PUBLIC

ALASKA RETIREMENT MANAGEMENT BOARD

MARCH
16-17, 2023

Alaska Retirement Management Board

Board of Trustees Meeting

Thursday, March 16, 2023

Location:	State Office Building Department of Administration Large Conference Room, 10th Floor 333 Willoughby Ave., Juneau, AK	**Teleconference:**	**Call-In #:** 1-907-202-7104 **Code:** 833 924 854#

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. Callers may need to press *6 to unmute.)*

VI. **Approval of Minutes – December 1-2, 2022**

VII. **9:15 AM** **Staff Reports**

A. Liaison Report

1. Disclosures Report
2. Communication Report
3. Meeting Calendars
4. Contract Review & Deadlines Timeline

Alysia Jones, Board Liaison

B. Fund Financial Presentation

Ryan Kauzlarich, Assistant Comptroller, Division of Treasury
Kevin Worley, Chief Financial Officer, Division of Retirement & Benefits

C. Retirement & Benefits Division Report

1. Legislative Update
2. Buck Consulting Invoices
3. Member Statistics
4. BEARS Project Update

Ajay Desai, Director, Division of Retirement & Benefits
Kevin Worley, Chief Financial Officer, Division of Retirement & Benefits
Kris Humbert, Business Integration Officer, Division of Retirement & Benefits

D. Treasury Division Report

Pamela Leary, Director, Division of Treasury

E. CIO Report

Zachary Hanna, Chief Investment Officer

F. Legal Report
Ben Hofmeister, Assistant Attorney General, Department of Law

VIII. 9:45 AM Trustee Reports

A. Chair Report, *Bob Williams*

B. Committee Reports

1. Audit Committee, *Michael Williams, Chair*
2. DC Plan Committee, *Bob Williams, Chair*
3. Actuarial Committee, *Allen Hippler, Chair*
4. Operations Committee, *Dennis Moen, Chair*
   Action: *General Consultant Contract - Callan LLC 2nd (of 2) Optional Renewal*
   Action: *Real Assets Consultant Contract - Callan LLC 2nd (of 2) Optional Renewal*
5. Alaska Retiree Health Plan Advisory Board, *Lorne Bretz, ARMB Member*

IX. 10:05 AM Managed Accounts Discussion
Marybeth Daubenspeck, Vice President, Government Markets, Empower
Liz Davidsen, State Director, Empower

X. 10:20 AM Managed Account Analysis
Bob Williams, ARMB Chair
Action: *Managed Account Analysis*

BREAK @ 10:25 am (10 MINUTES)

XI. 10:35 AM Presentations

10:35 – 10:40 **A. Buck / Gallagher Announcement**
Tonya Manning, US Wealth Practice Leader & Chief Actuary, Buck

10:40 – 10:50 **B. Draft June 30, 2022 Actuarial Reports**
David Kershner, Principal, Consulting Actuary, Buck
Stephen Oates, Principal, Health Actuary, Buck

10:50 – 11:05 **C. Actuarial Review of June 30, 2022 Valuations**
Paul Wood, Actuary, Senior Consultant & Team Leader, GRS
Bill Detweiler, Consultant, GRS

11:05– 12:00 **D. Performance Measurement – 4th Quarter**
Steve Center, Senior Vice President, Callan
Ivan (Butch) Cliff, Executive Vice President and Director of Research, Callan

LUNCH @ 12:00 pm (75 MINUTES)

1:15 – 1:55 **E. Public Equity**
Mark Moon, State Investment Officer

1:55 – 2:25 **F. Acadian Asset Management**
Ryan Taliaferro, Senior Vice President, Equity Strategies
Renee Hoffman, Senior Vice President, Senior Consultant Relation Officer

2:25 – 2:55 **G. First Eagle Investments**
Chad Gross, Head of North American Institutional Business Development
Alan Barr, Portfolio Manager

BREAK @ 2:55 pm (10 MINUTES)

3:05 – 3:35 **H. Legal & General Investment Management America**
David Barron, Head of US Equity Solutions
Melissa Ruffel, Client Strategist, LGIM America

3:35 – 4:05 **I. Investment Advisory Council Perspective**

XII. 4:05 PM Investment Actions

A. Hiring International Equity Manager – Acadian Asset Management
B. Hiring International Equity Manager – First Eagle Investments
C. Enhanced Indexing Mandate – LGIM America

NOTE: A blue box around presentation denotes educational session. All Times are approximate, every attempt will be made to stay on schedule; however, adjustments may be made.

Alaska Retirement Management Board

Board of Trustees Meeting

Friday, March 17, 2023

Location:	State Office Building Department of Administration Large Conference Room, 10th Floor 333 Willoughby Ave., Juneau, AK	**Via Computer or Mobile App** **Teleconference:**	**Meeting ID:** 235 027 263 290 **Passcode:** ADM6Az **Call-In #:** 1-907-202-7104 **Code:** 232 110 811#

XIII. 9:00 AM Presentations Continued

9:00 – 10:00 **A. JP Morgan Guide to Markets**
David Lebovitz, Managing Director

10:00 – 10:40 **B. Fixed Income**
Victor Djajalie, State Investment Officer
Casey Colton, State Investment Officer
Action: *Resolution 2023-01 Domestic Fixed Income Guidelines*

BREAK @ 10:40 am (10 MINUTES)

10:50 – 11:30 **C. Fidelity Tactical Bond**
Jeffrey Moore, Portfolio Manager
Michael Plage, Portfolio Manager
Beau Coash, Institutional Portfolio Manger
Kristin Shofner, Senior Vice President, Business Development

11:30 – 12:15 ***TRUSTEE TOUR OF OFFICES*** *- The ARMB Trustees, IAC members, & other guests will tour staff offices with Department of Revenue – Treasury Division and Department of Administration - Division of Retirement & Benefits*

LUNCH @ 12:15 pm (75 MINUTES)

1:30 – 2:00 **D. Risk Management**
Shane Carson, State Investment Officer

2:00 – 3:00 **E. Capital Market Assumptions**
Jay Kloepfer, Executive Vice President and Director, Capital Market Research
Adam Lozinski, Assistant Vice President, Capital Market Research

XIV. 3:00 PM Unfinished Business
XV. New Business
XVI. Other Matters to Properly Come Before the Board

XVII.		**Public/Member Comments** *(Three Minute Limit. Callers may need to press *6 to unmute.)*
XVIII.		**Investment Advisory Council Comments**
XIX.		**Trustee Comments**
XX.		**Future Agenda Items**
XXI.	**3:20 PM**	**Adjournment**

NOTE: A blue box around presentation denotes educational session. All Times are approximate, every attempt will be made to stay on schedule; however, adjustments may be made.

ALASKA RETIREMENT MANAGEMENT BOARD
BOARD OF TRUSTEES MEETING
HYBRID/TEAMS

December 1 & 2, 2022
9:00 a.m.

Originating at:
Atwood Conference Center
550 West 7th Avenue, 1st Floor
Anchorage, Alaska 99501

Trustees Present:
Bob Williams, Chair
Sandra Ryan *(12/01/2022 only)*
Mike Williams
Allen Hippler
Commissioner Paula Vrana
Donald Krohn
Dennis Moen
Lorne Bretz
Commissioner Adam Crum

Department of Revenue Staff Present:
Zach Hanna, Chief Investment Officer
Scott Jones, Investment Operations, Performance & Analytics
Shane Carson, State Investment Officer
Cahal Morehouse, State Investment Officer
Sean Howard, State Investment Officer
Grant Ficek, Business Analyst
Pamela Leary, Director, Treasury Division
Sam Hobbs, Accountant
Ryan Kauzlarich, Assistant Comptroller
Victor Djajalie, State Investment Officer
Hunter Romberg, Sr. Compliance Officer
Leighan Gonzales, Executive Assistant
Alysia Jones, Board Liaison

Department of Law Staff Present:
Ben Hofmeister, Assistant Attorney General

Investment Advisory Council Present:
Dr. William W. Jennings
Ruth Ryerson
Dr. Jerrold Mitchell

Department of Administration – Division of Retirement & Benefits Staff Present:
Ajay Desai, Director
Kevin Worley, Chief Financial Officer
Roberto Aceveda, Education & Counseling Manager
Jim Puckett, Chief Pension Officer
Christina Maiquis, Accountant 5
Nimeri Denis, Audit & Review Analyst 2
Bill Smith, State Chief Information Officer (OIT-Lead Management)
Brad Ewing, Chief Operating Officer (DSS Management)

Buck:
David Kershner, Principal, Consulting Actuary
Stephen Oates, Principal, Health Actuary

GRS:
Paul Wood, Actuary, Senior Consultant & Team Leader
Bill Detweiler, Consultant

KPMG:
Elizabeth Stuart, Audit Partner
Melissa Beedle, Audit Manager

Callan:
Steve Center, Senior Vice President
Paul Erlendson, Senior Vice President
Ivan "Butch" Cliff, Executive Vice President, Director of Research
Ashley Kahn, Vice President

Guests/ Presenters:
Matthew Smith, Managing Director, Abbott
Young Lee, Managing Director, Abbott
Matthew Barrett, Partner Glendon Capital
Alyssa Ellard, Glendon Capital
Mark Breunig, Alaska Cyber Coordinator, CISA
Chris Letterman, Chief Information Security Officer, Department of Administration
Henry McVey, Partner and Head of Global Macro, Balance Sheet, and Risk, KKR
Anthony Hass, KKR
Canyon Lew, Managing Director, Pathway Capital Management
Wyatt Geiger, Senior Vice President, Pathway Capital Management
Jesse Feldman, General Partner, Battery/Ventures
Karen Bommart, IR Partner, Battery Ventures
Erika Klein, Battery Ventures
Stephen Jeschke, Managing Director, GTCR

Public Present:
Tom Klaameyer, NEA Alaska President
Elaine Schroeder, 350Juneau
Randal Burns, RPEA President
Richard Farnell, 350Juneau
John Hudson, 350Juneau
Jim Simard, 350Juneau

PROCEEDINGS

CALL TO ORDER
CHAIR BOB WILLIAMS called the Alaska Retirement Management Board meeting to order, welcomed Commissioner Crum and asked for a roll call.

MS. JONES called the roll.

PUBLIC MEETING NOTICE
CHAIR BOB WILLIAMS asked if the public notice requirements were met for this meeting.

MS. JONES replied, yes, they had.

APPROVAL OF AGENDA
CHAIR BOB WILLIAMS stated that the agenda was before the Board and asked for a motion to approve.

TRUSTEE MOEN pointed out that the agenda shows two action items under the Operations Committee report, but there are actually three action items.

> **MOTION:** A motion to approve the agenda with that adjustment was made by TRUSTEE MIKE WILLIAMS; seconded by TRUSTEE KROHN.
>
> *There being no objection, the MOTION was APPROVED.*

PUBLIC/MEMBER PARTICIPATION, COMMUNICATIONS, AND APPEARANCES
CHAIR BOB WILLIAMS moved to the public member participation and had a list before him of people that had signed up. He reminded all of the three-minute time limit, and recognized Elaine Schroeder.

MS. SCHROEDER stated that she has lived in Juneau for over 40 years. She continued that there had been considerable controversy about the pros and cons of fossil fuels divestment. 350Juneau sent each trustee an AP article from the Juneau Empire about this subject. She added that she and three other 350Juneau board members would discuss the Board's fiduciary responsibility to conduct a climate risk assessment of ARMB investments, and to do so with full transparency.

CHAIR BOB WILLIAMS thanked Ms. Schroeder, and recognized Richard Farnell.

MR. FARNELL stated that he is a Board member of 350Juneau Climate Action for Alaska and is an active beneficiary of the PERS system. He continued that the fossil fuel industry faces an uncertain future, which poses a significant risk to investors. He added that the fiduciary responsibility of the ARMB, based on the State statute, is to all generations of Alaska public pension holders. It would be short-sighted to limit the bounds of fiduciary duty to only the near return projection of the principal and maximization of returns. 350Juneau members expect the ARMB to address the risk of continued investment in the traditional energy sector in light of the economic and societal upheaval that was forecasted to be the reality of climate chaos for the younger and future generations.

CHAIR BOB WILLIAMS thanked Mr. Farnell, and recognized John Hudson.

MR. HUDSON stated that he is a member of 350Juneau and Alaska PERS. According to the BlackRock analysis, divestment was prudent, actionable to implement, and a voice to the perils of stranded assets in a low-carbon economy. He continued that over 1500 institutions pledged to divest more than $40 trillion from fossil fuels; a 75,000-percent increase in committed assets in the last eight years. He thanked the Board for the opportunity to testify.

CHAIR BOB WILLIAMS thanked Mr. Hudson, and recognized Jim Simard.

MR. SIMARD stated that he lives in Juneau, is a beneficiary of the PERS system, and is a member of 350Juneau. He noted that the major oil producers continue to be targets of lawsuits brought by cities and states seeking huge settlements to help pay for damages attributable to climate disruption, and traceable to long-term burning of fossil fuels. The legal arguments rely heavily on evidence that the industry was aware decades ago of the environmental damage that would be caused over time by burning carbon-based fuels. He thanked the Board for their attention and for their good service.

CHAIR BOB WILLIAMS thanked Mr. Simard, and recognized Tom Klaameyer.

MR. KLAAMEYER stated that he is the NEA Alaska President. He thanked the Board for the opportunity for public comment. He continued, on the record, that there had been a series of e-mails back and forth between himself on behalf of members, the ARMB, Empower, and other members of the Department addressing concerns. He thanked everyone for the responsiveness responding to those concerns by the Board and staff, and to Empower for engaging in the discussions to address those concerns. He stated that there is continued concern on behalf of members for a description of the hybrid plan, and he asked the Board to continue the discussion as to whether or not that would be an appropriate characterization of the retirement system, which is leading to defined contribution. He added that the discussion of the term "hybrid" is less important than fixing the system to return to a defined benefit option. The system is not a hybrid system, and it needs a PR fix to stop referring to it as such.

CHAIR BOB WILLIAMS thanked Mr. Klaameyer and asked if there was anyone else in the room or online who would like to speak. There being no one, he concluded the public member participation, communications, and appearances time. He moved on to the minutes of September 15-16, 2022.

APPROVAL OF MINUTES - September 15-16, 2022
CHAIR BOB WILLIAMS asked for a motion to approve the minutes.

> **MOTION:** A motion was made to approve the minutes of the September 15-16, 2022, by TRUSTEE MOEN; seconded by TRUSTEE KROHN.
>
> *There being no objection, the MOTION was APPROVED.*

ELECTION OF OFFICERS

CHAIR BOB WILLIAMS moved to the election of officers. The officers on the Board were Chair, Vice Chair, and Secretary. He asked for a motion for nomination of officers.

> **MOTION:** TRUSTEE MIKE WILLIAMS nominated the current state of officers which were Bob Williams, Chair; Allen Hippler, Vice Chair; and Mike Williams, Secretary; seconded by TRUSTEE MOEN.

CHAIR BOB WILLIAMS asked for any discussion. He also asked if everyone was willing to continue to serve.

TRUSTEE HIPPLER replied yes.

TRUSTEE MIKE WILLIAMS replied yes.

CHAIR BOB WILLIAMS stated that he was also willing to continue. He asked for any other nominations. There being none, he asked for a roll-call vote.

> *After the roll-call vote, the MOTION was APPROVED. (Trustee Moen, yes; Trustee Ryan, yes; Commissioner Vrana, yes; Trustee Mike Williams, yes; Commissioner Crum, yes; Trustee Bretz, yes; Trustee Hippler, yes; Trustee Krohn, yes; Chair Bob Williams, yes.)*

TRUSTEE REPORTS

CHAIR REPORT

CHAIR BOB WILLIAMS reported that, since the last meeting, he had meetings around the agenda and the plans for this meeting with Director Desai, Director Leary, CIO Hanna, Chief Pension Officer Puckett, and Kevin Worley. He stated that there were also some meetings around the letter of concern from NEA Alaska. He met with Director Desai and Emily Ricci and the Governor's Teacher Retirement and Recruitment Task Force, which is now called the Alaska Teacher Retirement Improvement Task Force. There is a subcommittee on retirement, and he shared some information about what the ARMB does and how we are connected to retirement. It was a positive meeting. He concluded his report and moved to committee reports, beginning with the Audit Committee.

COMMITTEE REPORTS

AUDIT COMMITTEE REPORT

TRUSTEE MIKE WILLIAMS reported that the Audit Committee met on November 30, 2022. He stated that the audit report with KPMG was reviewed, and it expressed an unqualified opinion, commonly known as a clean opinion. We also discussed with the Division of Retirement and Benefit and Treasury Division minor improvements to streamline the process and to address certain challenges. He added that KPMG is on the agenda and would present the final audit report to the Board.

DEFINED CONTRIBUTION COMMITTEE REPORT

CHAIR BOB WILLIAMS stated that Callan did a presentation on DC plans investment structure best practices, a warmup presentation for the March structural analysis of the DC plans that they were committed to do. He continued that it was very informative and very constructive.

There was also an update from the Division of Retirement and Benefits given by Director Desai who explained why a two-year extension was done with the recordkeeping contract. A commitment to do an RFP at the end of that two-year contract was made. Also expressed was the need for some assistance through a consultant in that RFP process. Chief Pension Officer Puckett and Benefits and Counsel Manager Roberto Aceveda gave an update on some of their educational outreach. Empower had three agenda items: Fee transparency; response to the NEA Alaska quality concern letter; and managed accounts. There was also a discussion about whether members that have managed accounts were looked at, how the quality of that experience should be tested, and information was shared for how many members were in managed accounts. CFO Worley shared some information on PERS members that were not in SBS. It appeared that a lot of them are already in Social Security. There was also a Treasury update.

ACTUARIAL COMMITTEE REPORT

TRUSTEE HIPPLER stated that the Actuarial Committee met on November 30, 2022, and covered a few topics, although no formal actions were taken by the committee, nor were there any recommendations. He continued that GRS gave a presentation on normal cost with recommendations regarding risk matrices and risk tolerance regarding the funding of normal cost. This was a good discussion and would be helpful guiding the investigation of how to justify funding or not funding costs. There was a brief overview of inflation projections and a review of actuarial valuations with actuarial returns versus market returns were also discussed. There was a review of the impacts of the Inflation Reduction Act. He added that, going forward, there will be more discussion of risk profiles quantifying medical risk associated for cost funding using GRS's presentation as a counsel for guiding assets.

OPERATIONS COMMITTEE REPORT

TRUSTEE MOEN stated that Director Leary talked about the ongoing problem of recruitment and retention across the state, and that they were working together on improving skills. They also heard from the Middle Office, they moved databases and application servers to the Cloud. Network files have not been done yet. He continued that there were three action items. The first one was changing the timeframe for Dr. Jennings contract period; the second one was a request for services to solicit for an Investment Advisory Council member; and the third was a change to the language in the ARMB policy and procedures manual.

> **MOTION:** The Operations Committee recommended that the Alaska Retirement Management Board reappoint Dr. Jennings to the Investment Advisory Council and adjust the contract period from one year, July 1, 2023, to July 30, 2024, to maintain three members serving staggered three-year terms to keep the continuity of the IAC.

CHAIR BOB WILLIAMS stated that, since this is a motion coming from the Operations Committee, there is no need for a second. He asked for any discussion. He asked Dr. Jennings if he was willing to do this.

DR. JENNINGS replied that he looked forward to it.

CHAIR BOB WILLIAMS asked for a roll-call vote.

After the roll-call vote, the MOTION was APPROVED. (Trustee Hippler, yes;

Trustee Krohn, yes; Trustee Ryan, yes; Commissioner Vrana, yes; Commissioner Crum, yes; Trustee Bretz, yes; Trustee Mike Williams, yes; Trustee Moen, yes; Chair Bob Williams; yes.)

MOTION: The Operations Committee directed the Alaska Retirement and Management Board to advertise and solicit applications for persons interested in serving on the Investment Advisory Council.

CHAIR BOB WILLIAMS stated that the motion did not need a second and asked for any discussion. There being none, he asked for a roll-call vote.

After the roll-call vote, the MOTION was APPROVED. (Trustee Mike Williams, yes; Commissioner Vrana, yes; Trustee Bretz, yes; Commissioner Crum, yes; Trustee Hippler, yes; Trustee Krohn, yes; Trustee Moen; yes; Trustee Ryan, yes; Chair Bob Williams, yes.)

CHAIR BOB WILLIAMS stated that there would be a committee that would look at the IAC solicitation for the selection. He appointed four trustees to be on that committee: Trustee Mike Williams, Trustee Moen, Commissioner Crum, and himself. He moved to the third motion.

MOTION: The Operations Committee's third motion was a change to the Alaska Retirement Management Board Policies and Procedures Manual under the definition of "best run and managed": Best financial performance that achieved superior returns on a risk-adjusted basis relative to the ARMB's strategic asset allocation benchmark while considering total risk compared to that of the average public-sector plan over long term.

CHAIR BOB WILLIAMS stated that there was no need for a second. He commented that this one felt like there was a need for a change. Looking at the exact language could be viewed as limiting the fiduciary responsibility. This one looked like they were limited to what the average risk of a pool of plans were. He asked for a roll-call vote.

After the roll-call vote, the MOTION was APPROVED. (Trustee Bretz, yes; Commissioner Crum, yes; Trustee Hippler, yes; Trustee Krohn, yes; Trustee Moen, yes; Trustee Ryan, yes; Commissioner Vrana, yes; Trustee Mike Williams, yes; Chair Bob Williams, yes.)

TRUSTEE MOEN congratulated the re-elected officers and concluded the Operations Committee report.

ALASKA RETIREE HEALTH PLAN ADVISORY BOARD

CHAIR BOB WILLIAMS moved to the Alaska Retiree Health Plan Authority Board and stated that Trustee Bretz is the ARMB representative.

TRUSTEE BRETZ reported that the Advisory Board had met several times since the last meeting of the ARMB. He stated that plan utilization, trends, and legislation were discussed in-depth. He continued that two recommendations were made regarding gene-based, cellular, and innovative therapies, GCIT; and precertification penalty removal. Both of those items made things better for the members and had been looked at by actuaries to see how those changes

affected or will affect the plan as far as cost goes, which were deemed administrative in nature. He explained that for GCIT, it is focusing people in on a network. And that on average, the treatments in the network will end up saving 70 percent of the above-average wholesale price of applicable therapies. It would help members get the care they need and reduce the dangers of getting close to their lifetime limit of benefits. These therapies were very expensive, and there is a need to get them at the best price. He stated that the Division proposed to update the plans' precertification provision as outlined in a very detailed removal program proposal, and that was presented in September. The program proposal was evaluated by a certified Fellow of Society of Actuaries who found that the proposed changes were administrative in nature and anticipated increasing the plan costs by about $1 to 1.25 million, representing .15 to .2 percent of annual plan costs. He added that their next meeting is February 9th, and we would have another report at the March meeting.

CHAIR BOB WILLIAMS concluded the committee reports and moved to the KPMG Audit report with Audit Partner Elizabeth Stuart and Audit Manager Melissa Beedle.

KPMG AUDIT REPORT

MS. STUART stated that she is the audit partner with KPMG and also the managing partner of KPMG's Anchorage office. She introduced Melissa Beedle, the audit team manager, who has worked with the Board for quite a number of years. She added that they were both in Florida at training and were dialing in from the training facility. She continued that there was a summary presentation that gave an overview of the audit results in the Board packet. She stated that they met with the Audit Committee and went through that presentation in detail. She went through the overview slide which covered all of the audit results. She explained that there were no outstanding matters, and they issued the reports on the systems and plans as of October 15th. There were no challenges that caused delays in the issuance of the report. For the National Guard Plan, a qualified auditor's report was issued because they were unable to obtain sufficient audit evidence regarding their census data. For all of the other auditor's reports, an unmodified audit opinion was issued. That was the best audit opinion that can be received. She explained that it meant that based on following professional standards and the audit work performed, they were comfortable that the financial statements were materially correct for each of the systems and plans. The opinions expressed were consistent with the type of opinion expressed for the June 30, 2021, plans, with no changes in opinions. She stated that they did not identify any corrected misstatements that were reported in the financial statements, and they had no other matters that needed to be reported to the Audit Committee or Board of Trustees. She continued that the most significant estimate in the financial statements was the valuation of private investments and concluded that the value of the private markets reported were reasonably stated in correcting the financial statements.

MS. BEEDLE noted that the firm had been investing a lot in technology and data analysis which allowed them to provide more detail, more insights, and to focus the audit on riskier areas. They got to look at 100 percent of the data and were now analyzing 100 percent of the populations. For PERS, that was 63,000; and for TRS it was about 30,000 individuals. She talked about the census data for PERS which identified changes from last year to this year and allowed focus on what changed that was unexpected.

MS. STUART stated that one of the particular things focused on was an indication of the

potential of fraudulent distributions or large dollar amounts that would seem inconsistent with the plan documents.

CHAIR BOB WILLIAMS thanked them for their presentation, and recognized Alysia Jones for the Board Liaison Report.

STAFF REPORTS
BOARD LIAISON REPORT
MS. JONES stated that her report had the Third Quarter Disclosure Memorandum, Communications Memo, the 2023 Meeting Calendar, and the timeline. For the Third Quarter Disclosure Memorandum, no disclosure transaction required additional review or discussion. She continued that the fourth quarter ended 12/31, and that the deadline to submit disclosure forms for the current quarter was January 31st. She moved to the Communications Memorandum which included communications directed to and sent on behalf of the Board since the September meeting, as well as a summary of public-record requests received between September 1st and November 15th. The 2023 Meeting Calendar was approved by the Board at the June meeting and included in the packet, along with a timeline of the contract and review deadlines from FY23 to FY28. She noted that the timeline had been updated since the September meeting to reflect the changes that were made to align the IAC members' contracts to the fiscal year and account for Dr. Mitchell's upcoming retirement. She noted that the timeline also reflected the recordkeeping contract extension.

FUND FINANCIAL PRESENTATION
CHAIR BOB WILLIAMS moved on to the fund financial presentation by Assistant Comptroller Kauzlarich and Chief Financial Officer Worley.

MR. KAUZLARICH stated that the financial report for the period ending October 31, 2022, reported that the PERS assets were $21.8 billion; TRS assets were $10.2 billion; JRS assets were $262.3 million; NGNMRS assets were $42.2 million; SBS was $4.3 billion; Deferred Compensation was $1 billion; total nonparticipant-directed plans total $29.7 billion; and participant-directed plans totaled $7.9 billion. Total assets were $37.7 billion. He moved to the losses and added that all plans were within their asset allocation bands. He went through the updated figures as of November 29th and concluded this portion of the report.

MR. WORLEY stated that previously the Board requested a formal supplement for the Treasury Report showing the breakdown of cash receipts and cash disbursed during the same time period for the four months ending and presented that. Specifically of importance to the Board was the receipt of the State of Alaska annual additional State contributions for PERS, TRS, and the Judicial Retirement System. Those funds were received and recorded in July, and they are included in the year-to-date information. He added that the information could be found in the packet on Pages 82 to 84.

RETIREMENT & BENEFITS DIVISION REPORT
CHAIR BOB WILLIAMS recognized Director Desai.

DIRECTOR DESAI explained the recordkeeping contract extension. He noted that in May 2022, he had reported the potential of a one-year extension of the contract due to the BEARS go-live date conflicting with the key processes. He explained Empower provided proposals for two-

and three-year extensions that included a rate reduction and the decision was made to go with a two-year extension, as reported at the June 2022 meeting.

BUCK CONSULTING INVVOICES & MEMBER STATISTICS

MR. WORLEY noted the quarterly summaries of invoices for services, regular and non-regular, that were provided by Buck. Also reflected were the prior year's quarterly payment for comparative purposes. For the Member statistics report for the quarter ending September 30th, there was a decrease in active membership in PERS of 140 on the DB side, and an increase of 29 on the active side. Retires also increased 200 for PERS and 84 for TRS.

BEARS PROJECT UPDATE

DIRECTOR DESAI stated that the BEARS project was on target, on schedule, and was also under budget. They continue moving on to the next phase which was the members' portal. This is significant because it will create a lot of self-services for the membership.

TREASURY DIVISION REPORT

DIRECTOR LEARY stated that there was a great team in Treasury and that she did not have much to report. There was a discussion on improvement and retention in the Operations Committee, and noted the Division currently has a 20 percent vacancy. There were some recent hires. She welcomed Cahal Morehouse to the portfolio team, as well as Chris Madsen, the administrative operations manager, who is whipping the admin side into shape. She added that it is the time for budgets and the start of the Legislature, and we are starting to work through that process. The budget will come out in a few weeks.

CIO REPORT

CIO HANNA stated that this meeting would cover private equity in depth. Private equity has been a part of the ARMB portfolio for close to 25 years, and it is a large allocation, 14 percent of the portfolio. It has also been a top-performing asset class for a long time. He continued that the ARMB's private equity team put together a strong agenda including some points that should allow trustees to dig deeper into the asset class. He talked about the company FTX, a cryptocurrency exchange that was going through a well-publicized bankruptcy with allegations of malfeasance and fraud. He noted that staff had been very consistent in recommending the ARMB not invest directly in cryptocurrency for many reasons previously discussed. He stated that there is a higher level of risk associated with private equity and particularly with earlier stage venture capital. He added that the managers will monitor the situation and look to protect the interests to the extent they can. He moved to the quarter ending September 30th and stated that Callan would be covering that later. He also updated the Board on two investment manager searches that were underway and both progressing well. He talked about the five managers on watchlists: two for personnel turnover; two for performance. He stated that there were no recommended additions, but recommended that the fifth manager, Fidelity Signals be removed from the watchlist for personnel turnover and asked for a motion to that effect.

> **MOTION:** A motion to remove Fidelity Signals from the watchlist was made by COMMISSIONER CRUM; seconded by TRUSTEE MIKE WILLIAMS.
>
> *After the roll-call vote, the MOTION was APPROVED. (Trustee Krohn, yes; Trustee Moen, yes; Trustee Ryan, yes; Commissioner Vrana, yes; Trustee Bretz, yes;*

Trustee Hippler, yes; Trustee Mike Williams, yes; Chair Bob Williams, yes; Commissioner Crum, yes.)

CIO HANNA noted that the Real Estate High Income or REHI fund had improved performance to the point that they no longer qualify for the watchlist. However, staff would like to wait another quarter before making the recommendation for the removal to make sure that performance is persistent. There will be a full review of that strategy before making that recommendation. He discussed Section 3, the areas where he exercised CIO delegation from the Board for contracting. He then moved to the quarterly summary of portfolio rebalancing. He concluded his CIO report and noted that this was IAC Member Mitchell's third-to-last meeting and Paul Erlendson's last meeting, and that he looked forward to some insightful comments from both of them.

CHAIR BOB WILLIAMS thanked CIO Hanna and stated that Counsel Hofmeister with the legal report was next on the agenda.

LEGAL REPORT
MR. HOFMEISTER stated that he had nothing to report.

CHAIR BOB WILLIAMS called a 10-minute break.

(Break.)

CHAIR BOB WILLIAMS called the meeting back in session. He moved to the Summary of Preliminary 2022 Valuation Results and recognized David Kershner and Stephen Oates.

PRESENTATIONS
SUMMARY OF PRELIMINARY 2022 VALUATION RESULTS
MR. KERSHNER stated that the presentation started on Page 97. He covered the high-level results for the 6/30/22 actual valuations for PERS and TRS. He stated that assets performed below expectations relative to the assumed return that the Board has adopted, so that was a drain on the resources for the plans. He continued that pension liabilities were higher than expected because of proposed retirement pension adjustments increases tied to the consumer price index. Increases given to retirees were greater than expected, which increased the liabilities. Salary increases for the active members for both the PERS members as well as the teachers were higher than expected, which generated higher liabilities. He then went through the presentation in detail.

MR. OATES reviewed the healthcare gains in greater detail and added that a COVID adjustment to fiscal year'22 claims experience was not made.

PERFORMANCE MEASUREMENT – 3RD QUARTER
CHAIR BOB WILLIAMS moved to Performance Measurement and recognized Steve Center and Butch Cliff from Callan.

MR. CLIFF reported that the third quarter was the third consecutive quarter of the equity markets and bond markets drawing down simultaneously, and he went through the bad news. He added that through November 30th things got better. He moved to fixed income and talked about the

yield curve as a possible forecaster of an imminent recession. He continued that every recession was preceded by an inverted yield curve, but not every inverted yield curve resulted in recession.

MR. CENTER talked about the Self-Directed Plans with updates through November, but his numbers were through September. He began with the PERS DC plan with about $1.7 billion in assets. About 65 percent of the overall plan is invested in one of the asset allocation funds or multiple asset allocation funds. He talked about the Deferred Comp Plan, and continued through his presentation, explaining as he went along. He moved on to pension plans, explaining that the dashboard for the pension plans looked very strong. He commended CIO Hanna for making changes, the ceasing of the reinvestment of dividends, in particular, on the real asset side. He pointed out that the private equity portfolio is benchmarked to a blend of public equity indices and is one third each of the S&P 500, the Russell 2000, and the MSCI EAFE. That had been the historical benchmark for this asset class within the portfolio. The asset allocation differences have been measurable but has not had an overall impact. The biggest impact was that slight overweight to private equity. He continued on to the fixed income portfolio which performed extremely well relative to its benchmark, and he explained in more detail. He did point out that Callan's National Conference would be held in April in Scottsdale, Arizona, and invited all to attend.

CHAIR BOB WILLIAMS called a break for lunch.

(Lunch break.)

PRIVATE EQUITY ANNUAL PLAN

CHAIR BOB WILLIAMS called the meeting back to order and moved to the Private Equity Annual Plan with State Investment Officers Sean Howard and Cahal Morehouse.

MR. HOWARD stated that the ARMB has a full slate for the private equity presentation on the agenda, and he walked through what was to come. He continued that the purpose of this annual plan was to review ARMB's private equity program, as well as pacing, for the coming year. He began with a brief overview of private equity and talked about private equity structure. He stated that comparing private equity to other asset classes showed wide performance dispersion between funds and over vintage years. He asked Mr. Morehouse to continue.

MR. MOREHOUSE overviewed the private equity market and the portfolio's performance in the last years beginning with the trends over time, which gave a sense of both the growth and health in private markets. In looking at since-inception numbers, there is a sense of how much private equity impacted the fund's value. The portfolio outperformed public markets by over 5.5 percent, which is equivalent to $4.2 billion of additional fund value than if the investments were only in the public markets.

MR. HOWARD talked about cash flow, how the portfolio was positioned to move forward and last year's commitments. He stated that the commitments for 2022 were expected to be approximately $625 million. The year began with a target of $700 million, and we elected to slightly dial back commitments in the direct portfolio to maintain consistent commitment pacing going forward. He continued that a pacing model was used to guide commitment recommendations, and the purpose of this was to project forward commitments needed to achieve ARMB's targeted allocation to private equity. He added that the big challenge was the

current experience of a denominator effect in which there was a sharp decline in public markets this year without an equal decline in private markets. This resulted in an almost universal overweight to private equity among institutional investors. This was expected to self-correct over time with either public markets recovering or for private markets continuing to further decline in value in a lagged fashion. He stated that, in the coming year, he and Mr. Morehouse would evaluate the structure of the program to look for opportunities to drive performance and cost improvements, and he envisioned bringing back any potential recommendations to the Board this time next year. He added that there was an action item in the packet for consideration tomorrow to adopt this plan as presented.

CALLAN PRIVATE EQUITY MANAGER REVIEW

CHAIR BOB WILLIAMS asked Mr. Howard to introduce the next speaker.

MR. HOWARD stated that Ashley Kahn would be presenting on behalf of Callan's private markets group in reviewing the ARMB's private equity portfolio. She has been helpful in the quarterly pipeline calls in establishing new groups. She would also speak about the pacing model in further detail.

MS. KAHN stated that she is a private equity consultant with Callan and had been with them for eight years, based in the San Francisco office. She began with three key takeaways from the review: First was generating strong second quartile performance; second, all three managers are nicely diversified and have positively contributed to performance; and third, really strong distributions were received this year. She touched on Callan's pacing model assumptions that were leveraging a proprietary private equity pacing model for 30-plus years. The model was revamped in 2018 to improve precision by leveraging historical data to inform future cash flows. That has been used successfully across the client base for the last four or five years. She moved to the market trends and touched on valuations. She began the review and started with a history of the program in terms of the private equity target percentage which launched in 1998 with a 3 percent target and was up to 14 percent currently. She continued her presentation and broke down the program by manager and then touched on the performance of the total program. She explained in greater detail and answered questions along the way.

CHAIR BOB WILLIAMS called a five-minute break.

(Break.)

CHAIR BOB WILLIAMS called the meeting back to order and moved to a private equity presentation by Abbott Capital Management. He asked Mr. Howard to do the introductions.

ABBOTT CAPITAL MANAGEMENT

MR. HOWARD stated that Abbott had a long history with the ARMB dating back to 1998 as the original advisor for the Board in private equity investments. They managed the discretionary portfolio, primary, secondary and co-investments on the ARMB's behalf. He added that Matthew Smith and Young Lee were there to present.

MR. SMITH thanked all and stated appreciation for the opportunity to be there. He began with a quick overview of Abbott and the team, and then reviewed the portfolio with a specific emphasis

on commitment activity over the last several years, as well as cash flow activity. He stated that staff had asked them to provide a deeper dive into a specific topic area and selected valuation approaches and reporting in private equity. He thought that the process for valuation and reporting of private equity is different from a lot of other asset classes. He explained that Abbott understood the needs of investors like the ARMB and built the business around that specifically. He stated there are no outside owners or adjacent lines of business, and we are free from the conflicts that those things could sometimes present. He continued that they were completely focused on helping clients meet their private equity objectives, and that was done by reducing the complexities and the risks of investing in private equity and venture capital. The most customized solutions were separately managed accounts like the ARMB. The overall team was about 60 people led by ten managing directors that collectively own the business. He added that he joined the firm in 2000 and had been working with staff since his first day. He joined the firm as an associate and worked up through the ranks and became a partner in 2005. He recognized Mr. Lee.

MR. LEE stated that he joined the firm as an associate in 2007 and became a partner in 2015. He was pleased to be there to cover the ARMB portfolio which was an essential part of Abbott's investment activities. He explained that the firm is run by committees. Of the 60 people, 19 are investment professionals constantly on the hunt for the next great investment. Each member has a broad exposure to various strategies which leads to greater, stronger investment judgment by the firm, and no one particular strategy was dependent on a small subset of the people. He stated that the portfolio had been particularly strong over the past few years and added that the September marks should be close to the June marks, as many managers are holding evaluations flat in Q3.

MR. SMITH continued that since private equity was a self-liquidating asset class, there is a need to commit to new funds on a regular basis. For the record, the objective for 2022 was to commit $230 million in this part of the portfolio. Year to date, $225 million was committed to funds, to co-investments, and to secondaries. The balance of that may be committed before the end of the year, but no new primary funds would be committed before the end of the year. He stated that staff is reported to on a monthly basis.

MR. LEE discussed the net effect of all the valuation methods and the lag in reporting.

CHAIR BOB WILLIAMS thanked Mr. Smith and Mr. Lee for the presentation and the excellent long-term returns. He moved on to Special Situations with Glendon Capital, and asked Mr. Howard to do the introductions.

SPECIAL SITUATIONS – GLENDON CAPITAL

MR. HOWARD stated that Glendon is a distressed debt focus group in the Special Situations portfolio. Investing began in 2014, and he believed that they should offer somewhat of a differing perspective on the current market environment. Matthew Barrett would be presenting.

MR. BARRETT stated that he is a founder of Glendon Capital Management, a firm that specializes in distressed debt investing. He began with a brief history of the firm and distressed debt investing. He explained that the firm specialized in buying distressed debt, loans, or bonds at sizeable discounts. Distressed debt had been around for hundreds of years but has only been an asset class like bonds or equities or private equity for a few decades. He added that they had

$4 billion in assets under management in the strategy. He stated that COVID created a great opportunity as things were shut down with some great returns. Now it was a much more broad-based opportunity. He then discussed the asset class itself, the business of buying debt at a discount and realizing returns from working it out with a company, an entity that probably was not able to meet its original terms. He also went through the credit cycle of the economy and what drives default and opportunity. He then moved to the market environment for distressed debt investing, what the opportunities are, and today's conditions. He added that they did better in weaker times and were in the early stages of a credit cycle which would get broader and deeper. He continued that the economy would be slow, sluggish, and possibly in a recession. They would be seeing corporate profit recession over the near term, and the already high valuations will get increasingly more fragile, creating a great compulsion to sell among banks and bondholders. He noted that this asset class should be accessed at the right time, and he thought that it was a good time to access the asset class. He stated appreciation for the chance to share and also the partnership formed that was heading into the third fund.

CHAIR BOB WILLIAMS thanked Mr. Barrett and moved to the cybersecurity presentation.

CYBERSECURITY IN THE EXECUTIVE BRANCH

CHAIR BOB WILLIAMS moved to the last presentation for the day and asked Scott Jones to do the introductions.

MR. JONES stated that, as part of the ongoing efforts to aid the Board in fulfilling its fiduciary duty as it relates to information security, Chris Letterman, the chief information security officer in the State of Alaska, will do the presentation. He works for the Office of Information Technology within the Department of Administration, keeping both the Treasury Division and the Division of Retirement & Benefits safe. He continued that along with him was Mark Breunig, a former chief information security officer for the State of Alaska, who now works for the Department of Homeland Security as the Alaska cybersecurity coordinator for the Cybersecurity Infrastructure Security Agency (CISA).

MR. BREUNIG noted that CISA was the newest agency started in 2018 under the Department of Homeland Security, and their role was to be the nation's risk adviser. They work with partners to defend against today's threats, and they collaborate to build more secure and resilient infrastructure for the future. He continued that they work primarily with state, local, tribal, and territorial governments, as well as the private sector in critical infrastructure partners. They are a non-regulatory agency, and they do not have law enforcement powers. Their work is through partnerships and is all voluntary. He talked about the critical infrastructure sectors; there are 16 of them created by Presidential Policy Directive No. 21 in 2013. He talked about some of the threats and things being seen in the particular areas that were relevant to the ARMB and the State. He broke it down into two main categories: the nation-state actors, and the non-state actors. The nation-state actors were North Korea, China, Russia and Iran. The non-state actors are all motivated by financial gain. There are "hacktivists" who have an ideological motivation, as well as disgruntled employees. Internal threats were another sector.

MR. LETTERMAN stated that he functions as the chief information security officer. He worked in the office of OIT underneath the Chief Information Officer. He continued that cybersecurity is no longer just an IT issue. It is a whole of government and a whole of business problem. He went though some of the priorities that were being focused on for the organization. There are

three core tenets: First is security consolidation both from the perspective of consolidating the executive branch, centralized management of IT and centralizing all the functions that consolidate down to a limited number of security vendors and security solutions. The next tenet was enhancing the resilience and how to respond to incidents from an organizational perspective. The third piece, under workforce and conditional access, is that identity is the key to security. He explained that a lot of the cyber threat actors were now going after the identity of the user because from that they can launch attacks and are more difficult to discover in an organization. There is a lot of focus on protecting the identity of users. He stated that his goal as an organization was to mature to the point of protecting data no matter where it is.

CHAIR BOB WILLIAMS thanked him for the presentation and adjourned for the day.

(Alaska Retirement Management Board of Trustees meeting recessed at 4:50 p.m.)

December 2, 2022

CALL TO ORDER
CHAIR BOB WILLIAMS called the meeting back to order. He thanked Commissioner Crum for joining many of the committee meetings and, after consultation, he formally appointed him to the Actuarial Committee. He continued with the agenda, recognizing CIO Hanna for an introduction to macroeconomics.

MACRO ECONOMICS & PRIVATE EQUITY
CIO HANNA introduced Henry McVey from KKR who would be discussing the economic environment from his vantage point as the chief investment officer for the balance sheet of one of the world's largest private equity firms. He stated that Mr. McVey oversees firmwide risk for KKR and had held previous senior roles at Morgan Stanley and Fortress Investment Group. He continued that Mr. McVey's team had a very thoughtful approach to the market, and he welcomed him.

MR. McVEY stated that he had just returned from Asia and Europe and would try to tie in some of those views in his presentation. He continued that they own about 200 companies globally. He stated there are several important structural forces at work that warrant investor attention at this time of heightened uncertainty and that their work indicates that we are entering a new environment for investing. He talked about Europe feeling the impacts of a war; China easing; and Japan's rates essentially still at zero. Going into 2023, he called for an aggressive goods recession. An important insight is that we are moving from benign globalization to one great power competition and some form of deglobalization. The underlying mix was increasingly shifting towards inflation relative to real growth, with an expectation of more volatile inflation prints.

CHAIR BOB WILLIAMS thanked Mr. McVey and moved to Pathway Capital Management. He asked Mr. Howard to do the introduction.

PATHWAY CAPITAL MANAGEMENT
MR. HOWARD stated that the ARMB relationship with Pathway dates back about 20 years. Pathway manages a discretionary portfolio on behalf of the ARMB, investing in primary funds and co-investments. He welcomed Canyon Lew and Wyatt Geiger.

MR. LEW stated appreciation for the opportunity to provide an update on Pathway and the private equity portfolio. He stated that he was a managing director of the California office, and had been investing in private equity funds for the last 22 years; at Pathway for the last 18 years. He continued that, in addition to working with the ARMB, he co-heads the co-investment team and was also involved in the diligence of primary funds. He introduced Wyatt Geiger, a senior vice president, also in the California office, who joined Pathway in 2014. In addition to his investment duties, he leads the research function. He began with an update on Pathway and talked about the current market, both as it related to the private equity portfolio and the implications going forward. He also provided an update on the tactical plan, reviewed performance, diversification, and cash-flow activity. He concluded with a wrap-up of a comparison to benchmarks.

MR. GEIGER touched on the market environment and how that progressed over the course of the year, how it impacted the portfolio, and the expectations moving forward. He talked about the core reasons driving those things, and what needs to change. He stated that there was some uncertainty in the valuation environment, and the view would be some form of change or ongoing correction. Second, he pointed to the availability of debt financing for new buyout acquisitions. He continued that, relative to historical totals, there was fairly healthy activity in a functioning market. He noted that those levels continued to decline in the third and fourth quarters, but it was an active year for the portfolio. He continued that they were very confident in the outlook for the portfolio, and that there could be an interesting opportunity, once the market stabilizes, to deploy capital in a very different environment at different valuation levels than had been seen for much of the past decade.

MR. LEW added that a lot of dollars went out at pretty high valuations in 2021. From a math perspective, it suggests that it will not be a blockbuster vintage year. He thought that it was different from the period leading into the GFC, which had a lot of managers that kind of stretched themselves, went beyond their core competencies, and took a lot more risks. He moved to the portfolio update and pointed out that, historically, some of the strongest outperformances of the public markets were during periods of economic weakness.

MR. GEIGER moved to the summary of the portfolio's total performance and how that had changed over the past year.

MR. LEW stated that the final slide presented returns across a range of time horizons and provided a comparison of the 10-year and since-inception performance for public and private benchmarks.

CHAIR BOB WILLIAMS thanked them both for their presentation and called a 10-minute break.

(Break.)

VENTURE CAPITAL – BATTERY VENTURES

CHAIR BOB WILLIAMS called the meeting back into session and moved to Venture Capital with Battery Ventures. He asked Mr. Howard to do the introductions.

MR. HOWARD stated that Battery is a venture capital group that invests across stages and regions with a focus on technology and technology-related markets. He continued that the ARMB has had numerous investments with Battery dating back to 2005. He introduced Karen Bommart and Jesse Feldman.

MR. FELDMAN stated that he is a general partner at Battery, based in the Boston office. He joined the firm in 2005 as a senior associate and focuses on industrial, tech, and the life science tools markets. He also serves on Battery's executive committee.

MS. BOMMART stated that she heads up investor relations for Battery. She also joined the firm in 2005.

MR. FELDMAN began with a quick overview of the firm which was coming up on their 40th anniversary and stated that they had remained dedicated to investing in the technology markets. As a result of this product market focus, they end up being stage-agnostic investors. He continued that about a third of their capital goes into early-stage investment; a third goes into growth-stage investment; and a third goes into control deals. He added that they do not have hard and fast allocations at a fund level; the framework is based on the individual investors around the table. Each have particular markets and particular predispositions to stages that they invest in. There is a large and stable investment team, and they promote and grow from within. He talked about Battery's investment strategy, which was stage diversification. It was the outcome of market-based investing. Value and valuation were very specific to the deal type and the approach, and, in all cases, discipline was found to be a very important part of driving very consistent and repeatable performance across these different strategies. All the companies in a portfolio are reviewed quarterly, and the last important part of the portfolio was the management of exit. There is a standing exit committee with three general partners that review all decisions about exits. He moved to the themes that were being actively pursued. The first was future at work, looking at the new approaches to how workforces engage; second was artificial intelligence and machine learning and the infrastructure enabling these technologies with the need to measure and monitor climate change as a challenging theme; and the last was supply-chain logistics. Those were all examples of long-term macro themes. He added that they look for companies that have the best products to address these future needs. He moved to Battery XIV and talked about this $3.25 billion fund and how it was shaping up. He personally worked on Titian, a software business based in London that manages chemical and biological samples in pharmaceutical and life sciences research, a very interesting and compelling ecosystem. He explained its operating metrics.

MR. HOWARD noted that the ARMB had committed about $121 million since the first investment with Battery.

CHAIR BOB WILLIAMS thanked Mr. Feldman and Ms. Bommart for their presentation. He moved to GTCR, and asked Mr. Howard to do the introduction.

BUYOUT – GTCR

MR. HOWARD stated that GTCR is a growth-oriented middle-market group focused on financial services and TMT (meaning technology, media, and telecom), healthcare, and business consumer services. He introduced Stephen Jeschke.

MR. JESCHKE thanked all for the long partnership with GTCR. The ARMB has been investors and partners for over 20 years. The total from Fund VIII to Fund XIII invested was about $90 million over a period of time. He stated that they were in the midst of fundraising for Fund XIV, with a target of $9.25 billion. He noted that the firm was founded in 1980 and was one of the oldest private-equity firms in the country. They fundamentally believe that businesses are all about people. Their best opportunities were to take the capital search for industry-leading executives in spaces to focus and match and bring people together to create great companies. He continued that they focus on four domains: Tech, media, telecom, and network infrastructure; fintech and financial software; healthcare; and business and consumer services. A lot of very deep, proactive industry research, understanding those sectors and what was going on in the trends was done with more time focused on meeting great executives in each of those sectors. When partnering with those executives, they look to buy companies where there was an opportunity to execute significant transformation through the capital and their leadership expertise. He noted that transformation did not mean turnaround. He talked briefly about how the cost and availability of debt impacts the strategy and the capital stack of the portfolio companies. They make sure that every company has ample liquidity to not inhibit the ability to grow because of rising rate costs.

CHAIR BOB WILLIAMS thanked Mr. Jeschke for his presentation and moved to investment actions.

INVESTMENT ACTIONS

MR. HOWARD stated that this was an action item to adopt Resolution 2022-16, which approves staff's private equity annual tactical plan, which we presented with Callan yesterday. He continued that the main component of this plan was to set forth commitment pacing targets for the coming years, starting at $700 million in 2023, and growing over time to achieve a private equity allocation of 14 percent. He reminded the Board that this is something that is revisited once a year. The main component to focus on is that it is the commitment target for next year.

CHAIR BOB WILLIAMS asked for a motion.

> **MOTION:** A motion for the Alaska Retirement Management Board to adopt Resolution 2022-16 approving the 2022 private equity annual tactical plan was made by TRUSTEE HIPPLER, seconded by TRUSTEE KROHN.
>
> *After the roll-call vote, the MOTION was APPROVED. (Commissioner Crum, yes; Trustee Moen, yes; Trustee Hippler, yes; Trustee Bretz, yes; Trustee Krohn, yes; Commissioner Vrana, yes; Trustee Mike Williams, yes; Chair Bob Williams, yes.)*

CIO HANNA stated that Paul Erlendson, who is retiring, is the key person for the Callan contract. He continued that staff is quite comfortable with the transition to Steve Center as the lead on this account. Butch Cliff is also on the account. It was a stable and well-announced transition that was done effectively. Action had to be taken in order to affect the transition. The recommendation is that Steve Center replace Paul Erlendson as the key person on the Callan account.

MOTION: A motion to recommend that the ARMB direct staff to amend Section 6 of the contract designating Steve Center as the key person was made by TRUSTEE MOEN; seconded by TRUSTEE KROHN.

After the roll-call vote, the MOTION was APPROVED. (Trustee Mike Williams, yes; Commissioner Vrana, yes; Trustee Moen, yes; Trustee Krohn, yes; Trustee Hippler, yes; Commissioner Crum, yes; Trustee Bretz, yes; Chair Bob Williams, yes.)

UNFINISHED BUSINESS

CHAIR BOB WILLIAMS asked for any new business to come before the Board. He asked for any other matters to properly come before the Board. He asked for any public member comments from people in the room or online. There being none, he moved to IAC comments.

INVESTMENT ADVISORY COUNCIL COMMENTS

MS. RYERSON stated that she used to work with Empower and they have an amazing amount of data that can be used. She continued that, in Wyoming, they had a modest fund benefit, plus Social Security. Deferred comp was the third leg because there was no COLA with the defined benefits. A lot of time was spent looking at the deferred comp plan as far as utilization of funds and how well people were diversified. She shared a couple of slides to show how they could be utilized. She added that this was used as education to the members to be age-appropriate with their equity allocations. There were a lot of people that needed some education in assets and how to allocate those assets. She suggested asking for anything needed from the record keeper that would help in making better decisions.

CHAIR BOB WILLIAMS commented on the slides and asked Ms. Jones if those slides could be shared with IAC members and trustees.

MS. JONES responded affirmatively and noted that they would be added to the final version of the board packet.

CIO HANNA stated that a part of what Callan would be giving in their investment structure analysis in March would be looking at this data from Empower and presenting it in some form.

MS. CENTER noted that that data had been received from Empower.

CHAIR BOB WILLIAMS recognized Dr. Jennings for his comments.

DR. JENNINGS commended Paul Erlendson on his professionalism and expressed his appreciation for his direct questions with the various presenters. He wished him and Becky happy time (foreign language spoken) which was Icelandic for grandma and grandpa. He continued that there was a good series of presentations and that eight related presentations in one meeting were better than those same presentations spread over the year. It enriches the understanding and helps to draw connections. The other scheduling comment was ironic that a cyber security presentation was scheduled on one of the shortest daylight days. He commented on private equity and commended staff on building a great program. He added that anything that was saved on fees means more money for beneficiaries.

DR. MITCHELL stated that sometimes "uneventful" is a good word in investing and in investment meetings. The last couple of days were uneventful, meaning there were no crises, no surprises, no particular problems, just smooth presentations, clear numbers, and good questions. He thought that the private equity program was in good shape, with contributions from all sides --- staff, consultants, managers, all working together in a collaborative way. The process was consistent, logical, and should be stuck with. He continued that he was not as optimistic about inflation as Callan or the US Consensus and welcomed the KKR assessment of inflation. He added that inflation is hard to control and would need action from Congress on spending reduction, which is probably not in the cards. He stated that it was a great pleasure to work with Paul Erlendson, who is a true professional and a really nice guy.

TRUSTEE COMMENTS

COMMISSIONER CRUM stated that the past three quarterly meetings had a new commissioner at each one. His goal was to be here in March. He commended staff and Ms. Jones on the program that was put together. It was very educational, and he really appreciated it. He added the ARMB was a well-run organization with fantastic consultants and side boards put in place with the advisory committees, as well as the trustee participation, and he was honored to be a part of it.

CHAIR BOB WILLIAMS echoed a warm welcome to Commissioner Crum and thanked staff for a well-organized agenda and presentations. There were some really high levels of expertise in the presenters, and we hit private equity really well. He offered best wishes to Mr. Erlendson on his future endeavors. He also looked forward to continuing the positive relationship with Steve Center and Butch Cliff. He thanked everyone for making this a strong board that is doing great things for the members, for the fund, and fulfilling fiduciary duties. He asked for any future agenda items. Hearing none, he asked for a motion for adjournment.

> **MOTION:** A motion to adjourn the meeting was made by TRUSTEE MIKE WILLIAMS; seconded by TRUSTEE KROHN.
>
> *There being no objection, the MOTION was APPROVED.*

(Alaska Retirement Management Board of Trustees meeting adjourned at 12:33 p.m.)

ALASKA RETIREMENT MANAGEMENT BOARD

STAFF REPORT

Disclosure – Communications – Calendar Update
March 16, 2023

The 4th Quarter Disclosure Memorandum is included in the packet; no disclosure transactions require additional review or discussion.

The Communications Memorandum lists communications directed to and sent on behalf of the Board since the December 1-2, 2022, Board of Trustees meeting, as well as a summary of public records requests received between November 16 – February 28, 2023.

The 2023 meeting calendar approved by the Board at the June meeting is attached, along with the proposed 2024 meeting calendar.

Additionally, a timeline showing contract and review deadlines for FY2023 through FY2028 is included for trustee reference.

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

To: ARMB Trustees
From: Alysia Jones
Date: February 22, 2023
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.

4th Quarter October 1, 2022 – December 31, 2022

Name	Position Title	Disclosure Type	Disclosure Date
Michelle Prebula	State Investment Officer	Equities	10/19/2022
Victor Djajalie	State Investment Officer	Equities	12/21/2022
Donald Krohn	ARMB Trustee	Options	12/31/2022
Hunter Romberg	Senior Investment Compliance Officer	Equities/Fixed Income	1/6/2023
Jerrold Mitchell	IAC Member	Equities	1/11/2023

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

To: ARMB Trustees
From: Alysia Jones
Date: February 28, 2023
Subject: Communications & Information Requests

Communications to Trustees
The following is a list of communications directed to the Board, that were received since the December 1-2, 2022 Board of Trustees meeting.

Name	Type	Date	Topic
Marnie Hartill	Email	4/19/2023	Concerns RE: Managed Accounts

Communications Sent on behalf of the Board
There are no communications to report.

Public Records Requests
From November 16, 2022 – February 28, 2023

Topics	# of Requests	Description
Investment Portfolio	14	Portfolio performance data, Investment pools, hedge funds/absolute return, real estate, and private debt, historical data
Proxy Voting	1	Policies and guidelines
Meeting Materials	2	Summary of Board Actions
Procurement / Contracts	2	Investment manager searches
Communications	1	Request for communications between Commissioner of Revenue and ARMB

ALASKA RETIREMENT MANAGEMENT BOARD
2023 Meeting Calendar

DATE	LOCATION	DESCRIPTION
March 15 Wednesday	Juneau, AK	Actuarial Committee Audit Committee Operations Committee Defined Contribution Plan Committee
March 16-17 Thursday-Friday	**Juneau, AK**	**Board of Trustees Meeting:** *Performance Measurement – 4th Quarter* *Buck Draft Actuarial Report/GRS Draft Actuary Certification* *Capital Markets – Asset Allocation* *Manager Presentations*
April 27* Thursday	Videoconference	Actuarial Committee *Follow-up/additional discussion/questions on valuations*
April 28* Friday	**Videoconference**	**Board of Trustees Meeting**
June 14 Wednesday	Anchorage, AK	Actuarial Committee Audit Committee Operations Committee Defined Contribution Plan Committee
June 15-16 Thursday - Friday	**Anchorage, AK**	**Board of Trustees Meeting:** *Final Actuary Reports/Adopt Valuation* *Adopt Asset Allocation* *Performance Measurement - 1st Quarter* *Manager Presentations*
September 13 Wednesday	Anchorage, AK	Actuarial Committee Audit Committee Operations Committee Defined Contribution Plan Committee
September 14-15 Thursday - Friday	**Anchorage, AK**	**Board of Trustees Meeting:** *Set Contribution Rates* *Audit Results/Assets – Auditor* *Approve Budget* *Performance Measurement – 2nd Quarter* *Real Estate Annual Plan* *Real Assets Evaluation – Callan LLC* *Manager Presentations*
October 10 Tuesday *(placeholder)*	Videoconference	Audit Committee
December 6 Wednesday	Anchorage, AK	Actuarial Committee Audit Committee Operations Committee Defined Contribution Plan Committee
December 7-8 Thursday-Friday	**Anchorage, AK**	**Board of Trustees Meeting:** *Audit Report - DRB Auditor* *Performance Measurement – 3rd Quarter* *Manager Review (Questionnaire)* *Private Equity Evaluation - Callan LLC* *Review Private Equity Annual Plan* *Cybersecurity* *Manager Presentations*

NOTE: Meeting locations and topics are subject to change.

**Meetings to be held as necessary*

Approved 6/16/2022

Proposed ARMB Meeting Calendar 2024

JANUARY

Su	Mo	Tu	We	Th	Fr	Sa
31	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31	1	2	3
4	5	6	7	8	9	10

FEBRUARY

Su	Mo	Tu	We	Th	Fr	Sa
28	29	30	31	1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	1	2
3	4	5	6	7	8	9

MARCH

Su	Mo	Tu	We	Th	Fr	Sa
25	26	27	28	29	1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31	1	2	3	4	5	6

APRIL

Su	Mo	Tu	We	Th	Fr	Sa
31	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	1	2	3	4
5	6	7	8	9	10	11

MAY

Su	Mo	Tu	We	Th	Fr	Sa
28	29	30	1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	1
2	3	4	5	6	7	8

JUNE

Su	Mo	Tu	We	Th	Fr	Sa
26	27	28	29	30	31	1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	1	2	3	4	5	6

JULY

Su	Mo	Tu	We	Th	Fr	Sa
30	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31	1	2	3
4	5	6	7	8	9	10

AUGUST

Su	Mo	Tu	We	Th	Fr	Sa
28	29	30	31	1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31
1	2	3	4	5	6	7

SEPTEMBER

Su	Mo	Tu	We	Th	Fr	Sa
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	1	2	3	4	5
6	7	8	9	10	11	12

OCTOBER

Su	Mo	Tu	We	Th	Fr	Sa
29	30	1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31	1	2
3	4	5	6	7	8	9

NOVEMBER

Su	Mo	Tu	We	Th	Fr	Sa
27	28	29	30	31	1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
1	2	3	4	5	6	7

DECEMBER

Su	Mo	Tu	We	Th	Fr	Sa
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31	1	2	3	4
5	6	7	8	9	10	11

KEY

	Proposed ARMB Meeting Dates
	Alternate Meeting Dates (Tu-Th)
	APFC Meetings
	State Holidays
	NCTR Conference
	Spring Breaks (3/11-15 Anc/Fai, 3/18-22 Jnu)
	Callan conference (April 8-10)
	External Meeting Material Deadline

ALASKA RETIREMENT MANAGEMENT BOARD
2024 DRAFT Meeting Calendar

DATE	LOCATION	DESCRIPTION
March 6 Wednesday	Juneau, AK	Audit Committee Defined Contribution Plan Committee Actuarial Committee Operations Committee
March 8 Thursday-Friday	**Juneau, AK**	**Board of Trustees Meeting:** *Performance Measurement – 4th Quarter* *Buck Draft Actuarial Report/GRS Draft Actuary Certification* *Capital Markets – Asset Allocation* *Manager Presentations (Emphasis on Public Investments - Fixed Income & Equities)*
April/May TBD*	Videoconference	Actuarial Committee *Follow-up/additional discussion/questions on valuations*
April/May TBD*	**Videoconference**	**Board of Trustees Meeting**
June 12 Wednesday	Anchorage, AK	Audit Committee Defined Contribution Plan Committee Actuarial Committee Operations Committee
June 13-14 Thursday - Friday	**Anchorage, AK**	**Board of Trustees Meeting:** *Final Actuary Reports/Adopt Valuation* *Adopt Asset Allocation* *Performance Measurement - 1st Quarter* *Manager Presentations (Emphasis on Multi-Asset & Asset Allocation)*
September 18 Wednesday	Anchorage, AK	Audit Committee Defined Contribution Plan Committee Actuarial Committee Operations Committee
September 19-20 Thursday - Friday	**Fairbanks, AK**	**Board of Trustees Meeting:** *Set Contribution Rates* *Audit Results/Assets – Auditor* *Approve Budget* *Performance Measurement – 2nd Quarter* *Real Estate Annual Plan* *Real Assets Evaluation – Callan LLC* *Manager Presentations (Emphasis on Real Assets)*
October TBD*	Videoconference	Audit Committee
December 4 Wednesday	Anchorage, AK	Audit Committee Defined Contribution Plan Committee Actuarial Committee Operations Committee
December 5-6 Thursday-Friday	**Anchorage, AK**	**Board of Trustees Meeting:** *Audit Report - DRB Auditor* *Performance Measurement – 3rd Quarter* *Manager Review (Questionnaire)* *Private Equity Evaluation - Callan LLC* *Review Private Equity Annual Plan* *Cybersecurity* *Manager Presentations (Emphasis on Private Equity)*

NOTE: Meeting locations and topics are subject to change.

**Meetings to be held as necessary*

Created: 2/21/2023

ARMB Timeline of Contract and Review Deadlines FY2023 - FY2028

FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Trustee Appointments/ Nominations for Terms Ending 3/01/2023 *Finance Officer - L. Bretz* *Public - A. Hippler*	**Trustee Appointments/ Nominations for Terms Ending 3/01/2024** *Public - D. Krohn* *PERS - D. Moen* *TRS - B. Williams*		**Trustee Appointments/ Nominations for Terms Ending 3/01/2026** *PERS - M. Williams* *TRS - S. Ryan*	**Trustee Appointments/ Nominations for Terms Ending 3/01/2027** *Finance Officer - TBD* *Public - TBD*	**Trustee Appointments/ Nominations for Terms Ending 3/01/2028** *Public - TBD* *PERS - TBD* *TRS - TBD*
IAC Appointments ***Seat 1*** *- R. Ryerson* Reappt. 2.5yr term Effective Date: 1/1/2023 - 6/30/2025 ***Seat 2*** *- J. Mitchell* RFS 3 yr term Effective Date: 7/01/2023 (FY24) ***Seat 3*** *- W. Jennings* Reappt. 1yr term Effective Date: 7/01/2023 (FY24)	**IAC Appointments** *Seat 3 - W. Jennings* March 2024 agenda Effective Date: 7/01/2024 (FY25)	**IAC Appointments** *Seat 1 - R. Ryerson* March 2025 agenda Effective Date: 7/01/2025 (FY26)	**IAC Appointments** *Seat 2 - TBD* March 2025 agenda Effective Date: 7/01/2026 (FY27)	**IAC Appointments** *Seat 3 - TBD* March 2027 agenda Effective Date: 7/01/2027 (FY28)	**IAC Appointments** *Seat 1 - TBD* March 2028 agenda Effective Date: 7/01/2028 (FY29)
Performance Measurement (General) Consultant Contract (TRSY) *2nd Renewal Option - Callan LLC* March 2023 agenda Effective Date: 7/01/2023 (FY24)	**Performance Measurement (General) Consultant Contract (TRSY)** *RFP - March 2024* Effective Date: 7/01/2024 (FY25)			**Performance Measurement - General Consultant Contract (TRSY)** *1st Renewal Option or RFP* - TBD March 2027 agenda Effective Date: 7/1/2027 (FY28)	**Performance Measurement - General Consultant Contract (TRSY)** *2nd Renewal Option or RFP* - TBD March 2028 agenda Effective Date: 7/1/2028 (FY29)
	Performance Consultant Review (TRSY) AS 37.10.220(a)(11) *RFP - March 2024* Presentation Sept 2024 (FY25)				**Performance Consultant Review (TRSY)** AS 37.10.220(a)(11) *RFP - March 2028* Presentation Sept 2028 (FY29)
Real Assets Consultant Contract (TRSY) *2nd Renewal Option -Callan LLC* March 2023 agenda Effective Date: 7/01/2023 (FY24)	**Real Assets Consultant Contract (TRSY)** *RFP - March 2024* Effective Date: 7/01/2024 (FY25)			**Real Assets Consultant Contract** *1st Renewal Option or RFP* - TBD March 2027 agenda Effective Date: 7/1/2027 (FY28)	**Real Assets Consultant Contract** *2nd Renewal Option or RFP* - TBD March 2028 agenda Effective Date: 7/1/2028 (FY29)
	Asset Liability Study (TRSY) *Recommendation: Every 5 years*				
Actuary Contract (DRB) AS 37.10.220(a)(8 & 9) *3yr Renewal Option - Buck* Effective Date: 7/01/2023 (FY24)			**Actuary Contract (DRB)** AS 37.10.220(a)(8 & 9) *2yr Renewal Option - Buck* Effective Date: 7/01/2026 (FY27)		**Actuary Contract (DRB)** AS 37.10.220(a)(8 & 9) *RFP* Effective Date: 7/01/2028 (FY29)
		Review Actuary Contract (TRSY) AS 37.10.220(a)(9) *2yr Renewal Option* March 2025 agenda Effective Date: 7/01/2025 (FY26)		**Review Actuary Contract (TRSY)** AS 37.10.220(a)(9) *2 yr Renewal Option* March 2027 *agenda* Effective Date: 7/01/2027 (FY28)	
		Actuarial Audit RFP (TRSY) AS 37.10.220(a)(10) RFP March 2025 Effective Date: 7/01/2025 (FY26)			**Actuarial Audit RFP (TRSY)** AS 37.10.220(a)(10) *2 yr Reneawal Option* Effective Date: 7/01/2028 (FY29)
Actuarial Valuations AS 37.10.220(a)(8)	**Actuarial Valuations** AS 37.10.220(a)(8)	**Actuarial Valuations** AS 37.10.220(a)(8)	**Actuarial Valuations** AS 37.10.220(a)(8)	**Actuarial Valuations** AS 37.10.220(a)(8)	**Actuarial Valuations** AS 37.10.220(a)(8)
		Actuarial Experience Analysis AS 37.10.220(a)(9)			**Actuarial Experience Analysis** AS 37.10.220(a)(9)
Recordkeeper RFP (DRB) *2 yr Extension Approved - Empower* Effective Date: 7/01/2023 (F24)		**Recordkeeper RFP (DRB)** *RFP* Effective Date: 7/01/2025 (FY26)			
	Auditor (DRB) *2nd Renewal Option - KPMG* Effective Date: 7/01/2024 (FY25)				**Auditor (DRB)** *RFP* Effective Date: 7/01/2028 (FY29)

Updated: 2/23/2023

ALASKA RETIREMENT MANAGEMENT BOARD

STAFF REPORT

Fund Financials – Cash Flow Report
March 15, 2023

Ryan Kauzlarich, Assistant State Comptroller, Department of Revenue

As of January 2023 month-end, total plan assets were as follows: PERS - $23.1 billion, TRS - $10.7 billion, JRS - $277.8 million, NGNMRS - $44.6 million, SBS - $4.6 billion, DCP - $1.1 billion. Total non-participant directed plans totaled $31.4 billion, and participant-directed plans totaled $8.5 billion. Total assets were $39.9 billion.

Year-to-date income was $1.9 billion, and the plans experienced a net withdrawal of $784.8 million. Total assets were down 5.53% year-to-date.

Internally managed assets totaled $15.1 billion.

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

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

Presented is the Division of Retirement and Benefits (DRB) Supplement to the Treasury Division's Financial Report as of January 31, 2023.

DRB's supplement report expands on the ARMB Financial Report column "Net Contributions (Withdrawals)" located on pages 1 and 2. DRB reports the summary totals of actual employee and employer, State of Alaska, and other revenue items, as well as benefit payments, refunds & disbursements, and combined administrative & investment expenditures. DRB's supplement report presents cash inflows and outflows for the 7-months ended January 31, 2023 (page 1) and for the month of January 2023 (page 2).

Also presented are participant-directed distributions by plan and by type for the 7-month period on page 3. This page includes Tier information on the defined benefit refunds, and vested percentage on defined contribution distributions.

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

ALASKA RETIREMENT MANAGEMENT BOARD
FINANCIAL REPORT

As of January 31, 2023

ALASKA RETIREMENT MANAGEMENT BOARD
Schedule of Investment Income and Changes in Invested Assets by Fund
Fiscal Year-to-Date through January 31, 2023

	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	$ 10,837,529,623	$ 477,820,622	$ (277,369,037)	$ 11,037,981,208	1.85%	4.47%
Retirement Health Care Trust	8,933,550,736	398,454,916	(276,034,396)	9,055,971,256	1.37%	4.53%
Total Defined Benefit Plans	19,771,080,359	876,275,538	(553,403,433)	20,093,952,464	1.63%	4.50%
Defined Contribution Plans:						
Participant Directed Retirement	1,797,124,735	141,070,944	51,851,351	1,990,047,030	10.74%	7.74%
Health Reimbursement Arrangement	689,783,476	32,754,398	29,067,794	751,605,668	8.96%	4.65%
Retiree Medical Plan	207,591,164	9,912,814	10,140,065	227,644,043	9.66%	4.66%
Defined Benefit Occupational Death and Disability:						
Public Employees	43,232,741	2,070,301	2,287,810	47,590,852	10.08%	4.67%
Police and Firefighters	18,163,141	864,064	758,235	19,785,440	8.93%	4.66%
Total Defined Contribution Plans	2,755,895,257	186,672,521	94,105,255	3,036,673,033	10.19%	6.66%
Total PERS	**22,526,975,616**	**1,062,948,059**	**(459,298,178)**	**23,130,625,497**	2.68%	4.77%
Teachers' Retirement System (TRS)						
Defined Benefit Plans:						
Retirement Trust	6,044,974,411	265,190,016	(191,322,629)	6,118,841,798	1.22%	4.46%
Retirement Health Care Trust	3,414,090,333	153,029,870	(84,678,745)	3,482,441,458	2.00%	4.54%
Total Defined Benefit Plans	9,459,064,744	418,219,886	(276,001,374)	9,601,283,256	1.50%	4.49%
Defined Contribution Plans:						
Participant Directed Retirement	742,357,878	60,243,600	15,689,937	818,291,415	10.23%	8.03%
Health Reimbursement Arrangement	200,887,593	9,471,362	6,709,933	217,068,888	8.05%	4.64%
Retiree Medical Plan	66,714,952	3,134,988	1,973,358	71,823,298	7.66%	4.63%
Defined Benefit Occupational Death and Disability	6,540,428	306,470	167,059	7,013,957	7.24%	4.63%
Total Defined Contribution Plans	1,016,500,851	73,156,420	24,540,287	1,114,197,558	9.61%	7.11%
Total TRS	**10,475,565,595**	**491,376,306**	**(251,461,087)**	**10,715,480,814**	2.29%	4.75%
Judicial Retirement System (JRS)						
Defined Benefit Plan Retirement Trust	226,351,741	10,218,442	(812,917)	235,757,266	4.16%	4.52%
Defined Benefit Retirement Health Care Trust	40,479,282	1,842,690	(243,517)	42,078,455	3.95%	4.57%
Total JRS	**266,831,023**	**12,061,132**	**(1,056,434)**	**277,835,721**	4.12%	4.53%
National Guard/Naval Militia Retirement System (MRS)						
Defined Benefit Plan Retirement Trust	44,237,906	1,639,976	(1,262,562)	44,615,320	0.85%	3.76%
Other Participant Directed Plans						
Supplemental Annuity Plan	4,412,830,900	260,048,436	(51,708,511)	4,621,170,825	4.72%	5.93%
Deferred Compensation Plan	1,052,309,932	67,364,372	(20,037,210)	1,099,637,094	4.50%	6.46%
Total All Funds	**38,778,750,972**	**1,895,438,281**	**(784,823,982)**	**39,889,365,271**		
Total Non-Participant Directed	30,774,127,527	1,366,710,929	(780,619,549)	31,360,218,907	1.90%	4.50%
Total Participant Directed	8,004,623,445	528,727,352	(4,204,433)	8,529,146,364	6.55%	6.61%
Total All Funds	**$ 38,778,750,972**	**$ 1,895,438,281**	**$ (784,823,982)**	**$ 39,889,365,271**	**2.86%**	**4.94%**

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://treasury.dor.alaska.gov/armb/Reports-and-Policies/Investment-Performance.aspx

ALASKA RETIREMENT MANAGEMENT BOARD
Schedule of Investment Income and Changes in Invested Assets by Fund
For the Month Ended January 31, 2023

	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	$ 10,647,724,480	$ 424,822,569	$ (34,565,841)	$ 11,037,981,208	3.67%	4.00%
Retirement Health Care Trust	8,749,376,098	350,190,778	(43,595,620)	9,055,971,256	3.50%	4.01%
Total Defined Benefit Plans	19,397,100,578	775,013,347	(78,161,461)	20,093,952,464	3.59%	4.00%
Defined Contribution Plans:						
Participant Directed Retirement	1,862,192,622	114,750,255	13,104,153	1,990,047,030	6.87%	6.14%
Health Reimbursement Arrangement	717,695,948	28,778,011	5,131,709	751,605,668	4.72%	4.00%
Retiree Medical Plan	217,165,350	8,708,973	1,769,720	227,644,043	4.83%	3.99%
Defined Benefit Occupational Death and Disability:						
Public Employees	45,369,797	1,819,731	401,324	47,590,852	4.90%	3.99%
Police and Firefighters	18,900,873	757,771	126,796	19,785,440	4.68%	4.00%
Total Defined Contribution Plans	2,861,324,590	154,814,741	20,533,702	3,036,673,033	6.13%	5.39%
Total PERS	**22,258,425,168**	**929,828,088**	**(57,627,759)**	**23,130,625,497**	3.92%	4.18%
Teachers' Retirement System (TRS)						
Defined Benefit Plans:						
Retirement Trust	5,920,804,813	236,112,406	(38,075,421)	6,118,841,798	3.34%	4.00%
Retirement Health Care Trust	3,360,740,781	134,538,076	(12,837,399)	3,482,441,458	3.62%	4.01%
Total Defined Benefit Plans	9,281,545,594	370,650,482	(50,912,820)	9,601,283,256	3.44%	4.00%
Defined Contribution Plans:						
Participant Directed Retirement	765,915,589	48,274,375	4,101,451	818,291,415	6.84%	6.29%
Health Reimbursement Arrangement	207,435,257	8,316,542	1,317,089	217,068,888	4.64%	4.00%
Retiree Medical Plan	68,713,390	2,754,423	355,485	71,823,298	4.53%	4.00%
Defined Benefit Occupational Death and Disability	6,717,360	269,238	27,359	7,013,957	4.42%	4.00%
Total Defined Contribution Plans	1,048,781,596	59,614,578	5,801,384	1,114,197,558	6.24%	5.67%
Total TRS	**10,330,327,190**	**430,265,060**	**(45,111,436)**	**10,715,480,814**	3.73%	4.17%
Judicial Retirement System (JRS)						
Defined Benefit Plan Retirement Trust	227,514,815	9,076,057	(833,606)	235,757,266	3.62%	4.00%
Defined Benefit Retirement Health Care Trust	40,510,133	1,622,280	(53,958)	42,078,455	3.87%	4.01%
Total JRS	**268,024,948**	**10,698,337**	**(887,564)**	**277,835,721**	3.66%	4.00%
National Guard/Naval Militia Retirement System (MRS)						
Defined Benefit Plan Retirement Trust	43,125,254	1,668,524	(178,458)	44,615,320	3.46%	3.88%
Other Participant Directed Plans						
Supplemental Annuity Plan	4,409,571,681	227,646,485	(16,047,341)	4,621,170,825	4.80%	5.17%
Deferred Compensation Plan	1,050,590,665	54,696,432	(5,650,003)	1,099,637,094	4.67%	5.22%
Total All Funds	**38,360,064,906**	**1,654,802,926**	**(125,502,561)**	**39,889,365,271**		
Total Non-Participant Directed	30,271,794,349	1,209,435,379	(121,010,821)	31,360,218,907	3.60%	4.00%
Total Participant Directed	8,088,270,557	445,367,547	(4,491,740)	8,529,146,364	5.45%	5.51%
Total All Funds	**$ 38,360,064,906**	**$ 1,654,802,926**	**$ (125,502,561)**	**$ 39,889,365,271**	**3.99%**	**4.32%**

Notes:

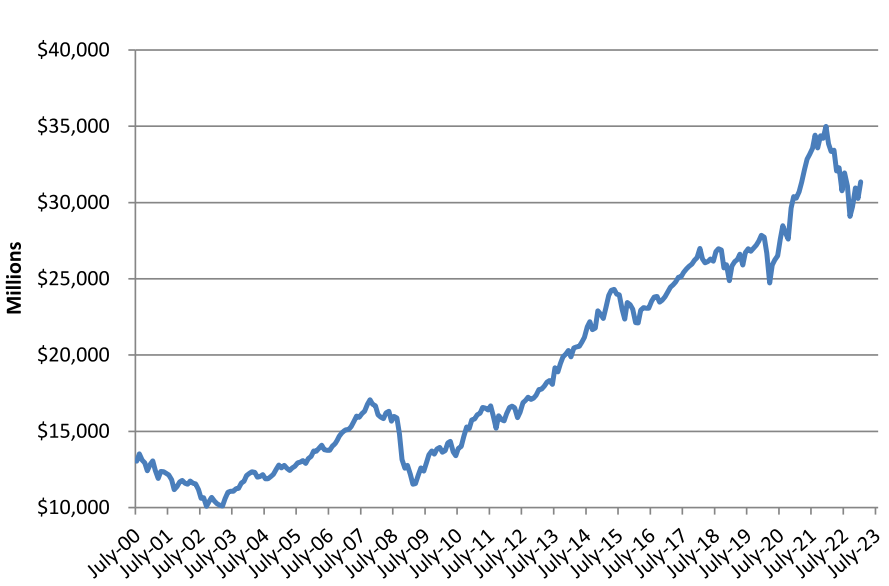
(1) Includes interest, dividends, securities lending, expenses, realized and unrealized gains/losses

(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://treasury.dor.alaska.gov/armb/Reports-and-Policies/Investment-Performance.aspx

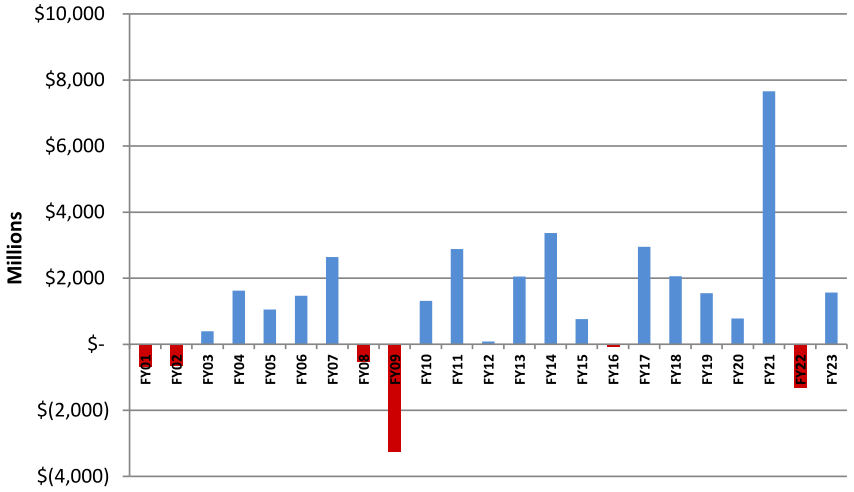
Total Non Participant Directed Assets

As of January 31, 2023

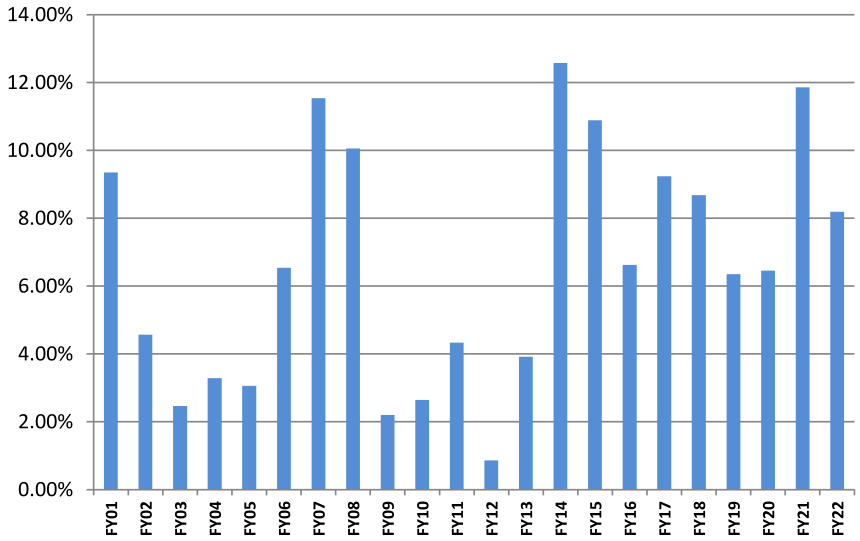
Total Assets History



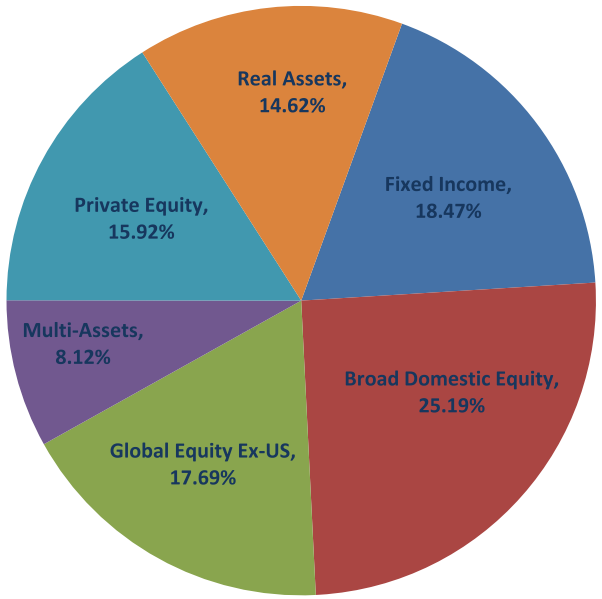
Income by Fiscal Year



5-year Annualized Returns as of Fiscal Year End



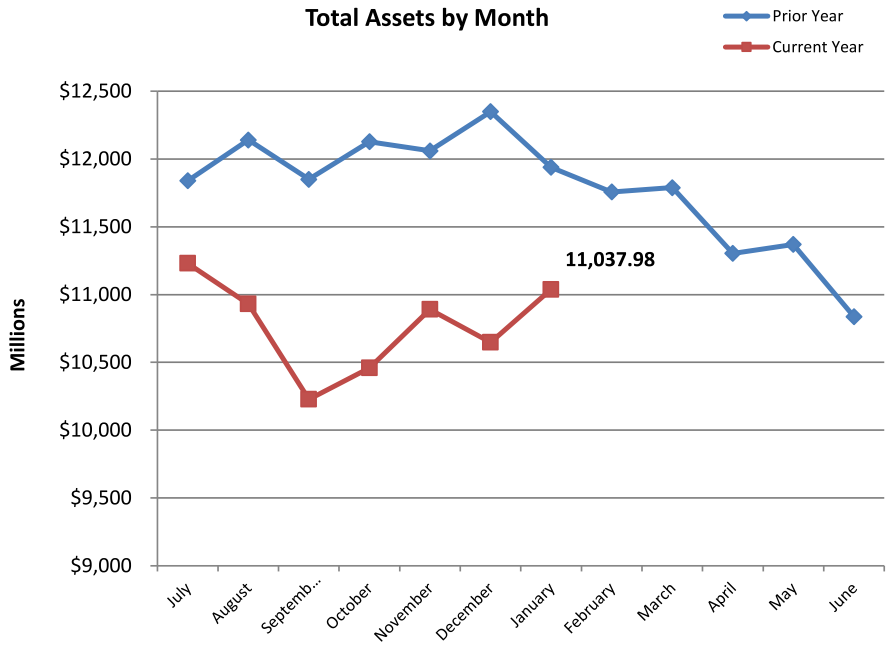
Actual Asset Allocation



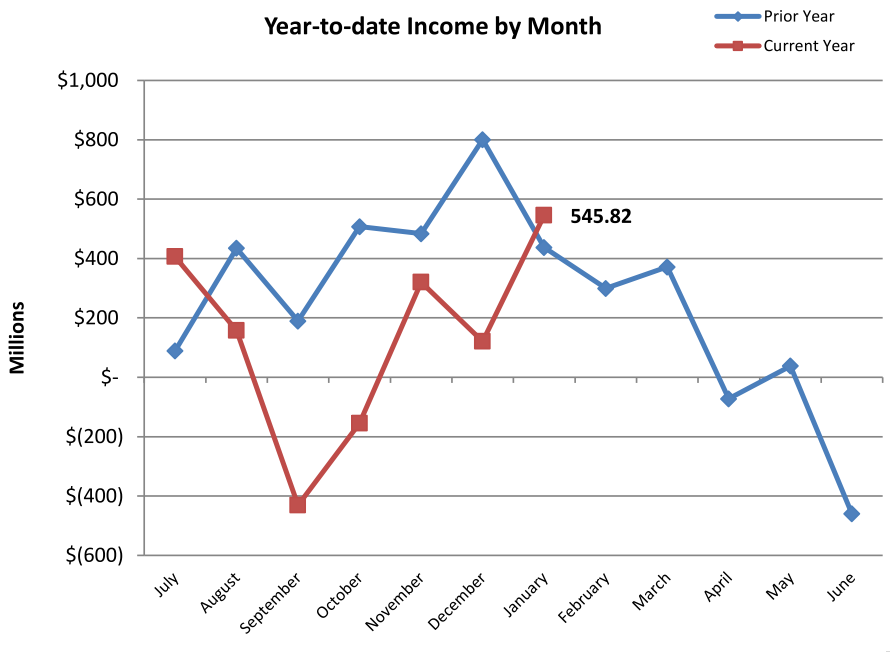
Public Employees' Retirement Pension Trust Fund

Fiscal Year-to-Date through January 31, 2023

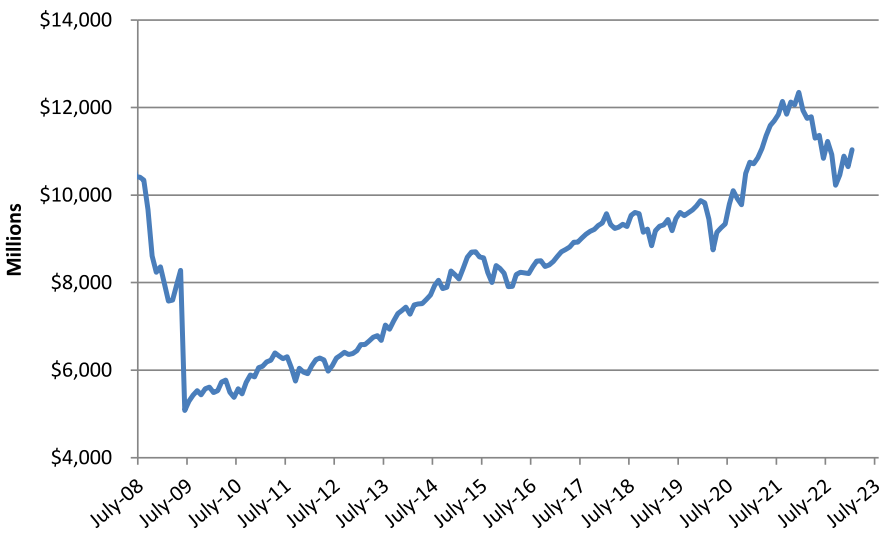
Total Assets by Month



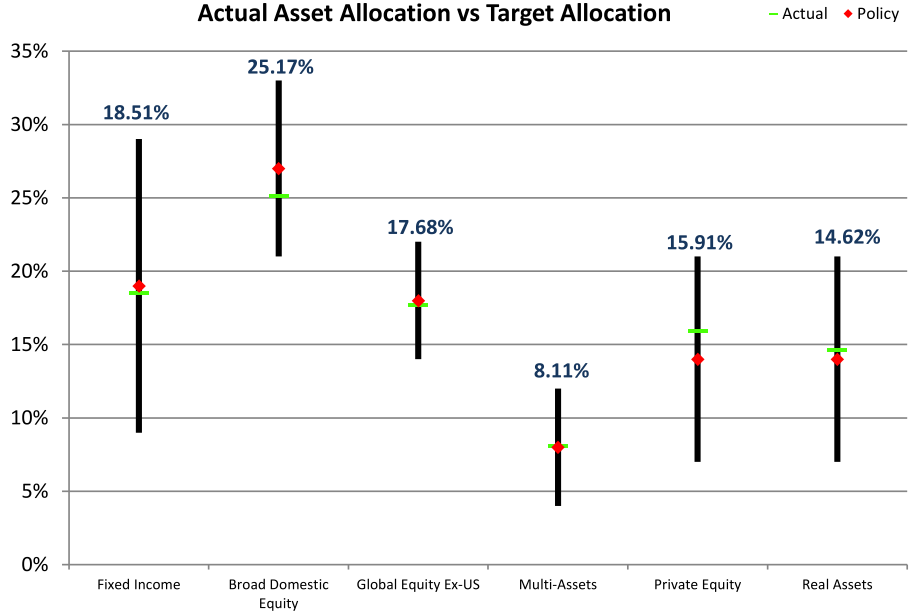
Year-to-date Income by Month



Total Assets History



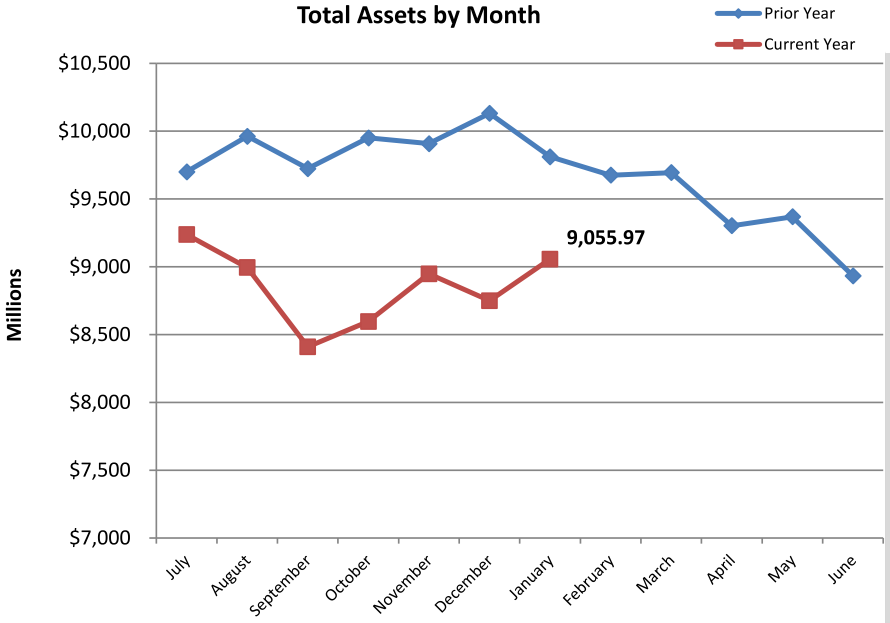
Actual Asset Allocation vs Target Allocation



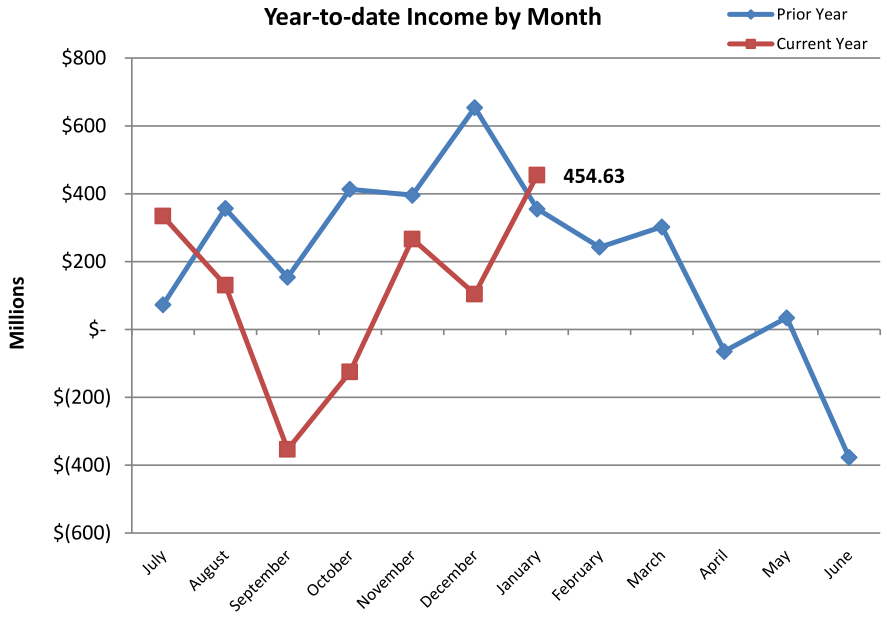
Public Employees' Retirement Health Care Trust Fund

Fiscal Year-to-Date through January 31, 2023

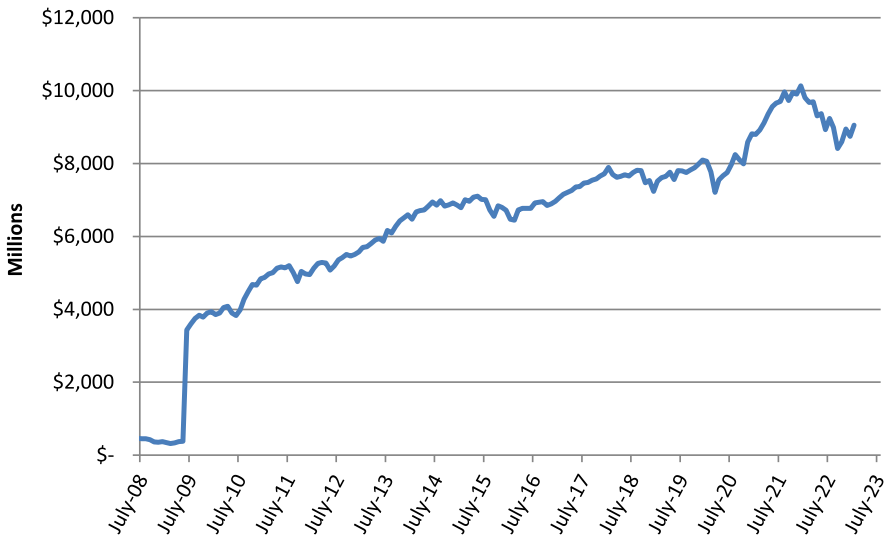
Total Assets by Month



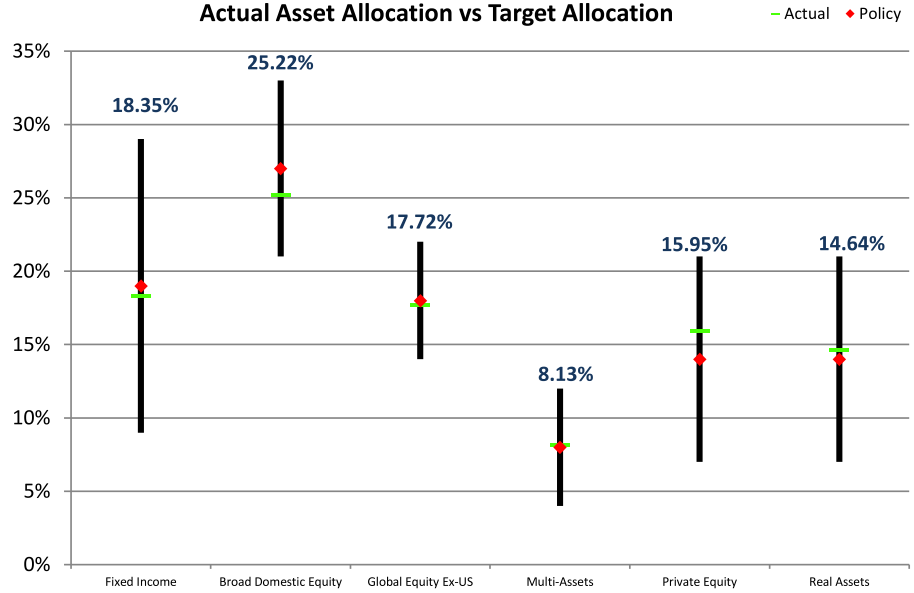
Year-to-date Income by Month



Total Assets History



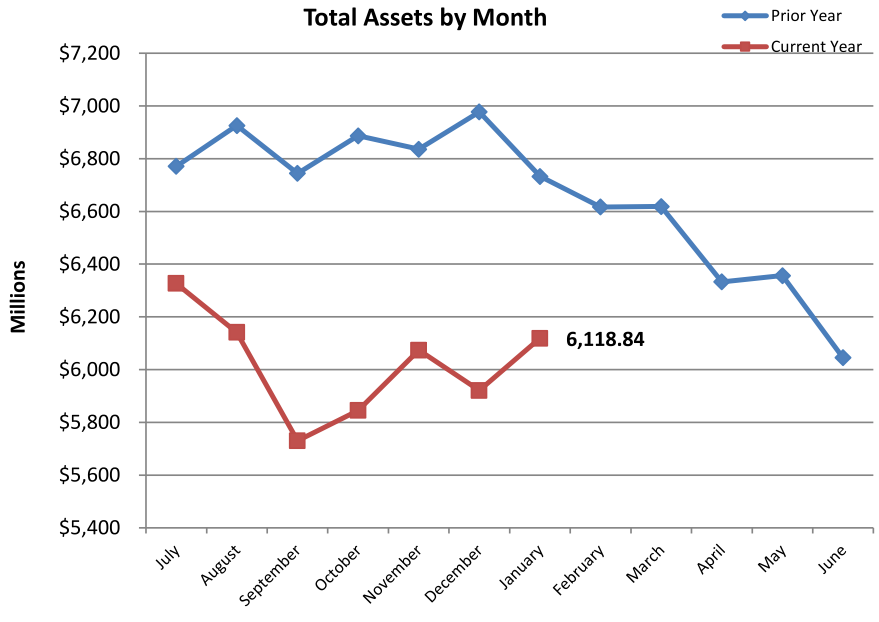
Actual Asset Allocation vs Target Allocation



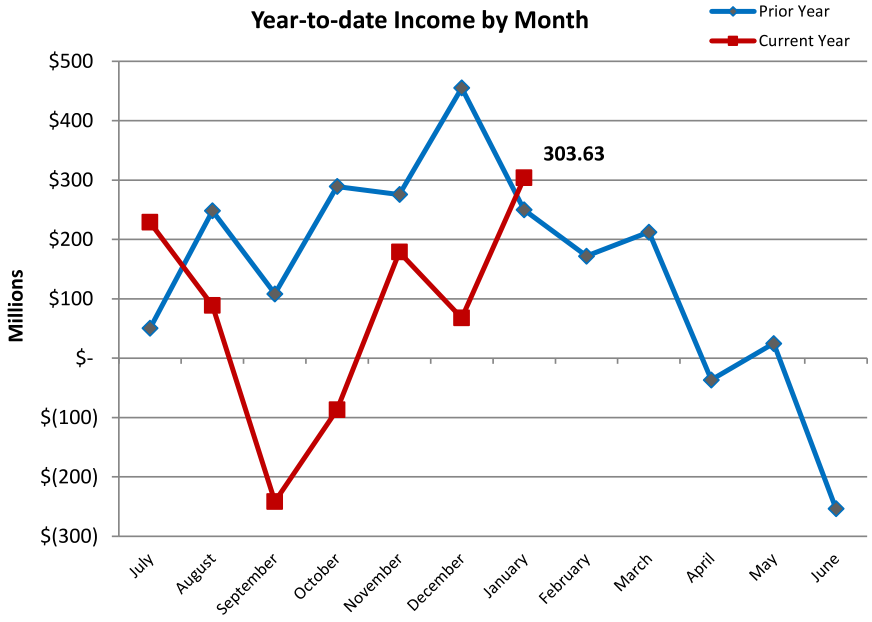
Teachers' Retirement Pension Trust Fund

Fiscal Year-to-Date through January 31, 2023

Total Assets by Month

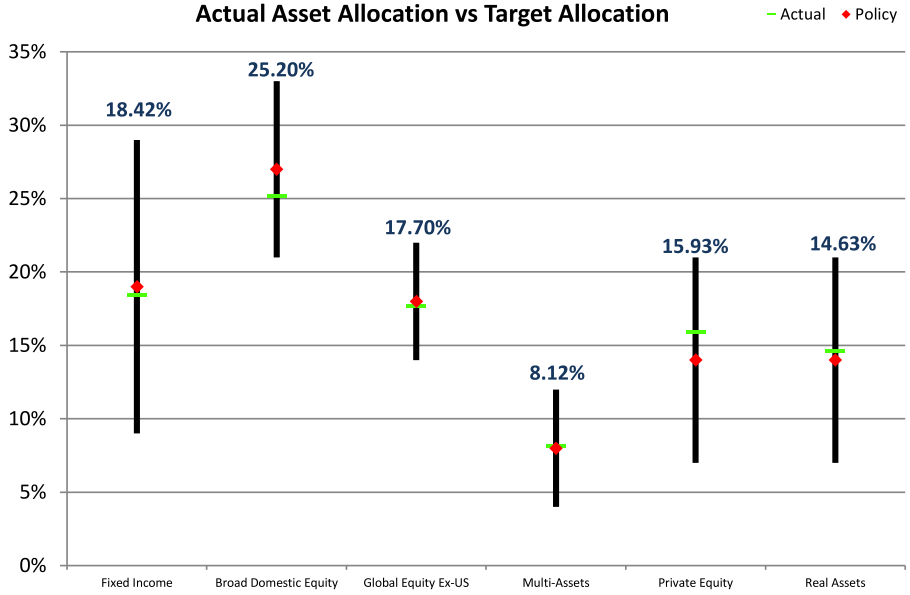


Year-to-date Income by Month



Total Assets History

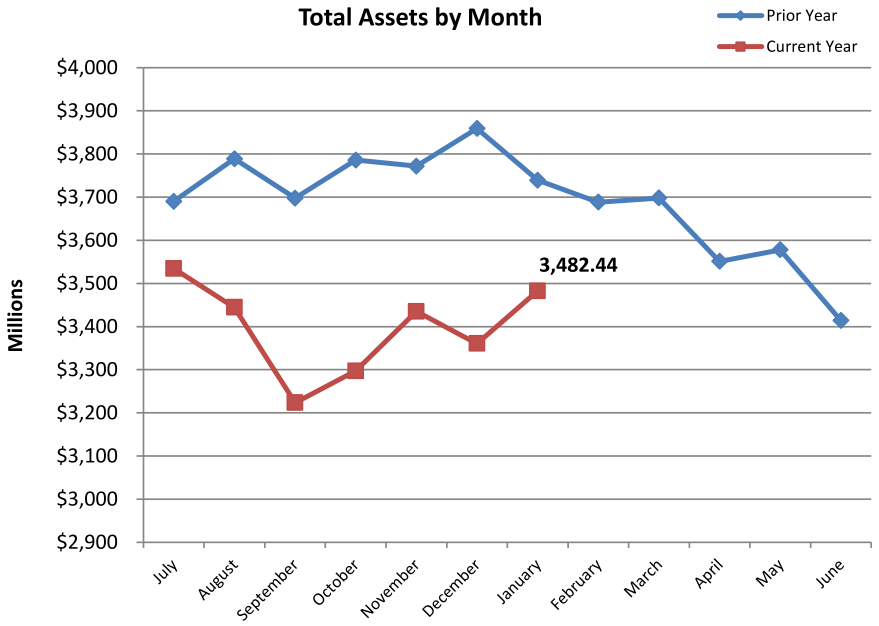
Actual Asset Allocation vs Target Allocation



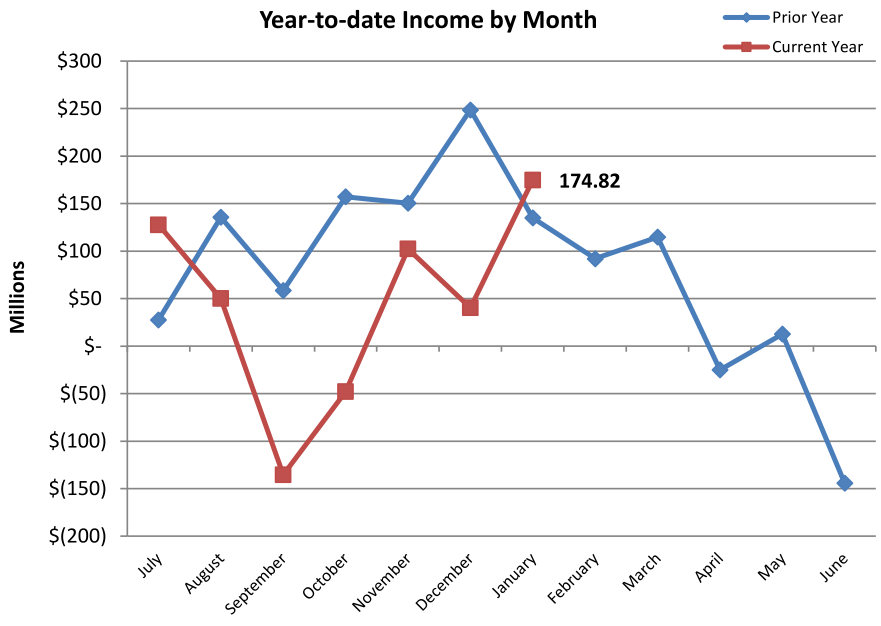
Teachers' Retirement Health Care Trust Fund

Fiscal Year-to-Date through January 31, 2023

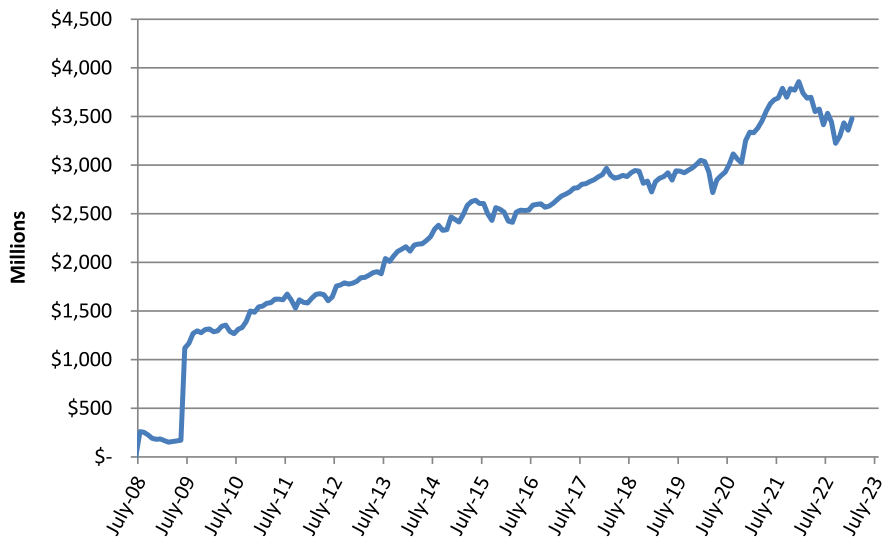
Total Assets by Month



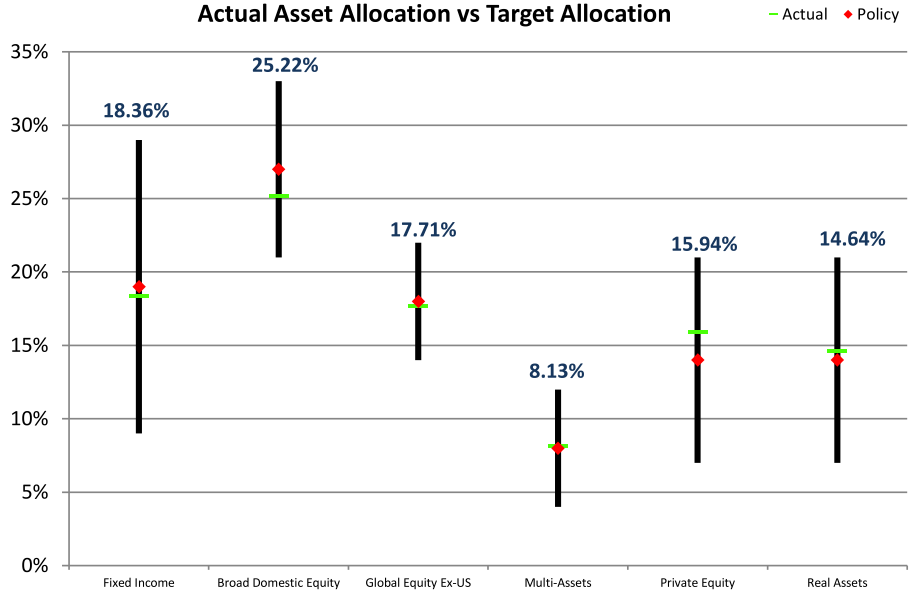
Year-to-date Income by Month



Total Assets History



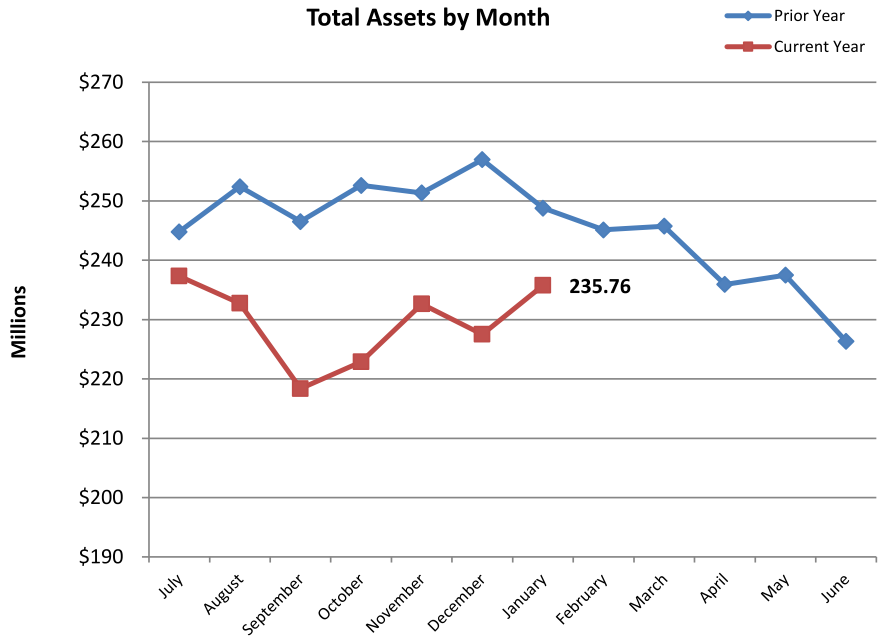
Actual Asset Allocation vs Target Allocation



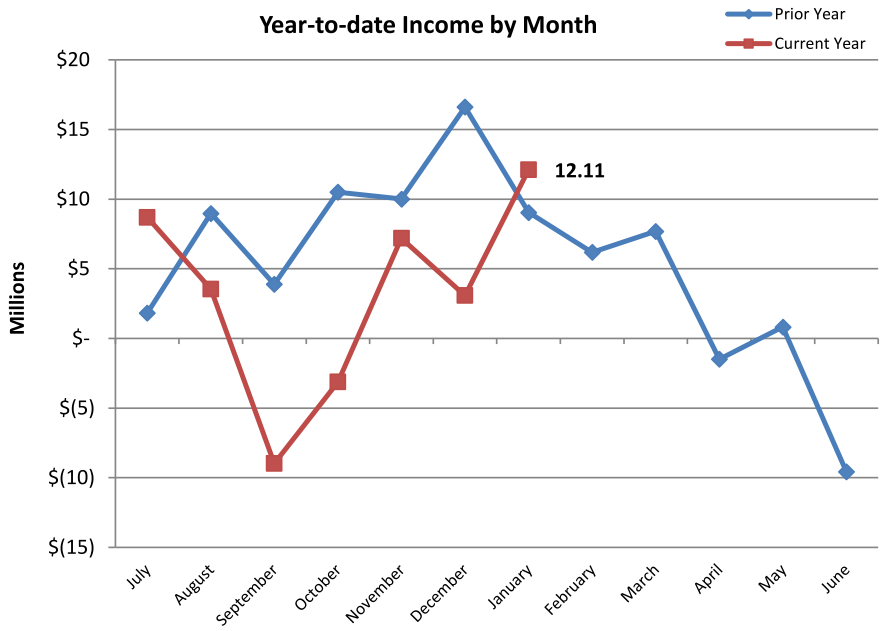
Judicial Retirement Pension Trust Fund

Fiscal Year-to-Date through January 31, 2023

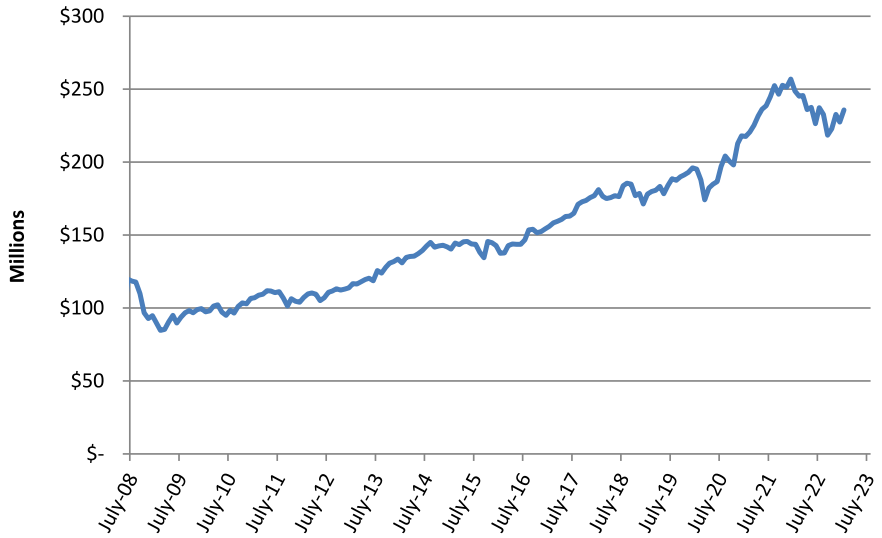
Total Assets by Month



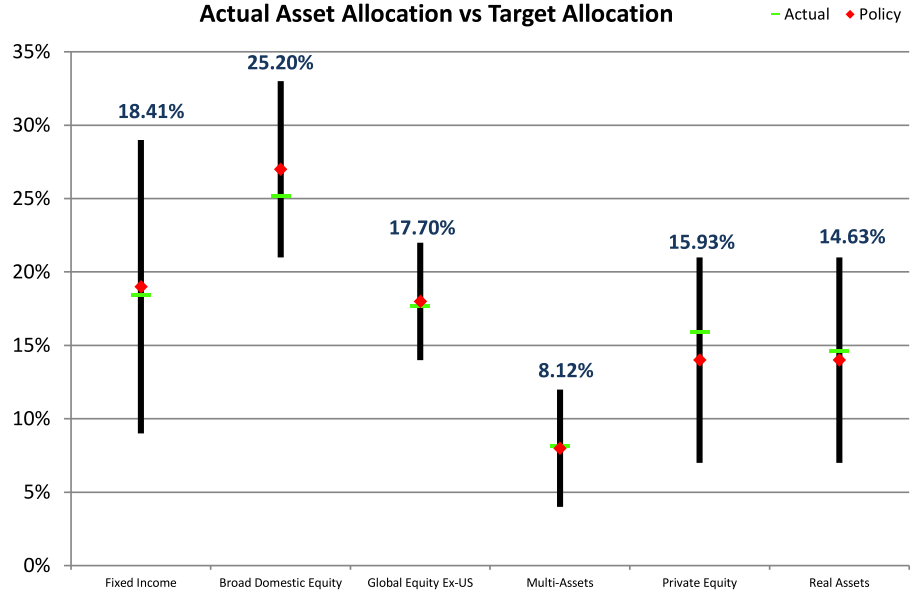
Year-to-date Income by Month



Total Assets History



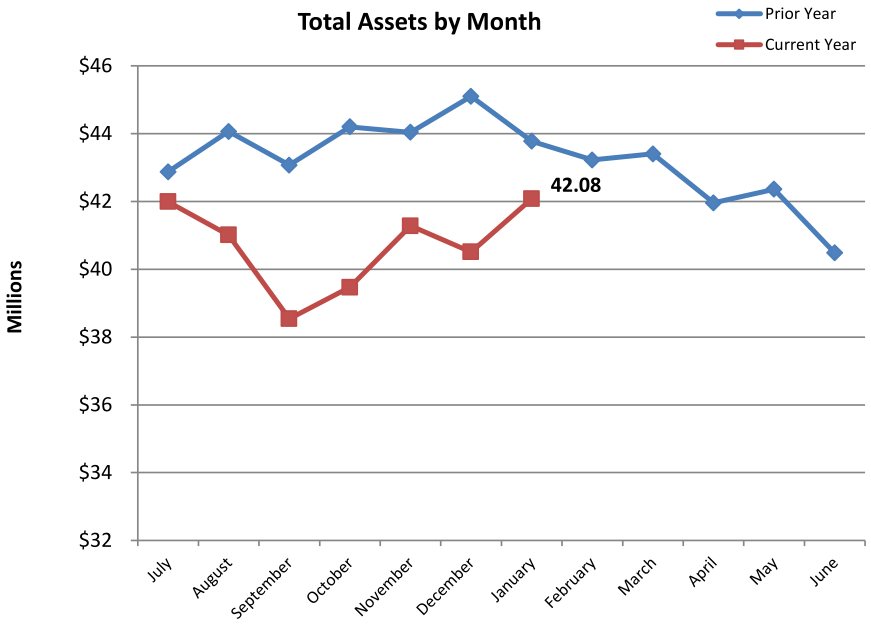
Actual Asset Allocation vs Target Allocation



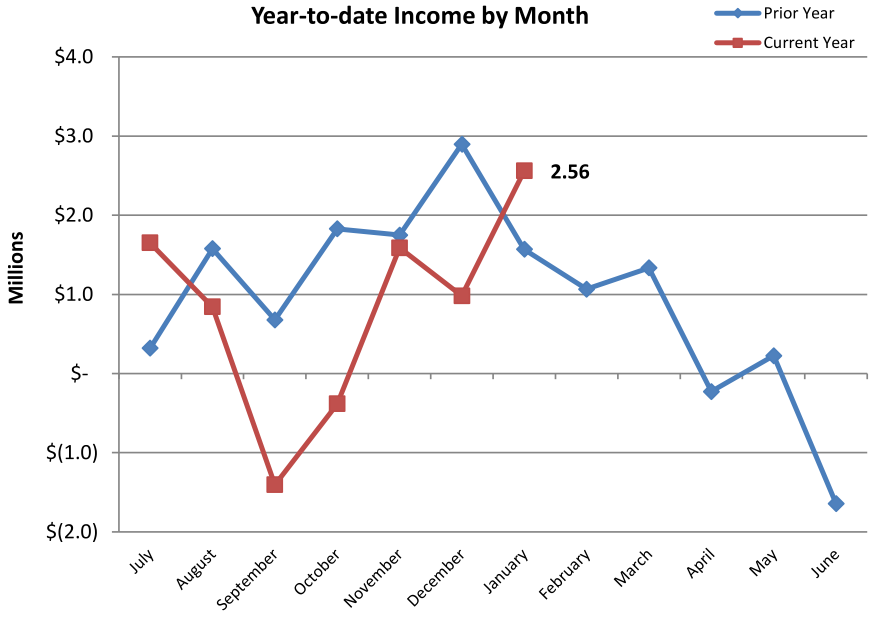
Judicial Retirement Health Care Trust Fund

Fiscal Year-to-Date through January 31, 2023

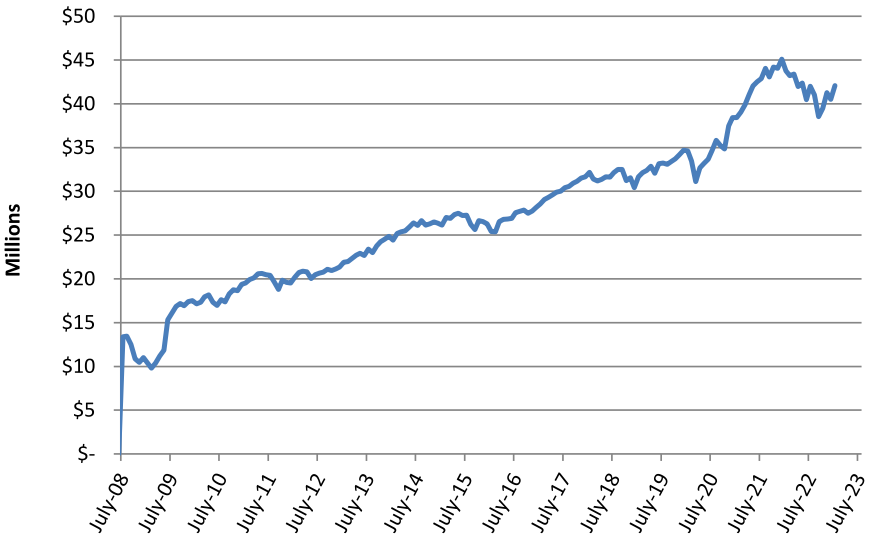
Total Assets by Month



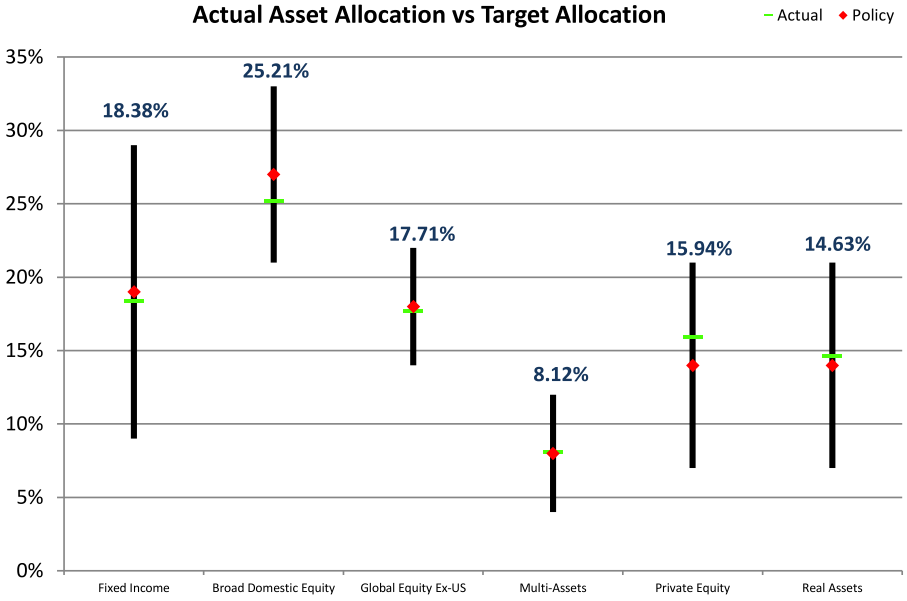
Year-to-date Income by Month



Total Assets History



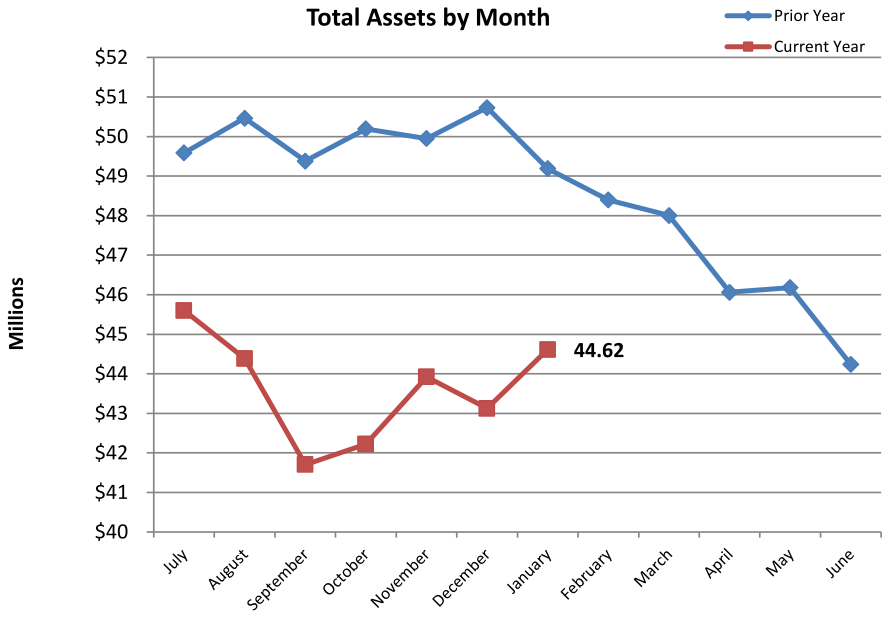
Actual Asset Allocation vs Target Allocation



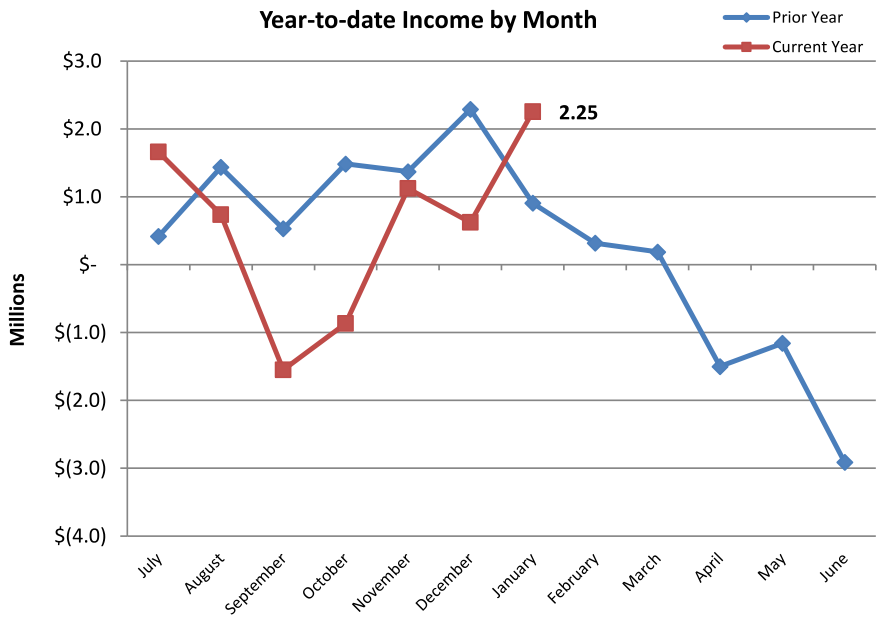
Military Retirement Trust Fund

Fiscal Year-to-Date through January 31, 2023

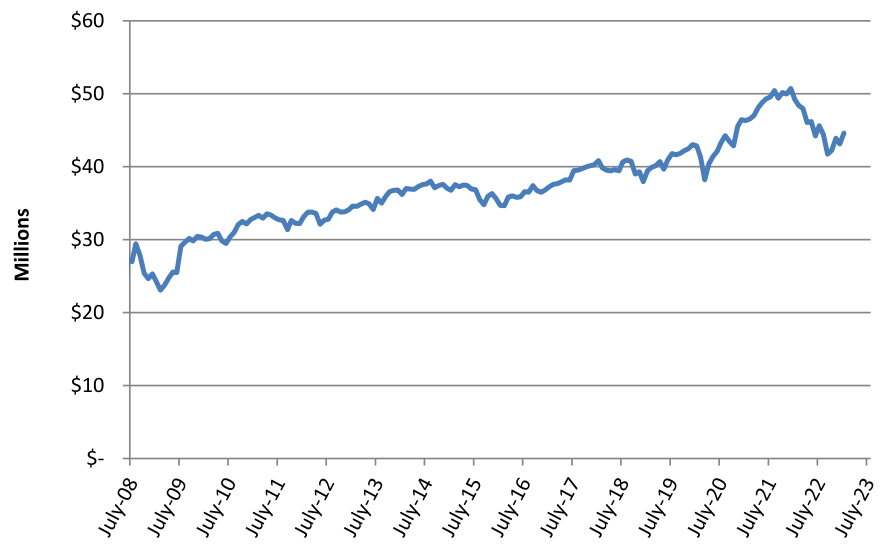
Total Assets by Month



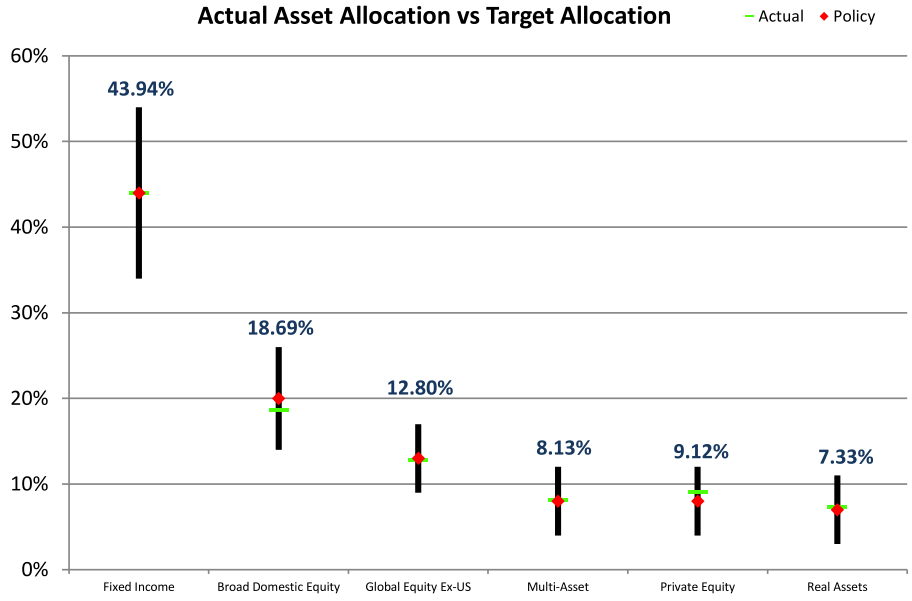
Year-to-date Income by Month



Total Assets History



Actual Asset Allocation vs Target Allocation



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 January 31, 2023

	Beginning Invested Assets	Investment Income	Net Contributions and (Withdrawals)	Ending Invested Assets	% increase (decrease)	% Change due to Investment Income
Cash						
Short-Term Fixed Income Pool	$ 304,656,667	$ 1,287,218	$ 14,021,257	$ 319,965,142	5.02%	0.41%
Securities Lending Income Pool	143,431	95,267	(141,245)	97,453	-32.06%	130.85%
Total Cash	304,800,098	1,382,485	13,880,012	320,062,595	5.01%	0.44%
Fixed Income						
Fidelity Inst. Asset Mgmt. High Yield CMBS	200,634,341	4,595,446	-	205,229,787	2.29%	2.29%
Fidelity Institutional Asset Management	839,740,608	33,757,638	70,000,000	943,498,246	12.36%	3.86%
MacKay Shields, LLC	883,189	17,880	-	901,069	2.02%	2.02%
Total Opportunistic Fixed Income	1,041,258,138	38,370,964	70,000,000	1,149,629,102	10.41%	3.57%
ARMB Barclays Agg Bond Fund	4,046,832,535	139,583,006	135,700,000	4,322,115,541	6.80%	3.39%
Total Fixed Income	5,088,090,673	177,953,970	205,700,000	5,471,744,643	7.54%	3.43%
Domestic Equities						
Small Cap						
Passively Managed						
ARMB S&P 600	609,713,418	57,852,956	-	667,566,374	9.49%	9.49%
Total Passive	609,713,418	57,852,956	-	667,566,374	9.49%	9.49%
Actively Managed						
Transition Account	-	-	-	-	-	-
Total Active	-	-	-	-	-	-
Total Small Cap	609,713,418	57,852,956	-	667,566,374	9.49%	9.49%

Alaska Retirement Management Board
All Non-Participant Directed Plans by Manager
Schedule of Investment Income and Changes in Invested Assets
For the Month Ended January 31, 2023

Large Cap						
Passively Managed						
ARMB S&P 900	4,794,367,995	308,705,503	(50,000,000)	5,053,073,498	5.40%	6.47%
Total Passive	4,794,367,995	308,705,503	(50,000,000)	5,053,073,498	5.40%	6.47%
Actively Managed						
ARMB Domestic Residual Assets	89,602	45,060	-	134,662	50.29%	50.29%
ARMB Large Cap Multi-Factor	1,011,532,487	70,320,177	-	1,081,852,664	6.95%	6.95%
ARMB Scientific Beta	1,031,925,305	63,766,936	63,236	1,095,755,477	6.19%	6.18%
Transition Account	20	-	-	20	-	-
Total Active	2,043,547,414	134,132,173	63,236	2,177,742,823	6.57%	6.56%
Total Large Cap	6,837,915,409	442,837,676	(49,936,764)	7,230,816,321	5.75%	6.50%
Total Domestic Equity	7,447,628,827	500,690,632	(49,936,764)	7,898,382,695	6.05%	6.75%
Global Equities						
Large Cap						
Arrow Street Capital	654,411,669	27,807,327	(128,700,000)	553,518,996	-15.42%	4.71%
Baillie Gifford Overseas Limited	425,764,939	47,796,990	417,612	473,979,541	11.32%	11.22%
Brandes Investment Partners	526,938,307	54,688,709	477,073	582,104,089	10.47%	10.37%
Cap Guardian Trust Co	463,534,543	41,131,288	-	504,665,831	8.87%	8.87%
Legal & General	775,467,970	54,935,815	47,448	830,451,233	7.09%	7.08%
ARMB Int'l Residual Assets	2,764,434	41,006	-	2,805,440	1.48%	1.48%
SSgA MSCI World Ex-US IMI Index Fund	1,631,402,641	121,391,961	(134,000,000)	1,618,794,602	-0.77%	7.76%
Total Large Cap	4,480,284,503	347,793,096	(261,757,867)	4,566,319,732	1.92%	8.00%

Alaska Retirement Management Board
All Non-Participant Directed Plans by Manager
Schedule of Investment Income and Changes in Invested Assets
For the Month Ended January 31, 2023

Emerging Markets Equity						
MSCI Emerging Markets Index Fund	621,572,055	49,795,160	-	671,367,215	8.01%	8.01%
Legal & General Sci-Beta Emerging Markets	294,788,456	15,351,604	16,313	310,156,373	5.21%	5.21%
Total Emerging Markets	916,360,511	65,146,764	16,313	981,523,588	7.11%	7.11%
Total Global Equities	5,396,645,014	412,939,860	(261,741,554)	5,547,843,320	2.80%	7.84%
Multi-Asset						
Alternative Equity Strategy						
Alternative Equity Strategies Transition Account	-	-	-	-	-	-
McKinley Global Health Care	306,673,742	8,911,191	-	315,584,933	2.91%	2.91%
Total Alternative Equity Strategy	306,673,742	8,911,191	-	315,584,933	2.91%	2.91%
Alternative Fixed Income						
Crestline Investors, Inc.	727,530,212	3,538,088	(14,722,631)	716,345,669	-1.54%	0.49%
Prisma Capital Partners	45,687,027	1,552,738	-	47,239,765	3.40%	3.40%
Crestline Specialty Fund	1	(1)	-	-	-100.00%	-100.00%
Crestline Specialty Lending Fund II	39,230,811	-	(1,747,950)	37,482,861	-4.46%	-
Crestline Specialty Lending Fund III	56,013,103	-	-	56,013,103	-	-
Total Alternative Fixed Income	868,461,154	5,090,825	(16,470,581)	857,081,398	-1.31%	0.59%
Alternative Beta						
Man Group Alternative Risk Premia	292,747,916	(968,606)	-	291,779,310	-0.33%	-0.33%
Total Alternative Beta	292,747,916	(968,606)	-	291,779,310	-0.33%	-0.33%
Other Opportunities						
Schroders Insurance Linked Securities	2,155,401	(403,908)	(1,500,000)	251,493	-88.33%	-28.74%
Total Other Opportunities	2,155,401	(403,908)	(1,500,000)	251,493	-88.33%	-28.74%
Tactical Allocation Strategies						
Fidelity Signals	508,331,018	31,946,030	-	540,277,048	6.28%	6.28%
PineBridge	515,319,407	25,503,009	-	540,822,416	4.95%	4.95%
Total Tactical Allocation Strategies	1,023,650,425	57,449,039	-	1,081,099,464	5.61%	5.61%
Total Multi-Asset	2,493,688,638	70,078,541	(17,970,581)	2,545,796,598	2.09%	2.82%

Alaska Retirement Management Board
All Non-Participant Directed Plans by Manager
Schedule of Investment Income and Changes in Invested Assets
For the Month Ended January 31, 2023

Private Equity						
Abbott Capital	1,958,217,801	2,752,476	2,430,071	1,963,400,348	0.26%	0.14%
Advent International GPE Fund VIII-B	29,373,251	-	-	29,373,251	-	-
Advent International GPE Fund IX	37,902,618	-	-	37,902,618	-	-
Advent International GPE Fund X	1,452,479	-	2,000,000	3,452,479	137.70%	-
Battery Ventures XIV	1,713,295	-	1,625,000	3,338,295	94.85%	-
Clearlake Capital Partners VI	42,188,048	-	-	42,188,048	-	-
Clearlake Capital Partners VII	20,225,158	-	-	20,225,158	-	-
Dyal Capital Partners III	43,036,826	-	-	43,036,826	-	-
Dyal Capital Partners IV	32,861,947	(40,589)	(1,130,869)	31,690,489	-3.56%	-0.13%
Genstar X	12,904,352	(1)	413,584	13,317,935	3.20%	0.00%
Glendon Opportunities	8,700,237	-	-	8,700,237	-	-
Glendon Opportunities II	83,743,995	-	-	83,743,995	-	-
Insight XII	22,108,368	-	1,226,342	23,334,710	5.55%	-
KKR Lending Partners II	7,362,580	-	-	7,362,580	-	-
Lexington Capital Partners VIII	33,324,597	(1,793,558)	(369,080)	31,161,959	-6.49%	-5.41%
Lexington Partners VII	10,601,258	(418,556)	(368,906)	9,813,796	-7.43%	-4.02%
Merit Capital Partners	3,974,150	-	-	3,974,150	-	-
NB SOF III	12,573,267	1	(124,600)	12,448,668	-0.99%	0.00%
NB SOF IV	35,540,583	-	-	35,540,583	-	-
Neuberger Berman Secondary Opportunities Fund V	12,470,436	-	-	12,470,436	-	-
New Mountain Partners IV	7,964,512	-	-	7,964,512	-	-
New Mountain Partners V	86,805,921	-	-	86,805,921	-	-
New Mountain Partners VI	26,240,053	-	5,006,534	31,246,587	19.08%	-
NGP XI	40,642,001	-	(1,336,026)	39,305,975	-3.29%	-
NGP XII	32,707,245	-	(2,396,073)	30,311,172	-7.33%	-
Onex Partnership III	3,916,089	-	-	3,916,089	-	-
Pathway Capital Management LLC	1,991,765,805	3,013,706	8,886,463	2,003,665,974	0.60%	0.15%
Resolute Fund III	9,352,271	-	-	9,352,271	-	-
Resolute Fund IV	75,793,198	-	(435,532)	75,357,666	-0.57%	-
Resolute Fund V	56,756,800	-	5,697,676	62,454,476	10.04%	-
Riverside Micro-Cap Fund VI	1,494,890	-	-	1,494,890	-	-
Summit Partners GE IX	60,291,029	-	-	60,291,029	-	-
Summit Partners GE X	31,767,744	-	-	31,767,744	-	-
Summit XI	5,259,624	-	-	5,259,624	-	-
Warburg Pincus Global Growth Fund	46,733,755	-	-	46,733,755	-	-
Warburg Pincus X	664,436	-	-	664,436	-	-
Warburg Pincus XI	11,029,901	-	-	11,029,901	-	-
Warburg Pincus XII	82,055,659	-	(13,876,850)	68,178,809	-16.91%	-
Total Private Equity	4,981,516,179	3,513,479	7,247,734	4,992,277,392	0.22%	0.07%

Alaska Retirement Management Board
All Non-Participant Directed Plans by Manager
Schedule of Investment Income and Changes in Invested Assets
For the Month Ended January 31, 2023

Real Assets						
Farmland						
UBS Farmland Investors LLC	986,289,799	-	-	986,289,799	-	-
Total Farmland	986,289,799	-	-	986,289,799	-	-
Timber						
Timberland Invt Resource LLC	380,385,333	-	(1,300,000)	379,085,333	-0.34%	-
Total Timber	380,385,333	-	(1,300,000)	379,085,333	-0.34%	-
Energy						
EIG Energy Fund XIV-A	3,669,005	(25,774)	-	3,643,231	-0.70%	-0.70%
EIG Energy Fund XV	7,621,276	(1,008,364)	(176,679)	6,436,233	-15.55%	-13.39%
EIG Energy Fund XVI	51,481,153	(3,827,765)	-	47,653,388	-7.44%	-7.44%
Total Energy	62,771,434	(4,861,903)	(176,679)	57,732,852	-8.03%	-7.76%
REIT						
REIT Transition Account	-	-	-	-	-	-
ARMB REIT	469,256,311	47,084,252	-	516,340,563	10.03%	10.03%
Total REIT	469,256,311	47,084,252	-	516,340,563	10.03%	10.03%
Infrastructure Private						
IFM Global Infrastructure Fund-Private	653,441,757	24,035,924	(5,896,562)	671,581,119	2.78%	3.70%
JP Morgan Infrastructure Fund-Private	151,778,925	-	(3,698,048)	148,080,877	-2.44%	-
Total Infrastructure Private	805,220,682	24,035,924	(9,594,610)	819,661,996	1.79%	3.00%

Alaska Retirement Management Board
All Non-Participant Directed Plans by Manager
Schedule of Investment Income and Changes in Invested Assets
For the Month Ended January 31, 2023

Real Estate						
Core Commingled Accounts						
BlackRock US Core Property Fund	440,493,274	(17,006,020)	(4,234,872)	419,252,382	-4.82%	-3.88%
JP Morgan	187,989,940	(4,553,439)	(996,282)	182,440,219	-2.95%	-2.43%
UBS Trumbull Property Fund	39,131,697	(1,822,401)	(216,952)	37,092,344	-5.21%	-4.67%
Total Core Commingled	667,614,911	(23,381,860)	(5,448,106)	638,784,945	-4.32%	-3.52%
Core Separate Accounts						
Sentinel Separate Account	307,342,986	-	(758,561)	306,584,425	-0.25%	-
UBS Realty	764,773,467	(1)	(1,707,914)	763,065,552	-0.22%	0.00%
Total Core Separate	1,072,116,453	(1)	(2,466,475)	1,069,649,977	-0.23%	0.00%
Non-Core Commingled Accounts						
Almanac Realty Securities V	47,815	-	-	47,815	-	-
Almanac Realty Securities VII	28,988,230	-	-	28,988,230	-	-
Almanac Realty Securities VIII	27,747,745	-	796,202	28,543,947	2.87%	-
Almanac Realty Securities IX	5,833,417	-	-	5,833,417	-	-
Clarion Ventures 4	7,136,758	-	-	7,136,758	-	-
Colony Investors VIII, L.P.	75,951	-	-	75,951	-	-
ING Clarion Development Ventures III	608,199	-	-	608,199	-	-
KKR Real Estate Partners Americas L.P.	3,716,950	-	-	3,716,950	-	-
KKR Real Estate Partners Americas II	8,979,653	-	-	8,979,653	-	-
KKR Real Estate Partners Americas III	30,542,008	-	-	30,542,008	-	-
Silverpeak Legacy Pension Partners II, L.P.	838,913	-	-	838,913	-	-
Silverpeak Legacy Pension Partners III, L.P.	1,104,784	-	-	1,104,784	-	-
Tishman Speyer Real Estate Venture VI	5,723	-	-	5,723	-	-
Tishman Speyer Real Estate Venture VII	143,851	-	-	143,851	-	-
Total Non-Core Commingled	115,769,997	-	796,202	116,566,199	0.69%	-
Total Real Estate	1,855,501,361	(23,381,861)	(7,118,379)	1,825,001,121	-1.64%	-1.26%
Total Real Assets	4,559,424,920	42,876,412	(18,189,668)	4,584,111,664	0.54%	0.94%
Total Assets	$ 30,271,794,349	$ 1,209,435,379	$ (121,010,821)	$ 31,360,218,907	3.60%	4.00%

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
January 31, 2023

	Beginning Invested Assets	Investment Income	Net Contributions (Withdrawals)	Transfers In (Out)	Ending Invested Assets	% Change in Invested Assets	% Change due to Investment Income (1)
Participant Options							
T. Rowe Price							
Stable Value Fund	$ 512,248,747	$ 824,058	$ (6,126,681)	$ 3,693,304	$ 510,639,428	-0.31%	0.16%
Small Cap Stock Fund	187,904,727	18,075,718	(804,605)	(1,145,291)	204,030,549	8.58%	9.67%
Alaska Balanced Trust	997,666,938	45,431,309	(5,064,763)	(661,983)	1,037,371,501	3.98%	4.57%
Long Term Balanced Fund	710,810,237	39,971,994	(1,772,513)	(1,118,234)	747,891,484	5.22%	5.63%
AK Target Date 2010 Trust	8,468,095	367,111	(93,052)	43,665	8,785,819	3.75%	4.35%
AK Target Date 2015 Trust	64,150,164	2,978,444	(295,598)	(189,649)	66,643,361	3.89%	4.66%
AK Target Date 2020 Trust	73,775,482	3,712,939	(401,836)	(535,521)	76,551,064	3.76%	5.06%
AK Target Date 2025 Trust	98,628,849	5,556,191	(107,469)	1,053,092	105,130,663	6.59%	5.61%
AK Target Date 2030 Trust	90,950,419	5,445,734	18,268	(376,904)	96,037,517	5.59%	6.00%
AK Target Date 2035 Trust	93,197,030	5,924,080	(3,754)	(258,606)	98,858,750	6.08%	6.37%
AK Target Date 2040 Trust	86,408,718	5,767,162	435,128	86,218	92,697,226	7.28%	6.65%
AK Target Date 2045 Trust	106,828,588	7,332,421	317,804	(425,383)	114,053,430	6.76%	6.87%
AK Target Date 2050 Trust	118,234,678	8,241,417	598,465	(302,350)	126,772,210	7.22%	6.96%
AK Target Date 2055 Trust	126,260,540	8,787,340	1,060,009	(301,309)	135,806,580	7.56%	6.94%
AK Target Date 2060 Trust	12,335,771	871,307	428,317	(56,221)	13,579,174	10.08%	6.96%
AK Target Date 2065 Trust	5,948,786	420,687	214,200	38,374	6,622,047	11.32%	6.92%
Total Investments with T. Rowe Price	3,293,817,769	159,707,912	(11,598,080)	(456,798)	3,441,470,803		
JP Morgan							
JPMorgan SmartRetirement Blend 2015 R6	936,373	41,811	933	3,202	982,319	4.91%	4.46%
JPMorgan SmartRetirement Blend 2020 R6	212,322	9,785	1,716	5	223,828	5.42%	4.59%
Total Investments with JP Morgan	1,148,695	51,596	2,649	3,207	1,206,147		
State Street Global Advisors							
Money Market	68,276,274	232,960	(318,387)	241,074	68,431,921	0.23%	0.34%
S&P 500 Stock Index	472,052,306	29,632,836	(1,658,208)	1,535,043	501,561,977	6.25%	6.28%
Russell 3000 Index	122,912,216	8,441,044	(111,777)	238,259	131,479,742	6.97%	6.86%
World Equity Ex-US Index	87,979,514	7,511,643	(309,663)	(885,778)	94,295,716	7.18%	8.60%
Total Investments with SSgA	751,220,310	45,818,483	(2,398,035)	1,128,598	795,769,356		
BlackRock							
Passive U.S. Bond Index Fund	146,141,389	4,756,786	(1,040,253)	1,562,515	151,420,437	3.61%	3.25%
Strategic Completion Fund	35,535,615	1,579,239	(114,441)	(551,769)	36,448,644	2.57%	4.49%
Total Investments with BlackRock	181,677,004	6,336,025	(1,154,694)	1,010,746	187,869,081		
Brandes and Baillie Gifford							
AK International Equity Fund	81,901,456	9,320,223	(151,164)	(1,008,799)	90,061,716	9.96%	11.46%
Northern Trust							
Environmental, Social, and Governance Fund	99,806,447	6,412,246	(748,017)	(676,954)	104,793,722	5.00%	6.47%
Total All Funds	$ 4,409,571,681	$ 227,646,485	$ (16,047,341)	$ -	$ 4,621,170,825	4.80%	5.17%

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

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

Supplemental Annuity Plan
Schedule of Invested Assets with
Schedule of Investment Income and Changes in Invested Assets
By Month Through the Month Ended
January 31, 2023
$ (Thousands)

Invested Assets (at fair value)	**July**	**August**	**September**	**October**	**November**	**December**	**January**
Investments with T. Rowe Price							
Stable Value Fund	$ 509,583	$ 504,379	$ 512,328	$ 514,522	$ 510,791	$ 512,249	$ 510,639
Small Cap Stock Fund	216,753	208,685	182,471	195,362	199,944	187,905	204,031
Alaska Balanced Trust	1,077,406	1,041,557	974,482	987,213	1,025,714	997,667	1,037,372
Long Term Balanced Fund	713,482	699,059	657,900	682,311	726,679	710,810	747,891
AK Target Date 2010 Trust	9,357	9,115	8,504	8,512	8,847	8,468	8,786
AK Target Date 2015 Trust	69,270	66,830	62,454	63,960	66,050	64,150	66,643
AK Target Date 2020 Trust	80,500	77,795	72,594	74,352	75,895	73,775	76,551
AK Target Date 2025 Trust	106,102	102,253	93,924	96,841	101,626	98,629	105,131
AK Target Date 2030 Trust	94,843	91,702	84,775	88,754	94,302	90,950	96,038
AK Target Date 2035 Trust	95,021	92,135	84,686	88,941	95,933	93,197	98,859
AK Target Date 2040 Trust	88,843	86,072	79,255	83,539	89,383	86,409	92,697
AK Target Date 2045 Trust	108,544	105,290	96,837	102,783	110,707	106,829	114,053
AK Target Date 2050 Trust	119,748	115,724	106,590	113,539	122,646	118,235	126,772
AK Target Date 2055 Trust	126,547	122,690	112,867	120,565	130,205	126,261	135,807
AK Target Date 2060 Trust	10,529	10,564	10,003	11,004	12,235	12,336	13,579
AK Target Date 2065 Trust	5,127	5,177	4,906	5,542	5,888	5,949	6,622
Investments with JP Morgan							
JPMorgan SmartRetirement Blend 2015 R6	960	937	887	907	953	936	982
JPMorgan SmartRetirement Blend 2020 R6	141	118	112	197	235	212	224
Investments with State Street Global Advisors							
Money Market	70,250	68,317	68,835	68,289	67,995	68,276	68,432
S&P 500 Stock Index	478,856	471,613	435,711	472,328	501,085	472,052	501,562
Russell 3000 Index	142,583	128,979	105,595	110,879	124,182	122,912	131,480
World Equity Ex-US Index	79,348	85,820	82,780	87,619	93,649	87,980	94,296
Investments with BlackRock							
Passive U.S. Bond Index Fund	142,459	139,488	142,949	143,766	148,872	146,141	151,420
Strategic Completion Fund	39,351	37,780	33,898	33,948	35,965	35,536	36,449
Investments with Brandes and Baillie Gifford							
AK International Equity Fund	97,564	85,972	69,982	71,719	81,670	81,901	90,062
Investments with Northern Trust							
Environmental, Social, and Governance Fund	143,617	129,320	110,137	115,750	114,110	99,806	104,794
Total Invested Assets	**$ 4,626,785**	**$ 4,487,371**	**$ 4,195,460**	**$ 4,343,141**	**$ 4,545,563**	**$ 4,409,572**	**$ 4,621,171**
Change in Invested Assets							
Beginning Assets	$ 4,412,831	$ 4,626,785	$ 4,487,371	$ 4,195,460	$ 4,343,141	$ 4,545,563	$ 4,409,572
Investment Earnings	217,056	(127,697)	(285,727)	153,684	209,714	(134,628)	227,646
Net Contributions (Withdrawals)	(3,102)	(11,717)	(6,184)	(6,003)	(7,291)	(1,363)	(16,047)
Ending Invested Assets	**$ 4,626,785**	**$ 4,487,371**	**$ 4,195,460**	**$ 4,343,141**	**$ 4,545,563**	**$ 4,409,572**	**$ 4,621,171**

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

Deferred Compensation Plan
Schedule of Invested Assets and Changes in Invested Assets
for the Month Ended
January 31, 2023

Participant Options	Beginning Invested Assets	Investment Income	Net Contributions (Withdrawals)	Transfers In (Out)	Ending Invested Assets	% Change in Invested Assets	% Change due to Investment Income (1)
T. Rowe Price							
Stable Value Fund	$ 204,127,652	$ 328,627	$ (2,961,373)	$ 839,119	$ 202,334,025	-0.88%	0.16%
Small Cap Stock Fund	107,640,108	10,345,179	(570,555)	(531,380)	116,883,352	8.59%	9.66%
Alaska Balanced Trust	37,582,712	1,710,269	(358,225)	125,434	39,060,190	3.93%	4.56%
Long Term Balanced Fund	91,164,426	5,134,373	(121,955)	250,394	96,427,238	5.77%	5.63%
AK Target Date 2010 Trust	2,242,333	98,029	(854)	380,746	2,720,254	21.31%	4.03%
AK Target Date 2015 Trust	8,144,719	377,803	(22,411)	(245,527)	8,254,584	1.35%	4.72%
AK Target Date 2020 Trust	19,226,444	963,510	(380,956)	16,720	19,825,718	3.12%	5.06%
AK Target Date 2025 Trust	26,273,177	1,477,540	(168,040)	323,616	27,906,293	6.22%	5.61%
AK Target Date 2030 Trust	17,595,604	1,052,724	(56,322)	(195,170)	18,396,836	4.55%	6.03%
AK Target Date 2035 Trust	14,239,245	910,398	54,795	28,929	15,233,367	6.98%	6.37%
AK Target Date 2040 Trust	12,637,158	847,358	98,425	(15,541)	13,567,400	7.36%	6.68%
AK Target Date 2045 Trust	9,957,426	683,801	82,672	(46,362)	10,677,537	7.23%	6.85%
AK Target Date 2050 Trust	8,497,691	593,724	112,759	(43,181)	9,160,993	7.81%	6.96%
AK Target Date 2055 Trust	6,637,545	461,170	80,184	(84,675)	7,094,224	6.88%	6.95%
AK Target Date 2060 Trust	1,561,975	110,055	21,298	22,310	1,715,638	9.84%	6.95%
AK Target Date 2065 Trust	628,277	44,185	10,272	(203)	682,531	8.64%	6.98%
Total Investments with T. Rowe Price	568,156,492	25,138,745	(4,180,286)	825,229	589,940,180		
JP Morgan							
JPMorgan SmartRetirement Blend 2015 R6	6,832	2,261	268	95,748	105,109	1438.48%	4.12%
JPMorgan SmartRetirement Blend 2020 R6	87,582	4,117	2,634	22,964	117,297	33.93%	4.10%
Total Investments with JP Morgan	94,414	6,378	2,902	118,712	222,406		
State Street Global Advisors							
Money Market	20,598,952	69,728	(77,862)	(189,878)	20,400,940	-0.96%	0.34%
S&P 500 Stock Index	237,352,854	14,869,350	(470,280)	(219,339)	251,532,585	5.97%	6.27%
Russell 3000 Index	46,581,051	3,200,444	38,915	83,302	49,903,712	7.13%	6.86%
World Equity Ex-US Index	27,556,064	2,358,067	2,761	(423,936)	29,492,956	7.03%	8.62%
Total Investments with SSgA	332,088,921	20,497,589	(506,466)	(749,851)	351,330,193		
BlackRock							
Passive U.S. Bond Index Fund	64,787,477	2,106,291	(579,961)	179,499	66,493,306	2.63%	3.26%
Strategic Completion Fund	14,274,541	636,605	3,392	(65,851)	14,848,687	4.02%	4.47%
Total Investments with BlackRock	79,062,018	2,742,896	(576,569)	113,648	81,341,993		
Brandes and Baillie Gifford							
AK International Equity Fund	34,915,270	3,973,243	(153,510)	(195,085)	38,539,918	10.38%	11.44%
Northern Trust							
Environmental, Social, and Governance Fund	36,273,550	2,337,581	(236,074)	(112,653)	38,262,404	5.48%	6.48%
Total All Funds	$ 1,050,590,665	$ 54,696,432	$ (5,650,003)	$ -	$ 1,099,637,094	4.67%	5.22%

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

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

Deferred Compensation Plan
Schedule of Invested Assets with
Schedule of Investment Income and Changes in Invested Assets
By Month Through the Month Ended
January 31, 2023
$ (Thousands)

Invested Assets (at fair value)	July	August	September	October	November	December	January
Investments with T. Rowe Price							
Stable Value Fund	$ 204,728	$ 204,568	$ 206,036	$ 205,294	$ 204,521	$ 204,128	$ 202,334
Small Cap Stock Fund	120,486	116,930	104,772	113,257	114,721	107,640	116,883
Alaska Balanced Trust	43,306	40,397	37,135	37,495	39,064	37,583	39,060
Long Term Balanced Fund	87,367	86,805	82,151	86,057	92,389	91,164	96,427
AK Target Date 2010 Trust	3,107	3,040	2,798	2,662	2,771	2,242	2,720
AK Target Date 2015 Trust	9,156	8,822	8,459	8,545	8,750	8,145	8,255
AK Target Date 2020 Trust	22,182	20,681	19,395	19,743	20,195	19,226	19,826
AK Target Date 2025 Trust	27,723	26,538	24,476	25,519	26,962	26,273	27,906
AK Target Date 2030 Trust	18,443	18,011	16,490	17,131	18,212	17,596	18,397
AK Target Date 2035 Trust	13,986	13,551	12,461	13,285	14,691	14,239	15,233
AK Target Date 2040 Trust	12,917	12,457	11,456	12,202	13,111	12,637	13,567
AK Target Date 2045 Trust	10,058	9,779	8,845	9,489	10,403	9,957	10,678
AK Target Date 2050 Trust	8,162	7,973	7,412	8,021	8,764	8,498	9,161
AK Target Date 2055 Trust	6,577	6,377	5,827	6,325	6,867	6,638	7,094
AK Target Date 2060 Trust	1,519	1,489	1,361	1,475	1,607	1,562	1,716
AK Target Date 2065 Trust	846	830	656	588	642	628	683
Investments with JP Morgan							
JPMorgan SmartRetirement Blend 2015 R6	7	7	6	6	7	7	105
JPMorgan SmartRetirement Blend 2020 R6	90	92	84	100	109	88	117
Investments with State Street Global Advisors							
Money Market	20,594	20,518	20,575	21,176	20,874	20,599	20,401
S&P 500 Stock Index	251,530	242,416	219,620	238,455	252,301	237,353	251,533
Russell 3000 Index	52,553	48,501	40,817	43,559	47,356	46,581	49,904
World Equity Ex-US Index	25,143	26,539	25,349	26,736	28,932	27,556	29,493
Investments with BlackRock							
Passive U.S. Bond Index Fund	64,888	63,658	63,759	63,960	65,905	64,787	66,493
Strategic Completion Fund	16,018	15,395	13,748	13,939	14,674	14,275	14,849
Investments with Brandes and Baillie Gifford							
AK International Equity Fund	38,664	35,180	29,625	30,584	34,769	34,915	38,540
Investments with Northern Trust							
Environmental, Social, and Governance Fund	48,847	44,859	38,650	40,833	41,074	36,274	38,262
Total Invested Assets	**$ 1,108,897**	**$ 1,075,411**	**$ 1,001,966**	**$ 1,046,436**	**$ 1,089,672**	**$ 1,050,591**	**$ 1,099,637**
Change in Invested Assets							
Beginning Assets	$ 1,052,310	$ 1,108,897	$ 1,075,411	$ 1,001,966	$ 1,046,436	$ 1,089,672	$ 1,050,591
Investment Earnings	57,738	(30,723)	(68,004)	43,838	45,813	(35,994)	54,696
Net Contributions (Withdrawals)	(1,151)	(2,763)	(5,442)	632	(2,577)	(3,087)	(5,650)
Ending Invested Assets	**$ 1,108,897**	**$ 1,075,411**	**$ 1,001,966**	**$ 1,046,436**	**$ 1,089,672**	**$ 1,050,591**	**$ 1,099,637**

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

Defined Contribution Retirement - Participant Directed PERS
Schedule of Investment Income and Changes in Invested Assets
for the Month Ended
January 31, 2023

Participant Options	Beginning Invested Assets	Investment Income	Net Contributions (Withdrawals)	Transfers In (Out)	Ending Invested Assets	% Change in Invested Assets	% Change due to Investment Income (1)
T. Rowe Price							
Stable Value Fund	$ 136,095,215	$ 220,684	$ (287,339)	$ 2,741,185	$ 138,769,745	1.97%	0.16%
Small Cap Stock Fund	78,900,997	7,632,570	278,734	(368,151)	86,444,150	9.56%	9.68%
Alaska Balanced Trust	41,875,982	1,911,123	(26,188)	433,279	44,194,196	5.54%	4.54%
Long Term Balanced Fund	60,258,779	3,430,143	(53,265)	955,643	64,591,300	7.19%	5.65%
AK Target Date 2010 Trust	2,820,523	122,545	19,549	-	2,962,617	5.04%	4.33%
AK Target Date 2015 Trust	10,426,989	482,616	(6,594)	(156,040)	10,746,971	3.07%	4.66%
AK Target Date 2020 Trust	37,393,558	1,879,136	41,888	(403,542)	38,911,040	4.06%	5.05%
AK Target Date 2025 Trust	76,419,658	4,289,661	771,737	(8,585)	81,472,471	6.61%	5.59%
AK Target Date 2030 Trust	90,355,483	5,426,542	329,779	(253,445)	95,858,359	6.09%	6.00%
AK Target Date 2035 Trust	114,722,271	7,335,286	771,703	9,879	122,839,139	7.08%	6.37%
AK Target Date 2040 Trust	134,557,584	8,984,114	1,013,782	(543,243)	144,012,237	7.03%	6.67%
AK Target Date 2045 Trust	179,158,707	12,339,821	1,809,458	(477,807)	192,830,179	7.63%	6.86%
AK Target Date 2050 Trust	213,938,899	14,952,191	2,257,003	(456,047)	230,692,046	7.83%	6.96%
AK Target Date 2055 Trust	234,687,058	16,372,320	3,000,373	(824,304)	253,235,447	7.90%	6.94%
AK Target Date 2060 Trust	17,207,472	1,232,371	1,141,946	(116,262)	19,465,527	13.12%	6.95%
AK Target Date 2065 Trust	9,873,759	709,969	742,460	(35,220)	11,290,968	14.35%	6.94%
Total Investments with T. Rowe Price	1,438,692,934	87,321,092	11,805,026	497,340	1,538,316,392		
JP Morgan							
JPMorgan SmartRetirement Blend 2015 R6	4,890	234	573	1,346	7,043	44.03%	4.00%
JPMorgan SmartRetirement Blend 2020 R6	48,732	2,259	1,257	-	52,248	7.21%	4.58%
Total Investments with JP Morgan	53,622	2,493	1,830	1,346	59,291		
State Street Global Advisors							
Money Market	20,045,909	68,718	(21,154)	217,320	20,310,793	1.32%	0.34%
S&P 500 Stock Index	109,534,237	6,927,807	429,960	987,207	117,879,211	7.62%	6.28%
Russell 3000 Index	61,696,354	4,257,039	377,467	243,225	66,574,085	7.91%	6.87%
World Equity Ex-US Index	65,239,919	5,565,402	192,301	(1,612,067)	69,385,555	6.35%	8.62%
Total Investments with SSgA	256,516,419	16,818,966	978,574	(164,315)	274,149,644		
BlackRock							
Passive U.S. Bond Index Fund	74,722,068	2,434,649	(104,747)	1,591,812	78,643,782	5.25%	3.23%
Strategic Completion Fund	9,533,342	437,607	41,881	171,175	10,184,005	6.83%	4.54%
Total Investments with BlackRock	84,255,410	2,872,256	(62,866)	1,762,987	88,827,787		
Brandes and Baillie Gifford							
AK International Equity Fund	49,925,881	5,641,393	255,829	(1,765,244)	54,057,859	8.28%	11.47%
Northern Trust							
Environmental, Social, and Governance Fund	32,748,356	2,094,055	125,760	(332,114)	34,636,057	5.76%	6.41%
Total All Funds	$ 1,862,192,622	$ 114,750,255	$ 13,104,153	$ -	$ 1,990,047,030	6.87%	6.14%

Notes: Source data provided by the record keeper, Empower Retirement.
(1) Income divided by beginning assets plus half of net contributions/(withdrawals). Actual returns are calculated by Callan and Associates.

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
January 31, 2023
$ (Thousands)

Invested Assets (at fair value)	**July**	**August**	**September**	**October**	**November**	**December**	**January**
Investments with T. Rowe Price							
Stable Value Fund	$ 116,967	$ 115,093	$ 128,475	$ 132,295	$ 135,607	$ 136,095	$ 138,770
Small Cap Stock Fund	100,573	96,648	78,633	81,853	83,008	78,901	86,444
Alaska Balanced Trust	52,462	48,824	45,502	45,638	45,426	41,876	44,194
Long Term Balanced Fund	36,697	40,771	45,768	50,021	58,070	60,259	64,591
AK Target Date 2010 Trust	2,967	2,900	2,763	2,789	2,883	2,821	2,963
AK Target Date 2015 Trust	11,309	10,922	10,154	10,313	10,698	10,427	10,747
AK Target Date 2020 Trust	40,687	39,224	36,233	36,973	38,431	37,394	38,911
AK Target Date 2025 Trust	80,473	77,812	72,154	74,877	78,641	76,420	81,472
AK Target Date 2030 Trust	93,945	91,404	84,768	88,276	93,252	90,355	95,858
AK Target Date 2035 Trust	118,370	114,833	105,761	111,329	118,613	114,722	122,839
AK Target Date 2040 Trust	140,376	135,488	124,746	131,498	139,318	134,558	144,012
AK Target Date 2045 Trust	183,395	177,707	163,436	173,615	185,831	179,159	192,830
AK Target Date 2050 Trust	217,574	210,643	193,381	205,856	222,335	213,939	230,692
AK Target Date 2055 Trust	235,982	228,742	210,659	225,122	242,950	234,687	253,235
AK Target Date 2060 Trust	13,814	13,943	13,475	15,140	17,074	17,207	19,466
AK Target Date 2065 Trust	7,664	7,813	7,586	8,444	9,698	9,874	11,291
Investments with JP Morgan							
JPMorgan SmartRetirement Blend 2015 R6	5	5	5	5	6	5	7
JPMorgan SmartRetirement Blend 2020 R6	45	47	70	44	47	49	52
State Street Global Advisors							
Money Market	17,090	17,477	19,526	20,181	19,524	20,046	20,311
S&P 500 Stock Index	89,480	94,854	92,341	102,453	112,334	109,534	117,879
Russell 3000 Index	79,923	70,080	51,027	50,821	58,912	61,696	66,574
World Equity Ex-US Index	62,442	68,540	62,361	65,388	69,349	65,240	69,386
Investments with BlackRock							
Passive U.S. Bond Index Fund	59,044	58,209	71,596	76,583	78,419	74,722	78,644
Strategic Completion Fund	5,972	5,095	4,670	4,780	7,474	9,533	10,184
Investments with Brandes and Baillie Gifford							
AK International Equity Fund	75,867	67,102	48,584	47,509	51,200	49,926	54,058
Investments with Northern Trust							
Environmental, Social, and Governance Fund	65,829	58,269	45,940	46,769	41,847	32,748	34,636
Total Invested Assets	**$ 1,908,952**	**$ 1,852,442**	**$ 1,719,613**	**$ 1,808,570**	**$ 1,920,944**	**$ 1,862,193**	**$ 1,990,047**
Change in Invested Assets							
Beginning Assets	$ 1,797,125	$ 1,908,952	$ 1,852,442	$ 1,719,613	$ 1,808,570	$ 1,920,944	$ 1,862,193
Investment Earnings	106,297	(61,483)	(140,884)	81,703	109,123	(68,434)	114,750
Net Contributions (Withdrawals)	5,531	4,973	8,054	7,254	3,252	9,683	13,104
Ending Invested Assets	**$ 1,908,952**	**$ 1,852,442**	**$ 1,719,613**	**$ 1,808,570**	**$ 1,920,944**	**$ 1,862,193**	**$ 1,990,047**

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

Defined Contribution Retirement - Participant Directed TRS
Schedule of Investment Income and Changes in Invested Assets
for the Month Ended
January 31, 2023

Participant Options	Beginning Invested Assets	Investment Income	Net Contributions (Withdrawals)	Transfers In (Out)	Ending Invested Assets	% Change in Invested Assets	% Change due to Investment Income (1)
T. Rowe Price							
Stable Value Fund	$ 51,432,017	$ 83,373	$ (206,611)	$ 1,067,835	$ 52,376,614	1.84%	0.16%
Small Cap Stock Fund	32,847,010	3,181,639	11,111	(153,418)	35,886,342	9.25%	9.71%
Alaska Balanced Trust	17,494,974	797,312	(42,074)	62,131	18,312,343	4.67%	4.55%
Long Term Balanced Fund	26,830,916	1,526,840	(43,353)	471,859	28,786,262	7.29%	5.65%
AK Target Date 2010 Trust	1,000,710	41,931	(38,713)	-	1,003,928	0.32%	4.27%
AK Target Date 2015 Trust	3,471,855	162,038	(30,305)	-	3,603,588	3.79%	4.69%
AK Target Date 2020 Trust	11,016,867	558,652	87,219	-	11,662,738	5.86%	5.05%
AK Target Date 2025 Trust	23,999,014	1,344,496	58,324	(241,872)	25,159,962	4.84%	5.62%
AK Target Date 2030 Trust	35,542,055	2,137,790	155,424	(41,310)	37,793,959	6.34%	6.01%
AK Target Date 2035 Trust	48,605,121	3,110,181	399,156	(152,706)	51,961,752	6.91%	6.38%
AK Target Date 2040 Trust	60,101,422	4,023,664	634,057	(311,917)	64,447,226	7.23%	6.68%
AK Target Date 2045 Trust	85,883,806	5,941,889	668,027	(86,074)	92,407,648	7.60%	6.90%
AK Target Date 2050 Trust	118,429,163	8,297,910	977,813	(82,293)	127,622,593	7.76%	6.98%
AK Target Date 2055 Trust	81,007,579	5,676,485	985,472	(112,303)	87,557,233	8.09%	6.97%
AK Target Date 2060 Trust	5,707,594	416,278	356,261	-	6,480,133	13.54%	7.07%
AK Target Date 2065 Trust	1,319,792	97,879	128,171	(2,469)	1,543,373	16.94%	7.08%
Total Investments with T. Rowe Price	604,689,895	37,398,357	4,099,979	417,463	646,605,694		
State Street Global Advisors							
Money Market	6,446,719	21,852	(178,430)	57,974	6,348,115	-1.53%	0.34%
S&P 500 Stock Index	35,362,757	2,245,906	166,586	452,183	38,227,432	8.10%	6.30%
Russell 3000 Index	25,268,505	1,749,241	64,913	249,306	27,331,965	8.17%	6.88%
World Equity Ex-US Index	29,183,318	2,491,057	70,520	(717,277)	31,027,618	6.32%	8.63%
Total Investments with SSgA	96,261,299	6,508,056	123,589	42,186	102,935,130		
BlackRock							
Passive U.S. Bond Index Fund	25,727,849	836,890	(189,715)	319,552	26,694,576	3.76%	3.24%
Strategic Completion Fund	3,867,849	177,651	(297)	60,682	4,105,885	6.15%	4.56%
Total Investments with BlackRock	29,595,698	1,014,541	(190,012)	380,234	30,800,461		
Brandes and Baillie Gifford							
AK International Equity Fund	22,202,929	2,509,444	31,836.00	(753,639)	23,990,570	8.05%	11.49%
Northern Trust							
Environmental, Social, and Governance Fund	13,165,768	843,977	36,059.00	(86,244)	13,959,560	6.03%	6.42%
Total All Funds	$ 765,915,589	$ 48,274,375	$ 4,101,451	$ -	$ 818,291,415	6.84%	6.29%

Notes: Source data provided by the record keeper, Empower Retirement.
(1) Income divided by beginning assets plus half of net contributions/(withdrawals). Actual returns are calculated by Callan and Associates.

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
January 31, 2023
$ (Thousands)

Invested Assets (at fair value)	**July**	**August**	**September**	**October**	**November**	**December**	**January**
Investments with T. Rowe Price							
Stable Value Fund	$ 45,641	$ 44,765	$ 47,427	$ 48,796	$ 50,458	$ 51,432	$ 52,377
Small Cap Stock Fund	40,776	38,396	32,660	34,208	34,711	32,847	35,886
Alaska Balanced Trust	22,213	19,807	18,235	18,760	18,907	17,495	18,312
Long Term Balanced Fund	15,873	18,369	19,406	21,490	25,376	26,831	28,786
AK Target Date 2010 Trust	1,532	1,498	1,143	1,158	1,017	1,001	1,004
AK Target Date 2015 Trust	3,668	3,576	3,376	3,465	3,631	3,472	3,604
AK Target Date 2020 Trust	12,107	11,706	10,681	10,996	11,345	11,017	11,663
AK Target Date 2025 Trust	26,104	25,080	22,928	23,801	25,007	23,999	25,160
AK Target Date 2030 Trust	36,650	35,226	32,560	34,161	36,544	35,542	37,794
AK Target Date 2035 Trust	51,272	49,004	44,701	47,085	50,495	48,605	51,962
AK Target Date 2040 Trust	61,928	59,549	54,727	58,088	62,478	60,101	64,447
AK Target Date 2045 Trust	88,513	85,155	77,804	82,765	89,283	85,884	92,408
AK Target Date 2050 Trust	121,377	116,909	107,070	114,207	123,294	118,429	127,623
AK Target Date 2055 Trust	82,948	79,620	72,931	77,995	84,311	81,008	87,557
AK Target Date 2060 Trust	4,935	4,780	4,478	5,086	5,810	5,708	6,480
AK Target Date 2065 Trust	993	950	928	1,097	1,304	1,320	1,543
Investments with State Street Global Advisors							
Money Market	5,583	5,551	5,963	6,055	6,148	6,447	6,348
S&P 500 Stock Index	26,108	30,067	29,314	33,075	36,201	35,363	38,227
Russell 3000 Index	32,509	27,219	20,875	20,627	24,257	25,269	27,332
World Equity Ex-US Index	27,123	30,294	27,831	29,256	31,278	29,183	31,028
Investments with BlackRock							
Passive U.S. Bond Index Fund	21,858	22,279	25,427	26,850	27,228	25,728	26,695
Strategic Completion Fund	1,745	1,664	1,510	1,551	2,832	3,868	4,106
Investments with Brandes and Baillie Gifford							
AK International Equity Fund	32,754	28,144	22,034	21,633	23,106	22,203	23,991
Investments with Northern Trust							
Environmental, Social, and Governance Fund	26,794	22,626	18,537	19,075	17,072	13,166	13,960
Total Invested Assets	**$ 791,005**	**$ 762,235**	**$ 702,547**	**$ 741,282**	**$ 792,092**	**$ 765,916**	**$ 818,291**
Change in Invested Assets							
Beginning Assets	$ 742,358	$ 791,005	$ 762,235	$ 702,547	$ 741,282	$ 792,092	$ 765,916
Investment Earnings	44,277	(25,432)	(58,565)	34,080	46,106	(28,497)	48,274
Net Contributions (Withdrawals)	4,370	(3,337)	(1,124)	4,655	4,704	2,320	4,101
Ending Invested Assets	**$ 791,005**	**$ 762,235**	**$ 702,547**	**$ 741,282**	**$ 792,092**	**$ 765,916**	**$ 818,291**

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

ALASKA RETIREMENT MANAGEMENT BOARD

FINANCIAL REPORT
(Supplement to the Treasury Division Report)

As of January 31, 2023

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 Seven Months Ending January 31, 2023

	Contributions				Expenditures				Net
	Contributions EE and/or 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 Pension Trust	$ 288,932,288	$ 33,933,000	$ 95,959	$ 322,961,247	$ (591,865,090)	$ (5,151,922)	$ (3,313,272)	$ (600,330,284)	$ (277,369,037)
Retirement Health Care Trust	4,300,198	-	48,758,553	53,058,751	(317,093,010)	-	(12,000,137)	(329,093,147)	(276,034,396)
Total Defined Benefit Plans	293,232,486	33,933,000	48,854,512	376,019,998	(908,958,100)	(5,151,922)	(15,313,409)	(929,423,431)	(553,403,433)
Defined Contribution Plans:									
Participant Directed Retirement	124,127,098	-	-	124,127,098	-	(68,079,247)	(4,196,500)	(72,275,747)	51,851,351
Health Reimbursement Arrangement [(a)]	29,674,280	-	-	29,674,280	(471,397)	-	(135,089)	(606,486)	29,067,794
Retiree Medical Plan [(a)]	10,930,014	-	126,299	11,056,313	(809,285)	-	(106,963)	(916,248)	10,140,065
Occupational Death and Disability: [(a)]									
All Others	2,414,787	-	-	2,414,787	(97,360)	-	(29,617)	(126,977)	2,287,810
Peace Officers and Firefighters	1,025,486	-	-	1,025,486	(255,688)	-	(11,563)	(267,251)	758,235
Total Defined Contribution Plans	168,171,665	-	126,299	168,297,964	(1,633,730)	(68,079,247)	(4,479,732)	(74,192,709)	94,105,255
Total PERS	**461,404,151**	**33,933,000**	**48,980,811**	**544,317,962**	**(910,591,830)**	**(73,231,169)**	**(19,793,141)**	**(1,003,616,140)**	**(459,298,178)**
Teachers' Retirement System (TRS)									
Defined Benefit Plans:									
Retirement Pension Trust	35,425,350	91,029,000	17,934	126,472,284	(314,956,363)	(960,228)	(1,878,322)	(317,794,913)	(191,322,629)
Retirement Health Care Trust	2,701,351	-	16,286,971	18,988,322	(99,275,815)	-	(4,391,252)	(103,667,067)	(84,678,745)
Total Defined Benefit Plans	38,126,701	91,029,000	16,304,905	145,460,606	(414,232,178)	(960,228)	(6,269,574)	(421,461,980)	(276,001,374)
Defined Contribution Plans:									
Participant Directed Retirement	35,953,795	-	-	35,953,795	-	(18,757,240)	(1,506,618)	(20,263,858)	15,689,937
Health Reimbursement Arrangement [(a)]	6,878,521	-	-	6,878,521	(129,285)	-	(39,303)	(168,588)	6,709,933
Retiree Medical Plan [(a)]	2,168,375	-	26,408	2,194,783	(166,652)	-	(54,773)	(221,425)	1,973,358
Occupational Death and Disability [(a)]	192,580	-	-	192,580	(15,144)	-	(10,377)	(25,521)	167,059
Total Defined Contribution Plans	45,193,271	-	26,408	45,219,679	(311,081)	(18,757,240)	(1,611,071)	(20,679,392)	24,540,287
Total TRS	**83,319,972**	**91,029,000**	**16,331,313**	**190,680,285**	**(414,543,259)**	**(19,717,468)**	**(7,880,645)**	**(442,141,372)**	**(251,461,087)**
Judicial Retirement System (JRS)									
Defined Benefit Plan Retirement Pension Trust	5,163,682	3,225,000	-	8,388,682	(9,105,558)	-	(96,041)	(9,201,599)	(812,917)
Defined Benefit Plan Retirement Health Care Trust	516,109	-	163,707	679,816	(873,149)	-	(50,184)	(923,333)	(243,517)
Total JRS	**5,679,791**	**3,225,000**	**163,707**	**9,068,498**	**(9,978,707)**	**-**	**(146,225)**	**(10,124,932)**	**(1,056,434)**
National Guard/Naval Militia Retirement System (NGNMRS)									
Defined Benefit Plan Retirement Pension Trust [(a)]	-	-	-	-	(1,154,411)	-	(108,151)	(1,262,562)	(1,262,562)
Other Participant Directed Plans									
Supplemental Annuity Plan (SBS)	102,612,738	-	-	102,612,738	-	(149,946,598)	(4,374,651)	(154,321,249)	(51,708,511)
Deferred Compensation Plan [(b)] (DCP)	28,586,194	-	-	28,586,194	-	(47,137,928)	(1,485,476)	(48,623,404)	(20,037,210)
Total All Funds	**681,602,846**	**128,187,000**	**65,475,831**	**875,265,677**	**(1,336,268,207)**	**(290,033,163)**	**(33,788,289)**	**(1,660,089,659)**	**(784,823,982)**
Total Non-Participant Directed	390,323,021	128,187,000	65,475,831	583,985,852	(1,336,268,207)	(6,112,150)	(22,225,044)	(1,364,605,401)	(780,619,549)
Total Participant Directed	291,279,825	-	-	291,279,825	-	(283,921,013)	(11,563,245)	(295,484,258)	(4,204,433)
Total All Funds	**$ 681,602,846**	**$ 128,187,000**	**$ 65,475,831**	**$ 875,265,677**	**$ (1,336,268,207)**	**$ (290,033,163)**	**$ (33,788,289)**	**$ (1,660,089,659)**	**$ (784,823,982)**

(a) Employer only contributions.
(b) Employee only contributions.

ALASKA RETIREMENT MANAGEMENT BOARD
SCHEDULE OF NON-INVESTMENT CHANGES BY FUND
(Supplement to the Treasury Division Report)
For the Month Ended January 31, 2023

	Contributions				Expenditures				Net
	Contributions EE and/or 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 Pension Trust	$ 50,775,381	$ -	$ 11,863	$ 50,787,244	$ (84,280,121)	$ (212,378)	$ (860,586)	$ (85,353,085)	$ (34,565,841)
Retirement Health Care Trust	177,134	-	12,639,052	12,816,186	(54,451,196)	-	(1,960,610)	(56,411,806)	(43,595,620)
Total Defined Benefit Plans	50,952,515	-	12,650,915	63,603,430	(138,731,317)	(212,378)	(2,821,196)	(141,764,891)	(78,161,461)
Defined Contribution Plans:									
Participant Directed Retirement	22,738,326	-	-	22,738,326	-	(8,952,836)	(681,337)	(9,634,173)	13,104,153
Health Reimbursement Arrangement [a]	5,241,184	-	-	5,241,184	(83,962)	-	(25,513)	(109,475)	5,131,709
Retiree Medical Plan [a]	1,913,723	-	31,835	1,945,558	(134,193)	-	(41,645)	(175,838)	1,769,720
Occupational Death and Disability: [a]								-	
All Others	435,189	-	-	435,189	(13,957)	-	(19,908)	(33,865)	401,324
Peace Officers and Firefighters	165,208	-	-	165,208	(30,880)	-	(7,532)	(38,412)	126,796
Total Defined Contribution Plans	30,493,630	-	31,835	30,525,465	(262,992)	(8,952,836)	(775,935)	(9,991,763)	20,533,702
Total PERS	**81,446,145**	**-**	**12,682,750**	**94,128,895**	**(138,994,309)**	**(9,165,214)**	**(3,597,131)**	**(151,756,654)**	**(57,627,759)**
Teachers' Retirement System (TRS)									
Defined Benefit Plans:									
Retirement Pension Trust	7,111,742	-	169	7,111,911	(44,699,011)	(34,760)	(453,561)	(45,187,332)	(38,075,421)
Retirement Health Care Trust	32,754	-	4,019,521	4,052,275	(16,150,760)	-	(738,914)	(16,889,674)	(12,837,399)
Total Defined Benefit Plans	7,144,496	-	4,019,690	11,164,186	(60,849,771)	(34,760)	(1,192,475)	(62,077,006)	(50,912,820)
Defined Contribution Plans:									
Participant Directed Retirement	7,116,064	-	-	7,116,064	-	(2,722,829)	(291,784)	(3,014,613)	4,101,451
Health Reimbursement Arrangement [a]	1,349,692	-	-	1,349,692	(25,216)	-	(7,387)	(32,603)	1,317,089
Retiree Medical Plan [a]	418,367	-	3,864	422,231	(34,107)	-	(32,639)	(66,746)	355,485
Occupational Death and Disability [a]	37,576	-	-	37,576	(2,172)	-	(8,045)	(10,217)	27,359
Total Defined Contribution Plans	8,921,699	-	3,864	8,925,563	(61,495)	(2,722,829)	(339,855)	(3,124,179)	5,801,384
Total TRS	**16,066,195**	**-**	**4,023,554**	**20,089,749**	**(60,911,266)**	**(2,757,589)**	**(1,532,330)**	**(65,201,185)**	**(45,111,436)**
Judicial Retirement System (JRS)									
Defined Benefit Plan Retirement Pension Trust	505,280	-	-	505,280	(1,315,591)	-	(23,295)	(1,338,886)	(833,606)
Defined Benefit Plan Retirement Health Care Trust	72,470	-	39,491	111,961	(156,142)	-	(9,777)	(165,919)	(53,958)
Total JRS	**577,750**	**-**	**39,491**	**617,241**	**(1,471,733)**	**-**	**(33,072)**	**(1,504,805)**	**(887,564)**
National Guard/Naval Militia Retirement System (NGNMRS)									
Defined Benefit Plan Retirement Pension Trust [a]	-	-	-	-	(143,486)	-	(34,972)	(178,458)	(178,458)
Other Participant Directed Plans									
Supplemental Annuity Plan (SBS)	14,407,842	-	-	14,407,842	-	(29,556,643)	(898,540)	(30,455,183)	(16,047,341)
Deferred Compensation Plan [b] (DCP)	3,996,013	-	-	3,996,013	-	(9,038,534)	(607,482)	(9,646,016)	(5,650,003)
Total All Funds	**116,493,945**	**-**	**16,745,795**	**133,239,740**	**(201,520,794)**	**(50,517,980)**	**-**	**(258,742,301)**	**(125,502,561)**
Total Non-Participant Directed	68,235,700	-	16,745,795	84,981,495	(201,520,794)	(247,138)	(4,224,384)	(205,992,316)	(121,010,821)
Total Participant Directed	48,258,245	-	-	48,258,245	-	(50,270,842)	(2,479,143)	(52,749,985)	(4,491,740)
Total All Funds	**$ 116,493,945**	**$ -**	**$ 16,745,795**	**$ 133,239,740**	**$ (201,520,794)**	**$ (50,517,980)**	**$ (6,703,527)**	**$ (258,742,301)**	**$ (125,502,561)**

(a) Employer only contributions.
(b) Employee only contributions.

ALASKA RETIREMENT MANAGEMENT BOARD
SCHEDULE OF NON-INVESTMENT CHANGES BY FUND
(Supplement to the Treasury Division Report)
For the Seven Months Ending January 31, 2023

PARTICIPANT DIRECTED DISBURSEMENTS BY PLAN AND TYPE

Type	PERS DCR Plan	TRS DCR Plan	Supplemental Annuity Plan	Deferred Compensation	TOTAL	% of Total
Payment to Beneficiary	$ 151,031	$ 2,582	$ 577,993	$ 159,991	$ 891,597	0.3%
Death Benefit	1,495,951	718,906	7,598,035	2,336,717	12,149,609	4.3%
Disability / Hardship	3,115	-	48,223	198,746	250,084	0.1%
Minimum Required Distribution	128,069	62,714	10,973,521	4,370,787	15,535,091	5.5%
Deminimus Acct Balance Distribution	-	-	-	4,856	4,856	0.0%
Qualified Domestic Relations Order	1,002,290	44,279	2,325,425	99,695	3,471,689	1.2%
Separation from Service / Retirement	47,806,411 [a]	15,126,867 [a]	125,976,100	38,882,266	227,791,644	80.1%
Purchase of Service Credit	10,390,551 [a]	1,493,575 [a]	2,447,301	24,862	14,356,289	5.1%
59-½ In-service Distribution	-	-	-	1,037,381	1,037,381	0.4%
Qualified Birth / Adoption Expense	-	-	-	22,627	22,627	0.0%
CARES Act Distributions	-	-	-	-	-	0.0%
DCR to DB Conversion	7,101,829 [a]	1,308,317 [a]	-	-	8,410,146	3.0%
TOTAL	$ 68,079,247	$ 18,757,240	$ 149,946,598	$ 47,137,928	$ 283,921,013	100.0%

[a] Employer distributions sent to the DB plan are shown as "DCR to DB Conversion". Employee funds sent to the DB plan are included with "Purchase of Service Credit". Excess employee money sent to employee after conversion are included in "Separation from Service".

PERS & TRS PARTICIPANT DIRECTED DISBURSEMENTS BY PLAN AND VESTED PERCENTAGE

Vesting	PERS DCR Plan	TRS DCR Plan	TOTAL	% of Total
100% Vested	$ 62,385,184	$ 16,452,889	$ 78,838,073	90.7%
75% Vested	1,064,359	811,555	1,875,914	2.2%
50% Vested	1,408,813	461,232	1,870,045	2.2%
25% Vested	1,136,679	499,981	1,636,660	1.9%
0% Vested	2,084,212	531,583	2,615,795	3.0%
TOTAL	$ 68,079,247	$ 18,757,240	$ 86,836,487	100.0%

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

	PERS DB Pension Plan				TRS DB Pension Plan			JRS	TOTAL
Contribution Type	Tier 1	Tier 2	Tier 3	Total	Tier 1	Tier 2	Total	DB Pension Plan	DB Pension Plan
Mandatory Vested	$ 30,829	$ 638,049	$ 1,002,442	$ 1,671,320	$ -	$ 83,465	$ 83,465	$ -	$ 1,754,785.00
Mandatory Non-Vested	107,694	172,848	471,736	752,278	222,034	600,419	822,453	-	1,574,731
Geographic Differential	-	142,534	62,514	205,048	-	-	-	-	205,048
Voluntary Full	211,010	924,533	1,115,387	2,250,930	-	-	-	-	2,250,930
Indebtedness, Lagging & Partial	14,050	83,347	174,949	272,346	-	54,310	54,310	-	326,656
TOTAL	$ 363,583	$ 1,961,311	$ 2,827,028	$ 5,151,922	$ 222,034	$ 738,194	$ 960,228	$ -	$ 6,112,150

Notes for the DRB Supplement to the Treasury Report

January 2023

This report is the DRB supplement to the Treasury Division's Financial Report. It expands the "Net Contributions/(Withdrawals)" column into contributions and expenditures. It shows contributions received from both employees and employers, contributions from the State of Alaska, and other non-investment income. This report also expands expenditures into benefits, refunds & disbursements, and administrative & investment expenditures.

The net amount of total contributions and total expenditures, presented as "Net Contributions/(Withdrawals)", agrees with the same column in the Treasury Division's Report. Page one shows the year-to-date totals for the first seven months of Fiscal Year 2023, while page two shows only the month of January 2023.

Highlights – On page one, for the seven months ending January 31, 2023:

- PERS DB Pension – Average employer and employee contributions of $41.3 million per month, benefit payments of approximately $84.6 million per month, refunds average $736 thousand, and administrative and investment expenditures of $473 thousand per month (DOR and DRB).
- PERS DB Healthcare – Average employer contributions of $614 thousand per month, and benefit payments of approximately $45.3 million per month. Other income of $18.7 million from OptumRx EGWP subsidies (most recently received in January for January 2023), $14.6 million from OptumRx pharmacy rebates (most recently received in November for 3rd Qtr 2022), $14.3 million from OptumRx EGWP coverage gap discount program (CGDP) (most recently received in December for 2nd Qtr 2022), $716 thousand from Aetna pharmacy rebates (most recently received in December for 2nd Qtr 2022), and average administrative and investment expenditures of $1.7 million per month (DOR and DRB).
- PERS DC Pension – Average employer and employee contributions of $17.7 million per month, participant disbursements average $9.7 million per month, and average administrative and investment expenditures of $600 thousand per month (DOR and DRB).
- PERS DCR Health – For HRA, RMP, and OD&D only, employer contributions average $6.3 million per month on behalf of participating employees, and benefit payments of approximately $233 thousand per month. Currently, 14 benefits are being paid from the Occupational Death & Disability plans, 134 retirees are participating in RMP, and 206 retirees are participating in HRA. Other income of $64 thousand from OptumRx EGWP subsidies (most recently received in January for January 2023), $30 thousand from OptumRx pharmacy rebates (most recently received in November for 3rd Qtr 2022), $30 thousand from OptumRx EGWP coverage gap discount program (CGDP) (most recently received in December for 2nd Qtr 2022), and administrative and investment expenditures were approximately $40 thousand per month (DOR and DRB).
- TRS DB Pension – Average employer and employee contributions of $5.1 million per month, benefit payments of approximately $45 million per month, refunds average $137 thousand, and average administrative and investment expenditures of $268 thousand per month (DOR and DRB).
- TRS DB Healthcare – For HRA, RMP, and OD&D only, average employer contributions of $386 thousand per month, and benefit payments of approximately $14.2 million per month. Other income of $6.5 million from OptumRx EGWP subsidies (most recently received in January for January 2023), $4.7 million from OptumRx pharmacy rebates (most recently received in November for 3rd Qtr 2022), $4.5 million from OptumRx EGWP coverage gap discount program (CGDP) (most recently received in December for 2nd Qtr 2022), $320 thousand from Aetna pharmacy rebates (most recently received in December for 2nd Qtr 2022), and average administrative and investment expenditures of $627 thousand per month (DOR and DRB).

- TRS DC Pension – Average employer and employee contributions of $5.1 million per month, participant disbursements average $2.7 million per month, and average administrative and investment expenditures of $215 thousand per month (DOR and DRB).
- TRS DCR Health – Average employer contributions of $1.3 million per month, and benefit payments of approximately $44 thousand per month. Other income of $11 thousand from OptumRx EGWP subsidies (most recently received in January for January 2023), $3 thousand from OptumRx pharmacy rebates (most recently received in November for 3rd Qtr 2022), $10 thousand from OptumRx EGWP coverage gap discount program (CGDP) (most recently received in December for 2nd Qtr 2022), and average administrative and investment expenditures of $15 thousand per month (DOR and DRB).
- JRS Pension – Average employer and employee contributions of $861 thousand per month, benefit payments of approximately $1.3 million per month, and average administrative and investment expenditures of $14 thousand per month (DOR and DRB).
- JRS Healthcare – Average employer contributions of $86 thousand per month, and benefit payments of approximately $125 thousand per month. Other income of $55 thousand from OptumRx EGWP subsidies (most recently received in January for January 2023), $48 thousand from OptumRx pharmacy rebates (most recently received in November for 3rd Qtr 2022), $54 thousand from EGWP coverage gap discount program (CGDP) (most recently received in December for 2nd Qtr 2022), and average administrative and investment expenditures of $7 thousand per month (DOR and DRB).
- NGNMRS – A combination of lump-sum and monthly benefit payments of $165 thousand per month, and average administrative and investment expenditures of $15 thousand per month (DOR and DRB).
- SBS – Average employer and employee contributions and transfers in of $14.7 million per month. Participant disbursements average of $21.4 million per month, and average administrative and investment expenditures of $625 thousand per month (DOR and DRB).
- Deferred Compensation – Average employer and employee contributions and transfers in of $4.1 million per month, participant disbursements average of $6.7 million per month, and average administrative and investment expenditures of $212 thousand per month (DOR and DRB).

Highlights – On page two, activity for the one month of January 2023 only:

- PERS DB Healthcare - Other income of $12.6 million from OptumRx EGWP subsidies and pharmacy rebates.
- TRS DB Healthcare - Other income of $4.0 million from OptumRx EGWP subsidies and pharmacy rebates.
- JRS DB Healthcare - Other income of $39 thousand from OptumRx EGWP subsidies and pharmacy rebates.
- All other funds - Nothing significant to report.

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

Alaska Retirement Management Board
Division of Retirement & Benefit
Legislative Update – 2023

Bills	Sponsor	Referrals	Summary	Status
Pension Plans				
HB7	Representative Hannan	(H) STA then JUD, FIN	This bill would change the types of proceedings handled by the Office of Administrative hearings (OAH), the entities that may use OAH, the duties of the chief administrative law judge, qualifications and powers of administrative law judges, subpoena powers, compensation, complaints against admin law judges and hearing officers, reimbursement for cost incurred by OAH, procedures for requesting and conducting proceedings of OAH	Referred to (H) State Affairs
HB22	Representative Josephson	(H) CRA, then STA, JUD, FIN	This bill would open a new PERS Defined Benefits tier allowing current police/fire fighters to elect the new tier or remain in the PERS DCR. Make necessary changes relating to eligibility of peace officers and firefighters for DCR medical, changes to employee contribution as set by the ARMB, and changes to the PRPA program based on the funding of the PERS system. *Companion Bill to SB35	Passed out of (H) CRA, Referred to (H) State Affairs

Bill	Sponsor	Referrals	Summary	Status
SB11	Senator Kiehl	(S) L&C then FIN	This bill would open a new PERS &TRS Defined Benefits (DB) tier and offer all PERS and TRS Defined Contribution Retirement (DCR) Plan members the choice to elect the new tier or to remain in the DCR including all new hires must within 90 days of joining the plan make an irrevocable election to participate in the DCR. Maintains the contribution rates from the DCR plan to the new DB tier, open to all participating employers, medical plan premium subsidy structure is similar to the DCR retiree health plan, no HRA, changes to disability benefits, and provides for the administrator to adjust the percentage of the medical plan premiums payment structure beginning on 7/1/2028 and every five years thereafter.	Referred to (S) Labor & Commerce
SB14	Senator Kawasaki	(S) L&C then FIN	This bill offers a retired teacher to be employed as a mentor without stopping their TRS benefit, and the retired teacher will not receive TRS service credit while reemployed. This bill also offers a temporary retirement incentive program to the defined benefits members of PERS and TRS. It allows qualified members to retire three years early, the cost percentages, eligibility, and reemployment cost if the employee returns to a covered position.	Referred to (S) Labor & Commerce
SB35	Senator Kawasaki	(S) L&C then FIN	This bill would open a new PERS Defined Benefits tier allowing current police/fire fighters to elect the new tier or remain in the PERS DCR. Make necessary changes relating to eligibility of peace officers and firefighters for DCR medical, changes to employee contribution as set by the ARMB, and changes to the PRPA program based on the funding of the PERS system. *Companion Bill to HB22	Referred to (S) Labor and Commerce

Bill	Sponsor	Referrals	Summary	Status
Health Plans				
HB17	Representative Carrick	(H) HSS, then CRA, L&C, FIN	Mandates specific coverage of contraceptives by the AlaskaCare employee plan and other specified health insurers in the state. *Companion Bill to SB 27	Heard in (H) Health & Social Services
HB21	Representative Vance	(H) EDC, then L&C	Allows school districts and local governmental units to elect to join the self-insured AlaskaCare employee plan.	Referred to (H) Education
SB3	Senator Hughes	(S) L&C then JUD	Includes multiple health care cost transparency provisions and requires specified insurers to establish a cash incentive program to encourage patients to seek care from lower cost providers. The provisions do not apply to AlaskaCare, however the bill requires DRB to analyze the potential impacts of complying with the provisions of the bill to the AlaskaCare employee plan, and to prepare a report to the legislature detailing the findings.	Referred to (S) Labor & Commerce
SB27	Senator Tobin	(S) HSS then L&C	Mandates specific coverage of contraceptives by the AlaskaCare employee plan and other specified health insurers in the state. *Companion Bill to HB 17	Referred to (S) Health & Social Services

ALASKA RETIREMENT MANAGEMENT BOARD
STAFF REPORT
Division of Retirement & Benefits Report
March 16, 2023

Summary of Monthly Billings – Buck Global LLC

Attached is the requested summary schedule of invoices by quarter related to actuarial services provided by the Division's consulting actuary, Buck Global LLC.

Included on this schedule is the quarter ended September 30, 2022 and the quarter ended December 31, 2022.

Items listed on the left side of the schedule represent regular and non-regular services provided under our current contract.

The associated costs of each service are charged to the System or Plan noted on the column headings.

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT:	Summary of Monthly Billings - Buck Global LLC	ACTION:	
DATE:	March 16, 2023	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 and Benefits provide quarterly summary updates to review services provided and costs incurred for actuarial valuations and other systems' requests.

STATUS:

Attached are the summary totals for the six months ended December 31, 2022, with comparative totals from the prior fiscal year.

Buck
Billing Summary
For the Three Months Ended September 30, 2022

	PERS	TRS	JRS	NGNMRS	EPORS	TOTAL
Actuarial valuations	$ 53,466	42,561	5,457	5,457	2,184	$ 109,125
KPMG audit information request	2,280	926	17	65	-	3,288
ARMB presentations and meeting attendance	3,411	3,414	-	-	-	6,825
FY24 final PERS/TRS contribution rates	3,411	3,414	-	-	-	6,825
GASB 67/74	7,572	6,060	759	759	-	15,150
GASB 68/75	22,722	18,180	2,274	2,274	-	45,450
Projections	6,750	6,750	-	-	-	13,500
Meeting materials	3,551	1,444	26	101	-	5,122
TOTAL	$ 103,163	82,749	8,533	8,656	2,184	$ 205,285
For the Three Months Ended September 30, 2021	$ 150,478	101,313	8,561	8,580	2,184	$ 271,116

For the Three Months Ended December 31, 2022

	PERS	TRS	JRS	NGNMRS	EPORS	TOTAL
Actuarial valuations	$ 53,466	42,561	5,457	5,457	2,184	$ 109,125
Change to valuation data request for DRB's new systems	832	332	-	-	-	1,164
ARMB presentations and meeting attendance	3,411	3,414	-	-	-	6,825
FY24 final PERS/TRS contribution rates	3,411	3,414	-	-	-	6,825
GASB 67/74	7,572	6,060	759	759	-	15,150
GASB 68/75	22,722	18,180	2,274	2,274	-	45,450
Projections	6,750	6,750	-	-	-	13,500
Meeting materials	7,538	3,065	55	215	-	10,873
TOTAL	$ 105,702	83,776	8,545	8,705	2,184	$ 208,912
For the Three Months Ended December 31, 2021	$ 143,005	98,949	8,825	9,795	2,184	$ 262,758

Summary through the Six Months Ended December 31, 2022

	PERS	TRS	JRS	NGNMRS	EPORS	TOTAL
Actuarial valuations	$ 106,932	85,122	10,914	10,914	4,368	$ 218,250
Change to valuation data request for DRB's new systems	832	332	-	-	-	1,164
KPMG audit information request	2,280	926	17	65	-	3,288
ARMB presentations and meeting attendance	6,822	6,828	-	-	-	13,650
FY24 final PERS/TRS contribution rates	6,822	6,828	-	-	-	13,650
GASB 67/74	15,144	12,120	1,518	1,518	-	30,300
GASB 68/75	45,444	36,360	4,548	4,548	-	90,900
Projections	13,500	13,500	-	-	-	27,000
Meeting materials	11,089	4,509	81	316	-	15,995
TOTAL	$ 208,865	166,525	17,078	17,361	4,368	$ 414,197
Summary through the Six Months Ended December 31, 2021	$ 293,483	200,262	17,386	18,375	4,368	$ 533,874

ALASKA RETIREMENT MANAGEMENT BOARD

STAFF REPORT

Division of Retirement & Benefits Report
March 16, 2023

Retirement System Membership Activity as of December 31, 2022

Attached are the membership statistics for the quarter ending

- December 31, 2022

Active counts have changed in the following manner:

- PERS Tier 1-3 active members increased from 8,856 to 8,911, or an increase of 55.
- PERS DCR active members increased from 25,434 to 25,984, or an increase of 550.
- PERS active members had a net increase of 605.

- TRS Tier 1-2 active members increased from 3,085 to 3,099, or an increase of 14.
- TRS DCR active members increased from 6,591 to 6,863, or an increase of 272.
- TRS active members had a net increase of 286.

Retiree counts have changed in the following manner:

- PERS retirees decreased from 37,649 to 37,565, or a decrease of 84 (all tiers).
- TRS retirees decreased from 13,746 to 13,684, or a decrease of 62 (all tiers).

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT: Retirement System Membership Activity
as of December 31, 2022

ACTION: _____

DATE: March 16, 2023

INFORMATION: **X**

BACKGROUND:

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

STATUS:

Membership information as of December 31, 2022.

MEMBERSHIP STATISTICS AS OF SEPTEMBER 30, 2022

	PERS						TRS					JRS	NGNMRS	SBS	DCP
	DB				DCR	SYSTEM	DB			DCR	SYSTEM				
	Tier I	Tier II	Tier III	Total	Tier IV	TOTAL	Tier I	Tier II	Total	Tier III	TOTAL				
Active Members	499	1,855	6,502	8,856	25,434	34,290	113	2,972	3,085	6,591	9,676	75	n/a	20,255	6,557
Terminated Members															
Entitled to Future Benefits	229	1,475	3,146	4,850	2,514	7,364	16	605	621	1,014	1,635	1	n/a	30,565	6,138
Other Terminated Members	958	1,930	7,218	10,106	18,257	28,363	209	1,388	1,597	3,035	4,632	2	n/a	n/a	n/a
Total Terminated Members	1,187	3,405	10,364	14,956	20,771	35,727	225	1,993	2,218	4,049	6,267	3	n/a	30,565	6,138
Retirees & Beneficiaries	21,845	9,701	5,902	37,448	201	37,649	9,811	3,880	13,691	55	13,746	147	698	n/a	n/a
Managed Accounts	n/a	n/a	n/a	n/a	6,017	6,017	n/a	n/a	n/a	1,501	1,501	n/a	n/a	3,564	3,498
Retirements - 1st QTR FY23	42	146	158	346	17	363	34	293	327	16	343	1	39	n/a	n/a
Full Disbursements - 1st QTR FY23	9	51	72	132	717	849	6	13	19	143	162	-	n/a	632	162
Partial Disbursements - 1st QTR FY23	n/a	n/a	n/a	n/a	203	203	n/a	n/a	n/a	66	66	n/a	n/a	1,385	567

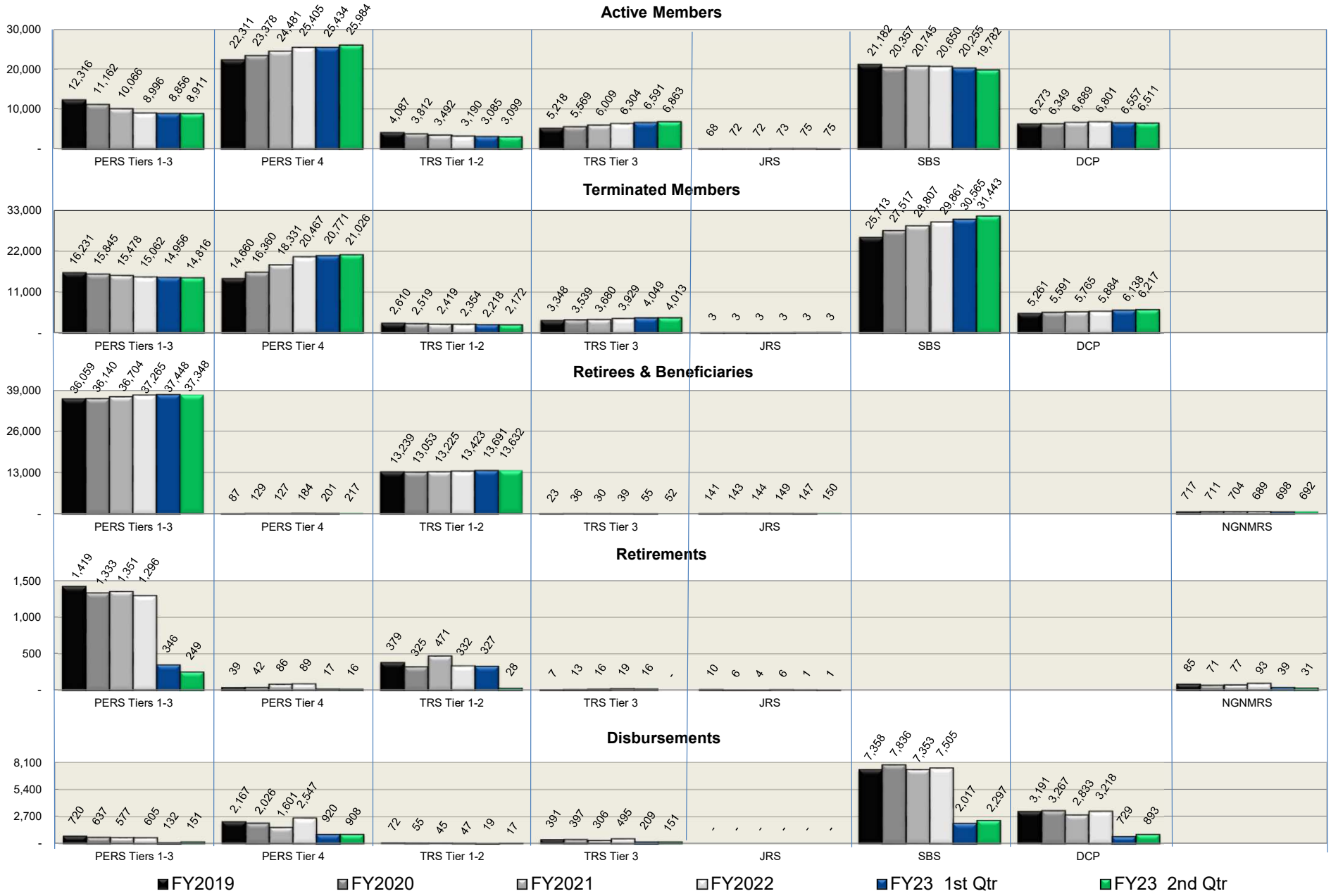
MEMBERSHIP STATISTICS AS OF DECEMBER 31, 2022

	PERS						TRS					JRS	NGNMRS	SBS	DCP
	DB				DCR	SYSTEM	DB			DCR	SYSTEM				
	Tier I	Tier II	Tier III	Total	Tier IV	TOTAL	Tier I	Tier II	Total	Tier III	TOTAL				
Active Members	497	1,873	6,541	8,911	25,984	34,895	116	2,983	3,099	6,863	9,962	75	n/a	19,782	6,511
Terminated Members															
Entitled to Future Benefits	220	1,427	3,136	4,783	2,602	7,385	12	587	599	1,009	1,608	1	n/a	31,443	6,217
Other Terminated Members	944	1,918	7,171	10,033	18,424	28,457	203	1,370	1,573	3,004	4,577	2	n/a	n/a	n/a
Total Terminated Members	1,164	3,345	10,307	14,816	21,026	35,842	215	1,957	2,172	4,013	6,185	3	n/a	31,443	6,217
Retirees & Beneficiaries	21,710	9,698	5,940	37,348	217	37,565	9,747	3,885	13,632	52	13,684	150	692	n/a	n/a
Managed Accounts	n/a	n/a	n/a	n/a	5,728	5,728	n/a	n/a	n/a	1,291	1,291	n/a	n/a	3,525	3,514
Managed account balance qtr end					$478,875,082					$186,552,674				$590,596,131	$162,104,760
Retirements - 2nd QTR FY23	38	97	114	249	16	265	6	22	28	-	28	1	31	n/a	n/a
Full Disbursements - 2nd QTR FY23	16	47	88	151	552	703	5	12	17	96	113	-	n/a	586	155
Partial Disbursements - 2nd QTR FY23	n/a	n/a	n/a	n/a	356	356	n/a	n/a	n/a	55	55	n/a	n/a	1,711	738

Alaska Division of Retirement and Benefits

FY 2023 QUARTERLY REPORT OF MEMBERSHIP STATISTICS

Annual & Quarterly Trends as of December 31, 2022



LEGEND

Active Members - All active members at the time of the data pull,
except SBS & DCP, which are counts of contributors during the final quarter of each period.

Terminated Members - All members who have terminated without refunding their account,
except SBS & DCP, which are counts of members with balances at the end of the period less active members.

Retirees & Beneficiaries - All members who have retired from the plans, including beneficiaries eligible for benefits.

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

Retirements - The number of retirement applications processed.

Full Disbursements - All types of disbursements that leave the member balance at zero.

Partial Disbursements - All types of disbursements that leave the member balance above zero. If more than one partial disbursement is completed during the quarter for a member, they are counted only once for statistical purposes.

Division of Retirement and Benefits
BEARS IT Modernization
Alaska Retirement Management Board
March 16, 2023

Project Background

With a capital appropriation in FY19, the Division of Retirement and Benefits (DRB) began implementing a multi-year project to modernize IT and work processes to drive efficiency, accuracy, and security associated with its core business and services.

This integrated, enterprise-wide system supports DRB's core business functions for pension and health plans of all tiers, including demographic information as a single source of truth.

The system will be an enterprise-level retirement information system solution providing many modern tools to enable the state to maintain and improve service to members. The system will integrate core business processes, facilitate consistency, and enable additional oversight and accountability.

DRB's contracted vendors, Linea (Project Management) and Sagitec (Technical Implementation), are working closely with DRB staff to continue to analyze any changes to DRB's needs, review all requirements, and design and develop the modules that will comprise the enterprise-wide system.

Status Update

Since the December 2022 update on the **BE**nefit **A**nd **R**etirement **S**ystem (BEARS) project, DRB had several accomplishments and met a number of milestones.

Accomplishments during this period include:

- *Scope Change Requests:* 12 of 13 change requests mentioned in the previous update have been fully designed and 10 have been fully developed.

- *Program Modules:* In-depth analysis and design has been completed on all but the "Return to Work" module, and development of all designed program modules is nearly complete. Pilot 2 testing in December was very successful, and Pilot 3 testing will be held in August 2023.

- *Data Conversion:* Taking place in conjunction with module design and development, as it requires that the data source be mapped correctly for accessibility within the new module design. Data mapping of 8 modules is 100% complete, 7 modules are at or over 95% complete, and the 1 remaining module is at 33% complete.

Division of Retirement and Benefits
BEARS IT Modernization
Alaska Retirement Management Board
March 16, 2023

Budget and Spending by Vendors (as of 2/28/2023):

Sagitec – Program design, development, and implementation

Total Auth	25,566,097
Spend-to-date	16,629,082
Balance Remaining	*8,937,015*

Linea – Program management

Due to the extension of the implementation date caused by the Scope Change Request reported in the previous update, DRB is currently evaluating a cost amendment to the Linea contract to provide on-going support for the remainder of the project. This process is underway and will be reported in the June 2023 update.

Total Auth	3,270,858
Spend-to-date	2,897,388
Balance Remaining	*373,470*

THE STATE of ALASKA
GOVERNOR MIKE DUNLEAVY

Department of Revenue

ALASKA RETIREMENT MANAGEMENT BOARD

PO Box 110405
Juneau, Alaska 99811-0405
Main: 907.465.3749
Fax: 907.465.4397

Chief Investment Officer Report – March 2023

1. CIO Update

2. Watch List:
   a. Existing – Fidelity Real Estate High Income, performance, 12/21
   b. Existing – Blackrock Real Estate, personnel turnover, 3/22
   c. Existing – Brandes International, performance, 3/22
   d. Existing – Baillie Gifford, performance, 9/22

3. Material contract and investment actions:
   a. 11/09/22 T.Rowe Price – pricing tier addition
   b. 12/05/22 Timberland Investment Resources – contract consolidation
   c. 02/08/23 Timberland Investment Resources – contract amendment
   d. 02/08/23 Ares Pathfinder Core Fund – $100 million private debt investment

4. Portfolio Transaction Update from November 2022 through January 2023

Individual Manager Transactions

Nov 2022 - Jan 2023

Asset Class	Total
Fixed Income	590,000,000
Broad Domestic Equity	(50,000,000)
Global Equity Ex-US	(540,000,000)
Real Assets	-
Multi-asset	-
Private Equity	-
Net Buys	590,000,000
Net Sells	(590,000,000)

Manager	Total	Fund	Asset Class	Description
ARMB Scientific Beta	(100,000,000)	AYLM	Dom. Equity	Rebalancing
ARMB Multi-factor	100,000,000	AYK4	Dom. Equity	Rebalancing
ARMB S&P 900	(50,000,000)	AY4L	Dom. Equity	Rebalancing
ARMB Aggregate Bond Fund	173,000,000	AY77	Fixed Income	Rebalancing
Short Term Fixed Income Pool	347,000,000	AY70	Fixed Income	Rebalancing
Fidelity Tactical Bond	70,000,000	AY1F	Fixed Income	Rebalancing
Legal & General International Scientific	(128,800,000)	AYLS	Intl. Equity	Rebalancing
Brandes Investment Partners	(148,500,000)	AY65	Intl. Equity	Rebalancing
SSGA World ex-US IMI	(134,000,000)	AYL7	Intl. Equity	Rebalancing
Arrowstreet Capital	(128,700,000)	AYLQ	Intl. Equity	Rebalancing
Project Pearl	(3,417,395)	AY1J	Real Assets	Strategy Close/Transfer
Timberland Investment Resources	3,417,395	AY9Q	Real Assets	Strategy Close/Transfer

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT:	Callan General Consulting Contract	ACTION:	X
DATE:	March 16-17, 2023	INFORMATION:	

BACKGROUND:

Callan LLC (Callan) currently serves as the Performance Measurement and Investment Advisory Consultant for the Alaska Retirement Management Board (ARMB).

Contractual services include the following:

1) Asset Liability Study,
2) Asset Allocation,
3) Manager Selection,
4) Performance Measurement,
5) Investment Management; and
6) General Consulting

The period of performance for this contract begins July 1, 2019, and ends June 30, 2022, with two optional one-year extensions. The first extension was exercised last year and expires June 30, 2023.

The contract was awarded to Callan in 2019 after going through a public RFP process.

STATUS:

Callan has served as the general investment consultant for 30 years and continues to do an excellent job.

Staff does not believe the cost/benefit of going through a new RFP process at this time is warranted.

The compensation terms of the arrangement will continue as agreed in the current contract.

RECOMMENDATION:

The Alaska Retirement Management Board direct staff to exercise the second of the two, one-year contract extensions to extend Callan's general consulting contract until June 30, 2024.

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT: Callan Real Assets Consulting Contract — ACTION: X

DATE: March 16-17, 2023 — INFORMATION: ____

BACKGROUND:

Callan LLC (Callan) currently serves as the Real Assets Consultant for the Alaska Retirement Management Board (ARMB).

Contractual services include the following:

1) Strategic Consulting,
2) Sourcing and Due Diligence,
3) Monitoring and Performance Measurement; and,
4) Other special projects as needed.

The period of performance for this contract begins July 1, 2019, and ends June 30, 2022, with two optional one-year extensions. The first extension was exercised last year and expires June 30, 2023.

The contract was awarded to Callan in 2019 after going through a public RFP process.

STATUS:

Callan replaced the former real estate consultant in 2019 and has done an excellent job providing consulting services across the broader real assets landscape. Having the same firm provide both general consulting and real assets consulting also helps streamline portfolio analysis and reporting to staff and ARMB.

Staff does not believe the cost/benefit of going through a new RFP process at this time is warranted.

The compensation terms of the arrangement will continue as agreed in the current contract.

RECOMMENDATION:

The Alaska Retirement Management Board direct staff to exercise the second of the two, one-year contract extensions to extend Callan's real assets consulting contract until June 30, 2024.

REPORT ON ALASKA RETIREE HEALTH PLAN ADVISORY BOARD MEETING FEBRUARY 9, 2023

The advisory board facilitates engagement and coordination between the State's retirement systems' members, the ARMB, and the Commissioner regarding the administration of the retiree health plan.

The Modernization Committee continues to review proposed changes to the Lifetime Maximum section of the Plan. The lifetime maximum on the Plan initially consisted of a $250,000 limit which increased to $1 million in 1985 and then to $2 million in 1999. It has been over 20 years since there has been a change in the lifetime maximum limit. Based on the Consumer Price Increase for All Urban Consumers (CPI-U) for Medical Services, the limit would have increased to about $4 million from 1999 to 2022.

Staff have considered the following options for the committee's consideration:

- Doubling the lifetime maximum to $4 million
    - $4 million annual maximum
    - .25% increase to actuarial value of plan
    - $1.7 million additional cost for annual impact
- Increasing the lifetime maximum to $8 million
    - $8 million annual maximum
    - .35% increase to actuarial value of plan
    - $2.4 million additional cost for annual impact
- Removing the lifetime maximum
    - .4% increase in actuarial value of plan
    - $2.7 million additional cost for annual impact

The Division is also exploring increasing the Standard Dental Plan's annual benefit maximum. This would allow members participating in the plan to receive coverage for more dental services each year, bringing the annual benefit maximum more in line with present day dental costs.

Costs for dental services, along with healthcare costs in general, continue to increase, resulting in more members reaching their annual maximum limit. In 2021, 7.4% (2,537 individuals) of Legacy Plan members met their annual maximum, up from 5.5% in 2020; while 6.1% (1,629 individuals) of Standard Plan members met their annual maximum; up from 5.0% in 2020.

Also there is a significant number of premium payers that are not utilizing any services. The board has asked the Division to research why there are so many that are not even partaking in the free annual preventative services.
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Next Meeting – May 4, 2023

Managed Accounts Discussion

- State of Alaska - Managed Accounts Response
- Empower Advisory Service Overview
- Empower Advisory Service Update

State of Alaska - Managed Accounts Response

- *I am deeply concerned that the information provided to the ARM Board was not correct and that the errors were not discovered in Empower's review processes before being submitted to the Board. Instead, the errors were found by an astute question by Dr. Jennings during the Defined Contribution November 30th meeting. It is unacceptable for the ARM Board to be a beta tester for the accuracy of Empower's reports.*

  I understand your concerns and extend my apologies to the members the ARM Board for providing incorrect data. The request for the reporting was received by my team just prior to the week of Thanksgiving. I asked the team to create a new custom report to fulfill the request. I was aware that our reporting team was short staffed during the holiday week and that the normal turn around time for a custom report of this nature was significantly longer than I was allowing for the creation of this report. In hindsight, I should have communicated that we would not be able to provide the report for the November 30th meeting and that we would have it available for the next quarterly meeting.

  I agree that it is unacceptable for the ARM Board to be a beta tester for the accuracy of our reports and have put procedures in place to prevent this from happening in the future.

- *I would like a clear explanation (included in the DC packet) as to how this happened and why it will not happen in the future. This rises to the level of concern to also be explained to the entire Board. I have added to the Board agenda a time in the morning of the first day for Empower to answer trustee questions about his matter.*

  As mentioned in the previous response, the turnaround time for the requested report was abbreviated. In our focus on fast delivery, we lost sight of a quality check that should have been completed. The data in the report was reviewed and was accurate. However, the format of the report was not appropriate for external use. The data was then manually entered into a presentation ready format. We should have been more careful to ensure that the data was moved without mistake. We take full responsibility for the inaccurate data and have put additional layers of review in place for future reports.

- *The Managed Account performance in the first version was the performance of All Investment Strategies. How do you define All Investment Strategies? Is this simply the member in each plan that is the median and reporting their portfolio performance? If so, this is nothing like the task of reporting the performance of managed accounts.*

  All Investment Strategies includes individual investors utilizing a Target Date Fund (TDF), Managed Account (MTR) or Do-It-Yourself (DIY) approach to allocating their assets across the entirety of the 1-, 3- and 5-year time periods, respectively. We determine a TDF, MTR and DIY user by applying rules to categorize each participant into one of these groups. As an example, an individual with only 5% of their allocation in TDFs would be

categorized as a DIYer. Similarly, an individual utilizing MTR for only half of the time period would also be categorized as DIY. This approach allows returns to have more reasonable comparisons across the groups. Rate of return is calculated based on all account activity between the first and last day of the period. It is calculated based on a formula which estimates the equivalent rate of return during the statement period, based on the opening balance, transaction activity and closing balance. The formula was reviewed by Empower Advisory Group, LLC, a registered investment adviser. This process calculates full period rates of return in 3 month, 1, 3-, 5-, 7- and 10-year intervals consistent with the procedures called by the participant website.

- *Please provide the portfolio construction that goes with each performance measure. I believe you are finding a member at the 25th, 50th, and 75th percentiles in each plan and are reporting their performance. Please provide their respective asset allocations that match with the each reported performance.*

  We are actively working to create the details in a format that can be easily consumed outside of the system and provides a robust data set for each of the 25th, median and 75th percentile returns used for the 9/30/2022 report. The detail will provide you with the respective participant(s) age band, investor type, investment, asset class and fund balance/allocation. In the event that the percentile was shared between two or more participants (e.g., a median for an even number of observations), the participant records immediately above and below the statistic are provided. This will give you a sense for the portfolio holdings for the demographic cohort, investor type and the median percentiles.

- *I have attached Callan reviewed ARM Board performance through September 30th, 2022, from our December 2022 Board meeting. Please confirm that you are comparing the same time periods in your revised report.*

  Confirmed. The Empower report is as of 9.30.2022, which is the date Callan utilized in the returns document provided.

- *I have attached Callan's 2016 Managed Account Review. Can you share an updated percentage on the number of managed account members that were defaulted into managed accounts? The 2016 estimation was 75%.*

  We have included default data in the attached presentation, *Empower Advisory Services Updates*, on pages 2-4.

- *Please provide updates to the tables on slides 13 and 14 of the Callan 2016 Review.*

  For slide 13, below is an update to the portfolio construction as of 9.30.2022.

3Q 2022

PLAN FUND UTILIZATION – BY PLAN PORTFOLIOS

The table below shows the utilization of each fund within each of the representative risk-based portfolios in your plan.

Please note that due to the data-compilation method, the funds shown below may be more recent than the funds utilized as of the date shown on the front of this Report Card.

	Representative Risk-based Portfolios*						
Fund	Very Conservative	Conservative	Moderately Conservative	Moderate	Moderately Aggressive	Aggressive	Very Aggressive
Alaska Balanced Trust	5%	8%	9%	8%	6%	2%	0%
Alaska Long-Term Balanced Trust	5%	9%	11%	9%	6%	3%	0%
International Equity Fund	0%	2%	3%	8%	14%	20%	24%
Passive U.S. Bond Index Fund	35%	24%	15%	10%	8%	5%	3%
Environmental Social and Governance Fd	3%	7%	9%	9%	9%	9%	8%
S & P 500 Stock Index Fund	0%	3%	5%	6%	6%	6%	6%
Russell 3000 Index	0%	0%	0%	5%	10%	15%	17%
World Equity Ex-US Index	3%	7%	10%	12%	13%	17%	21%
US Small Cap Trust	0%	5%	9%	13%	16%	19%	21%
Stable Value Fund	40%	33%	28%	20%	13%	5%	0%
State Street Inst Treasury Money Market	9%	5%	1%	0%	0%	0%	0%

Empower did not originally prepare slide 14. The performance comparison was created as part of Callan's managed account review that they were commissioned to execute. We spoke with Callan, and they will recreate the slide if the ARMB decides to conduct another managed account review.

- *I am interested in seeing managed account performance net fees that can be included in the ARM Board's quarterly performance reviews.*

  Confirmed. The attached presentation includes account performance net of fees.

EMPOWER

Empower Advisory Services Overview

As of 09/30/2022

FOR PLAN SPONSOR OR FINANCIAL PROFESSIONAL USE ONLY.

RO2096195-0422

State of Alaska Deferred Compensation Plan

98214-01

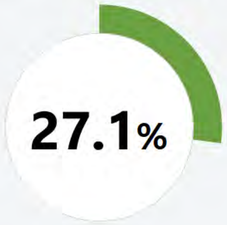
EMPOWER®

Advisory services

As of 9/30/2022

Advisory services compares participants using and not using the advisory service. The illustration includes participants actively employed and separated from service with a balance.

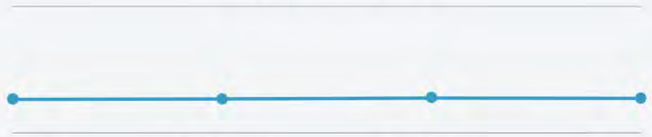
Population of participants using and not using My Total Retirement



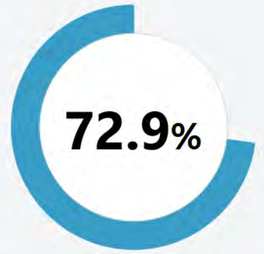
of participants are using
My Total Retirement

This amounts to
3,434 participants

Population over time



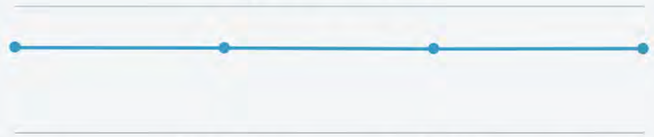
12/31/2021	3/31/2022	6/30/2022	9/30/2022
26.2%	**26.6%**	**27.4%**	**27.1%**



of participants are using
other investment strategies

This amounts to
9,231 participants

Population over time



12/31/2021	3/31/2022	6/30/2022	9/30/2022
73.8%	**73.4%**	**72.6%**	**72.9%**

F1.2a Empower Retirement Advisory Services Powered by Morningstar. Online Advice and My Total Retirement are part of the Empower Retirement Advisory Services suite of services offered by Empower Advisory Group, LLC, a registered investment adviser.
Median Lifetime Income Score and average contribution rate will show as not available when the data required for those calculations has not been provided

Advisory services

As of 9/30/2022

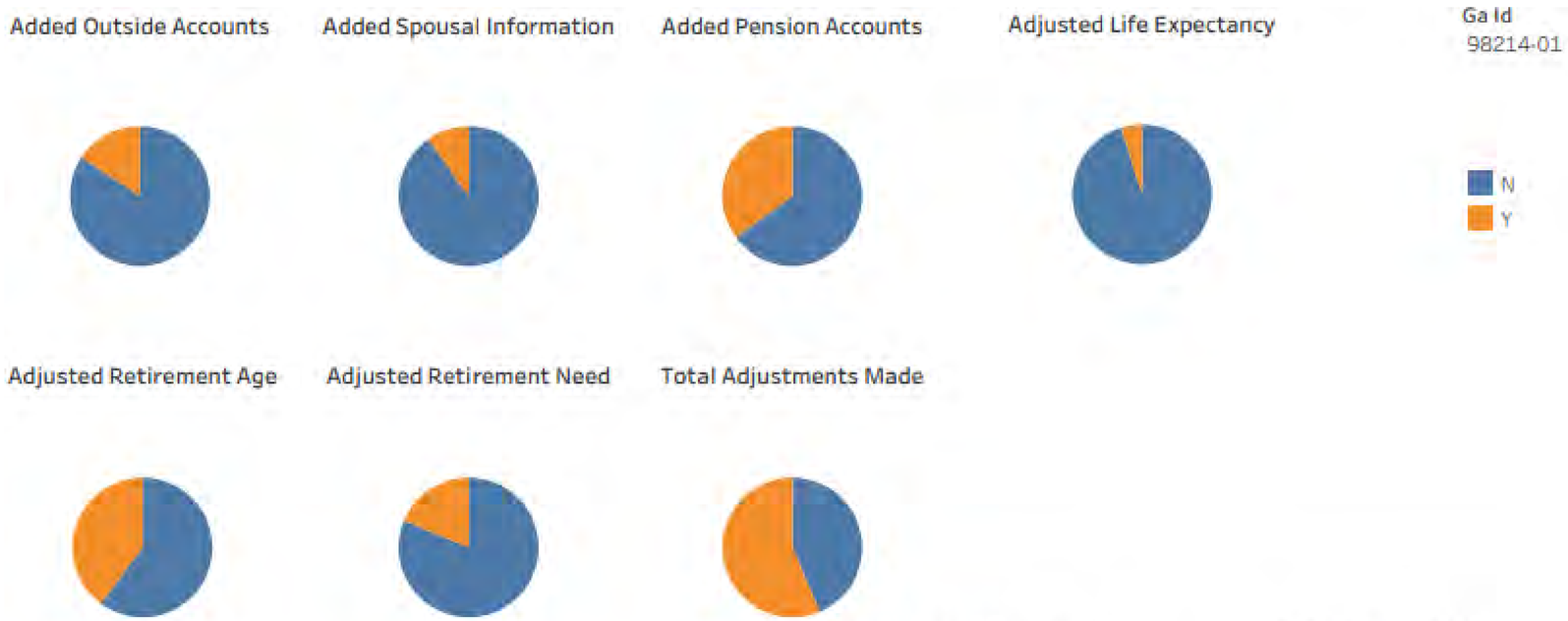
Advisory services compares participants using and not using the advisory service. The illustration includes participants actively employed and separated from service with a balance.

Insights into participants using and not using My Total Retirement

		Under 30 yrs	30-39 yrs	40-49 yrs	50-59 yrs	60-67 yrs	Over 67 yrs
My Total Retirement users	% of participants	43%	35%	28%	28%	23%	12%
	# of participants	278	833	750	864	525	184
	Average balance	$4,170	$12,619	$25,526	$60,752	$87,529	$97,199
	Average equity percent	53.7%	50.5%	47.3%	42.7%	37.1%	37.4%
Other investment strategy users	% of participants	57%	65%	72%	72%	77%	88%
	# of participants	371	1,543	1,973	2,189	1,783	1,371
	Average balance	$7,090	$18,006	$48,749	$93,989	$147,926	$188,691
	Average equity percent	54.2%	53.1%	51.5%	47.4%	40.5%	33.4%

Median Lifetime Income Score and average contribution rate will show as not available when the data required for those calculations has not been provided

Personalization – Deferred Comp Plan as of 9/30/22



	Participant Accounts	% of Total in MA
Added Outside Accounts [1]	597	15.75%
Added Spousal Information [2]	374	9.87%
Added Pension Accounts [1]	1,330	35.09%
Adjusted Life Expectancy [3]	185	4.88%
Adjusted Retirement Age [4]	1,507	39.76%
Adjusted Retirement Need [5]	709	18.71%
Total That Made Adjustments	2,138	56.41%
Total Enrolled	3,790	100.00%

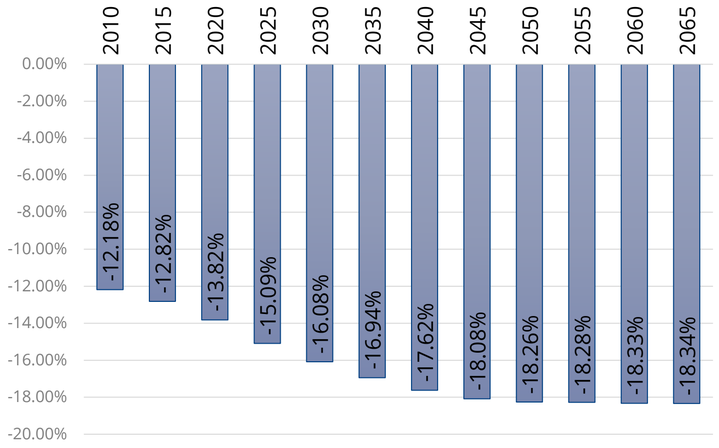
- 1 The Advisory Service process allows for the inclusion of outside financial and pension information to allows for more personalized retirement readiness recommendations
- 2 The inclusion of spousal/partner information allows for a holistic, household retirement income projection
- 3 Participants may adjust their life expectancy to help receive recommendations appropriate to their retirement income needs
- 4 Adjusting retirement age helps provide recommendations appropriate to the participant's savings horizon, and determined by a comparison of the retirement age in Advisory Services against the plan's default retirement age in the recordkeeping system
- 5 This column represents whether participants have adjusted their retirement income need to something other than 100%, post-tax replacement retirement income NOTAPPROVEDFORUSEWITHPLANPARTICIPANTS

- 98214-01 State of Alaska Deferred Compensation Plan

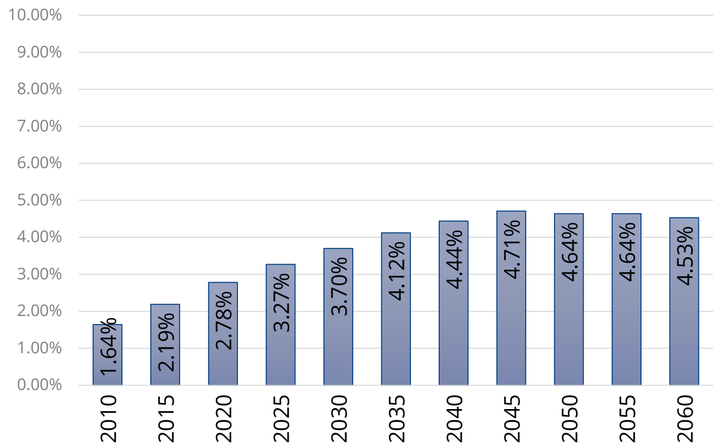
Annual Rate of Return Summary

As of 9/30/2022

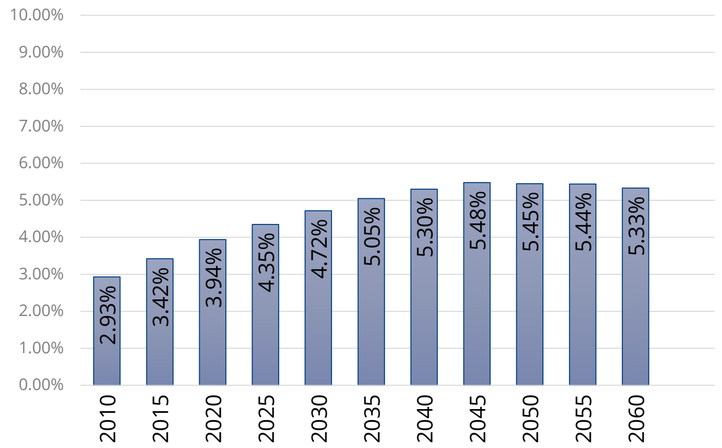
Alaska Target Date Fund - 1 Year



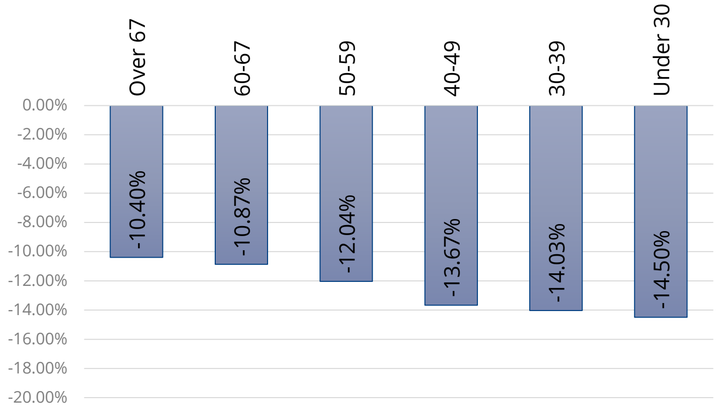
Alaska Target Date Fund - 3 Year



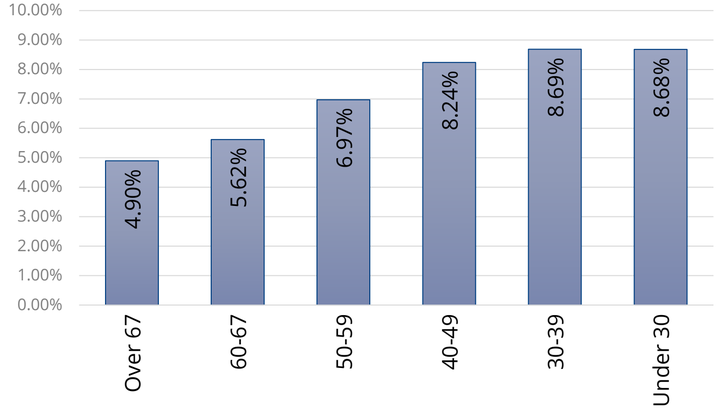
Alaska Target Date Fund - 5 Year



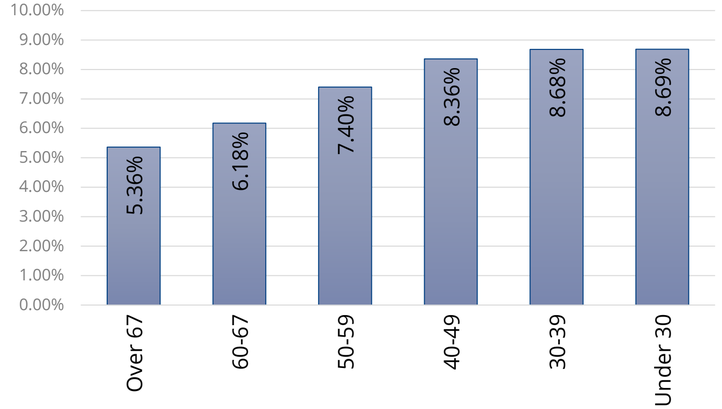
All Investment Strategies – Median 1 Year by Age Band



All Investment Strategies – Median 3 Year by Age Band



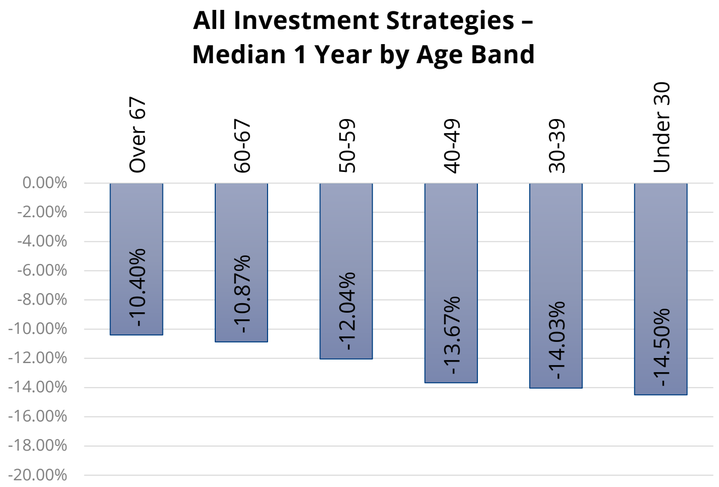
All Investment Strategies – Median 5 Year by Age Band

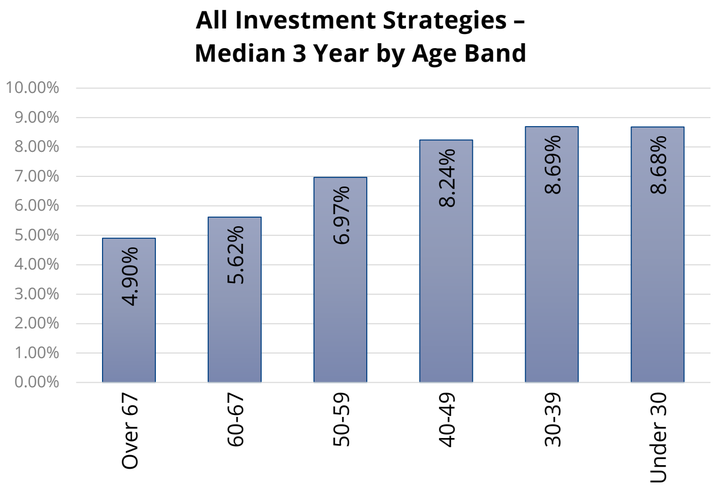


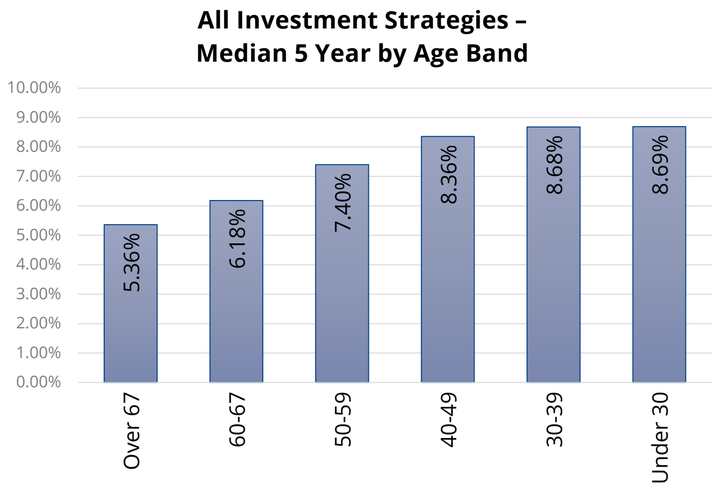
Performance data quoted represents past performance and is not a guarantee or prediction of future results. The investment return and principal value of an investment will fluctuate so that, when redeemed, shares/units may be worth more or less than their original cost. Current performance may be lower or higher than performance data shown. Performance for a share class before its inception is derived from the historical performance of the oldest share class. If the newer fund has lower expenses, the extended performance is not adjusted for the lower expenses; had it, returns would have been higher. For performance data current to the most recent month-end, please visit www.akdrb.com. Carefully consider the investment option's objectives, risks, fees and expenses. Contact us for a prospectus, summary prospectus for SEC registered products or disclosure document for unregistered products, if available, containing this information. Read each carefully before investing. You could lose money by investing in a Money Market Fund. Although the fund seeks to preserve the value of your investment at $1 per share, it cannot guarantee it will do so. An investment in the fund is not insured or guaranteed by the Federal Deposit Insurance Corporation or any other government agency. The fund's sponsor has no legal obligation to provide financial support to the fund, and you should not expect that the sponsor will provide financial support to the fund at any time. For additional fund information, please refer to the Fund Fact Sheet or Prospectus

Annual Rate of Return Summary

As of 9/30/2022







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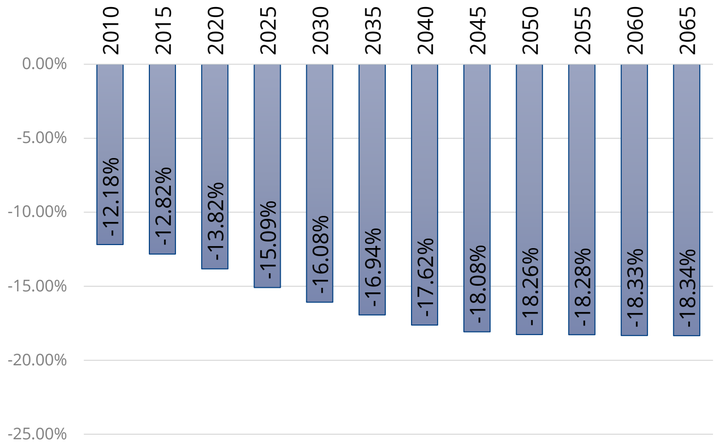
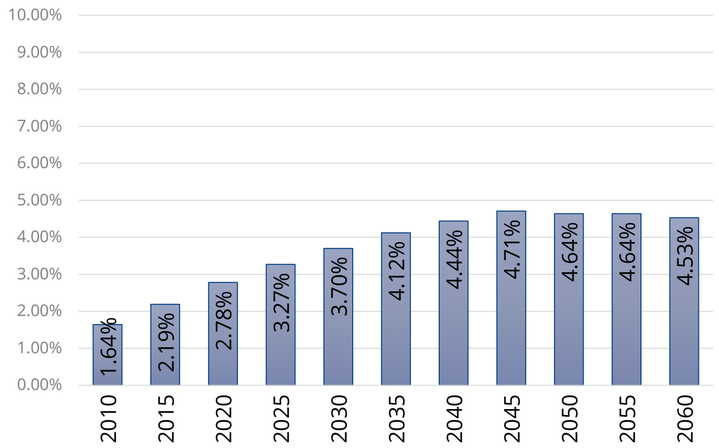
Annual Rate of Return Summary – 75th percentile

As of 9/30/2022

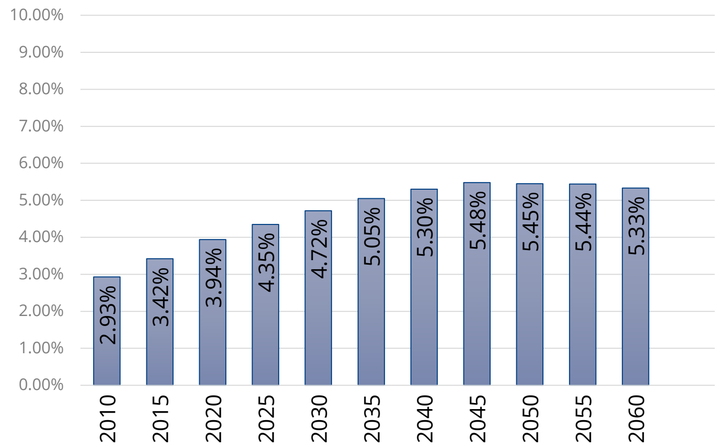
Alaska Target Date Fund - 1 Year



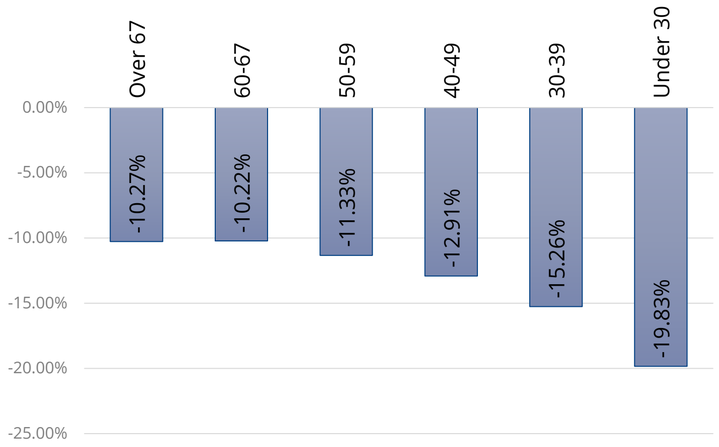
Alaska Target Date Fund - 3 Year



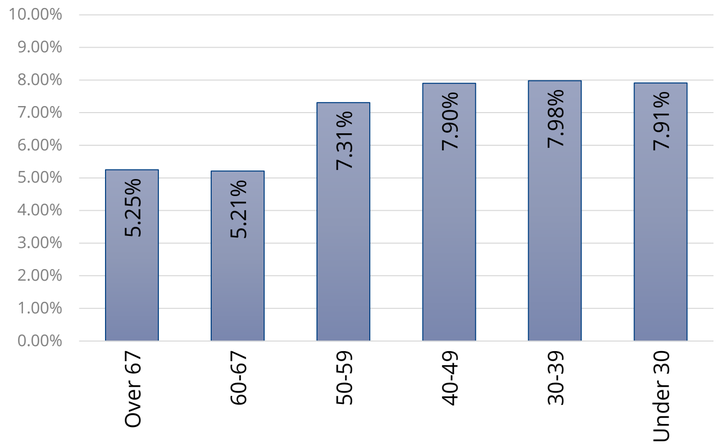
Alaska Target Date Fund - 5 Year



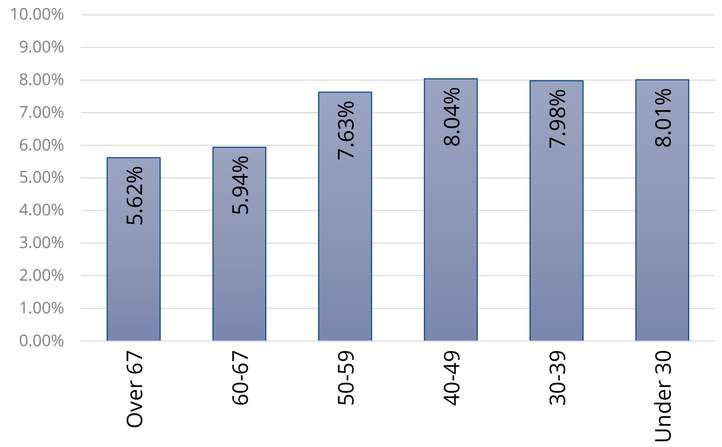
MTR – 75th Percentile 1 Year by Age Band



MTR – 75th Percentile 3 Year by Age Band



MTR – 75th Percentile 5 Year by Age Band



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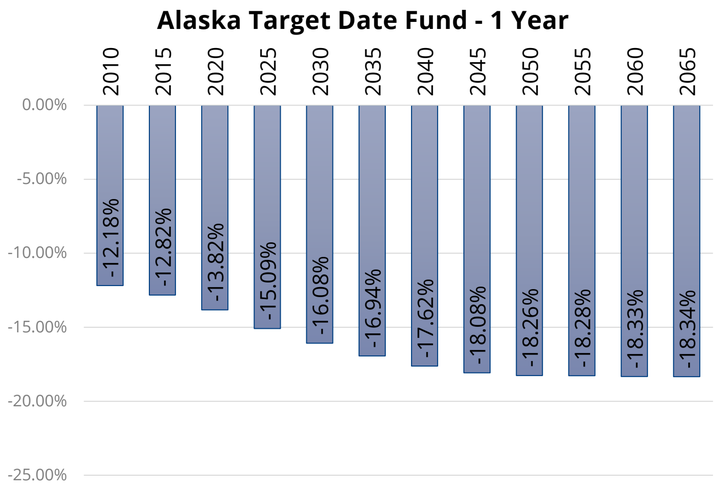
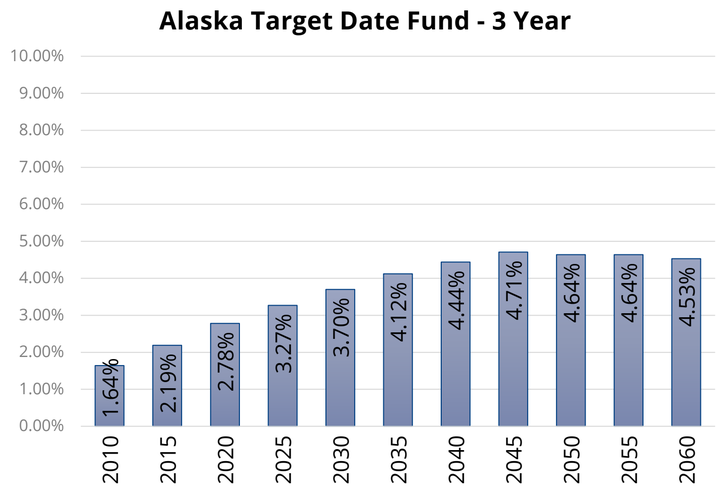
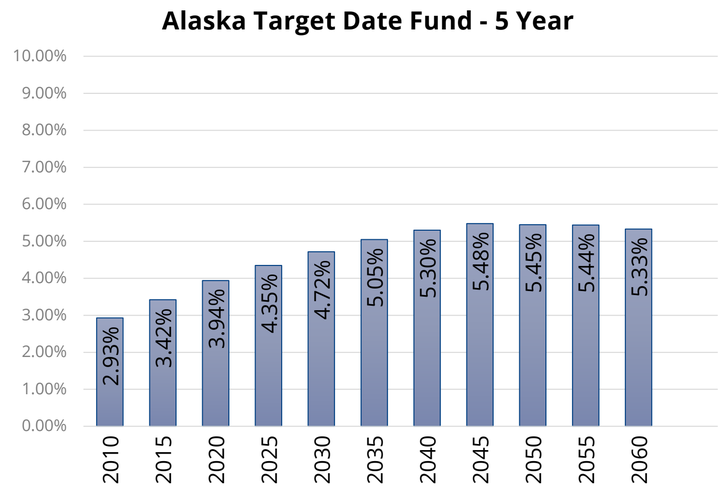
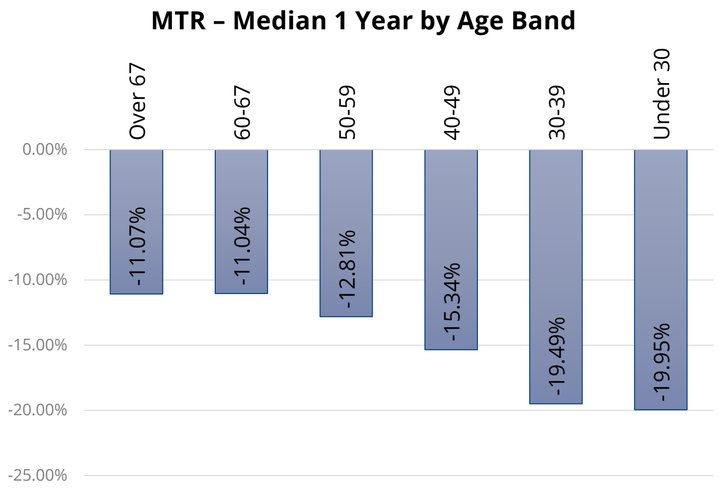
Annual Rate of Return Summary – Median

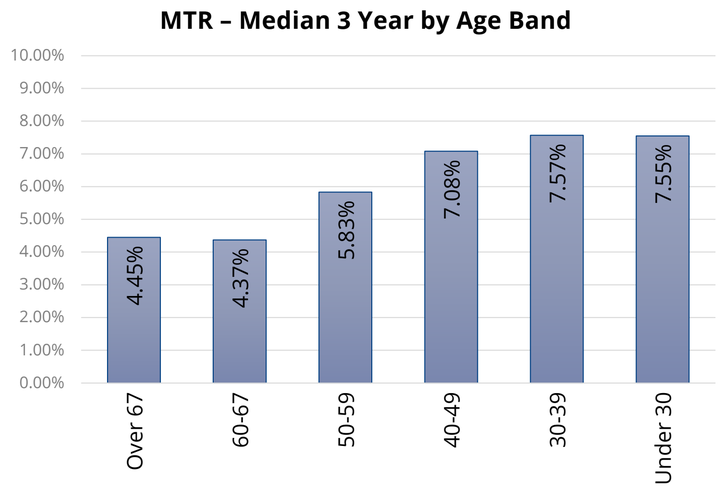
As of 9/30/2022

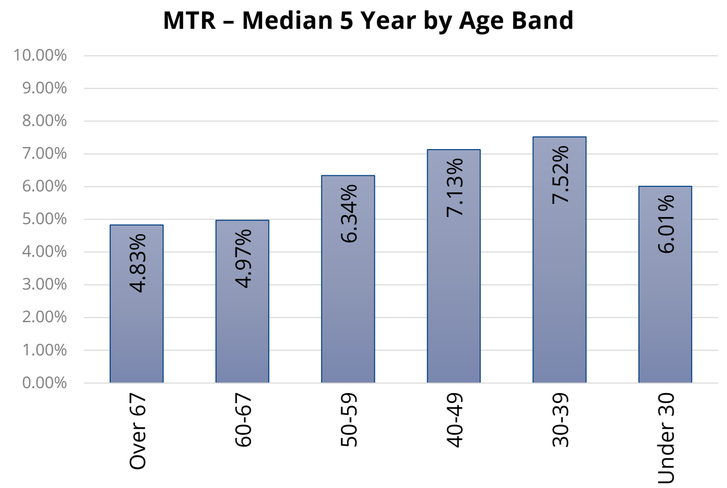












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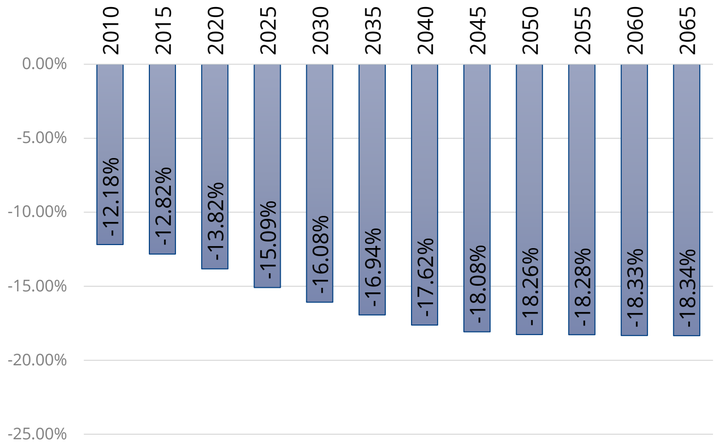
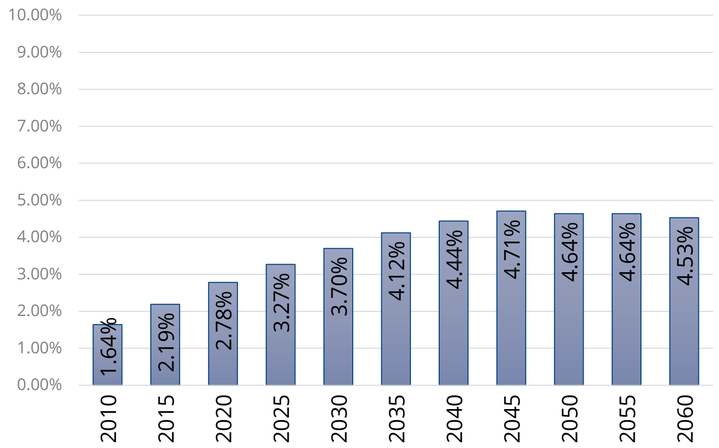
Annual Rate of Return Summary – 25th percentile

As of 9/30/2022

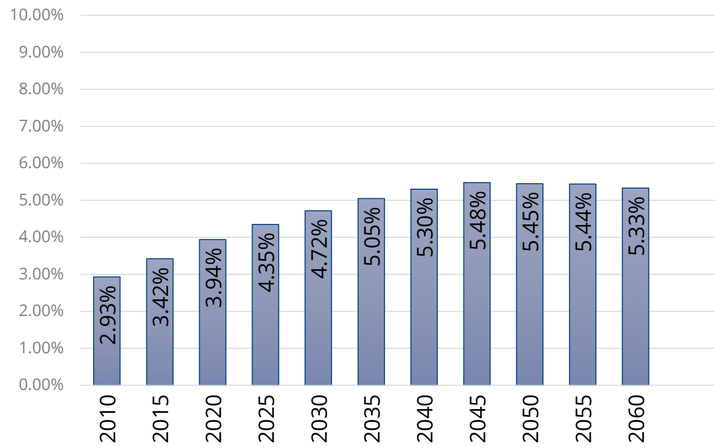
Alaska Target Date Fund - 1 Year



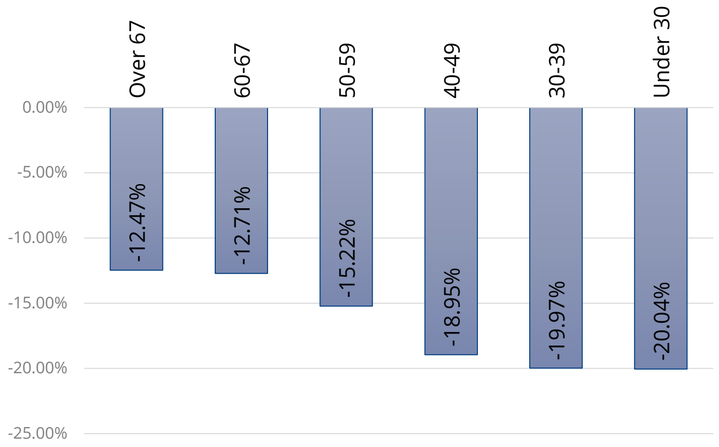
Alaska Target Date Fund - 3 Year



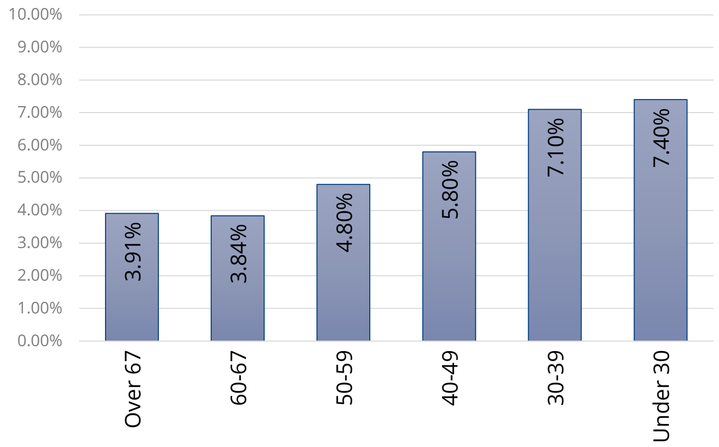
Alaska Target Date Fund - 5 Year



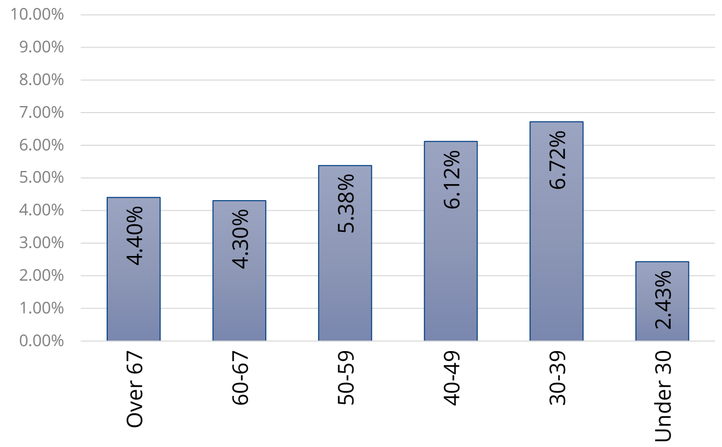
MTR – 25th Percentile 1 Year by Age Band



MTR – 25th Percentile 3 Year by Age Band



MTR – 25th Percentile 5 Year by Age Band



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Rate of Return Definitions & Methodology

Rate of Return:
Rate of return is calculated based on all account activity between the first and last day of the period. It is calculated based on a formula which estimates the equivalent rate of return during the statement period, based on the opening balance, transaction activity and closing balance. The formula was reviewed by Empower Advisory Group, LLC, a registered investment adviser.

There are two processes that calculate and store this data by plan participant: one is a process for My Total Retirement clients that receive a Morningstar report card and the second is a monthly rate of return process.

My Total Retirement Process Rate of Return: this process calculates full period rates of return in 3 month, 1, 3, 5, 7, and 10 year intervals consistent with the procedures called by the participant website. Given the nature of how this is calculated, annual rate of return results do not need to be aggregated for 1 year returns, and 3, 5, 7 and 10 year intervals just need to divide the period return by the number of years to create an average annual rate of return.

Monthly Process Rate of Return: this process calculates full period rates of return in 1 month intervals consistent with the procedures called by the participant website. Given the nature of how this is calculated, annual rate of return results do need to be aggregated for annual returns. Determining an annual rate of return using the monthly rates of return is achieved using an aggregation of an individual participant's monthly rates of return for that period. Only participants with a result across all months in the period are included in summary statistics presented. The math applied to achieve this assumes the following approach:

(1+[January Rate of Return]) * …(1[December Rate of Return])

Investor Type:
Reviewing participant rates of return effectively requires consideration on the approach that each individual has taken to allocate their balance. To simplify this review, we identify participants by the approach they consistently employed over the period the returns were realized. As a result, an individual that employed a joint strategy or switched strategies during the period will be considered a "Do-It-Yourself" type. Of note: Empower continues to enrich this source, and detail available for 1 year returns may not be available for 3 and 5 year turns.

*Annual Rates of return represent the plan weighted results of 1, 3 and 5 year average rates of return within the plan result compared to the median %tiles in the benchmark totals. A plan must have a minimum of 5 observations to be included in the data. To be included in the results for the 25^{th}/75^{th} and 10^{th}/90^{th}, the plan must have a minimum of 9 and 25 observations, respectively. The benchmark is limited to a relevant subset of Empower's total book of business, and includes only a portion of business recordkept by Empower.

*Median annual rates of return represent the participant weighted result of 1, 3 and 5 year average rate of returns within the specific plan result and Empower totals. All participant outcomes are included within the plans represented by the selected plan and benchmark. The benchmark is limited to a relevant subset of Empower's total book of business, and includes only a portion of 403b and 401k business recordkept by Empower.

State of Alaska Supplemental Annuity Plan

98214-03

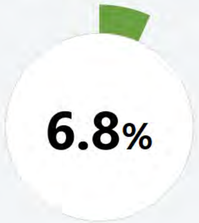
EMPOWER®

Advisory services

As of 9/30/2022

Advisory services compares participants using and not using the advisory service. The illustration includes participants actively employed and separated from service with a balance.

Population of participants using and not using My Total Retirement

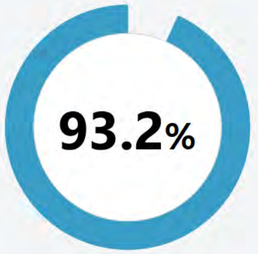


of participants are using
My Total Retirement

This amounts to
3,455 participants

Population over time

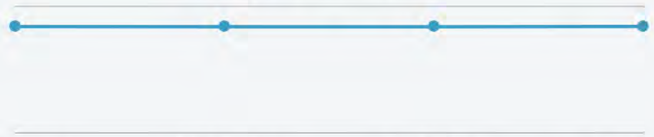
12/31/2021	3/31/2022	6/30/2022	9/30/2022
6.9%	**7.0%**	**7.0%**	**6.8%**



of participants are using
other investment strategies

This amounts to
47,352 participants

Population over time



12/31/2021	3/31/2022	6/30/2022	9/30/2022
93.1%	**93.0%**	**93.0%**	**93.2%**

F1.2a Empower Retirement Advisory Services Powered by Morningstar. Online Advice and My Total Retirement are part of the Empower Retirement Advisory Services suite of services offered by Empower Advisory Group, LLC, a registered investment adviser.

Median Lifetime Income Score and average contribution rate will show as not available when the data required for those calculations has not been provided

98214-03 State of Alaska Supplemental Annuity Plan

Advisory services

As of 9/30/2022

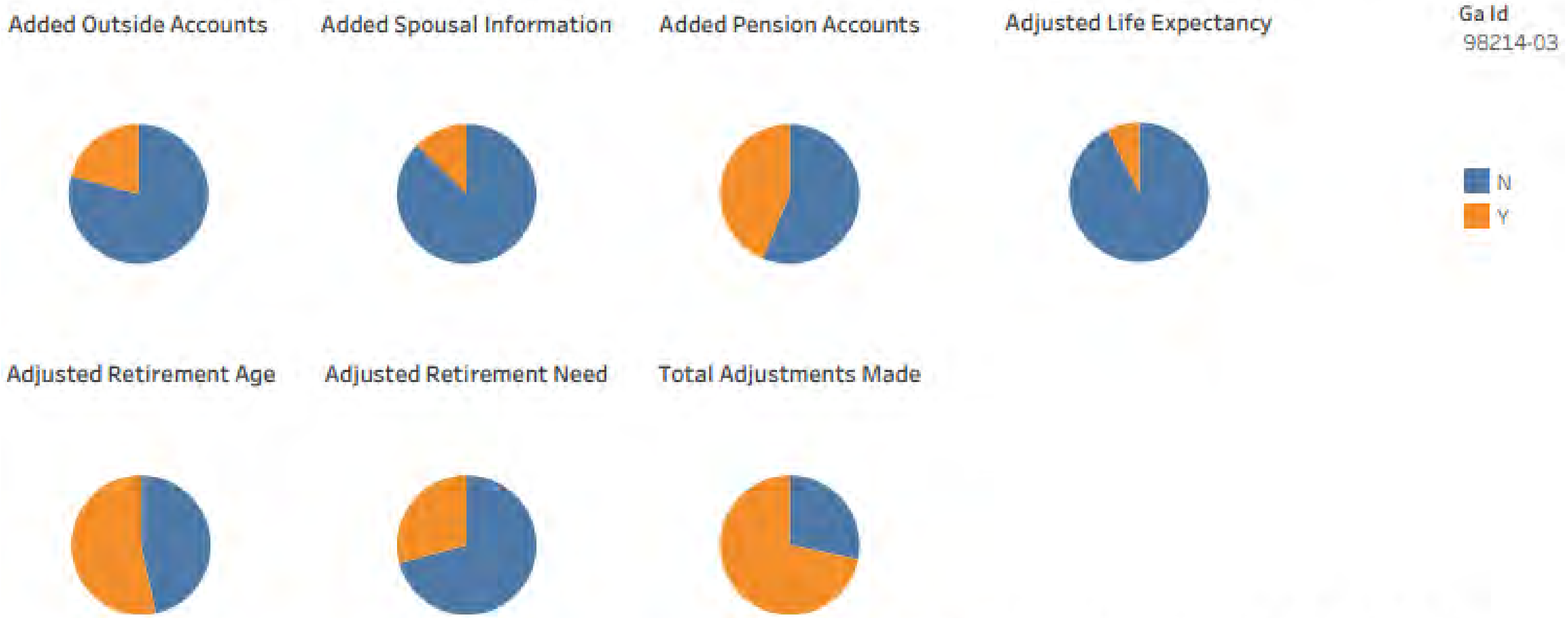
Advisory services compares participants using and not using the advisory service. The illustration includes participants actively employed and separated from service with a balance.

Insights into participants using and not using My Total Retirement

		Under 30 yrs	30-39 yrs	40-49 yrs	50-59 yrs	60-67 yrs	Over 67 yrs
My Total Retirement users	% of participants	2%	6%	7%	10%	10%	6%
	# of participants	176	687	705	898	713	276
	Average balance	$19,719	$60,271	$129,670	$201,128	$221,641	$240,081
	Average equity percent	62.1%	59.6%	52.8%	44.1%	38.2%	37.4%
Other investment strategy users	% of participants	98%	94%	93%	90%	90%	94%
	# of participants	7,020	11,107	9,500	8,473	6,456	4,721
	Average balance	$6,587	$27,142	$63,051	$106,597	$152,418	$173,685
	Average equity percent	50.3%	50.4%	50.1%	49.2%	45.6%	43.3%

Median Lifetime Income Score and average contribution rate will show as not available when the data required for those calculations has not been provided

Personalization – Supplemental Annuity Plan as of 9/30/22



	Participant Accounts	% of Total in MA
Added Outside Accounts [1]	693	20.87%
Added Spousal Information [2]	419	12.62%
Added Pension Accounts [1]	1,451	43.69%
Adjusted Life Expectancy [3]	250	7.53%
Adjusted Retirement Age [4]	1,773	53.39%
Adjusted Retirement Need [5]	966	29.09%
Total That Made Adjustments	2,384	71.79%
Total Enrolled	3,321	100.00%

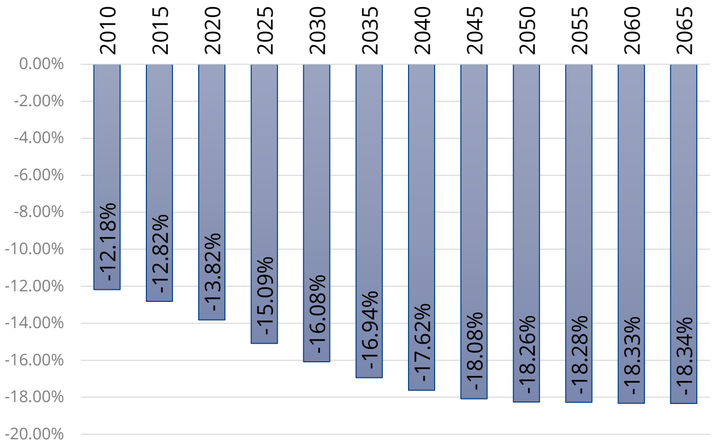
- 1 The Advisory Service process allows for the inclusion of outside financial and pension information to allows for more personalized retirement readiness recommendations
- 2 The inclusion of spousal/partner information allows for a holistic, household retirement income projection
- 3 Participants may adjust their life expectancy to help receive recommendations appropriate to their retirement income needs
- 4 Adjusting retirement age helps provide recommendations appropriate to the participant's savings horizon, and determined by a comparison of the retirement age in Advisory Services against the plan's default retirement age in the recordkeeping system
- 5 This column represents whether participants have adjusted their retirement income need to something other than 100%, post-tax replacement retirement income NOTAPPROVEDFORUSEWITHPLANPARTICIPANTS

- 98214-03 State of Alaska Supplemental Annuity Plan

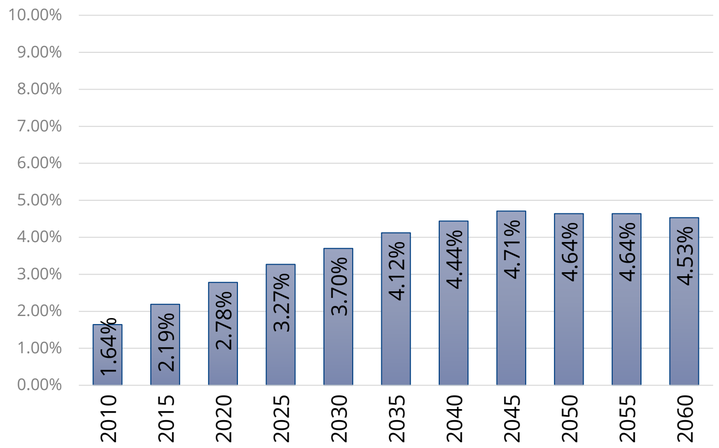
Annual Rate of Return Summary

As of 9/30/2022

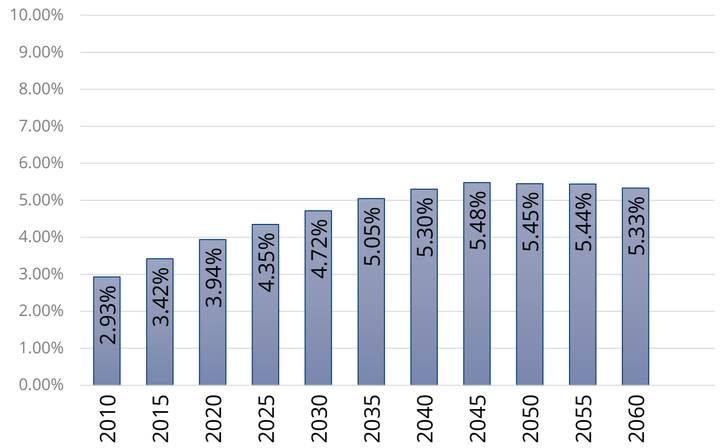
Alaska Target Date Fund - 1 Year



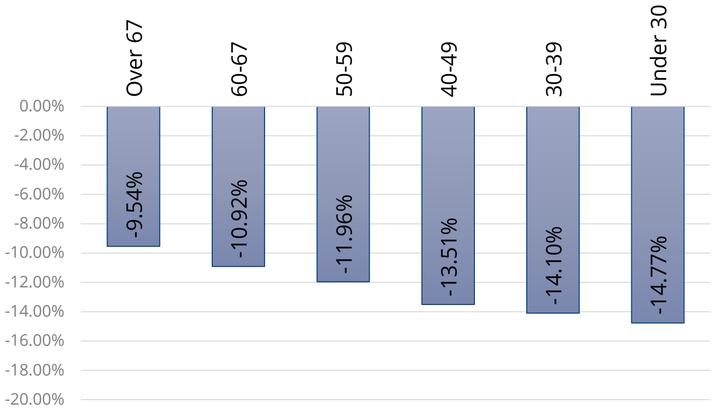
Alaska Target Date Fund - 3 Year



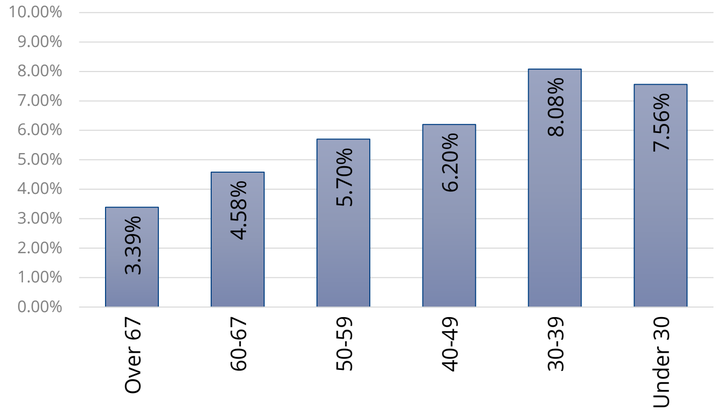
Alaska Target Date Fund - 5 Year



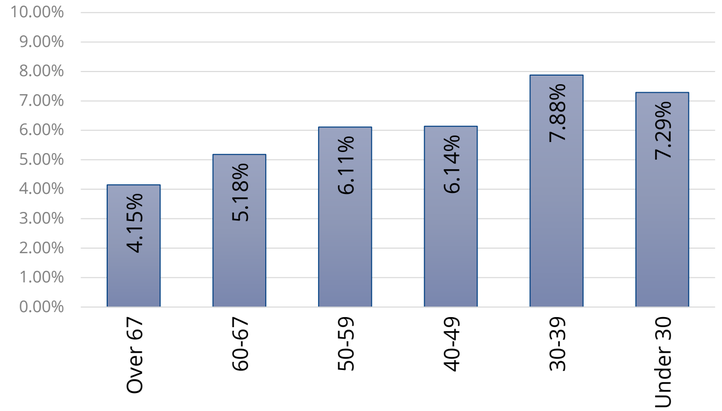
All Investment Strategies – Median 1 Year by Age Band



All Investment Strategies – Median 3 Year by Age Band



All Investment Strategies – Median 5 Year by Age Band



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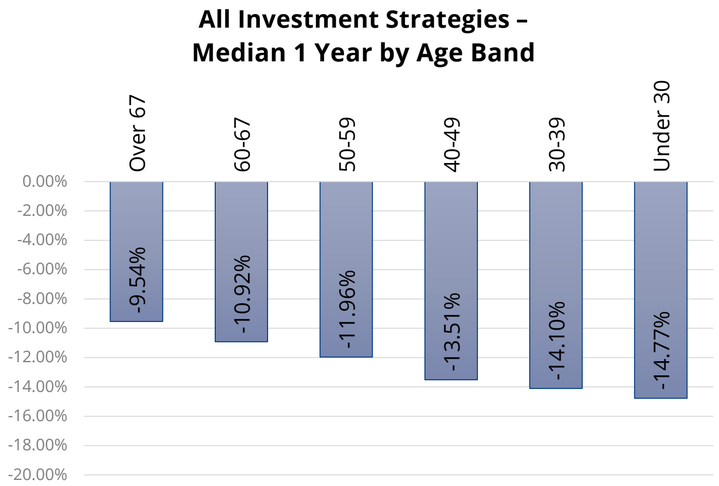
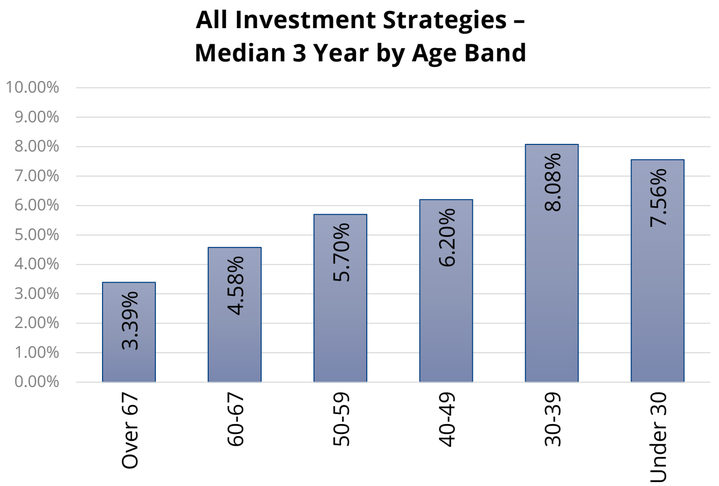
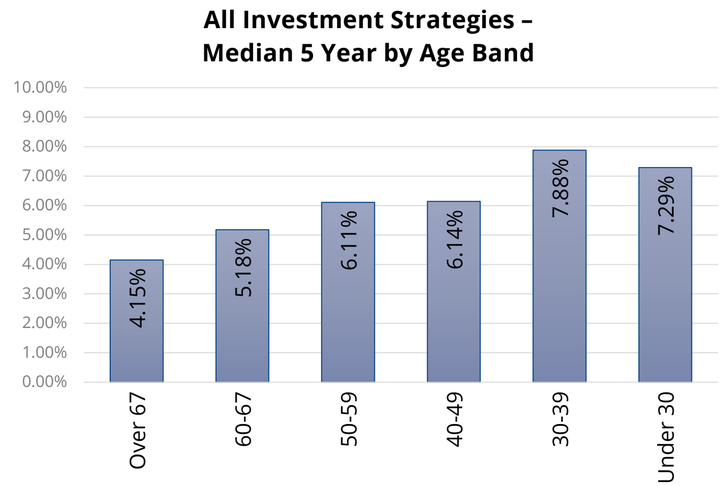
Annual Rate of Return Summary

As of 9/30/2022







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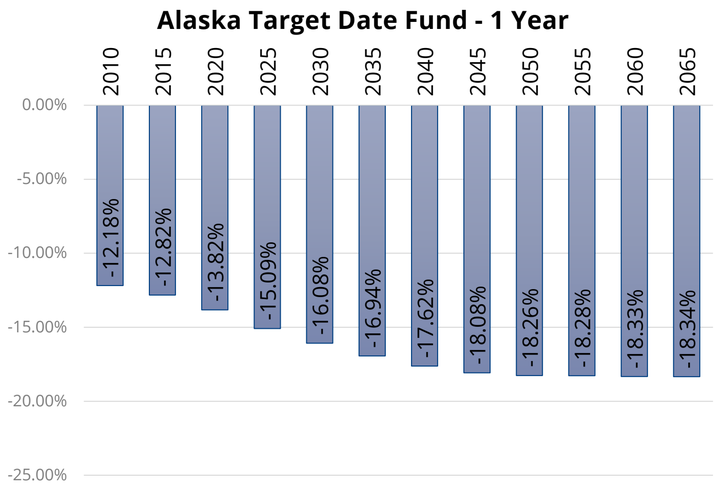
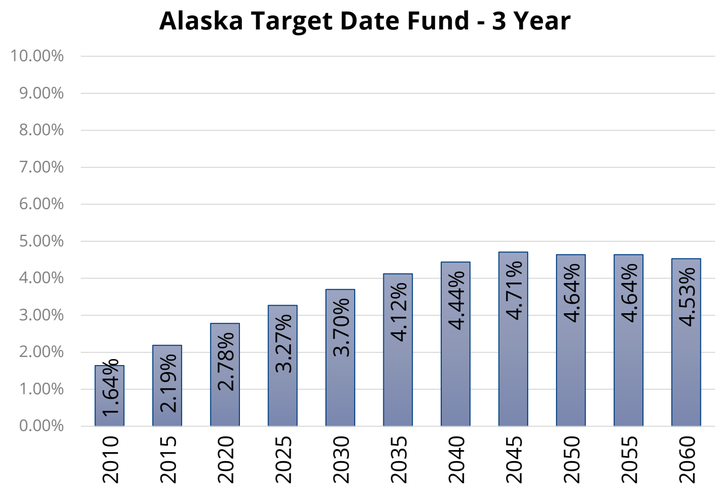
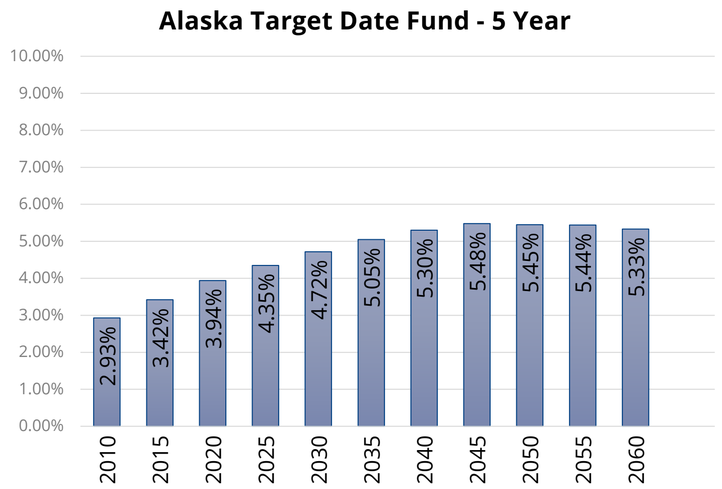
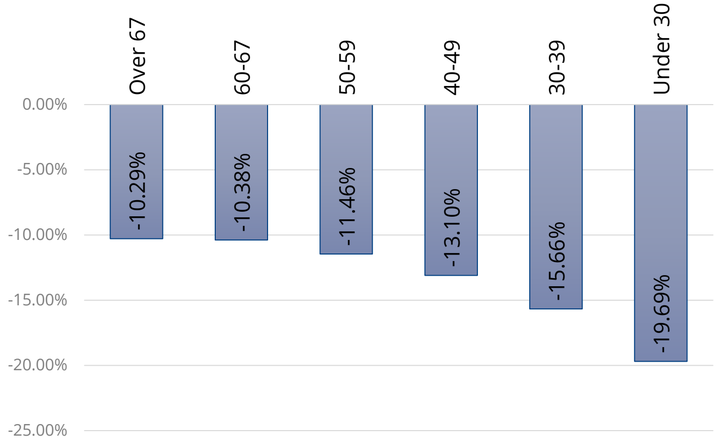
Annual Rate of Return Summary – 75th percentile

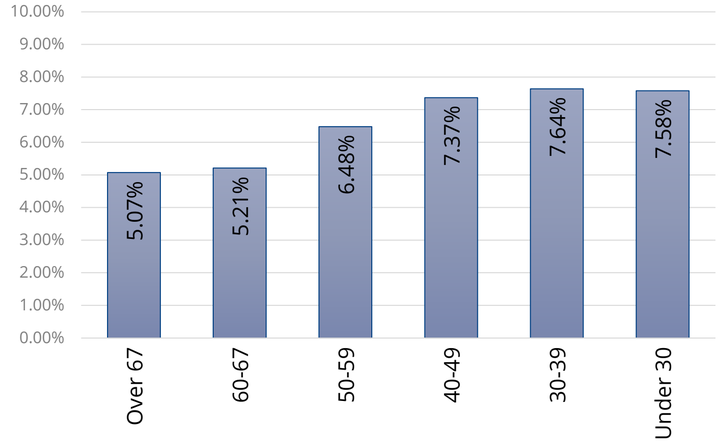
As of 9/30/2022











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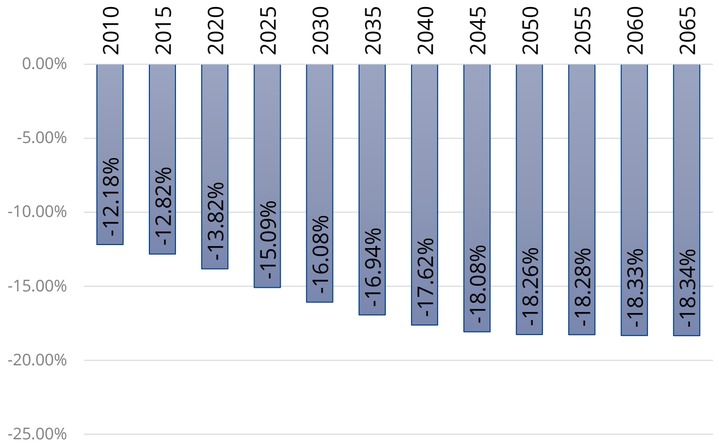
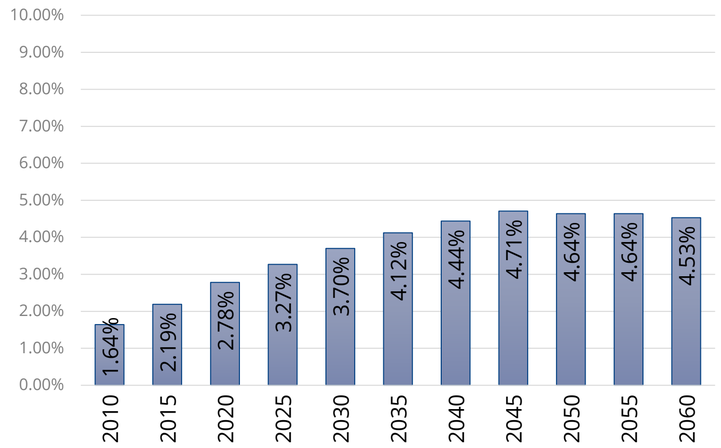
Annual Rate of Return Summary – Median

As of 9/30/2022

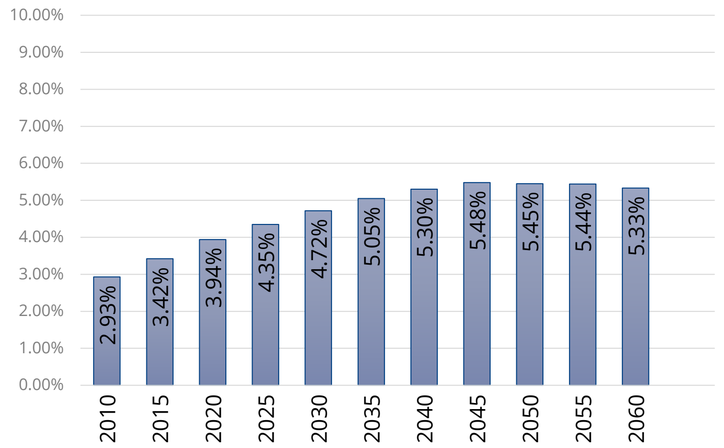
Alaska Target Date Fund - 1 Year



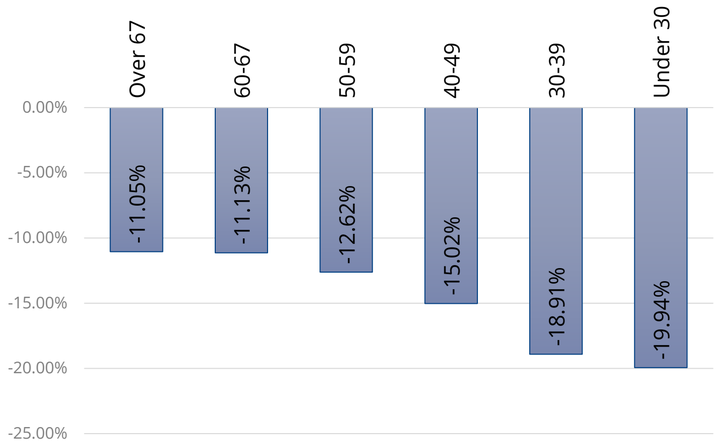
Alaska Target Date Fund - 3 Year



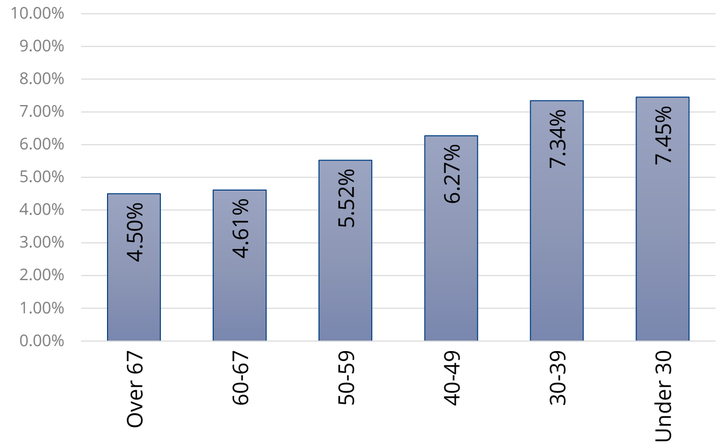
Alaska Target Date Fund - 5 Year



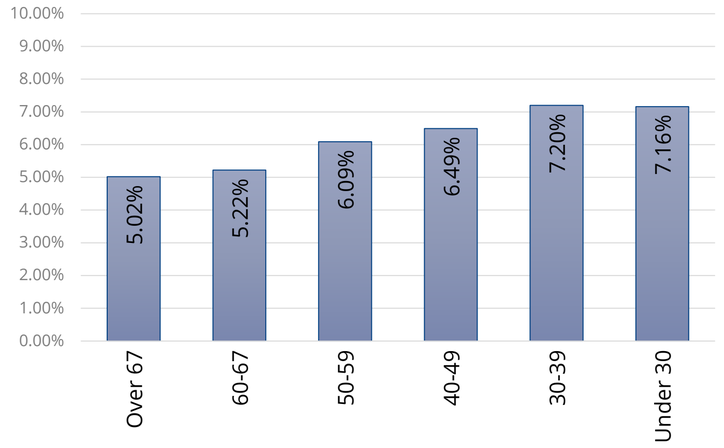
MTR – Median 1 Year by Age Band



MTR – Median 3 Year by Age Band



MTR – Median 5 Year by Age Band



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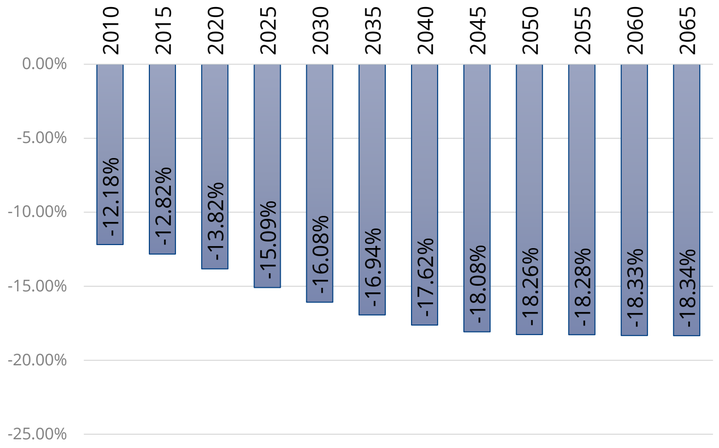
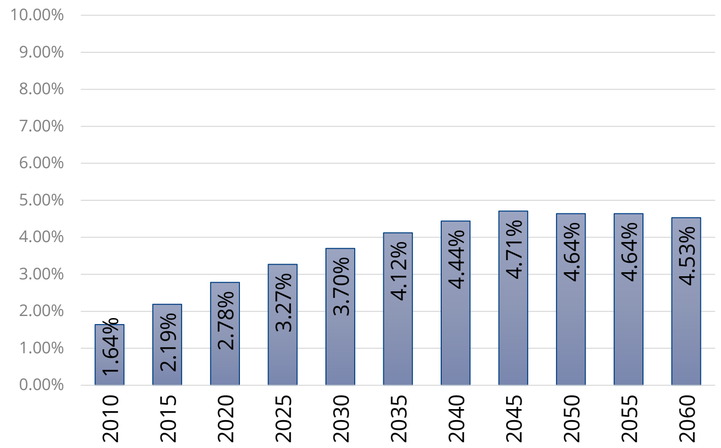
Annual Rate of Return Summary – 25th percentile

As of 9/30/2022

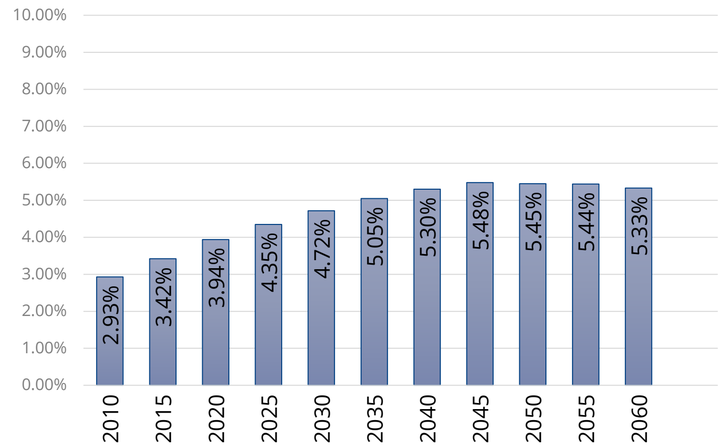
Alaska Target Date Fund - 1 Year



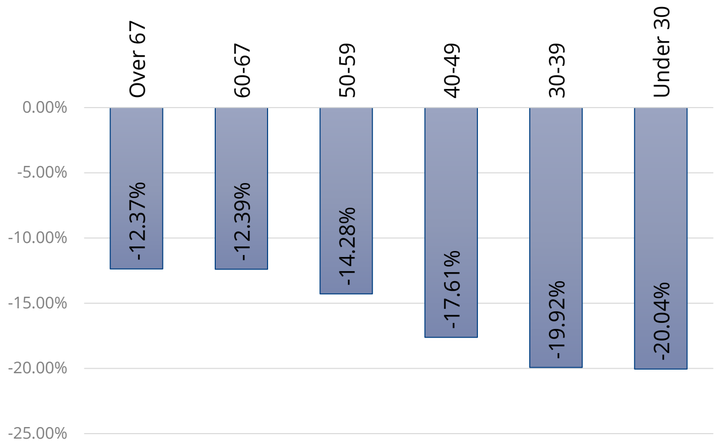
Alaska Target Date Fund - 3 Year



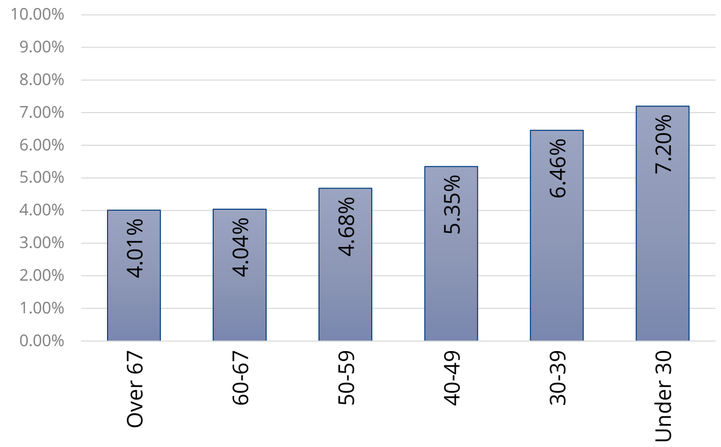
Alaska Target Date Fund - 5 Year



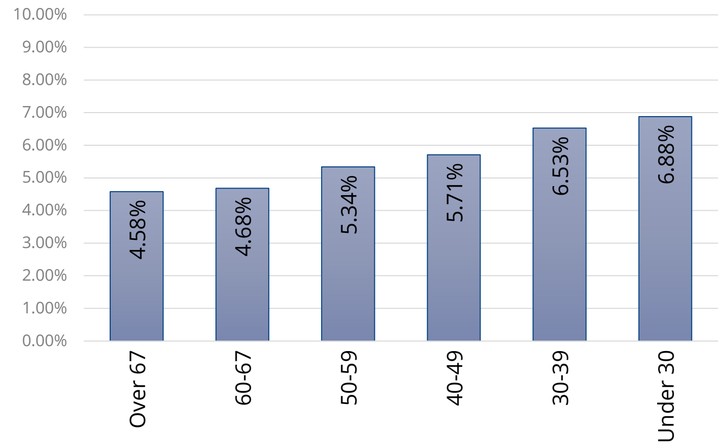
MTR – 25th Percentile 1 Year by Age Band



MTR – 25th Percentile 3 Year by Age Band



MTR – 25th Percentile 5 Year by Age Band



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Rate of Return Definitions & Methodology

Rate of Return:
Rate of return is calculated based on all account activity between the first and last day of the period. It is calculated based on a formula which estimates the equivalent rate of return during the statement period, based on the opening balance, transaction activity and closing balance. The formula was reviewed by Empower Advisory Group, LLC, a registered investment adviser.

There are two processes that calculate and store this data by plan participant: one is a process for My Total Retirement clients that receive a Morningstar report card and the second is a monthly rate of return process.

My Total Retirement Process Rate of Return: this process calculates full period rates of return in 3 month, 1, 3, 5, 7, and 10 year intervals consistent with the procedures called by the participant website. Given the nature of how this is calculated, annual rate of return results do not need to be aggregated for 1 year returns, and 3, 5, 7 and 10 year intervals just need to divide the period return by the number of years to create an average annual rate of return.

Monthly Process Rate of Return: this process calculates full period rates of return in 1 month intervals consistent with the procedures called by the participant website. Given the nature of how this is calculated, annual rate of return results do need to be aggregated for annual returns. Determining an annual rate of return using the monthly rates of return is achieved using an aggregation of an individual participant's monthly rates of return for that period. Only participants with a result across all months in the period are included in summary statistics presented. The math applied to achieve this assumes the following approach:

(1+[January Rate of Return]) * …(1[December Rate of Return])

Investor Type:
Reviewing participant rates of return effectively requires consideration on the approach that each individual has taken to allocate their balance. To simplify this review, we identify participants by the approach they consistently employed over the period the returns were realized. As a result, an individual that employed a joint strategy or switched strategies during the period will be considered a "Do-It-Yourself" type. Of note: Empower continues to enrich this source, and detail available for 1 year returns may not be available for 3 and 5 year turns.

*Annual Rates of return represent the plan weighted results of 1, 3 and 5 year average rates of return within the plan result compared to the median %tiles in the benchmark totals. A plan must have a minimum of 5 observations to be included in the data. To be included in the results for the 25^{th}/75^{th} and 10^{th}/90^{th}, the plan must have a minimum of 9 and 25 observations, respectively. The benchmark is limited to a relevant subset of Empower's total book of business, and includes only a portion of business recordkept by Empower.

*Median annual rates of return represent the participant weighted result of 1, 3 and 5 year average rate of returns within the specific plan result and Empower totals. All participant outcomes are included within the plans represented by the selected plan and benchmark. The benchmark is limited to a relevant subset of Empower's total book of business, and includes only a portion of 403b and 401k business recordkept by Empower.

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State of Alaska Public Employees' Tier IV Defined Contribution Retirement Plan

98214-04

EMPOWER®

Advisory services

As of 9/30/2022

Advisory services compares participants using and not using the advisory service. The illustration includes participants actively employed and separated from service with a balance.

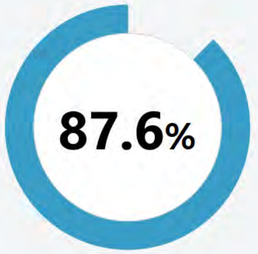
Population of participants using and not using My Total Retirement

of participants are using
My Total Retirement

This amounts to
5,741 participants

Population over time

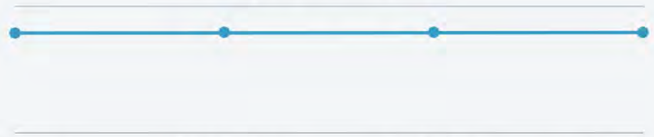
12/31/2021	3/31/2022	6/30/2022	9/30/2022
12.8%	**12.7%**	**12.6%**	**12.4%**



of participants are using
other investment strategies

This amounts to
40,725 participants

Population over time



12/31/2021	3/31/2022	6/30/2022	9/30/2022
87.2%	**87.3%**	**87.4%**	**87.6%**

F1.2a Empower Retirement Advisory Services Powered by Morningstar. Online Advice and My Total Retirement are part of the Empower Retirement Advisory Services suite of services offered by Empower Advisory Group, LLC, a registered investment adviser.

Median Lifetime Income Score and average contribution rate will show as not available when the data required for those calculations has not been provided

98214-04 State of Alaska Public Employees' Tier IV Defined Contribution Retirement Plan

Advisory services

As of 9/30/2022

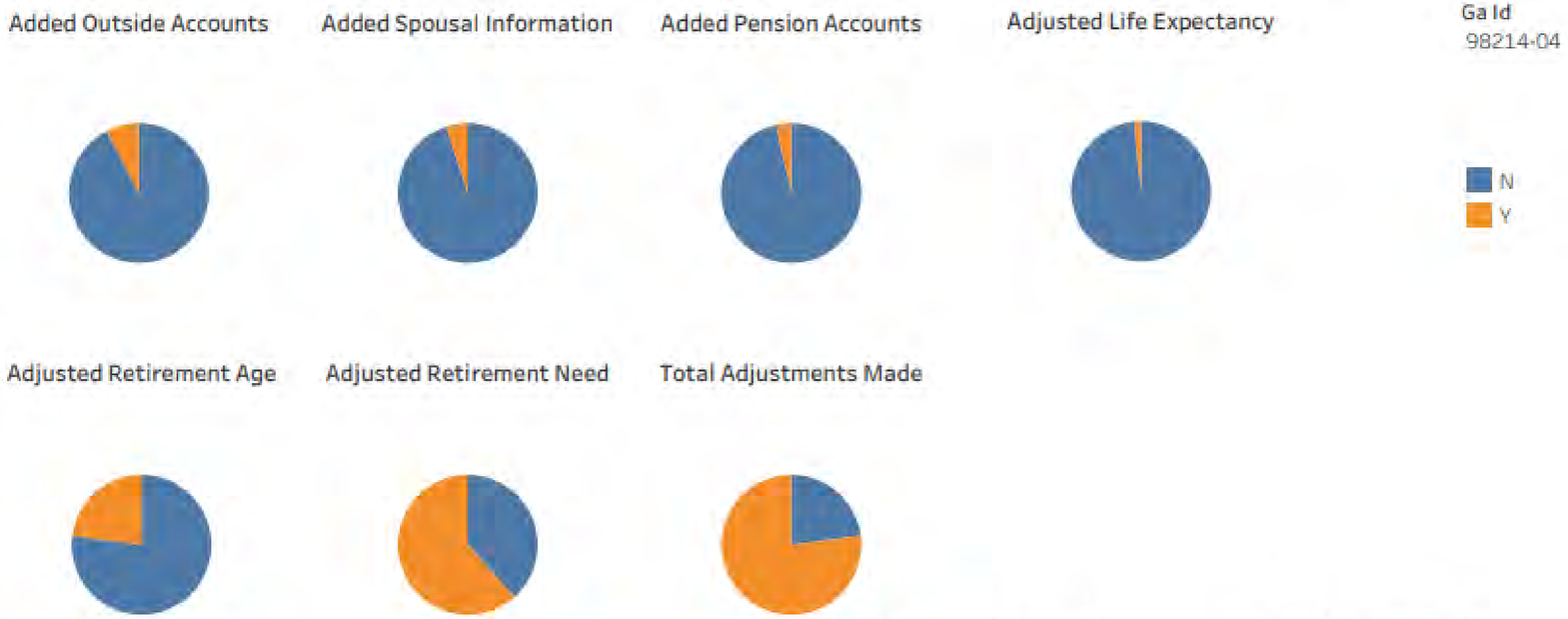
Advisory services compares participants using and not using the advisory service. The illustration includes participants actively employed and separated from service with a balance.

Insights into participants using and not using My Total Retirement

		Under 30 yrs	30-39 yrs	40-49 yrs	50-59 yrs	60-67 yrs	Over 67 yrs
My Total Retirement users	% of participants	3%	10%	16%	18%	19%	23%
	# of participants	219	1,620	1,681	1,298	689	234
	Average balance	$23,788	$65,770	$87,904	$87,884	$87,997	$66,668
	Average equity percent	63.3%	55.4	48.7%	40.4%	34.5%	33.2%
Other investment strategy users	% of participants	97%	90%	84%	82%	81%	77%
	# of participants	7,892	14,079	9,057	6,040	2,884	773
	Average balance	$10,491	$30,418	$40,241	$40,016	$41,909	$40,963
	Average equity percent	50.3%	50.6%	50.3%	50.0%	48.8%	49.2%

Median Lifetime Income Score and average contribution rate will show as not available when the data required for those calculations has not been provided

Personalization – Public Employees' Tier IV Plan as of 9/30/22



	Participant Accounts	% of Total in MA
Added Outside Accounts [1]	442	7.60%
Added Spousal Information [2]	290	4.99%
Added Pension Accounts [1]	205	3.53%
Adjusted Life Expectancy [3]	93	1.60%
Adjusted Retirement Age [4]	1,336	22.98%
Adjusted Retirement Need [5]	3,580	61.58%
Total That Made Adjustments	4,482	77.09%
Total Enrolled	5,814	100.00%

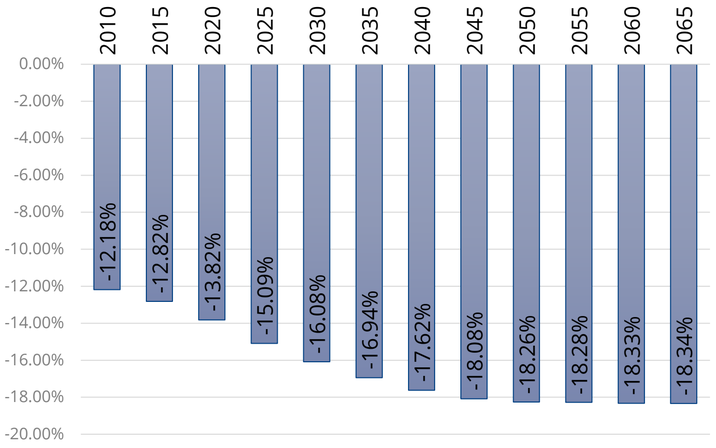
- 1 The Advisory Service process allows for the inclusion of outside financial and pension information to allows for more personalized retirement readiness recommendations
- 2 The inclusion of spousal/partner information allows for a holistic, household retirement income projection
- 3 Participants may adjust their life expectancy to help receive recommendations appropriate to their retirement income needs
- 4 Adjusting retirement age helps provide recommendations appropriate to the participant's savings horizon, and determined by a comparison of the retirement age in Advisory Services against the plan's default retirement age in the recordkeeping system
- 5 This column represents whether participants have adjusted their retirement income need to something other than 100%, post-tax replacement retirement income NOTAPPROVEDFORUSEWITHPLANPARTICIPANTS

- 98214-04 State of Alaska Public Employees' Tier IV Defined Contribution Retirement Plan

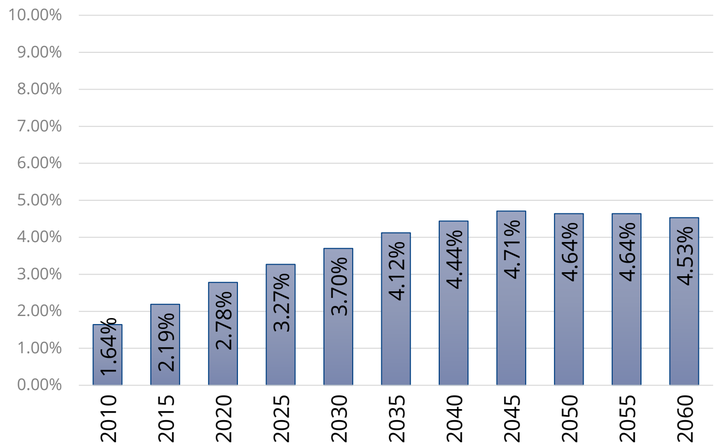
Annual Rate of Return Summary

As of 9/30/2022

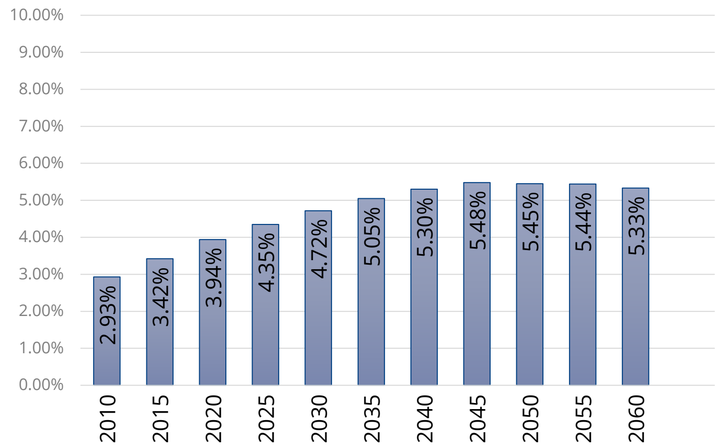
Alaska Target Date Fund - 1 Year



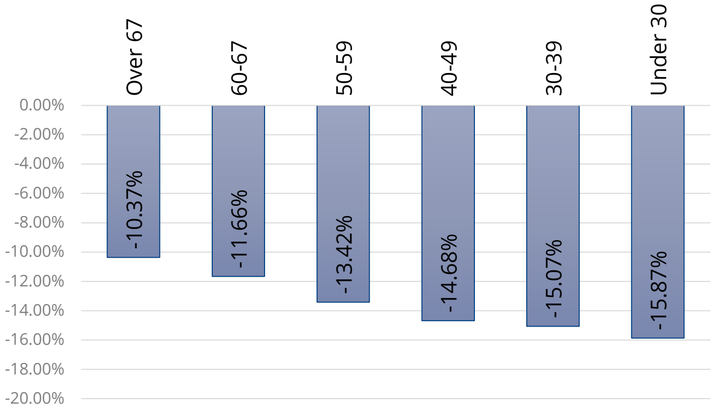
Alaska Target Date Fund - 3 Year



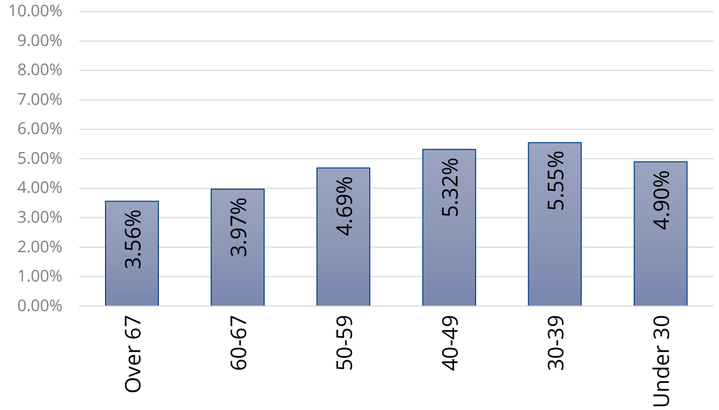
Alaska Target Date Fund - 5 Year



All Investment Strategies – Median 1 Year by Age Band



All Investment Strategies – Median 3 Year by Age Band



All Investment Strategies – Median 5 Year by Age Band

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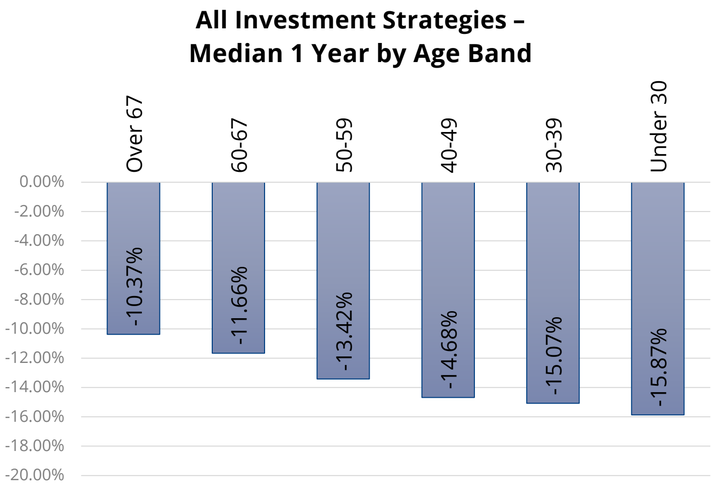
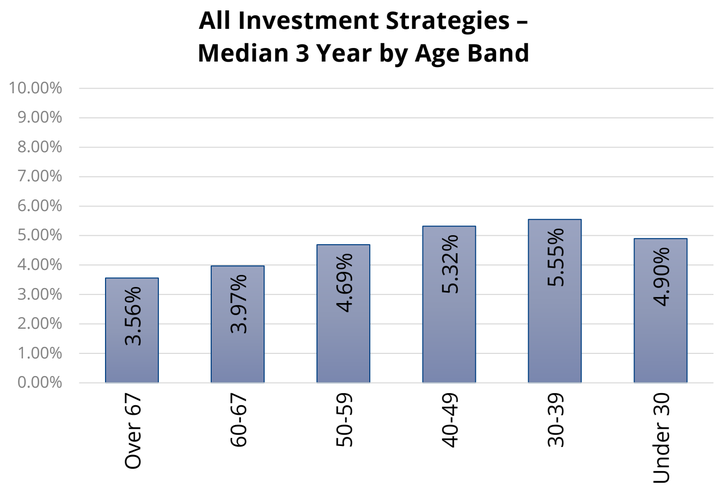
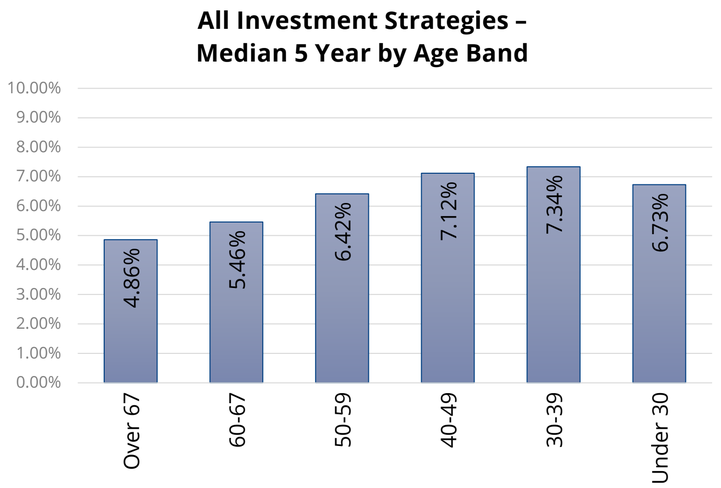
Annual Rate of Return Summary

As of 9/30/2022







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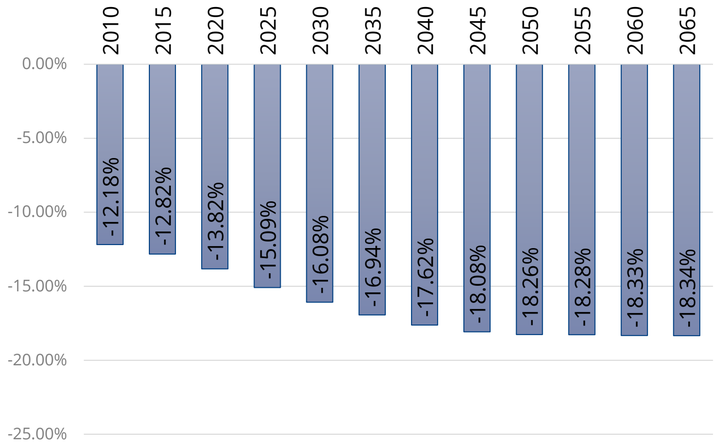
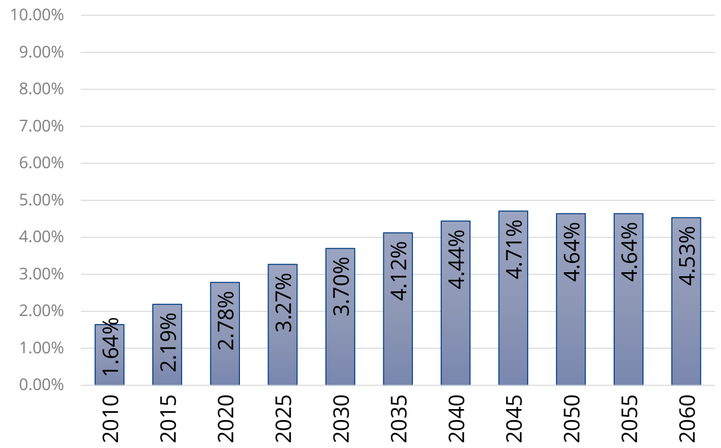
Annual Rate of Return Summary – 75th Percentile

As of 9/30/2022

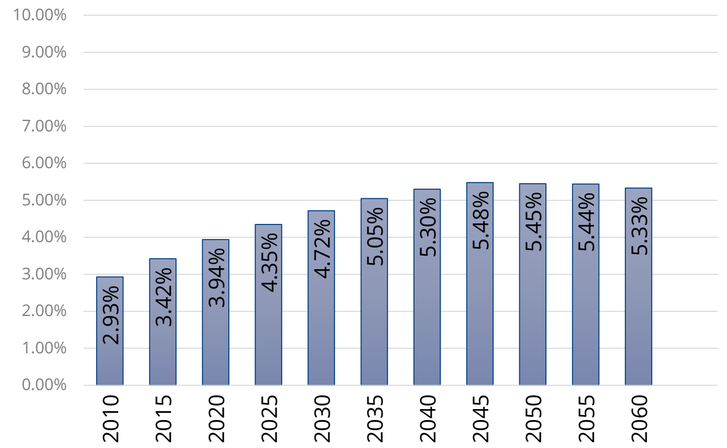
Alaska Target Date Fund - 1 Year



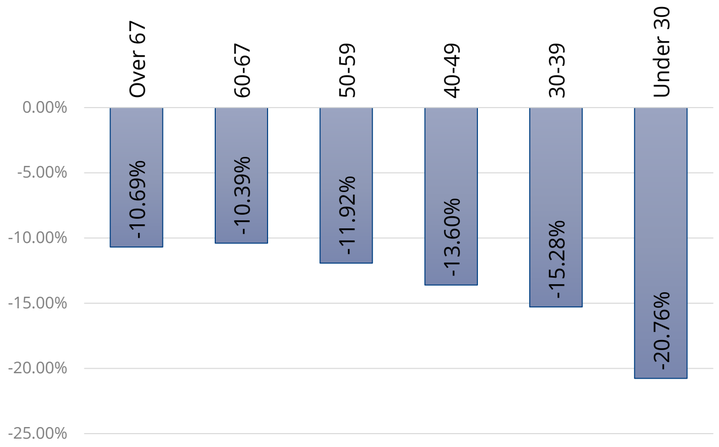
Alaska Target Date Fund - 3 Year



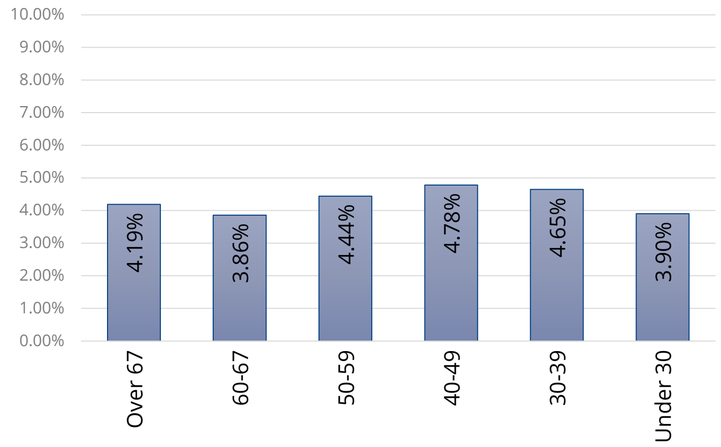
Alaska Target Date Fund - 5 Year



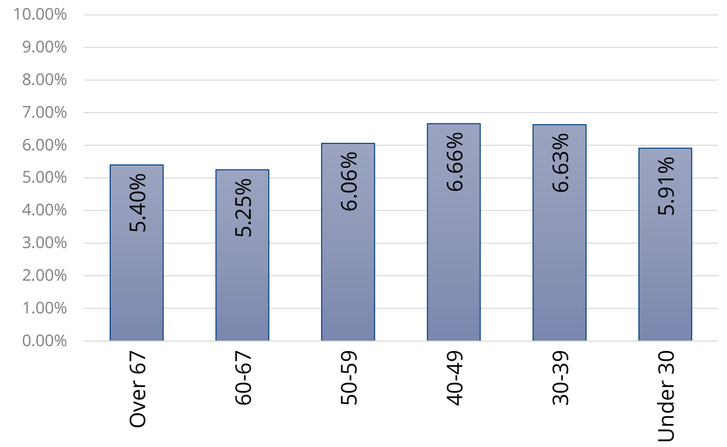
MTR – 75th Percentile 1 Year by Age Band



MTR – 75th Percentile 3 Year by Age Band



MTR – 75th Percentile 5 Year by Age Band



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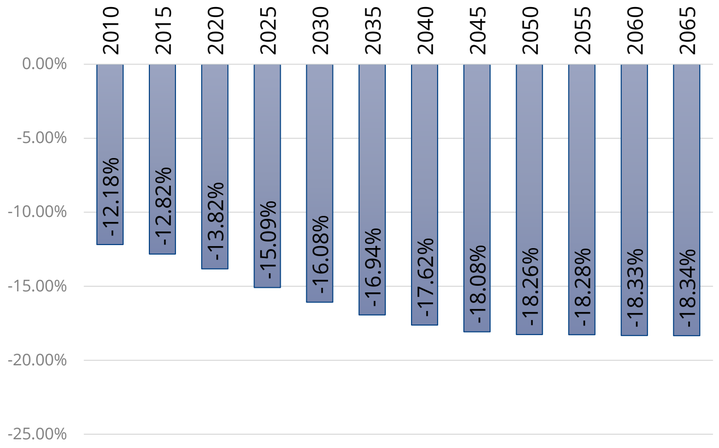
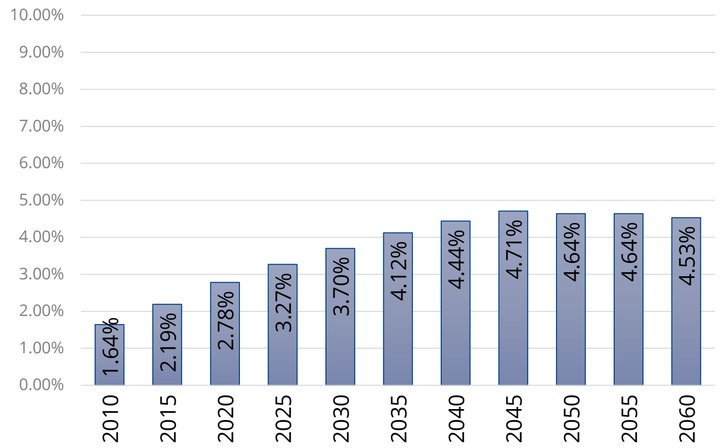
Annual Rate of Return Summary – Median

As of 9/30/2022

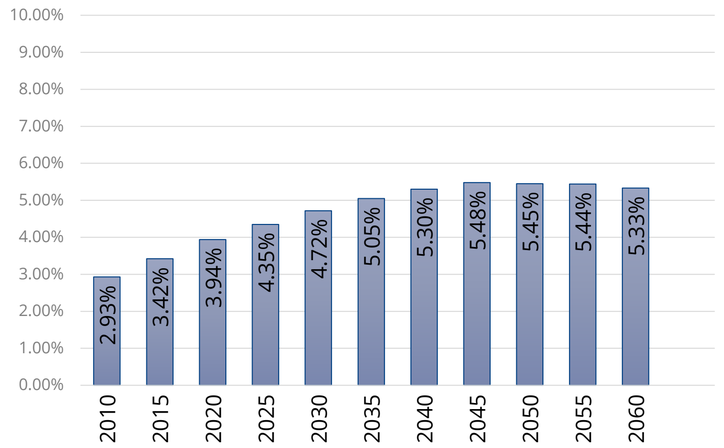
Alaska Target Date Fund - 1 Year



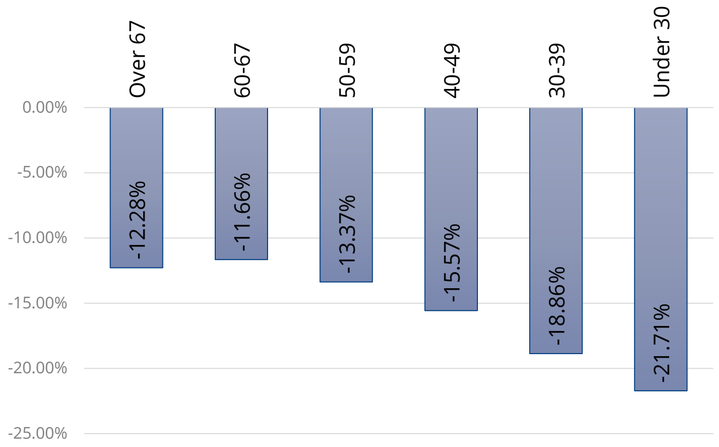
Alaska Target Date Fund - 3 Year



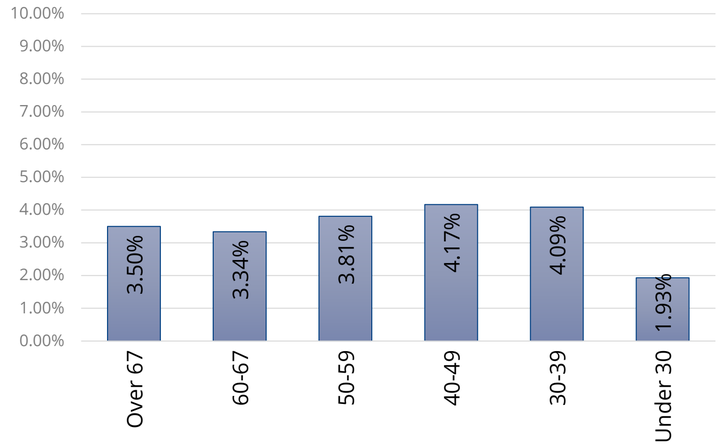
Alaska Target Date Fund - 5 Year



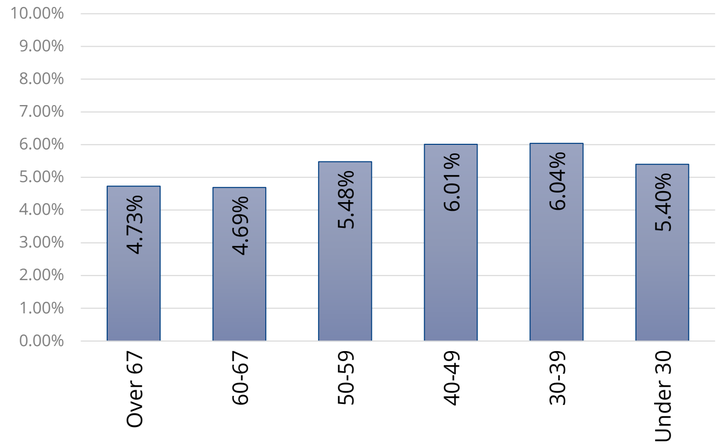
MTR – Median 1 Year by Age Band



MTR – Median 3 Year by Age Band



MTR – Median 5 Year by Age Band



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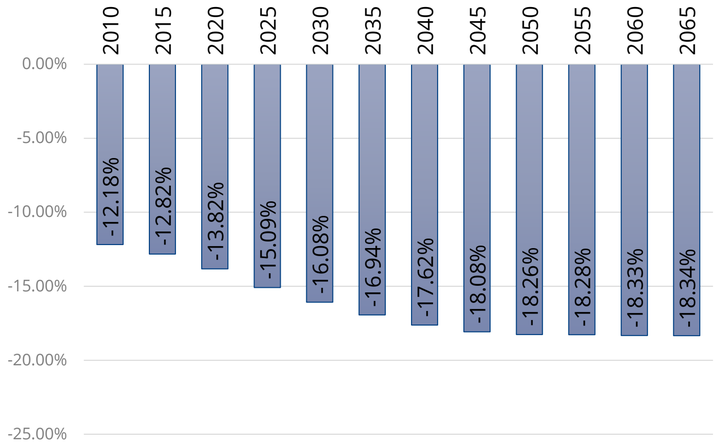
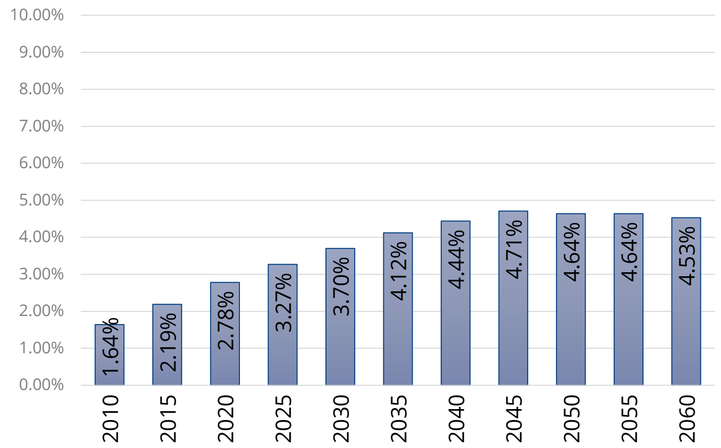
Annual Rate of Return Summary – 25th Percentile

As of 9/30/2022

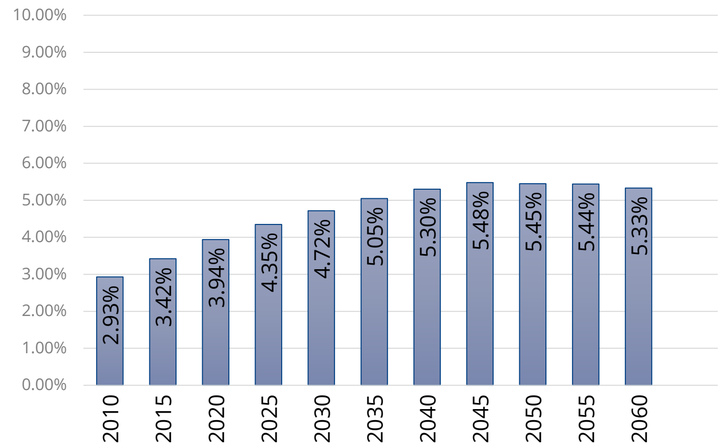
Alaska Target Date Fund - 1 Year



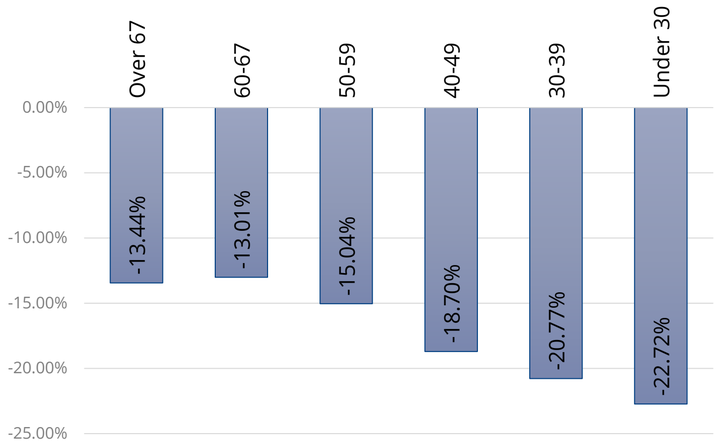
Alaska Target Date Fund - 3 Year



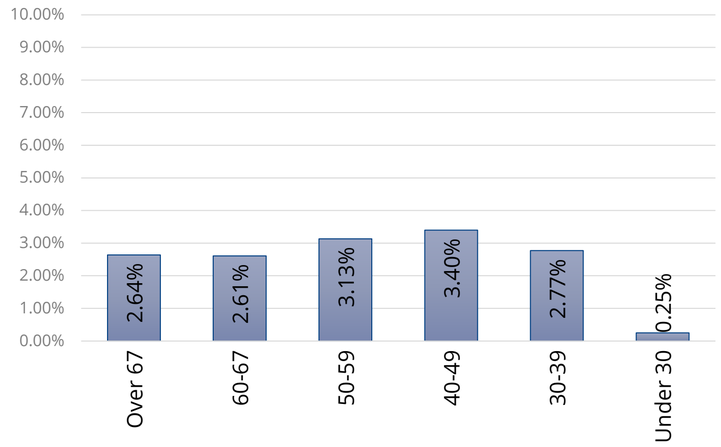
Alaska Target Date Fund - 5 Year



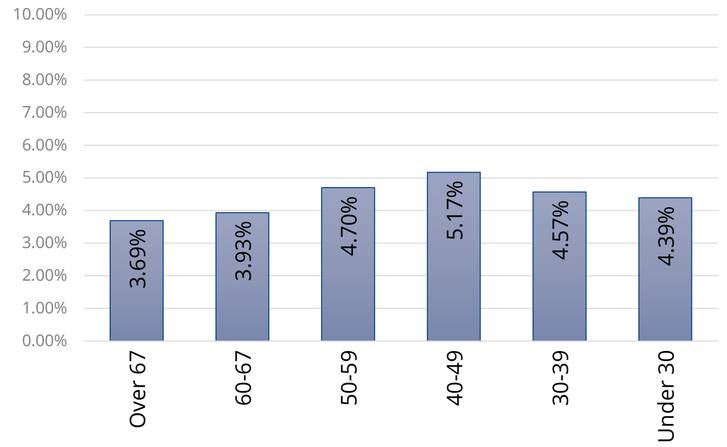
MTR – 25th Percentile 1 Year by Age Band



MTR – 25th Percentile 3 Year by Age Band



MTR – 25th Percentile 5 Year by Age Band



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Rate of Return Definitions & Methodology

Rate of Return:
Rate of return is calculated based on all account activity between the first and last day of the period. It is calculated based on a formula which estimates the equivalent rate of return during the statement period, based on the opening balance, transaction activity and closing balance. The formula was reviewed by Empower Advisory Group, LLC, a registered investment adviser.

There are two processes that calculate and store this data by plan participant: one is a process for My Total Retirement clients that receive a Morningstar report card and the second is a monthly rate of return process.

My Total Retirement Process Rate of Return: this process calculates full period rates of return in 3 month, 1, 3, 5, 7, and 10 year intervals consistent with the procedures called by the participant website. Given the nature of how this is calculated, annual rate of return results do not need to be aggregated for 1 year returns, and 3, 5, 7 and 10 year intervals just need to divide the period return by the number of years to create an average annual rate of return.

Monthly Process Rate of Return: this process calculates full period rates of return in 1 month intervals consistent with the procedures called by the participant website. Given the nature of how this is calculated, annual rate of return results do need to be aggregated for annual returns. Determining an annual rate of return using the monthly rates of return is achieved using an aggregation of an individual participant's monthly rates of return for that period. Only participants with a result across all months in the period are included in summary statistics presented. The math applied to achieve this assumes the following approach:

(1+[January Rate of Return]) * …(1[December Rate of Return])

Investor Type:
Reviewing participant rates of return effectively requires consideration on the approach that each individual has taken to allocate their balance. To simplify this review, we identify participants by the approach they consistently employed over the period the returns were realized. As a result, an individual that employed a joint strategy or switched strategies during the period will be considered a "Do-It-Yourself" type. Of note: Empower continues to enrich this source, and detail available for 1 year returns may not be available for 3 and 5 year turns.

*Annual Rates of return represent the plan weighted results of 1, 3 and 5 year average rates of return within the plan result compared to the median %tiles in the benchmark totals. A plan must have a minimum of 5 observations to be included in the data. To be included in the results for the 25^{th}/75^{th} and 10^{th}/90^{th}, the plan must have a minimum of 9 and 25 observations, respectively. The benchmark is limited to a relevant subset of Empower's total book of business, and includes only a portion of business recordkept by Empower.

*Median annual rates of return represent the participant weighted result of 1, 3 and 5 year average rate of returns within the specific plan result and Empower totals. All participant outcomes are included within the plans represented by the selected plan and benchmark. The benchmark is limited to a relevant subset of Empower's total book of business, and includes only a portion of 403b and 401k business recordkept by Empower.

State of Alaska Teachers' Retirement System Tier III Defined Contribution Plan

98214-05

EMPOWER®

Advisory services

As of 9/30/2022

Advisory services compares participants using and not using the advisory service. The illustration includes participants actively employed and separated from service with a balance.

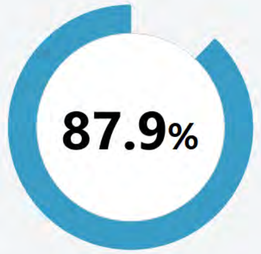
Population of participants using and not using My Total Retirement

of participants are using
My Total Retirement

This amounts to
1,285 participants

Population over time

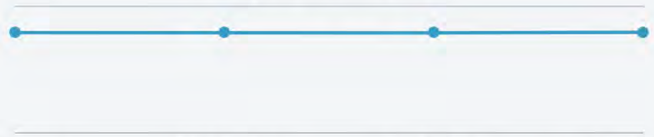
12/31/2021	3/31/2022	6/30/2022	9/30/2022
12.5%	**12.6%**	**12.7%**	**12.1%**



of participants are using
other investment strategies

This amounts to
9,332 participants

Population over time



12/31/2021	3/31/2022	6/30/2022	9/30/2022
87.5%	**87.4%**	**87.3%**	**87.9%**

F1.2a Empower Retirement Advisory Services Powered by Morningstar. Online Advice and My Total Retirement are part of the Empower Retirement Advisory Services suite of services offered by Empower Advisory Group, LLC, a registered investment adviser.

Median Lifetime Income Score and average contribution rate will show as not available when the data required for those calculations has not been provided

98214-05 State of Alaska Teachers' Retirement System Tier III Defined Contribution Plan

Advisory services

As of 9/30/2022

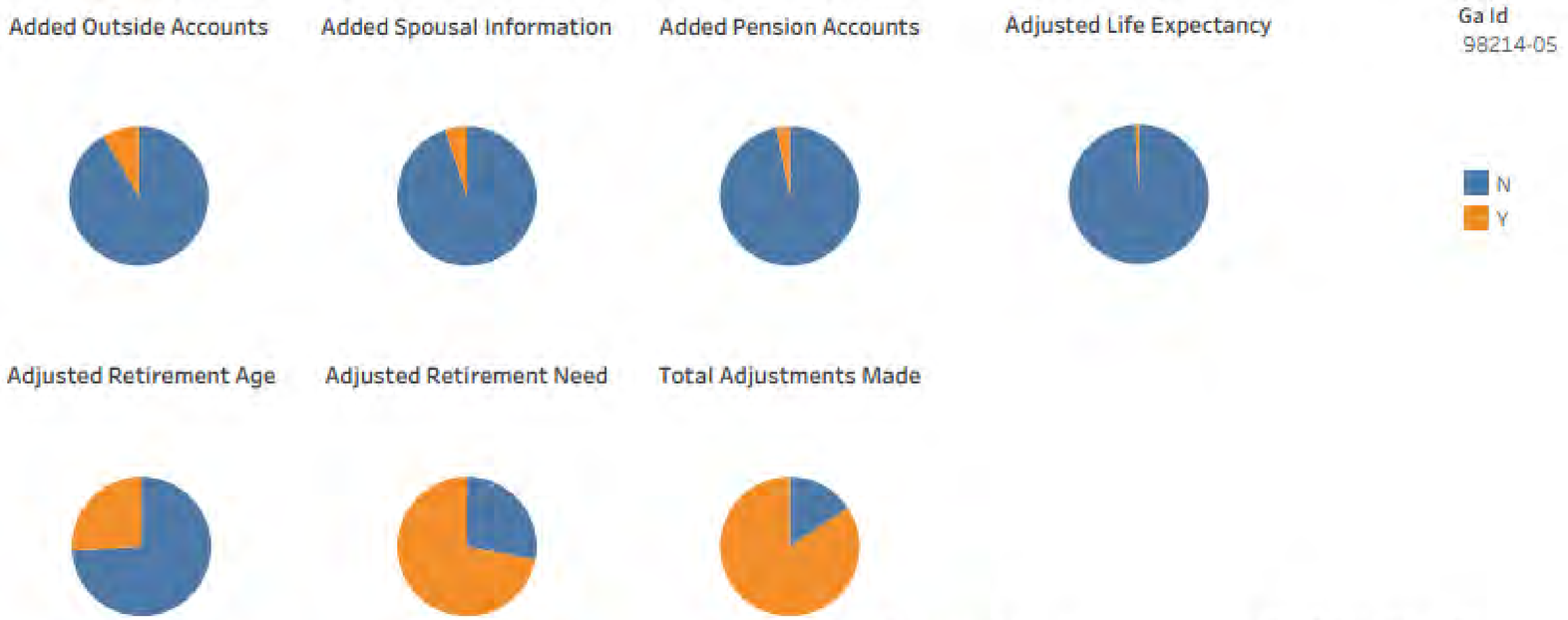
Advisory services compares participants using and not using the advisory service. The illustration includes participants actively employed and separated from service with a balance.

Insights into participants using and not using My Total Retirement

		Under 30 yrs	30-39 yrs	40-49 yrs	50-59 yrs	60-67 yrs	Over 67 yrs
My Total Retirement users	% of participants	1%	8%	17%	17%	18%	23%
	# of participants	13	299	504	286	130	53
	Average balance	$35,245	$116,556	$145,184	$147,624	$131,266	$98,496
	Average equity percent	62.5%	59.6%	52.5%	43.4%	37.0%	34.6%
Other investment strategy users	% of participants	99%	92%	83%	83%	82%	77%
	# of participants	1,113	3,578	2,434	1,421	606	180
	Average balance	$17,288	$53,151	$69,147	$69,822	$71,317	$52,188
	Average equity percent	50.2%	50.5%	50.5%	49.5%	47.7%	48.7%

Median Lifetime Income Score and average contribution rate will show as not available when the data required for those calculations has not been provided

Personalization – Teachers' Retirement System Tier III Plan as of 9/30/22



	Participant Accounts	% of Total in MA
Added Outside Accounts [1]	126	8.53%
Added Spousal Information [2]	74	5.01%
Added Pension Accounts [1]	46	3.11%
Adjusted Life Expectancy [3]	13	0.88%
Adjusted Retirement Age [4]	382	25.85%
Adjusted Retirement Need [5]	1,064	71.99%
Total That Made Adjustments	1,247	84.37%
Total Enrolled	1,478	100.00%

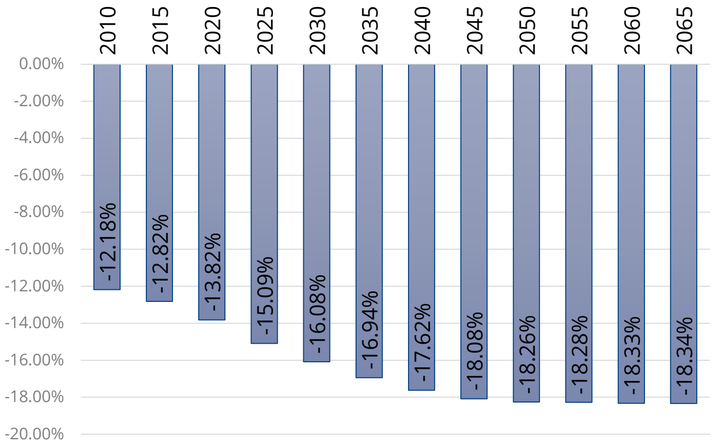
- 1 The Advisory Service process allows for the inclusion of outside financial and pension information to allows for more personalized retirement readiness recommendations
- 2 The inclusion of spousal/partner information allows for a holistic, household retirement income projection
- 3 Participants may adjust their life expectancy to help receive recommendations appropriate to their retirement income needs
- 4 Adjusting retirement age helps provide recommendations appropriate to the participant's savings horizon, and determined by a comparison of the retirement age in Advisory Services against the plan's default retirement age in the recordkeeping system
- 5 This column represents whether participants have adjusted their retirement income need to something other than 100%, post-tax replacement retirement income NOTAPPROVEDFORUSEWITHPLANPARTICIPANTS

- 98214-05 State of Alaska Teachers' Retirement System Tier III Defined Contribution Plan

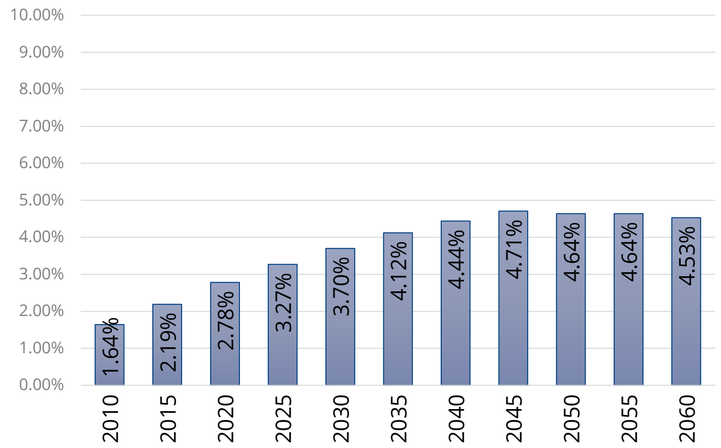
Annual Rate of Return Summary

As of 9/30/2022

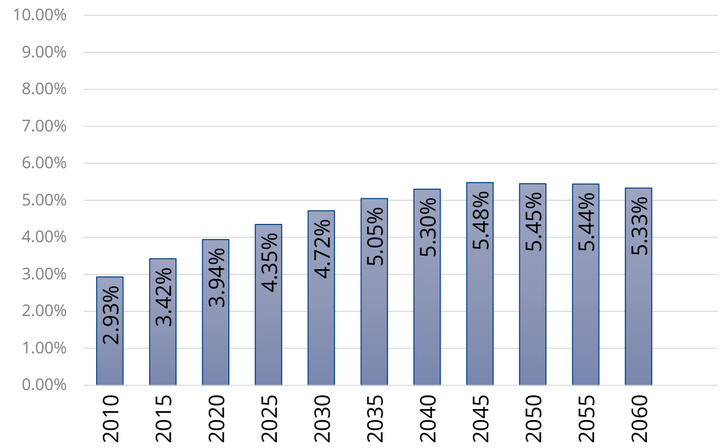
Alaska Target Date Fund - 1 Year



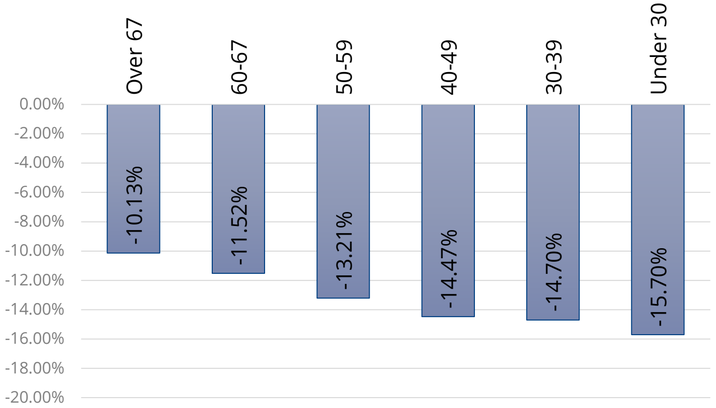
Alaska Target Date Fund - 3 Year



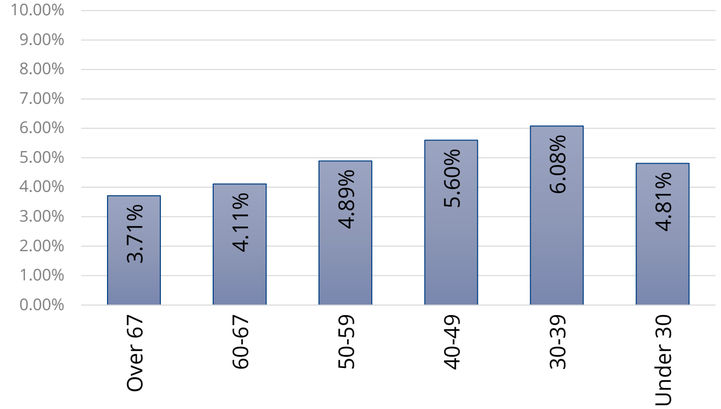
Alaska Target Date Fund - 5 Year



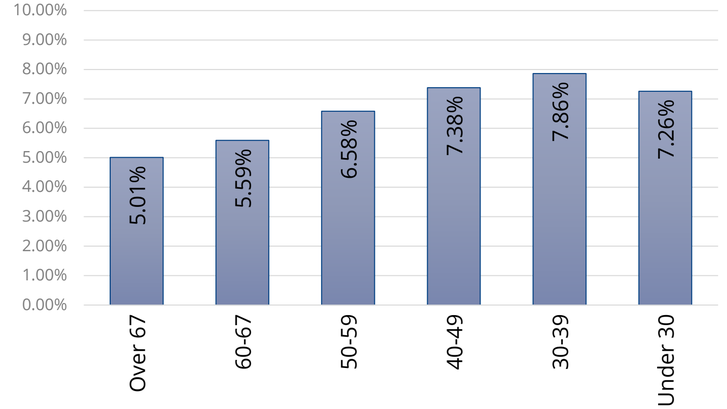
All Investment Strategies – Median 1 Year by Age Band



All Investment Strategies – Median 3 Year by Age Band



All Investment Strategies – Median 5 Year by Age Band



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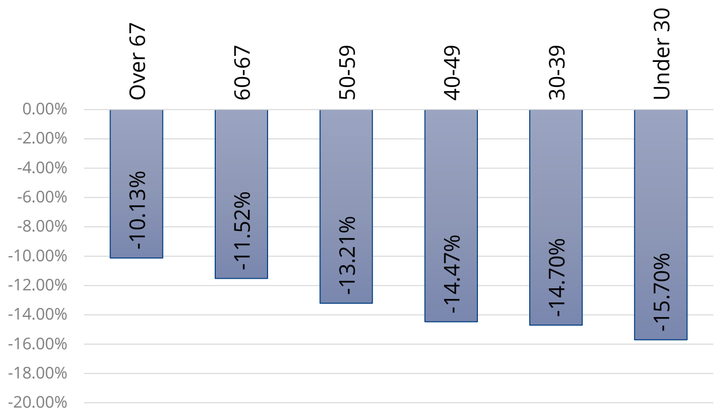
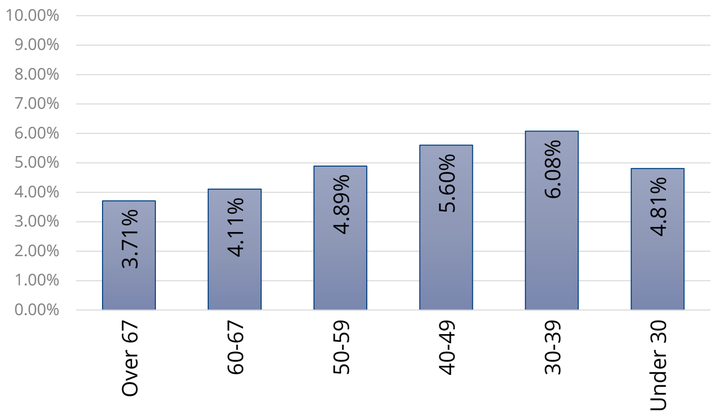
Annual Rate of Return Summary

As of 9/30/2022

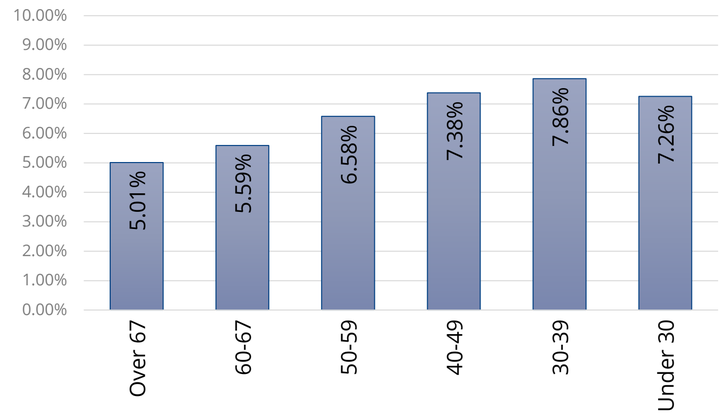
All Investment Strategies – Median 1 Year by Age Band



All Investment Strategies – Median 3 Year by Age Band



All Investment Strategies – Median 5 Year by Age Band



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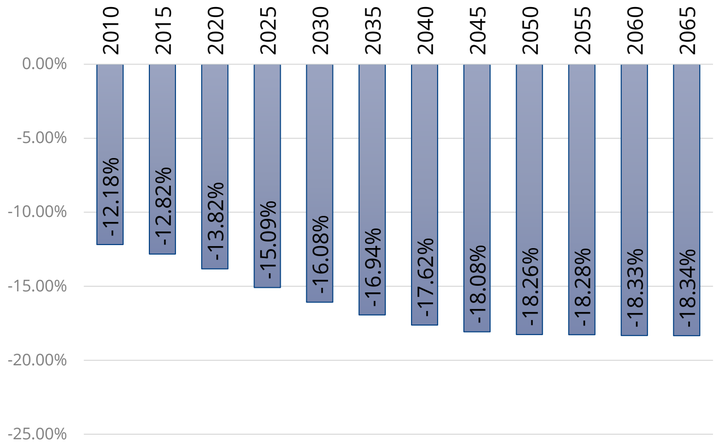
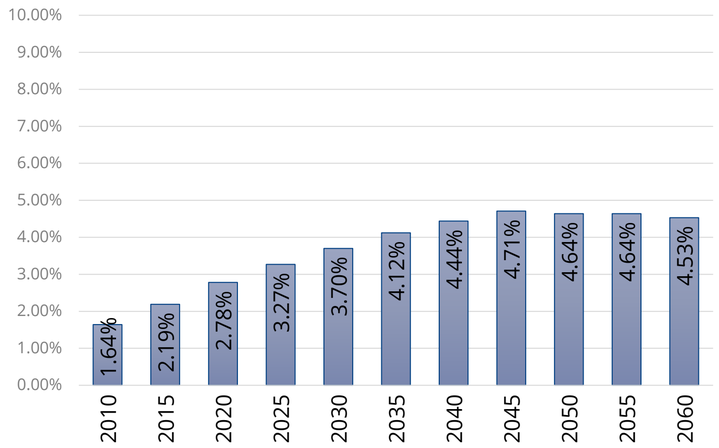
Annual Rate of Return Summary – 75th Percentile

As of 9/30/2022

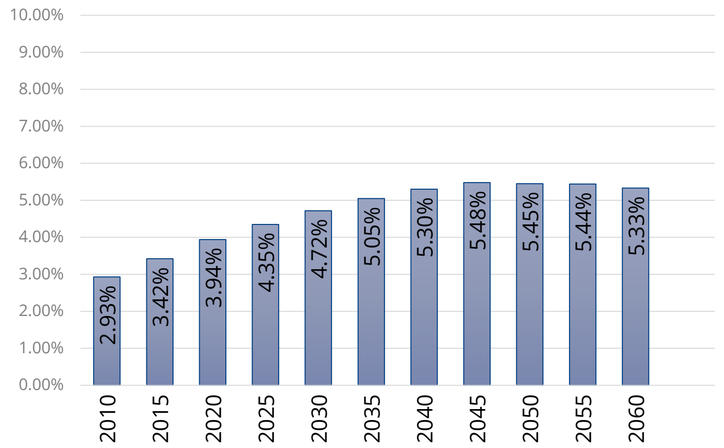
Alaska Target Date Fund - 1 Year



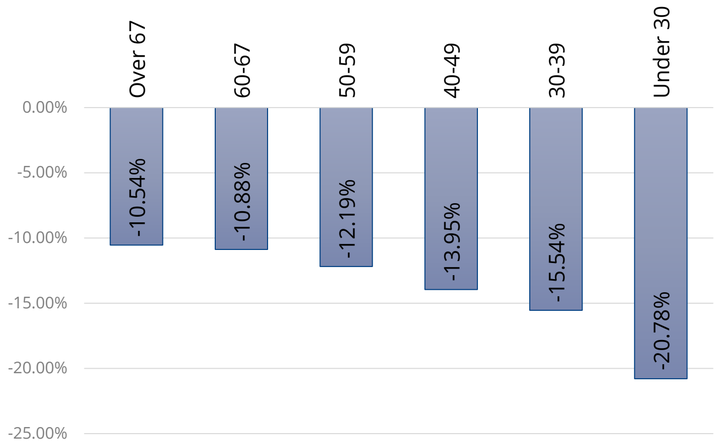
Alaska Target Date Fund - 3 Year



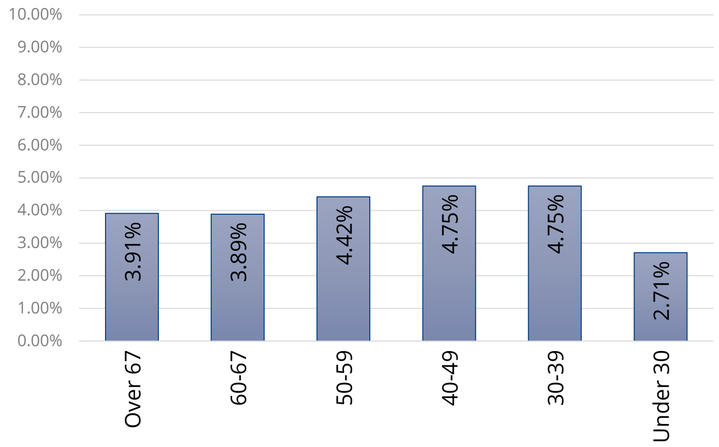
Alaska Target Date Fund - 5 Year



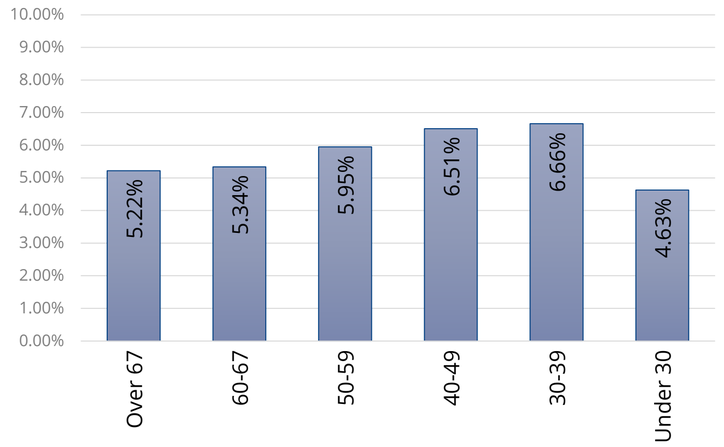
MTR – 75th Percentile 1 Year by Age Band



MTR – 75th Percentile 3 Year by Age Band



MTR – 75th Percentile 5 Year by Age Band



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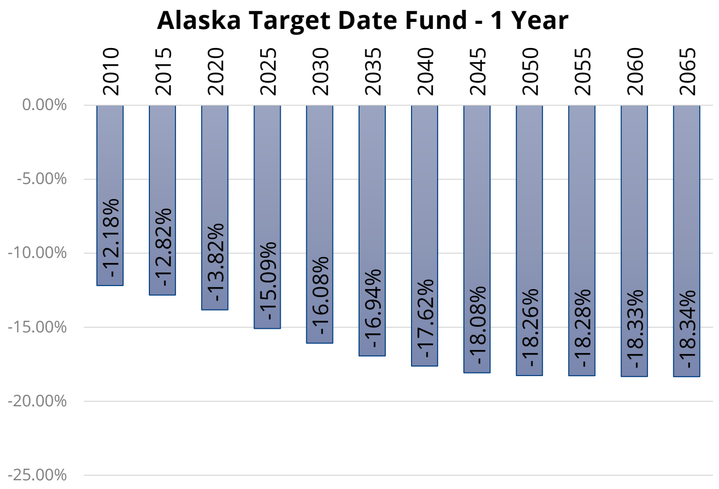
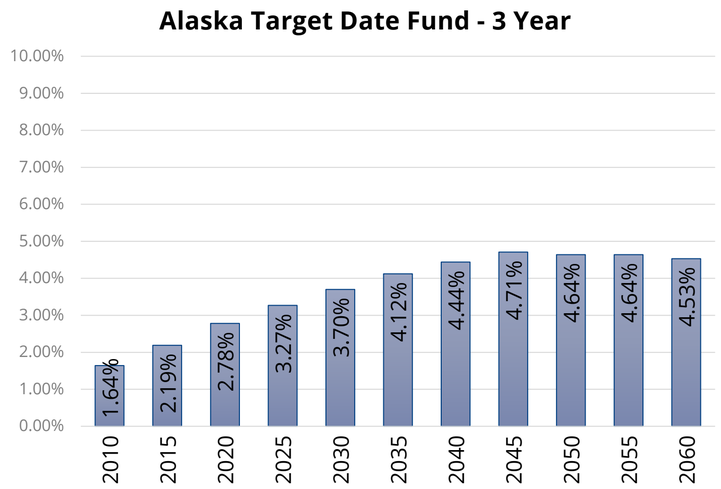
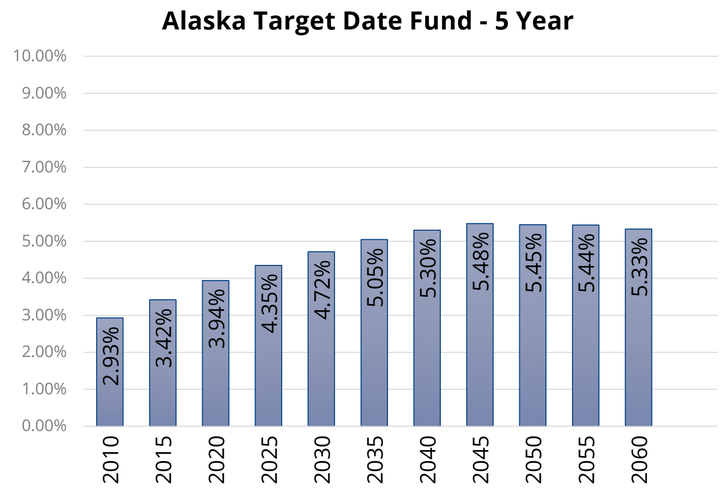
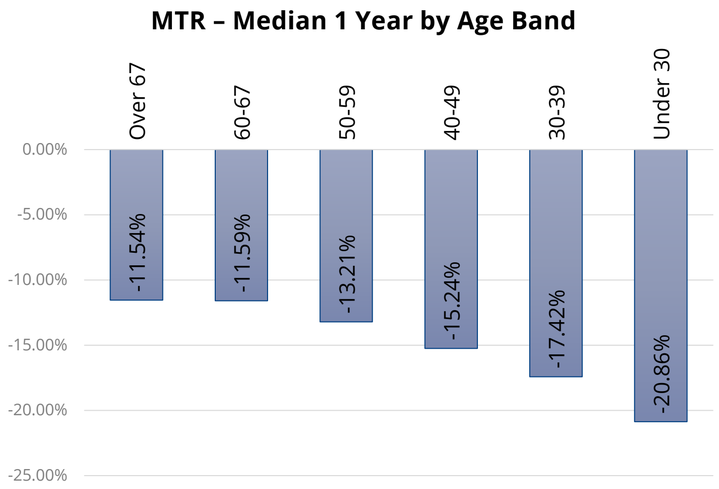
Annual Rate of Return Summary – Median

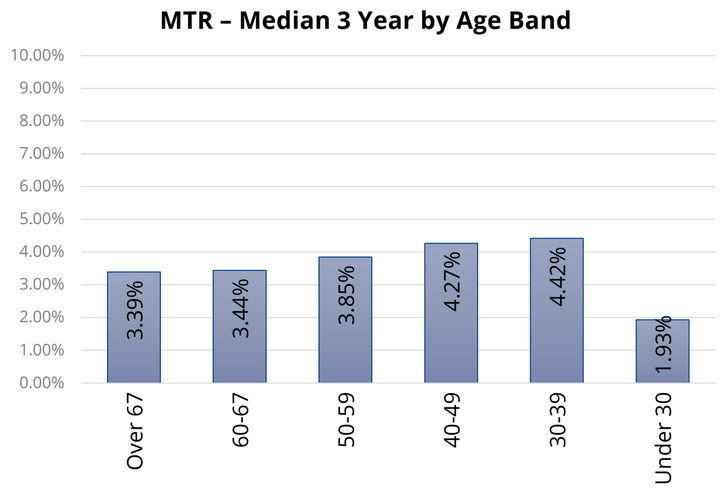
As of 9/30/2022

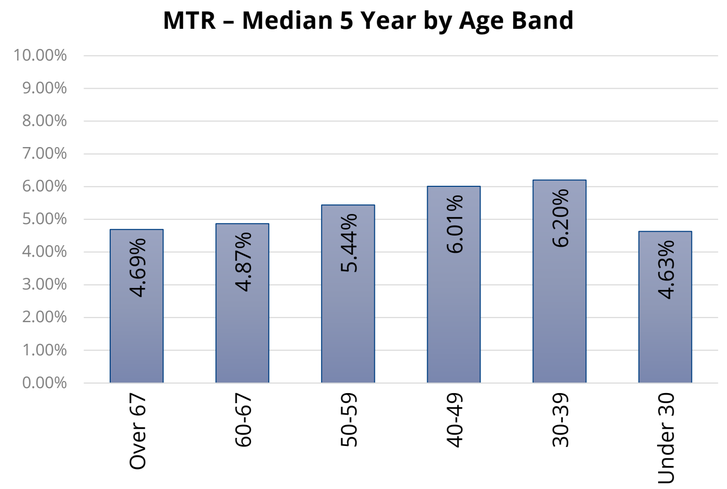












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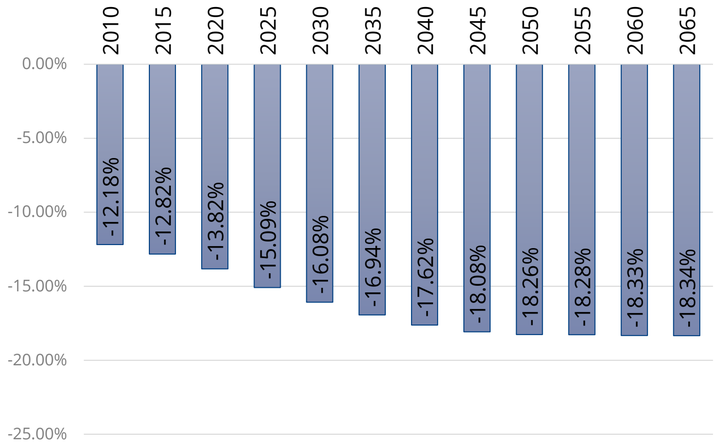
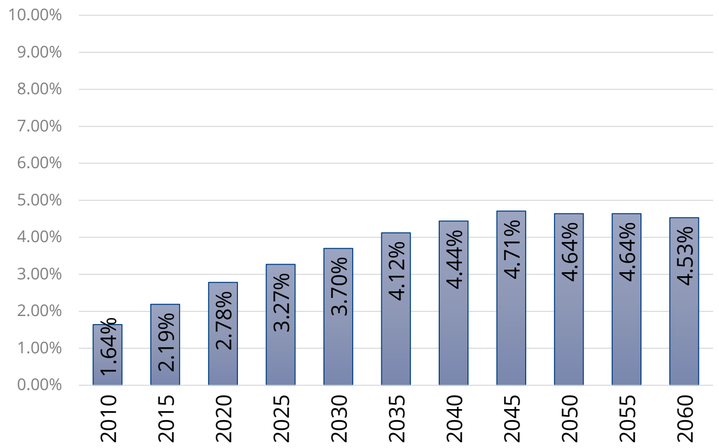
Annual Rate of Return Summary – 25th Percentile

As of 9/30/2022

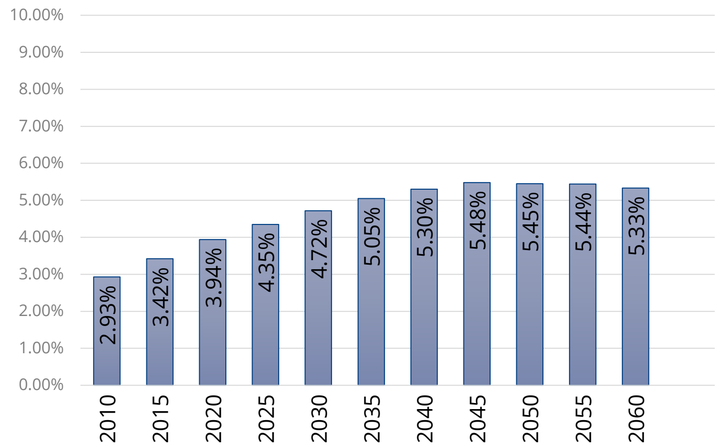
Alaska Target Date Fund - 1 Year



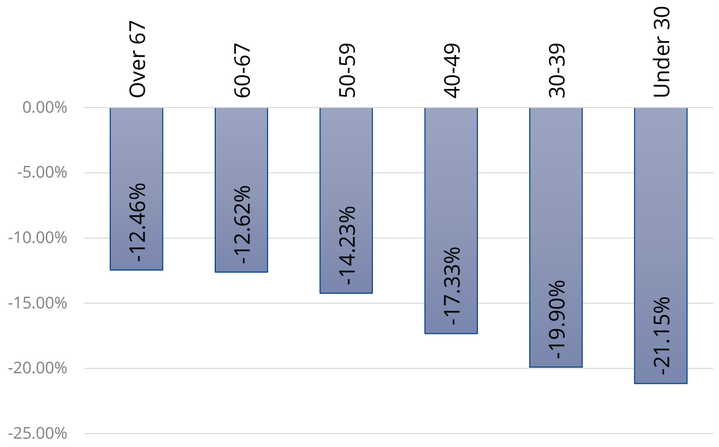
Alaska Target Date Fund - 3 Year



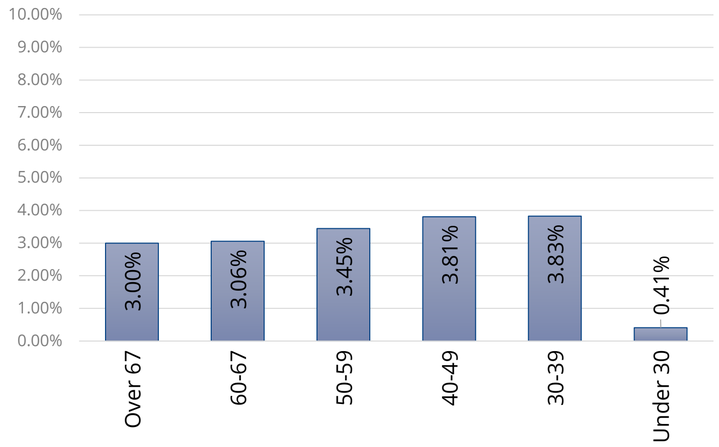
Alaska Target Date Fund - 5 Year



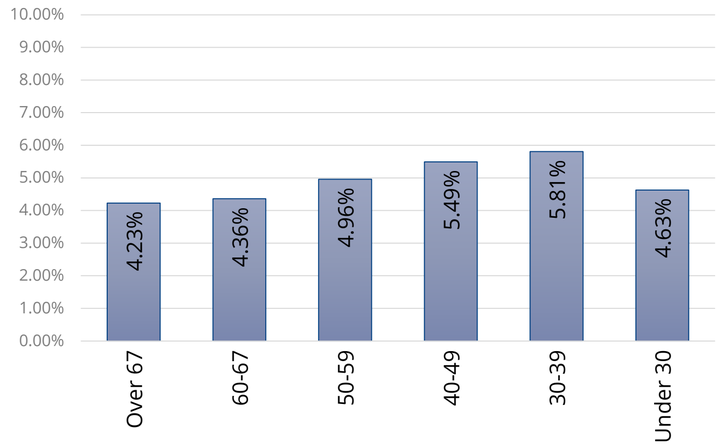
MTR – 25th Percentile 1 Year by Age Band



MTR – 25th Percentile 3 Year by Age Band



MTR – 25th Percentile 5 Year by Age Band



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Rate of Return Definitions & Methodology

Rate of Return:
Rate of return is calculated based on all account activity between the first and last day of the period. It is calculated based on a formula which estimates the equivalent rate of return during the statement period, based on the opening balance, transaction activity and closing balance. The formula was reviewed by Empower Advisory Group, LLC, a registered investment adviser.

There are two processes that calculate and store this data by plan participant: one is a process for My Total Retirement clients that receive a Morningstar report card and the second is a monthly rate of return process.

My Total Retirement Process Rate of Return: this process calculates full period rates of return in 3 month, 1, 3, 5, 7, and 10 year intervals consistent with the procedures called by the participant website. Given the nature of how this is calculated, annual rate of return results do not need to be aggregated for 1 year returns, and 3, 5, 7 and 10 year intervals just need to divide the period return by the number of years to create an average annual rate of return.

Monthly Process Rate of Return: this process calculates full period rates of return in 1 month intervals consistent with the procedures called by the participant website. Given the nature of how this is calculated, annual rate of return results do need to be aggregated for annual returns. Determining an annual rate of return using the monthly rates of return is achieved using an aggregation of an individual participant's monthly rates of return for that period. Only participants with a result across all months in the period are included in summary statistics presented. The math applied to achieve this assumes the following approach:

(1+[January Rate of Return]) * …(1[December Rate of Return])

Investor Type:
Reviewing participant rates of return effectively requires consideration on the approach that each individual has taken to allocate their balance. To simplify this review, we identify participants by the approach they consistently employed over the period the returns were realized. As a result, an individual that employed a joint strategy or switched strategies during the period will be considered a "Do-It-Yourself" type. Of note: Empower continues to enrich this source, and detail available for 1 year returns may not be available for 3 and 5 year turns.

*Annual Rates of return represent the plan weighted results of 1, 3 and 5 year average rates of return within the plan result compared to the median %tiles in the benchmark totals. A plan must have a minimum of 5 observations to be included in the data. To be included in the results for the 25^{th}/75^{th} and 10^{th}/90^{th}, the plan must have a minimum of 9 and 25 observations, respectively. The benchmark is limited to a relevant subset of Empower's total book of business, and includes only a portion of business recordkept by Empower.

*Median annual rates of return represent the participant weighted result of 1, 3 and 5 year average rate of returns within the specific plan result and Empower totals. All participant outcomes are included within the plans represented by the selected plan and benchmark. The benchmark is limited to a relevant subset of Empower's total book of business, and includes only a portion of 403b and 401k business recordkept by Empower.

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Investment Performance

EMPOWER®

Investment Performance

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Carefully consider the investment option's objectives, risks, fees and expenses. Contact us for a prospectus, summary prospectus for SEC registered products or disclosure document for unregistered products, if available, containing this information. Read each carefully before investing.

You could lose money by investing in a Money Market Fund. Although the fund seeks to preserve the value of your investment at $1 per share, it cannot guarantee it will do so. An investment in the fund is not insured or guaranteed by the Federal Deposit Insurance Corporation or any other government agency. The fund's sponsor has no legal obligation to provide financial support to the fund, and you should not expect that the sponsor will provide financial support to the fund at any time.

For additional fund information, please refer to the Fund Fact Sheet or Prospectus

INVESTMENT OPTION	Ticker	Gross/Net Expense Ratio	Inception Date	Returns as of Month Ending 10/31/2022						Returns as of Quarter Ending 09/30/2022					Calendar Year Returns		
				1 Month	YTD	1 Year	3 Year	5 Year	10 Year/ Since Inception	3 Month	1 Year	3 Year	5 Year	10 Year/ Since Inception	2021	2020	2019
Domestic Fixed Income																	
Passive U.S. Bond Index Fund	N/A	0.04 / 0.04	08-01-2018	-1.29	-15.62	-15.65	-3.77	N/A	-0.30	-4.75	-14.58	-3.26	N/A	0.00	-1.64	7.49	8.70
Barclays US Aggregate Bond Index[8]	N/A	- / -		-1.30	-15.72	-15.68	-3.77	-0.54	0.74	-4.75	-14.60	-3.26	-0.27	0.89	-1.54	7.51	8.72
Stable Value/Money Market																	
Stable Value Fund[6,27]	N/A	0.21 / 0.21	08-01-2018	0.17	1.57	1.87	2.12	N/A	2.24	0.48	1.86	2.13	N/A	2.25	1.93	2.43	2.65
State Street Inst Treasury Money Market[2]	TRIXX	0.12 / 0.12	10-25-2007	0.23	0.86	0.86	0.51	1.06	0.60	0.47	0.63	0.49	1.03	0.58	0.01	0.40	2.10
Citigroup 3-Month T-Bill[8,14]	N/A	- / -		*	*	*	*	*	*	0.45	0.63	0.57	1.13	0.66	0.05	0.58	2.25
Balanced																	
Alaska Balanced Trust[5,7,19,20,21]	N/A	0.10 / 0.10	03-31-1992	1.80	-13.40	-13.02	1.33	2.80	4.31	-4.66	-13.09	1.08	2.58	4.08	6.06	10.86	13.47
Alaska Balanced Custom Index[5,8,22]	N/A	- / -		1.92	-13.95	-13.46	1.12	2.72	4.19	-4.69	-13.54	0.84	2.48	3.96	6.43	10.42	13.91
Alaska Long-Term Balanced Trust[5,7,19,20,21]	N/A	0.12 / 0.12	06-18-2001	3.62	-15.66	-14.99	3.47	4.41	6.57	-5.20	-15.38	2.80	3.92	6.11	11.13	13.98	18.64
Alaska Long-Term Balanced Custom Index[5,7,8,22]	N/A	- / -		3.69	-16.35	-15.57	3.24	4.37	6.48	-5.21	-15.95	2.56	3.88	6.03	11.56	13.58	19.39
BlackRock Strategic Completion NL F[5,6]	N/A	0.11 / 0.11	09-01-2011	2.28	-13.77	-12.67	1.87	3.06	1.85	-7.87	-11.80	1.60	2.68	1.58	18.71	2.68	13.20

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Investment Performance

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				1 Month	YTD	1 Year	3 Year	5 Year	10 Year/ Since Inception	3 Month	1 Year	3 Year	5 Year	10 Year/ Since Inception	2021	2020	2019
Domestic Equity																	
Russell 3000 Index[6,21]	N/A	0.01 / 0.01	06-01-2000	8.21	-18.32	-16.36	9.82	9.90	6.82	-4.45	-17.46	7.73	8.65	11.41	25.74	20.78	31.04
Russell 3000 Index[8,26]	N/A	- / -		8.20	-18.44	-16.52	9.78	9.87	*	-4.46	-17.63	7.70	8.62	11.39	25.66	20.89	31.02
S & P 500 Stock Index Fund[1,21]	N/A	0.01 / 0.01	02-01-1996	8.09	-17.71	-14.62	10.19	10.42	12.77	-4.88	-15.48	8.14	9.22	11.69	28.69	18.36	31.47
S & P 500 Index[8,9,10]	N/A	- / -		8.10	-17.70	-14.61	10.22	10.44	12.79	-4.88	-15.47	8.16	9.24	11.70	28.71	18.40	31.49
Environmental, Social and Governance Fd[6,21]	N/A	0.05 / 0.05	08-01-2018	7.32	-20.52	-18.56	9.82	N/A	9.75	-6.33	-17.00	7.91	N/A	8.10	31.63	18.52	31.35
MSCI USA ESG Index[8,28]	N/A	- / -		7.30	-20.47	-18.50	9.92	*	9.87	-6.30	-16.92	8.03	*	8.23	31.73	18.84	31.66
US Small Cap Trust[7,21]	N/A	0.60 / 0.60	12-10-2001	8.63	-20.27	-21.30	7.25	9.21	12.23	-2.26	-24.10	4.92	7.71	11.05	17.12	25.10	34.20
Russell 2000 Index[4,8,25,29]	N/A	- / -		11.01	-16.86	-18.54	7.05	5.56	9.93	-2.19	-23.50	4.29	3.55	8.55	14.82	19.96	25.52
International Equity																	
World Equity Ex-US Index[6,17,21]	N/A	0.07 / 0.07	09-09-2008	3.44	-24.14	-24.54	-1.51	-0.43	3.42	-10.38	-24.98	-1.49	-0.73	3.11	8.03	10.78	21.73
International Equity Fund[7]	AKIEQ	0.38 / 0.38	03-27-2015	4.57	-30.11	-31.08	-1.92	-1.14	-0.18	-11.84	-32.68	-2.31	-1.90	-0.78	8.12	16.18	24.96
MSCI ACWI ex-US Index[8,24]	N/A	- / -		2.99	-24.31	-24.73	-1.68	-0.60	*	-9.91	-25.17	-1.52	-0.81	2.57	7.82	10.65	21.51

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Target Date																	
Alaska Target Date Retirement 2010 Trust[3,4,7,19,21,29]	N/A	0.21 / 0.21	04-30-2009	2.26	-12.38	-11.94	2.02	3.20	5.10	-4.52	-12.18	1.64	2.93	4.80	6.99	10.39	14.18
Alaska 2010 Custom Index[4,8,22,29]	N/A	- / -		2.38	-12.92	-12.38	1.86	3.18	5.05	-4.56	-12.64	1.47	2.89	4.75	7.40	10.08	14.63
Alaska Target Date Retirement 2015 Trust[3,4,7,19,20,21,29]	N/A	0.13 / 0.13	02-01-1996	2.63	-13.04	-12.54	2.63	3.74	5.96	-4.69	-12.82	2.19	3.42	5.61	8.25	11.50	15.85
Alaska 2015 Custom Index[4,8,22,29]	N/A	- / -		2.70	-13.67	-13.07	2.38	3.62	5.85	-4.70	-13.34	1.93	3.30	5.50	8.57	11.09	16.24
Alaska Target Date Retirement 2020 Trust[3,4,7,19,20,21,29]	N/A	0.14 / 0.14	11-02-2000	3.15	-14.11	-13.50	3.32	4.32	6.81	-4.91	-13.82	2.78	3.94	6.39	9.99	12.73	18.13
Alaska 2020 Custom Index[4,8,22,29]	N/A	- / -		3.21	-14.76	-14.05	3.06	4.20	6.68	-4.90	-14.36	2.52	3.81	6.26	10.33	12.32	18.56
Alaska Target Date Retirement 2025 Trust[3,4,7,19,20,21,29]	N/A	0.15 / 0.15	11-02-2005	3.78	-15.44	-14.73	3.95	4.83	7.54	-5.20	-15.09	3.27	4.35	7.05	11.90	14.04	20.18
Alaska 2025 Custom Index[4,8,22,29]	N/A	- / -		3.86	-16.09	-15.28	3.69	4.72	7.42	-5.16	-15.68	3.00	4.23	6.92	12.29	13.57	20.64
Alaska Target Date Retirement 2030 Trust[3,4,7,19,21,29]	N/A	0.15 / 0.15	04-30-2009	4.31	-16.44	-15.64	4.51	5.29	8.18	-5.39	-16.08	3.70	4.72	7.61	13.56	15.05	22.02
Alaska 2030 Custom Index[4,8,22,29]	N/A	- / -		4.40	-17.04	-16.14	4.31	5.21	8.08	-5.37	-16.61	3.48	4.64	7.51	14.04	14.61	22.49
Alaska Target Date Retirement 2035 Trust[3,4,7,19,21,29]	N/A	0.16 / 0.16	04-30-2009	4.84	-17.31	-16.41	5.06	5.70	8.72	-5.60	-16.94	4.12	5.05	8.09	15.04	16.08	23.63
Alaska 2035 Custom Index[4,8,22,29]	N/A	- / -		4.92	-17.90	-16.92	4.83	5.61	8.60	-5.55	-17.47	3.89	4.96	7.97	15.48	15.62	24.08
Alaska Target Date Retirement 2040 Trust[3,4,7,19,21,29]	N/A	0.16 / 0.16	04-30-2009	5.32	-17.96	-17.00	5.49	6.02	9.09	-5.78	-17.62	4.44	5.30	8.40	16.33	16.77	24.81
Alaska 2040 Custom Index[4,8,22,29]	N/A	- / -		5.38	-18.55	-17.51	5.26	5.93	8.96	-5.70	-18.15	4.20	5.21	8.28	16.76	16.29	25.26
Alaska Target Date Retirement 2045 Trust[3,4,7,19,21,29]	N/A	0.16 / 0.16	08-31-2009	5.69	-18.41	-17.39	5.87	6.28	9.26	-5.88	-18.08	4.71	5.48	8.53	17.41	17.31	25.61
Alaska 2045 Custom Index[4,8,22,29]	N/A	- / -		5.76	-19.00	-17.91	5.64	6.19	9.14	-5.81	-18.63	4.49	5.40	8.41	17.84	16.85	26.08
Alaska Target Date Retirement 2050 Trust[3,4,7,19,21,29]	N/A	0.16 / 0.16	08-31-2009	5.87	-18.54	-17.49	5.86	6.27	9.26	-5.93	-18.26	4.64	5.45	8.52	17.54	17.35	25.55
Alaska 2050 Custom Index[4,8,22,29]	N/A	- / -		5.92	-19.18	-18.09	5.59	6.16	9.12	-5.85	-18.89	4.38	5.34	8.38	17.93	16.85	26.08
Alaska Target Date Retirement 2055 Trust[3,4,7,19,21,29]	N/A	0.16 / 0.16	08-31-2009	5.87	-18.54	-17.51	5.86	6.27	9.25	-5.93	-18.28	4.64	5.44	8.51	17.55	17.31	25.62
Alaska 2055 Custom Index[4,8,22,29]	N/A	- / -		5.92	-19.18	-18.09	5.59	6.16	9.12	-5.85	-18.89	4.38	5.34	8.38	17.93	16.85	26.08

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				1 Month	YTD	1 Year	3 Year	5 Year	10 Year/ Since Inception	3 Month	1 Year	3 Year	5 Year	10 Year/ Since Inception	2021	2020	2019
Target Date																	
Alaska Target Date Retirement 2060 Trust[3,4,7,19,21,29]	N/A	0.23 / 0.23	11-05-2015	5.88	-18.57	-17.57	5.76	6.16	7.66	-5.95	-18.33	4.53	5.33	6.87	17.41	17.19	25.52
Alaska 2060 Custom Index[4,8,22,29]	N/A	- / -		5.92	-19.18	-18.09	5.59	6.16	7.69	-5.85	-18.89	4.38	5.34	6.89	17.93	16.85	26.08
Alaska Target Date Retirement 2065 Trust	N/A	0.23 / 0.23	01-07-2020	5.88	-18.59	-17.56	N/A	N/A	11.70	-5.89	-18.34	N/A	N/A	5.50	17.47	N/A	N/A
Alaska 2065 Custom Index[8]	N/A	- / -		5.92	-19.18	-18.09	N/A	N/A	*	-5.85	-18.89	N/A	N/A	4.85	17.93	N/A	N/A
JPMorgan SmartRetirement Blend 2015 R6[16,18]	JTQJX	1.24 / 0.19	12-30-2016	2.11	-15.75	-15.12	-1.56	0.71	2.18	-4.19	-15.38	-2.09	0.51	1.84	6.81	4.81	N/A
JPMorgan SmartRetirement Blend 2020 R6[15,18]	JSYRX	0.44 / 0.19	07-02-2012	2.11	-15.82	-15.28	0.26	2.10	4.89	-4.31	-15.58	-0.08	1.91	4.63	6.36	10.14	15.52

Performance data quoted represents past performance and is not a guarantee or prediction of future results. The investment return and principal value of an investment will fluctuate so that, when redeemed, shares/units may be worth more or less than their original cost. Current performance may be lower or higher than performance data shown. Performance for a share class before its inception is derived from the historical performance of the oldest share class. If the newer fund has lower expenses, the extended performance is not adjusted for the lower expenses; had it, returns would have been higher. For performance data current to the most recent month-end, please visit www.akdrb.com. Carefully consider the investment option's objectives, risks, fees and expenses. Contact us for a prospectus, summary prospectus for SEC registered products or disclosure document for unregistered products, if available, containing this information. Read each carefully before investing. You could lose money by investing in a Money Market Fund. Although the fund seeks to preserve the value of your investment at $1 per share, it cannot guarantee it will do so. An investment in the fund is not insured or guaranteed by the Federal Deposit Insurance Corporation or any other government agency. The fund's sponsor has no legal obligation to provide financial support to the fund, and you should not expect that the sponsor will provide financial support to the fund at any time. For additional fund information, please refer to the Fund Fact Sheet or Prospectus

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These returns and fund operating expenses are expressed as percentages. 3, 5 and 10 Year/Since Inception returns shown are annualized. For 10 Year/Since Inception, if the fund was not in existence for 10 years, returns shown are since inception. If the fund is less than one year old, returns are not annualized.
Performance returns reflect a deduction for fund operating expenses. Your Plan may also assess an administrative fee which would reduce the performance quoted above.
Funds may impose redemption fees and/or transfer restrictions if assets are held for less than the published holding period.
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Expense ratios provided are the Funds' total annual operating expense ratios, gross of any fee waivers or expense reimbursement.
Benchmark index performance is provided gross of all fees.
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A ticker symbol is not available for those funds that are exempt from SEC registration.
The net expense ratio is less applicable fee waivers or expense reimbursements the investment adviser and/or administrator may have agreed upon, either voluntary or by contractual agreement; the gross expense ratio is not. Voluntary fee waivers and reimbursements may be modified or terminated at any time. Additional information can be found in the Fund's prospectus and/or other disclosure documents regarding effective dates and/or if waivers or reimbursements are voluntary or by contractual agreement. Absent waivers or reimbursements, the performance would have been lower.
1.The investment management fees for the S&P 500 Stock Index Fund vary based on total assets of all participants in each fund. The fees for the S&P 500 Stock Index Fund include custodial expenses of approximately 0.05%.
2.You could lose money by investing in a money market fund. Although the fund seeks to preserve the value of your investment at $1 per share, it cannot guarantee it will do so. An investment in the fund is not insured or guaranteed by the Federal Deposit Insurance Corporation or any other government agency. The fund's sponsor has no legal obligation to provide financial support to the fund, and you should not expect that the sponsor will provide financial support to the fund at any time.
3.Asset allocation funds may be subject to operating expenses for the fund and for each underlying fund.
4.A target date fund will gradually shift its emphasis from more aggressive investments to more conservative ones based on its target date (which is the assumed retirement date for an investor).
5.Asset allocation and balanced investment options and models are subject to the risks of the underlying investments.
6.A collective trust is not a mutual fund and is exempt from SEC registration. Designed for and exclusively sold to qualified retirement plans and their participants, the funds are not available to individual retail investors.
7.Collective Trust Fund Option. A ticker symbol is not available for this investment option.
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9.Benchmark index returns are supplied by Morningstar, Inc. There may be another benchmark that is more specific to each of the funds listed under the broad asset class. Please refer to the fund's prospectus for more specific information as to the fund's actual benchmark index.
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14.The Citigroup 3-Month U.S. Treasury Bill Index is an unmanaged index which tracks the total return on currently traded U.S. Treasury bills with remaining maturity closest to three months.
15.The Fund has a Contractual Expense Ratio Waiver in the amount of .25% which expires on 31-MAR-2023.
16.The Fund has a Contractual Expense Ratio Waiver in the amount of 1.05% which expires on 31-MAR-2023.
17.#
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20.The inception dates for the Target Retirement 2015, Target Retirement 2020, Target Retirement 2025, Long Term Balanced Trust, and Balanced Trust are for a respective predecessor product managed substantially in the same style, and performance for the respective predecessor product has been used for periods prior to the current product's inception. For all products performance has been calculated beginning with the first full month of operations.
21.All performance is provided net of all fees.
22.The benchmarks for the Balanced, Long Term Balanced, Target 2010 Fund, and Target Retirement Trusts are custom component benchmarks weighted according to the strategic allocation for each option. Prior to 10/29/08, the weighted benchmark components consisted of Citigroup 3 Mth T-Bill Index, Bloomberg Barclays Capital U.S. Government/Credit Index, Bloomberg Barclays Capital U.S. GNMA Index, S&P 500 Index, Russell 2500 Index, and MSCI EAFE Index. As of 10/29/08, the weighted benchmark components consist of Citigroup 3 Mth T-Bill Index, Bloomberg Barclays Capital U.S. Aggregate Index, Russell 3000 Index, and MSCI EAFE Index. Citigroup 3 Mth T-Bill Index, MSCI EAFE Index and Custom Indices are from 1/31/96.
24.The MSCI ACWI Index (All Country World) is a broad equity index consisting of approximately 2,400 companies in 45 developed and emerging countries. Emerging markets exposure accounts for roughly 10% of the Index. The MSCI ACWI Index is a trademark of MSCI Inc.
25.The Russell 2000 Index is an unmanaged index which tracks the performance of the 2000 smallest companies in the Russell 3000 Index. The Russell 3000 Index measures the performance of the largest 3000 U.S. companies representing approximately 98% of the investable U.S. equity market. Russell Investment Group is the source and owner of the trademarks, service marks, and copyrights related to the Russell Indexes. Russell 2000 and Russell 3000 are trademarks of Russell Investment Group.
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27.Reported returns are inclusive of wrap fees but gross of investment management fees, custody fees, and administrative fees charged by the recordkeeper. Fees accrue daily and decline incrementally as the fund's assets increase. The effective investment management fee is calculated based on the aggregate/combined assets of the two portfolios (Alaska Interest Income Fund, Alaska Stable Value Fund).
28 Benchmark is a linked benchmark consisting of the S&P 500 Index from inception 10/30/08 through 9/30/13 and the MSCI USA ESG Index from 10/1/2013 forward.
29 The date in the name of the target date fund is the assumed date of retirement. The asset allocation becomes more conservative as the fund nears the target retirement date; however, the principal value of the fund is never guaranteed.

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Thank you

Empower Advisory Service Updates

Presented March 15, 2023

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Default analysis

EMPOWER RETIREMENT®

Default Analysis – Data as of 9/30/2016

	# participants	# participants in MTR	# of Participants defaulted* into MTR and have a balance (regardless of current investment strategy)	# of Participants defaulted into MTR, have a balance and remain in MTR	MTR defaulted participants as a percentage of total participants	MTR defaulted participants as a % of total MTR ppts
PERS	27,784	5,585	6,582	5,182	18%	92%
TRS	6,969	1,549	1,806	1,488	21%	96%

** MTR was the plan default investment option from 6/30/2006 to 6/30/2009.*

	# participants	# of Participants defaulted* into TDF and have a balance (regardless of current investment strategy)	# of Participants defaulted into TDF, have a balance and remain in TDF	TDF defaulted participants as a % of total ppts	TDF defaulted participants as a % of total TDF ppts
PERS	27,784	21,200	19,993	71%	94%
TRS	6,969	5,163	4,940	70%	95%

** T. Rowe Target Date Series was the plan default investment option from 7/1/2009 to present.*

Default Analysis – Data as of 2/15/2023

	# participants	# participants in MTR	# of Participants defaulted* into MTR and have a balance (regardless of current investment strategy)	# of Participants defaulted into MTR, have a balance and remain in MTR	MTR defaulted participants as a percentage of total participants	MTR defaulted participants as a % of total MTR ppts
PERS	47,616	5,989	5,336	3,854	8%	64%
TRS	10,946	1,509	1,534	1,194	10%	79%

** MTR was the plan default investment option from 6/30/2006 to 6/30/2009.*

	# participants	# of Participants defaulted* into TDF and have a balance (regardless of current investment strategy)	# of Participants defaulted into TDF, have a balance and remain in TDF	TDF defaulted participants as a % of total ppts	TDF defaulted participants as a % of total TDF ppts
PERS	47,616	42,307	37,854	79%	89%
TRS	10,946	9,412	8,608	78%	91%

** T. Rowe Target Date Series was the plan default investment option from 7/1/2009 to present.*

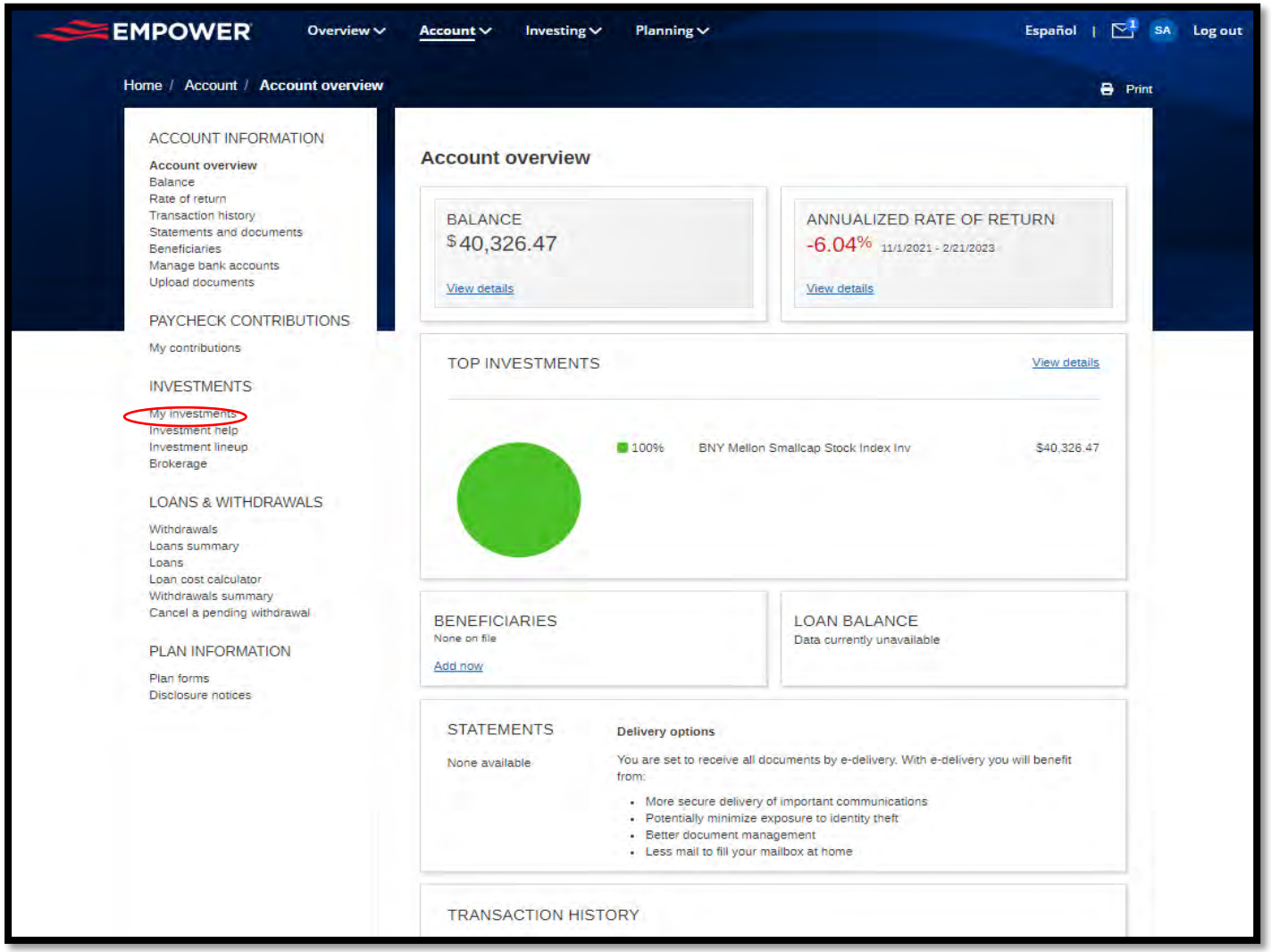
My Total Retirement™: Today vs. tomorrow experience

EMPOWER RETIREMENT®

My Investments– 1st screen

Account Overview - 1st screen

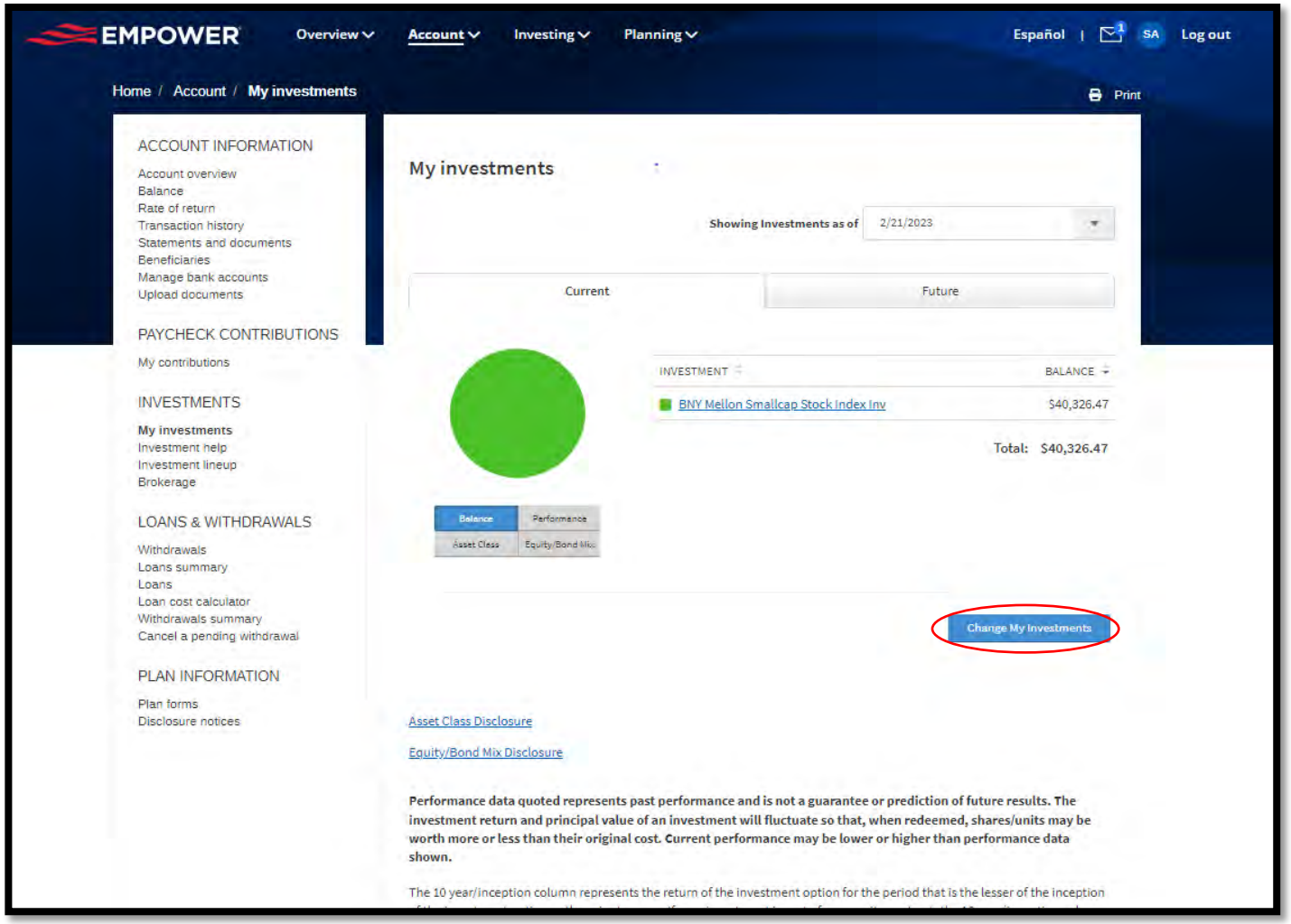
- Select “My Investments”



My Investments– 2nd screen

My Investments – 2nd screen

- Select “Change My Investments”

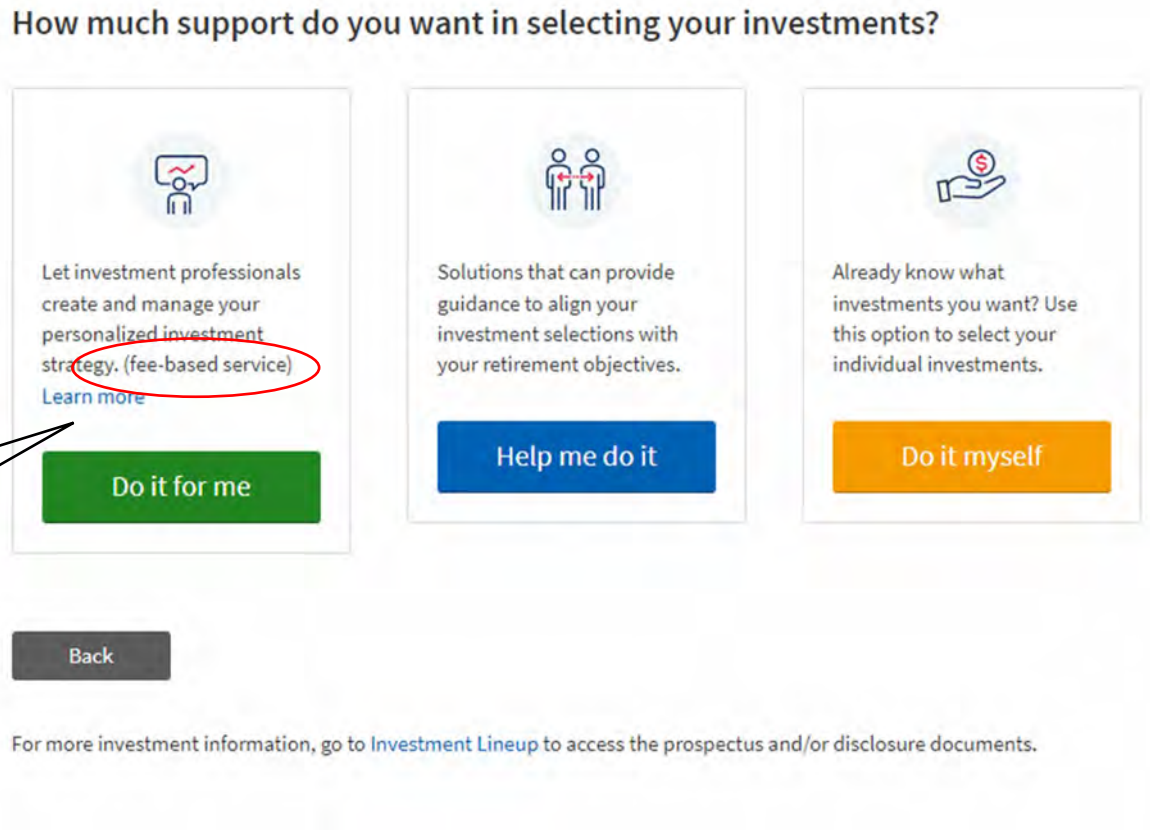


My Investments – 3rd screen
updated as of March 2023

Investment Help – decide how they want to be helped

- Choices are “Do it for me”, “Help me do it” or “Do it myself”
- Select “Do it for me” (add new language below)

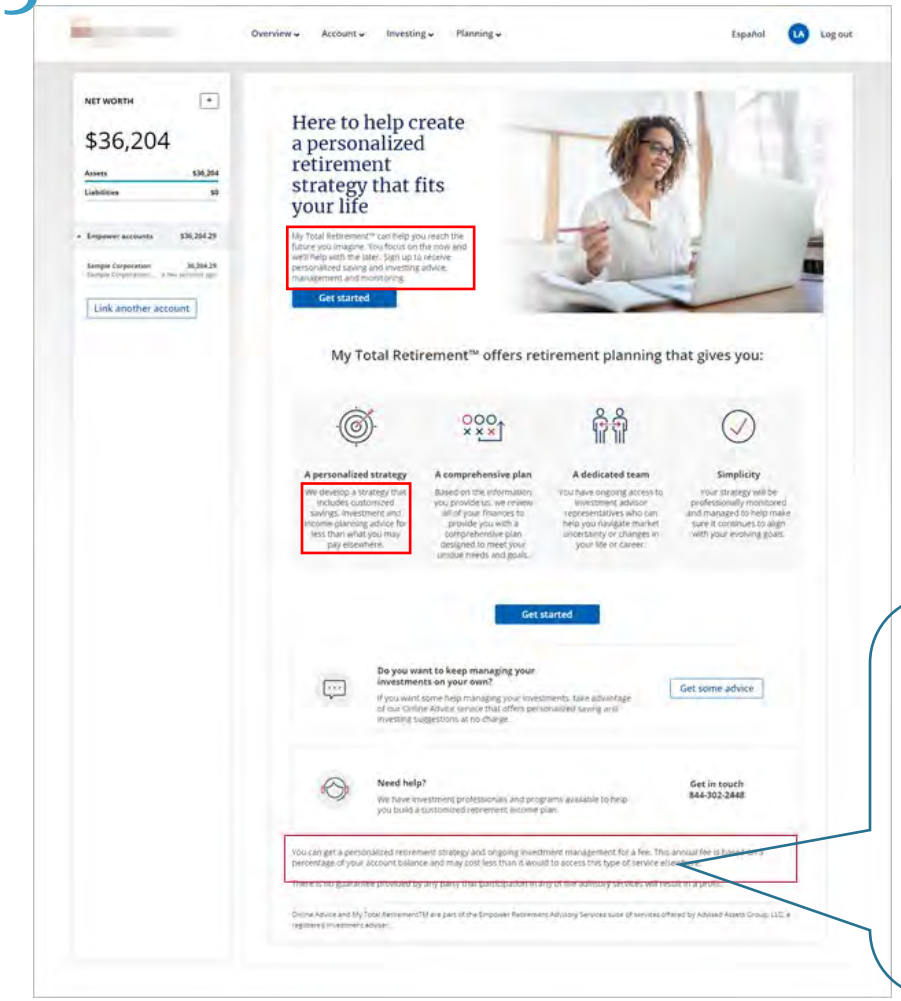
Let investment professionals create and manage your personalized investment strategy. (fee-based service) Learn more.



Information page – 4th screen
updated as of Feb 2023

Information screen

- All inquires of interest go through this page before a participant can choose to enroll.
- Select “Get Started”
  - Brings them to a page to determine if they would like to enrolls into MTR

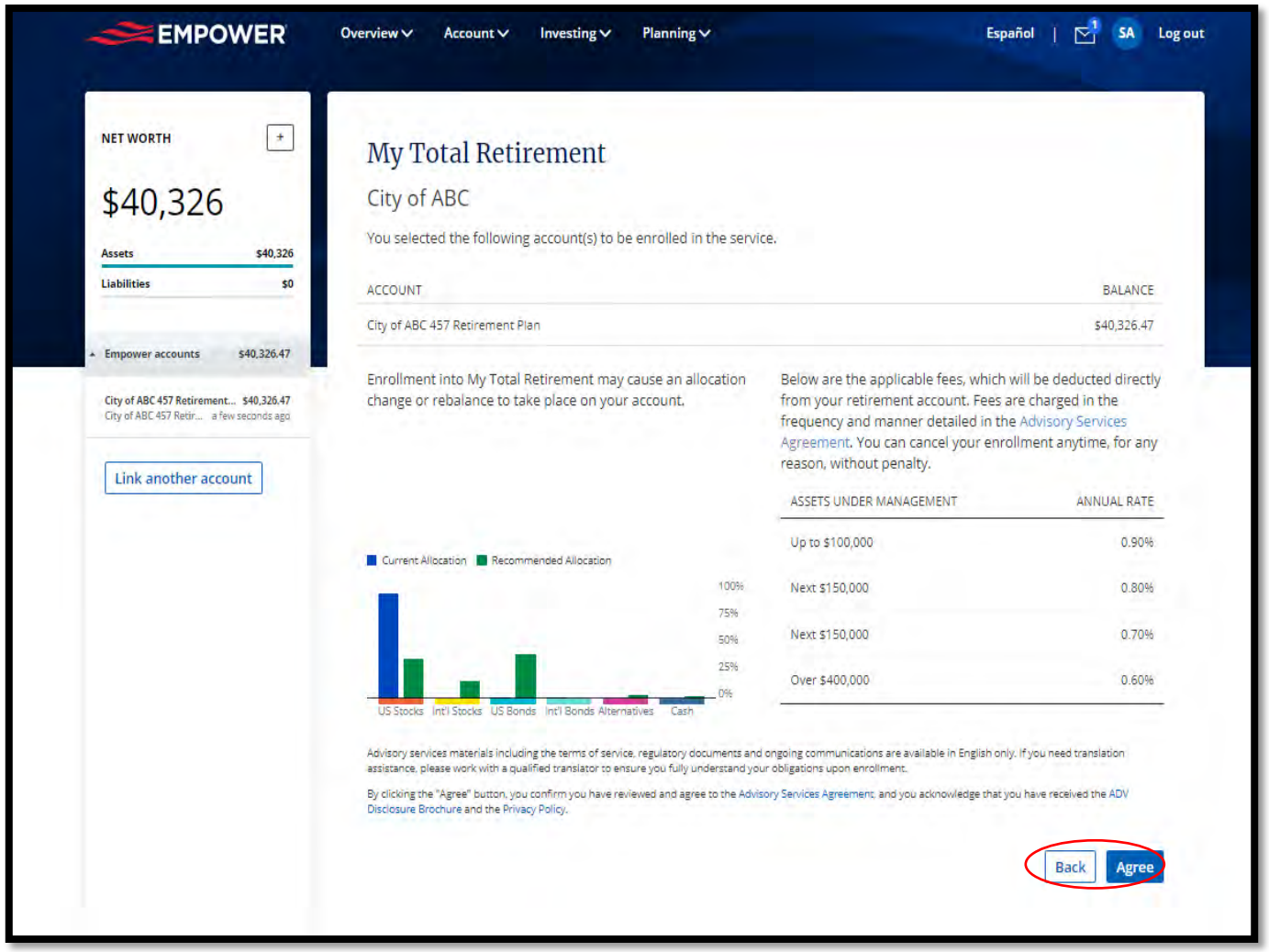


“You can elect to receive a personalized retirement strategy and ongoing investment management for a fee. This annual fee is based on a percentage of your account balance and may cost less than it would to access this type of service elsewhere.”

My Investments – 5th screen

MTR enrollment screen

- Navigates to MTR/AMA confirmation page, provides:
  - Allocation recommendation
  - Expenses
  - Advisory Agreement
- Select “Agree”
  - Enrolls them into MTR



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Empower Advisory Group, LLC, Internal Rate of Return (IROR) All Segments Study, 2018. The participant return distribution included in this study is used to illustrate the difference between those participants within the 90th percentile and the 10th percentile to preserve statistical integrity of the data reported. Refer to the study, available through AAG, for additional disclosures and methodologies.

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My Total Retirement offered through Empower Dynamic Retirement Manager is provided by AAG.

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RO1366437-1020

Thank you

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT:	Managed Account Review	ACTION:	X
DATE:	March 16-17, 2023	INFORMATION:	

BACKGROUND:

Managed account services are provided in Alaska's participant-directed investment programs by an affiliate of the recordkeeper Empower. A managed account provides several elective services to participants that generally includes asset allocation, portfolio construction, and rebalancing.

STATUS:

The last review of the managed account service was conducted by Callan LLC in 2016 and is attached. It is considered good practice to periodically re-evaluate managed account services.

Staff recommends engaging Callan LLC to conduct a review of the managed account service.

RECOMMENDATION:

The Alaska Retirement Management Board direct staff to engage Callan LLC to conduct a review of the managed account service.

State of Alaska

Presentation to ARMB Actuarial Committee

- Buck/Gallagher Announcement

Tonya Manning, FSA, EA, MAAA, FCA
US Wealth Practice Leader & Chief Actuary

March 15, 2023

Buck to be acquired by Arthur J. Gallagher & Co.

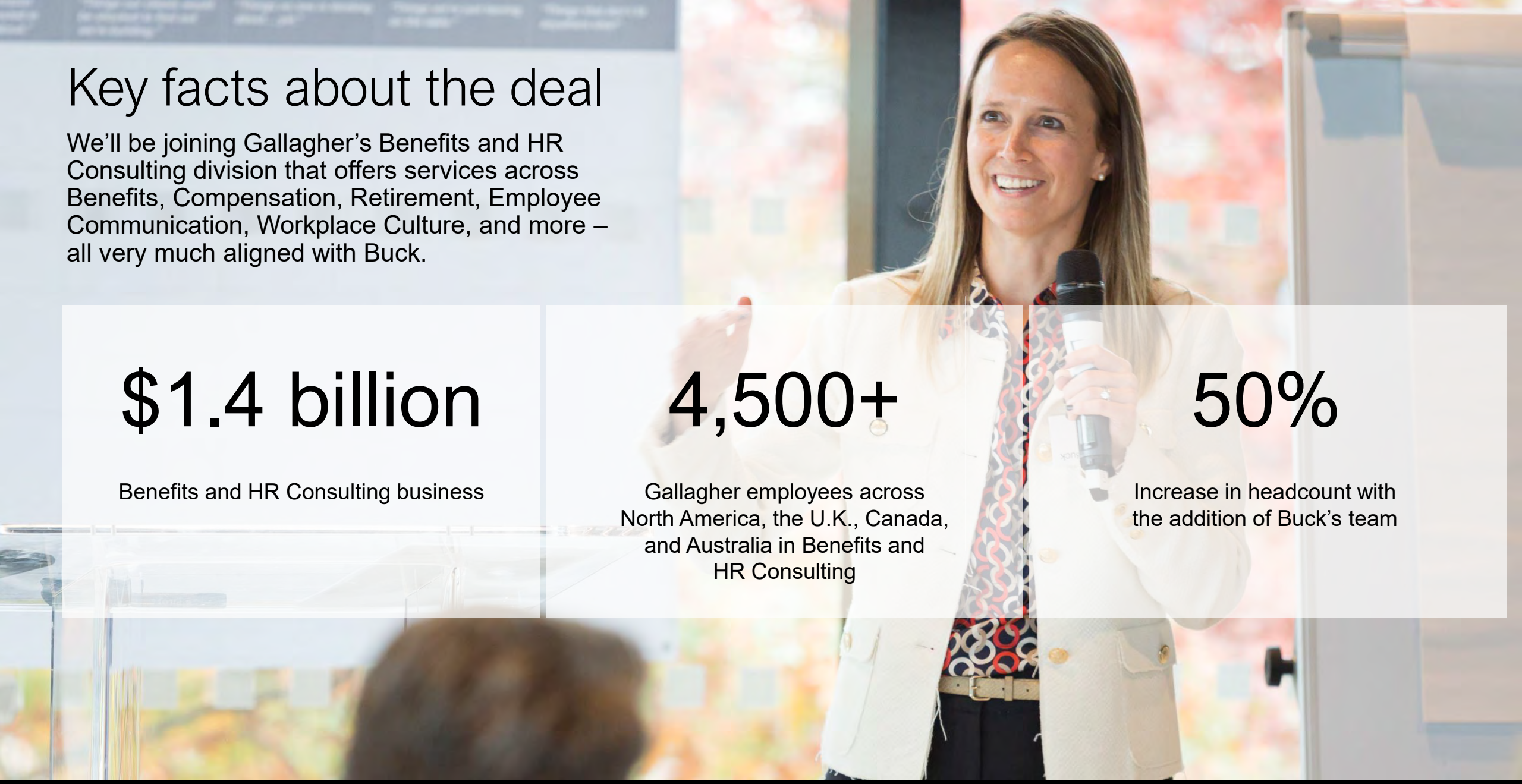
“I’m delighted to share an exciting and noteworthy milestone for Buck. Arthur J. Gallagher & Co. (“Gallagher”), a global insurance brokerage, risk management, and consulting services firm, has announced their agreement to acquire Buck globally. We expect the transaction to close in Q1 2023.

Buck is thrilled to be bringing our industry-leading capabilities to Gallagher’s best-in-class organization. Together, we’ll continue to build upon our excellent market reputations, breadth of talent, commitment to DE&I, and client-first mindset as we serve many of the world’s leading corporations and brands.
We could not have achieved this result without the dedication of our exceptional global workforce.”

— Jack Freker, CEO, Buck.

Key facts about the deal

We'll be joining Gallagher's Benefits and HR Consulting division that offers services across Benefits, Compensation, Retirement, Employee Communication, Workplace Culture, and more – all very much aligned with Buck.



$1.4 billion

Benefits and HR Consulting business

4,500+

Gallagher employees across North America, the U.K., Canada, and Australia in Benefits and HR Consulting

50%

Increase in headcount with the addition of Buck's team

Buck + Gallagher: Better together

Gallagher is an established Fortune 500 company and will bring added stability for Buck along with new opportunities for us to support your priorities.

What you can expect going forward

Gallagher's commitment

to supporting Buck and our clients

Superior service

from your current Buck team members will continue

Additional resources

to serve you even more effectively than we do today

People-first, client-centric culture

as these are shared priorities and we both have demonstrated commitments to DE&I

BUCK

State of Alaska Retirement Systems

Presentation to ARMB Actuarial Committee

- June 30, 2022 Valuations Results (PERS, TRS, PERS DCR, TRS DCR, JRS)
- Valuation Projections & Sensitivity Analysis (PERS, TRS)
- Historical Figures (PERS, TRS)

March 15, 2023

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Purpose of the 2022 Valuations

Purpose of the 2022 Valuations

- Measure each plan's funded status as of June 30, 2022.
- Compare actual FY22 experience (assets and liabilities) to expected experience based on the assumptions used in the 2021 valuations.
  - Differences between actual and expected experience are the gains/losses.
- Calculate the effects of the new assumptions adopted by the ARMB in June 2022 based on the 2021 experience study.
- Provide the basis for FY25 contribution rates to be adopted by the ARMB in September 2023.

2022 Valuation Highlights

Highlights of Valuation Results

- **Assets** underperformed relative to expectations in FY22.

($millions)	PERS	TRS	PERS DCR	TRS DCR	JRS
FY22 Market Asset Loss	2,858	1,373	38	10	39

- **Pension liabilities** are higher than expected primarily due to larger CPI-based Postretirement Pension Adjustments (PRPAs) and salary increases that exceeded assumed increases.

- **Healthcare liabilities** are lower than expected primarily due to favorable claims experience.

- **New assumptions** had a relatively small impact on the liabilities.

Key Reasons for FY22 Liability Gains/(Losses) – PERS
($000's)

	Pension	Healthcare
PRPA increases due to 2021 CPI > expected	(162,028)	n/a
Salary increases > expected	(50,545)	n/a
Demographic experience	8,059	(417)
Claims experience	n/a	251,976
Changes in dependent coverage elections	n/a	17,064
Medicare Part B only experience	n/a	5,064
Other	2,682	5,564
Total - $	(201,832)	279,251
Total - %	(1.3)%	4.1%

Key Reasons for FY22 Liability Gains/(Losses) – TRS
($000's)

	Pension	Healthcare
PRPA increases due to 2021 CPI > expected	(85,465)	n/a
Salary increases > expected	(30,870)	n/a
Demographic experience	(7,166)	(13,268)
Claims experience	n/a	94,487
Changes in dependent coverage elections	n/a	1,071
Medicare Part B only experience	n/a	1,235
Other	2,942	1,813
Total - $	(120,559)	85,338
Total - %	(1.5)%	3.5%

FY22 Claims Experience Gains

- Key reasons for the $252M (PERS) and $94M (TRS) per capita claims cost gains:
  - Medical costs are lower than projected (7% lower for Pre-Medicare / 5% lower for Medicare)
  - EGWP subsidy provided by Segal increased by 16% from $1,131 for 2022 to $1,309 for 2023

	Medical			Prescription Drugs (Rx)		
Fiscal 2023 Valuation age 65 per capita cost	**Pre-Medicare**	**Medicare Parts A & B**	**Medicare Part B Only**	**Pre-Medicare**	**Medicare**	**EGWP (Subsidy)**
- Expected	16,929	1,706	5,629	3,615	3,721	(1,211)
- Actual	15,706	1,625	5,363	3,712	3,907	(1,309)
- Dollar (Gain) / Loss	(1,223)	(81)	(266)	97	186	(98)
- Percentage (Gain) / Loss	(7.2%)	(4.7%)	(4.7%)	2.7%	5.0%	(8.1%)

Individual Retiree Cost at Age 65 Actual vs Expected

Medical, Rx and EGWP Combined Medicare Member with A&B

Pre-65 = Pre-Medicare Medical + Rx
Post-65 = Medicare A&B + Rx + EGWP

2022 Valuation Results

2022 Valuation Results – PERS

($000's)

	6/30/21	6/30/22	FY22 Gain/(Loss)	Increase/(Decrease) in 6/30/22 Liabilities for New Assumptions
Actuarial Accrued Liability				
Pension	15,419,975	16,093,679	(201,832)	205,891
Healthcare	6,856,170	6,657,069	279,251	(88,392)
Total	22,276,145	22,750,748	77,419	117,499
Actuarial Value of Assets				
Pension	10,466,709	10,961,498	127,582	
Healthcare	8,581,155	8,979,943	114,141	
Total	19,047,864	19,941,441	241,723	
Market Value of Assets				
Pension	11,912,309	10,816,140	(1,570,061)	
Healthcare	9,784,141	8,869,134	(1,288,435)	
Total	21,696,450	19,685,274	(2,858,496)	
Funded Ratio - Actuarial				
Pension	67.9%	68.1%		
Healthcare	125.2%	134.9%		
Total	85.5%	87.7%		
Funded Ratio - Market				
Pension	77.3%	67.2%		
Healthcare	142.7%	133.2%		
Total	97.4%	86.5%		

2022 Valuation Results – TRS

($000's)

	6/30/21	6/30/22	FY22 Gain/(Loss)	Increase/(Decrease) in 6/30/22 Liabilities for New Assumptions
Actuarial Accrued Liability				
Pension	7,471,887	7,804,046	(120,559)	144,033
Healthcare	2,439,603	2,442,577	85,338	20,542
Total	9,911,490	10,246,623	(35,221)	164,575
Actuarial Value of Assets				
Pension	5,910,369	6,100,204	74,323	
Healthcare	3,267,737	3,437,216	42,047	
Total	9,178,106	9,537,420	116,370	
Market Value of Assets				
Pension	6,731,481	6,026,651	(880,940)	
Healthcare	3,723,031	3,392,211	(491,853)	
Total	10,454,512	9,418,862	(1,372,793)	
Funded Ratio - Actuarial				
Pension	79.1%	78.2%		
Healthcare	133.9%	140.7%		
Total	92.6%	93.1%		
Funded Ratio - Market				
Pension	90.1%	77.2%		
Healthcare	152.6%	138.9%		
Total	105.5%	91.9%		

2022 Valuation Results – PERS DCR

($000's)

	6/30/21	6/30/22	FY22 Gain/(Loss)	Increase/(Decrease) in 6/30/22 Liabilities for New Assumptions
Actuarial Accrued Liability				
ODD	11,740	14,952	4,261	1,222
Healthcare	168,472	169,396	5,564	(22,348)
Total	180,212	184,348	9,825	(21,126)
Actuarial Value of Assets				
ODD	53,075	62,938	476	
Healthcare	180,536	212,638	1,638	
Total	233,611	275,576	2,114	
Market Value of Assets				
ODD	60,145	61,458	(8,596)	
Healthcare	204,555	207,686	(29,106)	
Total	264,700	269,144	(37,702)	
Funded Ratio - Actuarial				
ODD	452.1%	420.9%		
Healthcare	107.2%	125.5%		
Total	129.6%	149.5%		
Funded Ratio - Market				
ODD	512.3%	411.0%		
Healthcare	121.4%	122.6%		
Total	146.9%	146.0%		

2022 Valuation Results – TRS DCR

($000's)

	6/30/21	6/30/22	FY22 Gain/(Loss)	Increase/(Decrease) in 6/30/22 Liabilities for New Assumptions
Actuarial Accrued Liability				
ODD	205	199	353	0 *
Healthcare	44,396	47,797	90	(3,374)
Total	44,601	47,996	443	(3,374)
Actuarial Value of Assets				
ODD	5,843	6,700	56	
Healthcare	59,380	68,403	557	
Total	65,223	75,103	613	
Market Value of Assets				
ODD	6,623	6,557	(925)	
Healthcare	67,278	66,909	(9,418)	
Total	73,901	73,466	(10,343)	
Funded Ratio - Actuarial				
ODD	2850.2%	3366.8%		
Healthcare	133.8%	143.1%		
Total	146.2%	156.5%		
Funded Ratio - Market				
ODD	3230.7%	3295.0%		
Healthcare	151.5%	140.0%		

* Rounds to less than $1,000

June 30, 2022 Valuation Results – JRS

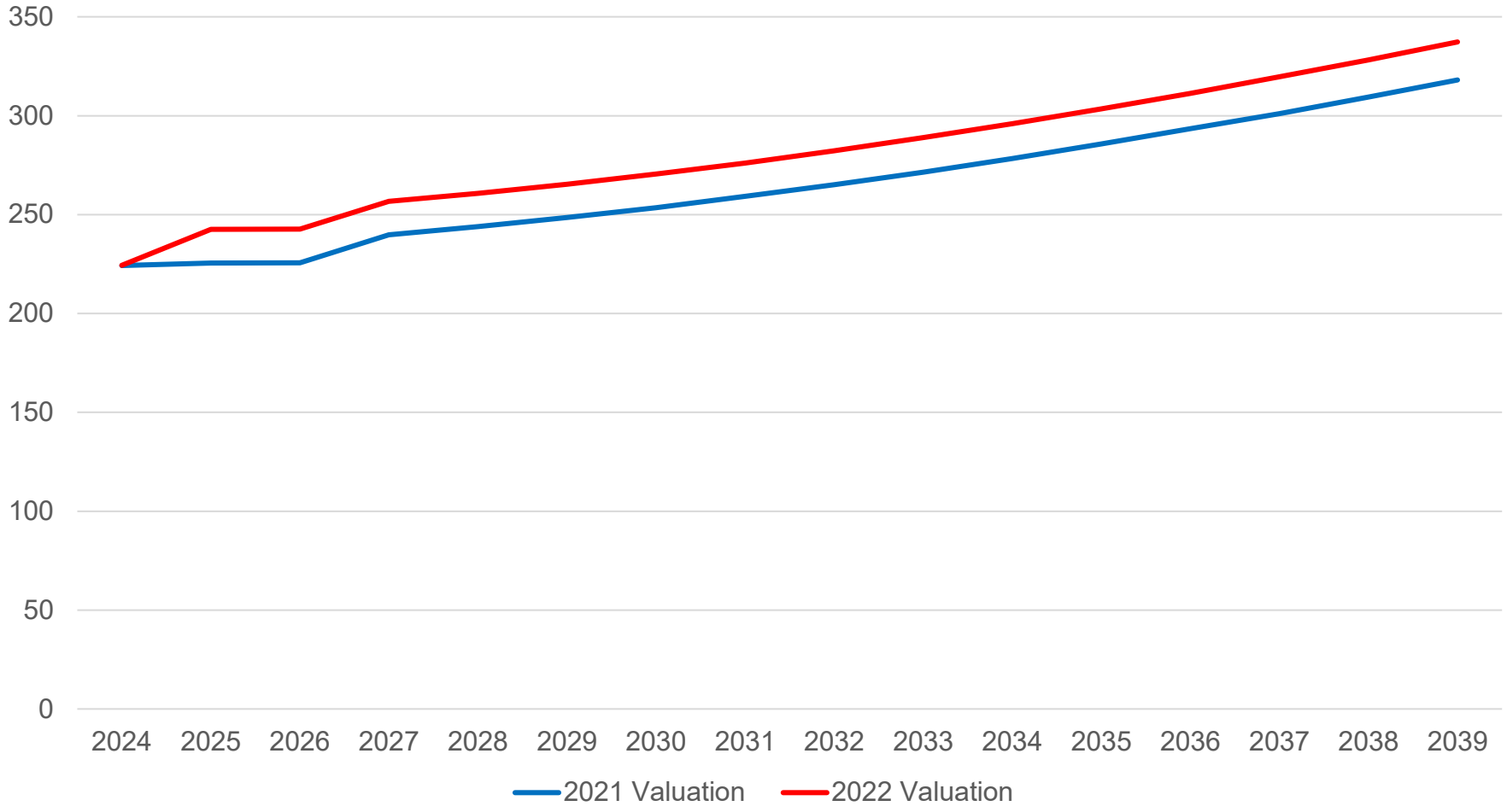
($000's)

	6/30/20	6/30/22	FY22 Gain/(Loss)	Increase/(Decrease) in 6/30/22 Liabilities for New Assumptions
Actuarial Accrued Liability				
Pension	211,742	211,705	(2,627)	(16,712)
Healthcare	16,764	18,036	557	(631)
Total	228,506	229,741	(2,070)	(17,343)
Actuarial Value of Assets				
Pension	194,788	230,802	2,443	
Healthcare	34,806	40,856	477	
Total	229,594	271,658	2,920	
Market Value of Assets				
Pension	189,844	227,182	(32,754)	
Healthcare	34,037	40,268	(5,791)	
Total	223,881	267,450	(38,545)	
Funded Ratio - Actuarial				
Pension	92.0%	109.0%		
Healthcare	207.6%	226.5%		
Total	100.5%	118.2%		
Funded Ratio - Market				
Pension	89.7%	107.3%		
Healthcare	203.0%	223.3%		
Total	98.0%	116.4%		

Liability gain/(loss) is for FY21 and FY22. 6/30/22 healthcare liabilities reflect a decrease of $224K for medical and Rx plan changes that were made in FY21.

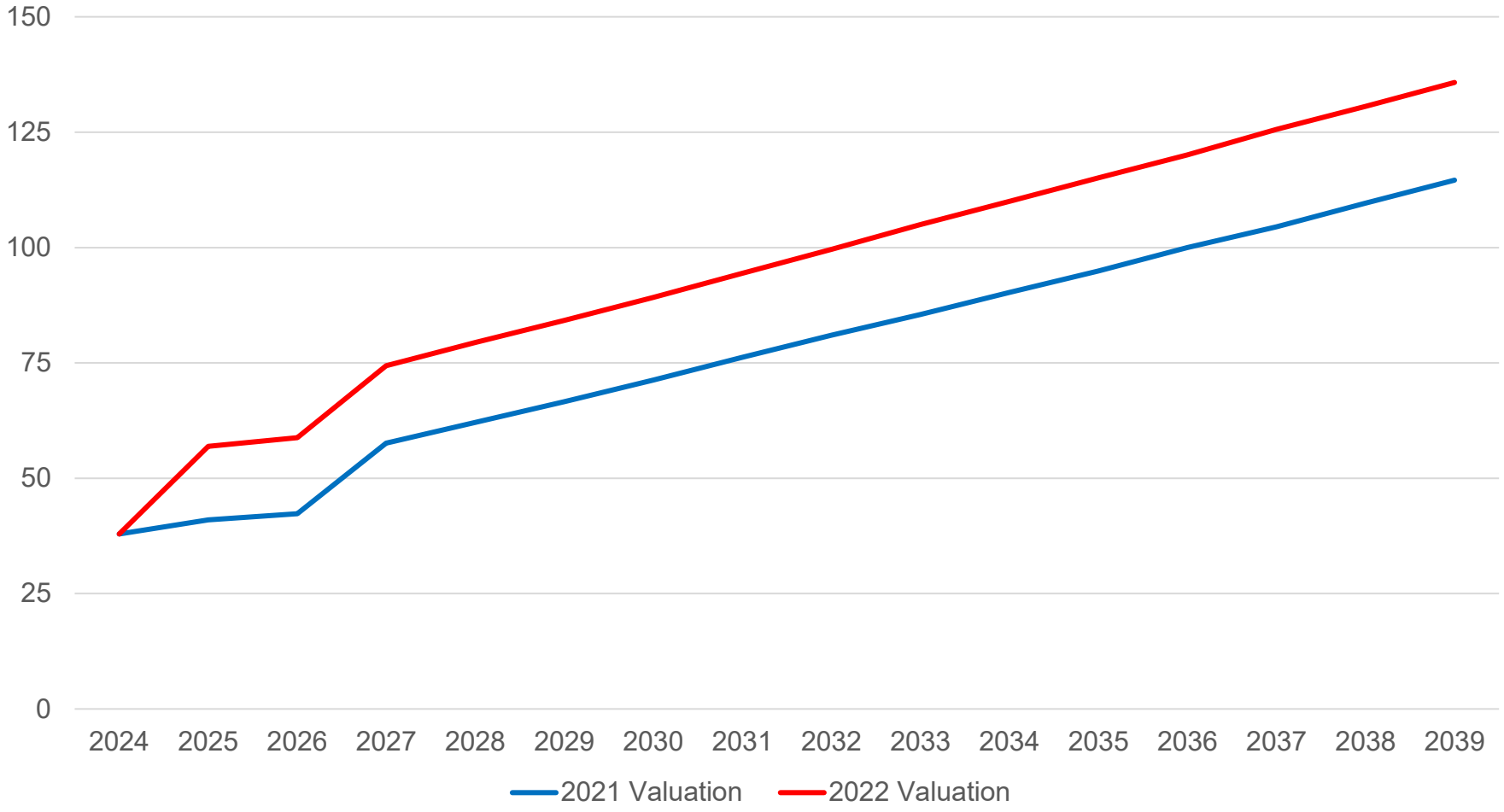
PERS/TRS State Contribution Projections

PERS – State-as-an-Employer Contributions
($millions)



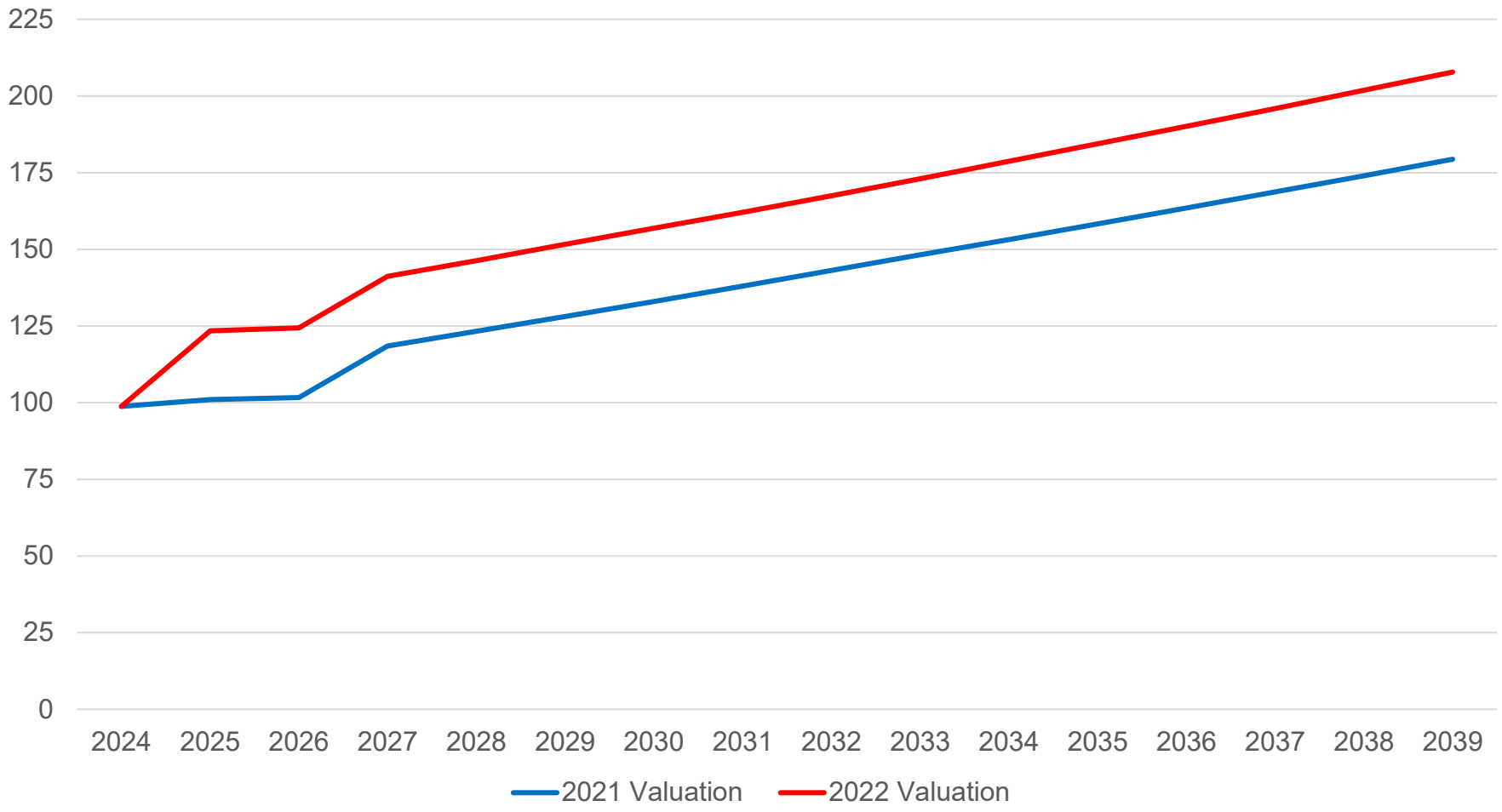
All figures reflect the FY24 adopted contribution rates and assume ***0%*** Normal Cost contribution to the Healthcare trust in FY25 and beyond.

PERS – Additional State Contributions
($millions)



All figures reflect the FY24 adopted contribution rates and assume ***0%*** Normal Cost contribution to the Healthcare trust in FY25 and beyond.

TRS – Additional State Contributions
($millions)



All figures reflect the FY24 adopted contribution rates and assume ***0%*** Normal Cost contribution to the Healthcare trust in FY25 and beyond.

State Contribution Projection Summary – PERS

($millions)

Fiscal Year	State-as-an-Employer Contributions			Additional State Contributions			Total State Contributions		
	2021 Valuation	2022 Valuation	Increase	2021 Valuation	2022 Valuation	Increase	2021 Valuation	2022 Valuation	Increase
2024	224	224	0	38	38	0	262	262	0
2025	226	243	17	41	57	16	267	300	33
2026	226	243	17	42	59	17	268	302	34
2027	240	257	17	58	74	17	297	331	34
2028	244	261	17	62	79	17	306	340	34
2029	249	265	17	67	84	18	315	350	34
2030	254	271	17	71	89	18	325	360	35
2031	259	276	17	76	94	18	335	371	35
2032	265	282	17	81	100	19	346	382	36
2033	272	289	17	86	105	20	357	394	37
2034	278	296	18	90	110	20	369	406	37
2035	286	304	18	95	115	20	381	419	38
2036	293	311	18	100	120	20	393	431	38
2037	301	320	19	105	126	21	406	445	40
2038	309	328	19	110	131	21	419	459	40
2039	318	337	19	115	136	21	433	473	40
2040-2052	270	476	206	0	0	0	270	476	206
Total	4,512	4,982	469	1,235	1,517	282	5,748	6,499	751

All figures reflect the FY24 adopted contribution rates and assume ***0%*** Normal Cost contribution to the Healthcare trust in FY25 and beyond.

State Contribution Projection Summary – TRS

($millions)

Fiscal Year	Additional State Contributions		
	2021 Valuation	2022 Valuation	Increase
2024	99	99	0
2025	101	123	22
2026	102	124	23
2027	119	141	23
2028	123	146	23
2029	128	152	24
2030	133	157	24
2031	138	162	24
2032	143	168	24
2033	148	173	25
2034	153	179	26
2035	158	184	26
2036	164	190	27
2037	169	196	27
2038	174	202	28
2039	179	208	28
2040-2052	0	15	15
Total	2,231	2,619	388

All figures reflect the FY24 adopted contribution rates and assume ***0%*** Normal Cost contribution to the Healthcare trust in FY25 and beyond.

PERS/TRS Sensitivity Analysis

Sensitivity Analysis – Background

- The projections shown on slides 17-21 assume all experience after FY22 matches the valuation assumptions.

- We also ran the 2022 valuation projections under the following **adverse experience** scenario:

Variable	Adverse Experience	Period*
Market Asset Returns	2.5%	FY23 – FY27
Healthcare Trend Increases	Valuation trend + 10%	FY23 – FY27
Inflation Rate	6%	FY23 – FY24

* For all other years, experience is assumed to match the valuation assumptions.

- For purposes of this analysis, the effect of higher inflation is measured only by the impact on PRPAs and salary increases.

- All sensitivity analysis figures reflect the FY24 adopted contribution rates and assume **100%** Normal Cost contribution to the Healthcare trust in FY25 and beyond (which is different than what was assumed for the projections on slides 17-21).

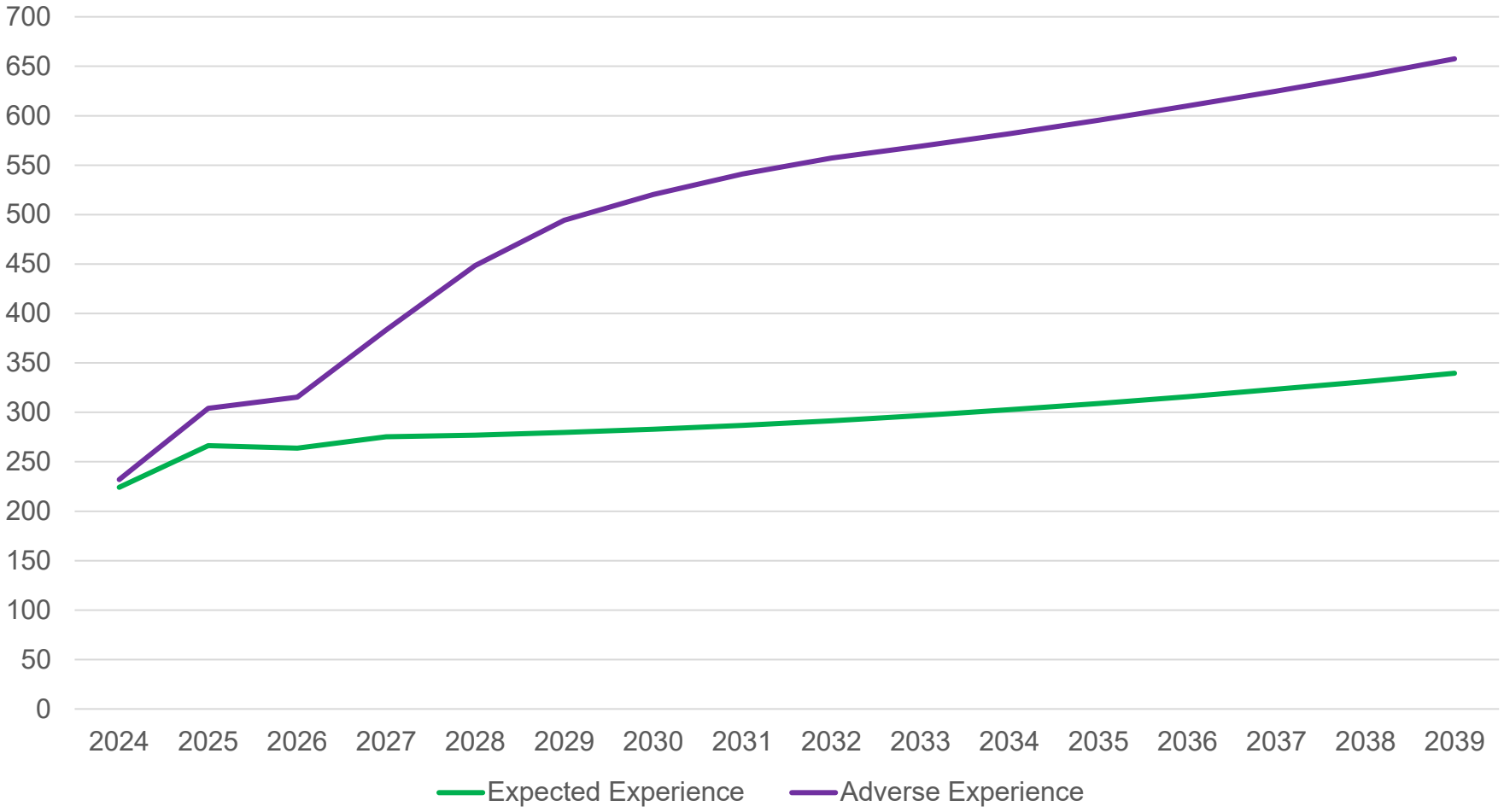
Sensitivity Analysis – Observations

- The choice of the 2.5% return for 5 years was based on the average market return during the 10-year period 2000-2009.
- The likelihood of 5 consecutive years with healthcare trends 10% above the current trend assumption (which starts in the 5.5%-7.5% range and declines to 4.5% per year for FY50+) is pretty small.
- As expected, the adverse asset returns have the largest impact on the projected figures. The total market losses during the 5 years are projected to be about $4B for PERS and $2B for TRS.
- The increases in projected State Contributions through FY52 are summarized below (in $millions):

	Adverse Asset Returns	Adverse Health Trend	Adverse Inflation	Total
PERS				
State-as-an-Employer Contributions	5,355	2,516	835	8,706
Additional State Contributions	4,641	794	285	5,720
Total	9,996	3,310	1,120	14,426
TRS				
Additional State Contributions	5,044	1,418	753	7,215

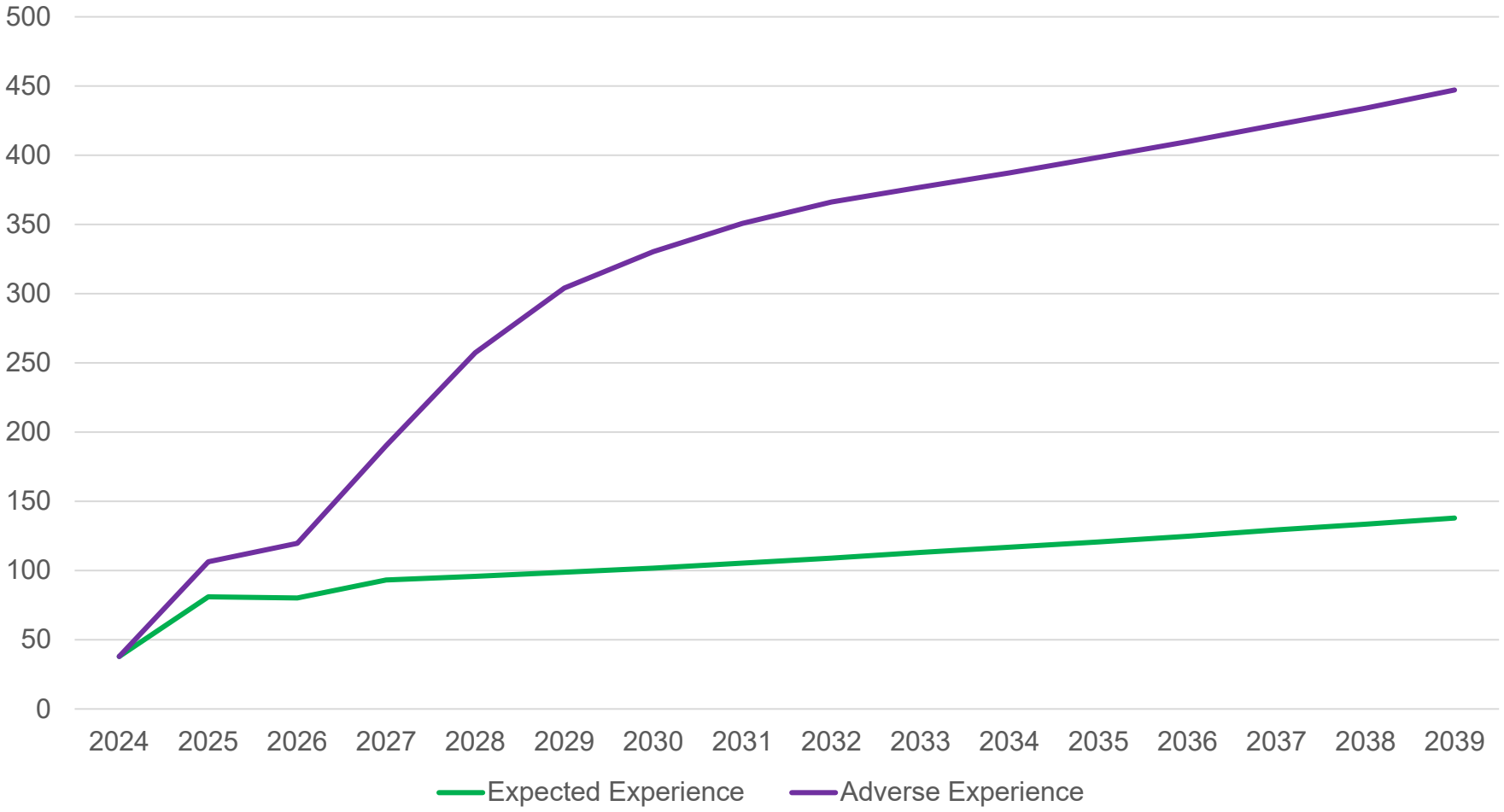
For purposes of this table, the effect of higher inflation is measured only by the impact on PRPAs and salary increases.

PERS – State-as-an-Employer Contributions
($millions)



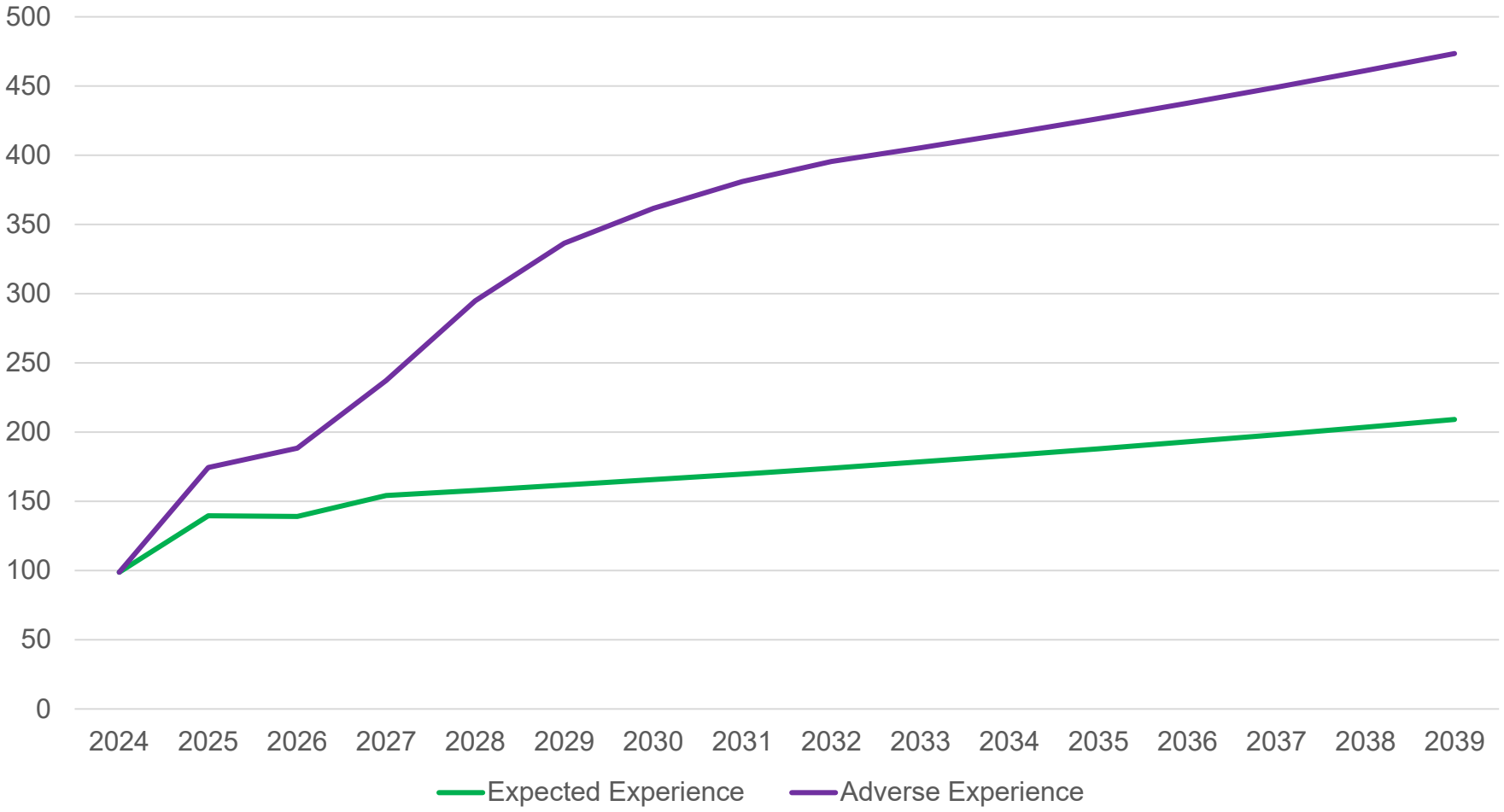
All figures reflect the FY24 adopted contribution rates and assume ***100%*** Normal Cost contribution to the Healthcare trust in FY25 and beyond.

PERS – Additional State Contributions
($millions)



All figures reflect the FY24 adopted contribution rates and assume ***100%*** Normal Cost contribution to the Healthcare trust in FY25 and beyond.

TRS – Additional State Contributions
($millions)



All figures reflect the FY24 adopted contribution rates and assume ***100%*** Normal Cost contribution to the Healthcare trust in FY25 and beyond.

State Contribution Projection Summary – PERS
($millions)

Fiscal Year	State-as-an-Employer Contributions			Additional State Contributions			Total State Contributions		
	Expected Experience	Adverse Experience	Increase	Expected Experience	Adverse Experience	Increase	Expected Experience	Adverse Experience	Increase
2024	224	232	8	38	38	0	262	270	8
2025	266	304	38	81	106	25	347	411	63
2026	264	315	52	80	120	39	344	435	91
2027	275	383	108	93	190	97	368	574	205
2028	277	448	172	96	257	161	373	706	333
2029	280	494	215	99	304	205	378	798	420
2030	283	520	237	102	330	229	385	851	466
2031	287	541	254	105	351	246	392	892	500
2032	292	557	266	109	366	257	401	923	523
2033	297	569	272	113	377	264	410	946	536
2034	303	582	279	117	387	271	420	969	550
2035	309	595	287	121	398	278	430	994	564
2036	316	610	294	125	410	285	441	1,020	579
2037	323	625	301	129	422	293	453	1,047	594
2038	331	641	309	134	434	301	465	1,075	610
2039	340	658	318	138	447	309	478	1,105	627
2040-2052	479	5,776	5,297	0	2,461	2,461	479	8,237	7,758
Total	5,145	13,851	8,706	1,679	7,399	5,720	6,824	21,250	14,426

All figures reflect the FY24 adopted contribution rates and assume ***100%*** Normal Cost contribution to the Healthcare trust in FY25 and beyond.

State Contribution Projection Summary – TRS
($millions)

Fiscal Year	Additional State Contributions		
	Expected Experience	Adverse Experience	Increase
2024	99	99	0
2025	140	175	35
2026	139	189	50
2027	154	237	83
2028	158	295	137
2029	162	337	175
2030	166	362	196
2031	170	381	211
2032	174	396	222
2033	179	405	227
2034	183	416	233
2035	188	426	238
2036	193	438	245
2037	198	449	251
2038	204	461	258
2039	209	473	264
2040-2052	15	4,406	4,391
Total	2,729	9,944	7,215

All figures reflect the FY24 adopted contribution rates and assume ***100%*** Normal Cost contribution to the Healthcare trust in FY25 and beyond.

Projected Funded Ratios

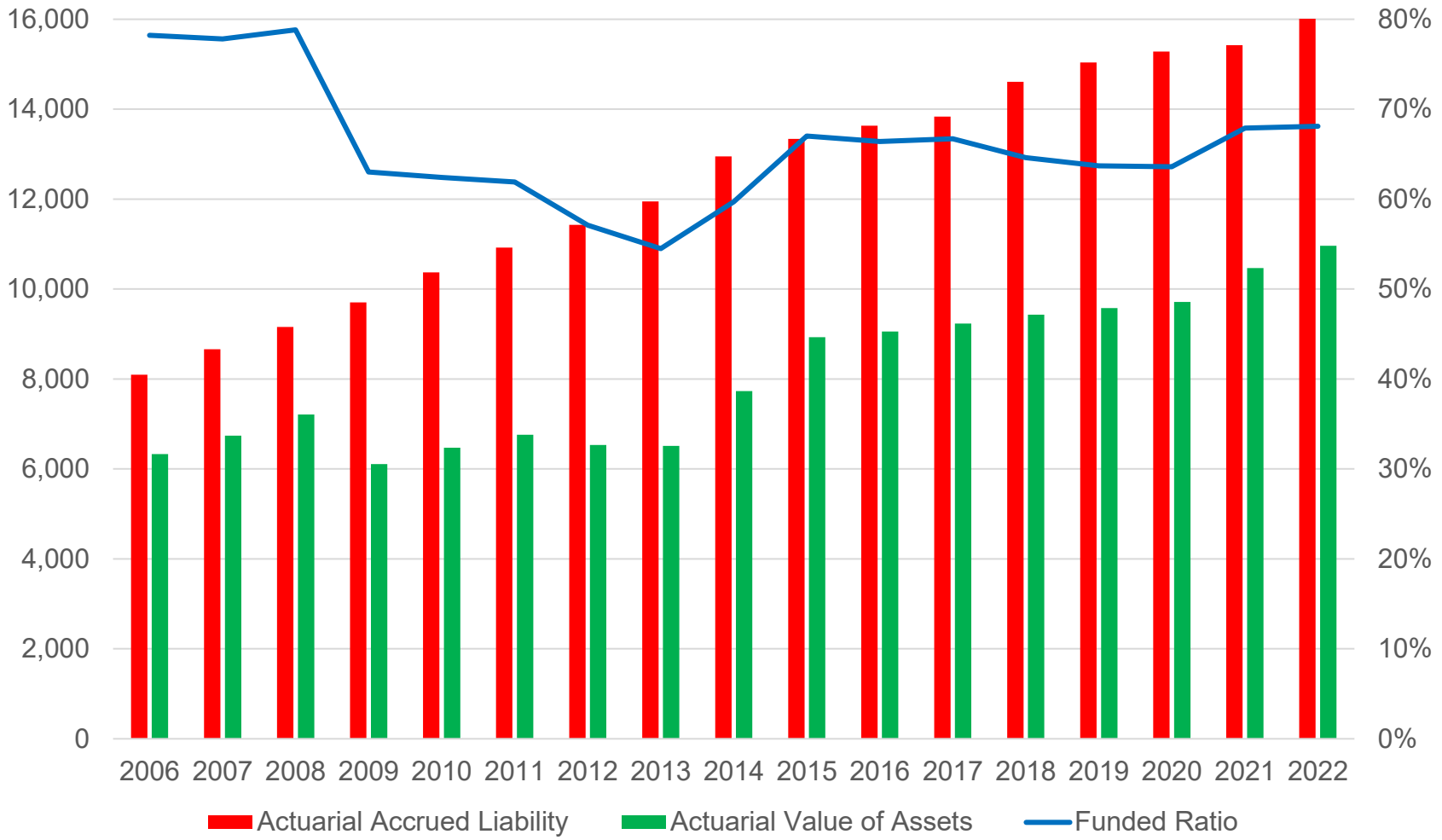
June 30	PERS - Pension		PERS - Healthcare		TRS - Pension		TRS - Healthcare	
	Expected Experience	Adverse Experience	Expected Experience	Adverse Experience	Expected Experience	Adverse Experience	Expected Experience	Adverse Experience
2022	68%	68%	135%	135%	78%	78%	141%	141%
2023	69%	67%	136%	127%	78%	76%	142%	133%
2024	70%	65%	138%	113%	79%	73%	144%	118%
2025	71%	64%	141%	100%	80%	72%	147%	105%
2026	70%	60%	140%	84%	78%	67%	146%	89%
2027	70%	58%	142%	73%	79%	64%	149%	77%
2028	71%	56%	145%	67%	79%	62%	152%	71%
2029	72%	55%	148%	64%	80%	60%	156%	68%
2030	73%	55%	152%	62%	81%	59%	160%	66%
2031	74%	55%	156%	61%	82%	59%	165%	65%
2032	76%	57%	160%	61%	83%	60%	170%	65%
2033	77%	58%	165%	60%	84%	61%	176%	64%
2034	79%	59%	171%	60%	85%	62%	182%	63%
2035	81%	61%	177%	59%	87%	63%	190%	63%
2036	84%	64%	185%	58%	89%	65%	198%	62%
2037	87%	66%	193%	58%	91%	67%	208%	61%
2038	90%	69%	202%	57%	94%	69%	218%	60%
2039	95%	73%	213%	56%	98%	73%	230%	59%

All figures reflect the FY24 adopted contribution rates and assume ***100%*** Normal Cost contribution to the Healthcare trust in FY25 and beyond.

PERS/TRS Historical Figures (2006-2022)

Assets, Liabilities and Funded Ratio – PERS Pension

($millions)

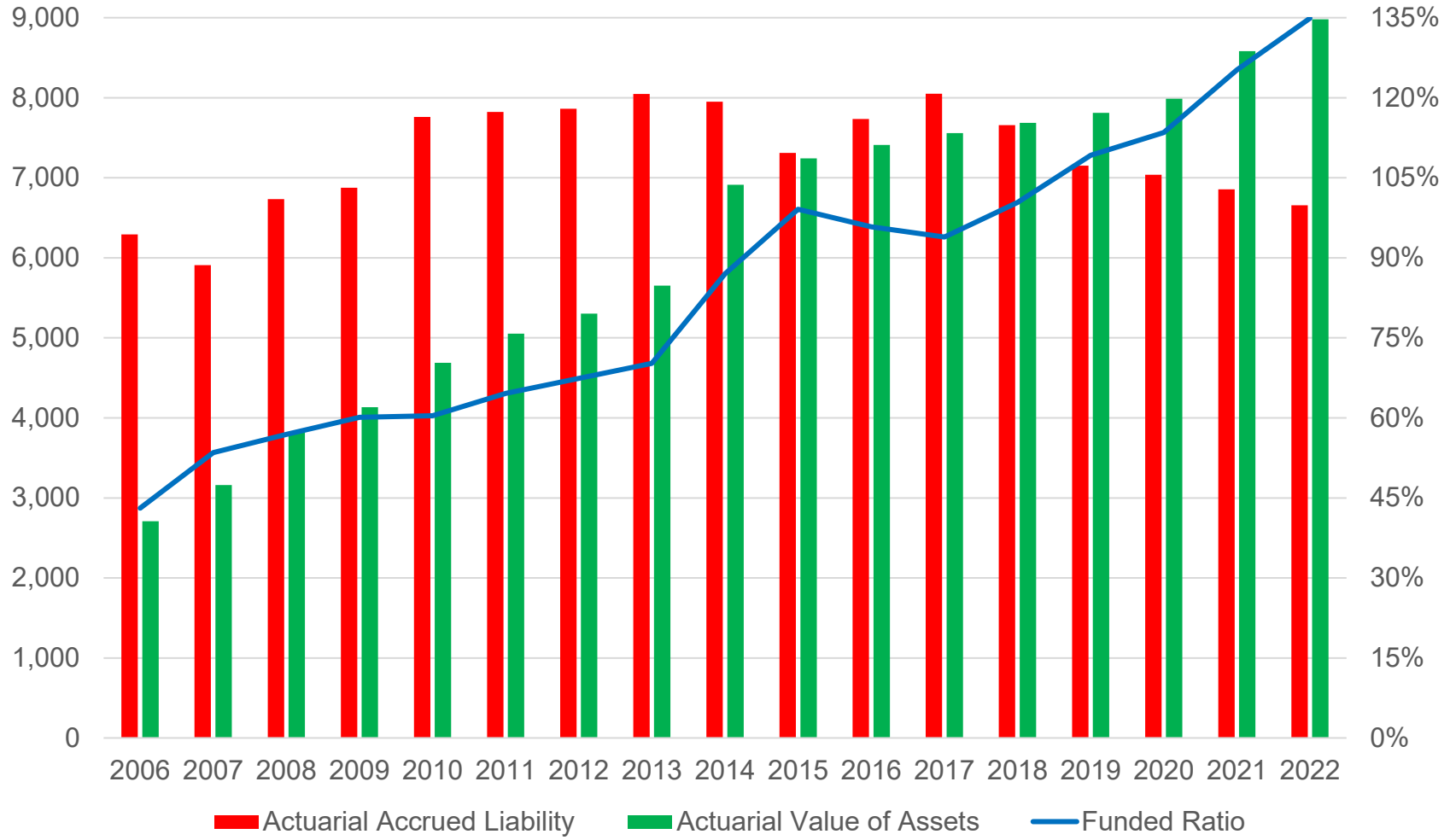


2006 Funded Ratio: 78.2%

2022 Funded Ratio: 68.1%

Assets, Liabilities and Funded Ratio – PERS Healthcare

($millions)

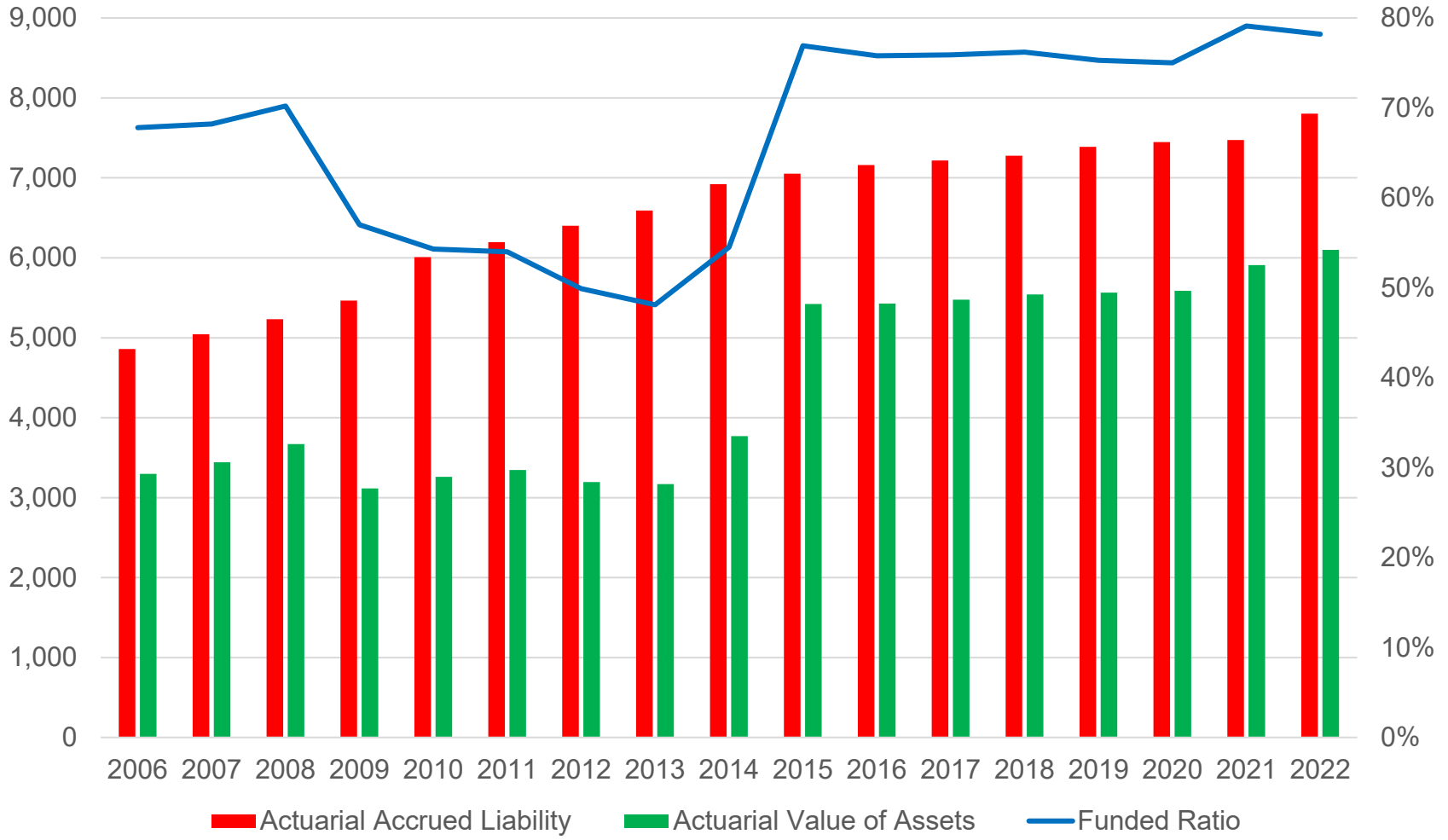


2006 Funded Ratio: 43.1%

2022 Funded Ratio: 134.9%

Assets, Liabilities and Funded Ratio – TRS Pension

($millions)

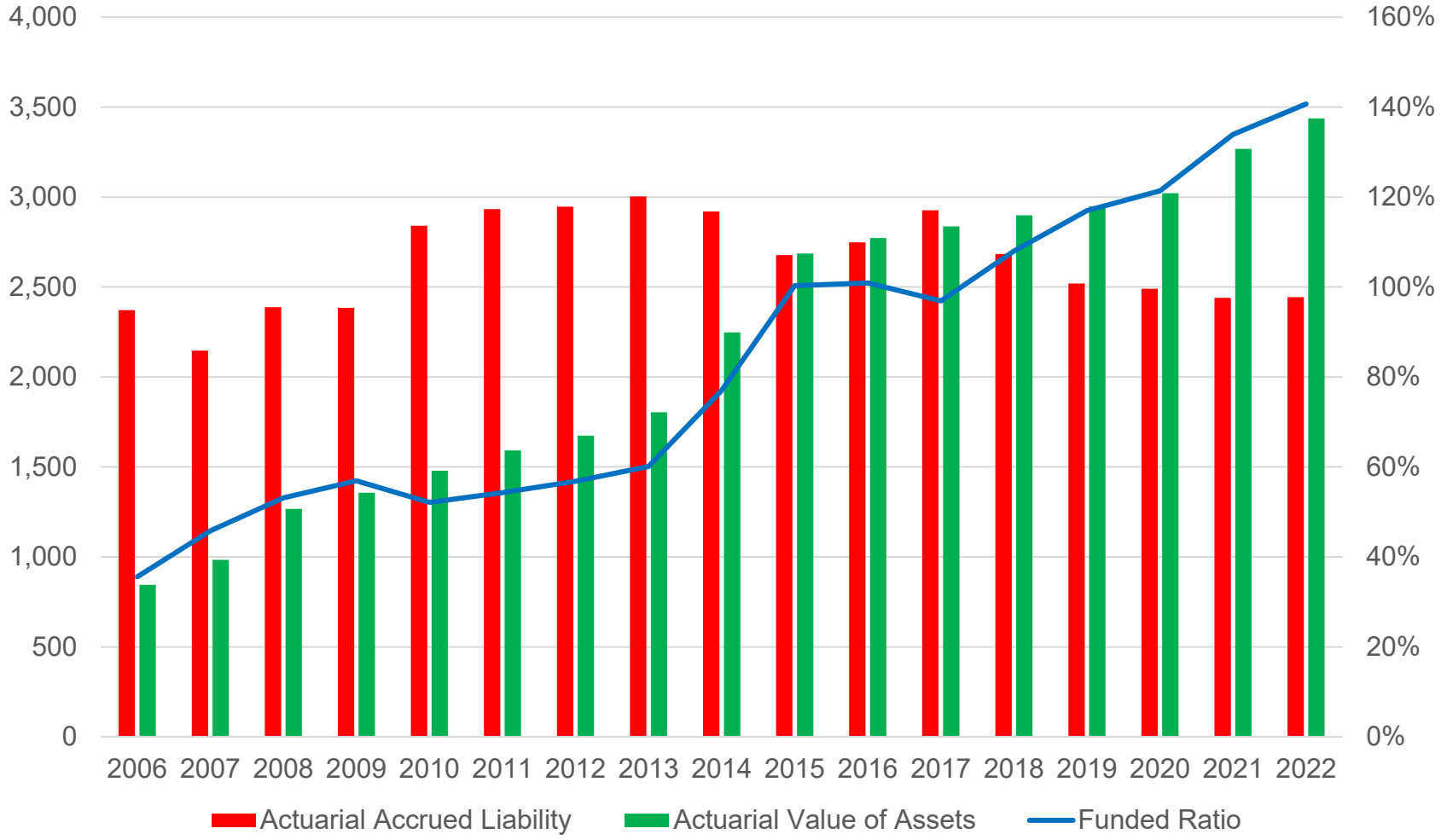


2006 Funded Ratio: 67.8%

2022 Funded Ratio: 78.2%

Assets, Liabilities and Funded Ratio – TRS Healthcare

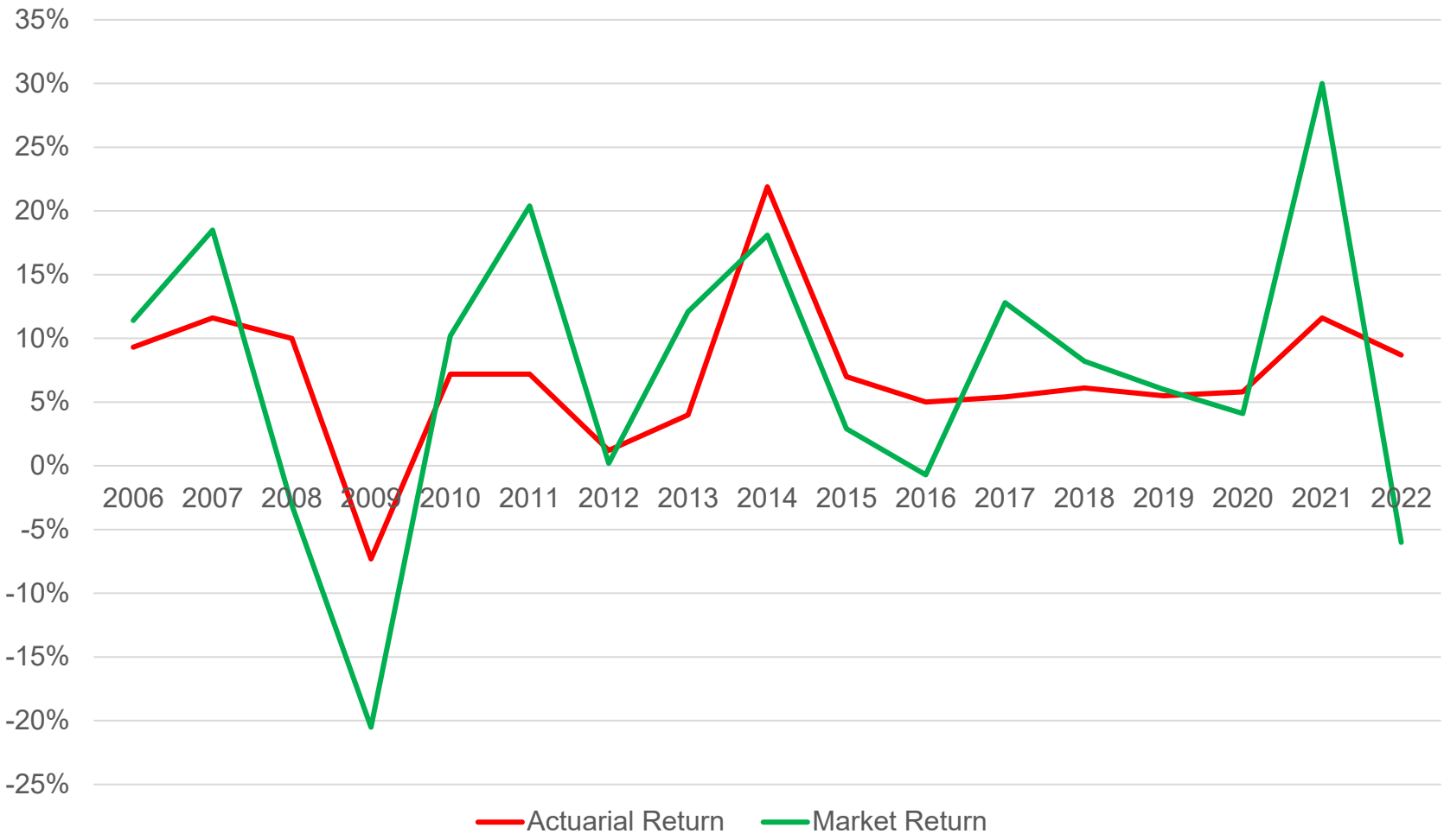
($millions)



2006 Funded Ratio: 35.6%

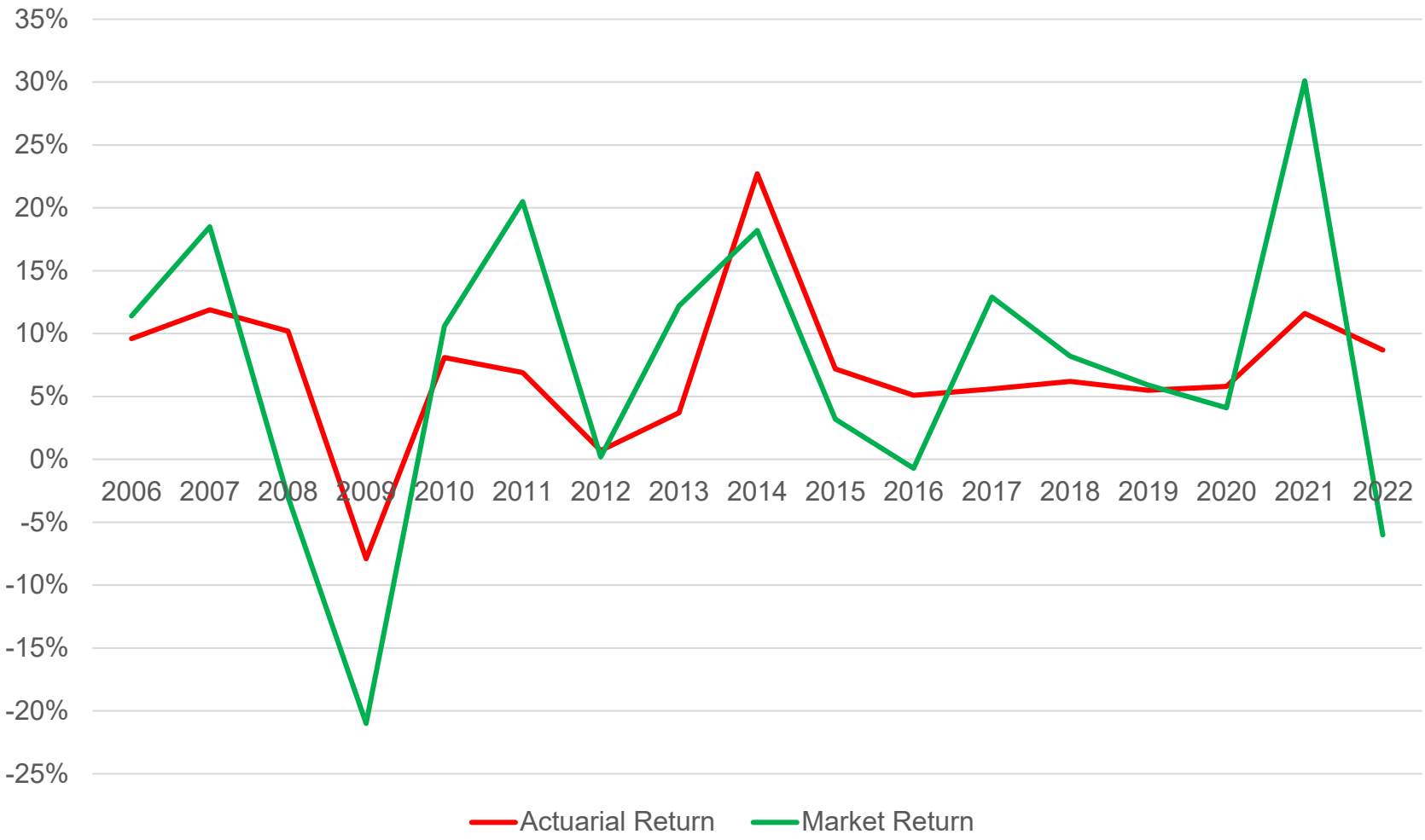
2022 Funded Ratio: 140.7%

Asset Returns – PERS



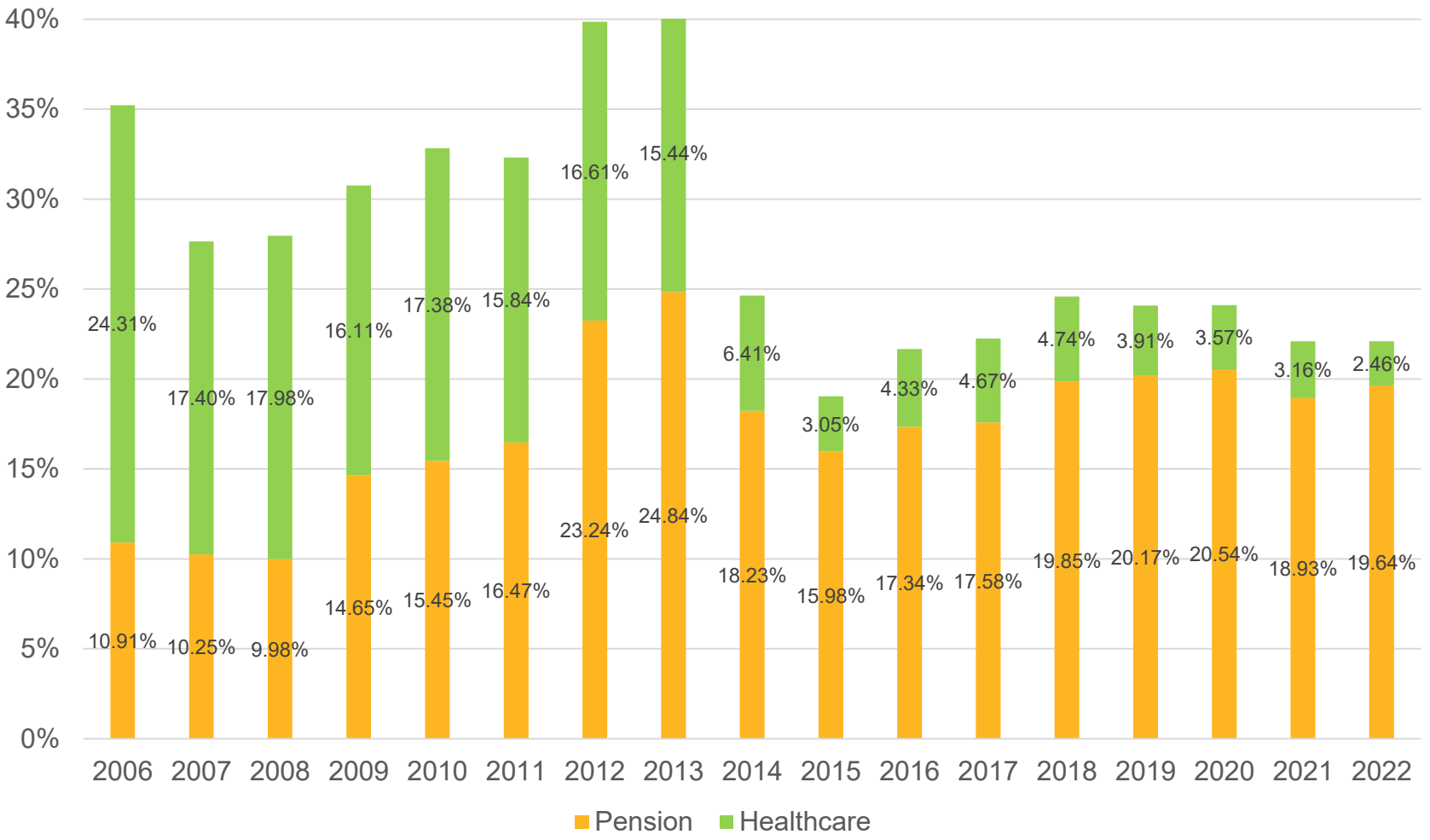
The spike in actuarial return in 2014 is due to the reset of actuarial value to market value that was effective 6/30/14.

Asset Returns – TRS



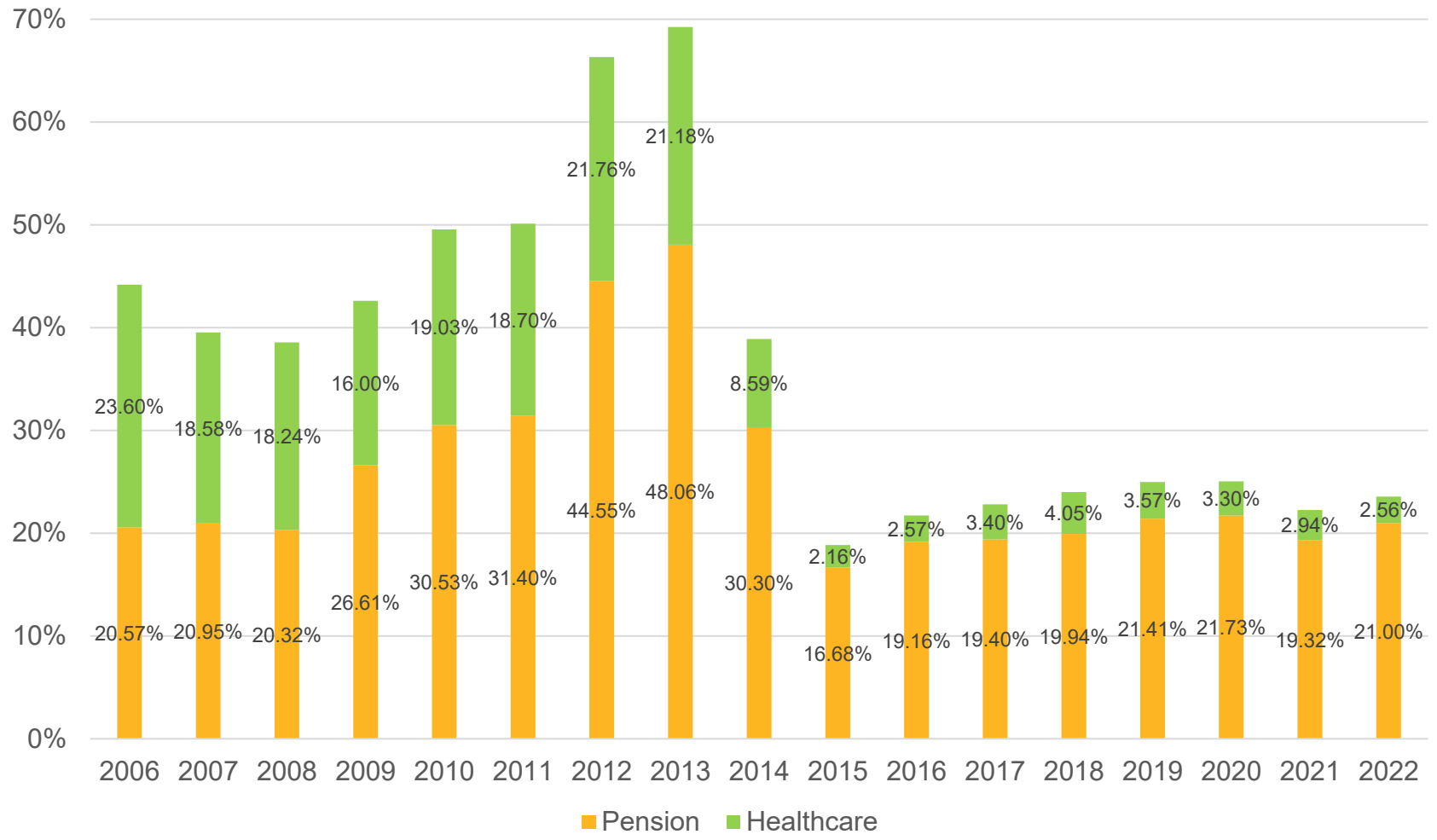
The spike in actuarial return in 2014 is due to the reset of actuarial value to market value that was effective 6/30/14.

June 30 Valuation Contribution Rates – PERS



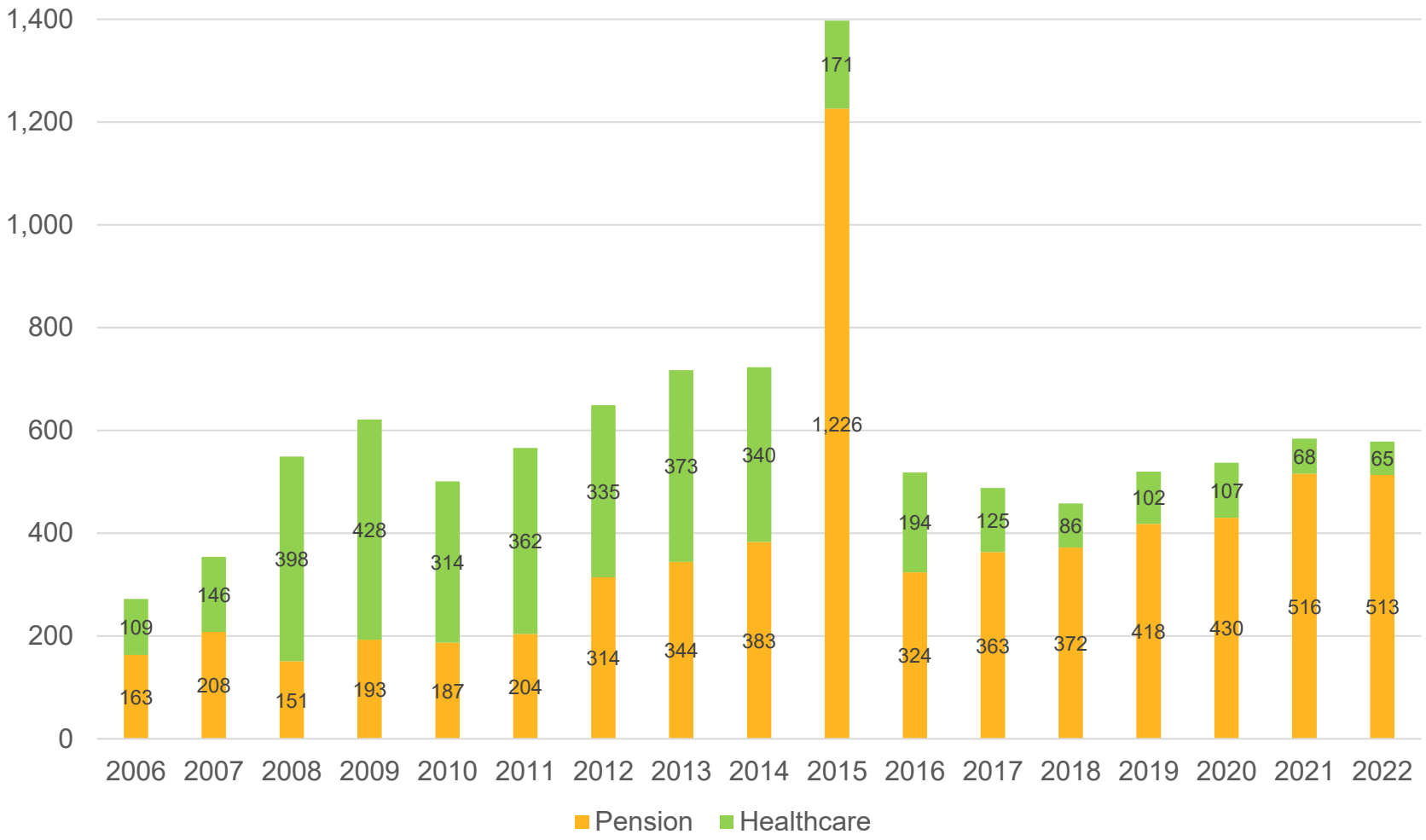
Rates shown for June 30, 2006 through June 30, 2013 are the ARMB-adopted contribution rates for the fiscal year beginning two years later. Starting with the June 30, 2014 valuations, the ARMB-adopted contribution rates (not shown on this slide) are based on a 2-year roll-forward of liabilities and a 1-year roll-forward of assets to the fiscal year beginning two years later. All rates are a percentage of DB/DCR payroll.

June 30 Valuation Contribution Rates – TRS



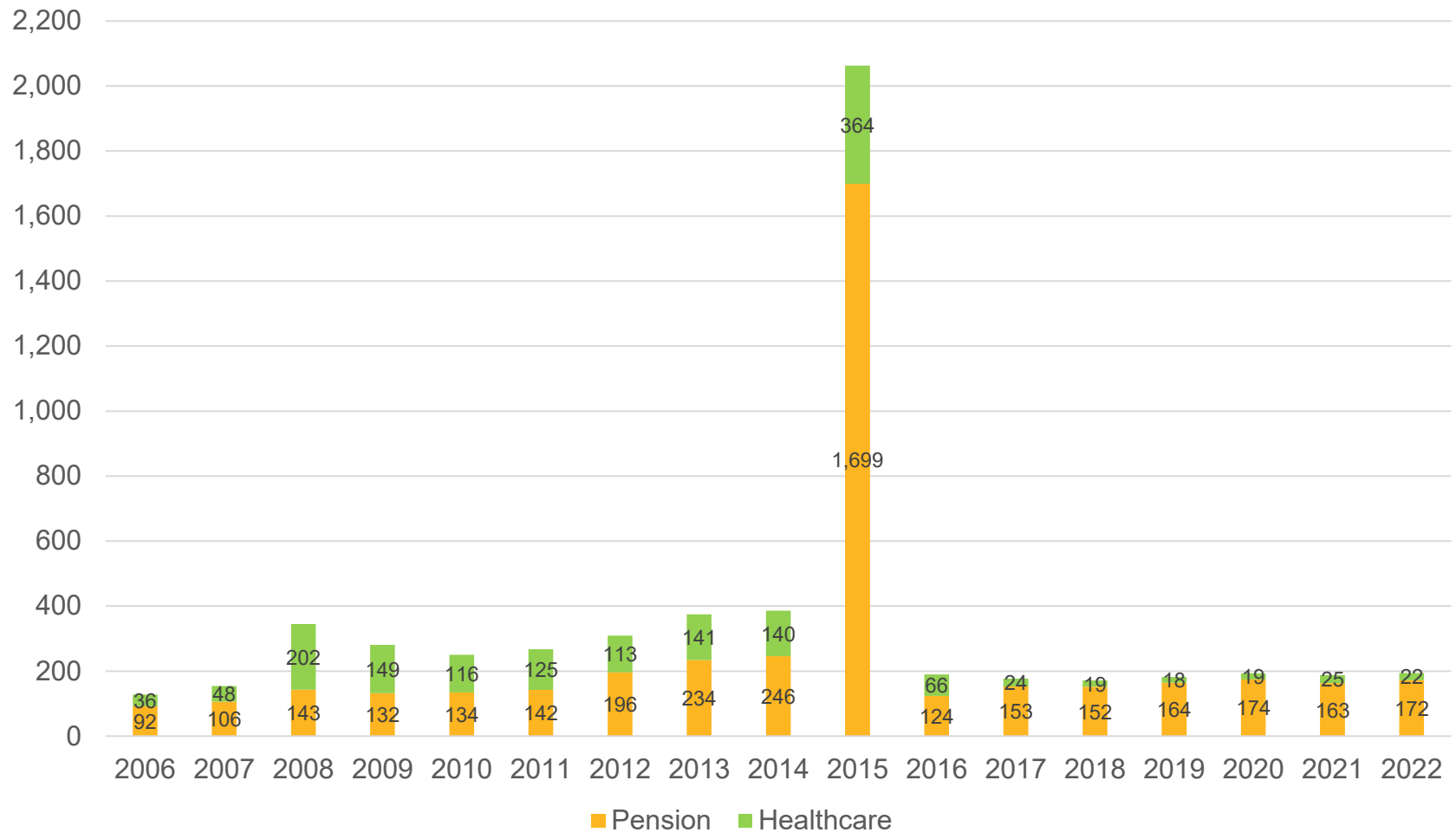
Rates shown for June 30, 2006 through June 30, 2013 are the ARMB-adopted contribution rates for the fiscal year beginning two years later. Starting with the June 30, 2014 valuations, the ARMB-adopted contribution rates (not shown on this slide) are based on a 2-year roll-forward of liabilities and a 1-year roll-forward of assets to the fiscal year beginning two years later. All rates are a percentage of DB/DCR payroll.

Employer/State Contributions – PERS
($millions)



The spike in 2015 is due to the $1B Additional State Contribution that was made to PERS in FY15.

Employer/State Contributions – TRS
($millions)



The spike in 2015 is due to the $2B Additional State Contribution that was made to TRS in FY15.

Actuarial Certification

Actuarial Certification

The purpose of this presentation is to provide the ARMB Actuarial Committee with June 30, 2022 valuation results and projections for discussion at the March 15, 2023 meeting. This presentation should be considered part of the June 30, 2022 actuarial valuation report services.

The data, assumptions, methods, and plan provisions used to determine the results shown in this presentation are as shown in the draft June 30, 2022 actuarial valuation reports. These reports include details related to potential risks associated with the plans, and information regarding our use of models.

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

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

The results were prepared under the direction of David Kershner and Steve Oates, both of whom meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein. These results have been prepared in accordance with all applicable Actuarial Standards of Practice.

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

Stephen Oates
ASA, EA, MAAA, FCA
Principal, Health

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State of Alaska

Timeline for June 30, 2022 Valuations (PERS, TRS, PERS DCR, TRS DCR, JRS, NGNMRS)

Item #	Task	Original Deadline	Revised Deadline	Date Completed	Team Responsible	Comments / Notes
1	Enrollment data request to Aetna	7/15/22		7/14/22	Buck	
2	Valuation data request to DRB	7/15/22		7/15/22	Buck	
3	Monthly audit discussion with GRS / Buck	7/20/22	7/22/22	7/22/22	GRS / Buck	
4	Monthly audit discussion with GRS / Buck	8/17/22	8/19/22	not needed	GRS / Buck	
5	Preliminary 6/30/22 assets to Buck	8/30/22		8/31/22	DRB	These will be used only for the adoption of FY24 contribution rates.
6	Valuation data to Buck	9/2/22		9/6/22	DRB	
7	Send valuation data files received from DRB to GRS	9/6/22		9/6/22	Buck	
8	**Actuarial Committee Meeting - FY24 contribution rates (based on 6/30/21 valuations)**	9/14/22		9/14/22	All	**Anchorage**. Deadline for meeting materials is 8/26 (extended to 9/6 since assets not available until the end of August).
9	Audit data and sample lives request to Buck	9/16/22		9/17/22	GRS	
10	Monthly audit discussion with GRS / Buck	9/21/22			GRS / Buck	
11	Claims data request to Segal/DRB	9/23/22		9/6/22	Buck	Incurred claims through 6/30/22 that are paid through 8/31/22.
12	Data questions to DRB	9/23/22		9/27/22	Buck	PERS data questions sent on 9/26, TRS sent on 9/27.
13	Data answers to Buck	10/7/22		10/7/22	DRB	
14	Final 6/30/22 assets to Buck	10/14/22		10/21/22	DRB	
15	Monthly audit discussion with GRS / Buck	10/19/22	10/21/22	10/21/22	GRS / Buck	
16	Claims data to Buck	10/21/22		10/24/22	Segal / DRB	Incurred claims through 6/30/22 that are paid through 8/31/22.
17	6/30/22 valuation data and DRB data questions to GRS	10/28/22		11/7/22	Buck	PERS pension/PERS DCR sent on 10/28, TRS pension/TRS DCR sent on 11/4, PERS/TRS OPEB sent on 11/7.
18	Sample life information to GRS	11/11/22		11/14/22	Buck	All except PERS pension active and OPEB DCR sample lives sent on 11/11. PERS pension active sent on 11/14. OPEB DCR sent on 11/18.
19	Monthly audit discussion with GRS / Buck	11/16/22	11/18/22	11/18/22	GRS / Buck	
20	Preliminary valuation results and PVB's by individual to GRS	11/18/22		11/18/22	Buck	PERS DCR sent on 12/9. TRS DCR sent on 12/12.
21	**Actuarial Committee Meeting - 6/30/22 valuation results (preliminary)**	11/30/22	11/30/22	11/30/22	All	**Anchorage**. Deadline for meeting materials is 11/14.
22	Monthly audit discussion with GRS / Buck	12/21/22	12/21/22	12/21/22	GRS / Buck	
23	Draft DCR valuation reports to GRS	1/6/23		1/6/23	Buck	
24	Monthly audit discussion with GRS / Buck	1/18/23	1/20/23	1/20/23	GRS / Buck	
25	Draft DB valuation reports to GRS	1/20/23		1/27/23	Buck	TRS sent on 1/20. PERS sent on 1/27. Revised PERS sent on 2/3 (projections were modified).
26	Monthly audit discussion with GRS / Buck	2/15/23	2/17/23	2/17/23	GRS / Buck	
27	Draft actuarial review report to Buck	3/7/23			GRS	
28	Monthly audit discussion with GRS / Buck	3/15/23	3/10/23		GRS / Buck	
29	**Actuarial Committee Meeting - 6/30/22 valuation results (full), projections, sensitivity analysis, draft valuation reports**	3/15/23			All	**Juneau**. Deadline for meeting materials is 2/24.
30	Monthly audit discussion with GRS / Buck	4/19/23			GRS / Buck	
31	**ARMB Meeting - follow-up to March meeting (if needed)**	April 2023 - TBD			All	**Teleconference.**
32	Monthly audit discussion with GRS / Buck	5/17/23			GRS / Buck	
33	**Actuarial Committee Meeting - final valuation reports**	6/14/23			All	**Anchorage**. Deadline for meeting materials is 5/26.

Note: All deadline and completion dates are specific to PERS and TRS.

Alaska Retirement Management Board
Full Board Meeting

Actuarial Review of June 30, 2022 Valuations

Paul Wood, ASA, FCA, MAAA
Bill Detweiler, ASA, EA, FCA, MAAA
March 16, 2023

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Review of the June 30, 2022 Actuarial Valuation

Areas of Focus

- New assumptions!
  - Adopted by Board in 2022 and first effective with these 6/30/2022 valuations
  - As expected, liabilities and contribution rates increased
    - Primarily due to decrease in investment return assumption
- PCCC Development
  - There was favorable medical claims experience
  - There was unfavorable prescription drug experience
  - Overall, there were liability gains
- Gains and losses
  - Based on old assumption this year, so not as useful
  - Next year will give a first glimpse at how well new assumptions are working
  - Starting to see the impact of high inflation in the form of losses on the PRPA

Test Life Review - Findings

- We choose test lives each year that are different and contain unique characteristics
- In years with new assumptions, we focus on making sure Buck is using the assumptions adopted by the Board

Test Life Review – Findings

- We identified one minor finding related to the new assumptions, and some minor findings related to data being used and the valuation of certain ancillary benefits, or related to unique characteristics of the test lives chosen
- We believe all of these findings are immaterial according to our standards of practice and, as long as Buck and the Board agree, recommend they be included in the next valuation

Test Life Review - Findings

- **Finding #1 - Date of Birth**
- **Finding #2 - Salary Increase Rate**
- **Finding #3 - Marriage Assumption**
- **Finding #4 - Occupational Death Lump Sum**
- **Finding #5 - Alaska COLA for Disabled Members**

Summary of Recommendations

- We recommend Buck continues to track the medical claims experience closely, particularly any impact from legislative changes
- We recommend Buck continue to disclose the nature and impact of all programming changes included in the valuation
- We recommend Buck generate a new gain/loss item that tracks the experience of the EGWP savings assumption
- We recommend that Buck implement the changes to their valuation methods as detailed in findings of the test life review
- We recommend Buck make some small modifications to their valuation reports to improve communication and disclosures

Questions?

Callan

March 16, 2023

ARMB Board Meeting

Preliminary Investment Performance
Periods Ended December 31, 2022

Steve Center, CFA
Senior Vice President

Ivan "Butch" Cliff, CFA
Executive Vice President and Director of Research

Hannah Vieira
Assistant Vice President

Agenda

- Market and Economic Environment

- Total Fund Performance
  - Participant-Directed Plans
  - Defined Benefit Plans
  - DB Plans Major Asset Classes

Equity and Fixed Income Markets Down Together in 2022

Declines for both stocks and bonds for three straight quarters are extremely unusual

Global equity markets down sharply in 2022 despite rebound in 4Q

- Similar impact across all equity market segments: developed, emerging, small cap

Fixed income down with sharply higher inflation and interest rates

- Bloomberg Aggregate: -13% for the year, worst year ever for the index by a wide margin
- CPI-U: +6.5% for the year ended Dec. 2022

- Number of times stocks and bonds have been down together
  - 38 quarters in almost 100 years, about 10% of the quarters
  - But just twice on annual basis
- Inflation at highest rate in decades
- Economic data show growth hit 'pause'
  - GDP rose 2.9% in 4Q22, after a 3.2% rise in 3Q, a 0.6% drop in 2Q, and a 1.6% decline in 1Q.

Returns for Periods ended 12/31/22

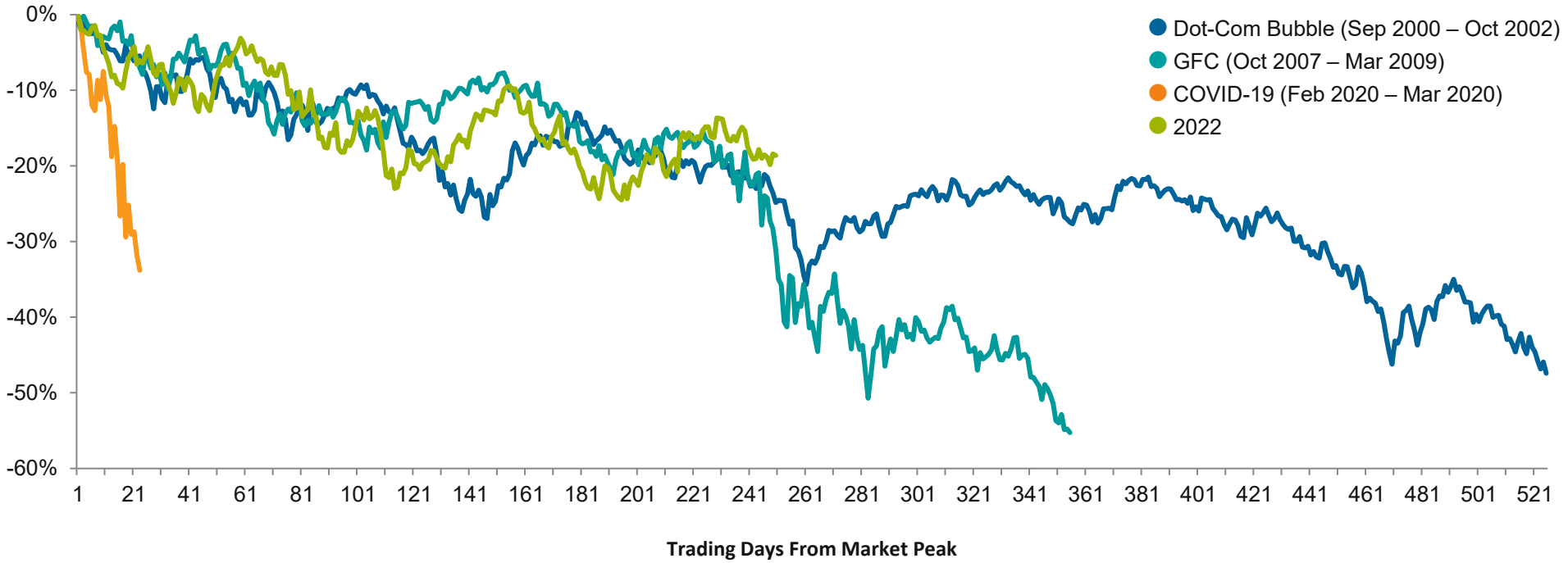
	Quarter	Year to Date	1 Year	5 Years	10 Years	25 Years
U.S. Equity						
Russell 3000	7.18	-19.21	-19.21	8.79	12.13	7.68
S&P 500	7.56	-18.11	-18.11	9.42	12.56	7.64
Russell 2000	6.23	-20.44	-20.44	4.13	9.01	7.13
Global ex-U.S. Equity						
MSCI World ex USA	16.18	-14.29	-14.29	1.79	4.59	4.65
MSCI Emerging Markets	9.70	-20.09	-20.09	-1.39	1.44	--
MSCI ACWI ex USA Small Cap	13.31	-19.97	-19.97	0.67	5.24	6.87
Fixed Income						
Bloomberg Aggregate	1.87	-13.01	-13.01	0.02	1.06	3.97
90-day T-Bill	0.84	1.46	1.46	1.26	0.76	1.91
Bloomberg Long Gov/Credit	2.61	-27.09	-27.09	-1.21	1.57	5.38
Bloomberg Global Agg ex-US	6.81	-18.70	-18.70	-3.07	-1.64	2.71
Real Estate						
NCREIF Property	-3.50	5.53	5.53	7.46	8.82	9.04
FTSE Nareit Equity	5.24	-24.37	-24.37	3.68	6.53	7.87
Alternatives						
CS Hedge Fund Index	0.92	1.06	1.06	4.25	4.24	5.81
Cambridge Private Equity*	-1.84	-3.77	-3.77	16.84	15.31	14.31
Bloomberg Commodity	2.22	16.09	16.09	6.44	-1.28	1.87
Gold Spot Price	9.22	-0.13	-0.13	6.88	0.86	7.64
Inflation - CPI-U	0.00	6.45	6.45	3.78	2.60	2.47

*Cambridge PE data through 09/30/22.
Sources: Bloomberg, Callan, Cambridge, Credit Suisse, FTSE Russell, MSCI, NCREIF, S&P Dow Jones Indices

2022 Equity Drawdown: A More 'Typical' Correction?

S&P 500 Cumulative Returns

Market Peak-to-Trough for Recent Corrections vs. 2022 Through 12/31/22



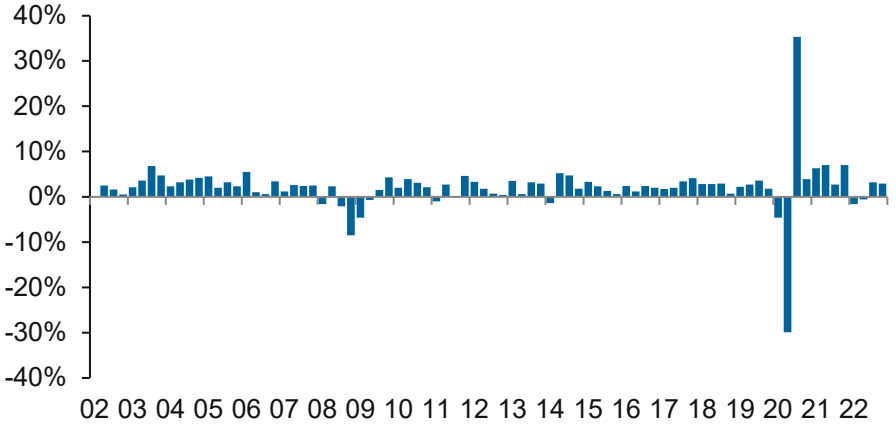
- While the COVID correction was swift and intense, the 2022 correction resembles the GFC and Dot-Com Bubble.
- The 2022 drawdown has been 250 trading days through December.
- It would take another 105 trading days to get to the bottom of the GFC and 275 trading days to get to the bottom of the Dot-Com Bubble.

Sources: Callan, S&P Dow Jones Indices

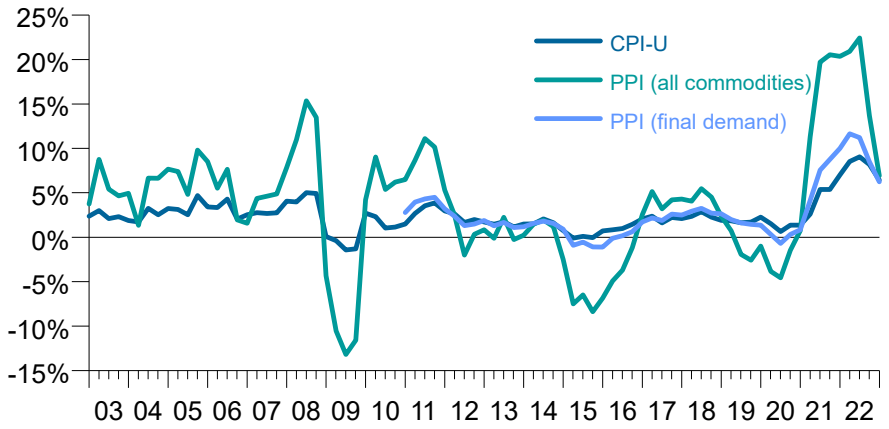
U.S. Economy—Summary

For periods ended 12/31/22

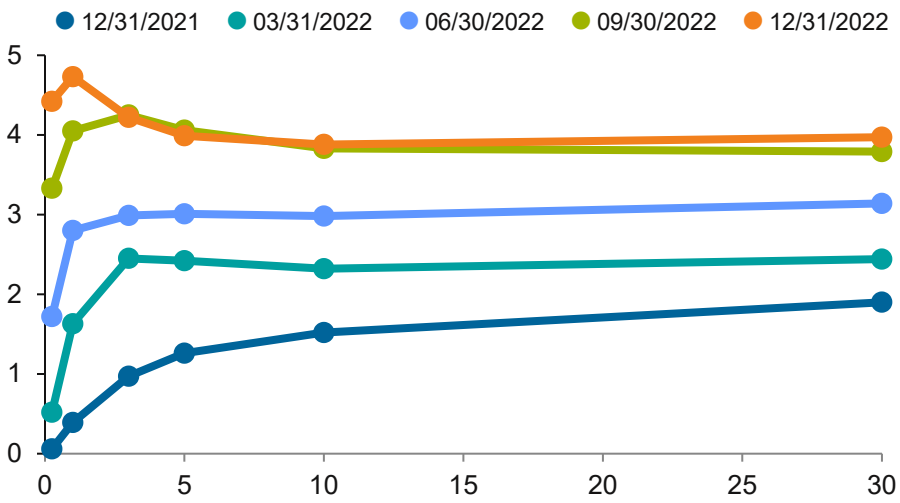
Quarterly Real GDP Growth



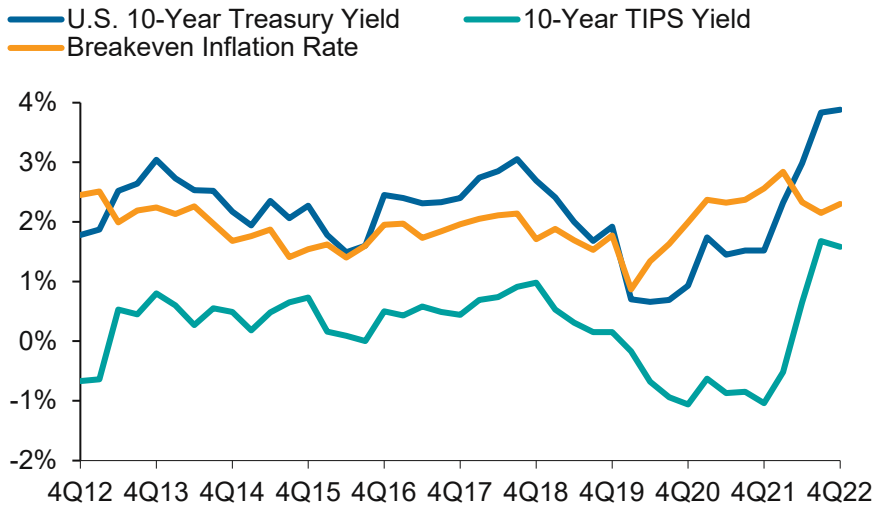
Inflation Year-Over-Year



U.S. Treasury Yield Curves



Historical 10-Year Yields Through 12/31/22

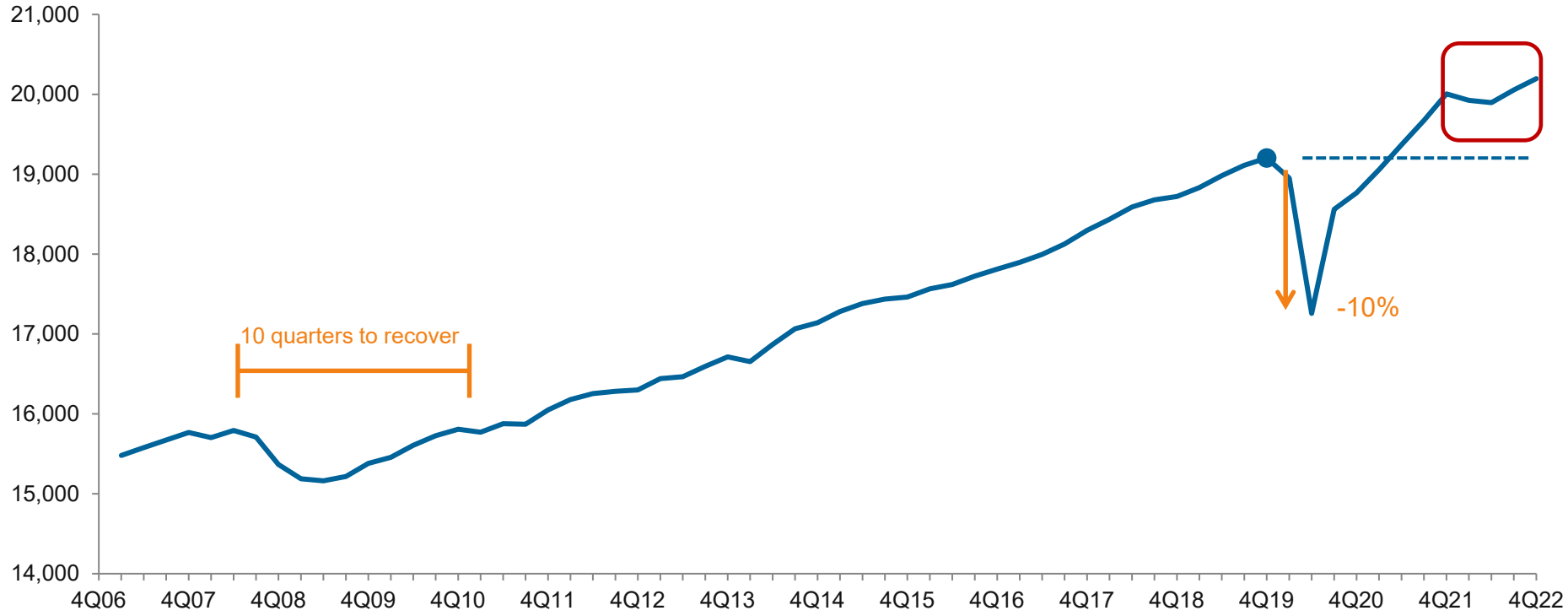


Sources: Bloomberg, Bureau of Labor Statistics, Callan

GDP Dropped for Two Straight Quarters in 1Q and 2Q, but Rebounded in 3Q and 4Q

Recovered pre-pandemic level in 2Q21 after deepest drop in 75 years

Seasonally Adjusted Real GDP in Billions of Dollars Through 12/31/22



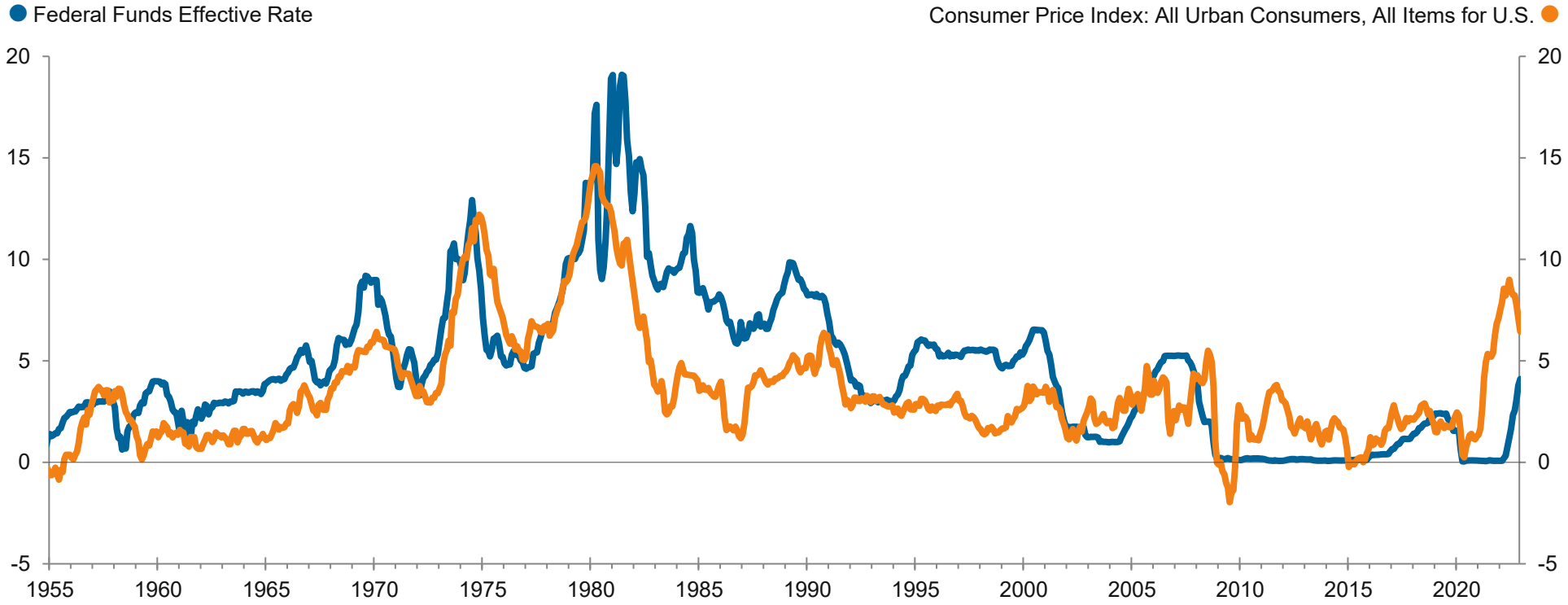
GDP growth in 2022 slowed compared to 2021 but rebounded after declines in the first two quarters of last year.

- 4Q22 GDP rose 2.9%, after a 3.2% rise in 3Q, a 0.6% drop in 2Q, and a 1.6% decline in 1Q.
- Loss of business and consumer confidence followed the start of the conflict in Ukraine.
- Consumer wealth hit by stock and bond market drop, and now a sharp slowdown in residential housing, as mortgage rates doubled from the start of the year.

Source: Federal Reserve Bank of St. Louis

Inflation vs. Interest Rates Over the Long Term

Federal Funds vs. Consumer Price Index



- We are now looking at an inflation spike that is above the last rise in inflation from 2005–08.
- The gap between inflation and the Fed Funds rate is larger than that seen just before the GFC.
  - Yield history suggests that the Fed Funds rate is typically above inflation, not below it.
- Recent gaps between CPI and the Fed Funds rate are unprecedented in the history of the CPI-U, going back to 1955
  - Resolution to the historical relationship requires the Fed Funds rate to rise and inflation to fall.

Source: Federal Reserve Bank of St. Louis

Callan Periodic Table of Investment Returns – Trailing Year

Monthly Returns												Trailing Year
Jan 2022	Feb 2022	Mar 2022	Apr 2022	May 2022	Jun 2022	Jul 2022	Aug 2022	Sep 2022	Oct 2022	Nov 2022	Dec 2022	12 Mos.
Emerging Market Equity	Small Cap Equity	Real Estate	High Yield	Dev ex-U.S. Equity	U.S. Fixed Income	Small Cap Equity	Emerging Market Equity	High Yield	Small Cap Equity	Emerging Market Equity	Global ex-U.S. Fixed Income	High Yield
-1.89%	1.07%	4.47%	-3.56%	0.83%	-1.57%	10.44%	0.42%	-3.97%	11.01%	14.83%	1.31%	-11.19%
Global ex-U.S. Fixed Income	High Yield	Large Cap Equity	U.S. Fixed Income	U.S. Fixed Income	Global ex-U.S. Fixed Income	Large Cap Equity	Small Cap Equity	U.S. Fixed Income	Large Cap Equity	Dev ex-U.S. Equity	U.S. Fixed Income	U.S. Fixed Income
-1.96%	-1.03%	3.71%	-3.79%	0.64%	-4.50%	9.22%	-2.05%	-4.32%	8.10%	10.65%	-0.45%	-13.01%
U.S. Fixed Income	Global ex-U.S. Fixed Income	Small Cap Equity	Real Estate	Emerging Market Equity	Emerging Market Equity	Real Estate	High Yield	Global ex-U.S. Fixed Income	Dev ex-U.S. Equity	Real Estate	Dev ex-U.S. Equity	Dev ex-U.S. Equity
-2.15%	-1.11%	1.24%	-5.48%	0.44%	-6.64%	7.96%	-2.30%	-5.87%	5.51%	6.73%	-0.48%	-14.29%
High Yield	U.S. Fixed Income	Dev ex-U.S. Equity	Emerging Market Equity	High Yield	High Yield	High Yield	U.S. Fixed Income	Large Cap Equity	Real Estate	Large Cap Equity	High Yield	Large Cap Equity
-2.73%	-1.12%	1.16%	-5.56%	0.25%	-6.73%	5.90%	-2.83%	-9.21%	2.99%	5.59%	-0.62%	-18.11%
Dev ex-U.S. Equity	Dev ex-U.S. Equity	High Yield	Dev ex-U.S. Equity	Large Cap Equity	Small Cap Equity	Dev ex-U.S. Equity	Large Cap Equity	Dev ex-U.S. Equity	High Yield	Global ex-U.S. Fixed Income	Emerging Market Equity	Global ex-U.S. Fixed Income
-4.41%	-1.56%	-1.15%	-6.57%	0.18%	-8.22%	4.97%	-4.08%	-9.26%	2.60%	5.58%	-1.41%	-18.70%
Large Cap Equity	Real Estate	Emerging Market Equity	Global ex-U.S. Fixed Income	Small Cap Equity	Large Cap Equity	U.S. Fixed Income	Dev ex-U.S. Equity	Small Cap Equity	Global ex-U.S. Fixed Income	U.S. Fixed Income	Real Estate	Emerging Market Equity
-5.17%	-2.47%	-2.26%	-6.83%	0.15%	-8.25%	2.44%	-4.67%	-9.58%	-0.14%	3.68%	-2.79%	-20.09%
Real Estate	Emerging Market Equity	U.S. Fixed Income	Large Cap Equity	Global ex-U.S. Fixed Income	Real Estate	Global ex-U.S. Fixed Income	Global ex-U.S. Fixed Income	Emerging Market Equity	U.S. Fixed Income	Small Cap Equity	Large Cap Equity	Small Cap Equity
-5.75%	-2.99%	-2.78%	-8.72%	0.01%	-8.69%	1.92%	-4.99%	-11.72%	-1.30%	2.34%	-5.76%	-20.44%
Small Cap Equity	Large Cap Equity	Global ex-U.S. Fixed Income	Small Cap Equity	Real Estate	Dev ex-U.S. Equity	Emerging Market Equity	Real Estate	Real Estate	Emerging Market Equity	High Yield	Small Cap Equity	Real Estate
-9.63%	-2.99%	-3.20%	-9.91%	-4.35%	-9.41%	-0.25%	-6.49%	-12.42%	-3.10%	2.17%	-6.49%	-25.10%

Sources: Bloomberg Aggregate · Bloomberg Corp High Yield · Bloomberg Global Aggregate ex US · FTSE EPRA Nareit Developed · MSCI World ex USA · MSCI Emerging Markets · Russell 2000 · S&P 500

Callan Periodic Table of Investment Returns – Trailing Fiscal Years

Fiscal Year Returns – Ending June 30

06/2014	06/2015	06/2016	06/2017	06/2018	06/2019	06/2020	06/2021	06/2022	2023 to Date
Large Cap Equity	Large Cap Equity	Real Estate	Small Cap Equity	Small Cap Equity	Large Cap Equity	U.S. Fixed Income	Small Cap Equity	U.S. Fixed Income	Dev ex-U.S. Equity
24.61%	7.42%	11.58%	24.60%	17.57%	10.42%	8.74%	62.03%	-10.29%	5.50%
Dev ex-U.S. Equity	Small Cap Equity	Global ex-U.S. Fixed Income	Emerging Market Equity	Large Cap Equity	U.S. Fixed Income	Large Cap Equity	Emerging Market Equity	Large Cap Equity	Small Cap Equity
23.83%	6.49%	11.24%	23.75%	14.37%	7.87%	7.51%	40.90%	-10.62%	3.91%
Small Cap Equity	U.S. Fixed Income	U.S. Fixed Income	Dev ex-U.S. Equity	Emerging Market Equity	Real Estate	Global ex-U.S. Fixed Income	Large Cap Equity	High Yield	High Yield
23.64%	1.86%	6.00%	19.49%	8.20%	7.68%	0.71%	40.79%	-12.81%	3.50%
Emerging Market Equity	Real Estate	Large Cap Equity	Large Cap Equity	Dev ex-U.S. Equity	High Yield	High Yield	Dev ex-U.S. Equity	Real Estate	Large Cap Equity
14.31%	-0.36%	3.99%	17.90%	7.04%	7.48%	0.03%	33.60%	-13.45%	2.31%
Real Estate	High Yield	High Yield	High Yield	Real Estate	Global ex-U.S. Fixed Income	Emerging Market Equity	Real Estate	Dev ex-U.S. Equity	Global ex-U.S. Fixed Income
13.55%	-0.40%	1.62%	12.70%	5.64%	4.10%	-3.39%	33.55%	-16.76%	-2.65%
High Yield	Emerging Market Equity	Small Cap Equity	Real Estate	Global ex-U.S. Fixed Income	Dev ex-U.S. Equity	Dev ex-U.S. Equity	High Yield	Global ex-U.S. Fixed Income	U.S. Fixed Income
11.73%	-5.12%	-6.73%	0.21%	2.78%	1.29%	-5.42%	15.37%	-18.78%	-2.97%
Global ex-U.S. Fixed Income	Dev ex-U.S. Equity	Dev ex-U.S. Equity	U.S. Fixed Income	High Yield	Emerging Market Equity	Small Cap Equity	Global ex-U.S. Fixed Income	Small Cap Equity	Emerging Market Equity
9.42%	-5.28%	-9.84%	-0.31%	2.62%	1.22%	-6.63%	4.60%	-25.20%	-2.99%
U.S. Fixed Income	Global ex-U.S. Fixed Income	Emerging Market Equity	Global ex-U.S. Fixed Income	U.S. Fixed Income	Small Cap Equity	Real Estate	U.S. Fixed Income	Emerging Market Equity	Real Estate
4.37%	-13.19%	-12.05%	-3.80%	-0.40%	-3.31%	-16.25%	-0.33%	-25.28%	-5.52%

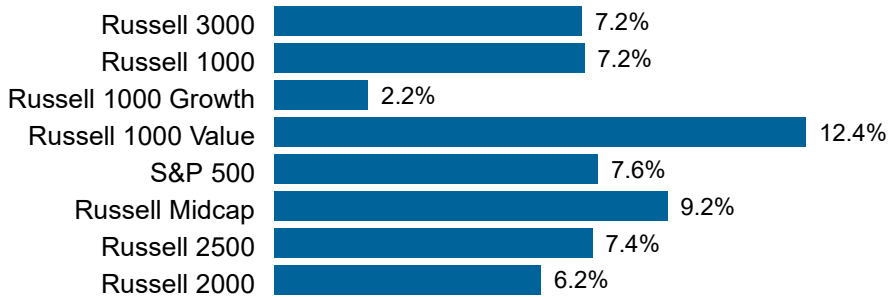
Sources: Bloomberg Aggregate · Bloomberg Corp High Yield · Bloomberg Global Aggregate ex US · FTSE EPRA Nareit Developed · MSCI World ex USA · MSCI Emerging Markets · Russell 2000 · S&P 500

U.S. Equity Performance: 4Q22

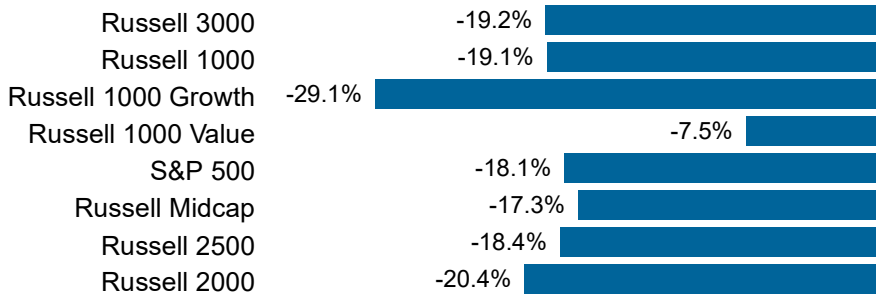
Markets retrace in December after gains in the prior two months

- The S&P 500 Index posted positive returns in both October and November but fell in December. The index was up 7.6% during 4Q22 but ended 2022 down 18.1%.
- Energy was the best-performing sector during the quarter and 2022, returning 23% and 66% respectively. Consumer Discretionary and Communication Services were the only two sectors that posted negative returns in 4Q.
- Value stocks outperformed growth across the market capitalization spectrum, and for both 4Q and the full year.
- Large cap stocks (Russell 1000) outperformed small caps (Russell 2000) last quarter and for the year.
- Continued macroeconomic concerns (e.g., inflation, potential recession, geopolitical issues) led to higher volatility and a down-year for U.S. equities.

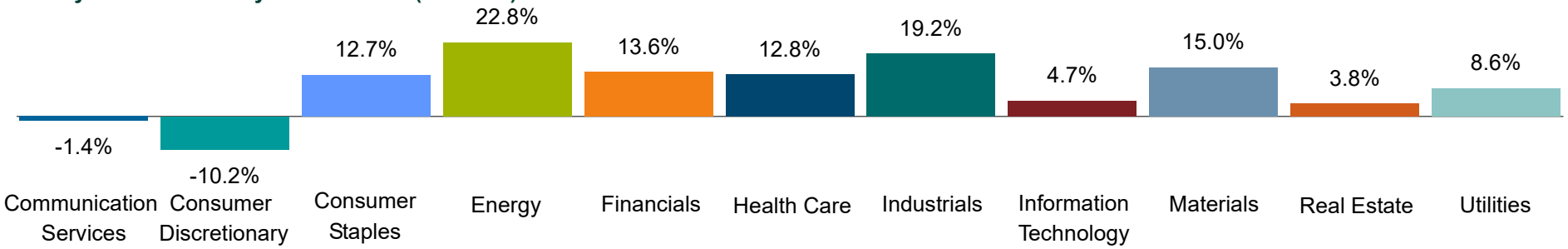
U.S. Equity Returns: Quarter Ended 12/31/22



U.S. Equity Returns: One Year Ended 12/31/22



Industry Sector Quarterly Performance (S&P 500) as of 12/31/22



Sources: FTSE Russell, S&P Dow Jones Indices

U.S. Equity Overview

Market valuations have reset with the broad-based sell-off

- The drop in the U.S. equity markets in 2022 was broad-based and almost every sector experienced negative returns. Higher interest rates had the most impact on growth-oriented sectors (e.g., Technology and Communication Services).
- Mega-cap technology and particularly FAANG stocks have underperformed, ending an extended period of market leadership.
- Large cap stocks are now trading around their historical average P/E ratio but they are not yet "cheap."
- Despite the recent outperformance of value stocks, value still looks attractive relative to growth heading into 2023.

S&P 500 Price to Earnings Ratio Is Close to Average

Value vs. Growth Relative Valuations

	Forward PE		Div. yield**	
Style	Current	Long-term avg.*	Current	Long-term avg.*
Value	13.95x	14.08x	2.35%	2.59%
Growth	21.14x	20.73x	1.16%	1.34%

Sources: Bloomberg, JP Morgan

Global/Global ex-U.S. Equity Performance: 4Q22

Ending on a high note

4Q22 was a bright spot during a tough calendar year in global and global ex-U.S. equity markets.

Encouraging signs

- Lower-than-expected U.S. inflation data buoyed market optimism at the end of the year.
- The Fed slowed its pace of tightening with further slowing expected in 2023.
- China reversed its zero-COVID policies, prompting exuberance from investors.

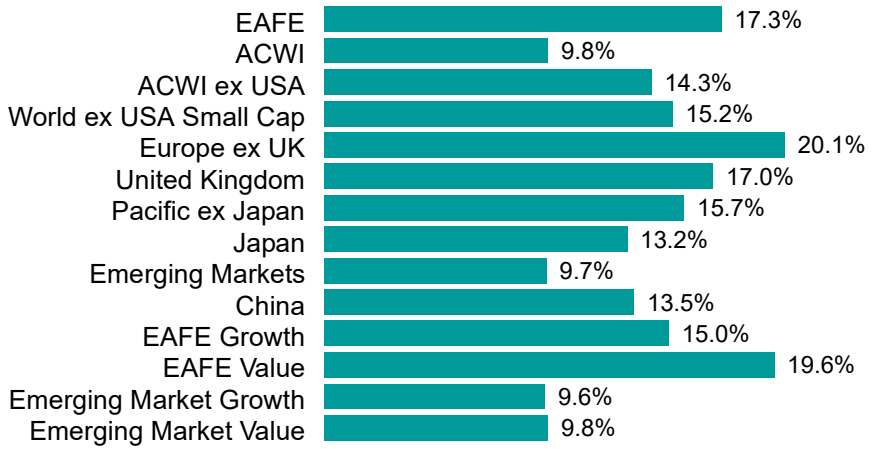
Growth vs. value

- Value outpaced growth across developed and emerging markets.
  - Economically sensitive sectors (e.g., Financials and Industrials) benefited from the anticipation of improved growth; Energy was the largest outperformer.

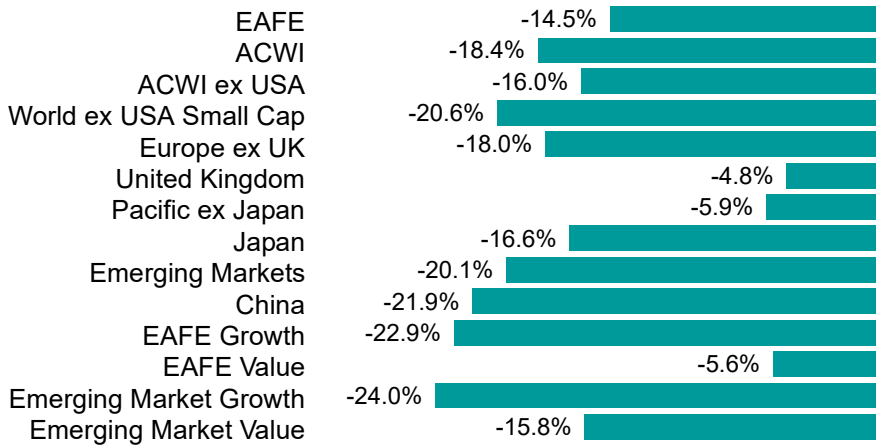
U.S. dollar vs. other currencies

- After reaching a multi-decade high, the dollar fell against all major currencies with signs of inflation easing.
  - Despite the 7.7% decline in 4Q22, the dollar still gained nearly 8% over the full year.

Global Equity Returns: Quarter Ended 12/31/22



Global Equity Returns: One Year Ended 12/31/22



Source: MSCI

U.S. Fixed Income Performance: 4Q22

Bonds were up in 4Q but 2022 results remain negative

- Aggregate: positive return driven by coupon income and spread tightening; interest rates rose modestly
- Rates were volatile intra-quarter
  - UST 10-year yield: high 4.22% on 11/7; low 3.42% on 12/7
  - Curve remained inverted at quarter-end; 10-year yield 3.88% and 2-year yield 4.41%; most since 1981
- Fed raised rates, bringing target to 4.25%-4.50%
  - Median expectation from Fed is 5.1% for year-end 2023
  - Inflation showed signs of moderating but job market remained tight with solid wage growth

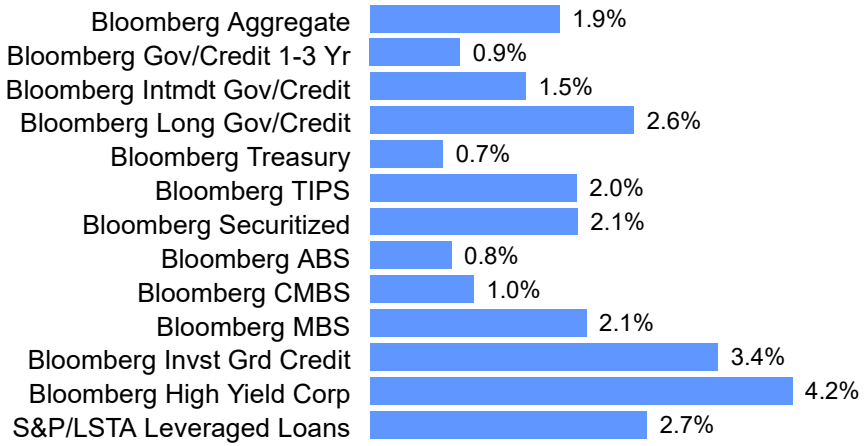
Corporates and mortgages outperformed Treasuries in 4Q but underperformed for the year

- 4Q: Corporates +289 bps excess return; RMBS +110 bps
- 2022: Corporates -125 bps excess return; RMBS -223 bps
- RMBS had worst month ever (September: -191 bps) and best month ever (November: +135 bps) in excess returns.

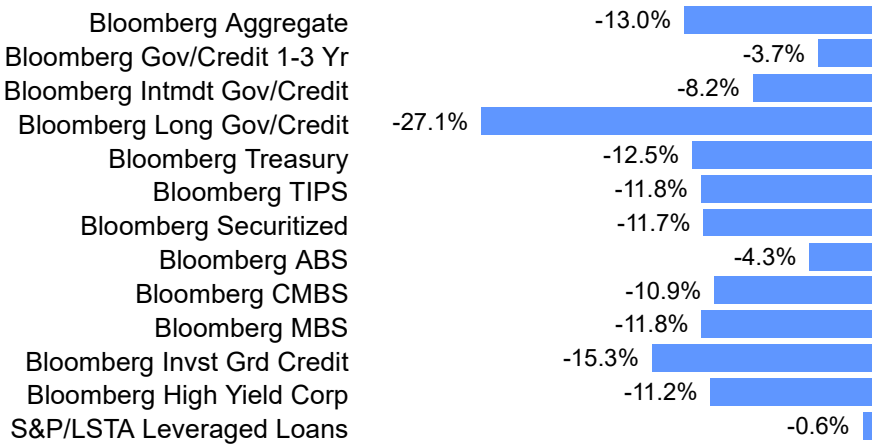
Valuations fair

- While absolute yields are higher, spreads have not widened materially and most are close to historical averages.
- An economic slowdown/recession could impact credit spreads.
- Higher yields boosting forward-looking return outlooks across sectors

U.S. Fixed Income Returns: Quarter Ended 12/31/22



U.S. Fixed Income Returns: One Year Ended 12/31/22

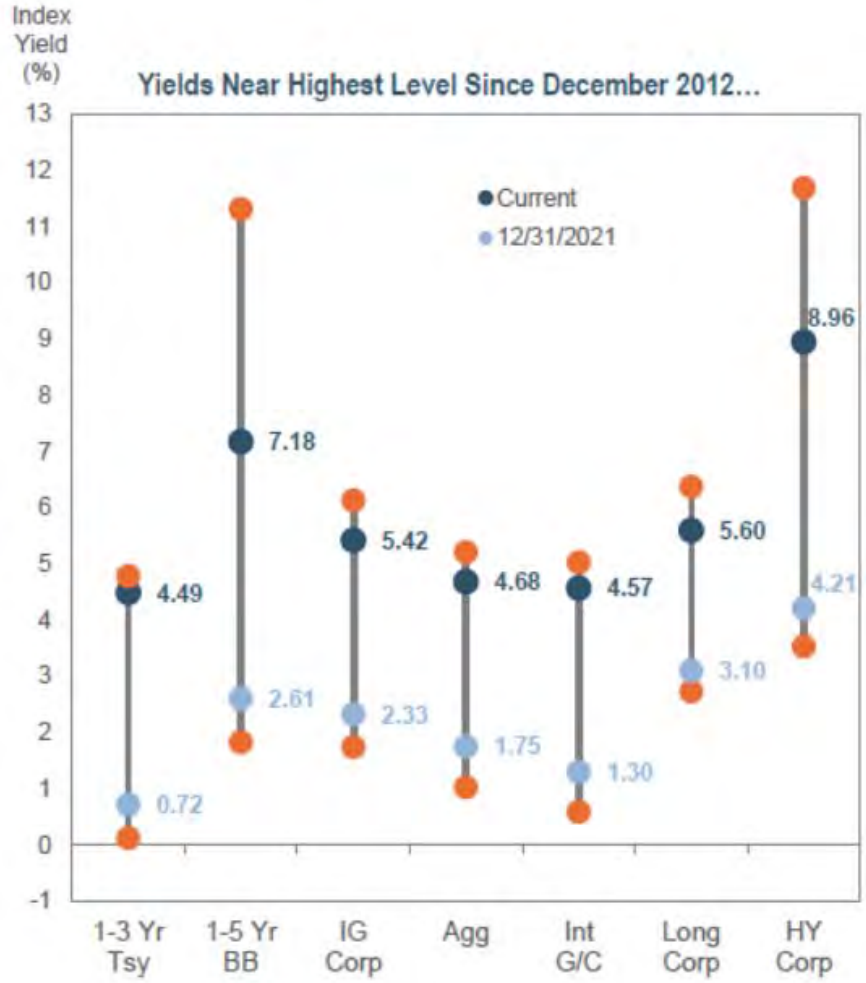


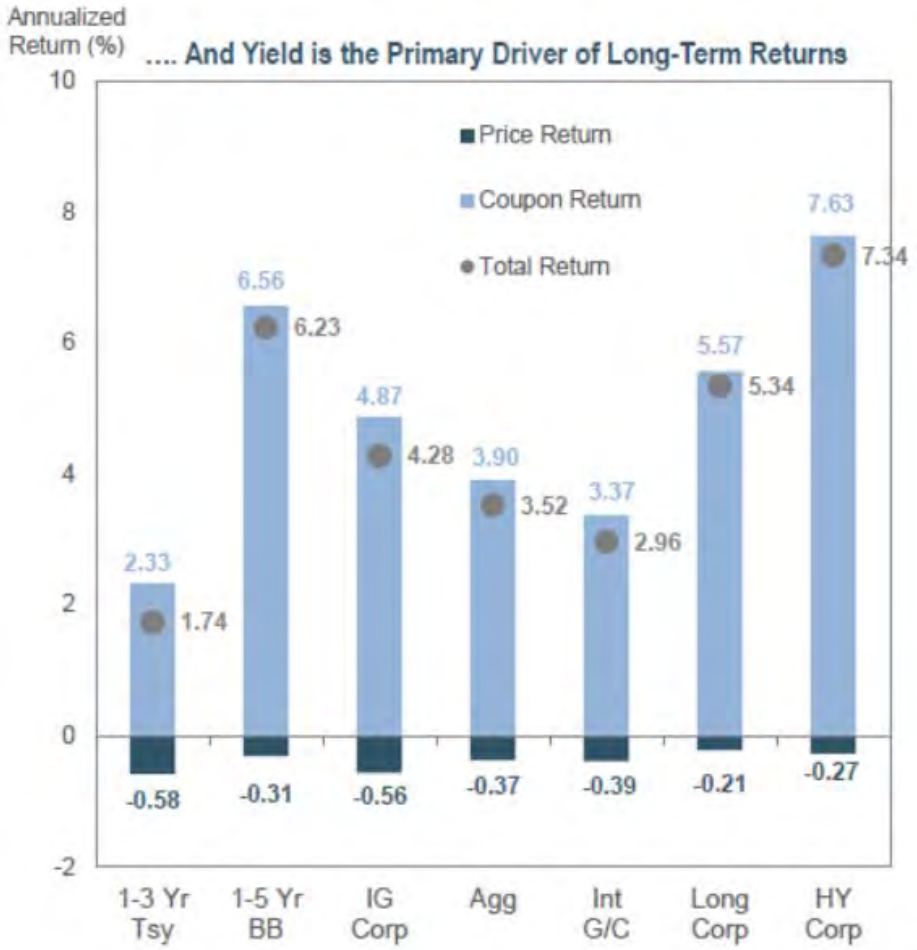
Sources: Bloomberg, S&P Dow Jones Indices

Fixed Income Themes

Yields rose in 2022, but the increase may bode well for investors in 2023

- Yields across fixed income rose to near 10-year highs in 2022
- Higher starting yield is a benefit to fixed income investors, as it is a major contributor to long-term results for fixed income





Sources: Bloomberg, Income Research + Management.
Yield range is from 12/31/12 to 12/30/22. Returns in the right chart are annualized from 12/30/02 to 12/30/22.

U.S. Private Real Estate Performance: 4Q22

Appreciation returns negative once again

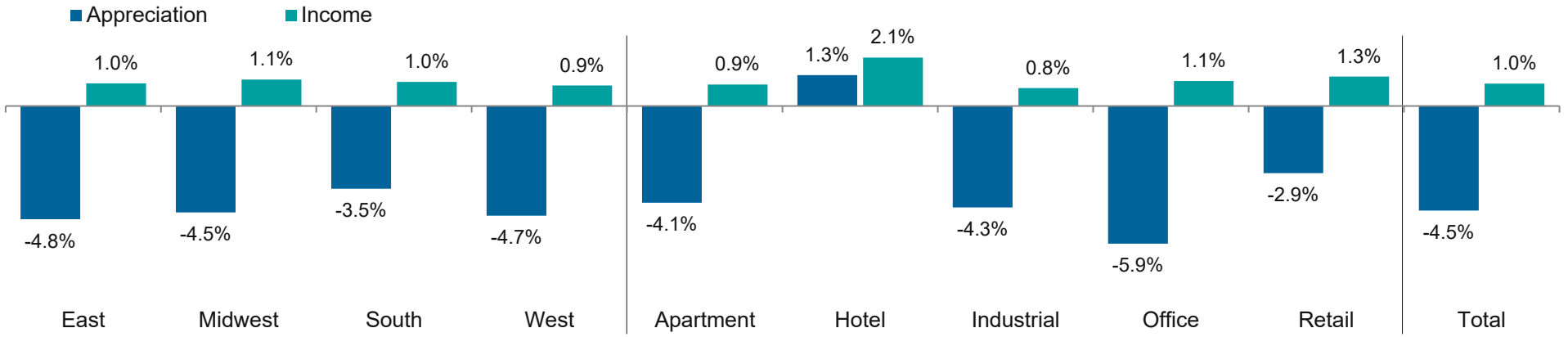
Negative appreciation in four major sectors

- Income returns were positive across sectors and regions.
- All property sectors and regions, except for Hotel, experienced negative appreciation.
- Valuations are reflective of higher interest rates, which have put upward pressure on capitalization rate and discount rate assumptions.
- Return dispersion by manager within the ODCE Index was due to the composition of underlying portfolios.

	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
NCREIF ODCE	-5.2%	6.6%	9.0%	7.7%	9.1%
Income	0.6%	2.6%	2.9%	3.0%	3.4%
Appreciation	-5.8%	3.9%	6.0%	4.6%	5.5%
NCREIF Property Index	-3.5%	5.5%	8.1%	7.5%	8.8%
Income	1.0%	3.9%	4.1%	4.3%	4.7%
Appreciation	-4.5%	1.6%	3.8%	3.1%	4.0%

Returns are geometrically linked

NCREIF Property Index Quarterly Returns by Region and Property Type

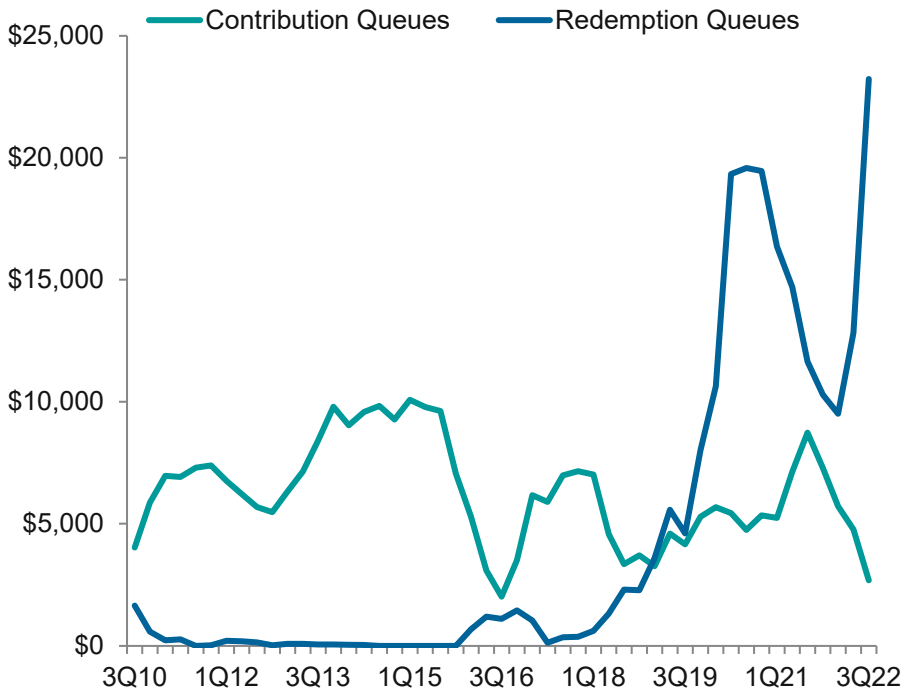


Source: NCREIF, ODCE return is net

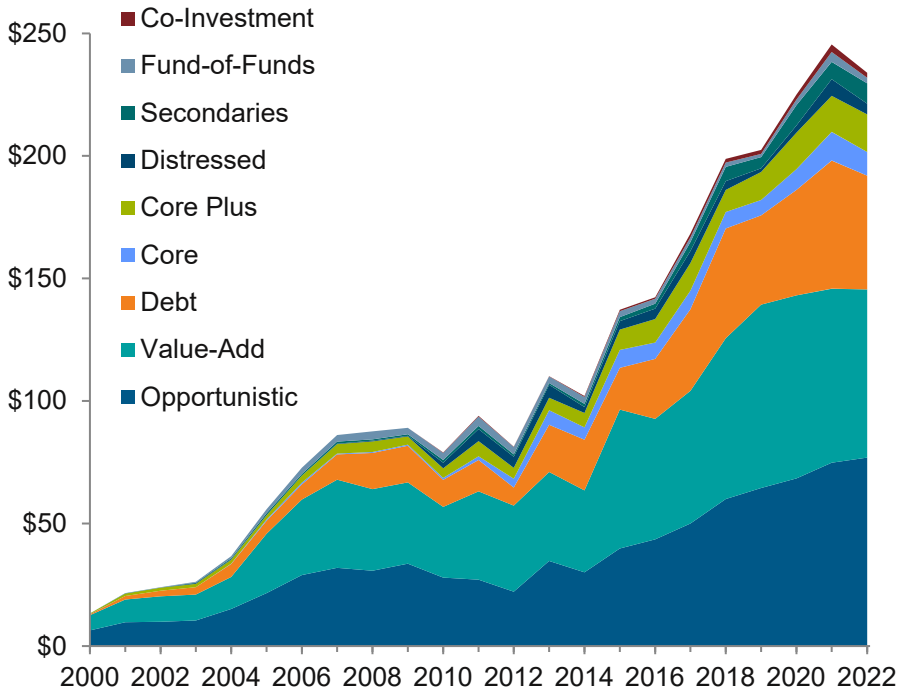
U.S. Private Real Estate Market Trends

Dry powder exceeds $200 billion

Core Fund Contribution/Redemption Queues ($mm)*



Dry Powder for CRE Investment in North America ($bn)



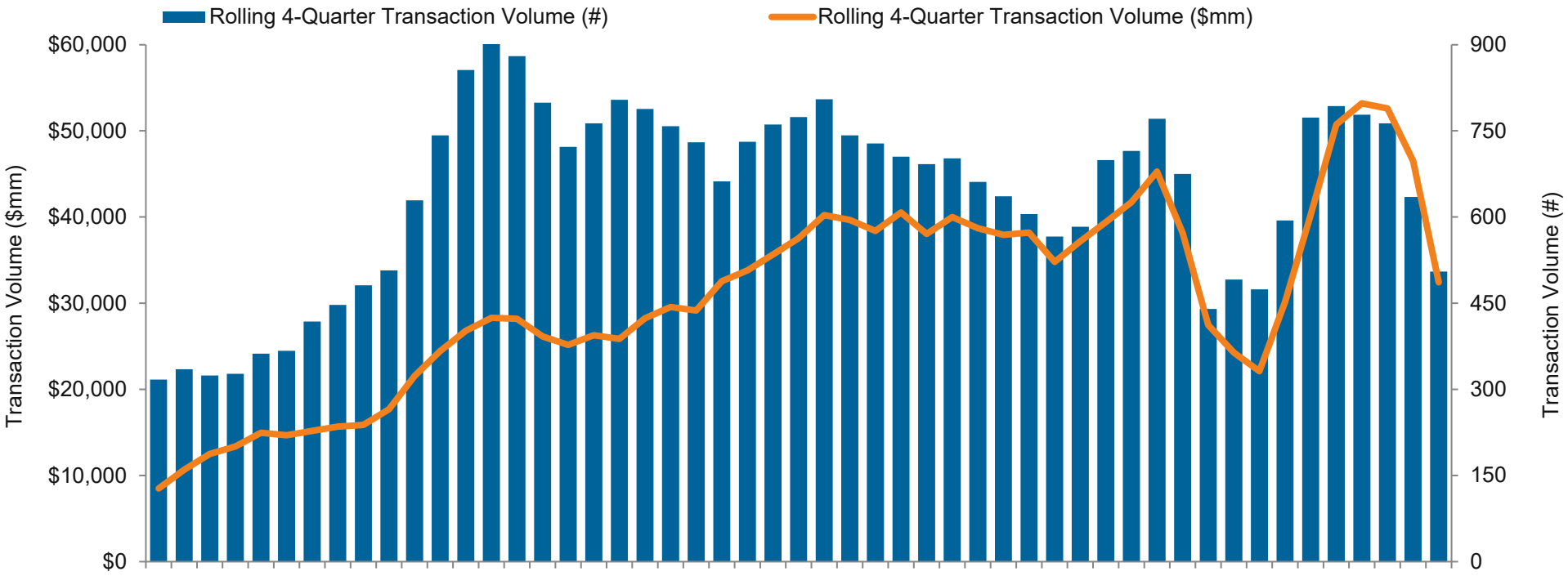
- Net core activity down for the past three quarters; investors rebalancing due to the denominator effect
- >$200 billion of capital waiting to be deployed in North America
- Majority of dry powder capital in opportunistic, value-add, and debt funds

Sources: AEW, NCREIF, Preqin
*Queue data as of 3Q22, the latest available at time of publication

U.S. Private Real Estate Market Trends

Pricing and transaction volumes decline through 4Q22

NCREIF Rolling 4-Quarter Transaction Totals Through 12/31/22



- Transaction volume continues to decrease on a rolling four-quarter basis and is now below five-year averages.
- In 4Q22 transaction volume increased on a quarter-over-quarter basis; however, transaction volume is significantly lower compared to 4Q21.
- The rise in interest rates is the driving force behind the slowdown in transactions. A bid-ask spread remains and price discovery continues to occur among market participants. Sectors that are in favor, such as multi-family and industrial, are more liquid.

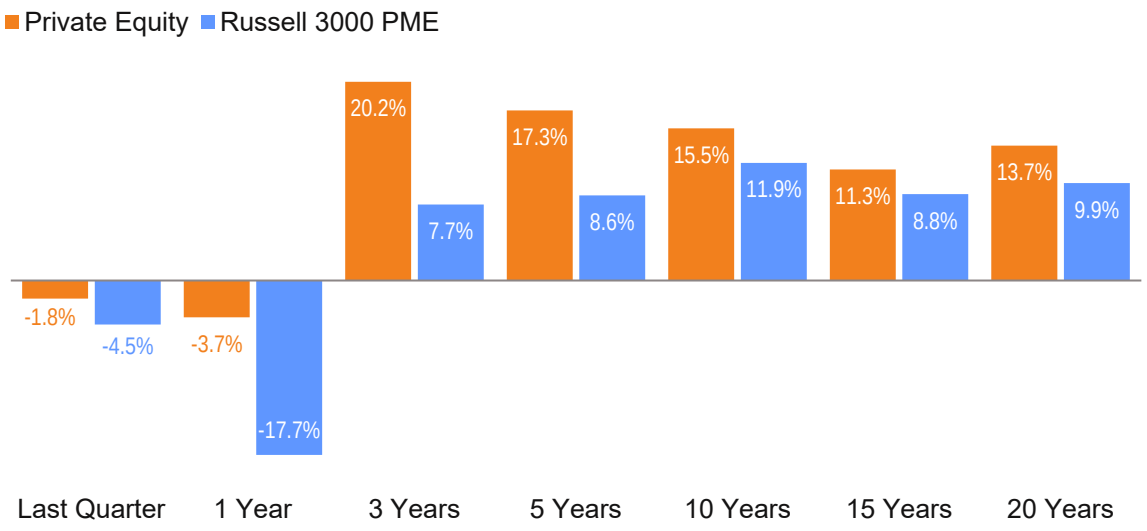
Source: NCREIF

Private Equity Performance

Smoothing effect in 3Q22 private equity returns

- As is typical for the asset class, private equity returns have experienced a smoothing effect in 2022 compared to the sharp declines seen in the public markets.
- Private equity was only down about a third as much as the public markets during 2022, on a PME basis.
- Portfolio companies are typically valued internally by the manager on a quarterly basis. Valuations are based on the operating metrics of the company, recent comparable transactions, and public market comps.
- Venture capital and growth equity experienced the sharpest declines so far this year, given their technology focus as well as post-IPO public equity holdings.

Net IRRs as of 09/30/22



Net IRRs by Strategy as of 09/30/22

Strategy	Last Quarter	1 Year	3 Years	5 Years	10 Years	20 Years
Venture Capital	-2.7%	-9.1%	28.4%	23.8%	19.4%	12.4%
Growth Equity	-1.8%	-9.4%	20.8%	18.4%	15.7%	14.3%
Buyouts	-1.9%	-1.4%	18.5%	16.1%	15.2%	14.7%
Mezzanine	0.2%	5.0%	11.8%	11.1%	11.3%	11.1%
Credit Opportunities	0.7%	3.9%	8.4%	7.2%	8.3%	9.9%
Control-Oriented Distressed	-0.2%	11.3%	19.4%	13.8%	12.7%	11.9%
Total Private Equity	**-1.8%**	**-3.7%**	**20.2%**	**17.3%**	**15.5%**	**13.7%**

Source: Refinitiv/Cambridge

Private Equity Overview

Fundraising slows and timelines become extended

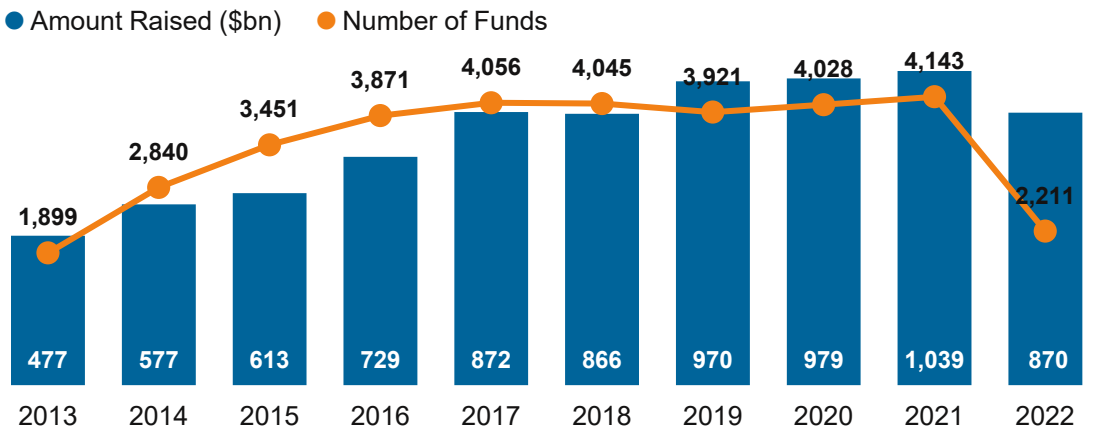
Fundraising slows

- In terms of dollars raised, fundraising down 16% in 2022, compared to the prior year
- Significantly fewer funds closed this year, with fundraising concentrated in larger funds: “flight to quality”
- Fundraising timelines extending due to so many funds in the market, slowing distributions, and constrained LP commitment budgets because of the “denominator effect,” delaying many final closes

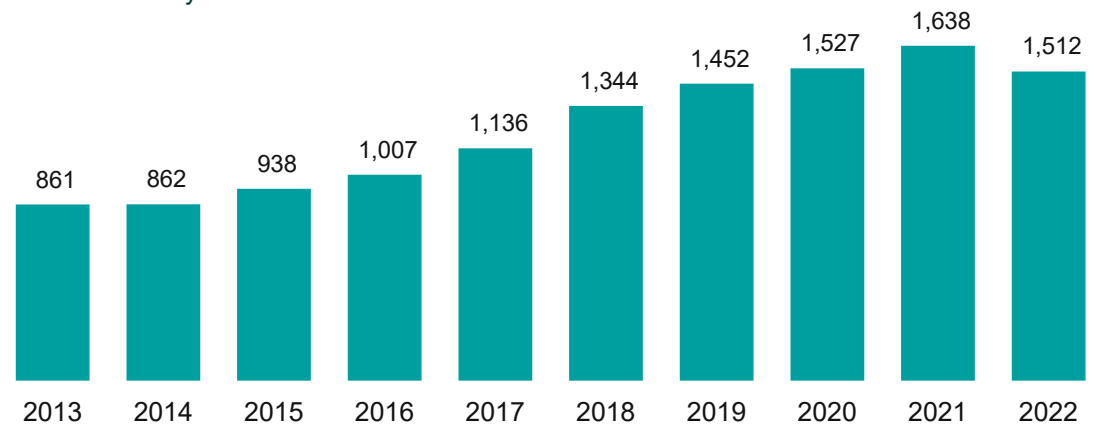
Dry powder levels off

- Level of dry powder influenced by two factors: fundraising and capital deployment
- Dry powder peaked in 2021 at $1.6 trillion due to strong annual fundraising levels
- Dry powder dropped in 2022 due to a slower fundraising environment

Annual Fundraising



Dry Powder ($bn)
Cumulative as of yearend



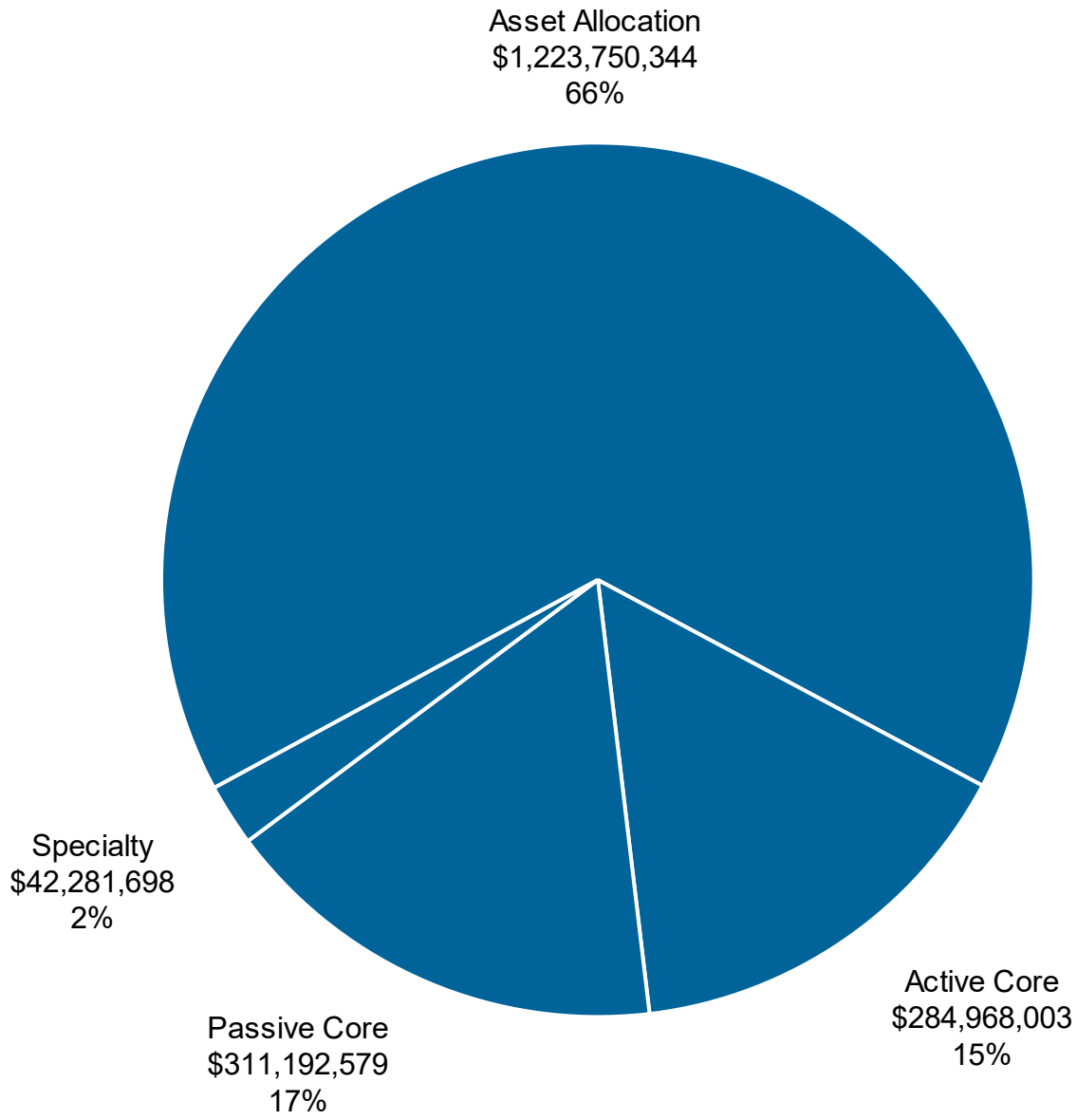
Source: PitchBook

Callan

Participant-Directed Plans

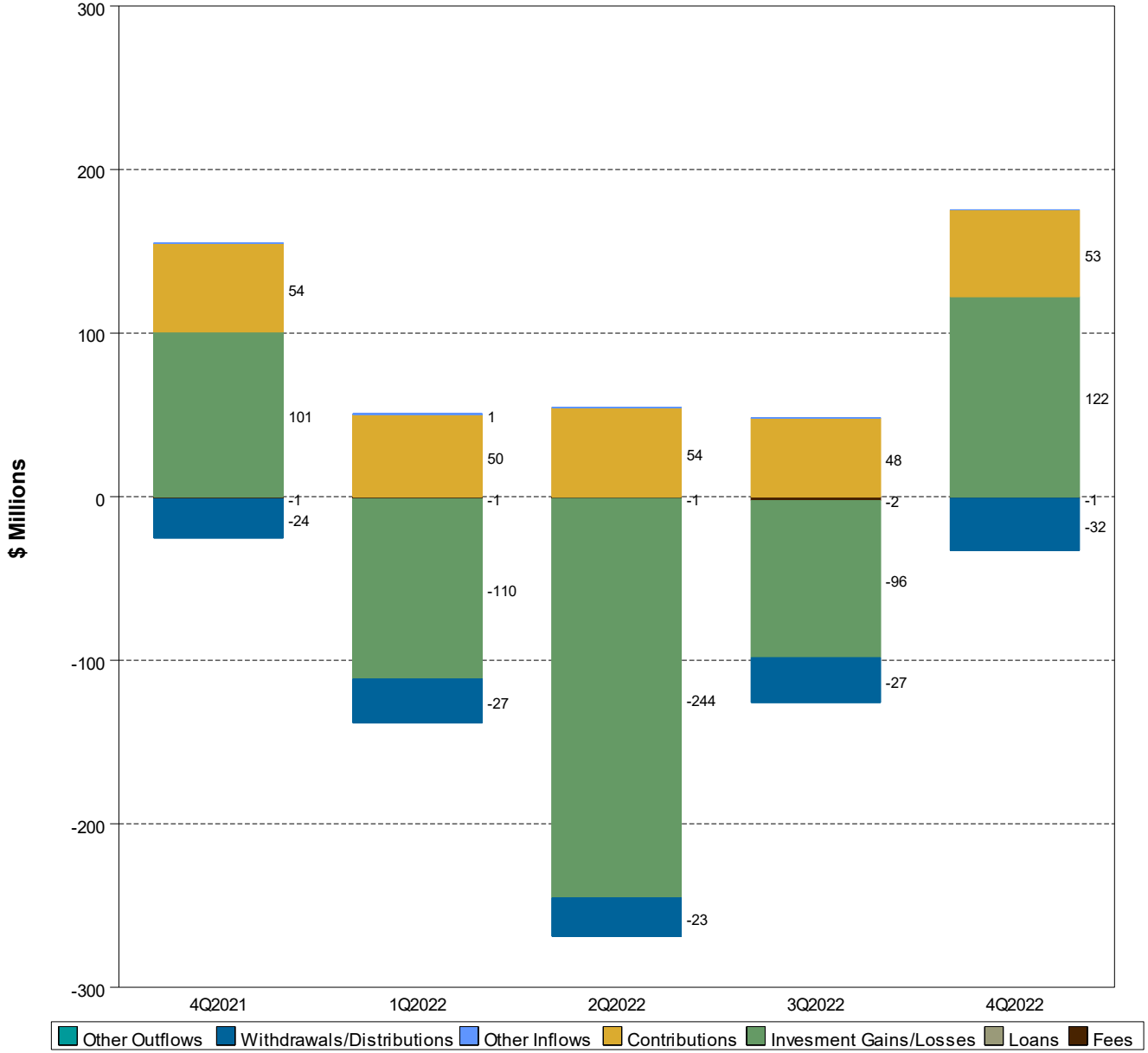
PERS DC Plan

December 31, 2022



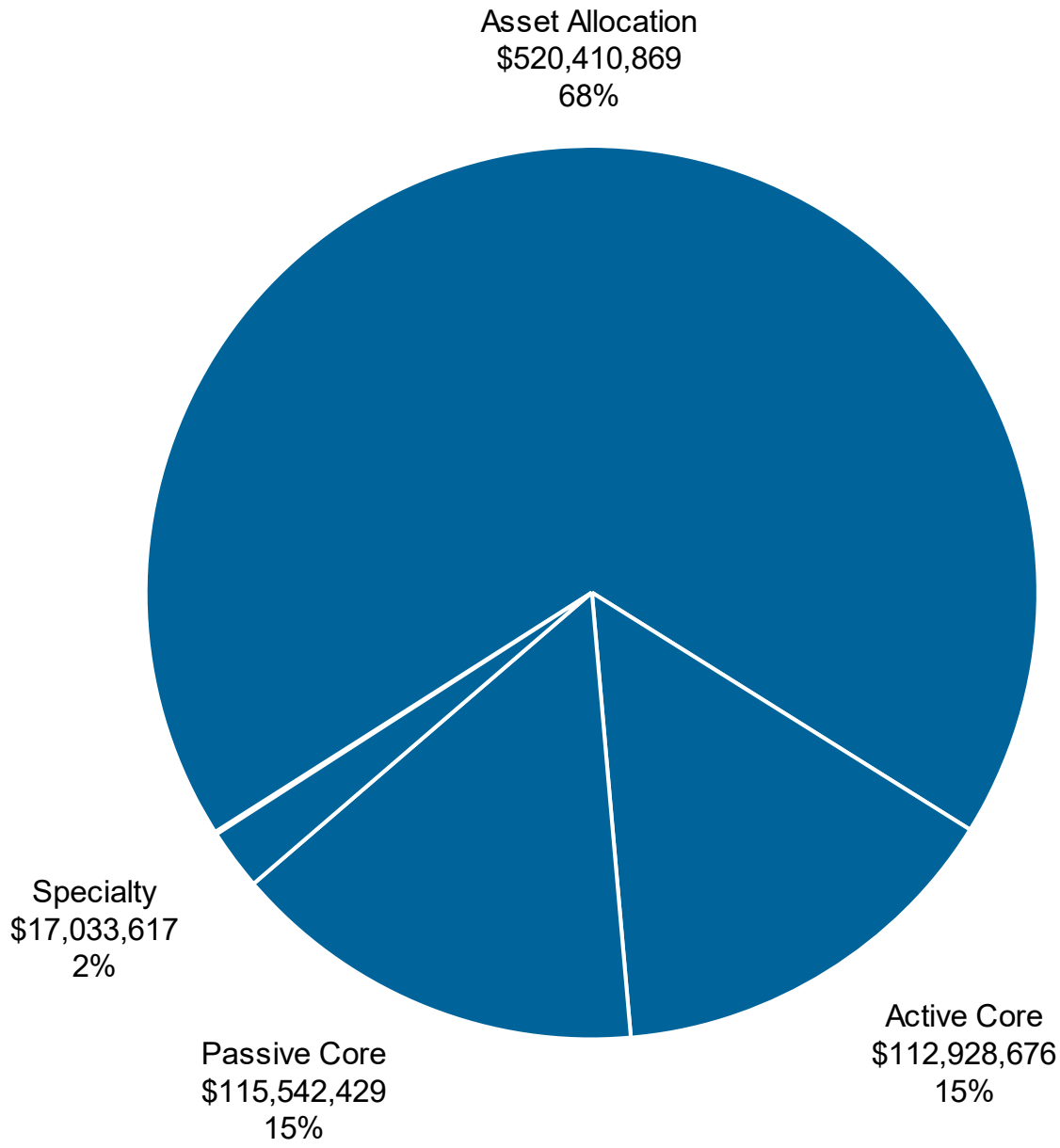
PERS DC Plan: Asset Changes

December 31, 2022



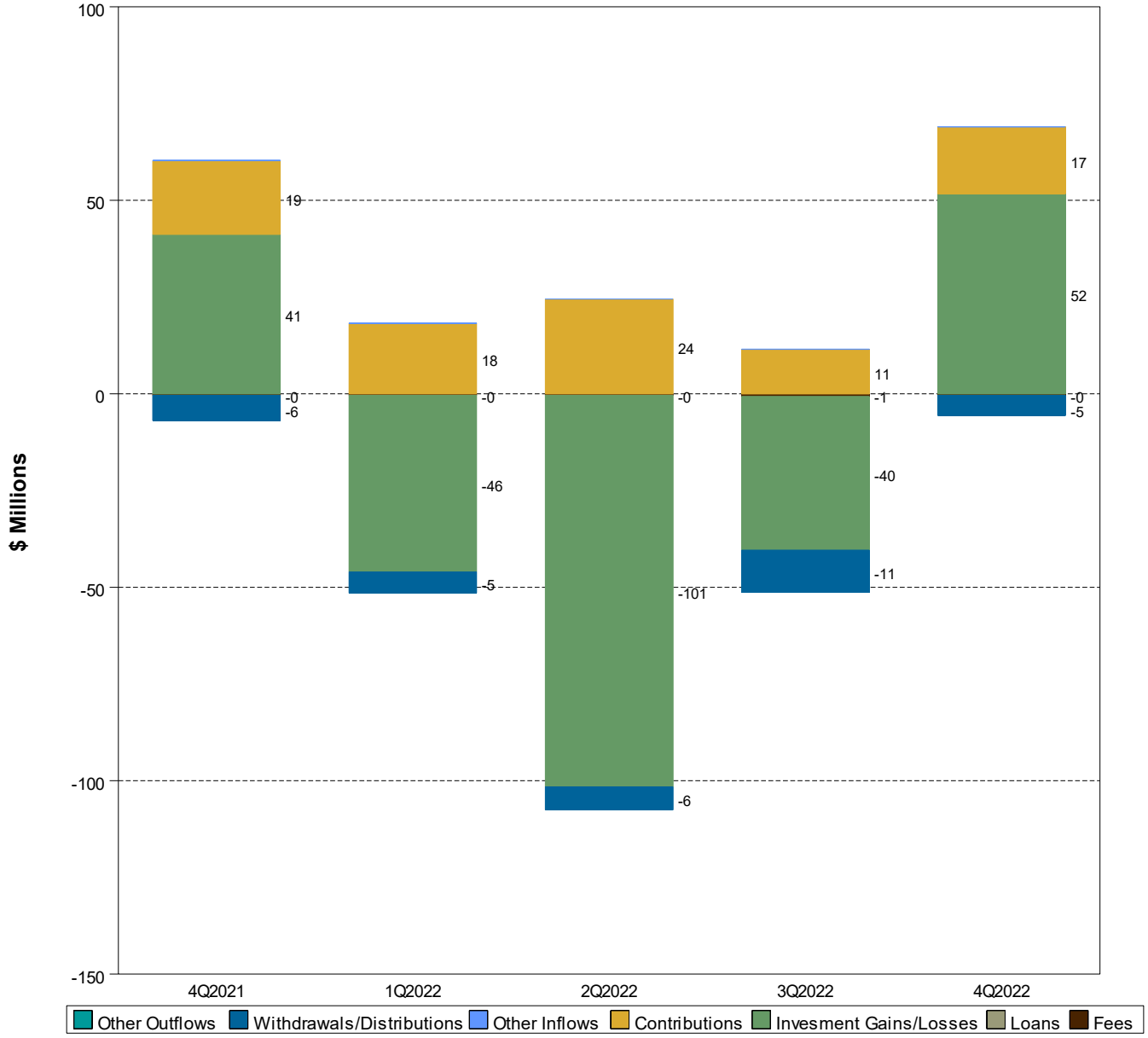
TRS DC Plan

December 31, 2022



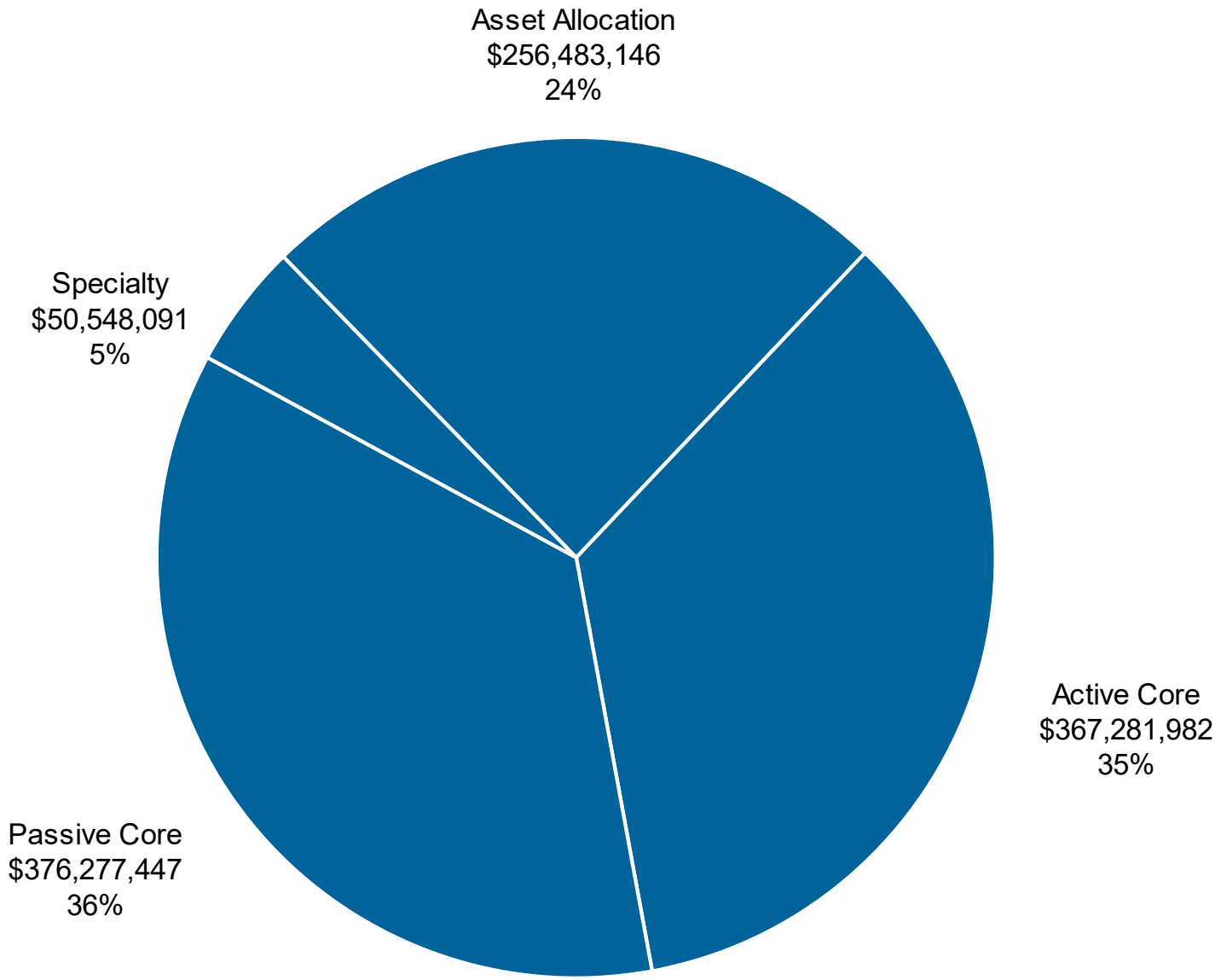
TRS DC Plan: Asset Changes

December 31, 2022



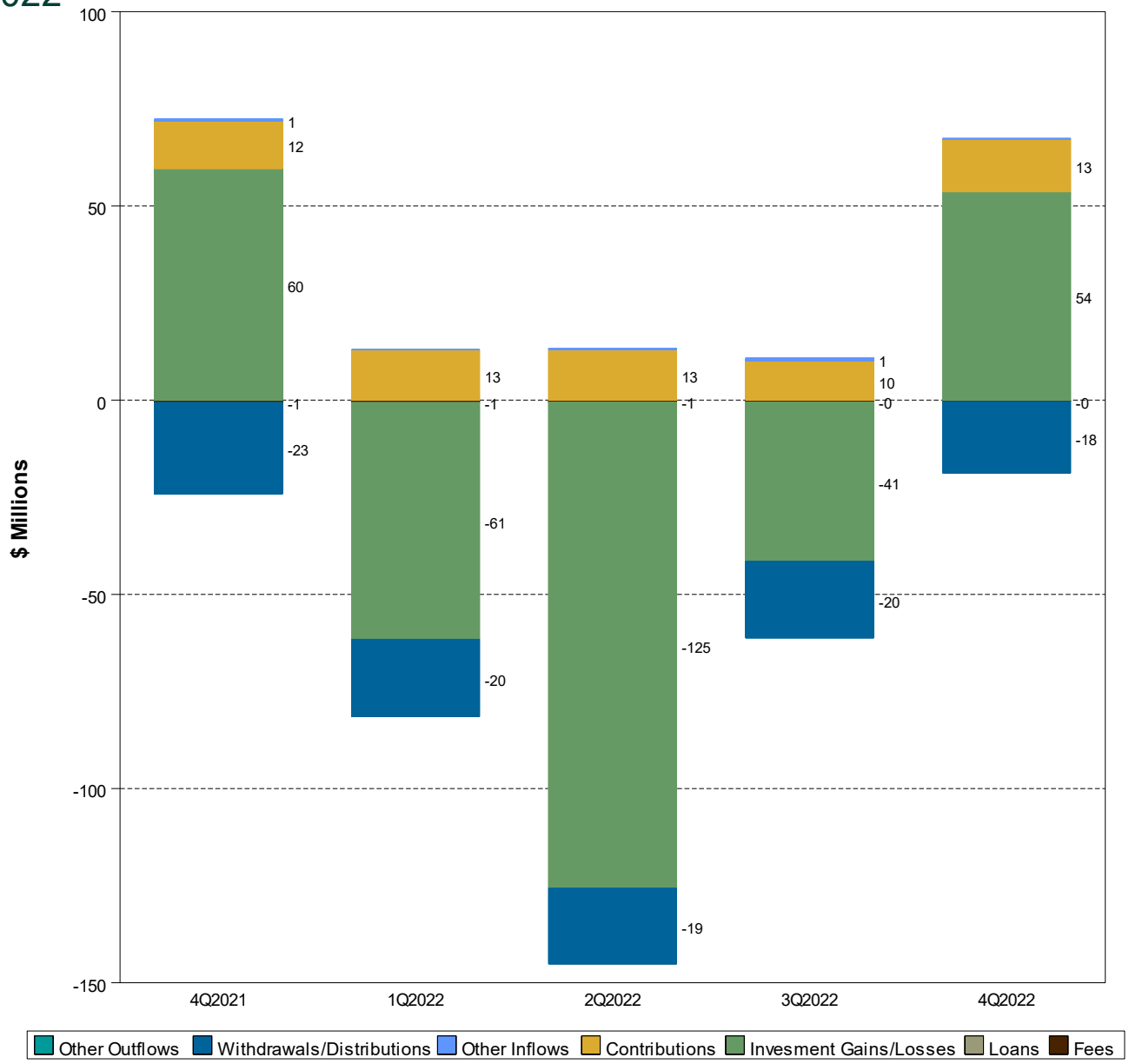
Deferred Comp Plan

December 31, 2022



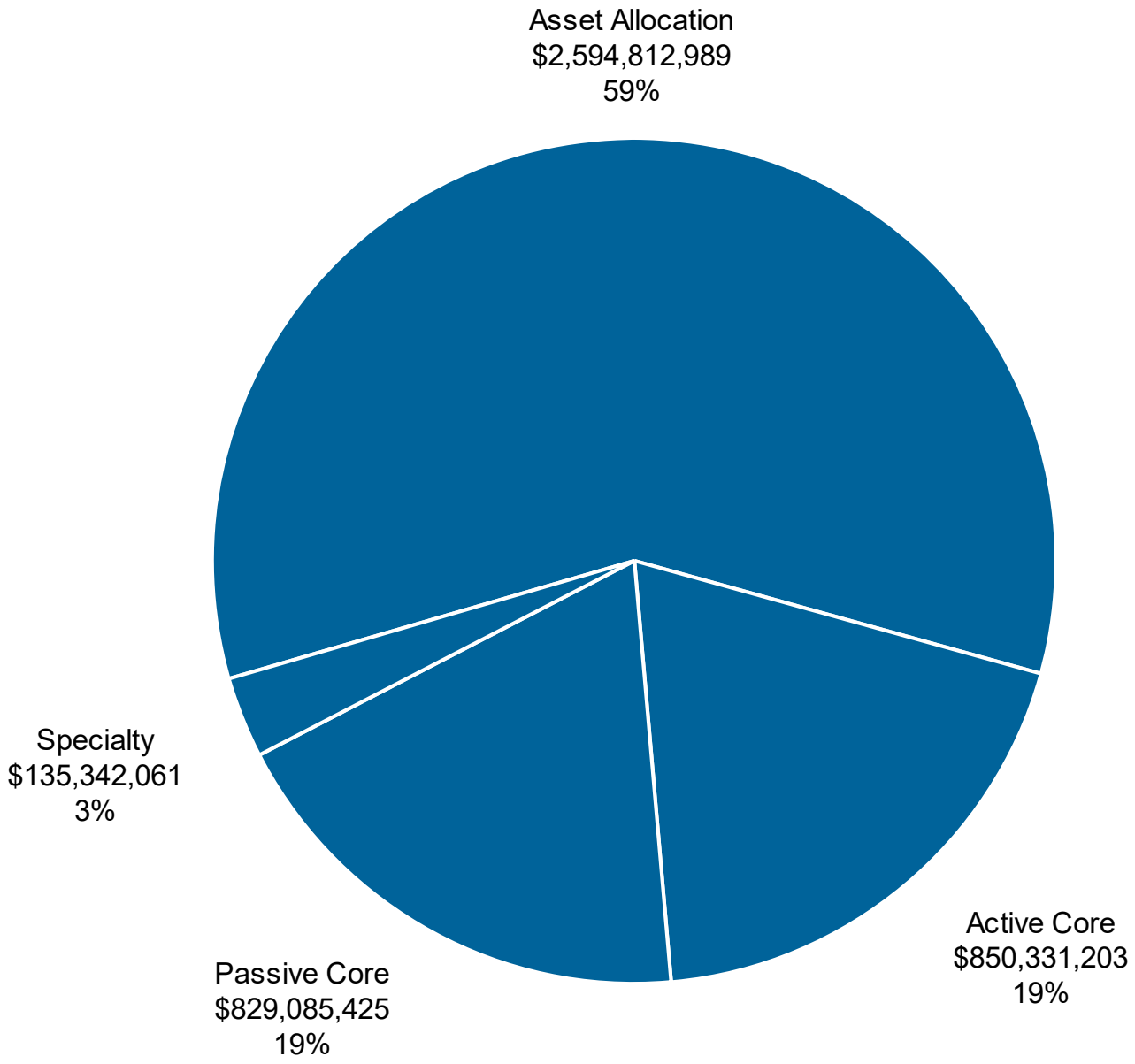
Deferred Comp Plan: Asset Changes

December 31, 2022



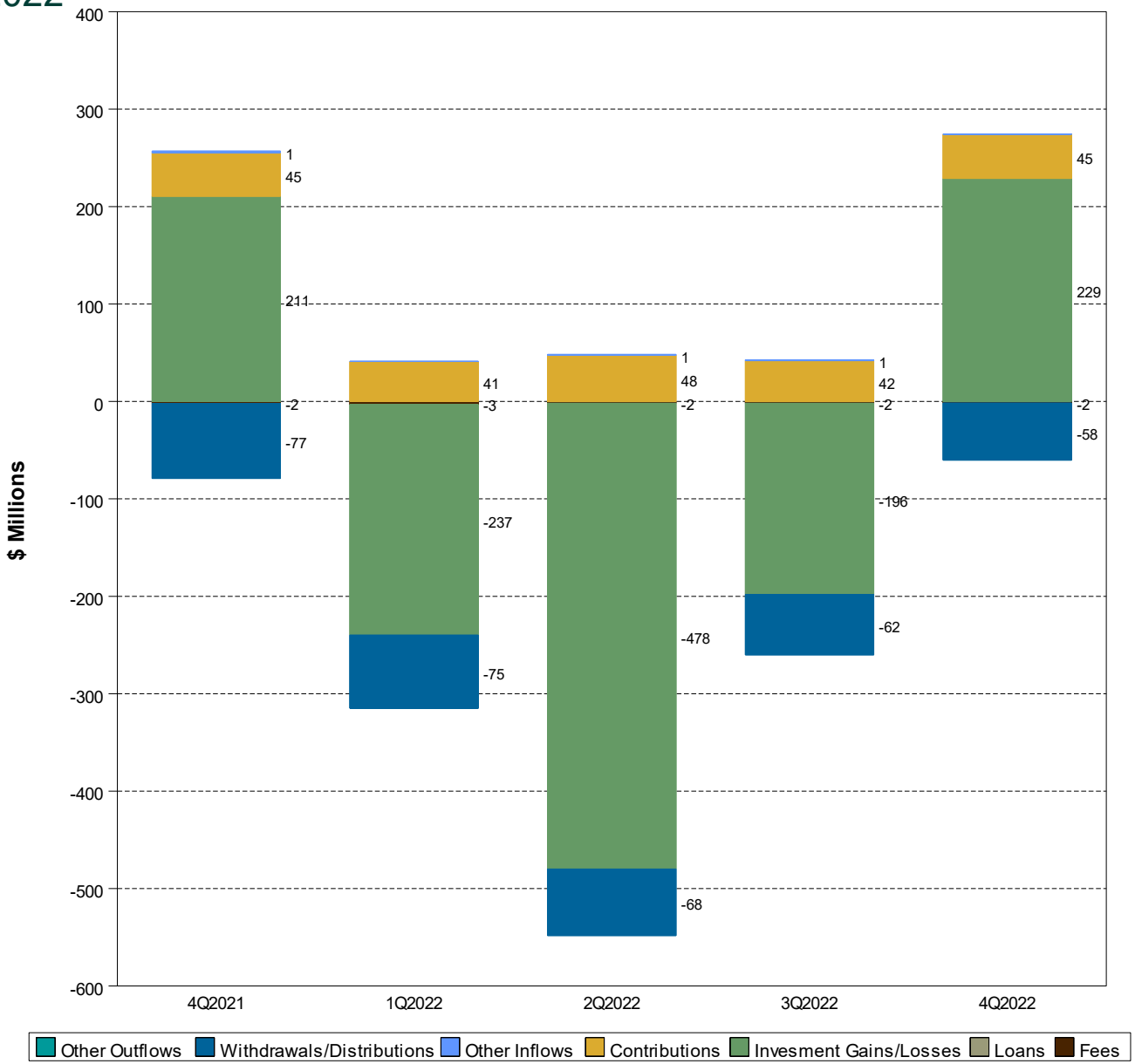
SBS Fund

December 31, 2022



SBS Fund: Asset Changes

December 31, 2022



Individual Account Option Performance: 12/31/22

Balanced & Target Date Funds

Investment Manager	Last Quarter Return	Last Year Return	3 Year Return	5 Year Return	7 Year Return	5 Year Risk	5 Year Risk Quadrant	5 Year Excess Rtn Ratio	3 Year Tracking Error	5 Year Sharpe Ratio
Asset Allocation										
Alaska Balanced Trust	**4.2** 48	**-11.4** 34	**1.4** 22	**3.0** 21	**4.2** 22	**8.3** 67		**0.1** 14	**0.5** 100	**0.2** 11
CAI MA Tgt Alloc Cons MFs										
Passive Target	4.5 36	-11.8 39	1.2 25	3.0 21	4.1 22	8.6 63				0.2 12
Alaska Long-Term Balanced	**6.1** 46	**-13.6** 48	**3.0** 37	**4.4** 31	**6.2** 33	**13.0** 58		**-0.1** 37	**0.5** 100	**0.2** 30
CAI MA Tgt Alloc Mod MFs										
Passive Target	6.4 39	-14.1 53	2.9 40	4.5 31	6.2 32	13.3 54				0.2 30
Target 2010 Trust	**4.4** 56	**-10.6** 16	**1.8** 22	**3.3** 22	**4.6** 33	**9.0** 69		**-0.1** 27	**0.5** 100	**0.2** 14
CAI Tgt Date 2010										
Custom Index	4.7 34	-11.0 17	1.7 23	3.3 21	4.7 30	9.3 56				0.2 14
Target 2015 Trust	**4.8** 66	**-11.2** 14	**2.3** 11	**3.8** 9	**5.4** 18	**10.2** 66		**0.1** 7	**0.5** 100	**0.2** 6
CAI Tgt Date 2015										
Custom Index	5.1 45	-11.7 15	2.1 23	3.7 11	5.3 19	10.6 54				0.2 7
Target 2020 Trust	**5.4** 44	**-12.2** 15	**2.9** 3	**4.3** 4	**6.2** 9	**12.0** 31		**0.1** 3	**0.5** 99	**0.3** 6
CAI Tgt Date 2020										
Custom Index	5.7 26	-12.7 22	2.7 7	4.3 4	6.1 9	12.4 26				0.2 7
Target 2025 Trust	**6.2** 29	**-13.5** 23	**3.4** 3	**4.8** 3	**6.8** 4	**13.9** 25		**0.1** 3	**0.6** 100	**0.3** 5
CAI Tgt Date 2025										
Custom Index	6.5 18	-14.0 32	3.2 5	4.7 3	6.8 4	14.2 19				0.2 6
Target 2030 Trust	**6.9** 40	**-14.4** 23	**3.8** 3	**5.2** 4	**7.4** 4	**15.4** 30		**-0.0** 4	**0.5** 100	**0.3** 7
CAI Tgt Date 2030										
Custom Index	7.1 24	-14.9 30	3.6 5	5.2 4	7.4 4	15.7 25				0.3 8
Target 2035 Trust	**7.5** 64	**-15.2** 16	**4.2** 4	**5.6** 5	**8.0** 6	**16.8** 47		**0.0** 4	**0.5** 100	**0.3** 5
CAI Tgt Date 2035										
Custom Index	7.7 48	-15.7 26	4.0 7	5.6 5	8.0 6	17.1 41				0.3 6
Target 2040 Trust	**8.0** 72	**-15.9** 19	**4.5** 4	**5.9** 4	**8.4** 6	**17.9** 56		**0.0** 4	**0.5** 100	**0.3** 5
CAI Tgt Date 2040										
Custom Index	8.2 64	-16.4 31	4.4 8	5.9 5	8.4 6	18.2 53				0.3 6
Target 2045 Trust	**8.4** 80	**-16.3** 17	**4.8** 5	**6.1** 6	**8.6** 4	**18.8** 70		**0.0** 6	**0.5** 100	**0.3** 4
CAI Tgt Date 2045										
Custom Index	8.6 75	-16.9 28	4.6 8	6.1 6	8.6 4	19.1 60				0.3 4

Returns:
- above median
- third quartile
- fourth quartile

Risk:
- below median
- second quartile
- first quartile

Risk Quadrant:

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

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

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

Individual Account Option Performance: 12/31/22

Balanced & Target Date Funds

Investment Manager	Last Quarter Return	Last Year Return	3 Year Return	5 Year Return	7 Year Return	5 Year Risk	5 Year Risk Quadrant	5 Year Excess Rtn Ratio	3 Year Tracking Error	5 Year Sharpe Ratio
Target 2050 Trust	**8.5** 82	**-16.5** 17	**4.8** 5	**6.1** 5	**8.6** 7	**18.8** 77		**0.1** 4	**0.5** 100	**0.3** 4
CAI Tgt Date 2050 Custom Index	8.7 77	-17.0 28	4.6 9	6.1 5	8.6 7	19.1 69				0.3 5
Target 2055 Trust	**8.5** 89	**-16.5** 16	**4.8** 6	**6.1** 5	**8.6** 6	**18.8** 83		**0.1** 4	**0.5** 100	**0.3** 3
CAI Tgt Date 2055 Custom Index	8.7 85	-17.0 23	4.6 10	6.1 5	8.6 7	19.1 79				0.3 4
Target 2060 Trust	**8.6** 85	**-16.5** 20	**4.7** 10	**6.0** 6	**8.5** 12	**18.9** 80		**-0.1** 11	**0.5** 100	**0.3** 5
CAI Tgt Date 2060 Custom Index	8.7 82	-17.0 24	4.6 12	6.1 6	8.6 11	19.1 77				0.3 5
Target 2065 Trust	**8.4** 88	**-16.6** 10								
CAI Tgt Date 2065 Custom Index	8.7 81	-17.0 12								
JPMorgan SmartRetirementBlend 2015 R6	**4.7** 72	**-13.6** 53								
Callan Target Date 2015 JPMorgan:SR Income MF Idx	5.6 13	-13.4 49	0.3 99	2.3 95	4.0 93	9.8 80				0.1 92
JPMorgan SmartRetirementBlend 2020 R6	**4.6** 78	**-13.7** 48								
Callan Target Date 2020 JPMorgan:SR 2020 MF Index	5.6 39	-13.4 37	0.4 90	2.4 87	4.6 74	10.4 80				0.1 86

Returns:
- above median
- third quartile
- fourth quartile

Risk:
- below median
- second quartile
- first quartile

Risk Quadrant:

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

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

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

Other Options: 12/31/22

Passive Strategies

Investment Manager	Last Quarter Return	Last Year Return	3 Year Return	5 Year Return	7 Year Return	5 Year Risk	5 Year Risk Quadrant	5 Year Excess Rtn Ratio	3 Year Tracking Error	5 Year Sharpe Ratio
Index Funds										
SSgA S&P 500 Index Fund (i)	**7.6** 6	**-18.1** 1	**7.6** 14	**9.4** 9	**11.5** 6	**20.6** 41		**-1.1** 18	**0.0** 82	**0.4** 8
Callan S&P 500 Index MFs										
S&P 500 Index	7.6 6	-18.1 1	7.7 6	9.4 2	11.5 2	20.6 34				0.4 1
SSgA Russell 3000 Index Fund (i)	**7.2** 53	**-19.1** 54	**7.1** 40	**8.8** 39	**11.0** 29	**21.6** 54		**0.4** 11	**0.1** 100	**0.3** 34
CAI Mut Fd: Large Cap Broad Style (Net)										
Russell 3000 Index	7.2 54	-19.2 55	7.1 41	8.8 39	11.0 30	21.6 54				0.3 34
SSgA World Equity ex-US Index Fund (i)	**14.8** 70	**-15.8** 50	**0.3** 64	**1.1** 61	**5.1** 34	**21.1** 74		**0.2** 33	**1.2** 100	**-0.0** 62
CAI MF: Non-U.S. Equity Style										
MSCI ACWI x U.S. Index (Net)	14.3 73	-16.0 55	0.1 67	0.9 66	4.8 44	20.7 83				-0.0 66
BlackRock Passive US Bd Index Fund (i)	**1.7** 61	**-13.1** 30	**-2.8** 80						**0.1** 100	
Callan Core Bond MFs										
Blmbg Aggregate	1.9 34	-13.0 28	-2.7 78	0.0 68	0.9 86	5.5 82				-0.2 73

Returns:
- above median
- third quartile
- fourth quartile

Risk:
- below median
- second quartile
- first quartile

Risk Quadrant:

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

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

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

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

Other Options: 12/31/22

Active Equity, Stable Value, and Money Market

Investment Manager	Last Quarter Return	Last Year Return	3 Year Return	5 Year Return	7 Year Return	5 Year Risk	5 Year Risk Quadrant	5 Year Excess Rtn Ratio	3 Year Tracking Error	5 Year Sharpe Ratio
Active and Other Funds										
BlackRock Strategic Completion Fd	**4.4** 70	**-12.0** 83	**2.4** 88						**0.3** 99	
Callan Real Assets MFs										
Strategic Completion Custom Index	4.4 71	-11.7 83	2.4 88							
Northern Trust ESG Fund	**7.7** 50	**-20.3** 59	**7.5** 35						**0.1** 100	
Callan Lg Cap Broad MF										
MSCI USA ESG	7.6 50	-20.2 58	7.7 31	9.8 20	11.5 17	20.2 83				0.4 16
International Equity Fund	**18.0** 32	**-21.1** 73	**-0.3** 73	**0.8** 67	**3.2** 80	**23.7** 29		**-0.0** 66	**5.2** 64	**-0.0** 66
CAI Mut Fd: Non-U.S. Equity Style										
MSCI ACWI ex US Index	14.3 73	-16.0 55	0.1 67	0.9 66	4.8 44	20.7 83				-0.0 66
T. Rowe Price Small Cap	**4.3** 77	**-23.5** 58	**3.9** 61	**7.9** 21	**10.5** 20	**25.6** 90		**0.6** 6	**6.4** 90	**0.3** 12
CAI Mut Fd: Sm Cap Broad Style										
Russell 2000 Index	6.2 59	-20.4 49	3.1 66	4.1 78	7.9 74	28.7 60				0.1 78
T. Rowe Price Stable Value	**0.5** 21	**1.9** 16	**2.1** 4	**2.3** 1	**2.3** 1	**0.2** 53		**2.1** 7	**0.5** 9	**6.3** 6
Callan Stable Value CT										
FTSE 3 Mo T-Bill	0.9 1	1.5 43	0.7 99	1.2 92	1.0 97	0.5 1				-0.0 92
SSgA Inst Treasury Money Market	**0.8** 48	**1.4** 30	**0.6** 22	**1.1** 12	**0.9** 11	**0.5** 17		**-2.5** 52	**0.1** 95	**-0.2** 13
Callan Money Market Funds										
FTSE 3 Mo T-Bill	0.9 20	1.5 19	0.7 5	1.2 3	1.0 2	0.5 8				-0.0 3

Returns:
- above median
- third quartile
- fourth quartile

Risk:
- below median
- second quartile
- first quartile

Risk Quadrant:

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

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

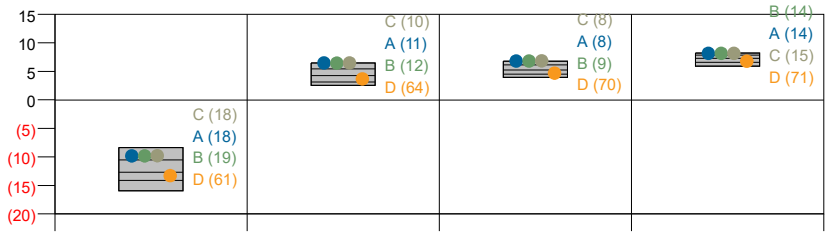
Sharpe Ratio:
- above median
- third quartile
- fourth quartile

Callan

Pension Plans

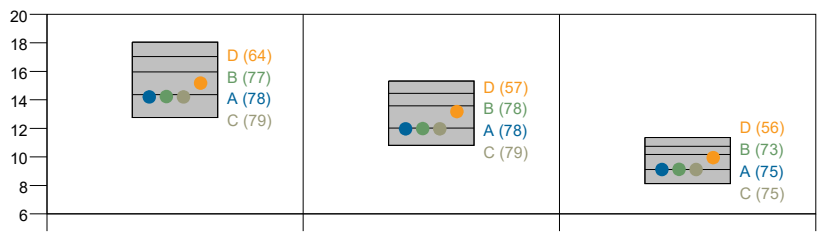
PERS, TRS, and JRS Performance Dashboard – December 31, 2022

Returns vs Callan Public Fund Sponsor Database



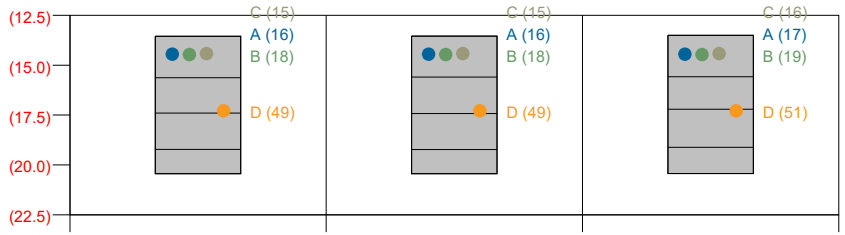
		Last Year	Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile		(8.35)	6.51	6.79	8.25
25th Percentile		(10.53)	5.43	6.15	7.89
Median		(12.66)	4.26	5.26	7.32
75th Percentile		(14.14)	3.16	4.52	6.61
90th Percentile		(15.94)	2.56	3.98	5.91
Member Count		173	172	171	165
Employees' Total Plan	A	(9.80)	6.48	6.85	8.18
Teachers' Total Plan	B	(9.83)	6.47	6.84	8.18
Judicial Total Plan	C	(9.78)	6.50	6.86	8.18
Policy Target	D	(13.27)	3.70	4.72	6.81

Standard Deviation vs Callan Public Fund Sponsor Database



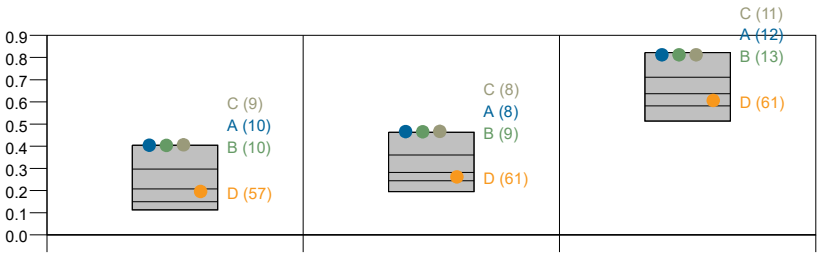
		Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile		18.05	15.33	11.37
25th Percentile		17.05	14.47	10.74
Median		15.97	13.60	10.17
75th Percentile		14.37	12.03	9.12
90th Percentile		12.77	10.82	8.14
Member Count		172	171	165
Employees' Total Plan	A	14.22	11.97	9.12
Teachers' Total Plan	B	14.23	11.99	9.13
Judicial Total Plan	C	14.21	11.97	9.12
Policy Target	D	15.18	13.19	9.96

Maximum Drawdown vs Callan Public Fund Sponsor Database



		Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile		(13.55)	(13.53)	(13.50)
25th Percentile		(15.62)	(15.58)	(15.58)
Median		(17.40)	(17.42)	(17.20)
75th Percentile		(19.21)	(19.23)	(19.11)
90th Percentile		(20.43)	(20.44)	(20.43)
Member Count		172	171	165
Employees' Total Plan	A	(14.44)	(14.44)	(14.44)
Teachers' Total Plan	B	(14.46)	(14.46)	(14.46)
Judicial Total Plan	C	(14.41)	(14.41)	(14.41)
Policy Target	D	(17.28)	(17.28)	(17.28)

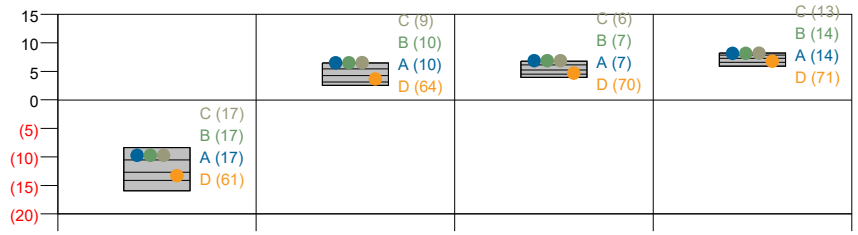
Sharpe Ratio vs Callan Public Fund Sponsor Database



		Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile		0.40	0.46	0.82
25th Percentile		0.30	0.36	0.71
Median		0.21	0.28	0.64
75th Percentile		0.15	0.24	0.58
90th Percentile		0.11	0.20	0.51
Member Count		172	171	165
Employees' Total Plan	A	0.41	0.47	0.81
Teachers' Total Plan	B	0.40	0.47	0.81
Judicial Total Plan	C	0.41	0.47	0.81
Policy Target	D	0.20	0.26	0.61

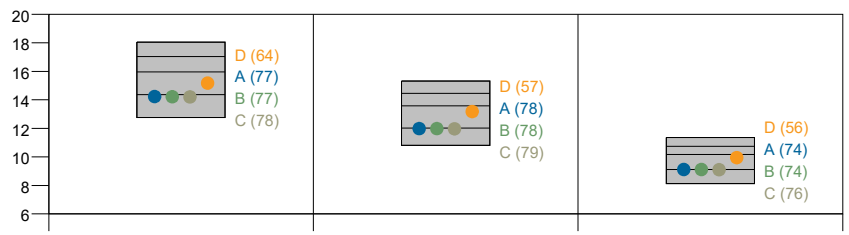
Health Care Plans Performance Dashboard – December 31, 2022

Returns vs Callan Public Fund Sponsor Database



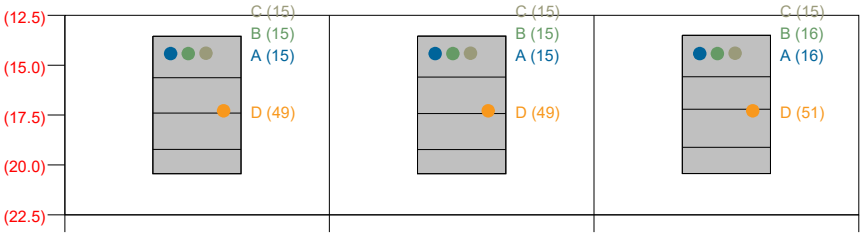
		Last Year	Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile		(8.35)	6.51	6.79	8.25
25th Percentile		(10.53)	5.43	6.15	7.89
Median		(12.66)	4.26	5.26	7.32
75th Percentile		(14.14)	3.16	4.52	6.61
90th Percentile		(15.94)	2.56	3.98	5.91
Member Count		173	172	171	165
PERS Health Plan	A	(9.72)	6.54	6.90	8.19
TRS Health Plan	B	(9.72)	6.54	6.90	8.19
JRS Health Plan	C	(9.70)	6.55	6.91	8.20
Policy Target	D	(13.27)	3.70	4.72	6.81

Standard Deviation vs Callan Public Fund Sponsor Database



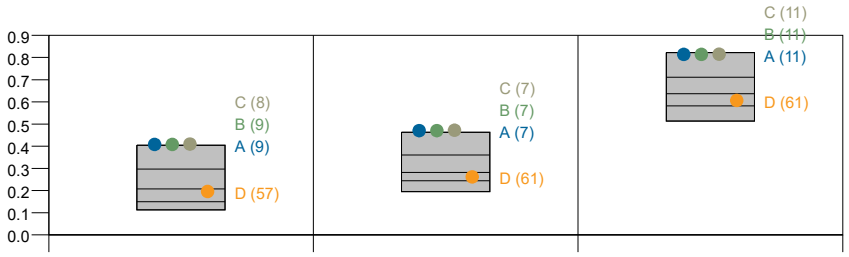
		Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile		18.05	15.33	11.37
25th Percentile		17.05	14.47	10.74
Median		15.97	13.60	10.17
75th Percentile		14.37	12.03	9.12
90th Percentile		12.77	10.82	8.14
Member Count		172	171	165
PERS Health Plan	A	14.23	11.99	9.12
TRS Health Plan	B	14.23	11.99	9.12
JRS Health Plan	C	14.21	11.97	9.11
Policy Target	D	15.18	13.19	9.96

Maximum Drawdown vs Callan Public Fund Sponsor Database



		Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile		(13.55)	(13.53)	(13.50)
25th Percentile		(15.62)	(15.58)	(15.58)
Median		(17.40)	(17.42)	(17.20)
75th Percentile		(19.21)	(19.23)	(19.11)
90th Percentile		(20.43)	(20.44)	(20.43)
Member Count		172	171	165
PERS Health Plan	A	(14.41)	(14.41)	(14.41)
TRS Health Plan	B	(14.41)	(14.41)	(14.41)
JRS Health Plan	C	(14.39)	(14.39)	(14.39)
Policy Target	D	(17.28)	(17.28)	(17.28)

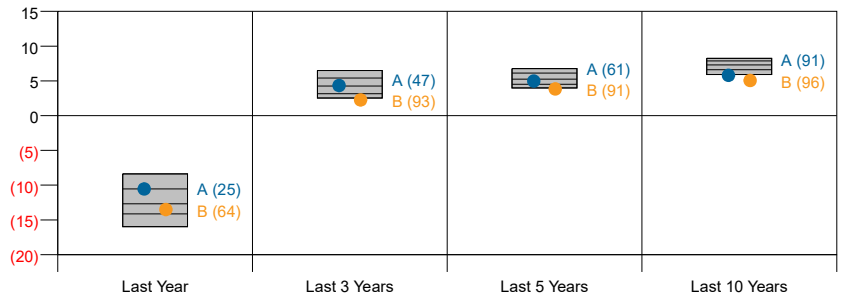
Sharpe Ratio vs Callan Public Fund Sponsor Database



		Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile		0.40	0.46	0.82
25th Percentile		0.30	0.36	0.71
Median		0.21	0.28	0.64
75th Percentile		0.15	0.24	0.58
90th Percentile		0.11	0.20	0.51
Member Count		172	171	165
PERS Health Plan	A	0.41	0.47	0.81
TRS Health Plan	B	0.41	0.47	0.81
JRS Health Plan	C	0.41	0.47	0.82
Policy Target	D	0.20	0.26	0.61

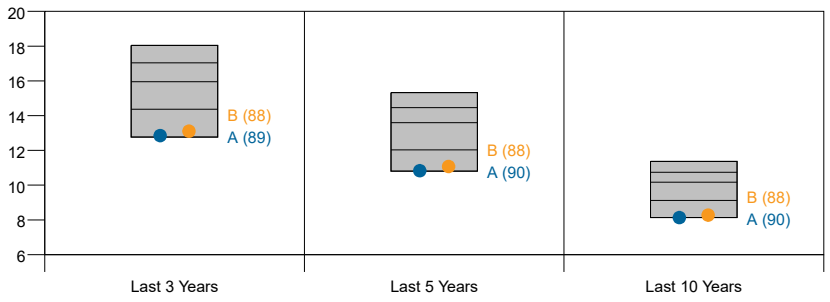
Military Plan Performance Dashboard – December 31, 2022

Returns vs Callan Public Fund Sponsor Database



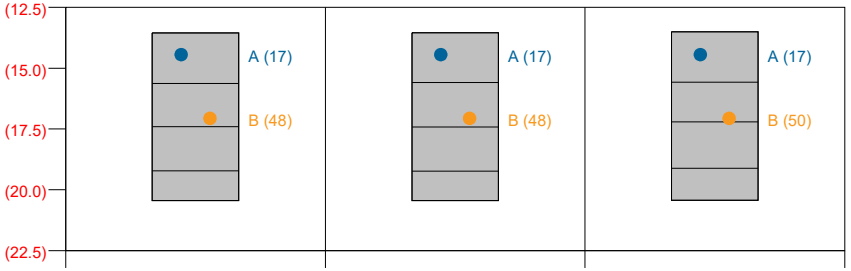
	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile	(8.35)	6.51	6.79	8.25
25th Percentile	(10.53)	5.43	6.15	7.89
Median	(12.66)	4.26	5.26	7.32
75th Percentile	(14.14)	3.16	4.52	6.61
90th Percentile	(15.94)	2.56	3.98	5.91
Member Count	173	172	171	165
Military Total Plan (A)	(10.53)	4.34	4.98	5.80
Military Policy Target (B)	(13.50)	2.28	3.85	5.06

Standard Deviation vs Callan Public Fund Sponsor Database



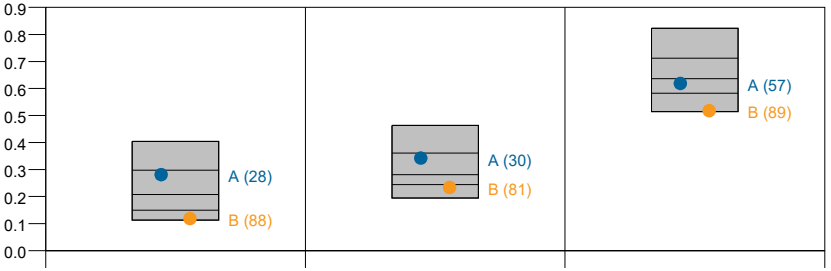
	Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile	18.05	15.33	11.37
25th Percentile	17.05	14.47	10.74
Median	15.97	13.60	10.17
75th Percentile	14.37	12.03	9.12
90th Percentile	12.77	10.82	8.14
Member Count	172	171	165
Military Total Plan (A)	12.86	10.83	8.14
Military Policy Target (B)	13.11	11.08	8.29

Maximum Drawdown vs Callan Public Fund Sponsor Database



	Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile	(13.55)	(13.53)	(13.50)
25th Percentile	(15.62)	(15.58)	(15.58)
Median	(17.40)	(17.42)	(17.20)
75th Percentile	(19.21)	(19.23)	(19.11)
90th Percentile	(20.43)	(20.44)	(20.43)
Member Count	172	171	165
Military Total Plan (A)	(14.44)	(14.44)	(14.44)
Military Policy Target (B)	(17.06)	(17.06)	(17.06)

Sharpe Ratio vs Callan Public Fund Sponsor Database

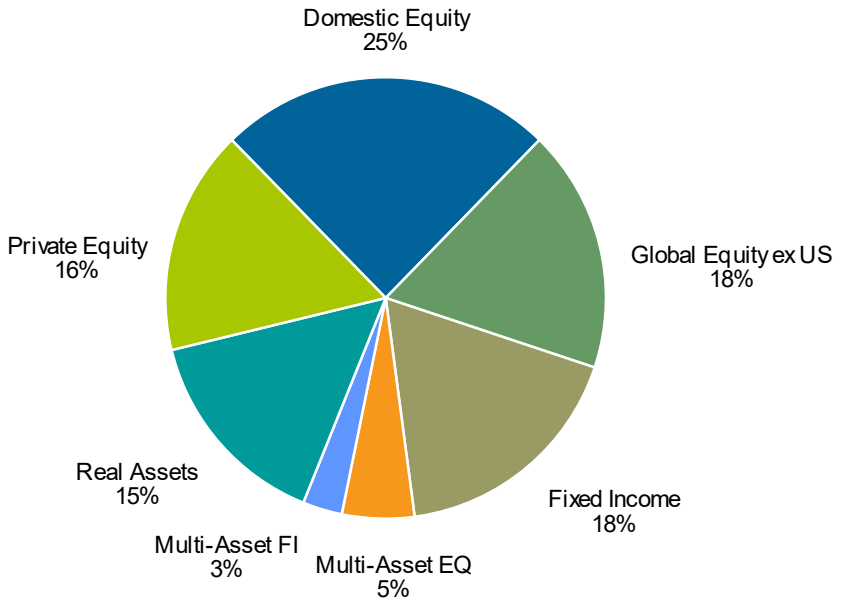


	Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile	0.40	0.46	0.82
25th Percentile	0.30	0.36	0.71
Median	0.21	0.28	0.64
75th Percentile	0.15	0.24	0.58
90th Percentile	0.11	0.20	0.51
Member Count	172	171	165
Military Total Plan (A)	0.28	0.34	0.62
Military Policy Target (B)	0.12	0.23	0.52

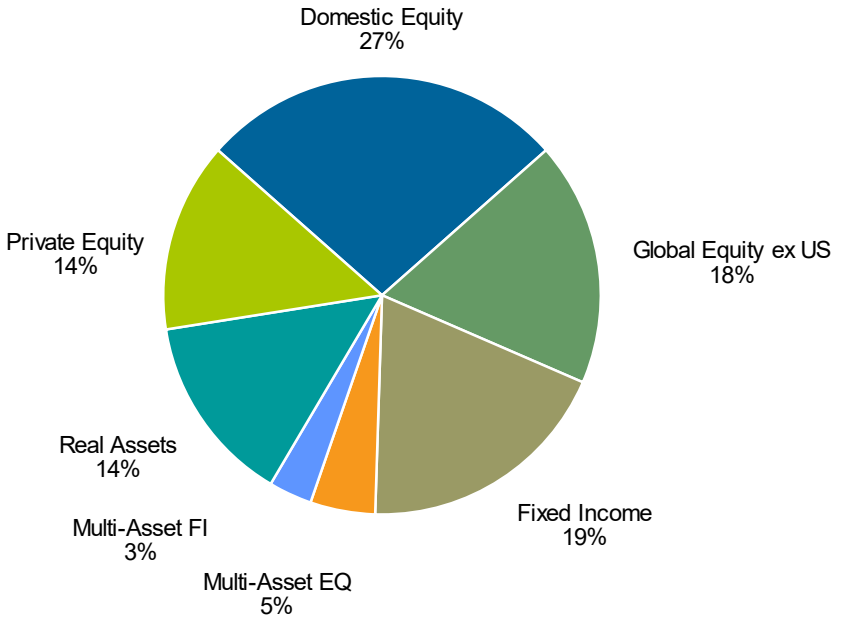
Asset Allocation – Public Employees' Retirement System

Quarter Ending December 31, 2022

Actual Asset Allocation



Target Asset Allocation



Asset Class	$000s Actual	Weight Actual	Target	Percent Difference	$000s Difference
Domestic Equity	2,618,472	24.6%	27.0%	(2.4%)	(256,400)
Global Equity ex US	1,897,444	17.8%	18.0%	(0.2%)	(19,138)
Fixed Income	1,899,790	17.8%	19.0%	(1.2%)	(123,268)
Multi-Asset EQ	569,267	5.3%	4.8%	0.5%	58,178
Multi-Asset FI	307,151	2.9%	3.2%	(0.3%)	(33,574)
Real Assets	1,603,702	15.1%	14.0%	1.1%	113,027
Private Equity	1,751,848	16.5%	14.0%	2.5%	261,174
Total	10,647,674	100.0%	100.0%		

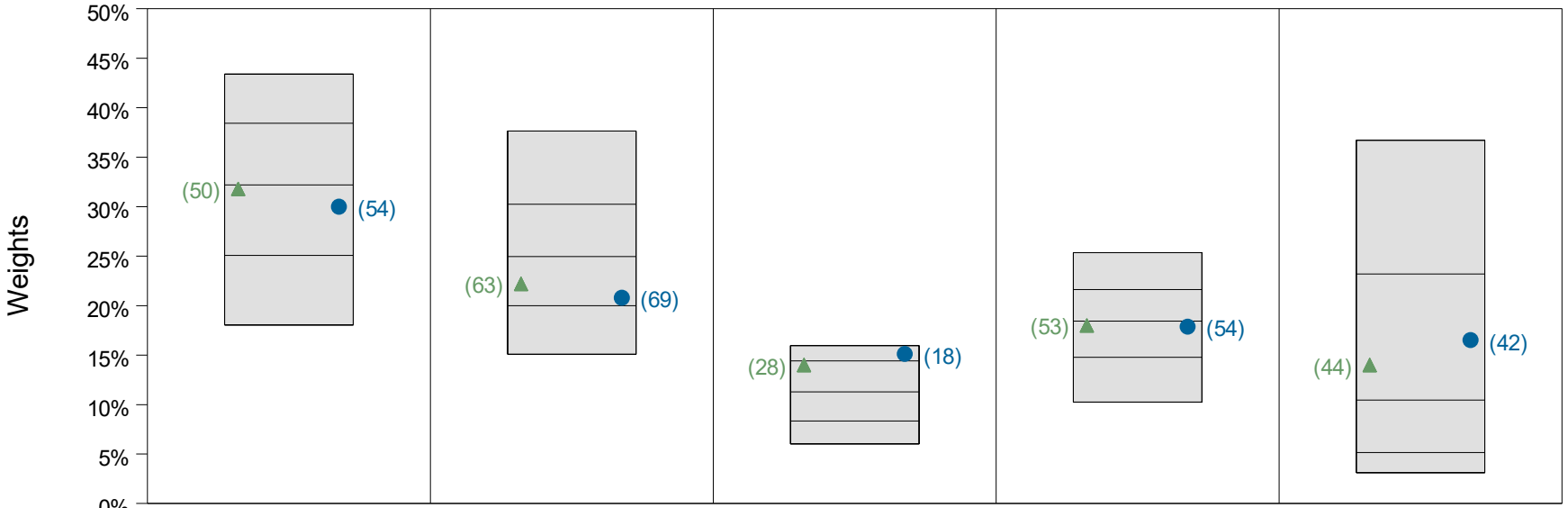
PERS is used as illustrative throughout the presentation.

The other plans exhibit modest variations from strategic target allocations.

Asset Allocation vs. Public Funds (PERS)

Callan Public Fund Database

Asset Class Weights vs Callan Public Fund Sponsor Database



	Domestic Broad Eq	Domestic Fixed	Real Assets	Global Equity ex US	Other Alternatives
10th Percentile	43.40	37.64	15.97	25.34	36.72
25th Percentile	38.42	30.25	14.41	21.63	23.19
Median	32.20	24.97	11.29	18.43	10.46
75th Percentile	25.07	19.99	8.34	14.78	5.15
90th Percentile	18.03	15.09	6.03	10.25	3.11
Fund ●	29.94	20.73	15.06	17.82	16.45
Target ▲	31.80	22.20	14.00	18.00	14.00

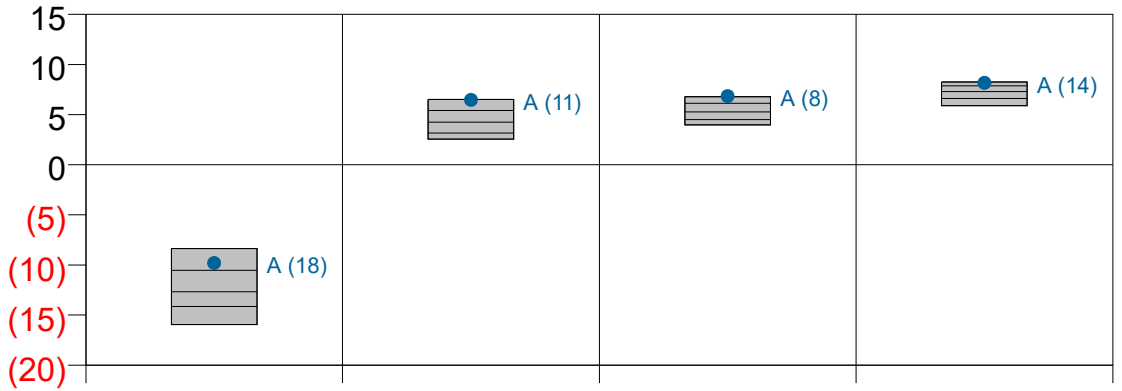
- Asset class allocations near targets after the asset allocation update and associated rebalancing.
- Weightings to real assets and alternatives are relatively high in comparison to other public funds.

Notes: Real Assets includes Private Real Estate, REITs, Farmland, Timber, Energy, and Infrastructure. Other Alternatives represents private equity.

Total Fund Return vs Public Funds (PERS)

Callan Public Fund Database

Gross of Fee Returns
for Periods Ended December 31, 2022
Group: Callan Public Fund Sponsor Database



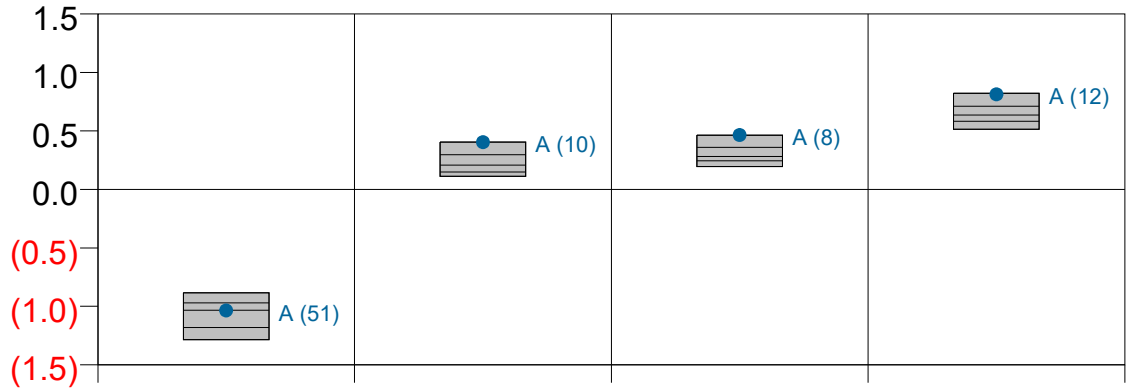
	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile	(8.35)	6.51	6.79	8.25
25th Percentile	(10.53)	5.43	6.15	7.89
Median	(12.66)	4.26	5.26	7.32
75th Percentile	(14.14)	3.16	4.52	6.61
90th Percentile	(15.94)	2.56	3.98	5.91
Member Count	173	172	171	165
PERS - Total Fund ● A	(9.80)	6.48	6.85	8.18

- Despite the recent change to the asset allocation, longer-term performance reflects ARMB's prior orientation toward capital growth as opposed to income generation.
- Performance was above the Public Funds median for the one-, three-, five-, and ten-year periods.

Total Fund Sharpe Ratio Rankings vs Public Funds (PERS)

Callan Public Fund Database

Gross of Fee Sharpe Ratio
for Periods Ended December 31, 2022
Group: Callan Public Fund Sponsor Database



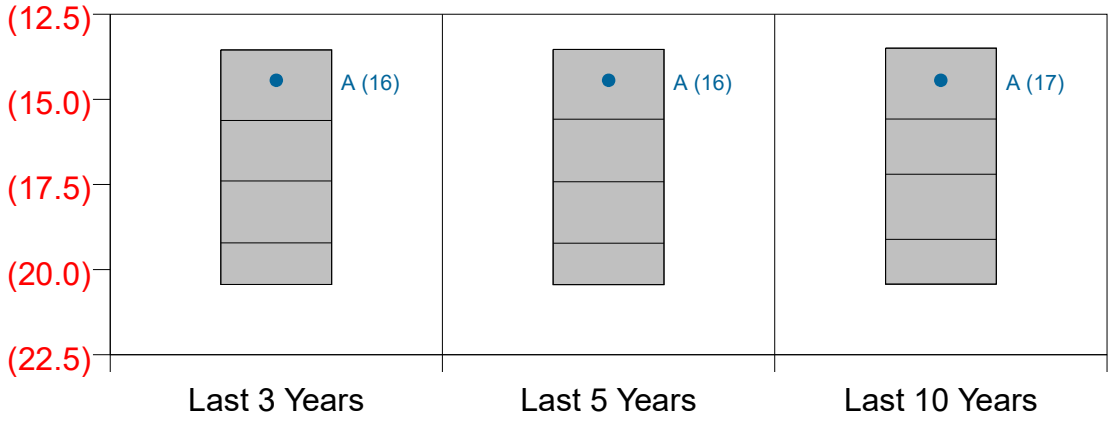
	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile	(0.88)	0.40	0.46	0.82
25th Percentile	(0.97)	0.30	0.36	0.71
Median	(1.03)	0.21	0.28	0.64
75th Percentile	(1.18)	0.15	0.24	0.58
90th Percentile	(1.28)	0.11	0.20	0.51
Member Count	173	172	171	165
PERS - Total Fund ● A	(1.03)	0.41	0.47	0.81

- "Sharpe ratio" is a risk-adjusted measure of excess return above the risk-free rate.
- ARMB's risk-adjusted return (Sharpe ratio) was above the Public Funds median for the three-, five-, and ten-year periods.

Total Maximum Drawdown Rankings vs Public Funds (PERS)

Callan Public Fund Database

Gross of Fee Maximum Drawdown
for Periods Ended December 31, 2022
Group: Callan Public Fund Sponsor Database



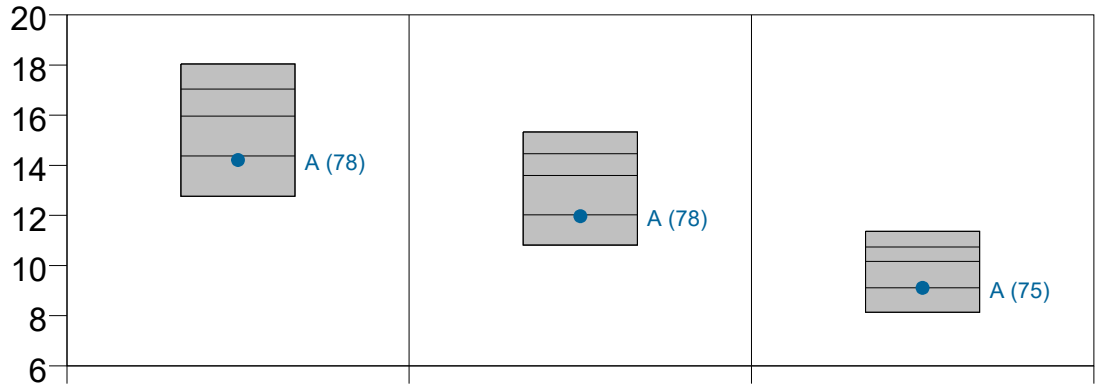
	Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile	(13.55)	(13.53)	(13.50)
25th Percentile	(15.62)	(15.58)	(15.58)
Median	(17.40)	(17.42)	(17.20)
75th Percentile	(19.21)	(19.23)	(19.11)
90th Percentile	(20.43)	(20.44)	(20.43)
Member Count	172	171	165
PERS - Total Fund ● A	(14.44)	(14.44)	(14.44)

- "Maximum drawdown" is a measure of the largest loss from peak to trough in each period.
- Lower rankings reflect larger drawdowns (i.e. bigger losses). ARMB's drawdown rankings for all periods have reflected better than average drawdowns (i.e. lower losses) and have improved over time.
- The drawdown experienced in the first quarter of 2020 is the largest of the last 10 years.

Standard Deviation Ranking vs Public Funds (PERS)

Callan Public Fund Database

Gross of Fee Standard Deviation
for Periods Ended December 31, 2022
Group: Callan Public Fund Sponsor Database



	Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile	18.05	15.33	11.37
25th Percentile	17.05	14.47	10.74
Median	15.97	13.60	10.17
75th Percentile	14.37	12.03	9.12
90th Percentile	12.77	10.82	8.14
Member Count	172	171	165
PERS - Total Fund ● A	14.22	11.97	9.12

- "Standard deviation" measures variability of returns. It is one measurement of investment risk.
- Less standard deviation results in lower rankings. A lower ranking of standard deviation suggests lower variability.
- ARMB's portfolio diversification has resulted in volatility that is lower than median compared to peers.

PERS Performance Attribution – 4th Quarter 2022 & Trailing Year

Relative Attribution Effects for Quarter ended December 31, 2022

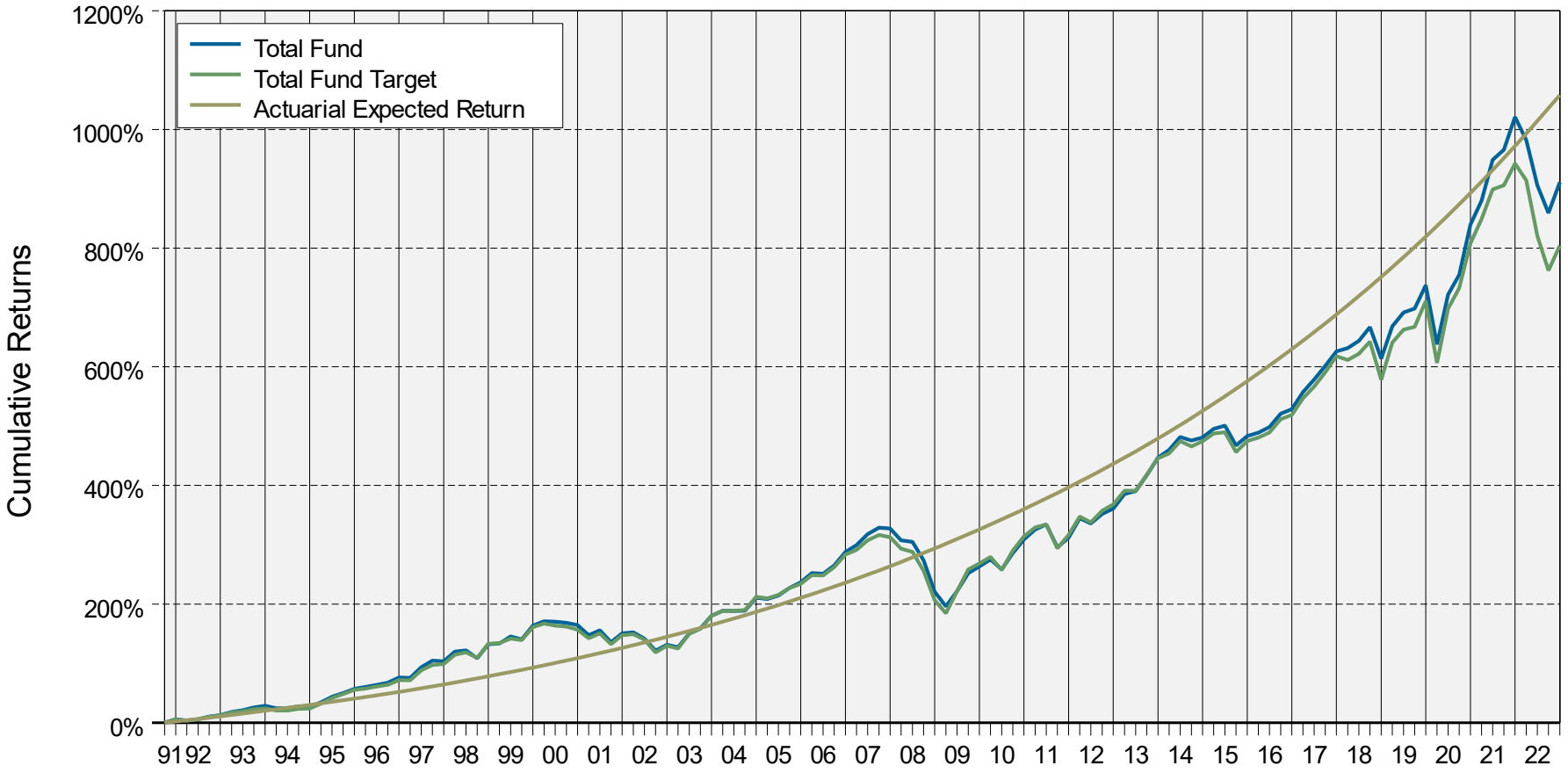
Asset Class	Effective Actual Weight	Effective Target Weight	Actual Return	Target Return	Manager Effect	Asset Allocation	Total Relative Return
Domestic Equity	24%	27%	8.34%	7.18%	0.28%	(0.06%)	0.22%
Fixed-Income	18%	19%	2.02%	1.82%	0.04%	0.02%	0.06%
Multi-Asset	8%	8%	3.72%	6.66%	(0.24%)	0.01%	(0.24%)
Real Assets	16%	14%	0.68%	1.75%	(0.17%)	(0.05%)	(0.22%)
Global Equity ex US	16%	18%	15.23%	14.15%	0.18%	(0.15%)	0.03%
Private Equity	17%	14%	0.51%	(5.48%)	1.03%	(0.31%)	0.72%
Total			**5.42%**	**= 4.84%**	**+ 1.11%**	**+ (0.54%)**	**0.57%**

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	26%	27%	(17.16%)	(19.21%)	0.55%	(0.11%)	0.44%
Fixed-Income	20%	20%	(9.65%)	(12.32%)	0.55%	0.06%	0.61%
Multi-Asset	7%	7%	(13.47%)	(16.07%)	0.12%	0.00%	0.13%
Real Assets	14%	14%	7.35%	9.15%	(0.20%)	(0.20%)	(0.40%)
Global Equity ex US	17%	18%	(16.82%)	(16.58%)	(0.04%)	(0.04%)	(0.08%)
Private Equity	16%	14%	(1.73%)	(21.37%)	3.21%	(0.45%)	2.76%
Total			**(9.80%)**	**= (13.27%)**	**+ 4.20%**	**+ (0.74%)**	**3.47%**

PERS Long-Term Total Fund Performance as of 12/31/2022

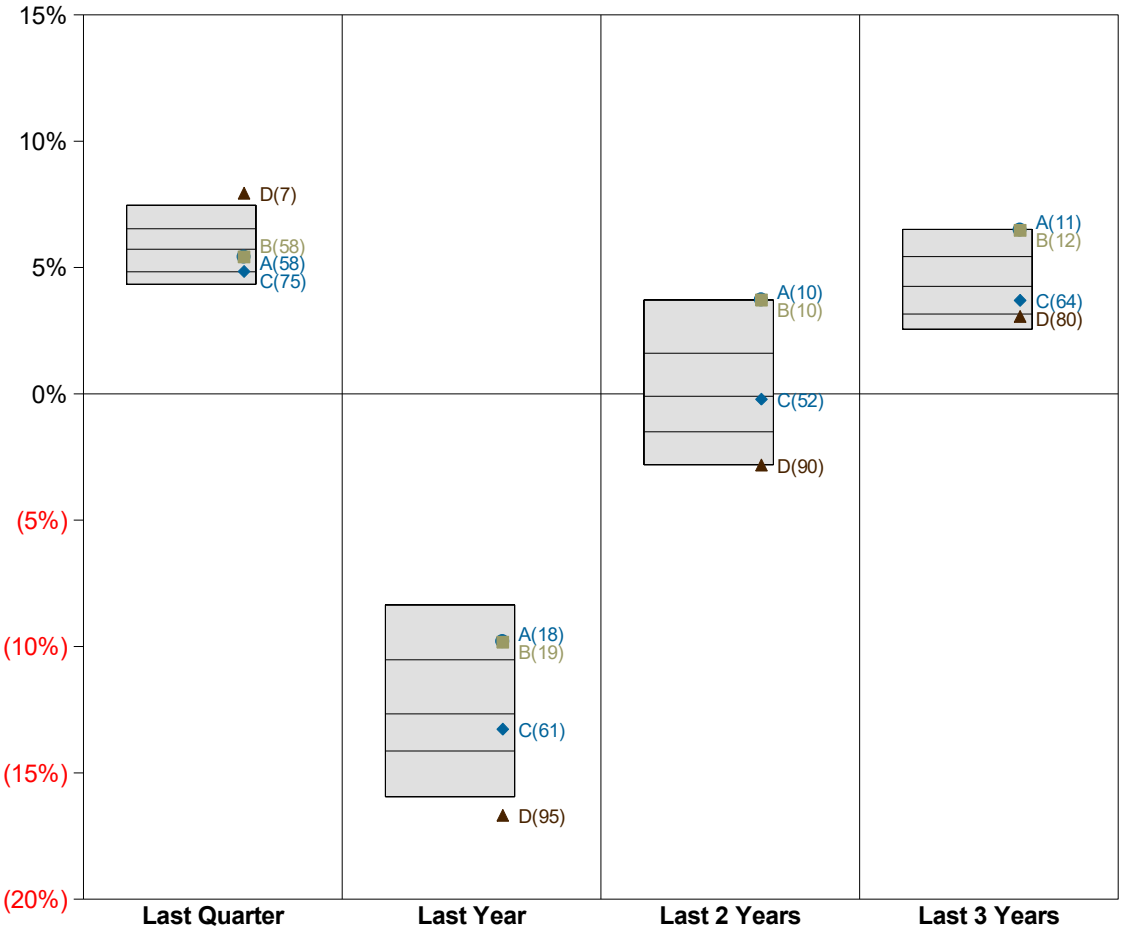
Cumulative Returns Actual vs Target



- 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.
- Market correction setbacks in 3Q15, 4Q18, 1Q20, and 2022 have hindered the Total Fund's progress toward closing the gap versus the actuarial return following the Global Financial Crisis of 2008/2009.

Annualized Total Fund Returns as of 12/31/22

Callan Public Fund Database



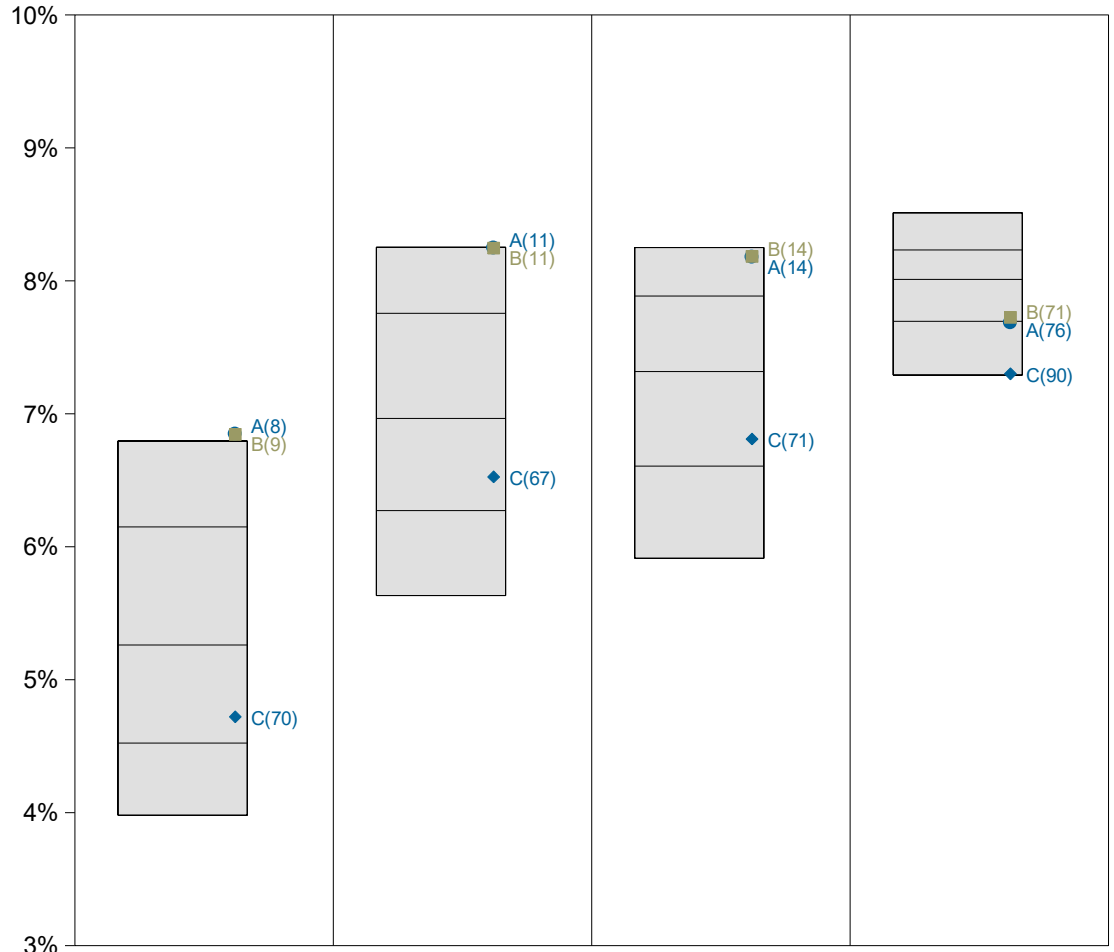
	Last Quarter	Last Year	Last 2 Years	Last 3 Years
10th Percentile	7.46	(8.35)	3.72	6.51
25th Percentile	6.54	(10.53)	1.61	5.43
Median	5.72	(12.66)	(0.09)	4.26
75th Percentile	4.84	(14.14)	(1.50)	3.16
90th Percentile	4.34	(15.94)	(2.81)	2.56
PERS Total Plan ● A	5.42	(9.80)	3.72	6.48
TRS Total Plan ■ B	5.42	(9.83)	3.71	6.47
Target Index ◆ C	4.84	(13.27)	(0.21)	3.70
Public Market Proxy ▲ D	7.94	(16.68)	(2.82)	3.07

- PERS and TRS have outperformed their target for the last quarter, year, two-year and three-year periods.

The Public Market Proxy consists of 45% Russell 3000 Index, 30% MSCI ACWI ex US IMI (Net), and 25% Bloomberg Aggregate Index.

Longer-Term Total Fund Returns as of 12/31/22

Callan Public Fund Database

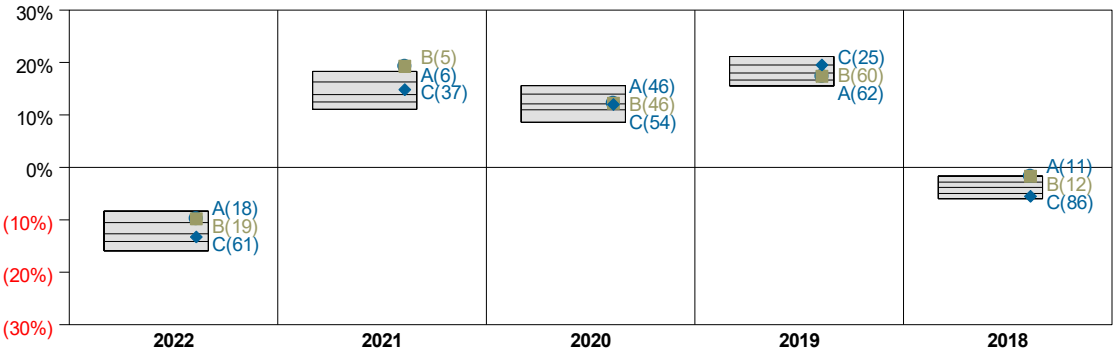


		Last 5 Years	Last 6 Years	Last 10 Years	Last 31-1/4 Years
10th Percentile		6.79	8.25	8.25	8.51
25th Percentile		6.15	7.76	7.89	8.23
Median		5.26	6.96	7.32	8.01
75th Percentile		4.52	6.27	6.61	7.69
90th Percentile		3.98	5.63	5.91	7.29
PERS Total Plan	A	6.85	8.25	8.18	7.68
TRS Total Plan	B	6.84	8.25	8.18	7.73
Target Index	C	4.72	6.53	6.81	7.30

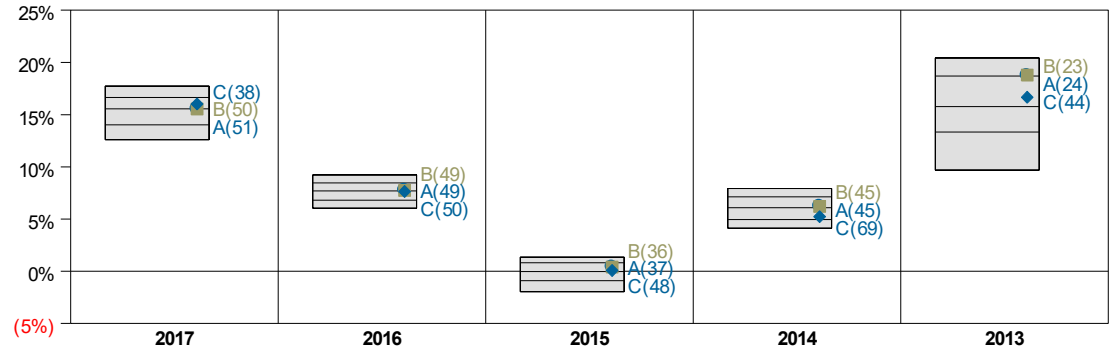
- Five-, six-, and ten-year performance is above target and median.
- 31-year and one quarter return for PERS beat the target by 38 basis points.

Calendar Period Total Fund Performance

Callan Public Fund Database



	2022	2021	2020	2019	2018
10th Percentile	(8.35)	18.29	15.60	21.15	(1.65)
25th Percentile	(10.53)	16.28	13.96	19.52	(2.80)
Median	(12.66)	13.88	12.09	18.01	(3.84)
75th Percentile	(14.14)	12.46	11.00	16.66	(4.97)
90th Percentile	(15.94)	11.08	8.59	15.52	(5.98)
PERS Total Plan (A)	(9.80)	19.27	12.23	17.34	(1.70)
TRS Total Plan (B)	(9.83)	19.28	12.21	17.36	(1.70)
Target Index (C)	(13.27)	14.81	11.99	19.54	(5.53)



	2017	2016	2015	2014	2013
10th Percentile	17.73	9.23	1.36	7.92	20.43
25th Percentile	16.64	8.46	0.82	7.14	18.70
Median	15.55	7.69	(0.02)	6.07	15.78
75th Percentile	14.03	6.81	(0.90)	4.96	13.34
90th Percentile	12.59	6.04	(1.96)	4.13	9.70
PERS Total Plan (A)	15.52	7.74	0.40	6.22	18.74
TRS Total Plan (B)	15.54	7.74	0.41	6.22	18.79
Target Index (C)	16.03	7.64	0.08	5.24	16.66

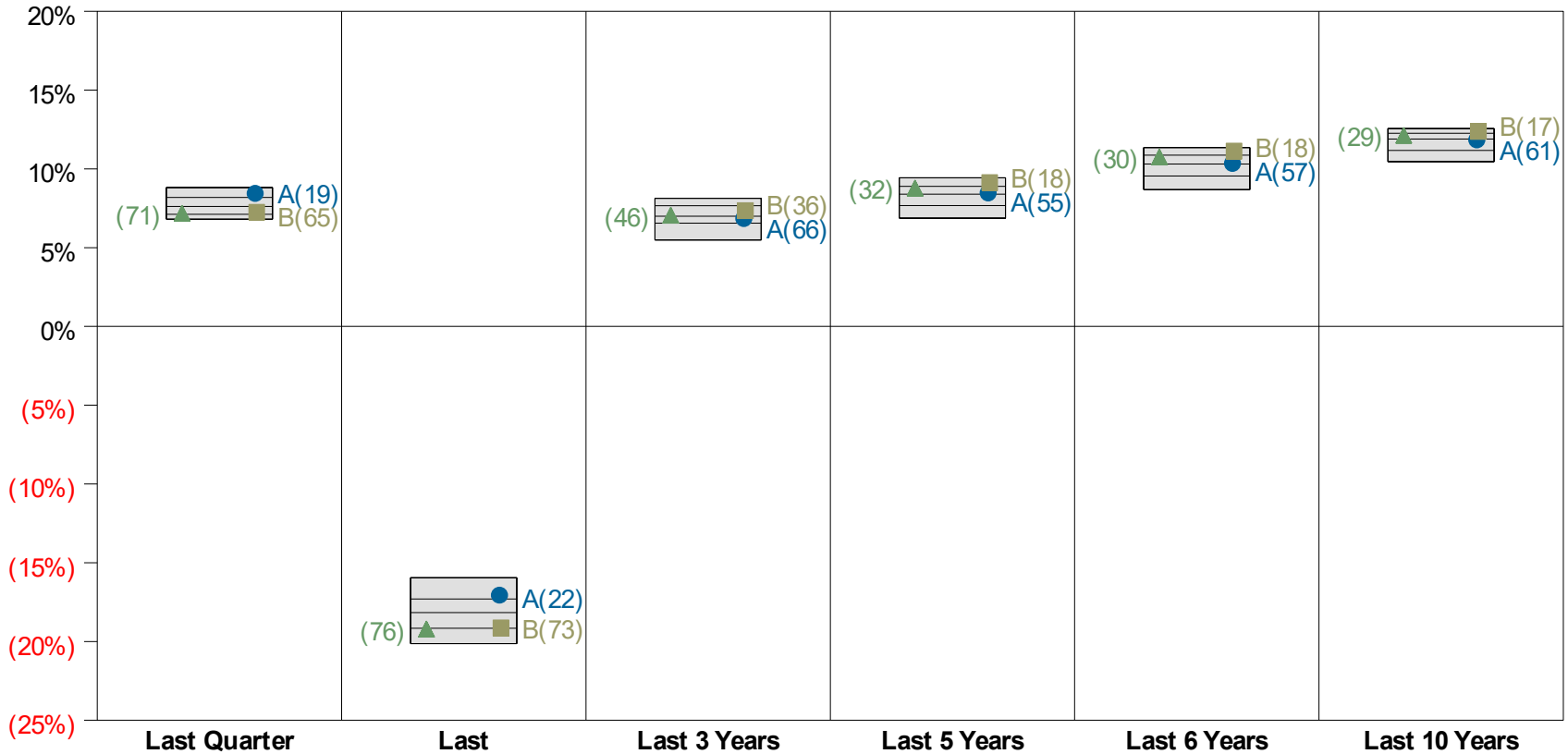
- PERS and TRS rank at or above median in nine of the ten periods shown.
- Peer group range of returns during 2016, 2015, and 2014 were very tight.
- Wide range of peer group returns during calendar 2013 due to varying fixed-income allocations within the Public Fund universe.
- In the three periods with negative Public Fund returns (calendar year to date 2022, 2018, and 2015), ARMB's results ranked well above median in the Public Fund universe.

Callan

Pension Plan – Asset Class Performance

Total Domestic Equity through 12/31/22

Performance vs Public Fund - Domestic Equity (Gross)



	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 6 Years	Last 10 Years
10th Percentile	8.82	(15.94)	8.13	9.44	11.35	12.57
25th Percentile	8.19	(17.29)	7.67	8.89	10.87	12.26
Median	7.62	(18.16)	7.00	8.40	10.31	11.90
75th Percentile	7.11	(19.16)	6.56	7.67	9.55	11.18
90th Percentile	6.82	(20.13)	5.48	6.87	8.70	10.46
Domestic Equity Pool ● A	8.34	(17.16)	6.74	8.37	10.24	11.73
Russell 1000 Index ■ B	7.24	(19.13)	7.35	9.13	11.13	12.37
Russell 3000 Index ▲	7.18	(19.21)	7.07	8.79	10.75	12.13

Domestic Equity Component Returns

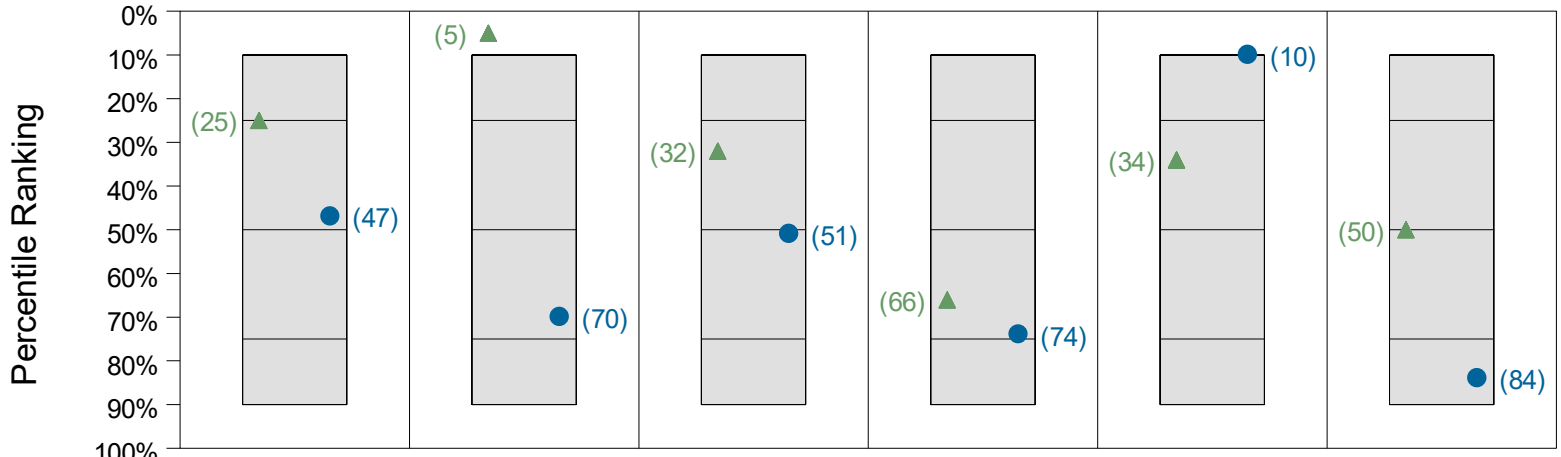
Returns for Periods Ended December 31, 2022

	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
Total Dom Equity Pool	8.34%	(17.16%)	6.74%	8.37%	11.73%
Russell 3000 Index	7.18%	(19.21%)	7.07%	8.79%	12.13%
Large Cap Managers	8.26%	(17.26%)	6.77%	8.57%	12.09%
Russell 1000 Index	7.24%	(19.13%)	7.35%	9.13%	12.37%
Small Cap Managers	9.20%	(16.16%)	5.53%	6.38%	10.57%
Russell 2000 Index	6.23%	(20.44%)	3.10%	4.13%	9.01%

- The large cap composite trailed its benchmark (the Russell 1000 Index) for the trailing 3-, 5-, and 10-year periods and outperformed over the last quarter and 1-year.
- The small cap composite has outperformed its benchmark (the Russell 2000 Index) over all periods shown.

Domestic Equity Portfolio Characteristics

Portfolio Characteristics Percentile Rankings
Rankings Against Public Fund - Domestic Equity
as of December 31, 2022

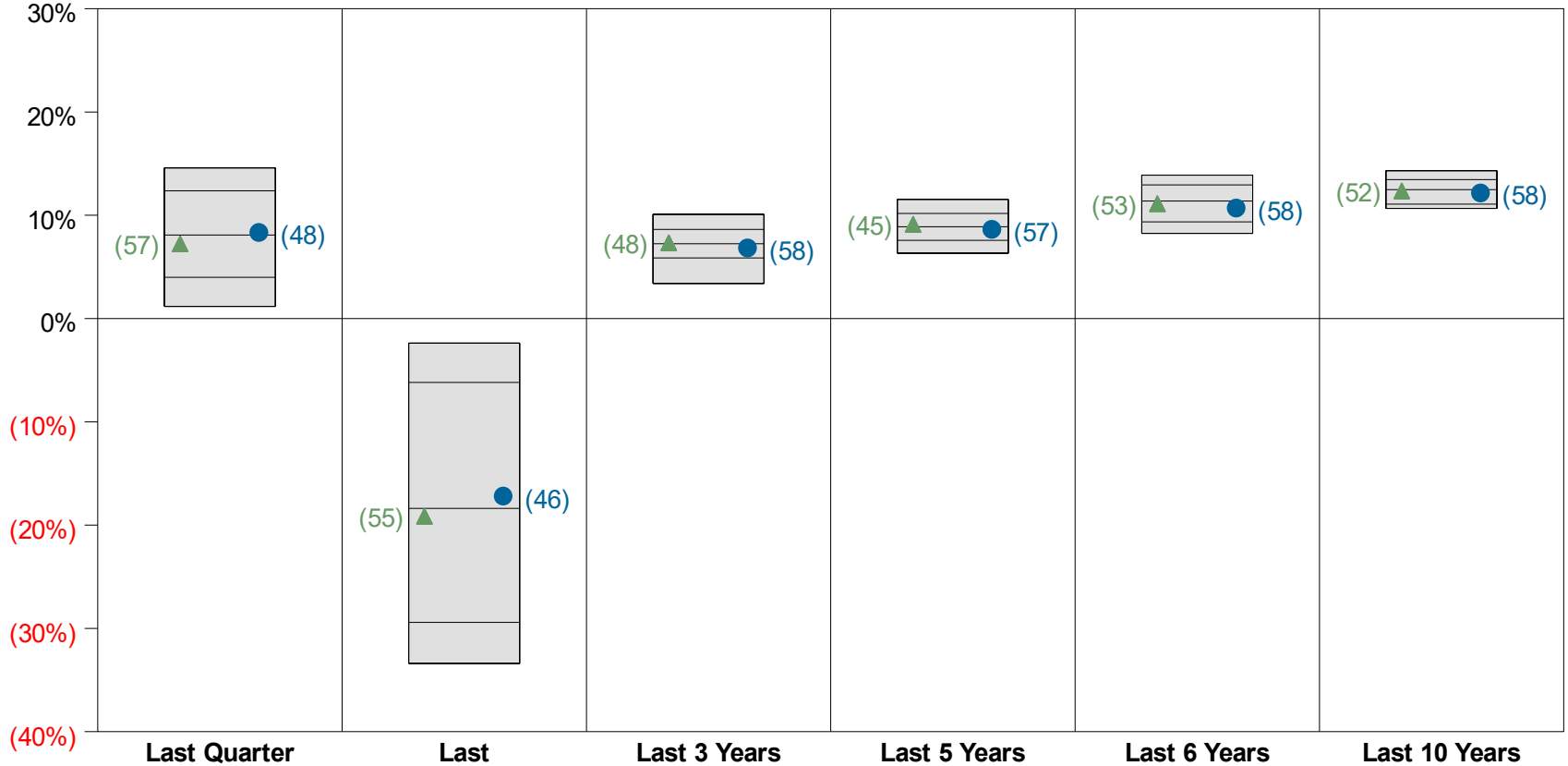


	Weighted Median Market Cap	Price/Fore-casted Earnings	Price/Book	Forecasted Earnings Growth	Dividend Yield	MSCI Combined Z-Score
10th Percentile	148.72	16.94	3.49	12.64	1.76	0.08
25th Percentile	109.89	16.89	3.42	12.10	1.75	0.03
Median	75.85	16.35	3.00	11.57	1.66	(0.01)
75th Percentile	53.60	15.51	2.73	10.35	1.56	(0.04)
90th Percentile	38.34	14.31	2.43	10.00	1.52	(0.19)
Domestic Equity Pool ●	77.32	15.90	2.97	10.56	1.76	(0.08)
Russell 3000 Index ▲	111.77	17.12	3.19	10.89	1.72	(0.01)

- ARMB's overall domestic equity portfolio's weighted median market capitalization is smaller than 47% of public funds (first column).
- Overall, ARMB's domestic equity portfolio tilts decidedly "value" versus peers (last column on right).
  - "MSCI Combined Z-Score" measures Growth and Value characteristics of individual stocks within managers' portfolios.
  - A low Z-Score rank (i.e.– the dot appears towards the top of the floating bar) indicates a Growth bias.
  - A high Z-Score rank (i.e. – the dot appears towards the bottom of the floating bar) indicates a Value bias.

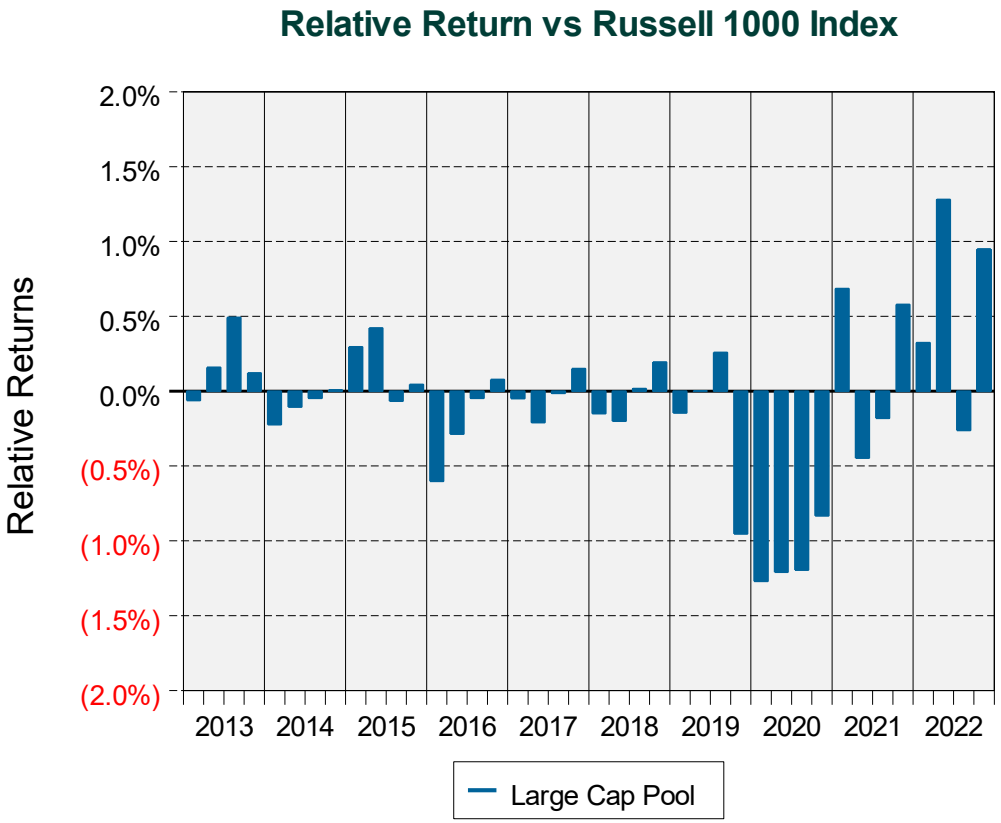
Large Cap Domestic Equity through 12/31/22

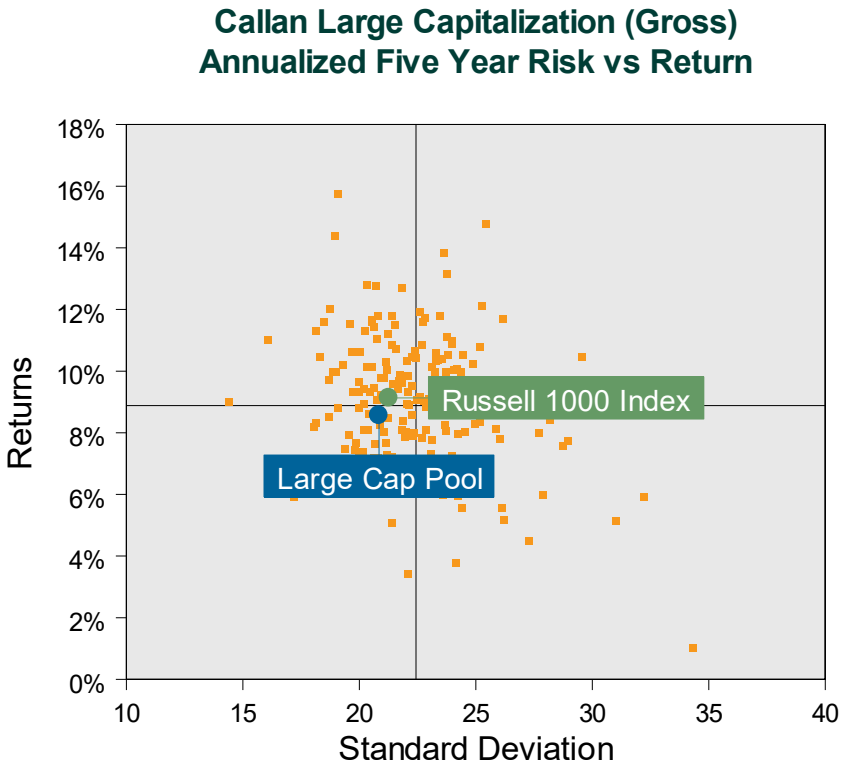
Performance vs Callan Large Capitalization (Gross)



	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 6 Years	Last 10 Years
10th Percentile	14.58	(2.37)	10.09	11.54	13.89	14.31
25th Percentile	12.38	(6.17)	8.64	10.19	12.94	13.46
Median	8.09	(18.37)	7.25	8.88	11.38	12.48
75th Percentile	3.98	(29.41)	5.87	7.56	9.37	11.08
90th Percentile	1.18	(33.38)	3.41	6.32	8.24	10.67
Large Cap Pool ●	8.26	(17.26)	6.77	8.57	10.63	12.09
Russell 1000 Index ▲	7.24	(19.13)	7.35	9.13	11.13	12.37

Large Cap Domestic Equity as of 12/31/22

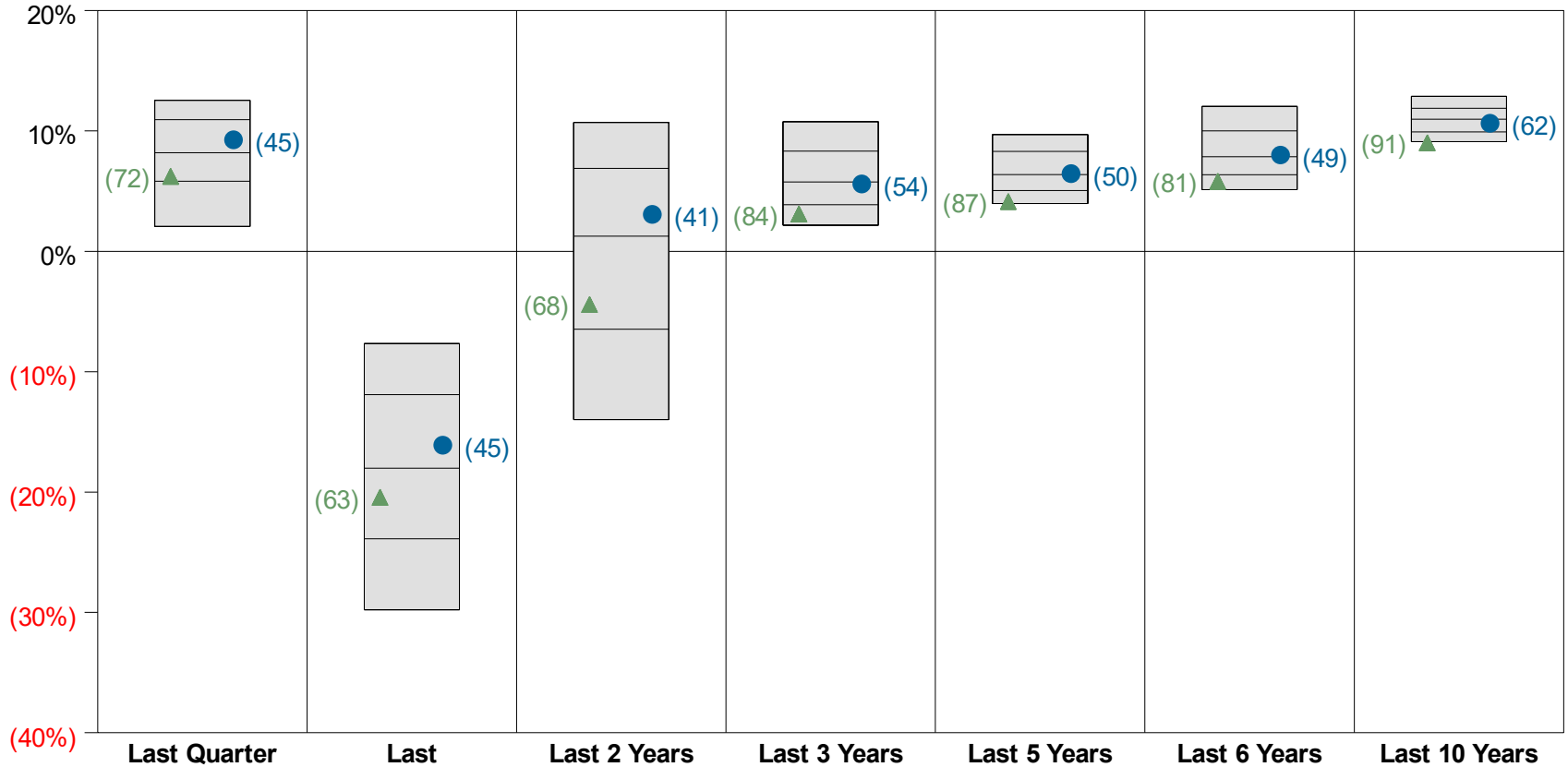




- Large Cap Domestic Equity returns outperformed the Russell 1000 index by 102bps in the fourth quarter of 2022.
- Long-term performance exhibits market-like returns with similar risk.
- Underperformance vs. the Russell 1000 Index in 4Q19 through 4Q20 was driven by Scientific Beta, which trailed the broad benchmark by between 2% and 4% in each of those quarters.
- Passive implementation also detracted as the S&P 900 Index trailed the Russell 1000 Index by 1.1% in 2Q20, 0.8% in 3Q20, and 0.9% in 4Q20.

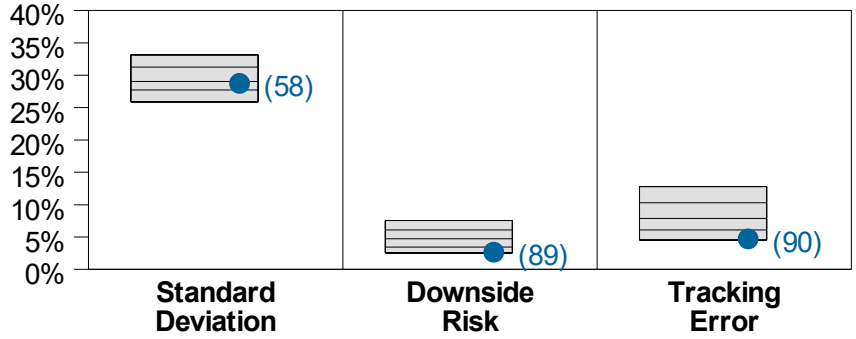
Small Cap Domestic Equity through 12/31/22

Performance vs Callan Small Capitalization (Gross)



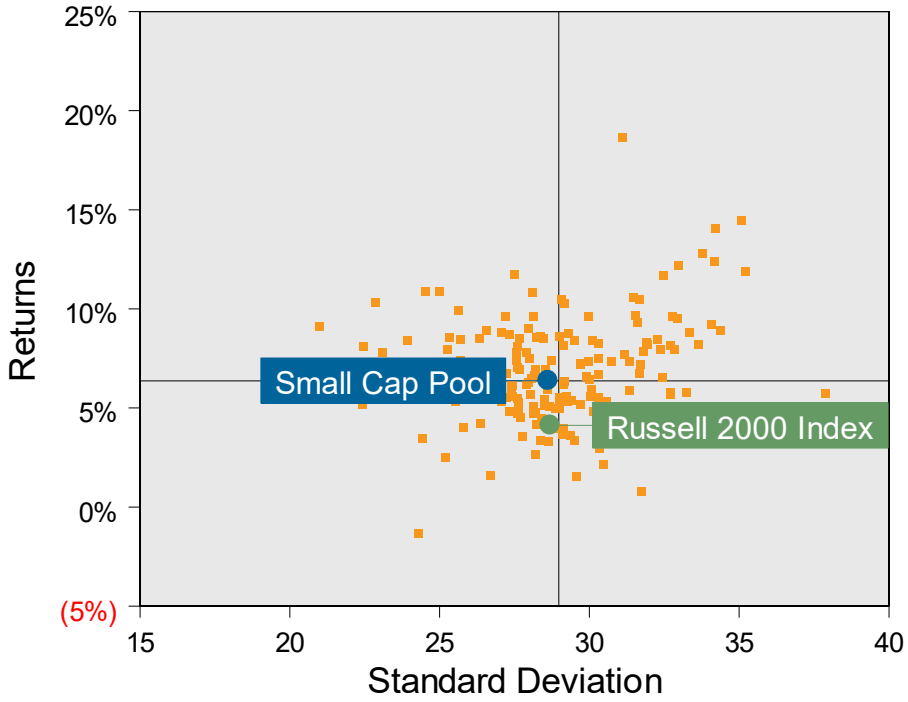
	Last Quarter	Last Year	Last 2 Years	Last 3 Years	Last 5 Years	Last 6 Years	Last 10 Years
10th Percentile	12.54	(7.67)	10.71	10.76	9.71	12.04	12.88
25th Percentile	10.94	(11.92)	6.89	8.33	8.29	10.00	11.88
Median	8.19	(18.01)	1.26	5.76	6.38	7.85	10.97
75th Percentile	5.82	(23.88)	(6.48)	3.87	5.05	6.36	9.91
90th Percentile	2.06	(29.78)	(13.98)	2.16	3.96	5.13	9.11
Small Cap Pool ●	9.20	(16.16)	2.99	5.53	6.38	7.93	10.57
Russell 2000 Index ▲	6.23	(20.44)	(4.42)	3.10	4.13	5.81	9.01

Small Cap Domestic Equity through 12/31/22



	Standard Deviation	Downside Risk	Tracking Error
10th Percentile	33.14	7.54	12.79
25th Percentile	31.25	6.12	10.30
Median	29.02	4.76	7.87
75th Percentile	27.72	3.47	6.12
90th Percentile	25.86	2.53	4.52
Small Cap Equity Pool ●	28.62	2.54	4.60

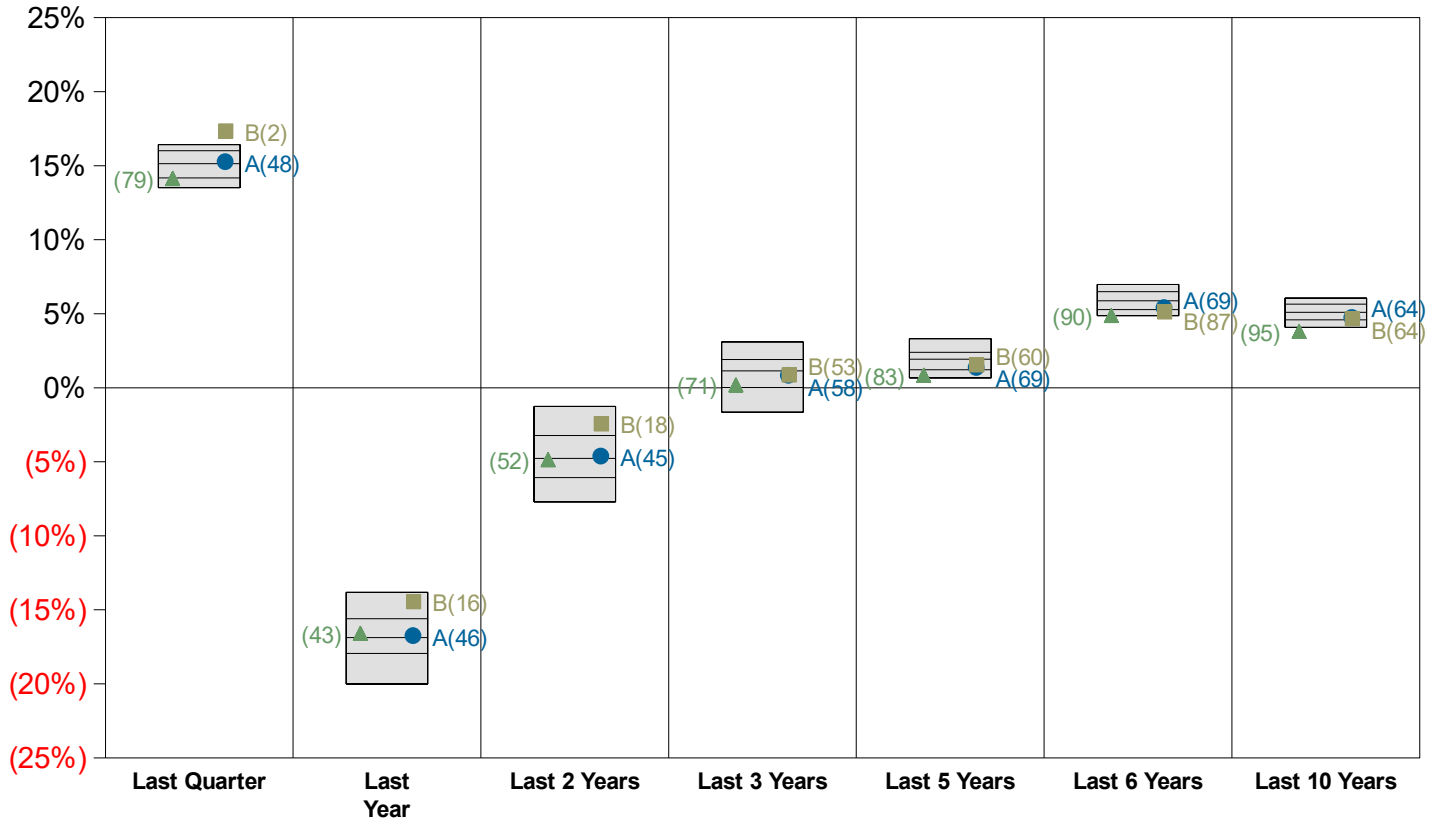
Callan Small Capitalization (Gross)
Annualized Five Year Risk vs Return



- The five-year risk statistics of standard deviation, downside risk, and tracking error compare favorably versus the peer group of small cap managers.
- Over this time period, the S&P Small Cap 600 Index has outperformed the Russell 2000 benchmark with similar risk.

Global Equity ex-US through 12/31/22

Performance vs Public Fund - International Equity (Gross)

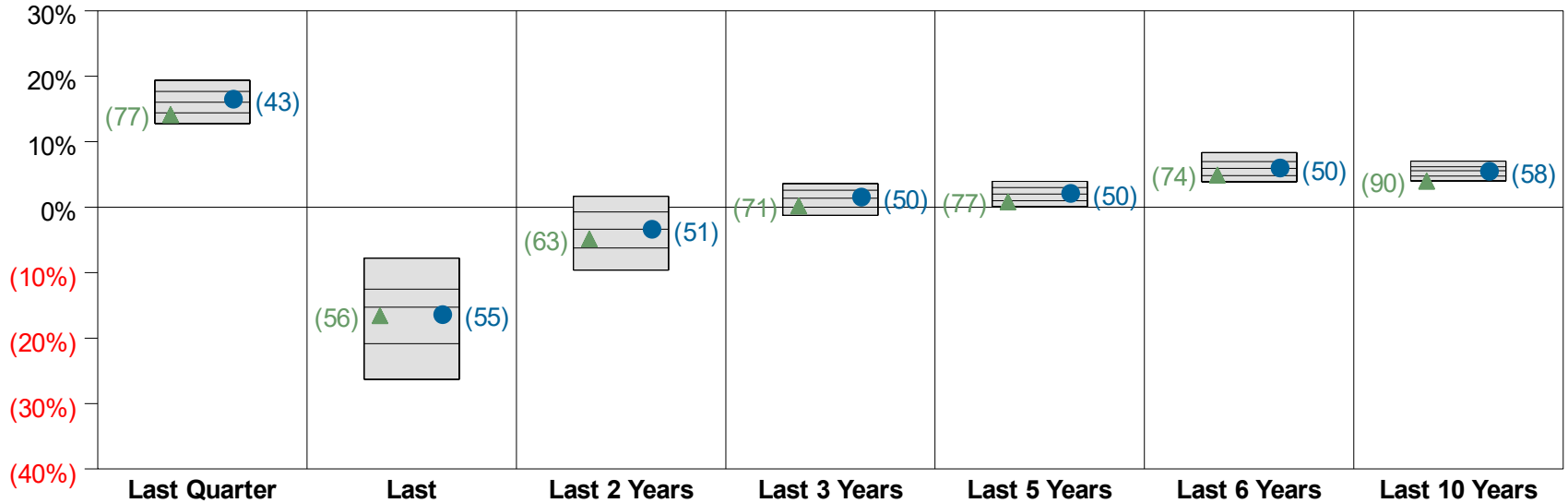


		Last Quarter	Last Year	Last 2 Years	Last 3 Years	Last 5 Years	Last 6 Years	Last 10 Years
10th Percentile		16.42	(13.82)	(1.26)	3.10	3.31	6.98	6.07
25th Percentile		16.00	(15.59)	(3.22)	1.92	2.40	6.49	5.65
Median		15.14	(16.88)	(4.77)	1.14	1.94	5.87	5.10
75th Percentile		14.17	(17.95)	(6.07)	0.02	1.22	5.28	4.59
90th Percentile		13.52	(20.02)	(7.70)	(1.65)	0.66	4.87	4.08
Global Equity ex-US	A	15.23	(16.79)	(4.65)	0.79	1.34	5.37	4.71
MSCI EAFE Index	B	17.34	(14.45)	(2.44)	0.87	1.54	5.13	4.67
Int'l Equity Target	▲	14.15	(16.58)	(4.85)	0.20	0.85	4.88	3.81

The Int'l Equity Target currently consists of MSCI ACWI ex U.S. IMI.

International Equity ex Emerging Markets through 12/31/22

Performance vs Callan Non-US Equity (Gross)



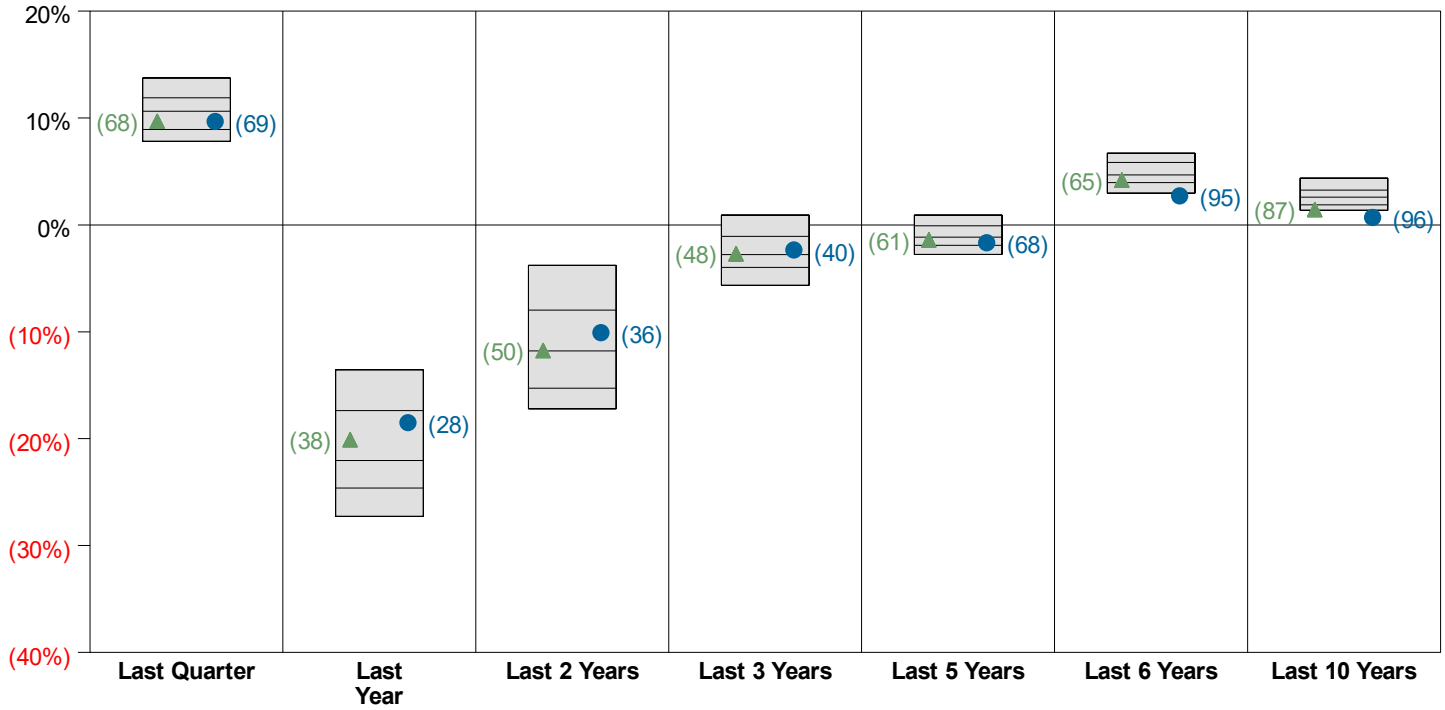
	Last Quarter	Last Year	Last 2 Years	Last 3 Years	Last 5 Years	Last 6 Years	Last 10 Years
10th Percentile	19.39	(7.79)	1.66	3.60	3.94	8.35	7.01
25th Percentile	17.66	(12.53)	(0.72)	2.59	3.00	6.96	6.17
Median	16.03	(15.29)	(3.38)	1.39	1.99	5.92	5.55
75th Percentile	14.40	(20.84)	(6.24)	(0.01)	0.98	4.83	4.75
90th Percentile	12.74	(26.29)	(9.61)	(1.24)	0.10	3.88	4.02
Int'l Equity Pool (ex Emerging. Mkt) ●	16.37	(16.51)	(3.49)	1.42	1.98	5.88	5.35
MSCI ACWI xUS IMI ▲	14.15	(16.58)	(4.85)	0.20	0.85	4.91	3.98

International Equity ex Emerging Markets through 12/31/22

	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
Int'l Equity Pool (ex Emerging Market)	**16.37%**	**(16.51%)**	**1.42%**	**1.98%**	**5.35%**
Arrowstreet ACWI ex -US	18.17%	(10.24%)	8.52%	6.58%	-
Baillie Gifford ACWI ex US	13.17%	(31.57%)	(1.62%)	1.36%	-
Brandes Investment	20.47%	(7.23%)	2.00%	1.93%	5.59%
Capital Guardian	15.64%	(25.40%)	(1.03%)	2.78%	5.93%
L&G Sci Beta Dev ex US	14.68%	(13.54%)	0.75%	-	-
SSgA World ex US IMI	16.02%	(15.16%)	1.12%	-	-
MSCI EAFE Index	17.34%	(14.45%)	0.87%	1.54%	4.67%
MSCI ACWI ex-US IMI Index	14.15%	(16.58%)	0.20%	0.85%	3.98%

Emerging Markets through 12/31/22

Performance vs Callan Emerging Broad (Gross)



	Last Quarter	Last Year	Last 2 Years	Last 3 Years	Last 5 Years	Last 6 Years	Last 10 Years
10th Percentile	13.74	(13.55)	(3.77)	0.92	0.92	6.71	4.39
25th Percentile	11.90	(17.38)	(7.97)	(1.07)	(0.08)	5.83	3.25
Median	10.65	(22.04)	(11.79)	(2.78)	(1.14)	4.68	2.59
75th Percentile	8.92	(24.63)	(15.28)	(3.98)	(1.91)	3.95	1.87
90th Percentile	7.82	(27.28)	(17.20)	(5.65)	(2.76)	2.98	1.38
Emerging Markets Pool ●	9.61	(18.58)	(10.15)	(2.42)	(1.74)	2.65	0.63
MSCI EM ▲	9.70	(20.09)	(11.75)	(2.69)	(1.39)	4.20	1.44

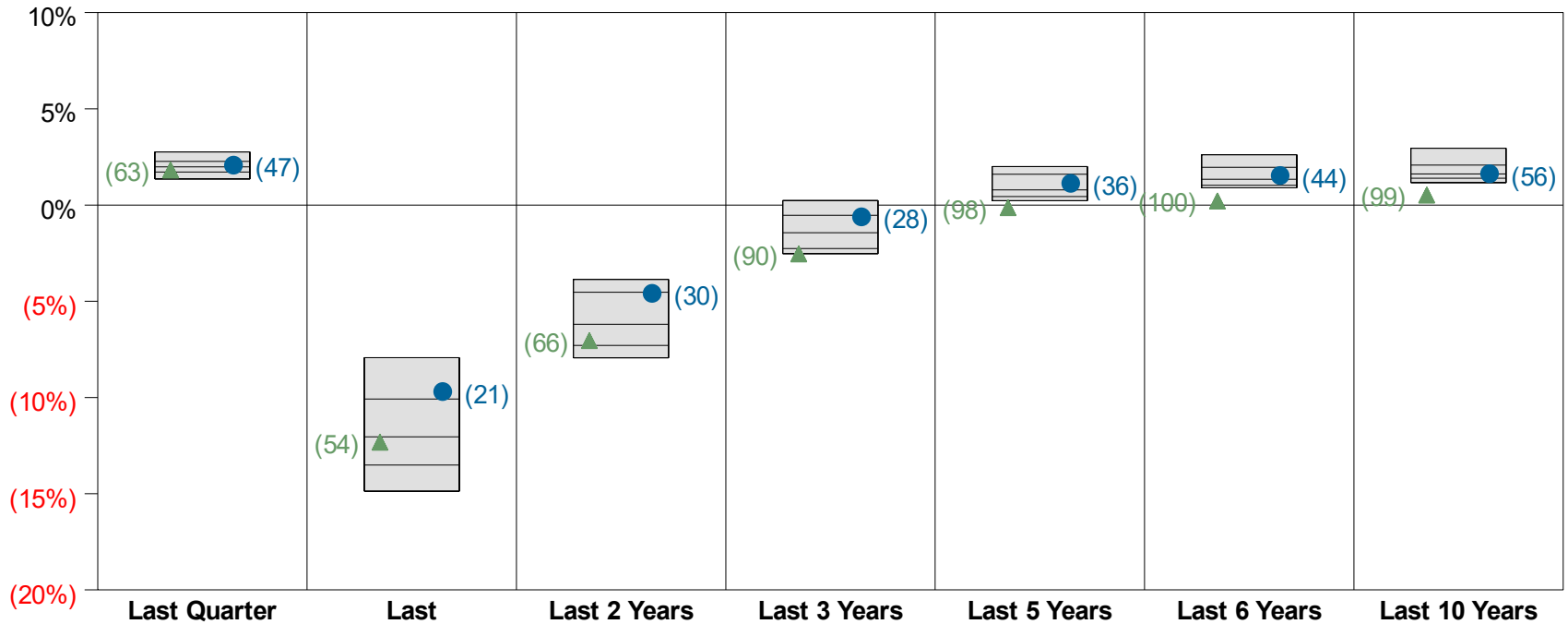
- The Emerging Markets Pool was restructured in 4Q2019 to be a blend of passive and smart beta investments.
- The restructured Pool found its footing in 2021 and outperformed the benchmark by 1.51% over the last year. For the most recent quarter, the Emerging Markets Pool lagged its benchmark by 0.09% and ranks above median over the last year.

Emerging Markets Pool through 12/31/22

	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
Emerging Markets Pool	**9.61%**	**(18.58%)**	**(2.42%)**	**(1.74%)**	**0.63%**
SSgA Emerging Markets	9.57%	(20.09%)	(2.76%)	-	-
L&G SciBeta EM	9.70%	(15.05%)	(2.12%)	-	-
MSCI EM	9.70%	(20.09%)	(2.69%)	(1.39%)	1.44%

Total Fixed Income as of 12/31/22

Performance vs Public Fund - Domestic Fixed (Gross)



	Last Quarter	Last Year	Last 2 Years	Last 3 Years	Last 5 Years	Last 6 Years	Last 10 Years
10th Percentile	2.76	(7.93)	(3.87)	0.24	2.00	2.62	2.94
25th Percentile	2.27	(10.08)	(4.54)	(0.53)	1.60	1.97	2.08
Median	1.98	(12.05)	(6.20)	(1.44)	0.79	1.35	1.62
75th Percentile	1.72	(13.50)	(7.30)	(2.26)	0.45	1.03	1.40
90th Percentile	1.36	(14.87)	(7.93)	(2.53)	0.22	0.89	1.17
Total Fixed Income Pool ●	2.04	(9.73)	(4.63)	(0.65)	1.10	1.50	1.59
Fixed Income Target ▲	1.82	(12.32)	(7.05)	(2.54)	(0.14)	0.22	0.52

- The Total Fixed Income Pool portfolio outperformed the Fixed Income Target in all time periods shown.
- The transition from intermediate Treasury to Aggregate mandates was completed during the fourth quarter of 2019.

Total Fixed Income through 12/31/22

	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
Fixed Income	**2.04%**	**(9.73%)**	**(0.65%)**	**1.10%**	**1.59%**
Fixed Income Target	1.82%	(12.32%)	(2.54%)	(0.14%)	0.52%
Blmbg Treasury Intmdt	1.02%	(7.77%)	(1.39%)	0.46%	0.69%
ARMB US Aggregate	2.06%	(12.35%)	(2.10%)	-	-
Opportunistic Fixed Income	**2.06%**	**(10.27%)**	**(1.71%)**	**1.66%**	**3.59%**
FIAM Tactical Bond	2.80%	(10.57%)	(0.37%)	2.23%	-
Blmbg Aggregate	1.87%	(13.01%)	(2.71%)	0.02%	1.06%
FIAM REHI	(0.80%)	(8.35%)	(1.66%)	1.78%	-
Blmbg:Universal CMBS xAaa	(0.88%)	(13.65%)	(2.57%)	0.82%	1.99%

Multi-Asset through 12/31/22

	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
Multi-Asset (T)	**3.81%**	**(13.21%)**	**2.58%**	**4.09%**	**-**
Alternative Equity Strategies	**5.06%**	**(25.94%)**	**4.88%**	**5.89%**	**7.66%**
McKinley Healthcare Transformation	5.06%	(25.94%)	4.88%	-	-
MSCI ACWI	9.76%	(18.36%)	4.00%	5.23%	7.98%
Tactical Allocation Strategies	**6.45%**	**(16.18%)**	**2.13%**	**-**	**-**
PineBridge	5.26%	(15.66%)	1.73%	-	-
Pine Bridge Benchmark	7.48%	(16.61%)	1.51%	3.10%	4.79%
Fidelity Signals	7.68%	(16.69%)	2.52%	-	-
Fidelity Signals Benchmark	7.48%	(16.61%)	1.71%	3.37%	5.41%
Alternative Beta	**3.61%**	**16.94%**	**2.28%**	**(0.11%)**	**-**
Man Group Alternative Risk Premia	3.61%	16.94%	4.57%	2.85%	-
T-Bills + 5%	2.04%	6.46%	5.72%	6.26%	5.76%
Alternative Fixed Income	**0.31%**	**5.81%**	**7.83%**	**-**	**-**
Crestline (Blue Glacier)	0.94%	7.58%	8.11%	6.87%	8.01%
Prisma Capital (Polar Bear)	(10.60%)	(19.23%)	(0.05%)	0.98%	2.57%
Crestline Specialty Lending Fund	0.67%	23.51%	19.38%	17.43%	-
Crestline Specialty Lndg Fd II	1.18%	8.77%	11.42%	9.09%	-
Crestline Specialty Lndg Fd III	2.01%	8.59%	-	-	-
HFRI Fund of Funds Idx	1.74%	(5.30%)	3.69%	3.01%	3.51%
T-Bills + 5%	2.04%	6.46%	5.72%	6.26%	5.76%

Private Equity as of 12/31/2022 With One Quarter Lag

	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
Private Eq Pool	0.51	(1.73)	22.98	22.25	18.71
Private Equity Target	(5.48)	(21.37)	0.76	3.15	7.81

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Callan Update

Published Research Highlights from 4Q22

Webinar: Rebalancing During this Unusual Market Environment

Considering Currency: A Guide for Institutional Investors

2022 Nuclear Decommissioning Funding Study

2022 ESG Survey

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Mark Andersen

Emerging Managers in Private Equity: A Guide for Success

David Smith

Additional Reading

Alternatives Focus quarterly newsletter
Active vs. Passive quarterly charts
Capital Markets Review quarterly newsletter
Monthly Updates to the Periodic Table
Market Pulse Flipbook quarterly markets update
Real Estate Indicators market outlook

Callan Institute Events

Upcoming conferences, workshops, and webinars

Callan College

Intro to Alternatives

This course is for institutional investors, including trustees and staff members of public plans, corporate plans, and nonprofits. This session familiarizes trustees and staff with alternative investments like private equity, hedge funds, and real estate and how they can play a key role in any portfolio. You will learn about the importance of allocations to alternatives and how to consider integrating, evaluating, and monitoring them.

- February 15–16, 2023 – Virtual Session via Zoom

Intro to Investments—Learn the Fundamentals

This course is for institutional investors, including trustees and staff members of public plans, corporate plans, and nonprofits. This session familiarizes trustees and staff with basic investment theory, terminology, and practices.

- March 1–2, 2023 – In-Person Session – Chicago
- May 23–25, 2023 – Virtual Session via Zoom

Please visit our website at callan.com/events-education as we add dates to our 2023 calendar!

Mark Your Calendar

2023 National Conference

April 2–4, 2023
Scottsdale, Arizona

2023 Regional Workshops

June 27, 2023 – Denver
June 29, 2023 – San Francisco

October 24, 2023 – New York
October 26, 2023 - Chicago

Watch your email for further details and an invitation.

Webinars & Research Café Sessions

Research Café: ESG Interview Series

February 23 , 2023 – 9:30am (PT)

Callan Updates

Firm updates by the numbers, as of 12/31/22

Total Associates: ~200

Ownership

- 100% employees
- 71% of employees are equity owners
- 55% of shareholders identify as women or minority

Total General and Investment Consultants: more than 55

Total Specialty and Research Consultants: more than 50

Total CFA/CAIA/FRMs: more than 55

Total Institutional Investor Clients: more than 475

Assets Under Advisement: more than $3 trillion

Milestones

- Celebrating our 50th anniversary
- Callan Institute Education offerings hit a record high attendance in 2022

DEI Updates

- 57% of Callan's Management Committee and 44% of all employees are women

"Not only is our Diversity, Equity & Belonging (DEB) initiative critical to Callan's success, we hope it will ultimately influence our entire industry. Supporting this initiative from the position of CEO is the best way for me to ensure its success. As the executive sponsor, I can make sure our team has the support and the resources to effect real change."

— Greg Allen, CEO, Chief Research Officer & DEB Executive Sponsor

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Past performance is no guarantee of future results.

THE STATE of ALASKA
GOVERNOR MIKE DUNLEAVY

Department of Revenue
ALASKA RETIREMENT MANAGEMENT BOARD

ARMB Public Equity

March 2023

Mark T. Moon
State Investment Officer, Treasury Division
Alaska Department of Revenue

Key Board Decisions

Determine Investment Objective

- Fund's Purpose
- Governance – who makes which decisions?

Determine Asset Allocation

- Strategic
- Tactical

Oversee Implementation

- Manager Structure – number and types of manager allocations.
- Manager Selection

Monitor Results

- Are the fund, asset classes and mandates performing as expected?
- Are they achieving objectives?

Preliminaries

High level starting premises

(aka, "stating the obvious")

Assuming market efficiency is a good starting point for public equity

- Even if market not completely efficient, alpha can be fleeting

Higher fees are bad

- Higher fees are generally known with certainty
- Alpha is only an expectation until after the fact

Quest for earning equity market returns involves continual focus on:

- Minimizing cash drag
- Maintaining beta of near 1.0
- Extensive sector and industry diversification
- Avoiding high concentration
- Minimizing trading costs

Aggregate investor behavior may create opportunities

- Liquidity matters
- Investor herding can generate mispricing

Existing ARMB public equity structure

Internal equity

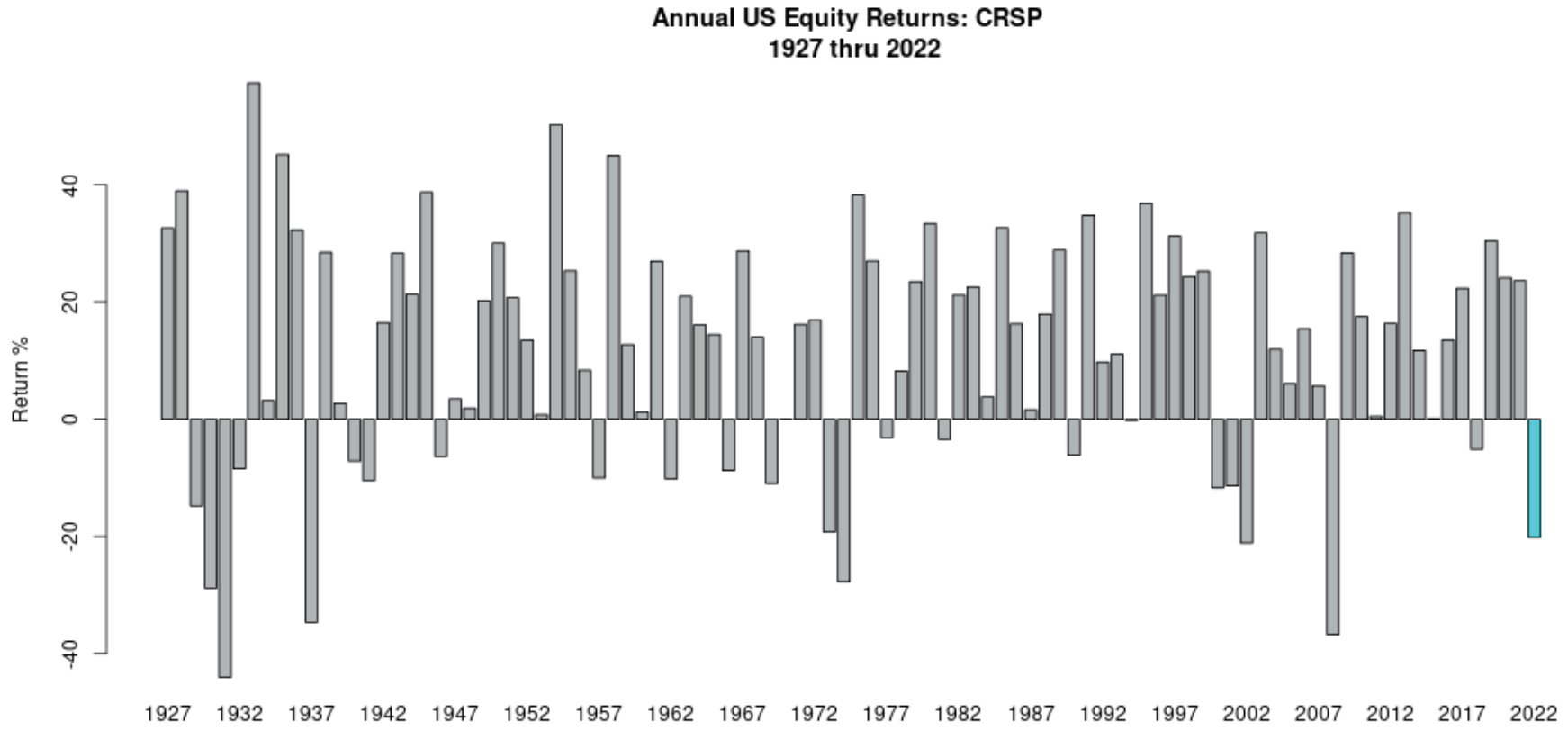
- Domestic portfolios
- $7.4 billion
- Passive + factor tilted strategies

External equity

- ex-US portfolios
- $5.4 billion
- Passive + factor tilted + active strategies

Performance

- 2022 a very difficult year for public equity: general revaluation of stock prices; many casualties in the Fed "war on inflation"



ARMB domestic equity (2022)

- Factor strategies outperformed benchmarks
- In small cap, S&P 600 outperformed Russell 2000

Return % As of December 31, 2022

	Last.Quarter	Fiscal.YTD	Last.Year	Last.3.Years	Last.5.Years
Broad Domestic Equity	8.34	3.05	-17.16	6.74	8.37
Large Cap Pool	8.26	3.00	-17.26	6.77	8.57
Large Cap Multi Factor	7.86	2.32	-16.66	6.57	--
S&P 900	7.74	2.65	-17.79	7.73	--
Scientific Beta	10.91	5.28	-15.01	4.80	6.78
Russell 1000 Index	7.24	2.30	-19.13	7.35	9.13
Small Cap Pool	9.20	3.49	-16.16	5.53	6.38
S&P 600	9.22	3.50	-16.15	5.53	5.76
Russell 2000 Index	6.23	3.91	-20.44	3.10	4.13

ARMB ex-US equity (2022)

- Factor strategies outperformed benchmarks
- Mixed bag for active managers: growth-orientation bad; value-orientation good

Return % As of December 31, 2022

	Last.Quarter	Fiscal.YTD	Last.Year	Last.3.Years	Last.5.Years
International Equity Pool	16.37	5.47	-16.51	1.42	1.98
Arrowstreet	18.05	9.07	-10.64	8.04	6.11
Baillie Gifford	13.06	3.13	-31.85	-2.04	0.92
Brandes	20.39	6.81	-7.52	1.65	1.57
Capital Guardian	15.52	4.29	-25.71	-1.45	2.36
L&G Sci Beta Dev ex US	14.67	3.43	-13.57	0.72	--
SSgA World ex US IMI	16.02	5.33	-15.17	1.10	--
MSCI EAFE Index	17.34	6.36	-14.45	0.87	1.54
MSCI ACWI ex-US Index	14.15	3.09	-16.58	0.20	0.85
Emerging Markets Pool	9.61	-1.97	-18.58	-2.42	-1.74
SSgA EM	9.56	-3.20	-20.10	-2.79	--
L&G Sci Beta EM	9.68	0.69	-15.12	-2.20	--
MSCI EM Index	9.70	-2.99	-20.09	-2.69	-1.39

Recent activities

Focus of recent efforts

- Continuing work on internal domestic equity enhancement
- Conducting search for 1-2 ex-US active managers
- Exploring "enhanced indexing" for portion of ex-US passive portfolio

Internal equity enhancement

- Custom exposure portfolios
- Wider risk budgets for passive strategies
- Custom passive portfolios
- Microcap strategy

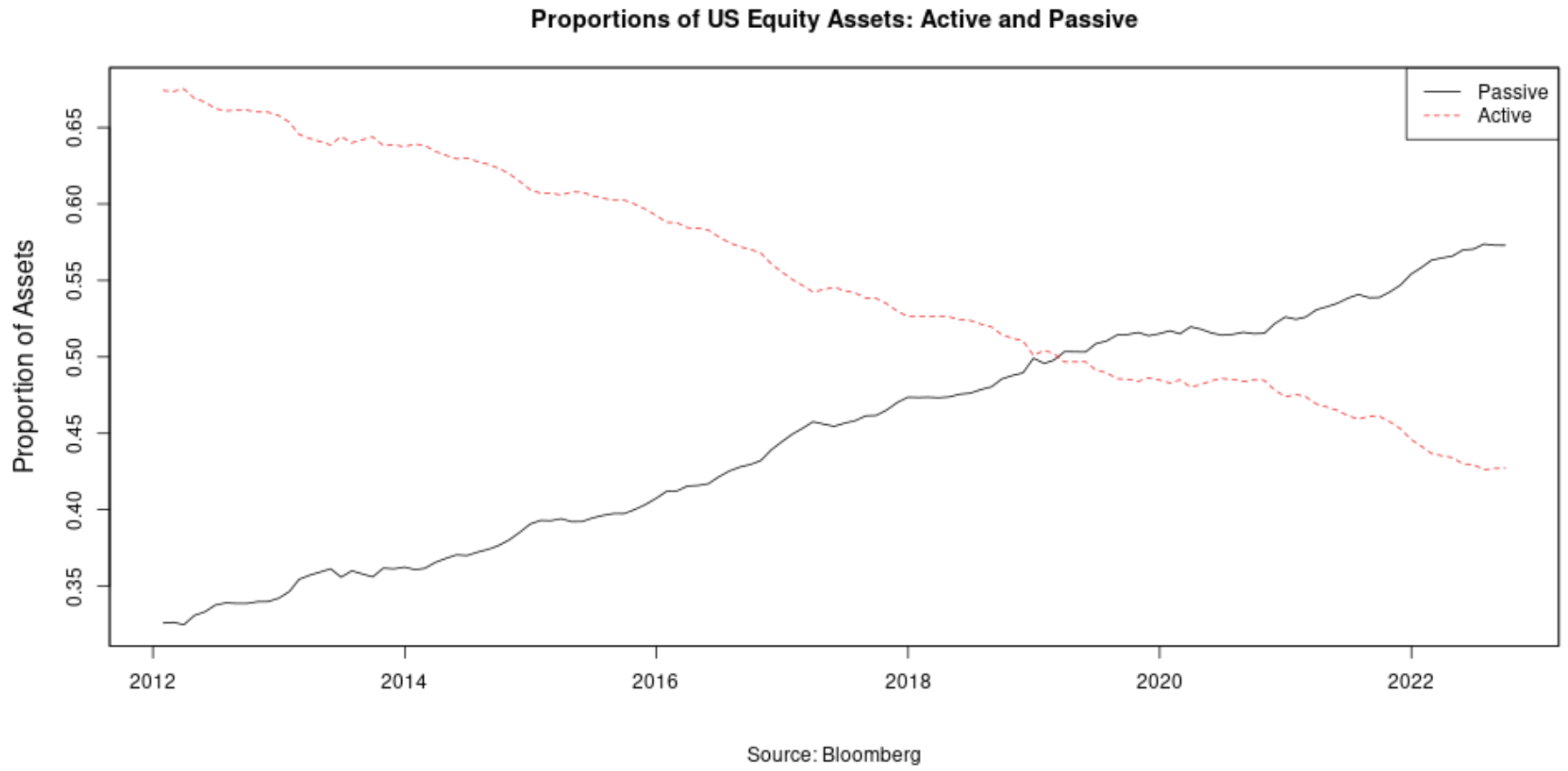
Custom exposure portfolios

- Q: Can we create portfolios with sensitivities to chosen quantities?
- A: Yes; used inflation as an example
  - Designed portfolio to show positive returns to increases in expected inflation
  - Used daily breakeven inflation inflation rates from 10 year TIPS market as inflation proxy
  - Optimized portfolio to maximize "inflation beta" subject to constraints
  - Appears to work as designed

Wider risk budgets for passive strategies

- "Investment indexes were created to help assess investment performance, NOT to be investment vehicles in and of themselves." –famous investment manager

Passive assets have increased dramatically

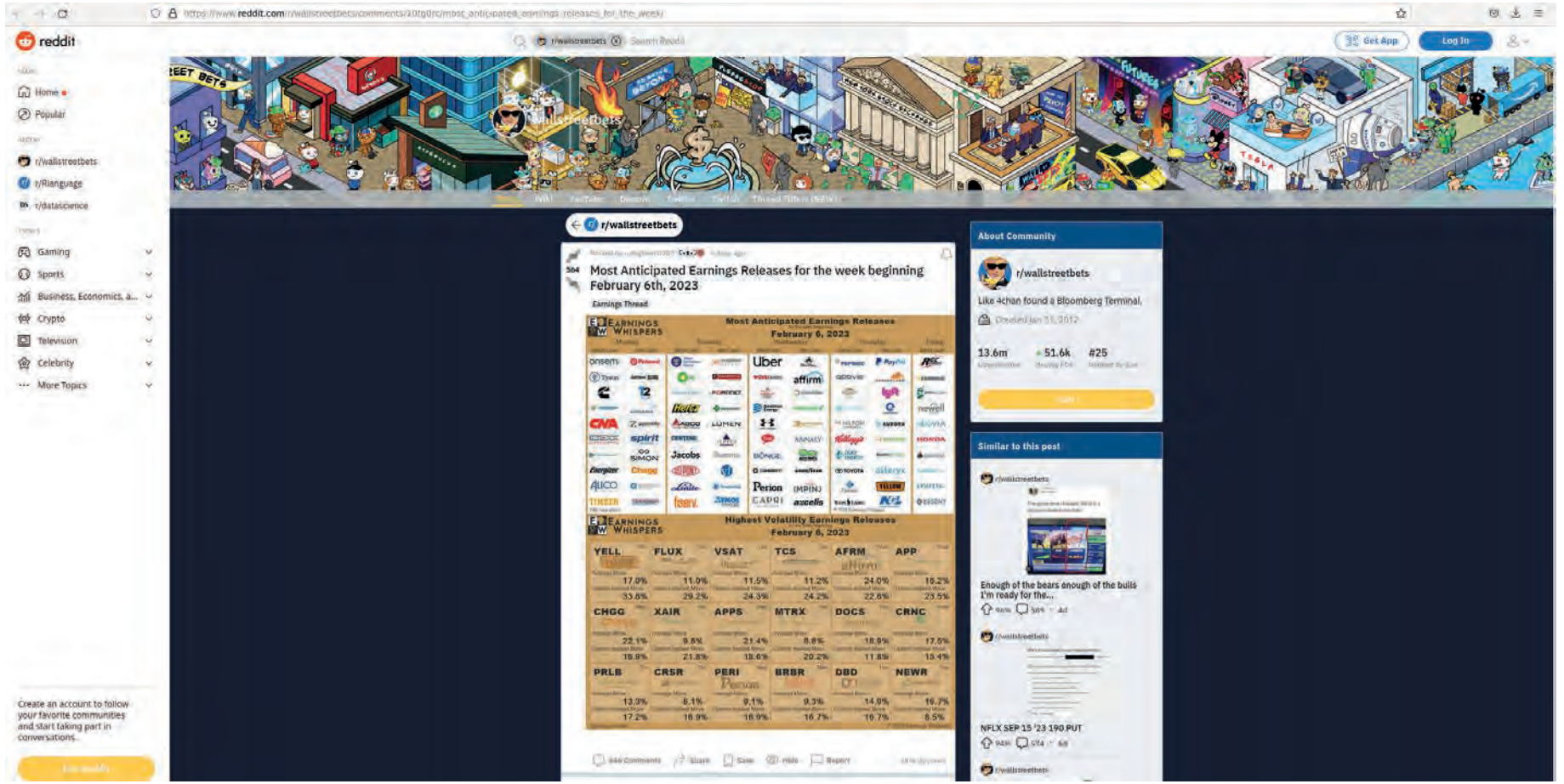


Increasingly, trading mimics index-assumed trading

- Q: If everyone is trading "in-phase", isn't that a bad thing?
  - Lessons from complex systems
  - Diversification that may be inherently fragile
- Q: Might too much in-phase trading create costs to trading with the herd and advantage trading away from the herd?

Meme stocks

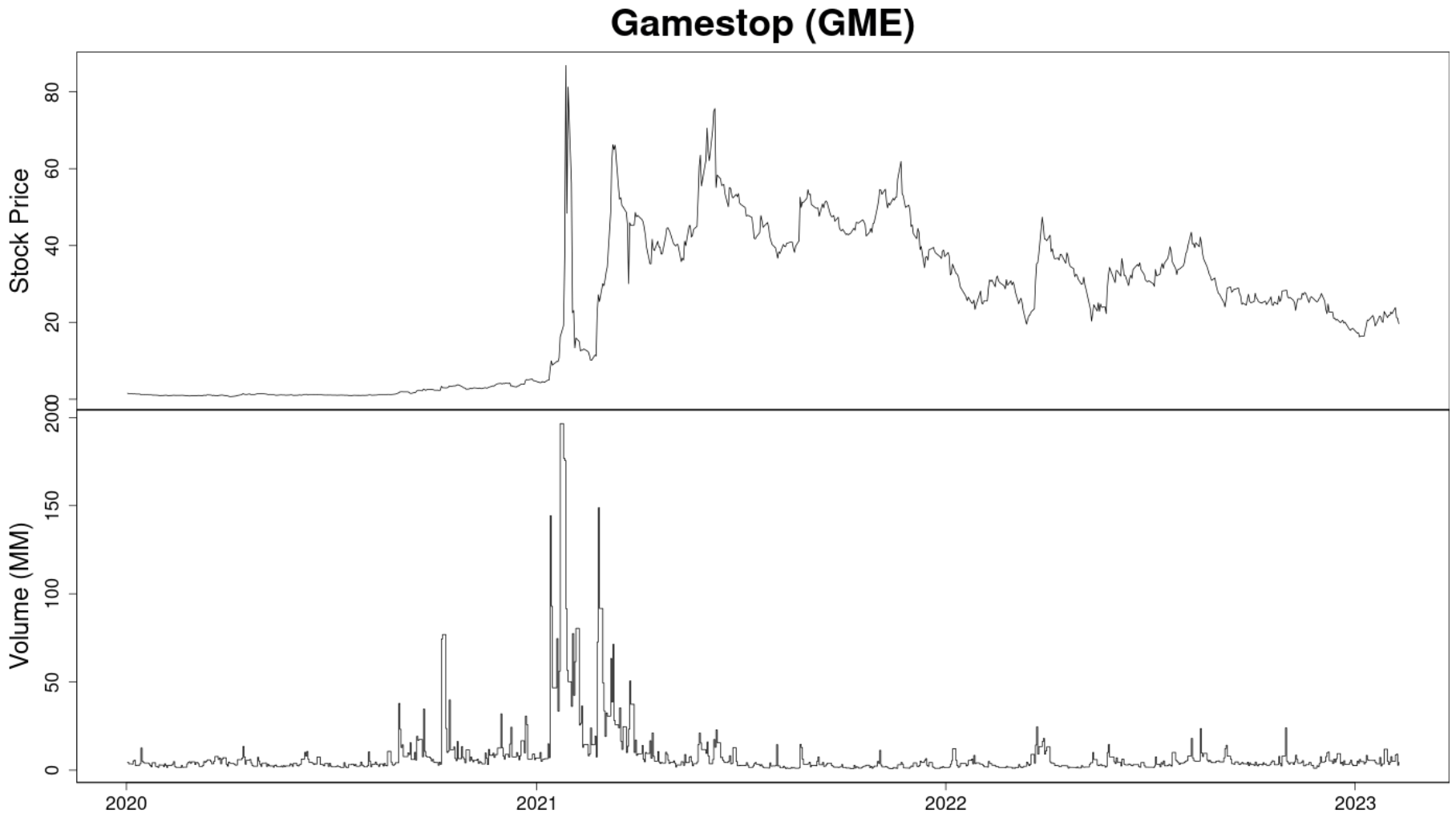
- Rise of online/mobile trading platforms + social media => meme stocks
- reddit.com/r/wallstreetbets



Various meme stocks can exist in passive portfolios (S&P 600, S&P 900)

- Generally, high short interest stocks subject to sudden short squeezes
- Q: Do these make sense to hold as indexes assume?
  - eg, Gamestop (GME), AMC (AMC), Bed Bath and Beyond (BBBY)

Meme stocks example



Index add/drop behavior

- Announcement of add/drop can have significant effects on prices
- Adverse price reactions can represent tax on passive investor for trading as index assumes

Corporate actions are a real world friction

- Indexes often assume corporate actions can be traded before shares appear in custody as tradeable securities
- Trading as assumed can mean settlement problems and costs

Illiquid securities/security classes

- Indexes at times assume inclusion of illiquid securities or security classes

Takeaway: Wider tracking error risk budgets around passive strategies may enhance long term returns

- Staff working on ways to operationalize these ideas

Custom passive portfolios

- May be more effective to create custom passive portfolios which rebalance not at same time as common indexes
- Equal weighted portfolios may enhance returns in more "normal" environments

Microcap strategy

- In-house active microcap strategy might be source of enhanced equity returns
  - Limited capacity of microcap means hard to find external managers and fees are high
  - Exploring daily API pricing data to facilitate internal approach to running strategy

Active ex-US manager search

- Initiation of search approved by ARMB at June 2022 board meeting
- Work with Callan has proceeded
- Goal: find 1-2 managers that fit well with existing portfolio

Search process

- Several filterings of managers down to managable numbers
- Ultimately, eight managers recommended by Callan to staff for consideration
- Staff interviewed managers, vetted approaches and analyzed position data

Goals

- Find 1-2 managers that fit well with existing ARMB ex-US active managers
- Emphasize strategies for ex-ante prospects
- Prefer managers staff can work well with and learn from

Resulting recommendations

- Add Acadian mandate (quantitative orientation)
- Add First Eagle mandate (disciplined value approach)

Exploring enhanced indexing strategy

- Premise:
  - Large inflows of capital into passive strategies over past 20 years
  - Index replicators mostly trade exactly as the underlying index assumes
  - These result in occasional, idiosyncratic opportunities for investors who can periodically trade differently from what index assumes

Resulting recommendation

- Add developed markets enhanced index mandate with Legal & General (LGIMA)
  - Small risk budget (tracking error)
  - Allow for occasionally trading different from strict indexers
  - Exploit idiosyncratic opportunities
  - Low management fee plus performance fees with benchmark hurdle
  - Recommend substituting for portion of existing SSGA passive developed markets mandate

Manager presentations

- Active ex-US
  - Acadian
  - First Eagle
- Enhanced index: LGIMA

ACADIAN

Alaska Retirement Management Board

All-Country World ex-U.S. Equity

March 16, 2023

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Presentation Team

Ryan Taliaferro, Ph.D. — Senior Vice President, Director, Equity Strategies

Ryan joined Acadian in 2011 and serves as the Director of Equity Strategies. He is also a member of the Acadian Executive Committee. Previously, Ryan was the lead portfolio manager for Acadian's Managed Volatility strategies. Prior to joining Acadian, he was a faculty member in the finance unit at Harvard Business School, where he taught corporate finance and asset pricing. Earlier, he was a consultant at the Boston Consulting Group. Ryan earned a Ph.D. in business economics (finance) from Harvard University and an M.B.A. in finance and economics from the University of Chicago. He also holds an A.M. in economics, and an A.M. and A.B. in physics from Harvard University.

Renee Hoffman — Senior Vice President, Senior Consultant Relations Officer

Renee joined Acadian in 1997 and is a senior member of the Consultant Relations Team, working closely with key consultant relationships. She is also a member of Acadian's Responsible Investing Committee and serves as chair of the Charitable Giving Committee at Acadian. Renee has served as a member of the Board of Directors of Bridge Over Troubled Waters, and also held the role of chair of the Investment Committee, and the Board of Directors of Hill House (a non-profit community center in downtown Boston), where she served as co-chair of the Development Committee. She received her B.A. from Colby College with a major in business and minor in economics. She also completed an executive education program at The Wharton School at the University of Pennsylvania.

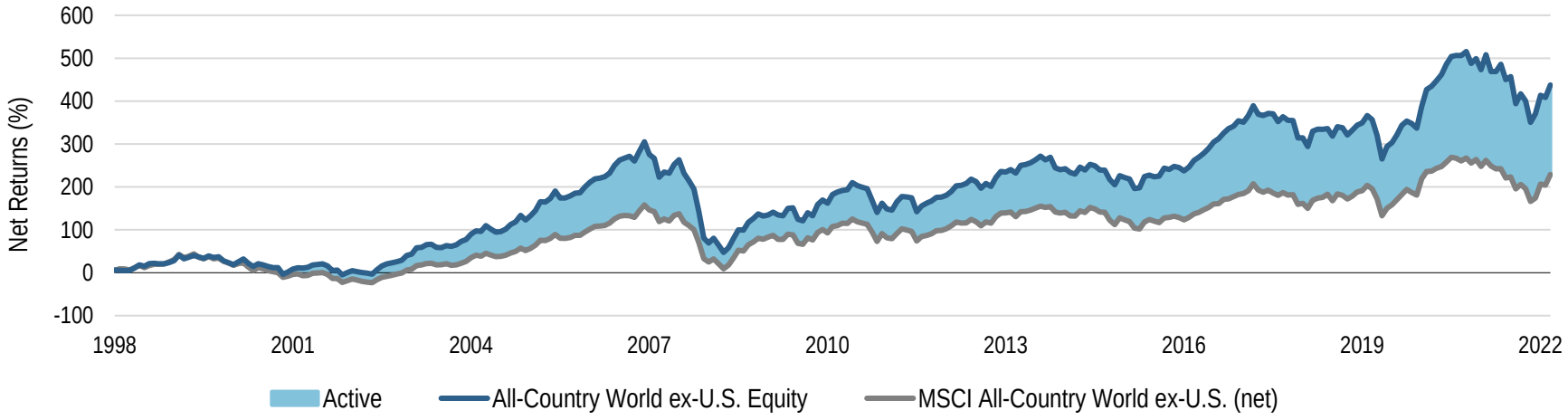
OVERVIEW

Acadian

Investing systematically for over 30 years, we combine intellectual rigor, rich data, and powerful tools to deliver results with analytical clarity.

Why Acadian In All-Country World Ex-U.S.?

- Focus on international equities since inception of firm 30+ years ago
- Broad and mispriced security universe in an inefficient asset class
- Outperformance in 18 out of 25 years, with a since inception annualized return of 7.2% versus 5.0% for the benchmark as of January 31, 2023*



208% cumulative value-added net of fees

*All-Country World ex-U.S. Equity composite vs. the MSCI All-Country World ex-U.S. benchmark. After management fees in USD. Inception November 1, 1998.
Reference to the benchmark is for comparative purposes only and is not intended to indicate that the composite will contain the same investments as the benchmark. Investors have the opportunity for losses as well as profits. Past performance is no guarantee of future results. Past performance may differ significantly from future performance due to market volatility. The complete performance disclosure can be found in the composite performance disclosure page attached. Index Source:
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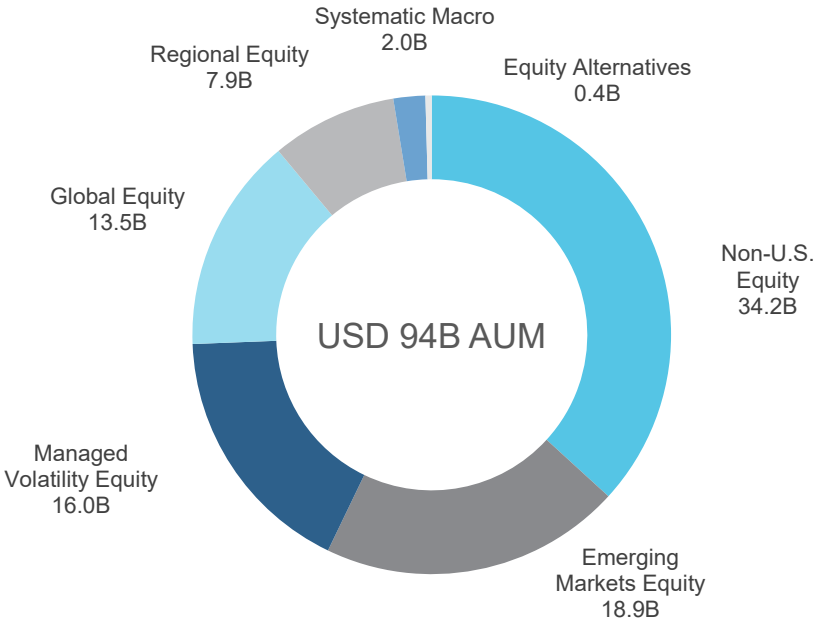
Organizational Overview

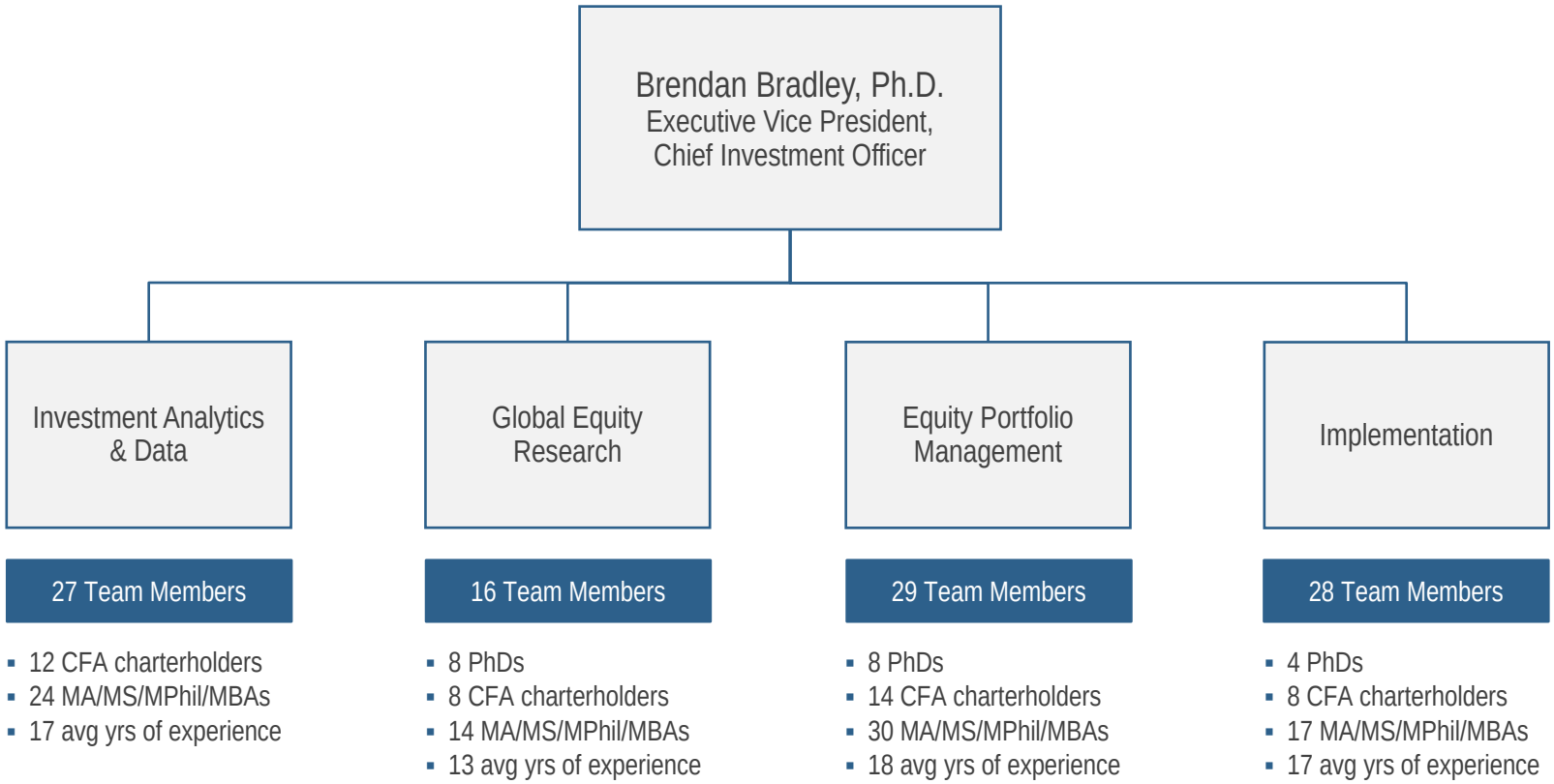
December 31, 2022

- Acadian has been a pioneer in systematic investing since our founding in 1986
- We believe that a systematic approach is well suited to delivering consistent risk-adjusted returns
- Our 387-person team is focused on continuous research and innovation



Rounding is applied to the total firm AUM which includes $831.8 million in model advisory contracts where Acadian does not have trading authority. The individual strategy level assets under management (AUM) are rounded to the nearest decimal point and do not include model advisory assets.
**As a separate legal entity, Acadian Asset Management (Australia) Limited. This was initially established as a join venture with Colonial First State Investments Limited and became a wholly owned entity on June 30, 2015.*

Investment Team Overview



Representative Investors

Public

Employees' Retirement Fund of the City of Dallas
Florida State Board of Administration
Los Angeles County Employees Retirement Association
Massachusetts Pension Reserves Investment Management Board
Municipal Employees' Retirement System of Michigan
New York City Employees Retirement System
Ohio Public Employees Retirement System
Oregon Public Employees
Public School & Education Employee Retirement
Systems of Missouri
Tennessee Consolidated Retirement System
Virginia Retirement System
West Virginia Investment Management Board

Corporate

3M Company
Altria Group
Dow Inc.
JM Family Enterprises, Inc.
Pfizer

Endowment/Foundation

Carnegie Mellon University
Cornell University
Georgia Tech Foundation
W.K. Kellogg Foundation

Sub-Advisory

Harbor Overseas Fund
Optimum International Fund
SEI

Taft-Hartley

North Atlantic States Carpenters Benefit Funds
Producer-Writers Guild of America Pension Plan

Australia

Equipsuper
Colonial First State Investments Ltd.
Aware Super

Canada

Mouvement Desjardins
Ville de Montréal

Europe

Fidelity International
Hampshire County Council
Ireland Strategic Investment Fund
Kempen Capital Management
PKA A/S

Names appearing on this representative list consist of separate account clients and fund participants in Acadian managed funds that have been selected from the group of clients and fund participants who permit us to utilize their name based upon their name recognition and to reflect the range of investor types we service. Names appearing on this list were not selected based on account performance and do not constitute an endorsement or recommendation of Acadian or our services.

PROCESS

Investment Philosophy

- Financial assets are often **mispriced** due to investors incorrectly processing information, having incomplete information, or both
- **Systematic** processes best capture inefficiencies arising from mispriced fundamental and market information
- Our **edge** comes from embracing new ideas and a continuous investment in people, technology, and data

Investment Process

All-Country World ex-U.S.

35,000 stock investment universe

Objective Return Forecast

Stock-specific
Selection within traditionally defined groups

+

Peer
Overlooked information from alternative peer groups

+

Macro
Top-down group signals (industry and country)

Disciplined Portfolio Construction

Multi-horizon forecasts

Proprietary risk models

Dynamic transaction cost modeling

Structured Trading Process

Systematic approach

Dynamic routing based on order profiling

Real-time oversight

The information provided is for illustrative purposes only.

Return Forecast Example

Model	Theme	Sample signals	Forecast
Stock-Specific	Value	Adjusted Intrinsic Value Extended Asset Value	+1.02
	Quality	Financial Strength Management Behavior	+0.49
	Growth	Earnings Surprise Recommendation Change	0.00
	Technical	Industry Leadership Smart Reversal	+0.13
Peer	Proprietary Networks	Momentum Fundamentals	+0.32
Macro	Country	Corruption Adjusted Valuation Macro Environment	+0.12
	Industry	Quality Global Growth Sensitivity	+0.16
	Country/Industry Intersection	Price Momentum Adjusted Valuation	+0.28

Total Forecast
+2.15%

Company: STRABAG SE
Market Cap: USD 4B
Country: Austria
Industry: Capital Goods
Description: Offers construction-related services

Source: Acadian Asset Management LLC. The information provided is for illustrative purposes only based on proprietary models. There can be no assurance that the forecasts will be achieved. The selected stock is intended to be an example of the process and is not a recommendation to buy or sell this specific security.

Risk Management and Portfolio Construction

All Country World ex-U.S. Equity

Active risk	4% - 6% tracking error
Market risk	Beta, volatility & size constrained to market
Security risk	2.25% active weight (dynamic)
Sector risk	+/- 8% active weight
Country risk	+/- 6% active weight
Factor crowding	Mitigate factor crowding through Dynamic Factor Weighting
Human oversight	Portfolio review, discretionary risk management

STRATEGY

Strategy Overview

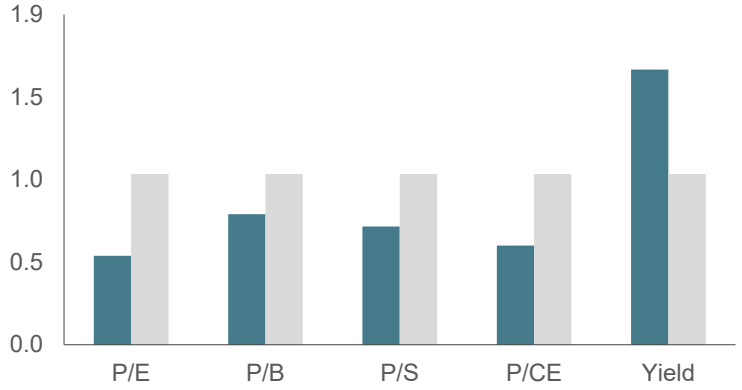
	ALL COUNTRY WORLD EX-U.S. EQUITY
Style	All-Cap, Core
Process	Systematic stock selection, 100+ proprietary signals
Universe	35,000 securities
Benchmark	MSCI All-Country World ex-U.S.
Performance Objective	2% - 3% (net of fees)
Active Risk	4% - 6%
Turnover	50% - 100%

All-Country World ex-U.S. Equity

Key Characteristics – January 31, 2023*

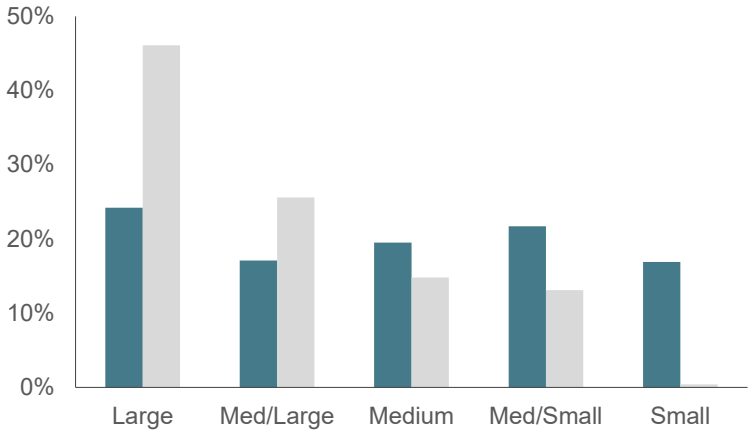
Valuation	Portfolio	Benchmark
Price/Earnings	7.3	14.0
Price/Book	1.3	1.7
Price/Sales	0.9	1.3
Price/Cash Earnings	5.0	8.6
Yield	5.0%	3.1%
Total Securities	1133	2257

Relative Valuation



Cap Size (USD Billions)	Portfolio	Benchmark
Large > $50B	24.2%	46.1%
Med/Large $20-$50	17.1%	25.6%
Medium $10-$20	19.5%	14.8%
Med/Small $3-$10	21.7%	13.1%
Small < $3	16.9%	0.4%
Median	0.9	9.2
Weighted Average	45.2	89.0

Cap Size (USD Billions)

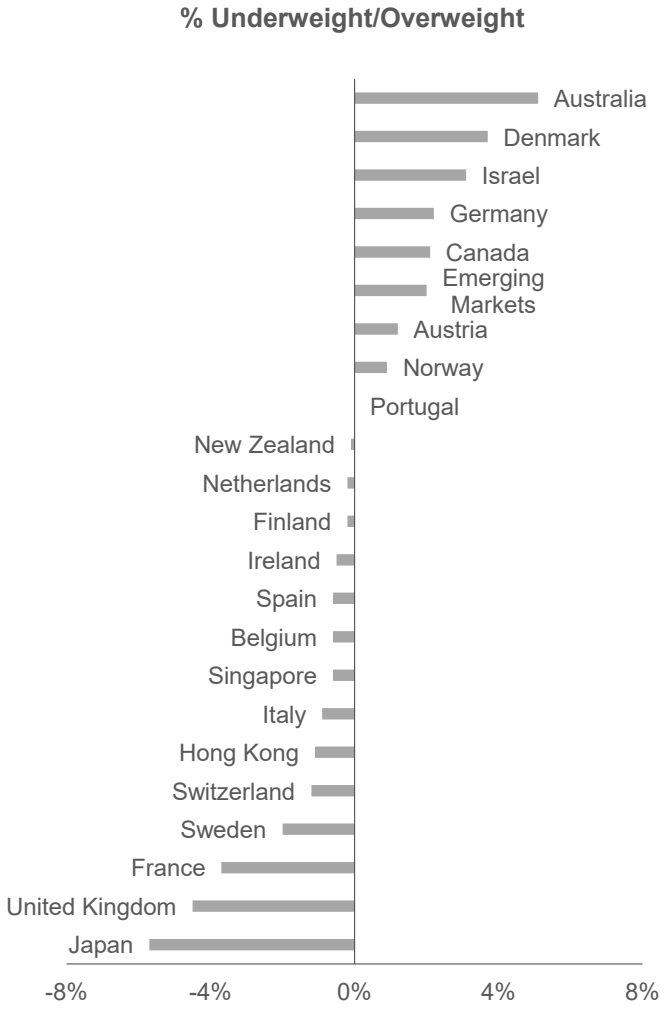


Portfolio: All-Country World ex-U.S. Equity. Benchmark: MSCI All-Country World ex-U.S..
**Preliminary. The data presented here is for a representative portfolio and is supplemental to the composite performance disclosure page attached. Reference to the benchmark is for comparative purposes only and is not intended to indicate that the composite will contain the same investments as the benchmark. Investors have the opportunity for losses as well as profits. Index Source: MSCI Copyright MSCI 2023. All Rights Reserved. Unpublished. PROPRIETARY TO MSCI.*

All-Country World ex-U.S. Equity

Regional Allocations – January 31, 2023*

	Portfolio	Benchmark	Difference
Continental Europe	**30.1%**	**31.9%**	**-1.8%**
Austria	1.3	0.1	1.2
Belgium	0.1	0.6	-0.6
Denmark	5.5	1.8	3.7
Finland	0.4	0.6	-0.2
France	4.1	7.8	-3.7
Germany	7.6	5.4	2.2
Ireland	0.0	0.5	-0.5
Italy	0.7	1.6	-0.9
Netherlands	2.7	2.9	-0.2
Norway	1.3	0.4	0.9
Portugal	0.1	0.1	0.0
Spain	1.0	1.6	-0.5
Sweden	0.1	2.1	-2.0
Switzerland	5.1	6.4	-1.2
United Kingdom	**5.1%**	**9.6%**	**-4.5%**
Australia/New Zealand	**10.3%**	**5.3%**	**5.0%**
Australia	10.3	5.2	5.1
New Zealand	0.0	0.1	-0.1
Hong Kong/Singapore	**1.1%**	**2.8%**	**-1.7%**
Hong Kong	0.7	1.9	-1.1
Singapore	0.4	1.0	-0.6
Japan	**8.1%**	**13.8%**	**-5.7%**
North America	**10.6%**	**7.8%**	**2.8%**
Canada	9.9	7.8	2.1
Middle East	**3.6%**	**0.4%**	**3.1%**
Israel	3.6	0.4	3.1
Emerging Markets	**30.3%**	**28.3%**	**2.0%**
Cash Equitization	**0.2**		
Cash	**0.5**		



Portfolio: All-Country World ex-U.S. Equity. Benchmark: MSCI All-Country World ex-U.S..
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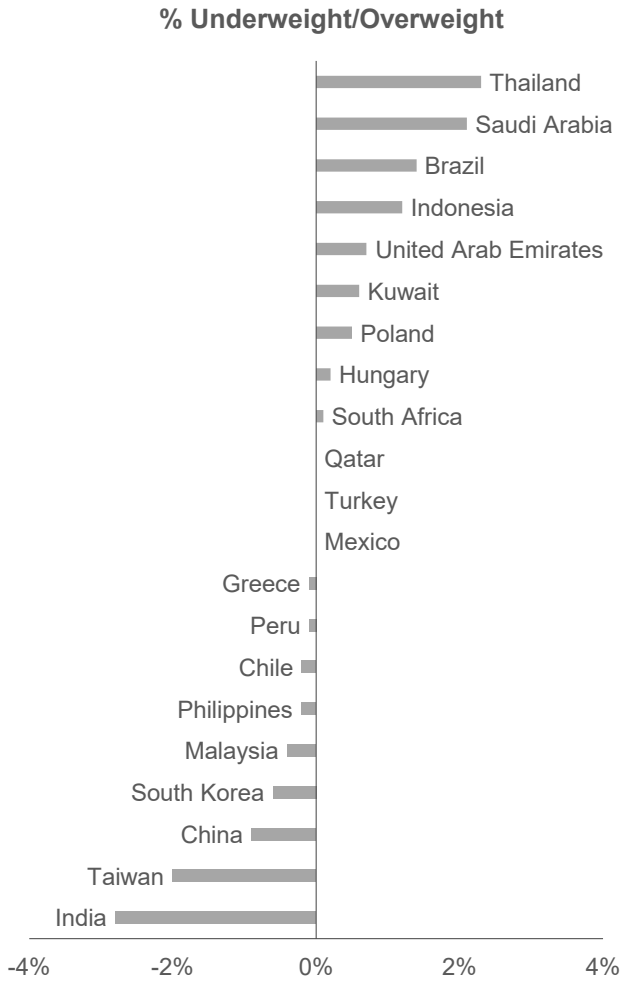
All-Country World ex-U.S. Equity

Emerging Markets Allocations – January 31, 2023*

	Portfolio	Benchmark	Difference
Europe/Mid East/Africa	**7.7%**	**3.5%**	**4.2%**
Czech Republic	0.0	0.0	0.0
Egypt	0.0	0.0	0.0
Greece	0.0	0.1	-0.1
Hungary	0.2	0.1	0.2
Kuwait	0.9	0.2	0.6
Poland	0.7	0.2	0.5
Qatar	0.3	0.3	0.0
Saudi Arabia	3.2	1.1	2.1
South Africa	1.1	1.0	0.1
Turkey	0.2	0.2	0.0
United Arab Emirates	1.0	0.3	0.7
Latin America	**3.6%**	**2.4%**	**1.2%**
Brazil	2.9	1.5	1.4
Chile	0.0	0.2	-0.2
Colombia	0.0	0.0	0.0
Mexico	0.7	0.7	0.0
Peru	0.0	0.1	-0.1
Asia	**19.0%**	**22.3%**	**-3.3%**
China	8.6	9.5	-0.9
India	0.9	3.7	-2.8
Indonesia	1.7	0.5	1.2
Malaysia	0.1	0.4	-0.4
Philippines	0.0	0.2	-0.2
South Korea	2.7	3.3	-0.6
Taiwan	2.0	4.1	-2.0
Thailand	2.9	0.6	2.3

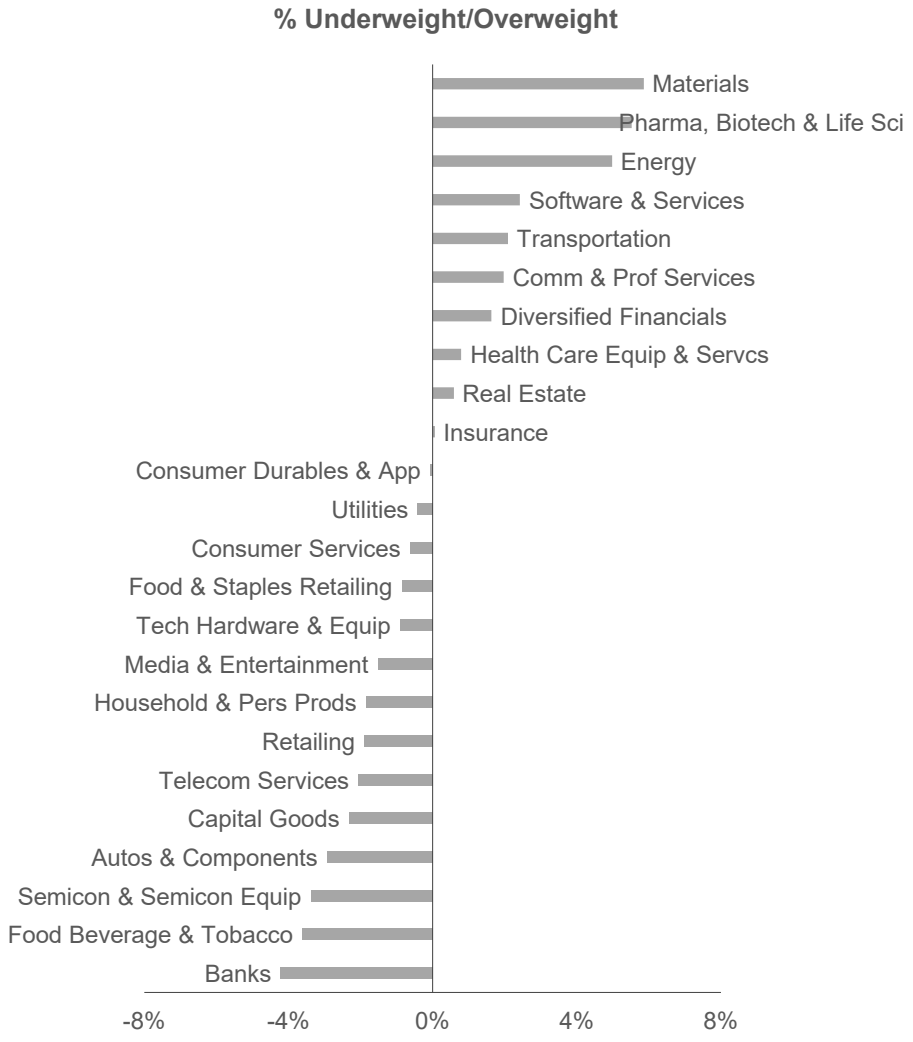


Portfolio: All-Country World ex-U.S. Equity. Benchmark: MSCI All-Country World ex-U.S..
**Preliminary. The data presented here is for a representative portfolio and is supplemental to the composite performance disclosure page attached. Reference to the benchmark is for comparative purposes only and is not intended to indicate that the composite will contain the same investments as the benchmark. Investors have the opportunity for losses as well as profits. Index Source: MSCI Copyright MSCI 2023. All Rights Reserved. Unpublished. PROPRIETARY TO MSCI.*

All-Country World ex-U.S. Equity

Industry Allocations – January 31, 2023*

	Portfolio	Benchmark	Difference
Communication Services	**2.7%**	**6.3%**	**-3.6%**
Media & Entertainment	2.0	3.5	-1.5
Telecommunication Services	0.7	2.8	-2.1
Consumer Discretionary	**6.5%**	**12.0%**	**-5.5%**
Automobiles & Components	0.5	3.5	-2.9
Consumer Durables & Apparel	3.7	3.7	-0.1
Consumer Services	0.9	1.5	-0.6
Retailing	1.4	3.3	-1.9
Consumer Staples	**2.2%**	**8.5%**	**-6.3%**
Food & Staples Retailing	0.7	1.5	-0.8
Food, Beverage & Tobacco	1.4	5.1	-3.6
Household & Personal Products	0.1	1.9	-1.8
Energy	**10.8%**	**5.8%**	**5.0%**
Financials	**18.4%**	**21.0%**	**-2.5%**
Banks	9.0	13.3	-4.2
Diversified Financials	4.5	2.9	1.6
Insurance	4.9	4.8	0.1
Health Care	**15.7%**	**9.3%**	**6.3%**
Health Care Equipment & Services	2.7	1.9	0.8
Pharmaceuticals, Biotechnology & Life Sciences	13.0	7.5	5.5
Industrials	**13.7%**	**12.0%**	**1.7%**
Capital Goods	5.8	8.1	-2.3
Commercial & Professional Services	3.3	1.3	2.0
Transportation	4.7	2.6	2.1
Information Technology	**9.5%**	**11.3%**	**-1.9%**
Semiconductors & Semiconductor Equipment	2.1	5.5	-3.4
Software & Services	5.5	3.0	2.4
Technology Hardware & Equipment	1.9	2.8	-0.9
Materials	**14.3%**	**8.4%**	**5.9%**
Real Estate	**2.8%**	**2.3%**	**0.6%**
Utilities	**2.7%**	**3.1%**	**-0.4%**
Cash Equitization	**0.2**		
Cash	**0.5**		



Portfolio: All-Country World ex-U.S. Equity. Benchmark: MSCI All-Country World ex-U.S..
**Preliminary. The data presented here is for a representative portfolio and is supplemental to the composite performance disclosure page attached. Reference to the benchmark is for comparative purposes only and is not intended to indicate that the composite will contain the same investments as the benchmark. Investors have the opportunity for losses as well as profits. Index Source: MSCI Copyright MSCI 2023. All Rights Reserved. Unpublished. PROPRIETARY TO MSCI.*

All-Country World ex-U.S. Equity

Top Ten Portfolio Holdings – January 31, 2023*

Name	Country	Industry	Portfolio (%)
NOVO NORDISK A S	Denmark	Pharmaceuticals, Biotechnology & Life Sciences	2.8
ROCHE HOLDING AG	Switzerland	Pharmaceuticals, Biotechnology & Life Sciences	2.6
BHP GROUP LTD	Australia	Materials	2.0
CHINA CONSTRUCTION BANK CORP.	China	Banks	1.9
AUSTRALIA AND NEW ZEALAND BANKING GROUP LIMITED	Australia	Banks	1.7
SOUTH32 LTD	Australia	Materials	1.6
WOLTERS KLUWER NV	Netherlands	Commercial & Professional Services	1.6
MANULIFE FINANCIAL CORPORATION	Canada	Insurance	1.6
GSK PLC	United Kingdom	Pharmaceuticals, Biotechnology & Life Sciences	1.5
CHECK POINT SOFTWARE TECHNOLOGIES LTD	Israel	Software & Services	1.4

Summary	Portfolio	Benchmark	Active Weight
% of Portfolio for Top 10 Active Weights	18.4	3.6	14.9
% of Portfolio for Top 20 Current Holdings	30.6	5.0	25.6
% of Non-Benchmark Portfolio Holdings	28.0		
Active Share of Portfolio	87.9		

Portfolio: All-Country World ex-U.S. Equity. Benchmark: MSCI All-Country World ex-U.S..
**Preliminary. Portfolio holdings are subject to change and should not be considered a recommendation to buy or sell individual securities. The data presented here is for a representative portfolio and is supplemental to the composite performance disclosure page attached. Reference to the benchmark is for comparative purposes only and is not intended to indicate that the composite will contain the same investments as the benchmark. Investors have the opportunity for losses as well as profits. Index Source: MSCI Copyright MSCI 2023. All Rights Reserved. Unpublished. PROPRIETARY TO MSCI.*

All-Country World ex-U.S. Equity Composite

Performance (Returns in USD – Before and After Management Fees)

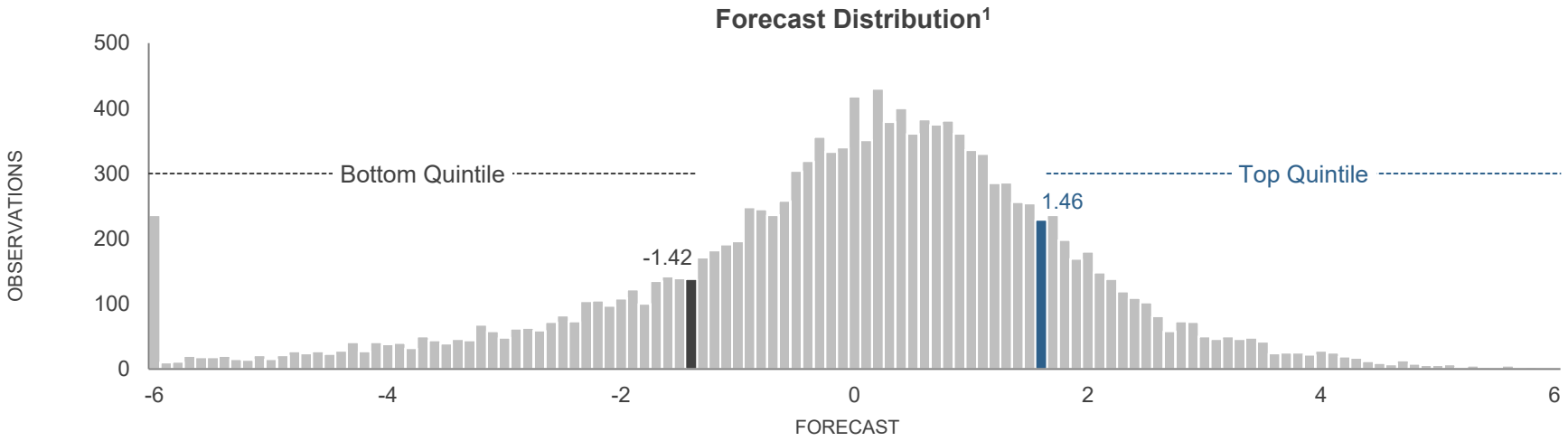
Time Period	Composite (gross)*	Composite (net)*	Benchmark	Value-Added (gross) vs. Benchmark
1998 (Inception: Nov 1, 1998)	5.5%	5.5%	9.0%	(3.5)%
1999	34.9	34.3	30.9	4.0
2000	(10.5)	(10.9)	(15.1)	4.6
2001	(10.4)	(10.9)	(19.7)	9.3
2002	(7.5)	(8.0)	(14.9)	7.4
2003	55.5	54.7	40.8	14.7
2004	26.0	25.4	20.9	5.1
2005	24.8	24.3	16.6	8.2
2006	31.1	30.4	26.7	4.4
2007	15.9	15.4	16.7	(0.8)
2008	(50.4)	(50.7)	(45.5)	(4.9)
2009	34.7	34.1	41.4	(6.7)
2010	18.0	17.4	11.2	6.8
2011	(12.3)	(12.7)	(13.7)	1.4
2012	18.6	18.1	16.8	1.8
2013	18.5	17.9	15.3	3.2
2014	(1.2)	(1.7)	(3.9)	2.7
2015	(3.9)	(4.3)	(5.7)	1.8
2016	9.5	9.0	4.5	5.0
2017	35.7	35.1	27.2	8.5
2018	(14.8)	(15.2)	(14.2)	(0.6)
2019	19.1	18.6	21.5	(2.4)
2020	13.9	13.4	10.7	3.2
2021	16.3	15.7	7.8	8.5
2022	(15.7)	(16.1)	(16.0)	0.3
2023 through January	5.7	5.7	8.1	(2.4)
One Year Annualized Return	(4.8)	(5.3)	(5.7)	0.9
Three Year Annualized Return	6.4	5.8	3.6	2.8
Five Year Annualized Return	2.7	2.2	1.4	1.3
Ten Year Annualized Return	6.7	6.2	4.2	2.5
Since-Inception Annualized Return	8.0	7.5	5.0	3.0
Since-Inception Annualized Standard Deviation	17.8	17.8	17.0	
Since-Inception Active Risk				4.2
Since-Inception Information Ratio				0.7

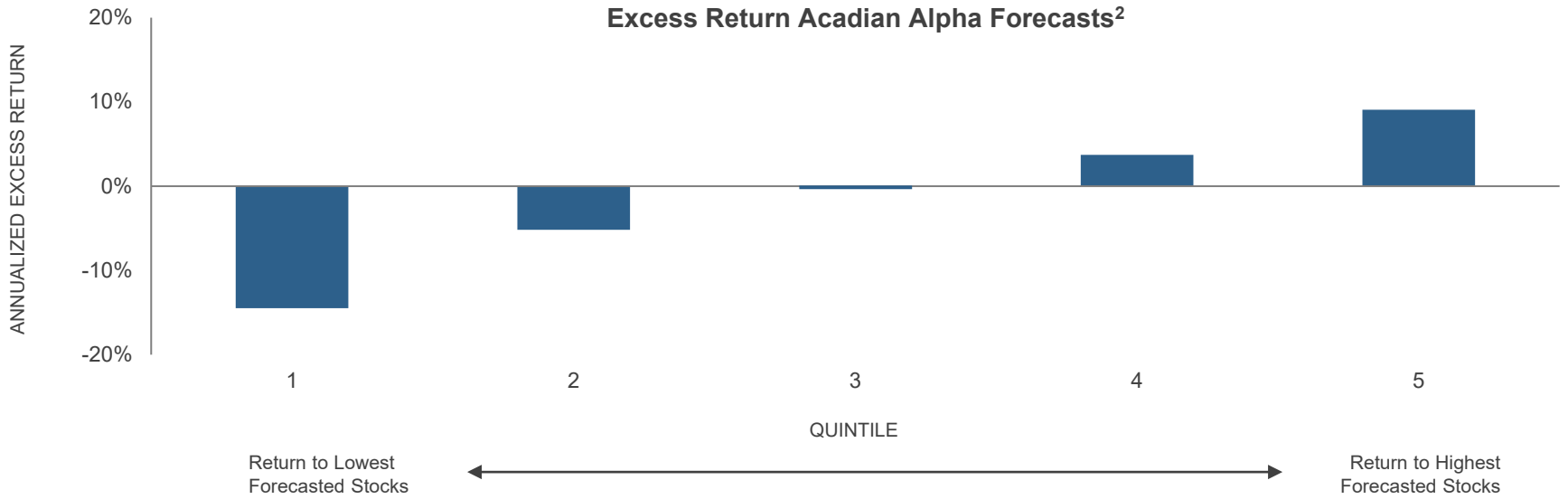
Composite: All-Country World ex-U.S. Equity. Benchmark: MSCI All-Country World ex-U.S. (net) 2001-01-01 To Present, MSCI AC World ex-USA (gross) 1998-11-01 To 2001-01-01.
**Returns that include the most recent month are preliminary. Net of fee returns reflect 48.3bps, which is the average fee based on a tiered schedule for Alaska Retirement Management Board's estimated initial investment amount. A performance page for this composite is later in this presentation with the standard fee schedule of 0.75% first $25M; 0.65% next $25M; 0.50% next $100M; 0.40% thereafter. Acadian Asset Management LLC claims compliance with the Global Investment Performance Standards (GIPS®). GIPS® is a registered trademark of CFA Institute. CFA Institute does not endorse or promote this organization, nor does it warrant the accuracy or quality of the content contained herein. Reference to the benchmark is for comparative purposes only and is not intended to indicate that the composite will contain the same investments as the benchmark. Investors have the opportunity for losses as well as profits. Past performance is no guarantee of future returns. Past performance may differ significantly from future performance due to market volatility. The complete performance disclosure can be found in the composite performance disclosure page attached. Index Source: MSCI Copyright MSCI 2023. All Rights Reserved. Unpublished. PROPRIETARY TO MSCI.*

SUPPORTING EXHIBITS

Stock Forecast Distribution and Returns

Trailing 10 Years as of December 2022





Source: Acadian Asset Management LLC. For illustrative purposes only

[1]Source: Acadian's All-Country World ex-U.S. universe with a market cap greater than $100M. Methodology: Observations represents the number of forecasts. The highlighted values represent the observations in the top and bottom quintiles. The information is not reflective of a particular time period and is provided for illustrative purposes only. The chart depicts our forecast distribution process based on proprietary models. There can be no assurance that the forecasts will be achieved.

[2]This is not intended to represent investment returns generated by an actual portfolio. They do not represent actual trading or an actual account but were achieved by means of using Acadian's All-Country World ex-U.S. universe of securities for the period specified above. Results do not reflect transaction costs or other implementation costs. Past performance is no guarantee of future results.

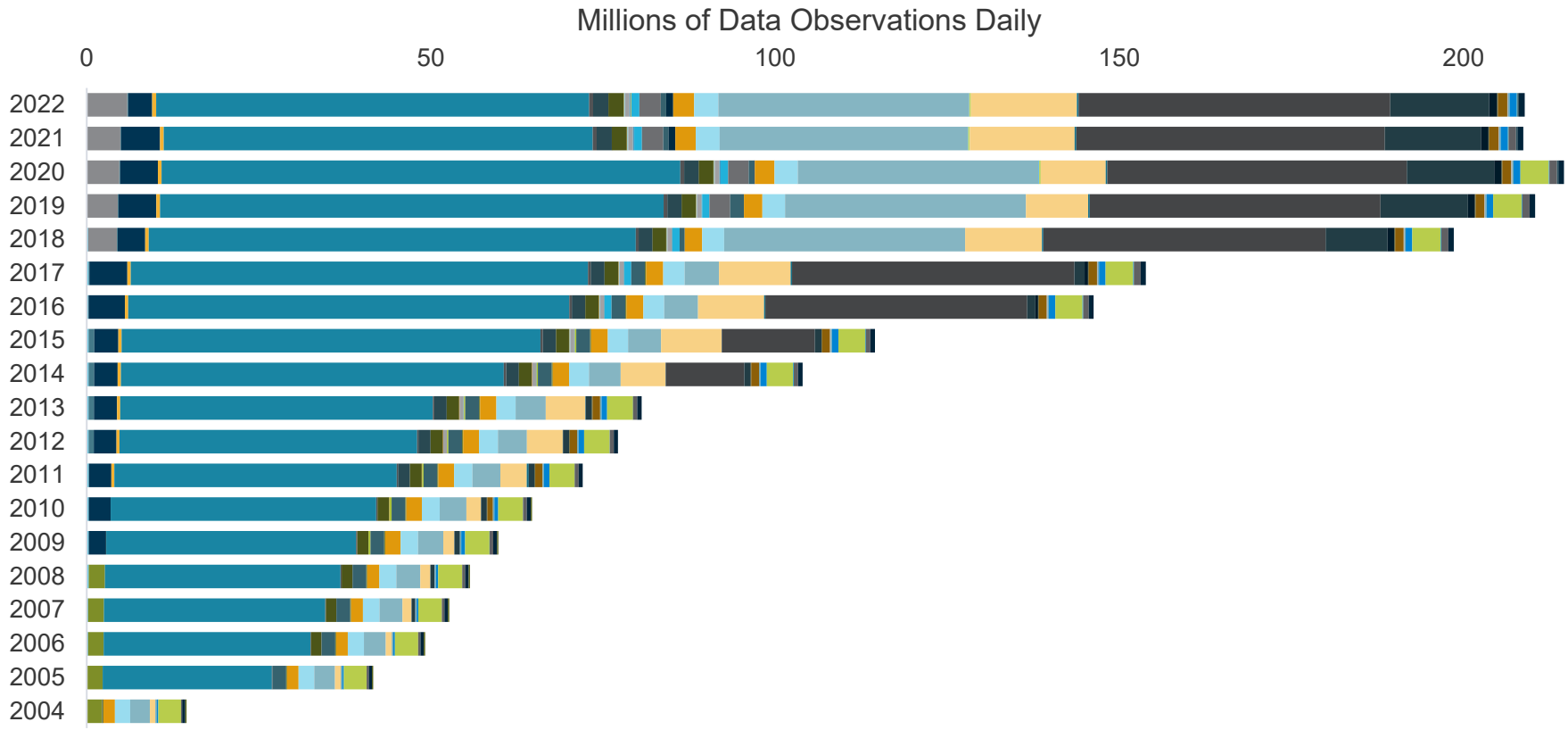
Global Data

43,500 COMPANIES
100 COUNTRIES

209 MILLION DAILY OBSERVATIONS

44 TERABYTE DATABASE

Daily data from over 40 sources including regulatory authorities, company websites, media sources, and industry trade organizations not available in standard vendor offerings:



Colors on the chart symbolize different data sources. Data as of January 2022.

BIOGRAPHIES

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- 25 years of investment experience
- Member of the Acadian Board of Managers, Executive Management Team, Executive Committee, Responsible Investing Committee
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- B.S. in chemical engineering from University of Maryland

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- B.S. in information engineering from Wuhan University, School of Remote Sensing and Information Engineering
- CFA charterholder

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Investment Team

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- B.S. in computer science from Hubei University of Police, China

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- CFA charterholder

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- M.S. mechanics from Rensselaer Polytechnic Institute
- M.S. in computer science from Rensselaer Polytechnic Institute
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- Sun Certified Enterprise Architect (SCEA)

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- CFA charterholder

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- University Foundation Studies of Commerce at St. Paul's International College

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- CFA charterholder

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- B.S.E. in mechanical engineering from the University of Michigan

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- B.A. in communications from the University of Massachusetts
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Investment Team

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- CAIA charterholder
- CFA charterholder

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- B.S. in finance and mathematics from Wuhan University

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- B.Sc. in mathematics from MIT

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- B.S. degrees in industrial engineering and in economics from Instituto Tecnologico Autonomo de Mexico

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- B.S. in actuarial sciences from The Ohio State University

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- M.S. in applied finance from Singapore Management University
- Specialist diploma in data science (artificial intelligence) from Singapore Polytechnic
- Bachelor of Business and Commerce from Monash University
- CFA charterholder

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- MSc in financial mathematics from University of Chicago
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- M.A. in statistics from the University of Michigan
- M.A. in political science from Peking University
- B.A. in economics and political science from Peking University

APPENDIX

All-Country World ex-U.S. Equity Composite

Performance (Returns in USD – Before and After Management Fees)

Time Period	Composite (gross)*	Composite (net)*	Benchmark	Value-Added (gross) vs. Benchmark
1998 (Inception: Nov 1, 1998)	5.5%	5.4%	9.0%	(3.5)%
1999	34.9	33.9	30.9	4.0
2000	(10.5)	(11.1)	(15.1)	4.6
2001	(10.4)	(11.1)	(19.7)	9.3
2002	(7.5)	(8.2)	(14.9)	7.4
2003	55.5	54.3	40.8	14.7
2004	26.0	25.1	20.9	5.1
2005	24.8	23.9	16.6	8.2
2006	31.1	30.1	26.7	4.4
2007	15.9	15.1	16.7	(0.8)
2008	(50.4)	(50.8)	(45.5)	(4.9)
2009	34.7	33.7	41.4	(6.7)
2010	18.0	17.1	11.2	6.8
2011	(12.3)	(13.0)	(13.7)	1.4
2012	18.6	17.8	16.8	1.8
2013	18.5	17.6	15.3	3.2
2014	(1.2)	(2.0)	(3.9)	2.7
2015	(3.9)	(4.6)	(5.7)	1.8
2016	9.5	8.7	4.5	5.0
2017	35.7	34.7	27.2	8.5
2018	(14.8)	(15.5)	(14.2)	(0.6)
2019	19.1	18.3	21.5	(2.4)
2020	13.9	13.1	10.7	3.2
2021	16.3	15.4	7.8	8.5
2022	(15.7)	(16.4)	(16.0)	0.3
2023 through January	5.7	5.7	8.1	(2.4)
One Year Annualized Return	(4.8)	(5.6)	(5.7)	0.9
Three Year Annualized Return	6.4	5.6	3.6	2.8
Five Year Annualized Return	2.7	1.9	1.4	1.3
Ten Year Annualized Return	6.7	5.9	4.2	2.5
Since-Inception Annualized Return	8.0	7.2	5.0	3.0
Since-Inception Annualized Standard Deviation	17.8	17.8	17.0	
Since-Inception Active Risk				4.2
Since-Inception Information Ratio				0.7

Composite: All-Country World ex-U.S. Equity. **Benchmark:** *MSCI All-Country World ex-U.S. (net) 2001-01-01 To Present, MSCI AC World ex-USA (gross) 1998-11-01 To 2001-01-01.*
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Annual Performance Disclosure

All-Country World ex-U.S. Equity Composite

	Composite Return (%) Gross-of-Fees	Composite Return (%) Net-of-Fees	Benchmark Return (%)	Dispersion of Returns Within Composite (%)	Three-Year ex-Post Standard Deviation of Absolute Gross Returns		Number of Portfolios in Composite	Assets In Composite ($MMs)	Total Firm Assets Under Management ($MMs)
					Composite	Benchmark			
2013	18.5	17.6	15.3	1.2	16.1	16.2	10	6,353	65,153
2014	-1.2	-2.0	-3.9	0.7	13.1	12.8	9	5,676	70,339
2015	-3.9	-4.6	-5.7	1.0	11.7	12.1	9	5,004	66,834
2016	9.5	8.7	4.5	1.3	12.2	12.5	9	5,388	74,174
2017	35.7	34.7	27.2	1.2	11.6	11.9	9	6,207	96,765
2018	-14.8	-15.5	-14.2	0.7	12.0	11.4	11	5,682	85,338
2019	19.1	18.3	21.5	1.0	11.7	11.3	13	8,251	101,232
2020	13.9	13.1	10.7	2.0	17.4	17.9	13	9,682	107,229
2021	16.3	15.4	7.8	1.0	16.4	16.8	13	11,837	116,160
2022	-15.7	-16.4	-16.0	2.0	19.5	19.3	13	10,199	92,796

Performance Inception: November 1, 1998. This composite was created on: December 1, 1998. All figures stated in USD.

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Methodology: Returns are net of foreign withholding taxes on dividends, interest, and capital gains. Since January 1, 2010 Acadian's methodology was augmented to produce a more accurate gross return figure by eliminating modest cash flows such as securities lending income and custodial fees which are regarded as independent of the investment management process; the reinvestment of all income and trading expenses continue to be included. Monthly composite results are asset-weighted by beginning-of-month asset values of member portfolios which are geometrically linked to arrive at the annual composite return. Net-of-fee performance is calculated on a monthly basis by deducting a model management fee equal to 1/12 of the highest annual management fee listed in the standard fee schedule for accounts shown below. The standard fee schedule for accounts managed with this product is 0.75% on the first $25 million, 0.65% on the next $25 million, 0.5% on the next $100 million, and 0.4% thereafter. The combined, all-in maximum fee that includes management and operating expenses for the Acadian All Country World ex US Equity CIT, which is included in the composite, is 0.65% on all assets. The standard management fee schedule and total expense ratio for the Acadian All-Country World ex U.S. Fund, which is included in the composite, are 0.75% on all assets and 0.89%, respectively. Management fees may vary according to the range of services provided, investment performance, and the amount of assets under management. Constituent portfolios are included from the first full month after inception to the present or the last full month prior to cessation of the client relationship with the firm. For example, an account that opened January 15, 2019 will be included beginning February 1, 2019. An account that terminated February 12, 2019 will be included through January 31, 2019. Policies for valuing investments, calculating performance, and preparing GIPS reports are available upon request.

Dispersion and Standard Deviation: Acadian's broad definitions are mainly the product of a highly customized process that may result in modest differences with regards to portfolio characteristics among constituents. All accounts managed with directly comparable investment objectives are included, though it's possible for members to utilize slightly different benchmarks in optimization and reporting. Although at times dispersion among constituents may be high, the long-term forecast for each portfolio is consistent with the overall composite. The 'Dispersion' statistic presented above uses gross of fee returns and is an annual, asset-weighted standard deviation calculation performed only on those portfolios who have been members for the entire calendar year. These figures are not applicable if there is only one portfolio in the composite for the full year. Thirty-six months are required to calculate the 'Three Year ex-Post Standard Deviation' statistic. These figures are not applicable if thirty-six months of composite returns are not available.

Composite Description: This composite invests broadly in developed and emerging equity markets excluding the United States. Complete lists of the firm's composite descriptions, limited distribution pooled fund descriptions, and broad distribution funds are available upon request.

Benchmark Description: The benchmark for the composite is MSCI All-Country World ex-U.S. (net of dividend withholding taxes). The MSCI All-Country World ex-U.S. Index is a free float-adjusted market capitalization weighted index that is designed to measure the equity market performance of developed and emerging markets excluding the United States.

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[1]Ashland Partners verified Acadian's GIPS Compliance claim through March 31, 2017. ACA Compliance Group acquired Ashland's GIPS Verification unit and provided subsequent verifications.

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First Eagle Investments

AS OF 31 DECEMBER 2022

Presentation

International Equity Strategy

Alaska Retirement Management Board

March 16, 2023

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Returns presented for the **First Eagle International Equity strategy (the "International Equity Strategy")** reflect the historical return of a hypothetical portfolio comprised of the equity holdings, excluding gold-related investments, within the First Eagle International Value strategy composite, scaled up to a 96% weighting, combined with a 4% cash weight, and monthly rebalancing. The time period for the hypothetical returns is 1 January 2003 to as of the most recent quarter end.* Returns prior to 2003 are not available due to the level of detail necessary to conduct this type of analysis.

General assumptions include: First Eagle would have been able to purchase the securities recommended by the model and the markets were sufficiently liquid to permit all trading. Changes in these assumptions may have a material impact on the back-tested returns presented. Certain assumptions have been made for modeling purposes and are unlikely to be realized. No representations and warranties are made as to the reasonableness of the assumptions. This information is provided for illustrative purposes only.

Back-tested performance results in a retroactive application of the aforementioned hypothetical investment portfolios. There are inherent limitations to data derived from such a retroactive application, which has been developed with the benefit of hindsight. Actual results may differ due to many reasons, including but not limited to investor demand and trade execution. Specifically, back-tested results do not reflect actual trading or the effect of material economic and market factors on the decision-making process. Since trades have not actually been executed, results may have under- or over-compensated for the impact, if any, of certain market factors, such as lack of liquidity, and may not reflect the impact that certain economic or market factors may have had on the decision-making process. Further, back testing allows the security selection methodology to be adjusted until past returns are maximized. Actual performance may differ significantly from back-tested performance.

Back-tested results presented herein are adjusted to reflect the reinvestment of dividends and other income and, except where otherwise indicated, are presented net of fees and include the effect of back-tested transaction costs, management fees, performance fees and expenses, if applicable. Please note all regulatory considerations regarding the presentation of fees must be taken into account. No cash balance or cash flow is included in the calculation.

*As of 31 December 2022

1. Firm Overview

2. Strategy Overview

3. Investment Philosophy and Process

4. Summary

5. Presenter Biographies

6. Appendix
   - International Equity Sector/Regional/Country Exposures
   - International Equity Simulated/Hypothetical Performance
   - International Value Performance
   - Disclosure Notes

Firm Overview

Entrusted to Grow Our Clients' Assets

Disciplined, Unconventional Thinking

- Absolute return orientation
- Active, fundamental investors
- Experienced approach focused on capital resilience
- Invest with patience, humility and conviction

Global Perspective

- A pioneering global investor
- Macro insights complement bottom-up research
- Clients worldwide

Long-Term Alignment

- Longevity of philosophy and team
- Key employees are shareholders in firm and strategies
- Investment-led culture
- Clients are our "senior partners"

Privately Owned Since

1864

14

Global Offices with Headquarters in New York

582

Employees

700+

Global Institutional Investors

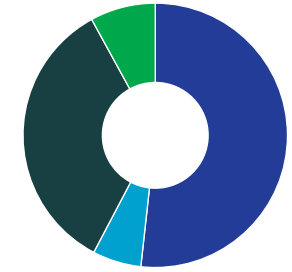
145

Investment Professionals

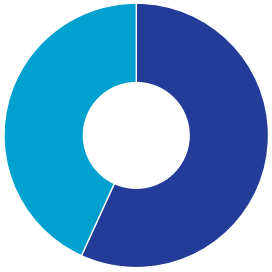
US$123.6B*

Assets Under Management

AUM by Asset Class



AUM by Client Type



* The total AUM represents the combined AUM of First Eagle Investment Management, LLC and its subsidiary investment advisers as of 31 December 2022. It includes $0.9 billion of committed and other non-fee-paying capital from First Eagle Alternative Credit, LLC and $1.4 billion of committed and other non-fee-paying capital from Napier Park Global Capital, inclusive of assets managed by Regatta Loan Management LLC.

Strategy Overview — International Equity

First Eagle International Equity Strategy Overview

Goal

We seek to deliver sound real returns over time while avoiding the permanent impairment of capital

Key Features

- Value as a Philosophy, Not as a Style
- Scarcity Drives Selectivity
- Time-Tested Approach to International Equities

Approach	Absolute Return, Bottom-Up Fundamental, Benchmark Agnostic, Global, Unconstrained, Diversified, Long Term
Range of holdings (approximate)	80–130
Active Share	>85%
Anticipated Portfolio Turnover (annual)	10–20%

The International Equity Strategy is a new strategy and has no historical track record. The above data is for illustrative purposes only. Portfolio characteristics presented above are not investment guidelines and are subject to change. The range of holdings is approximate.

Investment Team—International Equity Strategy

Matt McLennan, CFA *(1991)*
Co-Head of Global Value Team
Portfolio Manager

Kimball Brooker, Jr. *(1992)*
Co-Head of Global Value Team
Portfolio Manager

Alan Barr, CFA* *(1990)*
Portfolio Manager

Christian Heck, CFA* *(2011)*
Portfolio Manager

Director of Research

Matt Lamphier, CFA *(1994)*
Director of Research

Senior Advisors

William Green *(1997)*
Senior Advisor

Bruce Greenwald, PhD *(1982)*
Senior Advisor

Tano Santos, PhD *(1996)*
Senior Advisor

Equity

Julien Albertini *(2002)*
Beverages, commercial services, diversified industrials, healthcare

Benjamin Bahr, CFA *(2005)*
Agricultural commodities, automobiles, banks & other financials, chemicals, energy E&P

Alan Barr, CFA* *(1990)*
Forest products & paper, non-food consumer products, retail

Max Belmont, CFA *(2008)*
Precious metals, aerospace & defense

Manish Gupta *(2005)*
Technology, media, telecommunications, logistics

Christian Heck, CFA* *(2011)*
Gaming, lodging & leisure, healthcare, industrials, retail, technology

Thomas Kertsos *(2006)*
Precious metals, marine transportation

John Masi, CFA *(2009)*
Commercial vehicles & trucks, diversified industrials, infrastructure, insurance, utilities

Ben Offen *(2018)*
Generalist

George Ross, CFA* *(2002)*
Investment grade credit, metals & mining, midstream energy & infrastructure, oil equipment services & distribution, packaging

Neil Valecha *(2018)*
Generalist

David Wang, CFA *(2009)*
Building materials & products, healthcare, holding companies, packaged food, real estate

Mark Wright, CFA *(1994)*
Banks, credit cards & payments, food & tobacco

Melody Zhang *(2021)*
Generalist

Sovereign Debt, FX

Idanna Appio, PhD *(1998)*

Emily Howard *(2010)*

Fernando Freijedo *(2019)*

Trading

Mike Grazidei *(1999)*

Joseph Dargan *(1992)*

Brian Davis *(2013)*

Mark Salamone *(1999)*

Investment Grade Debt

Adrian Jones *(1988)*

George Ross, CFA* *(2002)*

Stewardship & Research Operations

Debbie Lusman *(1994)*

Mahoko Hikita *(2007)*

Oshamimi Mayaki *(2013)*

High Yield

Edward Meigs, CFA *(1988)*

Sean Slein, CFA *(1988)*

Stefanie Bachhuber, CFA *(1986)*

Kevin Kuzio, CFA *(1993)*

Andrew Bahl, CFA *(2006)*

Lina Kabaria, CFA *(2002)*

* Certain members of the investment team hold dual roles.

( ) = Industry Start

Investment Philosophy and Process

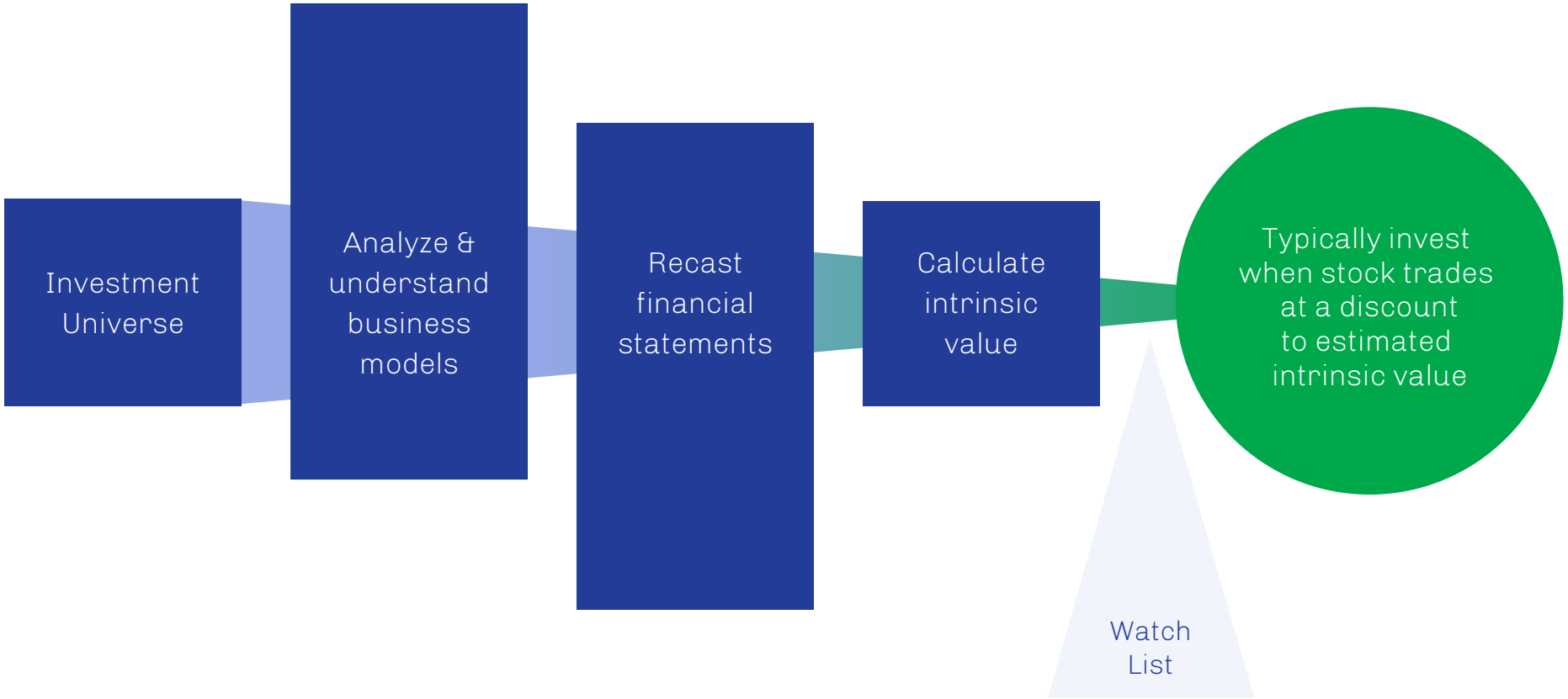
Long Standing Investment Philosophy Based on the International Value Strategy

"Value as a philosophy, not as a style"

- We believe that the market episodically fails to recognize, in our view, a company's "intrinsic value;" we selectively invest when price presents what we believe to be an appropriate "margin of safety"*
- We seek persistent businesses that embody asset scarcity, strong capital structures and corporate resilience
- Our fundamental, bottom-up approach requires a temperament focused on patience, humility and flexibility

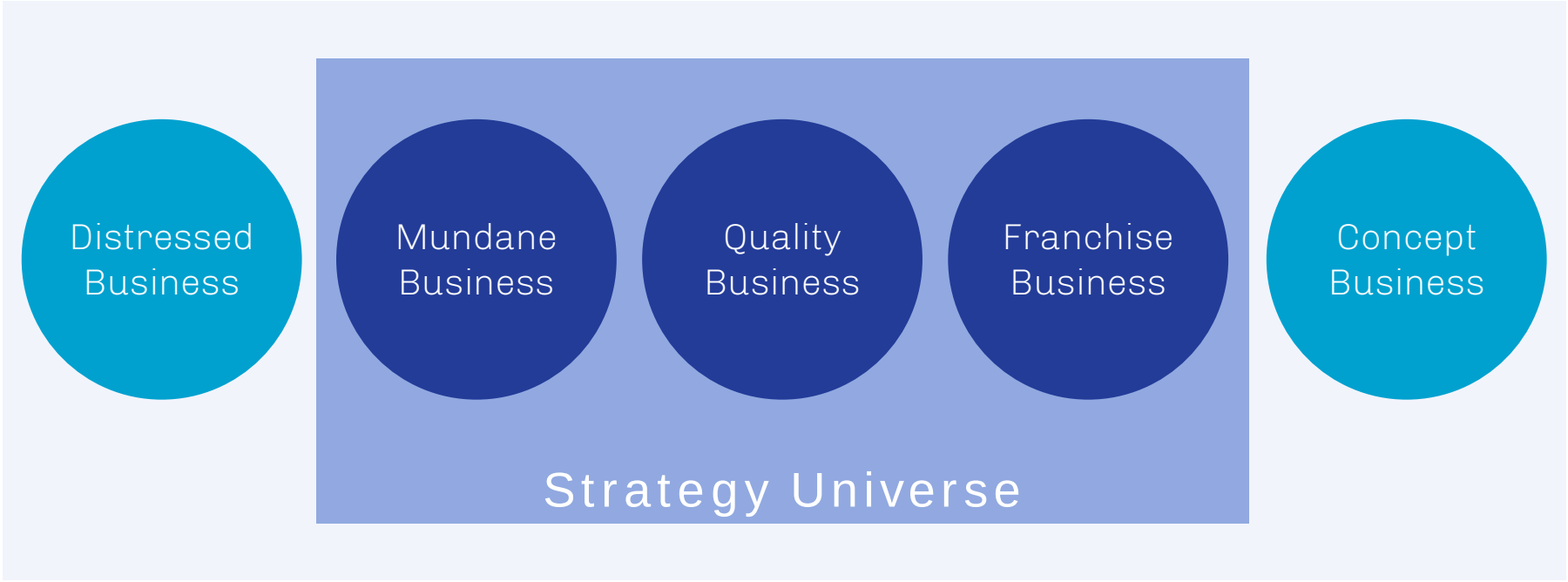
"Intrinsic value" is based on our judgment of what a prudent and rational business buyer would pay in cash for all of the company in normal markets.
*First Eagle defines "margin of safety" as the difference between a company's market value and our estimate of its intrinsic value. An investment made with a margin of safety is no guarantee against loss.

Quality Business First, Then Price



The investment process may change over time. The information set forth above is intended as a general illustration of some of the criteria the strategy team considers in selecting securities. Not all investments will meet such criteria.

Investment Universe



The investment process may change over time. The information set forth above is intended as a general illustration of some of the criteria the strategy team considers in selecting securities. Not all investments will meet such criteria.

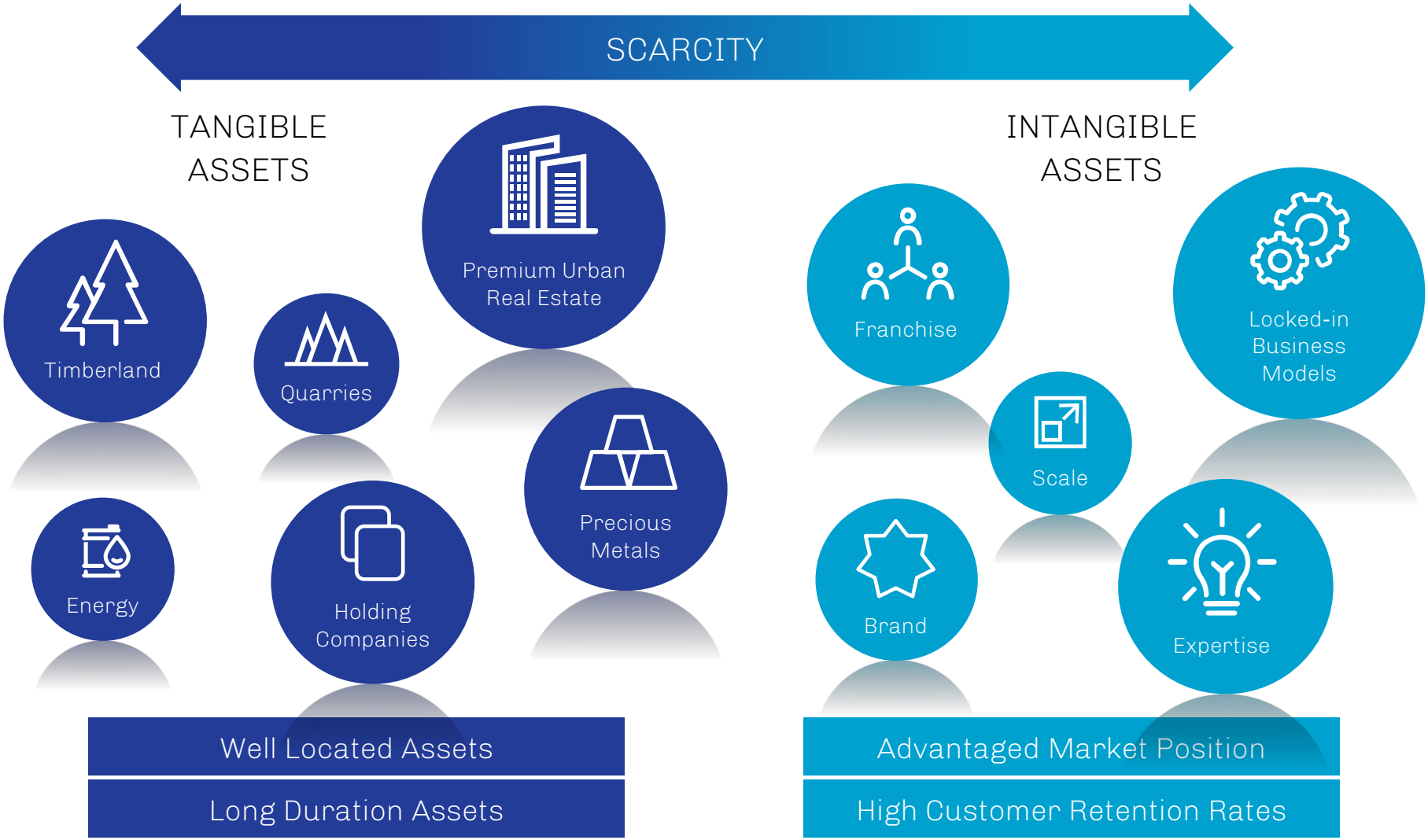
What We Avoid

What We Avoid Can Be as Important as What We Own.

31-Dec-99	**7.7%** in Tech/Telecom	MSCI EAFE:	27.6%
31-Dec-06	**2.8%** in Financials*	MSCI EAFE:	29.9%

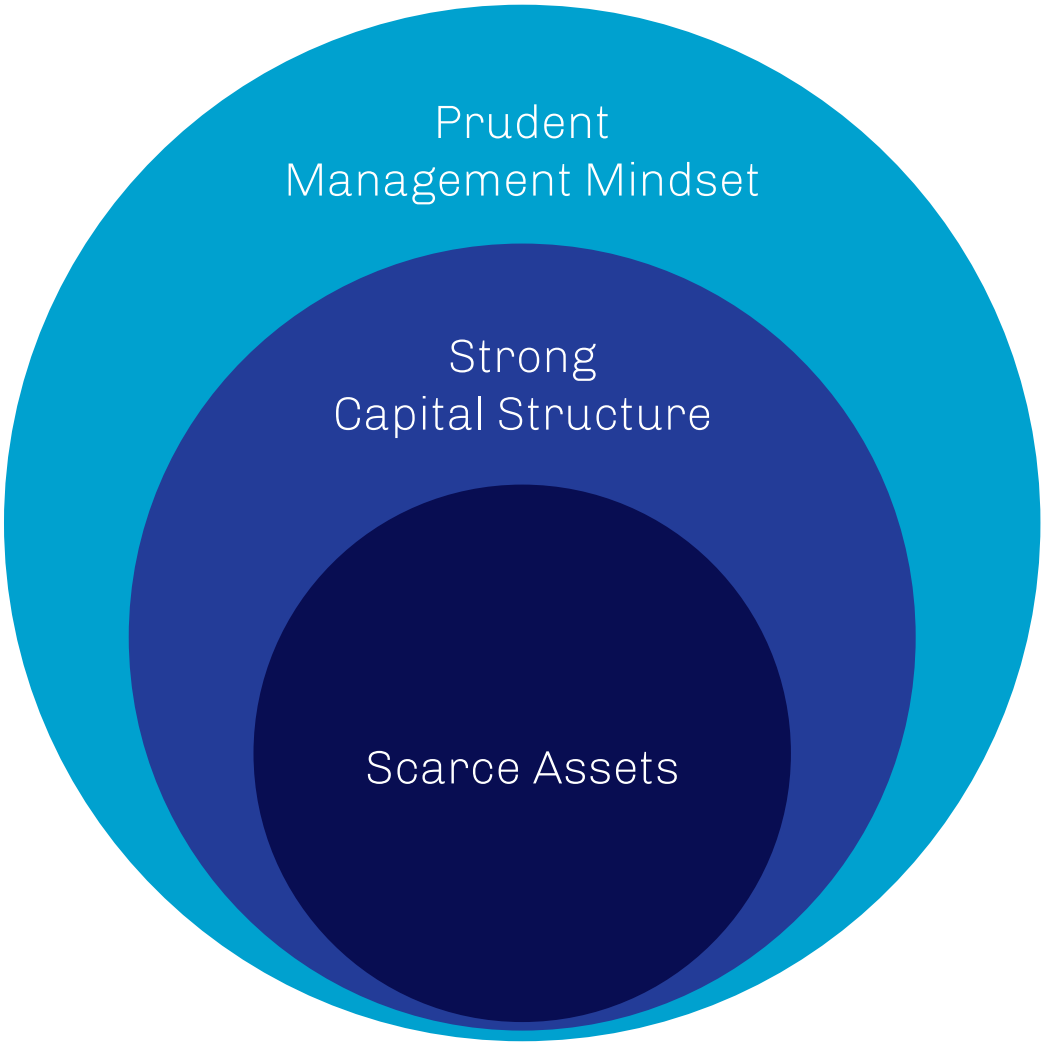
Based on the Global Value strategy. First Eagle acquired the Global Value strategy from another firm on 31 December 1999. A previous portfolio manager was primarily responsible for managing the strategy at the prior firm.

Asset Scarcity Is a Foundation of Persistence

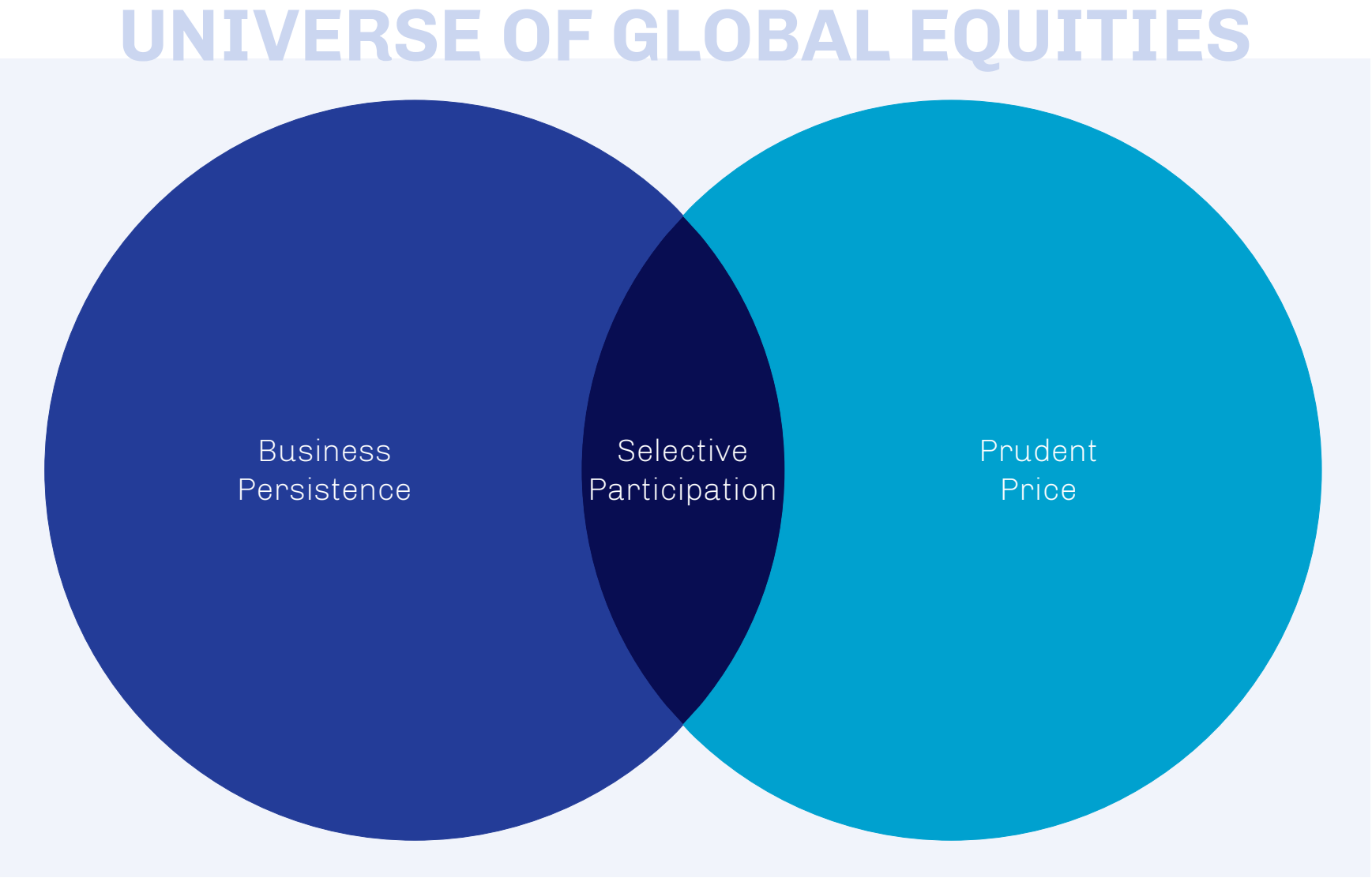


Not all companies held in this strategy will meet the criteria listed. Asset classes and industries represented by the icons on this page are not indicative of any intention to focus on particular asset classes or industries.

Translating Scarcity into Persistence



Selective Participation



Long-Term Ownership

Corporate Interactions

- Dialogue with a company's management team, as well as, when appropriate, with members of companies' Boards of Directors, has been a long-standing part of our investment process
- As an engaged owner, we seek to build constructive long-term relationships with companies and traditionally express our views privately and through our proxy votes

10 Oldest Current First Eagle International Value Strategy Portfolio Holdings

Company	Years Held
Shimano Inc.	27
Chofu Seisakusho Co., Ltd.	27
Industrias Penoles SAB de CV	27
T. Hasegawa Co., Ltd.	26
Namyang Dairy Products Co., Ltd	25
Secom Co., Ltd.	25
HIROSE ELECTRIC CO., LTD.	24
SK Kaken Co., Ltd.	23
Haw Par Corporation Limited	22
Lotte Corp	21

Data as of 31 December 2022.
The specific securities identified and described are not representative of all of the securities purchased, sold, or recommended for client accounts. It should not be assumed that an investment in the securities identified has or will be profitable. Actual holdings will vary for each client and there is no guarantee that a particular client's account will hold any or all of the securities listed.

Summary

Summary

Stable, privately owned firm dating back to 1864

- A pioneer in global investing
- Exclusively focused on investment management

Experienced, cohesive investment team

- Led by four portfolio managers who have worked together since 2013
- Supported by team of analysts averaging over 15 years of industry experience

Time-tested investment philosophy and process

- Over 40 years through multiple market cycles
- Long term, real return orientation

Based on the Global Value strategy. First Eagle acquired the Global Value strategy from another firm on 31 December 1999. A previous portfolio manager was primarily responsible for managing the strategy at the prior firm.

Presenter Biographies

Presenter Biographies

Alan Barr, CFA

Portfolio Manager and Senior Research Analyst

Alan Barr is portfolio manager of the International Value Equity, International Equity and Overseas ADR strategies, as well as a senior research analyst on the Global Value team covering non-food consumer products and forest products & paper. Prior to joining First Eagle in March 2001, Alan spent seven years at Rittenhouse Financial Services and four years at PNC Bank as an equity research analyst. Alan earned a BA in communications with a minor in economics from Temple University, and he holds the Chartered Financial Analyst designation.

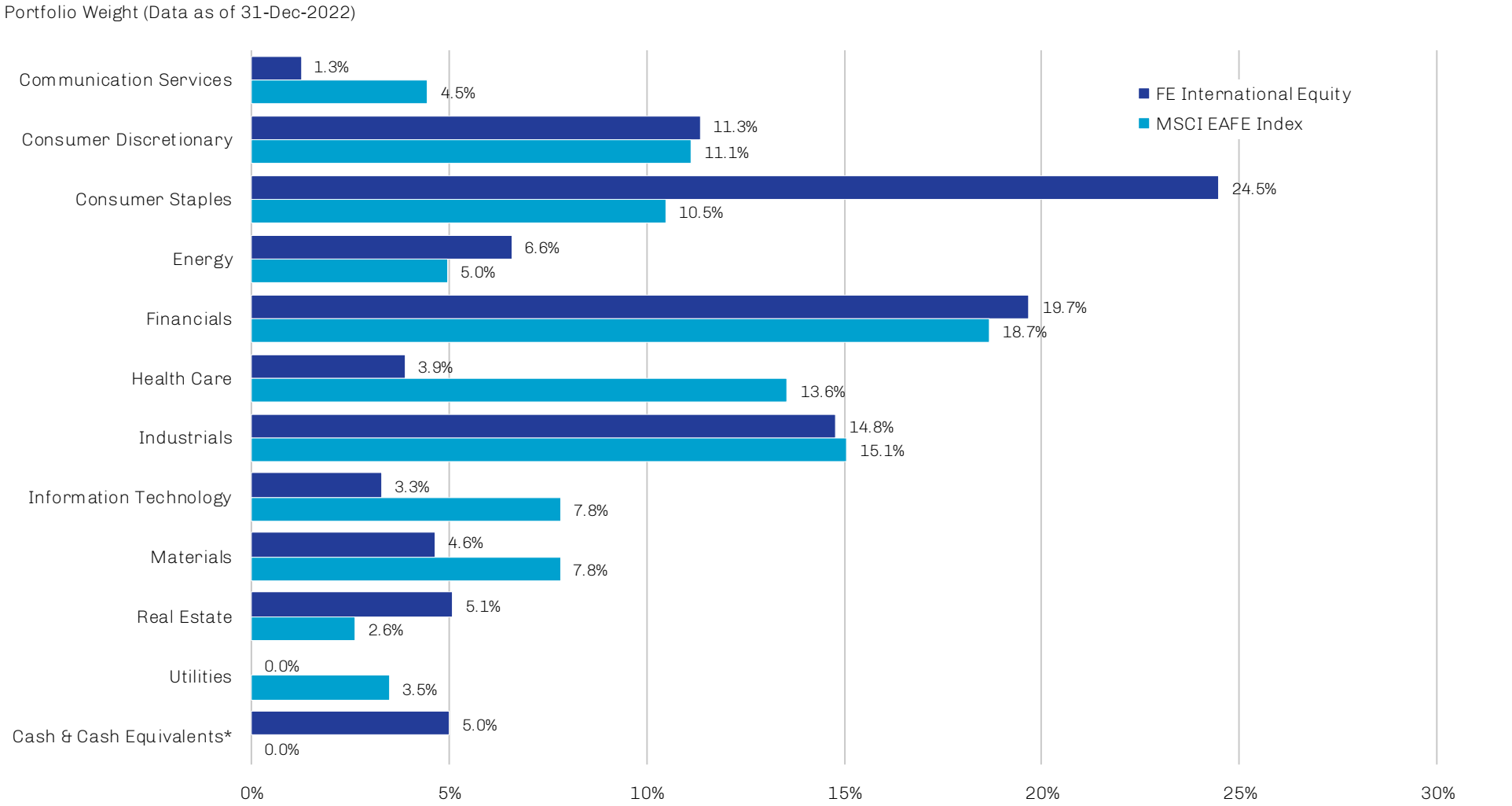
Chad Gross

Head of North American Institutional Business Development

Chad Gross is Head of North American Institutional Business Development, and also responsible for institutional business development in the western United States and Canada. Prior to joining First Eagle Investments in June 2020, he worked at Loomis, Sayles & Company, focusing on new business development among public funds, endowments and foundations. Previously, Chad held institutional business development roles at Manulife Asset Management and Janus Capital Group. Before that, he served as a Captain and aviation officer in the US Army. Chad was awarded a Bronze Star Medal and Air Medal for superior service in combat while on tour in Iraq. He earned a BBA in marketing from Texas Tech University.

Appendix: International Equity Sector/Regional/Country Exposures

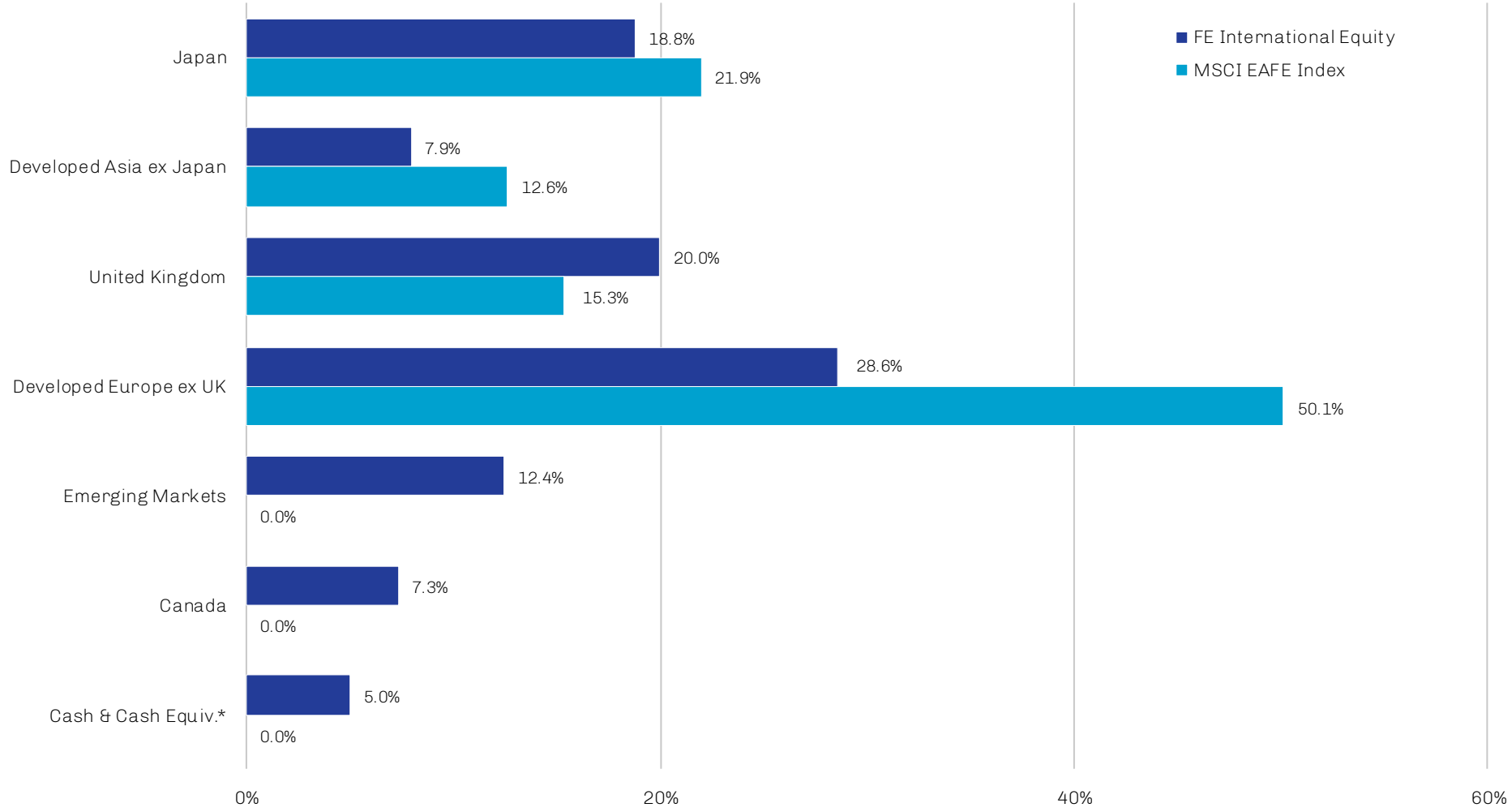
Sector Exposures vs. Index — FE International Equity



Source: FactSet.
* Cash & Cash Equivalents includes cash, forwards, and commercial paper.
The International Equity Strategy is a new strategy and has no historical track record. The above data is for illustrative purposes only. The above characteristics are from a representative portfolio. Actual portfolio may differ. Portfolio characteristics presented above are not investment guidelines and are subject to change. The range of holdings is approximate.

Regional Exposures vs. Index — FE International Equity

Portfolio Weight (Data as of 31-Dec-2022)



Source: FactSet.
* Cash & Cash Equivalents includes cash, forwards, and commercial paper.
The International Equity Strategy is a new strategy and has no historical track record. The above data is for illustrative purposes only. The above characteristics are from a representative portfolio. Actual portfolio may differ. Portfolio characteristics presented above are not investment guidelines and are subject to change.

Country Exposures vs. Index — FE International Equity

As of 31-Dec-2022

	FE International Equity	MSCI EAFE Index
North America	**7.3%**	**---**
Canada	7.3%	---
Developed Europe	**48.5%**	**65.4%**
Austria	2.7%	1.2%
Belgium	---	0.1%
Denmark	---	3.0%
France	8.4%	12.9%
Germany	2.6%	8.1%
Ireland	0.7%	0.7%
Israel	---	0.7%
Italy	---	2.2%
Netherlands	2.3%	4.4%
Norway	1.6%	0.8%
Portugal	---	0.2%
Spain	---	2.4%
Sweden	3.6%	3.3%
Switzerland	6.6%	10.1%
United Kingdom	20.0%	15.3%

	FE International Equity	MSCI EAFE Index
Developed Asia	**26.7%**	**34.6%**
Australia	---	7.9%
Hong Kong	5.4%	3.0%
New Zealand	---	0.2%
Singapore	2.6%	1.5%
Japan	18.8%	21.9%
Emerging Markets	**12.4%**	**---**
Brazil	3.4%	---
China	1.3%	---
Mexico	2.0%	---
South Korea	3.6%	---
Taiwan	1.4%	---
Thailand	0.8%	---
Cash & Cash Equiv.*	**5.0%**	**---**

Source: FactSet.
*Cash & Cash Equivalents includes cash, forwards, and commercial paper.
The International Equity Strategy is a new strategy and has no historical track record. The above data is for illustrative purposes only. The above characteristics are from a representative portfolio. Actual portfolio may differ. Portfolio characteristics presented above are not investment guidelines and are subject to change.

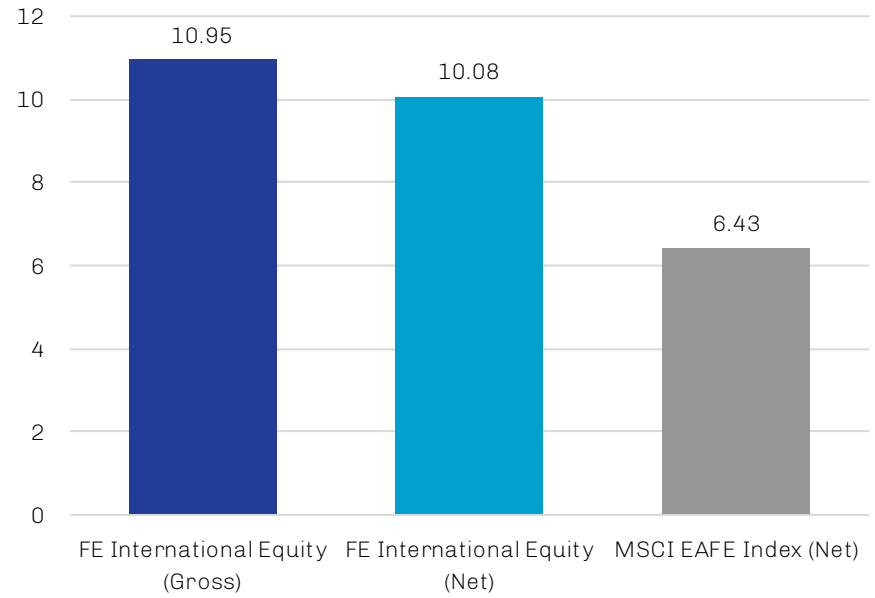
Appendix: International Equity Simulated/Hypothetical Performance

First Eagle International Equity: Attractive Risk/Return Trade Off

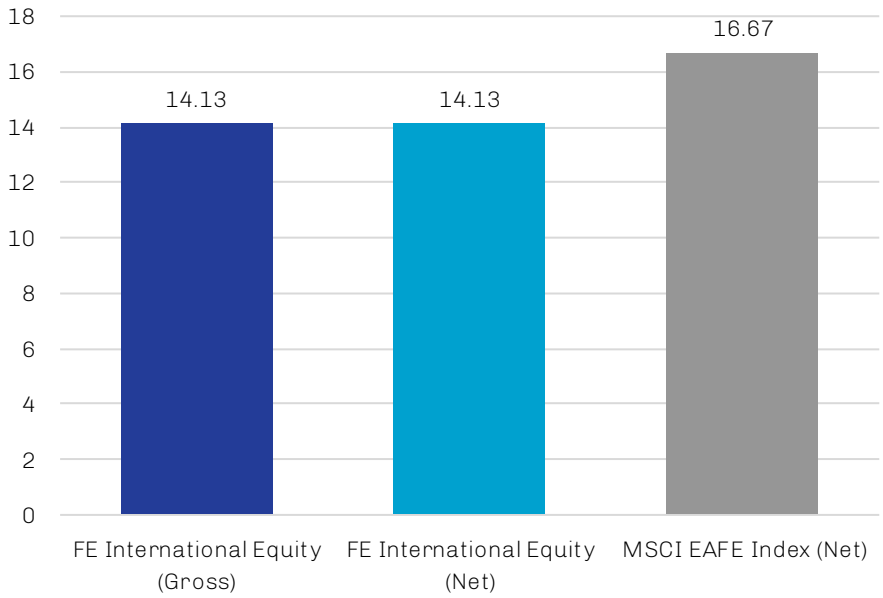
Simulated/Hypothetical Performance Results

Period 1-Jan-2003 to 31-Dec-2022

Return (annualized)



Std. Dev. (annualized)



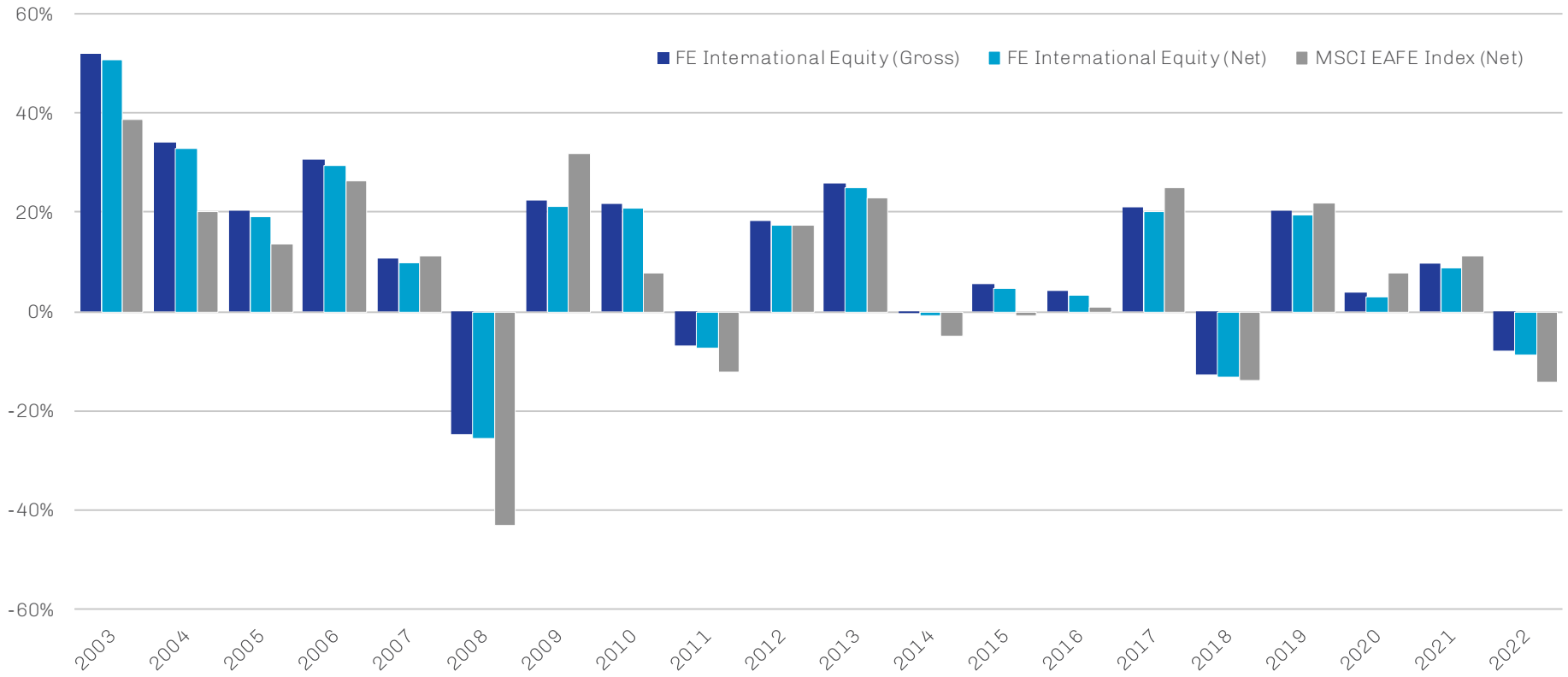
Source: FactSet

The International Equity Strategy is a new strategy and has no historical track record. The hypothetical return presented for the International Equity Strategy reflects back-tested performance derived from carving out the equity holdings from the First Eagle International Value strategy composite, while excluding gold-related allocations, limiting the average cash allocation to 4%, and rebalancing monthly. **Back-tested performance is NOT an indicator of future results.** The results do NOT represent returns that any investor actually attained. Back-tested results are calculated by the retroactive application of a model constructed on the basis of historical data, with the benefit of hindsight, and are based on assumptions integral to the model that may or may not be testable and are subject to losses. **See the General Disclosures on page 2 and the Appendix for additional important information.**

Simulated/Hypothetical Calendar Year Returns — FE International Equity

Simulated/Hypothetical Calendar Year Returns

Data as of 31-Dec-2022



Source: FactSet

The International Equity Strategy is a new strategy and has no historical track record. The hypothetical return presented for the International Equity Strategy reflects back-tested performance derived from carving out the equity holdings from the First Eagle International Value strategy composite, while excluding gold-related allocations, limiting the average cash allocation to 4%, and rebalancing monthly. **Back-tested performance is NOT an indicator of future results.** The results do NOT represent returns that any investor actually attained. Back-tested results are calculated by the retroactive application of a model constructed on the basis of historical data, with the benefit of hindsight, and are based on assumptions integral to the model that may or may not be testable and are subject to losses. **See the General Disclosures on page 2 and the Appendix for additional important information.**

Simulated/Hypothetical Returns — FE International Equity

Hypothetical Trailing Returns

Period: 01-Jan-2003 to 31-Dec-2022

	YTD	1 Year	3 Year	5 Year	10 Year	15 Year	01-Jan-2003 to 31-Dec-2022
FE International Equity – Gross	-7.93%	-7.93%	1.55%	1.92%	6.27%	5.59%	10.95%
FE International Equity – Net	-8.66%	-8.66%	0.74%	1.11%	5.42%	4.75%	10.08%
MSCI EAFE Index – Net Return	-14.45%	-14.45%	0.87%	1.54%	4.67%	1.81%	6.43%

All returns data beyond one-year figures are annualized. Performance numbers are preliminary.
Portfolio and index returns are shown in USD.

Hypothetical Calendar Year Returns

Period: 01-Jan-2003 to 31-Dec-2022

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
FE International Equity – Gross	51.98%	34.04%	20.23%	30.62%	10.53%	-24.96%	22.31%	21.64%	-6.80%	18.34%
FE International Equity – Net	50.81%	33.00%	19.29%	29.60%	9.65%	-25.57%	21.35%	20.68%	-7.54%	17.41%
MSCI EAFE Index - Net Return	38.59%	20.25%	13.54%	26.34%	11.17%	-43.38%	31.78%	7.75%	-12.14%	17.32%

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
FE International Equity – Gross	25.82%	-0.21%	5.57%	4.11%	21.00%	-12.72%	20.33%	3.76%	9.62%	-7.93%
FE International Equity – Net	24.84%	-1.01%	4.73%	3.29%	20.05%	-13.42%	19.38%	2.93%	8.73%	-8.66%
MSCI EAFE Index - Net Return	22.78%	-4.90%	-0.81%	1.00%	25.03%	-13.79%	22.01%	7.82%	11.26%	-14.45%

Source: FactSet

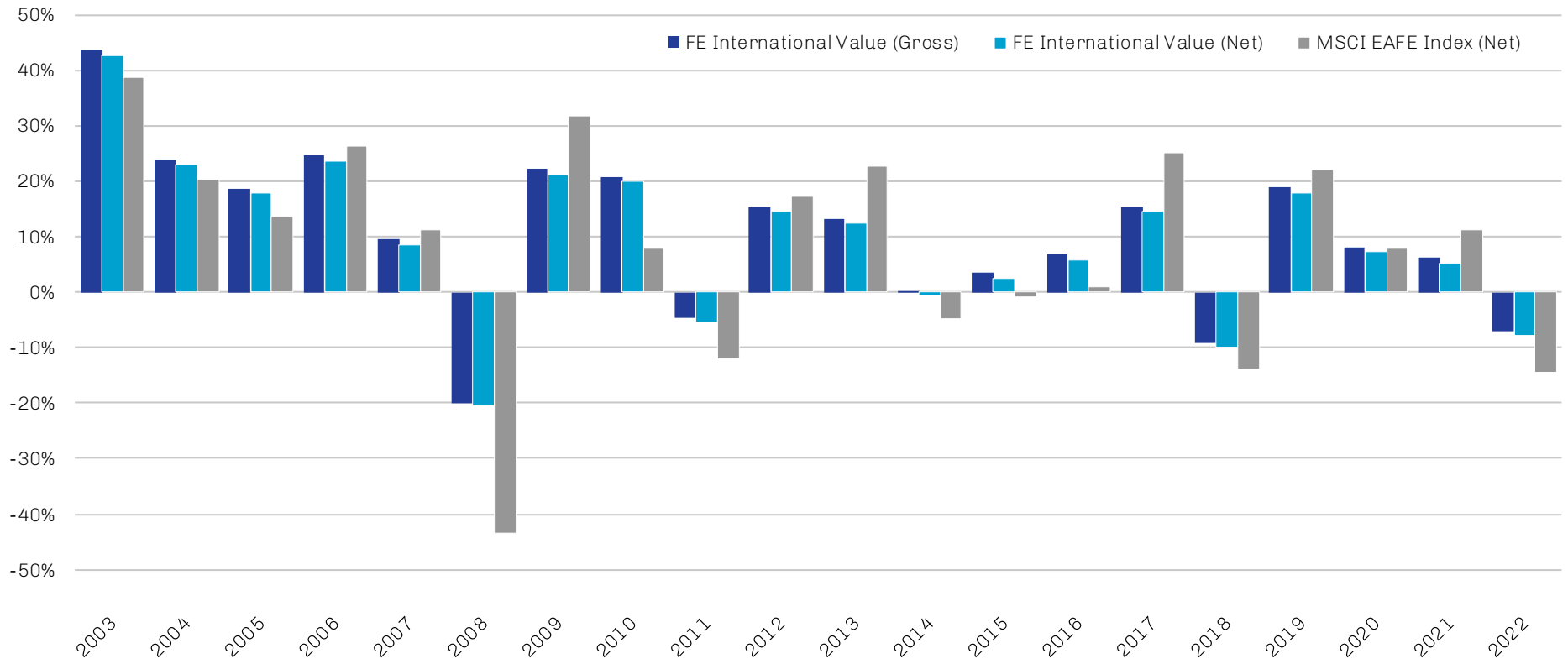
The International Equity Strategy is a new strategy and has no historical track record. The hypothetical return presented for the International Equity Strategy reflects back-tested performance derived from carving out the equity holdings from the First Eagle International Value strategy composite, while excluding gold-related allocations, limiting the average cash allocation to 4%, and rebalancing monthly. **Back-tested performance is NOT an indicator of future results.** The results do NOT represent returns that any investor actually attained. Back-tested results are calculated by the retroactive application of a model constructed on the basis of historical data, with the benefit of hindsight, and are based on assumptions integral to the model that may or may not be testable and are subject to losses. **See the General Disclosures on page 2 and the Appendix for additional important information.**

Appendix: International Value Performance

Calendar Year Returns

Calendar Year Returns

Data as of 31-Dec-2022



Annual returns are calculated using a monthly frequency.

Past performance is no guarantee of future results.

Trailing Returns — FE International Value

Trailing Returns

Period: 01-Jan-2003 to 31-Dec-2022

	YTD	1 Year	3 Year	5 Year	10 Year	15 Year	01-Jan-2003 to 31-Dec-2022
FE International Value (Gross)	-7.00%	-7.00%	2.19%	2.85%	5.20%	5.27%	9.56%
FE International Value (Net)	-7.70%	-7.70%	1.42%	2.08%	4.42%	4.48%	8.74%
MSCI EAFE Index (Net)	-14.45%	-14.45%	0.87%	1.54%	4.67%	1.81%	6.43%

All returns data beyond one-year figures are annualized. Performance numbers are preliminary.
Portfolio and index returns are shown in USD.

Past performance is not indicative of future results.

Appendix: Disclosure Notes

Additional Disclosures & Definitions

Risk Disclosure

All investments involve the risk of loss of principal.

There are risks associated with investing in securities of foreign countries, such as erratic market conditions, economic and political instability and fluctuations in currency exchange rates. These risks may be more pronounced with respect to investments in emerging markets.

A principal risk of investing in value stocks is that the price of the security may not approach its anticipated value or may decline in value. "Value" investments, as a category, or entire industries or sectors associated with such investments, may lose favor with investors as compared to those that are more "growth" oriented.

The opinions expressed are not necessarily those of the firm and are subject to change based on market and other conditions. These opinions are not intended to be a forecast of future events, a guarantee of future results, or investment advice. Any statistics contained herein have been obtained from sources believed to be reliable, but the accuracy of this information cannot be guaranteed. The views expressed herein may change at any time subsequent to the date of issue hereof. No reliance may be placed for any purpose on the information and opinions contained in this document or its accuracy or completeness. No representation, whether express or implied, is given as to the accuracy or completeness of the information or opinions contained herein by any of FEIM or its subsidiaries, employees, agents, advisors, and no liability is accepted by such persons for the accuracy or completeness of any such information or opinion.

The information provided is not to be construed as a recommendation or an offer to buy or sell or the solicitation of an offer to buy or sell any security. The information in this piece is not intended to provide and should not be relied on for accounting, legal, and tax advice.

The **MSCI EAFE Index** is an unmanaged total return index, reported in U.S. dollars, based on share prices and reinvested net dividends of approximately 1,100 companies from 22 countries and is not available for purchase. The index provides total returns in US dollars with net dividends reinvested. The **MSCI EAFE Value Index** captures large and mid cap securities exhibiting overall value style characteristics across Developed Markets countries around the world, excluding the US and Canada. countries and is not available for purchase. The value investment style characteristics for index construction are defined using three variables: book value to price, 12-month forward earnings to price and dividend yield. The index provides total returns in US dollars with net dividends reinvested. Indices presented are unmanaged and do not incur management fees or other operating expenses. One cannot invest directly in an index.

Private equity funds indirectly controlled by Blackstone Inc. and Corsair Capital LLC, as well as certain co-investors, indirectly own a majority stake in First Eagle Investment Management, LLC.

First Eagle Investments is the brand name for First Eagle Investment Management, LLC and its subsidiary investment advisers. First Eagle Alternative Credit and Napier Park are brand names for the two subsidiary investment advisers engaged in the alternative credit business.

FEF Distributors, LLC ("FEFD") distributes First Eagle products; it does not provide services to investors. As such, when FEFD presents a strategy or product to an investor, FEFD and its representatives do not determine whether the investment is in the best interests of, or is suitable for, the investor. Investors should exercise their own judgment and/or consult with a financial professional prior to investing in any First Eagle strategy or product.

First Eagle Investments is the brand name for the First Eagle Investment Management, LLC and its subsidiary investment advisers.

International Equity Composite Disclosures

International Equity Composite contains fully discretionary accounts invested in a range of asset classes from markets outside the United States. To achieve its objective, management will normally invest in common stocks (and securities convertible into common stocks) of foreign companies. For comparison purposes, the composite is measured against the MSCI EAFE (Net) Index. Returns include the effect of foreign currency exchange rates. The exchange rate source of the composite is Bloomberg 4 pm EST. The exchange rate source of the benchmark is Reuters 4 pm GMT. The asset mix of the accounts in the composite may not be comparable to the MSCI EAFE (Net) Index. Indices do not incur management fees or other operating expenses. Investments cannot be made directly into an index.

Prior to 7-Dec-2009, First Eagle Investment Management, LLC was known as Arnhold and S. Bleichroeder Advisers, LLC.

First Eagle Investment Management, LLC claims compliance with the Global Investment Performance Standards (GIPS®) and has prepared and presented this report in compliance with the GIPS standards. First Eagle Investment Management, LLC has been independently verified for the periods 1-Jan-1996 through 31-Dec-2021.

A firm that claims compliance with the GIPS standards must establish policies and procedures for complying with all the applicable requirements of the GIPS standards. Verification provides assurance on whether the firm's policies and procedures related to composite and pooled fund maintenance, as well as the calculation, presentation, and distribution of performance, have been designed in compliance with the GIPS standards and have been implemented on a firm-wide basis. The verification is available upon request.

GIPS® is a registered trademark of CFA Institute. CFA Institute does not endorse or promote this organization, nor does it warrant the accuracy or quality of the content contained herein.

First Eagle Investment Management, LLC is an independent SEC registered investment adviser. THL Credit Advisors was acquired and made a part of First Eagle Alternative Credit since Jan-2020. As of 1-Jan-2020, First Eagle Investment Management was redefined to include the Alternative Credit division. A list of composite descriptions, a list of limited distribution pooled fund descriptions, and a list of broad distribution pooled funds are available upon request.

Results are based on fully discretionary accounts under management, including those accounts no longer with the firm. Total returns of the composite and benchmark are presented net of estimated foreign withholding taxes on dividends, interest, and capital gains. Withholding taxes may vary according to the investor's domicile. MSCI uses withholding tax rates applicable to Luxembourg holding companies, as Luxembourg applies the highest rate.

The annual composite dispersion presented is an equal-weighted standard deviation calculated for the accounts in the composite for the entire year. The 3-year ex-post standard deviation is calculated using gross returns.

Past performance is not indicative of future results.

The US Dollar is the currency used to express performance. Returns are presented gross and net of management fees and include the reinvestment of all income. Net of fees performance was calculated using the highest applicable management fee of 0.80% applied monthly. Actual returns will be reduced by investment advisory fees and other expenses that may be incurred in the management of the account. The investment management fee schedule is 0.80% on assets. Actual investment advisory fees incurred by clients may vary.

The International Equity Composite was created 1-July-2022 and has an inception date of 1-Jul-2022.

Policies for valuing investments, calculating performance, and preparing GIPS reports are available upon request.

International Equity Composite Disclosures

Year End	Total Firm Assets (USD Millions)	Composite Assets (USD Millions)	Number of Accounts	Composite Gross	Composite Net	MSCI EAFE (Net)	3Y ex-post Std. Dev. Composite	3Y ex-post Std. Dev. MSCI World	Composite Dispersion
1-Jul-22 to 31-Dec-22	102,798	119	Five or Fewer	3.09%	2.68%	6.36%			N.A.

	Composite Gross	Composite Net	MSCI EAFE (Net)
1 Year Ending 31-Dec-2022	N.A.	N.A.	N.A.
3 Year Ending 31-Dec-2022	N.A.	N.A.	N.A.
5 Year Ending 31-Dec-2022	N.A.	N.A.	N.A.
10 Year Ending 31-Dec-2022	N.A.	N.A.	N.A.
Since Inception 1-Jul-2022	3.09%	2.68%	6.36%

N.A. – Information is not statistically meaningful due to an insufficient number of portfolios in the composite for the entire year. Composite dispersion calculated using gross returns.

International Value Composite Disclosures

International Value Composite contains fully discretionary accounts invested in a range of asset classes from markets outside the United States. To achieve its objective, management will normally invest in common stocks (and securities convertible into common stocks) of foreign companies. Prior to 14-Sep-2009, the composite was named Diversified International. For comparison purposes, the composite is measured against the MSCI EAFE (Net) Index. Returns include the effect of foreign currency exchange rates. The exchange rate source of the composite is Bloomberg 4 pm EST. The exchange rate source of the benchmark is Reuters 4 pm GMT. The asset mix of the accounts

in the composite may not be comparable to the MSCI EAFE (Net) Index. Indices do not incur management fees or other operating expenses. Investments cannot be made directly into an index.

Prior to 7-Dec-2009, First Eagle Investment Management, LLC was known as Arnhold and S. Bleichroeder Advisers, LLC.

First Eagle Investment Management, LLC claims compliance with the Global Investment Performance Standards (GIPS®) and has prepared and presented this report in compliance with the GIPS standards. First Eagle Investment Management, LLC has been independently verified for the periods 1-Jan-1996 through 31-Dec-2021.

A firm that claims compliance with the GIPS standards must establish policies and procedures for complying with all the applicable requirements of the GIPS standards. Verification provides assurance on whether the firm's policies and procedures related to composite and pooled fund maintenance, as well as the calculation, presentation, and distribution of performance, have been designed in compliance with the GIPS standards and have been implemented on a firm-wide basis. The International Value Composite has had a performance examination for the periods 1-Jan-2000 through 31-Dec-2020. The verification and performance examination reports are available upon request.

GIPS® is a registered trademark of CFA Institute. CFA Institute does not endorse or promote this organization, nor does it warrant the accuracy or quality of the content contained herein.

First Eagle Investment Management, LLC is an independent SEC registered investment adviser. THL Credit Advisors was acquired and made a part of First Eagle Alternative Credit since Jan-2020. As of 1-Jan-2020, First Eagle Investment Management was redefined to include the Alternative Credit division. A list of composite descriptions, a list of limited distribution pooled fund descriptions, and a list of broad distribution pooled funds are available upon request.

Results are based on fully discretionary accounts under management, including those accounts no longer with the firm. Total returns of the composite and benchmark are presented net of estimated foreign withholding taxes on dividends, interest, and capital gains. Withholding taxes may vary according to the investor's domicile. MSCI uses withholding tax rates applicable to Luxembourg holding companies, as Luxembourg applies the highest rate.

Derivatives may make up a material part of the composite strategy. The composite may invest in structured notes, the value of which is linked to the price of gold or silver to hedge against market conditions. The use of structured notes is subject to availability and market conditions. The composite frequently uses currency forwards to hedge currency exposure. Structured notes are purchased through large commercial banks with strong credit rankings.

The annual composite dispersion presented is an equal-weighted standard deviation calculated for the accounts in the composite for the entire year. The 3-year ex-post standard deviation is calculated using gross returns.

Past performance is not indicative of future results.

The US Dollar is the currency used to express performance. Returns are presented gross and net of management fees and include the reinvestment of all income. Net of fees performance was calculated using the highest applicable management fee of 0.75% applied monthly. Actual returns will be reduced by investment advisory fees and other expenses that may be incurred in the management of the account. The investment management fee schedule is 0.75% on assets. Actual investment advisory fees incurred by clients may vary.

The International Value Composite has an inception date of 1-Jan-2000. Prior to 1-Jan-2000, the strategy was managed by a prior portfolio manager while he served at a firm different from First Eagle Investment Management, LLC. First Eagle Investment Management, LLC acquired this prior firm and became investment adviser to the U.S. mutual fund on 31-Dec-1999. On 27-Mar-2009, Mr. Eveillard transitioned from having portfolio management responsibilities to a senior advisory role to First Eagle Investment Management, LLC, a position he also held from 1-Jan-2005 to 23-Mar-2007. Mr. Eveillard retired from First Eagle effective 30-Jun-2020.

Policies for valuing investments, calculating performance, and preparing GIPS reports are available upon request.

International Value Composite Disclosures

Year End	Total Firm Assets (USD Millions)	Composite Assets (USD Millions)	Number of Accounts	Composite Gross	Composite Net	MSCI EAFE (Net)	3Y ex-post Std. Dev. Composite	3Y ex-post Std. Dev. MSCI EAFE	Composite Dispersion
2022	102,798	13,267	6	-7.00%	-7.70%	-14.45%	12.24%	16.50%	0.47%
2021	110,254	16,422	8	6.10%	5.31%	11.26%	12.34%	16.92%	0.40%
2020	108,794	16,642	9	8.14%	7.33%	7.82%	12.60%	17.89%	0.40%
2019	96,434	16,202	11	18.90%	18.01%	22.01%	7.56%	10.81%	0.40%
2018	91,890	14,955	11	-9.29%	-9.97%	-13.79%	7.77%	11.24%	0.20%
2017	116,057	20,773	13	15.37%	14.51%	25.03%	8.14%	11.83%	0.30%
2016	99,086	17,114	12	6.70%	5.90%	1.00%	8.87%	12.46%	0.30%
2015	92,369	15,561	13	3.38%	2.61%	-0.81%	8.27%	12.46%	0.20%
2014	99,470	16,006	11	0.22%	-0.53%	-4.90%	8.96%	13.03%	0.40%
2013	92,511	16,633	11	12.98%	12.14%	22.78%	10.25%	16.25%	0.70%
2012	72,916	13,210	9	15.26%	14.40%	17.32%	11.87%	19.37%	0.30%
2011	59,646	10,439	7	-4.53%	-5.24%	-12.14%	13.29%	22.43%	N.A.

	Composite Gross	Composite Net	MSCI EAFE (Net)
1 Year Ending 31-Dec-2022	-7.00%	-7.70%	-14.45%
3 Year Ending 31-Dec-2022	2.19%	1.42%	0.87%
5 Year Ending 31-Dec-2022	2.85%	2.08%	1.54%
10 Year Ending 31-Dec-2022	5.20%	4.42%	4.67%

N.A. – Information is not statistically meaningful due to an insufficient number of portfolios in the composite for the entire year. Composite dispersion calculated using gross returns.

S-PR-IES-PTCHBK-D-LT

Presentation to

Alaska Retirement Management Board

Index Plus Strategy

March 16, 2023

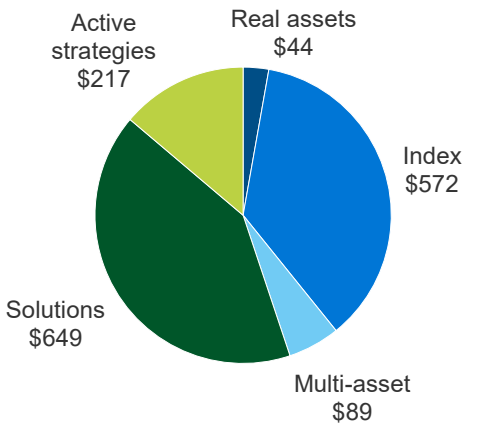
LGIM America

History – Global investment and solutions provider

Legal & General Group (ultimate parent company) is a financial services institution specializing in investment management, retirement solutions and insurance.

- Providing experience in active fixed income, index, LDI and multi-asset
- Founded in 1836
- **LGIM** (the global investment management arm of Legal & General Group) is the sixth largest institutional asset manager globally[1]

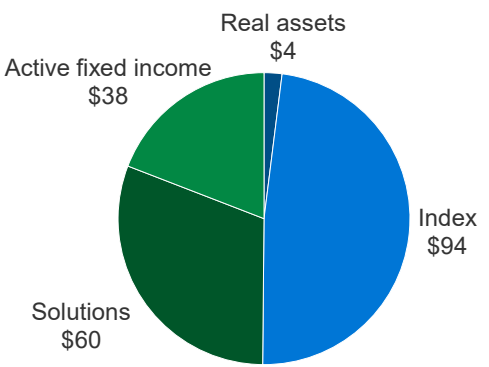
$1,571 billion in global assets[2]



LGIM America (LGIMA) has been committed to helping improve outcomes for US institutional clients since 2006 by aiming to:

- Help sponsors keep their pension promises
- Secure stream of income for DC plan participants
- Generate returns while making a positive difference

$200 billion in US-managed assets[3]



1 "Index Managers" Special Report, *Pensions and Investments*, November 15, 2021. Ranking by total worldwide indexed assets under management, as of June 30, 2021. www.pionline.com/indexmanagers21. This ranking does not imply that LGIMA will or has been successful in its product offerings or services.

2 The AUM disclosed aggregates the assets managed by Legal & General Investment Management (LGIM) in the UK, Legal & General Investment Management America (LGIMA) in the US, and Legal & General Investment Management (LGIM - Asia) in Hong Kong. The AUM includes the value of securities and derivatives positions. Conversion rate: 1 GBP = 1.2180 USD, as of June 30, 2022.

3 AUM excludes notional value from derivatives positions as of December 31, 2022.

LGIM America

Biographies

David Barron, CFA, CAIA, Head of US Equity Solutions

David Barron is Head of US Equity Solutions at LGIM America. In his role, he will help to expand the firm's footprint of ESG, Beta Enhancement, Outcome Oriented and other innovative equity solutions.

David joined LGIM America in 2015 as a Senior Portfolio Manager on the Index team. David then transitioned to work at LGIM as Head of Index Equity & Smart Beta where he led the Equity Index team with a focus on both traditional and smart beta index strategies. David returned to Chicago in late 2021 to take on his current role. Prior to joining LGIM America, David was a Portfolio Manager, Quantitative Management at Northern Trust and previously worked in overlay solutions and transition management at BNY Mellon.

David earned a BA in Economics with a focus on Mathematics from Colgate University. He is a CFA charterholder and a CAIA charterholder.

Melissa Ruffel, CFA, Client Strategist

Melissa Ruffel is a Client Strategist at LGIM America. In her role, she focuses on client engagement and ensuring our solutions continue to successfully achieve clients' long-term objectives.

Prior to joining LGIM America in 2019, Melissa was a Senior Analyst in Fixed Income and Derivatives Portfolio Management at NISA Investment Advisors, where she worked on the team trading and implementing interest rate derivatives strategies for LDI clients. She started her career at NISA in 2013.

Melissa earned a BS in Neuroscience from Washington & Lee University. She is a CFA charterholder and holds a Series 3 license registered with the NFA.

LGIM
America

Relationship summary

Alaska Retirement Management Board

- Scientific Beta equity index portfolios funded in December 2019 (Developed ex-USA and Emerging Markets exposure)
- Transitioned both strategies in September 2020 (to 6-factor sector neutral Scientific Beta benchmarks)

	12/31/2022 Market value
Scientific Beta Developed ex-USA HFI Diversified MBMS Sector Neutral 6-Factor 4-Strategy EW Index	$772,231,009
Scientific Beta EM HFI Diversified MBMS Sector Neutral 6 Factor 4 Strategy EW Index	$295,254,160

LGIM America

- Approach to client service and engagement
  - Client-led and collaborative
  - Solutions focus
  - Strategic partnership
- Commitment to equity indexing investment excellence
  - Index Plus strategies run globally
  - Fee transparency
  - Focus on net value of gross returns minus all costs
  - Add value and avoid wealth erosion in core passive equity allocations

Data: LGIMA

LGIM America

Index Plus Strategy

LGIM America

Objective of Index Plus strategy

*LGIM America's Index Plus strategy seeks to **exploit idiosyncratic market opportunities** to outperform market cap indices **within a tightly controlled risk budget***

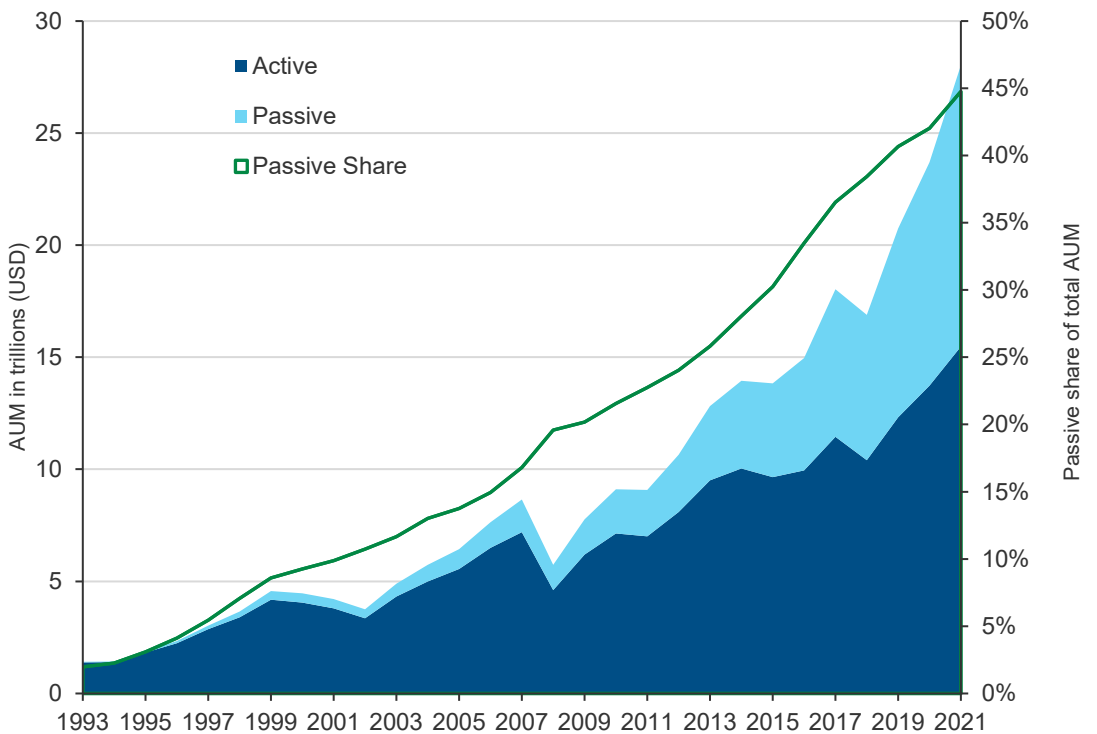
Index Plus Investment guidelines			
1	**Portfolio targets**		
	Proposed benchmark	MSCI World ex US IMI	
	Denomination	US$	
	Objective	Outperform by 10-20 bps relative to the return of the official policy benchmark, net of fees, adjusted for withholding tax differential	
2	**Investment parameters**		**Proposed benchmarks**
	Criteria		
	Limitations on risk profile		
	Ex-ante tracking error		0.25% p.a.
	Limitations on positions		
	Sector	Maximum	+/- 0.15%
	Stock	Maximum	+/- 0.15%
		Maximum cumulative exposure to non-benchmark stocks	3%
	Limitations on liquidity		
	Maximum eligible exchange traded equity market index, sector and stock futures		5%

Objectives are for illustrative purposes only. There is no guarantee that the objectives or guidelines will be achieved. They can be tailored to each client's objectives/constraints over time.

LGIM America

Indexing has grown up

Growth of passively managed assets vs actively managed



Time has taught us what matters most:

- **Design:** With millions of indices to choose from, the construction and methodology matters
- **Implementation:** More assets are moving at defined points (index events) that are known to the market. *Avoiding wealth erosion is critical*
- **Fund structures:** Investment management fees have come down, and index providers look to earn fees from other services

Growing Pains?

- *The large investable market continues to grow ($34 trillion 2025E AUM with projected ~15% AUM growth for ETFs per annum 2020-2025E)[1]*
- *The majority of these assets adopt conservative risk approaches (particularly in ETFs[1]), aiming to minimize tracking error*
- *Indices adhere to methodologies which prioritize investability and are generally reactive in their implementation of corporate events.*
- *Competitors are mostly concerned with retail index solutions, leaving a void for institutional quality and customizable approaches.*

Chart Source: Morningstar Direct, LGIMA as of 12/31/2021.

1 BCG Global Asset Management 2021 report *The$100 Trillion Machine*

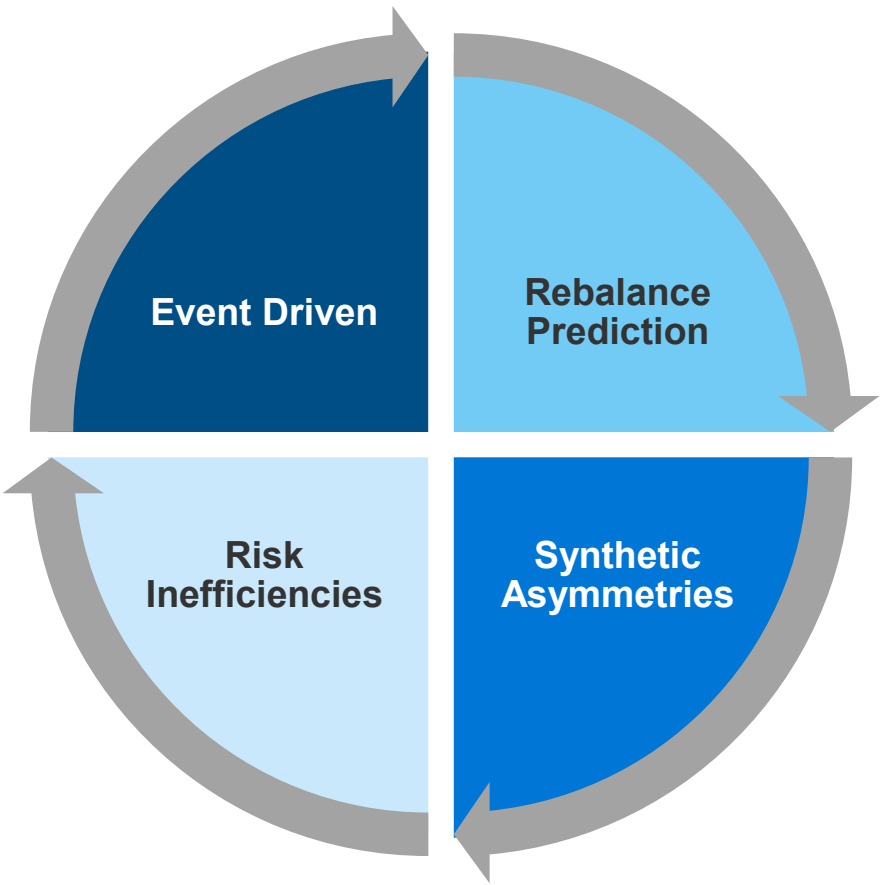
LGIM America

Breaking down the Index opportunity set

Index Plus seeks to exploit four pre-defined, micro opportunity sets

Event Driven

- IPOs/SPOs
- Pairs Trading
- Reweights
- M&A and Spin-offs
- Late Merger Arb



Rebalance Prediction

- Modelling most followed methodologies to predict adds/deletes
- Significant opportunity to pre-trade index announcements

Risk Inefficiencies

- Meme stocks
- Stranded assets
- Other Smart Sustainable
- Quality vs Junk
- Geopolitical risk

Synthetic Asymmetries

- Implied funding rates may drop in risk off environments paying those in synthetic equity over physicals
- Other supply/demand imbalance opportunities

LGIM America

Index opportunity set

Market conditions considerations

- **Overview**

  The strategy seeks to *generate alpha regardless of the market conditions* and seeks to diversify the opportunities across sub-strategies as much as possible to limit any dependencies on whether we are in a risk-on or risk-off state. The two main drivers of relative performance in the overall strategy include: (1) the number of opportunities we have in a year and (2) the likelihood of these opportunities performing well. These two components have various levels of expected correlations (positive, negative, neutral) with the overall market.

- **Rebalance prediction**
  - Opportunities present themselves regardless of market environment as we have a fixed/guaranteed rebalance calendar throughout the year
  - Performance is most stable/positive in directionally steady markets as we are heavily dependent on the market capitalization of securities relative to the index add/delete line. We do keep country/sector/style factors as neutral as possible to limit macro shocks to the basket of predictions, but choppy markets can see adds/deletes fall back below/above the line pre-announcement

- **Event Driven**
  - Opportunities are somewhat correlated to the market for IPOs and capital raising and very idiosyncratic for pairs and late merger arbitrage
  - Performance tends to be the least correlated to market for most of the event driven trades as they are very idiosyncratic in nature or very short trade horizons. Late Merger Arbitrage performance benefits from steady or down markets as we're attempting to lock a "cash-like" premium

- **Risk inefficiencies**
  - Opportunities can arise in risk-on markets with significant undeployed capital allowing for the presence of meme stocks and "junk" in mainstream indices, whereas other risk inefficiencies can be more idiosyncratic in nature
  - Performance benefits can be realized when the dispersion of market views shrinks (i.e., more consensus). Risk inefficiencies do have the potential to be highly volatile in nature and tend to be only deployed in high conviction scenarios, with limited capital, and likely coupled with other expectations (e.g., index add/delete or M&A)

- **Synthetic asymmetries**
  - Opportunities typically occur in times of stress with rapidly falling markets where there is significantly more sellers of equity beta than buyers allowing for natural long-term physical equity holders to offer some exposure synthetically
  - Performance benefits are realized either when the holding period of the synthetic instrument is met or when the supply/demand imbalance corrects and the opposite transaction can be executed to close the position

Appendix

LGIM America

Index Plus – Hypothetical Global DM performance and attribution

The LGIM Global Index Team employs a number of strategies seeking to take advantage of potential inefficiencies in index construction and other structural opportunities in pursuit of incrementally enhancing return, with additional incremental risk. The US Equity Solutions team leverages this investment philosophy and process to offer index plus strategies to US clients.

Performance

Global Developed Markets[1]	Portfolio Gross of Fees (%)	Portfolio Net of Fees (%)	Index (%)	Arithmetic Deviation Gross of fees (%)
2022	-13.23	-13.27	-13.17	-0.06
2021	30.81	30.72	30.68	0.13
2020	7.86	7.77	7.59	0.28
2019	30.67	30.60	30.48	0.18
2018	-3.65	-3.72	-3.74	0.09

Gross Attribution

Index changes (bp)	IPO (bp)	Secondary Placings (bp)	Other Index Plus (bp)	Total Index Plus (bp)
-11.0	1.6	0.0	4.0	**-5.4**
6.3	3.6	1.0	3.0	**13.9**
19.6	5.6	3.0	-0.6	**27.6**
13.2	1.6	1.7	1.4	**17.9**
8.6	0.4	2.0	2.1	**13.1**

Past performance is not indicative of future results.

As of December 31, 2022

1 Global Developed Markets Index = FTSE Developed Equities Custom Index EUR

Gross hypothetical performance is presented before management fees. Net performance is calculated by deducting the Model Fee from the hypothetical gross return. The Model Fee is the maximum potential management fee charged to an account in the index plus strategy, although actual fees may vary. The Model Fee is 0.07% per annum and may not be reflective of total actual fees and expenses charged to investors in a particular fund or account. Returns reflect the reinvestment of dividends and other income earnings. For additional information on the effect of all applicable fees, including investment advisory fees, investors should refer to Part 2A of Form ADV as well as the applicable investment management agreement (IMA) or associated fund documents. Please note this hypothetical track record does not comply with GIPS standards. For illustrative purposes only. These results are based on hypothetical assumptions that have certain inherent limitations. Unlike the results in an actual performance record, these results do not represent actual trading by LGIM America. Because these trades have not actually been executed by LGIM America portfolio managers or traders, these results may have under- or over-compensated for the impact, if any, of certain market factors, such as lack of liquidity, and the team's execution ability. No representation is being made that any account will or is likely to achieve profits or losses similar to these being shown.

LGIM America

Event driven trading illustration – Common pairs

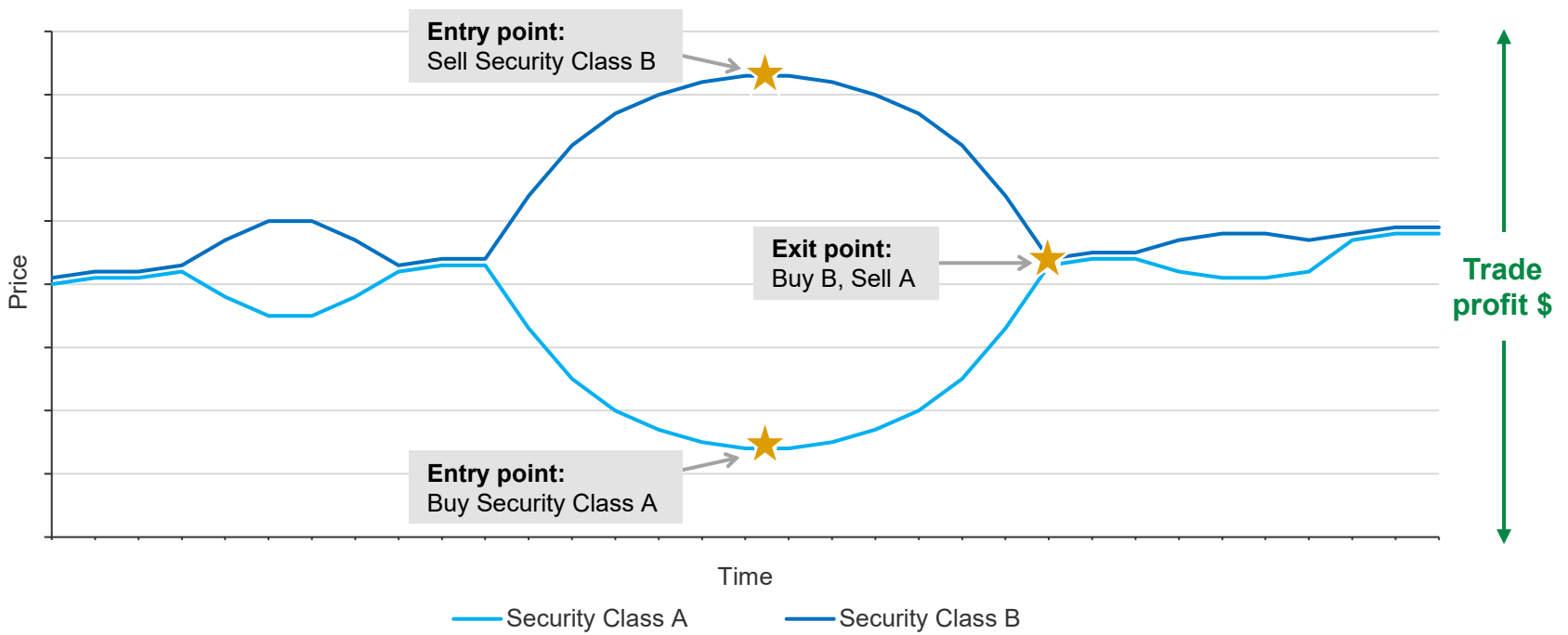
What is it: This trade attempts to isolate alpha by price dislocation, without a beta component, through highly correlated dual listings and/or share classes. These dislocations exist historically through time

Why does it exist: Typical distortions are the result of events that drive supply/demand imbalances in a single line (e.g. one line tends to be the liquid line when the market digests impactful news)

How do we execute: Simultaneously buy (sell) two securities at discount (premium) when the spread exceeds predefined limits

When do we win/lose: If the spread mean reverts, we seek to capture the alpha by unwinding the trade/ the spread widens further prompting further discussion to maintain, increase, or unwind a position; or a structural shift causes the spread to persist

Hypothetical trading example: Security Class A & Security Class B trading price over time



For educational purposes only. This hypothetical example does not represent an actual trade and is only meant to illustrate the expected trade actions and outcomes for this type of index event. There is no guarantee LGIMA will be successful in our approach to such index events.

LGIM America

Event driven trading illustration – Index adds/deletes

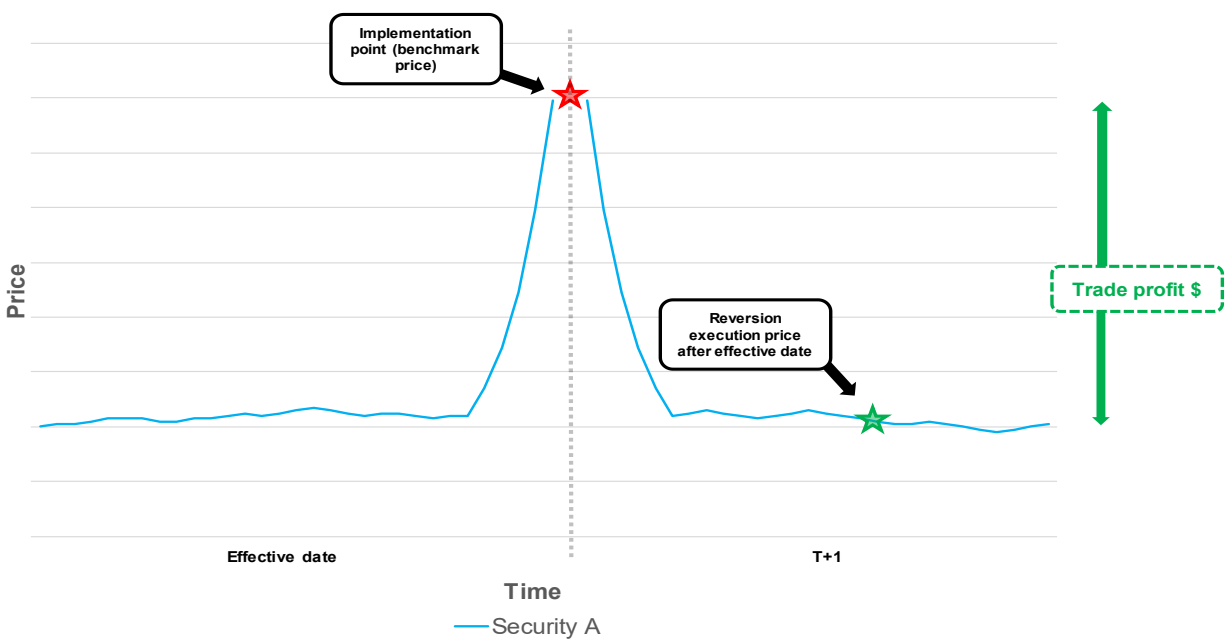
What is it: This trade attempts to isolate alpha by price dislocations given supply and demand leading up to the effective date for index additions and deletions

Why does it exist: Typical distortions are the result of events that drive supply/demand imbalances around index change events

How do we execute: Simultaneously buy (sell) the index addition (deletion), leaving a portion for reversion trading, and buy (sell) the security's related sector ETF for hedging & cash management purposes upon implementation point (effective date)

When do we win/lose: We seek to capture the alpha by buying (selling) the addition (deletion) pre-(post-) effective date at discount (premium) to index implementation price given mean reversion while selling (buying) sector ETF used for hedging & cash management

Hypothetical trading example: Security A trading price over effective date of index addition and post-effective date



For educational purposes only. This hypothetical example does not represent an actual trade and is only meant to illustrate the expected trade actions and outcomes for this type of index event. There is no guarantee LGIMA will be successful in our approach to such index events.

LGIM America

Event driven trading illustration – Index reweights

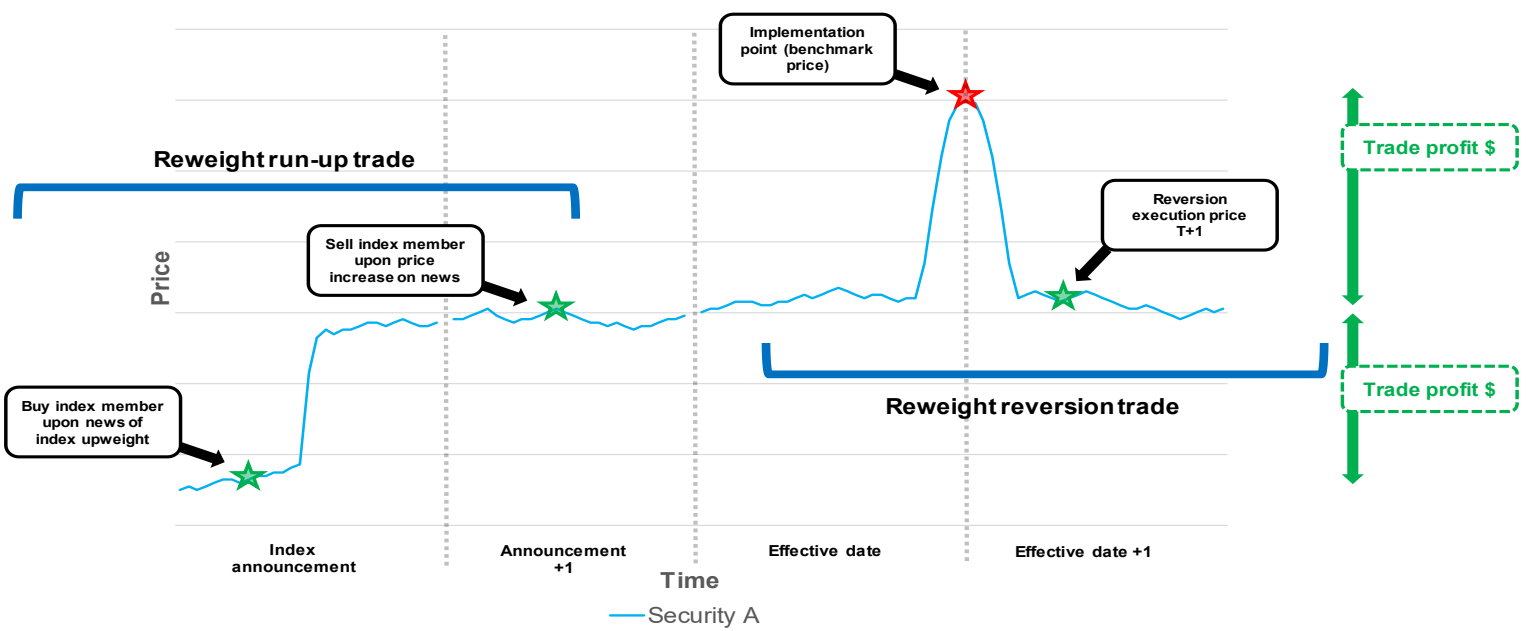
What is it: This trade attempts to isolate alpha through M&A activity on the price movement of initial news of index announcement of upweight and by price dislocation given supply and demand into the effective date close for index member upweight

Why does it exist: Typical distortions are the result of events that drive supply/demand imbalances around index change events

How do we execute: Buy index member morning after announcement from index provider before price increase and unwind one to two days later; then simultaneously buy the index member upweight, leaving a portion for one-day reversion trade, and buy the security's related sector ETF for hedging and cash management purposes upon implementation point (effective date)

When do we win/lose: We seek to capture the alpha through the initial price increase given news of index upweight and through buying the addition over the following day at a discount to index implementation price given mean reversion while unwinding (selling) sector ETF used for hedging and cash management

Hypothetical trading example: Security A trading price over reweight run-up trade & reweight reversion trade



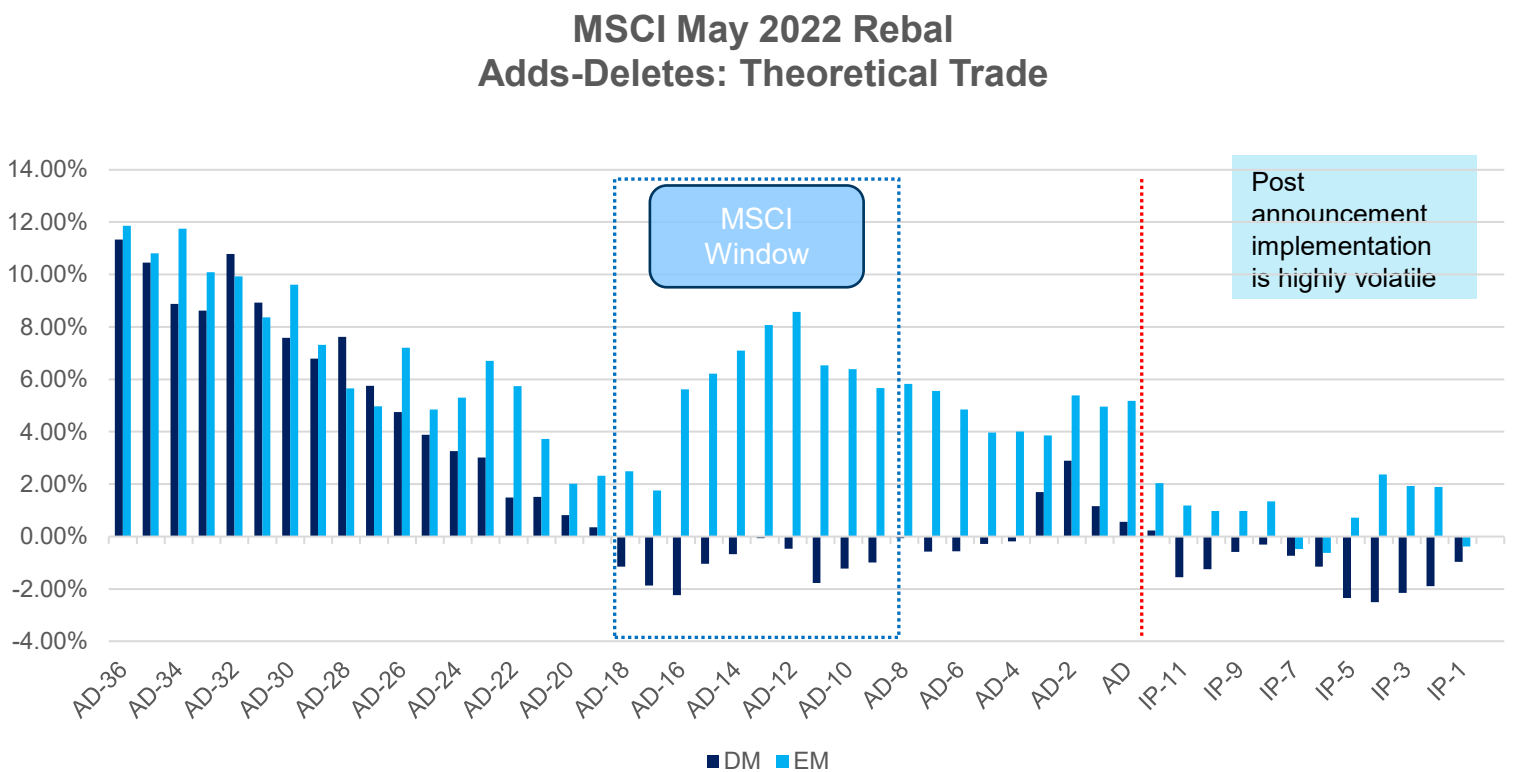
For educational purposes only. This hypothetical example does not represent an actual trade and is only meant to illustrate the expected trade actions and outcomes for this type of index event. There is no guarantee LGIMA will be successful in our approach to such index events.

GIM America

Index Event: MSCI Semi-Annual Review – Adds/Deletes 2022

Value add potential increases with earlier predictions

- Observing the historical return of an equal weighted baskets of adds and deletes leading up to index implementation point
- Research shows estimating adds and deletes in advanced can add value
- Trade seems to be agnostic to market (Developed or Emerging)



AD = Announcement Date
IP = Implementation Point
DM = MSCI World (Developed Markets)
EM = MSCI Emerging Markets
MSCI Window = MSCI calculates size segment cut-off

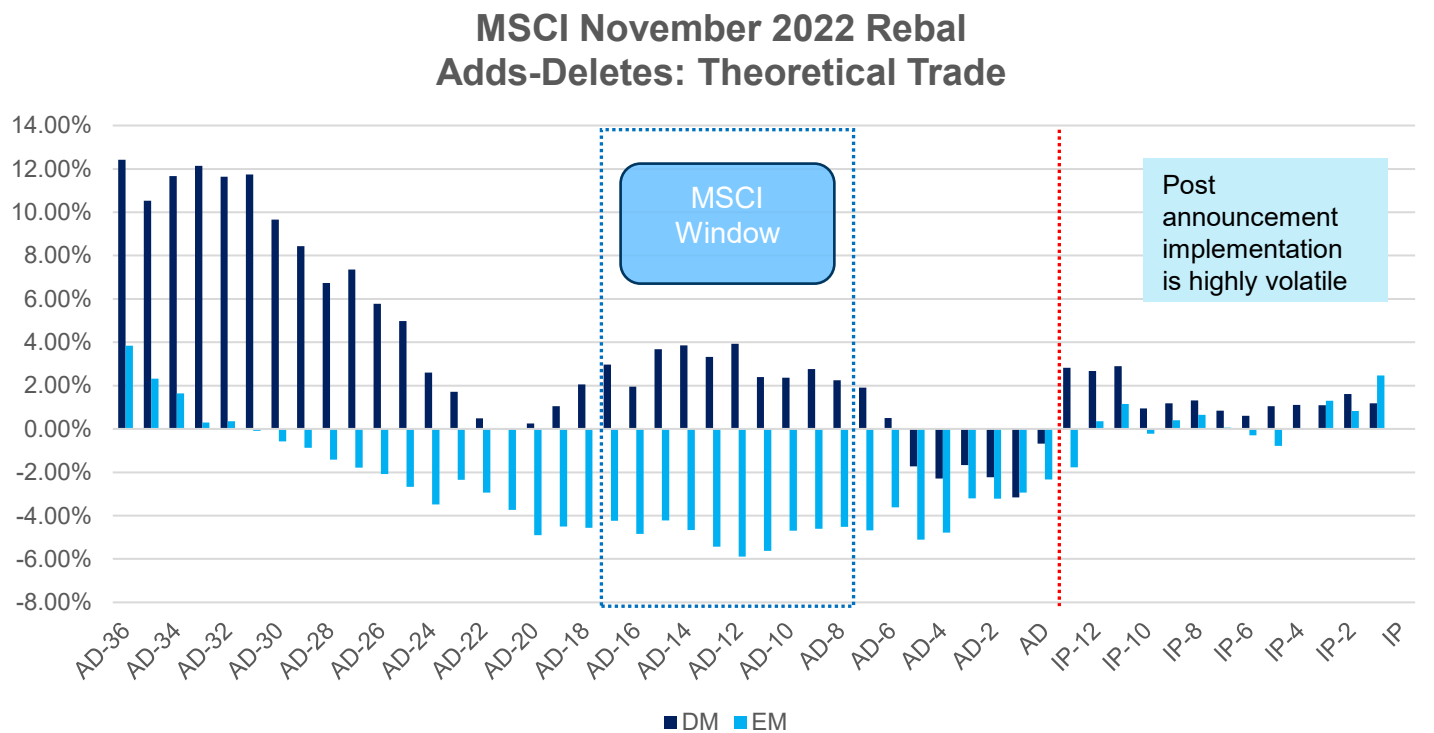
Source: Bloomberg, MSCI, LGIMA

LGIM America

Index Event: MSCI Semi-Annual Review – Adds/Deletes 2022

Value add potential increases with earlier predictions

- Observing the historical return of an equal weighted baskets of adds and deletes leading up to index implementation point
- Research shows estimating adds and deletes in advanced can add value
- Trade seems to be agnostic to market (Developed or Emerging)



AD = Announcement Date
IP = Implementation Point
DM = MSCI World (Developed Markets)
EM = MSCI Emerging Markets
MSCI Window = MSCI calculates size segment cut-off to determine adds and deletes, which is announced on AD

Source: Bloomberg, MSCI, LGIMA

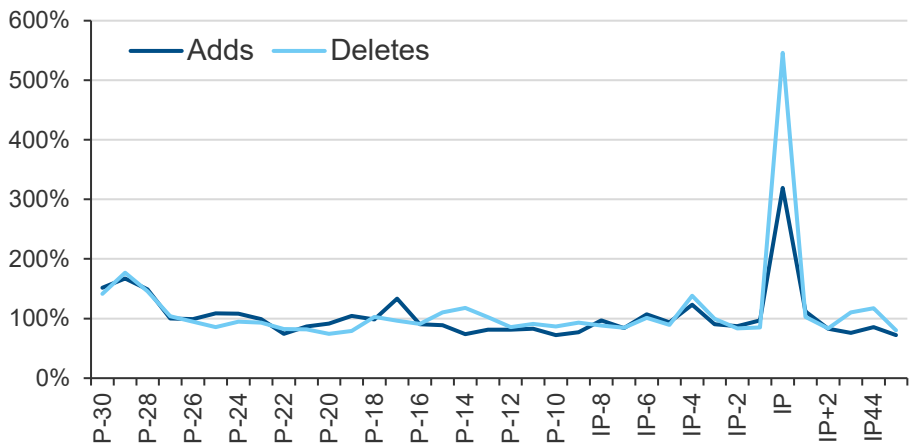
LGIM America

Index event: Russell annual reconstitution – Adds/Deletes 2022

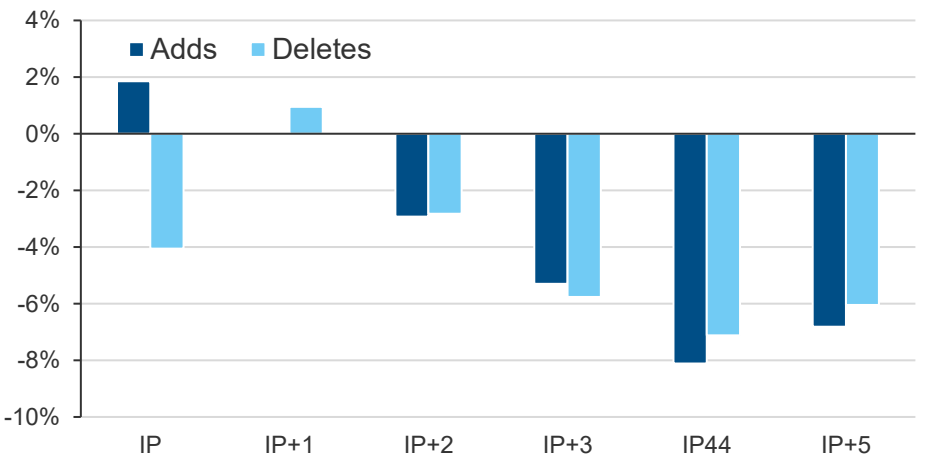
Value add potential of large moving names in the rebalance

- Observing the historical volume and return of an equal weighted baskets of adds and deletes leading up and after index implementation point
- Research shows trading away adds and deletes with large price movements on the rebalance day can add value
- Massive volume spikes on the adds and deletes, correspond to increase selling and buying pressure as seen in performance on the day of the event

Average daily volume of adds and deletes
30 day lead-up to rebalance event and 5 day post



Adds and deletes performance relative to R1



Average % volume change of adds (30 day lead up to rebalance)	545%
Average % price change of adds (T-1 to rebalance)	5.0%
Market premium for adds on T	1.9%

Average % volume change of deletes (30 day lead up to rebalance)	635%
Average % price change of deletes (T-1 to rebalance)	-0.9%
Market discount for deletes on T	-4.1%

Implementation Point (IP) of June 24, 2022.

Source: Bloomberg, Russell, LGIMA

As of 9/30/22. This case study is intended to demonstrate, for illustrative purposes only, our Index Plus approach to certain index events and is not intended to depict or demonstrate performance. This actual case study is the most recent trade example of the noted index event in this Index strategy as of the date indicated. Since Index Plus services and advice are predicated upon the client mandate, the index and index events, this specific example and its outcomes may not be representative of future services and advice. There is no guarantee LGIMA's future approach will be successful, follow this process or match the results presented. This illustration should not be construed as a recommendation to buy or sell the above position.

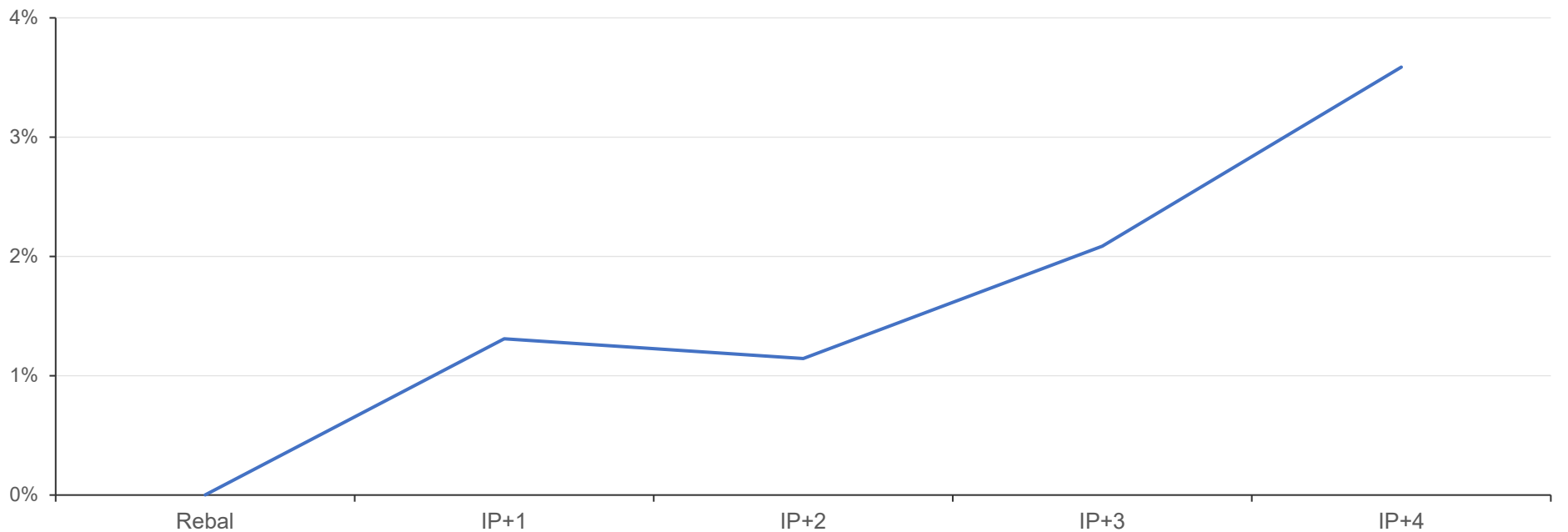
LGIM America

Index event: LGIMA trade – Adds and deletes 2022

LGIMA basket of targeted buys and sells outperformed the index by over 5%

- At the rebalance event, we targeted extreme movers in the index to mis-weight
- Value trade basket is represented by equal weight of target names, offset by returns of S&P 500 futures
- Opportunistically closed positions once realizing an acceptable level of positive return to the fund, approximately 1 bp in total outperformance for the trade at the fund level

Market-adjusted return of value trade basket

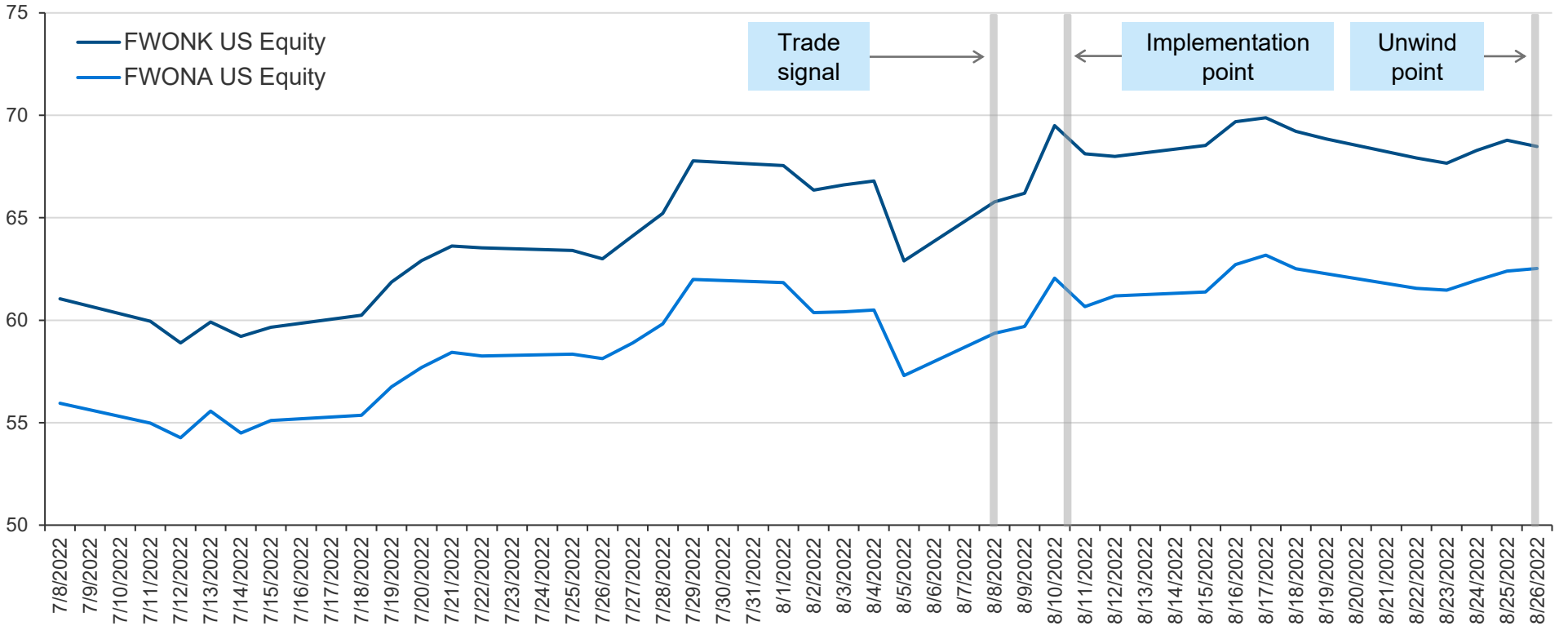


Implementation Point (IP) of June 24, 2022.
Source: Bloomberg, Russell, LGIMA
As of 9/30/22. This case study is intended to demonstrate, for illustrative purposes only, our Index Plus approach to certain index events and is not intended to depict or demonstrate performance. This actual case study is the most recent trade example of the noted index event in this Index strategy as of the date indicated. Since Index Plus services and advice are predicated upon the client mandate, the index and index events, this specific example and its outcomes may not be representative of future services and advice. There is no guarantee LGIMA's future approach will be successful, follow this process or match the results presented. This illustration should not be construed as a recommendation to buy or sell the above position.

LGIM America

Market event: multiple common pairs – August 2022

Multiple common pairs trade



Event implementation

- On August 8, our trading signals indicated the spread between Liberty Media C and Liberty Media A was in position to revert to its mean spread.
- On August 9 and 10, we set the position buying Liberty Media A and selling Liberty Media C at a target spread ratio
- On August 26, the spread narrowed to our target spread and unwound our trade selling Liberty Media A and buying Liberty Media C

Source: LGIMA, Bloomberg for Liberty Media A and C prices.

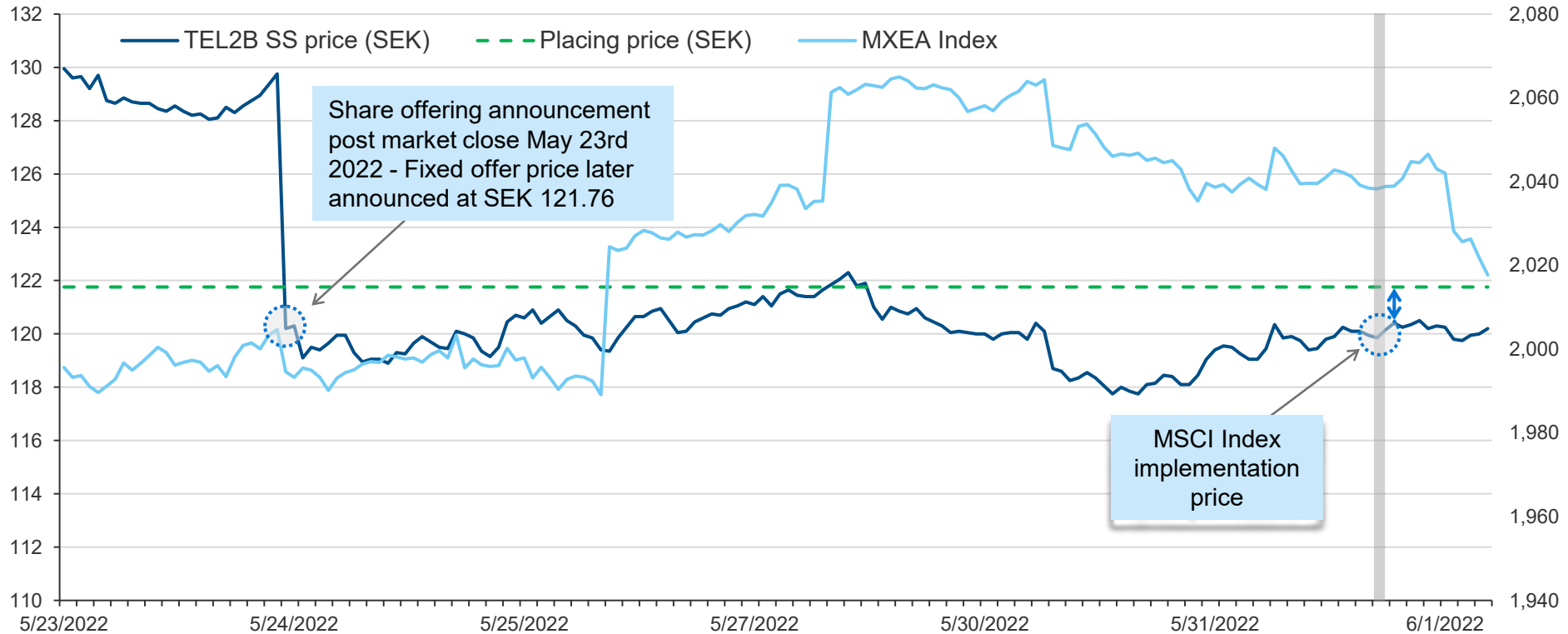
As of 9/30/22. This case study is intended to demonstrate, for illustrative purposes only, our Index Plus approach to certain index events and is not intended to depict or demonstrate performance. This actual case study is the most recent trade example of the noted index event in this Index strategy as of the date indicated. Since Index Plus services and advice are predicated upon the client mandate, the index and index events, this specific example and its outcomes may not be representative of future services and advice. There is no guarantee LGIMA's future approach will be successful, follow this process or match the results presented. This illustration should not be construed as a recommendation to buy or sell the above position.

LGIM America

Tele2 AB Class B share offering (Sweden)

MSCI developed market upweight: May 31, 2022

MSCI DM: Capital raise – share offering, May 2022



- Tele2 AB announced a share offering to raise capital after market close on May 23, in which LGIM America participated. The placing price was SEK 121.76.
- MSCI later announced an upweight of Tele2 AB to its EAFE index, effective May 3
- The closing price of Tele2 AB on May 31 was SEK 119.45, 1.90% below the placing price

Source: LGIM America, MSCI, Bloomberg

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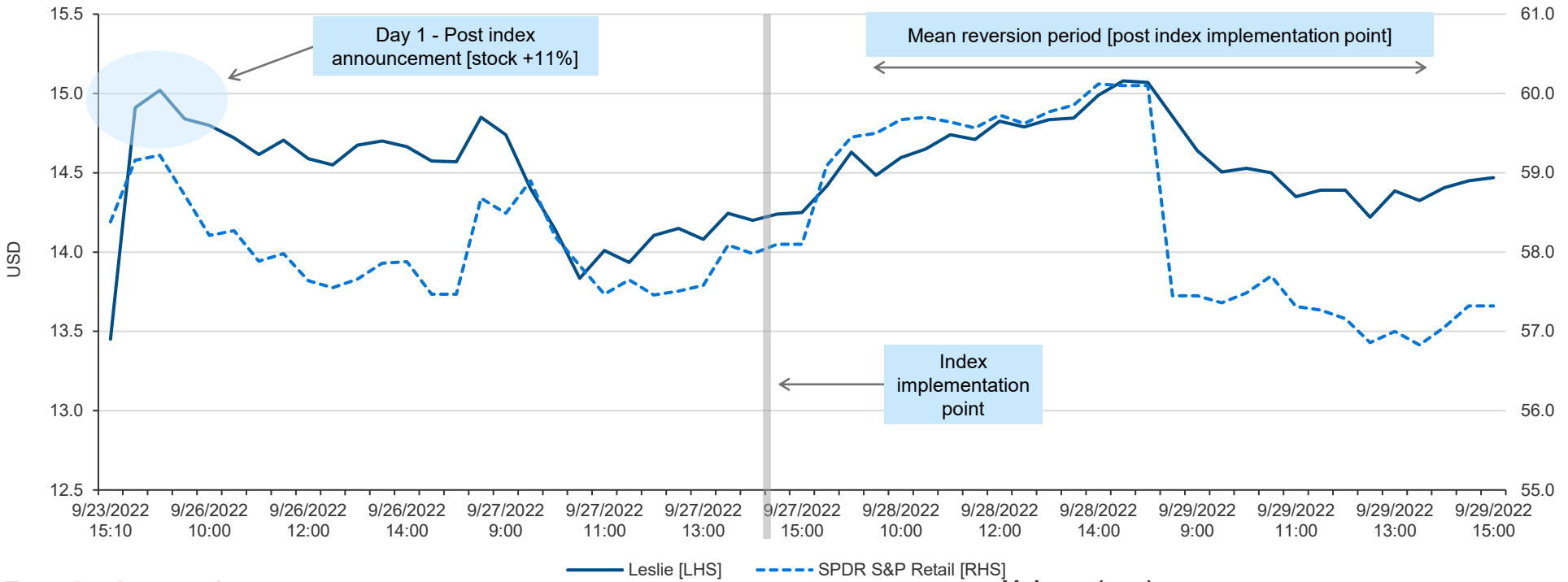
Index event: addition – Leslie's (S&P 600) Sept 2022

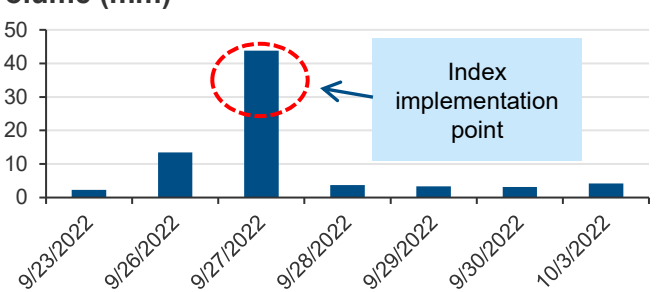
S&P 600: Index addition, Sept 2022



Event implementation

- Within the S&P 1500 family, we see more additions occur in the mid-cap [S&P 4000] and small-cap [S&P 600] space, rather than in the large-cap space.
- At the index implementation point at the close Sept 27th, remained underweight Leslie's and purchased the equivalent underweight position in the relevant sector ETF [XRT] for hedging purposes. Leslie's Inc. was approximately 0.3% in index weight when added.
- Post index implementation point, unwound our sector ETF position and reinvested those proceeds into Leslie's stock.
- In this specific example, the trade did not add any positive alpha to the fund.

Volume (mm)



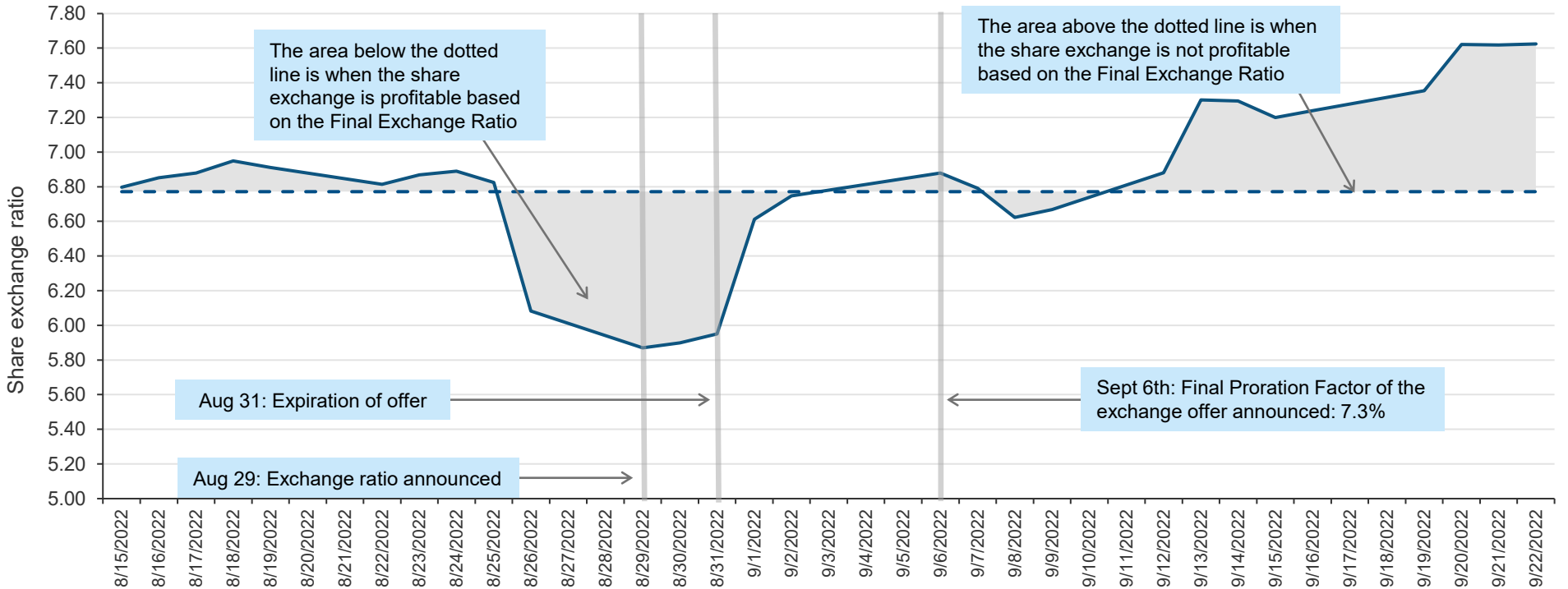
Source: LGIM America, MSCI, Bloomberg

As of 9/30/22. This case study is intended to demonstrate, for illustrative purposes only, our Index Plus approach to certain index events and is not intended to depict or demonstrate performance. This actual case study is the most recent trade example of the noted index event in this Index strategy as of the date indicated. Since Index Plus services and advice are predicated upon the client mandate, the index and index events, this specific example and its outcomes may not be representative of future services and advice. There is no guarantee LGIMA's future approach will be successful, follow this process or match the results presented. This illustration should not be construed as a recommendation to buy or sell the above position.

LGIM America

Index event: special situation – 3M (S&P 500) Sept 2022

3M - NEOGEN Share Exchange Offer, Sept 2022



Event implementation

- S&P 500 constituent 3M offered shareholders the opportunity to tender their shares for Neogen [S&P 400 constituent] on attractive terms [7% discount subject to an upper exchange limit].
- Share price terms were based on a 3-days' VWAP in late August. The final exchange ratio of 6.7713 [Neogen per 3M] was announced on Aug 29.
- Offer expired on Aug 31 with the final proration factor of the deal announced on Sept 6.
- The exchange triggered a reduction in market capitalization for 3M [Approx 16mm 3M shares were accepted in the tender]. S&P implemented this at the close Sept 2
- The Neogen shares were subsequently sold once final proration factor announced. A loss was incurred for the trade once completed.

Source: LGIMA, S&P, Bloomberg

As of 9/30/22. This case study is intended to demonstrate, for illustrative purposes only, our Index Plus approach to certain index events and is not intended to depict or demonstrate performance. This actual case study is the most recent trade example of the noted index event in this Index strategy as of the date indicated. Since Index Plus services and advice are predicated upon the client mandate, the index and index events, this specific example and its outcomes may not be representative of future services and advice. There is no guarantee LGIMA's future approach will be successful, follow this process or match the results presented. This illustration should not be construed as a recommendation to buy or sell the above position.

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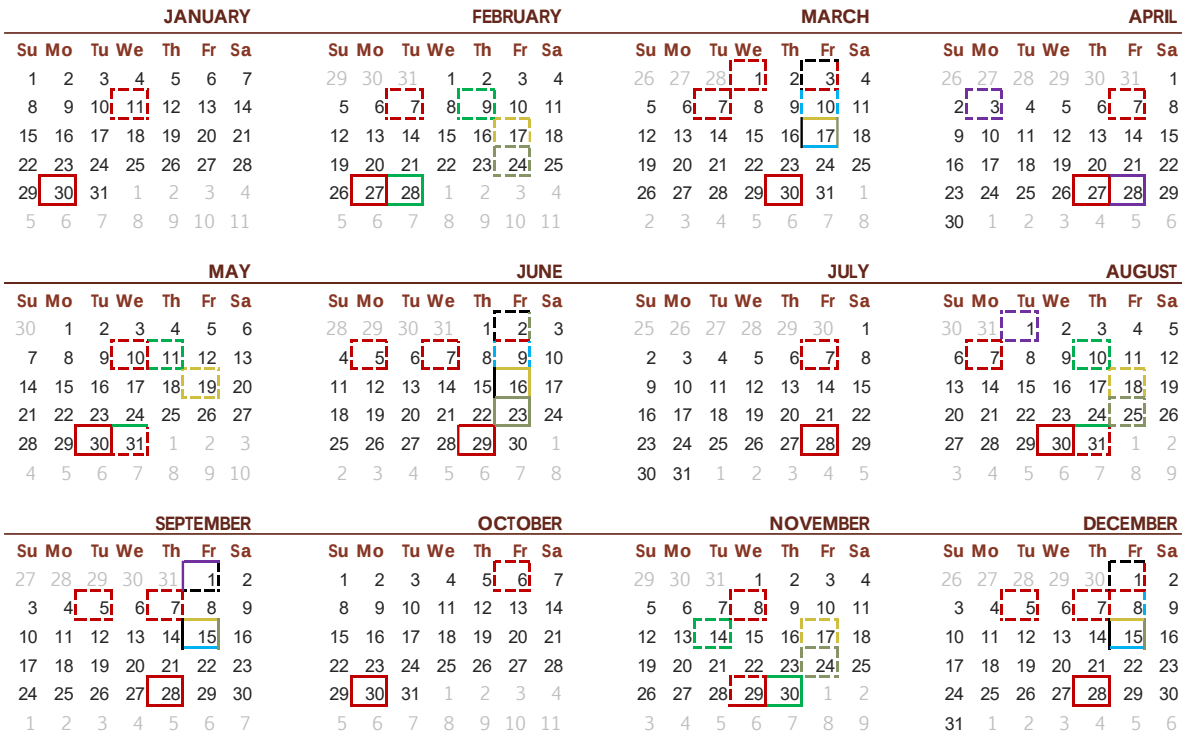
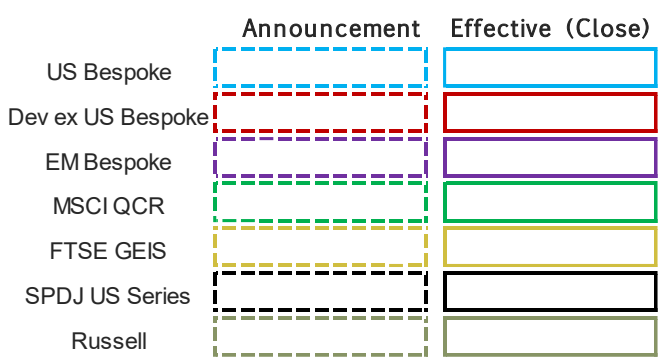
Index prediction not limited to benchmark index

Major index announcement and effective dates occur each month increasing opportunities





Index Series	Region/Country	Review Frequency	Timing Effective Date
MSCI	Global	Quarterly	Month End
FTSE GEIS	Global	Quarterly (2 Semis)	3rd Friday
SPDJ	USA	Quarterly	3rd Friday
Russell	USA	Quarterly + 1 Recon	3rd Friday (Recon 4th Friday)
NASDAQ	USA	Quarterly	3rd Friday
IBOV	Brazil	Tri-Annually	Around Month End
FTSE UK	UK	Quarterly	3rd Friday
EURO STOXX	Europe	Quarterly	3rd Friday
DAX	Germany	Quarterly	3rd Friday
TOPIX	Japan	Monthly	Around Month End
S&P/ASX	Australia	Quarterly	3rd Friday

Source: LGIM, FTSE Russell, MSCI, SPDJ, STOXX, DAX, TOPIX, IBOV, BAML; Major 2023 index announcement and effective dates as of December 2022

LGIM America

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All LGIMA performance returns in this presentation are presented gross of fees, but are accompanied with an explanation of performance net of investment management fees.

The presentation may also include performance that is based on simulated or hypothetical performance results that have certain inherent limitations. Unlike the results in an actual performance record, these results do not represent actual trading. Because these trades have not actually been executed, these results may have under- or over-compensated for the impact, if any, of certain market factors, such as lack of liquidity. Simulated or hypothetical trading programs in general are also subject to the fact that they are designed with the benefit of hindsight. No representation is being made that any account will or is likely to achieve profits or losses similar to these being shown.

Information obtained from third party sources, although believed to be reliable, has not been independently verified by LGIMA and its accuracy or completeness cannot be guaranteed.

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Disclosure

Hypothetical performance results have many inherent limitations and no representation is being made that any account will or is likely to achieve profits or losses similar to those shown. In fact, there are frequently sharp differences between hypothetical performance results and the actual results subsequently achieved by any particular trading program.

One of the limitations of hypothetical performance results is that they are generally prepared with the benefit of hindsight. In addition, hypothetical trading does not involve financial risk, and no hypothetical trading record can completely account for the impact of financial risk in actual trading. For example, the ability to withstand losses or to adhere to a particular trading program in spite of trading losses are material points which can also adversely affect actual trading results. There are numerous other factors related to the markets in general or to the implementation of any specific trading program which cannot be fully accounted for in the preparation of hypothetical performance results and all of which can adversely affect actual trading results. Moreover, all hypothetical results are presented gross of fees throughout this presentation.

The use of hypothetical performance is subject to inherent limitations derived from the reliance on historical data and the benefit of hindsight. All trading strategies applied to the analysis were available throughout the performance period. However, the analysis includes certain assumptions where actual performance could be different from the hypothetical performance presented.

In order to match the index returns a fund would need to track the security weightings in a way that would exactly match the Index and that the economic and market conditions were sufficient to have allowed effective execution of replicate the risk and return characteristics of the index. There are a number of factors that could reduce our ability to track index positions perfectly, including small position sizes and/or available liquidity in some securities. We estimate the net effects of index- and trading-related factors on the passive components of the strategy would affect performance either favorably or unfavorably depending on the size of the portfolio.

A review of the ERI Scientific Beta index methodology has been conducted by: a) comparing in and out of sample performance of the hypothetical back-tested information provided by Scientific Beta; b) testing the returns against the intended factor biases; c) conducting a comparison of similar multi-factor indicies to Scientific Beta's multi-factor index; and d) reviewing the reasonability of portfolio characteristics. The output of the indicies appears reasonable given the methodology and targeted portfolio risk biases.

LGIM America

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT: Global ex-US Manager Hire

ACTION: X

DATE: March 16, 2023

INFORMATION: ____

BACKGROUND:

At the June 2022 Alaska Retirement Management Board (ARMB) meeting, the ARMB directed staff to engage Callan Associates (Callan) to conduct a search for one or more Global Ex-US active investment manager(s), to evaluate the Callan search results and then bring a recommendation to the board at a subsequent meeting.

After various discussions with staff, late 2022 Callan's Search Committee approved and recommended to staff eight investment managers as finalists in the search. Staff then analyzed and conducted due diligence on each of the finalist investment managers. Strong consideration was placed on managers' potential fit within the existing ARMB equity ex-US portfolio.

RECOMMENDATION:

The Alaska Retirement Management Board direct staff to contract with investment manager Acadian Asset Management to manage initial investments of up to $350 million in an ex-US equity strategy, subject to successful contract and fee negotiations.

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT: Global ex-US Manager Hire — ACTION: X

DATE: March 16, 2023 — INFORMATION: ____

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After various discussions with staff, late 2022 Callan's Search Committee approved and recommended to staff eight investment managers as finalists in the search. Staff then analyzed and conducted due diligence on each of the finalist investment managers. Strong consideration was placed on managers' potential fit within the existing ARMB equity ex-US portfolio.

RECOMMENDATION:

The Alaska Retirement Management Board direct staff to contract with investment manager First Eagle Investments to manage initial investments of up to $350 million in an ex-US equity strategy, subject to successful contract and fee negotiations.

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT: Enhanced Index Manager Hire — ACTION: X

DATE: March 16, 2023 — INFORMATION: ____

BACKGROUND:

For a number of years the Alaska Retirement Management Board (ARMB) Global ex-US Equity portfolio has included passive strategies run by State Street Global Advisors (SSGA) in the form of two commingled funds which invest using passive approaches in developed markets ex-US and emerging markets, respectively. While these two sizeable investments have been commingled funds, all other ARMB strategies comprising the ARMB Global Equity portfolio have taken the form of separate accounts. Staff has recognized various efficiencies to having public equity strategies in separate accounts, in that this facilitates efficient consolidation of portfolios for reporting and analytic purposes. However, investments in public securities but run in commingled funds are far more difficult to consolidate with separate account investments at the position level. This has generated staff interest in the possibility of running passive Global ex-US Equity investments in separate accounts as opposed to commingled funds. Additionally, staff has become interested in the potential for largely passive strategies but that offer possible upside by trading slightly differently than that assumed by strict index replicators.

To this end, staff has had discussions with Legal & General Investment Management America (LGIMA) and Callan Associates exploring the possibility of an enhanced indexed strategy. LGIMA is the current investment manager of ARMB investments in Scientific Beta factor tilted strategies in ex-US developed markets and emerging markets. An enhanced index strategy represents a low tracking error, largely passive strategy designed to exploit occasional perceived idiosyncratic opportunities. Staff believes an enhanced index strategy may be a way to achieve passive returns plus a modest upside, with very little risk of long-term underperformance. Staff also believes the opportunity exists for increasing the scale and breath of such investments, should an initial investment prove to be successful.

RECOMMENDATION:

The Alaska Retirement Management Board direct staff to contract with LGIMA to manage an initial investment of up to $800 million in an ex-US Developed Markets enhanced index strategy subject to successful contract and fee negotiations.

Market Insights

Guide to the Markets®

U.S. | 1Q 2023

As of February 17, 2023

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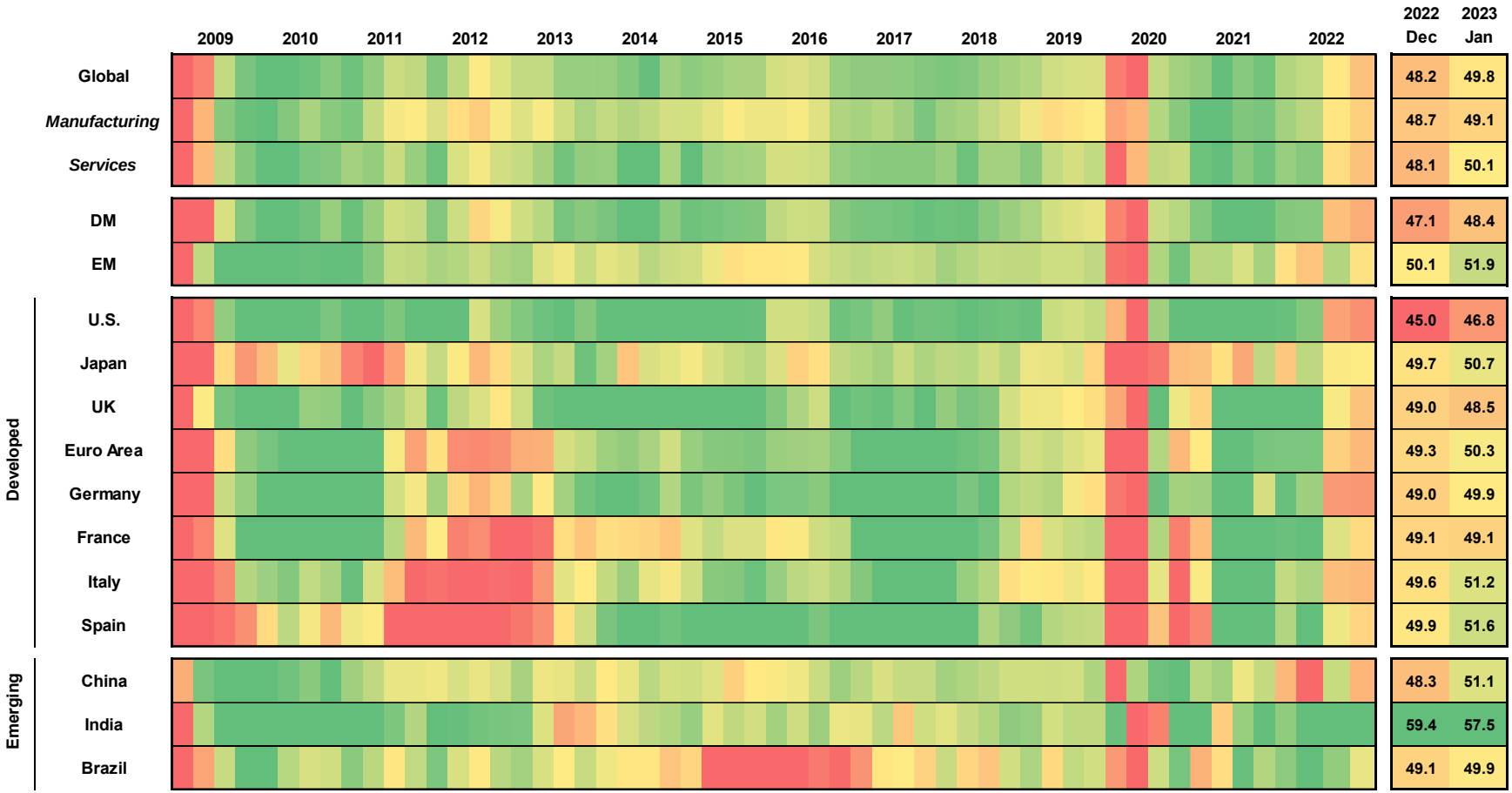
Global economic activity momentum

GTM | U.S. | 51

Global Composite (manufacturing & services combined) Purchasing Managers' Index, quarterly



Source: Standard & Poor's, J.P. Morgan Asset Management.
The Composite PMI includes both manufacturing and services sub-indices. Heatmap colors are based on PMI relative to the 50 level, which indicates acceleration or deceleration of the sector, for the time period shown. Heatmap is based on quarterly averages, with the exception of the two most recent figures, which are single month readings. Data for the U.S. are back-tested and filled in from December 2007 to September 2009 due to lack of existing PMI figures. DM and EM represent developed markets and emerging markets, respectively.
Guide to the Markets – U.S. Data are as of February 17, 2023.

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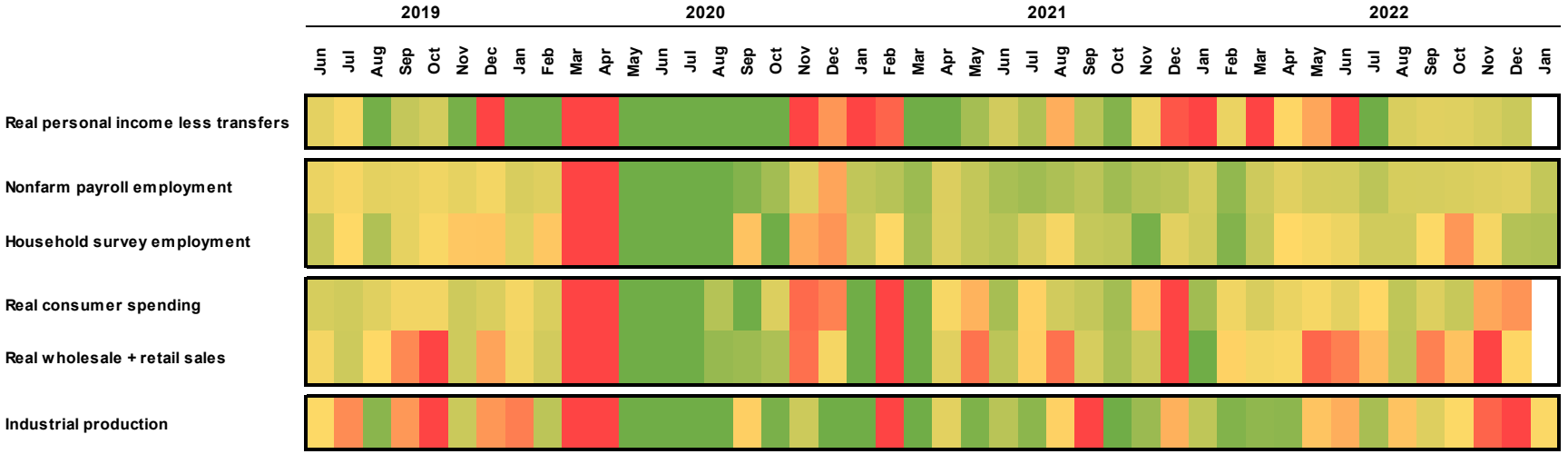
International

Recession determinants

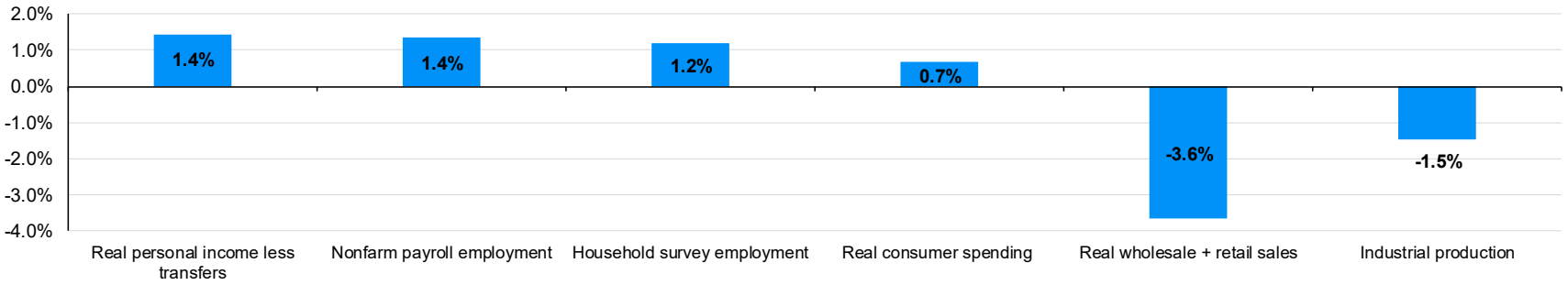
Economy

Variables used by the NBER in making recession determination*

% change month-over-month



% change, last six months



Source: Bureau of Economic Analysis, Bureau of Labor Statistics, Census Bureau, Federal Reserve of St. Louis, NBER, J.P. Morgan Asset Management. Heatmap shading reflects 10 years of data, with green and red reflecting a range of +/- 0.5 standard deviations from a baseline of 0% monthly growth. *The NBER's definition of a recession involves a significant decline in economic activity that is spread across the economy and lasts more than a few months. Because a recession must influence the economy broadly and not be confined to one sector, the committee emphasizes economy-wide measures of economic activity. Specifically, they consider real personal income less transfers, nonfarm payroll employment, employment as measured by the household survey, real personal consumption expenditures, wholesale-retail sales adjusted for price changes and industrial production. There is no fixed rule about which measures contribute to the process or how they are weighted, but the committee notes that "in recent decades, the two measures we have put the most weight on are real personal income less transfers and nonfarm payroll employment."

Guide to the Markets – U.S. Data are as of February 17, 2023.

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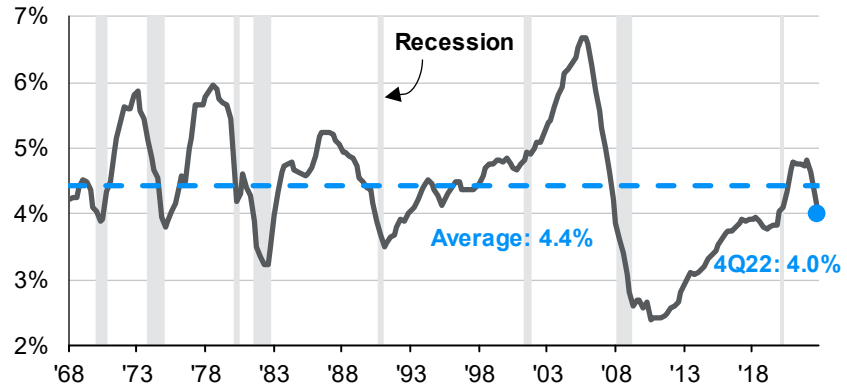
Cyclical sectors

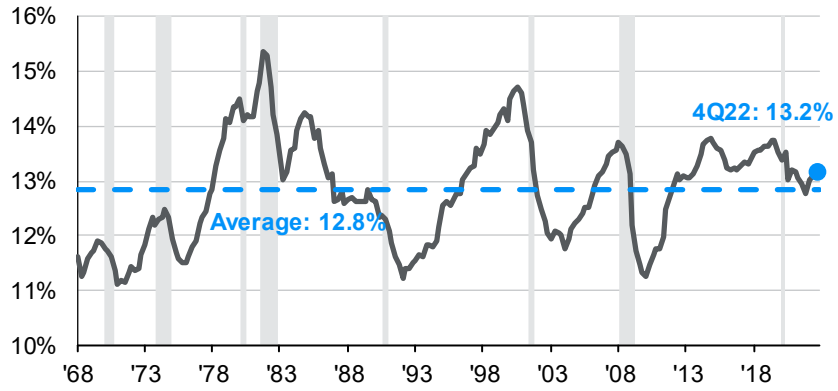
Residential investment as a % of GDP

Quarterly, seasonally adjusted



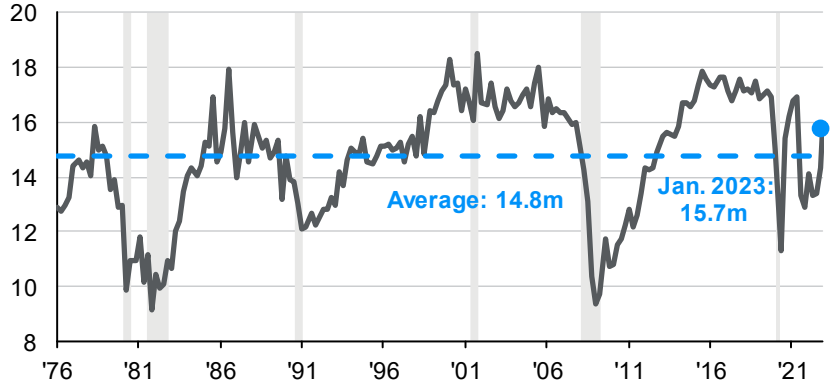
Business fixed investment as a % of GDP

Quarterly, seasonally adjusted



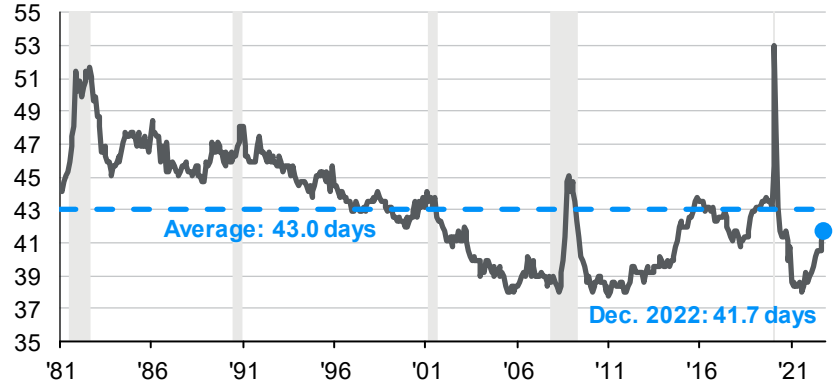
Light vehicle sales

Mil vehicles, seasonally adjusted ann. rate



Total business inventory/sales ratio

Days of sales, monthly, seasonally adjusted



Source: BEA, Census Bureau, FactSet, J.P. Morgan Asset Management. Data for light vehicle sales is quarterly apart from the latest monthly data point.
Guide to the Markets – U.S. Data are as of February 17, 2023.

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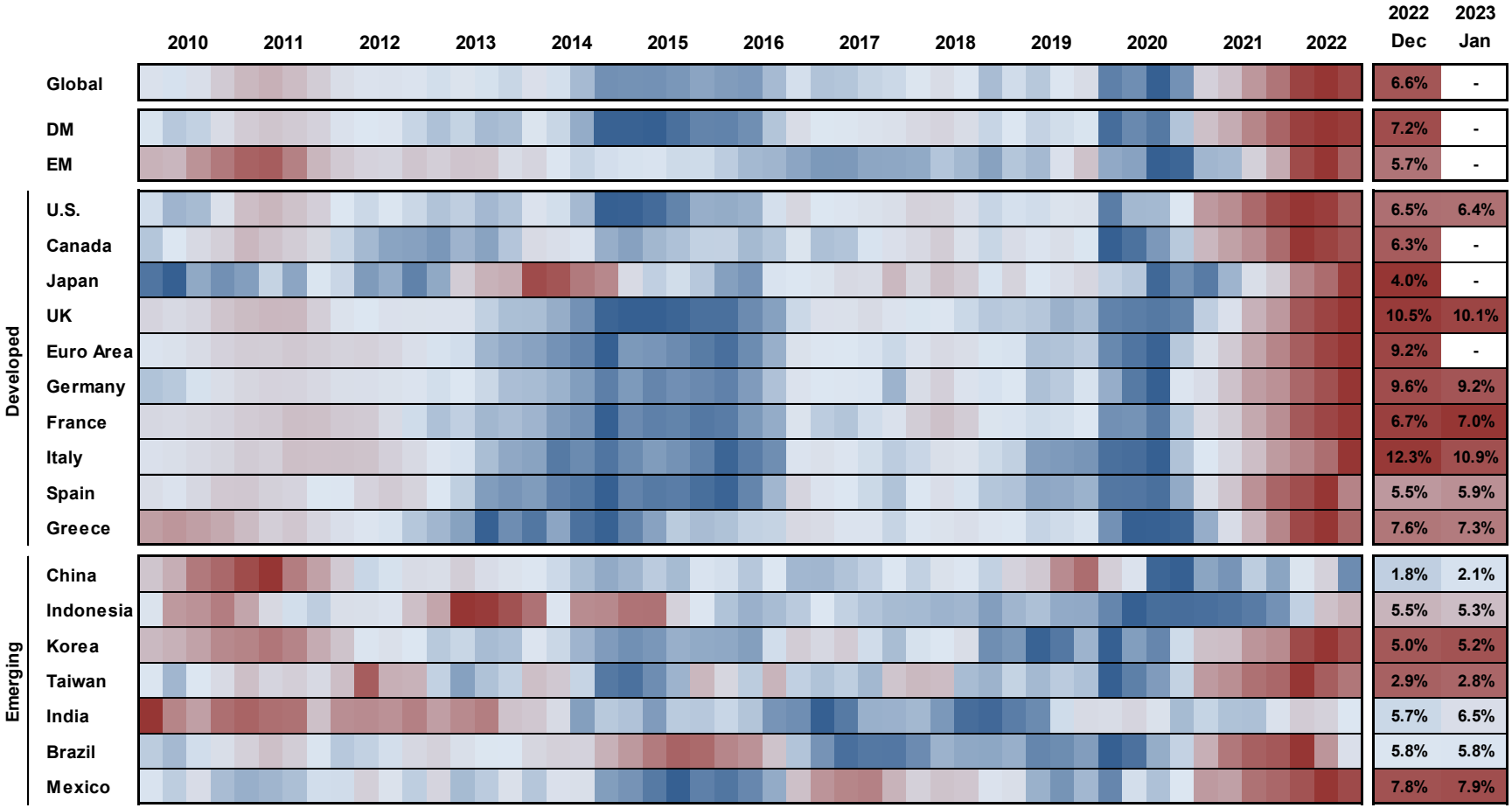
Global inflation

GTM | U.S. | 52

Year-over-year headline inflation by country and region, quarterly



Source: Bank of Mexico, DGBAS, Eurostat, FactSet, Federal Reserve, Goskomstat of Russia, IBGE, India Ministry of Statistics & Programme Implementation, Japan Ministry of Internal Affairs & Communications, Korean National Statistical Office, Melbourne Institute, National Bureau of Statistics China, Statistics Canada, Statistics Indonesia, UK Office for National Statistics (ONS), J.P. Morgan Asset Management. Heatmap is based on quarterly averages, with the exception of the two most recent figures, which are single month readings. Colors determined by percentiles of inflation values over the time period shown. Deep blue = lowest value, light blue = median, deep red = highest value. DM and EM represent developed markets and emerging markets, respectively.
Guide to the Markets – U.S. Data are as of February 17, 2023.

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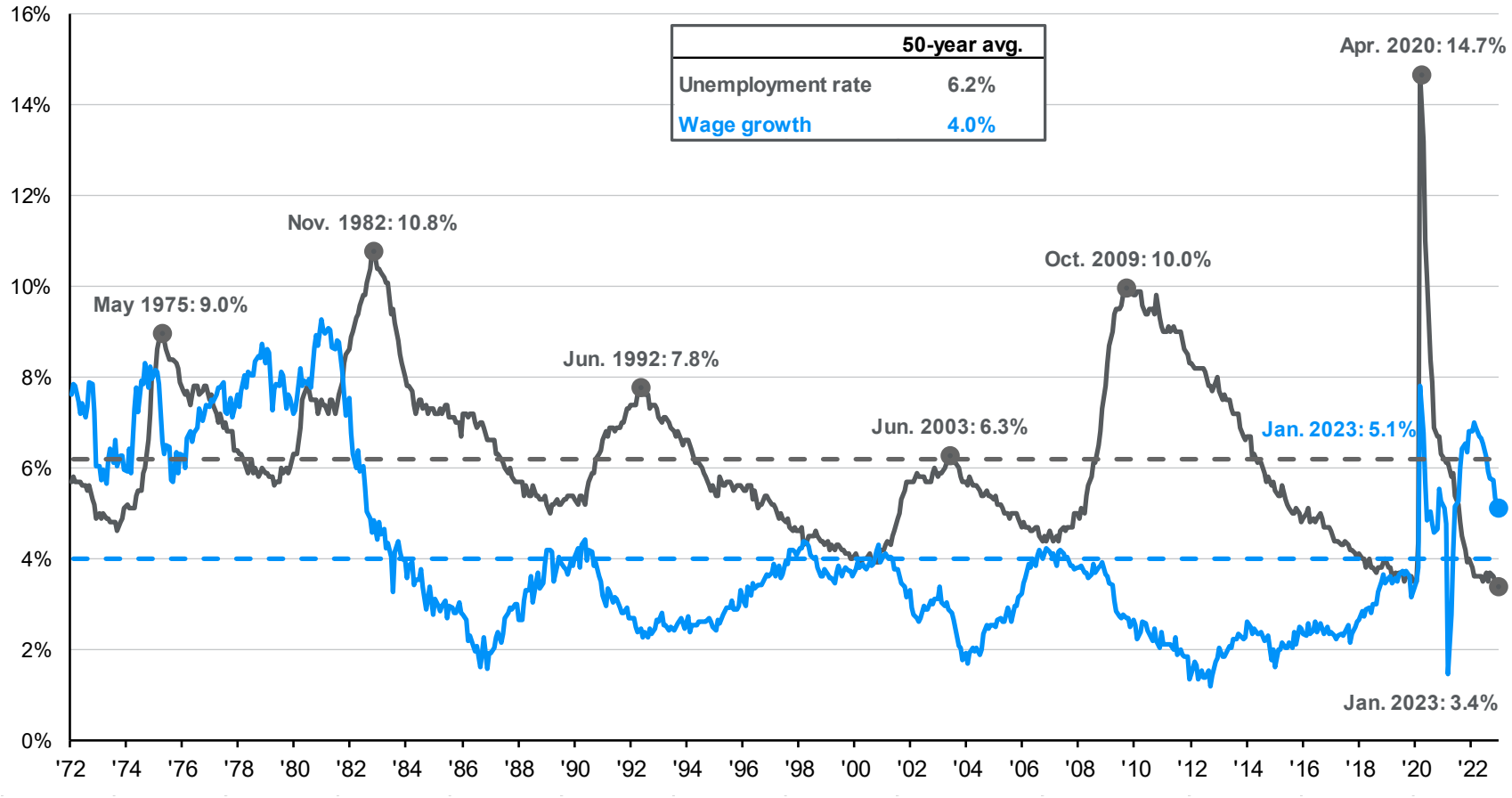
Unemployment and wages

Civilian unemployment rate and year-over-year wage growth

Private production and non-supervisory workers, seasonally adjusted, percent



Source: BLS, FactSet, J.P. Morgan Asset Management.
Guide to the Markets – U.S. Data are as of February 17, 2023.

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Inflation heatmap

Consumer Price Index, components

m/m % change, seasonally adjusted

	Weight	2021											2022											
		Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan
Headline CPI, y/y	100.0	1.7%	2.6%	4.1%	4.9%	5.3%	5.2%	5.2%	5.4%	6.2%	6.9%	7.2%	7.6%	8.0%	8.5%	8.2%	8.5%	8.9%	8.4%	8.2%	8.2%	7.8%	7.1%	6.4%	6.3%
Core CPI, y/y	78.4	1.3%	1.7%	3.0%	3.8%	4.4%	4.2%	3.9%	4.0%	4.6%	5.0%	5.5%	6.1%	6.4%	6.5%	6.1%	6.0%	5.9%	5.9%	6.3%	6.6%	6.3%	6.0%	5.7%	5.5%
Headline CPI, m/m	100.0	0.4%	0.5%	0.7%	0.7%	0.8%	0.4%	0.4%	0.4%	0.9%	0.8%	0.8%	0.6%	0.7%	1.0%	0.4%	0.9%	1.2%	0.0%	0.2%	0.4%	0.5%	0.2%	0.1%	0.5%
Core CPI, m/m	78.4	0.1%	0.3%	0.8%	0.7%	0.7%	0.3%	0.2%	0.3%	0.7%	0.6%	0.7%	0.6%	0.5%	0.3%	0.5%	0.6%	0.6%	0.3%	0.6%	0.6%	0.3%	0.3%	0.4%	0.4%
Energy	7.9	3.9%	3.5%	0.2%	0.3%	1.5%	1.7%	2.8%	1.5%	3.6%	2.6%	2.4%	0.8%	2.7%	8.2%	-1.0%	3.4%	6.9%	-4.7%	-3.9%	-1.7%	1.7%	-1.4%	-3.1%	2.0%
Gasoline	4.0	6.5%	6.3%	-0.6%	-0.1%	2.5%	2.5%	4.5%	1.5%	4.1%	4.2%	3.8%	-0.3%	4.7%	13.2%	-3.1%	3.2%	10.3%	-8.1%	-8.4%	-4.2%	3.4%	-2.3%	-7.0%	2.4%
Electricity	2.6	0.9%	-0.1%	0.9%	0.4%	0.0%	0.2%	0.7%	1.0%	1.6%	0.7%	0.9%	2.7%	-0.3%	1.7%	0.9%	1.3%	1.5%	1.5%	1.2%	0.8%	0.5%	0.5%	1.3%	0.5%
Utility Gas	1.0	2.1%	2.4%	1.6%	1.1%	1.2%	2.0%	1.6%	2.2%	6.7%	0.5%	0.1%	0.5%	2.0%	0.6%	2.5%	7.2%	7.5%	-3.8%	3.5%	2.2%	-3.7%	-3.4%	3.5%	6.7%
Food	13.8	0.1%	0.1%	0.3%	0.4%	0.7%	0.6%	0.4%	0.9%	0.9%	0.8%	0.6%	0.8%	1.0%	0.9%	0.8%	1.1%	1.0%	1.1%	0.8%	0.8%	0.7%	0.6%	0.4%	0.5%
Food at home	8.5	0.2%	0.1%	0.3%	0.3%	0.8%	0.5%	0.4%	1.2%	1.0%	1.0%	0.6%	0.9%	1.3%	1.3%	0.9%	1.3%	1.0%	1.3%	0.8%	0.7%	0.5%	0.6%	0.5%	0.4%
Food away from home	5.3	0.1%	0.1%	0.3%	0.6%	0.7%	0.8%	0.4%	0.5%	0.8%	0.6%	0.6%	0.7%	0.4%	0.3%	0.6%	0.7%	0.9%	0.7%	0.9%	0.9%	0.9%	0.5%	0.4%	0.6%
Core goods	20.9	-0.2%	0.1%	1.9%	1.7%	1.9%	0.3%	0.3%	0.3%	1.3%	1.1%	1.4%	0.9%	0.3%	-0.4%	0.1%	0.6%	0.6%	0.1%	0.4%	0.0%	-0.1%	-0.2%	-0.1%	0.1%
Apparel	2.4	-0.6%	0.1%	1.0%	0.8%	0.6%	0.0%	0.3%	-0.5%	1.0%	0.7%	0.9%	0.7%	0.6%	0.3%	-0.1%	0.4%	0.7%	-0.1%	0.3%	0.0%	-0.2%	0.1%	0.2%	0.8%
New vehicles	4.1	0.0%	0.0%	-0.1%	1.1%	1.6%	1.4%	1.2%	1.3%	1.5%	1.6%	1.8%	0.3%	0.1%	0.1%	0.4%	0.6%	0.5%	0.5%	0.8%	0.7%	0.6%	0.5%	0.6%	0.2%
Used cars	3.6	-0.8%	0.6%	9.6%	7.7%	9.1%	-0.4%	-1.3%	-0.5%	3.1%	3.2%	3.9%	1.4%	-0.6%	-3.6%	-0.7%	1.9%	0.5%	-0.8%	-0.2%	-1.1%	-1.7%	-2.0%	-2.0%	-1.9%
Medical care commod	1.5	-0.7%	0.1%	0.6%	0.0%	-0.4%	0.2%	-0.2%	0.3%	0.6%	0.1%	0.0%	0.9%	0.3%	0.2%	0.1%	0.3%	0.4%	0.6%	0.2%	-0.1%	0.0%	0.2%	0.1%	1.1%
Core services	57.5	0.2%	0.3%	0.4%	0.4%	0.3%	0.3%	0.1%	0.2%	0.4%	0.4%	0.4%	0.4%	0.5%	0.6%	0.6%	0.6%	0.6%	0.4%	0.6%	0.8%	0.5%	0.5%	0.6%	0.5%
Shelter	32.9	0.2%	0.3%	0.4%	0.3%	0.4%	0.5%	0.2%	0.4%	0.4%	0.5%	0.4%	0.3%	0.6%	0.5%	0.5%	0.6%	0.6%	0.6%	0.7%	0.7%	0.7%	0.6%	0.8%	0.7%
Rent of primary res.	7.4	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.3%	0.4%	0.4%	0.4%	0.4%	0.5%	0.6%	0.4%	0.6%	0.6%	0.8%	0.7%	0.7%	0.8%	0.7%	0.8%	0.8%	0.7%
OER	24.2	0.3%	0.2%	0.2%	0.3%	0.3%	0.3%	0.3%	0.4%	0.4%	0.4%	0.4%	0.5%	0.5%	0.5%	0.5%	0.6%	0.7%	0.6%	0.7%	0.8%	0.6%	0.7%	0.8%	0.7%
Medical care services	6.8	0.4%	0.1%	0.0%	-0.1%	-0.1%	0.1%	0.2%	0.0%	0.6%	0.5%	0.5%	0.5%	0.1%	0.6%	0.5%	0.4%	0.7%	0.4%	0.7%	0.8%	-0.4%	-0.5%	0.3%	-0.7%
Transportation services	6.0	0.1%	1.1%	1.3%	1.9%	0.9%	-0.8%	-0.7%	-0.9%	0.0%	1.2%	0.5%	0.7%	1.1%	2.1%	2.2%	1.6%	1.8%	-0.4%	1.0%	1.9%	0.6%	0.3%	0.6%	0.9%

Source: BLS, FactSet, J.P. Morgan Asset Management. Heatmap shading is relative to the two-year period shown. Component weights may not add to 100. OER refers to owner's equivalent rent.
Guide to the Markets – U.S. Data are as of February 17, 2023.

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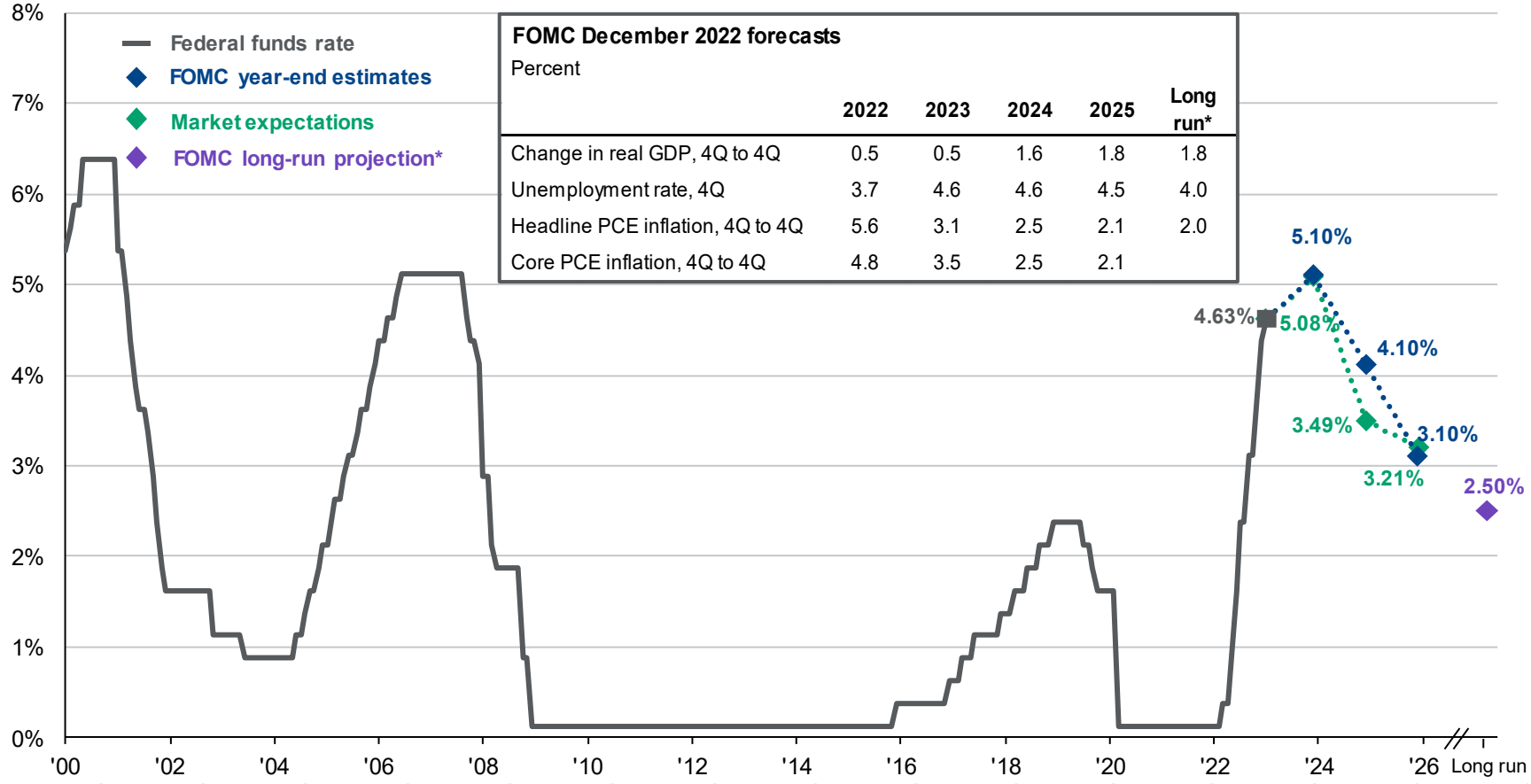
The Fed and interest rates

Federal funds rate expectations

FOMC and market expectations for the federal funds rate



FOMC December 2022 forecasts

Percent

	2022	2023	2024	2025	Long run*
Change in real GDP, 4Q to 4Q	0.5	0.5	1.6	1.8	1.8
Unemployment rate, 4Q	3.7	4.6	4.6	4.5	4.0
Headline PCE inflation, 4Q to 4Q	5.6	3.1	2.5	2.1	2.0
Core PCE inflation, 4Q to 4Q	4.8	3.5	2.5	2.1	

Source: Bloomberg, FactSet, Federal Reserve, J.P. Morgan Asset Management.
Market expectations are based off of the respective Federal Funds Futures contracts for December expiry. *Long-run projections are the rates of growth, unemployment and inflation to which a policymaker expects the economy to converge over the next five to six years in absence of further shocks and under appropriate monetary policy. Forecasts are not a reliable indicator of future performance. Forecasts, projections and other forward-looking statements are based upon current beliefs and expectations. They are for illustrative purposes only and serve as an indication of what may occur. Given the inherent uncertainties and risks associated with forecasts, projections or other forward-looking statements, actual events, results or performance may differ materially from those reflected or contemplated.
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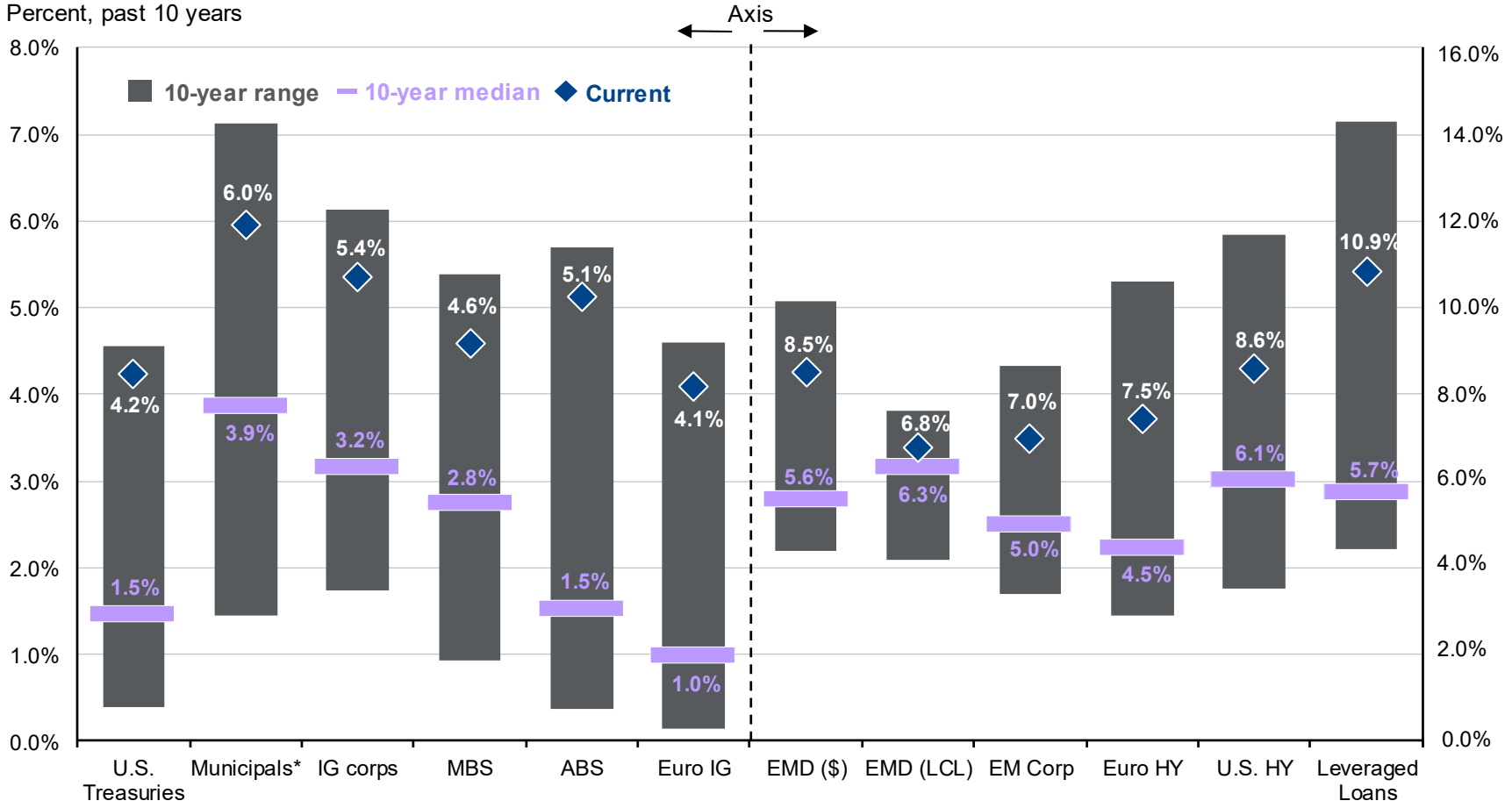
Fixed income valuations

Yield-to-worst across fixed income sectors

Percent, past 10 years



Source: Bloomberg, FactSet, J.P. Morgan Credit Research, J.P. Morgan Asset Management. Indices used are Bloomberg except for emerging market debt and leveraged loans: EMD ($): J.P. Morgan EMIGLOBAL Diversified Index; EMD (LCL): J.P. Morgan GBI-EM Global Diversified Index; EM Corp.: J.P. Morgan CEMBI Broad Diversified; Leveraged loans: JPM Leveraged Loan Index; Euro IG: Bloomberg Euro Aggregate Corporate Index; Euro HY: Bloomberg Pan-European High Yield Index. Yield-to-worst is the lowest possible yield that can be received on a bond apart from the company defaulting. All sectors shown are yield-to-worst except for Municipals, which is based on the tax-equivalent yield-to-worst assuming a top-income tax bracket rate of 37% plus a Medicare tax rate of 3.8%.

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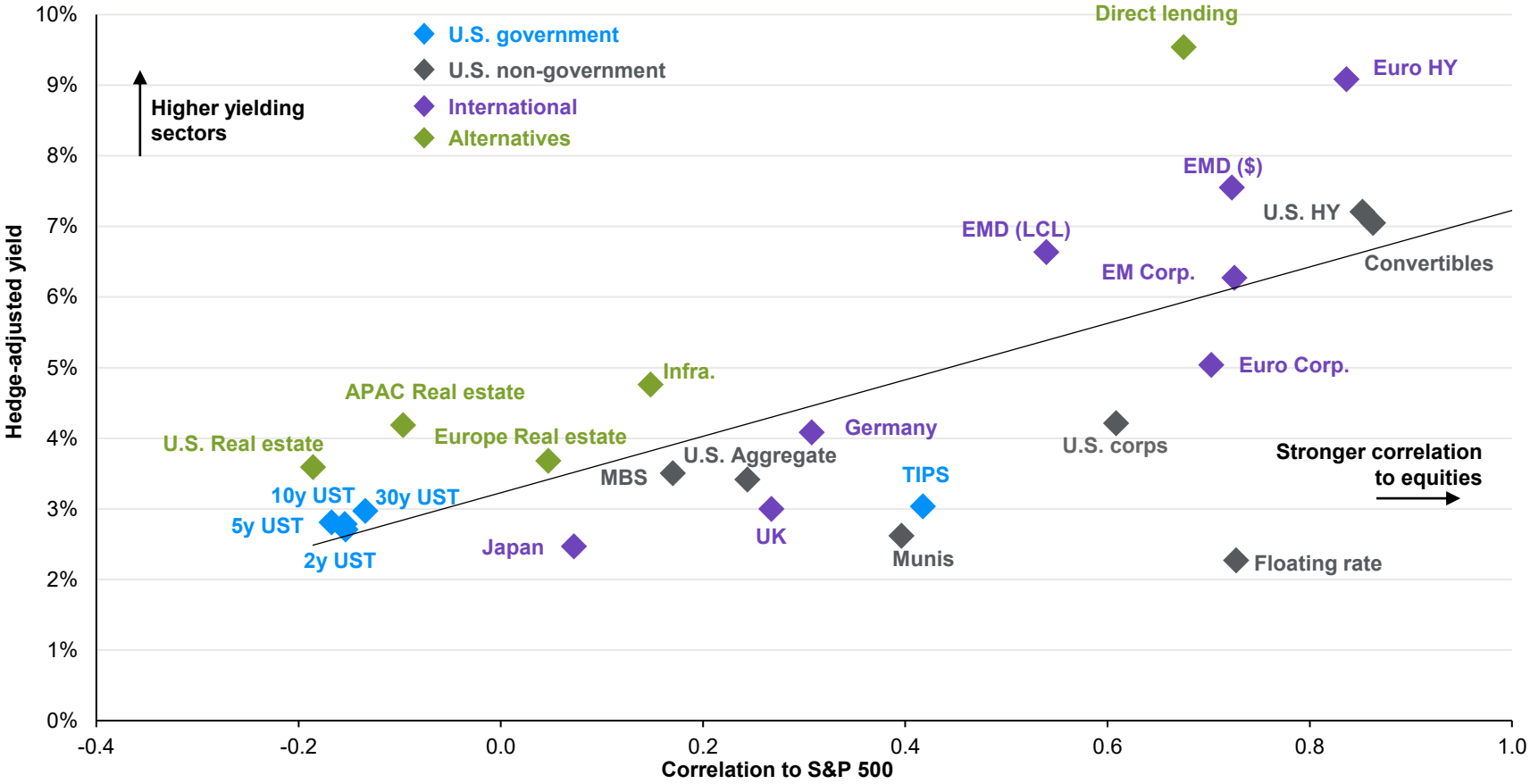
Equity market correlations and yields

Equity market correlations and yields

Hedge-adjusted yield, last 12 months, 10-year correlations, quarterly



Source: Bloomberg, Gilberto-Levy, NCREIF, MSCI, FactSet, ICE, J.P. Morgan Asset Management. *CML is commercial mortgage loans. Fixed income shown above are represented by Bloomberg indices except for EMD and ABS – U.S. Aggregate; MBS: U.S. Aggregate Securitized - MBS; U.S. corps: U.S. Corporates; Munis: Municipal Bond; U.S. HY: Corporate High Yield; TIPS: Treasury Inflation-Protected Securities (TIPS); Floating Rate: U.S. Floating Rate; Convertibles: U.S. Convertibles Composite; ABS: J.P. Morgan ABS Index; EMD ($): J.P. Morgan EMBIG Diversified Index; EMD (LCL): J.P. Morgan GBI EM Global Diversified Index; EM Corp: J.P. Morgan CEMBI Broad Diversified Index; Euro Corp.: Euro Aggregate Corporate Index; Euro HY: Pan-European High Yield Index; U.S. Real Estate: NCREIF Property Index – ODCE ; Europe Real Estate: Market weighted-avg. of MSCI Global Property Fund Indices - U.K. & Cont. Europe; APAC Real Estate: MSCI Global Property Index - Asia-Pacific; Global infra.: MSCI Global Quarterly Infrastructure Asset Index (equal weighted blend; U.S. Direct Lending: Cliffwater Direct Lending Index; Timber: NCREIF Timberland Property Index (U.S.); Transport returns and yield are derived from a J.P. Morgan Asset Management index; CML – Senior: Gilberto-Levy Commercial Mortgage Performance Aggregate Index. Convertibles yield is based on the U.S. portion of the Bloomberg Global Convertibles. Country yields are represented by the global aggregate for each country. Yield and return information based on bellwethers for Treasury securities. U.S. Real Estate yield is calculated using the MSCI Global Property Fund Index – North America. Correlations are based on quarterly return over the past 10 years through 9/30/2022. All non-alternative yields are as of 11/30/2022. Alt yields are as of 9/30/2022. Quarterly return correlations and yields for Infrastructure are as of 6/30/2022.
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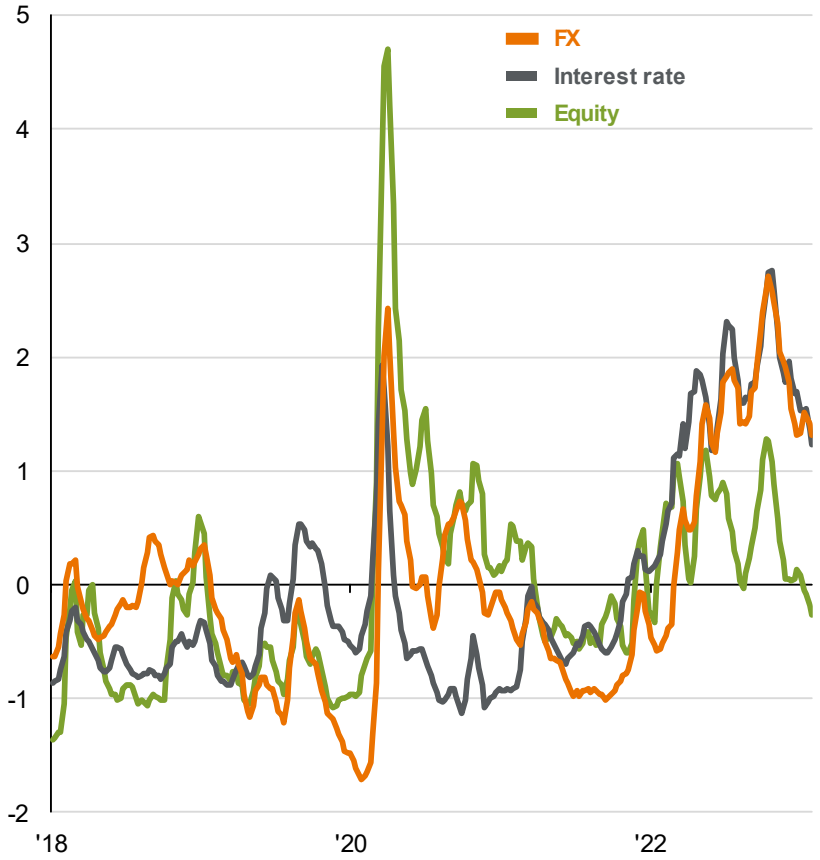
Alternatives

Market volatility and hedge funds

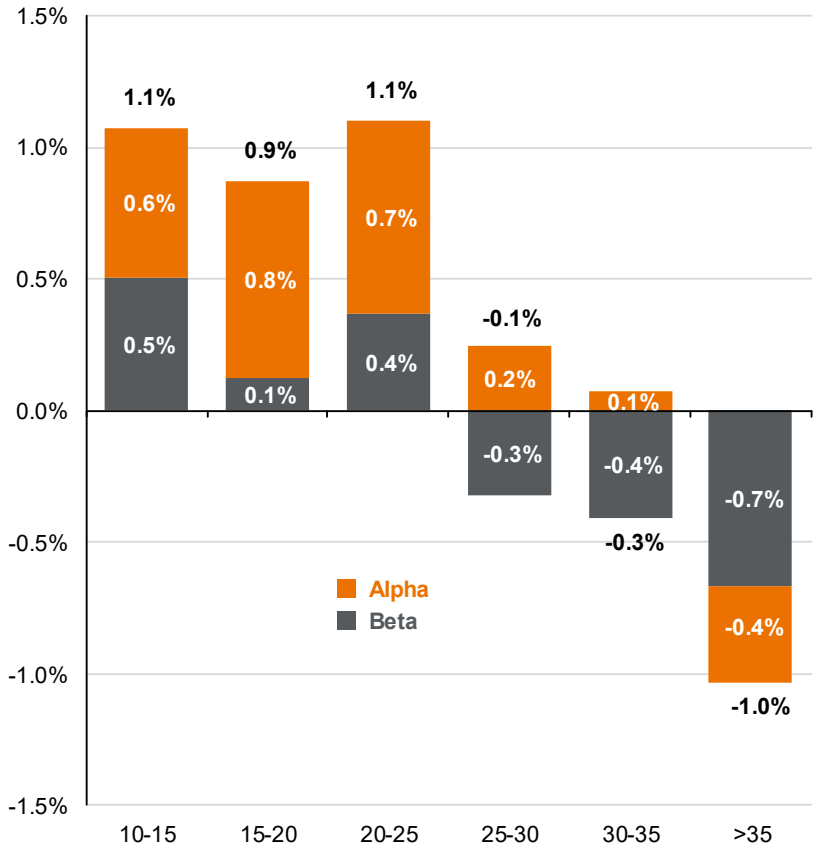
Equity, interest rate and foreign exchange volatility

Z-score, 4-week moving average



Hedge funds and volatility

Average monthly hedge fund returns by VIX level, 1990 – present



Source: CBOE, HFRI, MSCI, ICE BofA, J.P. Morgan Index Research, FactSet, J.P. Morgan Asset Management. (Right) Historical beta is based on regression analysis, where the HFRI is the dependent variable and the MSCI AC World Index is the independent variable. Monthly VIX reading is an average. Numbers may not sum to 100% due to rounding. (Left) Equity volatility is represented by the VIX Index, interest rate volatility is represented by the MOVE Index and foreign exchange volatility is represented by the J.P. Morgan Global FX Volatility Index. This slide comes from our Guide to Alternatives.

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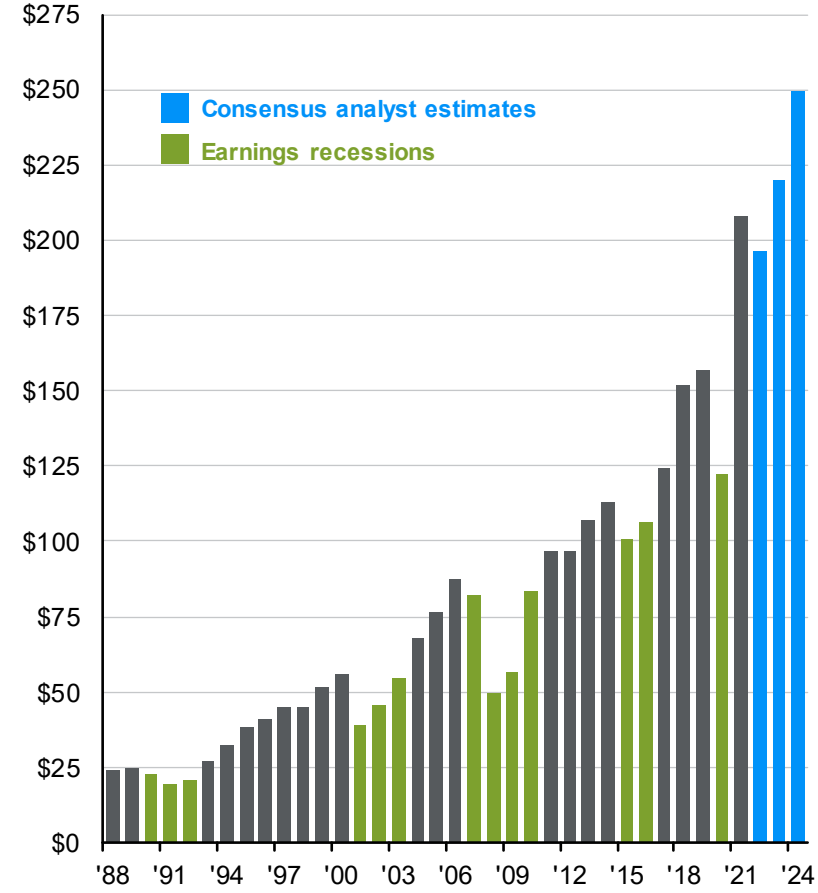
Corporate earnings and analyst expectations

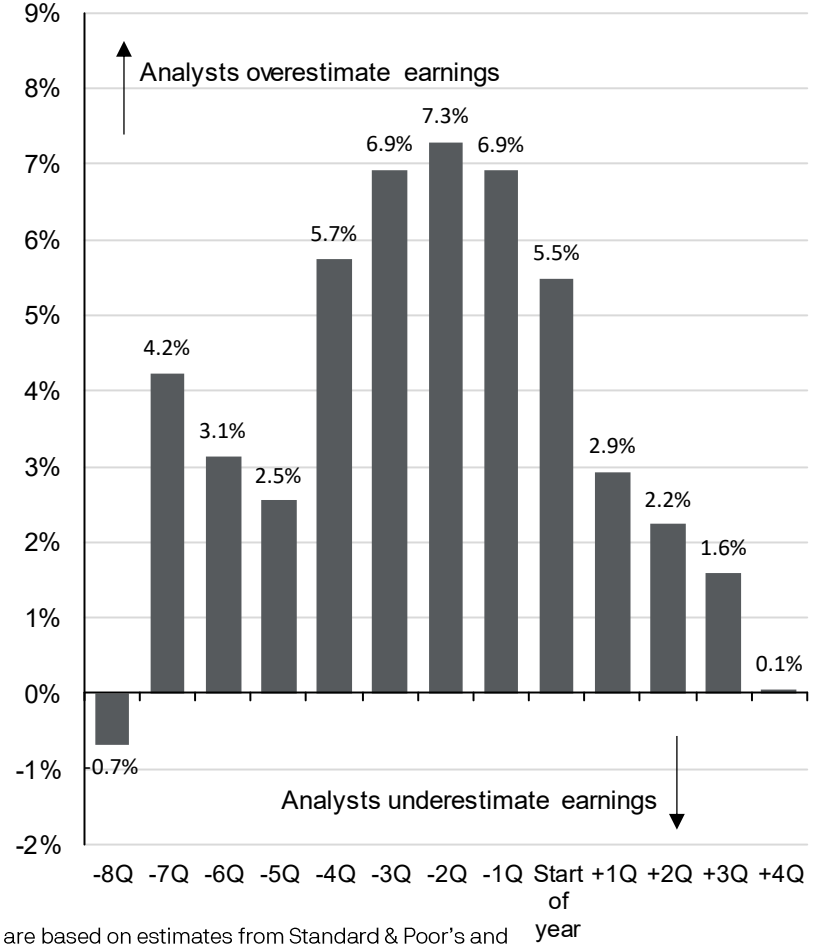
S&P 500 earnings per share

Index annual operating earnings



Average analyst over/underestimate of annual earnings

S&P 500, pro-forma EPS, 1996 - 2021



Source: Compustat, FactSet, Standard & Poor's, J.P. Morgan Asset Management.
Historical EPS levels are based on annual operating earnings per share. Earnings estimates are based on estimates from Standard & Poor's and FactSet Market Aggregates. *Earnings and multiple growth are both year-to-date percent changes of next 12-month estimates. Past performance is not indicative of future returns.
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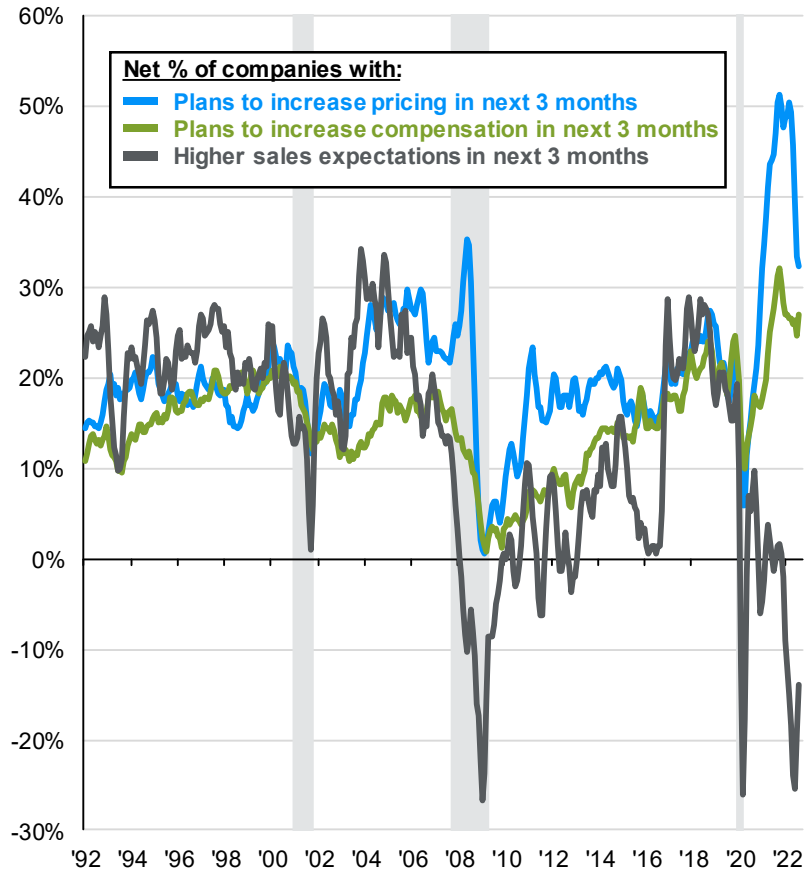
Profit margins

S&P 500 profit margins

Quarterly operating earnings/sales

Pricing, wages, and sales expectations for businesses

NFIB Small Business Economic Survey, three-month moving average



Source: Compustat, FactSet, NFIB, Standard & Poor's, J.P. Morgan Asset Management. Past performance is not indicative of future returns. (Left) *Current profit margin estimate is based on 84.1% of S&P 500 companies having reported 4Q22 earnings. (Right) All three data series are net and represent the % of respondents answering higher less the % of respondents answering lower. Data reflects answers to the following three questions: *"What are your pricing plans in the next 3 months?," "What are your compensation plans in the next 3 months?," What are your sales expectations in the next 3 months?"*
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Dollar drivers

The U.S. dollar

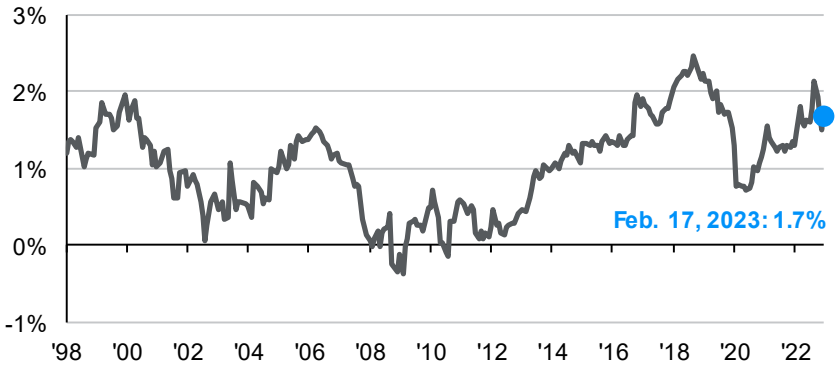
U.S. Dollar Index

The U.S. trade balance

Current account balance, % of GDP

Developed markets interest rate differentials

Difference between U.S. and international 10-year yields*



Source: J.P. Morgan Asset Management; (Left) FactSet, ICE; (Top right) Bureau of Economic Analysis, FactSet; (Bottom right) Tullett Prebon. Currencies in the DXY Index are: British pound, Canadian dollar, euro, Japanese yen, Swedish krona and Swiss franc. *Interest rate differential is the difference between the 10-year U.S. Treasury yield and a basket of the 10-year yields of each major trading partner (Australia, Canada, Europe, Japan, Sweden, Switzerland and UK). Weights in the basket are calculated using the 10-year average of total government bonds outstanding in each region. Europe is defined as the 19 countries in the euro area.
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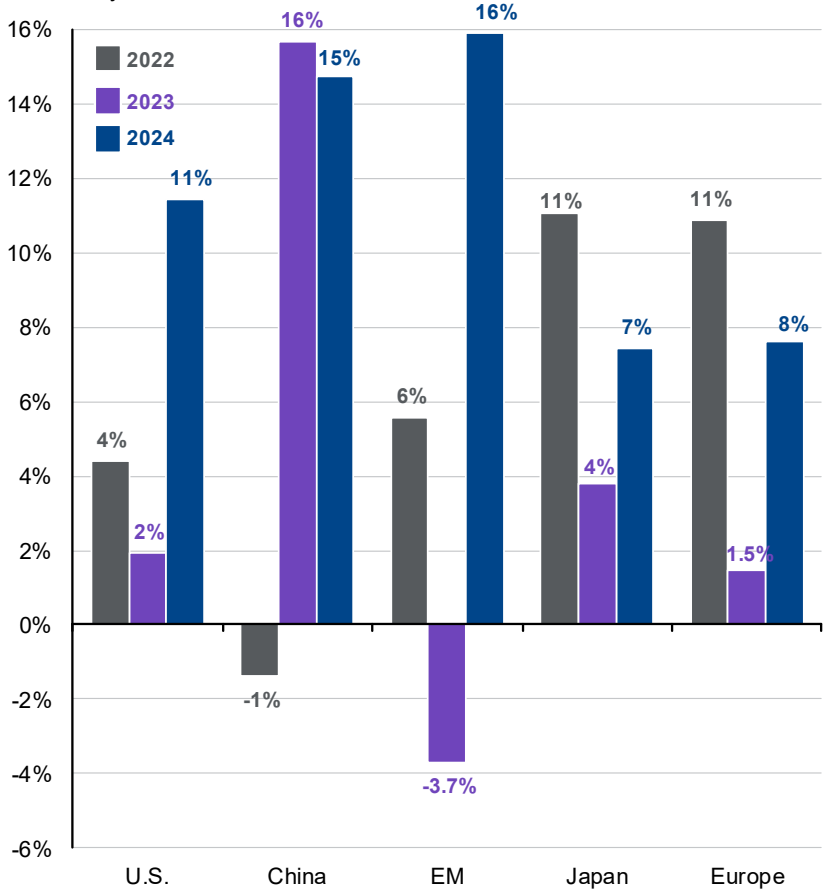
International equity earnings and valuations

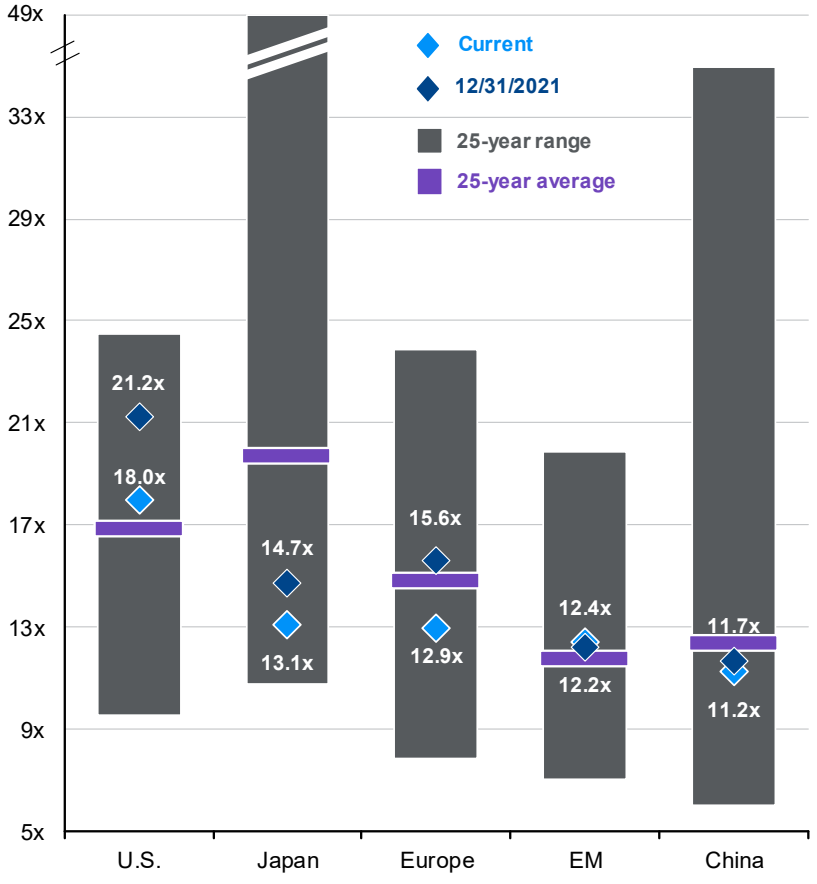
Global earnings growth

Calendar year consensus estimates



Global valuations

Current and 25-year next 12 months price-to-earnings ratio



Source: FactSet, MSCI, Standard & Poor's, Thomson Reuters, J.P. Morgan Asset Management.
Calendar year consensus estimates are based on pro-forma earnings. MSCI Europe includes the eurozone as well as countries not in the currency bloc, such as Norway, Sweden, Switzerland and the UK (which collectively make up 44% of the overall index). Past performance is not a reliable indicator of current and future results.
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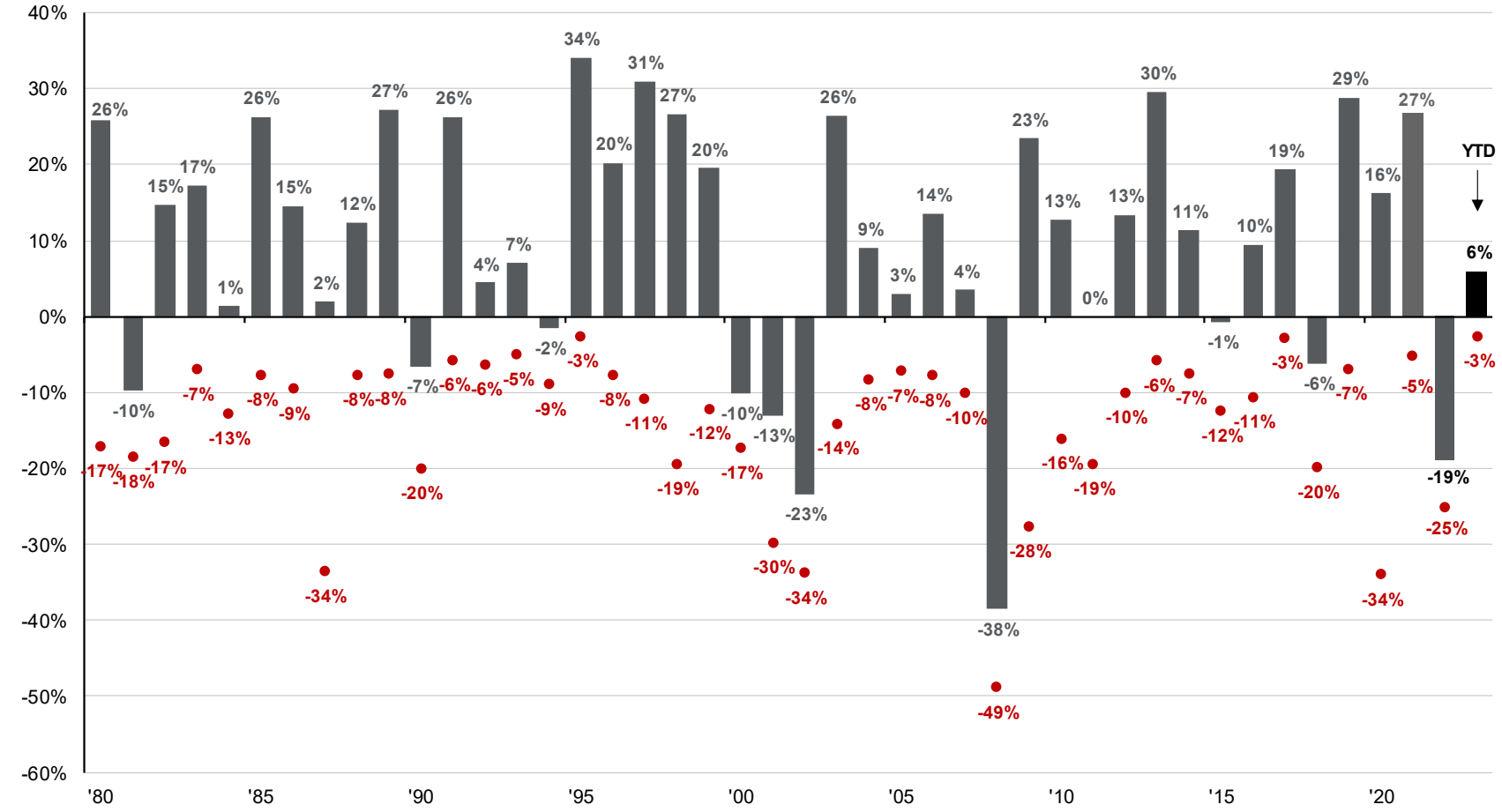
Annual returns and intra-year declines

S&P intra-year declines vs. calendar year returns

Despite average intra-year drops of 14.3%, annual returns were positive in 32 of 43 years



Source: FactSet, Standard & Poor's, J.P. Morgan Asset Management.
Returns are based on price index only and do not include dividends. Intra-year drops refers to the largest market drops from a peak to a trough during the year. For illustrative purposes only. Returns shown are calendar year returns from 1980 to 2022, over which time period the average annual return was 8.7%.
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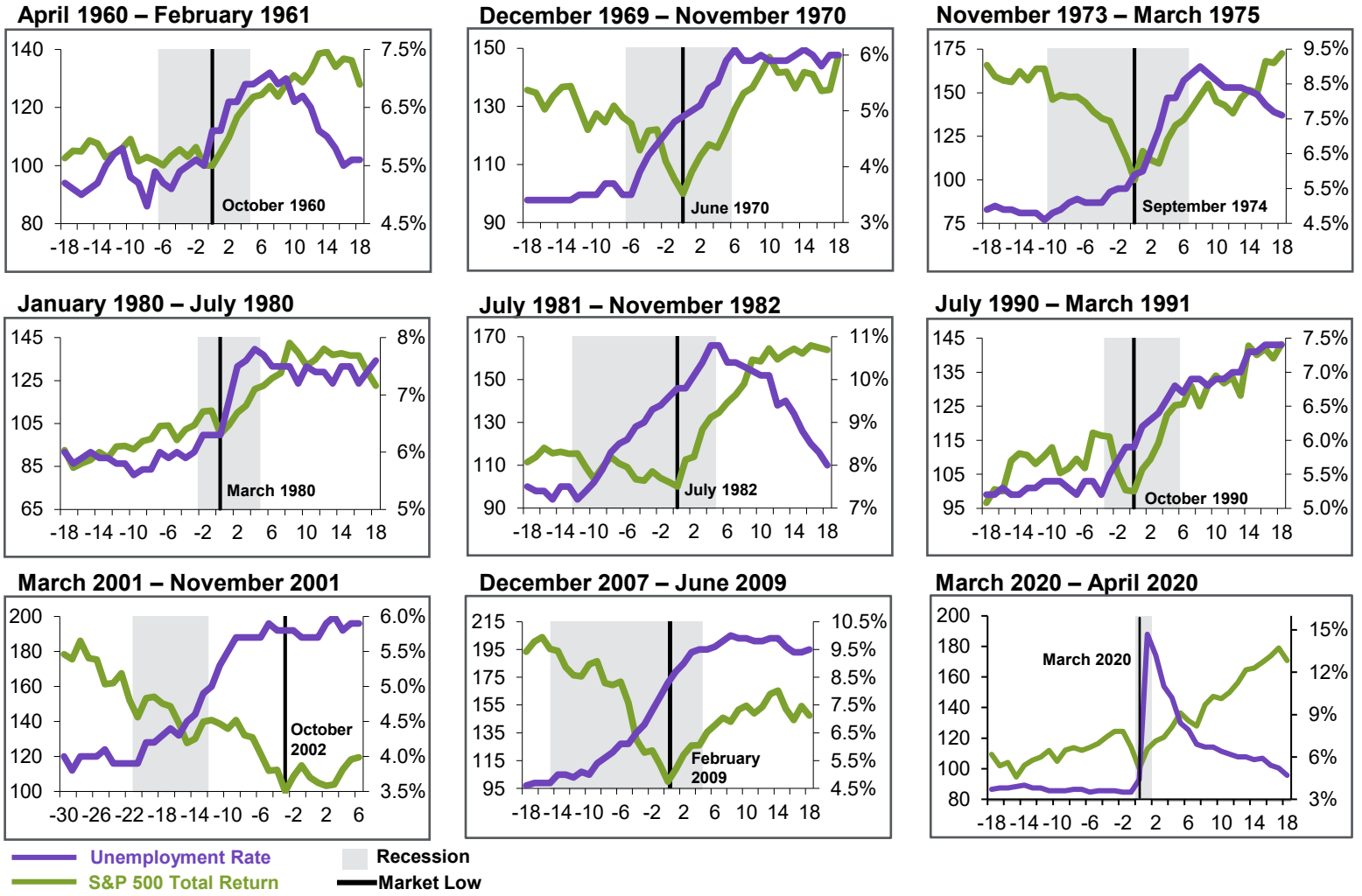
Market inflection points, recessions and the unemployment rate



Source: BLS, Ibbotson, J.P. Morgan Asset Management. Time zero represents the numeric low of the S&P 500 Total Return Index associated with the recessionary period defined by the shaded grey area; data shown in months. S&P 500 Index is rebased to 100 at time zero.
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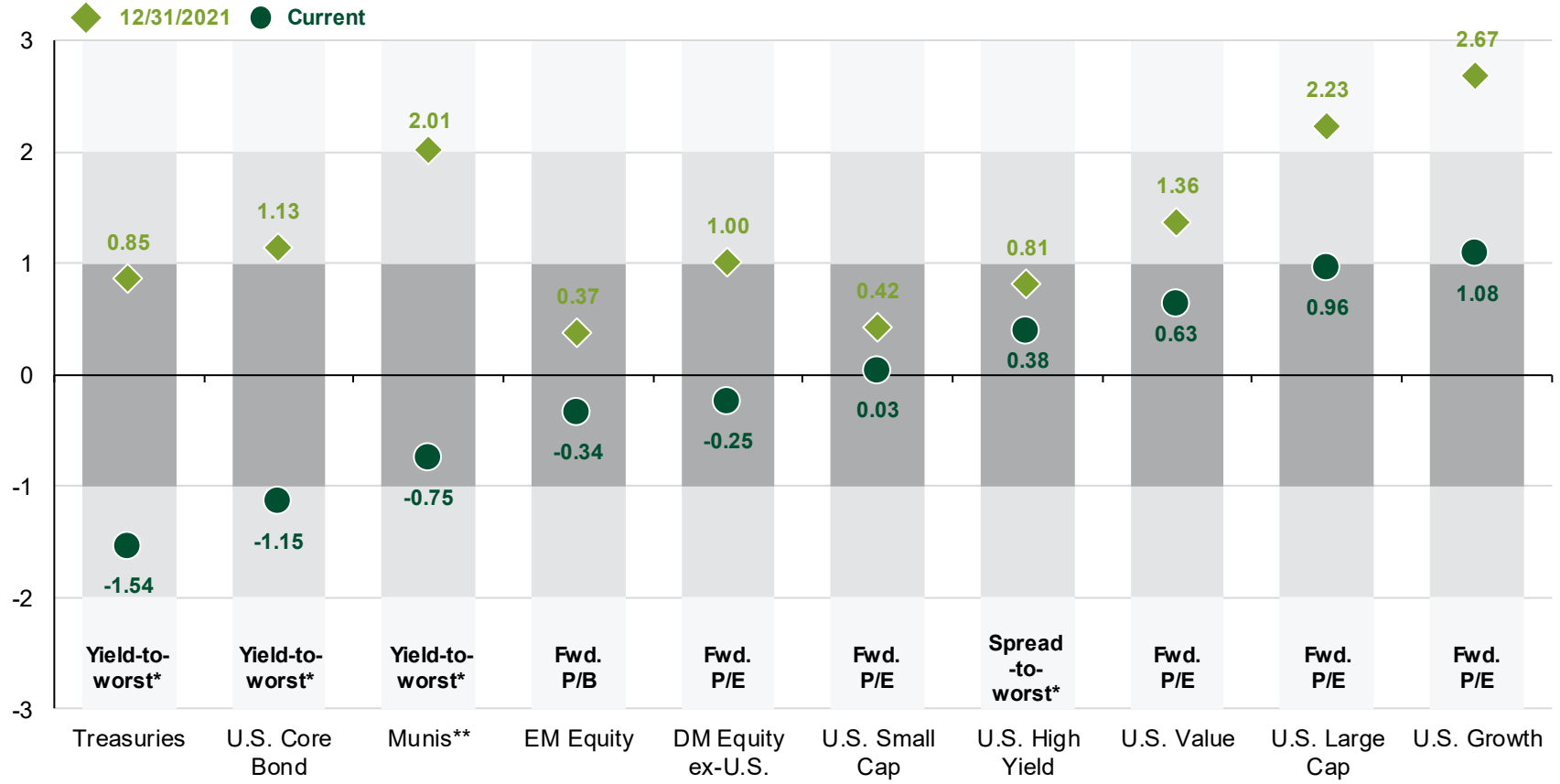
Valuations monitor

Asset class valuations

Z-scores based on 20-year average valuation measures



Source: Bloomberg, BLS, CME, FactSet, MSCI, Russell, Standard & Poor's, J.P. Morgan Asset Management.
U.S. Large Cap: S&P 500, U.S. Small Cap: Russell 2000, U.S. Mid Cap: Russell Midcap; EM Equity: MSCI EME, DM Equity: MSCI EAFE, U.S. Value: Russell 1000 Value, U.S. Growth: Russell 1000 Growth, U.S. High Yield: J.P. Morgan Domestic High Yield Index, U.S. Core Bond: Bloomberg US Aggregate, Treasuries: Bloomberg U.S. Aggregate Government – Treasury, Munis: Bloomberg Municipal Bond. *Yield-to-worst and spread-to-worst are inversely related to fixed income prices. **Munis yield-to-worst is based on the tax-equivalent yield-to-worst assuming a top-income tax bracket rate of 37% plus a Medicare tax rate of 3.8%.
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J.P. Morgan Asset Management – Index definitions

All indexes are unmanaged and an individual cannot invest directly in an index. Index returns do not include fees or expenses.

Equities:

The Dow Jones Industrial Average is a price-weighted average of 30 actively traded blue-chip U.S. stocks.

The MSCI ACWI (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 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 Emerging Markets Index is a free float-adjusted market capitalization index that is designed to measure equity market performance in the global emerging markets.

The MSCI Europe Index is a free float-adjusted market capitalization index that is designed to measure developed market equity performance in Europe.

The MSCI Pacific Index is a free float-adjusted market capitalization index that is designed to measure equity market performance in the Pacific region.

The Russell 1000 Index® measures the performance of the 1,000 largest companies in the Russell 3000.

The Russell 1000 Growth Index® measures the performance of those Russell 1000 companies with higher price-to-book ratios and higher forecasted growth values.

The Russell 1000 Value Index® measures the performance of those Russell 1000 companies with lower price-to-book ratios and lower forecasted growth values.

The Russell 2000 Index® measures the performance of the 2,000 smallest companies in 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 Russell 3000 Index® measures the performance of the 3,000 largest U.S. companies based on total market capitalization.

The Russell Midcap Index® measures the performance of the 800 smallest companies in the Russell 1000 Index.

The Russell Midcap Growth Index ® measures the performance of those Russell Midcap companies with higher price-to-book ratios and higher forecasted growth values. The stocks are also members of the Russell 1000 Growth index.

The Russell Midcap Value Index ® measures the performance of those Russell Midcap companies with lower price-to-book ratios and lower forecasted growth values. The stocks are also members of the Russell 1000 Value index.

The S&P 500 Index is widely regarded as the best single gauge of the U.S. equities market. The index includes a representative sample of 500 leading companies in leading industries of the U.S. economy. The S&P 500 Index focuses on the large-cap segment of the market; however, since it includes a significant portion of the total value of the market, it also represents the market.

Fixed income:

The Bloomberg 1-3 Month U.S. Treasury Bill Index includes all publicly issued zero-coupon US Treasury Bills that have a remaining maturity of less than 3 months and more than 1 month, are rated investment grade, and have $250 million or more of outstanding face value. In addition, the securities must be denominated in U.S. dollars and must be fixed rate and non convertible.

The Bloomberg Global High Yield Index is a multi-currency flagship measure of the global high yield debt market. The index represents the union of the US High Yield, the Pan-European High Yield, and Emerging Markets (EM) Hard Currency High Yield Indices. The high yield and emerging markets sub-components are mutually exclusive. Until January 1, 2011, the index also included CMBS high yield securities.

The Bloomberg Municipal Index: consists of a broad selection of investment-grade general obligation and revenue bonds of maturities ranging from one year to 30 years. It is an unmanaged index representative of the tax-exempt bond market.

The Bloomberg US Dollar Floating Rate Note (FRN) Index provides a measure of the U.S. dollar denominated floating rate note market.

The Bloomberg US Corporate Investment Grade Index is an unmanaged index consisting of publicly issued US Corporate and specified foreign debentures and secured notes that are rated investment grade (Baa3/BBB or higher) by at least two ratings agencies, have at least one year to final maturity and have at least $250 million par amount outstanding. To qualify, bonds must be SEC-registered.

The Bloomberg US High Yield Index covers the universe of fixed rate, non-investment grade debt. Eurobonds and debt issues from countries designated as emerging markets (sovereign rating of Baa1/BBB+/BBB+ and below using the middle of Moody's, S&P, and Fitch) are excluded, but Canadian and global bonds (SEC registered) of issuers in non-EMG countries are included.

The Bloomberg US Mortgage Backed Securities Index is an unmanaged index that measures the performance of investment grade fixed-rate mortgage backed pass-through securities of GNMA, FNMA and FHLMC.

The Bloomberg US TIPS Index consists of Inflation-Protection securities issued by the U.S. Treasury.

The J.P. Morgan Emerging Market Bond Global Index(EMBI)includes U.S. dollar denominated Brady bonds, Eurobonds, traded loans and local market debt instruments issued by sovereign and quasi-sovereign entities.

The J.P. Morgan Domestic High Yield Index is designed to mirror the investable universe of the U.S. dollar domestic high yield corporate debt market.

The J.P. Morgan Corporate Emerging Markets Bond Index Broad Diversified (CEMBI Broad Diversified)is an expansion of the J.P. Morgan Corporate Emerging Markets Bond Index (CEMBI). The CEMBI is a market capitalization weighted index consisting of U.S. dollar denominated emerging market corporate bonds.

The J.P. Morgan Emerging Markets Bond Index Global Diversified (EMBI Global Diversified) tracks total returns for U.S. dollar-denominated debt instruments issued by emerging market sovereign and quasi-sovereign entities: Brady bonds, loans, Eurobonds. The index limits the exposure of some of the larger countries.

The J.P. Morgan GBI EM Global Diversified tracks the performance of local currency debt issued by emerging market governments, whose debt is accessible by most of the international investor base.

The U.S. Treasury Index is a component of the U.S. Government index.

J.P.Morgan
ASSET MANAGEMENT

J.P. Morgan Asset Management – Definitions

Other asset classes:

The **Alerian MLP Index** is a composite of the 50 most prominent energy Master Limited Partnerships (MLPs) that provides investors with an unbiased, comprehensive benchmark for the asset class.

The **Bloomberg Commodity Index** and related sub-indices are composed of futures contracts on physical commodities and represents twenty two separate commodities traded on U.S. exchanges, with the exception of aluminum, nickel, and zinc

The **Cambridge Associates U.S. Global Buyout and Growth Index®** is based on data compiled from 1,768 global (U.S. & ex –U.S.) buyout and growth equity funds, including fully liquidated partnerships, formed between 1986 and 2013.

The **CS/Tremont Hedge Fund Index** is compiled by Credit Suisse Tremont Index, LLC. It is an asset-weighted hedge fund index and includes only funds, as opposed to separate accounts. The Index uses the Credit Suisse/Tremont database, which tracks over 4500 funds, and consists only of funds with a minimum of US$50 million under management, a 12-month track record, and audited financial statements. It is calculated and rebalanced on a monthly basis, and shown net of all performance fees and expenses. It is the exclusive property of Credit Suisse Tremont Index, LLC.

The **HFRI Monthly Indices (HFRI)** are equally weighted performance indexes, utilized by numerous hedge fund managers as a benchmark for their own hedge funds. The HFRI are broken down into 4 main strategies, each with multiple sub strategies. All single-manager HFRI Index constituents are included in the HFRI Fund Weighted Composite, which accounts for over 2200 funds listed on the internal HFR Database.

The **NAREIT EQUITY REIT Index** is designed to provide the most comprehensive assessment of overall industry performance, and includes all tax-qualified real estate investment trusts (REITs) that are listed on the NYSE, the American Stock Exchange or the NASDAQ National Market List.

The **NFI-ODCE**, short for NCREIF Fund Index -Open End Diversified Core Equity, is an index of investment returns reporting on both a historical and current basis the results of 33 open-end commingled funds pursuing a core investment strategy, some of which have performance histories dating back to the 1970s. The NFI-ODCE Index is capitalization-weighted and is reported gross of fees. Measurement is time-weighted.

Definitions:

Investing in **alternative assets** involves higher risks than traditional investments and is suitable only for sophisticated investors. Alternative investments involve greater risks than traditional investments and should not be deemed a complete investment program. They are not tax efficient and an investor should consult with his/her tax advisor prior to investing. Alternative investments have higher fees than traditional investments and they may also be highly leveraged and engage in speculative investment techniques, which can magnify the potential for investment loss or gain. The value of the investment may fall as well as rise and investors may get back less than they invested.

Bonds are subject to interest rate risks. Bond prices generally fall when interest rates rise.

Investments in **commodities** may have greater volatility than investments in traditional securities, particularly if the instruments involve leverage. The value of commodity-linked derivative instruments may be affected by changes in overall market movements, commodity index volatility, changes in interest rates, or factors affecting a particular industry or commodity, such as drought, floods, weather, livestock disease, embargoes, tariffs and international economic, political and regulatory developments. Use of leveraged commodity-linked derivatives creates an opportunity for increased return but, at the same time, creates the possibility for greater loss.

Derivatives may be riskier than other types of investments because they may be more sensitive to changes in economic or market conditions than other types of investments and could result in losses that significantly exceed the original investment. The use of derivatives may not be successful, resulting in investment losses, and the cost of such strategies may reduce investment returns.

Distressed Restructuring Strategies employ an investment process focused on corporate fixed income instruments, primarily on corporate credit instruments of companies trading at significant discounts to their value at issuance or obliged (par value) at maturity as a result of either formal bankruptcy proceeding or financial market perception of near term proceedings.

Investments in **emerging markets** can be more volatile. The normal risks of investing in foreign countries are heightened when investing in emerging markets. In addition, the small size of securities markets and the low trading volume may lead to a lack of liquidity, which leads to increased volatility. Also, emerging markets may not provide adequate legal protection for private or foreign investment or private property.

The price of **equity** securities may rise, or fall because of changes in the broad market or changes in a company's financial condition, sometimes rapidly or unpredictably. These price movements may result from factors affecting individual companies, sectors or industries, or the securities market as a whole, such as changes in economic or political conditions. Equity securities are subject to "stock market risk" meaning that stock prices in general may decline over short or extended periods of time.

Equity market neutral strategies employ sophisticated quantitative techniques of analyzing price data to ascertain information about future price movement and relationships between securities, select securities for purchase and sale. Equity Market Neutral Strategies typically maintain characteristic net equity market exposure no greater than 10% long or short.

Global macro strategies trade a broad range of strategies in which the investment process is predicated on movements in underlying economic variables and the impact these have on equity, fixed income, hard currency and commodity markets.

International investing involves a greater degree of risk and increased volatility. Changes in currency exchange rates and differences in accounting and taxation policies outside the U.S. can raise or lower returns. Some overseas markets may not be as politically and economically stable as the United States and other nations.

There is no guarantee that the use of **long and short positions** will succeed in limiting an investor's exposure to domestic stock market movements, capitalization, sector swings or other risk factors. Using long and short selling strategies may have higher portfolio turnover rates. Short selling involves certain risks, including additional costs associated with covering short positions and a possibility of unlimited loss on certain short sale positions.

Merger arbitrage strategies which employ an investment process primarily focused on opportunities in equity and equity related instruments of companies which are currently engaged in a corporate transaction.

Mid-capitalization investing typically carries more risk than investing in well-established "blue-chip" companies. Historically, mid-cap companies' stock has experienced a greater degree of market volatility than the average stock.

Price to forward earnings is a measure of the price-to-earnings ratio (P/E) using forecasted earnings. **Price to book value** compares a stock's market value to its book value. **Price to cash flow** is a measure of the market's expectations of a firm's future financial health. **Price to dividends** is the ratio of the price of a share on a stock exchange to the dividends per share paid in the previous year, used as a measure of a company's potential as an investment.

Real estate investments may be subject to a higher degree of market risk because of concentration in a specific industry, sector or geographical sector. Real estate investments may be subject to risks including, but not limited to, declines in the value of real estate, risks related to general and economic conditions, changes in the value of the underlying property owned by the trust and defaults by borrower.

Relative Value Strategies maintain positions in which the investment thesis is predicated on realization of a valuation discrepancy in the relationship between multiple securities.

Small-capitalization investing typically carries more risk than investing in well-established "blue-chip" companies since smaller companies generally have a higher risk of failure. Historically, smaller companies' stock has experienced a greater degree of market volatility than the average stock.

J.P.Morgan
ASSET MANAGEMENT

ALASKA RETIREMENT MANAGEMENT BOARD

Internally Managed Fixed Income

March 2023

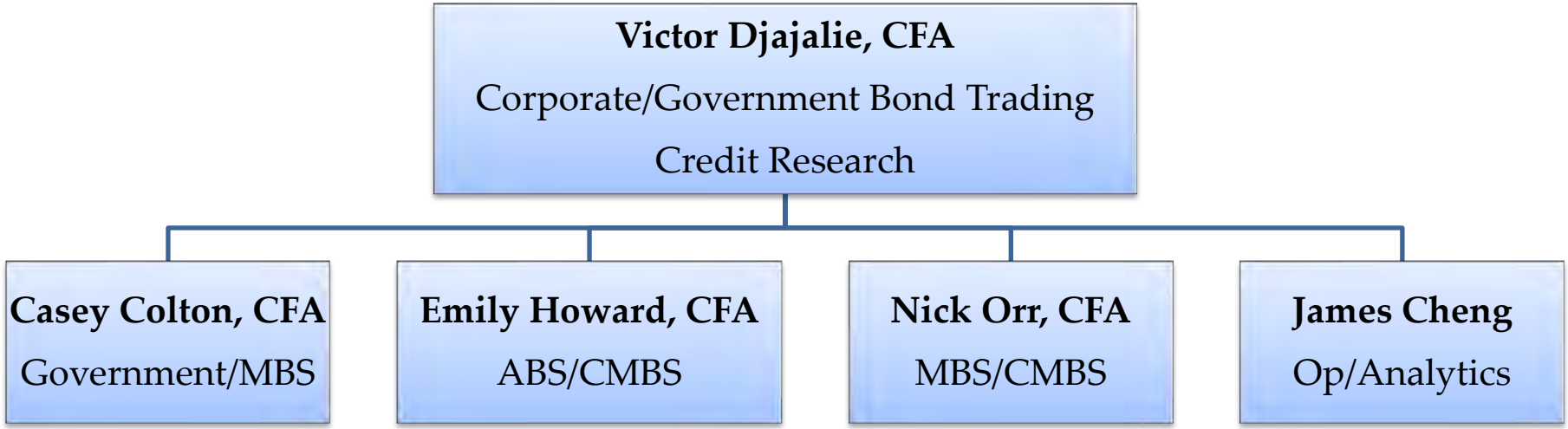
Victor Djajalie, CFA
Director of Internal Fixed Income

Casey Colton, CFA
State Investment Officer

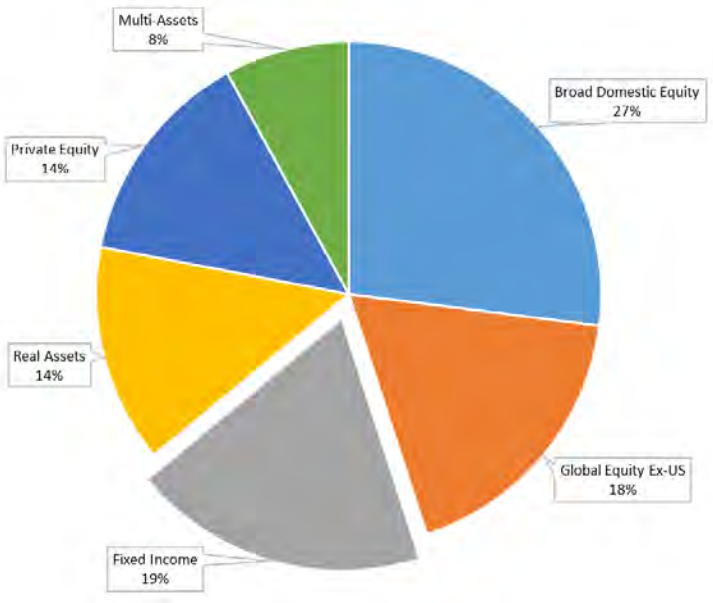
Presentation Agenda

- Portfolio Performance
- Fixed Income Market Outlook
- Internal Fixed Income Process
- Portfolio Positioning
- Action Item Recommendation

Fixed Income Investment Team



ARMB Target Asset Allocation
Fiscal Year 2023



- Staff manage the investable cash of the State and ARMB.
- We manage one domestic fixed income investment pool for the ARMB.
  - Fixed Income Pool.
  - Total: ~$4.05 billion.
- We manage three fixed income investment pools for the State.
  - Short Term Investment Pool ~$5.24billion.
  - Intermediate Term Investment Pool ~$0.99billion.
  - Long Term Investment Pool ~$0.71billion.
  - Total: ~$6.94billion.
- Total assets under management: ~$11billion.

Performance

As of Dec 31, 2022	Last Quarter	1 Year	3 Year	5 Year	10 Year
Short-term Fixed Income (AY70)	0.95%	1.60%	0.83%	1.39%	0.96%
3M T-Bill	0.84%	1.46%	0.72%	1.26%	0.76%
	0.11%	*0.14%*	*0.11%*	*0.13%*	*0.20%*

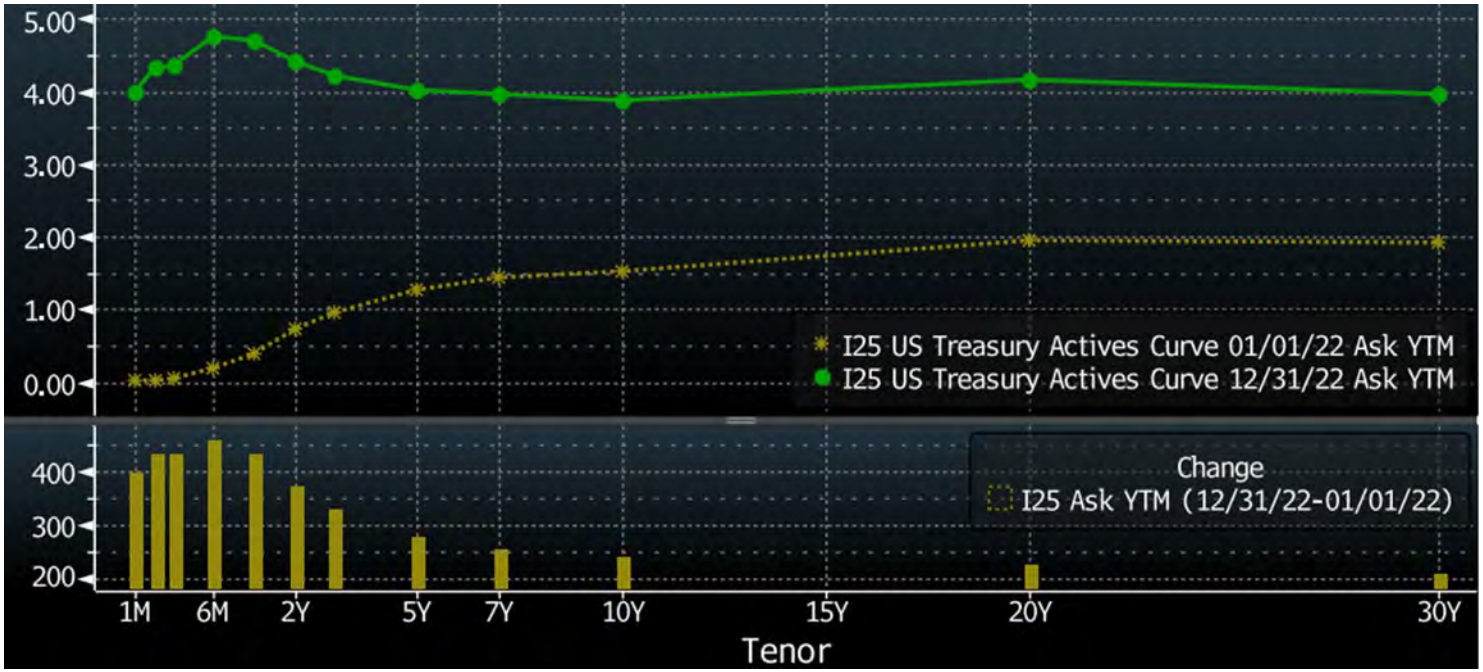
As of Dec 31, 2022	Last Quarter	1 Year	3 Year	Since Inception (Sep 2019)
ARMB Barclays Agg Bond Fund (AY77)	2.07%	-12.34%	-2.09%	-2.03%
Bloomberg Aggregate Index	1.87%	-13.01%	-2.71%	-2.55%
	0.20%	*0.67%*	*0.62%*	*0.52%*

Fixed Income Market Outlook

10 Year Treasury Yield

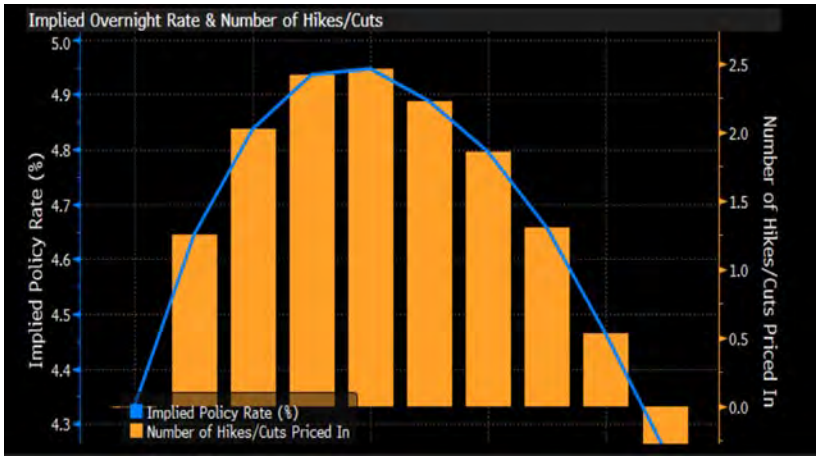
- Inflation concerns dominated the market in 2022 as the Fed aggressively hiked rates to cool down the economy.
- As rates rose, virtually all risky assets suffered. Core fixed income lost 13% in 2022, the worst period in over 40 years.

12 Month Curve Movements



- The Fed hiked fed funds 7x in 2022 for a total of 425bps including four 75bps moves, ending the fed fund at 4.25%-4.50% target. It is by far the most aggressive hiking cycle in more than 40 years.
- Aggressive hikes caused the 2 year and 10 year treasury curve to invert by 55bps!

Inflation and the Fed

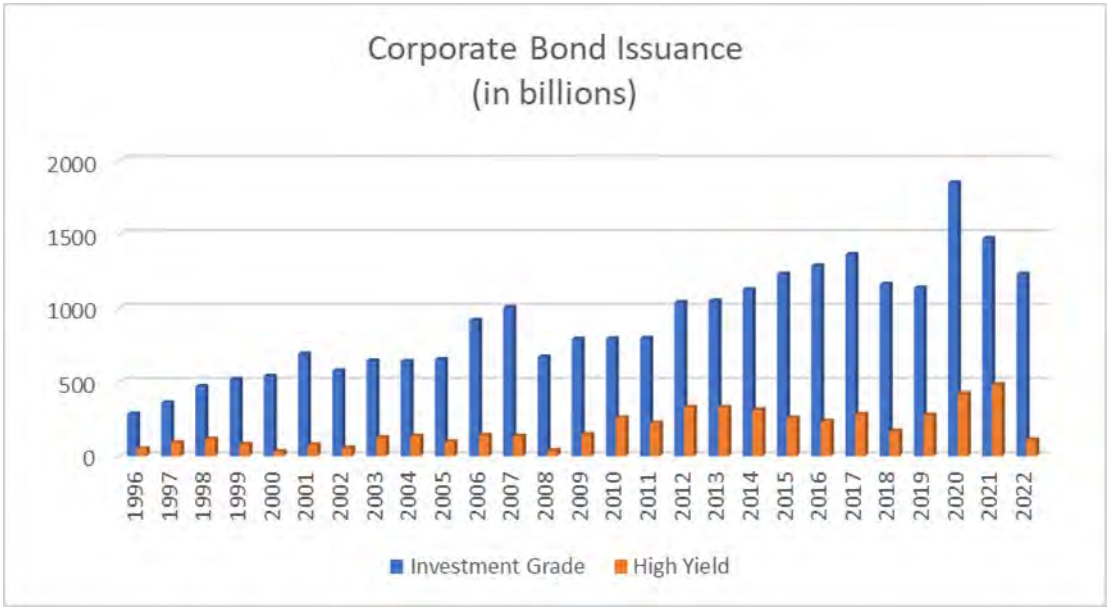


- Inflation may have peaked in 2022 and has started to show signs of cooling off. The labor market, however, remains tight and threatens to keep upward pressure on wages and prices.
- Markets are pricing in less aggressive Fed moves in 2023.

Profitability And Leverage

- Company profitability declined modestly as input costs rose but remained healthy overall.
- Gross leverage has been decent but may weaken if earnings decline going forward.

Corporate Bond Net Issuance



Source: Sifma

- Corporate bond issuance remained strong despite rising rate environment.
- Markets absorbed the new issues despite pockets of market turbulence spurred by unprecedented market moving events such as Russian invasion of Ukraine, UK pension crisis, China zero covid policy, and aggressive Fed hikes.

US Corporate Bond Yield

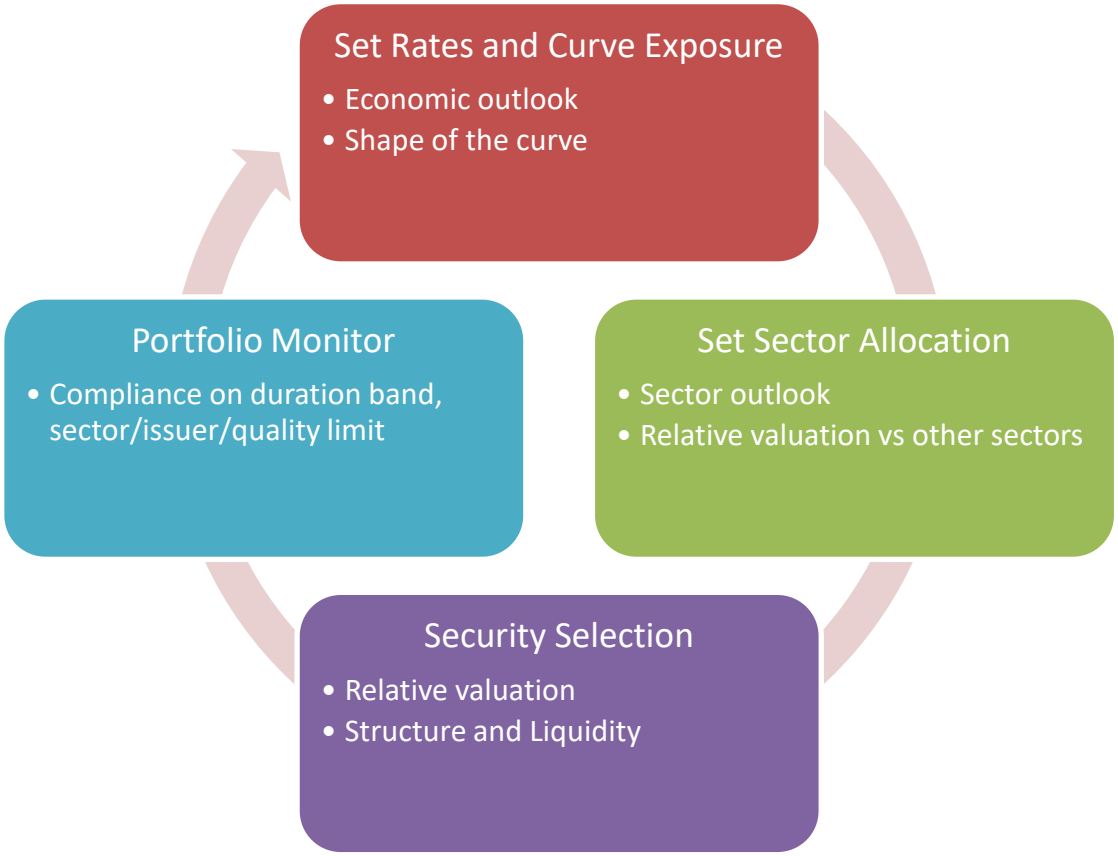
- Corporate bond yields have increased dramatically in 2022, reaching 5.4%.
- This level of yield has not been seen since prior to the global financial crisis of 2008/2009. Higher yields provide meaningful carry and better downside protection during rising rate environments.

Investment Grade Corporate Spreads

- Investment grade corporate bond spreads were volatile in 2022 with multiple periods of significant widening that were followed by strong rally.
- Spreads ended the year about 40bps wider. Pretty benign move given the multiple events that took place during 2022.

Internal Fixed Income Process

Fixed Income Investment Process



Technology Platform

Bloomberg Aggregate Index	ARMB Fixed Income
• Market value: $24tn • 13,000+ securities • Treasuries, agencies, MBS, Corporates, CMBS, ABS • Maturity: 1 to 100 years • 900+ issuers	• Market value: $4.2bn • 800+ securities • Treasuries, agencies, MBS, Corporates, CMBS, ABS • Maturity: 0 (cash) to 38 years • 200+ issuers

- Managing and constructing fixed income portfolios is a complex task as it involves working with a large number of securities with different characteristics.
- Sophisticated analytic tools such as YieldBook and Bloomberg are utilized to map general characteristics of the index and portfolio.
- Active exposures are then created in an attempt to generate excess return relative to the index.

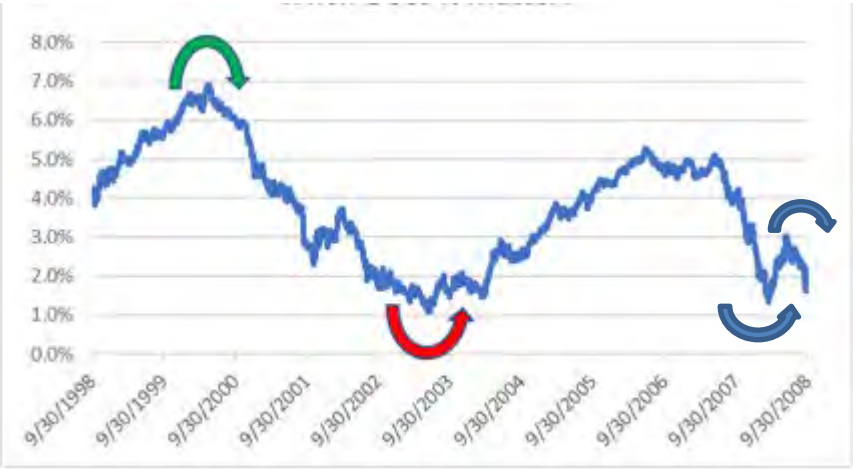
Fixed Income Investment Process

- Position portfolios (set exposures) to attempt to outperform modestly over a broad range of scenarios.
  - Securities which are (relatively) homogenous are easier to compare for (relative) fair value. For instance, the math for comparing on-the-run U.S. Treasury notes and bonds to their off-the-run cousins is fairly simple.
- Manage trading costs and give liquidity sparingly.
  - These funds will have significant flows throughout the year. Liquidity will be needed, and trading costs will count against total return. Be cognizant of drawdown risk.
- Find total return in non-Treasury holdings:
  - Position portfolio in higher conviction securities.
  - Anticipate convictions may change.
  - Diversify positions.

Monitor Exposure Over Cycles

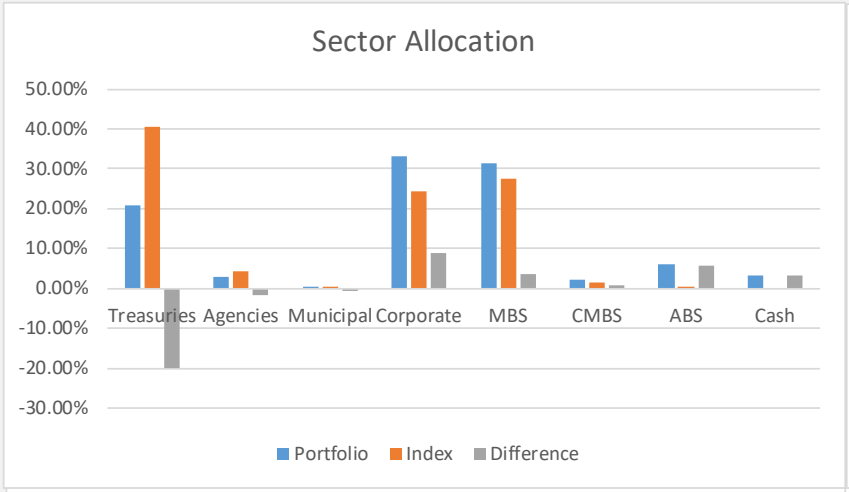
Risks to Investment Approach

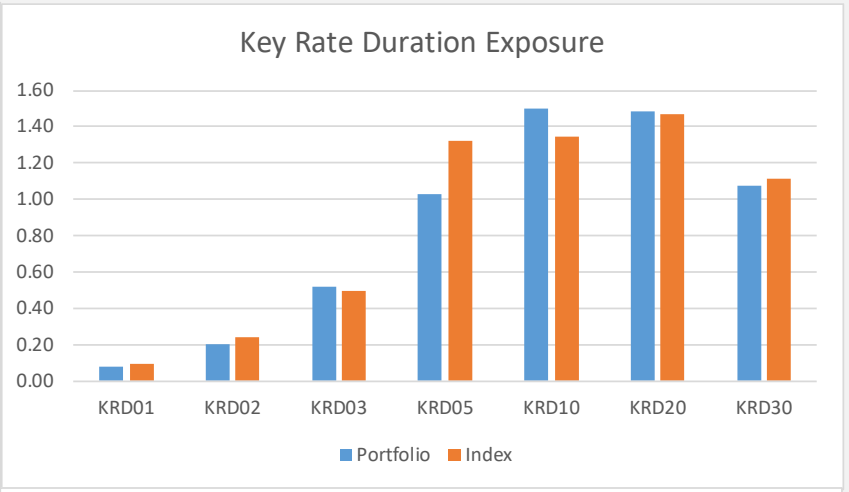
- The impact of yield curve changes, the implied volatility of interest rates, and other factors may be different than what was forecast.
- By the time a trend is recognized its direction may change.

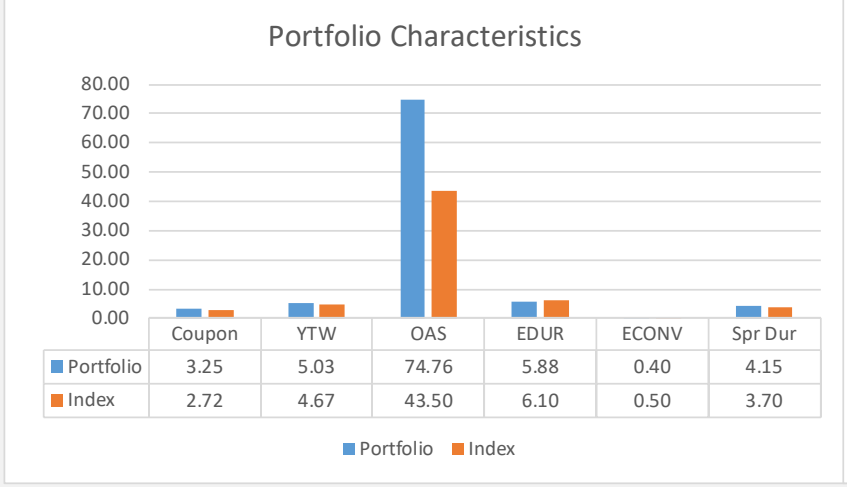


- Change in risk tolerance in the market are not explicitly incorporated, so this could detract from performance.
- Models may become dated unless maintained.
- Idiosyncratic, bond-specific, credit and structural risk are also present.
- Hire, train, and plan for turnover.

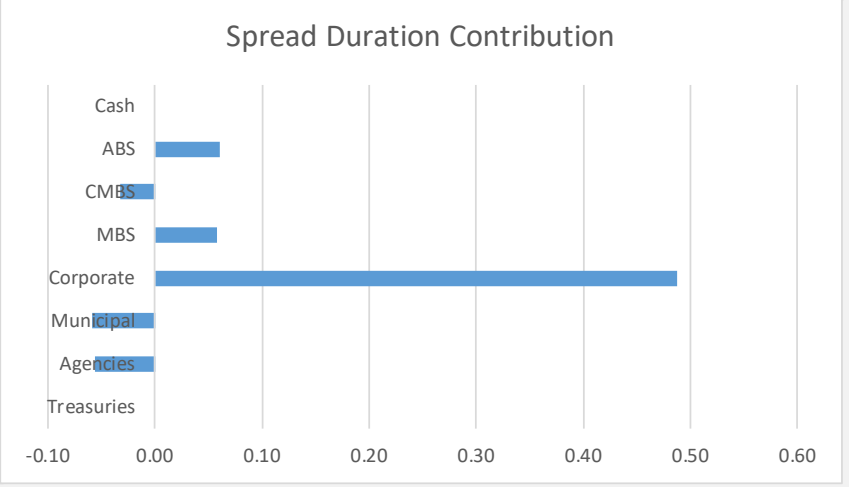
ARMB Fixed Income Dashboard
As of 12/30/2022



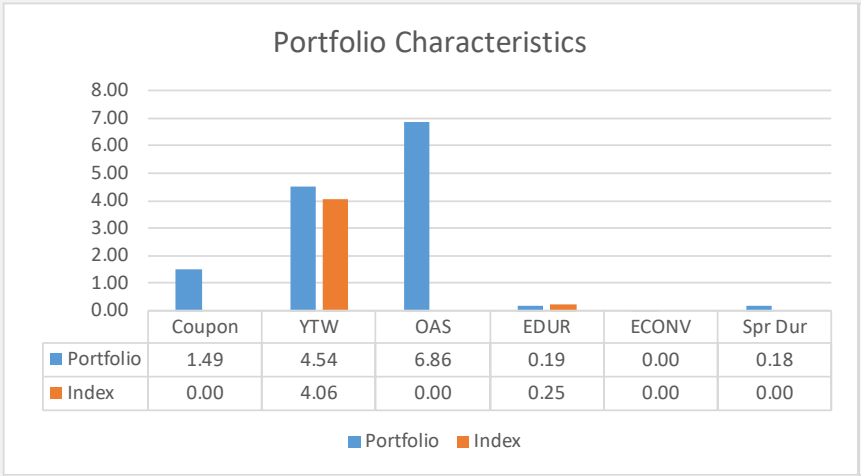




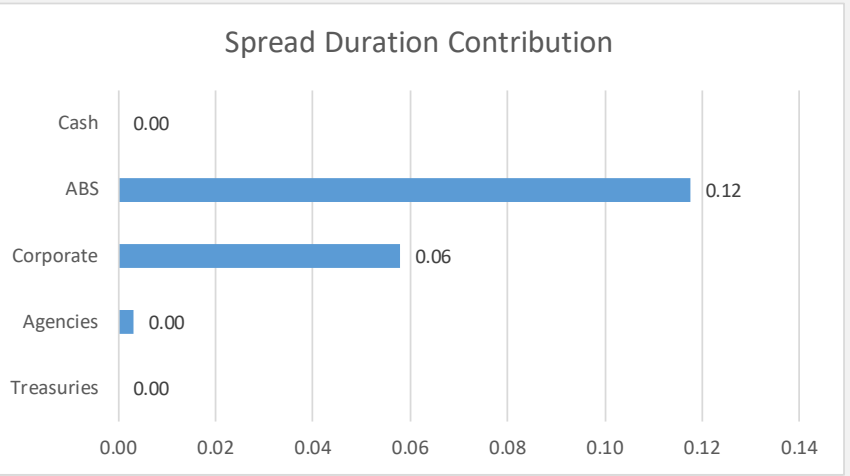
	Coupon	YTW	OAS	EDUR	ECONV	Spr Dur
Portfolio	3.25	5.03	74.76	5.88	0.40	4.15
Index	2.72	4.67	43.50	6.10	0.50	3.70

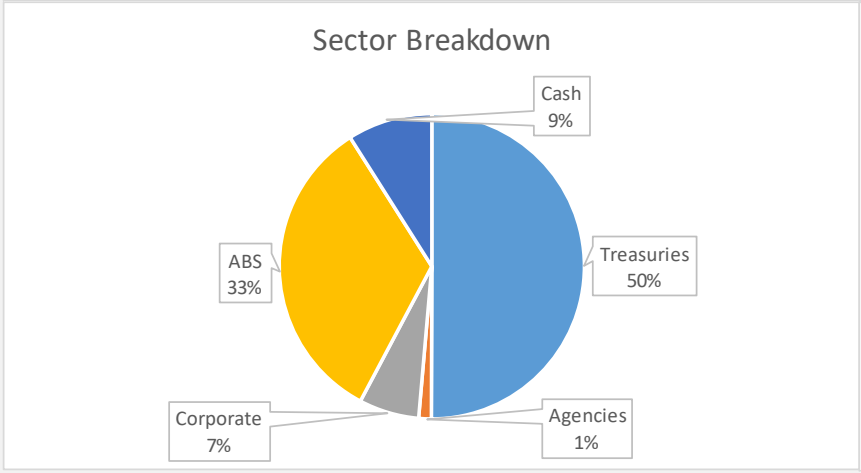


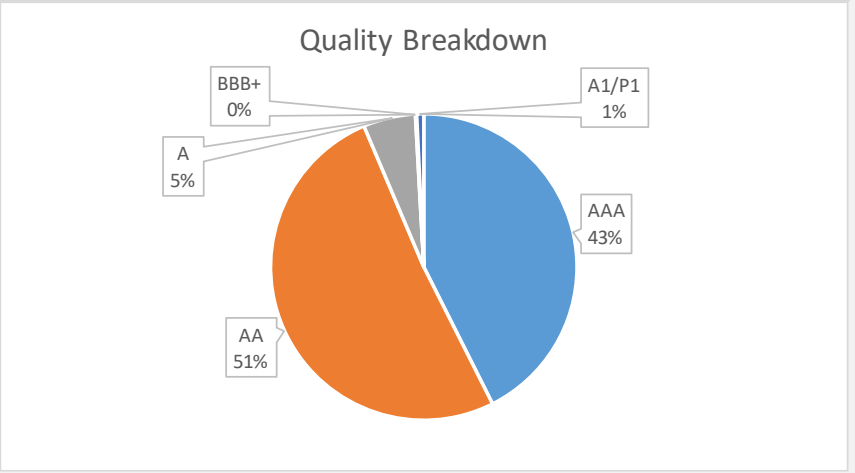
Short-term Fixed Income Dashboard as of 12/30/2022



	Coupon	YTW	OAS	EDUR	ECONV	Spr Dur
Portfolio	1.49	4.54	6.86	0.19	0.00	0.18
Index	0.00	4.06	0.00	0.25	0.00	0.00







Action Item Recommendation

- We recommend updating the guidelines to specifically include DBRS and KBRA as permissible rating agencies.
- Since the financial crisis, the ABS and non-agency CMBS portions of the Bloomberg Agg have seen considerable change in rating agency participants.
- Dominion Bond Rating Service (DBRS) and Kroll Bond Rating Agency (KBRA) now have enough market share in portions of the securitized part of the Bloomberg Agg that our current guidelines – which mention only Fitch/S&P/Moodys – at times no longer permit investment.

Chart 15. Rating Agency Market Share for Total Non-Agency U.S. CMBS Issued in 2019, 2020, and First Half of 2021

1H-2021 Rank	NRSRO	1H-2021 Issuance ($Mil.)	No. of deals	Market Share % ($)/(#)	2020 Issuance ($Mil.)	No. of deals	Market Share % ($)/(#)	2019 Issuance ($Mil.)	No. of deals	Market Share % ($)/(#)
1	Fitch	31,114	27	68.1/45.8	38,037	46	64.2/52.3	56,048	66	57.3/46.2
2	KBRA	23,053	20	50.4/33.9	25,825	32	43.6/36.4	45,924	56	47.0/39.2
3	DBRS	18,350	25	40.1/42.4	21,893	34	36.9/38.6	42,425	56	43.4/39.2
4	MIS	16,409	21	35.9/35.6	25,076	42	42.3/47.7	42,184	55	43.1/38.5
5	S&P	15,927	23	34.8/39.0	23,275	27	39.3/30.7	49,634	70	50.8/49.0
	Total Rated Market	**45,722**	**59**		**59,254**	**88**		**97,767**	**143**	

Chart 15 reflects market share percentages based on dollar amounts of issuance and number of deals rated. The sum of the market share percentages exceeds 100% because more than one NRSRO may rate a particular transaction. Likewise, the aggregate issuance volume and number of deals represented above exceed the Total Rated Market values for each time period.

Chart 19. Rating Agency Market Shares for U.S. ABS Issued in 2019, 2020, and First Half of 2021

1H-2021 Rank	NRSRO	1H-2021 Issuance ($Mil.)	No. of deals	Market Share % ($)/(#)	2020 Issuance ($Mil.)	No. of deals	Market Share % ($)/(#)	2019 Issuance ($Mil.)	No. of deals	Market Share % ($)/(#)
1	S&P	92,741	148	49.5/45.7	159,396	239	58.3/47.9	193,378	317	57.6/53.9
2	MIS	88,584	97	47.3/29.9	114,383	157	41.8/31.5	143,742	203	42.8/34.5
3	Fitch	63,954	85	34.1/26.2	109,286	151	40.0/30.3	151,090	192	45.0/32.7
4	DBRS	61,933	111	33.1/34.3	76,121	168	27.8/33.7	107,086	201	31.9/34.2
5	KBRA	40,538	108	21.6/33.3	50,228	137	18.4/27.5	64,909	177	19.3/30.1
	Total Rated Market	**187,300**	**324**		**273,360**	**499**		**335,931**	**588**	

Chart 19 reflects market share percentages based on dollar amounts of issuance and number of deals rated. The sum of the market share percentages exceeds 100% because more than one NRSRO may rate a particular transaction. Likewise, the aggregate issuance volume and number of deals represented above exceed the Total Rated Market values for each time period.

Source: https://www.sec.gov/files/2022-ocr-staff-report.pdf P34/37

Summary

- Portfolio Performance
- Fixed Income Market Outlook
- Internal Fixed Income Process
- Portfolio Positioning
- Action Item Recommendation

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT: Domestic Fixed Income Guidelines

ACTION: X

DATE: March 16-17, 2023

INFORMATION: _____

BACKGROUND

Staff manages a domestic fixed income mandate for the Alaska Retirement Management Board (ARMB). As of December 2022, the market value of this mandate was approximately $4.05 billion.

As part of the investment process, staff relies on credit ratings produced by independent rating agencies in addition to the internal evaluation of the securities. Historically, Standard and Poor's, Moody's, and Fitch were the primary rating agencies that provide rating services. More recently these three are seeing professional competition from Dominion Bond Rating Service (DBRS) and Kroll Bond Rating Agency (KBRA) in various segments of the structured product space within the Bloomberg Aggregate.

Chart 15. Rating Agency Market Share for Total Non-Agency U.S. CMBS Issued in 2019, 2020, and First Half of 2021

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STATUS

As Dominion Bond Rating Service (DBRS) and Kroll Bond Rating Agency (KBRA) gained significant market share, staff occasionally are prohibited from investing in securities when the bonds are only comparably rated by DBRS and KBRA because those rating agencies are not recognized in the ARMB Fixed Income investment guidelines. As such, staff recommends that the ARMB Fixed Income

investment guidelines are revised to include those two rating agencies in addition to Standard and Poor's, Moody's, and Fitch rating agencies.

RECOMMENDATION

The ARMB approve Resolution 2023-01 which adopts the revised Domestic Fixed Income Investment Guidelines.

State of Alaska
ALASKA RETIREMENT MANAGEMENT BOARD
Relating to Domestic Fixed Income Guidelines

Resolution 2023-01

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

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

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

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

WHEREAS, the Board has established an asset allocation for the funds that considers earnings and liabilities on a current as well as a future basis; and

WHEREAS, the Board has authorized investment in fixed income securities; and

WHEREAS, the Board will establish and from time to time as necessary modify guidelines for fixed income securities.

NOW THEREFORE BE IT RESOLVED THAT THE ALASKA RETIREMENT MANAGEMENT BOARD adopts the attached Domestic Fixed Income Guidelines, attached hereto and made a part hereof, regarding investment in domestic fixed income securities.

This resolution repeals and replaces Resolution 2020-06.

DATED at Juneau, Alaska this ____ day of March, 2023.

_____
Chair

ATTEST:

_____
Secretary

DOMESTIC FIXED INCOME GUIDELINES

A. Purpose. The emphasis of investments in fixed income securities shall be diversification, subject to defined constraints, to minimize risk, to generate income, and to provide liquidity as required.

B. Investment Management Service to be Performed. Domestic fixed income Contractors shall invest and reinvest the cash and securities allocated to them and deposited in their account, without distinction between principal and income, in a portfolio consisting of fixed income securities. These securities will be selected and retained by Contractors solely on the basis of their independent judgment relating to economic conditions, financial conditions, market timing, or market analysis, and will not be subject to direction from the ARMB.

C. Performance Standards. Contractors are expected to have returns, net of fees, in excess of the appropriate benchmark over rolling 6-year periods with an ex-ante tracking error, defined as the annualized standard deviation of returns relative to the index, of less than two percent. The benchmark is the Bloomberg Barclays Aggregate Index.

D. Investment Structure. Permissible U.S. dollar denominated debt investments shall be limited to the following:

1. Money market investments comprising:

    a. Repurchase agreements collateralized only by U.S. Treasury obligations, including bills, notes, and bonds, and only when the collateral carries a market value equal to or greater than 102% of the amount of the repurchase agreements, and only when the custodial bank appointed by retirement funds will take custody of the collateral;

    b. Commercial paper rated at least Prime-1 by Moody's Investor Services, Inc. and A-1 by Standard and Poor's Corporation;

    c. Negotiable certificates of deposit, provided that an issuing bank must have total assets in excess of $5 billion.

2. United States Treasury obligations including bills, notes, bonds, other debt obligations issued by the United States Treasury, and backed by the full faith and credit of the U.S. Government.

3. Other full faith and credit obligations of the U.S. Government.

4. Securities issued or guaranteed by agencies and instrumentalities of the U.S. Government, but not explicitly backed by the full faith and credit of the U.S. Government.

5. Securities issued or guaranteed by municipalities in the United States.

6. Obligations of foreign governments, sovereign states, supranational entities, and their instrumentalities denominated in U.S. dollars.

7. Investment grade corporate debt securities comprising:

    a. Corporate debt issued in the U.S. capital markets by U.S. companies;

    b. Euro-dollar debt (that is, U.S. dollar-denominated securities issued outside the U.S. capital markets by U.S. companies or by foreign issuers);

    c. Yankee debt (that is, U.S. dollar- denominated obligations and issued in the U.S. capital markets by foreign issuers).

8. Asset-backed Securities (ABS).

9. Agency and non-agency mortgage-backed securities backed by loans secured by residential, multifamily and commercial properties including, but not limited to pass-throughs, collateralized mortgage loans (CMO's), project loans, construction loans and adjustable rate mortgages.

10. High yield securities including the following securities and constraints:

    a. Convertible bonds;

    b. Preferred stock;

    c. Warrants and common stock only if issued in conjunction with or related to bonds purchased by the manager;

    d. Common stock received from the conversion of a convertible security, the exercise of a warrant or the restructuring of an issuer's debt should be sold within 90 days of receipt or within 90 days of expiration of a restructuring period. If more time is needed, the Chief Investment Officer must affirm in writing that it is in the Fund's best interest to allow more time.

11. Total return swaps referenced to components or sub-components of fixed income indices. To mitigate interest rate risk, the proceeds may not be invested in securities with a maturity beyond 90 days, unless invested in the Department of Revenue internally-managed Short-Term Fixed Income Pool.

12. The Alaska Department of Revenue's internally managed short-term or substantially similar portfolio.

E. Portfolio Constraints. The Contractor of the fixed-income portfolio shall apply appropriate diversification standards subject, however, to the following limitations based on the current market value of assets:

1. The portfolio's effective duration may not exceed a band of +/- 20% around the modified adjusted duration (or effective duration) of the Bloomberg Barclays Aggregate Index, unless the investment agreement with an external Contractor specifically allows for a different band.

2. Investments in fixed-income securities shall be placed solely in U.S. dollar denominated debt instruments.

3. The Contractor may not invest more than 40% of the portfolio's assets in investment grade corporate debt.

4. Up to 5% of the portfolio's assets at the time of purchase may be comprised of high yield securities.

   Other than for high yield securities, or unrated United States Treasury obligations, securities issued or guaranteed by agencies and instrumentalities of the U.S Government, agency commercial mortgage-backed securities, or agency mortgage-backed securities, securities must be rated investment grade. The rating is defined as the median rating of the following three rating agencies: Standard & Poor's Corporation, Moody's, and Fitch. Securities may contain two of these ratings. In such instances, the rating is defined as the lower of the two ratings.

   Asset-backed, non-agency mortgage-backed securities, and commercial mortgage-backed securities must be rated investment grade. The rating is defined as the median rating of the following five rating agencies: Standard & Poor's Corporation, Moody's, Dominion Bond Rating Service, Kroll Bond Rating Agency, and Fitch. Securities may contain two of these ratings. In such instances, the rating is defined as the lower of the two ratings. Asset-backed, non-agency mortgage-backed securities, and commercial mortgage-backed securities may be purchased if only rated by one of these agencies if they are rated AAA at the time of purchase.

5. The Contractor may not invest more than the benchmark weight plus 5% of the portfolio's assets in debt rated below A-, or equivalent.

6. The Contractor may not invest more than 25% of the portfolio's assets in any one corporate sector as defined by the Bloomberg Barclays Aggregate Index.

7. The Contractor may not purchase more than 10% of the currently outstanding par value of any corporate bond issue.

8. The Contractor may not invest more than 5% of the portfolio's assets in corporate bonds of any one company or affiliated group.

9. There shall be no investment in private placements, except Rule 144A securities.

10. The Contractor shall not sell securities short.

11. The Contractor shall not purchase securities on margin.

12. The Contractor shall not utilize options or futures.

13. Internally Managed Assets: the Contractor may only execute trades with dealers that have a minimum of $200,000,000 in capital. This requirement does not apply to or restrict trades with direct issuers of commercial paper and mortgage-backed securities otherwise eligible for investment under these guidelines. The dealers must be able to execute orders promptly at the most favorable prices reasonably attainable.

14. Externally Managed Assets: Internal cross trading is permitted but only in accordance with requirements under: (1) 29 U.S.C. §1108(b)(19); (2) 29 C.F.R.§2550.408b-19; and (3) 26 U.S.C. §4975(d)(22).

F. Required Remedies. Recognizing that ratings and relative asset worth may change, the Contractor shall liquidate invested securities with care and prudence when the credit rating of a security falls below the minimum standards set in these guidelines or when the relative market value of that investment type exceeds the levels of holdings permitted in these guidelines. The Contractor is required to notify the chief investment officer to discuss the situation and the proposed liquidation strategy if it is not prudent simply to liquidate immediately.

State of Alaska
ALASKA RETIREMENT MANAGEMENT BOARD
Relating to Domestic Fixed Income Guidelines

Resolution ~~2020~~2023-0~~106~~

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

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

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

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

WHEREAS, the Board has established an asset allocation for the funds that considers earnings and liabilities on a current as well as a future basis; and

WHEREAS, the Board has authorized investment in fixed income securities; and

WHEREAS, the Board will establish and from time to time as necessary modify guidelines for fixed income securities.

NOW THEREFORE BE IT RESOLVED THAT THE ALASKA RETIREMENT MANAGEMENT BOARD adopts the attached Domestic Fixed Income Guidelines, attached hereto and made a part hereof, regarding investment in domestic fixed income securities.

This resolution repeals and replaces Resolution ~~2019~~2020-06.

DATED at Juneau, Alaska this ____ day of ~~June~~March, ~~2020~~2023.

_____
Chair

ATTEST:

_____
Secretary

DOMESTIC FIXED INCOME GUIDELINES

A. **Purpose.** The emphasis of investments in fixed income securities shall be diversification, subject to defined constraints, to minimize risk, to generate income, and to provide liquidity as required.

B. **Investment Management Service to be Performed.** Domestic fixed income Contractors shall invest and reinvest the cash and securities allocated to them and deposited in their account, without distinction between principal and income, in a portfolio consisting of fixed income securities. These securities will be selected and retained by Contractors solely on the basis of their independent judgment relating to economic conditions, financial conditions, market timing, or market analysis, and will not be subject to direction from the ARMB.

C. **Performance Standards.** Contractors are expected to have returns, net of fees, in excess of the appropriate benchmark over rolling 6-year periods with an ex-ante tracking error, defined as the annualized standard deviation of returns relative to the index, of less than two percent. The benchmark is the Bloomberg Barclays Aggregate Index.

D. **Investment Structure.** Permissible U.S. dollar denominated debt investments shall be limited to the following:

1. Money market investments comprising:

   a. Repurchase agreements collateralized only by U.S. Treasury obligations, including bills, notes, and bonds, and only when the collateral carries a market value equal to or greater than 102% of the amount of the repurchase agreements, and only when the custodial bank appointed by retirement funds will take custody of the collateral;

   b. Commercial paper rated at least Prime-1 by Moody's Investor Services, Inc. and A-1 by Standard and Poor's Corporation;

   c. Negotiable certificates of deposit, provided that an issuing bank must have total assets in excess of $5 billion.

2. United States Treasury obligations including bills, notes, bonds, other debt obligations issued by the United States Treasury, and backed by the full faith and credit of the U.S. Government.

3. Other full faith and credit obligations of the U.S. Government.

4. Securities issued or guaranteed by agencies and instrumentalities of the U.S. Government, but not explicitly backed by the full faith and credit of the U.S. Government.

5. Securities issued or guaranteed by municipalities in the United States.

6. Obligations of foreign governments, sovereign states, supranational entities, and their instrumentalities denominated in U.S. dollars.

7. Investment grade corporate debt securities comprising:

   a. Corporate debt issued in the U.S. capital markets by U.S. companies;

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   c. Warrants and common stock only if issued in conjunction with or related to bonds purchased by the manager;

   d. Common stock received from the conversion of a convertible security, the exercise of a warrant or the restructuring of an issuer's debt should be sold within 90 days of receipt or within 90 days of expiration of a restructuring period. If more time is needed, the Chief Investment Officer must affirm in writing that it is in the Fund's best interest to allow more time.

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F. Required Remedies. Recognizing that ratings and relative asset worth may change. the Contractor shall liquidate invested securities with care and prudence when the credit rating of a security falls below the minimum standards set in these guidelines or when the relative market value of that investment type exceeds the levels of holdings permitted in these guidelines. The Contractor is required to notify the chief investment officer to discuss the situation and the proposed liquidation strategy if it is not prudent simply to liquidate immediately.

Tactical Bond

March 17, 2023

Presentation to:
State of Alaska Retirement Systems

Jeffrey Moore, CFA
Portfolio Manager

Michael Plage, CFA
Portfolio Manager

Beau Coash
Institutional Portfolio Manager

Kristin Shofner
Senior Vice President,
Business Development

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Table of Contents

1. Tactical Bond
2. Market Environment
3. Appendix
   A. Biographies
   B. Important Information

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

Tactical Bond

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State of Alaska Performance Review

Performance as of January 31, 2023

	CUMULATIVE	ANNUALIZED				
	3-Month	1-Year	3-Year	5-Year	Since Inception (10/7/14)	TNA ($M)
State of Alaska Retirement Systems Tactical Bond	**7.03**	**(5.92)**	**0.47**	**3.12**	**3.72**	**$944.1**
BBg US Agg Bond	6.39	(8.36)	(2.35)	0.86	1.30	
Relative Return	*0.64*	*2.44*	*2.82*	*2.26*	*2.42*	

Client data shown.

Past performance is no guarantee of future results.

All figures shown are in USD.

Any gross performance shown is gross of any fees and expenses, including advisory fees, which, when deducted, will reduce returns. If net performance is shown, it is less the client advisory fee charged employing this strategy; other fees and expenses will reduce returns. Past performance is no guarantee of future results.

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State of Alaska Performance Review

Performance attribution summary as of January 31, 2023

	1-Month	Calendar Year 2022
State of Alaska Tactical Bond (Gross)	**3.73%**	**(10.58%)**
Bloomberg U.S. Aggregate Index	3.08%	(13.01%)
Active Return (Gross)	*0.65%*	*2.43%*

CONTRIBUTION TO TACTICAL BOND TOTAL RETURN (Basis Points)		
Sector	**1-Month**	**1-Year**
Treasuries	109	(428)
TIPS	-	-
Government Related	-	(2)
Inv. Grade Corp	**42**	**(140)**
Financials	*16*	*(39)*
Industrials	*25*	*(97)*
Utilities	*1*	*(4)*
Securitized	**23**	**(10)**
MBS/RMBS	-	-
CMBS	*2*	*(2)*
ABS	*21*	*(8)*
High Yield	40	(169)
Emerging Market Debt	42	(55)
Leveraged Loans	43	(1)
Global Credit ex US	73	(233)
Cash/Other	1	(20)
Total Contribution to Return	**373**	**(1,058)**

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

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State of Alaska Tactical Bond Portfolio Positioning

As of January 31, 2023

Characteristics	FIAM Tactical Bond	Bloomberg U.S. Aggregate	Difference
YTW%	6.45%	4.28%	2.17%
Duration (yrs)	6.27	6.22	0.05
Sector Allocation (%)			
U.S. Treasuries	25.67	40.61	(14.93)
TIPS	0.00	0.00	0.00
Gov't Related	0.86	5.03	(4.16)
Corporate	19.84	24.57	(4.74)
Investment Grade	11.79	24.57	(12.79)
Financials	5.58	8.45	(2.87)
Industrials	6.02	14.11	(8.09)
Utilities	0.19	2.01	(1.82)
High Yield	8.05	0.00	8.05
Securitized	11.24	29.38	(18.14)
Agency MBS	0.00	27.12	(27.12)
Non-Agency MBS	0.00	0.00	0.00
CMBS	0.94	1.82	(0.88)
Consumer ABS	0.67	0.44	0.23
CLO's	9.63	0.00	9.63
Emerging Market Debt	6.45	0.00	6.45
Leveraged Loans	14.24	0.00	14.24
Global Credit	17.00	0.00	17.00
Cash/Other	4.68	0.41	4.27
Total	**100.00%**	**100.00%**	

Investment Grade Corporate Allocation (%)	FIAM Tactical Bond	Bloomberg U.S. Aggregate	Difference
Finance Companies	0.58	0.30	0.28
Energy	1.81	1.67	0.14
Natural Gas	0.00	0.13	(0.13)
Other	0.01	0.18	(0.17)
REITS	0.40	0.67	(0.27)
Capital Goods	0.96	1.29	(0.33)
Brokerage	0.00	0.33	(0.33)
Transportation	0.18	0.56	(0.38)
Insurance	0.48	1.13	(0.65)
Basic Industry	0.00	0.66	(0.66)
Consumer Cyclical	0.77	1.67	(0.90)
Communications	0.91	2.13	(1.22)
Electric	0.19	1.83	(1.64)
Banking	4.12	6.01	(1.89)
Consumer Non-Cyclical	1.30	3.61	(2.31)
Technology	0.08	2.40	(2.33)
Total	**11.79%**	**24.57%**	

Ratings Allocation (%)			
AAA	32.83	73.84	(41.01)
AA	9.97	4.62	5.36
A	4.20	10.76	(6.56)
BBB	25.57	10.79	14.78
BB	16.66	0.00	16.66
B	8.10	0.00	8.10
CCC	1.03	0.00	1.03
NR/Other	1.64	0.00	1.64
Total	**100.00%**	**100.00%**	

Client account information is shown.

Cash/Other may include cash and derivatives.

Ratings are based on highest of Moody's, S&P, and Fitch ratings.

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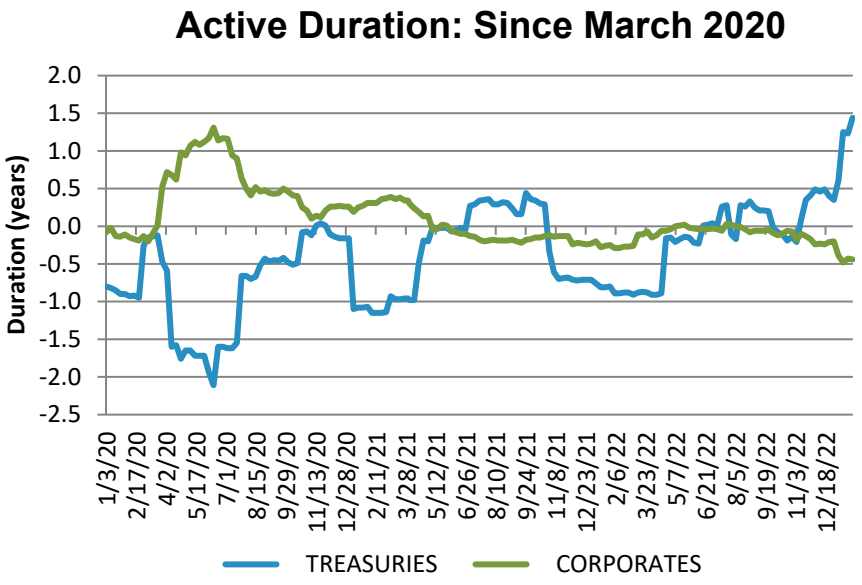
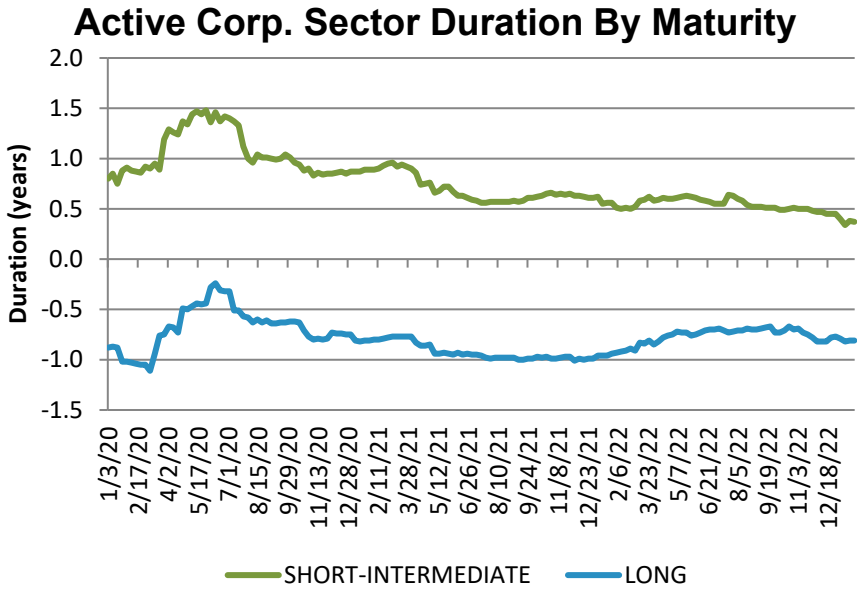
State of Alaska Asset Allocation Tactical Bond

As of January 31, 2023





Client account information is shown.

Source: Fidelity Investments, Bloomberg.

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202302-31397

Market Environment

Methodology Scenario Analysis

Model Objective: to provide an indication of how the portfolio's performance (as currently positioned) would be impacted over the next year, in the event of a substantial shock to an external market factor (ie, S&P 500 declines 20%; Treasury 10 Year rate increases 100 basis points, etc). The model is a stress test on the existing exposures of the portfolio given current market conditions and the stated hypothetical outcomes. The model estimates an instantaneous shock price return and projects total returns over the subsequent year assuming the current yield of the portfolio.

Investment Universe: Current portfolio and benchmark holdings are used. Benchmark is the primary benchmark for the strategy, Bloomberg US Aggregate Index.

Was leverage used? No

Why were the specific events/time periods chosen?

- The historical time periods represent historical market stress events which are used to get risk factor changes to provide an indication of how the current portfolio may perform if the historical event were to happen with todays exposures.
- The hypothetical scenarios use the most recent factor simulations which are conditioned on the level of volatility present in the market.

Trading/Taxes/Coupon income assumptions:

- Trading: The simulations assume a 'static' portfolio, with no hypothetical trades taking place.
- Tax treatment of gains: no trades occur, so all gains treated as unrealized.
- Coupon income: The strategy is assumed to have an income return equivalent to the current annualized yield of the portfolio. This yield is added to the instantaneous price shock of the portfolio to approximate total return.

Other information

- The model of hypothetical scenarios is an instantaneous shock based on the risk factor simulations generated from the risk model and is conditioned on the level of volatility seen in the market as represented by the VIX index. The model methodology will remain the same in future simulations, but more data will be available for the risk factors (longer time series), and the level of volatility in the market (VIX index) will change.
- The risk factors are based on real time series of data stretching back to January 2000. They are modeled by marginal skew-t distributions and related to each other through a skewed-t copular distribution. We simulate 20,000 draws from this copular, and then condition on the VIX to get 5000 conditioned simulations to the market. It is from this set that we then condition on hypothetically to get the risk factor changes in the hypothetical scenarios. The risk factor changes in the historical scenarios are historical factor changes from the specified periods at monthly cadence.

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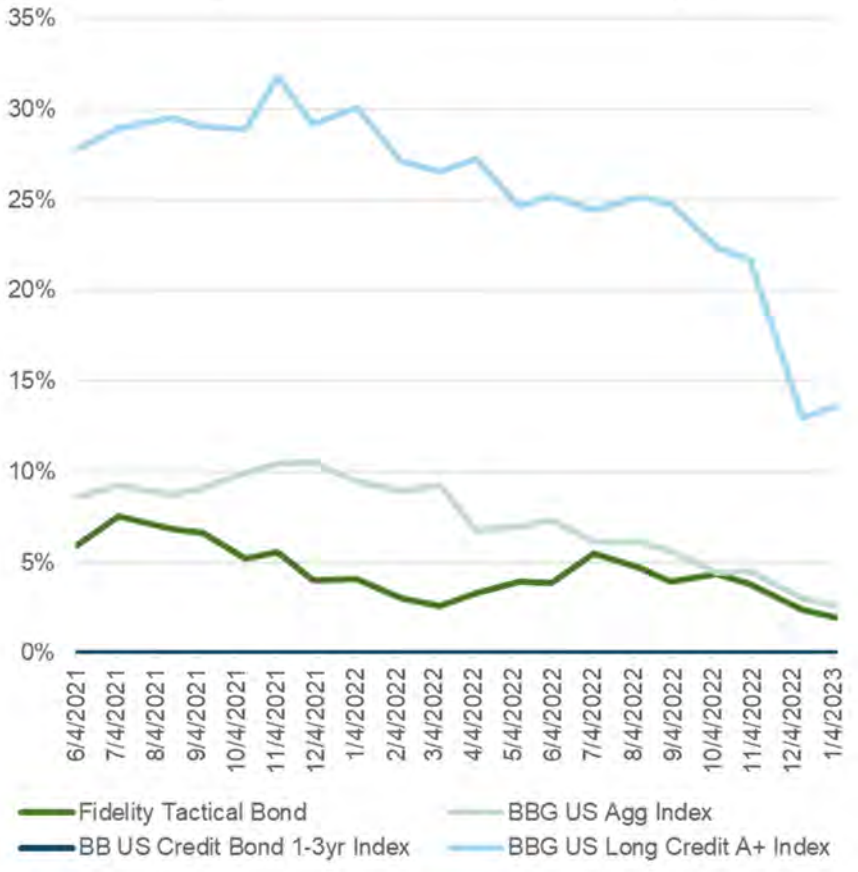
Simulated Probability of Annualized Quarterly Returns

Probability of >10% Annualized Projection

Probability of <-10% Annualized Projection



The risk model simulations are consistent with the implied volatility regime, on the dates shown and the portfolio/ and benchmark holdings along with and a dependency structure across the risk factors which has been estimated from historical relationships and conditioned on the level of volatility present in the market at that time. The impact on the portfolio and benchmark uses the sample space of 5000 simulated factor changes and coincident exposures to project contributions to price return for each factor.

Hypothetical data projections has inherent limitations due to the prospective application of a model designed using predicted and historical data trends and may not reflect the effect that any future material market or economic factors could have on performance. Projected returns are not reflective of actual results and, given that market conditions may vary, an investor should not expect to achieve such results. Projected returns are shown gross of fees and expenses, including advisory fees, which would reduce returns.

Thus Hypothetical Performance is speculative and of extremely limited use to any investor and should not be relied upon in any way. Hypothetical performance of the model is no guarantee of future results.

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202302-31397

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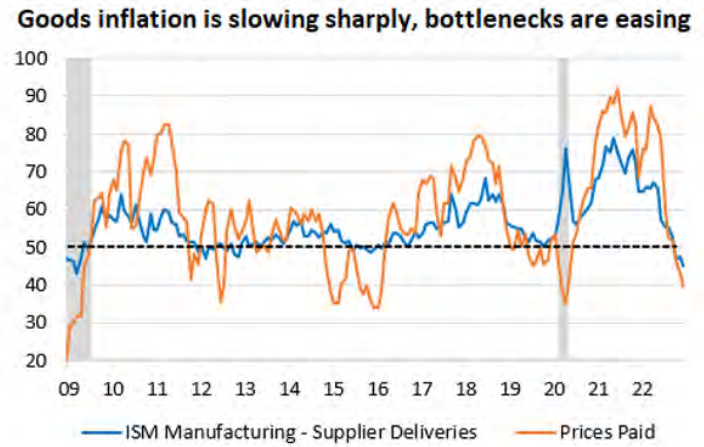
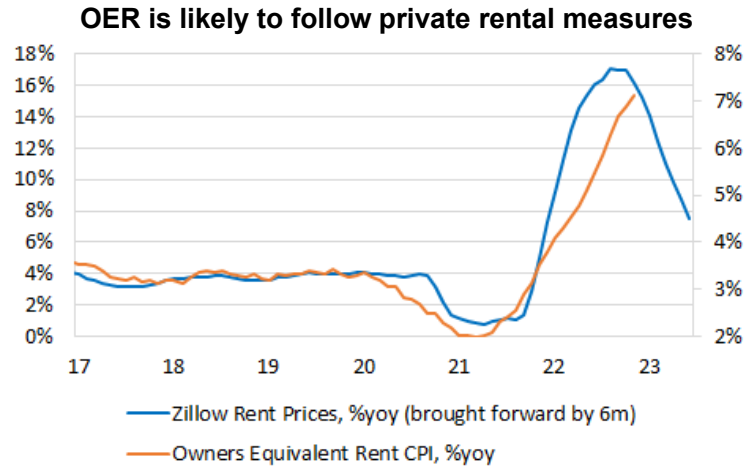
Entering The Easy Disinflation Phase – Goods And Shelter Can Be Powerful Forces. But Wages Are The Source Of Upside Risk





Source: Top left: ISM, Haver, Top right: Zillow, BLS, Haver, Bottom: Atlanta Fed, BLS, Haver.
As of 1/10/23.

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A Variety Of Scenarios Suggest Core Inflation Will Moderate In 2023. Labor Markets Will Determine Where We Ultimately Land

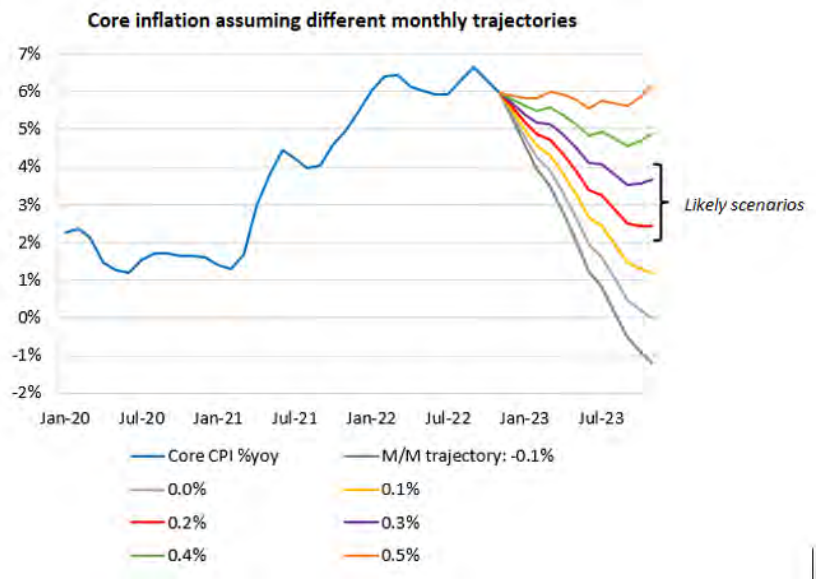
Shelter decelerates to 0.4% based on relationship with Zillow

	Services ex-shelter		
	@0.2%	@0.4%	@0.6%
Goods stay flat	0.2%	0.3%	0.4%
Goods deflate (-0.5%)	0.1%	0.2%	0.2%
Goods deflate massively (-1%)	0.0%	0.0%	0.1%

Shelter inflation slows like the GFC to 0.1%

	Services ex-shelter		
	@0.2%	@0.4%	@0.6%
Goods stay flat	0.1%	0.2%	0.2%
Goods deflate (-0.5%)	0.0%	0.0%	0.1%
Goods deflate massively (-1%)	-0.2%	-0.1%	0.0%

**circling most likely outcomes*



Source: BLS, Haver and Fidelity Investment as of 1/10/23.

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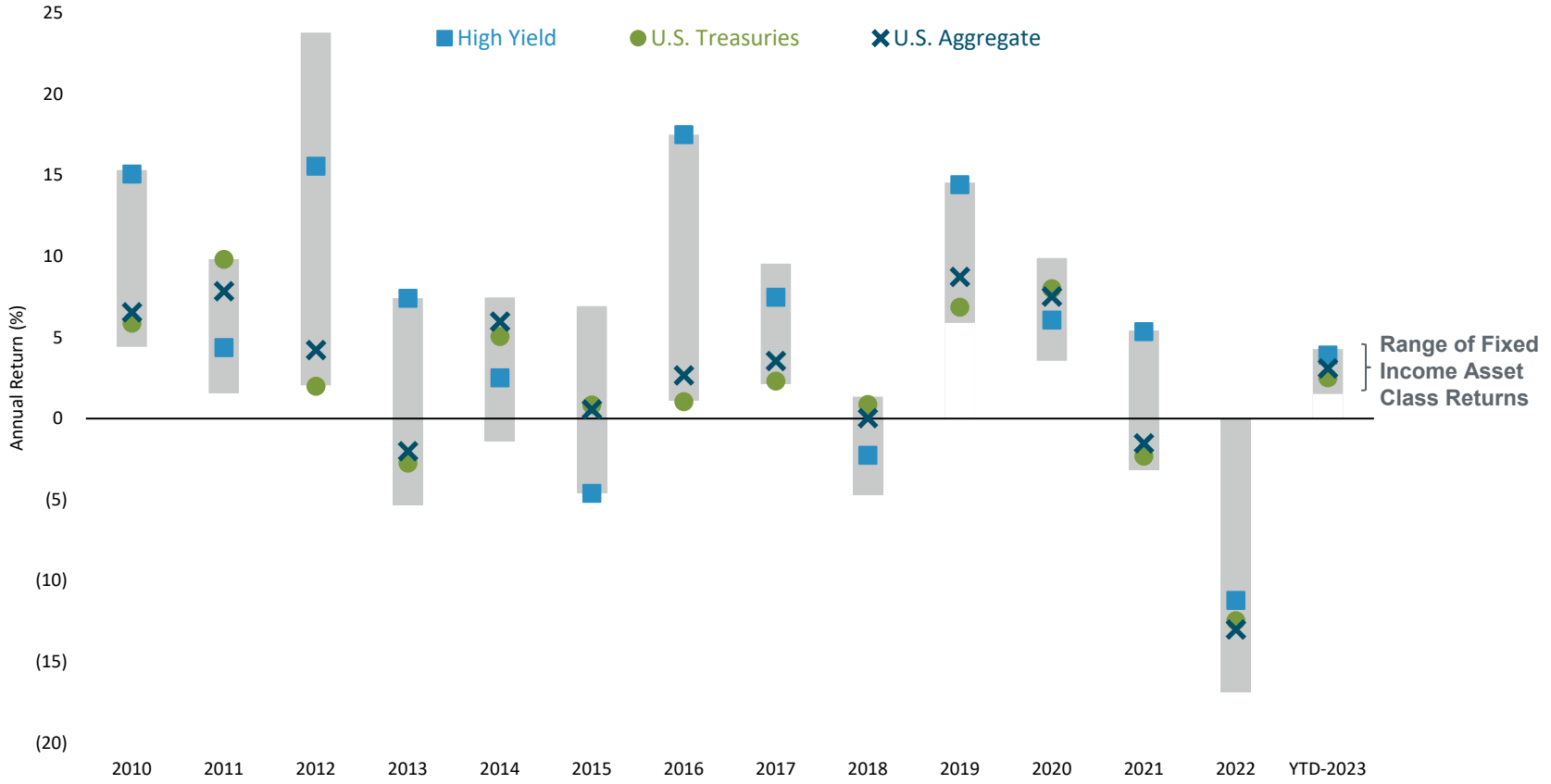
Bonds Offer Diverse Opportunity Set



Source: Bloomberg and Fidelity Investments, as of 1/31/23.

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

Calendar year performance from 2010 to 2022.

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

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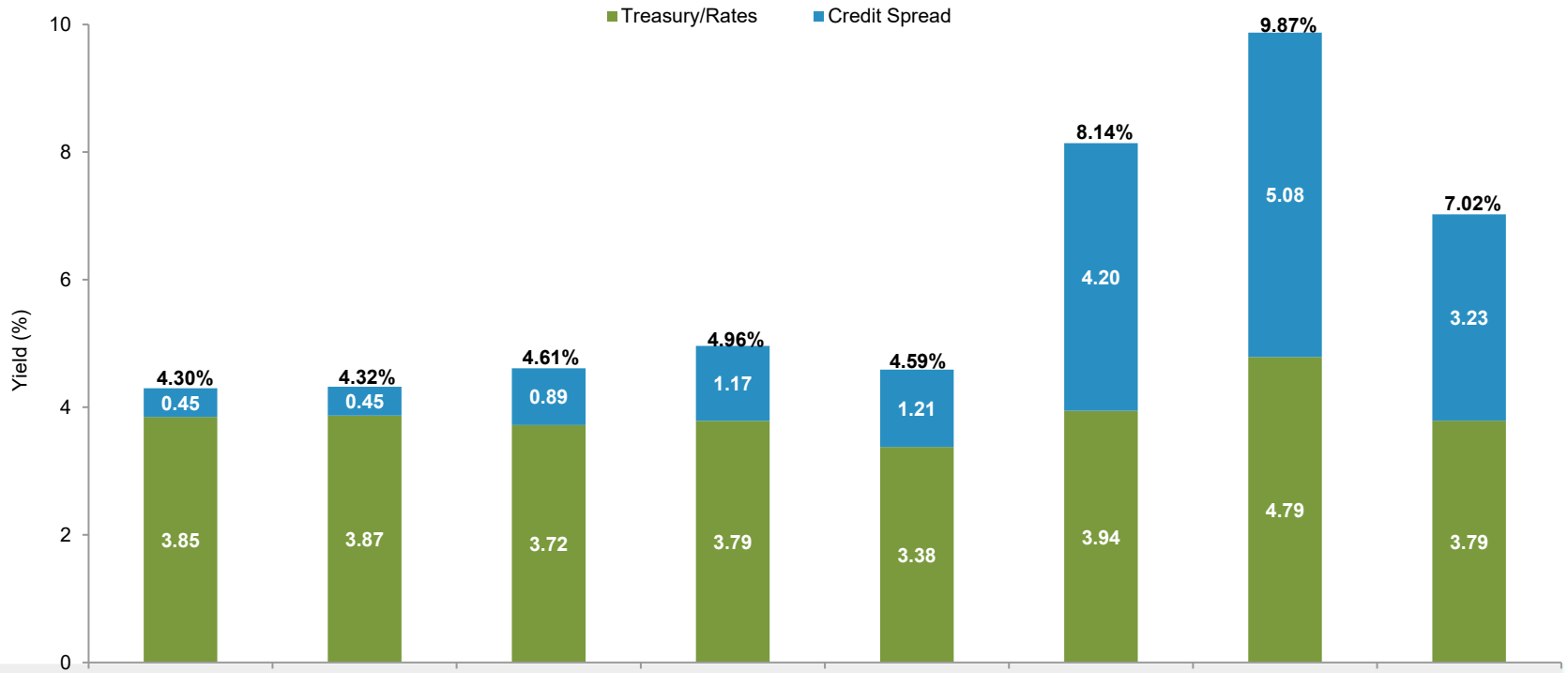
Fidelity INVESTMENTS

Fixed Income Yields and Spreads

Percentiles and OAS



Percentile Rank	U.S. Aggregate	Securitized	Local Authorities	U.S. Corp IG	International Credit	U.S. Corp HY	Lev Loan	EMD
Yield Rank	97	92	87	93	93	79	96	91
Spread Rank	35	55	11	31	45	39	60	51

Percentile ranks based on month-end data from January 2009 – January 2023

Source: Bloomberg and S&P, as of 1/31/23.
Note: Leveraged Loan is based on YTM (yield to maturity) and Spread to Maturity. The green portion of leveraged loan represents London Interbank Offered Rate (LIBOR). All others use YTW (yield-to-worst) and OAS (option-adjusted-spread). Yields and spreads are represented by the Bloomberg U.S. Aggregate Bond Index, Bloomberg U.S. Securitized Index, Bloomberg U.S. Aggregate Local Authorities Index, Bloomberg Corporate Investment Grade Index, Bloomberg Global Credit Index, Bloomberg U.S. Corporate High Yield Index, S&P/LSTA Leveraged Performing Loan Index, and Bloomberg Emerging Markets USD Aggregate Index. It is not possible to invest directly in an index. All market indices are unmanaged. Not intended to represent the performance of any Fidelity portfolio.

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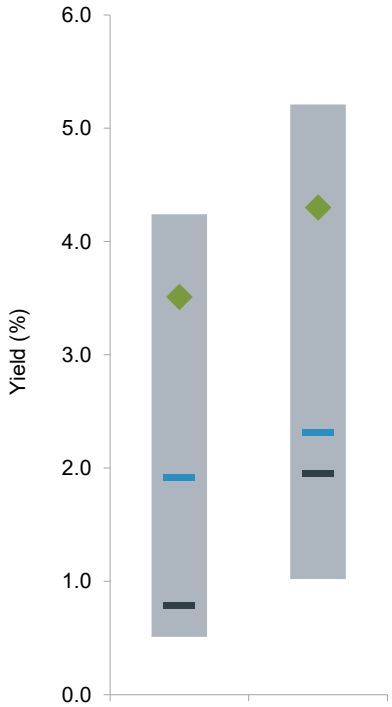
Fixed Income Yields and Spreads

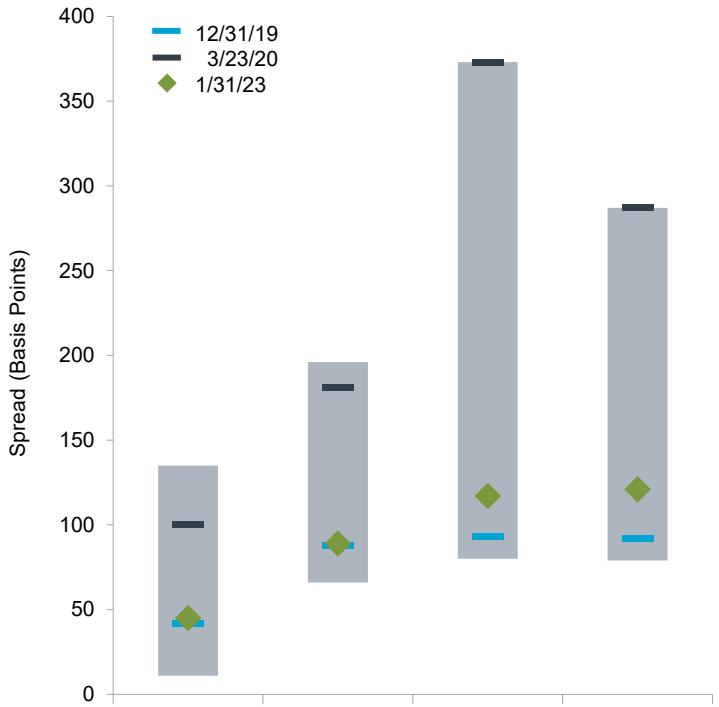
Rate and spread ranges since January 2010

10-YR TREASURY / U.S. AGG



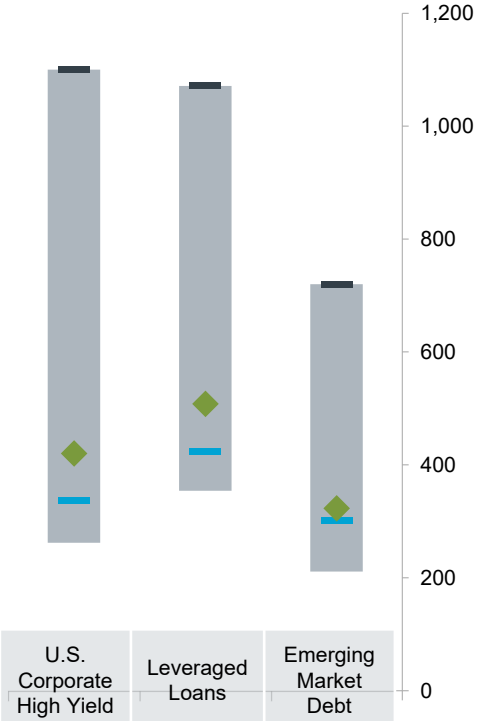
Asset Class	10-Year Treasury	U.S. Aggregate
Percentile Yield Rank	95	97

INVESTMENT GRADE SECTORS



Asset Class	Securitized	Local Authorities	U.S. Corporate IG	International Credit
Percentile Spread Rank	59	12	33	49

HIGH YIELD SECTORS



U.S. Corporate High Yield	Leveraged Loans	Emerging Market Debt
42	64	54

Notes: Data is for the period January 2010 – January 2023. Spread data is based on option-adjusted spread except for Leveraged Loans which is based on spread to maturity.

Sources: Bloomberg and S&P as of 1/31/23. Yields and spreads are represented by the Bloomberg U.S. Aggregate Bond Index, Bloomberg U.S. Securitized Index, Bloomberg U.S. Aggregate Local Authorities Index, Bloomberg Corporate Investment Grade Index, Bloomberg Global Credit Index, Bloomberg U.S. Corporate High Yield Index, S&P/LSTA Leveraged Performing Loan Index, and Bloomberg Emerging Markets USD Aggregate Index. It is not possible to invest directly in an index. All market indices are unmanaged. Not intended to represent the performance of any Fidelity portfolio.

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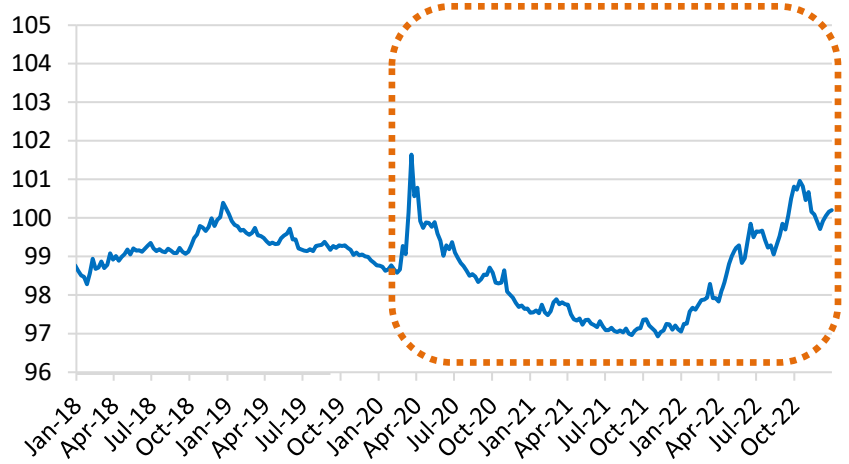
Fidelity INVESTMENTS

Financial Conditions

Financial Conditions Index

Financial Conditions Index



Source: Bloomberg, Goldman Sachs as of 12/31/22.

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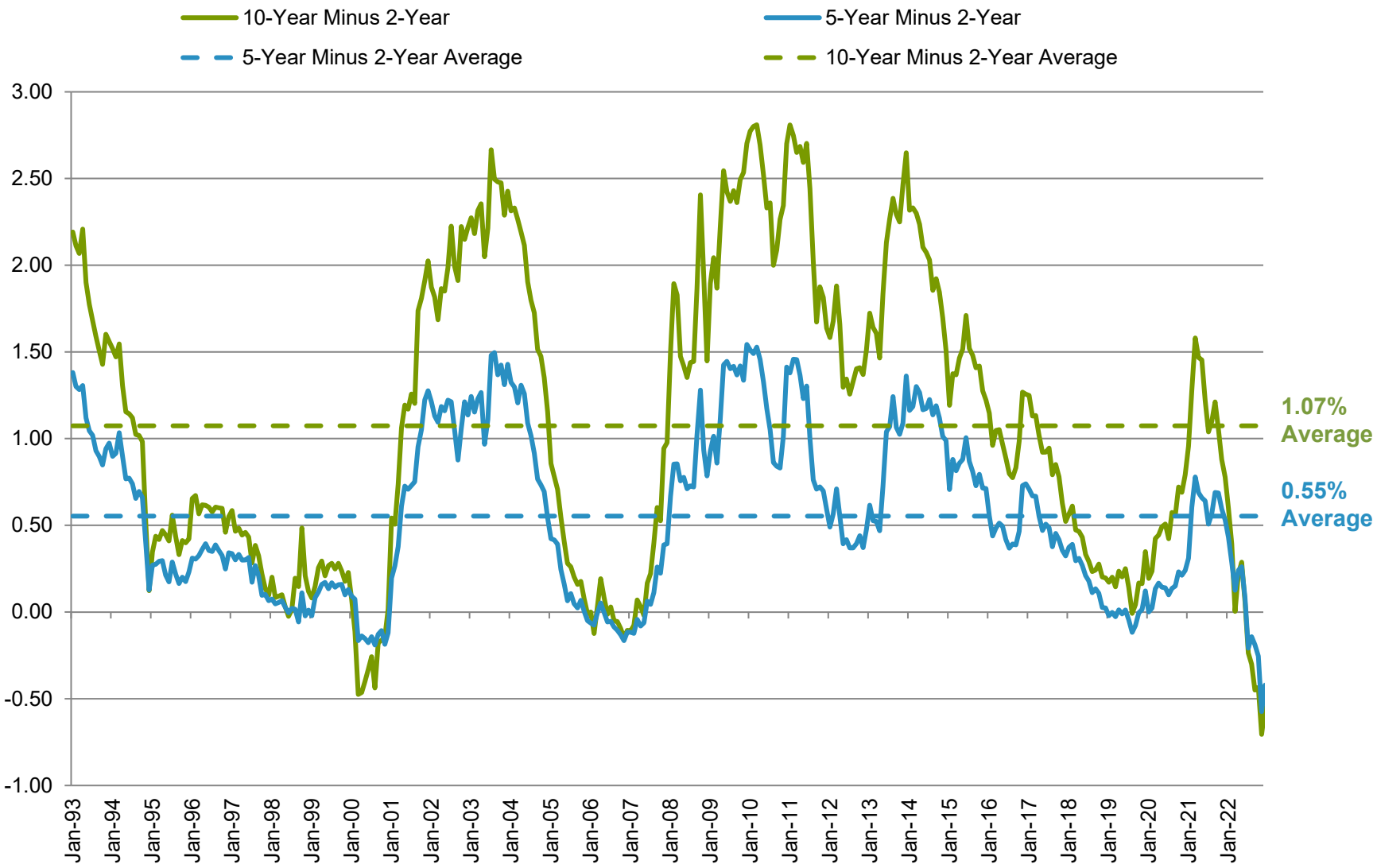
U.S. Treasury Curve Steepness



Source: Bloomberg, as of 12/31/22. Past performance is no guarantee of future results.

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Appendix

Fixed Income Assets Under Management

Active Diversified	Institutional $19.5B	Retail $121.4B	Total $140.9B
Core Constrained	4.1	0.0	4.1
Core	15.4	121.4	136.8
Core Plus[1]	7.6	51.6	59.1
Tactical Bond[1]	7.7	2.4	10.1

Limited Term	Institutional $56.9B	Retail $23.4B	Total $80.3B
Low Duration Solutions	5.9	10.8	16.7
Short/Stable Value	47.8	5.5	53.3
Short-Intermediate	0.8	3.0	3.8
Intermediate	2.4	4.2	6.6

LDI	Institutional $13.4B	Retail $0.0B	Total $35.3B[2]
Long Corporate	9.6	0.0	9.6
Long Gov't/Credit	3.8	0.0	3.8

Gov't/Mortgage	Institutional $3.1B	Retail $38.4B	Total $41.6B
Government	1.0	7.8	8.8
Mortgage	2.1	30.6	32.7

Municipal	Institutional $5.7B	Retail $38.0B	Total $43.7B
Municipal	5.7	38.0	43.7

Global Bond	Institutional $5.0B	Retail $21.7B	Total $26.8B
Global	2.2	12.4	14.6
Canada	2.8	9.3	12.1

Credit/Global Credit	Institutional $8.3B	Retail $6.4B	Total $14.7B
Credit	6.9	4.8	11.7
Global Credit	1.4	1.6	3.0

Passive	Institutional $19.7B	Retail $148.3B	Total $165.4B
US Multisector Bond	8.7	79.1	87.7
US Treasury	8.2	67.7	75.9
Municipal Bond	0.0	0.2	0.2
Canada	0.3	1.3	1.6

High Income	Institutional $19.4B	Retail $81.8B	Total $101.2B
High Yield	3.4	41.8	45.2
Leveraged Loan	10.2	18.4	28.6
Equity	0.9	6.1	7.0
Emerging Markets	2.6	9.4	12.0
HY CMBS	2.3	6.1	8.4

Total Fixed Income AUM	Institutional ($ Billions)	Retail ($ Billions)	Total ($ Billions)
Bonds	**$129.1**	**$397.6**	**$526.7**
High Income	**$19.4**	**$81.8**	**$101.2**
Money Market	**$290.2**	**$643.6**	**$933.8**
Total	**$438.7**	**$1,123.0**	**$1,561.7**

Data as of 12/31/22. Includes sub-portfolios. Totals may vary due to rounding.

[1] Assets are not included in total figures because they have been incorporated into the figures of the underlying investment categories.

[2] Total also includes Canadian LDI, Intermediate Duration LDI, and Long Term Treasury Bond Index LDI assets.

Fidelity Fixed Income Assets under management include accounts managed by FIAM and its affiliates, not all of which may be part of the FIAM firm for GIPS purposes.

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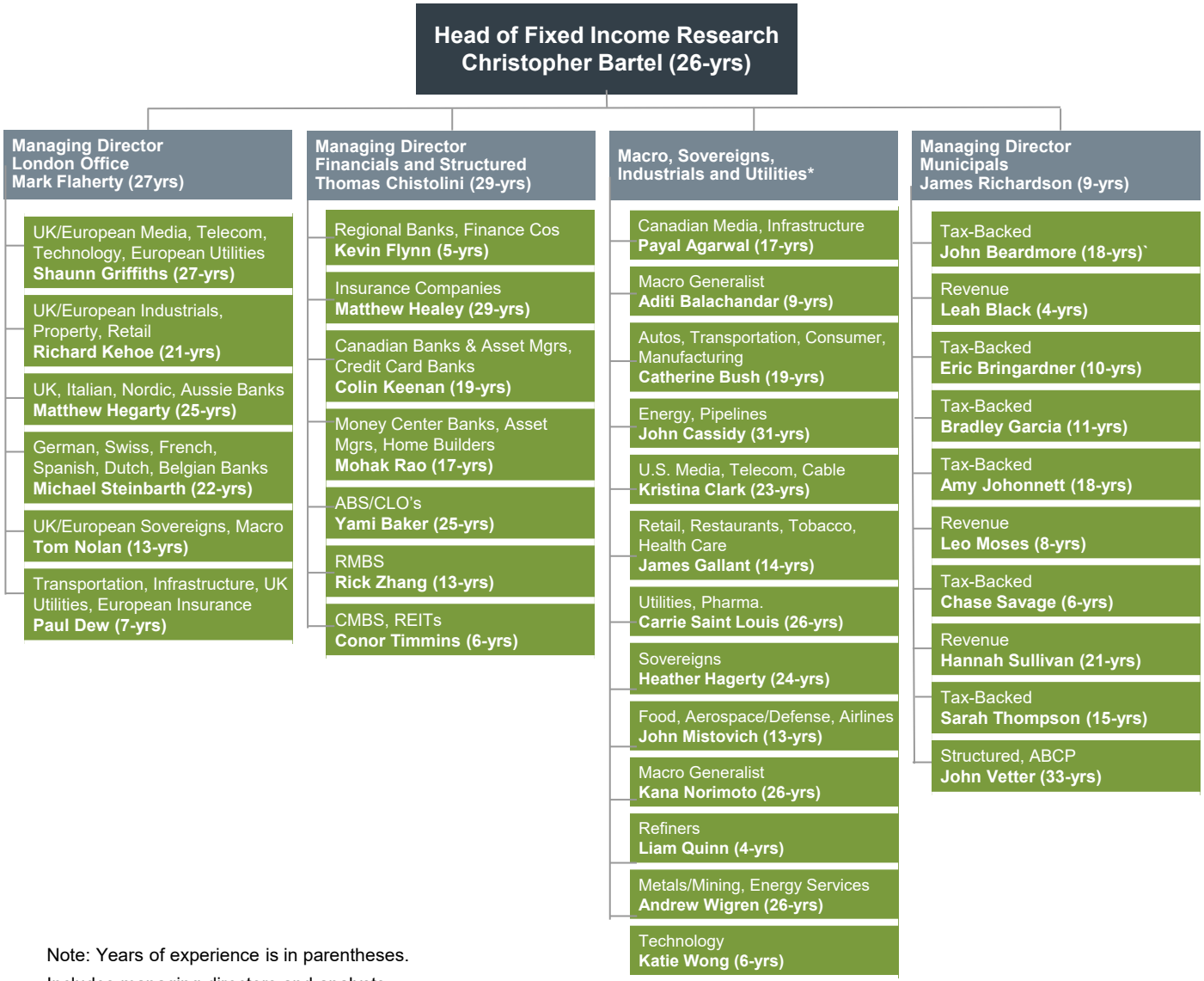
Emphasis on Strong Fundamental Research



- Broad-based research approach:
  - Macro/Sovereign
  - Finance
  - Industrial
  - Municipal
- Experienced team:
  - Many with 15–25+ years
  - Career analysts
  - Heavily influence process
- Deep financial coverage:
  - MNC, Regional, Non-U.S.
  - Macro benefit
- Macro/Muni broadens universe:
  - Expand beyond corporates
  - Requires deep analysis
  - Critical in long duration
- Leverage equity platform:
  - Attend company visits
  - Evaluate equity/debt perspectives

Note: Years of experience is in parentheses.

Includes managing directors and analysts.

* Christopher Bartel, in addition to being Head of Fixed Income Research, also manages the macro, sovereigns, industrials and utilities teams.

Source: FMR LLC., as of January 2023.

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Fidelity INVESTMENTS

Biographies

Jeffrey Moore, CFA

Portfolio Manager

Jeffrey Moore is a portfolio manager in the Fixed Income division at Fidelity Investments. Fidelity Investments is a leading provider of investment management, retirement planning, portfolio guidance, brokerage, benefits outsourcing, and other financial products and services to institutions, financial intermediaries, and individuals.

In this role, Mr. Moore co-manages the Fidelity and Fidelity Advisor Investment Grade Bond Funds, Fidelity and Fidelity Advisor Tactical Bond Funds, Fidelity and Fidelity Advisor Total Bond Funds, and Fidelity Investment Grade Bond ETF, as well as various institutional portfolios for U.S. and non- U.S. investors. Additionally, he is a presenting member of Fidelity's Asset Allocation Committee.

Prior to assuming his current position, Mr. Moore was a fixed income analyst assigned to several sectors, including sovereign debt, energy, real estate investment trusts (REITs), banks, and Canada.

Before joining Fidelity in 1995, Mr. Moore worked at Dominion Bond Rating Service in Toronto and in Canada's Department of Finance. Mr. Moore was selected for the Accelerated Economist Training Program, serving on the Treasury Board and in the Privy Council Office. He has been in the financial industry since 1990.

Mr. Moore earned his bachelor of arts degree, with honors, in economics from the University of Western Ontario and his master's degree in economics from the University of Waterloo. He is also a CFA® charterholder.

Mr. Moore has authored a number of Thought Leadership papers, most recently "Active Multi-Sector Fixed Income Investing in an Uncertain Yield Environment" in 2013, "Stretching for Yield in the Fixed Income Market" in 2012, and "What Does Risk Free Mean Now?" in 2012. In Canada, he authored the paper "The Art and Science of Fixed Income" in 2009 and co-authored the paper "The Social Cost of Labor Taxes" for the Canadian Tax Journal in 1990. Additionally, Mr. Moore and team received Morningstar's 2016 U.S. Fixed-Income Manager of the Year Award for Fidelity Total Bond Fund.

Biographies

Michael Plage, CFA
Portfolio Manager

Michael Plage is a portfolio manager in the Fixed Income division at Fidelity Investments. Fidelity Investments is a leading provider of investment management, retirement planning, portfolio guidance, brokerage, benefits outsourcing, and other financial products and services to institutions, financial intermediaries, and individuals.

In this role, Mr. Plage co-manages the Fidelity and Fidelity Advisor Investment Grade Bond Funds, Fidelity and Fidelity Advisor Sustainable Core Plus Bond Funds, Fidelity and Fidelity Advisor Tactical Bond Funds, Fidelity Investment Grade Bond ETF, Fidelity Sustainable Core Plus Bond ETF, and Fidelity Total Bond ETF, as well as various institutional portfolios for U.S. and non- U.S. investors.

Prior to assuming his current responsibilities, Mr. Plage managed Fidelity Corporate Bond ETF, Fidelity and Advisor Corporate Bond and Short Duration High Income Funds, and Fidelity Puritan Fund, as well as institutional and retail fixed income portfolios within credit strategies, including high yield. Previously, he worked as a fixed income trader from 2005 to 2009.

Before joining Fidelity in 2005, he was a trader at Travelers Insurance (Citigroup) from 1997 to 2005. He has been in the financial industry since 1997.

Mr. Plage earned his bachelor of science degree in management from the University of South Carolina and his master of business administration degree in finance from the University of Connecticut. He is also a CFA® charterholder.

Beau Coash
Institutional Portfolio Manager

Beau Coash is an institutional portfolio manager for fixed income strategies at Fidelity Investments. Fidelity Investments is a leading provider of investment management, retirement planning, portfolio guidance, brokerage, benefits outsourcing, and other financial products and services to institutions, financial intermediaries, and individuals. The institutional portfolio management team is a group within Fidelity's Asset Management Solutions division, an integrated investment, distribution, and client service organization dedicated to meeting the unique needs of the institutional marketplace.

In this role, Mr. Coash is an active part of the portfolio management team and represents the team's capabilities, thought processes, and views to clients and consultants. He is also the fixed income relationship partner for the Asset Allocation, Strategic Advisers, and Global Asset Allocation divisions.

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

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

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

Biographies

Kristin Shofner

Senior Vice President, Business Development

Kristin Shofner is senior vice president of business development within the Asset Management Solutions division at Fidelity Investments. Fidelity Investments is a leading provider of investment management, retirement planning, portfolio guidance, brokerage, benefits outsourcing, and other financial products and services to institutions, financial intermediaries, and individuals. The Fidelity Asset Management Solutions division is an integrated investment, distribution, and client service organization dedicated to meeting the unique needs of the institutional marketplace.

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

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

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

Melissa Moesman

Vice President, Account Executive

Melissa Moesman is a vice president account executive within the Asset Management Solutions division at Fidelity Investments. Fidelity Investments is a leading provider of investment management, retirement planning, portfolio guidance, brokerage, benefits outsourcing, and other financial products and services to institutions, financial intermediaries, and individuals. The Fidelity Asset Management Solutions division is an integrated investment, distribution, and client service organization dedicated to meeting the unique needs of the institutional marketplace.

In this role, Ms. Moesman is responsible for account management for both public and private institutional clients.

Prior to joining Fidelity in 2006, Ms. Moesman served as a relationship manager at Linedata Services. Previously, she held various client-related roles at Investors Bank & Trust Company, where she managed a corporate actions accounting group and the endowment, foundation, and institutional product line. Ms. Moesman also managed the donor relations program at Wellesley College. She has been in the financial industry since 2000.

Ms. Moesman earned her bachelor of arts degree from Wellesley College and her master of business administration degree from Babson College. She also holds the Financial Industry Regulatory Authority (FINRA) Series 7 and 63 licenses.

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Risks

Past performance is no guarantee of future results. An investment may be risky and may not be suitable for an investor's goals, objectives and risk tolerance. Investors should be aware that an investment's value may be volatile and any investment involves the risk that you may lose money.

The value of a strategy's investments will vary in response to many factors, including adverse issuer, political, regulatory, market, or economic developments. The value of an individual security or a particular type of security can be more volatile than and perform differently from the market as a whole. Nearly all accounts are subject to volatility in non-U.S. markets, either through direct exposure or indirect effects on U.S. markets from events abroad, including fluctuations in foreign currency exchange rates and, in the case of less developed markets, currency illiquidity. Events such as natural disasters, pandemics, epidemics, and social unrest in one country, region, or financial market may adversely impact issuers in a different country, region, or financial market. Performance could be negatively impacted if the value of a portfolio holding were harmed by such political or economic conditions or events. Moreover, such negative political and economic conditions and events could disrupt the processes necessary for investment operations.

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

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

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

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

Fidelity INVESTMENTS

Important Information, continued

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

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THE STATE of ALASKA
GOVERNOR MIKE DUNLEAVY

Department of Revenue
ALASKA RETIREMENT MANAGEMENT BOARD

ARMB Risk Reporting

March 2023

Shane Carson, CAIA, CFA
State Investment Officer, Treasury Division
Alaska Department of Revenue

Key Board Decisions

Determine Investment Objective

- Fund's Purpose
- Governance – who makes which decisions?

Determine Asset Allocation

- Strategic
- Tactical

Oversee Implementation

- Manager Structure – number and types of manager allocations.
- Manager Selection

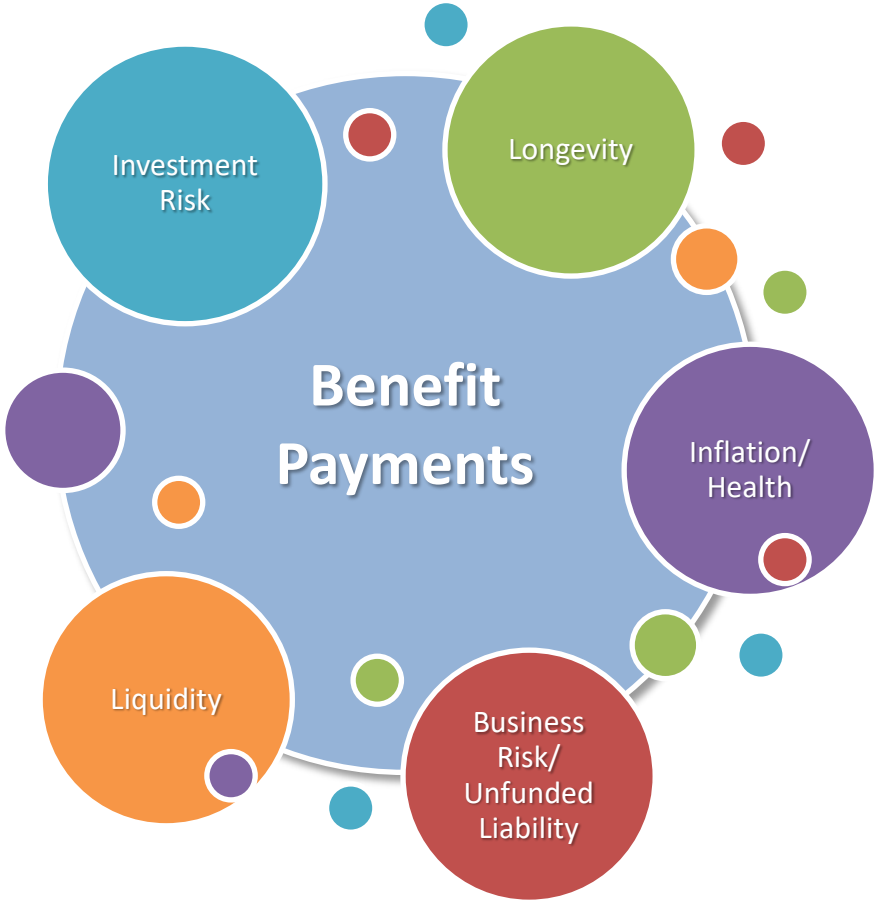
Monitor Results

- Are the fund, asset classes and mandates performing as expected?
- Are they achieving objectives?

Risk and the Retirement Systems

What does risk mean to the ARMB?

- At the most comprehensive level, risk is anything that could impact the objectives of the retirement systems.
- The defined benefit systems' primary objective is to pay all benefits when they are due.
- Risk encompasses both assets and liabilities.
- Defined benefit systems are designed to be able to take risks – distributing market, longevity, and other risks across time and a broad pool of participants.
- Setting and monitoring investment risk is one of the primary roles of the ARMB.



Risk Monitoring Tool: truView

- The ARMB is using truView for portfolio risk analytics. truView is State Street Global Exchange's risk measurement platform.
- truView analytics are run semi-annually, at month-end in June and December.
- We use truView to help answer the following questions:
  - Is the portfolio risk positioned according to the ARMB's asset allocation?
  - What is the probability and magnitude of potential losses?
  - Is the ARMB taking more or less risk than the strategic benchmark by asset class?
  - Are specific investment mandates or managers adding to or reducing risk?
  - Does the ARMB have unexpected risk exposures or concentration?
  - How would the ARMB's current portfolio perform in historic market events or scenarios?

Volatility Decomposition

- Public equity contributed 55% to portfolio volatility.
- Public and private equity contributed 76% of total volatility.
- Broad Fixed Income contributed about 1.3%. A significant decrease from the prior report. This is mainly due to the transfer of Alternative Fixed Income to Multi-Asset and a decrease in the Broad Fixed Income Target.
- Portfolio volatility has increased from 13.8% in June to 14.3% in December. FY23 long-term forecast as provided by Callan, was 13.9% for ARMB's target asset allocation.

Volatility Decomposition 12/31/2022

	Market Value (Millions)	Allocation (%)	Volatility[1] (% per annum)	Volatility Contribution (% of Total Vol)
Broad Domestic Equity	7,443	24.4%	20.1%	33.3%
Global Equity Ex-US	5,288	17.3%	18.4%	21.7%
Real Assets	4,555	14.9%	17.0%	15.8%
Broad Fixed Income	5,822	19.1%	8.1%	1.3%
Private Equity	4,982	16.3%	19.1%	21.4%
Multi-Asset	2,454	8.0%	11.9%	6.5%
TOTAL	**30,543**	**100.0%**	**14.3%**	**100.0%**

Volatility Decomposition 6/30/2022

	Market Value (Millions)	Allocation (%)	Volatility[1] (% per annum)	Volatility Contribution (% of Total Vol)
Broad Domestic Equity	7,535	24.5%	18.9%	33.0%
Global Equity Ex-US	4,921	16.0%	17.3%	19.5%
Real Assets	4,432	14.4%	15.3%	13.8%
Broad Fixed Income	6,785	22.1%	6.4%	5.7%
Private Equity	5,236	17.1%	17.9%	21.7%
Opportunistic	1,800	5.9%	15.0%	6.3%
TOTAL	**30,709**	**100.0%**	**13.8%**	**100.0%**

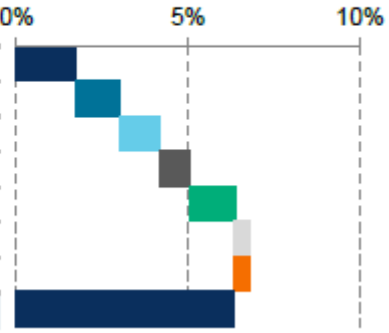
Volatility at the asset class level is calculated using parametric Value-at-Risk at 84th percentile, expressed as a percentage of the market value of each asset class.

Asset Class Risk and Diversification

- The monthly value-at-risk (VaR) is 6.3%.
- Broad Domestic Equity and Global Equity ex-US contributed 62% of VaR.
- VaR increased from June's report by 1.1%.
- The Diversification Benefit provided less reduction in overall VaR compared to June.
- The Conditional VaR is 10.5% in December versus 10.3% in June.

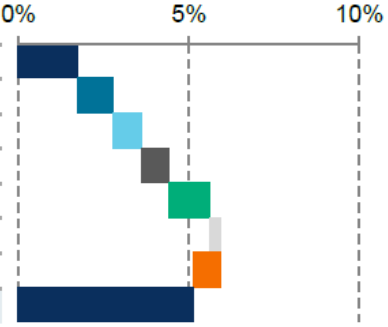
Asset Class Risk & Diversification 12/31/2022

	Allocation (%)	Value-at-Risk[1] Contribution (% of Total VaR)	Value-at-Risk[1] (% of Total MV)
Broad Domestic Equity	24.4%	42.1%	1.7%
Global Equity Ex-US	17.3%	19.6%	1.2%
Real Assets	14.9%	15.4%	1.2%
Broad Fixed Income	19.1%	-5.1%	0.9%
Private Equity	16.3%	21.8%	1.3%
Multi-Asset	8.0%	6.3%	0.4%
Diversification Benefit	-	-	-0.5%
TOTAL	100.0%	100.0%	6.3%



Asset Class Risk & Diversification 6/30/2022

	Allocation (%)	Value-at-Risk[1] Contribution (% of Total VaR)	Value-at-Risk[1] (% of Total MV)
Broad Domestic Equity	24.5%	27.2%	1.7%
Global Equity Ex-US	16.0%	13.8%	1.0%
Real Assets	14.4%	27.3%	0.8%
Broad Fixed Income	22.1%	7.4%	0.8%
Private Equity	17.1%	18.5%	1.2%
Opportunistic	5.9%	5.8%	0.3%
Diversification Benefit	-	-	-0.8%
TOTAL	100.0%	100.0%	5.2%



Equity Beta

- Equity betas are within expectations for 12/31/2022.
- ARMB's Domestic and Global ex-US equity portfolios should have betas close to their benchmarks.
- Five-year beta is unchanged from June's report. One-year Total Equity beta increased slightly closer to 1.0.

Sub Asset Class Beta Analysis

Asset Class / [Benchmark]	Market Value (Millions)	Allocation (%)	Beta[1] 1Y to the Benchmark	Beta[1] 5Y to the Benchmark
Broad Domestic Equity / [Russell 3000]	**7,443**	**58.5%**	**0.95**	**0.99**
Large Cap Pool (AYQK)	6,834	53.7%	0.94	0.97
Small Cap Pool (AYQC)	609	4.8%	1.03	1.20
Global Equity Ex-Us / [MSCI ACWI Ex US IMI]	**5,288**	**41.5%**	**0.92**	**0.97**
Emerging Markets Pool (AYSC)	916	7.2%	0.79	0.91
IE Large Cap Pool (AYRC)	4,372	34.3%	0.94	0.98
TOTAL Equity / [MSCI ACWI]	**12,731**	**100.0%**	**0.97**	**1.02**

1. Beta is the regression coefficient generated by a linear regression of the percent return time series of position on an explanatory time series. This explanatory time series is often composed of the returns from a broader market index, the benchmarks of each of the equity asset classes.

International Equity Country Exposure

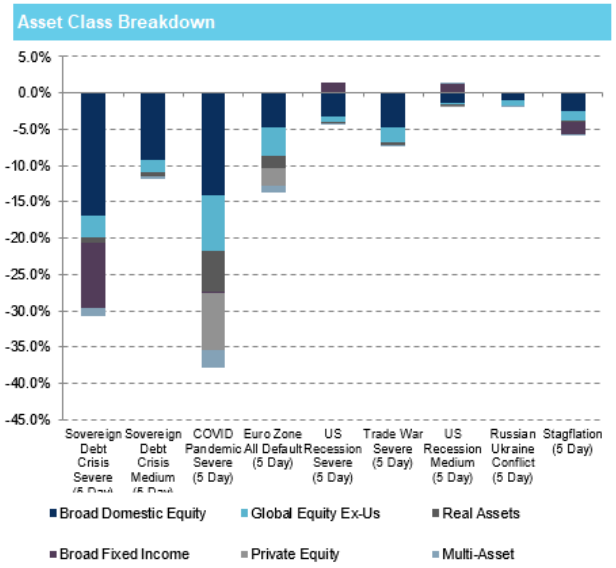
- For Fiscal Year 2023, the target allocation to International Equities is 18% of the total ARMB portfolio.
- The Global Equity Ex-US asset class invests in a diversified market basket across more than 40 countries.
- In aggregate, asset class level active country weights exist due to active management and factor exposures but are generally not concentrated and track reasonably close to the benchmark.

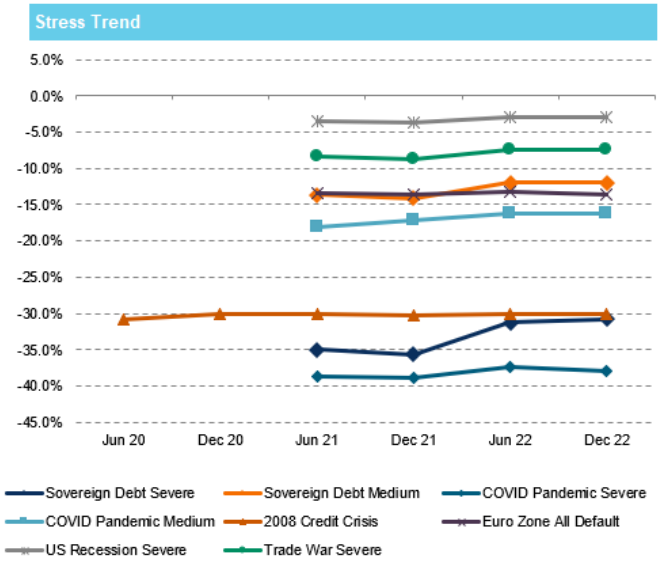
Country	International Portfolio	Benchmark	Difference	Country	International Portfolio	Benchmark	Difference
Japan	15.4%	15.0%	0.4%	Denmark	1.8%	1.8%	0.0%
United Kingdom	10.2%	9.3%	0.9%	Italy	1.6%	1.4%	0.2%
China	7.9%	7.6%	0.3%	Spain	1.4%	1.5%	-0.1%
France	7.4%	6.6%	0.8%	Singapore	1.1%	1.0%	0.1%
Switzerland	6.5%	6.4%	0.1%	Turkey	1.0%	0.2%	0.7%
Germany	5.6%	4.9%	0.7%	Mexico	1.0%	0.7%	0.3%
Canada	5.2%	7.6%	-2.4%	Finland	0.9%	0.9%	0.1%
Netherlands	3.9%	2.7%	1.2%	Russia	0.9%	0.0%	0.9%
India	3.6%	4.4%	-0.7%	Belgium	0.8%	0.6%	0.2%
Taiwan	3.5%	4.0%	-0.5%	South Africa	0.7%	1.1%	-0.4%
Australia	3.5%	5.3%	-1.8%	Saudi Arabia	0.6%	1.1%	-0.5%
South Korea	2.9%	3.3%	-0.4%	Norway	0.6%	0.6%	0.0%
Hong Kong	2.3%	2.4%	-0.1%	Israel	0.5%	0.7%	-0.1%
Sweden	2.2%	2.2%	0.0%	Ireland	0.5%	0.6%	-0.2%
Brazil	2.0%	1.5%	0.5%	Less than 0.5% weight	4.4%	5.3%	-0.5%

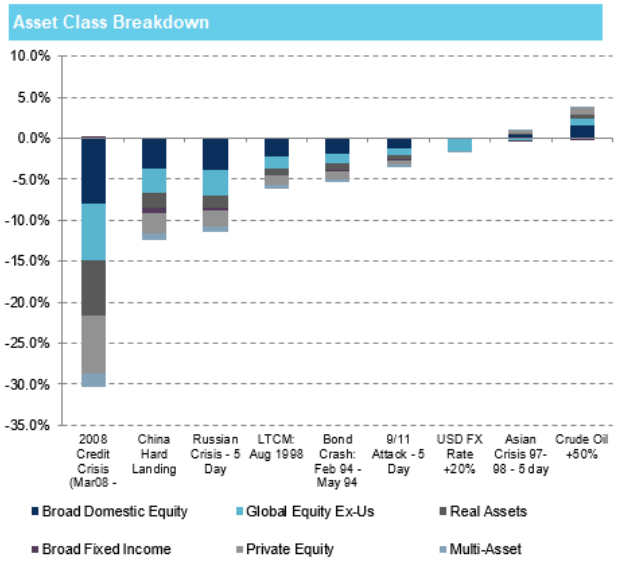
ARMB Global ex-US benchmark is MSCI ACWI ex-US IMI
Data as of 12/31/2022
Source: Custody and benchmark weights

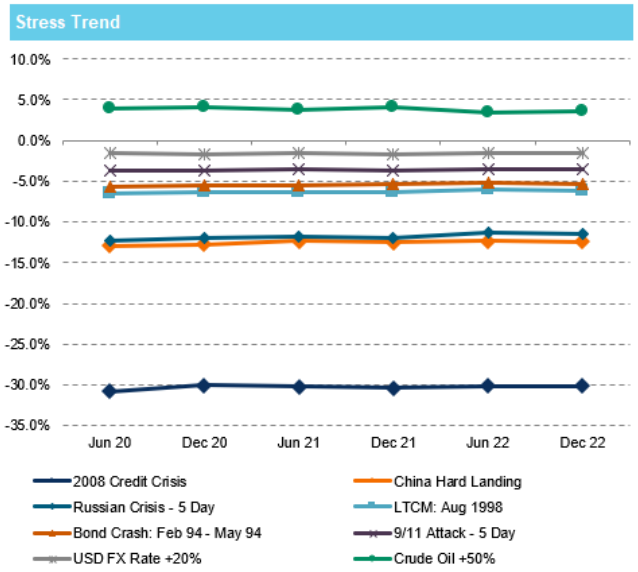
Stress Tests

- Stress tests reveal no significant change in expected outcomes.
- Added Russia/Ukraine Conflict and Stagflation to list of scenarios.
- The stress tests over time are largely unchanged from the June report.
  - This consistency would likely indicate there are no sudden or unexpected exposures to assets that are extraordinarily sensitive to these scenarios.







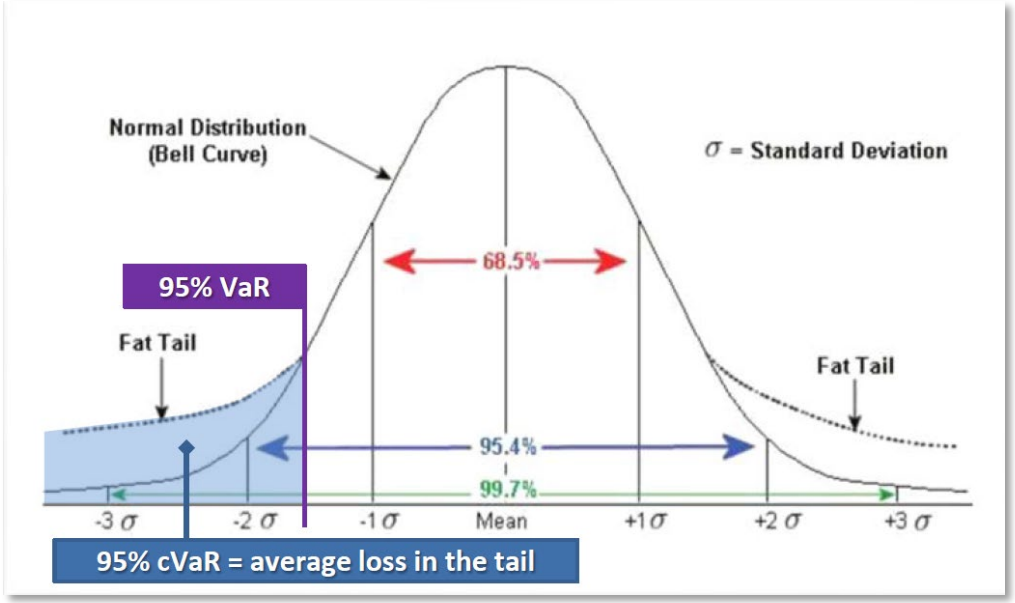


Summary

- Risk metrics are within expectations.
- Public equity allocation is the largest driver of portfolio volatility and value-at-risk as expected.
  - Overall portfolio volatility increased from the June report and is now in excess of long-term risk expectations.
- ARMB invests in a diversified basket of international equity. In aggregate, the country weights do not significantly deviate from the asset class benchmark.
- truView models several historical and predictive scenarios.
  - ARMB's portfolio sensitivity to the stress tests has been little changed over time indicating there are no sudden or unexpected exposures to assets that are sensitive to the scenarios provided.

What is Value-at-Risk

- Value-at-risk (VaR)
  - A commonly used measure of potential loss.
  - VaR represents a return threshold over a given time horizon whereby worse outcomes are only expected with some small and specific probability.
  - VaR can be estimated parametrically using the mean and standard deviation, but this ignores fat tails (kurtosis, skewness).
  - VaR also can be estimated using historic market information, which includes past fat tails – this is the approach truView takes.
- Expected shortfall (conditional VaR or cVaR) is the average loss contained in the left tail.
- Why are VaR and cVaR important?
  - They quantify the risk of loss for the portfolio.
  - Differences between historical and parametric-based VaR calculations suggest impact of fat tails.



Callan

2023 Capital Markets Projections

March 17, 2023

Alaska Retirement Management Board

Ivan Cliff, CFA
Head of Research

Jay Kloepfer
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Steven Center, CFA
Fund Sponsor Consulting

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Capital Market Research

Important Disclosures regarding the use of this document are included at the end of this document. These disclosures are an integral part of this document and should be considered by the user.

Agenda

Process overview

Why does Callan create capital markets projections?

Current market conditions

- Special topic: inflation

2023 expectations

- Economic outlook
- Asset class outlook
  - Equity
  - Fixed income
  - Alternative investments
- Forecast parameters
  - Returns
  - Risk
  - Correlation

Detailed 2023 projections and resulting portfolio returns

Callan

Process Overview

Why Make Capital Markets Projections?

Guiding objectives and process

Cornerstone of a prudent process is a long-term strategic investment plan

- Capital markets projections are key elements—set reasonable return and risk expectations for the appropriate time horizon
- Projections represent our best thinking regarding the long-term (10-year) outlook, recognizing our median projections represent the midpoint of a range, rather than a specific number
- Develop results that are readily defensible both for individual asset classes and for total portfolios
- Be conscious of the level of change suggested in strategic allocations for long-term investors: DB plan sponsors, foundations, endowments, trusts, DC participants, families, and individuals
- Reflect common sense and recent market developments, within reason

Callan's forecasts are informed by current market conditions, but are not built directly from them

- Balance recent, immediate performance and valuation against long-term equilibrium expectations

How Are Capital Markets Projections Constructed?

Guiding objectives and process

Underlying beliefs guide the development of the projections

- An initial bias toward long-run averages
- A conservative bias
- An awareness of risk premiums
- A presumption that markets are ultimately clear and rational

Reflect our beliefs that long-term equilibrium relationships between the capital markets and lasting trends in global economic growth are key drivers to setting capital markets expectations

Long-term compensated risk premiums represent “beta”—exposure to each broad market, whether traditional or “exotic,” with limited dependence on successful realization of alpha

The projection process is built around several key building blocks

- Advanced modeling at the individual asset class level (e.g., a detailed bond model, an equity model)
- A path for interest rates and inflation
- A cohesive economic outlook
- A framework that encompasses Callan beliefs about the long-term operation and efficiencies of the capital markets

2023 vs. 2022 Risk and Returns Assumptions

Summary of Callan's Long-Term Capital Markets Assumptions (2023–2032)

Asset Class	Index	Projected Return 1-Year Arithmetic	Projected Return 10-Year Geometric*	Real	Projected Risk Standard Deviation	2022–2031 1-Year Arithmetic	2022–2031 10-Year Geometric*	2022–2031 Standard Deviation	vs. 2022 Geometric* Delta	vs. 2022 Std Dev Delta
Equities										
Broad U.S. Equity	Russell 3000	8.75%	7.35%	4.85%	18.05%	8.00%	6.60%	17.95%	0.75%	0.10%
Large Cap U.S. Equity	S&P 500	8.60%	7.25%	4.75%	17.75%	7.85%	6.50%	17.70%	0.75%	0.05%
Smid Cap U.S. Equity	Russell 2500	9.60%	7.45%	4.95%	22.15%	8.75%	6.70%	21.30%	0.75%	0.85%
Global ex-U.S. Equity	MSCI ACWI ex USA	9.45%	7.45%	4.95%	21.25%	8.70%	6.80%	20.70%	0.65%	0.55%
Developed ex-U.S. Equity	MSCI World ex USA	9.00%	7.25%	4.75%	20.15%	8.25%	6.50%	19.90%	0.75%	0.25%
Emerging Market Equity	MSCI Emerging Markets	10.45%	7.45%	4.95%	25.70%	9.80%	6.90%	25.15%	0.55%	0.55%
Fixed Income										
Short Duration Gov/Credit	Bloomberg 1-3 Year Gov/Credit	3.75%	3.80%	1.30%	2.30%	1.50%	1.50%	2.00%	2.30%	0.30%
Core U.S. Fixed	Bloomberg Aggregate	4.25%	4.25%	1.75%	4.10%	1.80%	1.75%	3.75%	2.50%	0.35%
Long Government	Bloomberg Long Gov	4.55%	3.70%	1.20%	13.50%	1.85%	1.10%	12.50%	2.60%	1.00%
Long Credit	Bloomberg Long Credit	5.75%	5.20%	2.70%	11.75%	2.60%	2.10%	10.50%	3.10%	1.25%
Long Government/Credit	Bloomberg Long Gov/Credit	5.25%	4.75%	2.25%	11.35%	2.30%	1.80%	10.40%	2.95%	0.95%
TIPS	Bloomberg TIPS	4.10%	4.00%	1.50%	5.30%	1.35%	1.25%	5.05%	2.75%	0.25%
High Yield	Bloomberg High Yield	6.75%	6.25%	3.75%	11.75%	4.40%	3.90%	10.75%	2.35%	1.00%
Global ex-U.S. Fixed	Bloomberg Global Agg ex US	2.70%	2.25%	-0.25%	9.80%	1.20%	0.80%	9.20%	1.45%	0.60%
Emerging Market Sov Debt	EMBI Global Diversified	6.25%	5.85%	3.35%	10.65%	4.00%	3.60%	9.50%	2.25%	1.15%
Alternatives										
Core Real Estate	NCREIF ODCE	6.60%	5.75%	3.25%	14.20%	6.60%	5.75%	14.20%	0.00%	0.00%
Private Infrastructure	MSCI GI Infra/FTSE Dev Core 50/50	7.15%	6.15%	3.65%	15.45%	7.10%	6.10%	15.45%	0.05%	0.00%
Private Equity	Cambridge Private Equity	11.95%	8.50%	6.00%	27.60%	11.45%	8.00%	27.60%	0.50%	0.00%
Private Credit	N/A	8.00%	7.00%	4.50%	15.50%	6.40%	5.50%	14.60%	1.50%	0.90%
Hedge Funds	Callan Hedge FOF Database	5.80%	5.55%	3.05%	8.45%	4.35%	4.10%	8.20%	1.45%	0.25%
Commodities	Bloomberg Commodity	5.05%	3.50%	1.00%	18.00%	4.05%	2.50%	18.00%	1.00%	0.00%
Cash Equivalents	90-Day T-Bill	2.75%	2.75%	0.25%	0.90%	1.20%	1.20%	0.90%	1.55%	0.00%
Inflation	CPI-U		2.50%		1.60%		2.25%	1.60%	0.25%	0.00%

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

Source: Callan

Callan

Current Market Conditions

Mayhem in the Capital Markets

Russian invasion of Ukraine threw expectations for an orderly transition from pandemic era out the window.

Inflation is burning out of control, with CPI-U up more than 8% year-over-year in each month from March through September.

- Inflation readings decelerated after September but remained above 7% in October and November.

The S&P 500 and Bloomberg Aggregate were down together for three consecutive quarters through 3Q22; both were up in 4Q22.

The Fed remains on a mission to raise interest rates to fight inflation; new target range set in December 2022 is 4.25%–4.5%.

- The Fed has raised rates 425 bps since March, from a range of 0.0%-0.25%.

No place to hide in 2022; almost every asset class is down. It was the worst year for a 60/40 portfolio in decades.

Rising likelihood of recession: GDP declined in both 1Q and 2Q, rebounded in 3Q, and is expected to grow again in 4Q, but…

Yield curve is inverted!

Equity and Fixed Income Markets Down Together in 2022

Negative returns for stocks and bonds at the same time for three quarters are extremely unusual

Global equity markets down sharply in 2022 despite rebound in 4Q

- Similar impact across all equity market segments: developed, emerging, small cap

Fixed income down with sharply higher inflation and interest rates

- Bloomberg Aggregate: -13% for the year, worst year ever for the index by a wide margin
- CPI-U: +6.5% for the year ended Dec. 2022

- Number of times stocks and bonds have been down together
  - 38 quarters in almost 100 years, about 10% of the quarters
  - But just twice on annual basis
- Inflation at highest rate in decades
- Economic data show growth hit 'pause'
  - GDP recovered to 3.2% in 3Q22 and 2.9% in 4Q, after falling in both 2Q and 1Q
  - Growth for the year 2022 came in at 2.1%, forecasters predict as low as 1.5% for 2023.

Returns for Periods ended 12/31/22

	Quarter	Year to Date	1 Year	5 Years	10 Years	25 Years
U.S. Equity						
Russell 3000	7.18	-19.21	-19.21	8.79	12.13	7.68
S&P 500	7.56	-18.11	-18.11	9.42	12.56	7.64
Russell 2000	6.23	-20.44	-20.44	4.13	9.01	7.13
Global ex-U.S. Equity						
MSCI World ex USA	16.18	-14.29	-14.29	1.79	4.59	4.65
MSCI Emerging Markets	9.70	-20.09	-20.09	-1.39	1.44	--
MSCI ACWI ex USA Small Cap	13.31	-19.97	-19.97	0.67	5.24	6.87
Fixed Income						
Bloomberg Aggregate	1.87	-13.01	-13.01	0.02	1.06	3.97
90-day T-Bill	0.84	1.46	1.46	1.26	0.76	1.91
Bloomberg Long Gov/Credit	2.61	-27.09	-27.09	-1.21	1.57	5.38
Bloomberg Global Agg ex-US	6.81	-18.70	-18.70	-3.07	-1.64	2.71
Real Estate						
NCREIF Property	0.57	9.98	9.98	8.35	9.27	9.22
FTSE Nareit Equity	5.24	-24.37	-24.37	3.68	6.53	7.87
Alternatives						
CS Hedge Fund Index*	0.35	1.08	1.08	4.53	4.35	5.87
Cambridge Private Equity*	-5.60	3.34	3.34	18.22	15.90	14.75
Bloomberg Commodity	2.22	16.09	16.09	6.44	-1.28	1.87
Gold Spot Price	9.22	-0.13	-0.13	6.88	0.86	7.64
Inflation - CPI-U	0.00	6.45	6.45	3.78	2.60	2.47

*Cambridge PE data through 06/30/22. CS Hedge Fund Index data through 09/30/22.
Sources: Bloomberg, Callan, Cambridge, Credit Suisse, FTSE Russell, MSCI, NCREIF, S&P Dow Jones Indices

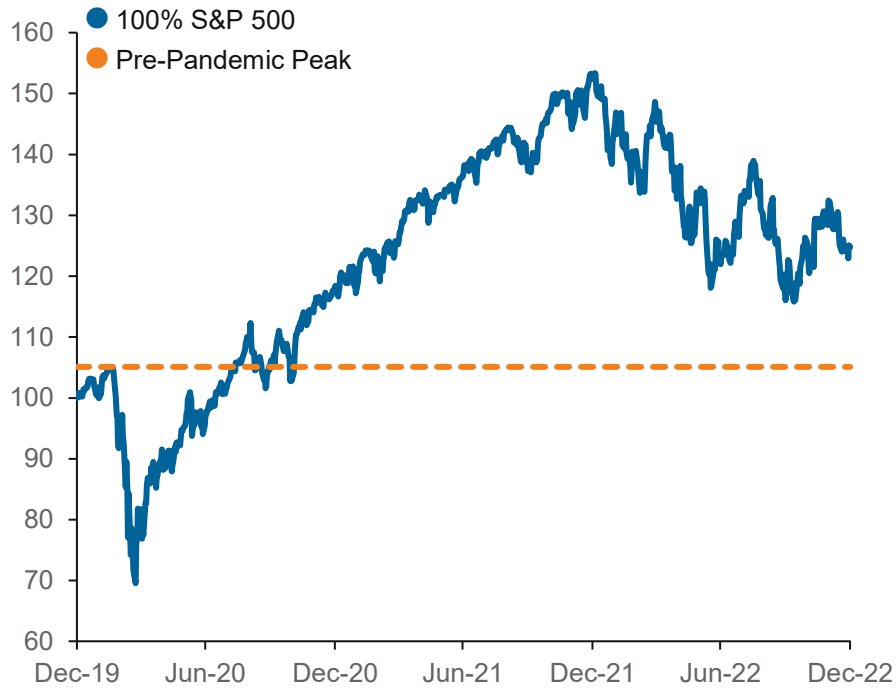
Callan Periodic Table of Investment Returns

Monthly Returns												Annual Returns
Jan 2022	Feb 2022	Mar 2022	Apr 2022	May 2022	Jun 2022	Jul 2022	Aug 2022	Sep 2022	Oct 2022	Nov 2022	Dec 2022	2022
Emerging Market Equity	Small Cap Equity	Real Estate	High Yield	Dev ex-U.S. Equity	U.S. Fixed Income	Small Cap Equity	Emerging Market Equity	High Yield	Small Cap Equity	Emerging Market Equity	Global ex-U.S. Fixed Income	High Yield
-1.89%	1.07%	4.47%	-3.56%	0.83%	-1.57%	10.44%	0.42%	-3.97%	11.01%	14.83%	1.31%	-11.19%
Global ex-U.S. Fixed Income	High Yield	Large Cap Equity	U.S. Fixed Income	U.S. Fixed Income	Global ex-U.S. Fixed Income	Large Cap Equity	Small Cap Equity	U.S. Fixed Income	Large Cap Equity	Dev ex-U.S. Equity	U.S. Fixed Income	U.S. Fixed Income
-1.96%	-1.03%	3.71%	-3.79%	0.64%	-4.50%	9.22%	-2.05%	-4.32%	8.10%	10.65%	-0.45%	-13.01%
U.S. Fixed Income	Global ex-U.S. Fixed Income	Small Cap Equity	Real Estate	Emerging Market Equity	Emerging Market Equity	Real Estate	High Yield	Global ex-U.S. Fixed Income	Dev ex-U.S. Equity	Real Estate	Dev ex-U.S. Equity	Dev ex-U.S. Equity
-2.15%	-1.11%	1.24%	-5.48%	0.44%	-6.64%	7.96%	-2.30%	-5.87%	5.51%	6.73%	-0.48%	-14.29%
High Yield	U.S. Fixed Income	Dev ex-U.S. Equity	Emerging Market Equity	High Yield	High Yield	High Yield	U.S. Fixed Income	Large Cap Equity	Real Estate	Large Cap Equity	High Yield	Large Cap Equity
-2.73%	-1.12%	1.16%	-5.56%	0.25%	-6.73%	5.90%	-2.83%	-9.21%	2.99%	5.59%	-0.62%	-18.11%
Dev ex-U.S. Equity	Dev ex-U.S. Equity	High Yield	Dev ex-U.S. Equity	Large Cap Equity	Small Cap Equity	Dev ex-U.S. Equity	Large Cap Equity	Dev ex-U.S. Equity	High Yield	Global ex-U.S. Fixed Income	Emerging Market Equity	Global ex-U.S. Fixed Income
-4.41%	-1.56%	-1.15%	-6.57%	0.18%	-8.22%	4.97%	-4.08%	-9.26%	2.60%	5.58%	-1.41%	-18.70%
Large Cap Equity	Real Estate	Emerging Market Equity	Global ex-U.S. Fixed Income	Small Cap Equity	Large Cap Equity	U.S. Fixed Income	Dev ex-U.S. Equity	Small Cap Equity	Global ex-U.S. Fixed Income	U.S. Fixed Income	Real Estate	Emerging Market Equity
-5.17%	-2.47%	-2.26%	-6.83%	0.15%	-8.25%	2.44%	-4.67%	-9.58%	-0.14%	3.68%	-2.79%	-20.09%
Real Estate	Emerging Market Equity	U.S. Fixed Income	Large Cap Equity	Global ex-U.S. Fixed Income	Real Estate	Global ex-U.S. Fixed Income	Global ex-U.S. Fixed Income	Emerging Market Equity	U.S. Fixed Income	Small Cap Equity	Large Cap Equity	Small Cap Equity
-5.75%	-2.99%	-2.78%	-8.72%	0.01%	-8.69%	1.92%	-4.99%	-11.72%	-1.30%	2.34%	-5.76%	-20.44%
Small Cap Equity	Large Cap Equity	Global ex-U.S. Fixed Income	Small Cap Equity	Real Estate	Dev ex-U.S. Equity	Emerging Market Equity	Real Estate	Real Estate	Emerging Market Equity	High Yield	Small Cap Equity	Real Estate
-9.63%	-2.99%	-3.20%	-9.91%	-4.35%	-9.41%	-0.25%	-6.49%	-12.42%	-3.10%	2.17%	-6.49%	-25.10%

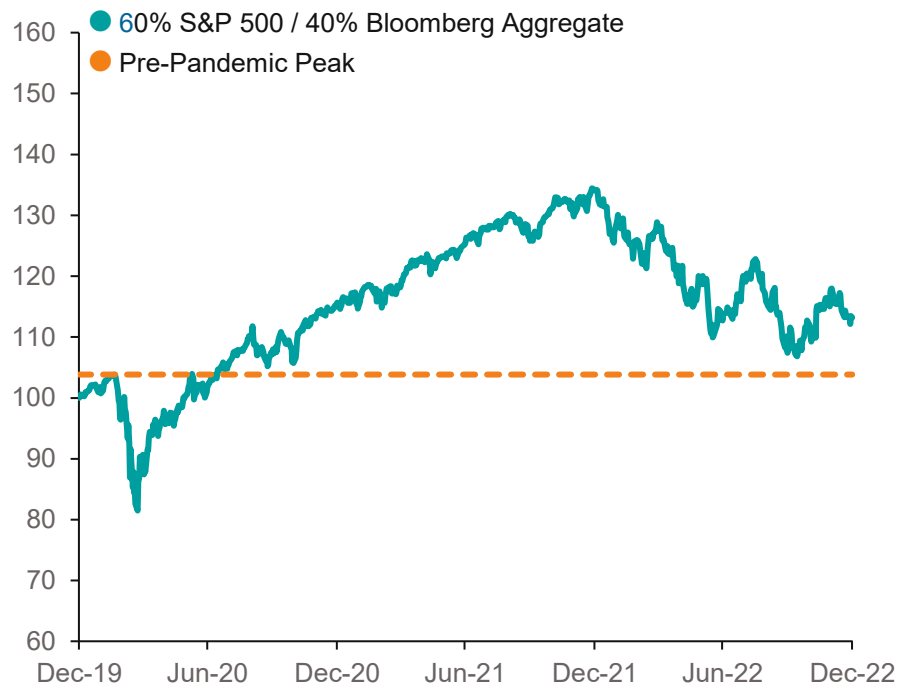
Sources: Bloomberg Aggregate, Bloomberg Corp High Yield, Bloomberg Global Aggregate ex US, FTSE EPRA Nareit Developed, MSCI World ex USA, MSCI Emerging Markets, Russell 2000, S&P 500

Post-Pandemic Market Performance

Growth of $100 Invested on 12/31/19



Growth of $100 Invested on 12/31/19

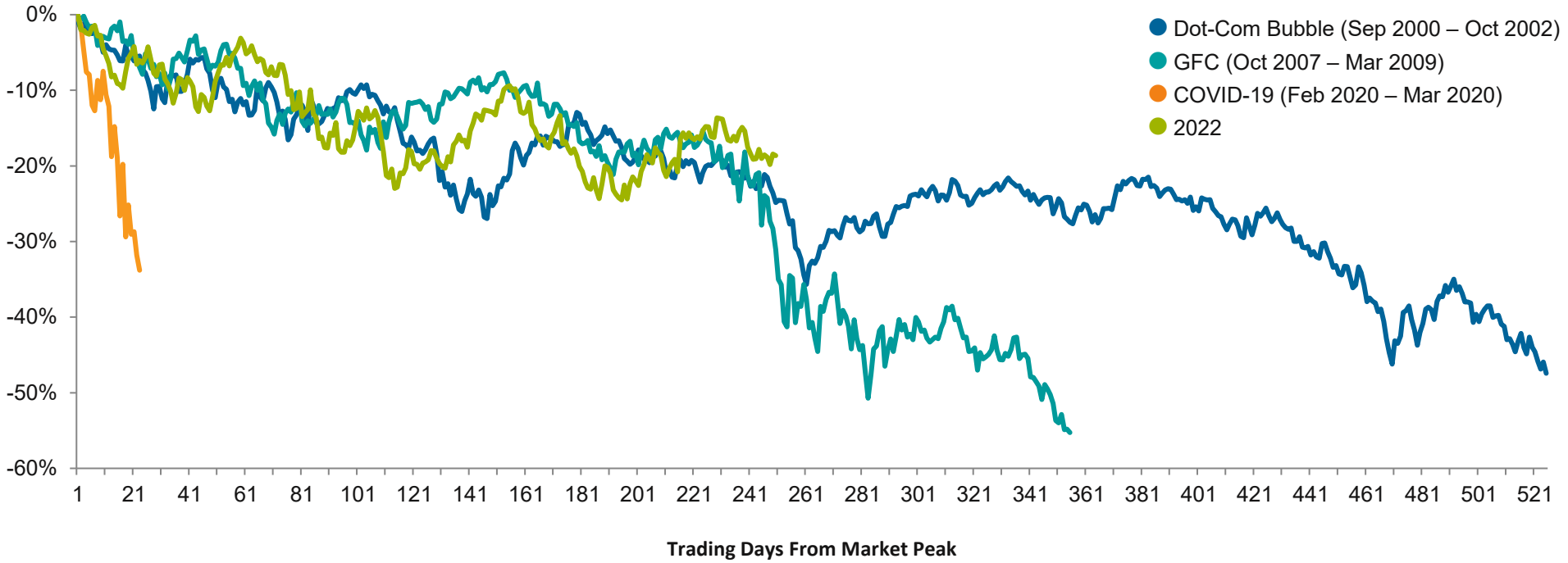


	Investment in S&P 500	Investment in 60% S&P 500 / 40% Bloomberg Agg
Gain from pre-pandemic peak to post-pandemic peak	45.9%	29.4%
Gain over pre-pandemic peak	18.8%	9.0%
Loss from post-pandemic peak	-18.6%	-15.8%
Further loss needed to return to pre-pandemic peak	-15.8%	-8.2%
Total loss if markets decline from post-pandemic peak to pre-pandemic peak	-31.5%	-22.7%

2022 Equity Drawdown: A More 'Typical' Correction?

S&P 500 Cumulative Returns

Market Peak-to-Trough for Recent Corrections vs. 2022 Through 12/31/22

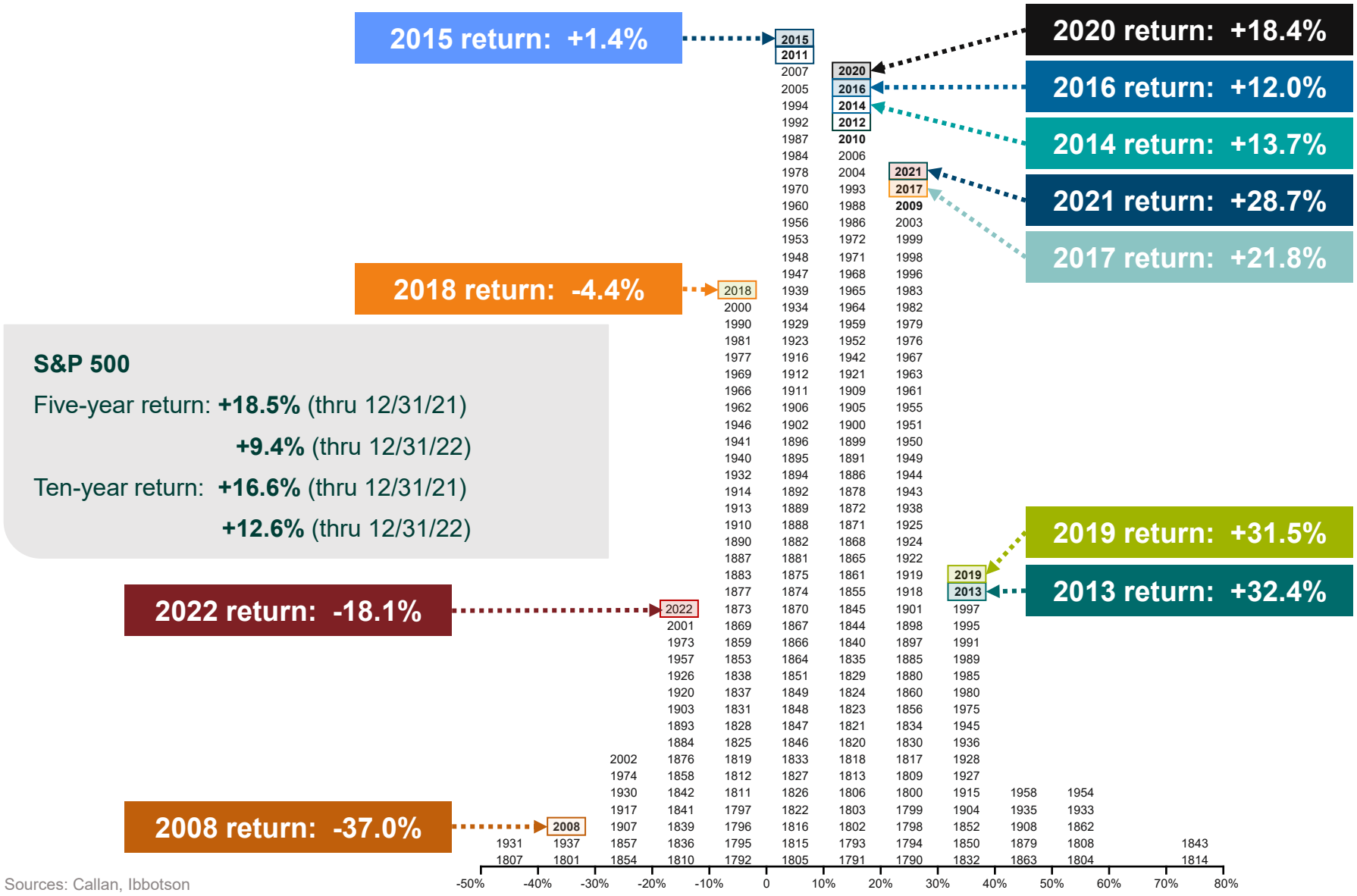


- While the COVID correction was swift and intense, the 2022 correction resembles the GFC and Dot-Com Bubble.
- The 2022 drawdown has been 250 trading days through December.
- It would take another 105 trading days to get to the bottom of the GFC and 275 trading days to get to the bottom of the Tech Bubble.

Sources: Callan, S&P Dow Jones Indices

Stock Market Returns by Calendar Year

2022 YTD performance in perspective: History of the U.S. stock market (233 years of returns)

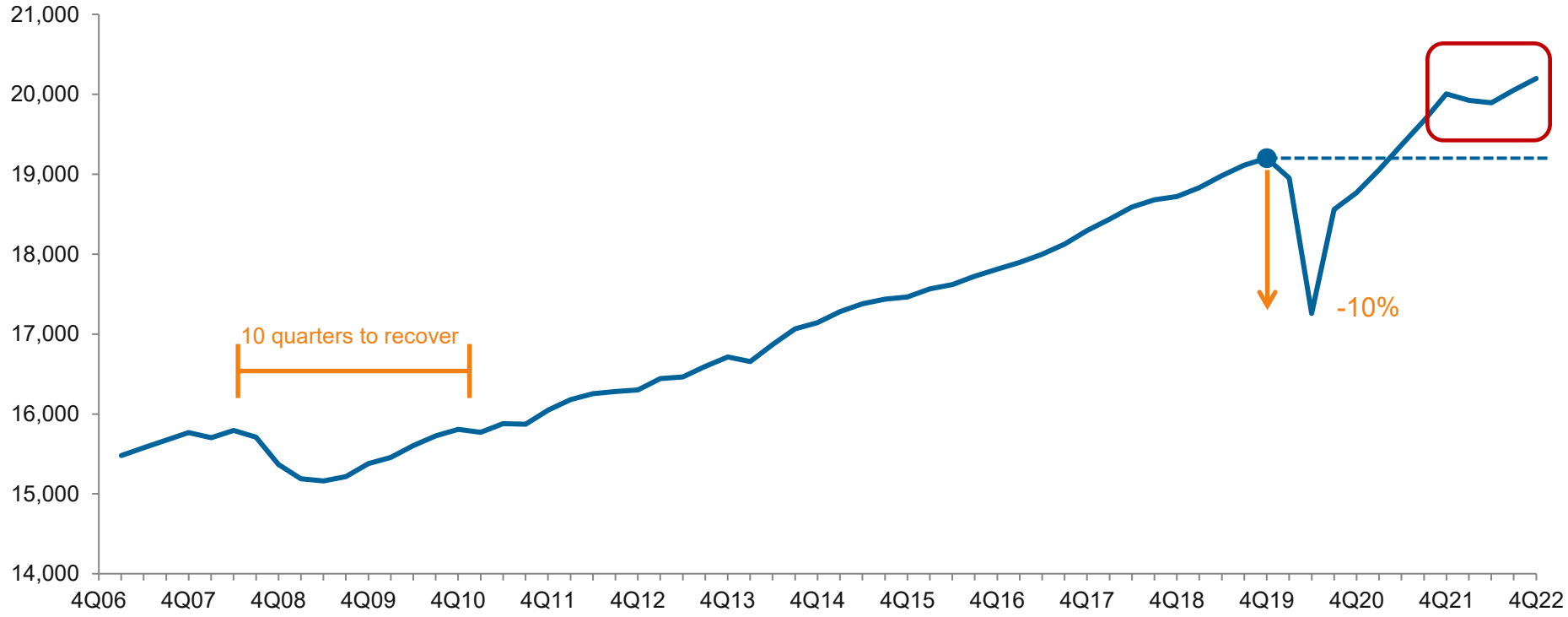


Sources: Callan, Ibbotson

GDP Fell for Two Consecutive Quarters in First Half, Up 3.2% and 2.9% in 3Q and 4Q

Recovered pre-pandemic level in 2Q21 after deepest drop in 75 years

Seasonally Adjusted Real GDP in Billions of Dollars Through 9/30/22



GDP growth in 2022 came in at 2.1% for the year, after starting the year with consecutive quarterly losses

- 3Q22 GDP rose 3.2%, 4Q rose 29%, after falling 1.6% in 1Q22 and 0.6% in 2Q22.
- Loss of business and consumer confidence followed the start of the conflict in Ukraine.
- Consumer wealth hit by stock and bond market drop, and now a sharp slowdown in residential housing, as mortgage rates doubled from the start of the year.

Source: Federal Reserve Bank of St. Louis

The Stock Market Is Not the Economy

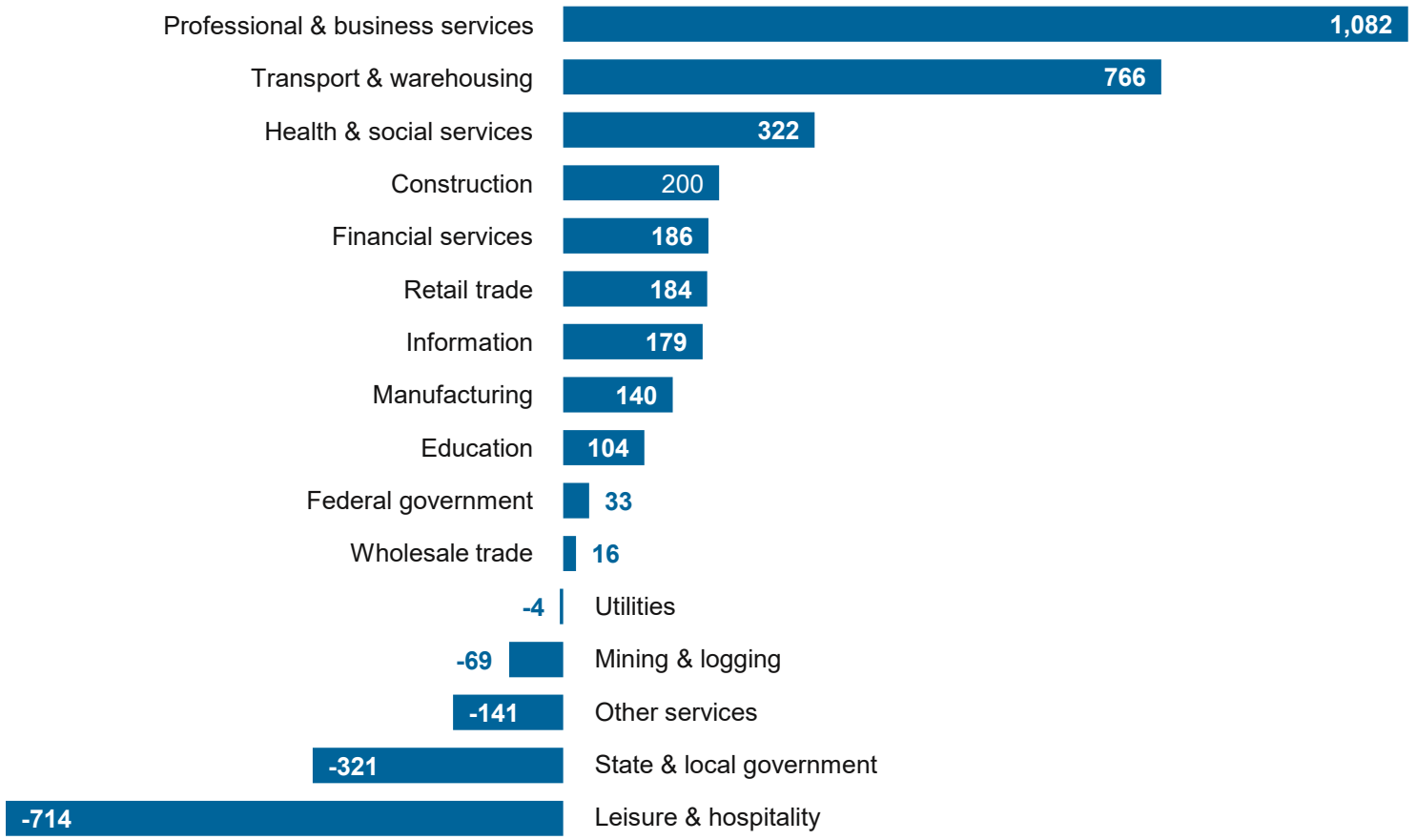
- The job market lost over 22 million jobs in the pandemic, and just regained the pre-pandemic high water mark in the summer of 2022.
- Steep structural challenges face many job-laden sectors of the economy that are underrepresented in the current stock market valuation.

Sources: St. Louis FRED, S&P Dow Jones Indices

While the Recovery Continues, Employment Landscape Remains Uneven

Leisure / hospitality remains by far the hardest-hit sector for job losses

Change in Payroll Employment Since 12/31/19 through 12/31/22 (thousands)

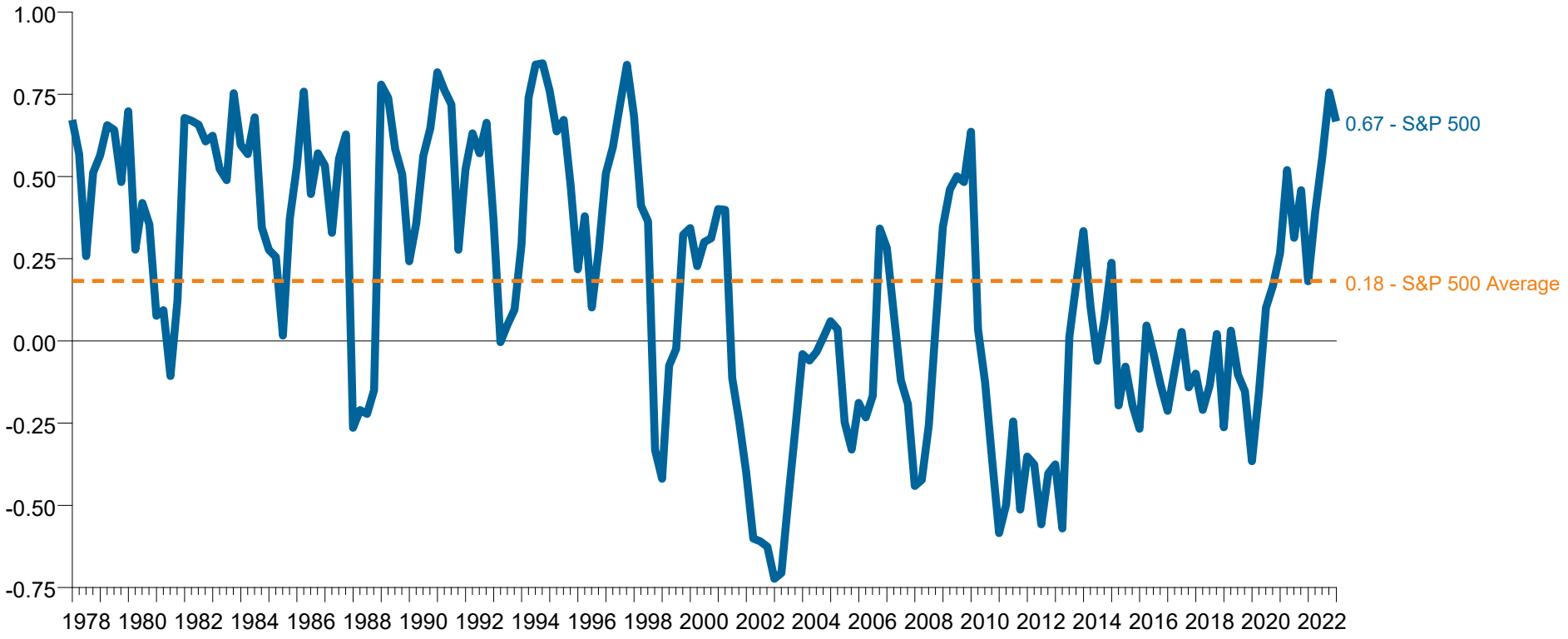


Sources: IHS Markit, Department of Labor

Did Diversification Fail in 2022?

Stocks and bonds down together in each of the first three quarters of 2022; up together in 4Q22

Rolling 1 Year Correlation of S&P 500 to Bloomberg Aggregate for 45 Years Ended 12/31/22



Are we seeing a return to a regime of higher correlation between stocks and bonds, potentially lessening the diversification benefit of bonds to stocks?

Sources: Bloomberg, Callan, S&P Dow Jones Indices

Did Diversification Fail in 2022?

How capital markets interact under stress

S&P 500 was down 4.6% in 1Q22, 16.1% in 2Q, and another 4.9% in 3Q

- Worst year since 2008 (-18.1%) despite strong rebound in 4Q (+7.6%)

Bloomberg Aggregate was down 5.9% in 1Q22, 4.7% in 2Q, and another 4.8% in 3Q; -13.1% for the year

Less decline in local currency around the global markets, but the strong U.S. dollar made things worse for U.S. investors

- MSCI ACWI ex USA down 16.0% in USD, 9.6% in local currency
- Global Aggregate down 16.3% in USD, 11.2% hedged to the U.S. dollar

How often does this happen?

- Stocks and bonds declined together in 10% of all quarters back to 1926.
- In quarters when the stock market declined, bonds declined 33% of the time.

The "curse" of zero correlation

- In a market drawdown, investors want correlation between stocks and bonds to be -1: when stocks go down, bonds are likely to be up.
- In real life, correlation of stocks to bonds is closer to zero.
  - *Zero correlation = when one asset class is down, the probability that the other asset class is up or down is similar; zero means no discernable pattern between the returns of the two asset classes.*

In normal times, correlation close to zero suggests a strong diversification benefit

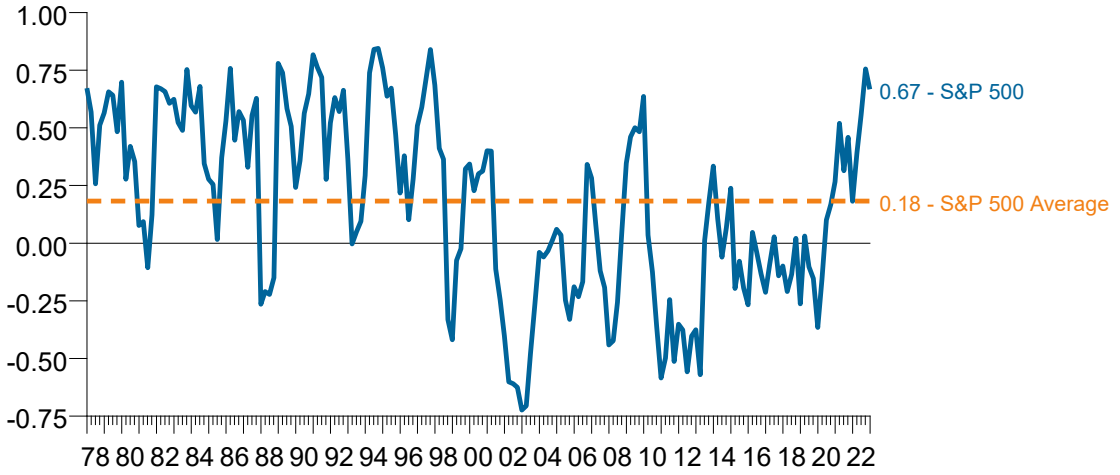
- A diversified portfolio of stocks and bonds will not see negative returns for stocks and bonds together 90% of the time.
- Note that when stocks are down, bonds can also be down about 1/3 of the time.

Correlation Changes With Interest Rate Regimes and Economic Conditions

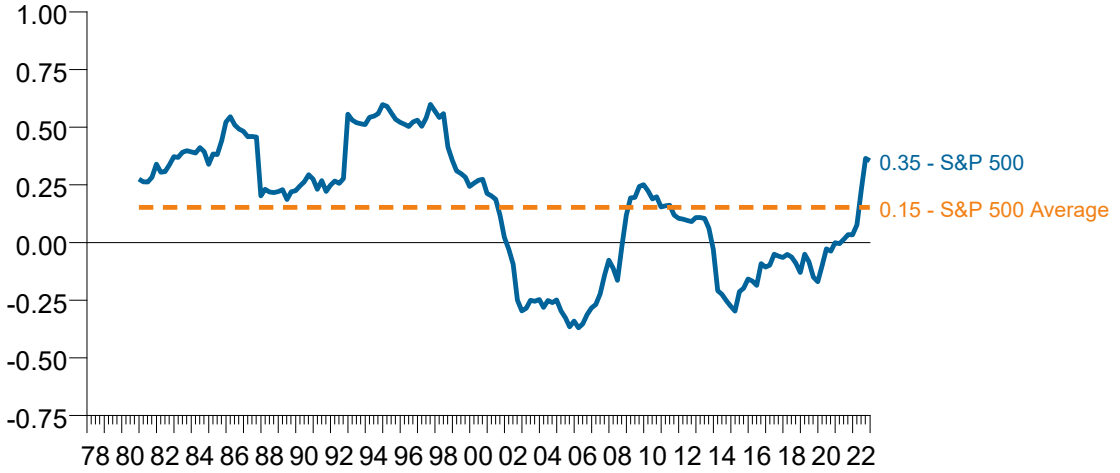
- Rolling one-year correlation spiked in 2021 and 2022.
- Rolling five-year shows how correlation runs in cycles over time.
- Table below examines correlation and the occurrence of negative returns for stocks and bonds together in three interest rate and inflation regimes. Regime 2 shows higher stock/bond correlation and suggests less diversification benefit under rising rates and inflation.

Period	Regime Description	Negative Return Frequency	Stock/ Bond Correlation
Regime 1 1926–1965	Low, stable interest rates	7%	0.13
Regime 2 1966–1981	Secular rate rise	26%	0.48
Regime 3 1982–present	Secular rate decline	6%	0.05

Rolling 1 Year Correlation of S&P 500 to Bloomberg Aggregate



Rolling 5 Year Correlation of S&P 500 to Bloomberg Aggregate



Sources: Bloomberg, Callan, S&P Dow Jones Indices

Recession Watch

Common definition of recession: two consecutive quarters of decline in GDP

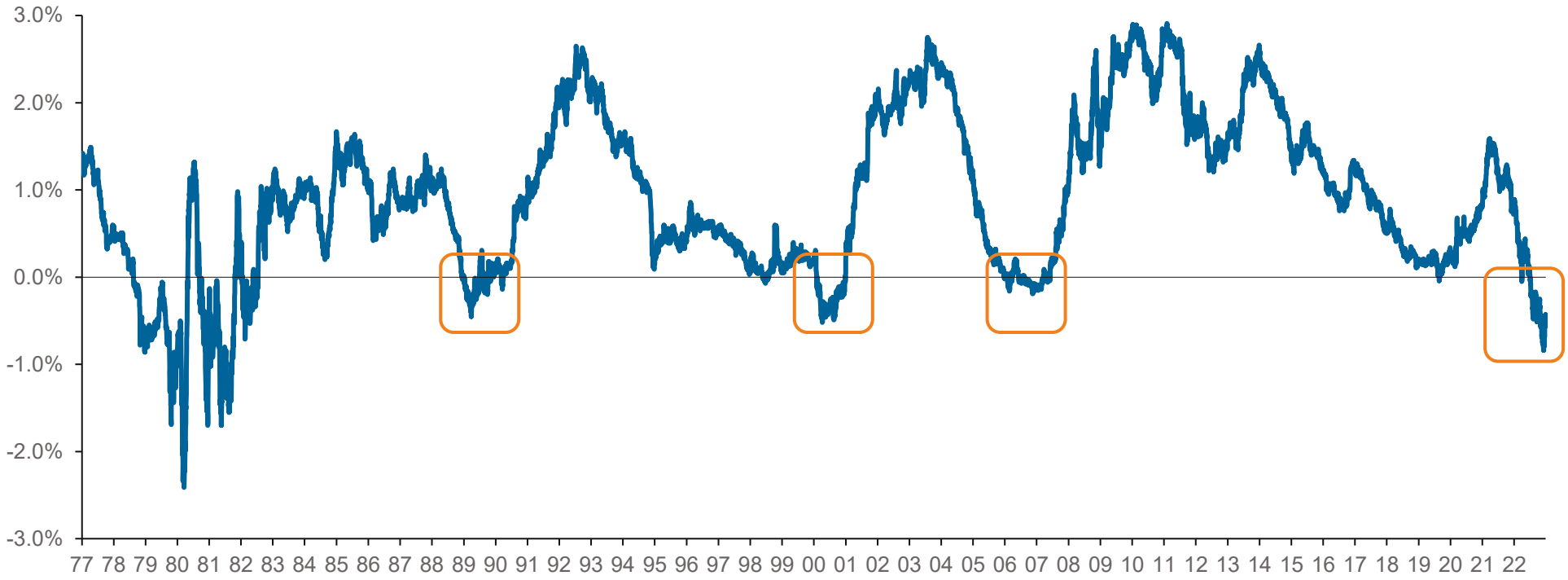
- Actual definition: The National Bureau of Economic Research (NBER) Business Cycle Dating Committee defines a recession as "a significant decline in economic activity that is spread across the economy and that lasts more than a few months."

Indicators to watch

- GDP declined in 1Q and 2Q22, the proverbial two-quarters-in-a-row rule of thumb that often indicates recession.
  - However, GDP rose 3.2% in 3Q, reversing the trend.
- Housing market is weakening with more than a doubling of mortgage rates since the start of 2022.
- Job market remains strong, with substantial job creation year to date; job listings remain larger than the number of seekers.
  - Initial unemployment claims are creeping up: a leading indicator.
- PMI is showing initial signs of recession in the business activity and output indices; PMI is also a leading indicator.
- Exports have weakened with slowing growth overseas, geopolitical uncertainty, and a strong dollar.
- Inflation remains historically high, sapping purchasing power and eroding confidence.
- Federal Reserve is committed to raising interest rates to combat inflation; target Fed Funds rate is 4.25%–4.50%.
- Fed's resolve may be tested if economy slows sharply in the fourth quarter or the first half of 2023.

Is the Bond Market Expecting a Recession?

10-Year Treasury vs. 2-Year Treasury Spread



- The 10-year to 2-year Treasury spread went negative two days in April and has been negative for most of 3Q and 4Q.
- Inversion in this spread does not always forecast a recession, but most recessions are preceded by a yield curve inversion.
  - Yield curve inversion means investors expect a recession will occur and that interest rates will be cut, and therefore increase their demand for securities with longer duration, and therefore a higher potential for capital gain when rates fall.
- The 10-year Treasury to cash spread turned negative, which may be a better indicator of whether recession has already struck.

Source: Federal Reserve Bank of St. Louis

Callan

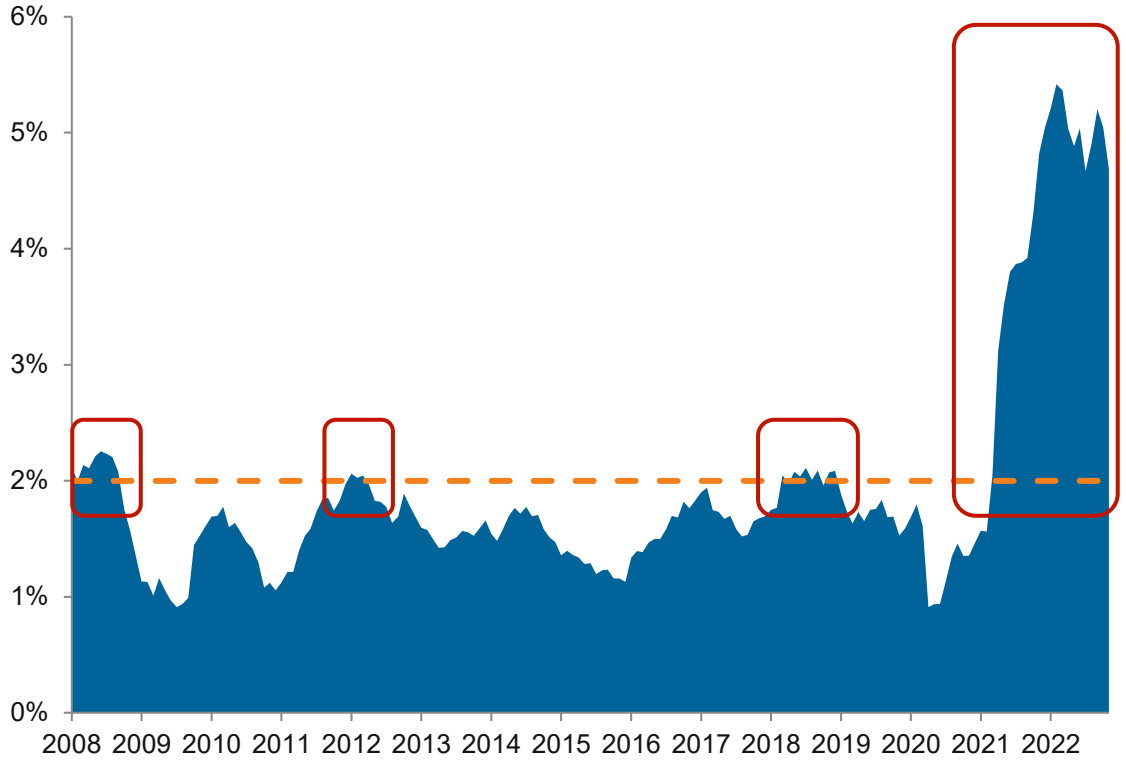
Current Market Conditions: Special Focus on Inflation

The Fed's New Inflation Framework

Targeting core Personal Consumption Expenditures Index

- Inflation worries are in the headlines, and the data are challenging the Fed's dual mandate to manage inflation and unemployment.
- Inflation had consistently undershot the Fed's 2% target, prompting the Fed to change its inflation framework.
- Fed's aim is to achieve an average of 2% inflation over the medium term, which is not specifically defined.
- Personal Consumption Expenditures (PCE) Index is the Fed's target, different from and typically lower than CPI-U, which had a year-over-year gain of 7.1% as of Nov. 30. Core PCE dropped from 5.4% in February to 4.7% in July, inched back up to 5.2% in September, and fell to 4.7% again in November.

PCE Excluding Food and Energy (Chain-Type Price Index) Year-Over-Year Change (Through 11/30/22)



Sources: Federal Reserve Bank of St. Louis, U.S. Bureau of Economic Analysis

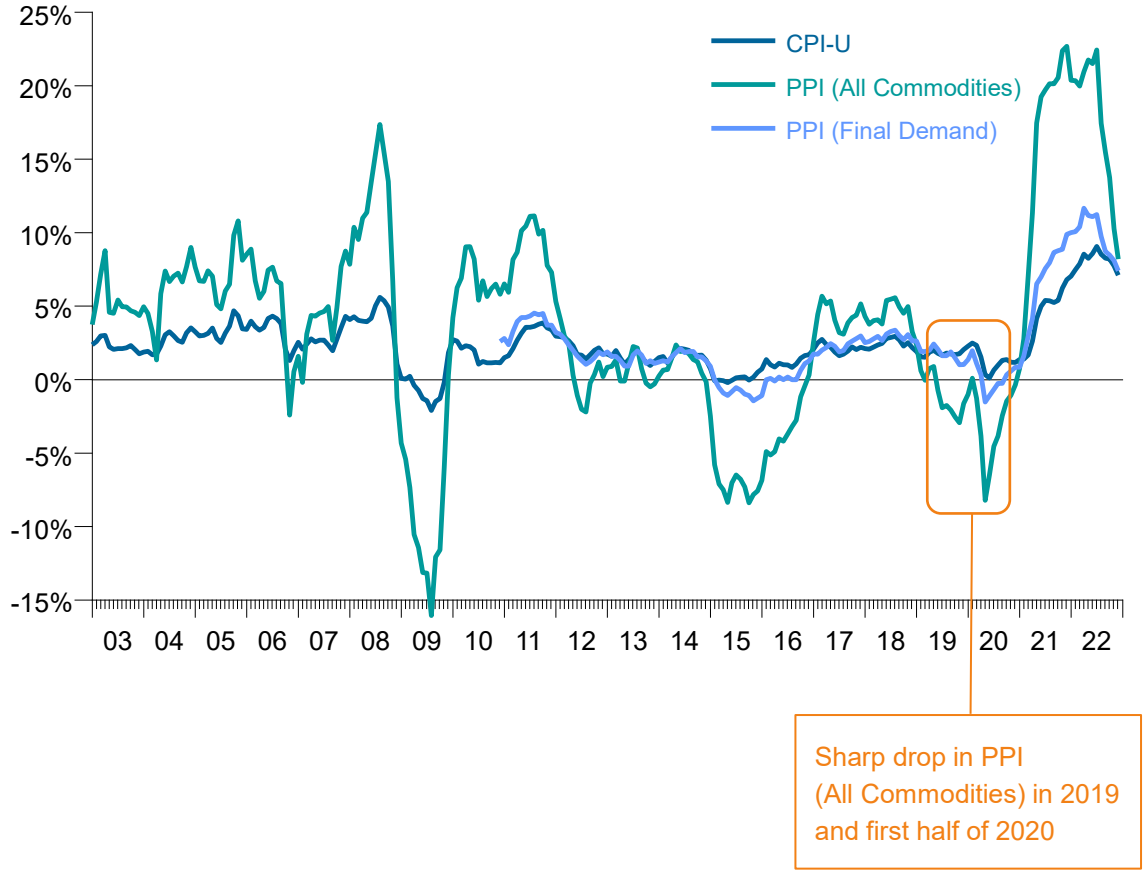
Inflation Rebounds and Spurs Headline Concerns

CPI and PPI remain at sharply elevated rates

Big drop for inflation at start of pandemic

- Sustained rise in 2022 CPI-U represents added pressure from the war in Ukraine on top of kinks in supply chains and labor markets after more than a year of global economic disruption and shutdown.
- Most recent CPI is up 7.1% year-over year; the 2Q 9.1% rise was the highest recorded inflation since 4Q81.
- Producer prices had been tumbling for more than a year prior to the pandemic; recovery to 2018 price ***levels*** happened by 2Q21, and generated eye-popping year-over-year percentage changes. PPI rose sharply through 2Q but has dropped by almost two-thirds through November.
- Prices for transportation goods, energy, and food are driving the elevated rates in both the Consumer and Producer Price Indices.

Consumer and Producer Price Indices – Inflation Year-Over-Year

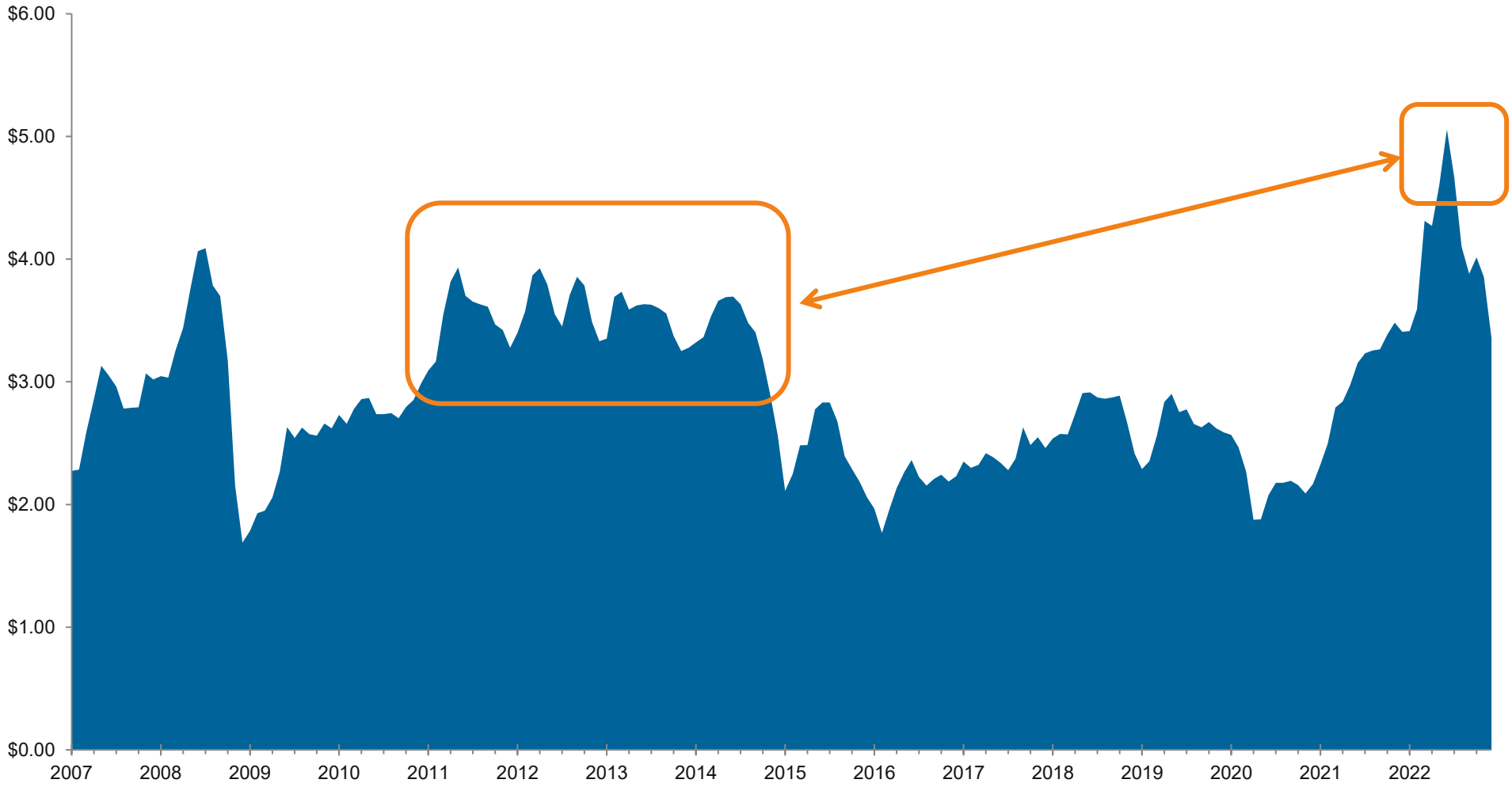


Source: Federal Reserve Bank of St. Louis (through November 2022)

Gasoline Prices Are Top of Mind for Consumers, Now Far Above Early 2010s Peaks

A highly visible inflation measure; feeds expectations

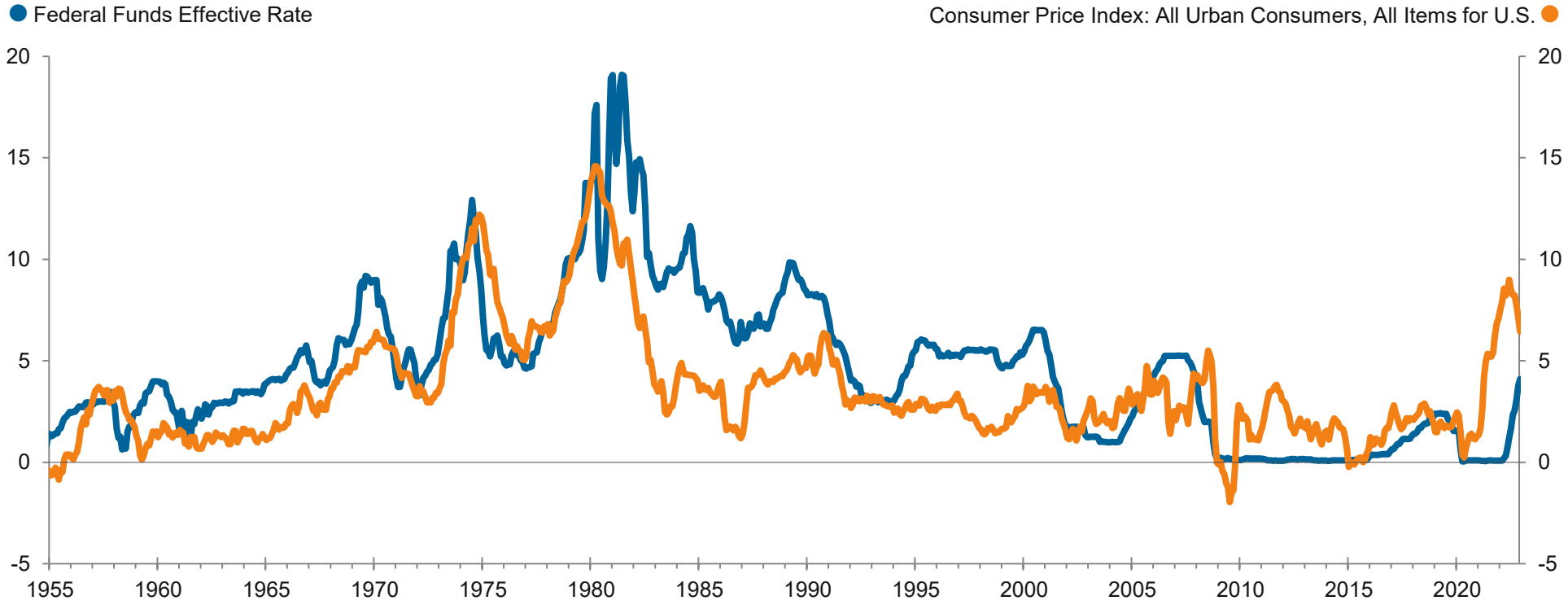
Average Price: Gasoline, Unleaded Regular (Cost per Gallon / 3.785 Liters) in U.S. City Average Through 11/30/22



Source: Federal Reserve Bank of St. Louis

Inflation vs. Interest Rates Over the Long Term

Federal Funds vs. Consumer Price Index



- We are now looking at an inflation spike that is above the last rise in inflation from 2005–08.
- The gap between inflation and the Fed Funds rate is larger than that seen just before the GFC.
  - Yield history suggests that the Fed Funds rate is typically above inflation, not below it.
- Recent gaps between CPI and the Fed Funds rate are unprecedented in the history of the CPI-U, going back to 1955
  - Resolution to the historical relationship requires the Fed Funds rate to rise and inflation to fall.

Source: Federal Reserve Bank of St. Louis

Inflation Is Currently a Problem: What Key Variables Should We Track?

The majority of the working-age and younger population has no experience with sustained inflation

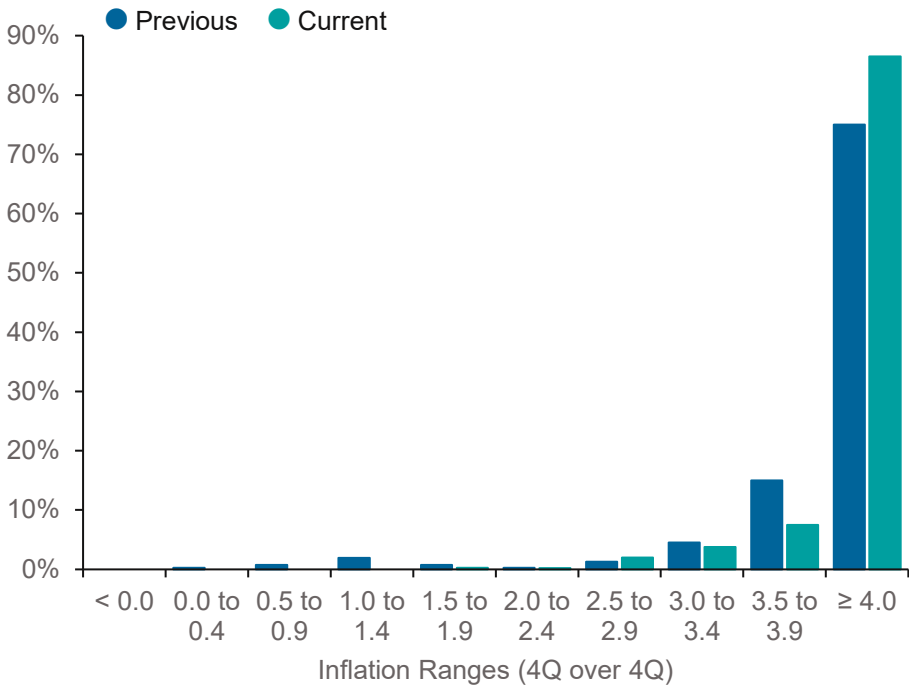
Key variables to track:

- Personal Consumption Expenditures Index—the Fed's preferred measure of inflation
  - Typically lower and less volatile than CPI-U
- Spread between inflation and the Fed Funds rate—at an extreme, suggesting some adjustment is coming in both variables
- Five-year, five-year forward rate, and 10-year breakeven rate
  - Bond market expectations
  - Long enough horizon to minimize short-term emotion and reaction to immediate events
- Philadelphia Fed survey of professional forecasters

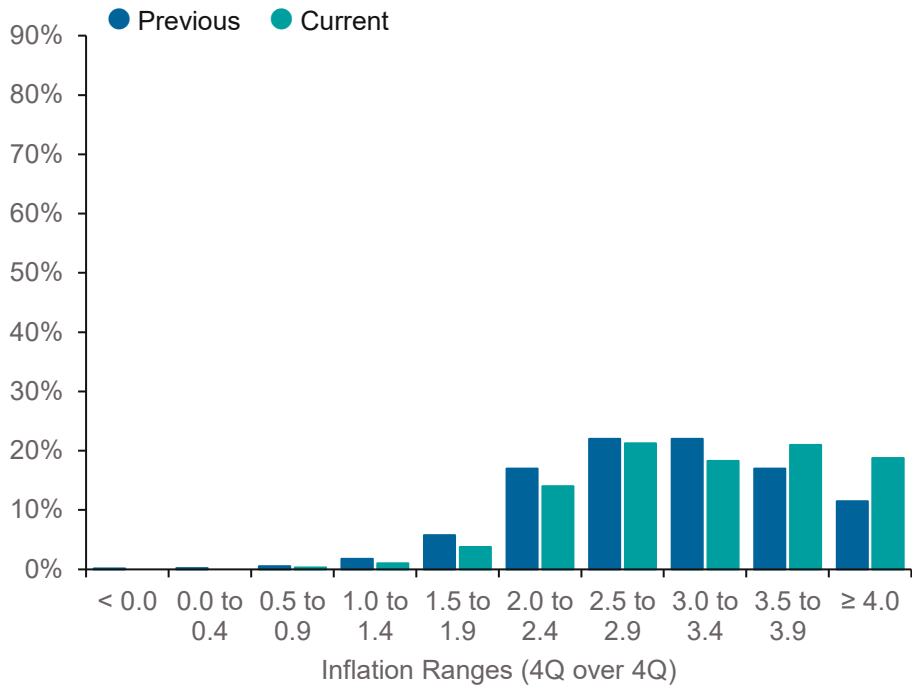
Inflation Forecasts: Survey of Professional Forecasters, Short Term

PCE inflation

Mean Probabilities for Core PCE Inflation in 2022



Mean Probabilities for Core PCE Inflation in 2023



2022 inflation forecasts have risen substantially throughout 2022.

- Inflation above 4% now forecast with about an 85% probability

Forecasts for 2023 are lower than for 2022.

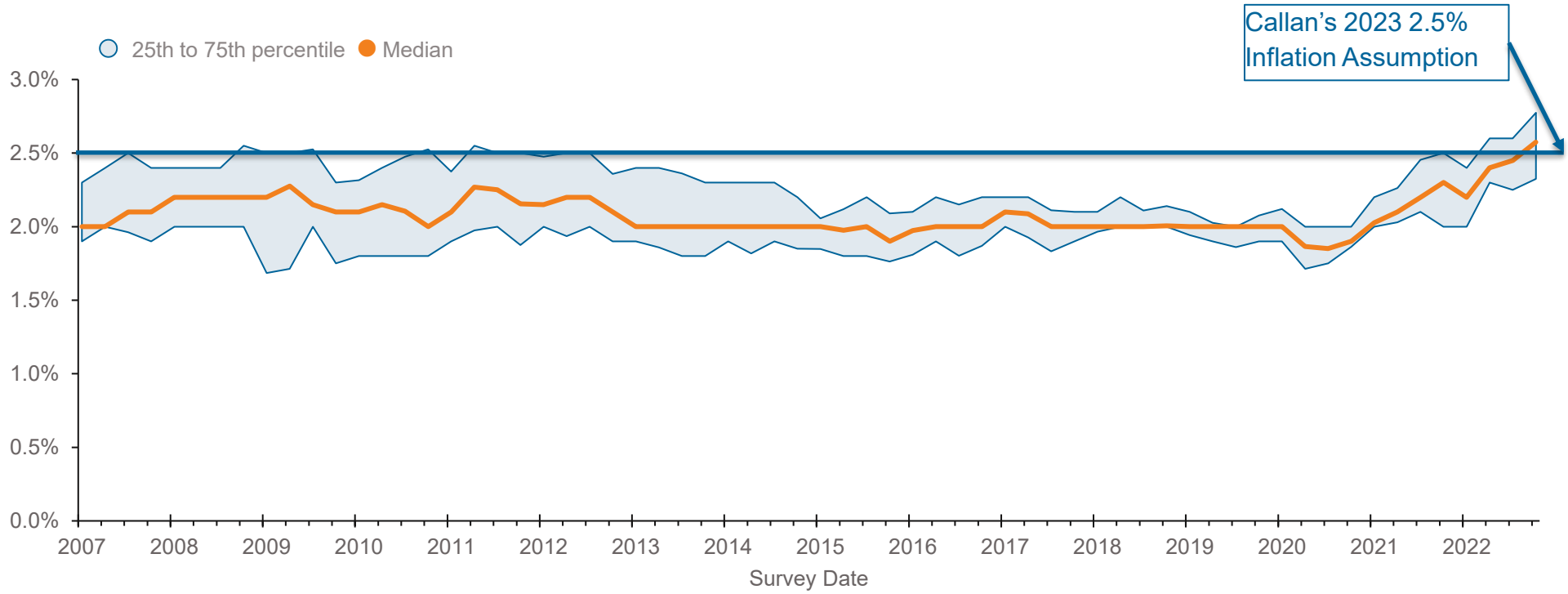
- 2.5% to 2.9% the highest probability scenario
- Higher inflation forecasts also claim a large portion of responses

Source: Philadelphia Federal Reserve, Fourth Quarter 2022 Survey of Professional Forecasters

Inflation Forecasts: Survey of Professional Forecasters, 10-Year Horizon

PCE inflation

Projections for the 10-Year Annual-Average Rate of PCE Inflation

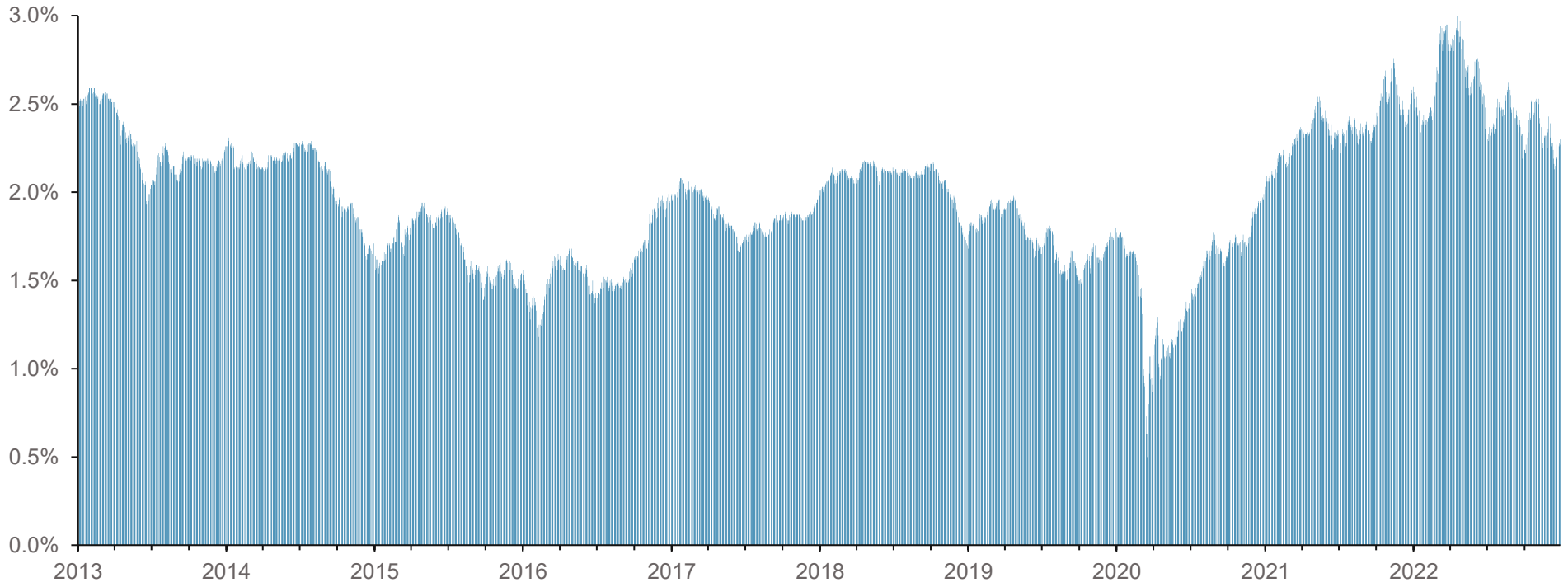


- Ten-year forecasts for inflation have risen since the start of 2021.
- In the most recent survey published in November, the 10-year forecast was 2.6%.

Source: Philadelphia Federal Reserve, *Fourth Quarter 2022 Survey of Professional Forecasters*

10-Year Breakeven Rate: Bond Market Forecast of Inflation

10-Year Breakeven Inflation Rate

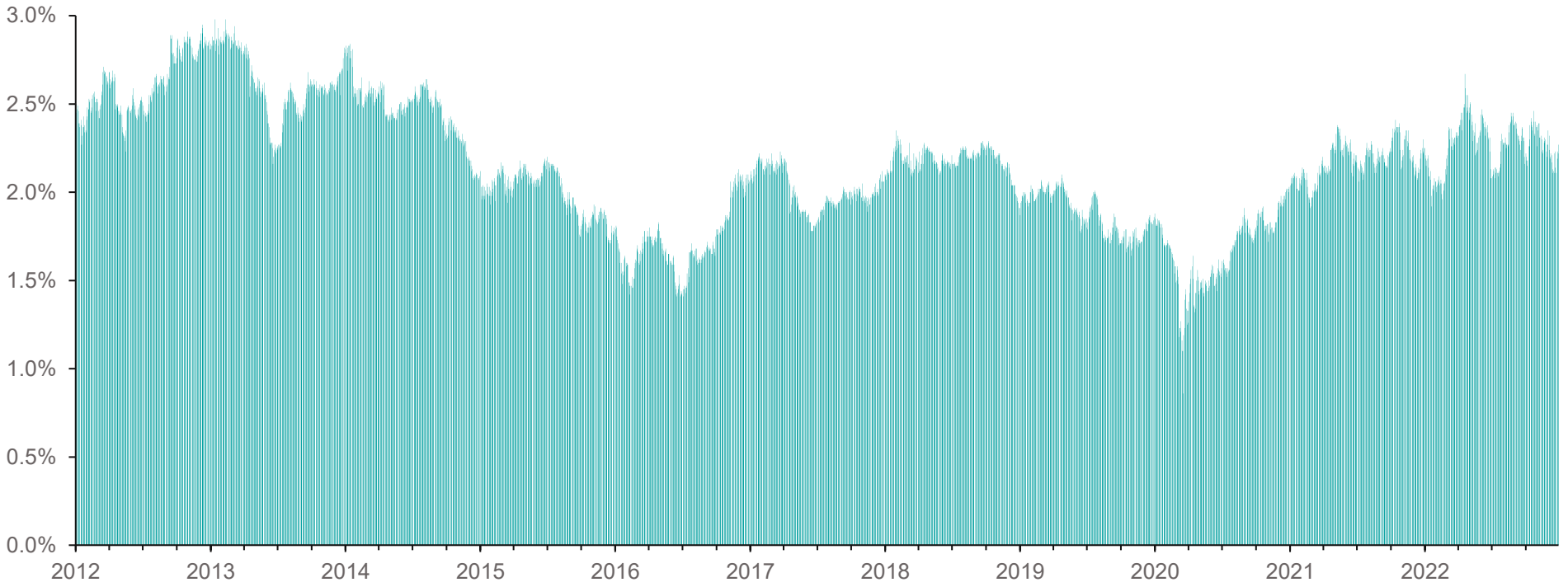


- 10-year breakeven inflation rate is the difference in yield between the nominal 10-year Treasury and the 10-year Treasury Inflation-Protected Security (TIPS).
  - Extra yield nominal Treasury would have to earn to maintain the same purchasing power as a TIPS investment.
- Values of implied inflation reached 3% in April but have since declined below 2.5%.
  - Includes current high levels of inflation

Source: Federal Reserve Bank of St. Louis

5-Year, 5-Year Forward Rate: Bond Market Forecast of Inflation

5-Year, 5-Year Forward Inflation Expectation Rate



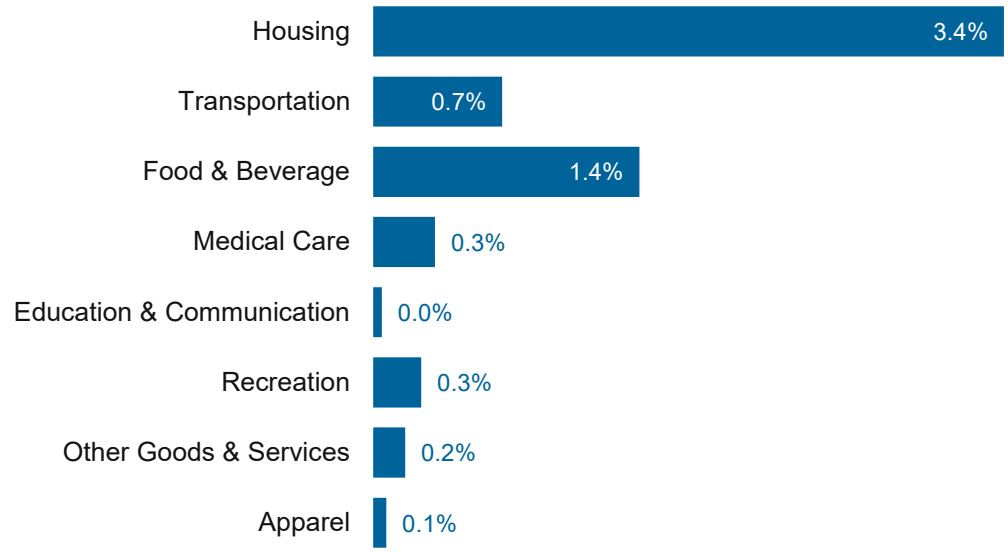
- The 5-year, 5-year forward rate is the bond market's estimate of the 5-year inflation rate 5 years from now.
  - Excludes current high levels of inflation
- The market inflation expectation for the years 2027 through 2031 is approaching 2% after peaking at 2.7% in April.

Source: Federal Reserve Bank of St. Louis

Contributors to Recent Inflation: Primary Categories

- Transportation inflation has finally begun to trend downward.
- Housing took over as the biggest weighted contributor to headline inflation due to the category's high weight in the index (42.4%).
- Transportation's downward trend in inflation has been somewhat offset by an upward trend for Food & Beverage and Housing.

Contribution to December 2022 Year-Over-Year Inflation

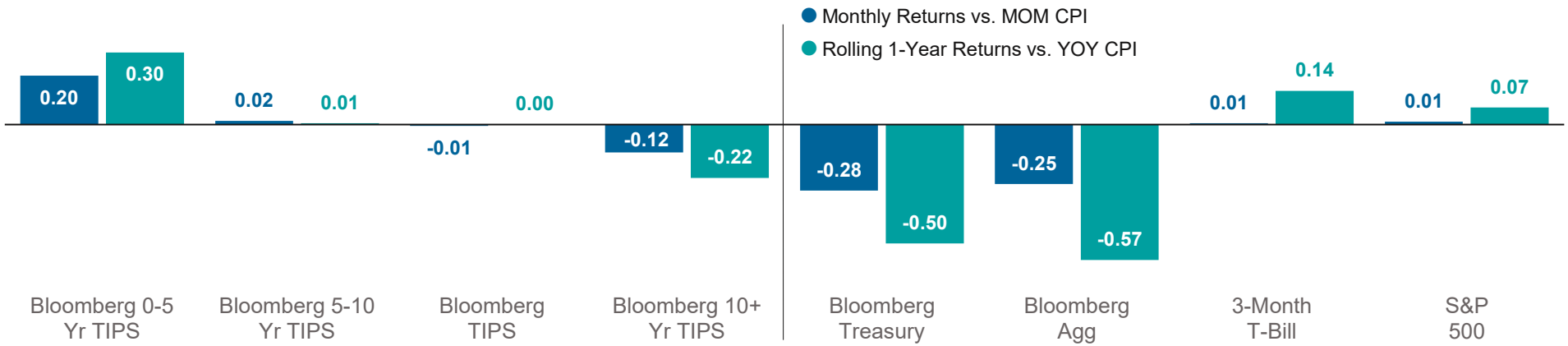


Primary Category	Primary Category Weight	Year-over-Year Change											
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
All Items	100.0%	7.5%	7.9%	8.5%	8.3%	8.6%	9.1%	8.5%	8.3%	8.2%	7.7%	7.1%	6.5%
Housing	42.4%	5.7%	5.9%	6.4%	6.5%	6.9%	7.3%	7.4%	7.8%	8.0%	7.9%	7.8%	8.1%
Transportation	18.2%	20.8%	21.1%	22.6%	19.9%	19.4%	19.7%	16.4%	13.4%	12.6%	11.2%	7.8%	3.9%
Food & Bev	14.3%	6.7%	7.6%	8.5%	9.0%	9.7%	10.0%	10.5%	10.9%	10.8%	10.6%	10.3%	10.1%
Medical Care	8.5%	2.5%	2.4%	2.9%	3.2%	3.7%	4.5%	4.8%	5.4%	6.0%	5.0%	4.2%	4.0%
Education & Communication	6.4%	1.6%	1.6%	1.5%	1.0%	0.8%	0.8%	0.5%	0.5%	0.2%	0.0%	0.7%	0.7%
Recreation	5.1%	4.7%	5.0%	4.8%	4.3%	4.5%	4.6%	4.4%	4.1%	4.1%	4.1%	4.7%	5.1%
Other Goods & Svcs	2.7%	4.9%	5.6%	5.5%	5.7%	6.3%	6.7%	6.3%	6.6%	6.9%	6.5%	7.0%	6.4%
Apparel	2.5%	5.3%	6.6%	6.8%	5.4%	5.0%	5.2%	5.1%	5.1%	5.5%	4.1%	3.6%	2.9%

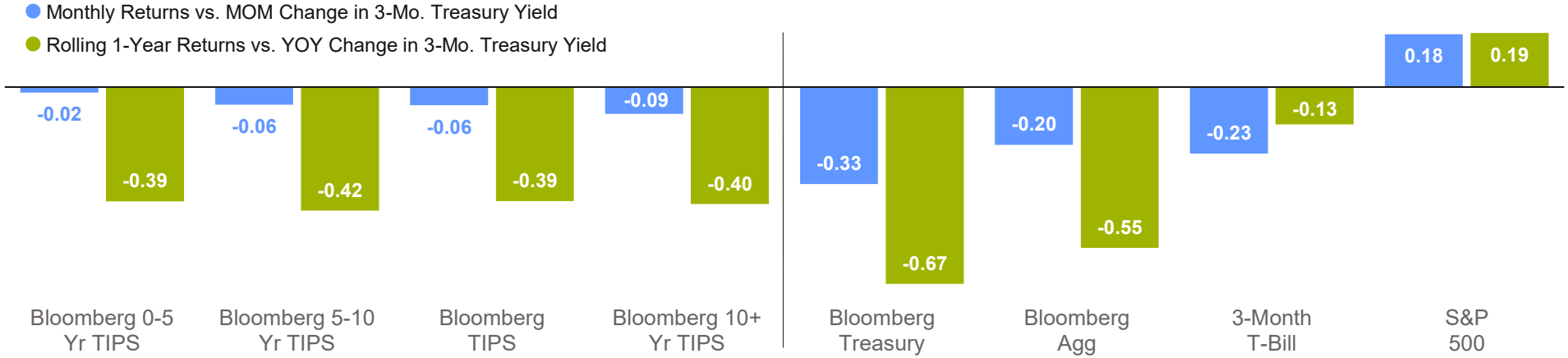
Source: U.S. Bureau of Labor Statistics

Do TIPS Hedge Inflation?

Correlation of Benchmark Returns vs. CPI Inflation



Correlation of Benchmark Returns vs. Changes in 90-day T-Bill Yield

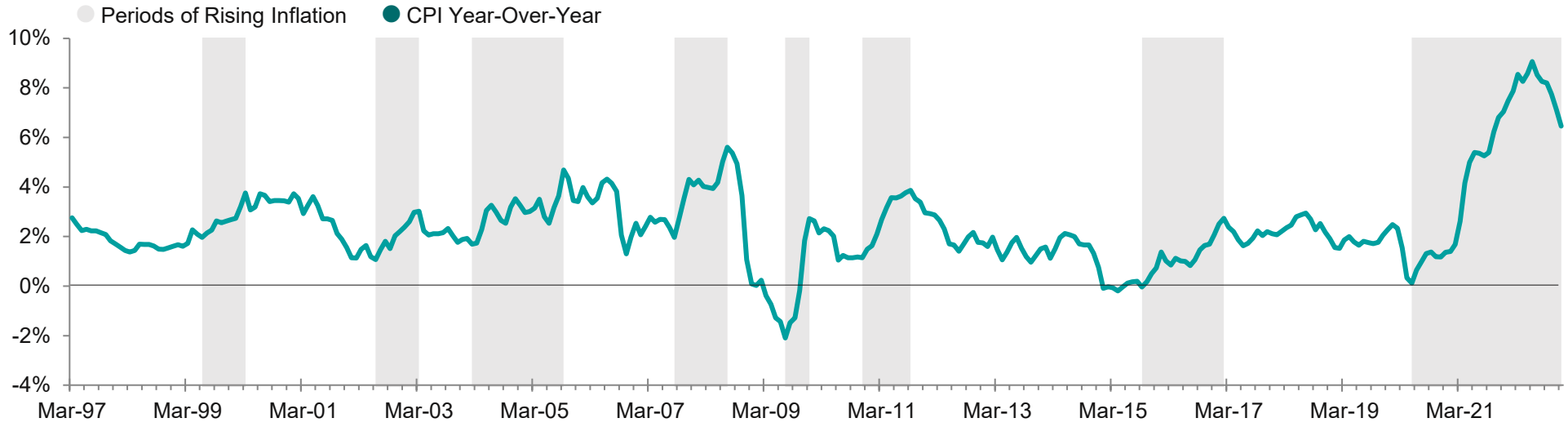


The correlation between the broad TIPS index and inflation is similar to that of cash and equities.

Short duration TIPS appear to be a better hedge to inflation than intermediate and longer-dated TIPS.

– Intermediate and longer-dated TIPS react just as strongly to movement in interest rates as they do to inflation, if not more.

TIPS May Not be a Pure Inflation Hedge, but Recent Performance Is NOT Typical



	Cumulative Bloomberg TIPS Nominal Return	Total Inflation Over Period	Cumulative Bloomberg TIPS Real Return	Change in 90-day Treasury Yield
7/1/99 – 3/31/00	4.85%	3.01%	1.85%	1.10%
7/1/02 – 3/31/03	11.60%	2.39%	9.21%	-0.56%
3/1/04 – 9/30/05	7.67%	6.77%	0.90%	2.59%
9/1/07 – 7/31/08	10.99%	5.79%	5.20%	-2.33%
8/1/09 – 12/31/09	4.82%	0.28%	4.54%	-0.12%
12/1/10 – 9/30/11	8.88%	3.70%	5.18%	-0.15%
10/1/15 – 2/28/17	5.38%	2.38%	3.01%	0.53%
6/1/20 – 12/31/22	-1.11%	15.76%	-16.87%	4.28%

Callan

Fixed Income

10-Year Expected Returns

	Income Return	+	Capital Gain/Loss	+	Credit Default	+	Roll Return	=	2023 Expected Return	2022 Expected Return	Change vs 2022
Cash	**2.75%**		**0.00%**		**0.00%**		**0.00%**		**2.75%**	**1.20%**	**1.55%**
1-3 Year G/C	**3.45%**		**0.20%**		**-0.10%**		**0.25%**		**3.80%**	**1.50%**	**2.30%**
1-3 Year Government	3.15%		0.20%		0.00%		0.25%		3.60%		
1-3 Year Credit	3.85%		0.10%		-0.20%		0.25%		4.00%		
Intermediate Gov/Credit	**3.95%**		**0.00%**		**-0.10%**		**0.25%**		**4.10%**	**1.70%**	**2.40%**
Intermediate Gov	3.65%		0.10%		0.00%		0.25%		4.00%		
Intermediate Credit	4.50%		-0.10%		-0.40%		0.25%		4.25%		
Aggregate	**4.30%**		**-0.20%**		**-0.10%**		**0.25%**		**4.25%**	**1.75%**	**2.50%**
Government	3.80%		-0.10%		0.00%		0.25%		3.95%		
Securitized	4.00%		0.00%		0.00%		0.25%		4.25%		
Credit	5.25%		-0.40%		-0.40%		0.25%		4.70%		
Long Duration Gov/Credit	**6.15%**		**-1.70%**		**-0.30%**		**0.60%**		**4.75%**	**1.80%**	**2.95%**
Long Government	4.90%		-1.80%		0.00%		0.60%		3.70%		
Long Credit	6.50%		-1.50%		-0.40%		0.60%		5.20%		
TIPS	**3.95%**		**-0.20%**		**0.00%**		**0.25%**		**4.00%**	**1.25%**	**2.75%**
Non-US Fixed (unhedged)	**2.40%**		**-0.20%**		**-0.20%**		**0.25%**		**2.25%**	**0.80%**	**1.45%**
High Yield	8.00%		0.20%		-2.20%		0.25%		6.25%	3.90%	2.35%
Emerging Market Debt	7.40%		0.20%		-2.00%		0.25%		5.85%	3.60%	2.25%
Bank Loans	7.40%		0.30%		-1.60%		0.00%		6.10%	4.60%	1.50%

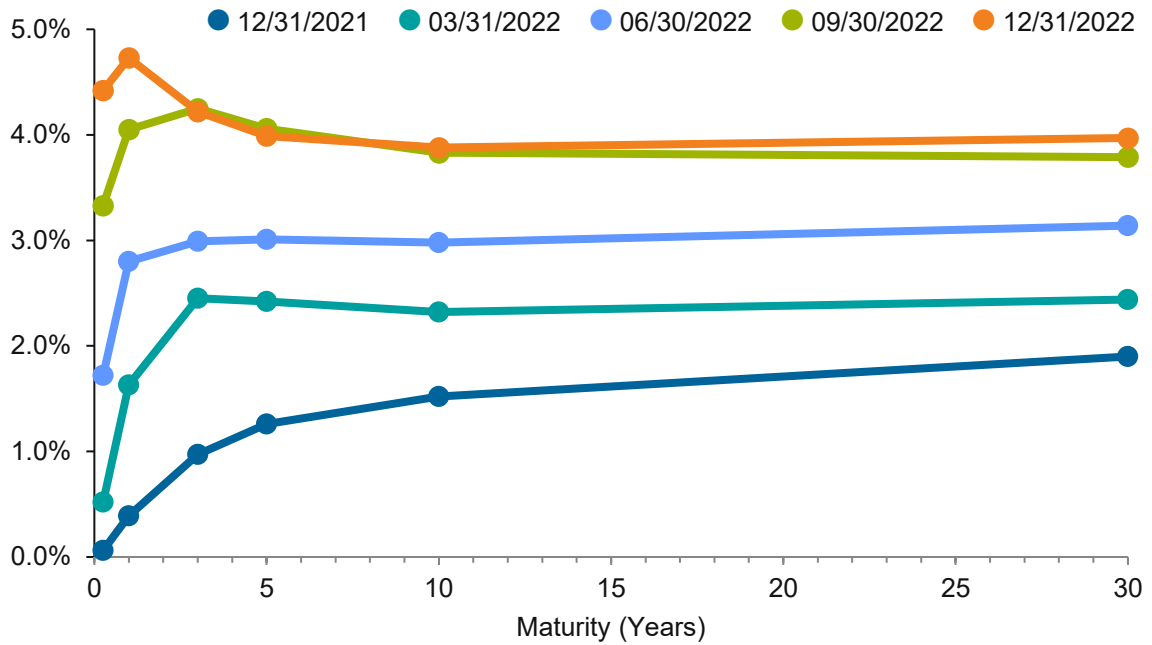
Source: Callan

Yield Curve Continued to Rise and Became Inverted in Second Half of 2022

Rising yields throughout 2022 brought capital losses across bond indices.

Higher yields would lead to higher future returns, especially if yields stay at elevated levels.

Treasury Yield Curve Change



	3 Month	1 Year	3 Year	5 Year	10 Year	30 Year
12/31/2021	0.06	0.39	0.97	1.26	1.52	1.90
03/31/2022	0.52	1.63	2.45	2.42	2.32	2.44
06/30/2022	1.72	2.80	2.99	3.01	2.98	3.14
09/30/2022	3.33	4.05	4.25	4.06	3.83	3.79
12/31/2022	4.42	4.73	4.22	3.99	3.88	3.97

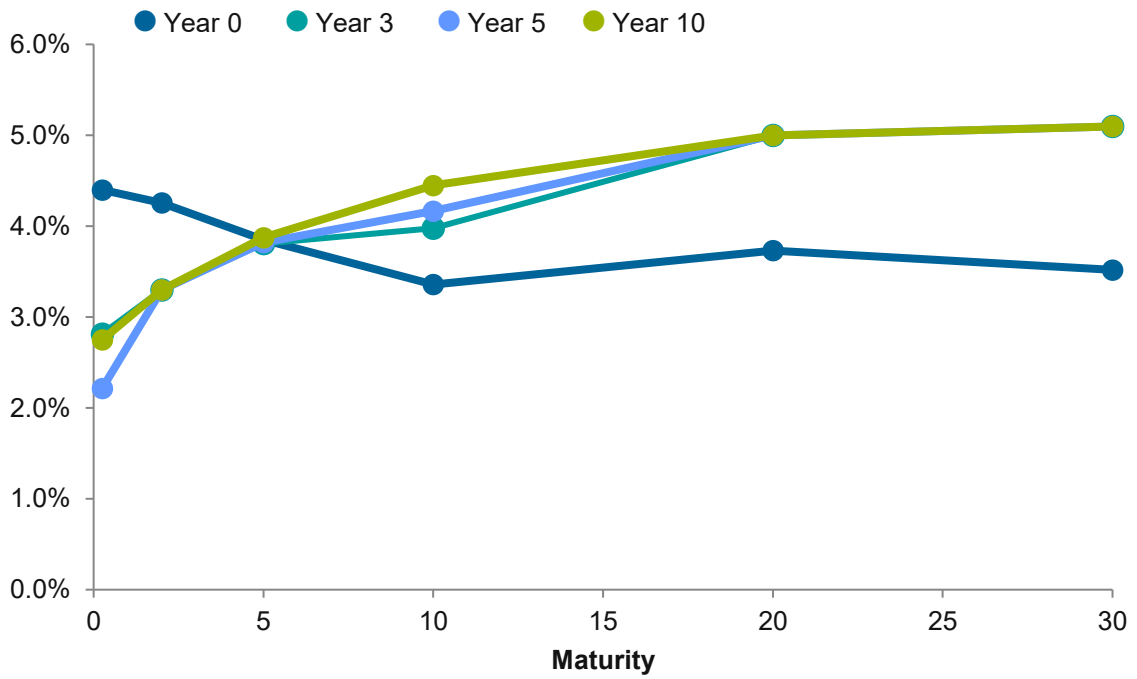
Source: Bloomberg

Shape of Yield Curve at Different Points in Forecast Horizon

Our forecast has the yield curve steepening within the first few years.

With yields already high, we expect yields to reach equilibrium by year 10 of our forecast (vs. year 30 in prior forecasts).

Yield Curve Forecast



	3 Month	2 Year	5 Year	10 Year	20 Year	30 Year
Forecast Year 0	4.40	4.26	3.85	3.36	3.73	3.52
Forecast Year 3	2.82	3.30	3.81	3.98	5.00	5.10
Forecast Year 5	2.22	3.30	3.82	4.17	5.00	5.10
Forecast Year 10 (Equilibrium Reached)	2.75	3.30	3.88	4.45	5.00	5.10

Source: Callan

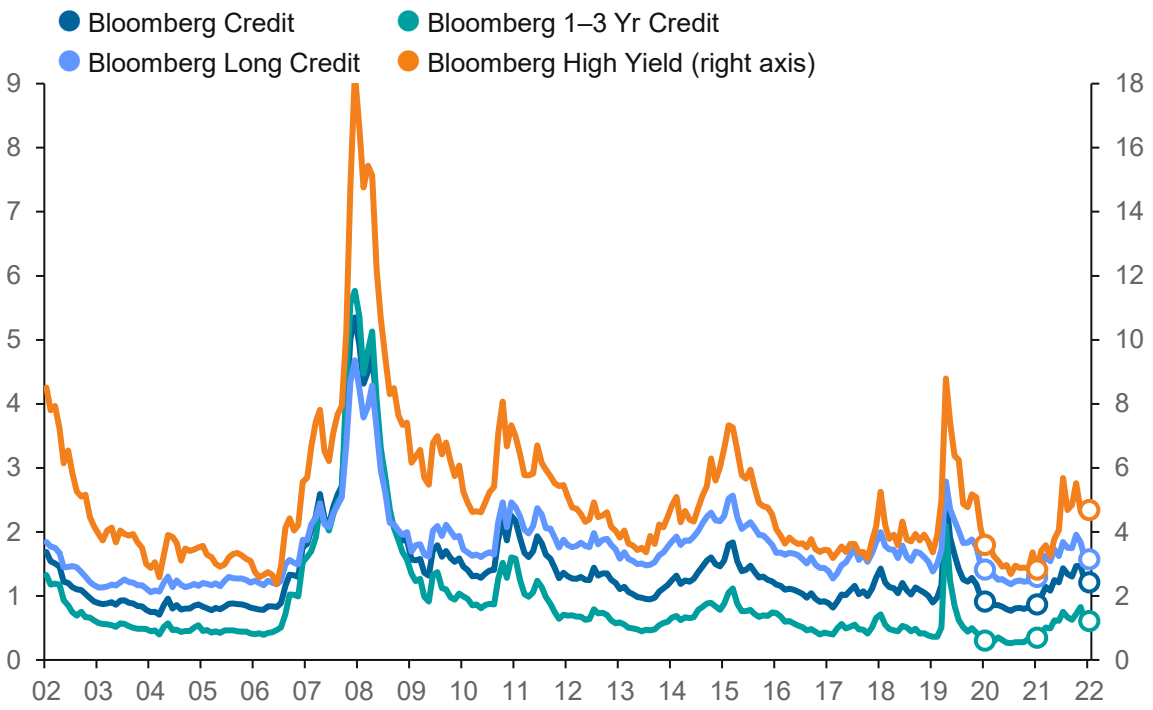
Spreads Dipped Through 2021 but Returned Toward Medians Throughout 2022

20 years ending 12/31/22

2022 projections had risk-free rates rising and credit spreads widening, creating twin headwinds for expected returns, especially for high yield.

After falling throughout 2021, credit spreads rose in 2022 and are closer to median in many cases.

Historical Option-Adjusted Spreads (OAS)



	December 2020		December 2021		December 2022	
	OAS	Percentile*	OAS	Percentile*	OAS	Percentile*
Bloomberg 1-3 Yr Credit	0.3	3%	0.4	5%	0.6	47%
Bloomberg Credit	0.9	23%	0.9	17%	1.2	50%
Bloomberg Long Credit	1.4	26%	1.3	22%	1.6	38%
Bloomberg HY	3.6	26%	2.8	3%	4.7	56%

*Percentiles based on 20-year history of OAS for each respective index.
Source: Bloomberg

Duration for Intermediate and Longer-Dated Credit Still High but Fell Meaningfully

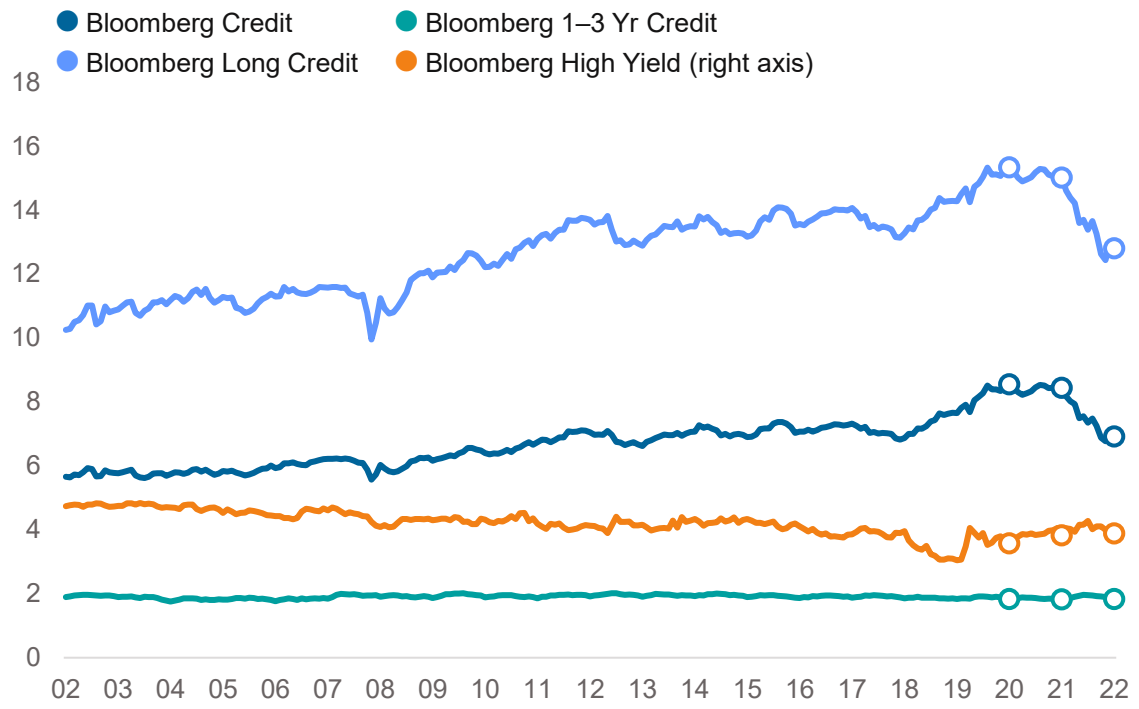
20 years ending 12/31/22

Duration for credit within the Agg is still high in historical terms but fell significantly in 2022.

- The same is true for long credit.

The yield-to-duration ratio has improved across the maturity spectrum.

Historical Duration

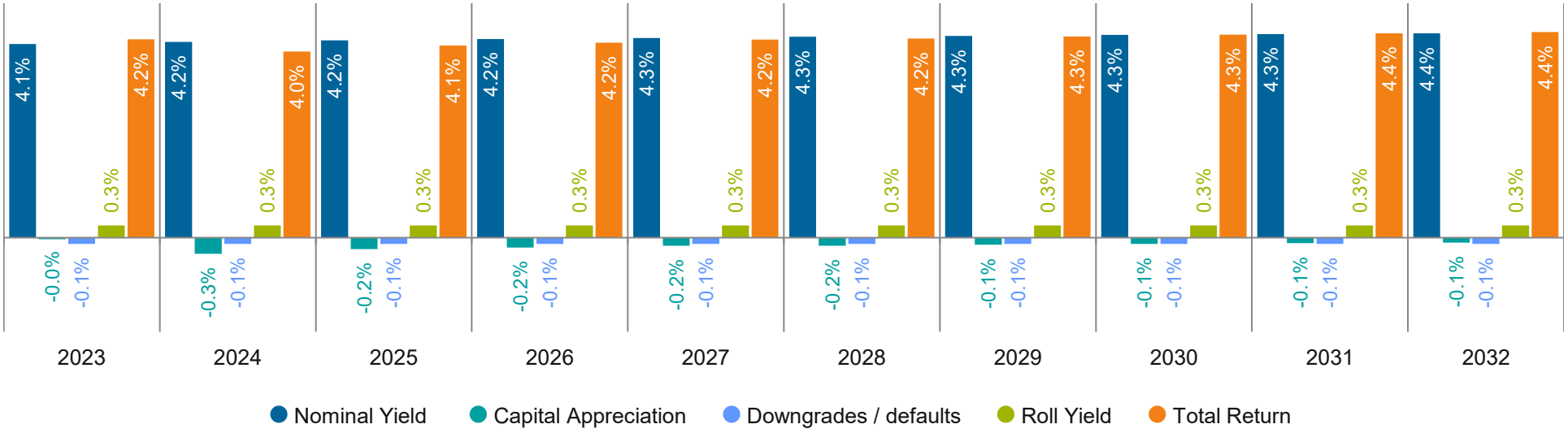


	December 2020	December 2021	December 2022
Bloomberg 1-3 Yr Credit	1.8	1.8	1.8
Bloomberg High Yield	3.6	3.8	3.9
Bloomberg Credit	8.6	8.4	6.9
Bloomberg Long Credit	15.3	15.0	12.8

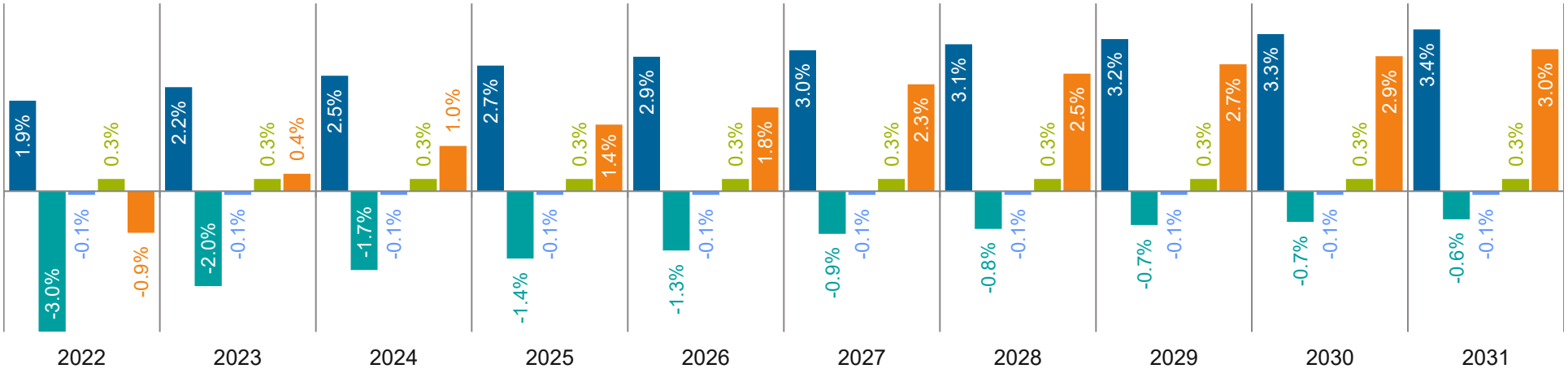
Source: Bloomberg

Comparison of Core Fixed Income Return Components

Total Return Attribution: Callan 2023 Projection



Total Return Attribution: Callan 2022 Projection



Source: Callan

Callan

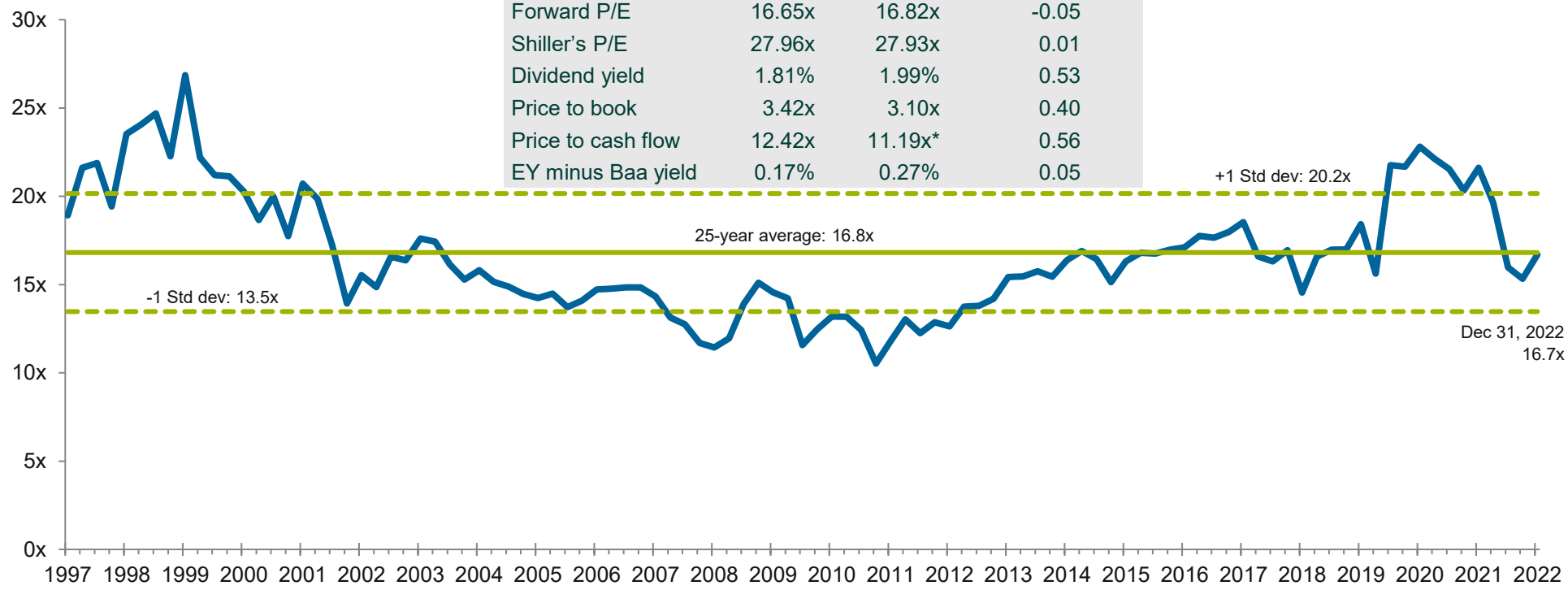
Equity

U.S. Equity Market: Key Metrics

S&P 500 valuation measures

S&P 500 Index: Forward P/E Ratio

Valuation Measure	Latest	25-year Average	Std Dev Over- / Under-valued
Forward P/E	16.65x	16.82x	-0.05
Shiller's P/E	27.96x	27.93x	0.01
Dividend yield	1.81%	1.99%	0.53
Price to book	3.42x	3.10x	0.40
Price to cash flow	12.42x	11.19x*	0.56
EY minus Baa yield	0.17%	0.27%	0.05



- All valuation measures are now within +/- one standard deviation of 25-year averages.
- Forward P/E is near the long-term average, but if we enter a recession both prices and earnings are likely to decline.

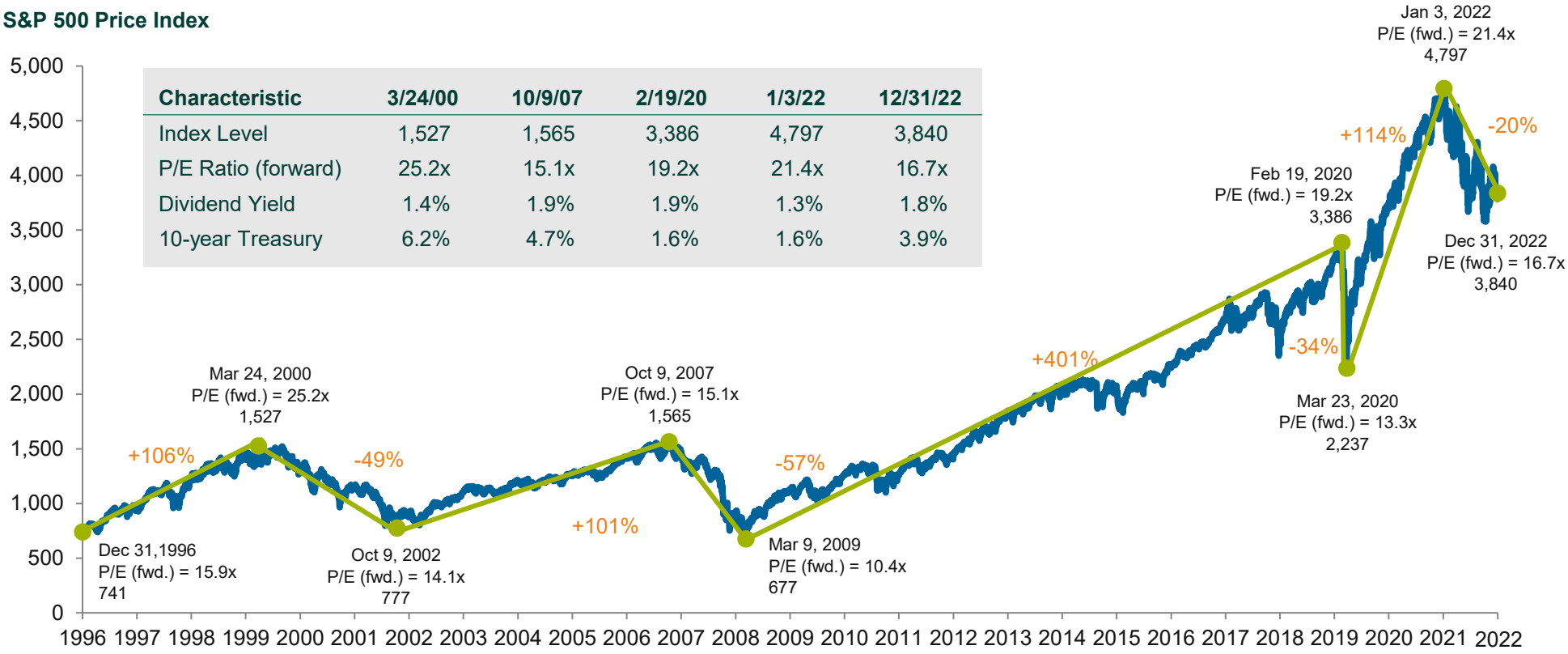
Source: FactSet, FRB, Refinitiv Datastream, Robert Shiller, Standard & Poor's, Thomson Reuters, J.P. Morgan Asset Management.
Price-to-earnings is price divided by consensus analyst estimates of earnings per share for the next 12 months as provided by IBES since December 1997 and by FactSet since January 2022. Current next 12 months consensus earnings estimates are $231. Average P/E and standard deviations are calculated using 25 years of history. Shiller's P/E uses trailing 10 years of inflation-adjusted earnings as reported by companies. Dividend yield is calculated as the next 12 months consensus dividend divided by most recent price. Price-to-book ratio is the price divided by book value per share. Price-to-cash flow is price divided by NTM cash flow. EY minus Baa yield is the forward earnings yield (consensus analyst estimates of EPS over the next 12 months divided by price) minus the Moody's Baa seasoned corporate bond yield. Std. dev. over-/under-valued is calculated using the average and standard deviation over 25 years for each measure. *P/CF is a 20-year average due to cash flow availability. Guide to the Markets – U.S. Data are as of Dec. 31, 2022

U.S. Equity Market: Price Relative to History

S&P 500 Index at inflection points

S&P 500 Price Index

Characteristic	3/24/00	10/9/07	2/19/20	1/3/22	12/31/22
Index Level	1,527	1,565	3,386	4,797	3,840
P/E Ratio (forward)	25.2x	15.1x	19.2x	21.4x	16.7x
Dividend Yield	1.4%	1.9%	1.9%	1.3%	1.8%
10-year Treasury	6.2%	4.7%	1.6%	1.6%	3.9%

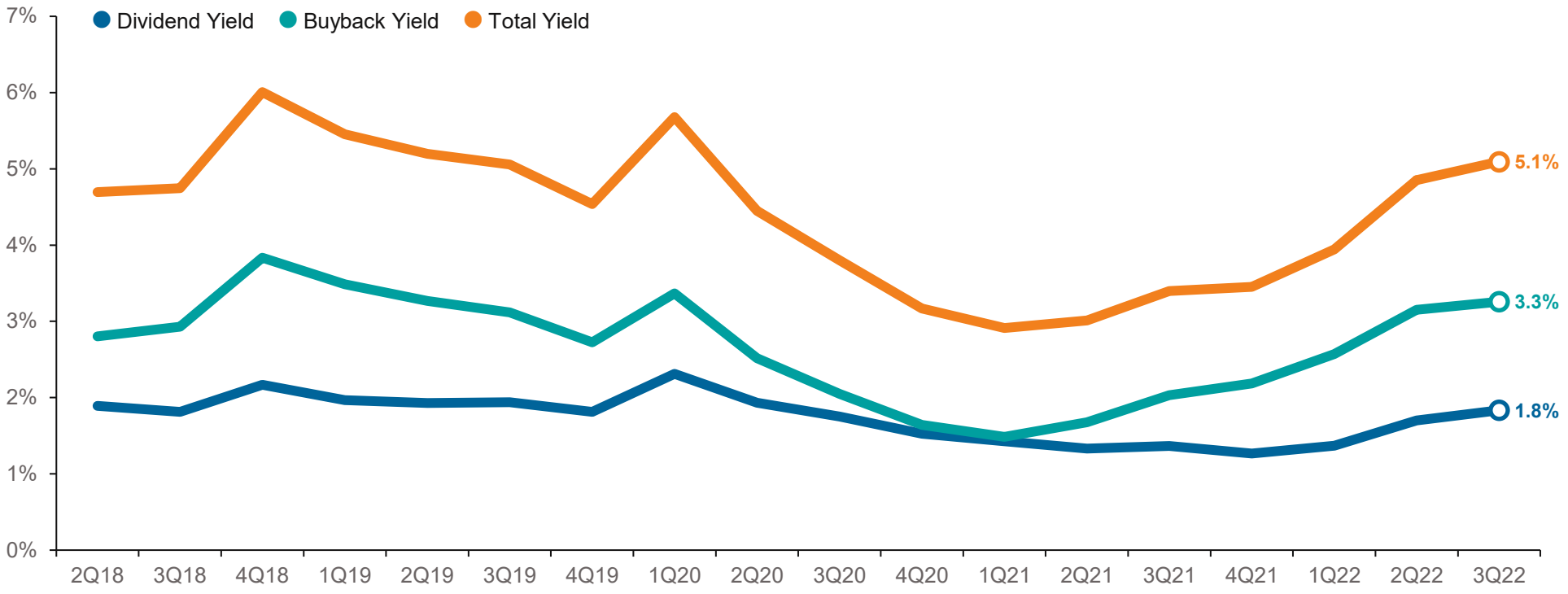


- The S&P is still up almost 80% from the pandemic low.
- Valuations have fallen dramatically throughout 2022.

Sources: Compustat, FactSet, Federal Reserve, Refinitiv Datastream, S&P Dow Jones Indices, J.P. Morgan Asset Management.
Dividend yield is calculated as consensus estimates of dividends for the next 12 months, divided by most recent price, as provided by Compustat. Forward price-to-earnings ratio is a bottom-up calculation based on IBES estimates and FactSet estimates since January 2022. Returns are cumulative and based on S&P 500 Index price movement only, and do not include the reinvestment of dividends. Past performance is not indicative of future returns.
Guide to the Markets – U.S. Data are as of December 31, 2022.

U.S. Equity Market: Return of Cash

S&P 500 yield broken down



Return of cash has risen in dollar terms and yields were further buoyed by declining share prices

Source: S&P Dow Jones Indices

Equity Forecasts

Building blocks

Index	Current Dividend Yield*	Forecast Dividend Yield	Net Buyback Yield	Inflation	Real Earnings Growth**	Valuation Adjustment	Total Geometric Return
S&P 500	1.77%	2.00%	0.50%	2.50%	2.25%	0.00%	7.25%
Russell 2500	1.61%	1.75%	0.00%	2.50%	3.20%	0.00%	7.45%
Russell 3000	1.72%	1.95%	0.45%	2.50%	2.45%	0.00%	7.35%
MSCI World ex USA	3.21%	3.75%	0.00%	1.75%	1.75%	0.00%	7.25%
MSCI Emerging Markets	3.27%	3.55%	-2.90%	3.00%	3.80%	0.00%	7.45%
Aggregate							4.25%
Cash							2.75%

Index	Forecast ERP Cash	Historical ERP Cash^	Delta ERP Cash	Forecast ERP Bonds	Historical ERP Bonds^^	Delta ERP Aggregate
S&P 500	4.50%	7.56%	-3.06%	3.00%	4.95%	-1.95%
Russell 2500	4.70%	7.22%	-2.52%	3.20%	4.61%	-1.41%

* Index yields as of Sept. 30, 2022

** S&P 500 real earnings growth is forecast real GDP growth. R 2500 real earnings growth is 100 bps spread over S&P 500. Developed and emerging markets earnings growth in line with their respective GDP assumptions.

^ Return relative to 90-day T-bills for 40 years ended Sept. 30, 2022

^^ Return relative to the Bloomberg Aggregate for 40 years ended Sept. 30, 2022

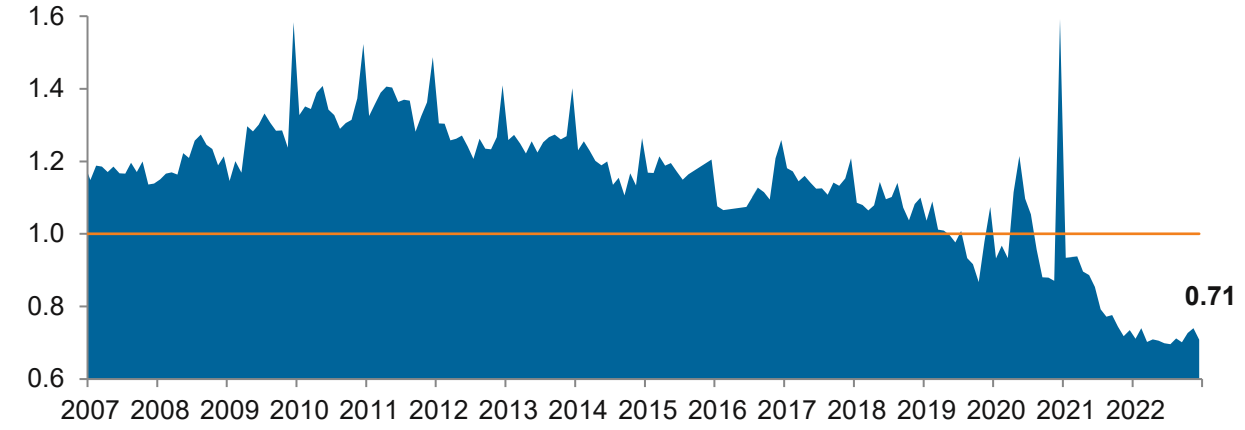
Source: Callan

U.S. Equity Assumptions

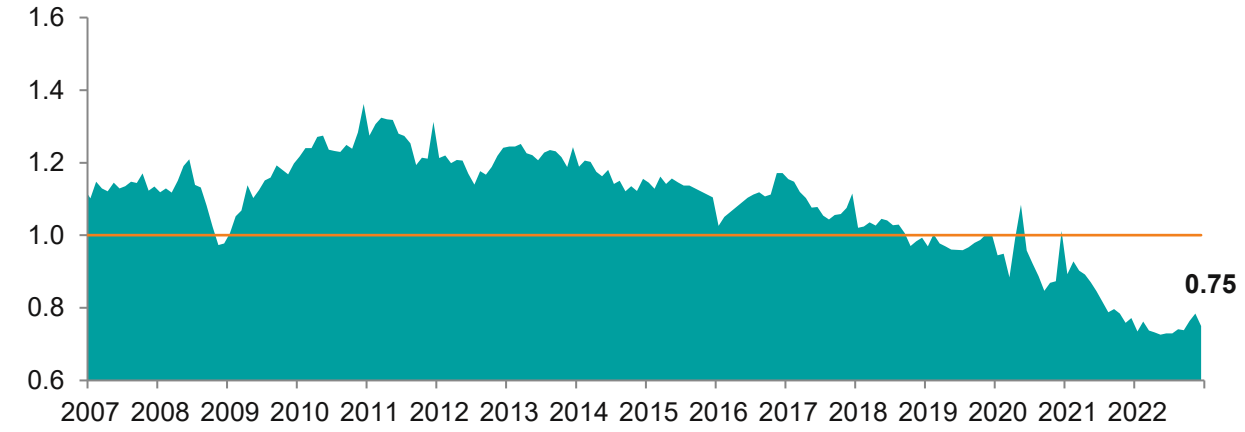
Mid and small cap relative valuations

- Large capitalization stocks still have relatively high valuations.
- Historically, smaller cap stocks have had higher valuations than large caps.
  - Investors buying future rather than historical earnings
- The small cap S&P 600 P/E is only 71% of the S&P 500 P/E.
- The mid cap S&P 400 P/E is only 75% of the S&P 500 P/E.
- Lower valuations improve the potential for higher returns relative to large cap going forward.

S&P 600/S&P 500 Relative Forward P/E Ratios



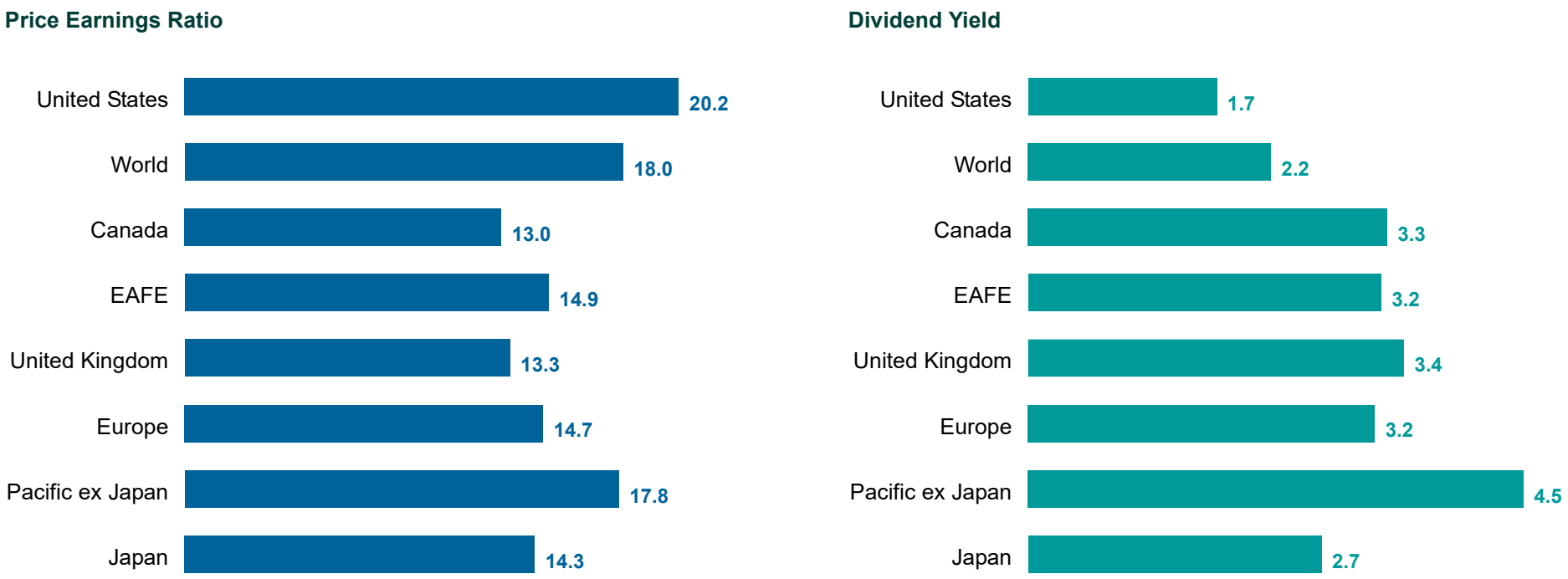
S&P 400/S&P 500 Relative Forward P/E Ratios



Source: S&P Dow Jones Indices

Global ex-U.S. Equity Assumptions

Developed market valuations and dividend yield



Valuations have come down over the past year across each of these developed market indices.

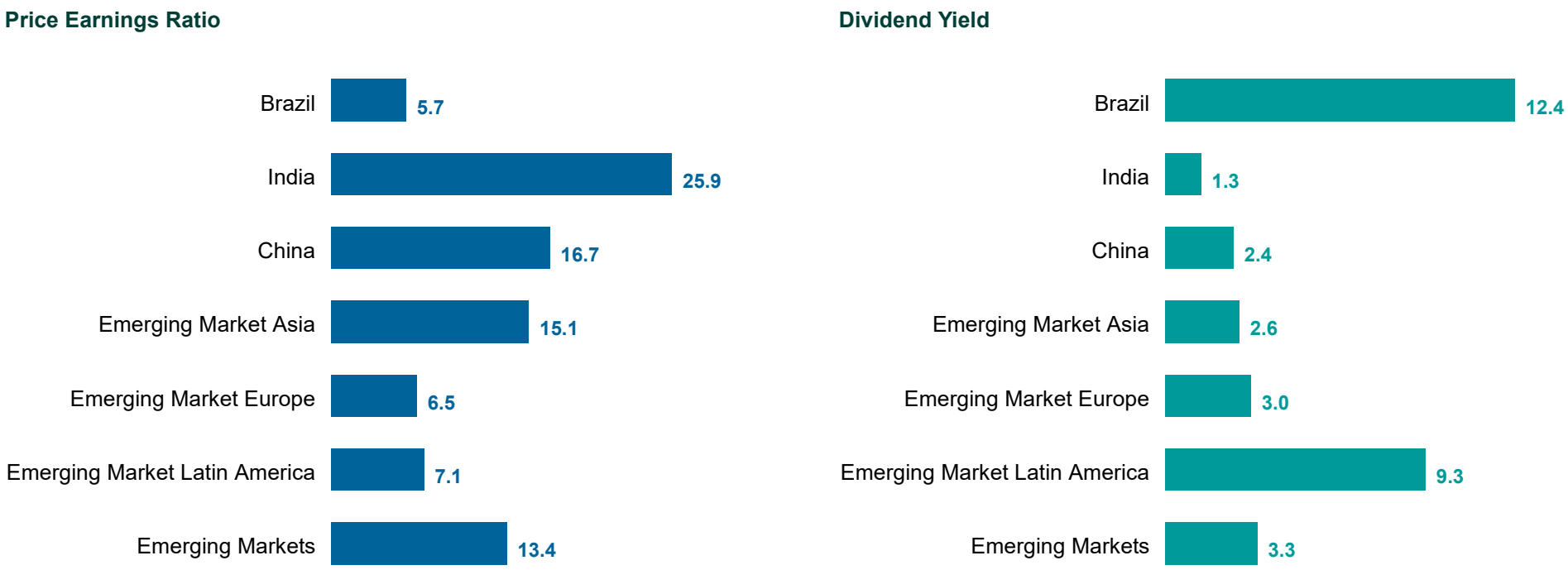
- U.S. continues to have the highest valuations.

Dividend yields have risen since last year for all indices shown except the U.K.

Source: MSCI (Dec. 31, 2022)

Global ex-U.S. Equity Assumptions

Emerging market valuations and dividend yield



Emerging market valuations have also come down over the last year, but moderately compared to developed market valuations.

- Asia has the highest regional valuations, Emerging Europe the lowest.
- Dividend yields have risen meaningfully across emerging market indices.

Significant dilution is realized as growing companies issue more shares.

Source: MSCI (Dec. 31, 2022)

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Alternatives

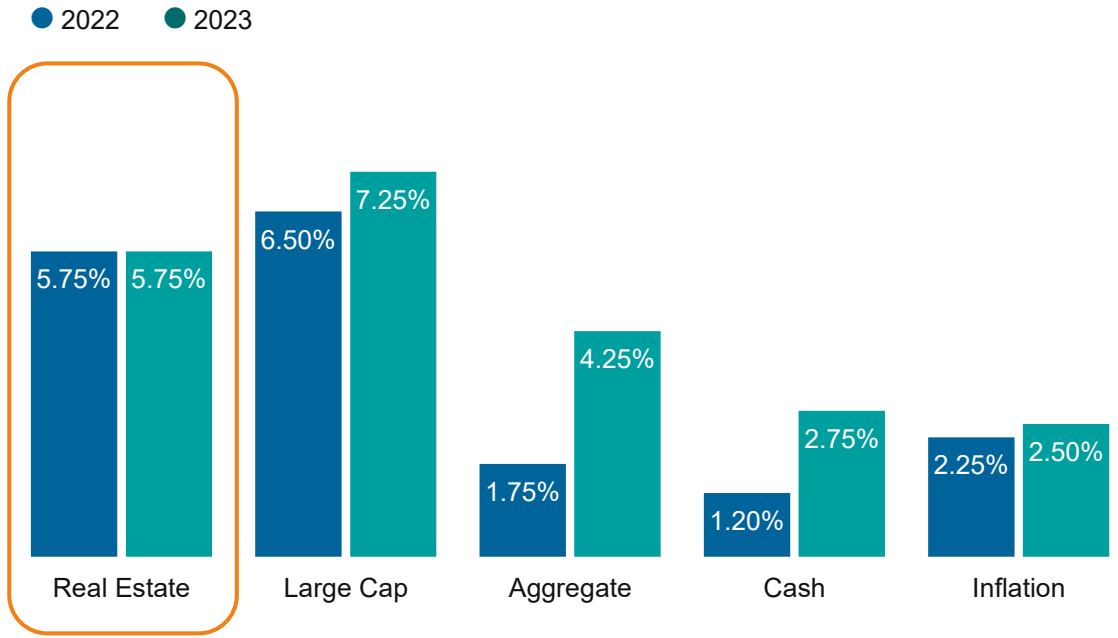
Core Real Estate

Background

- Real estate has characteristics of equity (ownership and appreciation) and bonds (income from rents). While both public equities and public fixed income saw meaningful increases in projected returns, we believe real estate valuations already reflect much of the potential forward-looking gains, as core real estate logged record appreciation in 2021 and 2022.
- No change to the outlook for real estate returns compared to last year.

2023 real estate return projection: 5.75% (unchanged)

Return Projections



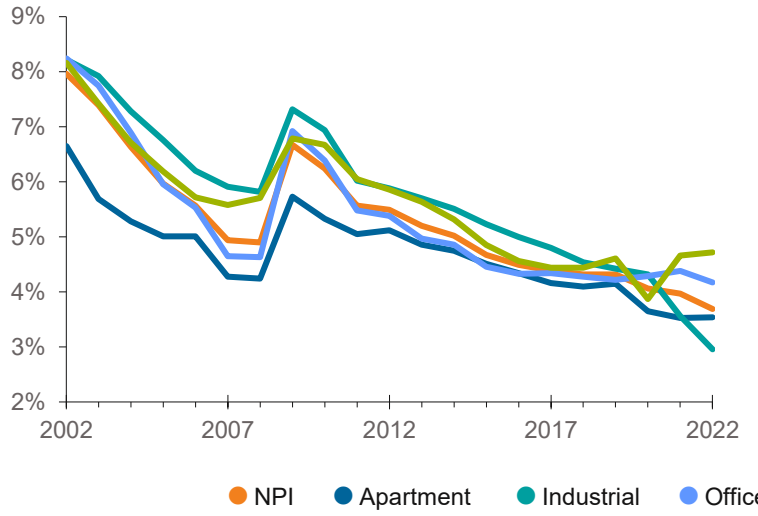
Source: Callan

Core Real Estate

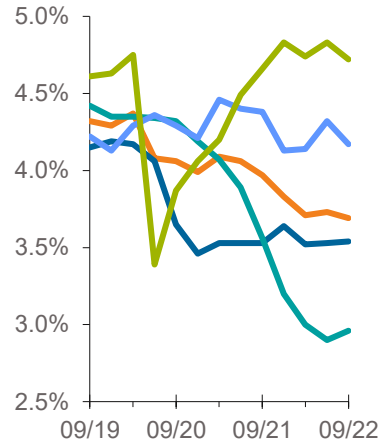
- 5.75% core real estate compound return (net of fees)
- Return calculations assume 4.7% cost of leverage and 0.4x debt-to-equity (30% loan-to-value)

Income Return (unlevered property)	5.1%
Appreciation (unlevered property)	0.7%
Total Return (before leverage)	5.8%

Annual Cap Rates



Quarterly



Callan Return Assumptions (unlevered property returns)

	Office	Retail	Industrial	Apartments	Other	NPI Index
Income	4.9%	5.7%	4.8%	5.0%	5.9%	5.1%
Appreciation	-0.1%	0.1%	1.4%	0.9%	0.9%	0.7%
Total Return	4.8%	5.7%	6.2%	5.9%	6.8%	5.8%

Source: NCREIF Property Index (NPI) cap rates correspond to unlevered property valuations

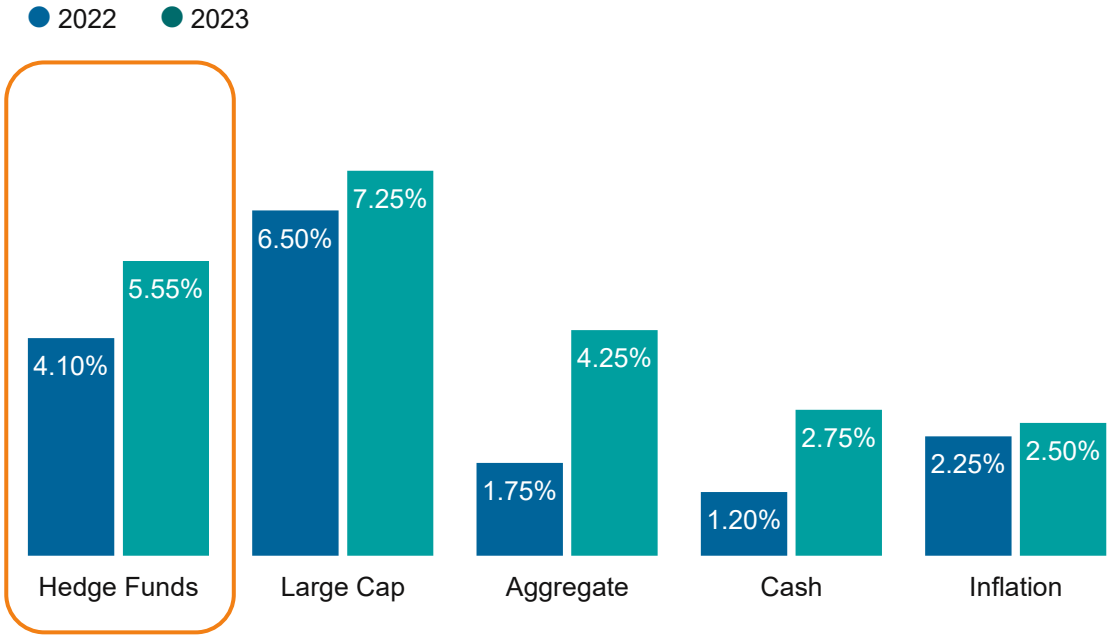
Hedge Funds

Background

- Hedge funds can be evaluated in a multi-factor context using the following relationship:
- Expected Return = Cash + Equity Beta x (Equity-Cash) + Exotic Beta + Net Alpha
- Callan's 10-year cash forecast is 2.75%.
- Diversified hedge fund portfolios have historically exhibited equity beta relative to the S&P 500 of about 0.4.
- Combined with our equity risk premium forecast, this results in an excess return from equity beta of 1.8%.
- Return from hedge fund exotic beta and illiquidity premia is forecast to be 0.5% to 1.0%, to arrive at an overall expected return of 5.55%.

2023 hedge fund return projection: 5.55% (up 145 bps)

Return Projections



Source: Callan

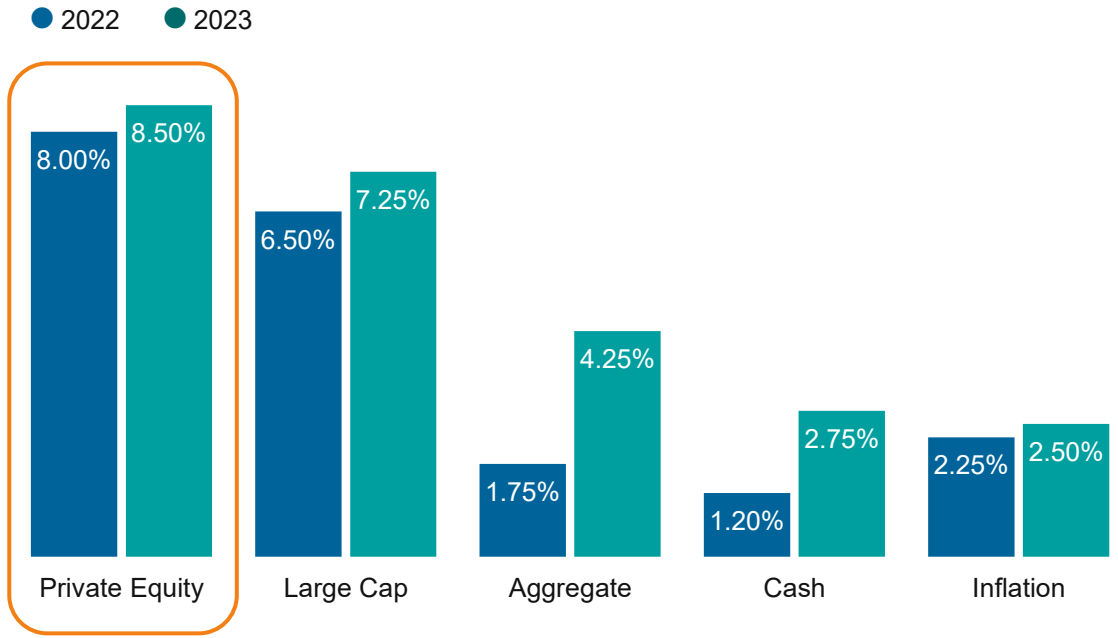
Private Equity

Background

- The private equity market in aggregate is driven by many of the same economic factors as public equity markets. However, we expect private equity to experience some write-downs that have not yet been reflected in performance.
- Consequently, the private equity performance expectations did not rise as much as public equity expectations.
- We see tremendous disparity between the best- and worst-performing private equity managers.
- The ability to select skillful managers could result in realized returns significantly greater than projected here.

2023 private equity return projection: 8.50% (up 50 bps)

Return Projections



Source: Callan

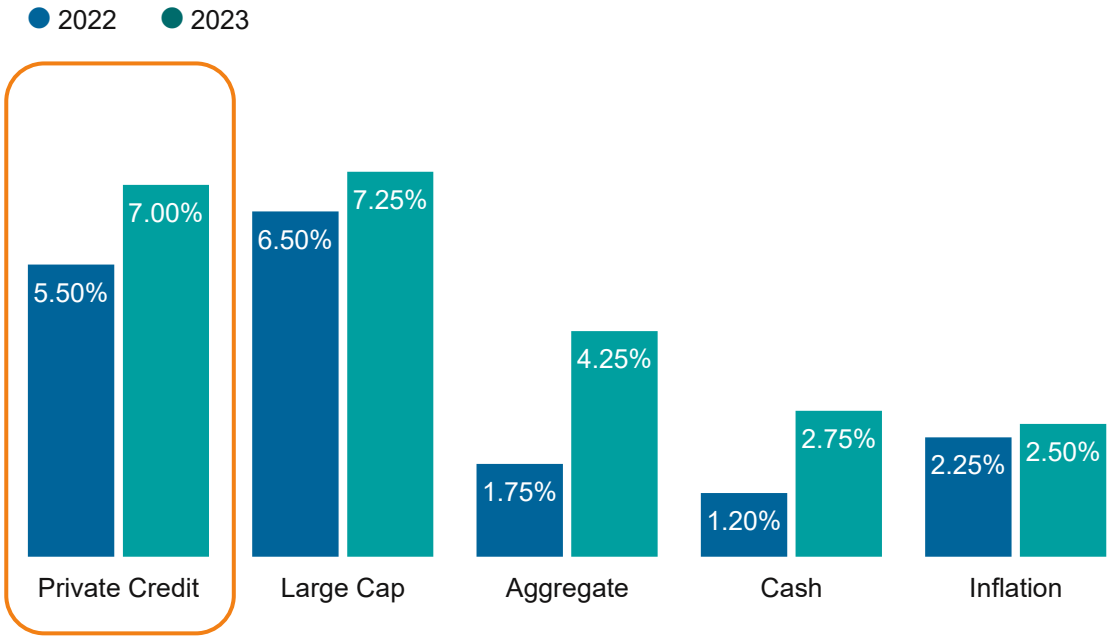
Private Credit

Background

- Return projection is anchored on middle market direct lending where yields have risen along with public fixed income yields.
- While banks are no longer major investors in this market, there is strong appetite from institutional and retail investors.
- A portfolio with more distressed and specialty finance exposure would have a higher return though with a lower current yield and higher volatility and higher correlation to public and private equity.

2023 private credit return projection: 7.0% (up 150 bps)

Return Projections



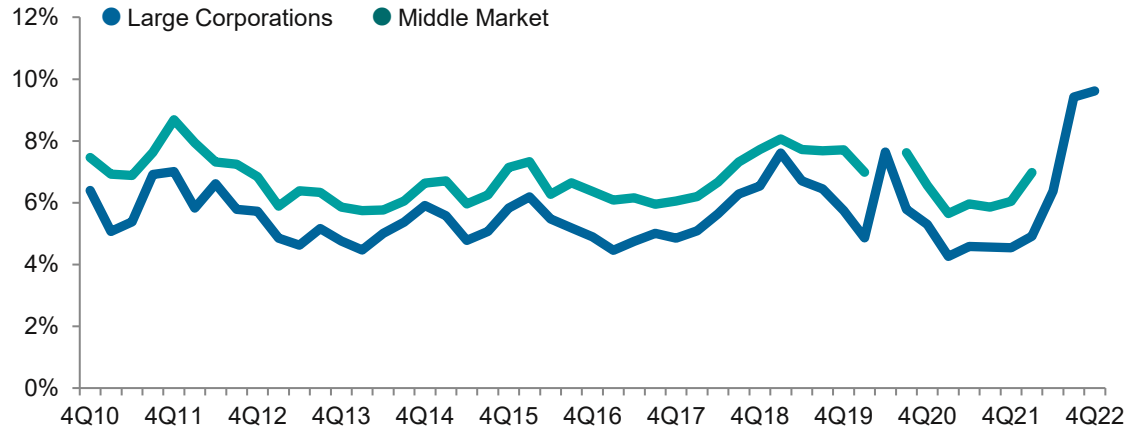
Source: Callan

Private Credit

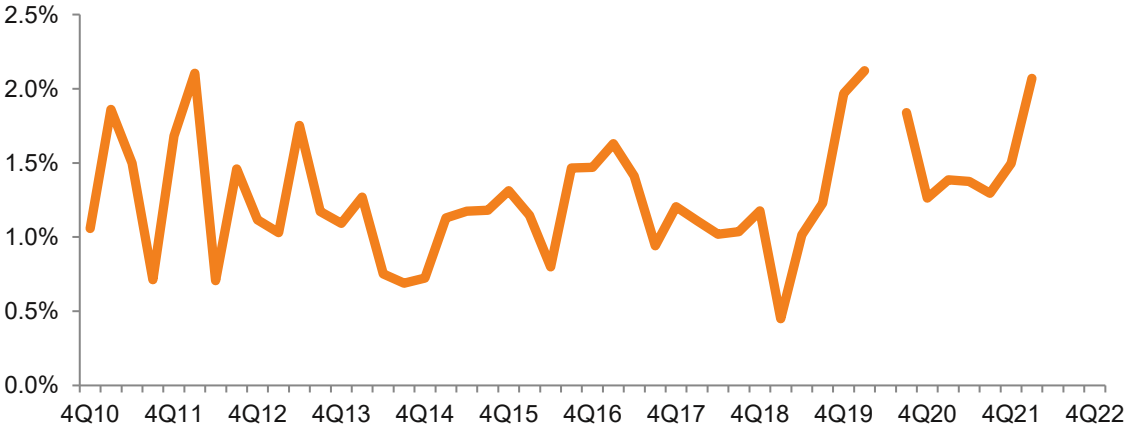
- Return calculations assume 5.25% cost of leverage and 1% unlevered loss ratio
- Corresponds to 7% compound return

Unlevered Yield	9.25%
Leverage	0.85x
Levered Yield	12.65%
Management Fee and OpEx	1.7%
Incentive Rate	15%
Hurdle	4%
Incentive Fee	1%
Total Fees and Expenses	2.7%
Loss Ratio	1.85%
Net Arithmetic	8%

Loan Yields



Middle Market Premium



Source: Refinitiv LPC. All-in yield (LIBOR + Spread + OID) assuming 3-year takeout
Note: 2Q20, 2Q22, and 3Q22 not shown due to lack of data points to calculate a MM institutional all-in yield statistic.

Callan

Detailed 2023 Expectations and Resulting Portfolio Returns and Risks

2023 vs. 2022 Risk and Returns Assumptions

Summary of Callan's Long-Term Capital Markets Assumptions (2023–2032)

Asset Class	Index	Projected Return 1-Year Arithmetic	Projected Return 10-Year Geometric*	Real	Projected Risk Standard Deviation	2022–2031 1-Year Arithmetic	2022–2031 10-Year Geometric*	2022–2031 Standard Deviation	vs. 2022 Geometric* Delta	vs. 2022 Std Dev Delta
Equities										
Broad U.S. Equity	Russell 3000	8.75%	7.35%	4.85%	18.05%	8.00%	6.60%	17.95%	0.75%	0.10%
Large Cap U.S. Equity	S&P 500	8.60%	7.25%	4.75%	17.75%	7.85%	6.50%	17.70%	0.75%	0.05%
Smid Cap U.S. Equity	Russell 2500	9.60%	7.45%	4.95%	22.15%	8.75%	6.70%	21.30%	0.75%	0.85%
Global ex-U.S. Equity	MSCI ACWI ex USA	9.45%	7.45%	4.95%	21.25%	8.70%	6.80%	20.70%	0.65%	0.55%
Developed ex-U.S. Equity	MSCI World ex USA	9.00%	7.25%	4.75%	20.15%	8.25%	6.50%	19.90%	0.75%	0.25%
Emerging Market Equity	MSCI Emerging Markets	10.45%	7.45%	4.95%	25.70%	9.80%	6.90%	25.15%	0.55%	0.55%
Fixed Income										
Short Duration Gov/Credit	Bloomberg 1-3 Year Gov/Credit	3.75%	3.80%	1.30%	2.30%	1.50%	1.50%	2.00%	2.30%	0.30%
Core U.S. Fixed	Bloomberg Aggregate	4.25%	4.25%	1.75%	4.10%	1.80%	1.75%	3.75%	2.50%	0.35%
Long Government	Bloomberg Long Gov	4.55%	3.70%	1.20%	13.50%	1.85%	1.10%	12.50%	2.60%	1.00%
Long Credit	Bloomberg Long Credit	5.75%	5.20%	2.70%	11.75%	2.60%	2.10%	10.50%	3.10%	1.25%
Long Government/Credit	Bloomberg Long Gov/Credit	5.25%	4.75%	2.25%	11.35%	2.30%	1.80%	10.40%	2.95%	0.95%
TIPS	Bloomberg TIPS	4.10%	4.00%	1.50%	5.30%	1.35%	1.25%	5.05%	2.75%	0.25%
High Yield	Bloomberg High Yield	6.75%	6.25%	3.75%	11.75%	4.40%	3.90%	10.75%	2.35%	1.00%
Global ex-U.S. Fixed	Bloomberg Global Agg ex US	2.70%	2.25%	-0.25%	9.80%	1.20%	0.80%	9.20%	1.45%	0.60%
Emerging Market Sov Debt	EMBI Global Diversified	6.25%	5.85%	3.35%	10.65%	4.00%	3.60%	9.50%	2.25%	1.15%
Alternatives										
Core Real Estate	NCREIF ODCE	6.60%	5.75%	3.25%	14.20%	6.60%	5.75%	14.20%	0.00%	0.00%
Private Infrastructure	MSCI GI Infra/FTSE Dev Core 50/50	7.15%	6.15%	3.65%	15.45%	7.10%	6.10%	15.45%	0.05%	0.00%
Private Equity	Cambridge Private Equity	11.95%	8.50%	6.00%	27.60%	11.45%	8.00%	27.60%	0.50%	0.00%
Private Credit	N/A	8.00%	7.00%	4.50%	15.50%	6.40%	5.50%	14.60%	1.50%	0.90%
Hedge Funds	Callan Hedge FOF Database	5.80%	5.55%	3.05%	8.45%	4.35%	4.10%	8.20%	1.45%	0.25%
Commodities	Bloomberg Commodity	5.05%	3.50%	1.00%	18.00%	4.05%	2.50%	18.00%	1.00%	0.00%
Cash Equivalents	90-Day T-Bill	2.75%	2.75%	0.25%	0.90%	1.20%	1.20%	0.90%	1.55%	0.00%
Inflation	CPI-U		2.50%		1.60%		2.25%	1.60%	0.25%	0.00%

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

Source: Callan

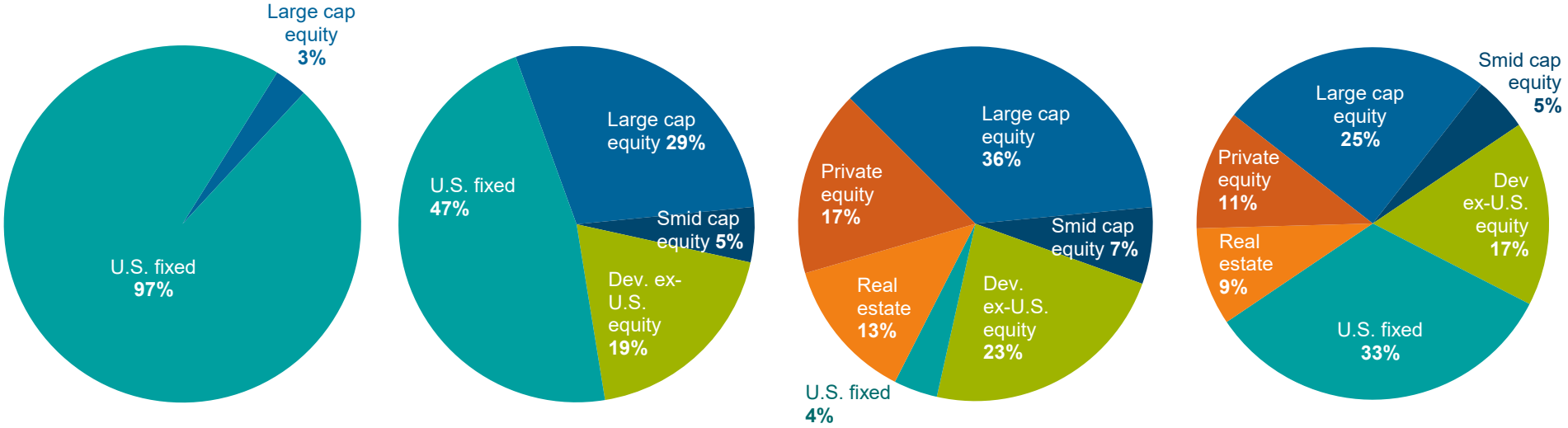
2023–2032 Callan Capital Markets Assumptions Correlations

	Large Cap	Smid Cap	Dev	Em Mkts	Short Dur	Core Fixed	Long Gov	Long Credit	TIPS	High Yield	Global ex-US Fixed	EM	Core Real Estate	Private Infra	Private Equity	Private Credit	Hedge Funds	Comm	Cash Equiv	Inflation
Large Cap U.S. Equity	1.00																			
Smid Cap U.S. Equity	0.88	1.00																		
Dev ex-U.S. Equity	0.73	0.79	1.00																	
Em Market Equity	0.79	0.83	0.89	1.00																
Short Dur Gov/Credit	0.05	0.01	0.04	-0.01	1.00															
Core U.S. Fixed	0.02	-0.02	0.00	-0.04	0.80	1.00														
Long Government	-0.05	-0.06	-0.03	-0.06	0.67	0.83	1.00													
Long Credit	0.45	0.40	0.40	0.40	0.64	0.80	0.65	1.00												
TIPS	-0.07	-0.08	-0.09	-0.11	0.56	0.70	0.50	0.52	1.00											
High Yield	0.75	0.74	0.73	0.75	0.10	0.09	0.00	0.45	0.02	1.00										
Global ex-U.S. Fixed	0.10	0.07	0.13	0.12	0.50	0.60	0.50	0.55	0.45	0.18	1.00									
EM Sovereign Debt	0.65	0.65	0.65	0.69	0.16	0.19	0.10	0.47	0.08	0.62	0.21	1.00								
Core Real Estate	0.44	0.42	0.42	0.41	0.16	0.14	0.05	0.30	0.09	0.31	0.16	0.29	1.00							
Private Infrastructure	0.48	0.47	0.46	0.46	0.14	0.15	0.10	0.33	0.08	0.34	0.18	0.32	0.76	1.00						
Private Equity	0.79	0.77	0.76	0.75	-0.01	-0.09	-0.13	0.30	-0.11	0.61	0.08	0.51	0.55	0.60	1.00					
Private Credit	0.69	0.68	0.65	0.68	0.11	0.00	-0.05	0.33	-0.12	0.63	0.12	0.50	0.25	0.27	0.67	1.00				
Hedge Funds	0.67	0.63	0.63	0.63	0.23	0.29	0.20	0.55	0.20	0.60	0.25	0.54	0.28	0.30	0.48	0.51	1.00			
Commodities	0.20	0.20	0.20	0.20	-0.05	-0.04	-0.10	0.05	0.00	0.20	0.10	0.15	0.18	0.15	0.20	0.17	0.23	1.00		
Cash Equivalents	-0.06	-0.08	-0.10	-0.10	0.30	0.15	0.12	0.00	0.12	-0.09	0.05	-0.06	0.00	-0.04	0.00	-0.04	-0.04	-0.02	1.00	
Inflation	-0.02	0.02	0.00	0.03	-0.21	-0.23	-0.30	-0.20	0.25	0.00	-0.15	-0.04	0.20	0.10	0.06	-0.05	0.05	0.35	0.05	1.00

Source: Callan

7% Expected Returns Over Past 30 Years

Increasing Complexity



1993	2008	2022	2023
Return: 7.0%	**Return: 7.0%**	**Return: 7.0%**	**Return: 7.0%**
Risk: 6.2%	**Risk: 9.4%**	**Risk: 16.8%**	**Risk: 11.8%**

Increasing Risk

In 1993, our return expectation for broad U.S. fixed income was 6.85%.

Just 3% in return-seeking assets was required to earn a 7% projected return.

15 years later, an investor would have needed over half of the portfolio in public equities to achieve a 7% projected return.

In 2022 an investor was required to include 96% in return-seeking assets (including 30% in private market investments) to earn a 7% projected return at almost 3x the volatility compared to 1993.

Today's 7% expected return portfolio is much more reasonable than it was just a year ago, with a third in fixed income and a correspondingly lower level of risk.

Customized 10-Year ARMB Capital Market Projections – PERS & TRS Target

ARMB Asset Allocation Model 2023-2032

Asset Class	Target Weight	PROJECTED RETURN 1-Year Arithmetic	PROJECTED RETURN 10-Year Geometric Return	PROJECTED RISK Annualized Standard Deviation	Projected Yield
Public Equities	**45.0%**				
Broad US Equity	27.0%	8.75%	7.35%	18.05%	1.95%
Global Ex-US Equity	18.0%	9.45%	7.45%	21.25%	3.70%
Fixed Income	**19.0%**				
ARMB Core Fixed Income	19.0%	4.20%	4.15%	3.90%	4.20%
Multi-Asset	**8.0%**				
Multi-Asset	8.0%	7.10%	6.65%	11.05%	3.30%
Private Equity	**14.0%**				
Private Equity	14.0%	11.95%	8.50%	27.60%	0.00%
Real Assets	**14.0%**	**7.00%**	**6.35%**	**13.10%**	**4.35%**
Real Estate	4.90%	6.60%	5.75%	14.20%	4.40%
Timber	1.40%	6.45%	5.40%	15.60%	3.70%
Farmland	3.50%	6.65%	5.55%	15.95%	4.25%
Private Infrastructure	2.10%	7.15%	6.15%	15.45%	4.60%
REITs	2.10%	8.85%	6.90%	20.90%	4.65%
Cash Equivalents	**0.0%**				
Cash Equivalents	0.0%	2.75%	2.75%	0.90%	2.75%
Inflation			2.50%	1.60%	
Total Fund	**100.0%**	**8.10%**	**7.35%**	**13.97%**	**2.87%**

Projection set customized to reflect specific ARMB strategies:

- Real assets, opportunistic and fixed income

Current target projected to generate a return of 7.35% compounded over 10 years, at a risk (standard deviation) of 13.97%. This return is 110 bps higher than that projected last year for a slightly different target (6.25%).

Source: Callan LLC

2023 Correlation Assumptions for Customized ARMB Asset Class Set

Correlation Matrix	Broad US	Large	SMID	Glb ex US	Int'l	Emerge	Dom Fix	ARMB Fix	Multi-A	Priv Cred	Core RE	Timber	Farm	Priv Infra	US REITs	Real A	HF	PE	Cash	CPI
Broad US Equity	**1.000**																			
Large Cap US Equity	0.996	**1.000**																		
Small/Mid Cap US Equity	0.915	0.876	**1.000**																	
Global ex-US Equity	0.797	0.771	0.830	**1.000**																
Developed ex-US Equity	0.754	0.728	0.795	0.986	**1.000**															
Emerging Market Equity	0.817	0.795	0.835	0.953	0.890	**1.000**														
Core US Fixed	0.016	0.024	-0.019	-0.013	0.005	-0.044	**1.000**													
ARMB Fixed Income	0.016	0.023	-0.019	-0.014	0.003	-0.045	1.000	**1.000**												
Multi-Asset	0.951	0.938	0.912	0.922	0.895	0.904	0.153	0.152	**1.000**											
Private Credit	0.701	0.690	0.680	0.678	0.650	0.680	0.000	-0.001	0.719	**1.000**										
Core Real Estate	0.441	0.435	0.421	0.424	0.415	0.410	0.145	0.145	0.473	0.250	**1.000**									
Timber	0.528	0.520	0.510	0.493	0.480	0.480	0.150	0.150	0.556	0.350	0.660	**1.000**								
Farmland	0.559	0.550	0.540	0.509	0.505	0.480	0.130	0.129	0.580	0.340	0.600	0.640	**1.000**							
Private Infrastructure	0.487	0.480	0.470	0.472	0.460	0.460	0.150	0.149	0.523	0.270	0.760	0.630	0.590	**1.000**						
US REITs	0.785	0.770	0.775	0.760	0.735	0.750	0.010	0.009	0.808	0.580	0.490	0.450	0.480	0.460	**1.000**					
Real Assets II	0.674	0.664	0.654	0.640	0.626	0.620	0.141	0.141	0.708	0.427	0.893	0.784	0.828	0.830	0.706	**1.000**				
Hedge Funds	0.675	0.670	0.630	0.648	0.630	0.633	0.290	0.289	0.734	0.510	0.280	0.400	0.450	0.300	0.500	0.464	**1.000**			
Private Equity	0.804	0.795	0.767	0.778	0.761	0.753	-0.086	-0.086	0.814	0.670	0.550	0.570	0.560	0.600	0.770	0.738	0.480	**1.000**		
Cash Equivalents	-0.065	-0.060	-0.080	-0.103	-0.100	-0.100	0.150	0.161	-0.063	-0.040	0.000	-0.010	-0.030	-0.040	-0.050	-0.029	-0.040	0.000	**1.000**	
Inflation	-0.013	-0.020	0.020	0.011	0.000	0.030	-0.230	-0.229	-0.038	-0.050	0.200	0.100	0.060	0.100	0.100	0.148	0.050	0.060	0.050	**1.000**

Source: Callan LLC

Expanding the Length of the Forecast Horizon

10-Year vs. Equilibrium Capital Market Expectations

- As the time horizon grows beyond 10 years, our capital market expectations increasingly incorporate “equilibrium returns”. Equilibrium returns reference ***long-term historical mean results***, with an overlay of informed judgment. Key elements to consider:
  - Nominal returns
  - Inflation
  - Real returns
  - Risk premium – bonds over cash, stocks over bonds, long duration over short
  - Long-term underlying economic growth (real GDP)
- 10-Year expectations:
  - Large Cap Stocks: 7.25% nominal, 4.75% real, 3.0% premium over bonds
  - Bonds: 4.25% nominal, 1.75% real, 1.50 % premium over cash
  - Cash: 2.75% nominal, .25% real
  - Inflation: 2.5%
  - Underlying economic growth (real GDP) – 2 to 2.5% per year
- Equilibrium expectations:
  - Large Cap Stocks: 8.50% nominal, 6.0% real, 3.4% premium over bonds
  - Bonds: 5.1% nominal, 2.6% real, 2.05% premium over cash
  - Cash: 3.05% nominal, 0.55% real
  - Inflation: 2.5%
  - Underlying economic growth (real GDP) – 3% per year

As Time Horizon Increases, Expected Returns Increase

Transition from 10-Year to 20-Year Horizon – Heading Toward LT Equilibrium

AssetClass	2023-2032 10-Year Annualized Return	2023-2042 20-Year Annualized Return	2023-2052 30-Year Annualized Return	Long-Term Annualized Equilibrium Return	Projected Standard Deviation
Broad US Equity	7.35%	7.65%	7.90%	8.55%	18.07%
Large Cap US Equity	7.25%	7.50%	7.75%	8.35%	17.75%
Small/Mid Cap US Equity	7.45%	7.85%	8.25%	9.05%	22.15%
Global ex-US Equity	7.45%	7.80%	8.15%	8.80%	21.26%
Developed ex-US Equity	7.25%	7.50%	7.75%	8.30%	20.15%
Emerging Market Equity	7.45%	8.00%	8.50%	9.40%	25.70%
Core US Fixed	4.25%	4.45%	4.65%	5.10%	4.10%
ARMB Fixed Income	4.15%	4.35%	4.55%	5.00%	3.90%
Multi-Asset	6.65%	6.95%	7.20%	7.75%	11.07%
Private Credit	7.00%	7.25%	7.55%	8.15%	15.50%
Core Real Estate	5.75%	6.15%	6.50%	7.35%	14.20%
Timber	5.40%	5.85%	6.25%	7.10%	15.60%
Farmland	5.55%	5.85%	6.35%	7.20%	15.95%
Private Infrastructure	6.15%	6.60%	7.00%	7.85%	15.45%
US REITs	6.90%	7.20%	7.45%	8.00%	20.90%
Real Assets	6.35%	6.70%	7.10%	7.90%	13.10%
Hedge Funds	5.55%	5.60%	5.70%	5.90%	8.45%
Private Equity	8.50%	8.85%	9.15%	9.55%	27.60%
Cash Equivalents	2.75%	2.85%	2.90%	3.05%	0.90%

Source: Callan LLC

Focus on 20-Year Horizon – PERS ($19.4 b) & TRS ($9.3b at 12/31/23)

Achieve 4.88% Real Return over 20-Year Horizon

ARMB adopted new target portfolio following the 2019 asset-liability study, and refined the target in the 2021 and 2022 asset allocation reviews

- Duration, cash flows and demographic forecasts suggest the investment time horizon for PERS and TRS remains long
- The 2023 10-year capital market forecasts gives investors some breathing room to meet a fixed return goal, with substantially higher return expectations for stocks and particularly for bonds
- Extending the forecast horizon enabled the plans to moderate exposure to risk assets while still meeting the return target over this longer horizon
- The target represents the risk posture of the plans and acknowledges future liquidity needs

Portfolios optimized using broad US and non-US equity, broad US fixed income, real assets and private equity

- Opportunistic is modeled as 60/40 exposure to public market stocks and bonds
- Real assets modeled using current target weights to each component within the total real asset composite
  - *35% Real estate*
  - *10% Timber*
  - *25% Farmland*
  - *15% Private Infrastructure*
  - *15% REITs*

Fixed income modeled as 95% broad market (BB Aggregate) and 5% cash

Customized 20-Year ARMB Capital Market Projections – PERS & TRS Target

ARMB Asset Allocation Model 2023-2042

Asset Class	Target Weight	PROJECTED RETURN 1-Year Arithmetic	PROJECTED RETURN 20-Year Geometric Return	PROJECTED RISK Annualized Standard Deviation	Projected Yield
Public Equities	**45.0%**				
Broad US Equity	27.0%	9.05%	7.65%	18.05%	1.95%
Global Ex-US Equity	18.0%	9.80%	7.80%	21.26%	3.70%
Fixed Income	**19.0%**				
ARMB Core Fixed Income	19.0%	4.45%	4.45%	4.10%	4.30%
Multi-Asset	**8.0%**				
Multi-Asset	8.0%	7.35%	6.95%	11.05%	3.30%
Private Equity	**14.0%**				
Private Equity	14.0%	12.30%	8.85%	27.60%	0.00%
Real Assets	**14.0%**	**7.40%**	**6.70%**	**13.10%**	**4.35%**
Real Estate	4.90%	7.00%	6.15%	14.20%	4.40%
Timber	1.40%	6.90%	5.85%	15.60%	3.70%
Farmland	3.50%	6.95%	5.85%	15.95%	4.25%
Private Infrastructure	2.10%	7.60%	6.60%	15.45%	4.60%
REITs	2.10%	9.15%	7.20%	20.90%	4.65%
Cash Equivalents	**0.0%**				
Cash Equivalents	0.0%	2.80%	2.85%	0.90%	2.75%
Inflation			2.50%	1.60%	
Total Fund	**100.0%**	**8.38%**	**7.64%**	**13.97%**	**2.87%**

Projection set customized to reflect specific ARMB strategies:

- Real assets, opportunistic and fixed income

Current target projected to generate a return of 7.64% compounded over 20 years, at a risk (standard deviation) of 13.97%. This return is 74 bps higher than that projected last year for the same target (6.90%).

Source: Callan LLC

Focus on 20-Year Time Horizon

Compare Return and Risk for 2023 vs. 2022 Capital Market Assumptions

- Target for 2023 (adopted in 2022) represents a portfolio designed to meet the goal of 7.13% nominal/4.88% real return over 20 years
- Inflation assumption is 2.5%, up from 2.25% projected in 2022
- 2023 assumptions suggest the target will generate a nominal return in excess of the 7.13%, an outperformance of 51 basis points (7.64%). Actuary's effective long term real return target is 4.88%
- Target shown at right is expected to generate a long-term (20-year) return that is above the plan's real return target (7.64% - 2.5% = 5.14%)
- Even with a higher inflation expectation, the real return of 5.14% is 49 bps above the projected real return in 2022.
- Target expected to generate a greater return for the same level of risk as a portfolio restricted to the public markets

	2023 Target for PRS/TRS	
	2023 Projection	2022 Projection
Broad US Equity	27	27
Global ex-US Equity	18	18
ARMB Fixed Income	19	19
Multi-Asset	8	8
Real Assets	14	14
Private Equity	14	14
Totals	100	100
Projected Arithmetic Return	8.08%	7.08%
10-year Compound Return	7.33%	6.29%
Projected Standard Deviation	13.97%	13.93%
Projected Arithmetic Return	8.38%	7.66%
20-year Compound Return	7.64%	6.90%
Projected Standard Deviation	13.97%	13.93%
Real Return (2.5% inflation for 2023, 2.25% for 2022)	5.14%	4.65%
Equity	59%	59%
Investment Grade Fixed Income	19%	19%
Alternatives	28%	28%

Source: Callan LLC

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APPENDIX

BUCK

State of Alaska

Public Employees' Retirement System

Actuarial Valuation Report
As of June 30, 2022

February 2023

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February 2, 2023

State of Alaska
The Alaska Retirement Management Board
The Department of Revenue, Treasury Division
The Department of Administration, Division of Retirement and Benefits
P.O. Box 110203
Juneau, AK 99811-0203

Certification of Actuarial Valuation

Dear Members of The Alaska Retirement Management Board, The Department of Revenue and The Department of Administration:

This report summarizes the annual actuarial valuation results of the State of Alaska Public Employees' Retirement System (PERS) as of June 30, 2022 performed by Buck Global, LLC (Buck).

The actuarial valuation is based on financial information provided in the financial statements audited by KPMG LLP, member data provided by the Division of Retirement and Benefits, and medical enrollment data provided by the healthcare claims administrator (Aetna), as summarized in this report. The benefits considered are those delineated in Alaska statutes effective June 30, 2022. The actuary did not verify the data submitted, but did perform tests for consistency and reasonableness.

All costs, liabilities, and other factors under PERS were determined in accordance with generally accepted actuarial principles and procedures. An actuarial cost method is used to measure the actuarial liabilities which we believe is reasonable. Buck is solely responsible for the actuarial data and actuarial results presented in this report. This report fully and fairly discloses the actuarial position of PERS as of June 30, 2022.

PERS is funded by Employer, State, and Member Contributions in accordance with the funding policy adopted by the Alaska Retirement Management Board (Board) and as required by Alaska state statutes. The funding objective for PERS is to pay required contributions that remain level as a percent of total PERS compensation. The Board has also established a funding policy objective that the required contributions be sufficient to pay the Normal Costs of active plan members, plan expenses, and amortize the Unfunded Actuarial Accrued Liability (UAAL) as a level percentage of total PERS compensation over a closed 25-year period as required by Alaska state statutes. The closed 25-year period was originally established effective June 30, 2014. Effective June 30, 2018, the Board adopted a 25-year layered UAAL amortization method as described in Section 5.2. The UAAL amortization continues to be on a level percent of pay basis. The compensation used to determine required contributions is the total compensation of all active members in PERS, including those hired after July 1, 2006 who are members of the Defined Contribution Retirement (DCR) Plan. This objective is currently being met and is projected to continue to be met. Absent future gains/losses, actuarially determined contributions are expected to remain level as a percent of pay and the overall funded status (on a combined pension/healthcare basis) is expected to increase to 100% in FY33 (the funded status of the pension trust is expected to increase to 100% in FY64).

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The Board and staff of the State of Alaska may use this report for the review of the operations of PERS. Use of this report for any other purpose or by anyone other than the Board or staff of the State of Alaska may not be appropriate and may result in mistaken conclusions due to failure to understand applicable assumptions, methodologies, or inapplicability of the report for that purpose. Because of the risk of misinterpretation of actuarial results, Buck recommends requesting its advanced review of any statement to be based on information contained in this report. Buck will accept no liability for any such statement made without its prior review.

Future actuarial measurements may differ significantly from current measurements due to plan experience differing from that anticipated by the actuarial assumptions, changes expected as part of the natural operation of the methodology used for these measurements, and changes in plan provisions or applicable law. In particular, retiree group benefits models necessarily rely on the use of approximations and estimates and are sensitive to changes in these approximations and estimates. Small variations in these approximations and estimates may lead to significant changes in actuarial measurements. An analysis of the potential range of such future differences is beyond the scope of this valuation.

In our opinion, the actuarial assumptions used are reasonable, taking into account the experience of the plan and reasonable long-term expectations, and represent our best estimate of the anticipated long-term experience under the plan. The actuary performs an analysis of plan experience periodically and recommends changes if, in the opinion of the actuary, assumption changes are needed to more accurately reflect expected future experience. The last full experience analysis was performed for the period July 1, 2017 to June 30, 2021. Based on that experience study, the Board adopted new assumptions effective beginning with the June 30, 2022 valuation to better reflect expected future experience. Based on our annual analysis of recent claims experience, changes were made to the healthcare per capita claims cost rates effective June 30, 2022 to better reflect expected future healthcare experience. A summary of the actuarial assumptions and methods used in this actuarial valuation is shown in Sections 5.2 and 5.3. We certify that the assumptions and methods described in Sections 5.2 and 5.3 of this report meet the requirements of all applicable Actuarial Standards of Practice.

Actuarial Standards of Practice No. 27 (ASOP 27) and No. 35 (ASOP 35) require the actuary to disclose the information and analysis used to support the actuary's determination that the assumptions selected by the plan sponsor do not significantly conflict with what, in the actuary's professional judgment, are reasonable for the purpose of the measurement. Buck provides advice on reasonable assumptions when performing periodic experience studies. The Board selects the assumptions used and annually the signing actuary reviews the assumptions through discussions with the Board staff and analyzing actuarial gain/loss experience. In the case of the Board's selection of the expected return on assets (EROA), the signing actuary has used economic information and tools provided by Buck's Financial Risk Management (FRM) practice. A spreadsheet tool created by the FRM practice converts averages, standard deviations, and correlations from Buck's Capital Markets Assumptions that are used for stochastic forecasting into approximate percentile ranges for the arithmetic and geometric average returns. It is intended to suggest possible reasonable ranges for EROA without attempting to predict or select a specific best estimate rate of return. It takes into account the duration (horizon) of investment and the target allocation of assets in the portfolio to various asset classes. Based on the actuary's analysis, including consistency with other assumptions used in the valuation, the percentiles generated by the spreadsheet tool described above, and review of actuarial gain/loss analysis, the actuary believes the assumptions do not significantly conflict with what, in the actuary's professional judgment, are reasonable for the purpose of the measurement.

Governmental Accounting Standards Board (GASB) Statement No. 67 (GASB 67) was effective for PERS beginning with fiscal year ending June 30, 2014, and Statement No. 74 (GASB 74) was effective for PERS beginning with fiscal year ending June 30, 2017. Separate GASB 67 and GASB 74 reports as of June 30, 2022 have been prepared. We have also prepared the member data tables shown in Section 4 of this report for the Statistical Section of the ACFR, as well as the

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summary of actuarial assumptions and analysis of financial experience for the Actuarial Section of the ACFR. Please see our separate GASB 67 and GASB 74 reports for other information needed for the ACFR.

Assessment of Risks

Actuarial Standard of Practice No. 51 (ASOP 51) applies to actuaries performing funding calculations related to a pension plan. ASOP 51 does not apply to actuaries performing services in connection with other post-employment benefits, such as medical benefits. Accordingly, ASOP 51 does not apply to the healthcare portion of PERS. See Section 6 of this report for further details regarding ASOP 51.

Use of Models

Actuarial Standard of Practice No. 56 (ASOP 56) provides guidance to actuaries when performing actuarial services with respect to designing, developing, selecting, modifying, using, reviewing, or evaluating models. In addition to the EROA analysis spreadsheet model disclosed above, Buck uses third-party software in the performance of annual actuarial valuations and projections. The model is intended to calculate the liabilities associated with the provisions of the plan using data and assumptions as of the measurement date under the funding methods specified in this report. The output from the third-party vendor software is used as input to internally developed models that apply applicable funding methods and policies to the derived liabilities and other inputs, such as plan assets and contributions, to generate many of the exhibits found in this report. Buck has an extensive review process in which the results of the liability calculations are checked using detailed sample life output, changes from year to year are summarized by source, and significant deviations from expectations are investigated. Other funding outputs and the internal models are similarly reviewed in detail and at a higher level for accuracy, reasonability, and consistency with prior results. Buck also reviews the third-party model when significant changes are made to the software. This review is performed by experts within Buck who are familiar with applicable funding methods, as well as the manner in which the model generates its output. If significant changes are made to the internal models, extra checking and review are completed. Significant changes to the internal models that are applicable to multiple clients are generally developed, checked, and reviewed by multiple experts within Buck who are familiar with the details of the required changes.

Additional models used in valuing health benefits are described later in the report.

COVID-19

The potential impact of the ongoing COVID-19 pandemic on costs and liabilities was considered and an adjustment was made in setting the medical per capita claims cost assumption. FY21 medical claims were adjusted for a COVID-19 related decline in those claims during the fiscal year. FY22 medical claims were not adjusted. A more detailed explanation on these adjustments is shown in Section 5.2.

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This report was prepared under the overall direction of David Kershner, who meets the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein. He is a Fellow of the Society of Actuaries, an Enrolled Actuary, a Member of the American Academy of Actuaries, and a Fellow of the Conference of Consulting Actuaries.

We are available to discuss this report with you at your convenience. David can be reached at 602-803-6174 and Brett can be reached at 260-423-1072.

Respectfully submitted,

David J. Kershner, FSA, EA, MAAA, FCA
Principal
Buck

Brett Hunter, ASA, EA, MAAA
Senior Consultant
Buck

The undersigned actuary is responsible for all assumptions related to the average annual per capita health claims cost and the health care cost trend rates, and hereby affirms his qualification to render opinions in such matters in accordance with the Qualification Standards of the American Academy of Actuaries.

Stephen R. Oates, ASA, EA, MAAA, FCA
Principal
Buck

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Executive Summary

Overview

The State of Alaska Public Employees' Retirement System (PERS) provides pension and postemployment healthcare benefits to eligible participants. The Commissioner of the Department of Administration is responsible for administering the plan. The Alaska Retirement Management Board has fiduciary responsibility over the assets of the plan. This report presents the results of the actuarial valuation of PERS as of the valuation date of June 30, 2022.

Purpose

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

1. To determine the Employer/State contribution necessary to meet the Board's funding policy for the plan;
2. To disclose the funding assets and liability measures as of the valuation date;
3. To review the current funded status of the plan and assess the funded status as an appropriate measure for determining future actuarially determined contributions;
4. To compare actual and expected experience under the plan during the last fiscal year; and
5. To report trends in contributions, assets, liabilities, and funded status over the last several years.

The actuarial valuation provides a "snapshot" of the funded position of PERS based on the plan provisions, membership data, assets, and actuarial methods and assumptions as of the valuation date.

Actuarial projections are also performed to provide a long-term view of the expected future funded status and contribution patterns (see Section 3). The future funded status and contribution patterns would be different than those shown in Section 3 if future experience does not match the actuarial assumptions used in the projections.

Retiree group benefits models necessarily rely on the use of approximations and estimates, and are sensitive to changes in these approximations and estimates. Small variations in these approximations and estimates may lead to significant changes in actuarial measurements.

Funded Status

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

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Funded Status as of June 30 ($'s in 000's)		2021	2022
Pension			
a.	Actuarial Accrued Liability	$ 15,419,975	$ 16,093,679
b.	Valuation Assets	10,466,709	10,961,498
c.	Unfunded Actuarial Accrued Liability, (a) - (b)	$ 4,953,266	$ 5,132,181
d.	Funded Ratio based on Valuation Assets, (b) ÷ (a)	67.9%	68.1%
e.	Fair Value of Assets	$ 11,912,309	$ 10,816,140
f.	Funded Ratio based on Fair Value of Assets, (e) ÷ (a)	77.3%	67.2%
Healthcare			
a.	Actuarial Accrued Liability	$ 6,856,170	$ 6,657,069
b.	Valuation Assets	8,581,155	8,979,943
c.	Unfunded Actuarial Accrued Liability, (a) - (b)	$ (1,724,985)	$ (2,322,874)
d.	Funded Ratio based on Valuation Assets, (b) ÷ (a)	125.2%	134.9%
e.	Fair Value of Assets	$ 9,784,141	$ 8,869,134
f.	Funded Ratio based on Fair Value of Assets, (e) ÷ (a)	142.7%	133.2%
Total			
a.	Actuarial Accrued Liability	$ 22,276,145	$ 22,750,748
b.	Valuation Assets	19,047,864	19,941,441
c.	Unfunded Actuarial Accrued Liability, (a) - (b)	$ 3,228,281	$ 2,809,307
d.	Funded Ratio based on Valuation Assets, (b) ÷ (a)	85.5%	87.7%
e.	Fair Value of Assets	$ 21,696,450	$ 19,685,274
f.	Funded Ratio based on Fair Value of Assets, (e) ÷ (a)	97.4%	86.5%

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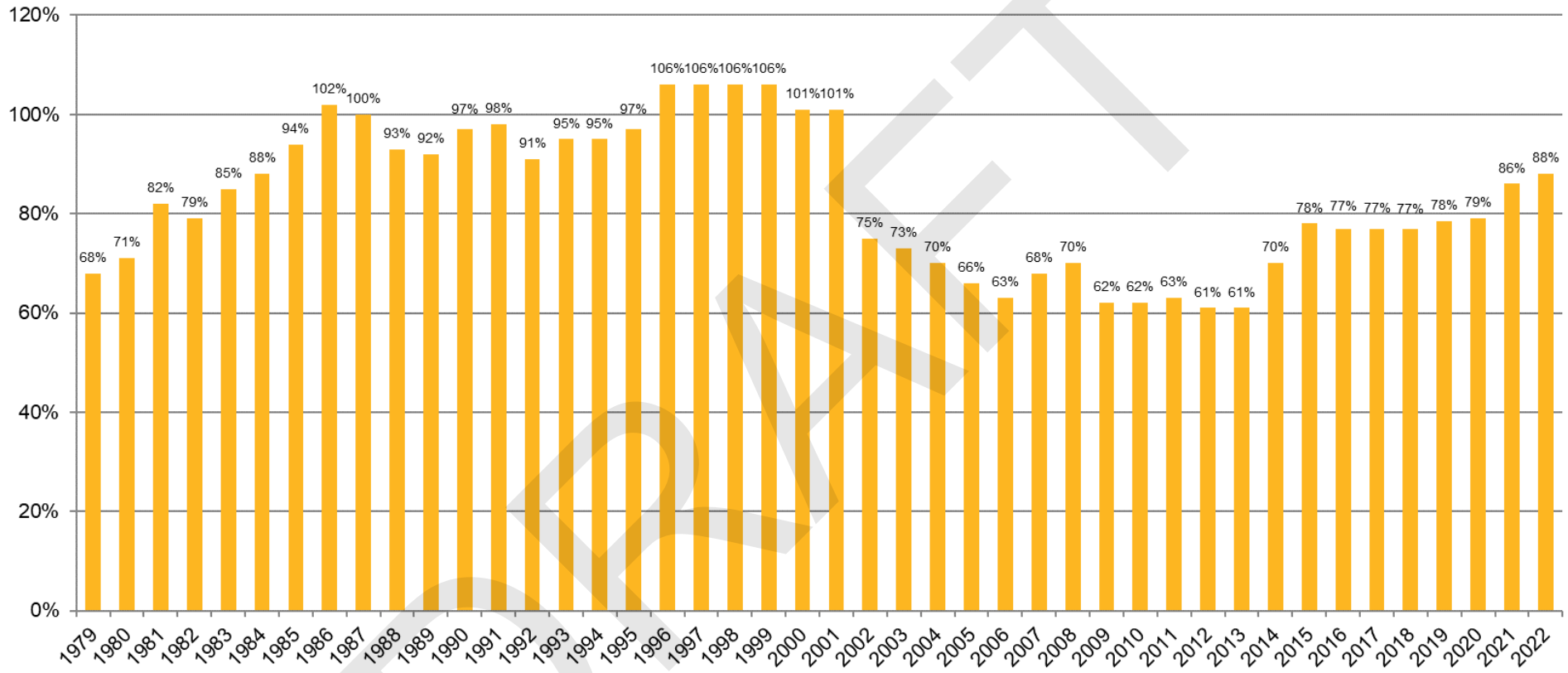
Funded Ratio History (Based on Valuation Assets)



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The key reasons for the change in the funded status are explained below. The funded status for healthcare benefits is not necessarily an appropriate measure to confirm that assets are sufficient to settle health plan obligations as there are no available financial instruments for purchase. Future experience is likely to vary from assumptions, so there is potential for actuarial gains or losses.

1. Investment Experience

The asset valuation method recognizes 20% of the investment gain or loss each year, for a period of five years. The FY22 investment return based on fair value of assets was approximately (6.0)% compared to the expected investment return of 7.38% (net of investment expenses). This resulted in a market asset loss of approximately $2,858 million. Due to the recognition of investment gains and losses over a 5-year period, the FY22 investment return based on actuarial value of assets was approximately 8.7%, which resulted in an actuarial asset gain of approximately $242 million.

2. Salary Increases

Salary increases for continuing active members during FY22 were higher than expected based on the valuation assumptions, resulting in a liability loss of approximately $51 million.

3. Demographic Experience

Section 4 provides statistics on active and inactive members. The number of active members decreased 11.1% from 9,888 at June 30, 2021 to 8,795 at June 30, 2022 due to active members exiting the plan during the year (due to retirement, termination, death, and disability) and the closure of the plan to new entrants as of July 1, 2006. The average age of active members increased from 53.51 to 53.78 and average credited service increased from 18.96 to 19.52 years.

The number of benefit recipients increased 1.4% from 37,717 to 38,243 and their average age increased from 71.17 to 71.61. The number of vested terminated participants decreased 3.5% from 5,135 to 4,955. Their average age increased from 53.92 to 54.37.

The overall effect of the demographic experience during FY22 was a liability loss of approximately $0.4 million (pension) and a liability gain of approximately $10.1[1] million (healthcare).

4. COLA / PRPA Experience

The cost-of-living increases (COLA) for benefit recipients during FY22 were less than expected based on the valuation assumptions, resulting in a liability gain of approximately $1.1 million. However, the CPI-based postretirement pension adjustments (PRPA) were more than expected, resulting in a liability loss of approximately $162 million.

5. Retiree Medical Claims Experience

As described in Section 5.2, recent medical claims experience and changes in healthcare enrollment data provided to us for the June 30, 2022 valuation generated a liability gain of approximately $252 million. Healthcare benefits paid during FY22 generated a liability gain of approximately $12 million.

[1] Includes the effects of changes in dependent coverage elections and Medicare Part B only experience.

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6. Changes in Methods Since the Prior Valuation

There were no changes in actuarial methods since the prior valuation.

7. Changes in Assumptions Since the Prior Valuation

Effective for the June 30, 2022 valuation, the Board adopted the changes to the demographic and economic assumptions recommended by the actuary, based on the results of an experience study performed on the plan experience from July 1, 2017 to June 30, 2021. The changes in assumptions were adopted at the June 2022 Board meeting. The effect of the new assumptions was to increase the total Actuarial Accrued Liability as of June 30, 2022 by approximately $117 million.

Healthcare claim costs are updated annually as described in Section 5.2. The amounts included in the Normal Cost for administrative expenses were updated based on the last two years of actual administrative expenses paid from plan assets

8. Changes in Benefit Provisions Since the Prior Valuation

There have been no changes in benefit provisions valued since the prior valuation.

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Comparative Summary of Contribution Rates

		Actual FY 2024	Estimated FY 2025
Pension			
a.	Normal Cost Rate Net of Member Contributions	2.14%	2.15%
b.	Past Service Cost Rate	16.33%	17.70%
c.	Total Employer/State Contribution Rate, (a) + (b), not less than (a)[1]	18.47%	19.85%
Healthcare			
a.	Normal Cost Rate	2.50%	1.94%
b.	Past Service Cost Rate	(5.83%)	(7.30%)
c.	Total Employer/State Contribution Rate, (a) + (b), not less than (a)[1]	2.50%	1.94%
Total			
a.	Normal Cost Rate Net of Member Contributions	4.64%	4.09%
b.	Past Service Cost Rate	16.33%	17.70%
c.	Total Employer/State Contribution Rate, (a) + (b)[1]	20.97%	21.79%
d.	Board Adopted Total Employer/State Contribution Rate	18.47%[2]	TBD
e.	Defined Contribution Retirement (DCR) Rate Paid by Employers	6.63%	6.73%
f.	Board Adopted Total Rate, Including DCR Rate Paid by Employers, (d) + (e)	25.10%	TBD

Contribution rates are based on total (DB and DCR) payroll. The contribution rates shown above for FY25 are estimated assuming no actuarial gains/losses during FY23 and FY24. Actual FY25 contribution rates will be adopted by the Board in September 2023 reflecting FY23 asset experience.

Contribution rates include Employer contribution rates as limited by Alaska state statutes and the Additional State Contribution required under SB 125.

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[1] Beginning with the June 30, 2014 valuation, contribution rates for FY17 and beyond are determined using new methodology in accordance with 2014 legislation under HB 385 and SB 119, 2014 Alaska Laws, which changed the amortization methodology to a closed 25-year period as a level percentage of pay, and eliminated the time lag on the contribution rate calculation by using a 2-year "roll-forward" approach assuming 0% population growth. Investment gains and losses are recognized over a 5-year period beginning in FY15. Beginning with the June 30, 2018 valuation, the UAAL amortization was changed as described in Section 5.2.

[2] The FY24 contribution rates adopted by the Board in September 2022 were 18.47% for Pension and 0.00% for Healthcare.

Summary of Actuarial Accrued Liability Gain/(Loss) and Other Changes During the Year

The following table summarizes the sources of change in the total Employer/State contribution rate as of June 30, 2021 and June 30, 2022 based on DB and DCR payroll combined:

	Pension	Healthcare	Total
1. Total Employer/State Contribution Rate as of June 30, 2021	18.93%	3.16%	22.09%
2. Change due to:			
a. Health Claims Experience	N/A	(0.11%)	(0.11%)
b. Salary Increases	0.13%	N/A	0.13%
c. Investment Experience	(0.34%)	0.00%	(0.34%)
d. Demographic Experience and Miscellaneous [1]	0.52%	(0.37%)	0.15%
e. Actual vs Expected Contributions	(0.14%)	0.00%	(0.14%)
f. Assumption/Method Changes	0.54%	(0.22%)	0.32%
g. Plan Changes	0.00%	0.00%	0.00%
h. Total Change, (a) + (b) + (c) + (d) + (e) + (f) + (g)	0.71%	(0.70%)	0.01%
3. Total Employer/State Contribution Rate as of June 30, 2022, (1) + (2)(h)	19.64%	2.46%	22.10%

The following table shows the FY22 gain/(loss) on actuarial accrued liability as of June 30, 2022 ($'s in 000's):

	Pension	Healthcare	Total
Retirement Experience	$ (20,482)	$ (9,371)	$ (29,853)
Termination Experience	(6,115)	(12,796)	(18,911)
Disability Experience	120	282	402
Active Mortality Experience	8,240	3,144	11,384
Inactive Mortality Experience	17,838	6,761	24,599
Salary Increases	(50,545)	N/A	(50,545)
Rehires (Net of Rehire Load)	8,458	11,563	20,021
Transfers between PF and Others	(724)	631	(93)
COLA Increases	1,134	N/A	1,134
PRPA Increases	(162,028)	N/A	(162,028)
Benefit Payments different than Expected	17,930	11,949	29,879
Per Capita Claims Cost	N/A	251,976	251,976
Medicare Part B Only Experience	N/A	5,064	5,064
Changes in Dependent Coverage Elections	N/A	17,064	17,064
Programming Changes[2]	791	(314)	477
Miscellaneous[3]	(16,449)	(6,702)	(23,151)
Total	$ (201,832)	$ 279,251	$ 77,419

[1] Includes the effects of census data changes between the two valuations.

[2] Includes adjustments to the way the 10% COLA minimum of $50 applies for all active members (pension), the calculation of occupational death benefits for married Peace Officer/Firefighters to include a minimum of 50% of salary (pension), the timing of the PRPA increases for Peace Officer/Firefighters who retire from occupational disability to be at their normal retirement date (pension), the elimination of child medical premiums for retirees over age 60 (healthcare), and the extension of disability rates beyond age 54 (healthcare).

[3] Includes the effects of various data changes that are typical when new census data is received for the annual valuation, as well as other items that do not fit neatly into any of the other categories. The pension amount includes a loss of $6,746 for unexpected beneficiaries and QDRO's based on last year's data.

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The rehire gain/(loss) amount shown on the previous page is the difference between (i) the increase in Actuarial Accrued Liability at June 30, 2022 due to rehires during the most recent plan year, and (ii) the load that was added to the June 30, 2021 Normal Cost based on the rehire load assumption used in the June 30, 2021 valuation. The development of the FY22 rehire gain/(loss) amount is shown in the table below ($'s in 000's):

	Pension	Healthcare	Total
1. Increase/(Decrease) in Actuarial Accrued Liability at June 30, 2022 due to Rehires	$ 11,800	$ (519)	$ 11,281
2. June 30, 2021 Normal Cost Rehire Load, with interest to June 30, 2022	$ 20,258	$ 11,044	$ 31,302
3. Rehire Gain/(Loss), (2) - (1)	$ 8,458	$ 11,563	$ 20,021

Other items that increased/(decreased) the actuarial accrued liability as of June 30, 2022 are shown below ($'s in 000's):

	Pension	Healthcare	Total
Experience Study Assumption Changes	$ 205,891	$ (88,392)	$ 117,499

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Section 1: Actuarial Funding Results

Section 1.1: Actuarial Liabilities and Normal Cost ($'s in 000's)

Peace Officer / Firefighter

As of June 30, 2022	Present Value of Projected Benefits	Actuarial Accrued (Past Service) Liability
Active Members		
Retirement Benefits	$ 933,907	$ 819,088
Termination Benefits	5,794	(650)
Disability Benefits	1,151	(1,627)
Death Benefits	5,205	2,791
Return of Contributions	531	(3,932)
Medical and Prescription Drug Benefits	345,828	292,498
Medicare Part D Subsidy	(32,479)	(27,510)
Indebtedness	(4,169)	(4,169)
Subtotal	$ 1,255,768	$ 1,076,489
Inactive Members		
Not Vested	$ 2,604	$ 2,604
Vested Terminations		
- Retirement Benefits	37,113	37,113
- Medical and Prescription Drug Benefits	99,317	99,317
- Medicare Part D Subsidy	(11,459)	(11,459)
- Indebtedness	(550)	(550)
Retirees & Beneficiaries		
- Retirement Benefits	1,855,975	1,855,975
- Medical and Prescription Drug Benefits	613,845	613,845
- Medicare Part D Subsidy	(93,135)	(93,135)
Subtotal	$ 2,503,710	$ 2,503,710
Total	**$ 3,759,478**	**$ 3,580,199**
Total Pension	**$ 2,837,561**	**$ 2,706,643**
Total Medical, Net of Part D Subsidy	**$ 921,917**	**$ 873,556**
Total Medical, Gross of Part D Subsidy	**$ 1,058,990**	**$ 1,005,660**

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Peace Officer / Firefighter

As of June 30, 2022	Present Value of Projected Benefits	Actuarial Accrued (Past Service) Liability
By Tier		
Tier 1		
- Pension	$ 980,148	$ 979,552
- Medical, Net of Part D Subsidy	249,473	249,070
Tier 2		
- Pension	728,229	716,835
- Medical, Net of Part D Subsidy	262,083	257,941
Tier 3		
- Pension	1,129,184	1,010,256
- Medical, Net of Part D Subsidy	410,361	366,545
Total	**$ 3,759,478**	**$ 3,580,199**

As of June 30, 2022	Normal Cost
Active Members	
Retirement Benefits	$ 22,133
Termination Benefits	1,306
Disability Benefits	560
Death Benefits	483
Return of Contributions	885
Medical and Prescription Drug Benefits	10,190
Medicare Part D Subsidy	(974)
Rehire Assumption (Pension)	3,881
Rehire Assumption (Medical)	221
Administrative Expenses (Pension)	2,175
Administrative Expenses (Medical)	639
Total	**$ 41,499**
Total Pension	**$ 31,423**
Total Medical, Net of Part D Subsidy	**$ 10,076**
Total Medical, Gross of Part D Subsidy	**$ 11,050**
By Tier	
Tier 1	
- Pension	$ 285
- Medical, Net of Part D Subsidy	174
Tier 2	
- Pension	3,775
- Medical, Net of Part D Subsidy	1,189
Tier 3	
- Pension	27,363
- Medical, Net of Part D Subsidy	8,713
Total	**$ 41,499**

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Section 1.1: Actuarial Liabilities and Normal Cost ($'s in 000's)

Others

As of June 30, 2022	Present Value of Projected Benefits	Actuarial Accrued (Past Service) Liability
Active Members		
Retirement Benefits	$ 3,268,920	$ 2,996,468
Termination Benefits	199,792	113,730
Disability Benefits	16,003	5,629
Death Benefits	24,789	19,011
Return of Contributions	10,360	(27,469)
Medical and Prescription Drug Benefits	1,695,732	1,406,497
Medicare Part D Subsidy	(238,440)	(202,857)
Indebtedness	(34,830)	(34,830)
Subtotal	$ 4,942,326	$ 4,276,179
Inactive Members		
Not Vested	$ 74,813	$ 74,813
Vested Terminations		
- Retirement Benefits	683,105	683,105
- Medical and Prescription Drug Benefits	896,206	896,206
- Medicare Part D Subsidy	(111,617)	(111,617)
- Indebtedness	(14,335)	(14,335)
Retirees & Beneficiaries		
- Retirement Benefits	9,570,914	9,570,914
- Medical and Prescription Drug Benefits	4,656,111	4,656,111
- Medicare Part D Subsidy	(860,827)	(860,827)
Subtotal	$ 14,894,370	$ 14,894,370
Total	**$ 19,836,696**	**$ 19,170,549**
Total Pension	**$ 13,799,531**	**$ 13,387,036**
Total Medical, Net of Part D Subsidy	**$ 6,037,165**	**$ 5,783,513**
Total Medical, Gross of Part D Subsidy	**$ 7,248,049**	**$ 6,958,814**

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Others

As of June 30, 2022	Present Value of Projected Benefits	Actuarial Accrued (Past Service) Liability
By Tier		
Tier 1		
- Pension	$ 6,012,181	$ 5,994,690
- Medical, Net of Part D Subsidy	2,170,866	2,155,098
Tier 2		
- Pension	3,992,776	3,916,074
- Medical, Net of Part D Subsidy	1,807,987	1,758,146
Tier 3		
- Pension	3,794,574	3,476,272
- Medical, Net of Part D Subsidy	2,058,312	1,870,269
Total	**$ 19,836,696**	**$ 19,170,549**

As of June 30, 2022	Normal Cost
Active Members	
Retirement Benefits	$ 52,076
Termination Benefits	13,971
Disability Benefits	1,772
Death Benefits	1,075
Return of Contributions	6,465
Medical and Prescription Drug Benefits	52,391
Medicare Part D Subsidy	(6,552)
Rehire Assumption (Pension)	11,530
Rehire Assumption (Medical)	1,100
Administrative Expenses (Pension)	6,460
Administrative Expenses (Medical)	3,179
Total	**$ 143,467**
Total Pension	**$ 93,349**
Total Medical, Net of Part D Subsidy	**$ 50,118**
Total Medical, Gross of Part D Subsidy	**$ 56,670**
By Tier	
Tier 1	
- Pension	$ 6,826
- Medical, Net of Part D Subsidy	5,336
Tier 2	
- Pension	21,435
- Medical, Net of Part D Subsidy	11,903
Tier 3	
- Pension	65,088
- Medical, Net of Part D Subsidy	32,879
Total	**$ 143,467**

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Section 1.1: Actuarial Liabilities and Normal Cost ($'s in 000's)

All Members

As of June 30, 2022	Present Value of Projected Benefits	Actuarial Accrued (Past Service) Liability
Active Members		
Retirement Benefits	$ 4,202,827	$ 3,815,556
Termination Benefits	205,586	113,080
Disability Benefits	17,154	4,002
Death Benefits	29,994	21,802
Return of Contributions	10,891	(31,401)
Medical and Prescription Drug Benefits	2,041,560	1,698,995
Medicare Part D Subsidy	(270,919)	(230,367)
Indebtedness	(38,999)	(38,999)
Subtotal	$ 6,198,094	$ 5,352,668
Inactive Members		
Not Vested	$ 77,417	$ 77,417
Vested Terminations		
- Retirement Benefits	720,218	720,218
- Medical and Prescription Drug Benefits	995,523	995,523
- Medicare Part D Subsidy	(123,076)	(123,076)
- Indebtedness	(14,885)	(14,885)
Retirees & Beneficiaries		
- Retirement Benefits	11,426,889	11,426,889
- Medical and Prescription Drug Benefits	5,269,956	5,269,956
- Medicare Part D Subsidy	(953,962)	(953,962)
Subtotal	$ 17,398,080	$ 17,398,080
Total	**$ 23,596,174**	**$ 22,750,748**
Total Pension	**$ 16,637,092**	**$ 16,093,679**
Total Medical, Net of Part D Subsidy	**$ 6,959,082**	**$ 6,657,069**
Total Medical, Gross of Part D Subsidy	**$ 8,307,039**	**$ 7,964,474**

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All Members

As of June 30, 2022	Present Value of Projected Benefits	Actuarial Accrued (Past Service) Liability
By Tier		
Tier 1		
- Pension	$ 6,992,329	$ 6,974,242
- Medical, Net of Part D Subsidy	2,420,339	2,404,168
Tier 2		
- Pension	4,721,005	4,632,909
- Medical, Net of Part D Subsidy	2,070,070	2,016,087
Tier 3		
- Pension	4,923,758	4,486,528
- Medical, Net of Part D Subsidy	2,468,673	2,236,814
Total	**$ 23,596,174**	**$ 22,750,748**

As of June 30, 2022	Normal Cost
Active Members	
Retirement Benefits	$ 74,209
Termination Benefits	15,277
Disability Benefits	2,332
Death Benefits	1,558
Return of Contributions	7,350
Medical and Prescription Drug Benefits	62,581
Medicare Part D Subsidy	(7,526)
Rehire Assumption (Pension)	15,411
Rehire Assumption (Medical)	1,321
Administrative Expenses (Pension)	8,635
Administrative Expenses (Medical)	3,818
Total	**$ 184,966**
Total Pension	**$ 124,772**
Total Medical, Net of Part D Subsidy	**$ 60,194**
Total Medical, Gross of Part D Subsidy	**$ 67,720**
By Tier	
Tier 1	
- Pension	$ 7,111
- Medical, Net of Part D Subsidy	5,510
Tier 2	
- Pension	25,210
- Medical, Net of Part D Subsidy	13,092
Tier 3	
- Pension	92,451
- Medical, Net of Part D Subsidy	41,592
Total	**$ 184,966**

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Section 1.2: Actuarial Contributions as of June 30, 2022 ($'s in 000's)

Peace Officer / Firefighter

Normal Cost Rate	Pension	Healthcare	Total
1. Total Normal Cost	$ 31,423	$ 10,076	$ 41,499
2. DB Rate Payroll Projected for FY23	142,154	142,154	142,154
3. DCR Rate Payroll Projected for FY23	249,857	249,857	249,857
4. Total Rate Payroll Projected for FY23	392,011	392,011	392,011
5. Normal Cost Rate			
a. Based on DB Rate Payroll, (1) ÷ (2)	22.10%	7.09%	29.19%
b. Based on Total Rate Payroll, (1) ÷ (4)	8.02%	2.57%	10.59%
6. Average Member Contribution Rate	2.72%	0.00%	2.72%
7. Employer Normal Cost, (5)(b) - (6)	5.30%	2.57%	7.87%

Past Service Rate	Pension	Healthcare	Total
1. Actuarial Accrued Liability	$ 2,706,643	$ 873,556	$ 3,580,199
2. Valuation Assets[1]	1,843,510	1,178,369	3,021,879
3. Unfunded Actuarial Accrued Liability, (1) - (2)	$ 863,133	$ (304,813)	$ 558,320
4. Funded Ratio, (2) ÷ (1)	68.1%	134.9%	84.4%
5. Past Service Cost Amortization Payment	68,268	(20,436)	47,832
6. Total Rate Payroll Projected for FY23	392,011	392,011	392,011
7. Past Service Rate, (5) ÷ (6)	17.41%	(5.21%)	17.41%
Total Employer / State Contribution Rate, not less than Normal Cost Rate	**22.71%**	**2.57%**	**25.28%**
Normal Cost Rate by Tier (Total Employer and Member)[2]			
Tier 1	23.97%	14.63%	38.60%
Tier 2	21.86%	6.88%	28.74%
Tier 3	22.12%	7.04%	29.16%

[1] Allocated between Peace Officer / Firefighter and Others in proportion to Actuarial Accrued Liability.

[2] Rates determined considering the payroll for members in each tier. DCR payroll is excluded from these calculations.

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Peace Officer / Firefighter

Schedule of Past Service Cost Amortizations - Pension ($'s in 000's)

Layer	Amortization Period		Balances		
	Date Created	Years Remaining	Initial	Outstanding	Beginning-of-Year Payment
Initial Amount	6/30/2018	17	$ 731,232	$ 711,892	$ 57,724
Change in Assumptions	6/30/2018	21	88,162	88,842	6,281
FY19 Loss	6/30/2019	22	61,980	62,507	4,296
FY20 Loss	6/30/2020	23	31,158	31,387	2,101
FY21 Gain	6/30/2021	24	(83,489)	(83,862)	(5,476)
Change in Assumptions	6/30/2022	25	42,593	42,593	2,718
FY22 Loss	6/30/2022	25	9,774	9,774	624
Total				**$ 863,133**	**$ 68,268**

Schedule of Past Service Cost Amortizations - Healthcare ($'s in 000's)

Layer	Amortization Period		Balances		
	Date Created	Years Remaining	Initial	Outstanding	Beginning-of-Year Payment
Initial Amount	6/30/2018	17	(30,991)	(30,172)	(2,447)
Change in Assumptions/Methods/EGWP	6/30/2018	21	27,556	27,768	1,963
FY19 Gain	6/30/2019	22	(77,575)	(78,234)	(5,376)
FY20 Gain	6/30/2020	23	(38,036)	(38,315)	(2,564)
Medical/Prescription Drug Plan Changes	6/30/2021	24	(7,361)	(7,394)	(483)
FY21 Gain	6/30/2021	24	(94,266)	(94,687)	(6,183)
Change in Assumptions	6/30/2022	25	4,475	4,475	286
FY22 Gain	6/30/2022	25	(88,254)	(88,254)	(5,632)
Total				**$ (304,813)**	**$ (20,436)**

Schedule of Past Service Cost Amortizations - Total ($'s in 000's)

Layer	Amortization Period		Balances		
	Date Created	Years Remaining	Initial	Outstanding	Beginning-of-Year Payment
Initial Amount	6/30/2018	17	700,241	681,720	55,277
Change in Assumptions/Methods/EGWP	6/30/2018	21	115,718	116,610	8,244
FY19 Gain	6/30/2019	22	(15,595)	(15,727)	(1,080)
FY20 Gain	6/30/2020	23	(6,878)	(6,928)	(463)
Medical/Prescription Drug Plan Changes	6/30/2021	24	(7,361)	(7,394)	(483)
FY21 Gain	6/30/2021	24	(177,755)	(178,549)	(11,659)
Change in Assumptions	6/30/2022	25	47,068	47,068	3,004
FY22 Gain	6/30/2022	25	(78,480)	(78,480)	(5,008)
Total				**$ 558,320**	**$ 47,832**

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Section 1.2: Actuarial Contributions as of June 30, 2022 ($'s in 000's)

Others

Normal Cost Rate	Pension	Healthcare	Total
1. Total Normal Cost	$ 93,349	$ 50,118	$ 143,467
2. DB Rate Payroll Projected for FY23	654,512	654,512	654,512
3. DCR Rate Payroll Projected for FY23	1,395,484	1,395,484	1,395,484
4. Total Rate Payroll Projected for FY23	2,049,996	2,049,996	2,049,996
5. Normal Cost Rate			
a. Based on DB Rate Payroll, (1) ÷ (2)	14.26%	7.66%	21.92%
b. Based on Total Rate Payroll, (1) ÷ (4)	4.55%	2.44%	6.99%
6. Average Member Contribution Rate	2.17%	0.00%	2.17%
7. Employer Normal Cost, (5)(b) - (6)	2.38%	2.44%	4.82%

Past Service Rate	Pension	Healthcare	Total
1. Actuarial Accrued Liability	$ 13,387,036	$ 5,783,513	$ 19,170,549
2. Valuation Assets[1]	9,117,988	7,801,574	16,919,562
3. Unfunded Actuarial Accrued Liability, (1) - (2)	$ 4,269,048	$ (2,018,061)	$ 2,250,987
4. Funded Ratio, (2) ÷ (1)	68.1%	134.9%	88.3%
5. Past Service Cost Amortization Payment	341,778	(133,951)	207,827
6. Total Rate Payroll Projected for FY23	2,049,996	2,049,996	2,049,996
7. Past Service Rate, (5) ÷ (6)	16.67%	(6.53%)	16.67%
Total Employer / State Contribution Rate, not less than Normal Cost Rate	**19.05%**	**2.44%**	**21.49%**
Normal Cost Rate by Tier (Total Employer and Member)[2]			
Tier 1	18.43%	14.41%	32.84%
Tier 2	13.73%	7.62%	21.35%
Tier 3	14.11%	7.13%	21.24%

[1] Allocated between Peace Officer / Firefighter and Others in proportion to Actuarial Accrued Liability.

[2] Rates determined considering the payroll for members in each tier. DCR payroll is excluded from these calculations.

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Others

Schedule of Past Service Cost Amortizations - Pension ($'s in 000's)

Layer	Amortization Period: Date Created	Amortization Period: Years Remaining	Balances: Initial	Balances: Outstanding	Beginning-of-Year Payment
Initial Amount	6/30/2018	17	$ 3,889,167	$ 3,786,305	$ 307,013
Change in Assumptions	6/30/2018	21	467,280	470,875	33,290
FY19 Loss	6/30/2019	22	235,559	237,556	16,325
FY20 Loss	6/30/2020	23	93,343	94,030	6,293
FY21 Gain	6/30/2021	24	(495,211)	(497,420)	(32,482)
Change in Assumptions	6/30/2022	25	163,298	163,298	10,420
FY22 Loss	6/30/2022	25	14,404	14,404	919
Total				**$ 4,269,048**	**$ 341,778**

Schedule of Past Service Cost Amortizations - Healthcare ($'s in 000's)

Layer	Amortization Period: Date Created	Amortization Period: Years Remaining	Balances: Initial	Balances: Outstanding	Beginning-of-Year Payment
Initial Amount	6/30/2018	17	(47,263)	(46,013)	(3,730)
Change in Assumptions/Methods/EGWP	6/30/2018	21	22,293	22,464	1,588
FY19 Gain	6/30/2019	22	(553,265)	(557,960)	(38,345)
FY20 Gain	6/30/2020	23	(253,711)	(255,575)	(17,106)
Medical/Prescription Drug Plan Changes	6/30/2021	24	(54,446)	(54,689)	(3,571)
FY21 Gain	6/30/2021	24	(613,647)	(616,386)	(40,250)
Change in Assumptions	6/30/2022	25	(92,867)	(92,867)	(5,926)
FY22 Gain	6/30/2022	25	(417,035)	(417,035)	(26,611)
Total				**$ (2,018,061)**	**$ (133,951)**

Schedule of Past Service Cost Amortizations - Total ($'s in 000's)

Layer	Amortization Period: Date Created	Amortization Period: Years Remaining	Balances: Initial	Balances: Outstanding	Beginning-of-Year Payment
Initial Amount	6/30/2018	17	3,841,904	3,740,292	303,283
Change in Assumptions/Methods/EGWP	6/30/2018	21	489,573	493,339	34,878
FY19 Gain	6/30/2019	22	(317,706)	(320,404)	(22,020)
FY20 Gain	6/30/2020	23	(160,368)	(161,545)	(10,813)
Medical/Prescription Drug Plan Changes	6/30/2021	24	(54,446)	(54,689)	(3,571)
FY21 Gain	6/30/2021	24	(1,108,858)	(1,113,806)	(72,732)
Change in Assumptions	6/30/2022	25	70,431	70,431	4,494
FY22 Gain	6/30/2022	25	(402,631)	(402,631)	(25,692)
Total				**$ 2,250,987**	**$ 207,827**

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Section 1.2: Actuarial Contributions as of June 30, 2022 ($'s in 000's)

All Members

Normal Cost Rate	Pension	Healthcare	Total
1. Total Normal Cost	$ 124,772	$ 60,194	$ 184,966
2. DB Rate Payroll Projected for FY23	796,666	796,666	796,666
3. DCR Rate Payroll Projected for FY23	1,645,341	1,645,341	1,645,341
4. Total Rate Payroll Projected for FY23	2,442,007	2,442,007	2,442,007
5. Normal Cost Rate			
a. Based on DB Rate Payroll, (1) ÷ (2)	15.66%	7.56%	23.22%
b. Based on Total Rate Payroll, (1) ÷ (4)	5.11%	2.46%	7.57%
6. Average Member Contribution Rate[1]	2.26%	0.00%	2.26%
7. Employer Normal Cost, (5)(b) - (6)	2.85%	2.46%	5.31%

Past Service Rate	Pension	Healthcare	Total
1. Actuarial Accrued Liability	$ 16,093,679	$ 6,657,069	$ 22,750,748
2. Valuation Assets	10,961,498	8,979,943	19,941,441
3. Unfunded Actuarial Accrued Liability, (1) - (2)	$ 5,132,181	$ (2,322,874)	$ 2,809,307
4. Funded Ratio, (2) ÷ (1)	68.1%	134.9%	87.7%
5. Past Service Cost Amortization Payment	410,046	(154,387)	255,659
6. Total Rate Payroll Projected for FY23	2,442,007	2,442,007	2,442,007
7. Past Service Rate, (5) ÷ (6)	16.79%	(6.32%)	16.79%
Total Employer / State Contribution Rate, not less than Normal Cost Rate	**19.64%**	**2.46%**	**22.10%**
Normal Cost Rate by Tier (Total Employer and Member)[2]			
Tier 1	18.60%	14.41%	33.01%
Tier 2	14.54%	7.55%	22.09%
Tier 3	15.80%	7.11%	22.91%

[1] 7.5% for Peace Officer / Firefighter and 6.82% weighted average for Others

[2] Rates determined considering the payroll for members in each tier. DCR payroll is excluded from these calculations.

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All Members

Schedule of Past Service Cost Amortizations - Pension ($'s in 000's)

Layer	Amortization Period		Balances		Beginning-of-Year Payment
	Date Created	Years Remaining	Initial	Outstanding	
Initial Amount	6/30/2018	17	$ 4,620,399	$ 4,498,197	$ 364,737
Change in Assumptions	6/30/2018	21	555,442	559,717	39,571
FY19 Loss	6/30/2019	22	297,539	300,063	20,621
FY20 Loss	6/30/2020	23	124,501	125,417	8,394
FY21 Gain	6/30/2021	24	(578,700)	(581,282)	(37,958)
Change in Assumptions	6/30/2022	25	205,891	205,891	13,138
FY22 Loss	6/30/2022	25	24,178	24,178	1,543
Total				**$ 5,132,181**	**$ 410,046**

Schedule of Past Service Cost Amortizations - Healthcare ($'s in 000's)

Layer	Amortization Period		Balances		Beginning-of-Year Payment
	Date Created	Years Remaining	Initial	Outstanding	
Initial Amount	6/30/2018	17	(78,254)	(76,185)	(6,177)
Change in Assumptions/Methods/EGWP	6/30/2018	21	49,849	50,232	3,551
FY19 Gain	6/30/2019	22	(630,840)	(636,194)	(43,721)
FY20 Gain	6/30/2020	23	(291,747)	(293,890)	(19,670)
Medical/Prescription Drug Plan Changes	6/30/2021	24	(61,807)	(62,083)	(4,054)
FY21 Gain	6/30/2021	24	(707,913)	(711,073)	(46,433)
Change in Assumptions	6/30/2022	25	(88,392)	(88,392)	(5,640)
FY22 Gain	6/30/2022	25	(505,289)	(505,289)	(32,243)
Total				**$ (2,322,874)**	**$ (154,387)**

Schedule of Past Service Cost Amortizations - Total ($'s in 000's)

Layer	Amortization Period		Balances		Beginning-of-Year Payment
	Date Created	Years Remaining	Initial	Outstanding	
Initial Amount	6/30/2018	17	4,542,145	4,422,012	358,560
Change in Assumptions/Methods/EGWP	6/30/2018	21	605,291	609,949	43,122
FY19 Gain	6/30/2019	22	(333,301)	(336,131)	(23,100)
FY20 Gain	6/30/2020	23	(167,246)	(168,473)	(11,276)
Medical/Prescription Drug Plan Changes	6/30/2021	24	(61,807)	(62,083)	(4,054)
FY21 Gain	6/30/2021	24	(1,286,613)	(1,292,355)	(84,391)
Change in Assumptions	6/30/2022	25	117,499	117,499	7,498
FY22 Gain	6/30/2022	25	(481,111)	(481,111)	(30,700)
Total				**$ 2,809,307**	**$ 255,659**

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Section 1.3: Roll-Forward Contribution Rate Calculation for FY25 ($'s in 000's)

	Pension	Healthcare	Total
1. Liability Roll Forward			
a. Actuarial Accrued Liability as of June 30, 2022	**$ 16,093,679**	**$ 6,657,069**	**$ 22,750,748**
b. Normal Cost	116,137	56,376	172,513
c. Interest on (a) and (b) at 7.25%	1,175,212	486,725	1,661,937
d. Estimated Benefit Payments	(1,037,270)	(410,266)	(1,447,536)
e. Interest on (d) at 7.25%, adjusted for timing	(40,081)	(14,612)	(54,693)
f. Expected Actuarial Accrued Liability as of June 30, 2023	**$ 16,307,677**	**$ 6,775,292**	**$ 23,082,969**
g. Projected Normal Cost	103,083	50,293	153,376
h. Interest on (f) and (g) at 7.25%	1,189,780	494,855	1,684,635
i. Estimated Benefit Payments	(1,087,579)	(431,186)	(1,518,765)
j. Interest on (i) at 7.25%, adjusted for timing	(42,024)	(15,357)	(57,381)
k. Expected Actuarial Accrued Liability as of June 30, 2024	**$ 16,470,937**	**$ 6,873,897**	**$ 23,344,834**
2. Asset Roll Forward			
a. Actuarial Value of Assets as of June 30, 2022	**$ 10,961,498**	**$ 8,979,943**	**$ 19,941,441**
b. Interest on (a) at 7.25%	794,709	651,046	1,445,755
c. Employee Contributions	60,769	0	60,769
d. Employer Contributions	414,488	0	414,488
e. State Assistance Contributions	33,933	0	33,933
f. Interest on (c) thru (e) at 7.25%, adjusted for timing*	19,387	0	19,387
g. Estimated Benefit Payments	(1,037,270)	(410,266)	(1,447,536)
h. Administrative Expenses	(8,635)	(3,818)	(12,453)
i. Interest on (g) and (h) at 7.25%, adjusted for timing	(40,388)	(14,748)	(55,136)
j. AVA Adjustments	6,792	11,126	17,918
k. Expected Actuarial Value of Assets as of June 30, 2023	**$ 11,205,283**	**$ 9,213,283**	**$ 20,418,566**
l. Interest on (k) at 7.25%	812,383	667,963	1,480,346
m. Employee Contributions	55,952	0	55,952
n. Employer Contributions	414,172	0	414,172
o. State Assistance Contributions**	37,942	0	37,942
p. Interest on (m) thru (o) at 7.25%, adjusted for timing*	19,495	0	19,495
q. Estimated Benefit Payments	(1,087,579)	(431,186)	(1,518,765)
r. Administrative Expenses	(7,716)	(3,410)	(11,126)
s. Interest on (q) and (r) at 7.25%, adjusted for timing	(42,299)	(15,478)	(57,777)
t. AVA Adjustments	32,783	29,961	62,744
u. Expected Actuarial Value of Assets as of June 30, 2024	**$ 11,440,416**	**$ 9,461,133**	**$ 20,901,549**
3. Expected Unfunded Actuarial Accrued Liability as of June 30, 2024, 1(k) - 2(u)	**$ 5,030,521**	**$ (2,587,236)**	**$ 2,443,285**

* Employee and Employer Contributions are paid throughout the year. State Assistance Contributions are assumed to be paid on July 1, 2022 for FY23, and July 1, 2023 for FY24.

** The FY24 State Assistance Contribution is expected to be contributed 100% to pension.

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	Pension	Healthcare	Total
4. Expected Annual Rate Payroll for FY25			
a. Defined Benefit Members			$ 649,344
b. Defined Contribution Retirement Members			1,815,216
c. Total Rate Payroll			**$ 2,464,560**
5. Expected FY25 Contribution Rate Calculation			
a. Projected Normal Cost for FY25	$ 98,092	$ 47,841	$ 145,933
b. Projected Normal Cost Rate for FY25	3.98%	1.94%	5.92%
c. Expected Member Contribution Rate for FY25	(1.83%)	0.00%	(1.83%)
d. Expected Employer Normal Cost Rate for FY25	**2.15%**	**1.94%**	**4.09%**
e. Expected Unfunded Liability as of June 30, 2024	$ 5,030,521	$ (2,587,236)	$ 2,443,285
f. FY25 Layered Amortization of Expected Unfunded Liability	436,203	(179,950)	256,253
g. Expected Past Service Cost Contribution Rate for FY25	**17.70%**	**(7.30%)**	**17.70%**
h. Expected Total Contribution Rate for FY25, not less than Normal Cost Rate	**19.85%**	**1.94%**	**21.79%**

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The components of the expected FY25 amortization amounts are shown below (totals may not add due to rounding):

Expected FY25 Schedule of Past Service Cost Amortizations - Pension ($'s in 000's)

Layer	Amortization Period		Balances		Beginning-of-Year Payment for FY25
	Date Created	Years Remaining at 6/30/24	Initial	Outstanding at 6/30/24	
Initial Amount	6/30/2018	15	$ 4,620,399	$ 4,352,600	$ 385,074
Change in Assumptions	6/30/2018	19	555,442	554,694	41,777
FY19 Loss	6/30/2019	20	297,539	298,706	21,771
FY20 Loss	6/30/2020	21	124,501	125,356	8,862
FY21 Gain	6/30/2021	22	(578,700)	(583,132)	(40,074)
FY22 Loss	6/30/2022	23	24,970	24,336	1,629
Change in Assumptions	6/30/2022	23	205,891	207,237	13,871
Expected FY23 Loss	6/30/2023	24	37,905	38,058	2,485
Expected FY24 Loss	6/30/2024	25	12,666	12,666	808
Total				**$ 5,030,521**	**$ 436,203**

Expected FY25 Schedule of Past Service Cost Amortizations - Healthcare ($'s in 000's)

Layer	Amortization Period		Balances		Beginning-of-Year Payment for FY25
	Date Created	Years Remaining at 6/30/24	Initial	Outstanding at 6/30/24	
Initial Amount	6/30/2018	15	$ (78,254)	$ (73,720)	$ (6,522)
Change in Assumptions/Methods/EGWP	6/30/2018	19	49,849	49,781	3,749
FY19 Gain	6/30/2019	20	(630,840)	(633,316)	(46,159)
FY20 Gain	6/30/2020	21	(291,747)	(293,747)	(20,767)
Medical/Prescription Drug Plan Changes	6/30/2021	22	(61,807)	(62,280)	(4,280)
FY21 Gain	6/30/2021	22	(707,913)	(713,337)	(49,022)
FY22 Gain	6/30/2022	23	(505,289)	(508,592)	(34,041)
Change in Assumptions/Methods/EGWP	6/30/2022	23	(88,392)	(88,969)	(5,955)
Expected FY23 Gain	6/30/2023	24	(112,290)	(112,746)	(7,362)
Expected FY24 Gain	6/30/2024	25	(150,310)	(150,310)	(9,591)
Total				**$ (2,587,236)**	**$ (179,950)**

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The components of the expected FY25 amortization amounts are shown below (totals may not add due to rounding):

Expected FY25 Schedule of Past Service Cost Amortizations - Total ($'s in 000's)

Layer	Amortization Period		Balances		Beginning-of-Year Payment for FY25
	Date Created	Years Remaining at 6/30/24	Initial	Outstanding at 6/30/24	
Initial Amount	6/30/2018	15	$ 4,542,145	$ 4,278,880	$ 378,552
Change in Assumptions/Methods/EGWP	6/30/2018	19	605,291	604,475	45,526
FY19 Gain	6/30/2019	20	(333,301)	(334,610)	(24,388)
FY20 Gain	6/30/2020	21	(167,246)	(168,391)	(11,905)
Medical/Prescription Drug Plan Changes	6/30/2021	22	(61,807)	(62,280)	(4,280)
FY21 Gain	6/30/2021	22	(707,913)	(1,296,469)	(89,096)
FY22 Gain	6/30/2022	23	(480,319)	(484,256)	(32,412)
Change in Assumptions/Methods/EGWP	6/30/2022	23	117,499	118,268	7,916
Expected FY23 Gain	6/30/2023	24	(74,385)	(74,688)	(4,877)
Expected FY24 Gain	6/30/2024	25	(137,644)	(137,644)	(8,783)
Total				**$ 2,443,285**	**$ 256,253**

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Section 1.4: Actuarial Gain/(Loss) for FY22 ($'s in 000's)

	Pension	Healthcare	Total
1. Expected Actuarial Accrued Liability			
a. Actuarial Accrued Liability as of June 30, 2021	$ 15,419,975	$ 6,856,170	$ 22,276,145
b. Normal Cost	119,376	70,467	189,843
c. Interest on (a) and (b) at 7.38%	1,146,804	511,186	1,657,990
d. Employer Group Waiver Plan	0	54,646	54,646
e. Benefit Payments	(953,055)	(453,308)	(1,406,363)
f. Refund of Contributions	(9,302)	0	(9,302)
g. Interest on (d) thru (f) at 7.38%, adjusted for timing	(37,842)	(14,449)	(52,291)
h. Assumptions/Methods Changes	205,891	(88,392)	117,499
i. Expected Actuarial Accrued Liability as of June 30, 2022 (a) + (b) + (c) + (d) + (e) + (f) + (g) + (h)	$ 15,891,847	$ 6,936,320	$ 22,828,167
2. Actual Actuarial Accrued Liability as of June 30, 2022	16,093,679	6,657,069	22,750,748
3. Liability Gain/(Loss), (1)(i) - (2)	**$ (201,832)**	**$ 279,251**	**$ 77,419**
4. Expected Actuarial Asset Value			
a. Actuarial Value of Assets as of June 30, 2021	$ 10,466,709	$ 8,581,155	$ 19,047,864
b. Interest on (a) at 7.38%	772,443	633,289	1,405,732
c. Employee Contributions	66,412	0	66,412
d. Employer Contributions	415,538	64,990	480,528
e. State Assistance Contributions	97,700	0	97,700
f. Employer Group Waiver Plan	0	54,646	54,646
g. Interest on (c) thru (f) at 7.38%, adjusted for timing	24,678	4,336	29,014
h. Benefit Payments	(953,055)	(453,308)	(1,406,363)
i. Refund of Contributions	(9,302)	0	(9,302)
j. Administrative Expenses	(9,038)	(2,776)	(11,814)
k. Interest on (h) thru (j) at 7.38%, adjusted for timing	(38,169)	(16,530)	(54,699)
l. Expected Actuarial Asset Value as of June 30, 2022 (a) + (b) + (c) + (d) + (e) + (f) + (g) + (h) + (i) + (j) + (k)	$ 10,833,916	$ 8,865,802	$ 19,699,718
5. Actual Actuarial Asset Value as of June 30, 2022	10,961,498	8,979,943	19,941,441
6. Actuarial Asset Value Gain/(Loss), (5) - (4)(l)	**$ 127,582**	**$ 114,141**	**$ 241,723**
7. Total Actuarial Gain/(Loss), (3) + (6)	**$ (74,250)**	**$ 393,392**	**$ 319,142**
8. Contribution Gain/(Loss)	**$ 51,250**	**$ 108,834**	**$ 160,084**
9. Administrative Expense Gain/(Loss)	**$ (1,178)**	**$ 3,063**	**$ 1,885**
10. FY22 Gain/(Loss), (7) + (8) + (9)	**$ (24,178)**	**$ 505,289**	**$ 481,111**

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Section 1.5: Development of Change in Unfunded Liability During FY22 ($'s in 000's)

	Pension	Healthcare	Total
1. 2021 Unfunded Liability	$ 4,953,266	$ (1,724,985)	$ 3,228,281
a. Interest on Unfunded Liability at 7.38%	$ 365,551	$ (127,304)	$ 238,247
b. Normal Cost	119,376	70,467	189,843
c. Employee Contributions	(66,412)	0	(66,412)
d. Employer Contributions	(415,538)	(64,990)	(480,528)
e. State Assistance Contributions	(97,700)	0	(97,700)
f. Administrative Expenses	9,038	2,776	11,814
g. Interest on (b) thru (f) at 7.38%, adjusted for timing	(15,541)	2,946	(12,595)
h. Assumptions/Methods Changes	205,891	(88,392)	117,499
i. Expected Change in Unfunded Liability During FY22 (a) + (b) + (c) + (d) + (e) + (f) + (g) + (h)	$ 104,665	$ (204,497)	$ (99,832)
2. Expected 2022 Unfunded Liability, (1) + (1)(i)	$ 5,057,931	$ (1,929,482)	$ 3,128,449
a. Liability (Gain)/Loss During FY22	$ 201,832	$ (279,251)	$ (77,419)
b. Actuarial Assets (Gain)/Loss During FY22	(127,582)	(114,141)	(241,723)
c. Total Actuarial (Gain)/Loss During FY22	$ 74,250	$ (393,392)	$ (319,142)
3. Actual 2022 Unfunded Liability, (2) + (2)(c)	$ 5,132,181	$ (2,322,874)	$ 2,809,307

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Section 1.6: Analysis of Financial Experience

Pension
Change in Employer / State Contribution Rate as of Valuation Date
Due to (Gains) and Losses in Actuarial Accrued Liabilities During the Last Five Fiscal Years
Resulting from Differences Between Assumed Experience and Actual Experience

	Change in Employer / State Contribution Rate During Fiscal Year				
	Pension				
Type of (Gain) or Loss	2018	2019	2020	2021	2022
1. Health Claims	N/A	N/A	N/A	N/A	N/A
2. Salary Experience	(0.30%)	0.16%	(0.03%)	0.05%	0.13%
3. Investment Experience	0.52%	0.50%	0.44%	(1.06%)	(0.34%)
4. Demographic Experience and Miscellaneous	0.26%	(0.45%)	(0.19%)	(0.54%)	0.52%
5. Actual vs Expected Contributions	0.14%	0.11%	0.15%	(0.06%)	(0.14%)
6. (Gain) or Loss During Year From Experience, (1) + (2) + (3) + (4) + (5)	0.62%	0.32%	0.37%	(1.61%)	0.17%
7. Assumptions / Method Changes	1.65%	0.00%	0.00%	0.00%	0.54%
8. Plan Changes	0.00%	0.00%	0.00%	0.00%	0.00%
9. Composite (Gain) or Loss During Year, (6) + (7) + (8)	2.27%	0.32%	0.37%	(1.61%)	0.71%
10. Beginning Total Employer / State Contribution Rate	17.58%	19.85%	20.17%	20.54%	18.93%
11. Ending Valuation Year Employer / State Contribution Rate, (9) + (10)	19.85%	20.17%	20.54%	18.93%	19.64%
12. Fiscal Year Rates Adopted by ARMB					
a. Fiscal Year Employer / State Contribution Rate	20.66%	20.89%	18.38%	18.47%	19.85% *
b. Fiscal Year for which Rate Applies	FY21	FY22	FY23	FY24	FY25

* Expected rate. Actual rate to be determined

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Healthcare
Change in Employer / State Contribution Rate as of Valuation Date
Due to (Gains) and Losses in Actuarial Accrued Liabilities During the Last Five Fiscal Years
Resulting from Differences Between Assumed Experience and Actual Experience

	Change in Employer / State Contribution Rate During Fiscal Year				
	Healthcare				
Type of (Gain) or Loss	2018	2019	2020	2021	2022
1. Health Claims	(1.51%)	(2.39%)	(0.87%)	(0.12%)	(0.11%)
2. Salary Experience	N/A	N/A	N/A	N/A	N/A
3. Investment Experience	0.40%	0.38%	0.31%	0.00%	0.00%
4. Demographic Experience and Miscellaneous	(1.08%)	1.16%	0.38%	(0.26%)	(0.37%)
5. Actual vs Expected Contributions	0.06%	0.02%	(0.16%)	0.00%	0.00%
6. (Gain) or Loss During Year From Experience, (1) + (2) + (3) + (4) + (5)	(2.13%)	(0.83%)	(0.34%)	(0.38%)	(0.48%)
7. Assumptions / Method Changes	2.20%	0.00%	0.00%	0.00%	(0.22%)
8. Plan Changes	0.00%	0.00%	0.00%	(0.03%)	0.00%
9. Composite (Gain) or Loss During Year, (6) + (7) + (8)	0.07%	(0.83%)	(0.34%)	(0.41%)	(0.70%)
10. Beginning Total Employer / State Contribution Rate	4.67%	4.74%	3.91%	3.57%	3.16%
11. Ending Valuation Year Employer / State Contribution Rate, (9) + (10)	4.74%	3.91%	3.57%	3.16%	2.46%
12. Fiscal Year Rates Adopted by ARMB					
a. Fiscal Year Employer / State Contribution Rate	4.27%	3.12%	0.00%	0.00%	1.94% *
b. Fiscal Year for which Rate Applies	FY21	FY22	FY23	FY24	FY25

* Expected rate. Actual rate to be determined

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Total
Change in Employer / State Contribution Rate as of Valuation Date
Due to (Gains) and Losses in Actuarial Accrued Liabilities During the Last Five Fiscal Years
Resulting from Differences Between Assumed Experience and Actual Experience

	Change in Employer / State Contribution Rate During Fiscal Year				
	Total				
Type of (Gain) or Loss	2018	2019	2020	2021	2022
1. Health Claims	(1.51%)	(2.39%)	(0.87%)	(0.12%)	(0.11%)
2. Salary Experience	(0.30%)	0.16%	(0.03%)	0.05%	0.13%
3. Investment Experience	0.92%	0.88%	0.75%	(1.06%)	(0.34%)
4. Demographic Experience and Miscellaneous	(0.82%)	0.71%	0.19%	(0.80%)	0.15%
5. Actual vs Expected Contributions	0.20%	0.13%	(0.01%)	(0.06%)	(0.14%)
6. (Gain) or Loss During Year From Experience, (1) + (2) + (3) + (4) + (5)	(1.51%)	(0.51%)	0.03%	(1.99%)	(0.31%)
7. Assumptions / Method Changes	3.85%	0.00%	0.00%	0.00%	0.32%
8. Plan Changes	0.00%	0.00%	0.00%	(0.03%)	0.00%
9. Composite (Gain) or Loss During Year, (6) + (7) + (8)	2.34%	(0.51%)	0.03%	(2.02%)	0.01%
10. Beginning Total Employer / State Contribution Rate	22.25%	24.59%	24.08%	24.11%	22.09%
11. Ending Valuation Year Employer / State Contribution Rate, (9) + (10)	24.59%	24.08%	24.11%	22.09%	22.10%
12. Fiscal Year Rates Adopted by ARMB					
a. Fiscal Year Employer / State Contribution Rate	24.93%	24.01%	18.38%	18.47%	21.79% *
b. Fiscal Year for which Rate Applies	FY21	FY22	FY23	FY24	FY25

* Expected rate. Actual rate to be determined

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Section 1.7: History of Unfunded Liability and Funded Ratio ($'s in 000's)

Valuation Date	Total Actuarial Accrued Liability	Valuation Assets	Assets as a Percent of Actuarial Accrued Liability	Unfunded Actuarial Accrued Liability (UAAL)
June 30, 2003	$ 10,561,653	$ 7,687,281	72.8%	$ 2,874,372
June 30, 2004	11,443,916	8,030,414	70.2%	3,413,502
June 30, 2005	12,844,841	8,442,919	65.7%	4,401,922
June 30, 2006	14,388,413	9,040,908	62.8%	5,347,505
June 30, 2007	14,570,933	9,900,960	68.0%	4,669,973
June 30, 2008	15,888,141	11,040,106	69.5%	4,848,035
June 30, 2009	16,579,371	10,242,978	61.8%	6,336,393
June 30, 2010	18,132,492	11,157,464	61.5%	6,975,028
June 30, 2011	18,740,550	11,813,774	63.0%	6,926,776
June 30, 2012	19,292,361	11,832,030	61.3%	7,460,331
June 30, 2013	19,992,759	12,162,626	60.8%	7,830,133
June 30, 2014	20,897,372	14,644,598	70.1%	6,252,774
June 30, 2015	20,648,663	16,173,459	78.3%	4,475,204
June 30, 2016	21,369,490	16,467,992	77.1%	4,901,498
June 30, 2017	21,881,395	16,786,771	76.7%	5,094,624
June 30, 2018	22,264,137	17,116,701	76.9%	5,147,436
June 30, 2019	22,190,874	17,387,184	78.4%	4,803,690
June 30, 2020	22,316,075	17,703,068	79.3%	4,613,007
June 30, 2021	22,276,145	19,047,864	85.5%	3,228,281
June 30, 2022	22,750,748	19,941,441	87.7%	2,809,307

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Section 2: Plan Assets

Section 2.1: Summary of Fair Value of Assets ($'s in 000's)

As of June 30, 2022	Pension	Healthcare	Total	Allocation Percent
Cash and Short-Term Investments				
- Cash and Cash Equivalents	$ 155,842	$ 112,908	$ 268,750	1.5%
- Subtotal	$ 155,842	$ 112,908	$ 268,750	1.5%
Fixed Income Investments				
- Domestic Fixed Income Pool	$ 2,300,390	$ 1,899,694	$ 4,200,084	21.3%
- International Fixed Income Pool	0	0	0	0.0%
- Tactical Fixed Income Pool	0	0	0	0.0%
- High Yield Pool	0	0	0	0.0%
- Treasury Inflation Protection Pool	0	0	0	0.0%
- Emerging Debt Pool	0	0	0	0.0%
- Subtotal	$ 2,300,390	$ 1,899,694	$ 4,200,084	21.3%
Equity Investments				
- Domestic Equity Pool	$ 2,618,110	$ 2,162,072	$ 4,780,182	24.2%
- International Equity Pool	1,421,227	1,173,607	2,594,834	13.1%
- Private Equity Pool	1,779,516	1,469,549	3,249,065	16.5%
- Emerging Markets Equity Pool	318,049	262,649	580,698	2.9%
- Alternative Equity Strategies	629,789	520,088	1,149,877	5.8%
- Subtotal	$ 6,766,691	$ 5,587,965	$ 12,354,656	62.5%
Other Investments				
- Real Estate Pool	$ 813,282	$ 672,726	$ 1,486,008	7.5%
- Other Investments Pool	778,899	643,225	1,422,124	7.2%
- Absolute Return Pool	0	0	0	0.0%
- Other Assets	15	967	982	0.0%
- Subtotal	$ 1,592,196	$ 1,316,918	$ 2,909,114	14.7%
Total Cash and Investments	$ 10,815,119	$ 8,917,485	$ 19,732,604	100.0%
Net Accrued Receivables	1,021	(48,351)	(47,330)	
Net Assets	$ 10,816,140	$ 8,869,134	$ 19,685,274	

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Section 2.2: Changes in Fair Value of Assets During FY22 ($'s in 000's)

Fiscal Year 2022	Pension	Healthcare	Total
1. Fair Value of Assets as of June 30, 2021	$ 11,912,309	$ 9,784,141	$ 21,696,450
2. Additions:			
a. Employee Contributions	$ 66,412	$ 0	$ 66,412
b. Employer Contributions	415,538	64,990	480,528
c. State Assistance Contributions	97,700	0	97,700
d. Interest and Dividend Income	153,569	127,317	280,886
e. Net Appreciation / Depreciation in Fair Value of Investments	(829,657)	(682,785)	(1,512,442)
f. Employer Group Waiver Plan	0	54,646	54,646
g. Other	187	125	312
h. Total Additions	$ (96,251)	$ (435,707)	$ (531,958)
3. Deductions:			
a. Medical Benefits	$ 0	$ 453,308	$ 453,308
b. Retirement Benefits	953,055	0	953,055
c. Refund of Contributions	9,302	0	9,302
d. Investment Expenses	28,523	23,216	51,739
e. Administrative Expenses	9,038	2,776	11,814
f. Total Deductions	$ 999,918	$ 479,300	$ 1,479,218
4. Fair Value of Assets as of June 30, 2022	$ 10,816,140	$ 8,869,134	$ 19,685,274
5. Approximate Fair Value Investment Return Rate during FY22 Net of Investment Expenses	-6.0%	-6.0%	-6.0%

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Section 2.3: Development of Actuarial Value of Assets ($'s in 000's)

The actuarial value of asset was set equal to the fair value as of June 30, 2014 and the 20% corridor was eliminated. Investment gains and losses after June 30, 2014 are recognized 20% per year over 5 years.

	Pension	Healthcare	Total
1. Deferral of Investment Gain / (Loss) for FY22			
a. Fair Value of Assets as of June 30, 2021	$ 11,912,309	$ 9,784,141	$ 21,696,450
b. Contributions	579,650	64,990	644,640
c. Employer Group Waiver Plan	0	54,646	54,646
d. Benefit Payments	962,357	453,308	1,415,665
e. Administrative Expenses	9,038	2,776	11,814
f. Actual Investment Return (net of investment expenses)	(704,424)	(578,559)	(1,282,983)
g. Expected Return Rate (net of investment expenses)	7.38%	7.38%	7.38%
h. Expected Return, Weighted for Timing	865,637	709,876	1,575,513
i. Investment Gain / (Loss) for the Year, (f) - (h)	(1,570,061)	(1,288,435)	(2,858,496)
2. Actuarial Value as of June 30, 2022			
a. Fair Value as of June 30, 2022	$ 10,816,140	$ 8,869,134	$ 19,685,274
b. Deferred Investment Gain / (Loss)	(145,358)	(110,809)	(256,167)
c. Actuarial Value as of June 30, 2022, (a) - (b)	10,961,498	8,979,943	19,941,441
3. Ratio of Actuarial Value of Assets to Fair Value of Assets	101.3%	101.2%	101.3%
4. Approximate Actuarial Value Investment Return Rate during FY22 Net of Investment Expenses	8.6%	8.7%	8.7%

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The tables below show the development of the gains/(losses) to be recognized in the current year ($'s in 000's):

Pension				
Fiscal Year Ending	Asset Gain / (Loss)	Gain / (Loss) Recognized in Prior Years	Gain / (Loss) Recognized This Year	Gain / (Loss) Deferred to Future Years
June 30, 2018	$ 17,834	$ 14,268	$ 3,566	$ 0
June 30, 2019	(136,242)	(81,744)	(27,248)	(27,250)
June 30, 2020	(310,824)	(124,330)	(62,165)	(124,329)
June 30, 2021	2,103,782	420,756	420,756	1,262,270
June 30, 2022	(1,570,061)	0	(314,012)	(1,256,049)
Total	**$ 104,489**	**$ 228,950**	**$ 20,897**	**$ (145,358)**

Healthcare				
Fiscal Year Ending	Asset Gain / (Loss)	Gain / (Loss) Recognized in Prior Years	Gain / (Loss) Recognized This Year	Gain / (Loss) Deferred to Future Years
June 30, 2018	$ 30,997	$ 24,796	$ 6,201	$ 0
June 30, 2019	(101,128)	(60,678)	(20,225)	(20,225)
June 30, 2020	(244,753)	(97,903)	(48,950)	(97,900)
June 30, 2021	1,730,106	346,021	346,021	1,038,064
June 30, 2022	(1,288,435)	0	(257,687)	(1,030,748)
Total	**$ 126,787**	**$ 212,236**	**$ 25,360**	**$ (110,809)**

Total				
Fiscal Year Ending	Asset Gain / (Loss)	Gain / (Loss) Recognized in Prior Years	Gain / (Loss) Recognized This Year	Gain / (Loss) Deferred to Future Years
June 30, 2018	$ 48,831	$ 39,064	$ 9,767	$ 0
June 30, 2019	(237,370)	(142,422)	(47,473)	(47,475)
June 30, 2020	(555,577)	(222,233)	(111,115)	(222,229)
June 30, 2021	3,833,888	766,777	766,777	2,300,334
June 30, 2022	(2,858,496)	0	(571,699)	(2,286,797)
Total	**$ 231,276**	**$ 441,186**	**$ 46,257**	**$ (256,167)**

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Section 2.4: Historical Asset Rates of Return

	Actuarial Value		Fair Value	
Year Ending	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%	18.1%	6.9%
June 30, 2015	7.0%	7.1%	2.9%	6.5%
June 30, 2016	5.0%	6.9%	(0.7%)	5.9%
June 30, 2017	5.4%	6.8%	12.8%	6.4%
June 30, 2018	6.1%	6.8%	8.2%	6.5%
June 30, 2019	5.5%	6.7%	6.0%	6.5%
June 30, 2020	5.8%	6.6%	4.1%	6.3%
June 30, 2021	11.6%	6.9%	30.0%	7.6%
June 30, 2022	8.7%	7.0%	(6.0%)	6.8%

* Cumulative since fiscal year ending June 30, 2005

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Section 3: Projections

Section 3.1: Projection Assumptions and Methods

Key Assumptions

- 7.25% investment return (net of investment expenses) on the Fair Value of Assets in all future years.
- The Actuarial Value of Assets was re-initialized to Fair Value as of June 30, 2014. The Actuarial Value of Assets after June 30, 2014 reflects the deferred gains and losses generated by the smoothing method. The current deferred amount is recognized in the first four years of the projections.
- Actuarial assumptions and methods as described in Section 5. No actuarial gains/losses are assumed after June 30, 2022 (other than the recognition of current deferred asset gains/losses).
- The actuarially calculated contribution rate using a two-year roll-forward approach is adopted each year.
- Projections assume a 0% increase in the total active member population. All new members are expected to enter the DCR plan.
- Contribution rates are determined as a percent of total DB and DCR payroll.
- The DCR contribution rate determined as of June 30, 2022 is assumed to remain constant in all future years.
- The active rehire assumption shown in Section 5 is assumed to grade to zero on a uniform basis over 20 years.
- The Normal Cost is increased by the administrative expenses shown in Section 5. For future years, the percent increase is assumed to remain constant.
- The % of total DB/DCR payroll represented by the State's employees based on the June 30, 2022 data was assumed to remain constant in all future years.
- Board-adopted contribution rates for FY23 and FY24 are reflected.
- The healthcare Normal Cost is assumed to be deposited to the healthcare trust in FY25 and beyond.

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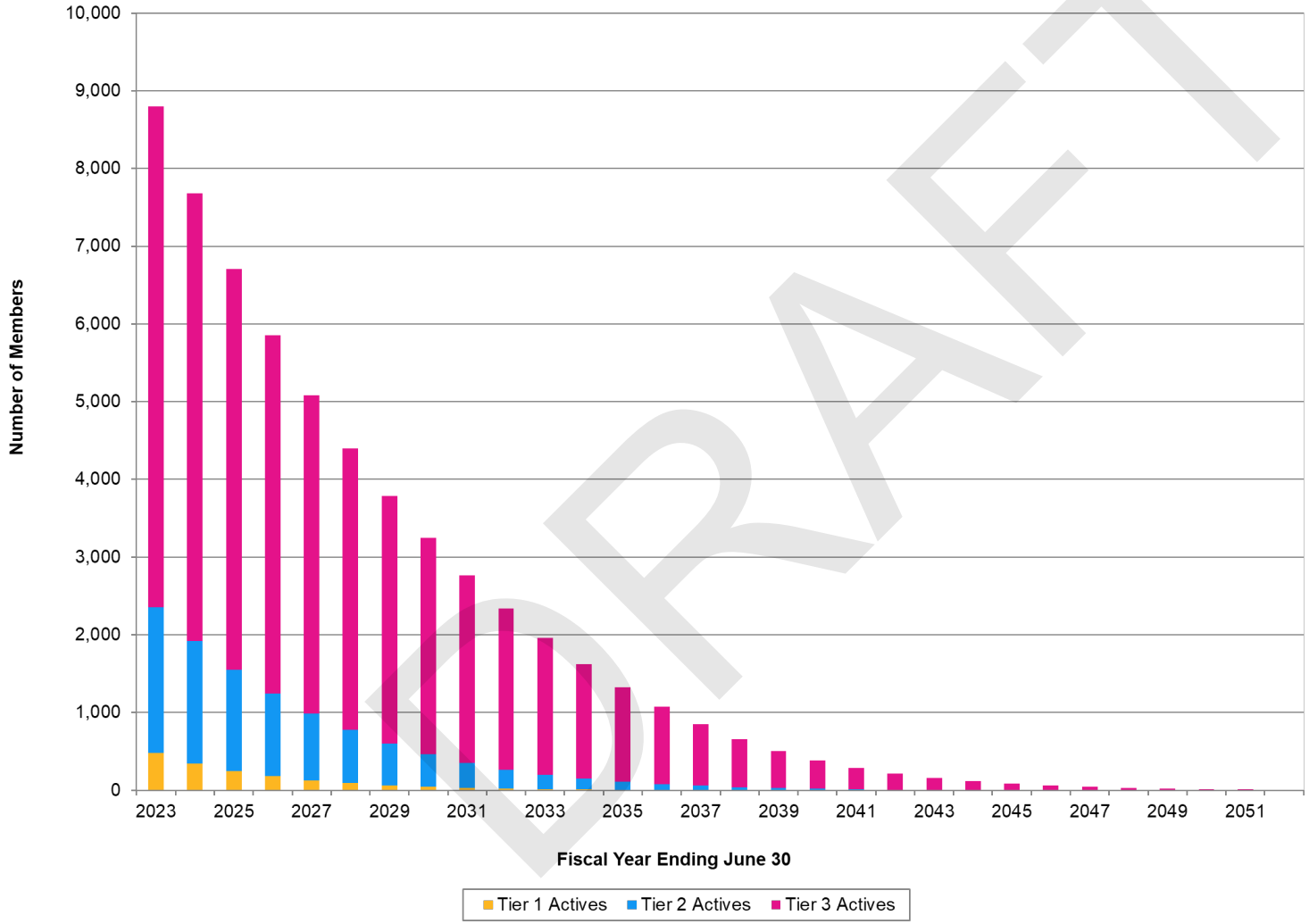
Section 3.2: Membership Projection

Projected Active Member Count



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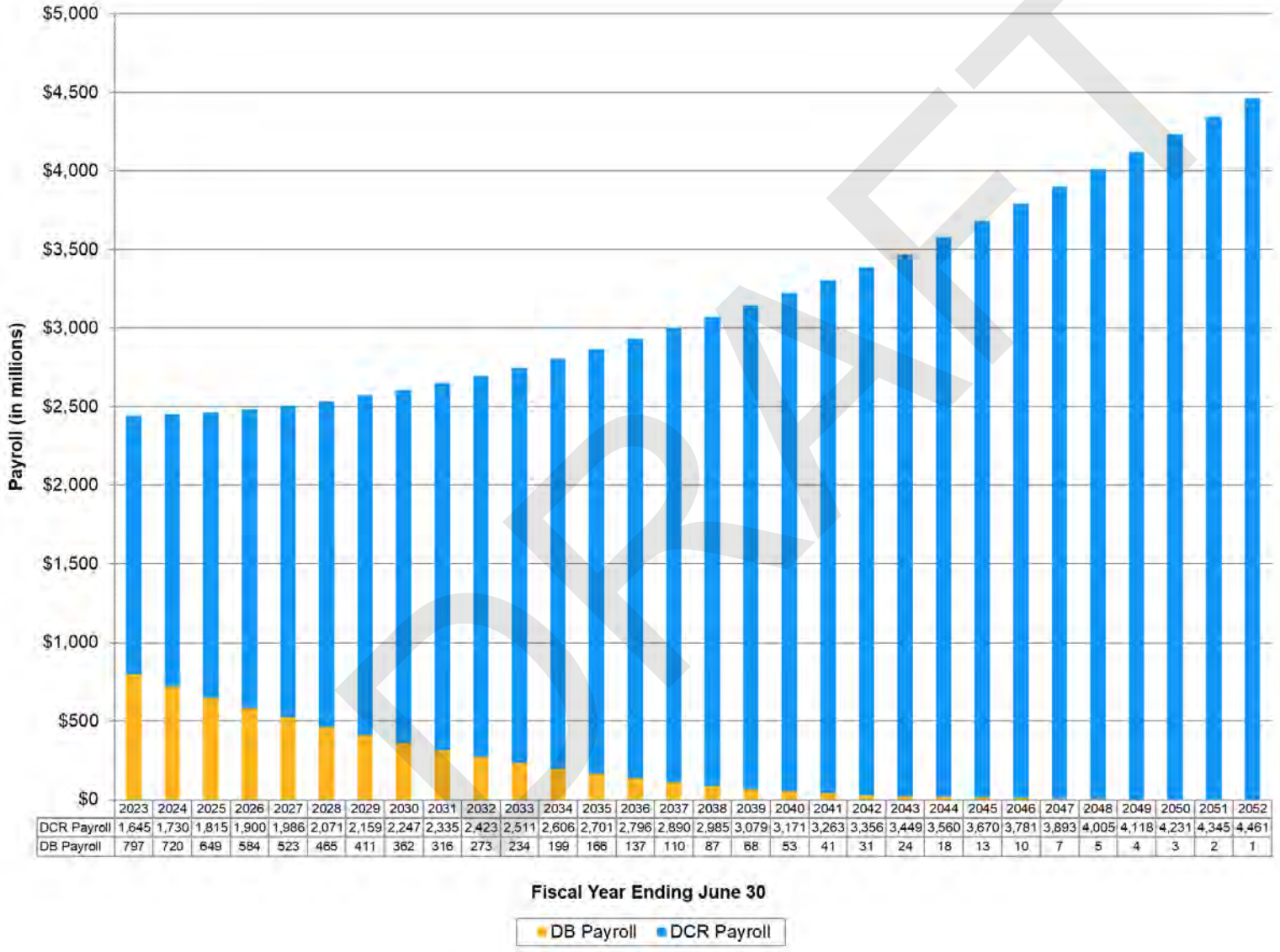
Projected DB and DCR Payroll



	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052
DCR Payroll	1,645	1,730	1,815	1,900	1,986	2,071	2,159	2,247	2,335	2,423	2,511	2,606	2,701	2,796	2,890	2,985	3,079	3,171	3,263	3,356	3,449	3,560	3,670	3,781	3,893	4,005	4,118	4,231	4,345	4,461
DB Payroll	797	720	649	584	523	465	411	362	316	273	234	199	166	137	110	87	68	53	41	31	24	18	13	10	7	5	4	3	2	1

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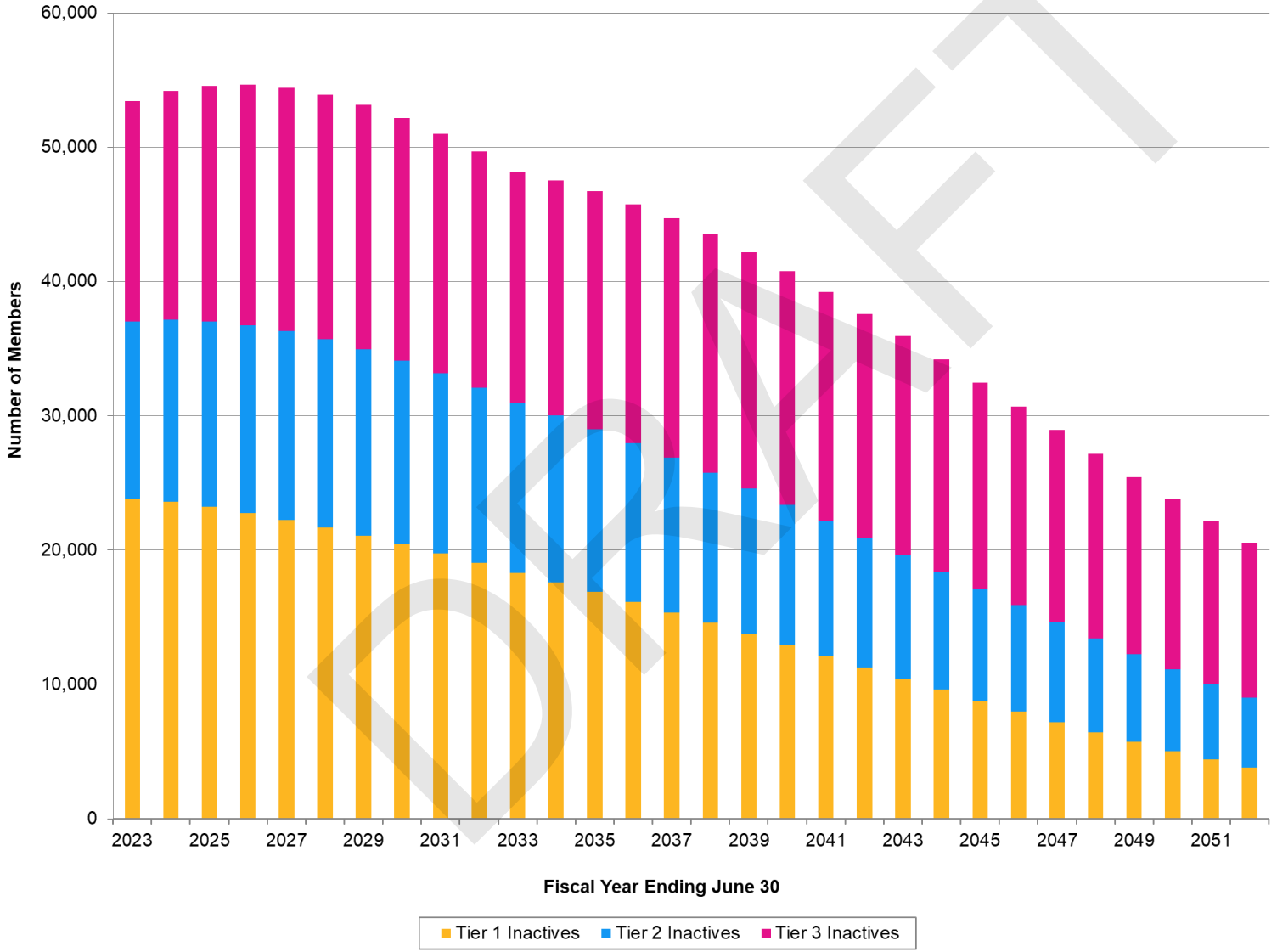
Projected Inactive Member Count



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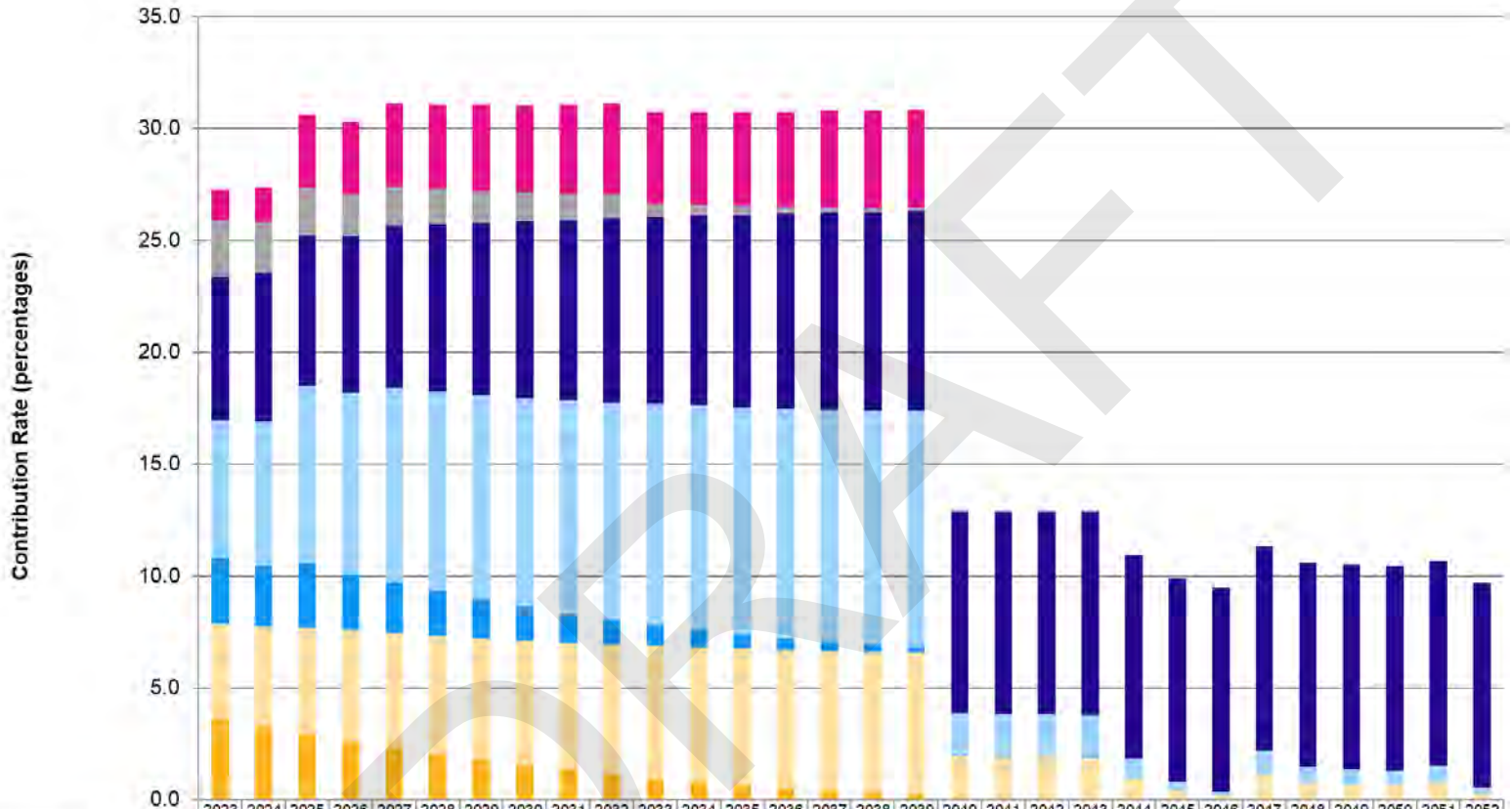
Section 3.3A: Projected Employer/State Contribution Rates

Based on Total DB and DCR Payroll



	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052
State Assistance	1.41	1.56	3.29	3.23	3.72	3.78	3.84	3.90	3.97	4.04	4.12	4.16	4.21	4.25	4.31	4.35	4.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
DB EE Contributions	2.49	2.28	2.09	1.91	1.73	1.58	1.44	1.31	1.19	1.08	0.59	0.49	0.40	0.32	0.25	0.20	0.15	0.11	0.09	0.06	0.05	0.03	0.03	0.02	0.01	0.01	0.01	0.00	0.00	0.00
DCR ER Contributions	6.41	6.63	6.73	6.99	7.24	7.47	7.68	7.87	8.05	8.21	8.36	8.49	8.61	8.71	8.81	8.88	8.94	8.99	9.03	9.06	9.08	9.10	9.11	9.12	9.12	9.13	9.13	9.14	9.14	9.14
State as ER on DCR Pay	6.14	6.47	7.96	8.12	8.69	8.92	9.14	9.34	9.53	9.72	9.89	10.03	10.15	10.27	10.38	10.47	10.56	1.89	1.87	1.87	1.87	0.90	0.39	0.17	1.09	0.73	0.67	0.65	0.76	0.27
State as ER on DB Pay	2.97	2.69	2.85	2.50	2.29	2.00	1.74	1.50	1.29	1.10	0.92	0.76	0.62	0.50	0.40	0.30	0.23	0.03	0.02	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
DB ER Contributions on DCR Pay	4.24	4.49	4.78	4.96	5.13	5.29	5.44	5.58	5.71	5.83	5.93	6.03	6.11	6.18	6.24	6.30	6.35	1.84	1.85	1.86	1.87	0.90	0.38	0.16	1.10	0.73	0.68	0.66	0.77	0.27
DB ER Contributions on DB Pay	3.62	3.26	2.92	2.61	2.31	2.03	1.78	1.54	1.32	1.12	0.95	0.79	0.64	0.52	0.41	0.31	0.24	0.11	0.08	0.06	0.04	0.03	0.02	0.01	0.01	0.01	0.00	0.00	0.00	0.00

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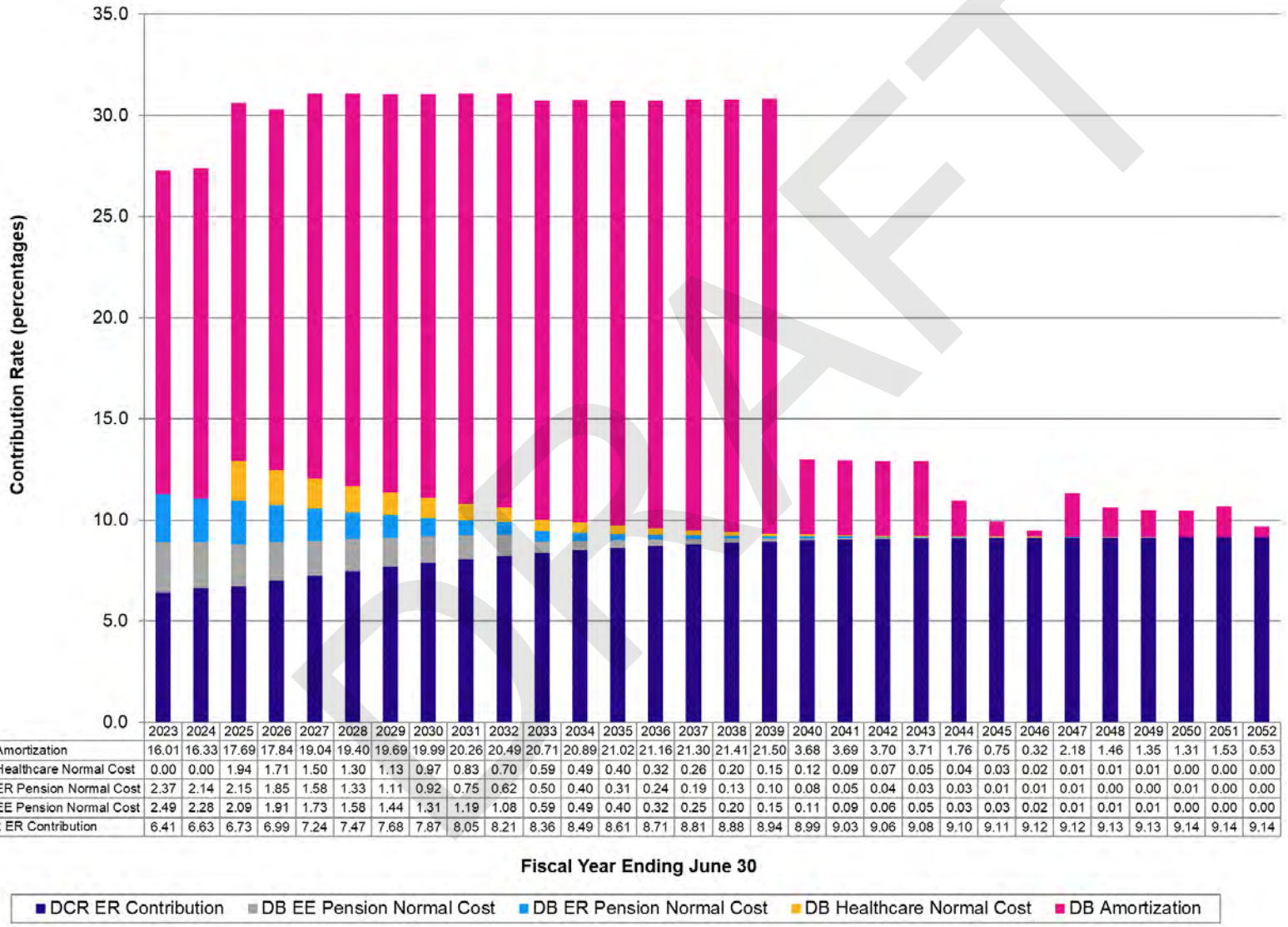
Section 3.3B: Components of Projected Total Contribution Rates

Based on Total DB and DCR Payroll



	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052
DB Amortization	16.01	16.33	17.69	17.84	19.04	19.40	19.69	19.99	20.26	20.49	20.71	20.89	21.02	21.16	21.30	21.41	21.50	3.68	3.69	3.70	3.71	1.76	0.75	0.32	2.18	1.46	1.35	1.31	1.53	0.53
DB Healthcare Normal Cost	0.00	0.00	1.94	1.71	1.50	1.30	1.13	0.97	0.83	0.70	0.59	0.49	0.40	0.32	0.26	0.20	0.15	0.12	0.09	0.07	0.05	0.04	0.03	0.02	0.01	0.01	0.01	0.00	0.00	0.00
DB ER Pension Normal Cost	2.37	2.14	2.15	1.85	1.58	1.33	1.11	0.92	0.75	0.62	0.50	0.40	0.31	0.24	0.19	0.13	0.10	0.08	0.05	0.04	0.03	0.03	0.01	0.01	0.01	0.00	0.00	0.01	0.00	0.00
DB EE Pension Normal Cost	2.49	2.28	2.09	1.91	1.73	1.58	1.44	1.31	1.19	1.08	0.59	0.49	0.40	0.32	0.25	0.20	0.15	0.11	0.09	0.06	0.05	0.03	0.03	0.02	0.01	0.01	0.01	0.00	0.00	0.00
DCR ER Contribution	6.41	6.63	6.73	6.99	7.24	7.47	7.68	7.87	8.05	8.21	8.36	8.49	8.61	8.71	8.81	8.88	8.94	8.99	9.03	9.06	9.08	9.10	9.11	9.12	9.12	9.13	9.13	9.14	9.14	9.14

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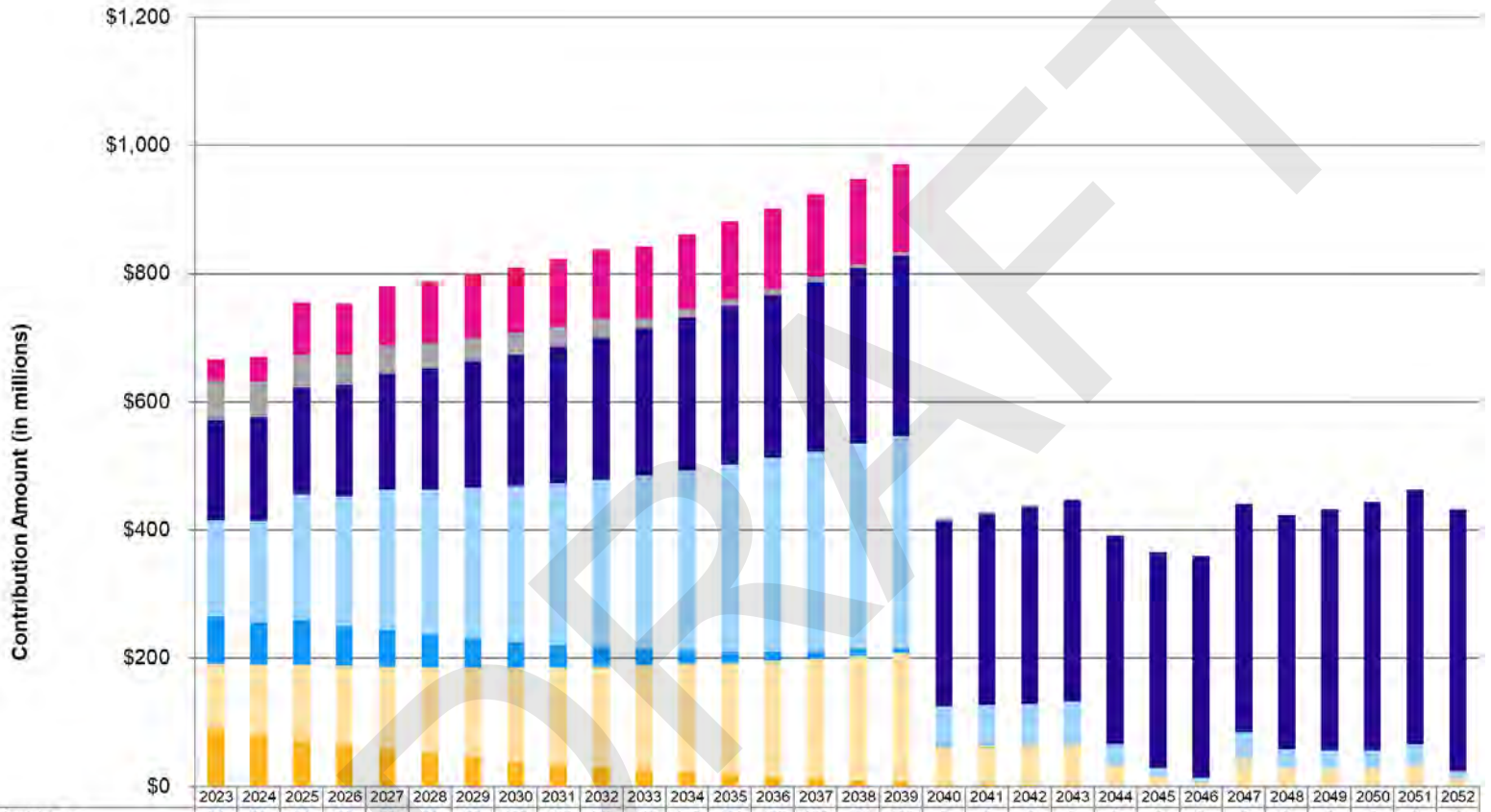
Section 3.4A: Projected Employer/State Contribution Amounts



	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052
State Assistance	34	38	81	80	93	96	99	102	105	109	113	117	121	125	129	134	138	0	0	0	0	0	0	0	0	0	0	0	0	0
DB EE Contributions	61	56	52	47	43	40	37	34	32	29	16	14	11	9	8	6	5	4	3	2	2	1	1	1	0	0	0	0	0	0
DCR ER Contributions	157	162	166	174	182	189	197	205	213	221	229	238	247	255	264	273	281	290	298	307	315	326	336	346	356	366	376	387	397	408
State as ER on DCR Pay	150	158	196	202	218	226	235	244	253	262	271	281	291	301	312	322	332	61	62	63	65	32	14	7	42	29	28	28	33	12
State as ER on DB Pay	73	66	70	62	57	51	45	39	34	30	25	21	18	15	12	9	7	1	1	1	0	0	0	0	0	0	0	0	0	0
DB ER Contributions on DCR Pay	104	110	118	123	129	134	140	146	151	157	163	169	175	181	187	194	200	59	61	63	65	32	14	6	43	29	28	28	33	12
DB ER Contributions on DB Pay	88	80	72	65	58	52	46	40	35	30	26	22	18	15	12	10	8	3	3	2	2	1	1	0	0	0	0	0	0	0

Fiscal Year Ending June 30

DB ER Contributions on DB Pay
DB ER Contributions on DCR Pay
State as ER on DB Pay
State as ER on DCR Pay
DCR ER Contributions
DB EE Contributions
State Assistance

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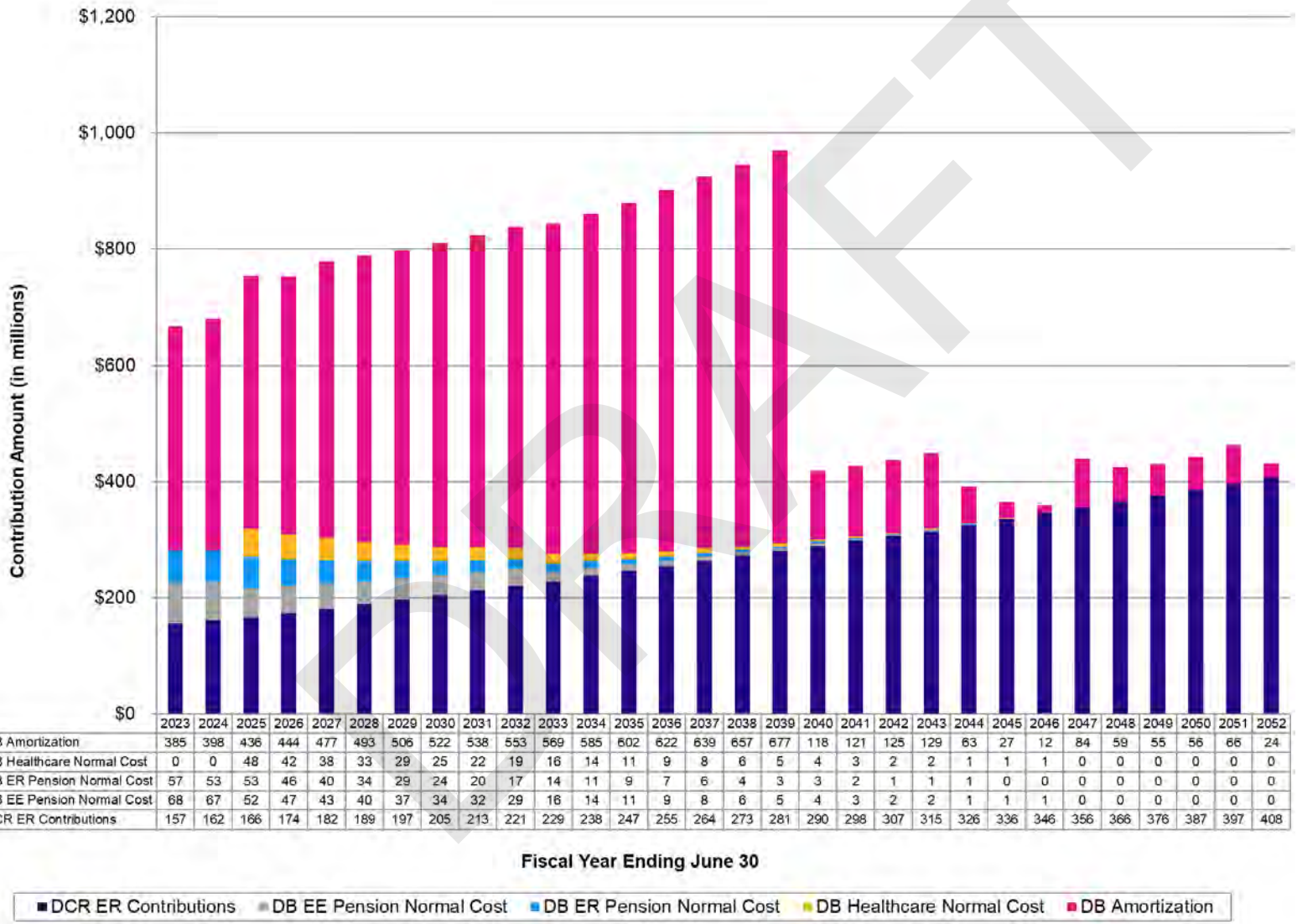
Section 3.4B: Components of Projected Total Contribution Amounts



	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052
DB Amortization	385	398	436	444	477	493	506	522	538	553	569	585	602	622	639	657	677	118	121	125	129	63	27	12	84	59	55	56	66	24
DB Healthcare Normal Cost	0	0	48	42	38	33	29	25	22	19	16	14	11	9	8	6	5	4	3	2	2	1	1	1	0	0	0	0	0	0
DB ER Pension Normal Cost	57	53	53	46	40	34	29	24	20	17	14	11	9	7	6	4	3	3	2	1	1	1	0	0	0	0	0	0	0	0
DB EE Pension Normal Cost	68	67	52	47	43	40	37	34	32	29	16	14	11	9	8	6	5	4	3	2	2	1	1	1	0	0	0	0	0	0
DCR ER Contributions	157	162	166	174	182	189	197	205	213	221	229	238	247	255	264	273	281	290	298	307	315	326	336	346	356	366	376	387	397	408

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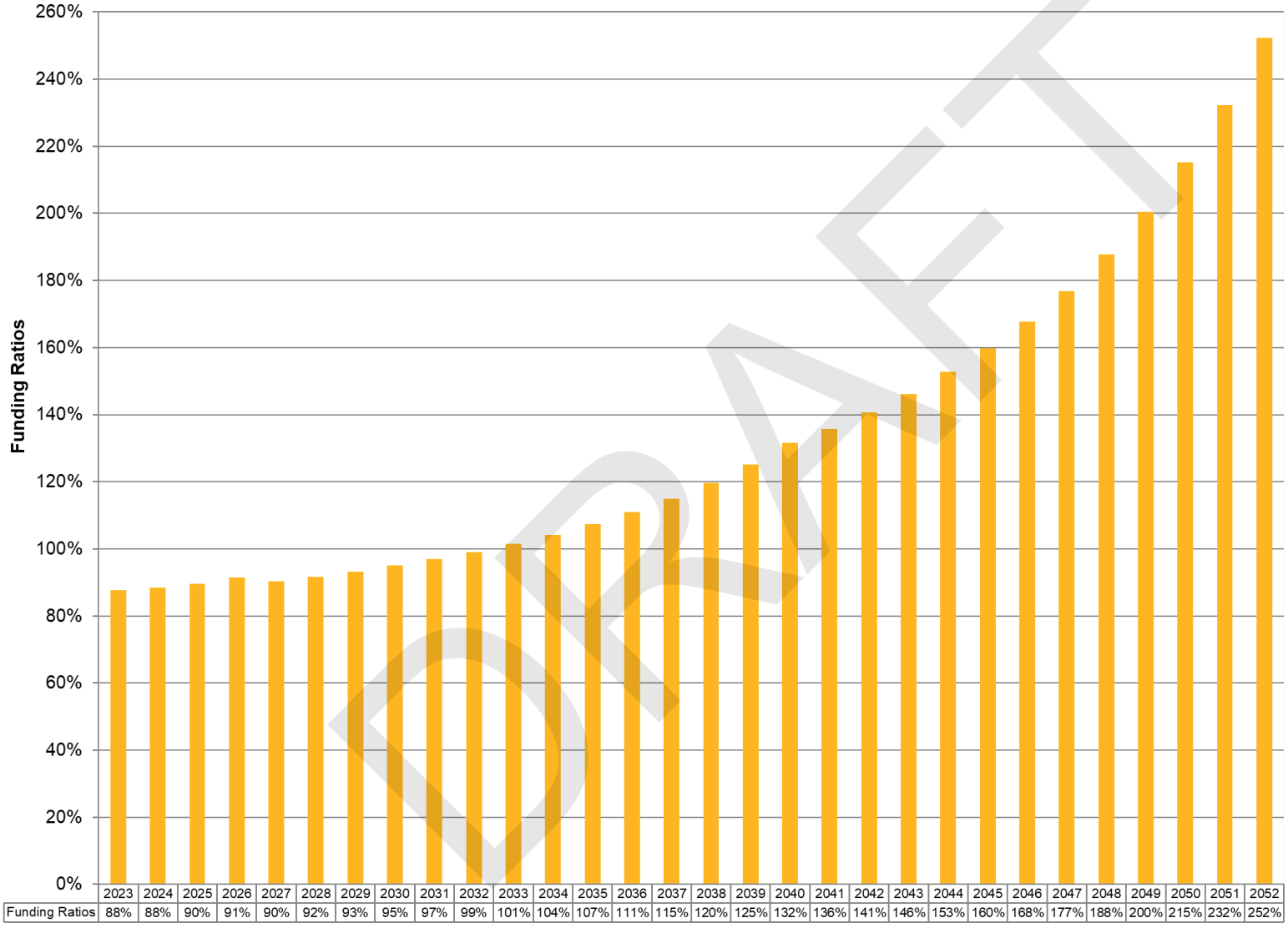
Section 3.5: Projection of Funded Ratios



	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052
Funding Ratios	88%	88%	90%	91%	90%	92%	93%	95%	97%	99%	101%	104%	107%	111%	115%	120%	125%	132%	136%	141%	146%	153%	160%	168%	177%	188%	200%	215%	232%	252%

Fiscal Year Ending June 30

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Section 3.6: Table of Projected Actuarial Results ($'s in 000's)

Fiscal Year End	Valuation Amounts on July 1 (Beginning of FY)				Cash Flow Amounts during Following 12 Months										Deferred Asset Gain / (Loss)
						Actuarial Contrib. Rates			DB Contributions						
	Actuarial Assets	Accrued Liability	Funding Ratio	Unfunded Liability / (Surplus)	Total Salaries	DB	DCR	Total	Non-State Employers	State as an Employer	State Assistance	Employee	Total	Benefit Payments	
2023	$ 19,941,441	$ 22,750,748	87.7%	$ 2,809,307	$ 2,442,007	18.38%	6.41%	24.79%	$ 191,953	$ 222,535	$ 33,933	$ 60,769	$ 509,190	$ 1,447,536	$ (292,658)
2024	20,418,566	23,082,969	88.5%	2,664,403	2,449,710	18.47%	6.63%	25.10%	189,842	224,330	37,942	55,952	508,066	1,518,765	(376,621)
2025	20,901,549	23,344,834	89.5%	2,443,285	2,464,560	21.79%	6.73%	28.52%	189,750	266,258	81,020	51,505	588,533	1,585,941	(571,699)
2026	21,541,041	23,544,166	91.5%	2,003,125	2,484,549	21.41%	6.99%	28.40%	188,031	263,737	80,173	47,358	579,299	1,647,739	0
2027	21,373,398	23,673,070	90.3%	2,299,672	2,508,463	22.13%	7.24%	29.37%	186,680	275,229	93,213	43,470	598,592	1,703,581	0
2028	21,770,326	23,738,225	91.7%	1,967,899	2,535,575	22.03%	7.47%	29.50%	185,757	276,947	95,883	40,074	598,661	1,756,237	0
2029	22,142,543	23,739,801	93.3%	1,597,258	2,570,663	21.94%	7.68%	29.62%	185,605	279,633	98,765	36,966	600,969	1,805,208	0
2030	22,494,315	23,678,541	95.0%	1,184,226	2,608,993	21.87%	7.87%	29.74%	185,874	282,897	101,816	34,079	604,666	1,853,252	0
2031	22,826,487	23,552,278	96.9%	725,791	2,650,982	21.83%	8.05%	29.88%	186,459	286,924	105,326	31,679	610,388	1,898,935	0
2032	23,142,129	23,360,022	99.1%	217,893	2,696,089	21.81%	8.21%	30.02%	187,457	291,539	109,021	29,238	617,255	1,940,536	0
2033	23,445,403	23,102,309	101.5%	(343,094)	2,745,032	21.81%	8.36%	30.17%	188,784	296,832	113,076	16,196	614,888	1,966,253	0
2034	23,742,291	22,780,284	104.2%	(962,007)	2,804,506	21.77%	8.49%	30.26%	191,036	302,706	116,799	13,742	624,283	1,996,729	0
2035	24,039,492	22,395,620	107.3%	(1,643,872)	2,867,406	21.73%	8.61%	30.34%	193,585	308,927	120,575	11,470	634,557	2,022,139	0
2036	24,343,138	21,949,956	110.9%	(2,393,182)	2,932,888	21.72%	8.71%	30.43%	196,527	315,836	124,660	9,385	646,408	2,042,499	0
2037	24,660,524	21,444,927	115.0%	(3,215,597)	3,000,710	21.74%	8.81%	30.55%	199,559	323,437	129,358	7,502	659,856	2,057,855	0
2038	24,999,477	20,881,988	119.7%	(4,117,489)	3,072,106	21.74%	8.88%	30.62%	203,223	331,133	133,520	6,144	674,020	2,063,953	0
2039	25,371,837	20,267,406	125.2%	(5,104,431)	3,146,912	21.76%	8.94%	30.70%	207,219	339,508	138,041	4,720	689,488	2,064,067	0
2040	25,787,541	19,604,678	131.5%	(6,182,863)	3,223,871	3.87%	8.99%	12.86%	62,906	61,858	0	3,546	128,310	2,053,618	0
2041	25,658,195	18,902,045	135.7%	(6,756,150)	3,304,029	3.82%	9.03%	12.85%	63,637	62,577	0	2,974	129,188	2,034,500	0
2042	25,540,398	18,166,228	140.6%	(7,374,170)	3,386,930	3.81%	9.06%	12.87%	65,063	63,979	0	2,032	131,074	2,007,046	0
2043	25,444,646	17,403,947	146.2%	(8,040,699)	3,472,665	3.79%	9.08%	12.87%	66,359	65,254	0	1,736	133,349	1,972,362	0
2044	25,380,414	16,621,204	152.7%	(8,759,210)	3,577,503	1.83%	9.10%	10.93%	33,010	32,459	0	1,073	66,542	1,926,698	0
2045	25,289,805	15,828,161	159.8%	(9,461,644)	3,683,645	0.78%	9.11%	9.89%	14,487	14,246	0	1,105	29,838	1,875,324	0
2046	25,207,992	15,030,193	167.7%	(10,177,799)	3,791,021	0.35%	9.12%	9.47%	6,690	6,579	0	758	14,027	1,817,246	0
2047	25,164,189	14,234,058	176.8%	(10,930,131)	3,900,021	2.20%	9.12%	11.32%	43,261	42,540	0	390	86,191	1,752,847	0
2048	25,258,803	13,446,562	187.8%	(11,812,241)	4,010,390	1.47%	9.13%	10.60%	29,724	29,229	0	401	59,354	1,686,540	0
2049	25,401,316	12,670,416	200.5%	(12,730,900)	4,121,778	1.36%	9.13%	10.49%	28,264	27,792	0	412	56,468	1,617,086	0
2050	25,623,265	11,909,793	215.1%	(13,713,472)	4,233,861	1.32%	9.14%	10.46%	28,178	27,709	0	0	55,887	1,548,027	0
2051	25,932,387	11,165,498	232.3%	(14,766,889)	4,347,409	1.53%	9.14%	10.67%	33,537	32,978	0	0	66,515	1,477,155	0
2052	26,348,488	10,440,665	252.4%	(15,907,823)	4,462,598	0.54%	9.14%	9.68%	12,150	11,948	0	0	24,098	1,406,815	0
								Total	$ 3,744,607	$ 5,367,556	$ 1,713,121	$ 514,676	$ 11,339,960		

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Section 3.6: Table of Projected Actuarial Results ($'s in 000's) (continued)

Fiscal Year End	Valuation Amounts on July 1 (Beginning of FY)					
	Funding Ratio			Unfunded Liability / (Surplus)		
	Pension	Healthcare	Total	Pension	Healthcare	Total
2023	68.1%	134.9%	87.7%	$ 5,132,181	$ (2,322,874)	$ 2,809,307
2024	68.7%	136.0%	88.5%	5,102,394	(2,437,991)	2,664,403
2025	69.5%	137.6%	89.5%	5,030,521	(2,587,236)	2,443,285
2026	70.7%	141.0%	91.5%	4,853,217	(2,850,092)	2,003,125
2027	69.5%	139.6%	90.3%	5,079,354	(2,779,682)	2,299,672
2028	70.3%	142.2%	91.7%	4,948,924	(2,981,025)	1,967,899
2029	71.2%	145.1%	93.3%	4,794,487	(3,197,229)	1,597,258
2030	72.2%	148.3%	95.0%	4,613,868	(3,429,642)	1,184,226
2031	73.2%	151.9%	96.9%	4,404,992	(3,679,201)	725,791
2032	74.4%	155.9%	99.1%	4,165,128	(3,947,235)	217,893
2033	75.8%	160.4%	101.5%	3,891,872	(4,234,966)	(343,094)
2034	77.4%	165.4%	104.2%	3,581,806	(4,543,813)	(962,007)
2035	79.2%	171.0%	107.3%	3,231,339	(4,875,211)	(1,643,872)
2036	81.3%	177.4%	110.9%	2,837,462	(5,230,644)	(2,393,182)
2037	83.8%	184.7%	115.0%	2,396,200	(5,611,797)	(3,215,597)
2038	86.8%	192.9%	119.7%	1,903,402	(6,020,891)	(4,117,489)
2039	90.3%	202.3%	125.2%	1,355,036	(6,459,467)	(5,104,431)
2040	94.5%	213.1%	131.5%	746,579	(6,929,442)	(6,182,863)
2041	94.8%	225.4%	135.7%	677,256	(7,433,406)	(6,756,150)
2042	95.2%	239.6%	140.6%	599,380	(7,973,550)	(7,374,170)
2043	95.7%	255.8%	146.2%	511,934	(8,552,633)	(8,040,699)
2044	96.4%	274.4%	152.7%	414,082	(9,173,292)	(8,759,210)
2045	96.5%	295.7%	159.8%	377,197	(9,838,841)	(9,461,644)
2046	96.3%	320.1%	167.7%	374,680	(10,552,479)	(10,177,799)
2047	96.0%	347.9%	176.8%	387,518	(11,317,649)	(10,930,131)
2048	96.4%	379.7%	187.8%	325,811	(12,138,052)	(11,812,241)
2049	96.6%	416.0%	200.5%	287,172	(13,018,072)	(12,730,900)
2050	96.9%	457.5%	215.1%	248,543	(13,962,015)	(13,713,472)
2051	97.2%	505.1%	232.3%	207,161	(14,974,050)	(14,766,889)
2052	97.8%	559.8%	252.4%	151,697	(16,059,520)	(15,907,823)

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Section 3.7: Projected Pension Benefit Recipients and Amounts ($'s in 000's)

Fiscal Year End	Pension	
	Recipient Counts	Benefit Amounts
2023	38,243	$ 1,037,270
2024	39,646	1,087,579
2025	40,749	1,134,873
2026	41,554	1,178,211
2027	42,129	1,219,750
2028	42,464	1,258,422
2029	42,564	1,293,897
2030	42,495	1,327,351
2031	42,278	1,358,009
2032	41,893	1,385,456
2033	41,363	1,396,648
2034	40,701	1,414,917
2035	39,914	1,429,026
2036	38,996	1,439,583
2037	37,995	1,445,486
2038	36,878	1,445,727
2039	35,636	1,440,578
2040	34,286	1,429,011
2041	32,850	1,412,789
2042	31,347	1,391,205
2043	29,803	1,364,438
2044	28,200	1,333,359
2045	26,596	1,297,461
2046	24,972	1,258,064
2047	23,362	1,215,316
2048	21,759	1,169,908
2049	20,193	1,122,196
2050	18,674	1,072,604
2051	17,206	1,021,741
2052	15,793	970,083
2053	14,442	918,022
2054	13,157	865,935
2055	11,944	814,178
2056	10,805	763,073
2057	9,740	712,885
2058	8,752	663,839
2059	7,838	616,122
2060	6,998	569,883
2061	6,228	525,239
2062	5,526	482,277
2063	4,887	441,064
2064	4,308	401,652

Fiscal Year End	Pension	
	Recipient Counts	Benefit Amounts
2065	3,783	$ 364,079
2066	3,310	328,379
2067	2,883	294,582
2068	2,500	262,715
2069	2,157	232,806
2070	1,850	204,880
2071	1,578	178,961
2072	1,336	155,063
2073	1,124	133,194
2074	937	113,347
2075	775	95,501
2076	635	79,617
2077	516	65,632
2078	415	53,463
2079	329	43,007
2080	259	34,143
2081	201	26,732
2082	154	20,629
2083	118	15,680
2084	88	11,733
2085	64	8,641
2086	48	6,262
2087	34	4,468
2088	25	3,140
2089	18	2,176
2090	13	1,492
2091	9	1,014
2092	7	687
2093	5	467
2094	4	321
2095	2	225
2096	2	160
2097	2	117
2098	1	88
2099	1	67
2100	1	52
2101	1	41
2102	0	0
2103	0	0
2104	0	0
2105	0	0
2106	0	0

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Section 4: Member Data

Section 4.1: Summary of Members Included

As of June 30	2018	2019	2020	2021	2022
Active Members					
1. Number	13,434	12,152	11,033	9,888	8,795[1]
2. Average Age	52.52	52.84	53.21	53.51	53.78
3. Average Credited Service	17.21	17.80	18.38	18.96	19.52
4. Average Entry Age	35.30	35.04	34.83	34.55	34.26
5. Average Annual Earnings	$ 77,813	$ 82,192	$ 83,757	$ 86,316	$ 89,603
6. Number Vested	13,103	11,868	10,791	9,675	8,604
7. Percent Who Are Vested	97.5%	97.7%	97.8%	97.8%	97.8%
Retirees, Disabilitants, and Beneficiaries					
1. Number	35,454	36,310	37,106	37,717	38,243
2. Average Age	69.85	70.29	70.77	71.17	71.61
3. Average Years Since Retirement	11.87	12.14	12.45	12.66	12.94
4. Average Monthly Pension Benefit					
a. Base	$ 1,616	$ 1,660	$ 1,704	$ 1,752	$ 1,802
b. COLA[2]	94	92	93	94	95
c. PRPA[2]	222	241	244	230	282
d. Adjustment	1	1	0	0	1
e. Total	$ 1,933	$ 1,994	$ 2,041	$ 2,076	$ 2,180
Vested Terminations (vested at termination, not refunded contributions, or commenced benefit)					
1. Number	5,660	5,499	5,327	5,135	4,955
2. Average Age	52.56	53.06	53.52	53.92	54.37
3. Average Monthly Pension Benefit	$ 1,087	$ 1,123	$ 1,158	$ 1,205	$ 1,258
Non-Vested Terminations (not vested at termination, not refunded contributions)					
1. Number	11,192	10,921	10,642	10,432	10,223
2. Average Account Balance	$ 6,558	$ 6,923	$ 7,060	$ 7,325	$ 7,573
Total Number of Members	**65,740**	**64,882**	**64,108**	**63,172**	**62,216**

[1] Includes 4,130 male active members and 4,665 female active members.

[2] Calculated by taking the average of the data field, as provided by the State of Alaska, for all participants in the group.

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Summary of Members Included

As of June 30, 2022	DB Tier 1	DB Tier 2	DB Tier 3	DB Total	DCR Tier 4	Grand Total
Active Members						
1. Number	483	1,875	6,437	8,795	24,702	33,497
2. Average Age	63.99	57.27	52.00	53.78	41.35	44.61
3. Average Credited Service	24.28	23.67	17.96	19.52	5.11	8.89
4. Average Entry Age	39.71	33.60	34.04	34.26	36.24	35.72
5. Annual Earnings						
a. Total (000's)	$ 38,284	$ 171,786	$ 577,988	$ 788,058	$ 1,622,742	$ 2,410,800
b. Average	$ 79,263	$ 91,619	$ 89,792	$ 89,603	$ 65,693	$ 71,971

Total and average annual earnings (“valuation pay”) are the annualized earnings for the fiscal year ending on the valuation date.

As of June 30, 2022	Tier 1	Tier 2	Tier 3	Total
Retirees, Disabilitants, and Beneficiaries				
1. Number	22,664	9,710	5,869	38,243
2. Average Age	73.52	69.54	67.68	71.61
3. Average Years Since Retirement	16.45	9.01	5.88	12.94
4. Average Monthly Pension Benefit				
a. Base	$ 1,790	$ 2,001	$ 1,521	$ 1,802
b. COLA	121	64	48	95
c. PRPA	391	152	78	282
d. Adjustment	1	1	1	1
e. Total	$ 2,303	$ 2,218	$ 1,648	$ 2,180

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Summary of Members Included

As of June 30, 2022	Active Members	Inactive Members				
		Retirees	Covered Spouses	Covered Children / Dependents	Deferred	Total Inactive Members
Retiree Medical Participants						
1. Retiree Coverage Only	8,730	19,879	0	0	2,413	22,292
2. Retiree + Spouse	0	12,795	12,795	0	2,785	28,375
3. Retiree + Children / Dependents	0	393	0	296	0	689
4. Family	0	691	691	1,112	0	2,494
5. Total	8,730	33,758	13,486	1,408	5,198	53,850

As of June 30, 2022	Retirees	Covered Spouses	Covered Children / Dependents	Deferred	Total Inactive Members
Retiree Medical Participants					
1. Pre-Medicare	6,647	4,390	1,408	4,999	17,444
2. Medicare Part A & B	26,858	9,044	0	199	36,101
3. Medicare Part B Only	253	52	0	0	305
4. Total	33,758	13,486	1,408	5,198	53,850

As of June 30, 2022	Retirees
Summary of Retiree Medical Data Received	
1. Retiree records on pension data	38,243
2. Remove duplicates on pension data	(1,193)
3. Valued in a different retiree healthcare plan[1]	(1,173)
4. Records without medical coverage	(2,255)
5. Medical only retirees	136
6. Total	33,758

[1] Each member's retiree medical benefits are valued in the plan indicated in the data from Aetna

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Summary of Members Included

Active Members – DB Only

As of June 30	2018	2019	2020	2021	2022
Peace Officer / Firefighter					
1. Number	1,507	1,382	1,266	1,137	1,014 [1]
2. Average Age	47.75	48.25	48.74	49.18	49.64
3. Average Credited Service	18.15	18.90	19.45	20.15	20.82
4. Average Entry Age	29.60	29.35	29.29	29.03	28.82
5. Average Annual Earnings	$ 108,580	$ 120,089	$ 123,436	$ 127,327	$ 135,357
6. Number Vested	1,500	1,374	1,260	1,134	1,011
7. Percent Who Are Vested	99.5%	99.4%	99.5%	99.7%	99.7%
Others					
1. Number	11,927	10,770	9,767	8,751	7,781 [2]
2. Average Age	53.12	53.43	53.79	54.07	54.32
3. Average Credited Service	17.09	17.66	18.24	18.80	19.35
4. Average Entry Age	36.03	35.77	35.55	35.27	34.97
5. Average Annual Earnings	$ 73,926	$ 77,329	$ 78,613	$ 80,987	$ 83,641
6. Number Vested	11,603	10,494	9,531	8,541	7,593
7. Percent Who Are Vested	97.3%	97.4%	97.6%	97.6%	97.6%
Total					
1. Number	13,434	12,152	11,033	9,888	8,795
2. Average Age	52.52	52.84	53.21	53.51	53.78
3. Average Credited Service	17.21	17.80	18.38	18.96	19.52
4. Average Entry Age	35.30	35.04	34.83	34.55	34.26
5. Average Annual Earnings	$ 77,813	$ 82,192	$ 83,757	$ 86,316	$ 89,603
6. Number Vested	13,103	11,868	10,791	9,675	8,604
7. Percent Who Are Vested	97.5%	97.7%	97.8%	97.8%	97.8%

Average annual earnings ("valuation pay") are the annualized earnings for the fiscal year ending on the valuation date.

[1] Includes 880 male active members and 134 female active members.

[2] Includes 3,250 male active members and 4,531 female active members.

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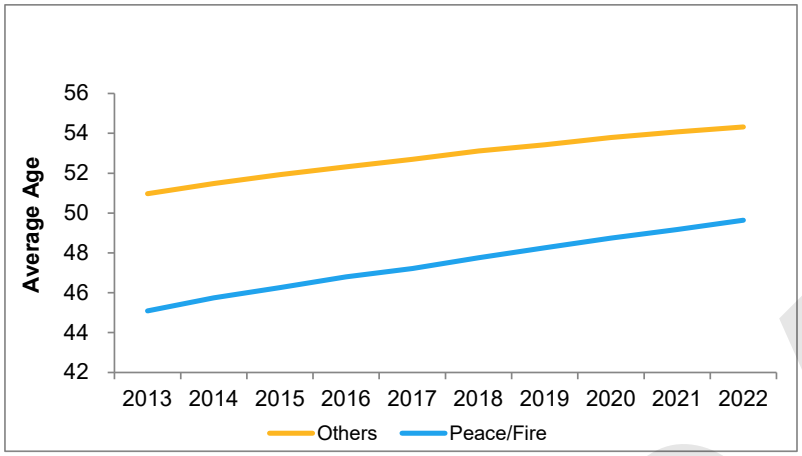
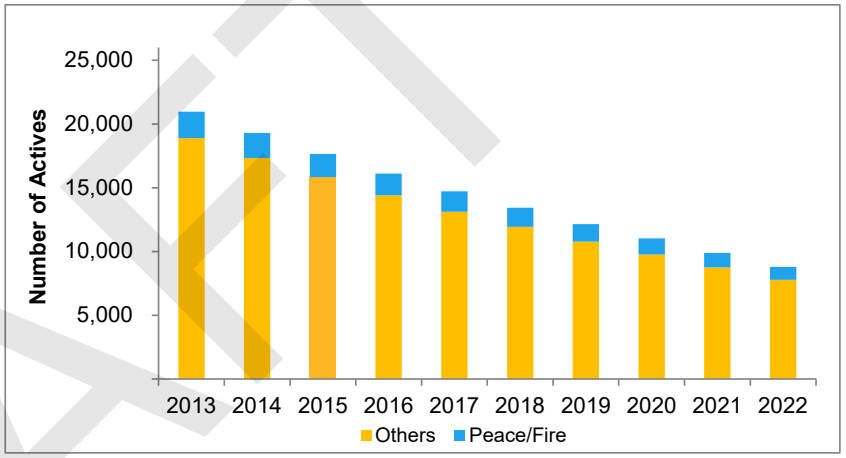
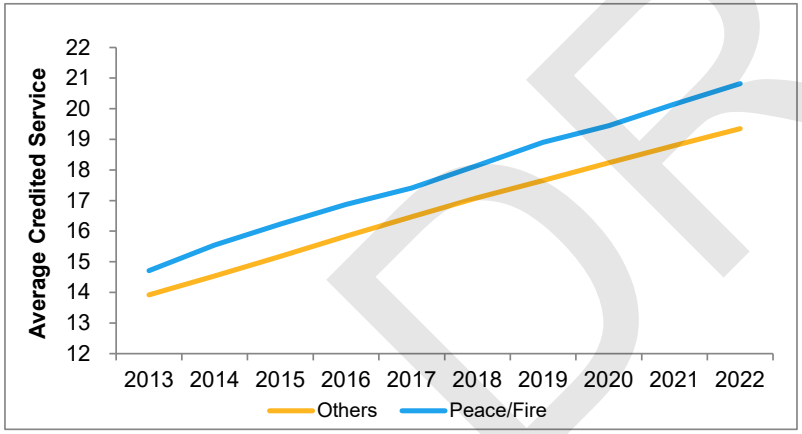
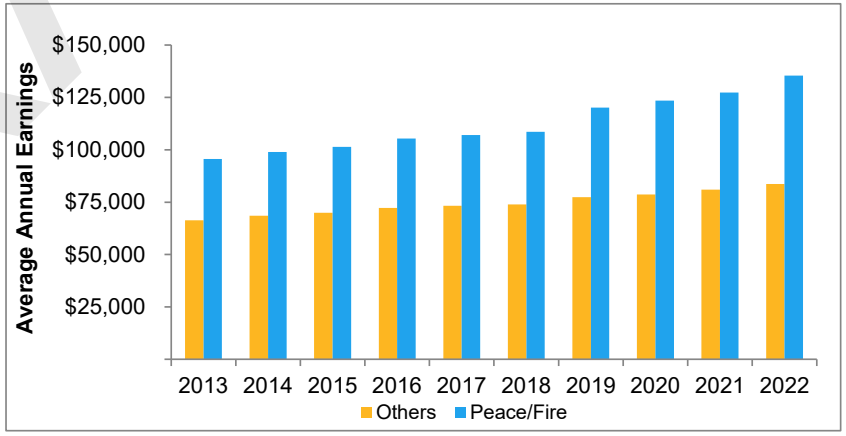
Summary of Members Included - Active Members at June 30









Average annual earnings (“valuation pay”) are the annualized earnings for the fiscal year ending on the valuation date.

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Section 4.2: Age and Service Distribution of Active Members

Peace Officer / Firefighter

Annual Earnings by Age

Age	Number	Total Annual Earnings	Average Annual Earnings
0 - 19	0	$ 0	$ 0
20 - 24	0	0	0
25 - 29	0	0	0
30 - 34	0	0	0
35 - 39	59	7,570,890	128,320
40 - 44	177	24,348,602	137,563
45 - 49	308	42,867,708	139,181
50 - 54	276	38,211,684	138,448
55 - 59	149	18,847,477	126,493
60 - 64	33	4,092,911	124,028
65 - 69	10	1,072,476	107,248
70 - 74	2	239,762	119,881
75+	0	0	0
Total	**1,014**	**$ 137,251,510**	**$ 135,357**

Annual Earnings by Credited Service

Years of Service	Number	Total Annual Earnings	Average Annual Earnings
0	0	$ 0	$ 0
1	1	100,959	100,959
2	0	0	0
3	2	154,382	77,191
4	0	0	0
0 - 4	**3**	**$ 255,341**	**$ 85,114**
5 - 9	7	666,577	95,225
10 - 14	51	5,107,462	100,146
15 - 19	392	51,435,257	131,212
20 - 24	405	56,507,206	139,524
25 - 29	132	19,788,474	149,913
30 - 34	22	3,139,103	142,687
35 - 39	1	222,150	222,150
40+	1	129,940	129,940
Total	**1,014**	**$ 137,251,510**	**$ 135,357**

Years of Credited Service by Age

	Years of Service									
Age	**0 - 4**	**5 - 9**	**10 - 14**	**15 - 19**	**20 - 24**	**25 - 29**	**30 - 34**	**35 - 39**	**40+**	**Total**
0 - 19	0	0	0	0	0	0	0	0	0	0
20 - 24	0	0	0	0	0	0	0	0	0	0
25 - 29	0	0	0	0	0	0	0	0	0	0
30 - 34	0	0	0	0	0	0	0	0	0	0
35 - 39	0	3	8	47	1	0	0	0	0	59
40 - 44	1	2	10	115	48	1	0	0	0	177
45 - 49	1	0	9	104	163	31	0	0	0	308
50 - 54	0	2	8	72	120	69	5	0	0	276
55 - 59	1	0	11	42	62	25	8	0	0	149
60 - 64	0	0	3	12	7	5	5	0	1	33
65 - 69	0	0	2	0	3	1	3	1	0	10
70 - 74	0	0	0	0	1	0	1	0	0	2
75+	0	0	0	0	0	0	0	0	0	0
Total	**3**	**7**	**51**	**392**	**405**	**132**	**22**	**1**	**1**	**1,014**

Total and average annual earnings (“valuation pay”) are the annualized earnings for the fiscal year ending on the valuation date.

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Age and Service Distribution of Active Members

Others

Annual Earnings by Age

Age	Number	Total Annual Earnings	Average Annual Earnings
0 - 19	0	$ 0	$ 0
20 - 24	0	0	0
25 - 29	0	0	0
30 - 34	6	582,629	97,105
35 - 39	258	20,520,116	79,535
40 - 44	833	71,590,584	85,943
45 - 49	1,259	110,184,532	87,517
50 - 54	1,654	145,167,129	87,767
55 - 59	1,953	161,507,573	82,697
60 - 64	1,169	91,568,637	78,331
65 - 69	488	37,063,462	75,950
70 - 74	118	9,289,294	78,723
75+	43	3,332,777	77,506
Total	**7,781**	**$ 650,806,733**	**$ 83,641**

Annual Earnings by Credited Service

Years of Service	Number	Total Annual Earnings	Average Annual Earnings
0	19	$ 737,323	$ 38,806
1	22	1,047,416	47,610
2	33	1,756,606	53,230
3	49	2,724,274	55,597
4	54	2,762,993	51,167
0 - 4	**177**	**$ 9,028,612**	**$ 51,009**
5 - 9	420	26,220,561	62,430
10 - 14	926	62,577,595	67,578
15 - 19	2,821	232,377,282	82,374
20 - 24	2,104	191,524,272	91,029
25 - 29	948	92,019,222	97,067
30 - 34	305	29,130,100	95,509
35 - 39	59	5,816,222	98,580
40+	21	2,112,867	100,613
Total	**7,781**	**$ 650,806,733**	**$ 83,641**

Years of Credited Service by Age

	Years of Service									
Age	**0 - 4**	**5 - 9**	**10 - 14**	**15 - 19**	**20 - 24**	**25 - 29**	**30 - 34**	**35 - 39**	**40+**	**Total**
0 - 19	0	0	0	0	0	0	0	0	0	0
20 - 24	0	0	0	0	0	0	0	0	0	0
25 - 29	0	0	0	0	0	0	0	0	0	0
30 - 34	1	0	2	3	0	0	0	0	0	6
35 - 39	17	33	76	129	3	0	0	0	0	258
40 - 44	30	68	125	484	126	0	0	0	0	833
45 - 49	28	77	148	511	410	84	1	0	0	1,259
50 - 54	36	82	158	569	538	229	41	1	0	1,654
55 - 59	26	79	215	592	555	365	113	8	0	1,953
60 - 64	24	50	145	367	306	177	78	19	3	1,169
65 - 69	10	20	43	135	131	73	57	13	6	488
70 - 74	5	8	13	22	23	17	11	11	8	118
75+	0	3	1	9	12	3	4	7	4	43
Total	**177**	**420**	**926**	**2,821**	**2,104**	**948**	**305**	**59**	**21**	**7,781**

Total and average annual earnings (“valuation pay”) are the annualized earnings for the fiscal year ending on the valuation date.

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Section 4.3: Member Data Reconciliation

Pension

		Inactive Members					
	Active Members	Due a Refund	Deferred Benefits	Retired Members	Disabled Members	Bene-ficiaries	Total
As of June 30, 2021	**9,888**	**10,432**	**5,135**	**33,015** *	**139**	**4,578**	**63,187**
Vested Terminations	(386)	(2)	388	0	0	0	0
Non-Vested Terminations	(44)	44	0	0	0	0	0
Refund of Contributions	(10)	(151)	(30)	0	0	0	(191)
Disability Retirements	(6)	0	(1)	0	7	0	0
Age Retirements	(838)	0	(399)	1,260	(23)	0	0
Deaths With Beneficiary	(16)	(5)	(2)	(289)	(3)	315	0
Deaths Without Beneficiary	(11)	(26)	(20)	(556)	(2)	(210)	(825)
Expired Benefits	0	0	0	0	0	0	0
Data Corrections	0	1	(2)	0	0	(8)	(9)
Converted To DCR Plan	11	0	0	0	0	0	11
Transfers In/Out	1	(2)	(4)	0	0	0	(5)
Rehires	203	(76)	(111)	(13)	0	0	3
Pick Ups***	3	8	1	0	0	47	59
Net Change	**(1,093)**	**(209)**	**(180)**	**402**	**(21)**	**144**	**(957)**
As of June 30, 2022	**8,795**	**10,223**	**4,955**	**33,417** **	**118**	**4,722**	**62,230**

* Includes 15 medical only retirees
** Includes 14 medical only retirees
*** Pickup beneficiaries are primarily new DROs.

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Member Data Reconciliation

Healthcare

		Inactive Members				
	Active Members	Retirees	Covered Spouses	Covered Children / Dependents	Deferred	Total Inactive Members
As of June 30, 2021	**9,817**	**33,254**	**13,420**	**1,524**	**5,434**	**53,632**
Vested Terminations	(362)	0	0	0	362	362
Non-Vested Terminations	(41)	0	0	0	0	0
Refund of Contributions	(9)	0	0	0	(30)	(30)
Disability Retirements	(7)	7	3	5	0	15
Age Retirements	(790)	790	430	135	0	1,355
Deferred Retirements	0	298	169	39	(298)	208
Retired without Medical Coverage	(60)	0	0	0	60	60
Deceased	(27)	(930)	(104)	(11)	(25)	(1,070)
New Beneficiaries	0	167	(167)	0	0	0
Added Retiree Medical Coverage	0	209	65	19	(184)	109
Added Dependent Coverage	0	0	104	72	0	176
Dropped Retiree Medical Coverage	0	(11)	(5)	(1)	1	(16)
Dropped Dependent Coverage	0	0	(419)	(375)	0	(794)
Rehires	202	(16)	(9)	0	(111)	(136)
Transfers In/Out	7	(10)	(1)	1	(11)	(21)
Net Change	**(1,087)**	**504**	**66**	**(116)**	**(236)**	**218**
As of June 30, 2022	**8,730**	**33,758**	**13,486**	**1,408**	**5,198**	**53,850**

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Section 4.4: Schedule of Active Member Data

Peace Officer / Firefighter

Valuation Date	Number	Annual Earnings (000's)	Annual Average Earnings	Percent Increase in Average Earnings	Number of Participating Employers
June 30, 2022	1,014	$ 137,252	$ 135,357	6.3%	150
June 30, 2021	1,137	144,771	127,327	3.2%	151
June 30, 2020	1,266	156,271	123,436	2.8%	153
June 30, 2019	1,382	165,963	120,089	10.6%	155
June 30, 2018	1,507	163,630	108,580	1.5%	155
June 30, 2017	1,606	171,821	106,987	1.6%	155
June 30, 2016	1,704	179,461	105,317	3.8%	155
June 30, 2015	1,827	185,350	101,450	2.5%	159
June 30, 2014	1,958	193,737	98,946	3.4%	159
June 30, 2013	2,065	197,534	95,658	4.8%	159

Others

Valuation Date	Number	Annual Earnings (000's)	Annual Average Earnings	Percent Increase in Average Earnings	Number of Participating Employers
June 30, 2022	7,781	$ 650,807	$ 83,641	3.3%	150
June 30, 2021	8,751	708,718	80,987	3.0%	151
June 30, 2020	9,767	767,817	78,613	1.7%	153
June 30, 2019	10,770	832,832	77,329	4.6%	155
June 30, 2018	11,927	881,716	73,926	1.0%	155
June 30, 2017	13,113	960,106	73,218	1.4%	155
June 30, 2016	14,401	1,039,960	72,214	3.2%	155
June 30, 2015	15,833	1,108,218	69,994	2.1%	159
June 30, 2014	17,339	1,188,918	68,569	3.4%	159
June 30, 2013	18,890	1,252,786	66,320	4.5%	159

Total and average annual earnings ("valuation pay") are the annualized earnings for the fiscal year ending on the valuation date.

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Section 4.5: Active Member Payroll Reconciliation

Payroll Field	Payroll Data (000's)
a) DRB actual reported salaries FY22 in employer list	$ 2,271,607
b) DRB actual reported salaries FY22 in valuation data	2,210,209
c) Annualized valuation data	2,410,800
d) Valuation payroll as of June 30, 2022	2,517,996
e) Rate payroll for FY23	2,442,007
f) Rate payroll for FY25	2,464,560

a) Actual reported salaries from DRB employer listing showing all payroll paid during FY22, including those who were not active as of June 30, 2022
b) Payroll from valuation data for people who are in active status as of June 30, 2022
c) Payroll from (b) annualized for both new entrants and part-timers
d) Payroll from (c) with one year of salary scale applied to estimate salaries payable for the upcoming year
e) Payroll from (d) with the part-timer annualization removed
f) Payroll from (e) with two years of assumed decrements and salary scale, and 0% population growth

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Section 4.6: Summary of New Pension Benefit Recipients

Peace Officer / Firefighter

During the Year Ending June 30	2018	2019	2020	2021	2022
Service					
1. Number	105	109	118	129	117
2. Average Age at Commencement	55.70	55.61	55.52	55.30	55.39
3. Average Monthly Pension Benefit	$ 4,519	$ 4,412	$ 5,199	$ 5,248	$ 5,647
Survivor (including surviving spouse and DROs)					
1. Number	44	36	43	58	39
2. Average Age at Commencement	63.76	68.19	67.92	64.58	70.91
3. Average Monthly Pension Benefit	$ 2,187	$ 1,842	$ 1,785	$ 1,971	$ 1,996
Disability					
1. Number	4	4	3	4	1
2. Average Age at Commencement	46.56	50.44	51.72	52.10	54.74
3. Average Monthly Pension Benefit	$ 3,230	$ 3,071	$ 5,276	$ 2,890	$ 5,427
Total					
1. Number	153	149	164	191	157
2. Average Age at Commencement	57.78	58.51	58.70	58.05	59.24
3. Average Monthly Pension Benefit	$ 3,814	$ 3,755	$ 4,305	$ 4,204	$ 4,739

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Summary of New Pension Benefit Recipients

Peace Officer / Firefighter

	Years of Credited Service						
	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30+
Period 7/1/2021 – 6/30/2022:							
Average Monthly Pension	$ 0	$ 860	$ 2,227	$ 4,341	$ 5,743	$ 7,831	$ 7,566
Number of Recipients	0	2	7	33	42	27	7
Period 7/1/2020 – 6/30/2021:							
Average Monthly Pension	$ 2,612	$ 767	$ 1,619	$ 3,711	$ 5,196	$ 6,960	$ 7,970
Number of Recipients	2	5	9	26	42	40	9
Period 7/1/2019 – 6/30/2020:							
Average Monthly Pension	$ 0	$ 694	$ 2,212	$ 3,626	$ 5,531	$ 6,829	$ 8,636
Number of Recipients	0	6	11	23	40	32	9
Period 7/1/2018 – 6/30/2019:							
Average Monthly Pension	$ 0	$ 651	$ 1,933	$ 3,362	$ 4,786	$ 6,196	$ 5,688
Number of Recipients	0	5	11	25	38	26	6
Period 7/1/2017 – 6/30/2018:							
Average Monthly Pension	$ 0	$ 1,063	$ 2,133	$ 3,747	$ 4,847	$ 6,024	$ 7,717
Number of Recipients	0	4	18	19	35	30	3
Period 7/1/2016 – 6/30/2017:							
Average Monthly Pension	$ 0	$ 686	$ 2,075	$ 3,234	$ 4,462	$ 5,151	$ 6,376
Number of Recipients	0	8	9	28	41	23	14
Period 7/1/2015 – 6/30/2016:							
Average Monthly Pension	$ 0	$ 958	$ 1,742	$ 3,347	$ 4,622	$ 5,778	$ 7,221
Number of Recipients	0	6	11	19	30	28	16
Period 7/1/2014 – 6/30/2015:							
Average Monthly Pension	$ 0	$ 1,173	$ 1,621	$ 3,632	$ 4,436	$ 5,457	$ 6,863
Number of Recipients	0	8	9	26	24	25	7
Period 7/1/2013 – 6/30/2014:							
Average Monthly Pension	$ 290	$ 1,423	$ 2,002	$ 2,902	$ 4,014	$ 5,464	$ 6,299
Number of Recipients	1	9	10	14	22	16	7
Period 7/1/2012 – 6/30/2013:							
Average Monthly Pension	$ 0	$ 865	$ 1,779	$ 2,762	$ 3,793	$ 4,983	$ 4,911
Number of Recipients	0	9	8	19	31	18	4

“Average Monthly Pension” includes postretirement pension adjustments and cost-of-living increases.

Beneficiaries are not included in the table above.

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Summary of New Pension Benefit Recipients

Others

During the Year Ending June 30	2018	2019	2020	2021	2022
Service					
1. Number	1,419	1,288	1,166	1,171	1,121
2. Average Age at Commencement	62.19	61.38	61.70	62.03	62.03
3. Average Monthly Pension Benefit	$ 2,477	$ 2,540	$ 2,701	$ 2,693	$ 2,915
Survivor (including surviving spouse and DROs)					
1. Number	261	238	297	391	326
2. Average Age at Commencement	70.38	69.25	72.09	72.34	70.13
3. Average Monthly Pension Benefit	$ 1,120	$ 1,249	$ 1,204	$ 1,265	$ 1,380
Disability					
1. Number	28	17	9	14	6
2. Average Age at Commencement	53.80	52.95	54.21	53.39	47.91
3. Average Monthly Pension Benefit	$ 1,896	$ 2,313	$ 2,422	$ 2,587	$ 2,533
Total					
1. Number	1,708	1,543	1,472	1,576	1,453
2. Average Age at Commencement	63.31	62.50	63.75	64.51	63.79
3. Average Monthly Pension Benefit	$ 2,260	$ 2,339	$ 2,397	$ 2,338	$ 2,569

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Summary of New Pension Benefit Recipients

Others

	Years of Credited Service						
	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30+
Period 7/1/2021 – 6/30/2022:							
Average Monthly Pension	$ 1,453	$ 623	$ 1,340	$ 2,181	$ 3,373	$ 4,644	$ 6,822
Number of Recipients	6	147	181	286	227	165	115
Period 7/1/2020 – 6/30/2021:							
Average Monthly Pension	$ 553	$ 628	$ 1,317	$ 2,213	$ 3,091	$ 4,607	$ 6,054
Number of Recipients	17	163	228	281	194	188	114
Period 7/1/2019 – 6/30/2020:							
Average Monthly Pension	$ 492	$ 601	$ 1,311	$ 2,065	$ 3,040	$ 4,686	$ 6,213
Number of Recipients	32	165	218	258	183	197	122
Period 7/1/2018 – 6/30/2019:							
Average Monthly Pension	$ 652	$ 646	$ 1,301	$ 2,071	$ 3,058	$ 4,596	$ 5,685
Number of Recipients	21	190	266	289	222	205	105
Period 7/1/2017 – 6/30/2018:							
Average Monthly Pension	$ 414	$ 607	$ 1,299	$ 1,982	$ 3,034	$ 4,475	$ 6,085
Number of Recipients	26	221	351	280	223	214	127
Period 7/1/2016 – 6/30/2017:							
Average Monthly Pension	$ 381	$ 640	$ 1,271	$ 2,067	$ 3,119	$ 4,579	$ 6,224
Number of Recipients	27	254	375	233	212	191	115
Period 7/1/2015 – 6/30/2016:							
Average Monthly Pension	$ 434	$ 660	$ 1,240	$ 2,017	$ 3,059	$ 4,158	$ 6,583
Number of Recipients	30	323	387	266	192	161	135
Period 7/1/2014 – 6/30/2015:							
Average Monthly Pension	$ 430	$ 685	$ 1,260	$ 2,008	$ 3,086	$ 4,544	$ 6,195
Number of Recipients	42	284	304	213	198	169	98
Period 7/1/2013 – 6/30/2014:							
Average Monthly Pension	$ 503	$ 700	$ 1,189	$ 2,065	$ 3,021	$ 4,439	$ 5,490
Number of Recipients	48	347	319	241	214	224	121
Period 7/1/2012 – 6/30/2013:							
Average Monthly Pension	$ 414	$ 650	$ 1,179	$ 1,925	$ 2,879	$ 4,356	$ 5,208
Number of Recipients	59	349	365	257	206	209	132

“Average Monthly Pension” includes postretirement pension adjustments and cost-of-living increases.

Beneficiaries are not included in the table above.

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Section 4.7: Summary of All Pension Benefit Recipients

	Peace Officer / Firefighter	Others
Service		
1. Number as of June 30, 2021	2,991	30,009
2. Net Change During FY22	65	338
3. Number as of June 30, 2022	3,056	30,347
4. Average Age at Commencement	53.31	58.58
5. Average Current Age	68.76	71.69
6. Average Monthly Pension Benefit	$ 3,760	$ 2,161
Survivors (including surviving spouses and DROs)		
1. Number as of June 30, 2021	656	3,922
2. Net Change During FY22	19	125
3. Number as of June 30, 2022	675	4,047
4. Average Age at Commencement	58.87	63.78
5. Average Current Age	70.26	73.93
6. Average Monthly Pension Benefit	$ 1,840	$ 1,185
Disability		
1. Number as of June 30, 2021	26	113
2. Net Change During FY22	(2)	(19)
3. Number as of June 30, 2022	24	94
4. Average Age at Commencement	45.65	45.67
5. Average Current Age	51.45	54.80
6. Average Monthly Pension Benefit	$ 3,232	$ 2,055
Total		
1. Number as of June 30, 2021	3,673	34,044
2. Net Change During FY22	82	444
3. Number as of June 30, 2022	3,755	34,488
4. Average Age at Commencement	54.26	59.16
5. Average Current Age	68.92	71.91
6. Average Monthly Pension Benefit	$ 3,411	$ 2,046

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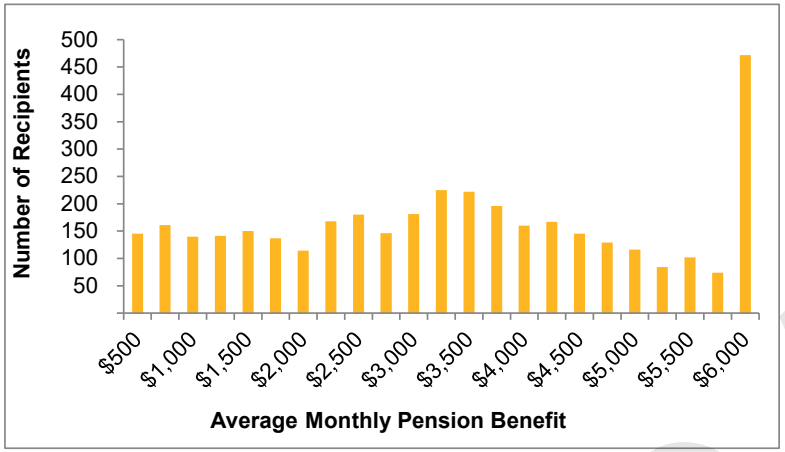
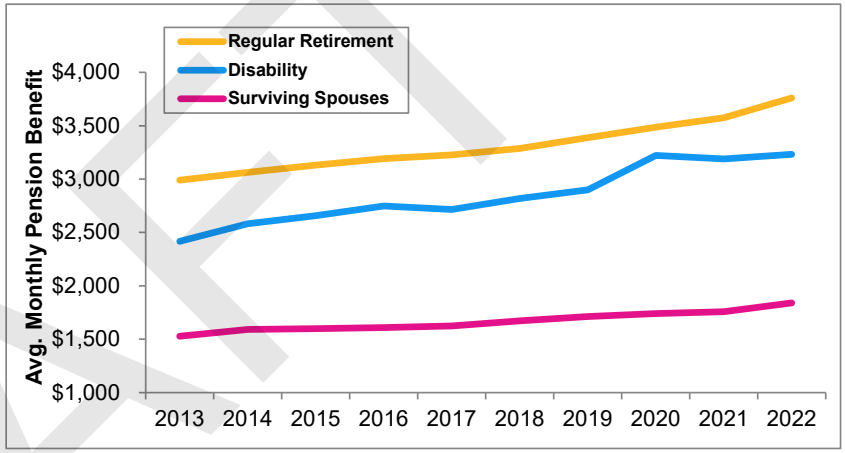
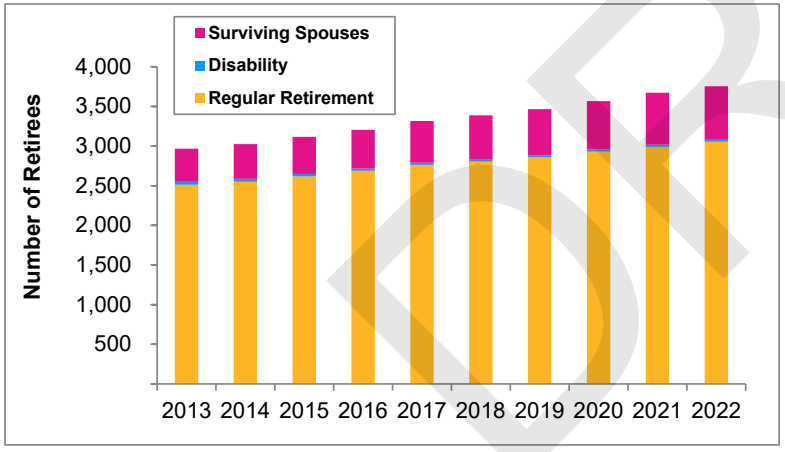
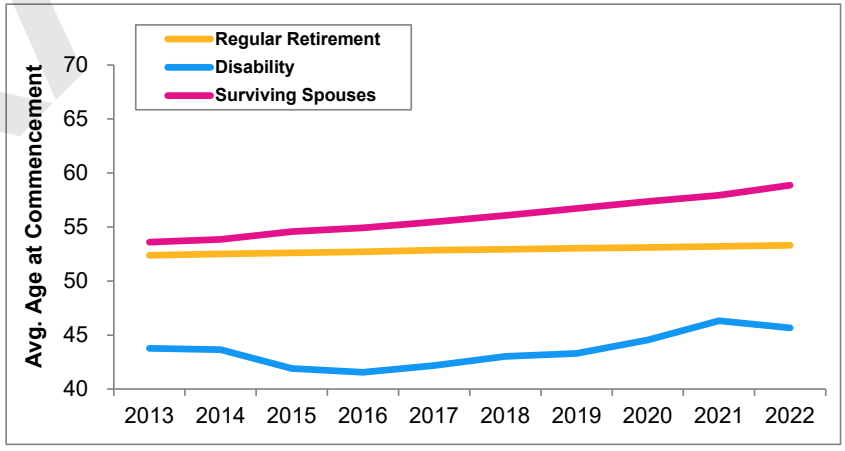
Summary of All Pension Benefit Recipients

Peace Officer / Firefighter









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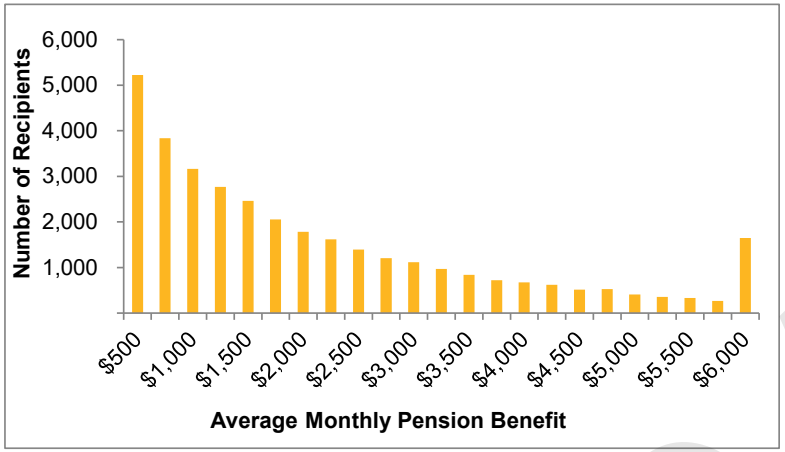
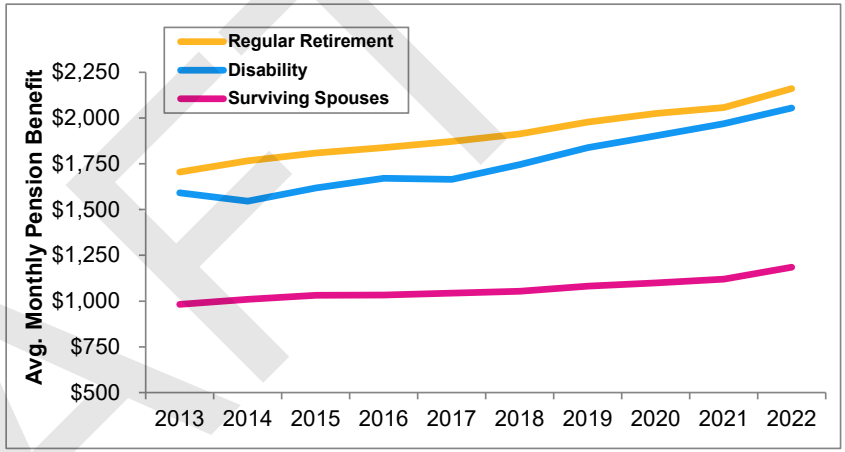
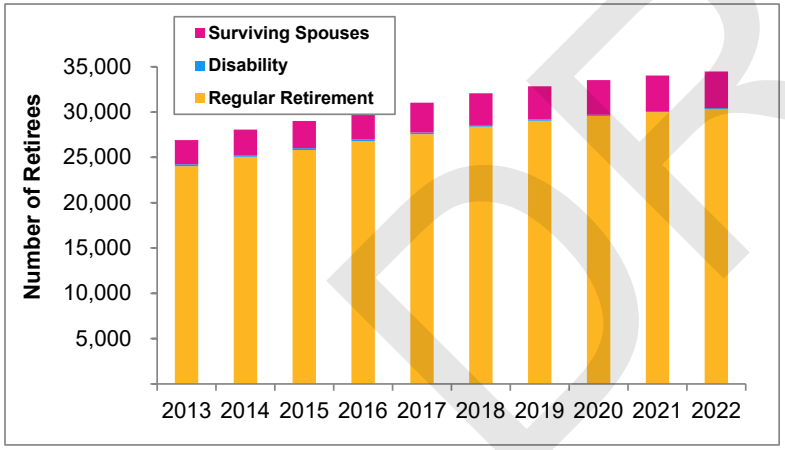
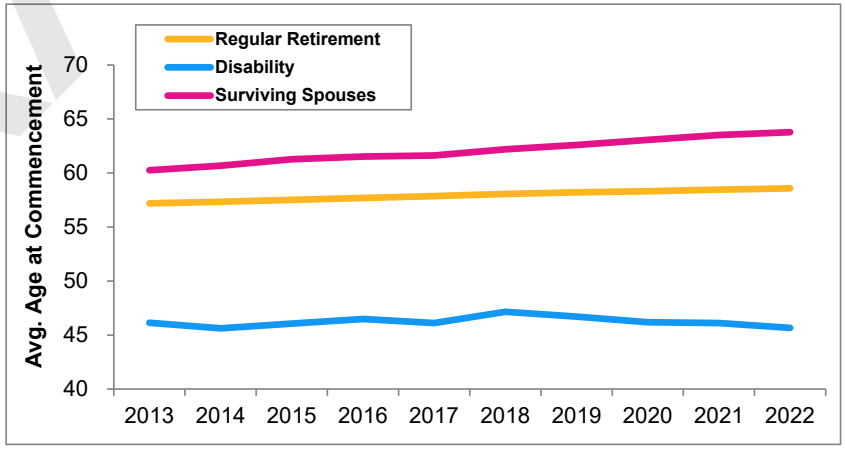
Summary of All Pension Benefit Recipients

Others









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Summary of All Pension Benefit Recipients

Peace Officer / Firefighter

Annual Pension Benefit by Age

Age	Number	Total Annual Pension Benefit	Average Annual Pension Benefit
0 - 19	0	$ 0	$ 0
20 - 24	0	0	0
25 - 29	0	0	0
30 - 34	0	0	0
35 - 39	1	58,921	58,921
40 - 44	15	707,476	47,165
45 - 49	78	4,763,503	61,071
50 - 54	229	13,826,806	60,379
55 - 59	312	17,320,370	55,514
60 - 64	557	23,367,302	41,952
65 - 69	784	29,395,298	37,494
70 - 74	784	28,356,090	36,168
75+	995	35,942,501	36,123
Total	**3,755**	**$ 153,738,267**	**$ 40,942**

Annual Pension Benefit by Years Since Commenced

Years Since Comm.	Number	Total Annual Pension Benefit	Average Annual Pension Benefit
0	179	$ 10,055,170	$ 56,174
1	189	9,674,708	51,189
2	153	8,018,026	52,405
3	152	6,890,326	45,331
4	133	6,194,174	46,573
0 - 4	**806**	**$ 40,832,404**	**$ 50,661**
5 - 9	635	28,145,526	44,324
10 - 14	527	17,241,596	32,717
15 - 19	592	20,091,585	33,938
20 - 24	630	22,935,992	36,406
25 - 29	288	11,736,592	40,752
30 - 34	156	6,755,468	43,304
35 - 39	94	5,033,308	53,546
40+	27	965,796	35,770
Total	**3,755**	**$ 153,738,267**	**$ 40,942**

Years Since Commencement by Age

	Years Since Commencement									
Age	**0 - 4**	**5 - 9**	**10 - 14**	**15 - 19**	**20 - 24**	**25 - 29**	**30 - 34**	**35 - 39**	**40+**	**Total**
0 - 19	0	0	0	0	0	0	0	0	0	0
20 - 24	0	0	0	0	0	0	0	0	0	0
25 - 29	0	0	0	0	0	0	0	0	0	0
30 - 34	0	0	0	0	0	0	0	0	0	0
35 - 39	0	1	0	0	0	0	0	0	0	1
40 - 44	11	2	1	1	0	0	0	0	0	15
45 - 49	69	8	1	0	0	0	0	0	0	78
50 - 54	158	58	10	1	2	0	0	0	0	229
55 - 59	162	105	31	11	0	1	2	0	0	312
60 - 64	191	149	93	89	34	1	0	0	0	557
65 - 69	88	188	155	180	146	21	3	1	2	784
70 - 74	50	72	158	195	212	69	23	3	2	784
75+	77	52	78	115	236	196	128	90	23	995
Total	**806**	**635**	**527**	**592**	**630**	**288**	**156**	**94**	**27**	**3,755**

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Summary of All Pension Benefit Recipients

Others

Annual Pension Benefit by Age

Age	Number	Total Annual Pension Benefit	Average Annual Pension Benefit
0 - 19	0	$ 0	$ 0
20 - 24	0	0	0
25 - 29	0	0	0
30 - 34	1	65,490	65,490
35 - 39	5	79,474	15,895
40 - 44	9	162,022	18,002
45 - 49	27	403,958	14,961
50 - 54	138	4,800,323	34,785
55 - 59	968	34,073,365	35,200
60 - 64	5,440	160,722,800	29,545
65 - 69	8,566	225,814,957	26,362
70 - 74	8,432	198,058,173	23,489
75+	10,902	222,282,181	20,389
Total	**34,488**	**$ 846,462,743**	**$ 24,544**

Annual Pension Benefit by Years Since Commenced

Years Since Comm.	Number	Total Annual Pension Benefit	Average Annual Pension Benefit
0	1,614	$ 48,933,655	$ 30,318
1	1,441	42,135,803	29,241
2	1,393	42,014,809	30,161
3	1,495	43,079,473	28,816
4	1,452	41,662,487	28,693
0 - 4	**7,395**	**$ 217,826,227**	**$ 29,456**
5 - 9	7,882	212,283,875	26,933
10 - 14	6,593	155,510,227	23,587
15 - 19	5,549	121,408,562	21,879
20 - 24	3,894	80,784,151	20,746
25 - 29	1,702	32,424,911	19,051
30 - 34	1,044	18,241,176	17,472
35 - 39	360	6,919,696	19,221
40+	69	1,063,918	15,419
Total	**34,488**	**$ 846,462,743**	**$ 24,544**

Years Since Commencement by Age

	Years Since Commencement									
Age	**0 - 4**	**5 - 9**	**10 - 14**	**15 - 19**	**20 - 24**	**25 - 29**	**30 - 34**	**35 - 39**	**40+**	**Total**
0 - 19	0	0	0	0	0	0	0	0	0	0
20 - 24	0	0	0	0	0	0	0	0	0	0
25 - 29	0	0	0	0	0	0	0	0	0	0
30 - 34	1	0	0	0	0	0	0	0	0	1
35 - 39	1	4	0	0	0	0	0	0	0	5
40 - 44	5	2	2	0	0	0	0	0	0	9
45 - 49	10	10	5	3	0	0	0	0	0	28
50 - 54	89	25	16	5	1	0	1	0	0	137
55 - 59	702	204	34	18	9	3	0	0	0	970
60 - 64	3,335	1,529	499	45	12	12	6	0	0	5,438
65 - 69	1,784	3,460	2,456	803	40	13	8	1	1	8,566
70 - 74	749	1,780	2,310	2,583	949	41	12	5	3	8,432
75+	719	868	1,271	2,092	2,883	1,633	1,017	354	65	10,902
Total	**7,395**	**7,882**	**6,593**	**5,549**	**3,894**	**1,702**	**1,044**	**360**	**69**	**34,488**

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Section 4.8: Pension Benefit Recipients by Type of Benefit and Option Elected

Peace Officer / Firefighter

Amount of Monthly Pension Benefit	Number of Recipients	Type of Pension Benefit			Option Selected				
		1	2	3	1	2	3	4	5
$ 1 – 300	47	13	34	0	37	2	0	1	7
301 – 600	168	102	66	0	96	35	18	8	11
601 – 900	186	103	82	1	110	42	14	11	9
901 – 1,200	160	84	76	0	106	30	12	7	5
1,201 – 1,500	176	106	69	1	107	36	21	5	7
1,501 – 1,800	164	109	55	0	95	34	24	6	5
1,801 – 2,100	147	99	47	1	69	40	27	5	6
2,101 – 2,400	218	168	49	1	98	69	34	9	8
2,401 – 2,700	190	146	41	3	85	54	35	8	8
2,701 – 3,000	209	180	26	3	79	81	30	12	7
3,001 – 3,300	268	231	33	4	98	102	51	11	6
3,301 – 3,600	257	227	28	2	89	96	44	17	11
3,601 – 3,900	208	180	26	2	83	84	28	8	5
3,901 – 4,200	208	197	10	1	58	98	36	13	3
4,200+	1,149	1,113	31	5	322	524	222	70	11
Total	3,755	3,058	673	24	1,532	1,327	596	191	109

Type of Pension Benefit
1. Regular Retirement
2. Survivor Payment
3. Disability

Option Selected
1. Whole Life Annuity
2. 75% Joint and Contingent Annuity
3. 50% Joint and Contingent Annuity
4. 66 2/3% Joint and Survivor Annuity
5. Level Income Option

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Pension Benefit Recipients by Type of Benefit and Option Elected

Others

Amount of Monthly Pension Benefit	Number of Recipients	Type of Pension Benefit			Option Selected				
		1	2	3	1	2	3	4	5
$ 1 – 300	1,924	1,400	524	0	939	350	251	58	326
301 – 600	4,908	4,087	817	4	2,632	1,100	804	236	136
601 – 900	4,198	3,481	707	10	2,253	1,015	655	174	101
901 – 1,200	3,394	2,889	500	5	1,716	794	637	166	81
1,201 – 1,500	3,042	2,646	383	13	1,538	741	590	105	68
1,501 – 1,800	2,411	2,127	272	12	1,129	655	493	83	51
1,801 – 2,100	2,075	1,843	221	11	994	550	384	89	58
2,101 – 2,400	1,834	1,660	165	9	818	530	370	70	46
2,401 – 2,700	1,482	1,363	108	11	662	395	314	66	45
2,701 – 3,000	1,352	1,235	114	3	607	405	265	43	32
3,001 – 3,300	1,166	1,104	59	3	479	359	256	48	24
3,301 – 3,600	931	879	47	5	363	307	204	30	27
3,601 – 3,900	857	827	29	1	353	275	168	47	14
3,901 – 4,200	759	732	27	0	305	254	157	31	12
4,200+	4,155	4,089	60	6	1,467	1,417	990	228	53
Total	34,488	30,362	4,033	93	16,255	9,147	6,538	1,474	1,074

Type of Pension Benefit
1. Regular Retirement
2. Survivor Payment
3. Disability

Option Selected
1. Whole Life Annuity
2. 75% Joint and Contingent Annuity
3. 50% Joint and Contingent Annuity
4. 66 2/3% Joint and Survivor Annuity
5. Level Income Option

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Section 4.9: Pension Benefit Recipients Added to and Removed from Rolls

Peace Officer / Firefighter

Year Ended	Added to Rolls		Removed from Rolls		Rolls at End of Year		Percent Increase in Annual Pension Benefits	Average Annual Pension Benefit
	No.[1]	Annual Pension Benefits[1]	No.[1]	Annual Pension Benefits[1]	No.	Annual Pension Benefits		
June 30, 2022	157	$ 8,928,276	75	$ (1,692,346)	3,755	$ 153,738,267	7.4%	$ 40,942
June 30, 2021	191	9,635,568	86	2,931,719	3,673	143,117,645	4.9%	38,965
June 30, 2020	164	8,472,240	61	1,078,932	3,568	136,413,796	5.7%	38,233
June 30, 2019	149	6,713,940	71	233,335	3,465	129,020,488	5.3%	37,235
June 30, 2018	153	7,002,504	81	2,573,694	3,387	122,539,883	3.7%	36,179
June 30, 2017	165	6,971,580	54	2,132,027	3,315	118,111,073	4.3%	35,629
June 30, 2016	137	6,618,744	49	1,594,394	3,204	113,271,520	4.6%	35,353
June 30, 2015	136	5,617,344	46	633,046	3,116	108,247,168	4.8%	34,739
June 30, 2014	109	4,270,620	50	(145,771)	3,026	103,262,870	4.5%	34,125
June 30, 2013	113	4,162,920	42	240,775	2,967	98,846,479	4.1%	33,315

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[1] Numbers are estimated, and include other internal transfers.

Pension Benefit Recipients Added to and Removed from Rolls

Others

Year Ended	Added to Rolls		Removed from Rolls		Rolls at End of Year		Percent Increase in Annual Pension Benefits	Average Annual Pension Benefit
	No.[1]	Annual Pension Benefits[1]	No.[1]	Annual Pension Benefits[1]	No.	Annual Pension Benefits		
June 30, 2022	1,453	$ 44,793,084	1,009	$ (5,580,072)	34,488	$ 846,462,743	6.3%	$ 24,544
June 30, 2021	1,576	44,216,256	1,070	20,522,550	34,044	796,089,587	3.1%	23,384
June 30, 2020	1,472	42,340,608	779	9,911,423	33,538	772,395,881	4.4%	23,030
June 30, 2019	1,543	43,301,707	765	3,096,594	32,845	739,966,696	5.7%	22,529
June 30, 2018	1,708	46,316,673	673	10,533,376	32,067	699,761,583	5.4%	21,823
June 30, 2017	1,699	44,619,382	816	14,610,212	31,032	663,978,286	4.7%	21,397
June 30, 2016	1,780	44,409,702	660	12,099,362	30,149	633,969,116	5.4%	21,028
June 30, 2015	1,583	39,939,292	627	7,232,812	29,029	601,658,776	5.7%	20,726
June 30, 2014	1,778	44,823,611	603	3,011,383	28,073	568,952,296	7.9%	20,267
June 30, 2013	1,808	43,247,667	554	4,861,626	26,898	527,140,068	7.9%	19,598

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[1] Numbers are estimated, and include other internal transfers.

Section 5: Basis of the Actuarial Valuation

Section 5.1: Summary of Plan Provisions

Effective Date

January 1, 1961, with amendments through June 30, 2022. Chapter 82, 1986 Session Laws of Alaska, created a two-tier retirement system. Members who were first hired under PERS before July 1, 1986 (Tier 1) are eligible for different benefits than members hired after June 30, 1986 (Tier 2). Chapter 4, 1996 Session Laws of Alaska created a third tier for members who were first hired after June 30, 1996 (Tier 3). Chapter 9, 2005 Session Laws of Alaska, closed the plan to new members hired after June 30, 2006.

Administration of Plan

The Commissioner of Administration or the Commissioner's designee is the administrator of the system. The Attorney General of the state is the legal counsel for the system and shall advise the administrator and represent the system in legal proceedings.

Prior to June 30, 2005, the Public Employees' Retirement Board prescribed policies and adopted regulations and performed other activities necessary to carry out the provisions of the system. The Alaska State Pension Investment Board, Department of Revenue, Treasury Division was responsible for investing PERS funds.

On July 27, 2005, Senate Bill 141, enacted as Chapter 9, 2005 Session laws of Alaska, replaced the Public Employees' Retirement Board and the Alaska State Pension Investment Board with the Alaska Retirement Management Board.

Employers Included

Currently there are 150 employers participating in PERS, including the State of Alaska and 149 political subdivisions and public organizations. Two additional political subdivisions participate in PERS for healthcare benefits only.

Membership

PERS membership is mandatory for all permanent full-time and part-time employees of the State of Alaska and participating political subdivisions and public organizations, unless they are specifically excluded by Alaska Statute or employer participation agreements. Employees participating in the University of Alaska's Optional Retirement Plan or other retirement plans funded by the State are not covered by PERS. Elected officials may waive PERS membership.

Certain members of the Alaska Teachers' Retirement System (TRS) are eligible for PERS retirement benefits for their concurrent elected public official service with municipalities. In addition, employees who work half-time in PERS and TRS simultaneously are eligible for half-time PERS and TRS credit.

Senate Bill 141, signed into law on July 27, 2005, closes the plan effective July 1, 2006, to new members first hired on or after July 1, 2006.

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Credited Service

Permanent employees who work at least 30 hours a week earn full-time credit; part-time employees working between 15 and 30 hours a week earn partial credit based on the number of hours worked. Members receiving PERS occupational disability benefits continue to earn PERS credit while disabled. Survivors who are receiving occupational death benefits continue to earn PERS service credit while occupational survivor benefits are being paid.

Members may claim other types of service, including:

- part-time State of Alaska service rendered after December 31, 1960, and before January 1, 1976;
- service with the State, former Territory of Alaska, or U.S. Government in Alaska before January 1, 1961;
- past Peace Officer, correctional officer, fire fighter, and special officer service after January 1, 1961;
- military service (not more than five years may be claimed);
- temporary service after December 31, 1960;
- elected official service before January 1, 1981;
- Alaska Bureau of Indian Affairs service;
- past service rendered by employees who worked half-time in PERS and TRS simultaneously;
- leave without pay service after June 13, 1987, while receiving Workers' Compensation;
- Village Public Safety Officer service; and
- service as a temporary employee of the legislature before July 1, 1979, but this service must have been claimed no later than July 1, 2003, or by the date of retirement, if sooner (not more than ten years may be claimed).

Except for service before January 1, 1961, with the State, former Territory of Alaska, or U.S. Government in Alaska, contributions are required for all past service.

Past employment with participating political subdivisions that occurred before the employers joined PERS is creditable if the employers agree to pay the required contributions.

At the election of certain PERS members, certain service may be credited in the same fashion as members in TRS.

Members employed as dispatchers or within a state correctional facility may, at retirement, elect to convert their dispatcher or correctional facility service from “all other” service to Peace Officer/Firefighter service and retire under the 20-year retirement option. Members pay the full actuarial cost of conversion.

Employer Contributions

PERS employers contribute the amounts required, in addition to employees’ contributions, to fund the benefits of the system.

The normal cost rate is a uniform rate for all participating employers (less the value of members’ contributions).

The past service rate is a uniform rate for all participating employers to amortize the unfunded past service liability with payments that are a level percentage of payroll amount over a closed 25-year period starting June 30, 2014. Effective June 30, 2018, each future year’s unfunded service liability is separately amortized on a level percent of pay basis over 25 years.

Employer rates cannot be less than the normal cost rate.

Pursuant to AS 39.35.255 effective July 1, 2008 and subsequently amended on July 1, 2021, each non-state PERS employer will pay a simple uniform contribution rate of 22% of non-state member payroll and

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the State as an employer will pay the total contribution rate, adopted by the Board, of State member payroll.

Additional State Contributions

Pursuant to AS 39.35.280 effective July 1, 2008, the State shall contribute an amount (in addition to the State contribution as an employer) that, when combined with the total employer contributions, will be sufficient to pay the total contribution rate adopted by the Board.

Member Contributions

Mandatory Contributions: Peace Officer/Firefighter members are required to contribute 7.5% of their compensation; all Others contribute 6.75%. Those all Others who have elected to have their service calculated under TRS rules contribute 9.76% of their compensation. Members' contributions are deducted from gross wages before federal income taxes are withheld.

Contributions for Claimed Service: Member contributions are also required for most of the claimed service described above.

Voluntary Contributions: Members may voluntarily contribute up to 5% of their salary on an after-tax basis. Voluntary contributions are recorded in a separate account and are payable to the:

a. member in lump sum payment upon termination of employment;
b. member's beneficiary if the member dies; or
c. member in a lump sum, life annuity, or payments over a designated period of time when the member retires.

Interest: Members' contributions earn 4.5% interest, compounded semiannually on June 30 and December 31.

Refund of Contributions: Terminated members may receive refunds of their member contribution accounts which includes their mandatory and voluntary contributions, indebtedness payments, and interest earned. Terminated members' accounts may be attached to satisfy claims under Alaska Statute 09.38.065, federal income tax levies, and valid Qualified Domestic Relations Orders.

Reinstatement of Contributions: Refunded accounts and the corresponding PERS service may be reinstated upon reemployment in PERS prior to July 1, 2010. Interest accrues on refunds until paid in full or members retire.

Retirement Benefits

Eligibility

a. Members, including deferred vested members, are eligible for normal retirement at age 55 or early retirement at age 50 if they were hired before July 1, 1986 (Tier 1), and age 60 or early retirement at age 55 if they were hired on or after July 1, 1986 (Tiers 2 & 3). Additionally, they must have at least:
   (i) five years of paid-up PERS service;
   (ii) 60 days of paid-up PERS service as employees of the legislature during each of five legislative sessions and they were first hired by the legislature before May 30, 1987;
   (iii) 80 days of paid-up PERS service as employees of the legislature during each of five legislative sessions and they were first hired by the legislature after May 29, 1987;
   (iv) two years of paid-up PERS service and they are vested in TRS; or
   (v) two years of paid-up PERS service and a minimum three years of TRS service to qualify for a public service benefit.

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b. Members may retire at any age when they have:
   (i) 20 paid-up years of PERS Peace Officer/Firefighter service; or
   (ii) 30 paid-up years of PERS "all other" or "elected official" service.

Benefit Type

Lifetime benefits are paid to members. Eligible members may receive normal, unreduced benefits when they (1) reach normal retirement age and complete the service required; or (2) satisfy the minimum service requirements under the "20 and out" or "30 and out" provisions. Members may receive early, reduced benefits when they reach early retirement age and complete the service required. Benefits are reduced by 6% per year prior to a member's normal retirement date.

Members may select a joint and survivor option. Members who entered PERS prior to July 1, 1996 may also select a 66-2/3 last survivor option or a level income option. Under these options and early retirement, benefits are actuarially adjusted so that members receive the actuarial equivalents of their normal benefit amounts.

Benefit Calculations

Retirement benefits are calculated by multiplying the average monthly compensation (AMC) times credited PERS service times the percentage multiplier. The AMC is determined by averaging the salaries earned during the five highest (three highest for Peace Officer/Firefighter members or members hired prior to July 1, 1996) consecutive payroll years. Members must earn at least 115 days of credit in the last year worked to include it in the AMC calculation. PERS pays a minimum benefit of $25.00 per month for each year of service when the calculated benefit is less.

The percentage multipliers for Peace Officer/Firefighter members are 2% for the first ten years of service and 2.5% for all service over ten years.

The percentage multipliers for all Others are 2% for the first ten years, 2.25% for the next ten years, and 2.5% for all remaining service earned on or after July 1, 1986. All service before that date is calculated at 2%.

Salaries are subject to compensation limits under IRC 401(a)(17) for members first hired on or after July 1, 1996. Retirement benefit amounts are subject to IRC 415(b) limits regardless of hire date.

Indebtedness

Members who terminate and refund their PERS contributions are not eligible to retire unless they return to PERS employment and pay back their refunds plus interest or accrue additional service which qualifies them for retirement. PERS refunds must be paid in full if the corresponding service is to count toward the minimum service requirements for retirement. Refunded PERS service is included in total service for the purpose of calculating retirement benefits. However, when refunds are not completely paid before retirement, benefits are actuarially reduced for life. Indebtedness balances may also be created when a member purchases qualified claimed service.

Reemployment of Retired Members

Retirement and retiree healthcare benefits are suspended while retired members are reemployed under PERS. During reemployment, members earn additional PERS service and contributions are withheld from their wages. A member who retired with a normal retirement benefit can elect to waive payment of PERS contributions. The waiver allows the member to continue receiving the retirement benefit during the period of reemployment. Members who elect the waiver option do not earn additional PERS service. The Waiver Option first became effective July 1, 2005 and applies to reemployment periods after that date. The Waiver Option is not available to members who retired early or under the Retirement Incentive Programs (RIPs). The Waiver Option is no longer available after June 30, 2009.

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Members retired under the Retirement Incentive Programs (RIPs) who return to employment will:

a. forfeit the three years of incentive credits that they received;

b. owe PERS 150% of the benefits that they received for state and political subdivision members, and 110% for school district employees, under the 1996-2000 RIP, which may include costs for health insurance, excluding amounts that they paid to participate for the 1986 and 1989 RIPs. Under prior RIPs, the penalty is 110% of the benefits received; and

c. be charged 7% interest from the date that they are reemployed until their indebtedness is paid in full or they retire again. If the indebtedness is not completely paid, future benefits will be actuarially reduced for life.

Employers make contributions to the unfunded liability of the plan on behalf of rehired retired members at the rate the employer is making contributions to the unfunded liability of the plan for other members.

Postemployment Healthcare Benefits

Major medical benefits are provided to retirees and their surviving spouses by PERS for all employees hired before July 1, 1986 (Tier 1) and disabled retirees. Employees hired after June 30, 1986 (Tier 2) and their surviving spouses with five years of credited service (or ten years of credited service for those first hired after June 30, 1996 (Tier 3)) must pay the full monthly premium if they are under age sixty and will receive benefits paid by PERS if they are over age sixty. Tier 3 Members with between five and ten years of credited service must pay the full monthly premium regardless of their age. Tier 2 and Tier 3 Members with less than five years of credited service are not eligible for postemployment healthcare benefits. Tier 2 Members who are receiving a conditional benefit and are age eligible are eligible for postemployment healthcare benefits. In addition, Peace Officers and their surviving spouses with twenty-five years of Peace Officer membership service, Other employees and their surviving spouses with thirty years of membership service, and any disabled member receive benefits paid by PERS, regardless of their age or date of hire.

Medical, prescription drug, dental, vision, and audio coverage is provided through the AlaskaCare Retiree Health Plan. Health plan provisions do not vary by retirement tier or age, except for Medicare coordination. Participants in dental, vision, and audio coverage pay a full self-supporting rate and those benefits are not included in this valuation.

Starting in 2022, prior authorization is required for certain specialty medications for all participants. There is no change to the medications that are covered by the plan.

Starting in 2022, certain preventive benefits for pre-Medicare participants are covered by the plan.

Surviving spouses continue coverage only if a pension payment form that provided survivor benefits was elected. Alternate payees (i.e. individuals who are the subject of a domestic relations order or DRO) are allowed to participate in the plan, but must pay the full cost.

Where premiums are required prior to age 60, the valuation bases this payment upon the age of the retiree.

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Participants in the defined benefit plan are covered under the following benefit design:

Plan Feature	Amounts
Deductible (single/family)	$150 / $450
Coinsurance (most services)	20%
Outpatient surgery/testing	0%
Maximum Out-of-Pocket (single/family, excluding deductible)	$800 / $2,400
Rx Copays (generic/brand/mail-order), does not apply to OOP max	$4 / $8 / $0
Lifetime Maximum	$2,000,000

The plan coordinates with Medicare on a traditional Coordination of Benefits Method. Starting in 2019, the prescription drug coverage is through a Medicare Part D EGWP arrangement.

Disability Benefits

Monthly disability benefits are paid to permanently disabled members until they die, recover, or become eligible for normal retirement. Members are appointed to normal retirement on the first of the month after they become eligible.

Occupational Disability

Members are not required to satisfy age or service requirements to be eligible for occupational disability. Monthly benefits are equal to 40% of their gross monthly compensation on the date of their disability. Members on occupational disability continue to earn PERS service until they become eligible for normal retirement. Peace Officer/Firefighter members may elect to retain the disability benefit formula for the calculation of their normal retirement benefits.

At the time a disabled Peace Officer/Firefighter member retires, the retirement benefit will be increased by a percentage equal to the total cumulative percentage that has been applied to the disability benefit.

Non-occupational Disability

Members must be vested (five paid up years of PERS service) to be eligible for non-occupational disability benefits. Monthly benefits are calculated based on the member's average monthly compensation and PERS service on the date of termination from employment because of disability. Members do not earn PERS service while on non-occupational disability.

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Death Benefits

Monthly death benefits may be paid to a spouse or dependent children upon the death of a member. If monthly benefits are not payable under the occupational and non-occupational death provisions, the designated beneficiary receives the lump sum benefit described below.

Occupational Death

When an active member (vested or non-vested) dies from occupational causes, a monthly survivor's pension may be paid to the spouse. The pension equals 40% of the member's gross monthly compensation on the date of death or disability, if earlier. If there is no spouse, the pension may be paid to the member's dependent children. On the member's normal retirement date, the benefit converts to a normal retirement benefit. The normal benefit is based on the member's salary on the date of death and service, including service accumulated from the date of the member's death to the normal retirement date. Survivors of Peace Officer/Firefighter members receive the greater of 50% of the member's gross monthly compensation on the date of death or disability, or 75% of the member's monthly normal retirement benefit (including service projected to Normal Retirement). If the member is unmarried with no children, a refund of contributions is payable to the estate.

Death after Occupational Disability

When a member dies while occupationally disabled, benefits are paid as described above in Occupational Death.

Non-Occupational Death

When a vested member dies from non-occupational causes, the surviving spouse may elect to receive a monthly 50% joint and survivor benefit or a lump sum benefit. The monthly benefit is calculated on the member's average monthly compensation and PERS service at the time of termination or death.

Lump Sum Non-Occupational Death Benefit

Upon the death of a member who has less than one year of service, the designated beneficiary receives the member's contribution account, which includes mandatory and voluntary contributions, indebtedness payments, and interest earned. If the member has more than one year of PERS service or is vested, the beneficiary also receives $1,000 and $100 for each year of PERS service.

Death After Retirement

When a retired member dies, the designated beneficiary receives the member's contribution account, less any benefits already paid and the member's last benefit check. If the member selected a survivor option at retirement, the eligible spouse receives continuing, lifetime monthly benefits.

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Postretirement Pension Adjustments

Postretirement pension adjustments (PRPAs) are granted annually to eligible benefit recipients when the consumer price index (CPI) for urban wage earners and clerical workers for Anchorage increases during the preceding calendar year. PRPAs are calculated by multiplying the recipient's base benefit including past PRPAs, but excluding the Alaska COLA, times:

a. The lesser of 75% of the CPI increase in the preceding calendar year or 9%, if the recipient is at least age 65 or on PERS disability; or
b. The lesser of 50% of the CPI increase in the preceding calendar year or 6%, if the recipient is at least age 60, or under age 60 if the recipient has been receiving benefits for at least five years.

Ad hoc PRPAs, up to a maximum of 4%, may be granted to eligible recipients who were first hired before July 1, 1986 (Tier 1) if the CPI increases and the funded ratio is at least 105%.

In a year where an ad hoc PRPA is granted, eligible recipients will receive the higher of the two calculations.

Alaska Cost-of-Living Allowance (COLA)

Eligible benefit recipients who reside in Alaska receive an Alaska COLA equal to 10% of their base benefits or $50, whichever is more. The following benefit recipients are eligible:

a. members who first entered PERS before July 1, 1986 (Tier 1) and their survivors;
b. members who first entered PERS after June 30, 1986 (Tiers 2 & 3) and their survivors if they are at least age 65; and
c. all disabled members.

Changes in Benefit Provisions Valued Since the Prior Valuation

There were no changes in benefit provisions since the prior valuation.

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Section 5.2: Description of Actuarial Methods and Valuation Procedures

The funding method used in this valuation was adopted by the Board in October 2006. Changes in methods were adopted by the Board in January 2019 based on the experience study for the period July 1, 2013 to June 30, 2017. The asset smoothing method used to determine valuation assets was changed effective June 30, 2014.

Benefits valued are those delineated in Alaska State statutes as of the valuation date. Changes in State statutes effective after the valuation date are not taken into consideration in setting the assumptions and methods.

Actuarial Cost Method

Liabilities and contributions shown in the report are computed using the Entry Age Normal Actuarial Cost Method, level percent of pay.

Effective June 30, 2018, the Board adopted a layered UAAL amortization method: Layer #1 equals the sum of (i) the UAAL at June 30, 2018 based on the 2017 valuation, plus (ii) the FY18 experience gain/loss. Layer #1 is amortized over the remainder of the 25-year closed period that was originally established in 2014[1]. Layer #2 equals the change in UAAL at June 30, 2018 due to the experience study and EGWP implementation. Layer #2 is amortized over a separate closed 25-year period starting in 2018. Future layers will be created each year based on the difference between actual and expected UAAL occurring that year, and will be amortized over separate closed 25-year periods. The UAAL amortization continues to be on a level percent of pay basis. State statutes allow the contribution rate to be determined on payroll for all members, defined benefit and defined contribution member payroll combined.

Projected pension and postemployment healthcare benefits were determined for all active members. Cost factors designed to produce annual costs as a constant percentage of each member's expected compensation in each year from the assumed entry age to the assumed retirement age were applied to the projected benefits to determine the normal cost (the portion of the total cost of the plan allocated to the current year under the method). The normal cost is determined by summing intermediate results for active members and determining an average normal cost rate which is then related to the total payroll of active members. The actuarial accrued liability for active members (the portion of the total cost of the plan allocated to prior years under the method) was determined as the excess of the actuarial present value of projected benefits over the actuarial present value of future normal costs.

The actuarial accrued liability for retired members and their beneficiaries currently receiving benefits, terminated vested members and disabled members not yet receiving benefits was determined as the actuarial present value of the benefits expected to be paid. No future normal costs are payable for these members.

The actuarial accrued liability under this method at any point in time is the theoretical amount of the fund that would have been accumulated had annual contributions equal to the normal cost been made in prior years (it does not represent the liability for benefits accrued to the valuation date). The unfunded actuarial accrued liability is the excess of the actuarial accrued liability over the actuarial value of plan assets measured on the valuation date.

Under this method, experience gains or losses, i.e., decreases or increases in accrued liabilities attributable to deviations in experience from the actuarial assumptions, adjust the unfunded actuarial accrued liability.

[1] Layer #1 is referred to as "initial amount" in Sections 1.2 and 1.3.

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Valuation of Assets

The actuarial asset value was reinitialized to equal Fair Value of Assets as of June 30, 2014. Beginning in FY15, the asset valuation method recognizes 20% of the gain or loss each year, for a period of five years. All assets are valued at fair value. Assets are accounted for on an accrued basis and are taken directly from financial statements audited by KPMG LLP.

Changes in Methods Since the Prior Valuation

There were no changes in the asset or valuation methods since the prior valuation.

Valuation of Retiree Medical and Prescription Drug Benefits

This section outlines the detailed methodology used in the internal model developed by Buck to calculate the initial per capita claims cost rates for the PERS postemployment healthcare plan. Note that the methodology reflects the results of our annual experience rate update for the period from July 1, 2021 to June 30, 2022.

Base claims cost rates are incurred healthcare costs expressed as a rate per member per year. Ideally, claims cost rates should be derived for each significant component of cost that can be expected to require differing projection assumptions or methods (i.e., medical claims, prescription drug claims, administrative costs, etc.). Separate analysis is limited by the availability and historical credibility of cost and enrollment data for each component of cost. This valuation reflects non-prescription claims separated by Medicare status, including eligibility for free Part A coverage. Prescription costs are analyzed separately as in prior valuations. Administrative costs are assumed in the final per capita claims cost rates used for valuation purposes, as described below. Analysis to date on Medicare Part A coverage is limited since Part A claim data is not available by individual, nor is this status incorporated into historical claim data.

Benefits

Medical, prescription drug, dental, vision and audio coverage is provided through the AlaskaCare Retiree Health Plan and is available to employees of the State and subdivisions who meet retirement criteria based on the retirement plan tier in effect at their date of hire. Health plan provisions do not vary by retirement tier or age, except for Medicare coordination for those Medicare-eligible. Dental, vision and audio claims (DVA) are excluded from data analyzed for this valuation because those are retiree-pay all benefits where rates are assumed to be self-supporting. Buck relies upon rates set by a third-party for the DVA benefits. Buck reviewed historical rate-setting information and views contribution rate adjustments made are not unreasonable.

Administration and Data Sources

The plan was administered by Wells Fargo Insurance Services (acquired by HealthSmart, in January 2012) from July 1, 2009 through December 31, 2013 and by Aetna effective January 1, 2014.

Claims incurred for the period from July 2020 through June 2022 (FY21 through FY22) were provided by the State of Alaska from reports extracted from their data warehouse, which separated claims by Medicare status. Monthly enrollment data for the same period was provided by Aetna.

Aetna also provided census information identifying Medicare Part B only participants. These participants are identified when hospital claims are denied by Medicare; Aetna then flags that participant as a Part B only participant. Buck added newly identified participants to our list of Medicare Part B only participants. Buck assumes that once identified as Part B only, that participant remains in that status until we are notified otherwise.

Aetna provided a snapshot file as of July 1, 2022 of retirees and dependents that included a coverage level indicator. The monthly enrollment data includes double coverage participants. These are participants whereby both the retiree and spouse are retirees from the State and both are reflected with Couple coverage in the enrollment. In this case, such a couple would show up as four members in the

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monthly enrollment (each would be both a retiree and a spouse). As a result, the snapshot census file was used to adjust the total member counts in the monthly enrollment reports to estimate the number of unique participants enrolled in coverage. Based on the snapshot files from the last two valuations, the total member count in the monthly enrollment reports needs to be reduced by approximately 13% to account for the number of participants with double coverage.

Aetna does not provide separate experience by Medicare status in standard reporting so the special reports mentioned above from the data warehouse were used this year to obtain that information and incorporate it into the per capita rate development for each year of experience (with corresponding weights applied in the final per capita cost).

Methodology

Buck projected historical claim data to FY23 for retirees using the following summarized steps:

1. Develop historical annual incurred claim cost rates – an analysis of medical costs was completed based on claims information and enrollment data provided by the State of Alaska and Aetna for each year in the experience period of FY21 through FY22.
    - Costs for medical services and prescriptions were analyzed separately, and separate trend rates were developed to project expected future medical and prescription costs for the valuation year (e.g. from the experience period up through FY23).
    - Because the reports provided reflected incurred claims, no additional adjustment was needed to determine incurred claims to be used in the valuation.
    - An offset for costs expected to be reimbursed by Medicare was incorporated beginning at age 65. Alaska retirees who do not have 40 quarters of Medicare-covered compensation do not qualify for Medicare Part A coverage free of charge. This is a relatively small and closed group. Medicare was applied to State employment for all employees hired after March 31, 1986. For the “no-Part A” individuals who are required to enroll in Medicare Part B, the State is the primary payer for hospital bills and other Part A services. Claim experience is not available separately for participants with both Medicare Parts A and B and those with Part B only. For Medicare Part B only participants, a lower average claims cost was applied to retirees covered by both Medicare Part A and B vs. retirees covered only by Medicare Part B based upon manual rate models that estimate the Medicare covered proportion of medical costs. To the extent that no-Part A claims can be isolated and applied strictly to the appropriate closed group, actuarial accrued liability will be more accurate.
    - Based on census data received from Aetna, less than 1% of the current retiree population was identified as having coverage only under Medicare Part B. We assume that 2% of actives hired before April 1, 1986 and current retirees who are not yet Medicare eligible will not be eligible for Medicare Part A.
    - Based upon a reconciliation of valuation census data to the snapshot eligibility files provided by Aetna as of July 1, 2021, and July 1, 2022, Buck adjusted member counts used for duplicate records where participants have double coverage; i.e. primary coverage as a retiree and secondary coverage as the covered spouse of another retiree. This is to reflect the total cost per distinct individual/member which is then applied to distinct members in the valuation census.
    - Buck understands that pharmacy claims reported do not reflect rebates. Based on actual pharmacy rebate information provided by Optum, rebates were assumed to be 16.2% of pre-Medicare, and 14.3% of Medicare prescription drug claims for FY21; and 20.1% of pre-Medicare, and 13.5% of Medicare prescription drug claims for FY22.
2. Develop estimated EGWP reimbursements – Segal provided estimated 2023 EGWP subsidies, developed with the assistance of OptumRx. These amounts are applicable only to Medicare-eligible participants.

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3. Adjust for claim fluctuation, anomalous experience, etc. – explicit adjustments are often made for anticipated large claims or other anomalous experience. FY21 and FY22 experience was thoroughly reviewed to assess the impact of COVID-19 and whether an adjustment to FY21 and FY22 claims was appropriate for use in the June 30, 2022 valuation. FY21 medical per capita claims were noticeably lower than expected, so a 4% load was added to the FY21 medical claims used in the per capita claims cost development to better reflect future expected long-term costs of the plan. FY22 medical per capita claims were reasonable when compared to pre-COVID levels, so no adjustments were made to the FY22 medical claims used in the per capita claims cost development. Total prescription drug claims experience for FY21 and FY22 was reasonable and consistent with FY19 and FY20 experience. Therefore, no adjustment was made to FY21 and FY22 prescription drug claims. Due to group size and demographics, we did not make any additional large claim adjustments. We do blend both Alaska plan-specific and national trend factors as described below. Buck compared data utilized to lag reports and quarterly plan experience presentations provided by the State and Aetna to assess accuracy and reasonableness of data.
4. Trend all data points to the projection period – project prior years' experience forward to FY23 for retiree benefits on an incurred claim basis. Trend factors derived from historical Alaska-specific experience and national trend factors are shown in the table in item 5 below.
5. Apply credibility to prior experience – adjust prior year's data by assigning weight to recent periods, as shown at the right of the table below. The Board approved a change in the weighting of experience periods beginning with the June 30, 2017 valuation as outlined below. Note also that for both years of prescription drugs we averaged projected plan costs using Alaska-specific trend factors and national trend factors, assigning 75% weight to Alaska-specific trends and 25% to national trends. For both years of medical we applied 100% weight to national trends because the Alaska-specific trends were impacted by COVID-19:

Alaska-Specific and National Average Weighted Trend from Experience Period to Valuation Year			
Experience Period	**Medical**	**Prescription**	**Weighting Factors**
FY21 to FY22	8.1% Pre-Medicare / 4.8% Medicare	8.0%	50%
FY22 to FY23	7.4% Pre-Medicare / 5.6% Medicare	9.5%	50%

Trend assumptions used for rate development are assessed annually and as additional/improved reporting becomes available, we will incorporate into rate development as appropriate.

6. Starting in 2022, prior authorization is required for certain specialty medications. There is no change to the medications that are covered by the plan. Segal provided an estimate of the impact of this change to the DB retiree health plan cost for calendar year 2022. The resulting adjustment factors for pre-Medicare prescription drug, Medicare prescription drug, and EGWP costs were applied to claims experience incurred before January 1, 2022. Additionally, starting in 2022, certain preventive benefits for pre-Medicare participants are covered by the plan. Segal provided an estimate of the impact of this change to the DB retiree health plan cost for calendar year 2022. The resulting adjustment factor for pre-Medicare medical costs was applied to claims experience incurred before January 1, 2022.
7. Develop separate administration costs – no adjustments were made for internal administrative costs. Third party retiree plan administration fees for FY23 are based upon total fees projected to 2023 by Segal based on actual FY22 fees. The annual per participant per year administrative cost rate for medical and prescription benefits is $449.

Healthcare Reform

Healthcare Reform legislation passed on March 23, 2010 included several provisions with potential implications for the State of Alaska Retiree Health Plan liability. Buck evaluated the impact due to these provisions.

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Because the State plan is retiree-only, and was in effect at the time the legislation was enacted, not all provisions of the health reform legislation apply to the State plan. Unlimited lifetime benefits and dependent coverage to age 26 are two of these provisions. We reviewed the impact of including these provisions, but there was no decision made to adopt them, and no requirement to do so.

Because Transitional Reinsurance fees are only in effect until 2016, we excluded these for valuation purposes.

The Further Consolidated Appropriations Act, 2020 passed in December 2019 repealed several healthcare-related taxes, including the Cadillac Tax.

The Tax Cuts and Jobs Act passed in December 2017 included the elimination of the individual mandate penalty and changed the inflation measure for purposes of determining the limits for the High Cost Excise Tax to use chained CPI. It is our understanding the law does not directly impact other provisions of the ACA. While the nullification of the ACA's individual mandate penalty does not directly impact employer group health plans, it could contribute to the destabilization of the individual market and increase the number of uninsured. Such destabilization could translate to increased costs for employers. We have considered this when setting our healthcare cost trend assumptions and will continue to monitor this issue.

The Inflation Reduction Act was signed into law on August 16, 2022. The law contains several provisions that are expected to impact Alaska's Medicare prescription drug plan (EGWP), which will be considered at the next measurement date.

We have not identified any other specific provisions of healthcare reform or its potential repeal that would be expected to have a significant impact on the measured obligation. We will continue to monitor legislative activity.

Data

In accordance with actuarial standards, we note the following specific data sources and steps taken to value retiree medical benefits:

The Division of Retirement and Benefits provided pension valuation census data, which for people currently in receipt of healthcare benefits was supplemented by coverage data from the healthcare claims administrator (Aetna).

Certain adjustments and assumptions were made to prepare the data for valuation:

- All records provided with retiree medical coverage on the Aetna data were included in this valuation and we relied on the Aetna data as the source of medical coverage for current retirees and their dependents.
- Some records in the Aetna data were duplicates due to the double coverage (i.e. coverage as a retiree and as a spouse of another retiree) allowed under the plan. Records were adjusted for these members so that each member was only valued once. Any additional value of the double coverage (due to coordination of benefits) is small and reflected in the per capita costs.
- Covered children included in the Aetna data were valued until age 23, unless disabled. We assumed that those dependents over 23 were only eligible and valued due to being disabled.
- For individuals included in the pension data expecting a future pension, we valued health benefits starting at the same point that the pension benefit is assumed to start.

We are not aware of any other data issues that would be expected to have a material impact on the results and there are no unresolved matters related to the data.

The chart below shows the basis of setting the per capita claims cost assumption, which includes both PERS and TRS.

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	Medical		Prescription Drugs (Rx)	
	Pre-Medicare	Medicare	Pre-Medicare	Medicare
A. Fiscal 2021				
1. Incurred Claims	$ 196,566,470	$ 86,512,435	$ 60,691,609	$ 207,822,858
2. Adjustments for Rx Rebates and COVID (Medical only)	7,862,659	3,460,497	(9,832,041)	(29,718,669)
3. Net incurred claims	$ 204,429,129	$ 89,972,933	$ 50,859,568	$ 178,104,189
4. Average Enrollment	18,106	47,025	18,106	47,025
5. Claim Cost Rate (3) / (4)	11,291	1,913	2,809	3,787
6. Trend to Fiscal 2023	1.161	1.107	1.183	1.183
7. Fiscal 2023 Incurred Cost Rate (5) x (6)	$ 13,108	$ 2,117	$ 3,322	$ 4,479
8. Adjustment Factor for 2022 Plan Changes	1.014	1.000	0.913	0.976
9. Adjusted Fiscal 2023 Incurred Cost Rate (7) x (8)	$ 13,290	$ 2,117	$ 3,034	$ 4,371
B. Fiscal 2022				
1. Incurred Claims	$ 197,733,173	$ 98,249,082	$ 64,076,270	$ 230,832,315
2. Adjustments for Rx Rebates	0	0	(12,879,330)	(31,162,363)
3. Net incurred claims	$ 197,733,173	$ 98,249,082	$ 51,196,940	$ 199,669,953
4. Average Enrollment	17,072	48,698	17,072	48,698
5. Claim Cost Rate (3) / (4)	11,582	2,018	2,999	4,100
6. Trend to Fiscal 2023	1.074	1.056	1.095	1.095
7. Fiscal 2023 Incurred Cost Rate (5) x (6)	$ 12,439	$ 2,131	$ 3,284	$ 4,490
8. Adjustment Factor for 2022 Plan Changes	1.007	1.000	0.957	0.988
9. Adjusted Fiscal 2023 Incurred Cost Rate (7) x (8)	$ 12,526	$ 2,131	$ 3,141	$ 4,436

	Medical		Prescription Drugs (Rx)	
	Pre-Medicare	Medicare	Pre-Medicare	Medicare
C. Adjusted Incurred Cost Rate by Fiscal Year				
1. Fiscal 2021 A.(9)	13,290	2,117	3,034	4,371
2. Fiscal 2022 B.(9)	12,526	2,131	3,141	4,436
D. Weighting by Fiscal Year				
1. Fiscal 2021	50%	50%	50%	50%
2. Fiscal 2022	50%	50%	50%	50%
E. Fiscal 2023 Incurred Cost Rate				
1. Rate at Average Age C x D	$ 12,908	$ 2,124	$ 3,088	$ 4,403
2. Average Aging Factor	0.822	1.279	0.832	1.127
3. Rate at Age 65 (1) / (2)	$ 15,706	$ 1,661	$ 3,712	$ 3,907
F. Development of Part A&B and Part B Only Cost from Pooled Rate Above				
1. Part A&B Average Enrollment		48,233		
2. Part B Only Average Enrollment		465		
3. Total Medicare Average Enrollment B(4)		48,698		
4. Cost ratio for those with Part B only to those with Parts A&B		3.300		
5. Factor to determine cost for those with Parts A&B (2) / (3) x (4) + (1) / (3) x 1.00		1.022		
6. Medicare per capita cost for all participants: E(3)		$ 1,661		
7. Cost for those eligible for Parts A&B: (6) / (5)		$ 1,625		
8. Cost for those eligible for Part B only: (7) x (4)		$ 5,363		

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Following the development of total projected costs, a distribution of per capita claims cost was developed. This was accomplished by allocating total projected costs to the population census used in the valuation. The allocation was done separately for each of prescription drugs and medical costs for the Medicare eligible and pre-Medicare populations. The allocation weights were developed using participant counts by age and assumed morbidity and aging factors. Results were tested for reasonableness based on historical trend and external benchmarks for costs paid by Medicare.

Below are the results of this analysis:

Distribution of Per Capita Claims Cost by Age
for the Period July 1, 2022 through June 30, 2023

Age	Medical and Medicare Parts A & B	Medical and Medicare Part B Only	Prescription Drug	Medicare EGWP Subsidy
45	$ 9,585	$ 9,585	$ 2,382	$ 0
50	10,844	10,844	2,829	0
55	12,270	12,270	3,369	0
60	13,882	13,882	3,532	0
65	1,625	5,363	3,907	1,309
70	1,794	5,921	4,335	1,452
75	1,981	6,537	4,810	1,611
80	2,209	7,289	4,738	1,587

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Section 5.3: Summary of Actuarial Assumptions

The demographic and economic assumptions used in the June 30, 2022 valuation are described below. Unless noted otherwise, these assumptions were adopted by the Board at the June 2022 meeting based on the experience study for the period July 1, 2017 to June 30, 2021.

Investment Return

7.25% per year, net of investment expenses.

Salary Scale

Salary scale rates based on the 2017-2021 actual experience (see Table 1).

Inflation – 2.50% per year.

Productivity – 0.25% per year.

Payroll Growth

2.75% per year (inflation + productivity).

Total Inflation

Total inflation as measured by the Consumer Price Index for urban and clerical workers for Anchorage is assumed to increase 2.50% annually.

Mortality (Pre-Commencement)

Mortality rates based on the 2017-2021 actual experience, to the extent the experience was statistically credible.

Employee mortality for Peace Officer/Firefighters in accordance with the following tables:

- Pension: Pub-2010 Safety Employee table, amount-weighted, and projected with MP-2021 generational improvement.
- Healthcare: Pub-2010 Safety Employee table, headcount-weighted, and projected with MP-2021 generational improvement.

Employee mortality for Others in accordance with the following tables:

- Pension: Pub-2010 General Employee table, amount-weighted, and projected with MP-2021 generational improvement.
- Healthcare: Pub-2010 General Employee table, headcount-weighted, and projected with MP-2021 generational improvement.

Deaths are assumed to result from occupational causes 70% of the time for Peace Officer/Firefighters, and 35% of the time for Others.

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Mortality (Post-Commencement)

Mortality rates based on the 2017-2021 actual experience, to the extent the experience was statistically credible.

Retiree mortality for Peace Officer/Firefighters in accordance with the following tables:

- Pension: Pub-2010 Safety Retiree table, amount-weighted, and projected with MP-2021 generational improvement.
- Healthcare: Pub-2010 Safety Retiree table, headcount-weighted, and projected with MP-2021 generational improvement.

Retiree mortality for Others in accordance with the following tables:

- Pension: 98% of male and 106% of female rates of the Pub-2010 General Retiree table, amount-weighted, and projected with MP-2021 generational improvement.
- Healthcare: 101% of male and 110% of female rates of the Pub-2010 General Retiree table, headcount-weighted, and projected with MP-2021 generational improvement.

Beneficiary mortality for Peace Officer/Firefighters in accordance with the following tables. These tables are applied only after the death of the original member.

- Pension: Pub-2010 Contingent Survivor table, amount-weighted, and projected with MP-2021 generational improvement.
- Healthcare: Pub-2010 Contingent Survivor table, headcount-weighted, and projected with MP-2021 generational improvement.

Beneficiary mortality for Others in accordance with the following tables. These tables are applied only after the death of the original member.

- Pension: 102% of male and 108% of female rates of the Pub-2010 Contingent Survivor table, amount-weighted, and projected with MP-2021 generational improvement.
- Healthcare: 101% of male and 108% of female rates of the Pub-2010 Contingent Survivor table, headcount-weighted, and projected with MP-2021 generational improvement.

Turnover

Select and ultimate rates based on the 2017-2021 actual experience (see Tables 2a and 2b).

Disability

No changes to the incidence rates from the prior valuation due to insufficient 2017-2021 actual experience (see Tables 3a and 3b). Disability rates cease once a member is eligible for retirement.

Disabilities are assumed to be occupational 70% of the time for Peace Officer/Firefighters, and 35% of the time for Others.

Post-disability mortality for Peace Officer/Firefighters in accordance with the following tables:

- Pension: Pub-2010 Safety Disabled Retiree table, amount-weighted, and projected with MP-2021 generational improvement.
- Healthcare: Pub-2010 Safety Disabled Retiree table, headcount-weighted, and projected with MP-2021 generational improvement.

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Post-disability mortality for Others in accordance with the following tables:

- Pension: Pub-2010 Non-Safety Disabled Retiree table, amount-weighted, and projected with MP-2021 generational improvement.
- Healthcare: Pub-2010 Non-Safety Disabled Retiree table, headcount-weighted, and projected with MP-2021 generational improvement.

Retirement

Retirement rates based on the 2017-2021 actual experience (see Tables 4a and 4b).

Deferred vested members are assumed to retire at their earliest unreduced retirement date.

The modified cash refund annuity is valued as a three-year certain and life annuity.

Spouse Age Difference

Males are assumed to be three years older than their wives. Females are assumed to be two years younger than their husbands.

Percent Married for Pension

For Peace Officer/Firefighters, 85% of male members and 60% of female members are assumed to be married at termination from active service. For Others, 75% of male members and 70% of female members are assumed to be married at termination from active service.

Dependent Spouse Medical Coverage Election

Applies to members who do not have double medical coverage. For Peace Officer/Firefighters, 75% of male members and 50% of female members are assumed to be married and cover a dependent spouse. For Others, 60% of male members and 50% of female members are assumed to be married and cover a dependent spouse.

Dependent Children

- Pension: None
- Healthcare: Benefits for dependent children have been valued only for members currently covering their dependent children. These benefits are only valued through the dependent children's age 23 (unless the child is disabled).

Imputed Data

Data changes from the prior year which are deemed to have an immaterial impact on liabilities and contribution rates are assumed to be correct in the current year's client data. Non-vested terminations with appropriate refund dates are assumed to have received a full refund of contributions. Active members with missing salary and service are assumed to be terminated with status based on their vesting percentage.

Active Data Adjustment

No adjustment was made to reflect participants who terminate employment before the valuation date and are subsequently rehired after the valuation date.

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Administrative Expenses

The Normal Cost as of June 30, 2022 was increased by the following amounts. These amounts are based on the average of actual administrative expenses during the last two fiscal years. For projections, the percent increase was assumed to remain constant in future years.

- Pension: $8,635,000
- Healthcare: $3,818,000

Rehire Assumption

The Normal Cost used for determining contribution rates and in the projections includes a rehire assumption to account for anticipated rehires. The Normal Cost shown in the report includes the following assumptions based on the four years of rehire loss experience through June 30, 2021. For projections, these assumptions were assumed to grade to zero uniformly over a 20-year period.

- Pension: 15.30%
- Healthcare: 2.40%

Re-Employment Option

All re-employed retirees are assumed to return to work under the Standard Option.

Service

Total credited service is provided by the State. This service is assumed to be the only service that should be used to calculate benefits. Additionally, the State provides claimed service (including Bureau of Indian Affairs Service). Claimed service is used for vesting and eligibility purposes as described in Section 5.1.

Part-Time Service

Peace Officer/Firefighter members are assumed to be full-time employees. For Other members, part-time employees are assumed to earn 0.75 years of service per year.

Final Average Earnings

Final Average Earnings is provided on the data for active members. This amount is used as a minimum in the calculation of the average earnings in the future.

Contribution Refunds

5% of terminating members with vested benefits are assumed to have their contributions refunded. 100% of those with non-vested benefits are assumed to have their contributions refunded.

Alaska Cost-of-Living Adjustments (COLA)

Of those benefit recipients who are eligible for the Alaska COLA, 60% of Peace Officers/Firefighters and 65% of Others are assumed to remain in Alaska and receive the COLA.

Postretirement Pension Adjustment (PRPA)

50% and 75% of assumed inflation, or 1.25% and 1.875% respectively, is valued for the annual automatic PRPA as specified in the statute.

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Healthcare Participation

100% of system paid members and their spouses are assumed to elect healthcare benefits as soon as they are eligible. For Peace Officer/Firefighters, 20% of non-system paid members and their spouses are assumed to elect healthcare benefits as soon as they are eligible. For Others, 25% of non-system paid members and their spouses are assumed to elect healthcare benefits as soon as they are eligible.

Medicare Part B Only

We assume that 2% of actives hired before April 1, 1986 and current retirees who are not yet Medicare eligible will not be eligible for Medicare Part A.

Healthcare Per Capita Claims Cost

Sample claims cost rates adjusted to age 65 for FY23 medical and prescription drugs are shown below. The prescription drug costs reflect the plan change to require prior authorization for certain specialty medications. The pre-Medicare medical cost reflects the coverage of additional preventive benefits.

	Medical	Prescription Drugs
Pre-Medicare	$ 15,706	$ 3,712
Medicare Parts A & B	$ 1,625	$ 3,907
Medicare Part B Only	$ 5,363	$ 3,907
Medicare Part D – EGWP	N/A	$ 1,309

Members are assumed to attain Medicare eligibility at age 65. All costs are for the 2023 fiscal year (July 1, 2022 – June 30, 2023).

The EGWP subsidy is assumed to increase in future years by the trend rates shown on the following pages. No future legislative changes or other events are anticipated to impact the EGWP subsidy. If any legislative or other changes occur in the future that impact the EGWP subsidy (which could either increase or decrease the plan's Actuarial Accrued Liability), those changes will be evaluated and quantified when they occur.

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Healthcare Morbidity

Morbidity rates (also called aging factors) are used to estimate utilization of healthcare benefits at each age to reflect the fact that healthcare utilization typically increases with age. Separate morbidity rates are used for medical and prescription drug benefits. These rates are based on the 2017-2021 actual experience.

Age	Medical	Prescription Drugs
0 - 44	2.0%	4.5%
45 - 54	2.5%	3.5%
55 - 64	2.5%	1.0%
65 - 74	2.0%	2.1%
75 - 84	2.2%	(0.3%)
85 - 94	0.5%	(2.5%)
95+	0.0%	0.0%

Healthcare Third Party Administrator Fees

$449 per person per year; assumed to increase at 4.50% per year.

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Healthcare Cost Trend

The table below shows the rate used to project the cost from the shown fiscal year to the next fiscal year. For example, 7.00% is applied to the FY23 pre-Medicare medical claims costs to get the FY24 medical claims costs.

	Medical Pre-65	Medical Post-65	Prescription Drugs / EGWP
FY23	7.00%	5.50%	7.50%
FY24	6.70%	5.50%	7.20%
FY25	6.40%	5.40%	6.90%
FY26	6.20%	5.40%	6.65%
FY27	6.05%	5.35%	6.35%
FY28	5.85%	5.35%	6.10%
FY29	5.65%	5.30%	5.80%
FY30	5.45%	5.30%	5.55%
FY31-FY38	5.30%	5.30%	5.30%
FY39	5.25%	5.25%	5.25%
FY40	5.20%	5.20%	5.20%
FY41	5.10%	5.10%	5.10%
FY42	5.05%	5.05%	5.05%
FY43	4.95%	4.95%	4.95%
FY44	4.90%	4.90%	4.90%
FY45	4.80%	4.80%	4.80%
FY46	4.75%	4.75%	4.75%
FY47	4.70%	4.70%	4.70%
FY48	4.60%	4.60%	4.60%
FY49	4.55%	4.55%	4.55%
FY50+	4.50%	4.50%	4.50%

For the June 30, 2014 valuation and later, the updated Society of Actuaries' Healthcare Cost Trend Model is used to project medical and prescription drug costs. This model estimates trend amounts that are projected out for 80 years. The model has been populated with assumptions that are specific to the State of Alaska.

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Retired Member Contributions for Medical Benefits

Currently contributions are required for PERS members who are under age 60 and have less than 30 years of service (25 for Peace Officer/Firefighter). Eligible Tier 1 members are exempt from contribution requirements. Annual FY23 contributions based on monthly rates shown below for calendar 2023 are assumed based on the coverage category for current retirees. The retiree only rate shown is used for current active and inactive members and spouses in Tier 2 or 3 who are assumed to retire prior to age 60 with less than 30 years of service and who are not disabled. For dependent children, we value 1/3 of the annual retiree contribution to estimate the per child rate based on the assumed number of children in rates where children are covered.

Coverage Category	Calendar 2023 Annual Contribution	Calendar 2023 Monthly Contribution	Calendar 2022 Monthly Contribution
Retiree Only	$ 8,448	$ 704	$ 704
Retiree and Spouse	$ 16,896	$ 1,408	$ 1,408
Retiree and Child(ren)	$ 11,940	$ 995	$ 995
Retiree and Family	$ 20,388	$ 1,699	$ 1,699
Composite	$ 12,552	$ 1,046	$ 1,046

Trend Rate for Retired Member Medical Contributions

The table below shows the rate used to project the retired member medical contributions from the shown fiscal year to the next fiscal year. For example, 4.0% is applied to the FY23 retired member medical contributions to get the FY24 retired member medical contributions.

Trend Assumptions	
FY23+	4.0%

Graded trend rates for retired member medical contributions are consistent with the rates used for the June 30, 2021 valuation. Actual FY23 retired member medical contributions are reflected in the valuation.

Changes in Assumptions Since the Prior Valuation

Effective for the June 30, 2022 valuation, the Board adopted the changes to the demographic and economic assumptions recommended by the actuary, based on the results of an experience study performed on the plan experience from July 1, 2017 to June 30, 2021. The changes in assumptions were adopted at the June 2022 Board meeting.

The healthcare per capita claims cost assumption is updated annually as described in Section 5.2. The amounts included in the Normal Cost for administrative expenses were changed from $7,625,000 to $8,635,000 for pension, and from $5,531,000 to $3,818,000 for healthcare (based on the most recent two years of actual administrative expenses paid from plan assets).

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Table 1: Salary Scales

Peace Officer / Firefighter		Others	
Years of Service	Percent Increase	Years of Service	Percent Increase
< 1	8.50%	< 1	6.75%
1	7.75%	1	6.00%
2	7.25%	2	5.50%
3	7.00%	3	5.00%
4	6.75%	4	4.75%
5	6.25%	5	4.25%
6	5.75%	6	4.05%
7	5.50%	7	3.95%
8	5.25%	8	3.75%
9	5.05%	9	3.55%
10	4.95%	10	3.45%
11	4.85%	11	3.25%
12	4.75%	12	3.10%
13	4.65%	13	3.05%
14	4.55%	14	3.00%
15	4.45%	15	2.95%
16	4.35%	16	2.90%
17	4.25%	17+	2.85%
18	4.05%		
19	4.05%		
20+	3.85%		

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Table 2a: Turnover Rates for Peace Officer / Firefighter

Select Rates during the First 5 Years of Employment

Years of Service	Male	Female
< 1	15.00%	15.00%
1	12.00%	8.00%
2	7.20%	6.40%
3	5.67%	5.60%
4	6.48%	7.20%

Ultimate Rates after the First 5 Years of Employment

Age	Male	Female
< 30	2.40%	5.80%
30 - 34	2.00%	5.10%
35 - 39	1.60%	3.00%
40 - 44	1.30%	3.00%
45 - 49	1.50%	2.90%
50 - 54	3.00%	5.00%
55+	2.25%	1.80%

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Table 2b: Turnover Rates for Others

Select Rates during the First 5 Years of Employment

Hire Age Under 35			Hire Age Over 35		
Years of Service	Male	Female	Years of Service	Male	Female
< 1	29.00%	29.00%	< 1	20.00%	20.00%
1	16.25%	20.00%	1	12.00%	15.00%
2	13.00%	16.00%	2	10.00%	12.50%
3	10.40%	12.80%	3	8.50%	10.00%
4	8.45%	10.40%	4	8.50%	9.00%

Ultimate Rates after the First 5 Years of Employment

Age	Male	Female
< 30	7.80%	8.20%
30 - 34	7.00%	7.10%
35 - 39	5.70%	5.50%
40 - 44	4.50%	5.20%
45 - 49	4.20%	4.40%
50 - 54	3.60%	4.70%
55+	2.90%	4.90%

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Table 3a: Disability Rates for Peace Officer / Firefighter

Age	Male	Female	Age	Male	Female
< 23	0.0179%	0.0112%	46	0.1247%	0.0780%
23	0.0244%	0.0153%	47	0.1337%	0.0836%
24	0.0310%	0.0194%	48	0.1462%	0.0914%
25	0.0374%	0.0234%	49	0.1588%	0.0993%
26	0.0440%	0.0275%	50	0.1714%	0.1071%
27	0.0505%	0.0316%	51	0.1839%	0.1150%
28	0.0526%	0.0329%	52	0.1965%	0.1228%
29	0.0548%	0.0343%	53	0.2294%	0.1434%
30	0.0570%	0.0356%	54	0.2624%	0.1640%
31	0.0591%	0.0370%	55	0.2954%	0.1846%
32	0.0612%	0.0383%	56	0.3283%	0.2052%
33	0.0634%	0.0397%	57	0.3613%	0.2258%
34	0.0657%	0.0411%	58	0.4112%	0.2570%
35	0.0679%	0.0425%	59	0.4611%	0.2882%
36	0.0702%	0.0439%	60	0.5110%	0.3194%
37	0.0724%	0.0453%	61	0.5610%	0.3506%
38	0.0757%	0.0473%	62	0.6109%	0.3818%
39	0.0789%	0.0493%	63	0.6109%	0.3818%
40	0.0822%	0.0514%	64	0.6109%	0.3818%
41	0.0854%	0.0534%	65	0.6109%	0.3818%
42	0.0886%	0.0554%	66	0.6109%	0.3818%
43	0.0977%	0.0611%	67	0.6109%	0.3818%
44	0.1066%	0.0667%	68	0.4073%	0.2546%
45	0.1157%	0.0723%	69	0.2036%	0.1273%
			70+	0.2036%	0.1273%

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Table 3b: Disability Rates for Others

Age	Male	Female	Age	Male	Female
< 23	0.0327%	0.0376%	46	0.1125%	0.1154%
23	0.0360%	0.0400%	47	0.1208%	0.1236%
24	0.0392%	0.0424%	48	0.1329%	0.1360%
25	0.0425%	0.0448%	49	0.1451%	0.1484%
26	0.0456%	0.0472%	50	0.1572%	0.1608%
27	0.0489%	0.0496%	51	0.1694%	0.1734%
28	0.0501%	0.0510%	52	0.1815%	0.1858%
29	0.0513%	0.0524%	53	0.2132%	0.2168%
30	0.0524%	0.0538%	54	0.2450%	0.2478%
31	0.0536%	0.0554%	55	0.2766%	0.2788%
32	0.0548%	0.0568%	56	0.3084%	0.3098%
33	0.0566%	0.0586%	57	0.3401%	0.3408%
34	0.0584%	0.0606%	58	0.4068%	0.4096%
35	0.0602%	0.0624%	59	0.4736%	0.4784%
36	0.0620%	0.0644%	60	0.5405%	0.5470%
37	0.0638%	0.0662%	61	0.6072%	0.6158%
38	0.0669%	0.0696%	62	0.6740%	0.6844%
39	0.0701%	0.0728%	63	0.8526%	0.8450%
40	0.0734%	0.0762%	64	1.0314%	1.0054%
41	0.0765%	0.0794%	65	1.2101%	1.1660%
42	0.0797%	0.0826%	66	1.3889%	1.3264%
43	0.0879%	0.0908%	67	1.5675%	1.4870%
44	0.0962%	0.0990%	68	1.0451%	0.9914%
45	0.1043%	0.1072%	69	0.5225%	0.4956%
			70+	0.5225%	0.4956%

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Table 4a: Retirement Rates for Peace Officer / Firefighter

	Reduced		Unreduced	
Age	Male	Female	Male	Female
< 47	N/A	N/A	9.00%	7.50%
47	N/A	N/A	13.00%	18.50%
48	N/A	N/A	13.00%	18.50%
49	N/A	N/A	13.00%	18.50%
50	5.00%	5.00%	20.00%	21.00%
51	5.00%	5.00%	20.00%	21.00%
52	7.00%	7.00%	20.00%	21.00%
53	7.00%	7.00%	20.00%	21.00%
54	7.00%	7.00%	20.00%	21.00%
55	7.50%	7.50%	29.00%	20.00%
56	7.50%	7.50%	29.00%	20.00%
57	7.50%	7.50%	29.00%	20.00%
58	7.50%	7.50%	29.00%	20.00%
59	20.00%	20.00%	29.00%	20.00%
60 - 64	N/A	N/A	29.00%	31.50%
65 - 69	N/A	N/A	45.00%	45.00%
70+	N/A	N/A	100.00%	100.00%

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Table 4b: Retirement Rates for Others

	Reduced		Unreduced	
Age	Male	Female	Male	Female
< 50	N/A	N/A	11.50%	11.50%
50	7.00%	8.50%	37.50%	40.50%
51	7.00%	8.50%	37.50%	40.50%
52	11.00%	8.50%	37.50%	40.50%
53	11.00%	8.50%	37.50%	40.50%
54	24.00%	16.50%	37.50%	40.50%
55	7.00%	6.50%	25.50%	24.00%
56	7.00%	6.50%	25.50%	24.00%
57	7.00%	6.50%	25.50%	24.00%
58	7.00%	6.50%	25.50%	24.00%
59	18.00%	22.00%	25.50%	24.00%
60 - 64	N/A	N/A	26.50%	24.50%
65 - 69	N/A	N/A	30.50%	28.50%
70 - 74	N/A	N/A	27.50%	27.50%
75 - 79	N/A	N/A	50.00%	50.00%
80+	N/A	N/A	100.00%	100.00%

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Section 6: Actuarial Standard of Practice No. 51

Funding future retirement benefits prior to when those benefits become due involves assumptions regarding future economic and demographic experience. These assumptions are applied to calculate actuarial liabilities, current contribution requirements, and the funded status of the plan. However, to the extent future experience deviates from the assumptions used, variations will occur in these calculated values. These variations create risk to the plan. Understanding the risks to the funding of the plan is important.

Actuarial Standard of Practice No. 51 (ASOP 51)[1] requires certain disclosures of potential risks to the plan and provides useful information for intended users of actuarial reports that determine plan contributions or evaluate the adequacy of specified contribution levels to support benefit provisions.

Under ASOP 51, risk is defined as the potential of actual future measurements deviating from expected future measurements resulting from actual future experience deviating from actuarially assumed experience.

It is important to note that not all risk is negative, but all risk should be understood and accepted based on knowledge, judgement, and educated decisions. Future measurements may deviate in ways that produce positive or negative financial impacts to the plan.

In the actuary's professional judgment, the following risks may reasonably be anticipated to significantly affect the pension plan's future financial condition and contribution requirements.

- Investment Risk – potential that the investment return will be different than the 7.25% expected in the actuarial valuation
- Contribution Risk – potential that the contribution actually made will be different than the actuarially determined contribution
- Long-Term Return on Investment Risk – potential that changes in long-term capital market assumptions or the plan's asset allocation will create the need to update the long-term return on investment assumption
- Longevity Risk – potential that participants live longer than expected compared to the valuation mortality assumptions
- Salary Increase Risk – potential that future salaries will be different than expected in the actuarial valuation
- Inflation Risk – potential that the consumer price index (CPI) for urban wage earners and clerical workers for Anchorage is different than the 2.5% assumed in the valuation
- Other Demographic Risk – potential that other demographic experience will be different than expected

The following information is provided to comply with ASOP 51 and furnish beneficial information on potential risks to the plan. **This list is not all-inclusive**; it is an attempt to identify the more significant risks and how those risks might affect the results shown in this report.

Note that ASOP 51 does not require the actuary to evaluate the ability or willingness of the plan sponsor to make contributions to the plan when due, or to assess the likelihood or consequences of potential future changes in law. In addition, this valuation report is not intended to provide investment advice or to provide guidance on the management or reduction of risk.

[1] ASOP 51 does not apply to the healthcare portion of the plan. Accordingly, all figures in this section relate to the pension portion.

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Assessment of Risks

Investment Risk

Plan costs are very sensitive to the market return.

- Any return on assets lower than assumed will increase costs.
- The plan uses an actuarial value of assets that smooths gains and losses on market returns over a five-year period to help control some of the volatility in costs due to investment risk.
- Historical experience of actual returns is shown in Section 2.4 of this report. This historical experience illustrates how returns can vary over time.

Contribution Risk

There is a risk to the plan when the employer's and/or State's actual contribution amount and the actuarially determined contribution differ.

- If the actual contribution is lower than the actuarially determined contribution, the plan may not be sustainable in the long term.
- Any underpayment of the contribution will increase future contribution amounts to help pay off the additional Unfunded Actuarial Accrued Liability associated with the underpayment(s).
- As long as the Board consistently adopts the actuarially determined contributions, this risk is mitigated due to Alaska statutes requiring the State to contribute additional funds necessary to pay the total contributions adopted by the Board.

Long-Term Return on Investment Risk

Inherent in the long-term return on investment assumption is the expectation that the current rate will be used until the last benefit payment of the plan is made. There is a risk that sustained changes in economic conditions, changes in long-term future capital market assumptions, or changes to the plan's asset allocation will necessitate an update to the long-term return on investment assumption used.

- Under a lower long-term return on investment assumption, less investment return is available to pay plan benefits. This may lead to a need for increased employer contributions.
- The liabilities will be higher at a lower assumed rate of return because future benefits will have a lower discount rate applied when calculating the present value.
- A 1% decrease in the long-term return on investment assumption will increase actuarial accrued liability by approximately 11%.
- This risk may be increased due to the plan being closed to new entrants. As the plan continues to mature, the magnitude of negative cash flow discussed in the Plan Maturity Measures later in this section will grow, thereby creating a need for more liquid assets that may not garner the same long-term return as currently assumed.

Longevity Risk

Plan costs will be increased as participants are expected to live longer.

- Benefits are paid over a longer lifetime when life expectancy is expected to increase. The longer duration of payments leads to higher liabilities.
- Health care has been improving, which affects the life expectancy of participants. As health care improves, leading to longer life expectancies, costs to the plan could increase.

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- The mortality assumption for the plan mitigates this risk by assuming future improvement in mortality. However, any improvement in future mortality greater than that expected by the current mortality assumption would lead to increased costs for the plan.
- The Postretirement Pension Adjustments and Alaska Cost-of-Living Allowance increase longevity risk because members who live longer than expected will incur more benefit payment increases than expected and therefore increase costs.

Salary Increase Risk

Plan costs will be increased if actual salary increases are larger than expected.

- Higher-than-expected salary increases will produce higher benefits.
- The higher benefits may be partially offset by increased employee contributions due to higher salaries.
- If future payroll grows at a rate different than assumed, contributions as a percentage of payroll will be affected.

Inflation Risk

Plan costs will be increased if the actual CPI for Anchorage is greater than the 2.5% assumed in the valuation.

- Retirement benefits will be greater than expected if the CPI is greater than the assumed rate, which will increase costs.
- This risk is mitigated by the 75% and 50% of CPI provisions and the 9% and 6% maximums.
- This risk is also mitigated by the age and time in payment requirements to receive an increase.
- Inflation risk may be associated with the interaction of inflation with other assumptions, but this is not significant as a standalone assumption, and therefore is considered as part of the associated assumption risk instead of being discussed here.

Other Demographic Risk

The plan is subject to risks associated with other demographic assumptions (e.g., retirement, termination, and retired members remaining in Alaska assumptions). Differences between actual and expected experience for these assumptions tend to have less impact on the overall costs of the plan. The demographic assumptions used in the valuation are re-evaluated regularly as part of the four-year experience studies to ensure the assumptions are consistent with long-term expectations.

Historical Information

Monitoring certain information over time may help understand risks faced by the plan. Historical information is included throughout this report. Some examples are:

- Funded Ratio History shown in the Executive Summary illustrates how the plan's funded status (comparison of actuarial accrued liabilities to actuarial value of assets) has changed over time.
- Section 1.6 shows historical analysis of financial experience including how contribution rates have changed over time.
- Section 2.4 shows the volatility of asset returns over time.
- Section 4 includes various historical information showing how member census data has changed over time.

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Plan Maturity Measures

There are certain measures that may aid in understanding the significant risks to the plan.

Ratio of Retired Liability to Total Liability ($'s in $000's)	June 30, 2021	June 30, 2022
1. Retiree and Beneficiary Accrued Liability	$ 10,774,140	$ 11,426,889
2. Total Accrued Liability	$ 15,419,975	$ 16,093,679
3. Ratio, (1) ÷ (2)	69.9%	71.0%

A high percentage of liability concentrated on participants in pay status indicates a mature plan (often a ratio above 60% - 65%). Because the plan was closed to new entrants in 2006, we expect the percentage in item #3 to continue to increase over time. An increasing percentage may indicate a need for a less risky asset allocation, which may lead to a lower long-term return on asset assumption and increased costs. Higher percentages may also indicate greater investment risk as benefit payments may be greater than contributions creating an increased reliance on investment returns. This ratio should be monitored each year in the future.

Ratio of Cash Flow to Assets ($'s in $000's)	FYE June 30, 2021	FYE June 30, 2022
1. Contributions	$ 586,737	$ 579,650
2. Benefit Payments	930,006	962,357
3. Cash Flow, (1) - (2)	$ (343,269)	$ (382,707)
4. Fair Value of Assets	$ 11,912,309	$ 10,816,140
5. Ratio, (3) ÷ (4)	(2.9%)	(3.5%)

When this cash flow ratio is negative, more cash is being paid out than deposited in the trust. Negative cash flow indicates the trust needs to rely on investment returns to cover benefit payments and / or may need to invest in more liquid assets to cover the benefit payments. More liquid assets may not generate the same returns as less liquid assets, which can increase the investment risk. Currently, the low magnitude of the ratio implies there may already be enough liquid assets to cover the benefit payments, less investment return is needed to cover the shortfall, or only a small portion of assets will need to be converted to cash. Therefore, the investment risk is likely not amplified at this time. However, due to the plan being closed, we expect this measure to become increasingly negative over time. This maturity measure should be monitored in the future.

Contribution Volatility ($'s in $000's)	June 30, 2021	June 30, 2022
1. Fair Value of Assets	$ 11,912,309	$ 10,816,140
2. DB/DCR Payroll	$ 2,406,757	$ 2,442,007
3. Asset to Payroll Ratio, (1) ÷ (2)	495.0%	442.9%
4. Accrued Liability	$ 15,419,975	$ 16,093,679
5. Liability to Payroll Ratio, (4) ÷ (2)	640.7%	659.0%

Plans that have higher asset-to-payroll ratios experience more volatile employer contributions (as a percentage of payroll) due to investment return. For example, a plan with an asset-to-payroll ratio of 10% may experience twice the contribution volatility due to investment return volatility than a plan with an asset-to-payroll ratio of 5%. Plans that have higher liability-to-payroll ratios experience more volatile employer contributions (as a percentage of payroll) due to changes in liability. For example, if an assumption change increases the liability of two plans by the same percent, the plan with a liability-to-payroll ratio of 10% may experience twice the contribution volatility than a plan with a liability-to-payroll ratio of 5%.

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Glossary of Terms

Actuarial Accrued Liability

Total accumulated cost to fund pension or postemployment benefits arising from service in all prior years.

Actuarial Cost Method

Technique used to assign or allocate, in a systematic and consistent manner, the expected cost of a pension or postemployment plan for a group of plan members to the years of service that give rise to that cost.

Actuarial Present Value of Projected Benefits

Amount which, together with future interest, is expected to be sufficient to pay all future benefits.

Actuarial Valuation

Study of probable amounts of future pension or postemployment benefits and the necessary amount of contributions to fund those benefits.

Actuary

Person who performs mathematical calculations pertaining to pension and insurance benefits based on specific procedures and assumptions.

GASB 67 and 68

Governmental Accounting Standards Board Statement Number 67 amends Number 25 effective for the fiscal year beginning after June 15, 2013 and defines new financial reporting requirements for public pension plans.

Governmental Accounting Standards Board Statement Number 68 amends Number 27 effective for fiscal years beginning after June 15, 2014 and defines new accounting and financial reporting requirements for employers sponsoring public pension plans.

GASB 74 and 75

Governmental Accounting Standards Board Statement Number 74 amends Number 43 effective for the fiscal year beginning after June 15, 2016 and defines new financial reporting requirements for public postemployment benefit plans.

Governmental Accounting Standards Board Statement Number 75 amends Number 45 effective for fiscal years beginning after June 15, 2017 and defines new accounting and financial reporting requirements for employers sponsoring public postemployment benefit plans.

Normal Cost

That portion of the actuarial present value of benefits assigned to a particular year in respect to an individual participant or the plan as a whole.

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Rate Payroll

Members' earnings used to determine contribution rates.

Unfunded Actuarial Accrued Liability (UAAL)

The portion of the actuarial accrued liability not offset by plan assets.

Valuation Payroll

Members' earnings used to determine Normal Cost and Actuarial Accrued Liability.

Vested Benefits

Benefits which are unconditionally guaranteed regardless of employment.

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BUCK

State of Alaska

Public Employees' Retirement System Defined Contribution Retirement Plan

For Occupational Death & Disability and Retiree Medical Benefits

Actuarial Valuation Report

As of June 30, 2022

January 2023

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January 6, 2023

State of Alaska
The Alaska Retirement Management Board
The Department of Revenue, Treasury Division
The Department of Administration, Division of Retirement and Benefits
P.O. Box 110203
Juneau, AK 99811-0203

Certification of Actuarial Valuation

Dear Members of The Alaska Retirement Management Board, The Department of Revenue and The Department of Administration:

This report summarizes the annual actuarial valuation results of the State of Alaska Public Employees' Retirement System Defined Contribution Retirement (PERS DCR) Plan as of June 30, 2022 performed by Buck Global, LLC (Buck).

The actuarial valuation is based on financial information provided in the financial statements audited by KPMG LLP, member data provided by the Division of Retirement and Benefits, and medical enrollment data provided by the healthcare claims administrator (Aetna), as summarized in this report. The benefits considered are those delineated in Alaska statutes effective June 30, 2022. The actuary did not verify the data submitted, but did perform tests for consistency and reasonableness.

All costs, liabilities and other factors under PERS DCR were determined in accordance with generally accepted actuarial principles and procedures. An actuarial cost method is used to measure the actuarial liabilities which we believe is reasonable. Buck is solely responsible for the actuarial data and actuarial results presented in this report. This report fully and fairly discloses the actuarial position of PERS DCR as of June 30, 2022.

PERS DCR is funded by Employer Contributions in accordance with the funding policy adopted by the Alaska Retirement Management Board (Board). The funding objective for PERS DCR is to pay required contributions that remain level as a percent of PERS DCR compensation. The Board has also established a funding policy objective that the required contributions be sufficient to pay the Normal Costs of active plan members, plan expenses, and amortize the Unfunded Actuarial Accrued Liability as a level percent of PERS DCR compensation over closed layered 25-year periods. This objective is currently being met and is projected to continue to be met as required by the Alaska State statutes. Absent future gains/losses, actuarially determined contributions are expected to remain level as a percent of pay and the overall funded status is expected to remain at or above 100%.

The Board and staff of the State of Alaska may use this report for the review of the operations of PERS DCR. Use of this report for any other purpose or by anyone other than the Board or staff of the State of Alaska may not be appropriate and may result in mistaken conclusions due to failure to understand applicable assumptions, methodologies, or inapplicability of the report for that purpose. Because of the risk of misinterpretation of actuarial results, Buck recommends requesting its advanced review of any statement to be based on information contained in this report. Buck will accept no liability for any such statement made without its prior review.

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Future actuarial measurements may differ significantly from current measurements due to plan experience differing from that anticipated by the actuarial assumptions, changes expected as part of the natural operation of the methodology used for these measurements, and changes in plan provisions or applicable law. In particular, retiree group benefits models necessarily rely on the use of approximations and estimates and are sensitive to changes in these approximations and estimates. Small variations in these approximations and estimates may lead to significant changes in actuarial measurements. An analysis of the potential range of such future differences is beyond the scope of this valuation.

In our opinion, the actuarial assumptions used are reasonable, taking into account the experience of the plan and reasonable long-term expectations, and represent our best estimate of the anticipated long-term experience under the plan. The actuary performs an analysis of plan experience periodically and recommends changes if, in the opinion of the actuary, assumption changes are needed to more accurately reflect expected future experience. The last full experience analysis was performed for the period July 1, 2017 to June 30, 2021. Based on that experience study, the Board adopted new assumptions effective beginning with the June 30, 2022 valuation to better reflect expected future experience. Based on our annual analysis of recent claims experience, changes were made to the healthcare per capita claims cost rates effective June 30, 2022 to better reflect expected future healthcare experience. A summary of the actuarial assumptions and methods used in this actuarial valuation is shown in Sections 4.2 and 4.3. We certify that the assumptions and methods described in Sections 4.2 and 4.3 of this report meet the requirements of all applicable Actuarial Standards of Practice.

Actuarial Standards of Practice No. 27 (ASOP 27) and No. 35 (ASOP 35) require the actuary to disclose the information and analysis used to support the actuary's determination that the assumptions selected by the plan sponsor do not significantly conflict with what, in the actuary's professional judgment, are reasonable for the purpose of the measurement. Buck provides advice on reasonable assumptions when performing periodic experience studies. The Board selects the assumptions used and annually the signing actuary reviews the assumptions through discussions with the Board staff and analyzing actuarial gain/loss experience. In the case of the Board's selection of the expected return on assets (EROA), the signing actuary has used economic information and tools provided by Buck's Financial Risk Management (FRM) practice. A spreadsheet tool created by the FRM practice converts averages, standard deviations, and correlations from Buck's Capital Markets Assumptions that are used for stochastic forecasting into approximate percentile ranges for the arithmetic and geometric average returns. It is intended to suggest possible reasonable ranges for EROA without attempting to predict or select a specific best estimate rate of return. It takes into account the duration (horizon) of investment and the target allocation of assets in the portfolio to various asset classes. Based on the actuary's analysis, including consistency with other assumptions used in the valuation, the percentiles generated by the spreadsheet tool described above, and review of actuarial gain/loss analysis, the actuary believes the assumptions do not significantly conflict with what, in the actuary's professional judgment, are reasonable for the purpose of the measurement.

Governmental Accounting Standards Board (GASB) Statement No. 74 (GASB 74) was effective for PERS DCR beginning with fiscal year ending June 30, 2017, and GASB 75 was effective beginning with fiscal year ending June 30, 2018. Separate GASB 74 and GASB 75 reports have been prepared.

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Assessment of Risks

Actuarial Standard of Practice No. 51 (ASOP 51) applies to actuaries performing funding calculations related to a pension plan. ASOP 51 does not apply to actuaries performing services in connection with other post-employment benefits, such as medical benefits. Accordingly, ASOP 51 does not apply to the retiree medical portion of PERS DCR. We also believe ASOP 51 does not apply to the occupational death & disability portion of PERS DCR. Therefore, information related to ASOP 51 is not included in this report. However, it may be beneficial to review the ASOP 51 information provided in the PERS valuation report for information on risks that may also relate to the occupational death & disability benefits provided by this plan.

Use of Models

Actuarial Standard of Practice No. 56 (ASOP 56) provides guidance to actuaries when performing actuarial services with respect to designing, developing, selecting, modifying, using, reviewing, or evaluating models. In addition to the EROA analysis spreadsheet model disclosed above, Buck uses third-party software in the performance of annual actuarial valuations and projections. The model is intended to calculate the liabilities associated with the provisions of the plan using data and assumptions as of the measurement date under the funding methods specified in this report. The output from the third-party vendor software is used as input to an internally developed model that applies applicable funding methods and policies to the derived liabilities and other inputs, such as plan assets and contributions, to generate many of the exhibits found in this report. Buck has an extensive review process in which the results of the liability calculations are checked using detailed sample life output, changes from year to year are summarized by source, and significant deviations from expectations are investigated. Other funding outputs and the internal model are similarly reviewed in detail and at a higher level for accuracy, reasonability, and consistency with prior results. Buck also reviews the third-party model when significant changes are made to the software. This review is performed by experts within Buck who are familiar with applicable funding methods, as well as the manner in which the model generates its output. If significant changes are made to the internal model, extra checking and review are completed. Significant changes to the internal model that are applicable to multiple clients are generally developed, checked, and reviewed by multiple experts within Buck who are familiar with the details of the required changes.

Buck used manual rate models to determine relative plan values for the defined benefit (DB) retiree medical plan and the DCR retiree medical plan, and to reflect the different Medicare coordination methods between the two plans. The manual rate models are intended to provide benchmark data and pricing capabilities, calculate per capita costs, and calculate actuarial values of different commercial health plans. Buck relied on the models, which were developed using industry data by actuaries and consultants at OptumInsight.

COVID-19

The potential impact of the ongoing COVID-19 pandemic on costs and liabilities was considered and an adjustment was made in setting the medical per capita claims cost assumption. FY21 medical claims were adjusted for a COVID-19 related decline in those claims during the fiscal year. FY22 medical claims were not adjusted. A more detailed explanation on these adjustments is shown in Sections 4.2 and 4.3 and in the valuation report for the DB plan.

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This report was prepared under the overall direction of David Kershner, who meets the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein. He is a Fellow of the Society of Actuaries, an Enrolled Actuary, a Member of the American Academy of Actuaries, and a Fellow of the Conference of Consulting Actuaries.

We are available to discuss this report with you at your convenience. David can be reached at 602-803-6174 and Brett can be reached at 260-423-1072.

Respectfully submitted,

David J. Kershner, FSA, EA, MAAA, FCA
Principal
Buck

Brett Hunter, ASA, EA, MAAA
Senior Consultant
Buck

The undersigned actuary is responsible for all assumptions related to the average annual per capita health claims cost and the health care cost trend rates, and hereby affirms his qualification to render opinions in such matters in accordance with the Qualification Standards of the American Academy of Actuaries.

Stephen R. Oates, ASA, EA, MAAA, FCA
Principal
Buck

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Executive Summary

Overview

The State of Alaska Public Employees' Retirement System Defined Contribution Retirement (PERS DCR) Plan provides occupational death & disability and retiree medical benefits to eligible members hired after June 30, 2006 or who have elected participation in this plan. The Commissioner of the Department of Administration is responsible for administering the plan. The Alaska Retirement Management Board has fiduciary responsibility over the assets of the plan. This report presents the results of the actuarial valuation of PERS DCR as of the valuation date of June 30, 2022.

Purpose

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

1. To determine the Employer contribution necessary to meet the Board's funding policy for the plan;
2. To disclose the funding assets and liability measures as of the valuation date;
3. To review the current funded status of the plan and assess the funded status as an appropriate measure for determining actuarially determined contributions;
4. To compare actual and expected experience under the plan during the last fiscal year; and
5. To report trends in contributions, assets, liabilities, and funded status over the last several years.

The actuarial valuation provides a "snapshot" of the funded position of PERS DCR based on the plan provisions, membership data, assets, and actuarial methods and assumptions as of the valuation date.

Funded Status

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

Funded Status as of June 30 ($'s in 000's)		2021	2022
Occupational Death & Disability			
a.	Actuarial Accrued Liability	$ 11,740	$ 14,952
b.	Valuation Assets	53,075	62,938
c.	Unfunded Actuarial Accrued Liability, (a) - (b)	$ (41,335)	$ (47,986)
d.	Funded Ratio based on Valuation Assets, (b) ÷ (a)	452.1%	420.9%
e.	Fair Value of Assets	$ 60,145	$ 61,458
f.	Funded Ratio based on Fair Value of Assets, (e) ÷ (a)	512.3%	411.0%

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Funded Status as of June 30 ($'s in 000's)		2021	2022
Retiree Medical			
a.	Actuarial Accrued Liability	$ 168,472	$ 169,396
b.	Valuation Assets	180,536	212,638
c.	Unfunded Actuarial Accrued Liability, (a) - (b)	$ (12,064)	$ (43,242)
d.	Funded Ratio based on Valuation Assets, (b) ÷ (a)	107.2%	125.5%
e.	Fair Value of Assets	$ 204,555	$ 207,686
f.	Funded Ratio based on Fair Value of Assets, (e) ÷ (a)	121.4%	122.6%
Total			
a.	Actuarial Accrued Liability	$ 180,212	$ 184,348
b.	Valuation Assets	233,611	275,576
c.	Unfunded Actuarial Accrued Liability, (a) - (b)	$ (53,399)	$ (91,228)
d.	Funded Ratio based on Valuation Assets, (b) ÷ (a)	129.6%	149.5%
e.	Fair Value of Assets	$ 264,700	$ 269,144
f.	Funded Ratio based on Fair Value of Assets, (e) ÷ (a)	146.9%	146.0%

The key reasons for the change in the funded status are explained below. The funded status for healthcare benefits is not necessarily an appropriate measure to confirm that assets are sufficient to settle health plan obligations as there are no available financial instruments for purchase. Future experience is likely to vary from assumptions so there is potential for actuarial gains or losses.

1. Investment Experience

The asset valuation method recognizes 20% of the investment gain or loss each year, for a period of five years. The FY22 investment return based on fair value of assets was approximately (6.3)% compared to the expected investment return of 7.38% (net of investment expenses). This resulted in a market asset loss of approximately $37,702,000. Due to the recognition of investment gains and losses over a 5-year period, the FY22 investment return based on actuarial value of assets was approximately 8.2%, which resulted in an actuarial asset gain of approximately $2,114,000.

2. Salary Increases

Salary increases for continuing active members during FY22 were higher than expected based on the valuation assumptions, resulting in a liability loss of approximately $160,000.

3. Demographic Experience

The number of active members increased 3.2% from 23,933 at June 30, 2021 to 24,702 at June 30, 2022. The average age of active members increased from 41.26 to 41.35 and average credited service increased from 4.93 to 5.11 years.

The demographic experience gains/losses are shown on page 5.

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4. Retiree Medical Claims Experience

Please refer to the State of Alaska Public Employees' Retirement System (PERS) Defined Benefit Plan Actuarial Valuation Report as of June 30, 2022 for a full description of the assumptions and costs of the retiree medical plan. Adjustments to these costs and assumptions are described in this report.

The recent claims experience described in Section 4.2 of this report (Section 5.2 of the PERS report) created an actuarial gain of approximately $3,679,000.

5. Changes in Methods Since the Prior Valuation

There were no changes in actuarial methods since the prior valuation.

6. Changes in Assumptions Since the Prior Valuation

Effective for the June 30, 2022 valuation, the Board adopted the changes to the demographic and economic assumptions recommended by the actuary, based on the results of an experience study performed on the plan experience from July 1, 2017 to June 30, 2021. The changes in assumptions were adopted at the June 2022 Board meeting. The effect of the new assumptions was to decrease the Actuarial Accrued Liability as of June 30, 2022 by approximately $21,126,000.

Healthcare claim costs are updated annually as described in Section 4.2. The amounts included in the Normal Cost for administrative expenses were updated based on the last two years of actual administrative expenses paid from plan assets.

7. Changes in Benefit Provisions Since the Prior Valuation

There have been no changes in benefit provisions valued since the prior valuation.

Comparative Summary of Contribution Rates

Occupational Death & Disability	FY 2024	FY 2025
Peace Officer/Firefighter		
a. Employer Normal Cost Rate	0.68%	0.69%
b. Past Service Cost Rate	(0.24)%	(0.20)%
c. Total Employer Contribution Rate, (a) + (b), not less than (a)	0.68%	0.69%
Others		
a. Employer Normal Cost Rate	0.30%	0.24%
b. Past Service Cost Rate	(0.19)%	(0.22)%
c. Total Employer Contribution Rate, (a) + (b), not less than (a)	0.30%	0.24%

Retiree Medical	FY 2024	FY 2025
a. Employer Normal Cost Rate	1.01%	0.83%
b. Past Service Cost Rate	(0.02)%	(0.14)%
c. Total Employer Contribution Rate, (a) + (b), not less than (a)	1.01%	0.83%

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Total	FY 2024	FY 2025
Peace Officer/Firefighter		
a. Employer Normal Cost Rate	1.69%	1.52%
b. Past Service Cost Rate	(0.26)%	(0.34)%
c. Total Employer Contribution Rate, (a) + (b), not less than (a)	1.69%	1.52%
Others		
a. Employer Normal Cost Rate	1.31%	1.07%
b. Past Service Cost Rate	(0.21)%	(0.36)%
c. Total Employer Contribution Rate, (a) + (b), not less than (a)	1.31%	1.07%

The exhibit below shows the historical Board-adopted employer contribution rates for PERS DCR.

		Total Employer Contribution Rate		
Valuation Date	Fiscal Year	Occupational Death & Disability (PF / Others)	Retiree Medical	Total (PF / Others)
June 30, 2008	FY11	1.18% / 0.31%	0.55%	1.73% / 0.86%
June 30, 2009	FY12	0.97% / 0.11%	0.51%	1.48% / 0.62%
June 30, 2010	FY13	0.99% / 0.14%	0.48%	1.47% / 0.62%
June 30, 2011	FY14	1.14% / 0.20%	0.48%	1.62% / 0.68%
June 30, 2012	FY15	1.06% / 0.22%	1.66%	2.72% / 1.88%
June 30, 2013	FY16	1.05% / 0.22%	1.68%	2.73% / 1.90%
June 30, 2014	FY17	0.49% / 0.17%	1.18%	1.67% / 1.35%
June 30, 2015	FY18	0.43% / 0.16%	1.03%	1.46% / 1.19%
June 30, 2016	FY19	0.76% / 0.26%	0.94%	1.70% / 1.20%
June 30, 2017	FY20	0.72% / 0.26%	1.32%	2.04% / 1.58%
June 30, 2018	FY21	0.70% / 0.31%	1.27%	1.97% / 1.58%
June 30, 2019	FY22	0.68% / 0.31%	1.07%	1.75% / 1.38%
June 30, 2020	FY23	0.68% / 0.30%	1.10%	1.78% / 1.40%
June 30, 2021	FY24	0.68% / 0.30%	1.01%	1.69% / 1.31%
June 30, 2022	FY25	TBD	TBD	TBD

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Summary of Actuarial Accrued Liability Gain/(Loss)

The following table shows the FY22 gain/(loss) on actuarial accrued liability as of June 30, 2022 ($'s in 000's):

	Occupational Death & Disability	Retiree Medical	Total
Retirement Experience	$ 0	$ (185)	$ (185)
Termination Experience	31	4,563	4,594
Disability Experience	2,109	355	2,464
Active Mortality Experience	1,966	(39)	1,927
Inactive Mortality Experience	(26)	(11)	(37)
Salary Increases	(160)	N/A	(160)
New Entrants	(76)	(1,887)	(1,963)
Rehires	(62)	(3,029)	(3,091)
Transfers Between P/F and Others	(45)	(11)	(56)
Benefit Payments Different than Expected	177	(316)	(139)
Per Capita Claims Cost	N/A	3,679	3,679
Miscellaneous[1]	347	2,445	2,792
Total	$ 4,261	$ 5,564	$ 9,825

Other items that increased/(decreased) the actuarial accrued liability as of June 30, 2022 are shown below ($'s in 000's):

	Occupational Death & Disability	Retiree Medical	Total
Experience Study Assumption Changes	$ 1,222	$ (22,348)	$ (21,126)

[1] Includes the effects of various data changes that are typical when new census data is received for the annual valuation, as well as other items that do not fit neatly into any of the other categories.

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Section 1: Actuarial Funding Results

Section 1.1: Actuarial Liabilities and Normal Cost ($'s in 000's)

Peace Officer / Firefighter

As of June 30, 2022	Present Value of Projected Benefits	Actuarial Accrued (Past Service) Liability
Active Members		
Occupational Death Benefits	$ 3,743	$ (49)
Occupational Disability Benefits	16,268	5,296
Medical and Prescription Drug Benefits	46,106	24,278
Medicare Part D Subsidy	(9,818)	(5,212)
Subtotal	$ 56,299	$ 24,313
Benefit Recipients		
Survivor Benefits	$ 311	$ 311
Disability Benefits	6,768	6,768
Medical and Prescription Drug Benefits	1,355	1,355
Medicare Part D Subsidy	(278)	(278)
Subtotal	$ 8,156	$ 8,156
Total	**$ 64,455**	**$ 32,469**
Total Occupational Death & Disability	**$ 27,090**	**$ 12,326**
Total Retiree Medical, Net of Part D Subsidy	**$ 37,365**	**$ 20,143**
Total Retiree Medical, Gross of Part D Subsidy	**$ 47,461**	**$ 25,633**

As of June 30, 2022	Normal Cost
Active Members	
Occupational Death Benefits	$ 467
Occupational Disability Benefits	1,246
Medical and Prescription Drug Benefits	2,339
Medicare Part D Subsidy	(496)
Subtotal	$ 3,556
Administrative Expense Load	
Occupational Death & Disability	$ 11
Retiree Medical	13
Subtotal	$ 24
Total	**$ 3,580**
Total Occupational Death & Disability	**$ 1,724**
Total Retiree Medical, Net of Part D Subsidy	**$ 1,856**
Total Retiree Medical, Gross of Part D Subsidy	**$ 2,352**

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Section 1.1: Actuarial Liabilities and Normal Cost ($'s in 000's)

Others

As of June 30, 2022	Present Value of Projected Benefits	Actuarial Accrued (Past Service) Liability
Active Members		
Occupational Death Benefits	$ 6,912	$ 589
Occupational Disability Benefits	14,492	1,523
Medical and Prescription Drug Benefits	271,491	183,466
Medicare Part D Subsidy	(62,156)	(42,205)
Subtotal	$ 230,739	$ 143,373
Benefit Recipients		
Survivor Benefits	$ 0	$ 0
Disability Benefits	514	514
Medical and Prescription Drug Benefits	10,441	10,441
Medicare Part D Subsidy	(2,449)	(2,449)
Subtotal	$ 8,506	$ 8,506
Total	**$ 239,245**	**$ 151,879**
Total Occupational Death & Disability	**$ 21,918**	**$ 2,626**
Total Retiree Medical, Net of Part D Subsidy	**$ 217,327**	**$ 149,253**
Total Retiree Medical, Gross of Part D Subsidy	**$ 281,932**	**$ 193,907**

As of June 30, 2022	Normal Cost
Active Members	
Occupational Death Benefits	$ 1,073
Occupational Disability Benefits	2,282
Medical and Prescription Drug Benefits	15,311
Medicare Part D Subsidy	(3,485)
Subtotal	$ 15,181
Administrative Expense Load	
Occupational Death & Disability	$ 22
Retiree Medical	26
Subtotal	$ 48
Total	**$ 15,229**
Total Occupational Death & Disability	**$ 3,377**
Total Retiree Medical, Net of Part D Subsidy	**$ 11,852**
Total Retiree Medical, Gross of Part D Subsidy	**$ 15,337**

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Section 1.1: Actuarial Liabilities and Normal Cost ($'s in 000's)

All Members

As of June 30, 2022	Present Value of Projected Benefits	Actuarial Accrued (Past Service) Liability
Active Members		
Occupational Death Benefits	$ 10,655	$ 540
Occupational Disability Benefits	30,760	6,819
Medical and Prescription Drug Benefits	317,597	207,744
Medicare Part D Subsidy	(71,974)	(47,417)
Subtotal	$ 287,038	$ 167,686
Benefit Recipients		
Survivor Benefits	$ 311	$ 311
Disability Benefits	7,282	7,282
Medical and Prescription Drug Benefits	11,796	11,796
Medicare Part D Subsidy	(2,727)	(2,727)
Subtotal	$ 16,662	$ 16,662
Total	**$ 303,700**	**$ 184,348**
Total Occupational Death & Disability	**$ 49,008**	**$ 14,952**
Total Retiree Medical, Net of Part D Subsidy	**$ 254,692**	**$ 169,396**
Total Retiree Medical, Gross of Part D Subsidy	**$ 329,393**	**$ 219,540**

As of June 30, 2022	Normal Cost
Active Members	
Occupational Death Benefits	$ 1,540
Occupational Disability Benefits	3,528
Medical and Prescription Drug Benefits	17,650
Medicare Part D Subsidy	(3,981)
Subtotal	$ 18,737
Administrative Expense Load	
Occupational Death & Disability	$ 33
Retiree Medical	39
Subtotal	$ 72
Total	**$ 18,809**
Total Occupational Death & Disability	**$ 5,101**
Total Retiree Medical, Net of Part D Subsidy	**$ 13,708**
Total Retiree Medical, Gross of Part D Subsidy	**$ 17,689**

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Section 1.2: Actuarial Contributions as of June 30, 2022 for FY25 ($'s in 000's)

Peace Officer / Firefighter

Normal Cost Rate	Occupational Death & Disability	Retiree Medical	Total
1. Total Normal Cost	$ 1,724	$ 1,856	$ 3,580
2. DCR Plan Rate Payroll Projected for FY23	249,857	249,857	249,857
3. Employer Normal Cost Rate, (1) ÷ (2)	0.69%	0.74%	1.43%
Past Service Rate			
1. Actuarial Accrued Liability	$ 12,326	$ 20,143	$ 32,469
2. Valuation Assets	18,616	25,285	43,901
3. Unfunded Actuarial Accrued Liability, (1) - (2)	$ (6,290)	$ (5,142)	$ (11,432)
4. Funded Ratio based on Valuation Assets	151.0%	125.5%	135.2%
5. Past Service Cost Amortization Payment	(490)	(287)	(777)
6. DCR Plan Rate Payroll Projected for FY23	249,857	249,857	249,857
7. Past Service Cost Rate, (5) ÷ (6)	(0.20%)	(0.11%)	(0.31%)
Total Employer Contribution Rate, not less than Normal Cost Rate	**0.69%**	**0.74%**	**1.43%**

The table below shows the total employer contribution rate based on total DB and DCR Plan payroll for informational purposes.

Total Employer Contribution Rate as Percent of Total Payroll	Occupational Death & Disability	Retiree Medical	Total
1. Total Normal Cost	$ 1,724	$ 1,856	$ 3,580
2. Total DB and DCR Plan Rate Payroll Projected for FY23	392,011	392,011	392,011
3. Employer Normal Cost Rate, (1) ÷ (2)	0.44%	0.47%	0.91%
4. Past Service Cost Amortization Payment	(490)	(287)	(777)
5. Past Service Cost Rate, (4) ÷ (2)	(0.12%)	(0.08%)	(0.20%)
Total Employer Contribution Rate, not less than Normal Cost Rate	**0.44%**	**0.47%**	**0.91%**

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Peace Officer / Firefighter

Schedule of Past Service Cost Amortizations - Occupational Death & Disability ($'s in 000's)

Layer	Amortization Period		Balances		Beginning-of-Year Payment
	Date Created	Years Remaining	Initial	Outstanding	
Initial Unfunded Liability	06/30/2007	10	$ (100)	$ (89)	$ (11)
FY08 Gain	06/30/2008	11	(586)	(534)	(60)
Change in Assumptions	06/30/2009	12	(104)	(98)	(10)
FY09 Loss	06/30/2009	12	446	419	44
Change in Assumptions	06/30/2010	13	79	75	7
FY10 Gain	06/30/2010	13	(282)	(273)	(27)
FY11 Loss	06/30/2011	14	73	69	6
FY12 Gain	06/30/2012	15	(349)	(348)	(31)
FY13 Gain	06/30/2013	16	(204)	(204)	(17)
Change in Assumptions	06/30/2014	17	(1,274)	(1,289)	(105)
PRPA Modification	06/30/2014	17	(91)	(91)	(7)
FY14 Gain	06/30/2014	17	(95)	(97)	(8)
FY15 Gain	06/30/2015	18	(664)	(673)	(53)
FY16 Loss	06/30/2016	19	4	4	0
FY17 Gain	06/30/2017	20	(525)	(533)	(39)
FY18 Gain	06/30/2018	21	(262)	(264)	(19)
Change in Assumptions	06/30/2018	21	(633)	(639)	(45)
FY19 Loss	06/30/2019	22	219	220	15
FY20 Gain	06/30/2020	23	(792)	(798)	(53)
FY21 Gain	06/30/2021	24	(1,842)	(1,850)	(121)
Change in Assumptions	06/30/2022	25	1,590	1,590	101
FY22 Gain	06/30/2022	25	(887)	(887)	(57)
Total				**$ (6,290)**	**$ (490)**

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Peace Officer / Firefighter

Schedule of Past Service Cost Amortizations - Retiree Medical ($'s in 000's)

	Amortization Period		Balances		
Layer	Date Created	Years Remaining	Initial	Outstanding	Beginning-of-Year Payment
Initial Unfunded Liability	06/30/2007	10	$ (21)	$ (21)	$ (3)
Change in Assumptions	06/30/2008	11	17	14	2
FY08 Gain	06/30/2008	11	(62)	(57)	(6)
Change in Assumptions	06/30/2009	12	(8)	(8)	(1)
FY09 Gain	06/30/2009	12	(38)	(37)	(4)
Change in Assumptions	06/30/2010	13	41	39	4
FY10 Gain	06/30/2010	13	(46)	(41)	(4)
FY11 Loss	06/30/2011	14	70	67	6
Change in Assumptions	06/30/2012	15	3,085	3,067	271
FY12 Gain	06/30/2012	15	(273)	(271)	(24)
FY13 Loss	06/30/2013	16	880	885	75
Change in Assumptions	06/30/2014	17	(3,034)	(3,067)	(249)
FY14 Loss	06/30/2014	17	1,213	1,226	99
FY15 Gain	06/30/2015	18	(712)	(722)	(56)
EGWP Gain	06/30/2016	19	(1,675)	(1,702)	(128)
FY16 Loss	06/30/2016	19	1,116	1,134	85
Change in Assumptions	06/30/2017	20	2,244	2,273	166
FY17 Gain	06/30/2017	20	(50)	(52)	(4)
FY18 Gain	06/30/2018	21	(231)	(233)	(16)
Change in Assumptions/Methods	06/30/2018	21	(649)	(654)	(46)
FY19 Gain	06/30/2019	22	(1,291)	(1,301)	(89)
Change in Assumptions	06/30/2020	23	1,116	1,124	75
FY20 Gain	06/30/2020	23	(1,082)	(1,090)	(73)
Prescription Drug Plan Changes	06/30/2021	24	(235)	(236)	(15)
FY21 Gain	06/30/2021	24	(1,726)	(1,734)	(113)
Change in Assumptions	06/30/2022	25	(1,769)	(1,769)	(113)
FY22 Gain	06/30/2022	25	(1,976)	(1,976)	(126)
Total				**$ (5,142)**	**$ (287)**

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Peace Officer / Firefighter

Schedule of Past Service Cost Amortizations - Total ($'s in 000's)

Layer	Amortization Period		Balances		Beginning-of-Year Payment
	Date Created	Years Remaining	Initial	Outstanding	
Initial Unfunded Liability	06/30/2007	10	$ (121)	$ (110)	$ (14)
Change in Assumptions	06/30/2008	11	17	14	2
FY08 Gain	06/30/2008	11	(648)	(591)	(66)
Change in Assumptions	06/30/2009	12	(112)	(106)	(11)
FY09 Loss	06/30/2009	12	408	382	40
Change in Assumptions	06/30/2010	13	120	114	11
FY10 Gain	06/30/2010	13	(328)	(314)	(31)
FY11 Loss	06/30/2011	14	143	136	12
Change in Assumptions	06/30/2012	15	3,085	3,067	271
FY12 Gain	06/30/2012	15	(622)	(619)	(55)
FY13 Loss	06/30/2013	16	676	681	58
Change in Assumptions	06/30/2014	17	(4,308)	(4,356)	(354)
PRPA Modification	06/30/2014	17	(91)	(91)	(7)
FY14 Loss	06/30/2014	17	1,118	1,129	91
FY15 Gain	06/30/2015	18	(1,376)	(1,395)	(109)
EGWP Gain	06/30/2016	19	(1,675)	(1,702)	(128)
FY16 Loss	06/30/2016	19	1,120	1,138	85
Change in Assumptions	06/30/2017	20	2,244	2,273	166
FY17 Gain	06/30/2017	20	(575)	(585)	(43)
FY18 Gain	06/30/2018	21	(493)	(497)	(35)
Change in Assumptions/Methods	06/30/2018	21	(1,282)	(1,293)	(91)
FY19 Gain	06/30/2019	22	(1,072)	(1,081)	(74)
Change in Assumptions	06/30/2020	23	1,116	1,124	75
FY20 Gain	06/30/2020	23	(1,874)	(1,888)	(126)
Prescription Drug Plan Changes	06/30/2021	24	(235)	(236)	(15)
FY21 Gain	06/30/2021	24	(3,568)	(3,584)	(234)
Change in Assumptions	06/30/2022	25	(179)	(179)	(12)
FY22 Gain	06/30/2022	25	(2,863)	(2,863)	(183)
Total				**$ (11,432)**	**$ (777)**

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Section 1.2: Actuarial Contributions as of June 30, 2022 for FY25 ($'s in 000's)

Others

Normal Cost Rate	Occupational Death & Disability	Retiree Medical	Total
1. Total Normal Cost	$ 3,377	$ 11,852	$ 15,229
2. DCR Plan Rate Payroll Projected for FY23	1,395,484	1,395,484	1,395,484
3. Employer Normal Cost Rate, (1) ÷ (2)	0.24%	0.85%	1.09%
Past Service Rate			
1. Actuarial Accrued Liability	$ 2,626	$ 149,253	$ 151,879
2. Valuation Assets	44,322	187,353	231,675
3. Unfunded Actuarial Accrued Liability, (1) - (2)	$ (41,696)	$ (38,100)	$ (79,796)
4. Funded Ratio based on Valuation Assets	1,687.8%	125.5%	152.5%
5. Past Service Cost Amortization Payment	(3,041)	(2,041)	(5,082)
6. DCR Plan Rate Payroll Projected for FY23	1,395,484	1,395,484	1,395,484
7. Past Service Cost Rate, (5) ÷ (6)	(0.22%)	(0.15%)	(0.37%)
Total Employer Contribution Rate, not less than Normal Cost Rate	**0.24%**	**0.85%**	**1.09%**

The table below shows the total employer contribution rate based on total DB and DCR Plan payroll for informational purposes.

Total Employer Contribution Rate as Percent of Total Payroll	Occupational Death & Disability	Retiree Medical	Total
1. Total Normal Cost	$ 3,377	$ 11,852	$ 15,229
2. Total DB and DCR Plan Rate Payroll Projected for FY23	2,049,996	2,049,996	2,049,996
3. Employer Normal Cost Rate, (1) ÷ (2)	0.16%	0.58%	0.74%
4. Past Service Cost Amortization Payment	(3,041)	(2,041)	(5,082)
5. Past Service Cost Rate, (4) ÷ (2)	(0.15%)	(0.10%)	(0.25%)
Total Employer Contribution Rate, not less than Normal Cost Rate	**0.16%**	**0.58%**	**0.74%**

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Others

Schedule of Past Service Cost Amortizations - Occupational Death & Disability ($'s in 000's)

	Amortization Period		Balances		
Layer	Date Created	Years Remaining	Initial	Outstanding	Beginning-of-Year Payment
Initial Unfunded Liability	06/30/2007	10	$ (40)	$ (36)	$ (4)
FY08 Gain	06/30/2008	11	(318)	(291)	(32)
Change in Assumptions	06/30/2009	12	(92)	(86)	(9)
FY09 Gain	06/30/2009	12	(1,924)	(1,804)	(189)
Change in Assumptions	06/30/2010	13	24	24	3
FY10 Gain	06/30/2010	13	(994)	(955)	(94)
FY11 Gain	06/30/2011	14	(1,184)	(1,157)	(107)
FY12 Gain	06/30/2012	15	(1,233)	(1,224)	(108)
FY13 Gain	06/30/2013	16	(779)	(783)	(66)
Change in Assumptions	06/30/2014	17	(51)	(50)	(4)
PRPA Modification	06/30/2014	17	(27)	(28)	(3)
FY14 Gain	06/30/2014	17	(2,003)	(2,022)	(164)
FY15 Gain	06/30/2015	18	(1,850)	(1,876)	(146)
FY16 Gain	06/30/2016	19	(2,361)	(2,396)	(180)
FY17 Gain	06/30/2017	20	(2,377)	(2,406)	(175)
FY18 Gain	06/30/2018	21	(2,590)	(2,611)	(184)
Change in Assumptions	06/30/2018	21	(272)	(275)	(20)
FY19 Gain	06/30/2019	22	(3,984)	(4,017)	(276)
FY20 Gain	06/30/2020	23	(4,803)	(4,838)	(324)
FY21 Gain	06/30/2021	24	(7,268)	(7,301)	(477)
Change in Assumptions	06/30/2022	25	(368)	(368)	(23)
FY22 Gain	06/30/2022	25	(7,196)	(7,196)	(459)
Total				**$ (41,696)**	**$ (3,041)**

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Others

Schedule of Past Service Cost Amortizations - Retiree Medical ($'s in 000's)

Layer	Amortization Period		Balances		Beginning-of-Year Payment
	Date Created	Years Remaining	Initial	Outstanding	
Initial Unfunded Liability	06/30/2007	10	$ (335)	$ (295)	$ (35)
Change in Assumptions	06/30/2008	11	165	151	16
FY08 Gain	06/30/2008	11	(702)	(638)	(72)
Change in Assumptions	06/30/2009	12	(122)	(114)	(12)
FY09 Gain	06/30/2009	12	(438)	(411)	(43)
Change in Assumptions	06/30/2010	13	(572)	(549)	(54)
FY10 Loss	06/30/2010	13	579	552	54
FY11 Loss	06/30/2011	14	820	805	75
Change in Assumptions	06/30/2012	15	25,180	25,024	2,214
FY12 Loss	06/30/2012	15	1,451	1,441	128
FY13 Loss	06/30/2013	16	9,974	10,016	847
Change in Assumptions	06/30/2014	17	(21,822)	(22,063)	(1,789)
FY14 Loss	06/30/2014	17	7,002	7,081	575
FY15 Gain	06/30/2015	18	(8,726)	(8,852)	(691)
EGWP Gain	06/30/2016	19	(17,884)	(18,144)	(1,367)
FY16 Loss	06/30/2016	19	10,367	10,518	793
Change in Assumptions	06/30/2017	20	21,288	21,550	1,570
FY17 Gain	06/30/2017	20	(1,658)	(1,677)	(122)
FY18 Loss	06/30/2018	21	118	119	8
Change in Assumptions/Methods	06/30/2018	21	(8,993)	(9,063)	(641)
FY19 Gain	06/30/2019	22	(10,841)	(10,935)	(752)
Change in Assumptions	06/30/2020	23	6,369	6,416	430
FY20 Gain	06/30/2020	23	(6,288)	(6,334)	(424)
Prescription Drug Plan Changes	06/30/2021	24	(1,794)	(1,802)	(118)
FY21 Gain	06/30/2021	24	(13,896)	(13,957)	(912)
Change in Assumptions	06/30/2022	25	(20,579)	(20,579)	(1,313)
FY22 Gain	06/30/2022	25	(6,360)	(6,360)	(406)
Total				**$ (38,100)**	**$ (2,041)**

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Others

Schedule of Past Service Cost Amortizations - Total ($'s in 000's)

Layer	Amortization Period		Balances		Beginning-of-Year Payment
	Date Created	Years Remaining	Initial	Outstanding	
Initial Unfunded Liability	06/30/2007	10	$ (375)	$ (331)	$ (39)
Change in Assumptions	06/30/2008	11	165	151	16
FY08 Gain	06/30/2008	11	(1,020)	(929)	(104)
Change in Assumptions	06/30/2009	12	(214)	(200)	(21)
FY09 Gain	06/30/2009	12	(2,362)	(2,215)	(232)
Change in Assumptions	06/30/2010	13	(548)	(525)	(51)
FY10 Gain	06/30/2010	13	(415)	(403)	(40)
FY11 Gain	06/30/2011	14	(364)	(352)	(32)
Change in Assumptions	06/30/2012	15	25,180	25,024	2,214
FY12 Loss	06/30/2012	15	218	217	20
FY13 Loss	06/30/2013	16	9,195	9,233	781
Change in Assumptions	06/30/2014	17	(21,873)	(22,113)	(1,793)
PRPA Modification	06/30/2014	17	(27)	(28)	(3)
FY14 Loss	06/30/2014	17	4,999	5,059	411
FY15 Gain	06/30/2015	18	(10,576)	(10,728)	(837)
EGWP Gain	06/30/2016	19	(17,884)	(18,144)	(1,367)
FY16 Loss	06/30/2016	19	8,006	8,122	613
Change in Assumptions	06/30/2017	20	21,288	21,550	1,570
FY17 Gain	06/30/2017	20	(4,035)	(4,083)	(297)
FY18 Gain	06/30/2018	21	(2,472)	(2,492)	(176)
Change in Assumptions/Methods	06/30/2018	21	(9,265)	(9,338)	(661)
FY19 Gain	06/30/2019	22	(14,825)	(14,952)	(1,028)
Change in Assumptions	06/30/2020	23	6,369	6,416	430
FY20 Gain	06/30/2020	23	(11,091)	(11,172)	(748)
Prescription Drug Plan Changes	06/30/2021	24	(1,794)	(1,802)	(118)
FY21 Gain	06/30/2021	24	(21,164)	(21,258)	(1,389)
Change in Assumptions	06/30/2022	25	(20,947)	(20,947)	(1,336)
FY22 Gain	06/30/2022	25	(13,556)	(13,556)	(865)
Total				**$ (79,796)**	**$ (5,082)**

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Section 1.2: Actuarial Contributions as of June 30, 2022 for FY25 ($'s in 000's)

All Members

Normal Cost Rate	Occupational Death & Disability	Retiree Medical	Total
1. Total Normal Cost	$ 5,101	$ 13,708	$ 18,809
2. DCR Plan Rate Payroll Projected for FY23	1,645,341	1,645,341	1,645,341
3. Employer Normal Cost Rate, (1) ÷ (2)	0.31%	0.83%	1.14%
Past Service Rate			
1. Actuarial Accrued Liability	$ 14,952	$ 169,396	$ 184,348
2. Valuation Assets	62,938	212,638	275,576
3. Unfunded Actuarial Accrued Liability, (1) - (2)	$ (47,986)	$ (43,242)	$ (91,228)
4. Funded Ratio based on Valuation Assets	420.9%	125.5%	149.5%
5. Past Service Cost Amortization Payment	(3,531)	(2,328)	(5,859)
6. DCR Plan Rate Payroll Projected for FY23	1,645,341	1,645,341	1,645,341
7. Past Service Cost Rate, (5) ÷ (6)	(0.21%)	(0.14%)	(0.35%)
Total Employer Contribution Rate, not less than Normal Cost Rate	**0.31%**	**0.83%**	**1.14%**

The table below shows the total employer contribution rate based on total DB and DCR Plan payroll for informational purposes.

Total Employer Contribution Rate as Percent of Total Payroll	Occupational Death & Disability	Retiree Medical	Total
1. Total Normal Cost	$ 5,101	$ 13,708	$ 18,809
2. Total DB and DCR Plan Rate Payroll Projected for FY23	2,442,007	2,442,007	2,442,007
3. Employer Normal Cost Rate, (1) ÷ (2)	0.21%	0.56%	0.77%
4. Past Service Cost Amortization Payment	(3,531)	(2,328)	(5,859)
5. Past Service Cost Rate, (4) ÷ (2)	(0.14%)	(0.10%)	(0.24%)
Total Employer Contribution Rate, not less than Normal Cost Rate	**0.21%**	**0.56%**	**0.77%**

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All Members

Schedule of Past Service Cost Amortizations - Occupational Death & Disability ($'s in 000's)

	Amortization Period		Balances		
Layer	Date Created	Years Remaining	Initial	Outstanding	Beginning-of-Year Payment
Initial Unfunded Liability	06/30/2007	10	$ (140)	$ (125)	$ (15)
FY08 Gain	06/30/2008	11	(904)	(825)	(92)
Change in Assumptions	06/30/2009	12	(196)	(184)	(19)
FY09 Gain	06/30/2009	12	(1,478)	(1,385)	(145)
Change in Assumptions	06/30/2010	13	103	99	10
FY10 Gain	06/30/2010	13	(1,276)	(1,228)	(121)
FY11 Gain	06/30/2011	14	(1,111)	(1,088)	(101)
FY12 Gain	06/30/2012	15	(1,582)	(1,572)	(139)
FY13 Gain	06/30/2013	16	(983)	(987)	(83)
Change in Assumptions	06/30/2014	17	(1,325)	(1,339)	(109)
PRPA Modification	06/30/2014	17	(118)	(119)	(10)
FY14 Gain	06/30/2014	17	(2,098)	(2,119)	(172)
FY15 Gain	06/30/2015	18	(2,514)	(2,549)	(199)
FY16 Gain	06/30/2016	19	(2,357)	(2,392)	(180)
FY17 Gain	06/30/2017	20	(2,902)	(2,939)	(214)
FY18 Gain	06/30/2018	21	(2,852)	(2,875)	(203)
Change in Assumptions	06/30/2018	21	(905)	(914)	(65)
FY19 Gain	06/30/2019	22	(3,765)	(3,797)	(261)
FY20 Gain	06/30/2020	23	(5,595)	(5,636)	(377)
FY21 Gain	06/30/2021	24	(9,110)	(9,151)	(598)
Change in Assumptions	06/30/2022	25	1,222	1,222	78
FY22 Gain	06/30/2022	25	(8,083)	(8,083)	(516)
Total				**$ (47,986)**	**$ (3,531)**

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All Members

Schedule of Past Service Cost Amortizations - Retiree Medical ($'s in 000's)

Layer	Amortization Period		Balances		Beginning-of-Year Payment
	Date Created	Years Remaining	Initial	Outstanding	
Initial Unfunded Liability	06/30/2007	10	$ (356)	$ (316)	$ (38)
Change in Assumptions	06/30/2008	11	182	165	18
FY08 Gain	06/30/2008	11	(764)	(695)	(78)
Change in Assumptions	06/30/2009	12	(130)	(122)	(13)
FY09 Gain	06/30/2009	12	(476)	(448)	(47)
Change in Assumptions	06/30/2010	13	(531)	(510)	(50)
FY10 Loss	06/30/2010	13	533	511	50
FY11 Loss	06/30/2011	14	890	872	81
Change in Assumptions	06/30/2012	15	28,265	28,091	2,485
FY12 Loss	06/30/2012	15	1,178	1,170	104
FY13 Loss	06/30/2013	16	10,854	10,901	922
Change in Assumptions	06/30/2014	17	(24,856)	(25,130)	(2,038)
FY14 Loss	06/30/2014	17	8,215	8,307	674
FY15 Gain	06/30/2015	18	(9,438)	(9,574)	(747)
EGWP Gain	06/30/2016	19	(19,559)	(19,846)	(1,495)
FY16 Loss	06/30/2016	19	11,483	11,652	878
Change in Assumptions	06/30/2017	20	23,532	23,823	1,736
FY17 Gain	06/30/2017	20	(1,708)	(1,729)	(126)
FY18 Gain	06/30/2018	21	(113)	(114)	(8)
Change in Assumptions/Methods	06/30/2018	21	(9,642)	(9,717)	(687)
FY19 Gain	06/30/2019	22	(12,132)	(12,236)	(841)
Change in Assumptions	06/30/2020	23	7,485	7,540	505
FY20 Gain	06/30/2020	23	(7,370)	(7,424)	(497)
Prescription Drug Plan Changes	06/30/2021	24	(2,029)	(2,038)	(133)
FY21 Gain	06/30/2021	24	(15,622)	(15,691)	(1,025)
Change in Assumptions	06/30/2022	25	(22,348)	(22,348)	(1,426)
FY22 Gain	06/30/2022	25	(8,336)	(8,336)	(532)
Total				**$ (43,242)**	**$ (2,328)**

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All Members

Schedule of Past Service Cost Amortizations - Total ($'s in 000's)

Layer	Amortization Period		Balances		Beginning-of-Year Payment
	Date Created	Years Remaining	Initial	Outstanding	
Initial Unfunded Liability	06/30/2007	10	$ (496)	$ (441)	$ (53)
Change in Assumptions	06/30/2008	11	182	165	18
FY08 Gain	06/30/2008	11	(1,668)	(1,520)	(170)
Change in Assumptions	06/30/2009	12	(326)	(306)	(32)
FY09 Gain	06/30/2009	12	(1,954)	(1,833)	(192)
Change in Assumptions	06/30/2010	13	(428)	(411)	(40)
FY10 Gain	06/30/2010	13	(743)	(717)	(71)
FY11 Gain	06/30/2011	14	(221)	(216)	(20)
Change in Assumptions	06/30/2012	15	28,265	28,091	2,485
FY12 Gain	06/30/2012	15	(404)	(402)	(35)
FY13 Loss	06/30/2013	16	9,871	9,914	839
Change in Assumptions	06/30/2014	17	(26,181)	(26,469)	(2,147)
PRPA Modification	06/30/2014	17	(118)	(119)	(10)
FY14 Loss	06/30/2014	17	6,117	6,188	502
FY15 Gain	06/30/2015	18	(11,952)	(12,123)	(946)
EGWP Gain	06/30/2016	19	(19,559)	(19,846)	(1,495)
FY16 Loss	06/30/2016	19	9,126	9,260	698
Change in Assumptions	06/30/2017	20	23,532	23,823	1,736
FY17 Gain	06/30/2017	20	(4,610)	(4,668)	(340)
FY18 Gain	06/30/2018	21	(2,965)	(2,989)	(211)
Change in Assumptions/Methods	06/30/2018	21	(10,547)	(10,631)	(752)
FY19 Gain	06/30/2019	22	(15,897)	(16,033)	(1,102)
Change in Assumptions	06/30/2020	23	7,485	7,540	505
FY20 Gain	06/30/2020	23	(12,965)	(13,060)	(874)
Prescription Drug Plan Changes	06/30/2021	24	(2,029)	(2,038)	(133)
FY21 Gain	06/30/2021	24	(24,732)	(24,842)	(1,623)
Change in Assumptions	06/30/2022	25	(21,126)	(21,126)	(1,348)
FY22 Gain	06/30/2022	25	(16,419)	(16,419)	(1,048)
Total				**$ (91,228)**	**$ (5,859)**

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Section 1.3: Actuarial Gain/(Loss) for FY22 ($'s in 000's)

	Occupational Death & Disability	Retiree Medical	Total
1. Expected Actuarial Accrued Liability			
a. Actuarial Accrued Liability as of June 30, 2021	$ 11,740	$ 168,472	$ 180,212
b. Normal Cost	5,456	15,587	21,043
c. Interest on (a) and (b) at 7.38%	1,269	13,584	14,853
d. Employer Group Waiver Plan	0	140	140
e. Benefit Payments	(456)	(463)	(919)
f. Interest on (d) and (e) at 7.38%, adjusted for timing	(18)	(12)	(30)
g. Experience Study Assumptions/Methods	1,222	(22,348)	(21,126)
h. Expected Actuarial Accrued Liability as of June 30, 2022 (a) + (b) + (c) + (d) + (e) + (f) + (g)	$ 19,213	$ 174,960	$ 194,173
2. Actual Actuarial Accrued Liability as of June 30, 2022	14,952	169,396	184,348
3. Liability Gain/(Loss), (1)(h) - (2)	**$ 4,261**	**$ 5,564**	**$ 9,825**
4. Expected Actuarial Asset Value			
a. Actuarial Asset Value as of June 30, 2021	$ 53,075	$ 180,536	$ 233,611
b. Interest on (a) at 7.38%	3,917	13,324	17,241
c. Employer Contributions	5,769	16,920	22,689
d. Employer Group Waiver Plan	0	140	140
e. Interest on (c) and (d) at 7.38%, adjusted for timing	209	618	827
f. Benefit Payments	(456)	(463)	(919)
g. Administrative Expenses	(33)	(56)	(89)
h. Interest on (f) and (g) at 7.38%, adjusted for timing	(19)	(19)	(38)
i. Expected Actuarial Asset Value as of June 30, 2022 (a) + (b) + (c) + (d) + (e) + (f) + (g) + (h)	$ 62,462	$ 211,000	$ 273,462
5. Actuarial Asset Value as of June 30, 2022	62,938	212,638	275,576
6. Actuarial Asset Gain/(Loss), (5) - (4)(i)	**$ 476**	**$ 1,638**	**$ 2,114**
7. Total Actuarial Gain/(Loss), (3) + (6)	**$ 4,737**	**$ 7,202**	**$ 11,939**
8. Contribution Gain/(Loss)	**$ 3,363**	**$ 1,166**	**$ 4,529**
9. Administrative Expense Gain/(Loss)	**$ (17)**	**$ (32)**	**$ (49)**
10. FY22 Gain/(Loss), (7) + (8) + (9)	**$ 8,083**	**$ 8,336**	**$ 16,419**

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Section 1.4: History of Unfunded Liability and Funded Ratio ($'s in 000's)

Valuation Date	Total Actuarial Accrued Liability	Valuation Assets	Assets as a Percent of Actuarial Accrued Liability	Unfunded Actuarial Accrued Liability (UAAL)
June 30, 2007	$ 759	$ 1,255	165.3%	$ (496)
June 30, 2008	2,018	4,007	198.6%	(1,989)
June 30, 2009	4,316	8,613	199.6%	(4,297)
June 30, 2010	8,038	13,568	168.8%	(5,530)
June 30, 2011	13,251	19,058	143.8%	(5,807)
June 30, 2012	46,921	24,915	53.1%	22,006
June 30, 2013	63,885	31,709	49.6%	32,176
June 30, 2014	53,844	41,461	77.0%	12,383
June 30, 2015	63,732	63,202	99.2%	530
June 30, 2016	77,052	87,027	112.9%	(9,975)
June 30, 2017	117,243	108,503	92.5%	8,740
June 30, 2018	126,311	131,058	103.8%	(4,747)
June 30, 2019	134,720	155,484	115.4%	(20,764)
June 30, 2020	161,335	187,776	116.4%	(26,441)
June 30, 2021	180,212	233,611	129.6%	(53,399)
June 30, 2022	184,348	275,576	149.5%	(91,228)

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Section 2: Plan Assets

Section 2.1: Summary of Fair Value of Assets ($'s in 000's)

As of June 30, 2022	Occupational Death & Disability	Retiree Medical	Total	Allocation Percent
Cash and Short-Term Investments				
- Cash and Cash Equivalents	$ 950	$ 3,135	$ 4,085	1.5%
- Subtotal	$ 950	$ 3,135	$ 4,085	1.5%
Fixed Income Investments				
- Domestic Fixed Income Pool	$ 13,018	$ 44,033	$ 57,051	21.3%
- International Fixed Income Pool	0	0	0	0.0%
- Tactical Fixed Income Pool	0	0	0	0.0%
- High Yield Pool	0	0	0	0.0%
- Treasury Inflation Protection Pool	0	0	0	0.0%
- Emerging Debt Pool	0	0	0	0.0%
- Subtotal	$ 13,018	$ 44,033	$ 57,051	21.3%
Equity Investments				
- Domestic Equity Pool	$ 14,818	$ 50,116	$ 64,934	24.2%
- International Equity Pool	8,041	27,199	35,240	13.1%
- Private Equity Pool	10,070	34,063	44,133	16.4%
- Emerging Markets Equity Pool	1,800	6,088	7,888	3.0%
- Alternative Equity Strategies	3,564	12,056	15,620	5.8%
- Subtotal	$ 38,293	$ 129,522	$ 167,815	62.5%
Other Investments				
- Real Estate Pool	$ 4,610	$ 15,594	$ 20,204	7.5%
- Other Investments Pool	4,408	14,909	19,317	7.2%
- Absolute Return Pool	0	0	0	0.0%
- Other Assets	0	0	0	0.0%
- Subtotal	$ 9,018	$ 30,503	$ 39,521	14.7%
Total Cash and Investments	$ 61,279	$ 207,193	$ 268,472	100.0%
Net Accrued Receivables	179	493	672	
Net Assets	$ 61,458	$ 207,686	$ 269,144	
Peace Officer / Firefighter	$ 18,178	N/A	N/A	
Others	43,280	N/A	N/A	
All Members	$ 61,458	$ 207,686	$ 269,144	

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Section 2.2: Changes in Fair Value of Assets During FY22 ($'s in 000's)

Fiscal Year 2022	Occupational Death & Disability	Retiree Medical	Total
1. Fair Value of Assets as of June 30, 2021	$ 60,145	$ 204,555	$ 264,700
2. Additions:			
a. Member Contributions	$ 0	$ 0	$ 0
b. Employer Contributions	5,769	16,920	22,689
c. Interest and Dividend Income	825	2,794	3,619
d. Net Appreciation/(Depreciation) in Fair Value of Investments	(4,641)	(15,687)	(20,328)
e. Employer Group Waiver Plan	0	140	140
f. Other	1	0	1
g. Total Additions	$ 1,954	$ 4,167	$ 6,121
3. Deductions:			
a. Medical Benefits	$ 0	$ 463	$ 463
b. Death & Disability Benefits	456	0	456
c. Investment Expenses	152	517	669
d. Administrative Expenses	33	56	89
e. Total Deductions	$ 641	$ 1,036	$ 1,677
4. Fair Value of Assets as of June 30, 2022	$ 61,458	$ 207,686	$ 269,144
5. Approximate Fair Value Investment Return Rate during FY22 Net of Investment Expenses	-6.3%	-6.3%	-6.3%

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Section 2.3: Development of Actuarial Value of Assets ($'s in 000's)

The actuarial value of assets and the fair value were $0 at June 30, 2006. Investment gains and losses are recognized 20% per year over 5 years. In no event may valuation assets be less than 80% or more than 120% of fair value as of the current valuation date.

	Occupational Death & Disability	Retiree Medical	Total
1. Investment Gain/(Loss) for FY22			
a. Fair Value as of June 30, 2021	$ 60,145	$ 204,555	$ 264,700
b. Contributions	5,769	16,920	22,689
c. Employer Group Waiver Plan	0	140	140
d. Benefit Payments	456	463	919
e. Administrative Expenses	33	56	89
f. Actual Investment Return (net of investment expenses)	(3,967)	(13,410)	(17,377)
g. Expected Return Rate (net of investment expenses)	7.38%	7.38%	7.38%
h. Expected Return	4,629	15,696	20,325
i. Investment Gain/(Loss) for the Year (f) - (h)	(8,596)	(29,106)	(37,702)
2. Actuarial Value as of June 30, 2022			
a. Fair Value as of June 30, 2022	$ 61,458	$ 207,686	$ 269,144
b. Deferred Investment Gain/(Loss)	(1,480)	(4,952)	(6,432)
c. Preliminary Actuarial Value as of June 30, 2022, (a) - (b)	62,938	212,638	275,576
d. Upper Limit: 120% of Fair Value as of June 30, 2022	73,749	249,223	322,972
e. Lower Limit: 80% of Fair Value as of June 30, 2022	49,167	166,149	215,316
f. Actuarial Value at June 30, 2022, (c) limited by (d) and (e)	62,938	212,638	275,576
3. Ratio of Actuarial Value of Assets to Fair Value of Assets	102.4%	102.4%	102.4%
4. Approximate Actuarial Value Investment Return Rate during FY22 Net of Investment Expenses	8.2%	8.2%	8.2%
5. Actuarial Value Allocation[1]			
a. Peace Officer / Firefighter	$ 18,616	$ 25,285	$ 43,901
b. Others	44,322	187,353	231,675
c. All Members	$ 62,938	$ 212,638	$ 275,576

[1] Occupational death & disability allocated using fair value of assets. Retiree medical allocated based on retiree medical actuarial accrued liability.

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The tables below show the development of the gains/(losses) to be recognized in the current year ($'s in 000's):

Occupational Death & Disability				
Fiscal Year Ending	Asset Gain / (Loss)	Gain / (Loss) Recognized in Prior Years	Gain / (Loss) Recognized This Year	Gain / (Loss) Deferred to Future Years
June 30, 2018	$ 23	$ 20	$ 3	$ 0
June 30, 2019	(370)	(222)	(74)	(74)
June 30, 2020	(1,178)	(472)	(236)	(470)
June 30, 2021	9,901	1,980	1,980	5,941
June 30, 2022	(8,596)	0	(1,719)	(6,877)
Total	**$ (220)**	**$ 1,306**	**$ (46)**	**$ (1,480)**

Retiree Medical				
Fiscal Year Ending	Asset Gain / (Loss)	Gain / (Loss) Recognized in Prior Years	Gain / (Loss) Recognized This Year	Gain / (Loss) Deferred to Future Years
June 30, 2018	$ (58)	$ (48)	$ (10)	$ 0
June 30, 2019	(1,212)	(726)	(242)	(244)
June 30, 2020	(3,825)	(1,530)	(765)	(1,530)
June 30, 2021	33,513	6,703	6,703	20,107
June 30, 2022	(29,106)	0	(5,821)	(23,285)
Total	**$ (688)**	**$ 4,399**	**$ (135)**	**$ (4,952)**

Total				
Fiscal Year Ending	Asset Gain / (Loss)	Gain / (Loss) Recognized in Prior Years	Gain / (Loss) Recognized This Year	Gain / (Loss) Deferred to Future Years
June 30, 2018	$ (35)	$ (28)	$ (7)	$ 0
June 30, 2019	(1,582)	(948)	(316)	(318)
June 30, 2020	(5,003)	(2,002)	(1,001)	(2,000)
June 30, 2021	43,414	8,683	8,683	26,048
June 30, 2022	(37,702)	0	(7,540)	(30,162)
Total	**$ (908)**	**$ 5,705**	**$ (181)**	**$ (6,432)**

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Section 2.4: Historical Asset Rates of Return

	Actuarial Value		Fair Value	
Year Ending	Annual	Cumulative*	Annual	Cumulative*
June 30, 2008	5.0%	5.0%	(7.1%)	(7.1%)
June 30, 2009	2.4%	3.7%	(13.0%)	(10.1%)
June 30, 2010	3.9%	3.8%	6.6%	(4.8%)
June 30, 2011	7.3%	4.6%	19.2%	0.7%
June 30, 2012	6.9%	5.1%	2.0%	0.9%
June 30, 2013	7.9%	5.5%	11.8%	2.7%
June 30, 2014	10.9%	6.3%	18.0%	4.7%
June 30, 2015	9.5%	6.7%	3.3%	4.6%
June 30, 2016	6.7%	6.7%	0.2%	4.1%
June 30, 2017	7.8%	6.8%	12.6%	4.9%
June 30, 2018	7.9%	6.9%	7.9%	5.2%
June 30, 2019	6.6%	6.9%	6.2%	5.2%
June 30, 2020	6.4%	6.8%	4.3%	5.2%
June 30, 2021	11.3%	7.2%	29.6%	6.7%
June 30, 2022	8.2%	7.2%	(6.3%)	5.8%

* Cumulative since fiscal year ending June 30, 2008

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Section 3: Member Data

Section 3.1: Summary of Members Included

As of June 30	2018	2019	2020	2021	2022
Active Members - Peace Officer / Firefighter					
1. Number	1,905	2,038	2,228	2,350	2,482[1]
2. Average Age	35.63	35.76	35.92	36.40	36.65
3. Average Credited Service	4.83	5.09	5.36	5.71	5.91
4. Average Entry Age	30.80	30.67	30.56	30.69	30.74
5. Average Annual Earnings	$ 78,603	$ 84,593	$ 87,365	$ 90,022	$ 95,429
Active Members - Others					
1. Number	18,473	19,864	20,695	21,583	22,220[2]
2. Average Age	41.34	41.49	41.78	41.79	41.87
3. Average Credited Service	4.08	4.25	4.59	4.84	5.02
4. Average Entry Age	37.26	37.24	37.19	36.95	36.85
5. Average Annual Earnings	$ 57,349	$ 58,223	$ 59,603	$ 61,129	$ 62,371
Active Members - Total					
1. Number	20,378	21,902	22,923	23,933	24,702[3]
2. Average Age	40.80	40.96	41.21	41.26	41.35
3. Average Credited Service	4.15	4.33	4.66	4.93	5.11
4. Average Entry Age	36.65	36.63	36.55	36.33	36.24
5. Average Annual Earnings	$ 59,336	$ 60,676	$ 62,302	$ 63,966	$ 65,693
Disabilitants and Beneficiaries (Occupational Death & Disability)					
1. Number	15	16	15	14	16
2. Average Age	43.66	42.28	44.66	47.27	46.22
3. Average Monthly Death & Disability Benefit	$ 2,285	$ 2,404	$ 2,698	$ 2,601	$ 2,791
Retirees, Surviving Spouses, and Dependent Spouses (Retiree Medical)					
1. Number	23	43	66	93	166
2. Average Age	69.97	69.72	68.85	69.75	69.46
Total Number of Members	**20,416**	**21,961**	**23,004**	**24,040**	**24,884**

Average annual earnings ("valuation pay") are the annualized earnings for the fiscal year ending on the valuation date.

[1] Includes 2,072 male active members and 410 female active members.

[2] Includes 9,673 male active members and 12,547 female active members.

[3] Includes 11,745 male active members and 12,957 female active members.

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Section 3.2: Age and Service Distribution of Active Members

Annual Earnings by Age

Age	Number	Total Annual Earnings	Average Annual Earnings
0 - 19	120	$ 4,370,840	$ 36,424
20 - 24	1,456	67,382,569	46,279
25 - 29	3,041	175,979,490	57,869
30 - 34	4,050	266,550,938	65,815
35 - 39	3,998	282,957,815	70,775
40 - 44	3,197	226,859,340	70,960
45 - 49	2,610	179,481,566	68,767
50 - 54	2,311	155,817,626	67,424
55 - 59	1,860	125,530,044	67,489
60 - 64	1,378	92,555,224	67,166
65 - 69	505	34,582,576	68,480
70 - 74	136	8,355,694	61,439
75+	40	2,318,179	57,954
Total	**24,702**	**$1,622,741,901**	**$ 65,693**

Annual Earnings by Credited Service

Years of Service	Number	Total Annual Earnings	Average Annual Earnings
0	4,548	$ 220,028,910	$ 48,379
1	3,012	169,357,375	56,228
2	2,474	147,936,480	59,796
3	2,427	153,783,513	63,364
4	1,889	124,827,090	66,081
0 - 4	**14,350**	**$ 815,933,368**	**$ 56,859**
5 - 9	6,453	474,512,127	73,534
10 - 14	3,515	296,020,583	84,216
15 - 19	384	36,275,823	94,468
20 - 24	0	0	0
25 - 29	0	0	0
30 - 34	0	0	0
35 - 39	0	0	0
40+	0	0	0
Total	**24,702**	**$1,622,741,901**	**$ 65,693**

Years of Credited Service by Age

	Years of Service									
Age	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40+	Total
0 - 19	120	0	0	0	0	0	0	0	0	120
20 - 24	1,452	4	0	0	0	0	0	0	0	1,456
25 - 29	2,659	379	3	0	0	0	0	0	0	3,041
30 - 34	2,647	1,181	219	3	0	0	0	0	0	4,050
35 - 39	1,985	1,226	722	65	0	0	0	0	0	3,998
40 - 44	1,582	922	618	75	0	0	0	0	0	3,197
45 - 49	1,248	760	534	68	0	0	0	0	0	2,610
50 - 54	1,058	717	482	54	0	0	0	0	0	2,311
55 - 59	777	583	451	49	0	0	0	0	0	1,860
60 - 64	562	451	326	39	0	0	0	0	0	1,378
65 - 69	186	174	121	24	0	0	0	0	0	505
70 - 74	59	39	32	6	0	0	0	0	0	136
75+	15	17	7	1	0	0	0	0	0	40
Total	**14,350**	**6,453**	**3,515**	**384**	**0**	**0**	**0**	**0**	**0**	**24,702**

Total and average annual earnings (“valuation pay”) are the annualized earnings for the fiscal year ending on the valuation date.

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Section 3.3: Member Data Reconciliation

	Actives	Retirees and Surviving Spouses	Dependent Spouses	OD&D Disabilitants	OD&D Beneficiaries	Total
As of June 30, 2021 [1]	**23,933**	**67**	**26**	**13**	**1**	**24,040**
New Entrants	4,253	0	0	0	0	4,253
Rehires	674	0	0	0	0	674
Vested Terminations	(706)	0	0	0	0	(706)
Non-Vested Terminations	(2,577)	0	0	0	0	(2,577)
Refund of Contributions	(774)	0	0	0	0	(774)
Disability Retirements	(2)	0	0	2	0	0
Age Retirements	(65)	65	18	0	0	18
Deaths With Beneficiary	(32)	0	0	0	0	(32)
Deaths Without Beneficiary	(2)	(1)	0	0	0	(3)
Converted To/From DB Plan	(11)	0	0	0	0	(11)
Added Dependent Coverage	0	0	1	0	0	1
Dropped Dependent Coverage	0	0	0	0	0	0
Transfers In/Out	(3)	(1)	(1)	0	0	(5)
Data Corrections	14	(6)	(2)	0	0	6
Net Change	**769**	**57**	**16**	**2**	**0**	**844**
As of June 30, 2022 [2]	**24,702**	**124**	**42**	**15**	**1**	**24,884**

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[1] 89 participants are expected to receive retiree medical benefits in a different plan and are included for OD&D benefits only.

[2] 94 participants are expected to receive retiree medical benefits in a different plan and are included for OD&D benefits only.

Section 3.4: Schedule of Active Member Data

Valuation Date	Number	Annual Earnings (000's)	Annual Average Earnings	Percent Increase in Average Earnings	Number of Participating Employers
June 30, 2022	24,702	$ 1,622,742	$ 65,693	2.7%	150
June 30, 2021	23,933	1,530,905	63,966	2.7%	151
June 30, 2020	22,923	1,428,140	62,302	2.7%	153
June 30, 2019	21,902	1,328,934	60,676	2.3%	155
June 30, 2018	20,378	1,209,152	59,336	2.3%	155
June 30, 2017	19,171	1,112,398	58,025	1.5%	157
June 30, 2016	18,215	1,041,437	57,175	3.4%	157
June 30, 2015	17,098	945,496	55,299	1.9%	159
June 30, 2014	15,800	857,150	54,250	3.7%	159
June 30, 2013	14,316	748,658	52,295	4.7%	159

Total and average annual earnings ("valuation pay") are the annualized earnings for the fiscal year ending on the valuation date.

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Section 3.5: Active Member Payroll Reconciliation

Payroll Field	Payroll Data (000's)
a) DRB actual reported salaries FY22 in employer list	$ 1,524,781
b) DRB actual reported salaries FY22 in valuation data	1,444,430
c) Annualized valuation data	1,622,742
d) Valuation payroll as of June 30, 2022	1,704,971
e) Rate payroll for FY23	1,645,341

a) Actual reported salaries from DRB employer listing showing all payroll paid during FY22, including those who were not active as of June 30, 2022
b) Payroll from valuation data for people who are in active status as of June 30, 2022
c) Payroll from (b) annualized for both new entrants and part-timers
d) Payroll from (c) with one year of salary scale applied to estimate salaries payable for the upcoming year
e) Payroll from (d) with the part-timer annualization removed

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Section 4: Basis of the Actuarial Valuation

Section 4.1: Summary of Plan Provisions

Effective Date

July 1, 2006, with amendments through June 30, 2022.

Administration of Plan

The Commissioner of Administration or the Commissioner's designee is the administrator of the Plan. The Attorney General of the state is the legal counsel for the Plan and shall advise the administrator and represent the Plan in legal proceedings.

The Alaska Retirement Management Board prescribes policies, adopts regulations, invests the funds, and performs other activities necessary to carry out the provisions of the Plan.

Employers Included

Currently there are 150 employers participating in PERS DCR, including the State of Alaska, and 149 political subdivisions and public organizations.

Membership

An employee of a participating employer who first enters service on or after July 1, 2006, or a member of the defined benefit plan who works for an employer who began participation on or after July 1, 2006, and meets the following criteria is a member in the Plan:

- Permanent full-time or part-time employees of the State of Alaska, participating political subdivisions or public organizations. An employee must be regularly scheduled to work 30 or more hours per week to be considered full-time by the PERS. An employee must be regularly scheduled to work 15 or more hours per week but less than 30 hours to be considered a part-time employee for PERS purposes.
- Elected state officials.
- Elected municipal officials who are compensated and receive at least $2,001.00 per month.

Members can convert to PERS DCR if they are an eligible non-vested member of the PERS defined benefit plan whose employer consents to transfers to the defined contribution plan and they elect to transfer his or her account balance to PERS DCR.

Member Contributions

Other than the member-paid premiums discussed later in this section, there are no member contributions for the occupational death & disability and retiree medical benefits.

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Retiree Medical Benefits

- Member must retire directly from the plan to be eligible for retiree medical coverage. Normal retirement eligibility is the earlier of a) 25 years of service as a peace officer or firefighter and 30 years of service for any other employee or b) Medicare eligible and 10 years of service.
- No subsidized retiree medical benefits are provided until normal retirement eligibility. The member's and any covered dependent's premium is 100% until the member is Medicare eligible. Upon the member's Medicare-eligibility, the required contribution will follow the service-based schedule shown below.
- Coverage cannot be denied except for failure to pay premium.
- Members who are receiving disability benefits or survivors who are receiving monthly survivor benefits are not eligible until the member meets, or would have met if he/she had lived, the normal retirement eligibility requirements.
- The following is a summary of the medical benefit design adopted in July 2016. The plan description below is used for valuation purposes and indicates participant cost-sharing. Please refer to the benefit handbook for more details.

Plan Design Feature	In-Network[1]	Out-of-Network[1] [2]
Deductible (single / family)	$300 / $600	
Medical services (participant share)	20%	40%
Emergency Room Copay (non-emergent use)	$100	$100
Medical Out-of-Pocket Maximum (single / family, including deductible)	$1,500 / $3,000	$3,000 / $6,000
Medicare Coordination	Exclusion	Exclusion
Pharmacy	No Deductible	No Deductible
Retail Generic (per 30-day fill)	20% $10 min / $50 max	
Retail Non-Formulary Brand (per 30-day fill)	25% $25 min / $75 max	40%
Retail Formulary Brand (per 30-day fill)	35% $80 min / $150 max	
Mail-Order Generic	$20 copay	
Mail-Order Non-Formulary Brand	$50 copay	40%
Mail-Order Formulary Brand	$100 copay	
Pharmacy Out-of-Pocket Max (single / family)	$1,000 / $2,000	
Medicare Pharmacy Arrangement	Retiree Drug Subsidy / Employer Group Waiver Plan effective 1/1/2019	
Wellness / Preventative	100% covered, not subject to deductible	20%, after deductible

[1] Section 1.1 of the AlaskaCare Defined Contribution Retiree Benefit Plan states that this health plan shall be updated from time to time to reflect changes in benefits, including annual adjustments to the premium, deductible, coinsurance, medical out-of-pocket limit, and prescription drug out-of-pocket limit.

[2] OON applies only to non-Medicare eligible participants.

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- Buck used manual rate models to determine relative plan values for the defined benefit (DB) retiree medical plan and the DCR retiree medical plan outlined above. We applied the ratio of the DCR retiree medical plan value to the DB retiree medical plan value to the per capita costs determined for each of pre/post-Medicare medical and pharmacy benefits to estimate corresponding values for the DCR retiree medical plan design. These factors are noted in Section 4.3. We further adjusted the Medicare medical manual rate to reflect the Medicare coordination method adopted. The estimated 2023 reimbursements under EGWP were provided by Segal Consulting (who worked with the EGWP administrator, Optum, to develop those estimates). We reflect estimated discounts and pharmacy rebates in the defined benefit medical cost so no further adjustment was needed for the DCR retiree medical plan. The medical network differential is reflected in the relative plan value adjustments.
- Starting in 2022, prior authorization is required for certain specialty medications. There is no change to the medications that are covered by the plan.
- The retiree medical plan's coverage is supplemental to Medicare. Medicare coordination is described in the DCR Plan Handbook, referred to in the industry as exclusion coordination: Medicare payment is deducted from the Medicare allowable expense and plan parameters are applied to the remaining amount. Starting in 2019, the prescription drug coverage is through a Medicare Part D EGWP arrangement.
- The premium for Medicare-eligible retirees will be based on the member's years of service. The percentage of premium paid by the member is as follows:

Years of Service	Percent of Premium Paid by Member
< 15	30%
15 – 19	25%
20 – 24	20%
25 – 29	15%
30+	10%

- The premium for dependents who are not eligible for Medicare aligns with the member's subsidy. While a member is not Medicare-eligible, premiums are 100% of the estimated cost.
- Members have a separate defined contribution Health Reimbursement Arrangement account, which is not reflected in this valuation, that can be used to pay for premiums or other medical expenses.
- For valuation purposes, retiree premiums were assumed to equal the percentages outlined in the table above times the age-related plan costs. Future premiums calculated and charged to DCR participants will need to be determined reflecting any appropriate adjustments to the defined benefit (DB) plan data because current DB premiums were determined using information based upon enrollment with members who have double coverage.
- Coverage will continue for surviving spouses of covered retired members.

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Occupational Disability Benefits

- Benefit is 40% of salary at date of disability.
- For Peace Officer and Firefighters there is a Disability Benefit Adjustment such that:
  - The disability benefit is increased by 75% of the cost-of-living increase in the preceding calendar year or 9%, whichever is less.
  - At the time the disabled member retires, the retirement benefit will be increased by a percentage equal to the total cumulative percentage that has been applied to the disability benefit. Monthly annuity payments are made from the member's contribution balance until the fund is exhausted, at which the plan pays all remaining payments.
- For Others, there is no increase in the occupational disability benefit after commencement.
- Member earns service while on occupational disability.
- Benefits cease when the member becomes eligible for normal retirement at Medicare-eligible age and 10 years of service, or at any age with 30 years of service for Others members or 25 years of service for Peace Officer/Firefighter members.
- Peace Officer/Firefighter members may select the defined contribution account or the monthly benefit payable as if they were retiring under Tier 3 (service continues during disability, final average salary is as of date of disability), but with payments first made from the member's DC account until it's exhausted.
- No subsidized retiree medical benefits are provided until normal retirement eligibility. The member's premium is 100% of the estimated cost until they are Medicare eligible. Medicare-eligible premiums follow the service-based schedule above.

Occupational Death Benefits

- Benefit is 40% of salary for Others members and 50% of salary for Peace Officer/Firefighter members.
- Survivor's Pension Adjustment: A survivor's pension is increased by 50% of the cost-of-living increase in the preceding calendar year or 6%, whichever is less, if the recipient is at least age 60 on July 1, or under age 60 if the recipient has been receiving PERS benefits for at least 5 years as of July 1.
- Benefits cease when the member would have become eligible for normal retirement.
- The period during which the survivor is receiving benefits is counted as service credit toward retiree medical benefits.
- No subsidized retiree medical benefits are provided until the member would have been eligible for normal retirement. The surviving spouse's premium is 100% of the estimated cost until the member would have been Medicare eligible. Medicare-eligible premiums follow the service-based schedule above.

Changes in Benefit Provisions Valued Since the Prior Valuation

There were no changes in benefit provisions since the prior valuation.

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Section 4.2: Description of Actuarial Methods and Valuation Procedures

The funding method used in this valuation was adopted by the Board in October 2006, and was modified as part of the experience study for the period July 1, 2013 to June 30, 2017. The asset smoothing method used to determine valuation assets was implemented effective June 30, 2006.

Benefits valued are those delineated in Alaska State statutes as of the valuation date. Changes in State statutes effective after the valuation date are not taken into consideration in setting the assumptions and methods.

Actuarial Cost Method

Liabilities and contributions shown in the report are computed using the Entry Age Normal Actuarial Cost Method, level percent of pay. Each year's difference between actual and expected unfunded actuarial accrued liability is amortized over 25 years as a level percentage of expected payroll.

Cost factors designed to produce annual costs as a constant percentage of each member's expected compensation in each year for death & disability benefits and retiree medical benefits, from the assumed entry age to the last age with a future benefit were applied to the projected benefits to determine the normal cost (the portion of the total cost of the plan allocated to the current year under the method). The normal cost is determined by summing intermediate results for active members and determining an average normal cost rate which is then related to the total DCR Plan payroll of active members. The actuarial accrued liability for active members (the portion of the total cost of the plan allocated to prior years under the method) was determined as the excess of the actuarial present value of projected benefits over the actuarial present value of future normal costs.

The actuarial accrued liability for beneficiaries and disabled members currently receiving benefits (if any) was determined as the actuarial present value of the benefits expected to be paid. No future normal costs are payable for these members.

The actuarial accrued liability under this method at any point in time is the theoretical amount of the fund that would have been accumulated had annual contributions equal to the normal cost been made in prior years (it does not represent the liability for benefits accrued to the valuation date). The unfunded actuarial accrued liability is the excess of the actuarial accrued liability over the actuarial value of plan assets measured on the valuation date.

Under this method, experience gains or losses, i.e., decreases or increases in accrued liabilities attributable to deviations in experience from the actuarial assumptions, adjust the unfunded actuarial accrued liability.

Valuation of Assets

Effective June 30, 2006, the asset valuation method recognizes 20% of the investment gain or loss in each of the current and preceding four years. This method was phased in over five years. Fair Value of Assets was $0 as of June 30, 2006. All assets are valued at fair value. Assets are accounted for on an accrued basis and are taken directly from financial statements audited by KPMG LLP. Valuation assets are constrained to a range of 80% to 120% of the fair value of assets.

Changes in Methods Since the Prior Valuation

There were no changes in the asset or valuation methods since the prior valuation.

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Valuation of Retiree Medical and Prescription Drug Benefits

The methodology used for the valuation of the retiree medical benefits is described in Section 5.2 of the State of Alaska Public Employees' Retirement System Defined Benefit Plan Actuarial Valuation Report as of June 30, 2022.

Starting in 2022, prior authorization is required for certain specialty medications. There is no change to the medications that are covered by the plan. Segal provided an estimate of the impact of this change to the DB retiree health plan cost for calendar year 2022. The resulting adjustment factors for pre-Medicare prescription drug, Medicare prescription drug, and EGWP costs were applied to claims experience incurred before January 1, 2022. Those base claims costs were used for the DCR valuation with further adjustments as noted below. Additionally, starting in 2022, certain common preventive benefits are covered for the DB plan. The resulting adjustment factor for pre-Medicare medical costs was applied to claims experience incurred before January 1, 2022. However, preventive benefits were already covered under the DCR plan so the pre-65 DCR medical adjustment factor referenced below was increased from 3.1% to 4.4%.

Due to the lack of experience for the DCR retiree medical plan, base claims costs are based on those described in the actuarial valuation as of June 30, 2022 for the Defined Benefit (DB) retiree medical plan covering TRS and PERS. The DB rates were used with some adjustments. The claims costs were adjusted to reflect the differences between the DCR medical plan and the DB medical plan. These differences include network steerage, different coverage levels, different Medicare coordination for medical benefits, and an indexing of the retiree out-of-pocket dollar amounts. To account for higher initial copays, deductibles, and out-of-pocket limits, projected FY23 claims costs were reduced 4.4% for pre-Medicare medical claims, 3.1% for Medicare medical claims, and 8.9% for prescription drugs. In addition, to account for the difference in Medicare coordination, projected FY23 medical claims costs for Medicare eligible retirees were further reduced 29.5%.

FY21 and FY22 experience was thoroughly reviewed to assess the impact of COVID-19 and whether an adjustment to FY21 and FY22 claims was appropriate for use in the June 30, 2022 valuation. FY21 medical per capita claims were noticeably lower than expected, so a 4% load was added to the FY21 medical claims used in the per capita claims cost development to better reflect future expected long-term costs of the plan. FY22 medical per capita claims were reasonable when compared to pre-COVID levels, so no adjustments were made to the FY22 medical claims used in the per capita claims cost development.

No implicit subsidies are assumed. Employees projected to retire with 30 years of service (25 years of service for Peace/Fire) prior to Medicare are valued with commencement deferred to Medicare eligibility, because those members will be required to pay the full plan premium prior to Medicare. Explicit subsidies for disabled and normal retirement are determined using the plan-defined percentages of age-related total projected plan costs, again with no implicit subsidy assumed.

The State transitioned to an Employer Group Waiver Program (EGWP) for DCR participants effective January 1, 2019. The estimated 2023 reimbursements under EGWP were provided by Segal Consulting (who worked with the EGWP administrator, Optum, to develop those estimates).

Healthcare Reform

Healthcare Reform legislation passed on March 23, 2010 included several provisions with potential implications for the State of Alaska Retiree Health Plan liability. Buck evaluated the impact due to these provisions.

Because the State plan is retiree-only, not all provisions are required. Unlimited lifetime benefits and dependent coverage to age 26 are two of these provisions. The adopted DCR plan does not place lifetime limits on benefits, but does restrict dependent child coverage.

The Further Consolidated Appropriations Act, 2020 passed in December 2019 repealed several healthcare-related taxes, including the Cadillac Tax.

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The Tax Cuts and Jobs Act passed in December 2017 included the elimination of the individual mandate penalty and changed the inflation measure for purposes of determining the limits for the High Cost Excise Tax to use chained CPI. It is our understanding the law does not directly impact other provisions of the ACA. While the nullification of the ACA's individual mandate penalty does not directly impact employer group health plans, it could contribute to the destabilization of the individual market and increase the number of uninsured. Such destabilization could translate to increased costs for employers. We have considered this when setting our healthcare cost trend assumptions and will continue to monitor this issue.

The Inflation Reduction Act was signed into law on August 16, 2022. The law contains several provisions that are expected to impact Alaska's Medicare prescription drug plan (EGWP), which will be considered at the next measurement date.

We have not identified any other specific provisions of healthcare reform or its potential repeal that would be expected to have a significant impact on the measured obligation. We will continue to monitor legislative activity.

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Section 4.3: Summary of Actuarial Assumptions

The demographic and economic assumptions used in the June 30, 2022 valuation are described below. Unless noted otherwise, these assumptions were adopted by the Board at the June 2022 meeting based on the experience study for the period July 1, 2017 to June 30, 2021.

Investment Return

7.25% per year, net of investment expenses.

Salary Scale

Salary scale rates based on the 2017-2021 actual experience (see Table 1).

Inflation – 2.50% per year.

Productivity – 0.25% per year.

Payroll Growth

2.75% per year (inflation + productivity).

Total Inflation

Total inflation as measured by the Consumer Price Index for urban and clerical workers for Anchorage is assumed to increase 2.50% annually.

Mortality (Pre-Commencement)

Mortality rates based on the 2017-2021 actual experience, to the extent the experience was statistically credible.

Employee mortality for Peace Officer/Firefighters in accordance with the following tables:

- Occ D&D: Pub-2010 Safety Employee table, amount-weighted, and projected with MP-2021 generational improvement.
- Healthcare: Pub-2010 Safety Employee table, headcount-weighted, and projected with MP-2021 generational improvement.

Employee mortality for Others in accordance with the following tables:

- Occ D&D: Pub-2010 General Employee table, amount-weighted, and projected with MP-2021 generational improvement.
- Healthcare: Pub-2010 General Employee table, headcount-weighted, and projected with MP-2021 generational improvement.

Deaths are assumed to result from occupational causes 70% of the time for Peace Officer/Firefighters, and 35% of the time for Others.

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Mortality (Post-Commencement)

Mortality rates based on the 2017-2021 actual experience, to the extent the experience was statistically credible.

Retiree mortality for Peace Officer/Firefighters in accordance with the following tables:

- Occ D&D: Pub-2010 Safety Retiree table, amount-weighted, and projected with MP-2021 generational improvement.
- Healthcare: Pub-2010 Safety Retiree table, headcount-weighted, and projected with MP-2021 generational improvement.

Retiree mortality for Others in accordance with the following tables:

- Occ D&D: 98% of male and 106% of female rates of the Pub-2010 General Retiree table, amount-weighted, and projected with MP-2021 generational improvement.
- Healthcare: 101% of male and 110% of female rates of the Pub-2010 General Retiree table, headcount-weighted, and projected with MP-2021 generational improvement.

Beneficiary mortality for Peace Officer/Firefighters in accordance with the following tables. These tables are applied only after the death of the original member.

- Occ D&D: Pub-2010 Contingent Survivor table, amount-weighted, and projected with MP-2021 generational improvement.
- Healthcare: Pub-2010 Contingent Survivor table, headcount-weighted, and projected with MP-2021 generational improvement.

Beneficiary mortality for Others in accordance with the following tables. These tables are applied only after the death of the original member.

- Occ D&D: 102% of male and 108% of female rates of the Pub-2010 Contingent Survivor table, amount-weighted, and projected with MP-2021 generational improvement.
- Healthcare: 101% of male and 108% of female rates of the Pub-2010 Contingent Survivor table, headcount-weighted, and projected with MP-2021 generational improvement.

Turnover

Select and ultimate rates based on the 2017-2021 actual experience (see Tables 2a and 2b).

Disability

No changes to the incidence rates from the prior valuation due to insufficient 2017-2021 actual experience (see Tables 3a and 3b). For retiree medical benefits, the disability rates cease once a member is eligible for retirement. However, the disability rates continue after retirement eligibility for occupational death & disability benefits.

Disabilities are assumed to be occupational 70% of the time for Peace Officer/Firefighters, and 35% of the time for Others.

For Peace Officer/Firefighters, members are assumed to take the monthly annuity 100% of the time.

Post-disability mortality for Peace Officer/Firefighters in accordance with the following tables:

- Occ D&D: Pub-2010 Safety Disabled Retiree table, amount-weighted, and projected with MP-2021 generational improvement.
- Healthcare: Pub-2010 Safety Disabled Retiree table, headcount-weighted, and projected with MP-2021 generational improvement.

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Post-disability mortality for Others in accordance with the following tables:

- Occ D&D: Pub-2010 Non-Safety Disabled Retiree table, amount-weighted, and projected with MP-2021 generational improvement.
- Healthcare: Pub-2010 Non-Safety Disabled Retiree table, headcount-weighted, and projected with MP-2021 generational improvement.

Retirement

Retirement rates based on the 2017-2021 actual experience (see Table 4).

Spouse Age Difference

Males are assumed to be three years older than their wives. Females are assumed to be two years younger than their husbands.

Percent Married for Occupational Death & Disability

For Others, 75% of male members and 70% of female members are assumed to be married at termination from active service. For Peace Officer/Firefighters, 85% of male members and 60% of female members are assumed to be married at termination from active service.

Dependent Spouse Medical Coverage Election

Applies to members who do not have double medical coverage. For Peace Officer/Firefighters, 75% of male members and 50% of female members are assumed to be married and cover a dependent spouse. For Others, 60% of male members and 50% of female members are assumed to be married and cover a dependent spouse.

Part-Time Service

Peace Officer/Firefighter members are assumed to be full-time employees. For Other members, part-time employees are assumed to earn 0.75 years of service per year.

Peace Officer / Firefighter Occupational Disability Retirement Benefit Commencement

The occupational disability retirement benefit is assumed to be first payable from the member's DC account and the retirement benefit payable from the occupational death & disability trust will commence five years later.

Imputed Data

Data changes from the prior year which are deemed to have immaterial impact on liabilities and contribution rates are assumed to be correct in the current year's client data.

Non-vested terminations with appropriate refund dates are assumed to have received a full refund of contributions. Active members with missing salary and service are assumed to be terminated with status based on their vesting percentage.

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Administrative Expenses

The Normal Cost as of June 30, 2022 was increased by $33,000 for occupational death & disability and $39,000 for retiree medical. These amounts are based on the average of actual administrative expenses during the last two fiscal years.

Retiree Medical Participation

Death / Disability Decrement		Retirement Decrement	
Age	**Percent Participation**	**Age**	**Percent Participation***
< 56	75.0%	55	50.0%
56	77.5%	56	55.0%
57	80.0%	57	60.0%
58	82.5%	58	65.0%
59	85.0%	59	70.0%
60	87.5%	60	75.0%
61	90.0%	61	80.0%
62	92.5%	62	85.0%
63	95.0%	63	90.0%
64	97.5%	64	95.0%
65+	100.0%	65+	**Years of Service**
			< 15 75.0%
			15 – 19 80.0%
			20 – 24 85.0%
			25 – 29 90.0%
			30+ 95.0%

* Participation assumption is a combination of (i) the service-based rates for retirement from employment at age 65+ and (ii) the age-based rates for retirement from employment before age 65. These rates reflect the expected plan election rate that varies by reason for decrement, duration that a member may pay full cost prior to Medicare eligibility, and availability of alternative and/or lower cost options, particularly in the Medicare market. This assumption is based on observed trends in participation from a range of other plans.

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Healthcare Per Capita Claims Cost

Sample claims cost rates (before base claims cost adjustments described below) adjusted to age 65 for FY23 medical and prescription drugs are shown below. The prescription drug costs reflect the plan change to require prior authorization for certain specialty medications.

	Medical	Prescription Drugs
Pre-Medicare	$ 15,706	$ 3,712
Medicare Parts A & B	$ 1,625	$ 3,907
Medicare Part D – EGWP	N/A	$ 1,309

Members are assumed to attain Medicare eligibility at age 65. All costs are for the 2023 fiscal year (July 1, 2022 – June 30, 2023).

The EGWP subsidy is assumed to increase in future years by the trend rates shown on the following pages. No future legislative changes or other events are anticipated to impact the EGWP subsidy. If any legislative or other changes occur in the future that impact the EGWP subsidy (which could either increase or decrease the plan's Actuarial Accrued Liability), those changes will be evaluated and quantified at the next measurement date.

Base Claims Cost Adjustments

Due to higher initial copays, deductibles, out-of-pocket limits, and member cost sharing compared to the DB medical plan, the following cost adjustments are applied to the per capita claims cost rates above:

- 0.956 for the pre-Medicare plan.
- 0.674 for both the Medicare medical plan and Medicare coordination method (3.1% reduction for the medical plan and 29.5% reduction for the coordination method).
- 0.911 for the prescription drug plan.

Healthcare Morbidity

Morbidity rates (also called aging factors) are used to estimate utilization of healthcare benefits at each age to reflect the fact that healthcare utilization typically increases with age. Separate morbidity rates are used for medical and prescription drug benefits. These rates are based on the 2017-2021 actual experience.

Age	Medical	Prescription Drugs
0 – 44	2.0%	4.5%
45 – 54	2.5%	3.5%
55 – 64	2.5%	1.0%
65 – 74	2.0%	2.1%
75 – 84	2.2%	-0.3%
85 – 94	0.5%	-2.5%
95+	0.0%	0.0%

Healthcare Third Party Administrator Fees

$449 per person per year; assumed to increase at 4.50% per year.

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Healthcare Cost Trend

The table below shows the rate used to project the cost from the shown fiscal year to the next fiscal year. For example, 7.00% is applied to the FY23 pre-Medicare medical claims costs to get the FY24 medical claims costs.

	Medical Pre-65	Medical Post-65	Prescription Drugs / EGWP
FY23	7.00%	5.50%	7.50%
FY24	6.70%	5.50%	7.20%
FY25	6.40%	5.40%	6.90%
FY26	6.20%	5.40%	6.65%
FY27	6.05%	5.35%	6.35%
FY28	5.85%	5.35%	6.10%
FY29	5.65%	5.30%	5.80%
FY30	5.45%	5.30%	5.55%
FY31-FY38	5.30%	5.30%	5.30%
FY39	5.25%	5.25%	5.25%
FY40	5.20%	5.20%	5.20%
FY41	5.10%	5.10%	5.10%
FY42	5.05%	5.05%	5.05%
FY43	4.95%	4.95%	4.95%
FY44	4.90%	4.90%	4.90%
FY45	4.80%	4.80%	4.80%
FY46	4.75%	4.75%	4.75%
FY47	4.70%	4.70%	4.70%
FY48	4.60%	4.60%	4.60%
FY49	4.55%	4.55%	4.55%
FY50+	4.50%	4.50%	4.50%

For the June 30, 2014 valuation and later, the updated Society of Actuaries' Healthcare Cost Trend Model is used to project medical and prescription drug costs. This model estimates trend amounts that are projected out for 80 years. The model has been populated with assumptions that are specific to the State of Alaska.

Changes in Assumptions Since the Prior Valuation

Effective for the June 30, 2022 valuation, the Board adopted the changes to the demographic and economic assumptions recommended by the actuary, based on the results of an experience study performed on the plan experience from July 1, 2017 to June 30, 2021. The changes in assumptions were adopted at the June 2022 Board meeting.

The healthcare per capita claims cost assumption is updated annually as described in Section 4.2. The amounts included in the Normal Cost for administrative expenses were changed from $16,000 to $33,000 for occupational death & disability, and from $24,000 to $39,000 for retiree medical (based on the most recent two years of actual administrative expenses paid from plan assets).

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Table 1: Salary Scales

Peace Officer / Firefighter		Others	
Years of Service	Percent Increase	Years of Service	Percent Increase
< 1	8.50%	< 1	6.75%
1	7.75%	1	6.00%
2	7.25%	2	5.50%
3	7.00%	3	5.00%
4	6.75%	4	4.75%
5	6.25%	5	4.25%
6	5.75%	6	4.05%
7	5.50%	7	3.95%
8	5.25%	8	3.75%
9	5.05%	9	3.55%
10	4.95%	10	3.45%
11	4.85%	11	3.25%
12	4.75%	12	3.10%
13	4.65%	13	3.05%
14	4.55%	14	3.00%
15	4.45%	15	2.95%
16	4.35%	16	2.90%
17	4.25%	17+	2.85%
18	4.05%		
19	4.05%		
20+	3.85%		

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Table 2a: Turnover Rates for Peace Officer / Firefighter

Select Rates during the First 5 Years of Employment

Years of Service	Male	Female
< 1	17.00%	27.00%
1	12.00%	21.00%
2	11.00%	15.00%
3	11.00%	13.00%
4	10.00%	9.00%

Ultimate Rates after the First 5 Years of Employment

Age	Male	Female
< 30	6.60%	10.20%
30 - 34	6.80%	10.00%
35 - 39	6.70%	9.90%
40 - 44	6.50%	9.50%
45 - 49	6.50%	9.30%
50 - 54	8.50%	9.10%
55 - 59	9.80%	9.60%
60 - 64	12.50%	10.30%
65+	19.20%	10.70%

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Table 2b: Turnover Rates for Others

Select Rates during the First 5 Years of Employment

Years of Service	Male	Female
< 1	28.00%	29.00%
1	20.00%	24.00%
2	16.00%	19.00%
3	14.00%	16.00%
4	12.00%	14.00%

Ultimate Rates after the First 5 Years of Employment

Age	Male	Female
< 30	13.70%	15.80%
30 - 34	12.20%	11.20%
35 - 39	9.70%	10.20%
40 - 44	8.50%	10.60%
45 - 49	8.90%	8.90%
50 - 54	8.40%	8.70%
55 - 59	8.70%	9.50%
60 - 64	10.10%	11.80%
65+	11.20%	15.70%

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Table 3a: Disability Rates for Peace Officer / Firefighter

Age	Male	Female	Age	Male	Female
< 23	0.0179%	0.0112%	46	0.1247%	0.0780%
23	0.0244%	0.0153%	47	0.1337%	0.0836%
24	0.0310%	0.0194%	48	0.1462%	0.0914%
25	0.0374%	0.0234%	49	0.1588%	0.0993%
26	0.0440%	0.0275%	50	0.1714%	0.1071%
27	0.0505%	0.0316%	51	0.1839%	0.1150%
28	0.0526%	0.0329%	52	0.1965%	0.1228%
29	0.0548%	0.0343%	53	0.2294%	0.1434%
30	0.0570%	0.0356%	54	0.2624%	0.1640%
31	0.0591%	0.0370%	55	0.2954%	0.1846%
32	0.0612%	0.0383%	56	0.3283%	0.2052%
33	0.0634%	0.0397%	57	0.3613%	0.2258%
34	0.0657%	0.0411%	58	0.4112%	0.2570%
35	0.0679%	0.0425%	59	0.4611%	0.2882%
36	0.0702%	0.0439%	60	0.5110%	0.3194%
37	0.0724%	0.0453%	61	0.5610%	0.3506%
38	0.0757%	0.0473%	62	0.6109%	0.3818%
39	0.0789%	0.0493%	63	0.6109%	0.3818%
40	0.0822%	0.0514%	64	0.6109%	0.3818%
41	0.0854%	0.0534%	65	0.6109%	0.3818%
42	0.0886%	0.0554%	66	0.6109%	0.3818%
43	0.0977%	0.0611%	67	0.6109%	0.3818%
44	0.1066%	0.0667%	68	0.4073%	0.2546%
45	0.1157%	0.0723%	69	0.2036%	0.1273%
			70+	0.2036%	0.1273%

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Table 3b: Disability Rates for Others

Age	Male	Female	Age	Male	Female
< 23	0.0327%	0.0376%	46	0.1125%	0.1154%
23	0.0360%	0.0400%	47	0.1208%	0.1236%
24	0.0392%	0.0424%	48	0.1329%	0.1360%
25	0.0425%	0.0448%	49	0.1451%	0.1484%
26	0.0456%	0.0472%	50	0.1572%	0.1608%
27	0.0489%	0.0496%	51	0.1694%	0.1734%
28	0.0501%	0.0510%	52	0.1815%	0.1858%
29	0.0513%	0.0524%	53	0.2132%	0.2168%
30	0.0524%	0.0538%	54	0.2450%	0.2478%
31	0.0536%	0.0554%	55	0.2766%	0.2788%
32	0.0548%	0.0568%	56	0.3084%	0.3098%
33	0.0566%	0.0586%	57	0.3401%	0.3408%
34	0.0584%	0.0606%	58	0.4068%	0.4096%
35	0.0602%	0.0624%	59	0.4736%	0.4784%
36	0.0620%	0.0644%	60	0.5405%	0.5470%
37	0.0638%	0.0662%	61	0.6072%	0.6158%
38	0.0669%	0.0696%	62	0.6740%	0.6844%
39	0.0701%	0.0728%	63	0.8526%	0.8450%
40	0.0734%	0.0762%	64	1.0314%	1.0054%
41	0.0765%	0.0794%	65	1.2101%	1.1660%
42	0.0797%	0.0826%	66	1.3889%	1.3264%
43	0.0879%	0.0908%	67	1.5675%	1.4870%
44	0.0962%	0.0990%	68	1.0451%	0.9914%
45	0.1043%	0.1072%	69	0.5225%	0.4956%
			70+	0.5225%	0.4956%

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Table 4: Retirement Rates

Age	Rate
< 55	2.00%
55	3.00%
56	3.00%
57	3.00%
58	3.00%
59	3.00%
60	5.00%
61	5.00%
62	10.00%
63	5.00%
64	5.00%
65	25.00%
66	25.00%
67	25.00%
68	20.00%
69	20.00%
70+	100.00%

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Glossary of Terms

Actuarial Accrued Liability

Total accumulated cost to fund pension or postemployment benefits arising from service in all prior years.

Actuarial Cost Method

Technique used to assign or allocate, in a systematic and consistent manner, the expected cost of a pension or postemployment plan for a group of plan members to the years of service that give rise to that cost.

Actuarial Present Value of Projected Benefits

Amount which, together with future interest, is expected to be sufficient to pay all future benefits.

Actuarial Valuation

Study of probable amounts of future pension or postemployment benefits and the necessary amount of contributions to fund those benefits.

Actuary

Person who performs mathematical calculations pertaining to pension and insurance benefits based on specific procedures and assumptions.

GASB 74 and 75

Governmental Accounting Standards Board Statement Number 74 amends Number 43 effective for the fiscal year beginning after June 15, 2016 and defines new financial reporting requirements for public postemployment benefit plans. Governmental Accounting Standards Board Statement Number 75 amends Number 45 effective for fiscal years beginning after June 15, 2017 and defines new accounting and financial reporting requirements for employers sponsoring public postemployment benefit plans.

Normal Cost

That portion of the actuarial present value of benefits assigned to a particular year in respect to an individual participant or the plan as a whole.

Rate Payroll

Members' earnings used to determine contribution rates.

Unfunded Actuarial Accrued Liability (UAAL)

The portion of the actuarial accrued liability not offset by plan assets.

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Valuation Payroll

Members' earnings used to determine Normal Cost and Actuarial Accrued Liability.

Vested Benefits

Benefits which are unconditionally guaranteed regardless of employment.

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BUCK

State of Alaska

Teachers' Retirement System

Actuarial Valuation Report
As of June 30, 2022

January 2023

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January 20, 2023

State of Alaska
The Alaska Retirement Management Board
The Department of Revenue, Treasury Division
The Department of Administration, Division of Retirement and Benefits
P.O. Box 110203
Juneau, AK 99811-0203

Certification of Actuarial Valuation

Dear Members of The Alaska Retirement Management Board, The Department of Revenue and The Department of Administration:

This report summarizes the annual actuarial valuation results of the State of Alaska Teachers' Retirement System (TRS) as of June 30, 2022 performed by Buck Global, LLC (Buck).

The actuarial valuation is based on financial information provided in the financial statements audited by KPMG LLP, member data provided by the Division of Retirement and Benefits, and medical enrollment data provided by the healthcare claims administrator (Aetna), as summarized in this report. The benefits considered are those delineated in Alaska statutes effective June 30, 2022. The actuary did not verify the data submitted, but did perform tests for consistency and reasonableness.

All costs, liabilities, and other factors under TRS were determined in accordance with generally accepted actuarial principles and procedures. An actuarial cost method is used to measure the actuarial liabilities which we believe is reasonable. Buck is solely responsible for the actuarial data and actuarial results presented in this report. This report fully and fairly discloses the actuarial position of TRS as of June 30, 2022.

TRS is funded by Employer, State, and Member Contributions in accordance with the funding policy adopted by the Alaska Retirement Management Board (Board) and as required by Alaska state statutes. The funding objective for TRS is to pay required contributions that remain level as a percent of total TRS compensation. The Board has also established a funding policy objective that the required contributions be sufficient to pay the Normal Costs of active plan members, plan expenses, and amortize the Unfunded Actuarial Accrued Liability (UAAL) as a level percentage of total TRS compensation over a closed 25-year period as required by Alaska state statutes. The closed 25-year period was originally established effective June 30, 2014. Effective June 30, 2018, the Board adopted a 25-year layered UAAL amortization method as described in Section 5.2. The UAAL amortization continues to be on a level percent of pay basis. The compensation used to determine required contributions is the total compensation of all active members in TRS, including those hired after July 1, 2006 who are members of the Defined Contribution Retirement (DCR) Plan. This objective is currently being met and is projected to continue to be met. Absent future gains/losses, actuarially determined contributions are expected to remain level as a percent of pay and the overall funded status (on a combined pension/healthcare basis) is expected to increase to 100% in FY31 (the funded status of the pension trust is expected to increase to 100% in FY52).

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The Board and staff of the State of Alaska may use this report for the review of the operations of TRS. Use of this report for any other purpose or by anyone other than the Board or staff of the State of Alaska may not be appropriate and may result in mistaken conclusions due to failure to understand applicable assumptions, methodologies, or inapplicability of the report for that purpose. Because of the risk of misinterpretation of actuarial results, Buck recommends requesting its advanced review of any statement to be based on information contained in this report. Buck will accept no liability for any such statement made without its prior review.

Future actuarial measurements may differ significantly from current measurements due to plan experience differing from that anticipated by the actuarial assumptions, changes expected as part of the natural operation of the methodology used for these measurements, and changes in plan provisions or applicable law. In particular, retiree group benefits models necessarily rely on the use of approximations and estimates and are sensitive to changes in these approximations and estimates. Small variations in these approximations and estimates may lead to significant changes in actuarial measurements. An analysis of the potential range of such future differences is beyond the scope of this valuation.

In our opinion, the actuarial assumptions used are reasonable, taking into account the experience of the plan and reasonable long-term expectations, and represent our best estimate of the anticipated long-term experience under the plan. The actuary performs an analysis of plan experience periodically and recommends changes if, in the opinion of the actuary, assumption changes are needed to more accurately reflect expected future experience. The last full experience analysis was performed for the period July 1, 2017 to June 30, 2021. Based on that experience study, the Board adopted new assumptions effective beginning with the June 30, 2022 valuation to better reflect expected future experience. Based on our annual analysis of recent claims experience, changes were made to the healthcare per capita claims cost rates effective June 30, 2022 to better reflect expected future healthcare experience. A summary of the actuarial assumptions and methods used in this actuarial valuation is shown in Sections 5.2 and 5.3. We certify that the assumptions and methods described in Sections 5.2 and 5.3 of this report meet the requirements of all applicable Actuarial Standards of Practice.

Actuarial Standards of Practice No. 27 (ASOP 27) and No. 35 (ASOP 35) require the actuary to disclose the information and analysis used to support the actuary's determination that the assumptions selected by the plan sponsor do not significantly conflict with what, in the actuary's professional judgment, are reasonable for the purpose of the measurement. Buck provides advice on reasonable assumptions when performing periodic experience studies. The Board selects the assumptions used and annually the signing actuary reviews the assumptions through discussions with the Board staff and analyzing actuarial gain/loss experience. In the case of the Board's selection of the expected return on assets (EROA), the signing actuary has used economic information and tools provided by Buck's Financial Risk Management (FRM) practice. A spreadsheet tool created by the FRM practice converts averages, standard deviations, and correlations from Buck's Capital Markets Assumptions that are used for stochastic forecasting into approximate percentile ranges for the arithmetic and geometric average returns. It is intended to suggest possible reasonable ranges for EROA without attempting to predict or select a specific best estimate rate of return. It takes into account the duration (horizon) of investment and the target allocation of assets in the portfolio to various asset classes. Based on the actuary's analysis, including consistency with other assumptions used in the valuation, the percentiles generated by the spreadsheet tool described above, and review of actuarial gain/loss analysis, the actuary believes the assumptions do not significantly conflict with what, in the actuary's professional judgment, are reasonable for the purpose of the measurement.

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Governmental Accounting Standards Board (GASB) Statement No. 67 (GASB 67) was effective for TRS beginning with fiscal year ending June 30, 2014, and Statement No. 74 (GASB 74) was effective for TRS beginning with fiscal year ending June 30, 2017. Separate GASB 67 and GASB 74 reports as of June 30, 2022 have been prepared. We have also prepared the member data tables shown in Section 4 of this report for the Statistical Section of the ACFR, as well as the summary of actuarial assumptions and analysis of financial experience for the Actuarial Section of the ACFR. Please see our separate GASB 67 and GASB 74 reports for other information needed for the ACFR.

Assessment of Risks

Actuarial Standard of Practice No. 51 (ASOP 51) applies to actuaries performing funding calculations related to a pension plan. ASOP 51 does not apply to actuaries performing services in connection with other post-employment benefits, such as medical benefits. Accordingly, ASOP 51 does not apply to the healthcare portion of TRS. See Section 6 of this report for further details regarding ASOP 51.

Use of Models

Actuarial Standard of Practice No. 56 (ASOP 56) provides guidance to actuaries when performing actuarial services with respect to designing, developing, selecting, modifying, using, reviewing, or evaluating models. In addition to the EROA analysis spreadsheet model disclosed above, Buck uses third-party software in the performance of annual actuarial valuations and projections. The model is intended to calculate the liabilities associated with the provisions of the plan using data and assumptions as of the measurement date under the funding methods specified in this report. The output from the third-party vendor software is used as input to internally developed models that apply applicable funding methods and policies to the derived liabilities and other inputs, such as plan assets and contributions, to generate many of the exhibits found in this report. Buck has an extensive review process in which the results of the liability calculations are checked using detailed sample life output, changes from year to year are summarized by source, and significant deviations from expectations are investigated. Other funding outputs and the internal models are similarly reviewed in detail and at a higher level for accuracy, reasonability, and consistency with prior results. Buck also reviews the third-party model when significant changes are made to the software. This review is performed by experts within Buck who are familiar with applicable funding methods, as well as the manner in which the model generates its output. If significant changes are made to the internal models, extra checking and review are completed. Significant changes to the internal models that are applicable to multiple clients are generally developed, checked, and reviewed by multiple experts within Buck who are familiar with the details of the required changes.

Additional models used in valuing health benefits are described later in the report.

COVID-19

The potential impact of the ongoing COVID-19 pandemic on costs and liabilities was considered and an adjustment was made in setting the medical per capita claims cost assumption. FY21 medical claims were adjusted for a COVID-19 related decline in those claims during the fiscal year. FY22 medical claims were not adjusted. A more detailed explanation on these adjustments is shown in Section 5.2.

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This report was prepared under the overall direction of David Kershner, who meets the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein. He is a Fellow of the Society of Actuaries, an Enrolled Actuary, a Member of the American Academy of Actuaries, and a Fellow of the Conference of Consulting Actuaries.

We are available to discuss this report with you at your convenience. David can be reached at 602-803-6174 and Brett can be reached at 260-423-1072.

Respectfully submitted,

David J. Kershner, FSA, EA, MAAA, FCA
Principal
Buck

Brett Hunter, ASA, EA, MAAA
Senior Consultant
Buck

The undersigned actuary is responsible for all assumptions related to the average annual per capita health claims cost and the health care cost trend rates, and hereby affirms his qualification to render opinions in such matters in accordance with the Qualification Standards of the American Academy of Actuaries.

Stephen R. Oates, ASA, EA, MAAA, FCA
Principal
Buck

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Executive Summary

Overview

The State of Alaska Teachers' Retirement System (TRS) provides pension and postemployment healthcare benefits to teachers and other eligible participants. The Commissioner of the Department of Administration is responsible for administering the plan. The Alaska Retirement Management Board has fiduciary responsibility over the assets of the plan. This report presents the results of the actuarial valuation of TRS as of the valuation date of June 30, 2022.

Purpose

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

1. To determine the Employer/State contribution necessary to meet the Board's funding policy for the plan;
2. To disclose the funding assets and liability measures as of the valuation date;
3. To review the current funded status of the plan and assess the funded status as an appropriate measure for determining future actuarially determined contributions;
4. To compare actual and expected experience under the plan during the last fiscal year; and
5. To report trends in contributions, assets, liabilities, and funded status over the last several years.

The actuarial valuation provides a "snapshot" of the funded position of TRS based on the plan provisions, membership data, assets, and actuarial methods and assumptions as of the valuation date.

Actuarial projections are also performed to provide a long-term view of the expected future funded status and contribution patterns (see Section 3). The future funded status and contribution patterns would be different than those shown in Section 3 if future experience does not match the actuarial assumptions used in the projections.

Retiree group benefits models necessarily rely on the use of approximations and estimates, and are sensitive to changes in these approximations and estimates. Small variations in these approximations and estimates may lead to significant changes in actuarial measurements.

Funded Status

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

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Funded Status as of June 30 ($'s in 000's)		2021	2022
Pension			
a.	Actuarial Accrued Liability	$ 7,471,887	$ 7,804,046
b.	Valuation Assets	5,910,369	6,100,204
c.	Unfunded Actuarial Accrued Liability, (a) - (b)	$ 1,561,518	$ 1,703,842
d.	Funded Ratio based on Valuation Assets, (b) ÷ (a)	79.1%	78.2%
e.	Fair Value of Assets	$ 6,731,481	$ 6,026,651
f.	Funded Ratio based on Fair Value of Assets, (e) ÷ (a)	90.1%	77.2%
Healthcare			
a.	Actuarial Accrued Liability	$ 2,439,603	$ 2,442,577
b.	Valuation Assets	3,267,737	3,437,216
c.	Unfunded Actuarial Accrued Liability, (a) - (b)	$ (828,134)	$ (994,639)
d.	Funded Ratio based on Valuation Assets, (b) ÷ (a)	133.9%	140.7%
e.	Fair Value of Assets	$ 3,723,031	$ 3,392,211
f.	Funded Ratio based on Fair Value of Assets, (e) ÷ (a)	152.6%	138.9%
Total			
a.	Actuarial Accrued Liability	$ 9,911,490	$ 10,246,623
b.	Valuation Assets	9,178,106	9,537,420
c.	Unfunded Actuarial Accrued Liability, (a) - (b)	$ 733,384	$ 709,203
d.	Funded Ratio based on Valuation Assets, (b) ÷ (a)	92.6%	93.1%
e.	Fair Value of Assets	$ 10,454,512	$ 9,418,862
f.	Funded Ratio based on Fair Value of Assets, (e) ÷ (a)	105.5%	91.9%

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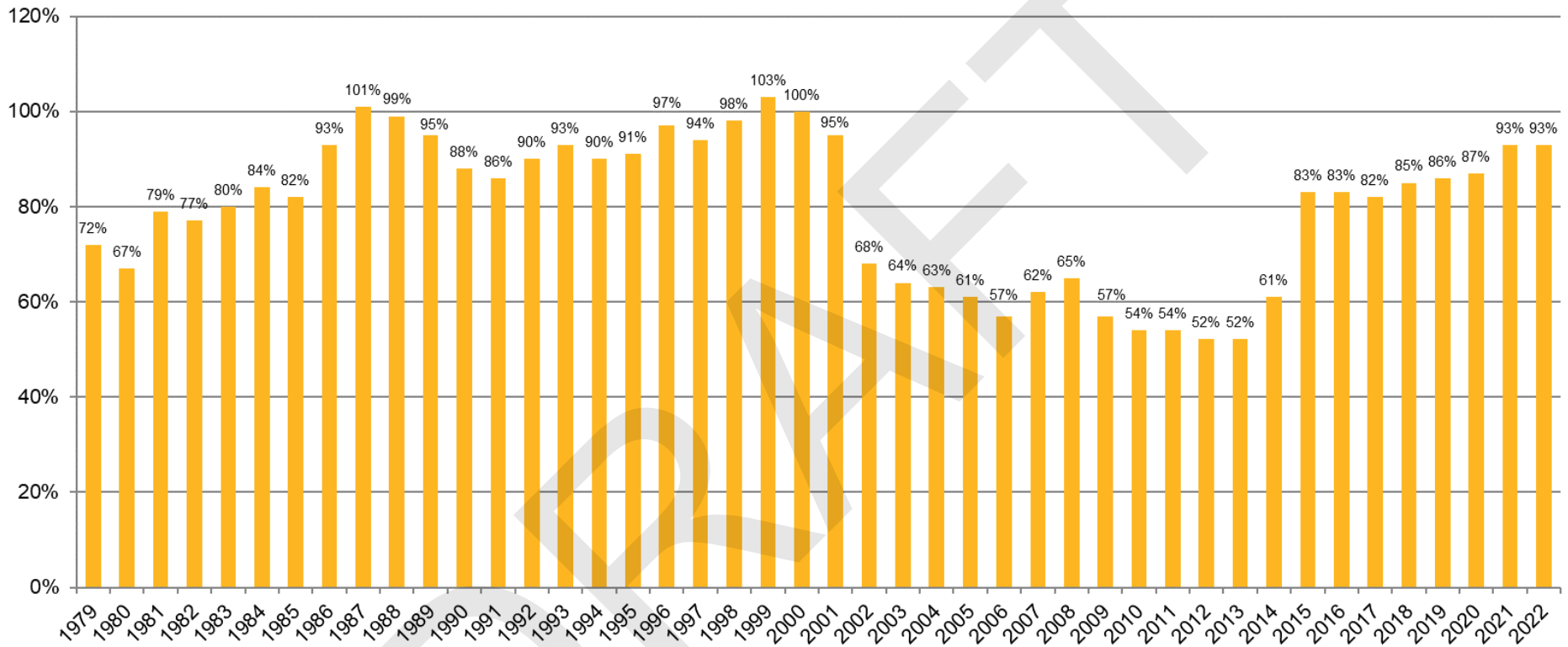
Funded Ratio History (Based on Valuation Assets)



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The key reasons for the change in the funded status are explained below. The funded status for healthcare benefits is not necessarily an appropriate measure to confirm that assets are sufficient to settle health plan obligations as there are no available financial instruments for purchase. Future experience is likely to vary from assumptions so there is potential for actuarial gains or losses.

1. Investment Experience

The asset valuation method recognizes 20% of the investment gain or loss each year, for a period of five years. The FY22 investment return based on fair value of assets was approximately (6.0%) compared to the expected investment return of 7.38% (net of investment expenses). This resulted in a market asset loss of approximately $1,373 million. Due to the recognition of investment gains and losses over a 5-year period, the FY22 investment return based on actuarial value of assets was approximately 8.7%, which resulted in an actuarial asset gain of approximately $116 million.

2. Salary Increases

Salary increases for continuing active members during FY22 were higher than expected based on the valuation assumptions, resulting in a liability loss of approximately $31 million.

3. Demographic Experience

Section 4 provides statistics on active and inactive members. The number of active members decreased 11.0% from 3,396 at June 30, 2021 to 3,023 at June 30, 2022 due to active members exiting the plan during the year (due to retirement, termination, death, and disability) and the closure of the plan to new entrants as of July 1, 2006. The average age of active members increased from 52.14 to 52.57 and average credited service increased from 20.31 to 20.85 years.

The number of benefit recipients increased 1.1% from 13,972 to 14,126, and their average age increased from 72.26 to 72.60. The number of vested terminated participants increased 0.3% from 727 to 729. Their average age increased from 52.68 to 53.22.

The overall effect of the demographic experience during FY22 was a liability loss of approximately $7 million (pension) and a liability loss of approximately $13[1] million (healthcare).

4. COLA / PRPA Experience

The cost-of-living increases (COLA) for benefit recipients during FY22 were less than expected based on the valuation assumptions, resulting in a liability gain of approximately $0.6 million. However, the CPI-based postretirement pension adjustments (PRPA) were more than expected, resulting in a liability loss of approximately $85 million.

5. Retiree Medical Claims Experience

As described in Section 5.2, recent medical claims experience and changes in healthcare enrollment data provided to us for the June 30, 2022 valuation generated a liability gain of approximately $94 million. Healthcare benefits paid during FY22 were less than expected, which generated a liability gain of approximately $5 million.

[1] Includes the effects of changes in dependent coverage elections and Medicare Part B only experience.

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6. Changes in Methods Since the Prior Valuation

There were no changes in actuarial methods since the prior valuation.

7. Changes in Assumptions Since the Prior Valuation

Effective for the June 30, 2022 valuation, the Board adopted the changes to the demographic and economic assumptions recommended by the actuary, based on the results of an experience study performed on the plan experience from July 1, 2017 to June 30, 2021. The changes in assumptions were adopted at the June 2022 Board meeting. The effect of the new assumptions was to increase the total Actuarial Accrued Liability as of June 30, 2022 by approximately $165 million.

Healthcare claim costs are updated annually as described in Section 5.2. The amounts included in the Normal Cost for administrative expenses were updated based on the last two years of actual administrative expenses paid from plan assets.

8. Changes in Benefit Provisions Since the Prior Valuation

There have been no changes in benefit provisions valued since the prior valuation.

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Comparative Summary of Contribution Rates

		Actual FY 2024	Estimated FY 2025
Pension			
a.	Normal Cost Rate Net of Member Contributions	2.05%	2.21%
b.	Past Service Cost Rate	16.44%	19.09%
c.	Total Employer/State Contribution Rate, (a) + (b), not less than (a)[1]	18.49%	21.30%
Healthcare			
a.	Normal Cost Rate	2.41%	2.10%
b.	Past Service Cost Rate	(9.08%)	(10.27%)
c.	Total Employer/State Contribution Rate, (a) + (b), not less than (a)[1]	2.41%	2.10%
Total			
a.	Normal Cost Rate Net of Member Contributions	4.46%	4.31%
b.	Past Service Cost Rate	16.44%	19.09%
c.	Total Employer/State Contribution Rate, (a) + (b)[1]	20.90%	23.40%
d.	Board Adopted Total Employer/State Contribution Rate	18.49%[2]	TBD
e.	Defined Contribution Retirement (DCR) Rate Paid by Employers	7.03%	7.29%
f.	Board Adopted Total Rate, Including DCR Rate Paid by Employers, (d) + (e)	25.52%	TBD

Contribution rates are based on total (DB and DCR) payroll. The contribution rates shown above for FY25 are estimated assuming no actuarial gains/losses during FY23 and FY24. Actual FY25 contribution rates will be adopted by the Board in September 2023 reflecting FY23 asset experience.

Contribution rates include Employer contribution rates as limited by Alaska state statutes and the Additional State Contribution required under SB 125.

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[1] Beginning with the June 30, 2014 valuation, contribution rates for FY17 and beyond are determined using new methodology in accordance with 2014 legislation under HB 385 and SB 119, 2014 Alaska Laws, which changed the amortization methodology to a closed 25-year period as a level percentage of pay, and eliminated the time lag on the contribution rate calculation by using a 2-year "roll-forward" approach assuming 0% population growth. Investment gains and losses are recognized over a 5-year period beginning in FY15. Beginning with the June 30, 2018 valuation, the UAAL amortization was changed as described in Section 5.2.

[2] The FY24 contribution rates adopted by the Board in September 2022 were 18.49% for Pension and 0.00% for Healthcare.

Summary of Actuarial Accrued Liability Gain/(Loss) and Other Changes During the Year

The following table summarizes the sources of change in the total Employer/State contribution rate as of June 30, 2021 and June 30, 2022 based on DB and DCR payroll combined:

	Pension	Healthcare	Total
1. Total Employer/State Contribution Rate as of June 30, 2021	19.32%	2.94%	22.26%
2. Change due to:			
a. Health Claims Experience	N/A	(0.11%)	(0.11%)
b. Salary Increases	0.26%	N/A	0.26%
c. Investment Experience	(0.63%)	0.00%	(0.63%)
d. Demographic Experience and Miscellaneous[1]	0.91%	(0.21%)	0.70%
e. Actual vs Expected Contributions	(0.25%)	0.00%	(0.25%)
f. Assumption/Method Changes	1.39%	(0.06%)	1.33%
g. Plan Changes	0.00%	0.00%	0.00%
h. Total Change, (a) + (b) + (c) + (d) + (e) + (f) + (g)	1.68%	(0.38%)	1.30%
3. Total Employer/State Contribution Rate as of June 30, 2022, (1) + (2)(h)	21.00%	2.56%	23.56%

The following table shows the FY22 gain/(loss) on actuarial accrued liability as of June 30, 2022 ($'s in 000's):

	Pension	Healthcare	Total
Retirement Experience	$ (3,443)	$ (13,048)	$ (16,491)
Termination Experience	(6,589)	(3,293)	(9,882)
Disability Experience	265	209	474
Active Mortality Experience	2,166	1,228	3,394
Inactive Mortality Experience	304	(291)	13
Salary Increases	(30,870)	N/A	(30,870)
Rehires (Net of Rehire Load)	131	1,927	2,058
COLA Increases	575	N/A	575
PRPA Increases	(85,465)	N/A	(85,465)
Benefit Payments Different than Expected	13,078	5,319	18,397
Per Capita Claims Cost	N/A	94,487	94,487
Medicare Part B Only Experience	N/A	1,235	1,235
Changes in Dependent Coverage Elections	N/A	1,071	1,071
Programming Changes[2]	(33)	(53)	(86)
Miscellaneous[3]	(10,678)	(3,453)	(14,131)
Total	$ (120,559)	$ 85,338	$ (35,221)

[1] Includes the effects of census data changes between the two valuations.
[2] Includes the adjustment to the post-decrement probability for the lump sum death benefit for married members (pension) and the elimination of child medical premiums for retirees over age 60 (healthcare).
[3] Includes the effects of various data changes that are typical when new census data is received for the annual valuation, as well as other items that do not fit neatly into any of the other categories.

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The rehire gain/(loss) amount shown on the previous page is the difference between (i) the increase in Actuarial Accrued Liability at June 30, 2022 due to rehires during the most recent plan year, and (ii) the load that was added to the June 30, 2021 Normal Cost based on the rehire load assumption used in the June 30, 2021 valuation. The development of the FY22 rehire gain/(loss) amount is shown in the table below ($'s in 000's):

	Pension	Healthcare	Total
1. Increase/(Decrease) in Actuarial Accrued Liability at June 30, 2022 due to Rehires	$ 6,340	$ 428	$ 6,768
2. June 30, 2021 Normal Cost Rehire Load, with interest to June 30, 2022	$ 6,471	$ 2,355	$ 8,826
3. Rehire Gain/(Loss), (2) - (1)	$ 131	$ 1,927	$ 2,058

Other items that increased/(decreased) the actuarial accrued liability as of June 30, 2022 are shown below ($'s in 000's):

	Pension	Healthcare	Total
Experience Study Assumption Changes	$ 144,033	$ 20,542	$ 164,575

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Section 1: Actuarial Funding Results

Section 1.1: Actuarial Liabilities and Normal Cost ($'s in 000's)

As of June 30, 2022	Present Value of Projected Benefits	Actuarial Accrued (Past Service) Liability
Active Members		
Retirement Benefits	$ 1,844,618	$ 1,682,909
Termination Benefits	21,080	362
Disability Benefits	1,257	(2,073)
Death Benefits	8,307	6,989
Return of Contributions	1,549	(29,226)
Medical and Prescription Drug Benefits	801,479	687,118
Medicare Part D Subsidy	(99,888)	(86,129)
Indebtedness	(24,627)	(24,627)
Subtotal	$ 2,553,775	$ 2,235,323
Inactive Members		
Not Vested	$ 38,632	$ 38,632
Vested Terminations		
- Retirement Benefits	159,390	159,390
- Medical and Prescription Drug Benefits	271,946	271,946
- Medicare Part D Subsidy	(35,448)	(35,448)
- Indebtedness	(5,567)	(5,567)
Retirees & Beneficiaries		
- Retirement Benefits	5,977,257	5,977,257
- Medical and Prescription Drug Benefits	1,955,212	1,955,212
- Medicare Part D Subsidy	(350,122)	(350,122)
Subtotal	$ 8,011,300	$ 8,011,300
Total	**$ 10,565,075**	**$ 10,246,623**
Total Pension	**$ 8,021,896**	**$ 7,804,046**
Total Medical, Net of Part D Subsidy	**$ 2,543,179**	**$ 2,442,577**
Total Medical, Gross of Part D Subsidy	**$ 3,028,637**	**$ 2,914,276**

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As of June 30, 2022	Present Value of Projected Benefits	Actuarial Accrued (Past Service) Liability
By Tier		
Tier 1		
- Pension	$ 4,382,835	$ 4,377,420
- Medical, Net of Part D Subsidy	1,030,113	1,027,939
Tier 2		
- Pension	3,639,061	3,426,626
- Medical, Net of Part D Subsidy	1,513,066	1,414,638
Total	**$ 10,565,075**	**$ 10,246,623**

As of June 30, 2022	Normal Cost
Active Members	
Retirement Benefits	$ 29,111
Termination Benefits	3,730
Disability Benefits	595
Death Benefits	250
Return of Contributions	5,603
Medical and Prescription Drug Benefits	19,926
Medicare Part D Subsidy	(2,447)
Rehire Assumption (Pension)	4,714
Rehire Assumption (Medical)	35
Administrative Expenses (Pension)	3,626
Administrative Expenses (Medical)	1,940
Total	**$ 67,083**
Total Pension	**$ 47,629**
Total Medical, Net of Part D Subsidy	**$ 19,454**
Total Medical, Gross of Part D Subsidy	**$ 21,901**
By Tier	
Tier 1	
- Pension	$ 1,964
- Medical, Net of Part D Subsidy	681
Tier 2	
- Pension	45,665
- Medical, Net of Part D Subsidy	18,773
Total	**$ 67,083**

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Section 1.2: Actuarial Contributions as of June 30, 2022 ($'s in 000's)

Normal Cost Rate	Pension	Healthcare	Total
1. Total Normal Cost	$ 47,629	$ 19,454	$ 67,083
2. DB Rate Payroll Projected for FY23	303,011	303,011	303,011
3. DCR Rate Payroll Projected for FY23	455,927	455,927	455,927
4. Total Rate Payroll Projected for FY23	758,938	758,938	758,938
5. Normal Cost Rate			
a. Based on DB Rate Payroll, (1) ÷ (2)	15.72%	6.42%	22.14%
b. Based on Total Rate Payroll, (1) ÷ (4)	6.28%	2.56%	8.84%
6. Average Member Contribution Rate[1]	3.45%	0.00%	3.45%
7. Employer Normal Cost, (5)(b) - (6)	2.83%	2.56%	5.39%

Past Service Rate	Pension	Healthcare	Total
1. Actuarial Accrued Liability	$ 7,804,046	$ 2,442,577	$ 10,246,623
2. Valuation Assets	6,100,204	3,437,216	9,537,420
3. Unfunded Actuarial Accrued Liability, (1) - (2)	$ 1,703,842	$ (994,639)	$ 709,203
4. Funded Ratio, (2) ÷ (1)	78.2%	140.7%	93.1%
5. Past Service Cost Amortization Payment	137,935	(67,255)	70,680
6. Total Rate Payroll Projected for FY23	758,938	758,938	758,938
7. Past Service Rate, (5) ÷ (6)	18.17%	(8.86%)	9.31%
Total Employer / State Contribution Rate, not less than Normal Cost Rate	**21.00%**	**2.56%**	**23.56%**
Normal Cost Rate by Tier (Total Employer and Member)[2]			
Tier 1	16.48%	5.71%	22.20%
Tier 2	15.69%	6.45%	22.14%

[1] Assumes no member contributions from members in the DCR plan, 9.65% contributions for Tier 1 members who elected supplemental coverage, and 8.65% for the remaining members.

[2] Rates determined considering the payroll for members in each tier. DCR payroll is excluded from these calculations.

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Schedule of Past Service Cost Amortizations - Pension ($'s in 000's)

Layer	Amortization Period		Balances		
	Date Created	Years Remaining	Initial	Outstanding	Beginning-of-Year Payment
Initial Amount	6/30/2018	17	$ 1,720,344	$ 1,674,843	$ 135,805
Change in Assumptions	6/30/2018	21	14,346	14,455	1,022
FY19 Loss	6/30/2019	22	94,314	95,115	6,537
FY20 Loss	6/30/2020	23	44,395	44,722	2,993
FY21 Gain	6/30/2021	24	(285,576)	(286,851)	(18,731)
Change in Assumptions	6/30/2022	25	144,033	144,033	9,191
FY22 Loss	6/30/2022	25	17,525	17,525	1,118
Total				**$ 1,703,842**	**$ 137,935**

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Schedule of Past Service Cost Amortizations - Healthcare ($'s in 000's)

Layer	Amortization Period		Balances		
	Date Created	Years Remaining	Initial	Outstanding	Beginning-of-Year Payment
Initial Amount	6/30/2018	17	$ (48,285)	$ (47,009)	$ (3,812)
Change in Assumptions/Methods/EGWP	6/30/2018	21	(166,274)	(167,555)	(11,846)
FY19 Gain	6/30/2019	22	(213,757)	(215,572)	(14,815)
FY20 Gain	6/30/2020	23	(101,507)	(102,254)	(6,844)
Medical/Prescription Drug Plan Changes	6/30/2021	24	(21,763)	(21,860)	(1,427)
FY21 Gain	6/30/2021	24	(273,877)	(275,099)	(17,964)
Change in Assumptions	6/30/2022	25	20,542	20,542	1,311
FY22 Gain	6/30/2022	25	(185,832)	(185,832)	(11,858)
Total				**$ (994,639)**	**$ (67,255)**

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Schedule of Past Service Cost Amortizations - Total ($'s in 000's)

Layer	Amortization Period		Balances		
	Date Created	Years Remaining	Initial	Outstanding	Beginning-of-Year Payment
Initial Amount	6/30/2018	17	$ 1,672,059	$ 1,627,834	$ 131,993
Change in Assumptions/Methods/EGWP	6/30/2018	21	(151,928)	(153,100)	(10,824)
FY19 Gain	6/30/2019	22	(119,443)	(120,457)	(8,278)
FY20 Gain	6/30/2020	23	(57,112)	(57,532)	(3,851)
Medical/Prescription Drug Plan Changes	6/30/2021	24	(21,763)	(21,860)	(1,427)
FY21 Gain	6/30/2021	24	(559,453)	(561,950)	(36,695)
Change in Assumptions	6/30/2022	25	164,575	164,575	10,502
FY22 Gain	6/30/2022	25	(168,307)	(168,307)	(10,740)
Total				**$ 709,203**	**$ 70,680**

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Section 1.3: Roll-Forward Contribution Rate Calculation for FY25 ($'s in 000's)

	Pension	Healthcare	Total
1. Liability Roll Forward			
a. Actuarial Accrued Liability as of June 30, 2022	**$ 7,804,046**	**$ 2,442,577**	**$ 10,246,623**
b. Normal Cost	44,003	17,514	61,517
c. Interest on (a) and (b) at 7.25%	568,984	178,357	747,341
d. Estimated Benefit Payments	(550,245)	(137,591)	(687,836)
e. Interest on (d) at 7.25%, adjusted for timing	(21,262)	(4,900)	(26,162)
f. Expected Actuarial Accrued Liability as of June 30, 2023	**$ 7,845,526**	**$ 2,495,957**	**$ 10,341,483**
g. Projected Normal Cost	39,619	16,023	55,642
h. Interest on (f) and (g) at 7.25%	571,673	182,119	753,792
i. Estimated Benefit Payments	(568,379)	(144,855)	(713,234)
j. Interest on (i) at 7.25%, adjusted for timing	(21,962)	(5,159)	(27,121)
k. Expected Actuarial Accrued Liability as of June 30, 2024	**$ 7,866,477**	**$ 2,544,085**	**$ 10,410,562**
2. Asset Roll Forward			
a. Actuarial Value of Assets as of June 30, 2022	**$ 6,100,204**	**$ 3,437,216**	**$ 9,537,420**
b. Interest on (a) at 7.25%	442,265	249,198	691,463
c. Employee Contributions	29,310	0	29,310
d. Employer Contributions	44,322	0	44,322
e. State Assistance Contributions	91,029	0	91,029
f. Interest on (c) thru (e) at 7.25%, adjusted for timing*	9,222	0	9,222
g. Estimated Benefit Payments	(550,245)	(137,591)	(687,836)
h. Administrative Expenses	(3,626)	(1,940)	(5,566)
i. Interest on (g) and (h) at 7.25%, adjusted for timing	(21,391)	(4,970)	(26,361)
j. AVA Adjustments	5,791	3,261	9,052
k. Expected Actuarial Value of Assets as of June 30, 2023	**$ 6,146,881**	**$ 3,545,174**	**$ 9,692,055**
l. Interest on (k) at 7.25%	445,649	257,025	702,674
m. Employee Contributions	27,141	0	27,141
n. Employer Contributions	42,176	0	42,176
o. State Assistance Contributions**	98,766	0	98,766
p. Interest on (m) thru (o) at 7.25%, adjusted for timing*	9,629	0	9,629
q. Estimated Benefit Payments	(568,379)	(144,855)	(713,234)
r. Administrative Expenses	(3,282)	(1,775)	(5,057)
s. Interest on (q) and (r) at 7.25%, adjusted for timing	(22,079)	(5,222)	(27,301)
t. AVA Adjustments	21,435	10,448	31,883
u. Expected Actuarial Value of Assets as of June 30, 2024	**$ 6,197,937**	**$ 3,660,795**	**$ 9,858,732**
3. Expected Unfunded Actuarial Accrued Liability as of June 30, 2024, 1(k) - 2(u)	**$ 1,668,540**	**$ (1,116,710)**	**$ 551,830**

* Employee and Employer Contributions are paid throughout the year. State Assistance Contributions are assumed to be paid on July 1, 2022 for FY23, and July 1, 2023 for FY24.

** The FY24 State Assistance Contribution is expected to be contributed 100% to pension.

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	Pension	Healthcare	Total
4. Expected Annual Rate Payroll for FY25			
a. Defined Benefit Members			$ 248,321
b. Defined Contribution Retirement Members			521,222
c. Total Rate Payroll			**$ 769,543**
5. Expected FY25 Contribution Rate Calculation			
a. Projected Normal Cost for FY25	$ 38,452	$ 16,196	$ 54,648
b. Projected Normal Cost Rate for FY25	5.00%	2.10%	7.10%
c. Expected Member Contribution Rate for FY25	(2.79%)	0.00%	(2.79%)
d. Expected Employer Normal Cost Rate for FY25	**2.21%**	**2.10%**	**4.31%**
e. Expected Unfunded Liability as of June 30, 2024	$ 1,668,540	$ (1,116,710)	$ 551,830
f. FY25 Layered Amortization of Expected Unfunded Liability	146,889	(79,005)	67,884
g. Expected Past Service Cost Contribution Rate for FY25	**19.09%**	**(10.27%)**	**19.09%**
h. Expected Total Contribution Rate for FY25, not less than Normal Cost Rate	**21.30%**	**2.10%**	**23.40%**

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The components of the expected FY25 amortization amounts are shown below (totals may not add due to rounding):

Expected FY25 Schedule of Past Service Cost Amortizations - Pension ($'s in 000's)

Layer	Amortization Period		Balances		
	Date Created	Years Remaining at 6/30/24	Initial	Outstanding at 6/30/24	Beginning-of-Year Payment for FY25
Initial Amount	6/30/2018	15	$ 1,720,344	$ 1,620,631	$ 143,377
Change in Assumptions	6/30/2018	19	14,346	14,325	1,079
FY19 Loss	6/30/2019	20	94,314	94,685	6,901
FY20 Loss	6/30/2020	21	44,395	44,700	3,160
FY21 Gain	6/30/2021	22	(285,576)	(287,765)	(19,776)
Change in Assumptions	6/30/2022	23	144,033	144,974	9,703
FY22 Loss	6/30/2022	23	17,525	17,640	1,181
Expected FY23 Loss	6/30/2023	24	19,209	19,289	1,260
Expected FY24 Loss	6/30/2024	25	61	61	4
Total				**$ 1,668,540**	**$ 146,889**

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The components of the expected FY25 amortization amounts are shown below (totals may not add due to rounding):

Expected FY25 Schedule of Past Service Cost Amortizations - Healthcare ($'s in 000's)

Layer	Amortization Period		Balances		
	Date Created	Years Remaining at 6/30/24	Initial	Outstanding at 6/30/24	Beginning-of-Year Payment for FY25
Initial Amount	6/30/2018	15	$ (48,285)	$ (45,487)	$ (4,024)
Change in Assumptions/Methods/EGWP	6/30/2018	19	(166,274)	(166,052)	(12,506)
FY19 Gain	6/30/2019	20	(213,757)	(214,597)	(15,641)
FY20 Gain	6/30/2020	21	(101,507)	(102,204)	(7,226)
Medical/Prescription Drug Plan Changes	6/30/2021	22	(21,763)	(21,929)	(1,507)
FY21 Gain	6/30/2021	22	(273,877)	(275,975)	(18,966)
Change in Assumptions	6/30/2022	23	20,542	20,676	1,384
FY22 Gain	6/30/2022	23	(185,832)	(187,047)	(12,519)
Expected FY23 Gain	6/30/2023	24	(54,598)	(54,820)	(3,580)
Expected FY24 Gain	6/30/2024	25	(69,275)	(69,275)	(4,420)
Total				**$ (1,116,710)**	**$ (79,005)**

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The components of the expected FY25 amortization amounts are shown below (totals may not add due to rounding):

Expected FY25 Schedule of Past Service Cost Amortizations - Total ($'s in 000's)

Layer	Amortization Period		Balances		
	Date Created	Years Remaining at 6/30/24	Initial	Outstanding at 6/30/24	Beginning-of-Year Payment for FY25
Initial Amount	6/30/2018	15	$ 1,672,059	$ 1,575,144	$ 139,353
Change in Assumptions/Methods/EGWP	6/30/2018	19	(151,928)	(151,727)	(11,427)
FY19 Gain	6/30/2019	20	(119,443)	(119,912)	(8,740)
FY20 Gain	6/30/2020	21	(57,112)	(57,504)	(4,066)
Medical/Prescription Drug Plan Changes	6/30/2021	22	(21,763)	(21,929)	(1,507)
FY21 Gain	6/30/2021	22	(559,453)	(563,740)	(38,742)
Change in Assumptions	6/30/2022	23	164,575	165,650	11,087
FY22 Gain	6/30/2022	23	(168,307)	(169,407)	(11,338)
Expected FY23 Gain	6/30/2023	24	(35,389)	(35,531)	(2,320)
Expected FY24 Gain	6/30/2024	25	(69,214)	(69,214)	(4,416)
Total				**$ 551,830**	**$ 67,884**

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Section 1.4: Actuarial Gain/(Loss) for FY22 ($'s in 000's)

	Pension	Healthcare	Total
1. Expected Actuarial Accrued Liability			
a. Actuarial Accrued Liability as of June 30, 2021	$ 7,471,887	$ 2,439,603	$ 9,911,490
b. Normal Cost	44,727	20,425	65,152
c. Interest on (a) and (b) at 7.38%	554,726	181,550	736,276
d. Employer Group Waiver Plan	0	18,819	18,819
e. Benefit Payments	(510,457)	(148,330)	(658,787)
f. Refund of Contributions	(1,305)	0	(1,305)
g. Interest on (d) thru (f) at 7.38%, adjusted for timing	(20,124)	(4,694)	(24,818)
h. Assumptions/Methods Changes	144,033	20,542	164,575
i. Expected Actuarial Accrued Liability as of June 30, 2022 (a) + (b) + (c) + (d) + (e) + (f) + (g) + (h)	$ 7,683,487	$ 2,527,915	$ 10,211,402
2. Actual Actuarial Accrued Liability as of June 30, 2022	7,804,046	2,442,577	10,246,623
3. Liability Gain/(Loss), (1)(i) - (2)	**$ (120,559)**	**$ 85,338**	**$ (35,221)**
4. Expected Actuarial Asset Value			
a. Actuarial Value of Assets as of June 30, 2021	$ 5,910,369	$ 3,267,737	$ 9,178,106
b. Interest on (a) at 7.38%	436,185	241,159	677,344
c. Employee Contributions	30,013	0	30,013
d. Employer Contributions	29,781	21,806	51,587
e. State Assistance Contributions	142,665	0	142,665
f. Employer Group Waiver Plan	0	18,819	18,819
g. Interest on (c) thru (f) at 7.38%, adjusted for timing	12,696	1,472	14,168
h. Benefit Payments	(510,457)	(148,330)	(658,787)
i. Refund of Contributions	(1,305)	0	(1,305)
j. Administrative Expenses	(3,805)	(2,044)	(5,849)
k. Interest on (h) thru (j) at 7.38%, adjusted for timing	(20,261)	(5,450)	(25,711)
l. Expected Actuarial Asset Value as of June 30, 2022 (a) + (b) + (c) + (d) + (e) + (f) + (g) + (h) + (i) + (j) + (k)	$ 6,025,881	$ 3,395,169	$ 9,421,050
5. Actual Actuarial Asset Value as of June 30, 2022	6,100,204	3,437,216	9,537,420
6. Actuarial Asset Value Gain/(Loss), (5) - (4)(l)	**$ 74,323**	**$ 42,047**	**$ 116,370**
7. Total Actuarial Gain/(Loss), (3) + (6)	**$ (46,236)**	**$ 127,385**	**$ 81,149**
8. Contribution Gain/(Loss)	**$ 29,199**	**$ 58,843**	**$ 88,042**
9. Administrative Expense Gain/(Loss)	**$ (488)**	**$ (396)**	**$ (884)**
10. FY22 Gain/(Loss), (7) + (8) + (9)	**$ (17,525)**	**$ 185,832**	**$ 168,307**

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Section 1.5: Development of Change in Unfunded Liability During FY22 ($'s in 000's)

	Pension	Healthcare	Total
1. 2021 Unfunded Liability	$ 1,561,518	$ (828,134)	$ 733,384
a. Interest on Unfunded Liability at 7.38%	$ 115,240	$ (61,116)	$ 54,124
b. Normal Cost	44,727	20,425	65,152
c. Employee Contributions	(30,013)	0	(30,013)
d. Employer Contributions	(29,781)	(21,806)	(51,587)
e. State Assistance Contributions	(142,665)	0	(142,665)
f. Administrative Expenses	3,805	2,044	5,849
g. Interest on (b) thru (f) at 7.38%, adjusted for timing	(9,258)	791	(8,467)
h. Assumptions/Methods Changes	144,033	20,542	164,575
i. Expected Change in Unfunded Liability During FY22 (a) + (b) + (c) + (d) + (e) + (f) + (g) + (h)	$ 96,088	$ (39,120)	$ 56,968
2. Expected 2022 Unfunded Liability, (1) + (1)(i)	$ 1,657,606	$ (867,254)	$ 790,352
a. Liability (Gain)/Loss During FY22	$ 120,559	$ (85,338)	$ 35,221
b. Actuarial Assets (Gain)/Loss During FY22	(74,323)	(42,047)	(116,370)
c. Total Actuarial (Gain)/Loss During FY22	$ 46,236	$ (127,385)	$ (81,149)
3. Actual 2022 Unfunded Liability, (2) + (2)(c)	$ 1,703,842	$ (994,639)	$ 709,203

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Section 1.6: Analysis of Financial Experience

Pension
Change in Employer / State Contribution Rate as of Valuation Date
Due to (Gains) and Losses in Actuarial Accrued Liabilities During the Last Five Fiscal Years
Resulting from Differences Between Assumed Experience and Actual Experience

	Change in Employer / State Contribution Rate During Fiscal Year				
	Pension				
Type of (Gain) or Loss	2018	2019	2020	2021	2022
1. Health Claims	N/A	N/A	N/A	N/A	N/A
2. Salary Experience	(0.39%)	(0.06%)	(0.06%)	0.25%	0.26%
3. Investment Experience	0.91%	0.93%	0.83%	(1.95%)	(0.63%)
4. Demographic Experience and Miscellaneous	0.37%	0.75%	(0.28%)	(0.68%)	0.91%
5. Actual vs Expected Contributions	(0.03%)	(0.15%)	(0.17%)	(0.03%)	(0.25%)
6. (Gain) or Loss During Year From Experience, (1) + (2) + (3) + (4) + (5)	0.86%	1.47%	0.32%	(2.41%)	0.29%
7. Assumptions / Method Changes	(0.32%)	0.00%	0.00%	0.00%	1.39%
8. Plan Changes	0.00%	0.00%	0.00%	0.00%	0.00%
9. Composite (Gain) or Loss During Year, (6) + (7) + (8)	0.54%	1.47%	0.32%	(2.41%)	1.68%
10. Beginning Total Employer / State Contribution Rate	19.40%	19.94%	21.41%	21.73%	19.32%
11. Ending Valuation Year Employer / State Contribution Rate, (9) + (10)	19.94%	21.41%	21.73%	19.32%	21.00%
12. Fiscal Year Rates Adopted by ARMB					
a. Fiscal Year Employer / State Contribution Rate	20.94%	22.51%	17.90%	18.49%	21.30% *
b. Fiscal Year for which Rate Applies	FY21	FY22	FY23	FY24	FY25

* Expected rate. Actual rate to be determined

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Healthcare
Change in Employer / State Contribution Rate as of Valuation Date
Due to (Gains) and Losses in Actuarial Accrued Liabilities During the Last Five Fiscal Years
Resulting from Differences Between Assumed Experience and Actual Experience

	Change in Employer / State Contribution Rate During Fiscal Year				
	Healthcare				
Type of (Gain) or Loss	2018	2019	2020	2021	2022
1. Health Claims	(1.58%)	(2.51%)	(0.95%)	(0.11%)	(0.11%)
2. Salary Experience	N/A	N/A	N/A	N/A	N/A
3. Investment Experience	0.45%	0.45%	0.38%	0.00%	0.00%
4. Demographic Experience and Miscellaneous	1.49%	1.60%	0.49%	(0.23%)	(0.21%)
5. Actual vs Expected Contributions	0.05%	(0.02%)	(0.19%)	0.00%	0.00%
6. (Gain) or Loss During Year From Experience, (1) + (2) + (3) + (4) + (5)	0.41%	(0.48%)	(0.27%)	(0.34%)	(0.32%)
7. Assumptions / Method Changes	0.24%	0.00%	0.00%	0.00%	(0.06%)
8. Plan Changes	0.00%	0.00%	0.00%	(0.02%)	0.00%
9. Composite (Gain) or Loss During Year, (6) + (7) + (8)	0.65%	(0.48%)	(0.27%)	(0.36%)	(0.38%)
10. Beginning Total Employer / State Contribution Rate	3.40%	4.05%	3.57%	3.30%	2.94%
11. Ending Valuation Year Employer / State Contribution Rate, (9) + (10)	4.05%	3.57%	3.30%	2.94%	2.56%
12. Fiscal Year Rates Adopted by ARMB					
a. Fiscal Year Employer / State Contribution Rate	3.40%	2.98%	0.00%	0.00%	2.10% *
b. Fiscal Year for which Rate Applies	FY21	FY22	FY23	FY24	FY25

* Expected rate. Actual rate to be determined

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Total
Change in Employer / State Contribution Rate as of Valuation Date
Due to (Gains) and Losses in Actuarial Accrued Liabilities During the Last Five Fiscal Years
Resulting from Differences Between Assumed Experience and Actual Experience

	Change in Employer / State Contribution Rate During Fiscal Year				
	Total				
Type of (Gain) or Loss	2018	2019	2020	2021	2022
1. Health Claims	(1.58%)	(2.51%)	(0.95%)	(0.11%)	(0.11%)
2. Salary Experience	(0.39%)	(0.06%)	(0.06%)	0.25%	0.26%
3. Investment Experience	1.36%	1.38%	1.21%	(1.95%)	(0.63%)
4. Demographic Experience and Miscellaneous	1.86%	2.35%	0.21%	(0.91%)	0.70%
5. Actual vs Expected Contributions	0.02%	(0.17%)	(0.36%)	(0.03%)	(0.25%)
6. (Gain) or Loss During Year From Experience, (1) + (2) + (3) + (4) + (5)	1.27%	0.99%	0.05%	(2.75%)	(0.03%)
7. Assumptions / Method Changes	(0.08%)	0.00%	0.00%	0.00%	1.33%
8. Plan Changes	0.00%	0.00%	0.00%	(0.02%)	0.00%
9. Composite (Gain) or Loss During Year, (6) + (7) + (8)	1.19%	0.99%	0.05%	(2.77%)	1.30%
10. Beginning Total Employer / State Contribution Rate	22.80%	23.99%	24.98%	25.03%	22.26%
11. Ending Valuation Year Employer / State Contribution Rate, (9) + (10)	23.99%	24.98%	25.03%	22.26%	23.56%
12. Fiscal Year Rates Adopted by ARMB					
a. Fiscal Year Employer / State Contribution Rate	24.34%	25.49%	17.90%	18.49%	23.40% *
b. Fiscal Year for which Rate Applies	FY21	FY22	FY23	FY24	FY25

* Expected rate. Actual rate to be determined

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Section 1.7: History of Unfunded Liability and Funded Ratio ($'s in 000's)

Valuation Date	Total Actuarial Accrued Liability	Valuation Assets	Assets as a Percent of Actuarial Accrued Liability	Unfunded Actuarial Accrued Liability (UAAL)
June 30, 2003	$ 5,835,609	$ 3,752,285	64.3%	$ 2,083,324
June 30, 2004	6,123,600	3,845,370	62.8%	2,278,230
June 30, 2005	6,498,556	3,958,939	60.9%	2,539,617
June 30, 2006	7,229,851	4,141,700	57.3%	3,088,151
June 30, 2007	7,189,403	4,424,399	61.5%	2,765,004
June 30, 2008	7,619,178	4,936,976	64.8%	2,682,202
June 30, 2009	7,847,514	4,472,958	57.0%	3,374,556
June 30, 2010	8,847,788	4,739,128	53.6%	4,108,660
June 30, 2011	9,128,795	4,937,937	54.1%	4,190,858
June 30, 2012	9,346,444	4,869,154	52.1%	4,477,290
June 30, 2013	9,592,107	4,974,076	51.9%	4,618,031
June 30, 2014	9,841,032	6,019,274	61.2%	3,821,758
June 30, 2015	9,729,117	8,108,923	83.3%	1,620,194
June 30, 2016	9,907,624	8,200,391	82.8%	1,707,233
June 30, 2017	10,144,618	8,313,637	82.0%	1,830,981
June 30, 2018	9,960,440	8,440,309	84.7%	1,520,131
June 30, 2019	9,906,664	8,511,493	85.9%	1,395,171
June 30, 2020	9,936,711	8,608,347	86.6%	1,328,364
June 30, 2021	9,911,490	9,178,106	92.6%	733,384
June 30, 2022	10,246,623	9,537,420	93.1%	709,203

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Section 2: Plan Assets

Section 2.1: Summary of Fair Value of Assets ($'s in 000's)

As of June 30, 2022	Pension	Healthcare	Total	Allocation Percent
Cash and Short-Term Investments				
- Cash and Cash Equivalents	$ 80,385	$ 42,932	$ 123,317	1.3%
- Subtotal	$ 80,385	$ 42,932	$ 123,317	1.3%
Fixed Income Investments				
- Domestic Fixed Income Pool	$ 1,284,523	$ 726,044	$ 2,010,567	21.3%
- International Fixed Income Pool	0	0	0	0.0%
- Tactical Fixed Income Pool	0	0	0	0.0%
- High Yield Pool	0	0	0	0.0%
- Treasury Inflation Protection Pool	0	0	0	0.0%
- Emerging Debt Pool	0	0	0	0.0%
- Subtotal	$ 1,284,523	$ 726,044	$ 2,010,567	21.3%
Equity Investments				
- Domestic Equity Pool	$ 1,461,935	$ 826,322	$ 2,288,257	24.2%
- International Equity Pool	793,625	448,533	1,242,158	13.2%
- Private Equity Pool	993,669	561,647	1,555,316	16.5%
- Emerging Markets Equity Pool	177,596	100,382	277,978	3.0%
- Alternative Equity Strategies	351,670	198,773	550,443	5.8%
- Subtotal	$ 3,778,495	$ 2,135,657	$ 5,914,152	62.7%
Other Investments				
- Real Estate Pool	$ 454,131	$ 257,109	$ 711,240	7.5%
- Other Investments Pool	434,931	245,834	680,765	7.2%
- Absolute Return Pool	0	0	0	0.0%
- Other Assets	0	318	318	0.0%
- Subtotal	$ 889,062	$ 503,261	$ 1,392,323	14.7%
Total Cash and Investments	$ 6,032,465	$ 3,407,894	$ 9,440,359	100.0%
Net Accrued Receivables	(5,814)	(15,683)	(21,497)	
Net Assets	$ 6,026,651	$ 3,392,211	$ 9,418,862	

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Section 2.2: Changes in Fair Value of Assets During FY22 ($'s in 000's)

Fiscal Year 2022	Pension	Healthcare	Total
1. Fair Value of Assets as of June 30, 2021	$ 6,731,481	$ 3,723,031	$ 10,454,512
2. Additions:			
a. Employee Contributions	$ 30,013	$ 0	$ 30,013
b. Employer Contributions	29,781	21,806	51,587
c. State Assistance Contributions	142,665	0	142,665
d. Interest and Dividend Income	86,780	48,505	135,285
e. Net Appreciation / Depreciation in Fair Value of Investments	(462,389)	(260,772)	(723,161)
f. Employer Group Waiver Plan	0	18,819	18,819
g. Other	36	47	83
h. Total Additions	$ (173,114)	$ (171,595)	$ (344,709)
3. Deductions:			
a. Medical Benefits	$ 0	$ 148,330	$ 148,330
b. Retirement Benefits	510,457	0	510,457
c. Refund of Contributions	1,305	0	1,305
d. Investment Expenses	16,149	8,851	25,000
e. Administrative Expenses	3,805	2,044	5,849
f. Total Deductions	$ 531,716	$ 159,225	$ 690,941
4. Fair Value of Assets as of June 30, 2022	$ 6,026,651	$ 3,392,211	$ 9,418,862
5. Approximate Fair Value Investment Return Rate during FY22 Net of Investment Expenses	(6.0%)	(6.0%)	(6.0%)

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Section 2.3: Development of Actuarial Value of Assets ($'s in 000's)

The actuarial value of asset was set equal to the fair value as of June 30, 2014 and the 20% corridor was eliminated. Investment gains and losses after June 30, 2014 are recognized 20% per year over 5 years.

	Pension	Healthcare	Total
1. Deferral of Investment Gain / (Loss) for FY22			
a. Fair Value of Assets as of June 30, 2021	$ 6,731,481	$ 3,723,031	$ 10,454,512
b. Contributions	202,459	21,806	224,265
c. Employer Group Waiver Plan	0	18,819	18,819
d. Benefit Payments	511,762	148,330	660,092
e. Administrative Expenses	3,805	2,044	5,849
f. Actual Investment Return (net of investment expenses)	(391,722)	(221,071)	(612,793)
g. Expected Return Rate (net of investment expenses)	7.38%	7.38%	7.38%
h. Expected Return, Weighted for Timing	489,218	270,782	760,000
i. Investment Gain / (Loss) for the Year, (f) - (h)	(880,940)	(491,853)	(1,372,793)
2. Actuarial Value as of June 30, 2022			
a. Fair Value as of June 30, 2022	$ 6,026,651	$ 3,392,211	$ 9,418,862
b. Deferred Investment Gain / (Loss)	(73,553)	(45,005)	(118,558)
c. Actuarial Value as of June 30, 2022, (a) - (b)	6,100,204	3,437,216	9,537,420
3. Ratio of Actuarial Value of Assets to Fair Value of Assets	101.2%	101.3%	101.3%
4. Approximate Actuarial Value Investment Return Rate during FY22 Net of Investment Expenses	8.7%	8.7%	8.7%

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The tables below show the development of the gains/(losses) to be recognized in the current year ($'s in 000's):

Pension				
Fiscal Year Ending	Asset Gain / (Loss)	Gain / (Loss) Recognized in Prior Years	Gain / (Loss) Recognized This Year	Gain / (Loss) Deferred to Future Years
June 30, 2018	$ 13,001	$ 10,400	$ 2,601	$ 0
June 30, 2019	(82,246)	(49,347)	(16,450)	(16,449)
June 30, 2020	(181,816)	(72,726)	(36,363)	(72,727)
June 30, 2021	1,200,625	240,125	240,125	720,375
June 30, 2022	(880,940)	0	(176,188)	(704,752)
Total	**$ 68,624**	**$ 128,452**	**$ 13,725**	**$ (73,553)**

Healthcare				
Fiscal Year Ending	Asset Gain / (Loss)	Gain / (Loss) Recognized in Prior Years	Gain / (Loss) Recognized This Year	Gain / (Loss) Deferred to Future Years
June 30, 2018	$ 9,619	$ 7,696	$ 1,923	$ 0
June 30, 2019	(38,309)	(22,986)	(7,661)	(7,662)
June 30, 2020	(92,367)	(36,946)	(18,474)	(36,947)
June 30, 2021	655,144	131,029	131,029	393,086
June 30, 2022	(491,853)	0	(98,371)	(393,482)
Total	**$ 42,234**	**$ 78,793**	**$ 8,446**	**$ (45,005)**

Total				
Fiscal Year Ending	Asset Gain / (Loss)	Gain / (Loss) Recognized in Prior Years	Gain / (Loss) Recognized This Year	Gain / (Loss) Deferred to Future Years
June 30, 2018	$ 22,620	$ 18,096	$ 4,524	$ 0
June 30, 2019	(120,555)	(72,333)	(24,111)	(24,111)
June 30, 2020	(274,183)	(109,672)	(54,837)	(109,674)
June 30, 2021	1,855,769	371,154	371,154	1,113,461
June 30, 2022	(1,372,793)	0	(274,559)	(1,098,234)
Total	**$ 110,858**	**$ 207,245**	**$ 22,171**	**$ (118,558)**

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Section 2.4: Historical Asset Rates of Return

	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%
June 30, 2016	5.1%	7.1%	(0.7%)	5.9%
June 30, 2017	5.6%	6.9%	12.9%	6.4%
June 30, 2018	6.2%	6.9%	8.2%	6.6%
June 30, 2019	5.5%	6.8%	5.9%	6.5%
June 30, 2020	5.8%	6.7%	4.1%	6.4%
June 30, 2021	11.6%	7.0%	30.1%	7.6%
June 30, 2022	8.7%	7.1%	(6.0%)	6.8%

* Cumulative since fiscal year ending June 30, 2005

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Section 3: Projections

Section 3.1: Projection Assumptions and Methods

Key Assumptions

- 7.25% investment return (net of investment expenses) on the Fair Value of Assets in all future years.
- The Actuarial Value of Assets was re-initialized to Fair Value as of June 30, 2014. The Actuarial Value of Assets after June 30, 2014 reflects the deferred gains and losses generated by the smoothing method. The current deferred amount is recognized in the first four years of the projections.
- Actuarial assumptions and methods as described in Section 5. No actuarial gains/losses are assumed after June 30, 2022 (other than the recognition of current deferred asset gains/losses).
- The actuarially calculated contribution rate using a two-year roll-forward approach is adopted each year.
- Projections assume a 0% increase in the total active member population. All new members are expected to enter the DCR plan.
- Contribution rates are determined as a percent of total DB and DCR payroll.
- The DCR contribution rate determined as of June 30, 2022 is assumed to remain constant in all future years.
- The active rehire assumption shown in Section 5 is assumed to grade to zero on a uniform basis over 20 years.
- The Normal Cost is increased by the administrative expenses shown in Section 5. For future years, the percent increase is assumed to remain constant.
- Board-adopted contribution rates for FY23 and FY24 are reflected.
- The healthcare Normal Cost is assumed to be deposited to the healthcare trust in FY25 and beyond.

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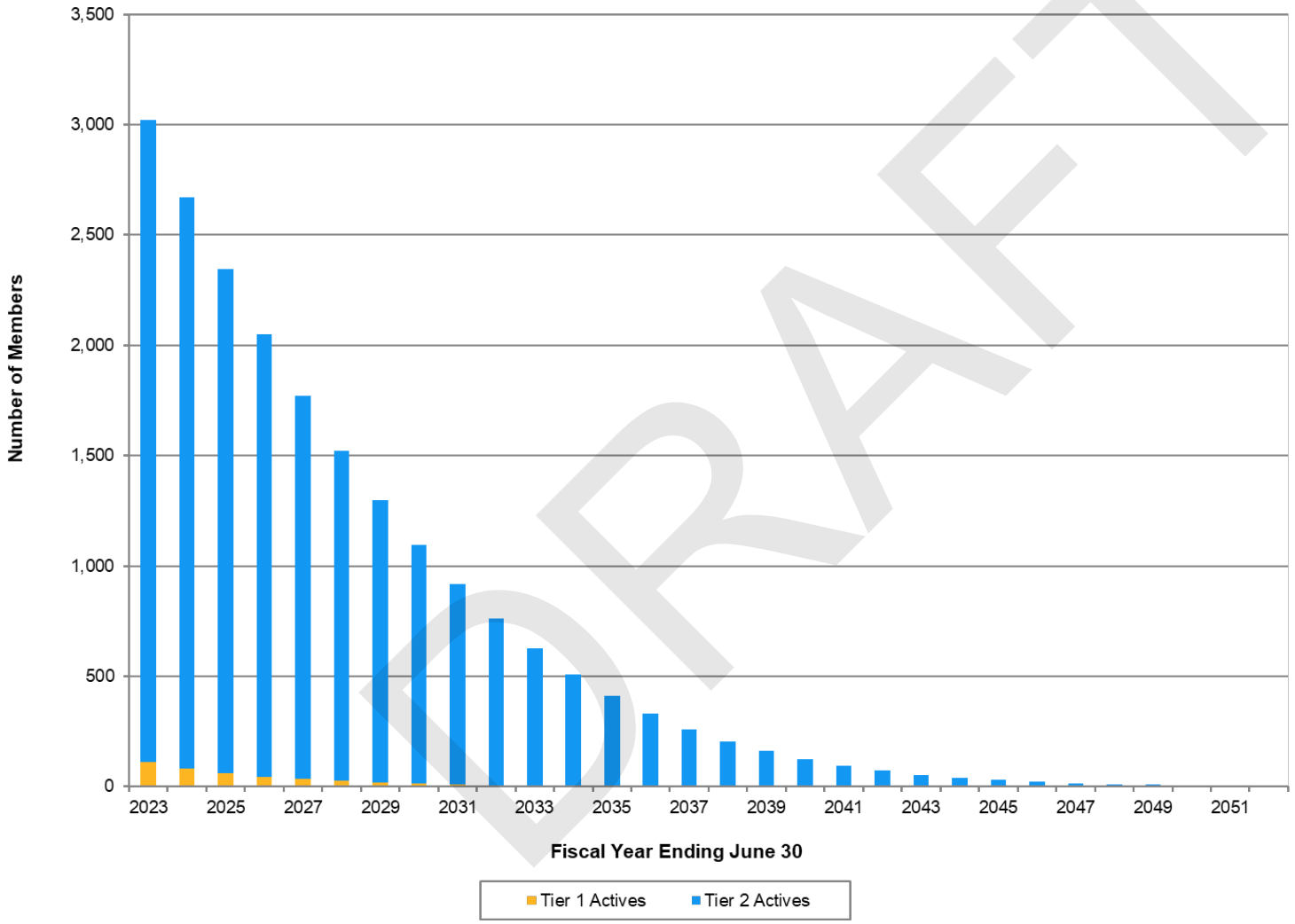
Section 3.2: Membership Projection

Projected Active Member Count



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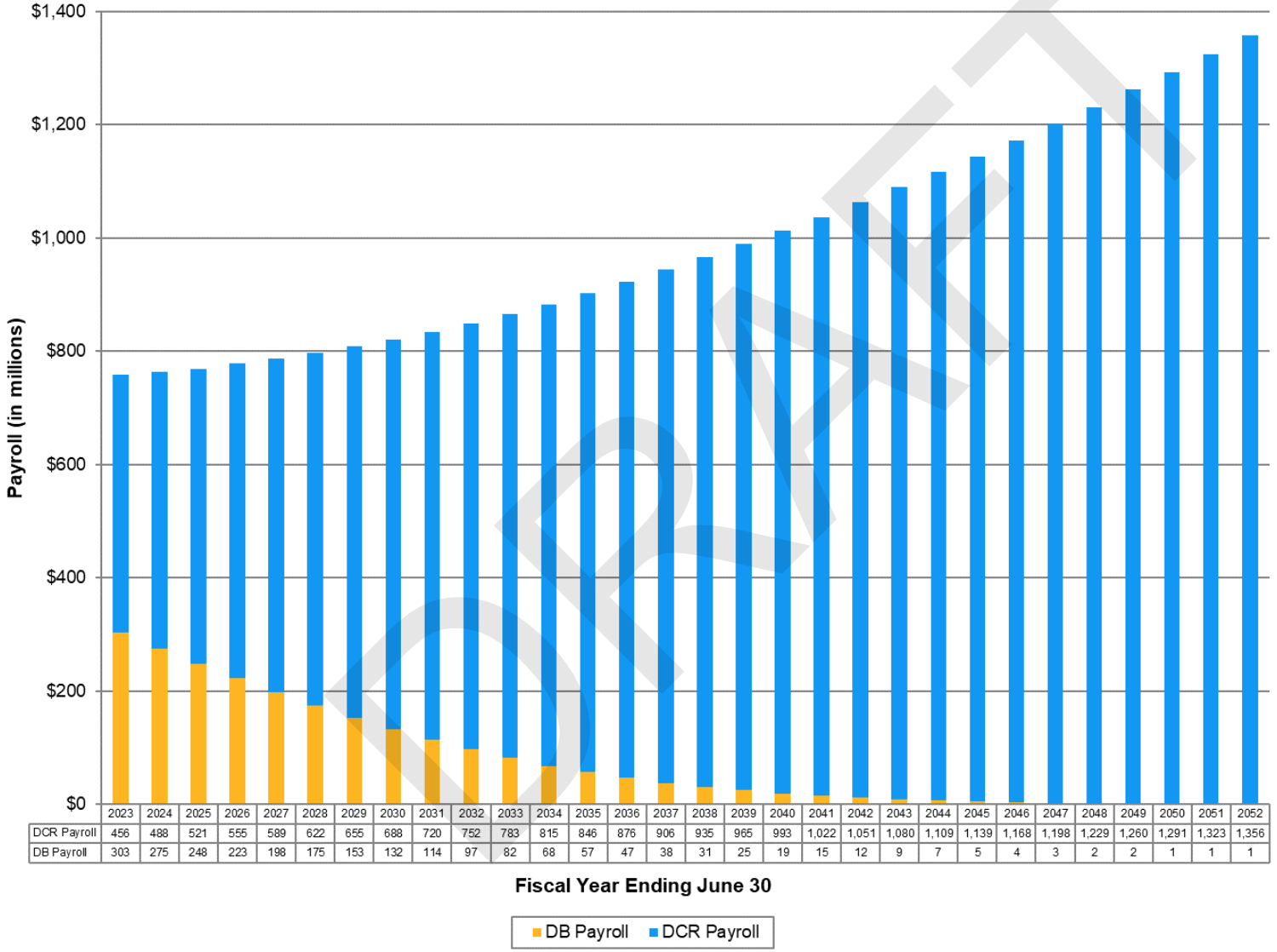
Projected DB and DCR Payroll



	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052
DCR Payroll	456	488	521	555	589	622	655	688	720	752	783	815	846	876	906	935	965	993	1,022	1,051	1,080	1,109	1,139	1,168	1,198	1,229	1,260	1,291	1,323	1,356
DB Payroll	303	275	248	223	198	175	153	132	114	97	82	68	57	47	38	31	25	19	15	12	9	7	5	4	3	2	2	1	1	1

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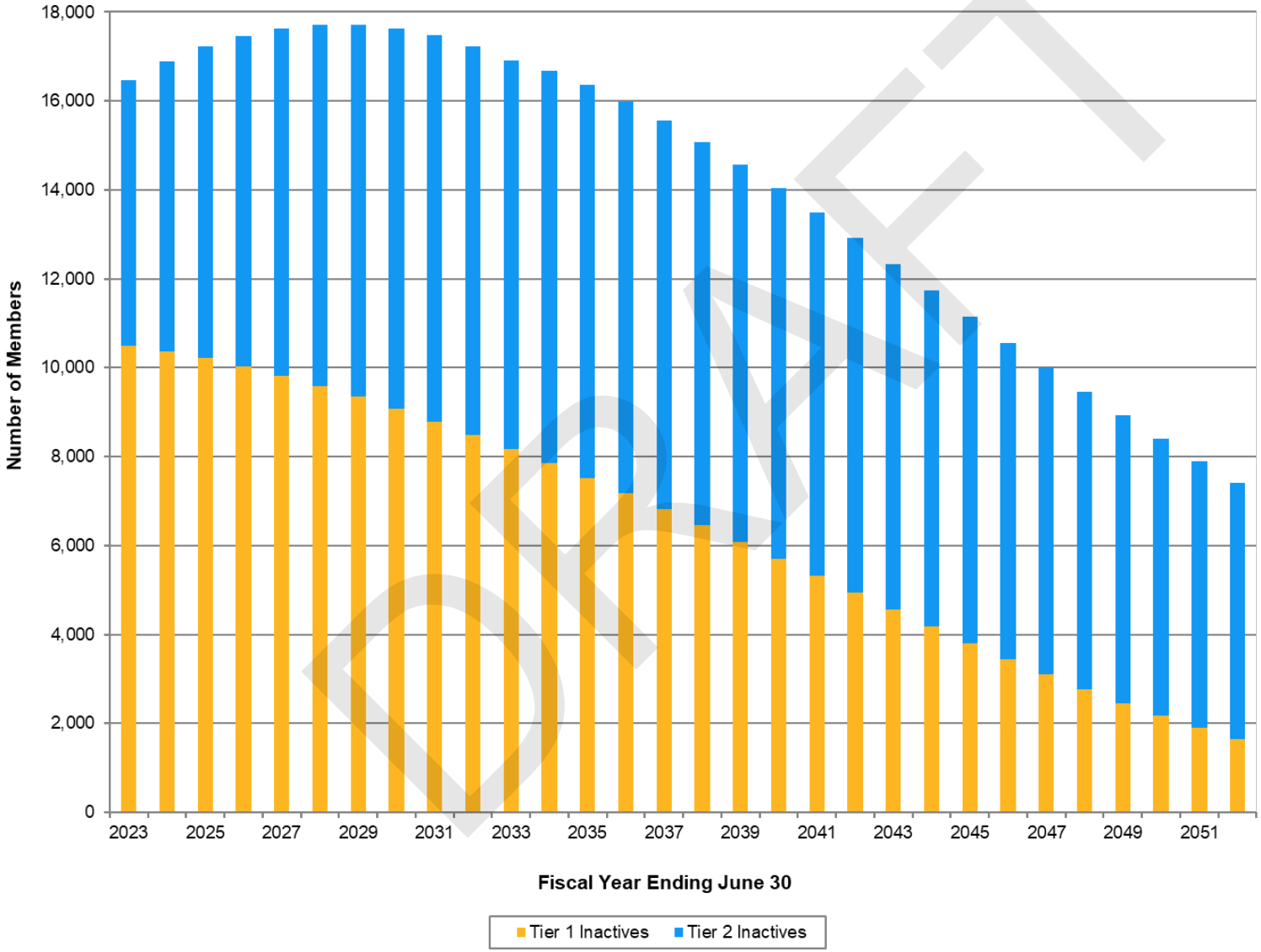
Projected Inactive Member Count



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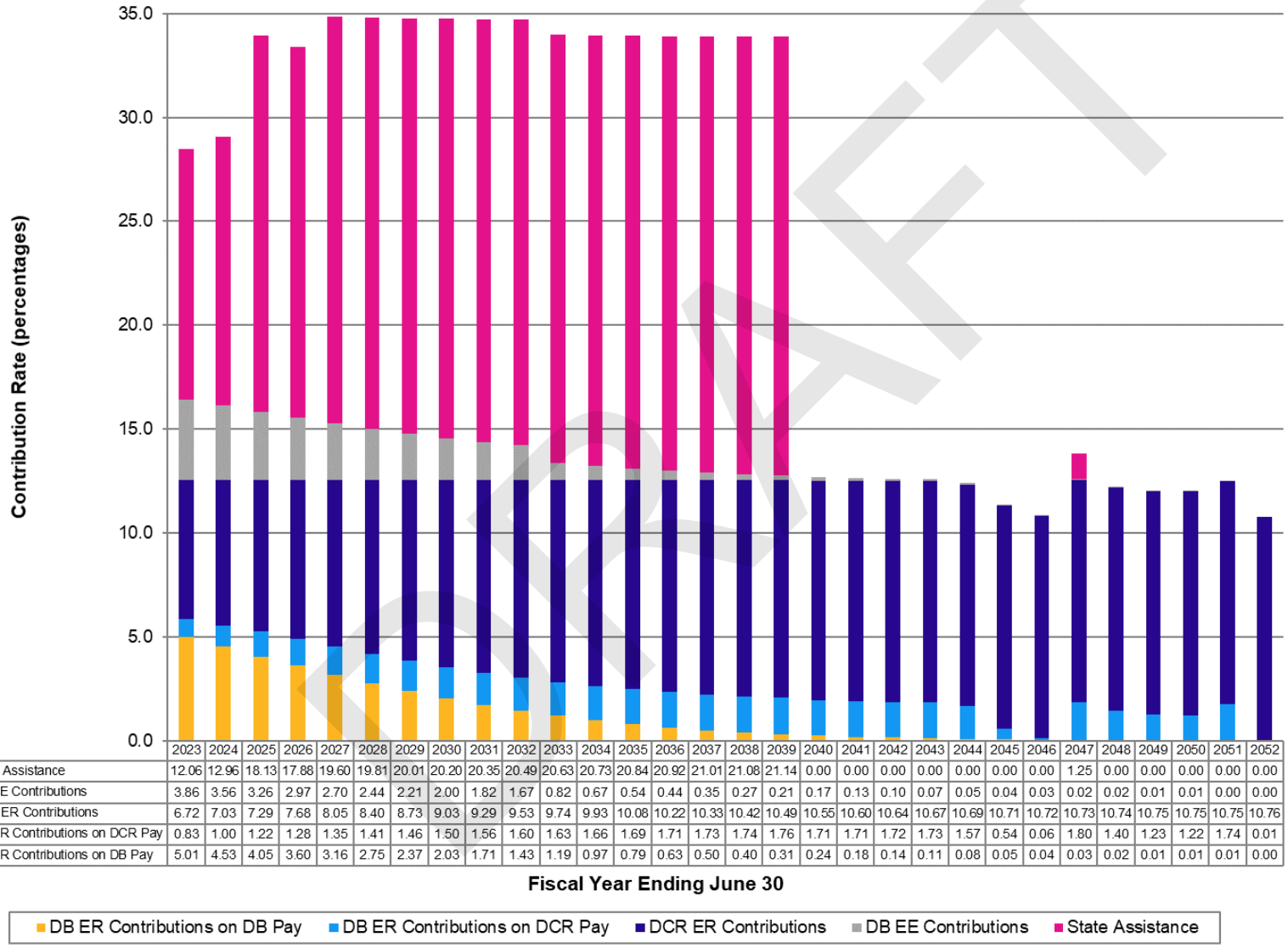
Section 3.3A: Projected Employer/State Contribution Rates

Based on Total DB and DCR Payroll



	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052
State Assistance	12.06	12.96	18.13	17.88	19.60	19.81	20.01	20.20	20.35	20.49	20.63	20.73	20.84	20.92	21.01	21.08	21.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.25	0.00	0.00	0.00	0.00	0.00
DB EE Contributions	3.86	3.56	3.26	2.97	2.70	2.44	2.21	2.00	1.82	1.67	0.82	0.67	0.54	0.44	0.35	0.27	0.21	0.17	0.13	0.10	0.07	0.05	0.04	0.03	0.02	0.02	0.01	0.01	0.00	0.00
DCR ER Contributions	6.72	7.03	7.29	7.68	8.05	8.40	8.73	9.03	9.29	9.53	9.74	9.93	10.08	10.22	10.33	10.42	10.49	10.55	10.60	10.64	10.67	10.69	10.71	10.72	10.73	10.74	10.75	10.75	10.75	10.76
DB ER Contributions on DCR Pay	0.83	1.00	1.22	1.28	1.35	1.41	1.46	1.50	1.56	1.60	1.63	1.66	1.69	1.71	1.73	1.74	1.76	1.71	1.71	1.72	1.73	1.57	0.54	0.06	1.80	1.40	1.23	1.22	1.74	0.01
DB ER Contributions on DB Pay	5.01	4.53	4.05	3.60	3.16	2.75	2.37	2.03	1.71	1.43	1.19	0.97	0.79	0.63	0.50	0.40	0.31	0.24	0.18	0.14	0.11	0.08	0.05	0.04	0.03	0.02	0.01	0.01	0.01	0.00

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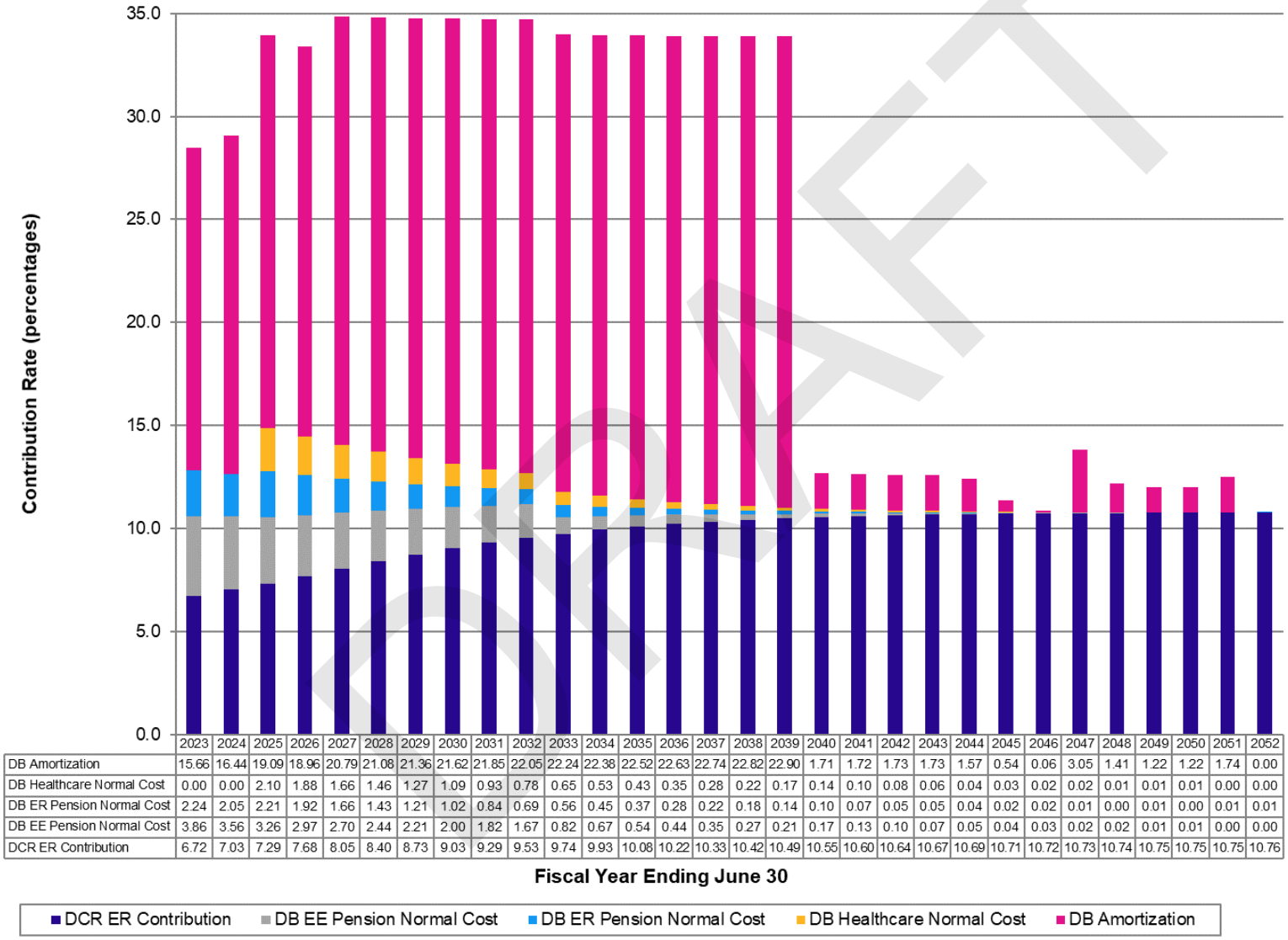
Section 3.3B: Components of Projected Total Contribution Rates

Based on Total DB and DCR Payroll



	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052
DB Amortization	15.66	16.44	19.09	18.96	20.79	21.08	21.36	21.62	21.85	22.05	22.24	22.38	22.52	22.63	22.74	22.82	22.90	1.71	1.72	1.73	1.73	1.57	0.54	0.06	3.05	1.41	1.22	1.22	1.74	0.00
DB Healthcare Normal Cost	0.00	0.00	2.10	1.88	1.66	1.46	1.27	1.09	0.93	0.78	0.65	0.53	0.43	0.35	0.28	0.22	0.17	0.14	0.10	0.08	0.06	0.04	0.03	0.02	0.02	0.01	0.01	0.01	0.00	0.00
DB ER Pension Normal Cost	2.24	2.05	2.21	1.92	1.66	1.43	1.21	1.02	0.84	0.69	0.56	0.45	0.37	0.28	0.22	0.18	0.14	0.10	0.07	0.05	0.05	0.04	0.02	0.02	0.01	0.00	0.01	0.00	0.01	0.01
DB EE Pension Normal Cost	3.86	3.56	3.26	2.97	2.70	2.44	2.21	2.00	1.82	1.67	0.82	0.67	0.54	0.44	0.35	0.27	0.21	0.17	0.13	0.10	0.07	0.05	0.04	0.03	0.02	0.02	0.01	0.01	0.00	0.00
DCR ER Contribution	6.72	7.03	7.29	7.68	8.05	8.40	8.73	9.03	9.29	9.53	9.74	9.93	10.08	10.22	10.33	10.42	10.49	10.55	10.60	10.64	10.67	10.69	10.71	10.72	10.73	10.74	10.75	10.75	10.75	10.76

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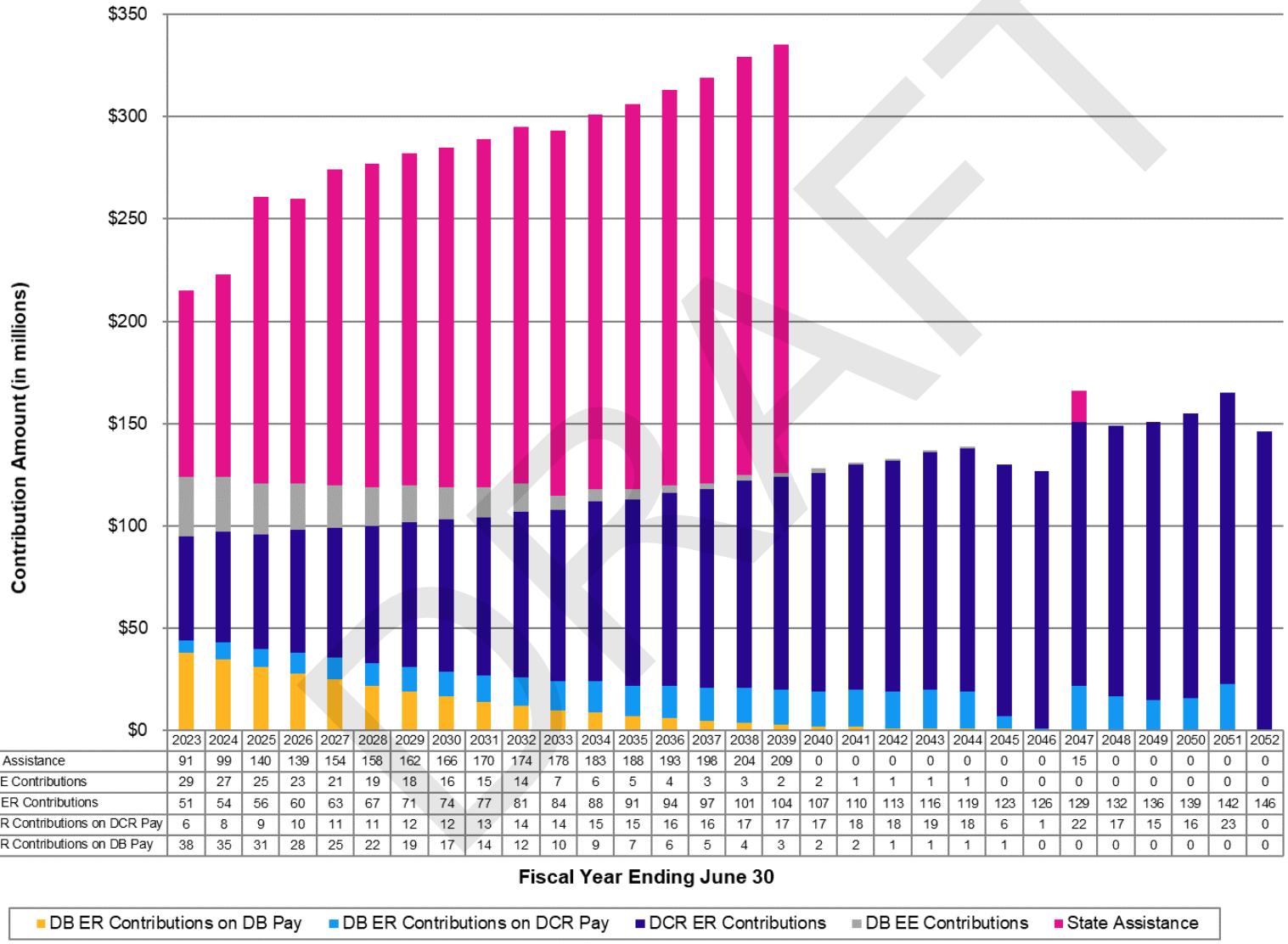
Section 3.4A: Projected Employer/State Contribution Amounts



	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052
State Assistance	91	99	140	139	154	158	162	166	170	174	178	183	188	193	198	204	209	0	0	0	0	0	0	0	15	0	0	0	0	0
DB EE Contributions	29	27	25	23	21	19	18	16	15	14	7	6	5	4	3	3	2	2	1	1	1	1	0	0	0	0	0	0	0	0
DCR ER Contributions	51	54	56	60	63	67	71	74	77	81	84	88	91	94	97	101	104	107	110	113	116	119	123	126	129	132	136	139	142	146
DB ER Contributions on DCR Pay	6	8	9	10	11	11	12	12	13	14	14	15	15	16	16	17	17	17	18	18	19	18	6	1	22	17	15	16	23	0
DB ER Contributions on DB Pay	38	35	31	28	25	22	19	17	14	12	10	9	7	6	5	4	3	2	2	1	1	1	1	0	0	0	0	0	0	0

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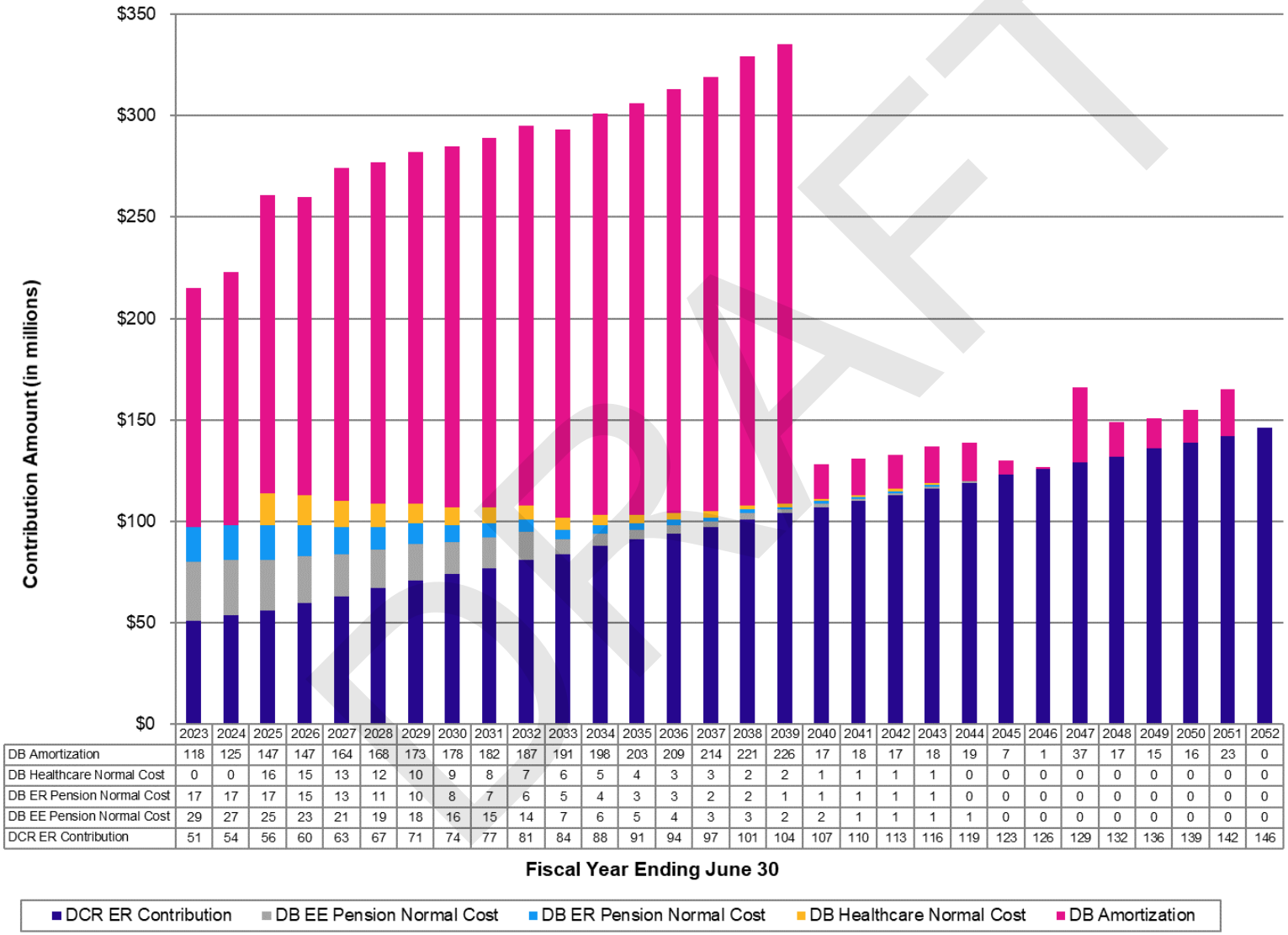
Section 3.4B: Components of Projected Total Contribution Amounts



	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052
DB Amortization	118	125	147	147	164	168	173	178	182	187	191	198	203	209	214	221	226	17	18	17	18	19	7	1	37	17	15	16	23	0
DB Healthcare Normal Cost	0	0	16	15	13	12	10	9	8	7	6	5	4	3	3	2	2	1	1	1	1	0	0	0	0	0	0	0	0	0
DB ER Pension Normal Cost	17	17	17	15	13	11	10	8	7	6	5	4	3	3	2	2	1	1	1	1	1	0	0	0	0	0	0	0	0	0
DB EE Pension Normal Cost	29	27	25	23	21	19	18	16	15	14	7	6	5	4	3	3	2	2	1	1	1	1	0	0	0	0	0	0	0	0
DCR ER Contribution	51	54	56	60	63	67	71	74	77	81	84	88	91	94	97	101	104	107	110	113	116	119	123	126	129	132	136	139	142	146

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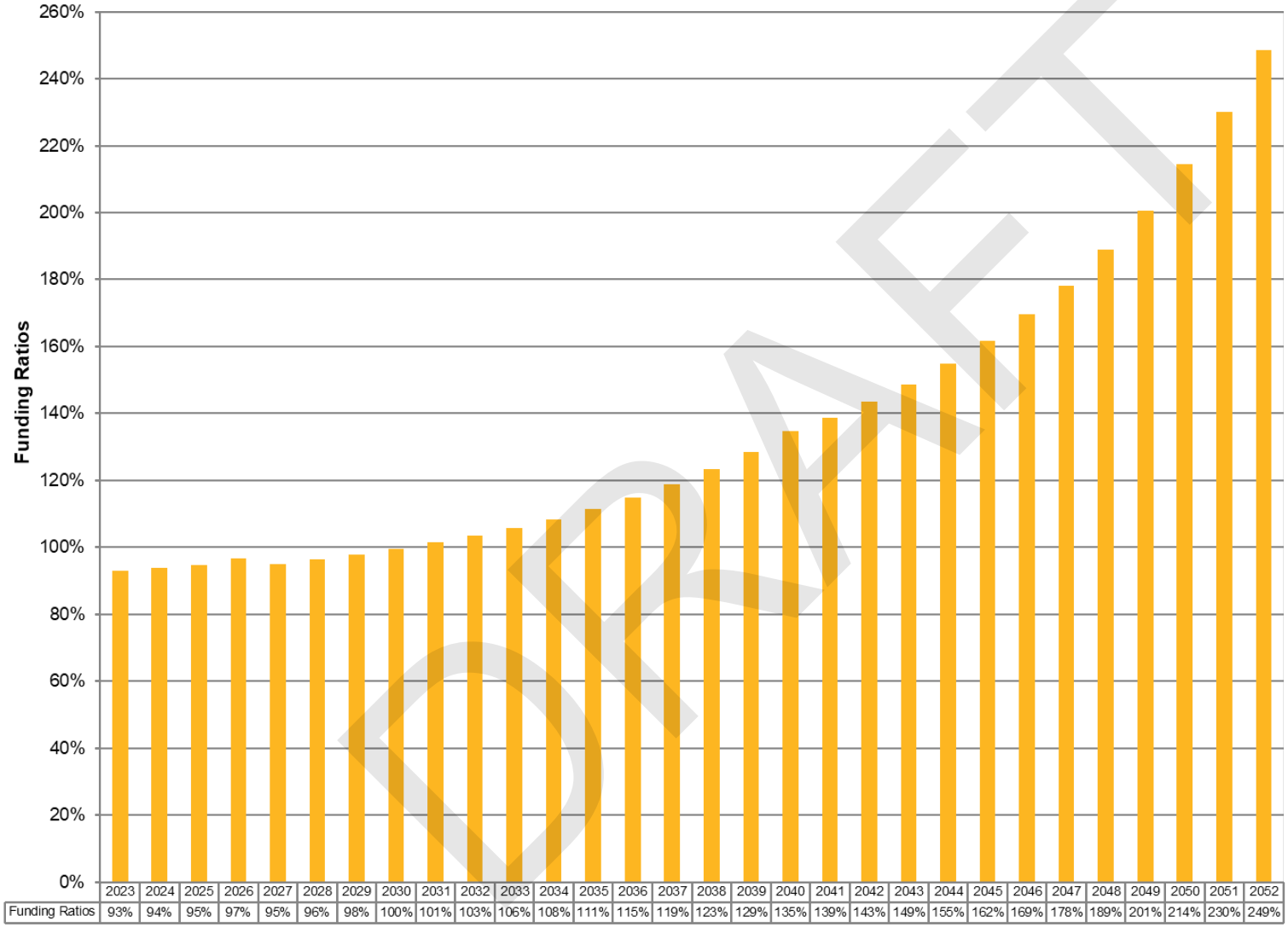
Section 3.5: Projection of Funded Ratios



	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052
Funding Ratios	93%	94%	95%	97%	95%	96%	98%	100%	101%	103%	106%	108%	111%	115%	119%	123%	129%	135%	139%	143%	149%	155%	162%	169%	178%	189%	201%	214%	230%	249%

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Section 3.6: Table of Projected Actuarial Results ($'s in 000's)

Fiscal Year End	Valuation Amounts on July 1 (Beginning of FY)				Cash Flow Amounts during Following 12 Months									Deferred Asset Gain / (Loss)
						Actuarial Contrib. Rates			DB Contributions					
	Actuarial Assets	Accrued Liability	Funding Ratio	Unfunded Liability / (Surplus)	Total Salaries	DB	DCR	Total	Employer	State Assistance	Employee	Total	Benefit Payments	
2023	$ 9,537,420	$ 10,246,623	93.1%	$ 709,203	$ 758,938	17.90%	6.72%	24.62%	$ 44,322	$ 91,029	$ 29,310	$ 164,661	$ 687,836	$ (136,205)
2024	9,692,055	10,341,483	93.7%	649,428	762,674	18.49%	7.03%	25.52%	42,176	98,766	27,141	168,083	713,234	(177,963)
2025	9,858,732	10,410,562	94.7%	551,830	769,543	23.40%	7.29%	30.69%	40,555	139,518	25,050	205,123	738,588	(274,559)
2026	10,103,358	10,454,691	96.6%	351,333	777,644	22.76%	7.68%	30.44%	37,949	139,043	23,117	200,109	762,473	0
2027	9,958,052	10,470,260	95.1%	512,208	786,668	24.11%	8.05%	32.16%	35,479	154,187	21,248	210,914	784,730	0
2028	10,085,798	10,458,669	96.4%	372,871	796,835	23.97%	8.40%	32.37%	33,149	157,853	19,446	210,448	806,853	0
2029	10,199,951	10,418,413	97.9%	218,462	807,915	23.84%	8.73%	32.57%	30,944	161,664	17,862	210,470	828,160	0
2030	10,300,857	10,348,748	99.5%	47,891	820,089	23.73%	9.03%	32.76%	28,949	165,658	16,420	211,027	846,576	0
2031	10,391,087	10,251,016	101.4%	(140,071)	833,636	23.62%	9.29%	32.91%	27,260	169,645	15,210	212,115	862,631	0
2032	10,472,832	10,126,135	103.4%	(346,697)	848,709	23.52%	9.53%	33.05%	25,716	173,900	14,151	213,767	876,591	0
2033	10,548,214	9,974,852	105.7%	(573,362)	865,045	23.45%	9.74%	33.19%	24,394	178,459	7,093	209,946	882,277	0
2034	10,619,676	9,797,766	108.4%	(821,910)	883,121	23.36%	9.93%	33.29%	23,227	183,071	5,917	212,215	889,551	0
2035	10,691,556	9,597,533	111.4%	(1,094,023)	902,185	23.32%	10.08%	33.40%	22,374	188,015	4,872	215,261	893,383	0
2036	10,768,241	9,376,403	114.8%	(1,391,838)	922,342	23.26%	10.22%	33.48%	21,583	192,954	4,058	218,595	893,881	0
2037	10,853,804	9,136,702	118.8%	(1,717,102)	943,547	23.24%	10.33%	33.57%	21,041	198,239	3,302	222,582	891,659	0
2038	10,952,375	8,880,230	123.3%	(2,072,145)	965,801	23.22%	10.42%	33.64%	20,668	203,591	2,608	226,867	886,105	0
2039	11,068,636	8,609,531	128.6%	(2,459,105)	989,011	23.21%	10.49%	33.70%	20,472	209,077	2,077	231,626	878,722	0
2040	11,206,246	8,325,739	134.6%	(2,880,507)	1,012,805	1.95%	10.55%	12.50%	19,750	0	1,722	21,472	869,182	0
2041	11,138,489	8,030,344	138.7%	(3,108,145)	1,037,390	1.89%	10.60%	12.49%	19,606	0	1,349	20,955	855,481	0
2042	11,079,587	7,726,974	143.4%	(3,352,613)	1,062,873	1.86%	10.64%	12.50%	19,769	0	1,063	20,832	838,903	0
2043	11,033,561	7,418,184	148.7%	(3,615,377)	1,089,093	1.84%	10.67%	12.51%	20,039	0	762	20,801	818,079	0
2044	11,005,829	7,108,072	154.8%	(3,897,757)	1,116,241	1.65%	10.69%	12.34%	18,417	0	558	18,975	795,642	0
2045	10,997,521	6,798,315	161.8%	(4,199,206)	1,143,969	0.59%	10.71%	11.30%	6,749	0	458	7,207	770,886	0
2046	11,002,147	6,491,422	169.5%	(4,510,725)	1,172,308	0.10%	10.72%	10.82%	1,172	0	352	1,524	746,300	0
2047	11,026,763	6,187,512	178.2%	(4,839,251)	1,201,260	3.08%	10.73%	13.81%	21,983	15,016	240	37,239	721,660	0
2048	11,116,299	5,886,925	188.8%	(5,229,374)	1,230,971	1.42%	10.74%	12.16%	17,480	0	246	17,726	698,170	0
2049	11,215,965	5,588,770	200.7%	(5,627,195)	1,261,453	1.24%	10.75%	11.99%	15,642	0	126	15,768	674,537	0
2050	11,345,376	5,293,413	214.3%	(6,051,963)	1,292,425	1.23%	10.75%	11.98%	15,897	0	129	16,026	651,156	0
2051	11,508,721	5,000,834	230.1%	(6,507,887)	1,324,176	1.75%	10.75%	12.50%	23,173	0	0	23,173	627,282	0
2052	11,716,101	4,711,773	248.7%	(7,004,328)	1,356,780	0.01%	10.76%	10.77%	136	0	0	136	603,329	0
								Total	$ 700,071	$ 2,819,685	$ 245,887	$ 3,765,643		

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Section 3.6: Table of Projected Actuarial Results ($'s in 000's) (continued)

Fiscal Year End	Valuation Amounts on July 1 (Beginning of FY)					
	Funding Ratio			Unfunded Liability / (Surplus)		
	Pension	Healthcare	Total	Pension	Healthcare	Total
2023	78.2%	140.7%	93.1%	$ 1,703,842	$ (994,639)	$ 709,203
2024	78.3%	142.0%	93.7%	1,698,645	(1,049,217)	649,428
2025	78.8%	143.9%	94.7%	1,668,540	(1,116,710)	551,830
2026	80.0%	147.4%	96.6%	1,577,316	(1,225,983)	351,333
2027	78.1%	146.2%	95.1%	1,721,863	(1,209,655)	512,208
2028	78.6%	149.0%	96.4%	1,670,745	(1,297,874)	372,871
2029	79.2%	152.3%	97.9%	1,611,261	(1,392,799)	218,462
2030	79.9%	155.9%	99.5%	1,542,720	(1,494,829)	47,891
2031	80.7%	160.0%	101.4%	1,464,321	(1,604,392)	(140,071)
2032	81.6%	164.6%	103.4%	1,375,311	(1,722,008)	(346,697)
2033	82.6%	169.8%	105.7%	1,274,772	(1,848,134)	(573,362)
2034	83.8%	175.6%	108.4%	1,161,419	(1,983,329)	(821,910)
2035	85.2%	182.2%	111.4%	1,034,136	(2,128,159)	(1,094,023)
2036	86.9%	189.7%	114.8%	891,525	(2,283,363)	(1,391,838)
2037	89.0%	198.1%	118.8%	732,622	(2,449,724)	(1,717,102)
2038	91.4%	207.5%	123.3%	555,877	(2,628,022)	(2,072,145)
2039	94.2%	218.2%	128.6%	359,975	(2,819,080)	(2,459,105)
2040	97.6%	230.2%	134.6%	143,299	(3,023,806)	(2,880,507)
2041	97.7%	243.9%	138.7%	135,177	(3,243,322)	(3,108,145)
2042	97.7%	259.4%	143.4%	125,935	(3,478,548)	(3,352,613)
2043	97.8%	276.9%	148.7%	115,416	(3,730,793)	(3,615,377)
2044	98.0%	296.5%	154.8%	103,516	(4,001,273)	(3,897,757)
2045	98.1%	318.4%	161.8%	92,085	(4,291,291)	(4,199,206)
2046	98.0%	342.7%	169.5%	91,631	(4,602,356)	(4,510,725)
2047	97.8%	369.8%	178.2%	96,711	(4,935,962)	(4,839,251)
2048	98.4%	400.1%	188.8%	64,466	(5,293,840)	(5,229,374)
2049	98.7%	434.4%	200.7%	50,409	(5,677,604)	(5,627,195)
2050	99.0%	473.4%	214.3%	37,278	(6,089,241)	(6,051,963)
2051	99.3%	518.1%	230.1%	22,873	(6,530,760)	(6,507,887)
2052	100.0%	569.3%	248.7%	(146)	(7,004,182)	(7,004,328)

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Section 3.7: Projected Pension Benefit Recipients and Amounts ($'s in 000's)

Fiscal Year End	Pension		Fiscal Year End	Pension	
	Recipient Counts	Benefit Amounts		Recipient Counts	Benefit Amounts
2023	14,126	$ 550,245	2061	3,214	$ 252,805
2024	14,609	568,379	2062	2,926	234,246
2025	15,021	585,728	2063	2,653	216,010
2026	15,372	601,776	2064	2,394	198,141
2027	15,663	616,595	2065	2,149	180,696
2028	15,881	630,201	2066	1,918	163,739
2029	16,020	642,414	2067	1,700	147,347
2030	16,079	652,806	2068	1,496	131,598
2031	16,071	661,318	2069	1,307	116,576
2032	15,974	668,212	2070	1,131	102,362
2033	15,811	666,955	2071	970	89,027
2034	15,568	669,193	2072	825	76,648
2035	15,254	669,276	2073	693	65,273
2036	14,876	667,217	2074	576	54,939
2037	14,460	663,100	2075	473	45,671
2038	13,980	657,207	2076	383	37,469
2039	13,480	649,134	2077	307	30,316
2040	12,963	639,305	2078	243	24,172
2041	12,416	627,824	2079	188	18,982
2042	11,857	614,595	2080	144	14,669
2043	11,280	599,853	2081	109	11,151
2044	10,696	583,913	2082	81	8,332
2045	10,123	566,826	2083	59	6,119
2046	9,562	548,818	2084	43	4,414
2047	9,014	530,064	2085	30	3,130
2048	8,486	510,689	2086	21	2,182
2049	7,978	490,853	2087	15	1,500
2050	7,486	470,728	2088	10	1,017
2051	7,009	450,452	2089	7	685
2052	6,548	430,117	2090	4	460
2053	6,106	409,801	2091	4	309
2054	5,682	389,559	2092	2	211
2055	5,276	369,439	2093	2	147
2056	4,889	349,476	2094	1	104
2057	4,520	329,695	2095	1	75
2058	4,168	310,119	2096	1	55
2059	3,834	290,767	2097	0	0
2060	3,516	271,655	2098	0	0

Counts include retirees, disabilitants, and beneficiaries.

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Section 4: Member Data

Section 4.1: Summary of Members Included

As of June 30	2018	2019	2020	2021	2022
Active Members					
1. Number	4,418	4,044	3,789	3,396	3,023[1]
2. Average Age	51.13	51.48	51.92	52.14	52.57
3. Average Credited Service	18.62	19.21	19.76	20.31	20.85
4. Average Entry Age	32.51	32.27	32.16	31.83	31.72
5. Average Annual Earnings	$ 87,374	$ 88,879	$ 90,564	$ 94,143	$ 97,702
6. Number Vested	4,418	4,044	3,789	3,396	3,023
7. Percent Who Are Vested	100.0%	100.0%	100.0%	100.0%	100.0%
Retirees, Disabilitants, and Beneficiaries					
1. Number	13,277	13,491	13,689	13,972	14,126
2. Average Age	70.78	71.30	71.85	72.26	72.60
3. Average Years Since Retirement	14.40	14.74	15.06	15.24	15.51
4. Average Monthly Pension Benefit					
a. Base	$ 2,273	$ 2,303	$ 2,330	$ 2,363	$ 2,411
b. COLA[2]	128	126	126	125	123
c. PRPA[2]	488	518	519	491	561
d. Adjustment	0	0	0	(1)	0
e. Sick	65	67	68	70	72
f. Total	$ 2,954	$ 3,014	$ 3,043	$ 3,048	$ 3,167
Vested Terminations (vested at termination, not refunded contributions, or commenced benefit)					
1. Number	797	812	764	727	729
2. Average Age	51.01	51.71	52.37	52.68	53.22
3. Average Monthly Pension Benefit	$ 1,350	$ 1,534	$ 1,579	$ 1,635	$ 1,725
Non-Vested Terminations (not vested at termination, not refunded contributions)					
1. Number	1,900	1,810	1,744	1,679	1,616
2. Average Account Balance	$ 20,872	$ 21,612	$ 22,591	$ 23,388	$ 23,906
Total Number of Members	**20,392**	**20,157**	**19,986**	**19,774**	**19,494**

[1] Includes 932 male active members and 2,091 female active members.

[2] Calculated by taking the average of the data field, as provided by the State of Alaska, for all participants in the group.

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Summary of Members Included

As of June 30, 2022	DB Tier 1	DB Tier 2	DB Total	DCR Tier 3	Grand Total
Active Members					
1. Number	113	2,910	3,023	5,688	8,711
2. Average Age	64.37	52.11	52.57	42.26	45.84
3. Average Credited Service	30.22	20.49	20.85	6.60	11.55
4. Average Entry Age	34.15	31.62	31.72	35.66	34.29
5. Annual Earnings					
a. Total	$ 11,438,370	$ 283,915,330	$ 295,353,700	$ 437,727,514	$ 733,081,214
b. Average	$ 101,225	$ 97,565	$ 97,702	$ 76,956	$ 84,156

Total and average annual earnings (“valuation pay”) are the annualized earnings for the fiscal year ending on the valuation date.

As of June 30, 2022	Tier 1	Tier 2	Total
Retirees, Disabilitants, and Beneficiaries			
1. Number	10,264	3,862	14,126
2. Average Age	74.99	66.26	72.60
3. Average Years Since Retirement	18.92	6.44	15.51
4. Average Monthly Pension Benefit			
a. Base	$ 2,392	$ 2,462	$ 2,411
b. COLA	147	60	123
c. PRPA	724	127	561
d. Adjustment	0	1	0
e. Sick	70	77	72
f. Total	$ 3,333	$ 2,727	$ 3,167

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Summary of Members Included

As of June 30, 2022	Active Members	Inactive Members				
		Retirees	Covered Spouses	Covered Children / Dependents	Deferred	Total Inactive Members
Retiree Medical Participants						
1. Retiree Coverage Only	2,997	7,814	0	0	423	8,237
2. Retiree + Spouse	0	3,996	3,996	0	543	8,535
3. Retiree + Children / Dependents	0	197	0	131	0	328
4. Family	0	318	318	505	0	1,141
5. Total	2,997	12,325	4,314	636	966	18,241

As of June 30, 2022	Retirees	Covered Spouses	Covered Children / Dependents	Deferred	Total Inactive Members
Retiree Medical Participants					
1. Pre-Medicare	2,200	1,260	636	947	5,043
2. Medicare Part A & B	9,907	3,020	0	19	12,946
3. Medicare Part B Only	218	34	0	0	252
4. Total	12,325	4,314	636	966	18,241

As of June 30, 2022	Retirees
Summary of Retiree Medical Data Received	
1. Retiree records on pension data	14,126
2. Remove duplicates on pension data	(533)
3. Valued in a different retiree healthcare plan[1]	(848)
4. Records without medical coverage	(461)
5. Medical only retirees	41
6. Total	12,325

[1] Each member's retiree medical benefits are valued in the plan indicated in the data from Aetna

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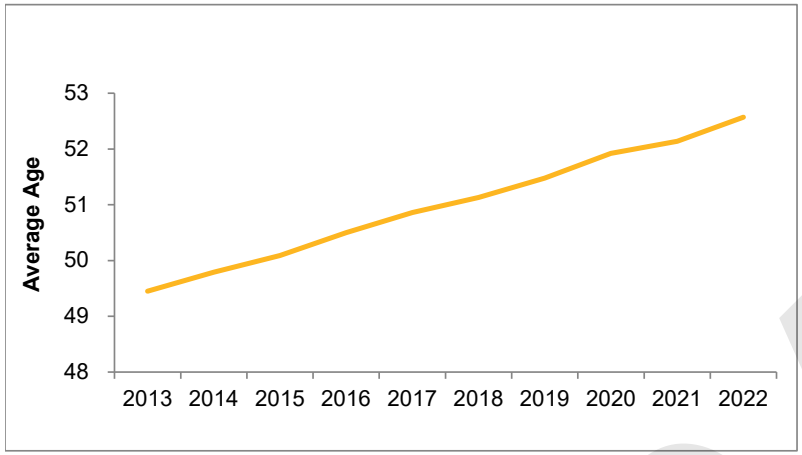
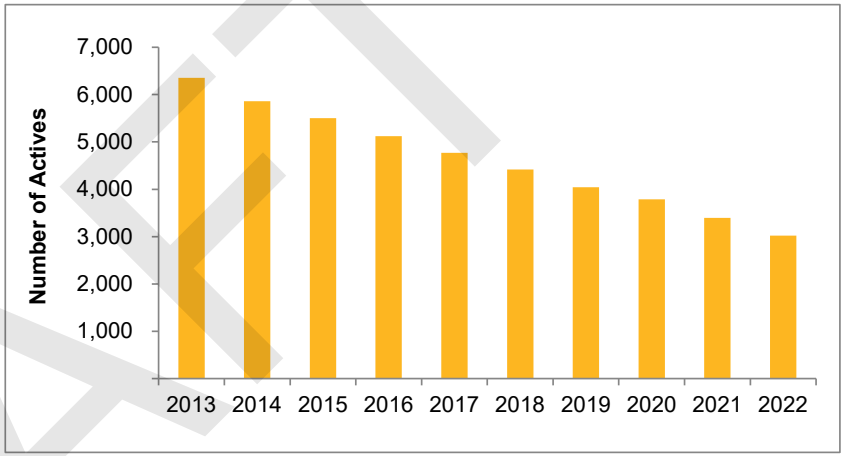
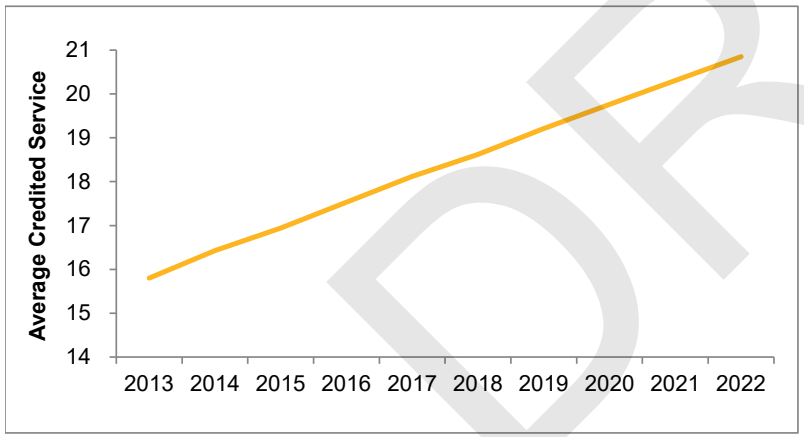
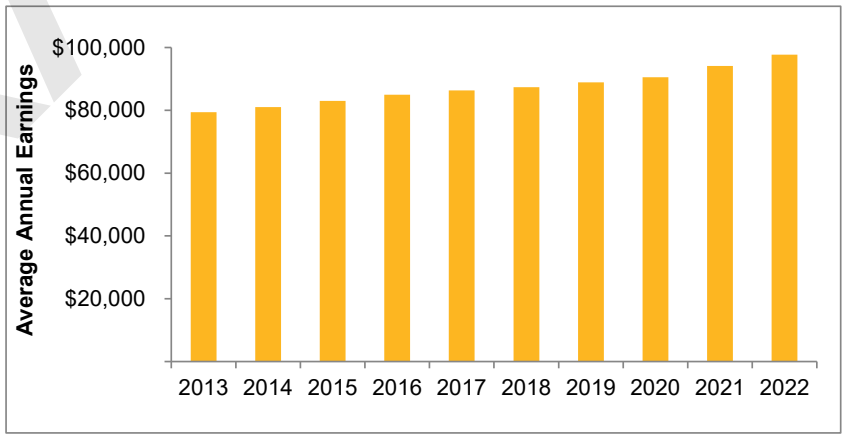
Summary of Members Included - Active Members at June 30









Average annual earnings (“valuation pay”) are the annualized earnings for the fiscal year ending on the valuation date.

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Section 4.2: Age and Service Distribution of Active Members

Annual Earnings by Age

Age	Number	Total Annual Earnings	Average Annual Earnings
0 - 19	0	$ 0	$ 0
20 - 24	0	0	0
25 - 29	0	0	0
30 - 34	0	0	0
35 - 39	10	908,821	90,882
40 - 44	420	39,180,439	93,287
45 - 49	742	71,832,639	96,809
50 - 54	881	87,454,084	99,267
55 - 59	527	52,125,887	98,911
60 - 64	272	26,873,041	98,798
65 - 69	104	10,236,778	98,431
70 - 74	48	4,872,498	101,510
75+	19	1,869,513	98,395
Total	**3,023**	**$295,353,700**	**$ 97,702**

Annual Earnings by Credited Service

Years of Service	Number	Total Annual Earnings	Average Annual Earnings
0	0	$ 0	$ 0
1	1	53,264	53,264
2	4	326,267	81,567
3	3	102,100	34,033
4	6	422,274	70,379
0 - 4	**14**	**$ 903,905**	**$ 64,565**
5 - 9	81	6,019,002	74,309
10 - 14	192	16,193,103	84,339
15 - 19	956	90,842,789	95,024
20 - 24	1,198	120,450,569	100,543
25 - 29	428	44,602,104	104,211
30 - 34	117	12,212,111	104,377
35 - 39	26	2,870,993	110,423
40+	11	1,259,124	114,466
Total	**3,023**	**$295,353,700**	**$ 97,702**

Years of Credited Service by Age

	Years of Service									
Age	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40+	Total
0 - 19	0	0	0	0	0	0	0	0	0	0
20 - 24	0	0	0	0	0	0	0	0	0	0
25 - 29	0	0	0	0	0	0	0	0	0	0
30 - 34	0	0	0	0	0	0	0	0	0	0
35 - 39	0	1	1	8	0	0	0	0	0	10
40 - 44	1	14	52	278	75	0	0	0	0	420
45 - 49	1	25	58	264	360	34	0	0	0	742
50 - 54	7	25	42	213	409	179	6	0	0	881
55 - 59	0	13	23	107	199	121	57	7	0	527
60 - 64	3	1	9	53	99	68	33	4	2	272
65 - 69	1	2	6	23	33	15	13	10	1	104
70 - 74	1	0	1	7	14	8	8	3	6	48
75+	0	0	0	3	9	3	0	2	2	19
Total	**14**	**81**	**192**	**956**	**1,198**	**428**	**117**	**26**	**11**	**3,023**

Total and average annual earnings (“valuation pay”) are the annualized earnings for the fiscal year ending on the valuation date.

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Section 4.3: Member Data Reconciliation

Pension

		Inactive Members					
	Active Members	Due a Refund	Deferred Benefits	Retired Members	Disabled Members	Bene-ficiaries	Total
As of June 30, 2021	**3,396**	**1,679**	**727**	**12,459**	**20**	**1,493**	**19,774**
Vested Terminations	(125)	0	125	0	0	0	0
Non-Vested Terminations	(4)	4	0	0	0	0	0
Refund of Contributions	0	(43)	(1)	0	0	0	(44)
Disability Retirements	0	0	0	0	0	0	0
Age Retirements	(300)	(6)	(84)	394	(4)	0	0
Deaths With Beneficiary	(4)	0	(2)	(117)	0	123	0
Deaths Without Beneficiary	(3)	(6)	(1)	(157)	0	(68)	(235)
Data Corrections	0	(2)	1	(1)	0	(20)	(22)
Transfers In/Out	9	0	0	0	0	0	9
Rehires	54	(10)	(36)	(8)	0	0	0
Pick Ups*	0	0	0	0	0	12	12
Net Change	**(373)**	**(63)**	**2**	**111**	**(4)**	**47**	**(280)**
As of June 30, 2022	**3,023**	**1,616**	**729**	**12,570**	**16**	**1,540**	**19,494**

* Pickup beneficiaries are primarily new DROs.

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Healthcare

		Inactive Members				
	Active Members	Retirees	Covered Spouses	Covered Children / Dependents	Deferred	Total Inactive Members
As of June 30, 2021	**3,366**	**12,138**	**4,266**	**661**	**971**	**18,036**
Vested Terminations	(92)	0	0	0	92	92
Non-Vested Terminations	(4)	0	0	0	0	0
Refund of Contributions	0	0	0	0	0	0
Disability Retirements	(1)	1	1	0	0	2
Age Retirements	(278)	278	162	88	0	528
Deferred Retirements	0	49	24	12	(49)	36
Retired without Medical Coverage	(44)	0	0	0	44	44
Deceased	(7)	(294)	(26)	(1)	(3)	(324)
New Beneficiaries	0	63	(63)	0	0	0
Added Retiree Medical Coverage	0	93	39	18	(59)	91
Added Dependent Coverage	0	0	53	39	0	92
Dropped Retiree Medical Coverage	0	(2)	(1)	0	2	(1)
Dropped Dependent Coverage	0	0	(140)	(181)	0	(321)
Rehires	60	(5)	(3)	0	(37)	(45)
Transfers In/Out	(3)	4	2	0	5	11
Net Change	**(369)**	**187**	**48**	**(25)**	**(5)**	**205**
As of June 30, 2022	**2,997**	**12,325**	**4,314**	**636**	**966**	**18,241**

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Section 4.4: Schedule of Active Member Data

Valuation Date	Number	Annual Earnings (000's)	Annual Average Earnings	Percent Increase in Average Earnings	Number of Participating Employers
June 30, 2022	3,023	$ 295,354	$ 97,702	3.8%	57
June 30, 2021	3,396	319,711	94,143	4.0%	56
June 30, 2020	3,789	343,146	90,564	1.9%	56
June 30, 2019	4,044	359,426	88,879	1.7%	56
June 30, 2018	4,418	386,016	87,373	1.2%	56
June 30, 2017	4,772	411,951	86,327	1.6%	57
June 30, 2016	5,123	435,222	84,955	2.4%	57
June 30, 2015	5,502	456,636	82,995	2.4%	58
June 30, 2014	5,861	474,873	81,023	2.1%	58
June 30, 2013	6,352	504,260	79,386	2.6%	58

Total and average annual earnings ("valuation pay") are the annualized earnings for the fiscal year ending on the valuation date.

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Section 4.5: Active Member Payroll Reconciliation

Payroll Field	Payroll Data (000's)
a) DRB actual reported salaries FY22 in employer list	$ 816,150
b) DRB actual reported salaries FY22 in valuation data	723,385
c) Annualized valuation data	733,081
d) Valuation payroll as of June 30, 2022	766,219
e) Rate payroll for FY23	758,938
f) Rate payroll for FY25	769,543

a) Actual reported salaries from DRB employer listing showing all payroll paid during FY22, including those who were not active as of June 30, 2022
b) Payroll from valuation data for people who are in active status as of June 30, 2022
c) Payroll from (b) annualized for both new entrants and part-timers
d) Payroll from (c) with one year of salary scale applied to estimate salaries payable for the upcoming year
e) Payroll from (d) with the part-timer annualization removed
f) Payroll from (e) with two years of assumed decrements and salary scale, and 0% population growth

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Section 4.6: Summary of New Pension Benefit Recipients

During the Year Ending June 30	2018	2019	2020	2021	2022
Service					
1. Number	465	367	331	447	394
2. Average Age at Commencement	59.98	59.87	59.71	59.79	58.49
3. Average Monthly Pension Benefit	$ 3,527	$ 3,562	$ 3,693	$ 3,593	$ 4,079
Survivor (including surviving spouse and DROs)					
1. Number	87	96	127	145	135
2. Average Age at Commencement	71.61	74.36	74.16	76.80	73.76
3. Average Monthly Pension Benefit	$ 2,022	$ 1,795	$ 1,903	$ 1,951	$ 2,071
Disability					
1. Number	3	5	2	1	0
2. Average Age at Commencement	49.92	51.51	53.65	54.35	0.00
3. Average Monthly Pension Benefit	$ 3,625	$ 4,182	$ 3,019	$ 4,886	$ 0
Total					
1. Number	555	468	460	593	529
2. Average Age at Commencement	61.75	62.75	63.67	63.94	62.39
3. Average Monthly Pension Benefit	$ 3,292	$ 3,206	$ 3,196	$ 3,194	$ 3,567

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Summary of New Pension Benefit Recipients

Average Pension Benefit Payments

	Years of Credited Service						
	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30+
Period 7/1/2021 – 6/30/2022:							
Average Monthly Pension	$ 1,073	$ 994	$ 1,828	$ 2,952	$ 3,984	$ 4,743	$ 6,936
Number of Recipients	5	19	15	69	139	101	46
Period 7/1/2020 – 6/30/2021:							
Average Monthly Pension	$ 451	$ 764	$ 1,509	$ 2,684	$ 3,625	$ 4,659	$ 6,090
Number of Recipients	8	24	33	83	142	112	46
Period 7/1/2019 – 6/30/2020:							
Average Monthly Pension	$ 243	$ 1,054	$ 1,647	$ 2,600	$ 3,616	$ 4,874	$ 6,772
Number of Recipients	8	19	26	72	90	78	40
Period 7/1/2018 – 6/30/2019:							
Average Monthly Pension	$ 334	$ 891	$ 1,540	$ 2,760	$ 3,567	$ 4,666	$ 6,777
Number of Recipients	4	23	39	87	93	85	41
Period 7/1/2017 – 6/30/2018:							
Average Monthly Pension	$ 204	$ 899	$ 1,583	$ 2,583	$ 3,422	$ 4,580	$ 6,083
Number of Recipients	5	21	61	85	109	130	57
Period 7/1/2016 – 6/30/2017:							
Average Monthly Pension	$ 426	$ 795	$ 1,626	$ 2,433	$ 3,549	$ 4,536	$ 6,351
Number of Recipients	10	22	60	75	100	64	48
Period 7/1/2015 – 6/30/2016:							
Average Monthly Pension	$ 245	$ 1,002	$ 1,535	$ 2,540	$ 3,445	$ 4,472	$ 6,168
Number of Recipients	11	31	82	69	105	74	54
Period 7/1/2014 – 6/30/2015:							
Average Monthly Pension	$ 349	$ 1,041	$ 1,342	$ 2,205	$ 3,267	$ 4,220	$ 5,900
Number of Recipients	11	33	70	67	137	125	94
Period 7/1/2013 – 6/30/2014:							
Average Monthly Pension	$ 235	$ 904	$ 1,435	$ 2,398	$ 3,016	$ 4,073	$ 7,485
Number of Recipients	8	31	31	28	22	18	12
Period 7/1/2012 – 6/30/2013:							
Average Monthly Pension	$ 253	$ 1,030	$ 1,496	$ 2,450	$ 3,281	$ 4,384	$ 6,052
Number of Recipients	10	57	67	90	101	79	64

“Average Monthly Pension” includes postretirement pension adjustments and cost-of-living increases.

Beneficiaries are not included in the table above.

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Section 4.7: Summary of All Pension Benefit Recipients

As of June 30	2018	2019	2020	2021	2022
Service					
1. Number, Fiscal Year Start	11,716	11,988	12,147	12,267	12,459
2. Net Change	272	159	120	192	111
3. Number, Fiscal Year End	11,988	12,147	12,267	12,459	12,570
4. Average Age at Commencement	55.70	55.82	55.93	56.05	56.12
5. Average Current Age	70.50	70.99	71.50	71.85	72.20
6. Average Monthly Pension Benefit	$ 3,093	$ 3,161	$ 3,199	$ 3,210	$ 3,338
Surviving Spouse (including DROs)					
1. Number, Fiscal Year Start	1,237	1,261	1,315	1,400	1,493
2. Net Change	24	54	85	93	47
3. Number, Fiscal Year End	1,261	1,315	1,400	1,493	1,540
4. Average Age at Commencement	63.16	63.73	64.49	65.32	65.24
5. Average Current Age	73.90	74.65	75.26	75.97	76.13
6. Average Monthly Pension Benefit	$ 1,618	$ 1,629	$ 1,665	$ 1,688	$ 1,770
Survivor (other than spouse)					
1. Number, Fiscal Year Start	3	3	3	2	0
2. Net Change	0	0	(1)	(2)	0
3. Number, Fiscal Year End	3	3	2	0	0
4. Average Age at Commencement	53.85	53.85	53.94	0.00	0.00
5. Average Current Age	60.65	61.65	61.56	0.00	0.00
6. Average Monthly Pension Benefit	$ 749	$ 765	$ 705	$ 0	$ 0
Disability					
1. Number, Fiscal Year Start	27	25	26	20	20
2. Net Change	(2)	1	(6)	0	(4)
3. Number, Fiscal Year End	25	26	20	20	16
4. Average Age at Commencement	44.40	45.75	46.74	47.37	46.92
5. Average Current Age	50.02	51.08	51.73	52.85	53.23
6. Average Monthly Pension Benefit	$ 3,494	$ 3,666	$ 3,658	$ 3,643	$ 3,752
Total					
1. Number, Fiscal Year Start	12,983	13,277	13,491	13,689	13,972
2. Net Change	294	214	198	283	154
3. Number, Fiscal Year End	13,277	13,491	13,689	13,972	14,126
4. Average Age at Commencement	56.38	56.56	56.79	57.02	57.09
5. Average Current Age	70.78	71.30	71.85	72.26	72.60
6. Average Monthly Pension Benefit	$ 2,954	$ 3,014	$ 3,043	$ 3,048	$ 3,167

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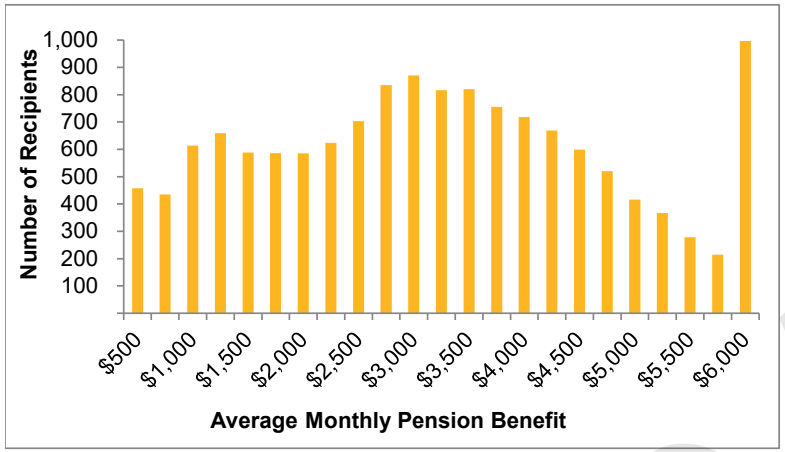
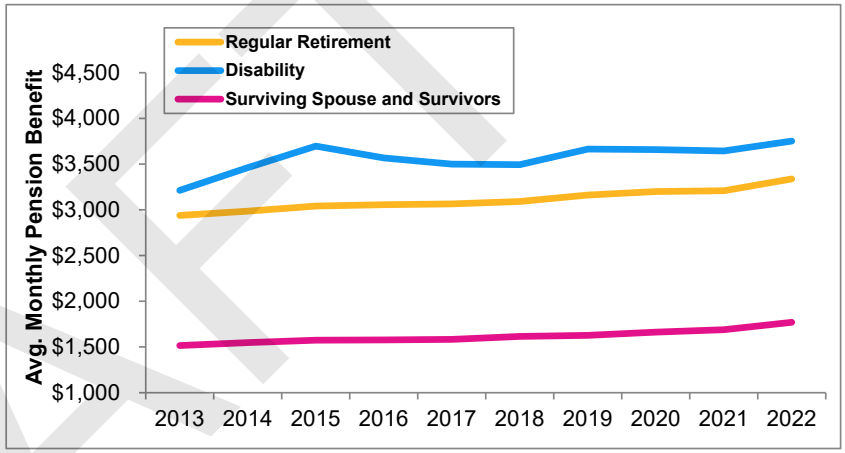
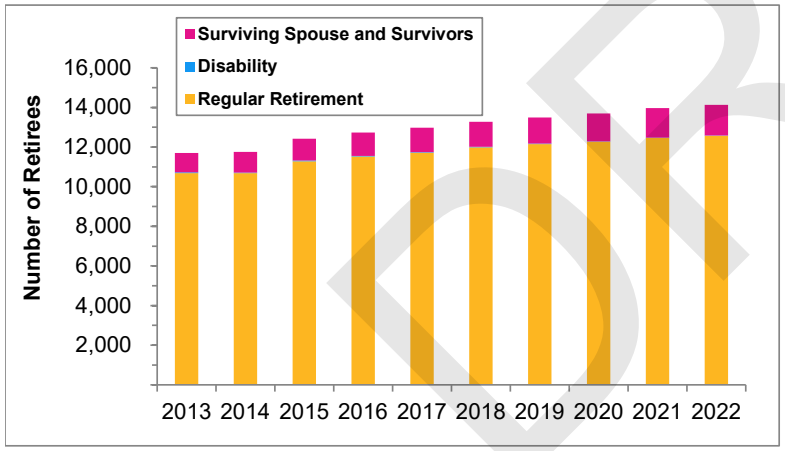
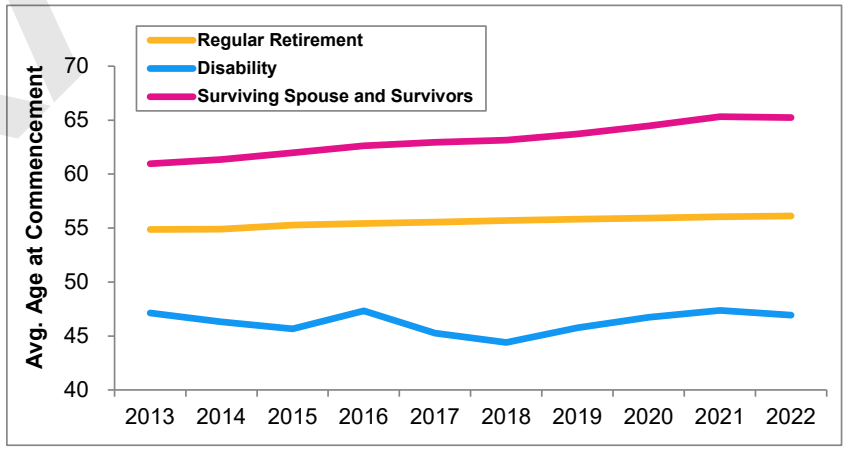
Summary of All Pension Benefit Recipients









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Summary of All Pension Benefit Recipients

Distribution of Annual Pension Benefits for Benefit Recipients

Annual Pension Benefit by Age

Age	Number	Total Annual Pension Benefit	Average Annual Pension Benefit
0 - 19	0	$ 0	$ 0
20 - 24	0	0	0
25 - 29	0	0	0
30 - 34	0	0	0
35 - 39	0	0	0
40 - 44	6	185,086	30,848
45 - 49	66	2,589,686	39,238
50 - 54	282	12,961,903	45,964
55 - 59	698	31,141,008	44,615
60 - 64	1,599	61,948,984	38,742
65 - 69	2,624	97,313,596	37,086
70 - 74	3,329	118,456,102	35,583
75+	5,522	212,304,175	38,447
Total	**14,126**	**$536,900,540**	**$ 38,008**

Annual Pension Benefit by Years Since Commenced

Years Since Comm.	Number	Total Annual Pension Benefit	Average Annual Pension Benefit
0	468	$ 19,871,349	$ 42,460
1	533	21,957,990	41,197
2	464	18,370,535	39,592
3	467	18,712,392	40,069
4	482	20,163,296	41,833
0 - 4	**2,414**	**$ 99,075,562**	**$ 41,042**
5 - 9	2,515	97,855,022	38,909
10 - 14	2,151	77,048,086	35,820
15 - 19	2,019	65,415,464	32,400
20 - 24	2,069	73,529,769	35,539
25 - 29	1,665	67,904,294	40,783
30 - 34	674	28,520,266	42,315
35 - 39	514	23,990,419	46,674
40+	105	3,561,658	33,921
Total	**14,126**	**$536,900,540**	**$ 38,008**

Years Since Commencement by Age

	Years Since Commencement									
Age	**0 - 4**	**5 - 9**	**10 - 14**	**15 - 19**	**20 - 24**	**25 - 29**	**30 - 34**	**35 - 39**	**40+**	**Total**
0 - 19	0	0	0	0	0	0	0	0	0	0
20 - 24	0	0	0	0	0	0	0	0	0	0
25 - 29	0	0	0	0	0	0	0	0	0	0
30 - 34	0	0	0	0	0	0	0	0	0	0
35 - 39	0	0	0	0	0	0	0	0	0	0
40 - 44	5	1	0	0	0	0	0	0	0	6
45 - 49	56	9	1	0	0	0	0	0	0	66
50 - 54	231	46	3	0	2	0	0	0	0	282
55 - 59	430	195	59	13	0	1	0	0	0	698
60 - 64	751	458	240	123	23	3	1	0	0	1,599
65 - 69	408	911	666	378	212	48	0	0	1	2,624
70 - 74	216	554	732	851	632	298	41	2	3	3,329
75+	317	341	450	654	1,200	1,315	632	512	101	5,522
Total	**2,414**	**2,515**	**2,151**	**2,019**	**2,069**	**1,665**	**674**	**514**	**105**	**14,126**

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Section 4.8: Pension Benefit Recipients by Type of Benefit and Option Elected

Amount of Monthly Pension Benefit	Number of Recipients	Type of Pension Benefit			Option Selected			
		1	2	3	1	2	3	4
$ 1 – 300	231	156	75	0	143	43	39	6
301 – 600	387	252	135	0	230	62	74	21
601 – 900	614	471	143	0	340	123	118	33
901 – 1,200	802	631	171	0	469	153	140	40
1,201 – 1,500	721	555	166	0	413	152	136	20
1,501 – 1,800	708	524	184	0	405	148	132	23
1,801 – 2,100	705	539	166	0	398	134	152	21
2,101 – 2,400	813	681	132	0	381	192	207	33
2,401 – 2,700	927	830	97	0	419	225	255	28
2,701 – 3,000	1,051	968	80	3	472	251	294	34
3,001 – 3,300	991	923	64	4	418	232	313	28
3,301 – 3,600	958	924	32	2	371	231	330	26
3,601 – 3,900	886	855	31	0	365	187	310	24
3,901 – 4,200	811	793	16	2	324	173	284	30
4,200+	3,521	3,468	48	5	1,369	652	1,380	120
Total	14,126	12,570	1,540	16	6,517	2,958	4,164	487

Type of Pension Benefit
1. Regular Retirement
2. Survivor Payment
3. Disability

Option Selected
1. Whole Life Annuity
2. 75% Joint and Contingent Annuity
3. 50% Joint and Contingent Annuity
4. 66 2/3% Joint and Survivor Annuity

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Section 4.9: Pension Benefit Recipients Added to and Removed from Rolls

Year Ended	Added to Rolls		Removed from Rolls		Rolls at End of Year		Percent Increase in Annual Pension Benefits	Average Annual Pension Benefit
	No.[1]	Annual Pension Benefits[1]	No.[1]	Annual Pension Benefits[1]	No.	Annual Pension Benefits		
June 30, 2022	529	$ 22,643,316	375	$ (3,174,745)	14,126	$ 536,900,540	5.1%	$ 38,008
June 30, 2021	593	22,728,504	310	11,391,465	13,972	511,082,479	2.3%	36,579
June 30, 2020	460	17,641,920	262	5,527,983	13,689	499,745,440	2.5%	36,507
June 30, 2019	468	18,004,896	254	871,684	13,491	487,631,503	3.6%	36,145
June 30, 2018	555	21,924,986	261	6,926,129	13,277	470,498,291	3.3%	35,437
June 30, 2017	487	17,151,684	230	7,736,025	12,983	455,499,434	2.1%	35,084
June 30, 2016	530	18,364,581	222	6,144,109	12,726	446,083,775	2.8%	35,053
June 30, 2015	888	34,120,658	220	3,531,501	12,418	433,863,303	7.6%	34,938
June 30, 2014	226	5,964,256	181	(1,150,187)	11,750	403,274,146	1.8%	34,321
June 30, 2013	576	19,387,542	172	1,652,575	11,705	396,159,703	4.7%	33,845

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[1] Numbers are estimated, and include other internal transfers.

Section 5: Basis of the Actuarial Valuation

Section 5.1: Summary of Plan Provisions

Effective Date

July 1, 1955, with amendments through June 30, 2022. Chapter 97, 1990 Session Laws of Alaska, created a two-tier retirement system. Members who were first hired under TRS before July 1, 1990 (Tier 1) are eligible for different benefits than members hired after June 30, 1990 (Tier 2). Chapter 9, 2005 Session Laws of Alaska, closed the plan to new members hired after June 30, 2006.

Administration of Plan

The Commissioner of Administration or the Commissioner's designee is the administrator of the system. The Attorney General of the state is the legal counsel for the system and shall advise the administrator and represent the system in legal proceedings.

Prior to June 30, 2005, the Teachers' Retirement Board prescribed policies and adopted regulations and performed other activities necessary to carry out the provisions of the system. The Alaska State Pension Investment Board, Department of Revenue, Treasury Division was responsible for investing TRS funds.

On July 27, 2005, Senate Bill 141, enacted as Chapter 9, 2005 Session laws of Alaska, replaced the Teachers' Retirement Board and the Alaska State Pension Investment Board with the Alaska Retirement Management Board.

Employers Included

Currently, there are 57 employers participating in TRS, including the State of Alaska, 53 school districts, and three other eligible organizations.

Membership

Membership in TRS is mandatory for the following employees hired before July 1, 2006:

- certificated full-time and part-time elementary and secondary teachers, certificated school nurses, and certificated employees in positions requiring teaching certificates;
- positions requiring a teaching certificate as a condition of employment in the Department of Education and Early Development and the Department of Labor and Workforce Development;
- University of Alaska full-time and part-time teachers, and full-time administrative employees in positions requiring academic standing if approved by the TRS administrator;
- certain full-time or part-time teachers of Alaska Native language or culture who have elected to be covered under TRS;
- members on approved sabbatical leave under AS 14.20.310;
- certain State legislators who have elected to be covered under TRS; and
- a teacher who has filed for worker's compensation benefits due to an on-the-job assault and who, as a result of the physical injury, is placed on leave without pay.

Employees participating in the University of Alaska's Optional Retirement Plan or other retirement plans funded by the State are not covered by TRS.

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Employees who work half-time in TRS and Public Employees' Retirement System (PERS) simultaneously are eligible for half-time TRS and PERS credit.

Senate Bill 141, signed into law on July 27, 2005, closes the plan effective July 1, 2006 to new members first hired on or after July 1, 2006.

Credited Service

TRS members receive a year of membership credit if they work a minimum of 172 days during the school year (July 1 through June 30 of the following year). Fractional credit is determined based on the number of days worked. Part-time members who work at least 50% of full-time receive membership credit for each day in proportion to full-time service. Credit is granted for all Alaskan public school service.

Members may claim other types of service, including:

- Outside teaching service in out-of-state schools or Alaska private schools (not more than ten years may be claimed);
- Military service (not more than five years of military service or ten years of combined outside and military service may be claimed);
- Alaska Bureau of Indian Affairs (BIA) service;
- Retroactive Alaskan service that was not creditable at the time it occurred, but later became creditable because of legislative change;
- Unused sick leave credit after members retire; and
- Leave of absence without pay.

Except for retroactive Alaska service that occurred before July 1, 1955, and unused sick leave, contributions are required for all claimed service.

Members receiving TRS disability benefits continue to earn TRS credit while disabled.

Survivors who are receiving occupational death benefits continue to earn TRS service credit while occupational survivor benefits are being paid.

Employer Contributions

TRS employers contribute the amounts required, in addition to employees' contributions, to fund the benefits of the system.

The normal cost rate is a uniform rate for all participating employers (less the value of members' contributions).

The past service rate is a uniform rate for all participating employers to amortize the unfunded past service liability with payments that are a level percentage of payroll amount over a closed 25-year period starting June 30, 2014. Effective June 30, 2018, each future year's unfunded service liability is separately amortized on a level percent of pay basis over 25 years.

Employer rates cannot be less than the normal cost rate.

Pursuant to AS14.25.070 effective July 1, 2008, each TRS employer will pay a simple uniform contribution rate of 12.56% of member payroll.

Additional State Contributions

Pursuant to AS14.25.085 effective July 1, 2008, the State shall contribute an amount (in addition to the State contribution as an employer) that, when combined with the employer contribution of 12.56%, will be sufficient to pay the total contribution rate adopted by the Board.

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Member Contributions

Mandatory Contributions: Members are required to contribute 8.65% of their base salaries. Members' contributions are deducted from gross salaries before federal income taxes are withheld.

Contributions for Claimed Service: Member contributions are also required for most of the claimed service described above.

1% Supplemental Contributions: Members who joined the system before July 1, 1982 and elected to participate in the supplemental contributions provision are required to contribute an additional 1% of their salaries. Supplemental contributions are deducted from gross salaries after federal income taxes are withheld. Under the supplemental provision, an eligible spouse or dependent child will receive a survivor's allowance or spouse's pension if the member dies (see below). Supplemental contributions are only refundable upon death (see below).

Interest: Members' contributions earn 4.5% interest, compounded annually on June 30.

Refund of Contributions: Terminated members may receive refunds of their member contribution accounts which includes their mandatory contributions, indebtedness payments, and interest earned. Terminated members' accounts may be attached to satisfy claims under Alaska Statute 09.38.065, federal income tax levies, and valid Qualified Domestic Relations Orders.

Reinstatement of Contributions: Refunded accounts and the corresponding TRS service may be reinstated upon reemployment in TRS prior to July 1, 2010. Interest accrues on refunds until paid in full or members retire.

Retirement Benefits

Eligibility

a. Members, including deferred vested members, are eligible for normal retirement at age 55 or early retirement at age 50 if they were hired before July 1, 1990 (Tier 1), and age 60 or early retirement at age 55 if they were hired on or after July 1, 1990 (Tier 2). Additionally, they must have at least:
   (i) eight years of paid-up membership service;
   (ii) 15 years of paid-up creditable service, the last five years of which are membership service, and they were first hired under TRS before July 1, 1975;
   (iii) five years of paid-up membership service and three years of paid-up Alaska Bureau of Indian Affairs service;
   (iv) 12 years of combined part-time and full-time paid-up membership service;
   (v) two years of paid-up membership service if they are vested in PERS; or
   (vi) one year of paid-up membership service if they are retired from PERS.

b. Members may retire at any age when they have:
   (i) 25 years of paid-up creditable service, the last five years of which are membership service;
   (ii) 20 years of paid-up membership service;
   (iii) 20 years of combined paid-up membership and Alaska Bureau of Indian Affairs service, the last five years of which are membership service; or
   (iv) 20 years of combined paid-up part-time and full-time membership service.

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Benefit Type

Lifetime benefits are paid to members. Eligible members may receive normal, unreduced benefits when they (1) reach normal retirement age and complete the service required; or (2) satisfy the minimum service requirements to retire at any age under (b) above. Members may receive early, actuarially reduced benefits when they reach early retirement age and complete the service required.

Members may select joint and survivor options and a last survivor option. Under these options and early retirement, benefits are actuarially adjusted so that members receive the actuarial equivalents of their normal benefit amounts.

Benefit Calculations

Retirement benefits are calculated by multiplying the average base salary (ABS) times the total TRS service times the percentage multiplier. The ABS is determined by averaging the salaries earned during the three highest school years. Members must earn at least 115 days of credit in a school year to include it in the ABS calculation. TRS pays a minimum benefit of $25.00 per month for each year of service when the calculated benefit is less.

The percentage multipliers are 2% for the first 20 years and 2.5% for all remaining service. Service before July 1, 1990 is calculated at 2%.

Salaries are subject to compensation limits under IRC 401(a)(17) for members first hired on or after July 1, 1996. Retirement benefit amounts are subject to IRC 415(b) limits regardless of hire date.

Indebtedness

Members who terminate and refund their TRS contributions are not eligible to retire unless they return to TRS employment and pay back their refunds plus interest or accrue additional service which qualifies them for retirement. TRS refunds must be paid in full if the corresponding service is to count toward the minimum service requirements for retirement. Refunded TRS service is included in total service for the purpose of calculating retirement benefits. However, when refunds are not completely paid before retirement, benefits are actuarially reduced for life. Indebtedness balances may also be created when a member purchases qualified claimed service.

Reemployment of Retired Members

Retirees who return to work in a permanent full-time or part-time TRS position after a Normal Retirement are eligible to return under the Standard Option.

Under the Standard Option, retirement and retiree healthcare benefits are suspended while retired members are reemployed under TRS. During reemployment, members earn additional TRS service and contributions are withheld from their wages.

Members retired under the Retirement Incentive Programs (RIPs) who return to employment will:

a. forfeit the three years of incentive credits that they received;

b. owe TRS 110% of the benefits that they received under the RIP, which may include costs for health insurance, excluding amounts that they paid to participate; and

c. be charged 7% interest from the date that they are reemployed until their indebtedness is paid in full or they retire again. If the indebtedness is not completely paid, future benefits will be actuarially reduced for life.

Employers make contributions to the unfunded liability of the plan on behalf of rehired retired members at the rate the employer is making contributions to the unfunded liability of the plan for other members.

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Postemployment Healthcare Benefits

When pension benefits begin, major medical benefits are provided by TRS to (1) all employees first hired before July 1, 1990 (Tier 1) and their surviving spouses and (2) members and their surviving spouses who have 25 years of membership service, are disabled or age 60 or older, regardless of their initial hire dates. Employees first hired after June 30, 1990 (Tier 2) and their surviving spouses may receive major medical benefits prior to age 60 by paying premiums.

Medical, prescription drug, dental, vision, and audio coverage is provided through the AlaskaCare Retiree Health Plan. Health plan provisions do not vary by retirement tier or age, except for Medicare coordination. Participants in dental, vision, and audio coverage pay a full self-supporting rate and those benefits are not included in this valuation.

Starting in 2022, prior authorization is required for certain specialty medications for all participants. There is no change to the medications that are covered by the plan.

Starting in 2022, certain preventive benefits for pre-Medicare participants are covered by the plan.

Surviving spouses continue coverage only if a pension payment form that provided survivor benefits was elected. Alternate payees (i.e. individuals who are the subject of a domestic relations order or DRO) are allowed to participate in the plan, but must pay the full cost.

Where premiums are required prior to age 60 (Tier 2), the valuation bases this payment upon the age of the retiree.

Participants in the defined benefit plan are covered under the following benefit design:

Plan Feature	Amounts
Deductible (single/family)	$150 / $450
Coinsurance (most services)	20%
Outpatient surgery/testing	0%
Maximum Out-of-Pocket (single/family, excluding deductible)	$800 / $2,400
Rx Copays (generic/brand/mail-order), does not apply to OOP max	$4 / $8 / $0
Lifetime Maximum	$2,000,000

The plan coordinates with Medicare on a traditional Coordination of Benefits Method. Starting in 2019, the prescription drug coverage is through a Medicare Part D EGWP arrangement.

Disability Benefits

Monthly disability benefits are paid to permanently disabled members until they die, recover, or become eligible for normal retirement. To be eligible, members must have at least five years of paid-up membership service.

Disability benefits are equal to 50% of the member's base salary at the time of disability. The benefit is increased by 10% of the base salary for each minor child, up to a maximum of 40%. Members continue to earn TRS service until eligible for normal retirement.

Members are appointed to normal retirement on the first of the month after they become eligible.

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Death Benefits

Monthly death benefits may be paid to a spouse or dependent children upon the death of a member. If monthly benefits are not payable under the supplemental contributions provision or occupational and non-occupational death provisions, the designated beneficiary receives the lump sum benefit described below.

Occupational Death

When an active member dies from occupational causes, a monthly survivor's pension may be paid to the spouse, unless benefits are payable under the supplemental contributions provision (see below). The pension equals 40% of the member's base salary on the date of death or disability, if earlier. If there is no spouse, the pension may be paid to the member's dependent children. On the member's normal retirement date, the benefit converts to a normal retirement benefit. The normal benefit is based on the member's average base salary on the date of death and service, including service accumulated from the date of the member's death to the normal retirement date.

Non-Occupational Death

When a vested member dies from non-occupational causes, the surviving spouse may elect to receive a monthly 50% joint and survivor benefit or a lump sum benefit, unless benefits are payable under the supplemental contributions provision (see below). The monthly benefit is calculated on the member's average base salary and TRS service accrued at the time of death.

Lump Sum Benefit

Upon the death of an active member who has less than one year of service or an inactive member who is not vested, the designated beneficiary receives the member's contribution account, which includes mandatory contributions, indebtedness payments, and interest earned. Any supplemental contributions will also be refunded. If the member has more than one year of TRS service or is vested, the beneficiary also receives $1,000 and $100 for each year of TRS service, up to a maximum of $3,000. An additional $500 may be payable if the member is survived by dependent children.

Supplemental Contributions Provision

Members are eligible for supplemental coverage if they joined TRS before July 1, 1982, elected to participate in the supplemental provision, and made the required contributions. A survivor's allowance or spouse's pension (see below) may be payable if the member made supplemental contributions for at least one year and dies while in membership service or while disabled under TRS. In addition, the allowance and pension may be payable if the member dies while retired or in deferred vested status if supplemental contributions were made for at least five years.

a. **Survivor's Allowance:** If the member is survived by dependent children, the surviving spouse and dependent children are entitled to a survivor's allowance. The allowance for the spouse is equal to 35% of the member's base salary at the time of death or disability, plus 10% for each dependent child up to a maximum of 40%. The allowance terminates and a spouse's pension becomes payable when there is no longer an eligible dependent child.

b. **Spouse's Pension:** The spouse's pension is equal to 50% of the retirement benefit that the deceased member was receiving or the unreduced retirement benefit that the deceased member would have received if retired at the time of death. The spouse's pension begins on the first of the month after the member's death or termination of the survivor's allowance.

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Death After Retirement

If a joint and survivor option was selected at retirement, the eligible spouse receives continuing, lifetime monthly benefits after the member dies. A survivor's allowance or spouse's pension may be payable if the member participated in the supplemental contributions provision. If a joint and survivor option was not selected and benefits are not payable under the supplemental contributions provision, the designated beneficiary receives the member's contribution account, less any benefits already paid and the member's last benefit check.

Postretirement Pension Adjustments

Postretirement pension adjustments (PRPAs) are granted annually to eligible benefit recipients when the consumer price index (CPI) for urban wage earners and clerical workers for Anchorage increases during the preceding calendar year. PRPAs are calculated by multiplying the recipient's base benefit including past PRPAs, but excluding the Alaska COLA, times:

a. The lesser of 75% of the CPI increase in the preceding calendar year or 9% if the recipient is at least age 65 or on TRS disability; or
b. The lesser of 50% of the CPI increase in the preceding calendar year or 6% if the recipient is at least age 60, or under age 60 if the recipient has been receiving benefits for at least eight years.

Ad hoc PRPAs, up to a maximum of 4%, may be granted to eligible recipients who were first hired before July 1, 1990 (Tier 1) if the CPI increases and the funded ratio is at least 105%.

In a year where an ad hoc PRPA is granted, eligible recipients will receive the higher of the two calculations.

Alaska Cost-of-Living Allowance (COLA)

Eligible benefit recipients who reside in Alaska receive an Alaska COLA equal to 10% of their base benefits. The following benefit recipients are eligible:

a. members who were first hired under TRS before July 1, 1990 (Tier 1) and their survivors;
b. members who were first hired under TRS after June 30, 1990 (Tier 2) and their survivors if they are at least age 65; and
c. all disabled members.

Changes in Benefit Provisions Valued Since the Prior Valuation

There were no changes in benefit provisions since the prior valuation.

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Section 5.2: Description of Actuarial Methods and Valuation Procedures

The funding method used in this valuation was adopted by the Board in October 2006. Changes in methods were adopted by the Board in January 2019 based on the experience study for the period July 1, 2013 to June 30, 2017. The asset smoothing method used to determine valuation assets was changed effective June 30, 2014.

Benefits valued are those delineated in Alaska State statutes as of the valuation date. Changes in State statutes effective after the valuation date are not taken into consideration in setting the assumptions and methods.

Actuarial Cost Method

Liabilities and contributions shown in the report are computed using the Entry Age Normal Actuarial Cost Method, level percent of pay.

Effective June 30, 2018, the Board adopted a layered UAAL amortization method: Layer #1 equals the sum of (i) the UAAL at June 30, 2018 based on the 2017 valuation, plus (ii) the FY18 experience gain/loss. Layer #1 is amortized over the remainder of the 25-year closed period that was originally established in 2014[1]. Layer #2 equals the change in UAAL at June 30, 2018 due to the experience study and EGWP implementation. Layer #2 is amortized over a separate closed 25-year period starting in 2018. Future layers will be created each year based on the difference between actual and expected UAAL occurring that year, and will be amortized over separate closed 25-year periods. The UAAL amortization continues to be on a level percent of pay basis. State statutes allow the contribution rate to be determined on payroll for all members, defined benefit and defined contribution member payroll combined.

Projected pension and postemployment healthcare benefits were determined for all active members. Cost factors designed to produce annual costs as a constant percentage of each member's expected compensation in each year from the assumed entry age to the assumed retirement age were applied to the projected benefits to determine the normal cost (the portion of the total cost of the plan allocated to the current year under the method). The normal cost is determined by summing intermediate results for active members and determining an average normal cost rate which is then related to the total payroll of active members. The actuarial accrued liability for active members (the portion of the total cost of the plan allocated to prior years under the method) was determined as the excess of the actuarial present value of projected benefits over the actuarial present value of future normal costs.

The actuarial accrued liability for retired members and their beneficiaries currently receiving benefits, terminated vested members and disabled members not yet receiving benefits was determined as the actuarial present value of the benefits expected to be paid. No future normal costs are payable for these members.

The actuarial accrued liability under this method at any point in time is the theoretical amount of the fund that would have been accumulated had annual contributions equal to the normal cost been made in prior years (it does not represent the liability for benefits accrued to the valuation date). The unfunded actuarial accrued liability is the excess of the actuarial accrued liability over the actuarial value of plan assets measured on the valuation date.

Under this method, experience gains or losses, i.e., decreases or increases in accrued liabilities attributable to deviations in experience from the actuarial assumptions, adjust the unfunded actuarial accrued liability.

[1] Layer #1 is referred to as "initial amount" in Sections 1.2 and 1.3.

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Valuation of Assets

The actuarial asset value was reinitialized to equal Fair Value of Assets as of June 30, 2014. Beginning in FY15, the asset valuation method recognizes 20% of the gain or loss each year, for a period of five years. All assets are valued at fair value. Assets are accounted for on an accrued basis and are taken directly from financial statements audited by KPMG LLP.

Changes in Methods Since the Prior Valuation

There were no changes in the asset or valuation methods since the prior valuation.

Valuation of Retiree Medical and Prescription Drug Benefits

This section outlines the detailed methodology used in the internal model developed by Buck to calculate the initial per capita claims cost rates for the TRS postemployment healthcare plan. Note that the methodology reflects the results of our annual experience rate update for the period from July 1, 2021 to June 30, 2022.

Base claims cost rates are incurred healthcare costs expressed as a rate per member per year. Ideally, claims cost rates should be derived for each significant component of cost that can be expected to require differing projection assumptions or methods (i.e., medical claims, prescription drug claims, administrative costs, etc.). Separate analysis is limited by the availability and historical credibility of cost and enrollment data for each component of cost. This valuation reflects non-prescription claims separated by Medicare status, including eligibility for free Part A coverage. Prescription costs are analyzed separately as in prior valuations. Administrative costs are assumed in the final per capita claims cost rates used for valuation purposes, as described below. Analysis to date on Medicare Part A coverage is limited since Part A claim data is not available by individual, nor is this status incorporated into historical claim data.

Benefits

Medical, prescription drug, dental, vision and audio coverage is provided through the AlaskaCare Retiree Health Plan and is available to employees of the State and subdivisions who meet retirement criteria based on the retirement plan tier in effect at their date of hire. Health plan provisions do not vary by retirement tier or age, except for Medicare coordination for those Medicare-eligible. Dental, vision and audio claims (DVA) are excluded from data analyzed for this valuation because those are retiree-pay all benefits where rates are assumed to be self-supporting. Buck relies upon rates set by a third-party for the DVA benefits. Buck reviewed historical rate-setting information and views contribution rate adjustments made are not unreasonable.

Administration and Data Sources

The plan was administered by Wells Fargo Insurance Services (acquired by HealthSmart, in January 2012) from July 1, 2009 through December 31, 2013 and by Aetna effective January 1, 2014.

Claims incurred for the period from July 2020 through June 2022 (FY21 through FY22) were provided by the State of Alaska from reports extracted from their data warehouse, which separated claims by Medicare status. Monthly enrollment data for the same period was provided by Aetna.

Aetna also provided census information identifying Medicare Part B only participants. These participants are identified when hospital claims are denied by Medicare; Aetna then flags that participant as a Part B only participant. Buck added newly identified participants to our list of Medicare Part B only participants. Buck assumes that once identified as Part B only, that participant remains in that status until we are notified otherwise.

Aetna provided a snapshot file as of July 1, 2022 of retirees and dependents that included a coverage level indicator. The monthly enrollment data includes double coverage participants. These are participants whereby both the retiree and spouse are retirees from the State and both are reflected with Couple coverage in the enrollment. In this case, such a couple would show up as four members in the

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monthly enrollment (each would be both a retiree and a spouse). As a result, the snapshot census file was used to adjust the total member counts in the monthly enrollment reports to estimate the number of unique participants enrolled in coverage. Based on the snapshot files from the last two valuations, the total member count in the monthly enrollment reports needs to be reduced by approximately 13% to account for the number of participants with double coverage.

Aetna does not provide separate experience by Medicare status in standard reporting so the special reports mentioned above from the data warehouse were used this year to obtain that information and incorporate it into the per capita rate development for each year of experience (with corresponding weights applied in the final per capita cost).

Methodology

Buck projected historical claim data to FY23 for retirees using the following summarized steps:

1. Develop historical annual incurred claim cost rates – an analysis of medical costs was completed based on claims information and enrollment data provided by the State of Alaska and Aetna for each year in the experience period of FY21 through FY22.
    - Costs for medical services and prescriptions were analyzed separately, and separate trend rates were developed to project expected future medical and prescription costs for the valuation year (e.g. from the experience period up through FY23).
    - Because the reports provided reflected incurred claims, no additional adjustment was needed to determine incurred claims to be used in the valuation.
    - An offset for costs expected to be reimbursed by Medicare was incorporated beginning at age 65. Alaska retirees who do not have 40 quarters of Medicare-covered compensation do not qualify for Medicare Part A coverage free of charge. This is a relatively small and closed group. Medicare was applied to State employment for all employees hired after March 31, 1986. For the “no-Part A” individuals who are required to enroll in Medicare Part B, the State is the primary payer for hospital bills and other Part A services. Claim experience is not available separately for participants with both Medicare Parts A and B and those with Part B only. For Medicare Part B only participants, a lower average claims cost was applied to retirees covered by both Medicare Part A and B vs. retirees covered only by Medicare Part B based upon manual rate models that estimate the Medicare covered proportion of medical costs. To the extent that no-Part A claims can be isolated and applied strictly to the appropriate closed group, actuarial accrued liability will be more accurate.
    - Based on census data received from Aetna, less than 1% of the current retiree population was identified as having coverage only under Medicare Part B. We assume that 2% of actives hired before April 1, 1986 and current retirees who are not yet Medicare eligible will not be eligible for Medicare Part A.
    - Based upon a reconciliation of valuation census data to the snapshot eligibility files provided by Aetna as of July 1, 2021, and July 1, 2022, Buck adjusted member counts used for duplicate records where participants have double coverage; i.e. primary coverage as a retiree and secondary coverage as the covered spouse of another retiree. This is to reflect the total cost per distinct individual/member which is then applied to distinct members in the valuation census.
    - Buck understands that pharmacy claims reported do not reflect rebates. Based on actual pharmacy rebate information provided by Optum, rebates were assumed to be 16.2% of pre-Medicare, and 14.3% of Medicare prescription drug claims for FY21; and 20.1% of pre-Medicare, and 13.5% of Medicare prescription drug claims for FY22.
2. Develop estimated EGWP reimbursements – Segal provided estimated 2023 EGWP subsidies, developed with the assistance of OptumRx. These amounts are applicable only to Medicare-eligible participants.

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3. Adjust for claim fluctuation, anomalous experience, etc. – explicit adjustments are often made for anticipated large claims or other anomalous experience. FY21 and FY22 experience was thoroughly reviewed to assess the impact of COVID-19 and whether an adjustment to FY21 and FY22 claims was appropriate for use in the June 30, 2022 valuation. FY21 medical per capita claims were noticeably lower than expected, so a 4% load was added to the FY21 medical claims used in the per capita claims cost development to better reflect future expected long-term costs of the plan. FY22 medical per capita claims were reasonable when compared to pre-COVID levels, so no adjustments were made to the FY22 medical claims used in the per capita claims cost development. Total prescription drug claims experience for FY21 and FY22 was reasonable and consistent with FY19 and FY20 experience. Therefore, no adjustment was made to FY21 and FY22 prescription drug claims. Due to group size and demographics, we did not make any additional large claim adjustments. We do blend both Alaska plan-specific and national trend factors as described below. Buck compared data utilized to lag reports and quarterly plan experience presentations provided by the State and Aetna to assess accuracy and reasonableness of data.
4. Trend all data points to the projection period – project prior years' experience forward to FY23 for retiree benefits on an incurred claim basis. Trend factors derived from historical Alaska-specific experience and national trend factors are shown in the table in item 5 below.
5. Apply credibility to prior experience – adjust prior year's data by assigning weight to recent periods, as shown at the right of the table below. The Board approved a change in the weighting of experience periods beginning with the June 30, 2017 valuation as outlined below. Note also that for both years of prescription drugs we averaged projected plan costs using Alaska-specific trend factors and national trend factors, assigning 75% weight to Alaska-specific trends and 25% to national trends. For both years of medical we applied 100% weight to national trends because the Alaska-specific trends were impacted by COVID-19:

Alaska-Specific and National Average Weighted Trend from Experience Period to Valuation Year			
Experience Period	**Medical**	**Prescription**	**Weighting Factors**
FY21 to FY22	8.1% Pre-Medicare / 4.8% Medicare	8.0%	50%
FY22 to FY23	7.4% Pre-Medicare / 5.6% Medicare	9.5%	50%

Trend assumptions used for rate development are assessed annually and as additional/improved reporting becomes available, we will incorporate into rate development as appropriate.

6. Starting in 2022, prior authorization is required for certain specialty medications. There is no change to the medications that are covered by the plan. Segal provided an estimate of the impact of this change to the DB retiree health plan cost for calendar year 2022. The resulting adjustment factors for pre-Medicare prescription drug, Medicare prescription drug, and EGWP costs were applied to claims experience incurred before January 1, 2022. Additionally, starting in 2022, certain preventive benefits for pre-Medicare participants are covered by the plan. Segal provided an estimate of the impact of this change to the DB retiree health plan cost for calendar year 2022. The resulting adjustment factor for pre-Medicare medical costs was applied to claims experience incurred before January 1, 2022.
7. Develop separate administration costs – no adjustments were made for internal administrative costs. Third party retiree plan administration fees for FY23 are based upon total fees projected to 2023 by Segal based on actual FY22 fees. The annual per participant per year administrative cost rate for medical and prescription benefits is $449.

Healthcare Reform

Healthcare Reform legislation passed on March 23, 2010 included several provisions with potential implications for the State of Alaska Retiree Health Plan liability. Buck evaluated the impact due to these provisions.

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Because the State plan is retiree-only, and was in effect at the time the legislation was enacted, not all provisions of the health reform legislation apply to the State plan. Unlimited lifetime benefits and dependent coverage to age 26 are two of these provisions. We reviewed the impact of including these provisions, but there was no decision made to adopt them, and no requirement to do so.

Because Transitional Reinsurance fees are only in effect until 2016, we excluded these for valuation purposes.

The Further Consolidated Appropriations Act, 2020 passed in December 2019 repealed several healthcare-related taxes, including the Cadillac Tax.

The Tax Cuts and Jobs Act passed in December 2017 included the elimination of the individual mandate penalty and changed the inflation measure for purposes of determining the limits for the High Cost Excise Tax to use chained CPI. It is our understanding the law does not directly impact other provisions of the ACA. While the nullification of the ACA's individual mandate penalty does not directly impact employer group health plans, it could contribute to the destabilization of the individual market and increase the number of uninsured. Such destabilization could translate to increased costs for employers. We have considered this when setting our healthcare cost trend assumptions and will continue to monitor this issue.

The Inflation Reduction Act was signed into law on August 16, 2022. The law contains several provisions that are expected to impact Alaska's Medicare prescription drug plan (EGWP), which will be considered at the next measurement date.

We have not identified any other specific provisions of healthcare reform or its potential repeal that would be expected to have a significant impact on the measured obligation. We will continue to monitor legislative activity.

Data

In accordance with actuarial standards, we note the following specific data sources and steps taken to value retiree medical benefits:

The Division of Retirement and Benefits provided pension valuation census data, which for people currently in receipt of healthcare benefits was supplemented by coverage data from the healthcare claims administrator (Aetna).

Certain adjustments and assumptions were made to prepare the data for valuation:

- All records provided with retiree medical coverage on the Aetna data were included in this valuation and we relied on the Aetna data as the source of medical coverage for current retirees and their dependents.
- Some records in the Aetna data were duplicates due to the double coverage (i.e. coverage as a retiree and as a spouse of another retiree) allowed under the plan. Records were adjusted for these members so that each member was only valued once. Any additional value of the double coverage (due to coordination of benefits) is small and reflected in the per capita costs.
- Covered children included in the Aetna data were valued until age 23, unless disabled. We assumed that those dependents over 23 were only eligible and valued due to being disabled.
- For individuals included in the pension data expecting a future pension, we valued health benefits starting at the same point that the pension benefit is assumed to start.

We are not aware of any other data issues that would be expected to have a material impact on the results and there are no unresolved matters related to the data.

The chart below shows the basis of setting the per capita claims cost assumption, which includes both PERS and TRS.

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	Medical		Prescription Drugs (Rx)	
	Pre-Medicare	Medicare	Pre-Medicare	Medicare
A. Fiscal 2021				
1. Incurred Claims	$ 196,566,470	$ 86,512,435	$ 60,691,609	$ 207,822,858
2. Adjustments for Rx Rebates and COVID (Medical only)	7,862,659	3,460,497	(9,832,041)	(29,718,669)
3. Net incurred claims	$ 204,429,129	$ 89,972,933	$ 50,859,568	$ 178,104,189
4. Average Enrollment	18,106	47,025	18,106	47,025
5. Claim Cost Rate (3) / (4)	11,291	1,913	2,809	3,787
6. Trend to Fiscal 2023	1.161	1.107	1.183	1.183
7. Fiscal 2023 Incurred Cost Rate (5) x (6)	$ 13,108	$ 2,117	$ 3,322	$ 4,479
8. Adjustment Factor for 2022 Plan Changes	1.014	1.000	0.913	0.976
9. Adjusted Fiscal 2023 Incurred Cost Rate (7) x (8)	$ 13,290	$ 2,117	$ 3,034	$ 4,371
B. Fiscal 2022				
1. Incurred Claims	$ 197,733,173	$ 98,249,082	$ 64,076,270	$ 230,832,315
2. Adjustments for Rx Rebates	0	0	(12,879,330)	(31,162,363)
3. Net incurred claims	$ 197,733,173	$ 98,249,082	$ 51,196,940	$ 199,669,953
4. Average Enrollment	17,072	48,698	17,072	48,698
5. Claim Cost Rate (3) / (4)	11,582	2,018	2,999	4,100
6. Trend to Fiscal 2023	1.074	1.056	1.095	1.095
7. Fiscal 2023 Incurred Cost Rate (5) x (6)	$ 12,439	$ 2,131	$ 3,284	$ 4,490
8. Adjustment Factor for 2022 Plan Changes	1.007	1.000	0.957	0.988
9. Adjusted Fiscal 2023 Incurred Cost Rate (7) x (8)	$ 12,526	$ 2,131	$ 3,141	$ 4,436

	Medical		Prescription Drugs (Rx)	
	Pre-Medicare	Medicare	Pre-Medicare	Medicare
C. Adjusted Incurred Cost Rate by Fiscal Year				
1. Fiscal 2021 A.(9)	13,290	2,117	3,034	4,371
2. Fiscal 2022 B.(9)	12,526	2,131	3,141	4,436
D. Weighting by Fiscal Year				
1. Fiscal 2021	50%	50%	50%	50%
2. Fiscal 2022	50%	50%	50%	50%
E. Fiscal 2023 Incurred Cost Rate				
1. Rate at Average Age C x D	$ 12,908	$ 2,124	$ 3,088	$ 4,403
2. Average Aging Factor	0.822	1.279	0.832	1.127
3. Rate at Age 65 (1) / (2)	$ 15,706	$ 1,661	$ 3,712	$ 3,907
F. Development of Part A&B and Part B Only Cost from Pooled Rate Above				
1. Part A&B Average Enrollment		48,233		
2. Part B Only Average Enrollment		465		
3. Total Medicare Average Enrollment B(4)		48,698		
4. Cost ratio for those with Part B only to those with Parts A&B		3.300		
5. Factor to determine cost for those with Parts A&B (2) / (3) x (4) + (1) / (3) x 1.00		1.022		
6. Medicare per capita cost for all participants: E(3)		$ 1,661		
7. Cost for those eligible for Parts A&B: (6) / (5)		$ 1,625		
8. Cost for those eligible for Part B only: (7) x (4)		$ 5,363		

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Following the development of total projected costs, a distribution of per capita claims cost was developed. This was accomplished by allocating total projected costs to the population census used in the valuation. The allocation was done separately for each of prescription drugs and medical costs for the Medicare eligible and pre-Medicare populations. The allocation weights were developed using participant counts by age and assumed morbidity and aging factors. Results were tested for reasonableness based on historical trend and external benchmarks for costs paid by Medicare.

Below are the results of this analysis:

Distribution of Per Capita Claims Cost by Age
for the Period July 1, 2022 through June 30, 2023

Age	Medical and Medicare Parts A & B	Medical and Medicare Part B Only	Prescription Drug	Medicare EGWP Subsidy
45	$ 9,585	$ 9,585	$ 2,382	$ 0
50	10,844	10,844	2,829	0
55	12,270	12,270	3,369	0
60	13,882	13,882	3,532	0
65	1,625	5,363	3,907	1,309
70	1,794	5,921	4,335	1,452
75	1,981	6,537	4,810	1,611
80	2,209	7,289	4,738	1,587

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Section 5.3: Summary of Actuarial Assumptions

The demographic and economic assumptions used in the June 30, 2022 valuation are described below. Unless noted otherwise, these assumptions were adopted by the Board at the June 2022 meeting based on the experience study for the period July 1, 2017 to June 30, 2021.

Investment Return

7.25% per year, net of investment expenses.

Salary Scale

Salary scale rates based on the 2017-2021 actual experience (see Table 1).

Inflation – 2.50% per year.

Productivity – 0.25% per year.

Payroll Growth

2.75% per year (inflation + productivity).

Total Inflation

Total inflation as measured by the Consumer Price Index for urban and clerical workers for Anchorage is assumed to increase 2.50% annually.

Mortality (Pre-Commencement)

Mortality rates based on the 2017-2021 actual experience, to the extent the experience was statistically credible.

- Pension: Pub-2010 Teachers Employee table, amount-weighted, and projected with MP-2021 generational improvement.
- Healthcare: Pub-2010 Teachers Employee table, headcount-weighted, and projected with MP-2021 generational improvement.

Deaths are assumed to result from occupational causes 15% of the time.

Mortality (Post-Commencement)

Mortality rates based on the 2017-2021 actual experience, to the extent the experience was statistically credible.

Retiree mortality in accordance with the following tables:

- Pension: 97% of male and 97% of female rates of the Pub-2010 Teachers Retiree table, amount-weighted, and projected with MP-2021 generational improvement.
- Healthcare: 98% of male and 100% of female rates of the Pub-2010 Teachers Retiree table, headcount-weighted, and projected with MP-2021 generational improvement.

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Beneficiary mortality in accordance with the following tables. These tables are applied only after the death of the original member.

- Pension: 100% of male and 95% of female rates of the Pub-2010 Contingent Survivor table, amount-weighted, and projected with MP-2021 generational improvement.
- Healthcare: 100% of male and 94% of female rates of the Pub-2010 Contingent Survivor table, headcount-weighted, and projected with MP-2021 generational improvement.

Turnover

Select and ultimate rates based on the 2017-2021 actual experience (see Table 2).

Disability

No changes to the incidence rates from the prior valuation due to insufficient 2017-2021 actual experience (see Table 3). Disability rates cease once a member is eligible for retirement.

Post-disability mortality in accordance with the following tables:

- Pension: Pub-2010 Non-Safety Disabled Retiree table, amount-weighted, and projected with MP-2021 generational improvement.
- Healthcare: Pub-2010 Non-Safety Disabled Retiree table, headcount-weighted, and projected with MP-2021 generational improvement.

Retirement

Retirement rates based on the 2017-2021 actual experience (see Table 4).

Deferred vested members are assumed to retire at their earliest unreduced retirement date.

The modified cash refund annuity is valued as a three-year certain and life annuity.

Spouse Age Difference

Males are assumed to be three years older than their wives. Females are assumed to be two years younger than their husbands.

Percent Married for Pension

85% of male members and 75% of female members are assumed to be married at termination from active service.

Dependent Spouse Medical Coverage Election

Applies to members who do not have double medical coverage. 60% of male members and 50% of female members are assumed to be married and cover a dependent spouse.

Dependent Children

- Pension: For the participants who are assumed to be married, those between ages 25 and 45 are assumed to have two dependent children.
- Healthcare: Benefits for dependent children have been valued only for members currently covering their dependent children. These benefits are only valued through the dependent children's age 23 (unless the child is disabled).

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Imputed Data

Data changes from the prior year which are deemed to have an immaterial impact on liabilities and contribution rates are assumed to be correct in the current year's client data.

Non-vested terminations with appropriate refund dates are assumed to have received a full refund of contributions. Active members with missing salary and service are assumed to be terminated with status based on their vesting percentage.

Active Data Adjustment

No adjustment was made to reflect participants who terminate employment before the valuation date and are subsequently rehired after the valuation date.

Administrative Expenses

The Normal Cost as of June 30, 2022 was increased by the following amounts. These amounts are based on the average of actual administrative expenses during the last two fiscal years. For projections, the percent increase was assumed to remain constant in future years.

- Pension: $3,626,000
- Healthcare: $1,940,000

Rehire Assumption

The Normal Cost used for determining contribution rates and in the projections includes a rehire assumption to account for anticipated rehires. The Normal Cost shown in the report includes the following assumptions based on the four years of rehire loss experience through June 30, 2021. For projections, these assumptions were assumed to grade to zero uniformly over a 20-year period.

- Pension: 12.00%
- Healthcare: 0.20%

Re-Employment Option

All re-employed retirees are assumed to return to work under the Standard Option.

Service

Total credited service is provided by the State. This service is assumed to be the only service that should be used to calculate benefits. Additionally, the State provides claimed service (including Bureau of Indian Affairs Service). Claimed service is used for vesting and eligibility purposes as described in Section 5.1.

Part-Time Service

Part-time employees are assumed to earn 0.75 years of credited service per year.

Unused Sick Leave

5.25 days of unused sick leave for each year of service are assumed to be available to be credited once the member is retired, terminates, or dies.

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Final Average Earnings

Final Average Earnings is provided on the data for active members. This amount is used as a minimum in the calculation of the average earnings in the future.

Contribution Refunds

0% of terminating members with vested benefits are assumed to have their contributions refunded. 100% of those with non-vested benefits are assumed to have their contributions refunded.

Alaska Cost-of-Living Adjustments (COLA)

Of those benefit recipients who are eligible for the Alaska COLA, 60% are assumed to remain in Alaska and receive the COLA.

Postretirement Pension Adjustment (PRPA)

50% and 75% of assumed inflation, or 1.25% and 1.875% respectively, is valued for the annual automatic PRPA as specified in the statute.

Healthcare Participation

100% of system paid members and their spouses are assumed to elect healthcare benefits as soon as they are eligible. 20% of non-system paid members and their spouses are assumed to elect healthcare benefits as soon as they are eligible.

Medicare Part B Only

We assume that 2% of actives hired before April 1, 1986 and current retirees who are not yet Medicare eligible will not be eligible for Medicare Part A.

Healthcare Per Capita Claims Cost

Sample claims cost rates adjusted to age 65 for FY23 medical and prescription drugs are shown below. The prescription drug costs reflect the plan change to require prior authorization for certain specialty medications. The pre-Medicare medical cost reflects the coverage of additional preventive benefits.

	Medical	Prescription Drugs
Pre-Medicare	$ 15,706	$ 3,712
Medicare Parts A & B	$ 1,625	$ 3,907
Medicare Part B Only	$ 5,363	$ 3,907
Medicare Part D – EGWP	N/A	$ 1,309

Members are assumed to attain Medicare eligibility at age 65. All costs are for the 2023 fiscal year (July 1, 2022 – June 30, 2023).

The EGWP subsidy is assumed to increase in future years by the trend rates shown on the following pages. No future legislative changes or other events are anticipated to impact the EGWP subsidy. If any legislative or other changes occur in the future that impact the EGWP subsidy (which could either increase or decrease the plan's Actuarial Accrued Liability), those changes will be evaluated and quantified when they occur.

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Healthcare Morbidity

Morbidity rates (also called aging factors) are used to estimate utilization of healthcare benefits at each age to reflect the fact that healthcare utilization typically increases with age. Separate morbidity rates are used for medical and prescription drug benefits. These rates are based on the 2017-2021 actual experience.

Age	Medical	Prescription Drugs
0 - 44	2.0%	4.5%
45 - 54	2.5%	3.5%
55 - 64	2.5%	1.0%
65 - 74	2.0%	2.1%
75 - 84	2.2%	(0.3%)
85 - 94	0.5%	(2.5%)
95+	0.0%	0.0%

Healthcare Third Party Administrator Fees

$449 per person per year; assumed to increase at 4.50% per year.

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Healthcare Cost Trend

The table below shows the rate used to project the cost from the shown fiscal year to the next fiscal year. For example, 7.00% is applied to the FY23 pre-Medicare medical claims costs to get the FY24 medical claims costs.

	Medical Pre-65	Medical Post-65	Prescription Drugs / EGWP
FY23	7.00%	5.50%	7.50%
FY24	6.70%	5.50%	7.20%
FY25	6.40%	5.40%	6.90%
FY26	6.20%	5.40%	6.65%
FY27	6.05%	5.35%	6.35%
FY28	5.85%	5.35%	6.10%
FY29	5.65%	5.30%	5.80%
FY30	5.45%	5.30%	5.55%
FY31-FY38	5.30%	5.30%	5.30%
FY39	5.25%	5.25%	5.25%
FY40	5.20%	5.20%	5.20%
FY41	5.10%	5.10%	5.10%
FY42	5.05%	5.05%	5.05%
FY43	4.95%	4.95%	4.95%
FY44	4.90%	4.90%	4.90%
FY45	4.80%	4.80%	4.80%
FY46	4.75%	4.75%	4.75%
FY47	4.70%	4.70%	4.70%
FY48	4.60%	4.60%	4.60%
FY49	4.55%	4.55%	4.55%
FY50+	4.50%	4.50%	4.50%

For the June 30, 2014 valuation and later, the updated Society of Actuaries' Healthcare Cost Trend Model is used to project medical and prescription drug costs. This model estimates trend amounts that are projected out for 80 years. The model has been populated with assumptions that are specific to the State of Alaska.

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Retired Member Contributions for Medical Benefits

Currently contributions are required for TRS members who are under age 60 and have less than 25 years of service. Eligible Tier 1 members are exempt from contribution requirements. Annual FY23 contributions based on monthly rates shown below for calendar 2023 are assumed based on the coverage category for current retirees. The retiree only rate shown is used for current active and inactive members and spouses in Tier 2 who are assumed to retire prior to age 60 with less than 25 years of service and who are not disabled. For dependent children, we value 1/3 of the annual retiree contribution to estimate the per child rate based on the assumed number of children in rates where children are covered.

Coverage Category	Calendar 2023 Annual Contribution	Calendar 2023 Monthly Contribution	Calendar 2022 Monthly Contribution
Retiree Only	$ 8,448	$ 704	$ 704
Retiree and Spouse	$ 16,896	$ 1,408	$ 1,408
Retiree and Child(ren)	$ 11,940	$ 995	$ 995
Retiree and Family	$ 20,388	$ 1,699	$ 1,699
Composite	$ 12,552	$ 1,046	$ 1,046

Trend Rate for Retired Member Medical Contributions

The table below shows the rate used to project the retired member medical contributions from the shown fiscal year to the next fiscal year. For example, 4.0% is applied to the FY23 retired member medical contributions to get the FY24 retired member medical contributions.

Trend Assumptions	
FY23+	4.0%

Graded trend rates for retired member medical contributions are consistent with the rates used for the June 30, 2021 valuation. Actual FY23 retired member medical contributions are reflected in the valuation.

Changes in Assumptions Since the Prior Valuation

Effective for the June 30, 2022 valuation, the Board adopted the changes to the demographic and economic assumptions recommended by the actuary, based on the results of an experience study performed on the plan experience from July 1, 2017 to June 30, 2021. The changes in assumptions were adopted at the June 2022 Board meeting.

The healthcare per capita claims cost assumption is updated annually as described in Section 5.2. The amounts included in the Normal Cost for administrative expenses were changed from $3,217,000 to $3,626,000 for pension, and from $1,604,000 to $1,940,000 for healthcare (based on the most recent two years of actual administrative expenses paid from plan assets).

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Table 1: Salary Scale

Years of Service	Percent Increase
< 1	7.00%
1	6.50%
2	6.00%
3	5.75%
4	5.50%
5	5.25%
6	5.00%
7	4.75%
8	4.50%
9	4.25%
10	4.00%
11	3.75%
12	3.50%
13	3.45%
14	3.35%
15	3.25%
16	3.15%
17	3.05%
18	3.00%
19	2.95%
20+	2.85%

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Table 2: Turnover Rates

Select Rates during the First 8 Years of Employment

Years of Service	Male	Female
< 1	20.40%	17.00%
1	20.40%	17.00%
2	16.80%	14.00%
3	14.40%	12.00%
4	12.00%	10.00%
5	10.80%	9.00%
6	9.00%	7.50%
7	7.20%	6.00%

Ultimate Rates after the First 8 Years of Employment

Age	Male	Female
< 30	3.60%	4.60%
30 - 34	3.60%	5.40%
35 - 39	3.60%	3.90%
40 - 44	3.10%	2.60%
45 - 49	3.10%	2.60%
50 - 54	4.60%	4.80%
55+	2.80%	4.80%

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Table 3: Disability Rates

Age	Male	Female	Age	Male	Female
< 31	0.0337%	0.0612%	50	0.0601%	0.1093%
31	0.0337%	0.0613%	51	0.0634%	0.1152%
32	0.0337%	0.0613%	52	0.0666%	0.1211%
33	0.0342%	0.0622%	53	0.0746%	0.1356%
34	0.0347%	0.0631%	54	0.0826%	0.1501%
35	0.0353%	0.0641%	55	0.0905%	0.1645%
36	0.0357%	0.0650%	56	0.0985%	0.1790%
37	0.0362%	0.0659%	57	0.1064%	0.1935%
38	0.0371%	0.0674%	58	0.1245%	0.2263%
39	0.0379%	0.0689%	59	0.1426%	0.2592%
40	0.0387%	0.0703%	60	0.1606%	0.2920%
41	0.0395%	0.0718%	61	0.1787%	0.3249%
42	0.0403%	0.0733%	62	0.1967%	0.3577%
43	0.0423%	0.0770%	63	0.2253%	0.4096%
44	0.0443%	0.0806%	64	0.2572%	0.4677%
45	0.0464%	0.0843%	65	0.2933%	0.5332%
46	0.0483%	0.0879%	66	0.3343%	0.6079%
47	0.0504%	0.0916%	67	0.3812%	0.6930%
48	0.0536%	0.0975%	68	0.4345%	0.7900%
49	0.0569%	0.1034%	69	0.4953%	0.9006%
			70+	0.5647%	1.0267%

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Table 4: Retirement Rates

	Reduced		Unreduced	
Age	Male	Female	Male	Female
< 45	N/A	N/A	3.00%	3.00%
45	N/A	N/A	5.50%	7.00%
46	N/A	N/A	5.50%	7.00%
47	N/A	N/A	5.50%	7.00%
48	N/A	N/A	5.50%	7.00%
49	N/A	N/A	5.50%	7.00%
50	5.00%	5.00%	12.50%	13.00%
51	5.00%	5.00%	12.50%	13.00%
52	5.00%	10.00%	12.50%	13.00%
53	5.00%	5.00%	12.50%	13.00%
54	10.00%	5.00%	12.50%	13.00%
55	14.50%	11.00%	20.00%	17.50%
56	9.50%	11.00%	20.00%	17.50%
57	9.50%	11.00%	20.00%	17.50%
58	9.50%	11.00%	20.00%	17.50%
59	9.50%	11.00%	20.00%	17.50%
60 - 64	N/A	N/A	19.50%	23.50%
65 - 69	N/A	N/A	28.00%	23.50%
70 - 74	N/A	N/A	30.00%	36.00%
75 - 79	N/A	N/A	50.00%	50.00%
80+	N/A	N/A	100.00%	100.00%

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Section 6: Actuarial Standard of Practice No. 51

Funding future retirement benefits prior to when those benefits become due involves assumptions regarding future economic and demographic experience. These assumptions are applied to calculate actuarial liabilities, current contribution requirements, and the funded status of the plan. However, to the extent future experience deviates from the assumptions used, variations will occur in these calculated values. These variations create risk to the plan. Understanding the risks to the funding of the plan is important.

Actuarial Standard of Practice No. 51 (ASOP 51)[1] requires certain disclosures of potential risks to the plan and provides useful information for intended users of actuarial reports that determine plan contributions or evaluate the adequacy of specified contribution levels to support benefit provisions.

Under ASOP 51, risk is defined as the potential of actual future measurements deviating from expected future measurements resulting from actual future experience deviating from actuarially assumed experience.

It is important to note that not all risk is negative, but all risk should be understood and accepted based on knowledge, judgement, and educated decisions. Future measurements may deviate in ways that produce positive or negative financial impacts to the plan.

In the actuary's professional judgment, the following risks may reasonably be anticipated to significantly affect the pension plan's future financial condition and contribution requirements.

- Investment Risk – potential that the investment return will be different than the 7.25% expected in the actuarial valuation
- Contribution Risk – potential that the contribution actually made will be different than the actuarially determined contribution
- Long-Term Return on Investment Risk – potential that changes in long-term capital market assumptions or the plan's asset allocation will create the need to update the long-term return on investment assumption
- Longevity Risk – potential that participants live longer than expected compared to the valuation mortality assumptions
- Salary Increase Risk – potential that future salaries will be different than expected in the actuarial valuation
- Inflation Risk – potential that the consumer price index (CPI) for urban wage earners and clerical workers for Anchorage is different than the 2.5% assumed in the valuation
- Other Demographic Risk – potential that other demographic experience will be different than expected

The following information is provided to comply with ASOP 51 and furnish beneficial information on potential risks to the plan. **This list is not all-inclusive**; it is an attempt to identify the more significant risks and how those risks might affect the results shown in this report.

Note that ASOP 51 does not require the actuary to evaluate the ability or willingness of the plan sponsor to make contributions to the plan when due, or to assess the likelihood or consequences of potential future changes in law. In addition, this valuation report is not intended to provide investment advice or to provide guidance on the management or reduction of risk.

[1] ASOP 51 does not apply to the healthcare portion of the plan. Accordingly, all figures in this section relate to the pension portion.

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Assessment of Risks

Investment Risk

Plan costs are very sensitive to the market return.

- Any return on assets lower than assumed will increase costs.
- The plan uses an actuarial value of assets that smooths gains and losses on market returns over a five-year period to help control some of the volatility in costs due to investment risk.
- Historical experience of actual returns is shown in Section 2.4 of this report. This historical experience illustrates how returns can vary over time.

Contribution Risk

There is a risk to the plan when the employer's and/or State's actual contribution amount and the actuarially determined contribution differ.

- If the actual contribution is lower than the actuarially determined contribution, the plan may not be sustainable in the long term.
- Any underpayment of the contribution will increase future contribution amounts to help pay off the additional Unfunded Actuarial Accrued Liability associated with the underpayment(s).
- As long as the Board consistently adopts the actuarially determined contributions, this risk is mitigated due to Alaska statutes requiring the State to contribute additional funds necessary to pay the total contributions adopted by the Board.

Long-Term Return on Investment Risk

Inherent in the long-term return on investment assumption is the expectation that the current rate will be used until the last benefit payment of the plan is made. There is a risk that sustained changes in economic conditions, changes in long-term future capital market assumptions, or changes to the plan's asset allocation will necessitate an update to the long-term return on investment assumption used.

- Under a lower long-term return on investment assumption, less investment return is available to pay plan benefits. This may lead to a need for increased employer contributions.
- The liabilities will be higher at a lower assumed rate of return because future benefits will have a lower discount rate applied when calculating the present value.
- A 1% decrease in the long-term return on investment assumption will increase actuarial accrued liability by approximately 11%.
- This risk may be increased due to the plan being closed to new entrants. As the plan continues to mature, the magnitude of negative cash flow discussed in the Plan Maturity Measures later in this section will grow, thereby creating a need for more liquid assets that may not garner the same long-term return as currently assumed.

Longevity Risk

Plan costs will be increased as participants are expected to live longer.

- Benefits are paid over a longer lifetime when life expectancy is expected to increase. The longer duration of payments leads to higher liabilities.
- Health care has been improving, which affects the life expectancy of participants. As health care improves, leading to longer life expectancies, costs to the plan could increase.

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- The mortality assumption for the plan mitigates this risk by assuming future improvement in mortality. However, any improvement in future mortality greater than that expected by the current mortality assumption would lead to increased costs for the plan.
- The Postretirement Pension Adjustments and Alaska Cost-of-Living Allowance increase longevity risk because members who live longer than expected will incur more benefit payment increases than expected and therefore increase costs.

Salary Increase Risk

Plan costs will be increased if actual salary increases are larger than expected.

- Higher-than-expected salary increases will produce higher benefits.
- The higher benefits may be partially offset by increased employee contributions due to higher salaries.
- If future payroll grows at a rate different than assumed, contributions as a percentage of payroll will be affected.

Inflation Risk

Plan costs will be increased if the actual CPI for Anchorage is greater than the 2.5% assumed in the valuation.

- Retirement benefits will be greater than expected if the CPI is greater than the assumed rate, which will increase costs.
- This risk is mitigated by the 75% and 50% of CPI provisions and the 9% and 6% maximums.
- This risk is also mitigated by the age and time in payment requirements to receive an increase.
- Inflation risk may be associated with the interaction of inflation with other assumptions, but this is not significant as a standalone assumption, and therefore is considered as part of the associated assumption risk instead of being discussed here.

Other Demographic Risk

The plan is subject to risks associated with other demographic assumptions (e.g., retirement, termination, and retired members remaining in Alaska assumptions). Differences between actual and expected experience for these assumptions tend to have less impact on the overall costs of the plan. The demographic assumptions used in the valuation are re-evaluated regularly as part of the four-year experience studies to ensure the assumptions are consistent with long-term expectations.

Historical Information

Monitoring certain information over time may help understand risks faced by the plan. Historical information is included throughout this report. Some examples are:

- Funded Ratio History shown in the Executive Summary illustrates how the plan's funded status (comparison of actuarial accrued liabilities to actuarial value of assets) has changed over time.
- Section 1.6 shows historical analysis of financial experience including how contribution rates have changed over time.
- Section 2.4 shows the volatility of asset returns over time.
- Section 4 includes various historical information showing how member census data has changed over time.

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Plan Maturity Measures

There are certain measures that may aid in understanding the significant risks to the plan.

Ratio of Retired Liability to Total Liability ($'s in $000's)	June 30, 2021	June 30, 2022
1. Retiree and Beneficiary Accrued Liability	$ 5,657,056	$ 5,977,257
2. Total Accrued Liability	$ 7,471,887	$ 7,804,046
3. Ratio, (1) ÷ (2)	75.7%	76.6%

A high percentage of liability concentrated on participants in pay status indicates a mature plan (often a ratio above 60% - 65%). Because the plan was closed to new entrants in 2006, we expect the percentage in item #3 to continue to increase over time. An increasing percentage may indicate a need for a less risky asset allocation, which may lead to a lower long-term return on asset assumption and increased costs. Higher percentages may also indicate greater investment risk as benefit payments may be greater than contributions creating an increased reliance on investment returns. This ratio should be monitored each year in the future.

Ratio of Cash Flow to Assets ($'s in $000's)	FYE June 30, 2021	FYE June 30, 2022
1. Contributions	$ 196,748	$ 202,459
2. Benefit Payments	501,429	511,762
3. Cash Flow, (1) - (2)	$ (304,681)	$ (309,303)
4. Fair Value of Assets	$ 6,731,481	$ 6,026,651
5. Ratio, (3) ÷ (4)	(4.5%)	(5.1%)

When this cash flow ratio is negative, more cash is being paid out than deposited in the trust. Negative cash flow indicates the trust needs to rely on investment returns to cover benefit payments and / or may need to invest in more liquid assets to cover the benefit payments. More liquid assets may not generate the same returns as less liquid assets, which can increase the investment risk. Currently, the low magnitude of the ratio implies there may already be enough liquid assets to cover the benefit payments, less investment return is needed to cover the shortfall, or only a small portion of assets will need to be converted to cash. Therefore, the investment risk is likely not amplified at this time. However, due to the plan being closed, we expect this measure to become increasingly negative over time. This maturity measure should be monitored in the future.

Contribution Volatility ($'s in $000's)	June 30, 2021	June 30, 2022
1. Fair Value of Assets	$ 6,731,481	$ 6,026,651
2. DB/DCR Payroll	$ 750,334	$ 758,938
3. Asset to Payroll Ratio, (1) ÷ (2)	897.1%	794.1%
4. Accrued Liability	$ 7,471,887	$ 7,804,046
5. Liability to Payroll Ratio, (4) ÷ (2)	995.8%	1,028.3%

Plans that have higher asset-to-payroll ratios experience more volatile employer contributions (as a percentage of payroll) due to investment return. For example, a plan with an asset-to-payroll ratio of 10% may experience twice the contribution volatility due to investment return volatility than a plan with an asset-to-payroll ratio of 5%. Plans that have higher liability-to-payroll ratios experience more volatile employer contributions (as a percentage of payroll) due to changes in liability. For example, if an assumption change increases the liability of two plans by the same percent, the plan with a liability-to-payroll ratio of 10% may experience twice the contribution volatility than a plan with a liability-to-payroll ratio of 5%.

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Glossary of Terms

Actuarial Accrued Liability

Total accumulated cost to fund pension or postemployment benefits arising from service in all prior years.

Actuarial Cost Method

Technique used to assign or allocate, in a systematic and consistent manner, the expected cost of a pension or postemployment plan for a group of plan members to the years of service that give rise to that cost.

Actuarial Present Value of Projected Benefits

Amount which, together with future interest, is expected to be sufficient to pay all future benefits.

Actuarial Valuation

Study of probable amounts of future pension or postemployment benefits and the necessary amount of contributions to fund those benefits.

Actuary

Person who performs mathematical calculations pertaining to pension and insurance benefits based on specific procedures and assumptions.

GASB 67 and 68

Governmental Accounting Standards Board Statement Number 67 amends Number 25 effective for the fiscal year beginning after June 15, 2013 and defines new financial reporting requirements for public pension plans.

Governmental Accounting Standards Board Statement Number 68 amends Number 27 effective for fiscal years beginning after June 15, 2014 and defines new accounting and financial reporting requirements for employers sponsoring public pension plans.

GASB 74 and 75

Governmental Accounting Standards Board Statement Number 74 amends Number 43 effective for the fiscal year beginning after June 15, 2016 and defines new financial reporting requirements for public postemployment benefit plans.

Governmental Accounting Standards Board Statement Number 75 amends Number 45 effective for fiscal years beginning after June 15, 2017 and defines new accounting and financial reporting requirements for employers sponsoring public postemployment benefit plans.

Normal Cost

That portion of the actuarial present value of benefits assigned to a particular year in respect to an individual participant or the plan as a whole.

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Rate Payroll

Members' earnings used to determine contribution rates.

Unfunded Actuarial Accrued Liability (UAAL)

The portion of the actuarial accrued liability not offset by plan assets.

Valuation Payroll

Members' earnings used to determine Normal Cost and Actuarial Accrued Liability.

Vested Benefits

Benefits which are unconditionally guaranteed regardless of employment.

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BUCK

State of Alaska

Teachers' Retirement System Defined Contribution Retirement Plan

For Occupational Death & Disability and Retiree Medical Benefits

Actuarial Valuation Report

As of June 30, 2022

January 2023

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January 6, 2023

State of Alaska
The Alaska Retirement Management Board
The Department of Revenue, Treasury Division
The Department of Administration, Division of Retirement and Benefits
P.O. Box 110203
Juneau, AK 99811-0203

Certification of Actuarial Valuation

Dear Members of The Alaska Retirement Management Board, The Department of Revenue and The Department of Administration:

This report summarizes the annual actuarial valuation results of the State of Alaska Teachers' Retirement System Defined Contribution Retirement (TRS DCR) Plan as of June 30, 2022 performed by Buck Global, LLC (Buck).

The actuarial valuation is based on financial information provided in the financial statements audited by KPMG LLP, member data provided by the Division of Retirement and Benefits, and medical enrollment data provided by the healthcare claims administrator (Aetna), as summarized in this report. The benefits considered are those delineated in Alaska statutes effective June 30, 2022. The actuary did not verify the data submitted, but did perform tests for consistency and reasonableness.

All costs, liabilities and other factors under TRS DCR were determined in accordance with generally accepted actuarial principles and procedures. An actuarial cost method is used to measure the actuarial liabilities which we believe is reasonable. Buck is solely responsible for the actuarial data and actuarial results presented in this report. This report fully and fairly discloses the actuarial position of TRS DCR as of June 30, 2022.

TRS DCR is funded by Employer Contributions in accordance with the funding policy adopted by the Alaska Retirement Management Board (Board). The funding objective for TRS DCR is to pay required contributions that remain level as a percent of TRS DCR compensation. The Board has also established a funding policy objective that the required contributions be sufficient to pay the Normal Costs of active plan members, plan expenses, and amortize the Unfunded Actuarial Accrued Liability as a level percent of TRS DCR compensation over closed layered 25-year periods. This objective is currently being met and is projected to continue to be met as required by the Alaska State statutes. Absent future gains/losses, actuarially determined contributions are expected to remain level as a percent of pay and the overall funded status is expected to remain at or above 100%.

The Board and staff of the State of Alaska may use this report for the review of the operations of TRS DCR. Use of this report for any other purpose or by anyone other than the Board or staff of the State of Alaska may not be appropriate and may result in mistaken conclusions due to failure to understand applicable assumptions, methodologies, or inapplicability of the report for that purpose. Because of the risk of misinterpretation of actuarial results, Buck recommends requesting its advanced review of any statement to be based on information contained in this report. Buck will accept no liability for any such statement made without its prior review.

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Future actuarial measurements may differ significantly from current measurements due to plan experience differing from that anticipated by the actuarial assumptions, changes expected as part of the natural operation of the methodology used for these measurements, and changes in plan provisions or applicable law. In particular, retiree group benefits models necessarily rely on the use of approximations and estimates and are sensitive to changes in these approximations and estimates. Small variations in these approximations and estimates may lead to significant changes in actuarial measurements. An analysis of the potential range of such future differences is beyond the scope of this valuation.

In our opinion, the actuarial assumptions used are reasonable, taking into account the experience of the plan and reasonable long-term expectations, and represent our best estimate of the anticipated long-term experience under the plan. The actuary performs an analysis of plan experience periodically and recommends changes if, in the opinion of the actuary, assumption changes are needed to more accurately reflect expected future experience. The last full experience analysis was performed for the period July 1, 2017 to June 30, 2021. Based on that experience study, the Board adopted new assumptions effective beginning with the June 30, 2022 valuation to better reflect expected future experience. Based on our annual analysis of recent claims experience, changes were made to the healthcare per capita claims cost rates effective June 30, 2022 to better reflect expected future healthcare experience. A summary of the actuarial assumptions and methods used in this actuarial valuation is shown in Sections 4.2 and 4.3. We certify that the assumptions and methods described in Sections 4.2 and 4.3 of this report meet the requirements of all applicable Actuarial Standards of Practice.

Actuarial Standards of Practice No. 27 (ASOP 27) and No. 35 (ASOP 35) require the actuary to disclose the information and analysis used to support the actuary's determination that the assumptions selected by the plan sponsor do not significantly conflict with what, in the actuary's professional judgment, are reasonable for the purpose of the measurement. Buck provides advice on reasonable assumptions when performing periodic experience studies. The Board selects the assumptions used and annually the signing actuary reviews the assumptions through discussions with the Board staff and analyzing actuarial gain/loss experience. In the case of the Board's selection of the expected return on assets (EROA), the signing actuary has used economic information and tools provided by Buck's Financial Risk Management (FRM) practice. A spreadsheet tool created by the FRM practice converts averages, standard deviations, and correlations from Buck's Capital Markets Assumptions that are used for stochastic forecasting into approximate percentile ranges for the arithmetic and geometric average returns. It is intended to suggest possible reasonable ranges for EROA without attempting to predict or select a specific best estimate rate of return. It takes into account the duration (horizon) of investment and the target allocation of assets in the portfolio to various asset classes. Based on the actuary's analysis, including consistency with other assumptions used in the valuation, the percentiles generated by the spreadsheet tool described above, and review of actuarial gain/loss analysis, the actuary believes the assumptions do not significantly conflict with what, in the actuary's professional judgment, are reasonable for the purpose of the measurement.

Governmental Accounting Standards Board (GASB) Statement No. 74 (GASB 74) was effective for TRS DCR beginning with fiscal year ending June 30, 2017, and GASB 75 was effective beginning with fiscal year ending June 30, 2018. Separate GASB 74 and GASB 75 reports have been prepared.

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Assessment of Risks

Actuarial Standard of Practice No. 51 (ASOP 51) applies to actuaries performing funding calculations related to a pension plan. ASOP 51 does not apply to actuaries performing services in connection with other post-employment benefits, such as medical benefits. Accordingly, ASOP 51 does not apply to the retiree medical portion of TRS DCR. We also believe ASOP 51 does not apply to the occupational death & disability portion of TRS DCR. Therefore, information related to ASOP 51 is not included in this report. However, it may be beneficial to review the ASOP 51 information provided in the TRS valuation report for information on risks that may also relate to the occupational death & disability benefits provided by this plan.

Use of Models

Actuarial Standard of Practice No. 56 (ASOP 56) provides guidance to actuaries when performing actuarial services with respect to designing, developing, selecting, modifying, using, reviewing, or evaluating models. In addition to the EROA analysis spreadsheet model disclosed above, Buck uses third-party software in the performance of annual actuarial valuations and projections. The model is intended to calculate the liabilities associated with the provisions of the plan using data and assumptions as of the measurement date under the funding methods specified in this report. The output from the third-party vendor software is used as input to an internally developed model that applies applicable funding methods and policies to the derived liabilities and other inputs, such as plan assets and contributions, to generate many of the exhibits found in this report. Buck has an extensive review process in which the results of the liability calculations are checked using detailed sample life output, changes from year to year are summarized by source, and significant deviations from expectations are investigated. Other funding outputs and the internal model are similarly reviewed in detail and at a higher level for accuracy, reasonability, and consistency with prior results. Buck also reviews the third-party model when significant changes are made to the software. This review is performed by experts within Buck who are familiar with applicable funding methods, as well as the manner in which the model generates its output. If significant changes are made to the internal model, extra checking and review are completed. Significant changes to the internal model that are applicable to multiple clients are generally developed, checked, and reviewed by multiple experts within Buck who are familiar with the details of the required changes.

Buck used manual rate models to determine relative plan values for the defined benefit (DB) retiree medical plan and the DCR retiree medical plan, and to reflect the different Medicare coordination methods between the two plans. The manual rate models are intended to provide benchmark data and pricing capabilities, calculate per capita costs, and calculate actuarial values of different commercial health plans. Buck relied on the models, which were developed using industry data by actuaries and consultants at OptumInsight.

COVID-19

The potential impact of the ongoing COVID-19 pandemic on costs and liabilities was considered and an adjustment was made in setting the medical per capita claims cost assumption. FY21 medical claims were adjusted for a COVID-19 related decline in those claims during the fiscal year. FY22 medical claims were not adjusted. A more detailed explanation on these adjustments is shown in Sections 4.2 and 4.3 and in the valuation report for the DB plan.

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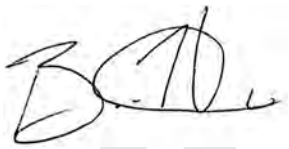
This report was prepared under the overall direction of David Kershner, who meets the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein. He is a Fellow of the Society of Actuaries, an Enrolled Actuary, a Member of the American Academy of Actuaries, and a Fellow of the Conference of Consulting Actuaries.

We are available to discuss this report with you at your convenience. David can be reached at 602-803-6174 and Brett can be reached at 260-423-1072.

Respectfully submitted,

David J. Kershner, FSA, EA, MAAA, FCA
Principal
Buck



Brett Hunter, ASA, EA, MAAA
Senior Consultant
Buck

The undersigned actuary is responsible for all assumptions related to the average annual per capita health claims cost and the health care cost trend rates, and hereby affirms his qualification to render opinions in such matters in accordance with the Qualification Standards of the American Academy of Actuaries.

Stephen R. Oates, ASA, EA, MAAA, FCA
Principal
Buck

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Executive Summary

Overview

The State of Alaska Teachers' Retirement System Defined Contribution Retirement (TRS DCR) Plan provides occupational death & disability and retiree medical benefits to teachers and other eligible members hired after June 30, 2006 or who have elected participation in this plan. The Commissioner of the Department of Administration is responsible for administering the plan. The Alaska Retirement Management Board has fiduciary responsibility over the assets of the plan. This report presents the results of the actuarial valuation of TRS DCR as of the valuation date of June 30, 2022.

Purpose

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

1. To determine the Employer contribution necessary to meet the Board's funding policy for the plan;
2. To disclose the funding assets and liability measures as of the valuation date;
3. To review the current funded status of the plan and assess the funded status as an appropriate measure for determining actuarially determined contributions;
4. To compare actual and expected experience under the plan during the last fiscal year; and
5. To report trends in contributions, assets, liabilities, and funded status over the last several years.

The actuarial valuation provides a "snapshot" of the funded position of TRS DCR based on the plan provisions, membership data, assets, and actuarial methods and assumptions as of the valuation date.

Funded Status

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

Funded Status as of June 30 ($'s in 000's)		2021	2022
Occupational Death & Disability			
a.	Actuarial Accrued Liability	$ 205	$ 199
b.	Valuation Assets	5,843	6,700
c.	Unfunded Actuarial Accrued Liability, (a) - (b)	$ (5,638)	$ (6,501)
d.	Funded Ratio based on Valuation Assets, (b) ÷ (a)	2,850.2%	3,366.8%
e.	Fair Value of Assets	$ 6,623	$ 6,557
f.	Funded Ratio based on Fair Value of Assets, (e) ÷ (a)	3,230.7%	3,295.0%

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Funded Status as of June 30 ($'s in 000's)	2021	2022
Retiree Medical		
a. Actuarial Accrued Liability	$ 44,396	$ 47,797
b. Valuation Assets	59,380	68,403
c. Unfunded Actuarial Accrued Liability, (a) - (b)	$ (14,984)	$ (20,606)
d. Funded Ratio based on Valuation Assets, (b) ÷ (a)	133.8%	143.1%
e. Fair Value of Assets	$ 67,278	$ 66,909
f. Funded Ratio based on Fair Value of Assets, (e) ÷ (a)	151.5%	140.0%
Total		
a. Actuarial Accrued Liability	$ 44,601	$ 47,996
b. Valuation Assets	65,223	75,103
c. Unfunded Actuarial Accrued Liability, (a) - (b)	$ (20,622)	$ (27,107)
d. Funded Ratio based on Valuation Assets, (b) ÷ (a)	146.2%	156.5%
e. Fair Value of Assets	$ 73,901	$ 73,466
f. Funded Ratio based on Fair Value of Assets, (e) ÷ (a)	165.7%	153.1%

The key reasons for the change in the funded status are explained below. The funded status for healthcare benefits is not necessarily an appropriate measure to confirm that assets are sufficient to settle health plan obligations as there are no available financial instruments for purchase. Future experience is likely to vary from assumptions so there is potential for actuarial gains or losses.

1. Investment Experience

The asset valuation method recognizes 20% of the investment gain or loss each year, for a period of five years. The FY22 investment return based on fair value of assets was approximately (6.2)% compared to the expected investment return of 7.38% (net of investment expenses). This resulted in a market asset loss of approximately $10,343,000. Due to the recognition of investment gains and losses over a 5-year period, the FY22 investment return based on actuarial value of assets was approximately 8.3%, which resulted in an actuarial asset gain of approximately $613,000.

2. Salary Increases

Salary increases for continuing active members during FY22 were higher than expected based on the valuation assumptions, resulting in a liability loss of approximately $1,000.

3. Demographic Experience

The number of active members increased 3.0% from 5,521 at June 30, 2021 to 5,688 at June 30, 2022. The average age of active members increased from 41.90 to 42.26 and average credited service increased from 6.34 to 6.60 years.

The demographic experience gains/losses are shown on page 4.

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4. Retiree Medical Claims Experience

Please refer to the State of Alaska Teachers' Retirement System (TRS) Defined Benefit Plan Actuarial Valuation Report as of June 30, 2022 for a full description of the assumptions and costs of the retiree medical plan. Adjustments to these costs and assumptions are described in this report.

The recent claims experience described in Section 4.2 of this report (Section 5.2 of the TRS report) created an actuarial gain of approximately $1,006,000.

5. Changes in Methods Since the Prior Valuation

There were no changes in actuarial methods since the prior valuation.

6. Changes in Assumptions Since the Prior Valuation

Effective for the June 30, 2022 valuation, the Board adopted the changes to the demographic and economic assumptions recommended by the actuary, based on the results of an experience study performed on the plan experience from July 1, 2017 to June 30, 2021. The changes in assumptions were adopted at the June 2022 Board meeting. The effect of the new assumptions was to decrease the Actuarial Accrued Liability as of June 30, 2022 by approximately $3,374,000.

Healthcare claim costs are updated annually as described in Section 4.2. The amounts included in the Normal Cost for administrative expenses were updated based on the last two years of actual administrative expenses paid from plan assets.

7. Changes in Benefit Provisions Since the Prior Valuation

There have been no changes in benefit provisions valued since the prior valuation.

Comparative Summary of Contribution Rates

	FY 2024	FY 2025
Occupational Death & Disability		
a. Employer Normal Cost Rate	0.08%	0.08%
b. Past Service Cost Rate	(0.11)%	(0.11)%
c. Total Employer Contribution Rate, (a) + (b), not less than (a)	0.08%	0.08%
Retiree Medical		
a. Employer Normal Cost Rate	0.82%	0.68%
b. Past Service Cost Rate	(0.22)%	(0.29)%
c. Total Employer Contribution Rate, (a) + (b), not less than (a)	0.82%	0.68%
Total		
a. Employer Normal Cost Rate	0.90%	0.76%
b. Past Service Cost Rate	(0.33)%	(0.40)%
c. Total Employer Contribution Rate, (a) + (b), not less than (a)	0.90%	0.76%

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The exhibit below shows the historical Board-adopted employer contribution rates for TRS DCR.

		Total Employer Contribution Rate		
Valuation Date	Fiscal Year	Occupational Death & Disability	Retiree Medical	Total
June 30, 2011	FY14	0.00%	0.47%	0.47%
June 30, 2012	FY15	0.00%	2.04%	2.04%
June 30, 2013	FY16	0.00%	2.04%	2.04%
June 30, 2014	FY17	0.00%	1.05%	1.05%
June 30, 2015	FY18	0.00%	0.91%	0.91%
June 30, 2016	FY19	0.08%	0.79%	0.87%
June 30, 2017	FY20	0.08%	1.09%	1.17%
June 30, 2018	FY21	0.08%	0.93%	1.01%
June 30, 2019	FY22	0.08%	0.83%	0.91%
June 30, 2020	FY23	0.08%	0.87%	0.95%
June 30, 2021	FY24	0.08%	0.82%	0.90%
June 30, 2022	FY25	TBD	TBD	TBD

Summary of Actuarial Accrued Liability Gain/(Loss)

The following table shows the FY22 gain/(loss) on actuarial accrued liability as of June 30, 2022 ($'s in 000's):

	Occupational Death & Disability	Retiree Medical	Total
Retirement Experience	$ 0	$ 89	$ 89
Termination Experience	(3)	2,157	2,154
Disability Experience	235	(35)	200
Active Mortality Experience	122	(60)	62
Inactive Mortality Experience	(1)	(13)	(14)
Salary Increases	(1)	N/A	(1)
New Entrants	0	(630)	(630)
Rehires	0	(2,402)	(2,402)
Benefit Payments Different than Expected	9	(17)	(8)
Per Capita Claims Cost	N/A	1,006	1,006
Miscellaneous[1]	(8)	(5)	(13)
Total	$ 353	$ 90	$ 443

[1] Includes the effects of various data changes that are typical when new census data is received for the annual valuation, as well as other items that do not fit neatly into any of the other categories.

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Other items that increased/(decreased) the actuarial accrued liability as of June 30, 2022 are shown below ($'s in 000's):

	Occupational Death & Disability	Retiree Medical	Total
Experience Study Assumption Changes	$ 0*	$ (3,374)	$ (3,374)

* Impact was less than $1,000.

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Section 1: Actuarial Funding Results

Section 1.1: Actuarial Liabilities and Normal Cost ($'s in 000's)

As of June 30, 2022	Present Value of Projected Benefits	Actuarial Accrued (Past Service) Liability
Active Members		
Occupational Death Benefits	$ 746	$ 106
Occupational Disability Benefits	1,481	(81)
Medical and Prescription Drug Benefits	85,800	59,854
Medicare Part D Subsidy	(20,034)	(13,970)
Subtotal	$ 67,993	$ 45,909
Benefit Recipients		
Survivor Benefits	$ 0	$ 0
Disability Benefits	174	174
Medical and Prescription Drug Benefits	2,495	2,495
Medicare Part D Subsidy	(582)	(582)
Subtotal	$ 2,087	$ 2,087
Total	**$ 70,080**	**$ 47,996**
Total Occupational Death & Disability	**$ 2,401**	**$ 199**
Total Retiree Medical, Net of Part D Subsidy	**$ 67,679**	**$ 47,797**
Total Retiree Medical, Gross of Part D Subsidy	**$ 88,295**	**$ 62,349**

As of June 30, 2022	Normal Cost
Active Members	
Occupational Death Benefits	$ 103
Occupational Disability Benefits	236
Medical and Prescription Drug Benefits	4,008
Medicare Part D Subsidy	(936)
Subtotal	$ 3,411
Administrative Expense Load	
Occupational Death & Disability	$ 9
Retiree Medical	35
Subtotal	$ 44
Total	**$ 3,455**
Total Occupational Death & Disability	**$ 348**
Total Retiree Medical, Net of Part D Subsidy	**$ 3,107**
Total Retiree Medical, Gross of Part D Subsidy	**$ 4,043**

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Section 1.2: Actuarial Contributions as of June 30, 2022 for FY25 ($'s in 000's)

Normal Cost Rate	Occupational Death & Disability	Retiree Medical	Total
1. Total Normal Cost	$ 348	$ 3,107	$ 3,455
2. DCR Plan Rate Payroll Projected for FY23	455,927	455,927	455,927
3. Employer Normal Cost Rate, (1) ÷ (2)	0.08%	0.68%	0.76%
Past Service Cost Rate			
1. Actuarial Accrued Liability	$ 199	$ 47,797	$ 47,996
2. Valuation Assets	6,700	68,403	75,103
3. Unfunded Actuarial Accrued Liability, (1) - (2)	$ (6,501)	$ (20,606)	$ (27,107)
4. Funded Ratio based on Valuation Assets	3,366.8%	143.1%	156.5%
5. Past Service Cost Amortization Payment	(515)	(1,300)	(1,815)
6. DCR Plan Rate Payroll Projected for FY23	455,927	455,927	455,927
7. Past Service Cost Rate, (5) ÷ (6)	(0.11%)	(0.29%)	(0.40%)
Total Employer Contribution Rate, not less than Normal Cost Rate	**0.08%**	**0.68%**	**0.76%**

The table below shows the total employer contribution rate based on total DB and DCR Plan payroll for informational purposes.

Total Employer Contribution Rate as Percent of Total Payroll	Occupational Death & Disability	Retiree Medical	Total
1. Total Normal Cost	$ 348	$ 3,107	$ 3,455
2. Total DB and DCR Plan Rate Payroll Projected for FY23	758,938	758,938	758,938
3. Employer Normal Cost Rate, (1) ÷ (2)	0.05%	0.41%	0.46%
4. Past Service Cost Amortization Payment	(515)	(1,300)	(1,815)
5. Past Service Cost Rate, (4) ÷ (2)	(0.07%)	(0.17%)	(0.24%)
Total Employer Contribution Rate, not less than Normal Cost Rate	**0.05%**	**0.41%**	**0.46%**

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Schedule of Past Service Cost Amortizations - Occupational Death & Disability ($'s in 000's)

Layer	Amortization Period		Balances		Beginning-of-Year Payment
	Date Created	Years Remaining	Initial	Outstanding	
Initial Unfunded Liability	06/30/2007	10	$ 16	$ 13	$ 2
FY08 Gain	06/30/2008	11	(392)	(352)	(39)
Change in Assumptions	06/30/2009	12	(82)	(75)	(8)
FY09 Gain	06/30/2009	12	(594)	(558)	(58)
Change in Assumptions	06/30/2010	13	(7)	(8)	(1)
FY10 Gain	06/30/2010	13	(479)	(460)	(45)
FY11 Gain	06/30/2011	14	(560)	(547)	(51)
FY12 Gain	06/30/2012	15	(129)	(129)	(11)
FY13 Gain	06/30/2013	16	(149)	(148)	(13)
Change in Assumptions	06/30/2014	17	(50)	(53)	(4)
PRPA Modification	06/30/2014	17	(25)	(25)	(2)
FY14 Gain	06/30/2014	17	(255)	(258)	(21)
FY15 Gain	06/30/2015	18	(275)	(278)	(22)
FY16 Gain	06/30/2016	19	(209)	(214)	(16)
FY17 Gain	06/30/2017	20	(251)	(252)	(18)
Change in Assumptions[1]	06/30/2018	21	0	0	0
FY18 Gain	06/30/2018	21	(257)	(259)	(18)
FY19 Gain	06/30/2019	22	(338)	(340)	(23)
FY20 Gain	06/30/2020	23	(637)	(642)	(43)
FY21 Gain	06/30/2021	24	(985)	(989)	(65)
Change in Assumptions[1]	06/30/2022	25	0	0	0
FY22 Gain	06/30/2022	25	(927)	(927)	(59)
Total				**$ (6,501)**	**$ (515)**

[1] The net effect of changing assumptions was less than $1,000.

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Schedule of Past Service Cost Amortizations - Retiree Medical ($'s in 000's)

Layer	Amortization Period		Balances		Beginning-of-Year Payment
	Date Created	Years Remaining	Initial	Outstanding	
Initial Unfunded Liability	06/30/2007	10	$ (239)	$ (210)	$ (25)
Change in Assumptions	06/30/2008	11	84	79	9
FY08 Gain	06/30/2008	11	(393)	(352)	(39)
Change in Assumptions	06/30/2009	12	(69)	(63)	(7)
FY09 Gain	06/30/2009	12	(281)	(265)	(28)
Change in Assumptions[1]	06/30/2010	13	0	0	0
FY10 Gain	06/30/2010	13	(545)	(523)	(51)
FY11 Gain	06/30/2011	14	(94)	(90)	(8)
Change in Assumptions	06/30/2012	15	11,518	11,448	1,013
FY12 Gain	06/30/2012	15	(60)	(56)	(5)
FY13 Loss	06/30/2013	16	3,439	3,457	292
Change in Assumptions	06/30/2014	17	(9,736)	(9,845)	(798)
FY14 Loss	06/30/2014	17	1,616	1,632	132
FY15 Gain	06/30/2015	18	(3,485)	(3,534)	(276)
EGWP Impact	06/30/2016	19	(6,400)	(6,494)	(489)
FY16 Loss	06/30/2016	19	958	975	73
Change in Assumptions	06/30/2017	20	7,645	7,739	564
FY17 Gain	06/30/2017	20	(1,451)	(1,469)	(107)
Change in Assumptions/Methods	06/30/2018	21	(9,505)	(9,577)	(677)
FY18 Loss	06/30/2018	21	2,491	2,511	178
FY19 Gain	06/30/2019	22	(4,904)	(4,947)	(340)
Change in Assumptions	06/30/2020	23	2,153	2,169	145
FY20 Gain	06/30/2020	23	(1,655)	(1,667)	(112)
Prescription Drug Plan Changes	06/30/2021	24	(528)	(530)	(35)
FY21 Gain	06/30/2021	24	(5,449)	(5,473)	(357)
Change in Assumptions	06/30/2022	25	(3,374)	(3,374)	(215)
FY22 Gain	06/30/2022	25	(2,147)	(2,147)	(137)
Total				**$ (20,606)**	**$ (1,300)**

[1] The net effect of changing assumptions was less than $1,000. The demographic assumption changes decreased liability by $133,000 and the economic assumptions changes increased the liability by $133,000. Therefore, the net effect of all assumptions changes is $0 for amortization purposes.

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Schedule of Past Service Cost Amortizations - Total ($'s in 000's)

Layer	Amortization Period		Balances		Beginning-of-Year Payment
	Date Created	Years Remaining	Initial	Outstanding	
Initial Unfunded Liability	06/30/2007	10	$ (223)	$ (197)	$ (23)
Change in Assumptions	06/30/2008	11	84	79	9
FY08 Gain	06/30/2008	11	(785)	(704)	(78)
Change in Assumptions	06/30/2009	12	(151)	(138)	(15)
FY09 Gain	06/30/2009	12	(875)	(823)	(86)
Change in Assumptions	06/30/2010	13	(7)	(8)	(1)
FY10 Gain	06/30/2010	13	(1,024)	(983)	(96)
FY11 Gain	06/30/2011	14	(654)	(637)	(59)
Change in Assumptions	06/30/2012	15	11,518	11,448	1,013
FY12 Gain	06/30/2012	15	(189)	(185)	(16)
FY13 Loss	06/30/2013	16	3,290	3,309	279
Change in Assumptions	06/30/2014	17	(9,786)	(9,898)	(802)
PRPA Modification	06/30/2014	17	(25)	(25)	(2)
FY14 Loss	06/30/2014	17	1,361	1,374	111
FY15 Gain	06/30/2015	18	(3,760)	(3,812)	(298)
EGWP Impact	06/30/2016	19	(6,400)	(6,494)	(489)
FY16 Loss	06/30/2016	19	749	761	57
Change in Assumptions	06/30/2017	20	7,645	7,739	564
FY17 Gain	06/30/2017	20	(1,702)	(1,721)	(125)
Change in Assumptions/Methods	06/30/2018	21	(9,505)	(9,577)	(677)
FY18 Loss	06/30/2018	21	2,234	2,252	160
FY19 Gain	06/30/2019	22	(5,242)	(5,287)	(363)
Change in Assumptions	06/30/2020	23	2,153	2,169	145
FY20 Gain	06/30/2020	23	(2,292)	(2,309)	(155)
Prescription Drug Plan Changes	06/30/2021	24	(528)	(530)	(35)
FY21 Gain	06/30/2021	24	(6,434)	(6,462)	(422)
Change in Assumptions	06/30/2022	25	(3,374)	(3,374)	(215)
FY22 Gain	06/30/2022	25	(3,074)	(3,074)	(196)
Total				**$ (27,107)**	**$ (1,815)**

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Section 1.3: Actuarial Gain/(Loss) for FY22 ($'s in 000's)

	Occupational Death & Disability	Retiree Medical	Total
1. Expected Actuarial Accrued Liability			
a. Actuarial Accrued Liability as of June 30, 2021	$ 205	$ 44,396	$ 44,601
b. Normal Cost	335	3,448	3,783
c. Interest on (a) and (b) at 7.38%	40	3,531	3,571
d. Employer Group Waiver Plan	0	18	18
e. Benefit Payments	(27)	(128)	(155)
f. Interest on (d) and (e) at 7.38%, adjusted for timing	(1)	(4)	(5)
g. Assumptions/Methods Changes	0	(3,374)	(3,374)
h. Expected Actuarial Accrued Liability as of June 30, 2022 (a) + (b) + (c) + (d) + (e) + (f) + (g)	$ 552	$ 47,887	$ 48,439
2. Actual Actuarial Accrued Liability as of June 30, 2022	199	47,797	47,996
3. Liability Gain/(Loss), (1)(h) - (2)	**$ 353**	**$ 90**	**$ 443**
4. Expected Actuarial Asset Value			
a. Actuarial Asset Value as of June 30, 2021	$ 5,843	$ 59,380	$ 65,223
b. Interest on (a) at 7.38%	431	4,382	4,813
c. Employer Contributions	393	4,086	4,479
d. Employer Group Waiver Plan	0	18	18
e. Interest on (c) and (d) at 7.38%, adjusted for timing	14	149	163
f. Benefit Payments	(27)	(128)	(155)
g. Administrative Expenses	(9)	(35)	(44)
h. Interest on (f) and (g) at 7.38%, adjusted for timing	(1)	(6)	(7)
i. Expected Actuarial Asset Value as of June 30, 2022 (a) + (b) + (c) + (d) + (e) + (f) + (g) + (h)	$ 6,644	$ 67,846	$ 74,490
5. Actuarial Asset Value as of June 30, 2022	6,700	68,403	75,103
6. Actuarial Asset Gain/(Loss), (5) - (4)(i)	**$ 56**	**$ 557**	**$ 613**
7. Total Actuarial Gain/(Loss), (3) + (6)	**$ 409**	**$ 647**	**$ 1,056**
8. Contribution Gain/(Loss)	**$ 522**	**$ 1,513**	**$ 2,035**
9. Administrative Expense Gain/(Loss)	**$ (4)**	**$ (13)**	**$ (17)**
10. FY22 Gain/(Loss), (7) + (8) + (9)	**$ 927**	**$ 2,147**	**$ 3,074**

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Section 1.4: History of Unfunded Liability and Funded Ratio ($'s in 000's)

Valuation Date	Total Actuarial Accrued Liability	Valuation Assets	Assets as a Percent of Actuarial Accrued Liability	Unfunded Actuarial Accrued Liability (UAAL)
June 30, 2007	$ 374	$ 597	159.7%	$ (223)
June 30, 2008	801	1,728	215.7%	(927)
June 30, 2009	1,460	3,424	234.5%	(1,964)
June 30, 2010	2,448	5,472	223.5%	(3,024)
June 30, 2011	3,858	7,566	196.1%	(3,708)
June 30, 2012	16,874	9,285	55.0%	7,589
June 30, 2013	22,138	11,146	50.3%	10,992
June 30, 2014	16,296	13,611	83.5%	2,685
June 30, 2015	19,797	20,847	105.3%	(1,050)
June 30, 2016	22,007	28,733	130.6%	(6,726)
June 30, 2017	33,707	34,586	102.6%	(879)
June 30, 2018	32,459	40,621	125.1%	(8,162)
June 30, 2019	33,221	46,666	140.5%	(13,445)
June 30, 2020	40,857	54,487	133.4%	(13,630)
June 30, 2021	44,601	65,223	146.2%	(20,622)
June 30, 2022	47,996	75,103	156.5%	(27,107)

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Section 2: Plan Assets

Section 2.1: Summary of Fair Value of Assets ($'s in 000's)

As of June 30, 2022	Occupational Death & Disability	Retiree Medical	Total	Allocation Percent
Cash and Short-Term Investments				
- Cash and Cash Equivalents	$ 87	$ 894	$ 981	1.3%
- Subtotal	$ 87	$ 894	$ 981	1.3%
Fixed Income Investments				
- Domestic Fixed Income Pool	$ 1,389	$ 14,176	$ 15,565	21.3%
- International Fixed Income Pool	0	0	0	0.0%
- Tactical Fixed Income Pool	0	0	0	0.0%
- High Yield Pool	0	0	0	0.0%
- Treasury Inflation Protection Pool	0	0	0	0.0%
- Emerging Debt Pool	0	0	0	0.0%
- Subtotal	$ 1,389	$ 14,176	$ 15,565	21.3%
Equity Investments				
- Domestic Equity Pool	$ 1,582	$ 16,134	$ 17,716	24.2%
- International Equity Pool	858	8,756	9,614	13.1%
- Private Equity Pool	1,075	10,966	12,041	16.5%
- Emerging Markets Equity Pool	192	1,960	2,152	3.0%
- Alternative Equity Strategies	380	3,880	4,260	5.8%
- Subtotal	$ 4,087	$ 41,696	$ 45,783	62.6%
Other Investments				
- Real Estate Pool	$ 493	$ 5,020	$ 5,513	7.6%
- Other Investments Pool	471	4,800	5,271	7.2%
- Absolute Return Pool	0	0	0	0.0%
- Other Assets	0	0	0	0.0%
- Subtotal	$ 964	$ 9,820	$ 10,784	14.8%
Total Cash and Investments	$ 6,527	$ 66,586	$ 73,113	100.0%
Net Accrued Receivables	30	323	353	
Net Assets	$ 6,557	$ 66,909	$ 73,466	

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Section 2.2: Changes in Fair Value of Assets During FY22 ($'s in 000's)

Fiscal Year 2022	Occupational Death & Disability	Retiree Medical	Total
1. Fair Value of Assets as of June 30, 2021	$ 6,623	$ 67,278	$ 73,901
2. Additions:			
a. Member Contributions	$ 0	$ 0	$ 0
b. Employer Contributions	393	4,086	4,479
c. Interest and Dividend Income	89	905	994
d. Net Appreciation/(Depreciation) in Fair Value of Investments	(494)	(5,037)	(5,531)
e. Employer Group Waiver Plan	0	18	18
f. Other	0	0	0
g. Total Additions	$ (12)	$ (28)	$ (40)
3. Deductions:			
a. Medical Benefits	$ 0	$ 128	$ 128
b. Death & Disability Benefits	27	0	27
c. Investment Expenses	18	178	196
d. Administrative Expenses	9	35	44
e. Total Deductions	$ 54	$ 341	$ 395
4. Fair Value of Assets as of June 30, 2022	$ 6,557	$ 66,909	$ 73,466
5. Approximate Fair Value Investment Return Rate during FY22 Net of Investment Expenses	(6.2%)	(6.2%)	(6.2%)

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Section 2.3: Development of Actuarial Value of Assets ($'s in 000's)

The actuarial value of assets and the fair value were $0 at June 30, 2006. Investment gains and losses are recognized 20% per year over 5 years. In no event may valuation assets be less than 80% or more than 120% of fair value as of the current valuation date.

	Occupational Death & Disability	Retiree Medical	Total
1. Investment Gain/(Loss) for FY22			
a. Fair Value as of June 30, 2021	$ 6,623	$ 67,278	$ 73,901
b. Contributions	393	4,086	4,479
c. Employer Group Waiver Plan	0	18	18
d. Benefit Payments	27	128	155
e. Administrative Expenses	9	35	44
f. Actual Investment Return (net of investment expenses)	(423)	(4,310)	(4,733)
g. Expected Return Rate (net of investment expenses)	7.38%	7.38%	7.38%
h. Expected Return	502	5,108	5,610
i. Investment Gain/(Loss) for the Year (f) - (h)	(925)	(9,418)	(10,343)
2. Actuarial Value as of June 30, 2022			
a. Fair Value as of June 30, 2022	$ 6,557	$ 66,909	$ 73,466
b. Deferred Investment Gain/(Loss)	(143)	(1,494)	(1,637)
c. Preliminary Actuarial Value as of June 30, 2022, (a) - (b)	6,700	68,403	75,103
d. Upper Limit: 120% of Fair Value as of June 30, 2022	7,868	80,290	88,158
e. Lower Limit: 80% of Fair Value as of June 30, 2022	5,246	53,528	58,774
f. Actuarial Value at June 30, 2022, (c) limited by (d) and (e)	6,700	68,403	75,103
3. Ratio of Actuarial Value of Assets to Fair Value of Assets	102.2%	102.2%	102.2%
4. Approximate Actuarial Value Investment Return Rate during FY22 Net of Investment Expenses	8.3%	8.3%	8.3%

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The tables below show the development of the gains/(losses) to be recognized in the current year ($'s in 000's):

Occupational Death & Disability				
Fiscal Year Ending	Asset Gain / (Loss)	Gain / (Loss) Recognized in Prior Years	Gain / (Loss) Recognized This Year	Gain / (Loss) Deferred to Future Years
June 30, 2018	$ 8	$ 8	$ 0	$ 0
June 30, 2019	(48)	(30)	(10)	(8)
June 30, 2020	(140)	(56)	(28)	(56)
June 30, 2021	1,103	221	221	661
June 30, 2022	(925)	0	(185)	(740)
Total	**$ (2)**	**$ 143**	**$ (2)**	**$ (143)**

Retiree Medical				
Fiscal Year Ending	Asset Gain / (Loss)	Gain / (Loss) Recognized in Prior Years	Gain / (Loss) Recognized This Year	Gain / (Loss) Deferred to Future Years
June 30, 2018	$ (19)	$ (16)	$ (3)	$ 0
June 30, 2019	(460)	(276)	(92)	(92)
June 30, 2020	(1,367)	(546)	(273)	(548)
June 30, 2021	11,132	2,226	2,226	6,680
June 30, 2022	(9,418)	0	(1,884)	(7,534)
Total	**$ (132)**	**$ 1,388**	**$ (26)**	**$ (1,494)**

Total				
Fiscal Year Ending	Asset Gain / (Loss)	Gain / (Loss) Recognized in Prior Years	Gain / (Loss) Recognized This Year	Gain / (Loss) Deferred to Future Years
June 30, 2018	$ (11)	$ (8)	$ (3)	$ 0
June 30, 2019	(508)	(306)	(102)	(100)
June 30, 2020	(1,507)	(602)	(301)	(604)
June 30, 2021	12,235	2,447	2,447	7,341
June 30, 2022	(10,343)	0	(2,069)	(8,274)
Total	**$ (134)**	**$ 1,531**	**$ (28)**	**$ (1,637)**

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Section 2.4: Historical Asset Rates of Return

	Actuarial Value		Fair Value	
Year Ending	Annual	Cumulative*	Annual	Cumulative*
June 30, 2008	6.4%	6.4%	(0.3%)	(0.3%)
June 30, 2009	3.2%	4.8%	(12.0%)	(6.3%)
June 30, 2010	4.2%	4.6%	6.4%	(2.3%)
June 30, 2011	7.4%	5.3%	18.9%	2.6%
June 30, 2012	6.9%	5.6%	1.6%	2.4%
June 30, 2013	7.7%	6.0%	11.9%	3.9%
June 30, 2014	10.9%	6.6%	18.0%	5.8%
June 30, 2015	9.5%	7.0%	3.1%	5.5%
June 30, 2016	6.5%	6.9%	(0.1%)	4.9%
June 30, 2017	7.6%	7.0%	12.6%	5.6%
June 30, 2018	7.8%	7.1%	8.0%	5.8%
June 30, 2019	6.4%	7.0%	6.2%	5.9%
June 30, 2020	6.3%	7.0%	4.3%	5.7%
June 30, 2021	11.3%	7.3%	29.5%	7.3%
June 30, 2022	8.3%	7.3%	(6.2%)	6.3%

* Cumulative since fiscal year ending June 30, 2008

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Section 3: Member Data

Section 3.1: Summary of Members Included

As of June 30	2018	2019	2020	2021	2022
Active Members					
1. Number	4,915	4,998	5,332	5,521	5,688 [1]
2. Average Age	40.64	41.06	41.63	41.90	42.26
3. Average Credited Service	5.30	5.67	6.03	6.34	6.60
4. Average Entry Age	35.34	35.39	35.60	35.56	35.66
5. Average Annual Earnings	$ 68,119	$ 69,619	$ 71,118	$ 74,045	$ 76,956
Disabilitants and Beneficiaries (Occupational Death & Disability)					
1. Number	0	1	1	1	1
2. Average Age	N/A	53.45	54.45	55.45	56.45
3. Average Monthly Death & Disability Benefit	N/A	$ 2,024	$ 2,024	$ 2,024	$ 2,170
Retirees, Surviving Spouses, and Dependent Spouses (Retiree Medical)					
1. Number	9	12	17	24	35
2. Average Age	68.59	68.54	68.79	67.71	69.66
Total Number of Members	**4,924**	**5,011**	**5,350**	**5,546**	**5,724**

Average annual earnings (“valuation pay”) are the annualized earnings for the fiscal year ending on the valuation date.

[1] Includes 1,491 male active members and 4,197 female active members.

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Section 3.2: Age and Service Distribution of Active Members

Annual Earnings by Age

Age	Number	Total Annual Earnings	Average Annual Earnings
0 - 19	0	$ 0	$ 0
20 - 24	104	5,695,426	54,764
25 - 29	562	35,093,794	62,444
30 - 34	895	63,279,431	70,703
35 - 39	1,120	87,641,129	78,251
40 - 44	964	76,341,532	79,192
45 - 49	693	56,341,880	81,301
50 - 54	550	45,132,752	82,060
55 - 59	416	34,907,787	83,913
60 - 64	262	22,967,760	87,663
65 - 69	94	7,932,649	84,390
70 - 74	21	1,783,921	84,949
75+	7	609,453	87,065
Total	**5,688**	**$437,727,514**	**$ 76,956**

Annual Earnings by Credited Service

Years of Service	Number	Total Annual Earnings	Average Annual Earnings
0	159	$ 9,124,198	$ 57,385
1	697	44,530,493	63,889
2	550	37,784,490	68,699
3	492	35,110,031	71,362
4	473	35,157,436	74,329
0 - 4	**2,371**	**$161,706,648**	**$ 68,202**
5 - 9	1,800	141,742,765	78,746
10 - 14	1,215	106,234,786	87,436
15 - 19	300	27,879,926	92,933
20 - 24	2	163,389	81,695
25 - 29	0	0	0
30 - 34	0	0	0
35 - 39	0	0	0
40+	0	0	0
Total	**5,688**	**$437,727,514**	**$ 76,956**

Years of Credited Service by Age

	Years of Service									
Age	**0 - 4**	**5 - 9**	**10 - 14**	**15 - 19**	**20 - 24**	**25 - 29**	**30 - 34**	**35 - 39**	**40+**	**Total**
0 - 19	0	0	0	0	0	0	0	0	0	0
20 - 24	103	1	0	0	0	0	0	0	0	104
25 - 29	463	99	0	0	0	0	0	0	0	562
30 - 34	442	401	52	0	0	0	0	0	0	895
35 - 39	358	364	362	36	0	0	0	0	0	1,120
40 - 44	316	288	277	82	1	0	0	0	0	964
45 - 49	243	214	172	64	0	0	0	0	0	693
50 - 54	177	180	145	48	0	0	0	0	0	550
55 - 59	140	132	111	32	1	0	0	0	0	416
60 - 64	84	79	72	27	0	0	0	0	0	262
65 - 69	32	34	18	10	0	0	0	0	0	94
70 - 74	12	5	4	0	0	0	0	0	0	21
75+	1	3	2	1	0	0	0	0	0	7
Total	**2,371**	**1,800**	**1,215**	**300**	**2**	**0**	**0**	**0**	**0**	**5,688**

Total and average annual earnings (“valuation pay”) are the annualized earnings for the fiscal year ending on the valuation date.

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Section 3.3: Member Data Reconciliation

	Actives	Retirees and Surviving Spouses	Dependent Spouses	OD&D Disabilitants	OD&D Beneficiaries	Total
As of June 30, 2021 [1]	**5,521**	**20**	**4**	**1**	**0**	**5,546**
New Entrants	738	0	0	0	0	738
Rehires	268	0	0	0	0	268
Vested Terminations	(356)	0	0	0	0	(356)
Non-Vested Terminations	(414)	0	0	0	0	(414)
Refund of Contributions	(50)	0	0	0	0	(50)
Disability Retirements	0	0	0	0	0	0
Age Retirements	(6)	6	3	0	0	3
Deaths With Beneficiary	0	0	0	0	0	0
Deaths Without Beneficiary	(5)	0	0	0	0	(5)
Transfers In/Out	(8)	1	1	0	0	(6)
Data Corrections	0	0	0	0	0	0
Net Change	**167**	**7**	**4**	**0**	**0**	**178**
As of June 30, 2022 [2]	**5,688**	**27**	**8**	**1**	**0**	**5,724**

[1] 128 participants are expected to receive retiree medical benefits in a different plan and are included for OD&D benefits only.

[2] 124 participants are expected to receive retiree medical benefits in a different plan and are included for OD&D benefits only.

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Section 3.4: Schedule of Active Member Data

Valuation Date	Number	Annual Earnings (000's)	Annual Average Earnings	Percent Increase in Average Earnings	Number of Participating Employers
June 30, 2022	5,688	$ 437,728	$ 76,956	3.9%	57
June 30, 2021	5,521	408,805	74,045	4.1%	57
June 30, 2020	5,332	379,201	71,118	2.2%	57
June 30, 2019	4,998	347,957	69,619	2.2%	57
June 30, 2018	4,915	334,803	68,119	2.4%	57
June 30, 2017	4,694	312,347	66,542	2.0%	57
June 30, 2016	4,383	285,854	65,219	2.5%	58
June 30, 2015	4,095	260,584	63,635	2.7%	58
June 30, 2014	3,547	219,701	61,940	2.4%	58
June 30, 2013	3,272	197,944	60,496	3.5%	58

Total and average annual earnings ("valuation pay") are the annualized earnings for the fiscal year ending on the valuation date.

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Section 3.5: Active Member Payroll Reconciliation

Payroll Field	Payroll Data (000's)
a) DRB actual reported salaries FY22 in employer list	$ 485,788
b) DRB actual reported salaries FY22 in valuation data	430,240
c) Annualized valuation data	437,728
d) Valuation payroll as of June 30, 2022	460,736
e) Rate payroll for FY23	455,927

a) Actual reported salaries from DRB employer listing showing all payroll paid during FY22, including those who were not active as of June 30, 2022
b) Payroll from valuation data for people who are in active status as of June 30, 2022
c) Payroll from (b) annualized for both new entrants and part-timers
d) Payroll from (c) with one year of salary scale applied to estimate salaries payable for the upcoming year
e) Payroll from (d) with the part-timer annualization removed

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Section 4: Basis of the Actuarial Valuation

Section 4.1: Summary of Plan Provisions

Effective Date

July 1, 2006, with amendments through June 30, 2022.

Administration of Plan

The Commissioner of Administration or the Commissioner's designee is the administrator of the Plan. The Attorney General of the state is the legal counsel for the Plan and shall advise the administrator and represent the Plan in legal proceedings.

The Alaska Retirement Management Board prescribes policies, adopts regulations, invests the funds, and performs other activities necessary to carry out the provisions of the Plan.

Employers Included

Currently there are 57 employers participating in TRS DCR, including the State of Alaska, 53 school districts, and three other eligible organizations.

Membership

An employee of a participating employer who first enters service on or after July 1, 2006, or a member of the defined benefit plan who works for an employer who began participation on or after July 1, 2006, and meets the following criteria is a member in the Plan:

- Permanent full-time or part-time elementary or secondary teachers, school nurses, or a person in a position requiring a teaching certificate as a condition of hire in a public school of the State of Alaska, the Department of Education and Early Development, or in the Department of Labor and Workforce Development.
- Full-time or part-time teachers at the University of Alaska or persons occupying full-time administrative positions requiring academic standing who are not in the University's Optional Retirement Plan.

Members can convert to TRS DCR if they are an eligible non-vested member of the TRS defined benefit plan whose employer consents to transfers to the defined contribution plan and they elect to transfer his or her account balance to TRS DCR.

Member Contributions

Other than the member-paid premiums discussed later in this section, there are no member contributions for the occupational death & disability and retiree medical benefits.

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Retiree Medical Benefits

- Member must retire directly from the plan to be eligible for retiree medical coverage. Normal retirement eligibility is the earlier of a) 30 years of service or b) Medicare eligible and 10 years of service.
- No subsidized retiree medical benefits are provided until normal retirement eligibility. The member's and any covered dependent's premium is 100% until the member is Medicare eligible. Upon the member's Medicare-eligibility, the required contribution will follow the service-based schedule shown below.
- Coverage cannot be denied except for failure to pay premium.
- Members who are receiving disability benefits or survivors who are receiving monthly survivor benefits are not eligible until the member meets, or would have met if he/she had lived, the normal retirement eligibility requirements.
- The following is a summary of the medical benefit design adopted in July 2016. The plan description below is used for valuation purposes and indicates participant cost-sharing. Please refer to the benefit handbook for more details.

Plan Design Feature	In-Network[1]	Out-of-Network[1] [2]
Deductible (single / family)	$300 / $600	
Medical services (participant share)	20%	40%
Emergency Room Copay (non-emergent use)	$100	$100
Medical Out-of-Pocket Maximum (single / family, including deductible)	$1,500 / $3,000	$3,000 / $6,000
Medicare Coordination	Exclusion	Exclusion
Pharmacy	No Deductible	No Deductible
Retail Generic (per 30-day fill)	20% $10 min / $50 max	
Retail Non-Formulary Brand (per 30-day fill)	25% $25 min / $75 max	40%
Retail Formulary Brand (per 30-day fill)	35% $80 min / $150 max	
Mail-Order Generic	$20 copay	
Mail-Order Non-Formulary Brand	$50 copay	40%
Mail-Order Formulary Brand	$100 copay	
Pharmacy Out-of-Pocket Max (single / family)	$1,000 / $2,000	
Medicare Pharmacy Arrangement	Retiree Drug Subsidy / Employer Group Waiver Plan effective 1/1/2019	
Wellness / Preventative	100% covered, not subject to deductible	20%, after deductible

[1] Section 1.1 of the AlaskaCare Defined Contribution Retiree Benefit Plan states that this health plan shall be updated from time to time to reflect changes in benefits, including annual adjustments to the premium, deductible, coinsurance, medical out-of-pocket limit, and prescription drug out-of-pocket limit.

[2] OON applies only to non-Medicare eligible participants.

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- Buck used manual rate models to determine relative plan values for the defined benefit (DB) retiree medical plan and the DCR retiree medical plan outlined above. We applied the ratio of the DCR retiree medical plan value to the DB retiree medical plan value to the per capita costs determined for each of pre/post-Medicare medical and pharmacy benefits to estimate corresponding values for the DCR retiree medical plan design. These factors are noted in Section 4.3. We further adjusted the Medicare medical manual rate to reflect the Medicare coordination method adopted. The estimated 2023 reimbursements under EGWP were provided by Segal Consulting (who worked with the EGWP administrator, Optum, to develop those estimates). We reflect estimated discounts and pharmacy rebates in the defined benefit medical cost so no further adjustment was needed for the DCR retiree medical plan. The medical network differential is reflected in the relative plan value adjustments.
- Starting in 2022, prior authorization is required for certain specialty medications. There is no change to the medications that are covered by the plan.
- The retiree medical plan's coverage is supplemental to Medicare. Medicare coordination is described in the DCR Plan Handbook, referred to in the industry as exclusion coordination: Medicare payment is deducted from the Medicare allowable expense and plan parameters are applied to the remaining amount. Starting in 2019, the prescription drug coverage is through a Medicare Part D EGWP arrangement.
- The premium for Medicare-eligible retirees will be based on the member's years of service. The percentage of premium paid by the member is as follows:

Years of Service	Percent of Premium Paid by Member
< 15	30%
15 – 19	25%
20 – 24	20%
25 – 29	15%
30+	10%

- The premium for dependents who are not eligible for Medicare aligns with the member's subsidy. While a member is not Medicare-eligible, premiums are 100% of the estimated cost.
- Members have a separate defined contribution Health Reimbursement Arrangement account, which is not reflected in this valuation, that can be used to pay for premiums or other medical expenses.
- For valuation purposes, retiree premiums were assumed to equal the percentages outlined in the table above times the age-related plan costs. Future premiums calculated and charged to DCR participants will need to be determined reflecting any appropriate adjustments to the defined benefit (DB) plan data because current DB premiums were determined using information based upon enrollment with members who have double coverage.
- Coverage will continue for surviving spouses of covered retired members.

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Occupational Disability Benefits

- Benefit is 40% of salary at date of disability.
- Disability Benefit Adjustment: The disability benefit is increased by 75% of the cost-of-living increase in the preceding calendar year or 9%, whichever is less.
- Member earns service while on occupational disability.
- Benefits cease when the member becomes eligible for normal retirement at Medicare-eligible age and 10 years of service, or at any age with 30 years of service.
- No subsidized retiree medical benefits are provided until normal retirement eligibility. The member's premium is 100% of the estimated cost until they are Medicare eligible. Medicare-eligible premiums follow the service-based schedule above.

Occupational Death Benefits

- Benefit is 40% of salary.
- Survivor's Pension Adjustment: A survivor's pension is increased by 50% of the cost-of-living increase in the preceding calendar year or 6%, whichever is less, if the recipient is at least age 60 on July 1, or under age 60 if the recipient has been receiving TRS benefits for at least 8 years as of July 1.
- Benefits cease when the member would have become eligible for normal retirement.
- The period during which the survivor is receiving benefits is counted as service credit toward retiree medical benefits.
- No subsidized retiree medical benefits are provided until the member would have been eligible for normal retirement. The surviving spouse's premium is 100% of the estimated cost until the member would have been Medicare eligible. Medicare-eligible premiums follow the service-based schedule above.

Changes in Benefit Provisions Valued Since the Prior Valuation

There were no changes in benefit provisions since the prior valuation.

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Section 4.2: Description of Actuarial Methods and Valuation Procedures

The funding method used in this valuation was adopted by the Board in October 2006, and was modified as part of the experience study for the period July 1, 2013 to June 30, 2017. The asset smoothing method used to determine valuation assets was implemented effective June 30, 2006.

Benefits valued are those delineated in Alaska State statutes as of the valuation date. Changes in State statutes effective after the valuation date are not taken into consideration in setting the assumptions and methods.

Actuarial Cost Method

Liabilities and contributions shown in the report are computed using the Entry Age Normal Actuarial Cost Method, level percent of pay. Each year's difference between actual and expected unfunded actuarial accrued liability is amortized over 25 years as a level percentage of expected payroll.

Cost factors designed to produce annual costs as a constant percentage of each member's expected compensation in each year for death & disability benefits and retiree medical benefits, from the assumed entry age to the last age with a future benefit were applied to the projected benefits to determine the normal cost (the portion of the total cost of the plan allocated to the current year under the method). The normal cost is determined by summing intermediate results for active members and determining an average normal cost rate which is then related to the total DCR Plan payroll of active members. The actuarial accrued liability for active members (the portion of the total cost of the plan allocated to prior years under the method) was determined as the excess of the actuarial present value of projected benefits over the actuarial present value of future normal costs.

The actuarial accrued liability for beneficiaries and disabled members currently receiving benefits (if any) was determined as the actuarial present value of the benefits expected to be paid. No future normal costs are payable for these members.

The actuarial accrued liability under this method at any point in time is the theoretical amount of the fund that would have been accumulated had annual contributions equal to the normal cost been made in prior years (it does not represent the liability for benefits accrued to the valuation date). The unfunded actuarial accrued liability is the excess of the actuarial accrued liability over the actuarial value of plan assets measured on the valuation date.

Under this method, experience gains or losses, i.e., decreases or increases in accrued liabilities attributable to deviations in experience from the actuarial assumptions, adjust the unfunded actuarial accrued liability.

Valuation of Assets

Effective June 30, 2006, the asset valuation method recognizes 20% of the investment gain or loss in each of the current and preceding four years. This method was phased in over five years. Fair Value of Assets was $0 as of June 30, 2006. All assets are valued at fair value. Assets are accounted for on an accrued basis and are taken directly from financial statements audited by KPMG LLP. Valuation assets are constrained to a range of 80% to 120% of the fair value of assets.

Changes in Methods Since the Prior Valuation

There were no changes in the asset or valuation methods since the prior valuation.

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Valuation of Retiree Medical and Prescription Drug Benefits

The methodology used for the valuation of the retiree medical benefits is described in Section 5.2 of the State of Alaska Teachers' Retirement System Defined Benefit Plan Actuarial Valuation Report as of June 30, 2022.

Starting in 2022, prior authorization is required for certain specialty medications. There is no change to the medications that are covered by the plan. Segal provided an estimate of the impact of this change to the DB retiree health plan cost for calendar year 2022. The resulting adjustment factors for pre-Medicare prescription drug, Medicare prescription drug, and EGWP costs were applied to claims experience incurred before January 1, 2022. Those base claims costs were used for the DCR valuation with further adjustments as noted below. Additionally, starting in 2022, certain common preventive benefits are covered for the DB plan. The resulting adjustment factor for pre-Medicare medical costs was applied to claims experience incurred before January 1, 2022. However, preventive benefits were already covered under the DCR plan so the pre-65 DCR medical adjustment factor referenced below was increased from 3.1% to 4.4%.

Due to the lack of experience for the DCR retiree medical plan, base claims costs are based on those described in the actuarial valuation as of June 30, 2022 for the Defined Benefit (DB) retiree medical plan covering TRS and PERS. The DB rates were used with some adjustments. The claims costs were adjusted to reflect the differences between the DCR medical plan and the DB medical plan. These differences include network steerage, different coverage levels, different Medicare coordination for medical benefits, and an indexing of the retiree out-of-pocket dollar amounts. To account for higher initial copays, deductibles, and out-of-pocket limits, projected FY23 claims costs were reduced 4.4% for pre-Medicare medical claims, 3.1% for Medicare medical claims, and 8.9% for prescription drugs. In addition, to account for the difference in Medicare coordination, projected FY23 medical claims costs for Medicare eligible retirees were further reduced 29.5%.

FY21 and FY22 experience was thoroughly reviewed to assess the impact of COVID-19 and whether an adjustment to FY21 and FY22 claims was appropriate for use in the June 30, 2022 valuation. FY21 medical per capita claims were noticeably lower than expected, so a 4% load was added to the FY21 medical claims used in the per capita claims cost development to better reflect future expected long-term costs of the plan. FY22 medical per capita claims were reasonable when compared to pre-COVID levels, so no adjustments were made to the FY22 medical claims used in the per capita claims cost development.

No implicit subsidies are assumed. Employees projected to retire with 30 years of service prior to Medicare are valued with commencement deferred to Medicare eligibility, because those members will be required to pay the full plan premium prior to Medicare. Explicit subsidies for disabled and normal retirement are determined using the plan-defined percentages of age-related total projected plan costs, again with no implicit subsidy assumed.

The State transitioned to an Employer Group Waiver Program (EGWP) for DCR participants effective January 1, 2019. The estimated 2023 reimbursements under EGWP were provided by Segal Consulting (who worked with the EGWP administrator, Optum, to develop those estimates).

Healthcare Reform

Healthcare Reform legislation passed on March 23, 2010 included several provisions with potential implications for the State of Alaska Retiree Health Plan liability. Buck evaluated the impact due to these provisions.

Because the State plan is retiree-only, not all provisions are required. Unlimited lifetime benefits and dependent coverage to age 26 are two of these provisions. The adopted DCR plan does not place lifetime limits on benefits, but does restrict dependent child coverage.

The Further Consolidated Appropriations Act, 2020 passed in December 2019 repealed several healthcare-related taxes, including the Cadillac Tax.

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The Tax Cuts and Jobs Act passed in December 2017 included the elimination of the individual mandate penalty and changed the inflation measure for purposes of determining the limits for the High Cost Excise Tax to use chained CPI. It is our understanding the law does not directly impact other provisions of the ACA. While the nullification of the ACA's individual mandate penalty does not directly impact employer group health plans, it could contribute to the destabilization of the individual market and increase the number of uninsured. Such destabilization could translate to increased costs for employers. We have considered this when setting our healthcare cost trend assumptions and will continue to monitor this issue.

The Inflation Reduction Act was signed into law on August 16, 2022. The law contains several provisions that are expected to impact Alaska's Medicare prescription drug plan (EGWP), which will be considered at the next measurement date.

We have not identified any other specific provisions of healthcare reform or its potential repeal that would be expected to have a significant impact on the measured obligation. We will continue to monitor legislative activity.

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Section 4.3: Summary of Actuarial Assumptions

The demographic and economic assumptions used in the June 30, 2022 valuation are described below. Unless noted otherwise, these assumptions were adopted by the Board at the June 2022 meeting based on the experience study for the period July 1, 2017 to June 30, 2021.

Investment Return

7.25% per year, net of investment expenses.

Salary Scale

Salary scale rates based on the 2017-2021 actual experience (see Table 1).

Inflation – 2.50% per year.

Productivity – 0.25% per year.

Payroll Growth

2.75% per year (inflation + productivity).

Total Inflation

Total inflation as measured by the Consumer Price Index for urban and clerical workers for Anchorage is assumed to increase 2.50% annually.

Mortality (Pre-Commencement)

Mortality rates based on the 2017-2021 actual experience, to the extent the experience was statistically credible.

- Occ D&D: Pub-2010 Teachers Employee table, amount-weighted, and projected with MP-2021 generational improvement.
- Healthcare: Pub-2010 Teachers Employee table, headcount-weighted, and projected with MP-2021 generational improvement.

Deaths are assumed to result from occupational causes 15% of the time.

Mortality (Post-Commencement)

Mortality rates based on the 2017-2021 actual experience, to the extent the experience was statistically credible.

Retiree mortality in accordance with the following tables:

- Occ D&D: 97% of male and 97% of female rates of the Pub-2010 Teachers Retiree table, amount-weighted, and projected with MP-2021 generational improvement.
- Healthcare: 98% of male and 100% of female rates of the Pub-2010 Teachers Retiree table, headcount-weighted, and projected with MP-2021 generational improvement.

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Beneficiary mortality in accordance with the following tables. These tables are applied only after the death of the original member.

- Occ D&D: 100% of male and 95% of female rates of the Pub-2010 Contingent Survivor table, amount-weighted, and projected with MP-2021 generational improvement.
- Healthcare: 100% of male and 94% of female rates of the Pub-2010 Contingent Survivor table, headcount-weighted, and projected with MP-2021 generational improvement.

Turnover

Select and ultimate rates based on the 2017-2021 actual experience (see Table 2).

Disability

No changes to the incidence rates from the prior valuation due to insufficient 2017-2021 actual experience (see Table 3). For retiree medical benefits, the disability rates cease once a member is eligible for retirement. However, the disability rates continue after retirement eligibility for occupational death & disability benefits.

Disabilities are assumed to be occupational 15% of the time.

Post-disability mortality in accordance with the following tables:

- Occ D&D: Pub-2010 Non-Safety Disabled Retiree table, amount-weighted, and projected with MP-2021 generational improvement.
- Healthcare: Pub-2010 Non-Safety Disabled Retiree table, headcount-weighted, and projected with MP-2021 generational improvement.

Retirement

Retirement rates based on the 2017-2021 actual experience (see Table 4).

Spouse Age Difference

Males are assumed to be three years older than their wives. Females are assumed to be two years younger than their husbands.

Percent Married for Occupational Death & Disability

85% of male members and 75% of female members are assumed to be married at termination from active service.

Dependent Spouse Medical Coverage Election

Applies to members who do not have double medical coverage. 60% of male members and 50% of female members are assumed to be married and cover a dependent spouse.

Part-Time Service

Part-time employees are assumed to earn 0.75 years of service per year.

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Imputed Data

Data changes from the prior year which are deemed to have immaterial impact on liabilities and contribution rates are assumed to be correct in the current year's client data.

Non-vested terminations with appropriate refund dates are assumed to have received a full refund of contributions. Active members with missing salary and service are assumed to be terminated with status based on their vesting percentage.

Administrative Expenses

The Normal Cost as of June 30, 2022 was increased by $9,000 for occupational death & disability and $35,000 for retiree medical. These amounts are based on the average of actual administrative expenses during the last two fiscal years.

Retiree Medical Participation

Death / Disability Decrement		Retirement Decrement	
Age	Percent Participation	Age	Percent Participation*
< 56	75.0%	55	50.0%
56	77.5%	56	55.0%
57	80.0%	57	60.0%
58	82.5%	58	65.0%
59	85.0%	59	70.0%
60	87.5%	60	75.0%
61	90.0%	61	80.0%
62	92.5%	62	85.0%
63	95.0%	63	90.0%
64	97.5%	64	95.0%
65+	100.0%	65+	**Years of Service**
			< 15 75.0%
			15 – 19 80.0%
			20 – 24 85.0%
			25 – 29 90.0%
			30+ 95.0%

* Participation assumption is a combination of (i) the service-based rates for retirement from employment at age 65+ and (ii) the age-based rates for retirement from employment before age 65. These rates reflect the expected plan election rate that varies by reason for decrement, duration that a member may pay full cost prior to Medicare eligibility, and availability of alternative and/or lower cost options, particularly in the Medicare market. This assumption is based on observed trends in participation from a range of other plans.

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Healthcare Per Capita Claims Cost

Sample claims cost rates (before base claims cost adjustments described below) adjusted to age 65 for FY23 medical and prescription drugs are shown below. The prescription drug costs reflect the plan change to require prior authorization for certain specialty medications.

	Medical	Prescription Drugs
Pre-Medicare	$ 15,706	$ 3,712
Medicare Parts A & B	$ 1,625	$ 3,907
Medicare Part D – EGWP	N/A	$ 1,309

Members are assumed to attain Medicare eligibility at age 65. All costs are for the 2023 fiscal year (July 1, 2022 – June 30, 2023).

The EGWP subsidy is assumed to increase in future years by the trend rates shown on the following pages. No future legislative changes or other events are anticipated to impact the EGWP subsidy. If any legislative or other changes occur in the future that impact the EGWP subsidy (which could either increase or decrease the plan's Actuarial Accrued Liability), those changes will be evaluated and quantified at the next measurement date.

Base Claims Cost Adjustments

Due to higher initial copays, deductibles, out-of-pocket limits, and member cost sharing compared to the DB medical plan, the following cost adjustments are applied to the per capita claims cost rates above:

- 0.956 for the pre-Medicare plan.
- 0.674 for both the Medicare medical plan and Medicare coordination method (3.1% reduction for the medical plan and 29.5% reduction for the coordination method).
- 0.911 for the prescription drug plan.

Healthcare Morbidity

Morbidity rates (also called aging factors) are used to estimate utilization of healthcare benefits at each age to reflect the fact that healthcare utilization typically increases with age. Separate morbidity rates are used for medical and prescription drug benefits. These rates are based on the 2017-2021 actual experience.

Age	Medical	Prescription Drugs
0 – 44	2.0%	4.5%
45 – 54	2.5%	3.5%
55 – 64	2.5%	1.0%
65 – 74	2.0%	2.1%
75 – 84	2.2%	-0.3%
85 – 94	0.5%	-2.5%
95+	0.0%	0.0%

Healthcare Third Party Administrator Fees

$449 per person per year; assumed to increase at 4.50% per year.

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Healthcare Cost Trend

The table below shows the rate used to project the cost from the shown fiscal year to the next fiscal year. For example, 7.00% is applied to the FY23 pre-Medicare medical claims costs to get the FY24 medical claims costs.

	Medical Pre-65	Medical Post-65	Prescription Drugs / EGWP
FY23	7.00%	5.50%	7.50%
FY24	6.70%	5.50%	7.20%
FY25	6.40%	5.40%	6.90%
FY26	6.20%	5.40%	6.65%
FY27	6.05%	5.35%	6.35%
FY28	5.85%	5.35%	6.10%
FY29	5.65%	5.30%	5.80%
FY30	5.45%	5.30%	5.55%
FY31-FY38	5.30%	5.30%	5.30%
FY39	5.25%	5.25%	5.25%
FY40	5.20%	5.20%	5.20%
FY41	5.10%	5.10%	5.10%
FY42	5.05%	5.05%	5.05%
FY43	4.95%	4.95%	4.95%
FY44	4.90%	4.90%	4.90%
FY45	4.80%	4.80%	4.80%
FY46	4.75%	4.75%	4.75%
FY47	4.70%	4.70%	4.70%
FY48	4.60%	4.60%	4.60%
FY49	4.55%	4.55%	4.55%
FY50+	4.50%	4.50%	4.50%

For the June 30, 2014 valuation and later, the updated Society of Actuaries' Healthcare Cost Trend Model is used to project medical and prescription drug costs. This model estimates trend amounts that are projected out for 80 years. The model has been populated with assumptions that are specific to the State of Alaska.

Changes in Assumptions Since the Prior Valuation

Effective for the June 30, 2022 valuation, the Board adopted the changes to the demographic and economic assumptions recommended by the actuary, based on the results of an experience study performed on the plan experience from July 1, 2017 to June 30, 2021. The changes in assumptions were adopted at the June 2022 Board meeting.

The healthcare per capita claims cost assumption is updated annually as described in Section 4.2. The amounts included in the Normal Cost for administrative expenses were changed from $5,000 to $9,000 for occupational death & disability, and from $22,000 to $35,000 for retiree medical (based on the most recent two years of actual administrative expenses paid from plan assets).

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Table 1: Salary Scale

Years of Service	Percent Increase
< 1	7.25%
1	6.75%
2	6.25%
3	5.75%
4	5.25%
5	5.00%
6	4.75%
7	4.50%
8	4.25%
9	4.00%
10	3.75%
11	3.50%
12	3.25%
13	3.05%
14	3.00%
15	2.95%
16	2.90%
17+	2.85%

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Table 2: Turnover Rates

Select Rates during the First 6 Years of Employment

Years of Service	Male	Female
< 1	28.00%	31.00%
1	28.00%	21.00%
2	19.00%	18.00%
3	17.00%	13.00%
4	13.00%	13.00%
5	13.00%	10.00%

Ultimate Rates after the First 6 Years of Employment

Age	Male	Female
< 30	10.50%	8.70%
30 - 34	10.50%	8.70%
35 - 39	10.40%	8.60%
40 - 44	10.30%	8.60%
45 - 49	10.00%	8.40%
50 - 54	9.50%	8.10%
55 - 59	8.80%	7.90%
60 - 64	9.30%	8.70%
65+	10.90%	7.40%

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Table 3: Disability Rates

Age	Male	Female	Age	Male	Female
< 31	0.0337%	0.0612%	50	0.0601%	0.1093%
31	0.0337%	0.0613%	51	0.0634%	0.1152%
32	0.0337%	0.0613%	52	0.0666%	0.1211%
33	0.0342%	0.0622%	53	0.0746%	0.1356%
34	0.0347%	0.0631%	54	0.0826%	0.1501%
35	0.0353%	0.0641%	55	0.0905%	0.1645%
36	0.0357%	0.0650%	56	0.0985%	0.1790%
37	0.0362%	0.0659%	57	0.1064%	0.1935%
38	0.0371%	0.0674%	58	0.1245%	0.2263%
39	0.0379%	0.0689%	59	0.1426%	0.2592%
40	0.0387%	0.0703%	60	0.1606%	0.2920%
41	0.0395%	0.0718%	61	0.1787%	0.3249%
42	0.0403%	0.0733%	62	0.1967%	0.3577%
43	0.0423%	0.0770%	63	0.2253%	0.4096%
44	0.0443%	0.0806%	64	0.2572%	0.4677%
45	0.0464%	0.0843%	65	0.2933%	0.5332%
46	0.0483%	0.0879%	66	0.3343%	0.6079%
47	0.0504%	0.0916%	67	0.3812%	0.6930%
48	0.0536%	0.0975%	68	0.4345%	0.7900%
49	0.0569%	0.1034%	69	0.4953%	0.9006%
			70+	0.5647%	1.0267%

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Table 4: Retirement Rates

Age	Rate
< 55	2.00%
55	3.00%
56	3.00%
57	3.00%
58	3.00%
59	3.00%
60	5.00%
61	5.00%
62	10.00%
63	5.00%
64	5.00%
65	25.00%
66	25.00%
67	25.00%
68	20.00%
69	20.00%
70+	100.00%

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Glossary of Terms

Actuarial Accrued Liability

Total accumulated cost to fund pension or postemployment benefits arising from service in all prior years.

Actuarial Cost Method

Technique used to assign or allocate, in a systematic and consistent manner, the expected cost of a pension or postemployment plan for a group of plan members to the years of service that give rise to that cost.

Actuarial Present Value of Projected Benefits

Amount which, together with future interest, is expected to be sufficient to pay all future benefits.

Actuarial Valuation

Study of probable amounts of future pension or postemployment benefits and the necessary amount of contributions to fund those benefits.

Actuary

Person who performs mathematical calculations pertaining to pension and insurance benefits based on specific procedures and assumptions.

GASB 74 and 75

Governmental Accounting Standards Board Statement Number 74 amends Number 43 effective for the fiscal year beginning after June 15, 2016 and defines new financial reporting requirements for public postemployment benefit plans. Governmental Accounting Standards Board Statement Number 75 amends Number 45 effective for fiscal years beginning after June 15, 2017 and defines new accounting and financial reporting requirements for employers sponsoring public postemployment benefit plans.

Normal Cost

That portion of the actuarial present value of benefits assigned to a particular year in respect to an individual participant or the plan as a whole.

Rate Payroll

Members' earnings used to determine contribution rates.

Unfunded Actuarial Accrued Liability (UAAL)

The portion of the actuarial accrued liability not offset by plan assets.

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Valuation Payroll

Members' earnings used to determine Normal Cost and Actuarial Accrued Liability.

Vested Benefits

Benefits which are unconditionally guaranteed regardless of employment.

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