



City of Milwaukee
Employees' Retirement System

Bernard J. Allen
Executive Director

David M. Silber, CFA, CAIA
Chief Investment Officer

Melody Johnson
Deputy Director

April 12, 2024

Mr. Jim Owczarski
City Clerk
Room 205, City Hall

Dear Mr. Owczarski:

Please be advised that an Investment Committee Meeting of the Annuity and Pension Board has been scheduled for **Thursday, April 18, 2024 at 9:00 a.m.** This meeting will be conducted via teleconference.

Special Notice: Instructions for the public on how to observe the meeting will be available on the ERS's website (www.cmers.com) prior to the meeting.

The agenda is as follows:

- I. Election of Vice Chair.
- II. Approval of FactSet Client License Agreement as Amended.
- III. Callan Investment Manager Due Diligence Report.
- IV. Callan Presentation on Act 12 Framework & Peer Group Comparison.
- V. CMERS 1st Quarter 2024 Preliminary Performance Update.
- VI. Chief Investment Officer Report.

Sincerely,

A handwritten signature in black ink that reads "Bernard J. Allen". The signature is written in a cursive style with a large, stylized initial "B".

Bernard J. Allen
Executive Director

BJA:jmw

FactSet[®] Client License Agreement Amendment

FactSet Research Systems Inc. 45 Glover Avenue Norwalk, CT 06850 T +1.203.810.1000 F +1.203.810.1001

Reference is made to the FactSet Client License Agreement, dated 14 March 2019, between EMPLOYES' RETIREMENT SYSTEM OF THE CITY OF MILWAUKEE ("Licensee" or "You") and FactSet Research Systems Inc. ("FactSet" or "Licensor"), as amended from time to time (the "Agreement" or "License"). All terms used and not defined herein shall have the meanings assigned to them in such License. Except as expressly set forth herein, this Amendment shall not alter, modify, or in any way affect the terms contained in the License, all of which are ratified and affirmed in all respects and shall continue in full force and effect. As of 01 April 2024 the License is amended as follows:

Section 3.c of the License shall be deleted in its entirety and replaced with the following: "Upon 90 days' written notice, FactSet will raise your Annual Fees once every twelve months by the greater of 3% or the percentage increase in the United States Bureau of Labor Statistics' Consumer Price Index. Supplier increases to fees for access to Supplier data are not subject to the restrictions of this Section 3.c. If a Supplier increases its fees to FactSet, we will raise your fees for your access to that Supplier's data by that amount. If you object to a Supplier-imposed increase, you may terminate your access to that Supplier's data by notifying FactSet in writing within 30 days of receiving notice of the fee increase."

The last sentence of Section 4.c shall be deleted in its entirety and replaced with the following: "Licensee hereby allows FactSet to use its name and logo to identify Licensee as a client of FactSet on its website, industry event presentations, and marketing slide decks. Such use shall be subject to Licensee's standard name and logo usage guidelines, if the same have been communicated to FactSet. FactSet shall not disclose Licensee's use case or any of Licensee's Confidential Information. Otherwise, FactSet may leverage the name and logo listed on Licensee's website."

The following shall be added as Section 4.e of the License:

"The Service may include cognitive computing and generative artificial intelligence components ("GenAI"), including large language models ("LLM"). The Service will not include any publicly-exposed LLM. For any private LLMs or private-instances of public LLMs that are provided as part of the Service (each a "Private LLM"), unless otherwise agreed by Licensee and FactSet in writing, such Private LLM may only be trained using Licensee's Confidential Information if there is an instance of such Private LLM that is isolated from other clients and is expunged upon the termination of Licensee's subscription to the applicable Service in the same manner as Licensee's Confidential Information is expunged. The use of Licensee Confidential Information via a Retrieval Augmented Generation (RAG) technique, or via a vector database, or through an external plugin does not constitute training an LLM.

Licensee may not enter illegal, defamatory, or obscene input into any GenAI. FactSet GenAI provides users with the ability to submit queries using natural language and receive machine-generated responses in natural language format summarizing elements of data licensed as part of the Service, data provided by Licensee for use within the Service, and/or analytics performed on any such datasets using FactSet's tools. FactSet GenAI does not advise users on what actions to take or avoid. Without limiting the disclaimers set forth in the License, Licensee acknowledges and agrees that responses provided by GenAI: (i) may contain inaccuracies, including those unique to generative artificial intelligence products and services, and (ii) are provided only for informational purposes and do not constitute advice, rating, projection, or opinion with respect to any course of action, investment vehicle, financial instrument, or security by FactSet or any of its affiliates. Licensee's queries and responses will be logged to improve FactSet's products and services in the manner detailed below. FactSet will not fine-tune or train any LLM in an unsupervised fashion using Licensee's queries and responses, but may use humans to evaluate the natural language accuracy and context of responses in efforts to improve the Service based on user feedback on response accuracy. For the avoidance of doubt, Licensee's queries and responses will not influence the substance of responses given to any other client, as user queries and responses are isolated and protected. FactSet shall be under no obligation to expunge data relating to queries and responses so long as it is only used in accordance with this Section.

Licensee's use of data provided via the Service in any LLMs that are outside of the Service shall be permitted only to the extent specified in the applicable Schedule."



Schedule A

Licensee Company Name & Address:	Employees' Retirement System of the City of Milwaukee 789 North Water Street Suite 300 Milwaukee, Wisconsin 53202-3584			fdsCRM ID:	762874
Authorized Affiliates (include departments if relevant):	None			Authorized Locations:	Milwaukee, Wisconsin [762874]
Initial Term begins on:	01 Apr 2024	and ends on:	31 Mar 2026	Invoice Frequency:	Monthly in Advance
Cancellation Terms:	You or FactSet may cancel this License or a portion of it effective at the end of the Initial Term or the end of any renewal term by giving at least three full months' written notice in advance.				

Products:

Description	Qty	Annual Unit Price	Annual Unit Discount	Price Start Date	Price End Date	Currency	Annual Subtotal
Asset Owner Essential - Enterprise Solution	1	42,100	6,315	01 Apr 2024	31 Mar 2026	USD	35,785
Asset Owner - Essential	2	25,000	3,750	01 Apr 2024	31 Mar 2026	USD	42,500
FactSet Workstation - SPAR Only IM	1	5,000	0	01 Apr 2024	31 Mar 2026	USD	5,000

Service Notes:

1. Asset Owner Essential - Enterprise Solution includes access to:
 - a. FactSet's Portfolio Analysis engine for the calculation of standard- and client-configured analytics. Analytical capabilities span across asset classes and capabilities such as attribution, characteristics, and risk. They also include the integration of commercial content via the FactSet workstation. As a result, certain analytical functions and content sets may require additional licensing.
 - b. FactSet's Portfolio Services team and framework for the integration of client content from one primary source. This includes the design of Standard Operating Procedure (SOP) and workflow documentation, 24/7 proactive monitoring and communication, and access to Portfolio Services transparency tools for associated workflows.
 - c. The FactSet Investor Network platform facilitates the aggregation and distribution of portfolio data for up to 5 portfolios.
 - d. Enterprise Advanced Fixed Income Analytics provides access to advanced fixed income analytics. This includes the ability to run analytics based on a client-provided price, advanced fixed income attribution columns, and models, and the following analytics: key rate durations, scenario analysis, projected cash flows, and MAC calcs.
 - e. The automation and production of up to 250 monthly-equivalent Portfolio Analysis reports via FactSet's Portfolio Reporting Batching application.
2. Upon the expiration of the Initial Term, all discounts shall automatically expire. The expiration of any discount shall not be considered an increase in Fees pursuant to Section 3.c of the License.
3. Any additional products or services ordered shall be subject to Licensor's then-current rate-card pricing unless otherwise agreed by both parties in writing.



Agreed to by:
FACTSET RESEARCH SYSTEMS INC.

Signature (Duly authorized manager or officer)

Name (Please print or type)

Title (Please print or type)

Agreed to by:
EMPLOYES' RETIREMENT SYSTEM OF THE CITY OF MILWAUKEE

Signature (Duly authorized officer or partner)

Name (Please print or type)

Title (Please print or type)



FactSet[®] Client License Agreement

FactSet Research Systems Inc. 601 Merritt 7 Norwalk, CT 06851 T +1 203 810 1000 F +1 203 810 1001

Licensor:	FactSet Research Systems Inc. and its affiliates	Effective Date:	14 Mar 2019
Licensee:	EMPLOYES' RETIREMENT SYSTEM OF THE CITY OF MILWAUKEE	CRM No.:	762874

This License with the Schedules to it are our complete agreement and supersede any previous agreement. Defined terms are in Section 11 below. You may accept these terms by signing below, or by clicking "I agree" if you are reviewing this License electronically. Your use of our Service also constitutes your acceptance of these terms.

The License

1. Scope

FactSet grants to you, the Licensee, the limited, non-exclusive, nontransferable right to use our Service under the terms of this License. Your Authorized Users are the only people authorized to use our Service under this License. FactSet will issue a free network ID for your IT Staff, who may access our Service solely for purposes of loading and maintaining the Service. IT Staff do not count towards any number limit of Authorized Users. FactSet and our third-party Suppliers own the components of the Service and retain all rights, including intellectual property rights, in the Service. We are licensing our Service to you, not selling it.

2. Term

- a. The Initial Term of this License is stated on your Schedule. After the Initial Term, this License will automatically renew for successive one-year periods unless you or FactSet cancel it in accordance with this License. You or FactSet may cancel this License or a portion of it effective at the end of the Initial Term or the end of any renewal term by giving at least three full months' written notice in advance. If you properly cancel any portion of the Service that you are permitted to cancel, your Schedule and Annual Fees will be deemed amended and reduced to reflect such cancellation. When this entire License terminates, for whatever reason, all Schedules will terminate on that same date. You or FactSet may cancel this License: (i) if the other party materially breaches this License and fails to cure or correct such breach within 30 days after receiving written notice; or (ii) upon the bankruptcy or bankruptcy-related event of the other party. Trials of our Service, if any, are limited to 30 days and are subject to the terms of this License, including the confidentiality terms set forth herein. You must permit FactSet to provide reasonable training and support to your Authorized Users at your Authorized Locations at least once each calendar quarter.
- b. When all or any portion of this License terminates, for any reason, you must: (i) delete all data, software and documentation associated with the terminated Service, except an Insubstantial Amount of Data used in accordance with Section 4.a and copies that you are required to keep for legal or regulatory compliance purposes; and (ii) promptly certify your compliance with this requirement in writing, if FactSet requests. You must use reasonable efforts to destroy any remaining data, including any Insubstantial Amount of Data used in accordance with Section 4.a, in accordance with your normal document destruction policies. If you are a CTS client, and a CTS product such as a data feed is terminated for any reason, you must grant FactSet reasonable access to the places you used the CTS product for the sole purpose of confirming that you have complied with this Section. FactSet will only do this once, during the 12-month period following termination, and we will accommodate your reasonable business, confidentiality and security rules.

The Fees

3. Fees

- a. You must pay the Annual Fees for the duration of the Initial Term and any period after the Initial Term for which this License remains active, together with any sales, use, excise, services, consumption, value-added and other applicable taxes other than any taxes based on FactSet's net income. If your License renews for any period beyond the Initial Term, your Annual Fees will be calculated under Section 3.c based on FactSet's then-current rates for your then-current subscriptions. Unless you have preauthorized charges to your purchasing card, you will receive a periodic invoice. You must pay the invoiced fees in full within 30 days of receipt of the invoice. You may order additional components of our Service if you pay the associated fees. Upon your payment of a revised invoice, the Annual Fees

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on your Schedule will be deemed amended to reflect the additional Services you ordered. FactSet may require you to execute a revised Schedule for extensive additional Services. If you believe your invoice is incorrect, you must notify FactSet in writing within 60 days of the due date of your invoice, otherwise you will be deemed to have agreed to the accuracy of your invoice.

- b. If you do not pay your invoiced and undisputed fees in full within the 60-day Grace Period following the due date of your invoice, you will owe FactSet interest in the amount of 1% per month on all overdue undisputed amounts, compounded monthly, beginning after the Grace Period, along with our reasonable collection costs and attorneys' fees.
- c. FactSet will raise your Annual Fees once each year on January 1st, by the greater of 3% or the percentage increase in the United States Bureau of Labor Statistics' Consumer Price Index. Supplier increases to fees for access to Supplier data are not subject to the restrictions of this Section 3.c. If a Supplier increases its fees to FactSet, we will raise your fees for your access to that Supplier's data by that amount. If you object to a Supplier-imposed increase, you may terminate your access to that Supplier's data by notifying FactSet in writing within 30 days of receiving notice of the fee increase.

The Data

4. Limitations and Protections

- a. You must not use or permit use of our Service for any unlawful or unauthorized purpose or to compete with any FactSet service. You must not download, copy, transfer, distribute, reproduce, reverse engineer, decrypt, decompile, disassemble, create derivative works from or make any part of our Service available to non-Authorized Users or third parties. However, you may download an Insubstantial Amount of Data from our Service on an ad hoc basis, to be used in the normal conduct of your business, such as in reports, charts, pitch books and similar presentations to your employees, customers, agents and consultants. Except to the extent expressly permitted by a Schedule, you may not (i) set up recurring, systematic or automated downloading or validation processes, or (ii) use the downloading functionality to create, enhance or maintain an internal database, feed an internal system, or as a substitute for licensing the Service or any portion of it. Use of the Service for validation of the accuracy of any data set that is owned by you or a third party is only permitted on an ad hoc basis using an Insubstantial Amount of Data. You are not permitted to share FactSet IDs or passwords or use common workstations or kiosks.
- b. You shall provide such information as FactSet may reasonably request to ascertain your compliance with the terms of this License. FactSet may require you to certify in writing the accuracy of the information you provide as well as your compliance with the terms of this License. Notwithstanding anything to the contrary, FactSet may immediately limit, restrict or suspend your access to any portion of the Service without credit or refund if, in FactSet's sole reasonable judgment: (i) you fail to provide the information or certification as set forth above, or (ii) your use of any portion of the Service is in material breach of this License.
- c. You must not use any trademarks, service marks, names, logos, or other identifiers from the Service without permission, except that you must follow our attribution guidelines if you wish to use any data from our Service in your reports or presentations. We have posted our attribution guidelines for you here: <http://www.factset.com/about/resources/attribution>. You must keep all copyright, trademark, service mark and other proprietary notices in our Service and you must not modify our Service in a way that would constitute an infringement of any third party's intellectual property rights. FactSet will not use your name or marks without your permission.
- d. You must comply with the additional terms required by Suppliers for your use of Supplier data through the Service: www.factset.com/about/resources/thirdpartyterms. If you choose to receive any Premium Supplier Content via the Service, you shall be solely responsible for obtaining any Supplier authorization or entering into a license agreement directly with the Supplier if required by the Supplier. FactSet may immediately terminate your access to any Premium Supplier Content for which you do not have valid authorization.

Miscellaneous

5. Warranties and Limitation of Liability

- a. FactSet represents and warrants that we have all rights necessary to deliver the FactSet proprietary portions of the Service to you and valid licenses with our Suppliers to deliver the Supplier portions of the Service to you. FACTSET AND OUR SUPPLIERS DO NOT WARRANT THAT THE PROVISION OF SERVICES WILL BE UNINTERRUPTED, ERROR FREE, TIMELY, COMPLETE OR ACCURATE, NOR DO FACTSET OR OUR SUPPLIERS MAKE ANY WARRANTIES, EXPRESS OR IMPLIED, AS TO THE RESULTS TO BE OBTAINED FROM THE USE OF THE SERVICE AND THERE ARE NO EXPRESS OR IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR USE. YOU ACKNOWLEDGE THAT NOTHING IN THE SERVICE CONSTITUTES INVESTMENT ADVICE OF ANY KIND AND THAT THE



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- b. FactSet will indemnify you and hold you harmless and, at FactSet's expense, defend you against any claim arising out of FactSet's breach of the warranties in Section 5.a. You will indemnify FactSet and hold FactSet harmless and, at your expense, defend FactSet against any third-party claim arising out of (i) your use of our Service in violation of the terms of this License; and (ii) your request that we share your information with, or receive your information from, a third party. A party claiming indemnification must: (i) promptly notify the other party in writing of the claim; (ii) grant the indemnifying party sole control of the settlement and defense of any action to which this indemnity relates, except that the indemnifying party cannot settle the claim unless it unconditionally releases the indemnified party of all liability; and (iii) reasonably cooperate to facilitate such defense. If you become aware of any suspected infringement by a third party of any proprietary rights of FactSet, you must promptly notify FactSet of such activities.
- c. To keep our Service current and useful to you, we may update or change it from time to time. We may discontinue parts of the Service as a result of a general product discontinuation or the unavailability of Supplier data, and, in such cases, we will refund to you a ratable portion of any prepaid fees, and this will be your sole remedy. If you fail to download our free updates to the Service at least once a year to ensure that you are always using one of FactSet's two most recently released software versions, Authorized Users may lose access to the Service without credit or refund. If you have a third party, such as a custodian, send your information to FactSet you acknowledge it is your responsibility to make sure the correct information is sent to FactSet. You agree and acknowledge that FactSet may use anonymized, aggregated usage metrics to improve the Service.

6. Assignment

You may not transfer this License, including any assignment by operation of law in connection with a merger or Acquisition, without FactSet's prior written consent, which we will not unreasonably withhold. If you Acquire, or are Acquired by, an existing FactSet client, we may require you to execute a new License.

7. Survival

The following provisions of this License will survive the termination of this License and any attached Schedule: Sections 2.b, 4, 5, 6, 7, 8, 9 and 10.

8. Notices

All notices under this License must be in writing to the appropriate Notice Recipient on the signature page of this License. You may order additional services via email, but email is not an acceptable method of giving notice of a legal issue, which must be made in writing and sent by certified mail or overnight delivery.

9. Claim Resolution

This License was written in English. To the extent any translated version of this License conflicts with the English version, the English version controls. The laws of the State of New York will govern this License without regard to conflict of law provisions. You agree to submit to the exclusive jurisdiction of the courts located in New York County, New York, for the resolution of any dispute or claim relating to this License. You and FactSet each waive any right to a trial by jury.

10. Confidential Information

Confidential Information means any non-public information received by a party in connection with this License. This includes, among other things, any non-public information you or your agents provide to us about your clients or your business. Confidential Information will not include information that becomes publicly available without any action or omission by the recipient, is otherwise available without anyone's violation of any confidentiality obligation, or is independently developed by the recipient without reliance on the Confidential Information. You and FactSet agree to not disclose each other's Confidential Information to any third party without the prior written consent of the other party unless required to do so by law, or legal or regulatory process and except to those agents with a need to



know and subject to confidentiality obligations at least as protective as these. You and FactSet each agree to give the other party a reasonable chance to protect its Confidential Information in the event of a legally compelled disclosure, to the extent that it is practically and legally possible to do so. The terms and conditions, but not the existence, of this License will constitute Confidential Information.

11. Defined Terms

Acquisition (or to **Acquire**) refers to a transaction that results in a change of control of a company.

Annual Fees are the annual fees for the Service on your Schedule.

Authorized Affiliates are the Licensee affiliates and departments listed on your Schedule.

Authorized Locations means the Licensee address and Authorized Locations listed on your Schedule.

Authorized User means a Licensee employee with a valid FactSet ID and password to access the Service who works at an Authorized Location or Authorized Affiliate listed on your Schedule.

Confidential Information means any non-public information received by you or us in connection with this License, as described more fully in Section 10.

CTS means FactSet's Content & Technology Solutions division. Your Schedule will indicate if you are subscribing to any CTS Service.

FactSet means FactSet Research Systems Inc.

Force Majeure means any circumstances beyond a party's reasonable control, including, among other things, natural disasters, labor disruptions, computer line or transmission failures, computer viruses, power outages, or acts of terrorism.

Grace Period means the 60-day period after the due date of your FactSet invoice, during which no additional fees or costs will accrue.

Initial Term means the initial term stated on your Schedule.

Insubstantial Amount of Data means an amount of data that has no independent commercial value, could not be used as a substitute for our Service or any part of it, and is not separately marketed by you, FactSet or a Supplier.

IT Staff means your information technology and support employees.

License means this agreement with the Schedules to it.

Licensee means the Licensee Company named on the Schedule along with its Authorized Locations, Authorized Affiliates and Authorized Users. Licensee does not include any other affiliated entities (such as subsidiaries or sister companies) that are not listed on your Schedule.

Notice Recipients are the individuals designated to receive legal notices for you and us, as listed on the signature page.

Premium Supplier Content means any Supplier data or software that is available via the Service subject to additional fees and/or a separate Supplier authorization or license agreement that must be entered into directly with the Supplier.

Schedule means any schedule to your License, as updated from time to time under the terms of your License.

Service means the FactSet and Supplier software, data, databases, consulting services, file transfer and file sharing services, documentation and hardware, if any, whether provided on a paid or trial basis.

Supplier means any third-party supplier to FactSet or you of data or software used via the Service.

(signature page follows)



Agreed to by:
FACTSET RESEARCH SYSTEMS INC.

Janet Post
Signature (Duly authorized manager or officer)

Janet Post
Name (Please print or type)

VP, Sales Manager
Title (Please print or type)

FactSet Notice Recipients:

1. Josie Reinhardt
Institutional Sales Representative
181 W. Madison Street, 33rd Floor
Chicago, IL 60602; and
2. Rachel R. Stern, SVP & General Counsel,
FactSet Research Systems Inc.,
601 Merritt 7, Norwalk, CT 06851

Agreed to by:
EMPLOYEES' RETIREMENT SYSTEM OF THE CITY OF MILWAUKEE

Bernard J. Allen
Signature (Duly authorized officer or partner)

Bernard J. Allen
Name (Please print or type)

Executive Director
Title (Please print or type)

Licensee Notice Recipient:

1. David M. Silber
Chief Investment Officer
789 North Water Street, Suite 300
Milwaukee, Wisconsin 53202-3584



FactSet[®] License Agreement

Schedule A

Licensee Company Name & Address:	Employees' Retirement System of the City of Milwaukee 789 North Water Street Suite 300 Milwaukee, Wisconsin 53202-3584			Licensee Contact:	David M. Silber 4142868235 david.silber@cmers.com		
Authorized Affiliates (include departments if relevant):	None			Authorized Locations:	Milwaukee, Wisconsin [762874]		
Initial Term begins on:	01 Apr 2019	and ends on:	31 Mar 2020	Invoice Frequency:	Monthly in Advance	fdsCRM ID:	762874
Cancellation Terms:	You or FactSet may cancel this License or a portion of it effective at the end of the Initial Term or the end of any renewal term by giving at least three full months' written notice in advance.					First Price Increase Occurs On:	01 Jan 2022

Products:

Description	Qty	Annual Unit Price	Price Start Date	Price End Date	Currency	Annual Subtotal
FactSet Plan Sponsor Base Fee - Asset Allocator	1	20,000	01 Apr 2019	31 Mar 2020	USD	20,000
Plan Sponsor Workstation - Asset Allocator	2	17,500	01 Apr 2019	31 Mar 2020	USD	35,000
SPAR plus Asset Allocation plus Econ Only	1	7,500	01 Apr 2019	31 Mar 2020	USD	7,500
Portfolio Services	1	10,000	01 Apr 2019	31 Mar 2020	USD	10,000

The following term applies for the Portfolio Services product: Pricing for this product is based on usage. If usage of this product is increased beyond the level contemplated on this Schedule, the fees will increase commensurately. Licensor will readjust fees on a quarterly basis.



CMERS Manager Assessment Summary

As of December 31, 2023

	Manager Overall	Product People	Philosophy/Process	Short Term Performance	Long Term Performance	Product Dynamics	Product Overall	STATUS	NOTES
LARGE CAP VALUE EQUITY									
BlackRock Russell 1000 Value	●	●	●	●	●	●	●	Within Expectations	• Head of iShares and Index Investments Salim Ramji will be departing the firm in Q1 2024. Callan will monitor BlackRock's decision on Ramji's successor, however the index team remains deep at the portfolio management level.
DFA Large Cap Value	●	●	●	●	●	●	●	Within Expectations	
LARGE CAP CORE EQUITY									
Northern Trust Global	●	●	●	●	●	●	●	Within Expectations	
LARGE CAP GROWTH EQUITY									
Polen Capital Management	●	●	●	●	●	●	●	Within Expectations	<ul style="list-style-type: none"> • Employee ownership currently stands at 72%; employees continue to control 100% of the firm. • Polen completed a 2022 acquisition of a credit team and in 2023, acquired a Hong Kong-based Emerging Markets Growth team. • Firm recently announced the imminent departure of Jeff Mueller, co-portfolio manager for the Global Growth strategy and fundamental analyst for the Focus Growth strategy, due to personal reasons. Mueller's departed as of December 31, 2023; fundamental coverage for impacted strategies will be absorbed by team members. • Short-term performance remains challenged due to stock selection issues; continuing to monitor the portfolio's positioning and ability to provide downside protection, which has historically been a portfolio attribute. Polen struggled in the 2022 downturn.
DOMESTIC MID CAP EQUITY									
Earnest Partners LLC	●	●	●	●	●	●	●	Within Expectations	<ul style="list-style-type: none"> • Firm founder Paul Viera owns majority of firm. • Weighted median and average market cap is well above the Mid Core peer group median but in-line with the Russell Mid-Cap Index. • Portfolio style may exhibit value bias over short-term time periods but remains within expectations of a core style strategy.
SMALL CAP VALUE EQUITY									
DFA Small Cap Value	●	●	●	●	●	●	●	Within Expectations	• Strategy AUM exceeds \$19 billion but mitigated by large number of portfolio holdings and low turnover.
NON-US DEVELOPED SMALL VALUE									
DFA International Small Cap	●	●	●	●	●	●	●	Within Expectations	
ACWI XUS VALUE									
Brandes Investment Partners	●	●	●	●	●	●	●	Within Expectations	<ul style="list-style-type: none"> • Organization should be monitored going forward but asset levels and flow activity have stabilized in recent years; the firm continues to maintain a healthy level of profitability in part due to cost restructuring (e.g., outsourcing client reporting/back office functions to SEI) several years ago. • Profitability of the firm may be compromised below \$10 billion. • The International Equity strategy makes up 1/3 of firm assets and should be monitored accordingly.
ACWI XUS GROWTH									
William Blair & Company	●	●	●	●	●	●	●	Within Expectations	• Andy Siepker joined Ken McAtamney and Simon Fennell on the portfolio management team in January 2022.
EMERGING MARKETS CORE									
AQR Emerging Markets	●	●	●	●	●	●	●	Within Expectations	<ul style="list-style-type: none"> • Firm and product AUM decline is notable, which sparked work-force reduction, although the majority was not related to the long-only equity products. • Investment professional and client stability should be monitored closely due to a series of departures and redemptions in recent years; however, AQR continues to maintain leadership continuity, deep investment team and a healthy level of assets. • Short- and long-term performance has recovered.

● Within Expectations

● Notable

● Cautionary

● Under Review

GLOBAL ACWI CORE										
BlackRock Global Alpha Tilts	●	●	●	●	●	●	●	●	Within Expectations	
GLOBAL ACWI GROWTH										
MFS Investment Management	●	●	●	●	●	●	●	●	Within Expectations	
CORE PLUS BOND										
Loomis, Sayles & Company, L.P.	●	●	●	●	●	●	●	●	Within Expectations	<ul style="list-style-type: none"> Loomis offered a voluntary separation program in 4Q22 to eligible personnel at the firm, excluding portfolio managers. A number of fixed income analysts within the central research team accepted the buyout. Elaine Stokes, co-lead of Full Discretion team, retired at year-end 2023; Matt Eagan took over as sole lead of team.
Reams Asset Management	●	●	●	●	●	●	●	●	Within Expectations	<ul style="list-style-type: none"> Securitized Credit PM Stephen Vincent retired April 2023; Neil Aggarwal hired in December 2022 to replace him as Head of Securitized Products.
INTERMEDIATE FIXED INCOME										
BlackRock US Govt Bond	●	●	●	●	●	●	●	●	Within Expectations	
DIVERSIFIED REAL ASSETS										
Principal DRA	●	●	●	●	●	●	●	●	Within Expectations	<ul style="list-style-type: none"> On January 11, 2024 Principal announced that its CEO since 2018, Pat Halter, would be stepping down on February 10 and would retire on April 2. Halter will be replaced by Kamal Bhatia, the current Global Head of Investments and President and Chair of Principal Funds. Bhatia joined Principal in 2019 from Oppenheimer Funds, he was promoted to COO in 2020 and his current position in March 2023. Principal announced on January 16, 2024, that Indraneel ("Indy") Karlekar, PhD has voluntarily resigned from his position as Global Head of Research and Portfolio Strategies. Mr. Karlekar has led the research function at Principal Real Estate Investors for the past 10 years. Principal has begun an external search to replace Mr. Karlekar. In the meantime, the Principal Real Estate Global Research and Data Strategy & Analytics group of 12 individuals will continue to firm's research initiatives and will be led by Madhan Rengarajan, CFA. Team has remained stable since May Tong assumed leadership in March 2022. The Dynamic Outcome team remains deep and experienced; follows a team approach and repeatable process.

April 18, 2024



City of Milwaukee Employees' Retirement System

Act 12 Framework & Peer Group Comparison

John P. Jackson, CFA
Senior Vice President

Michael Joecken
Senior Vice President

Jason Ellement, FSA, CFA
Senior Vice President

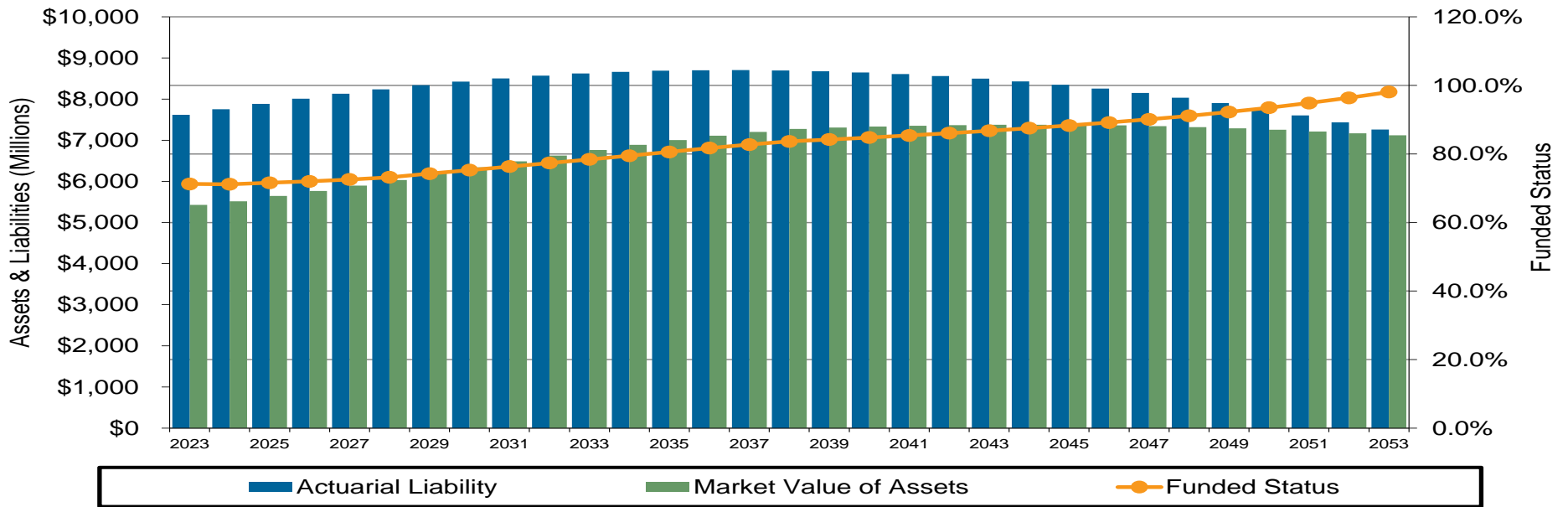
Adam Lozinski, CFA
Senior Vice President

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Introduction

- Callan completed an asset/liability study and a new target was approved in June 2023
- Act 12 was subsequently passed which significantly modifies the CMERS Plan
- Although we completed an asset-liability study last year, the significant changes from Act 12 warrant a revisit; Callan recommends completing a new asset-liability study
 - Consider alternative asset mixes and de-risking approaches
 - Reassess liquidity needs and gradual winding down of illiquid investments
 - Explore investment solutions, e.g., cash flow matching
 - Re-assess contribution volatility in light of Act 12 Requirements
- The second section of the presentation compares the CMERS Plan to other Public Pension Plans along the lines of:
 - Return Assumption (aka actuarial discount rate)
 - Public equity exposure
 - Funded Status
 - Net Cash flows
 - Amount of Liquid Assets
 - Risk-Return of other Public Funds

Act 12 Is A Game Changer



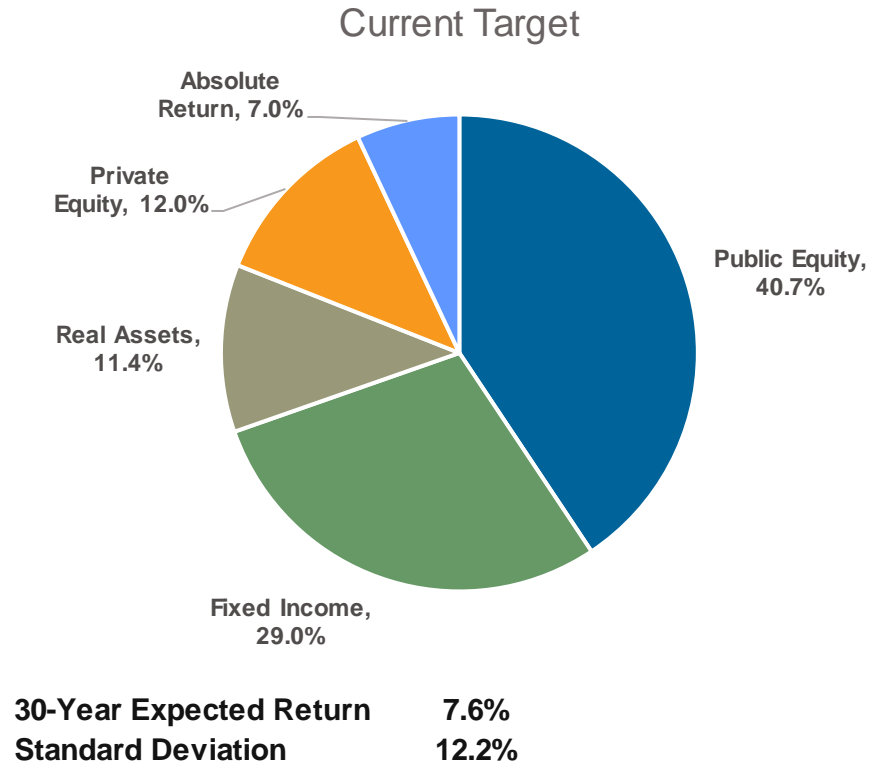
Source: Cavanaugh Macdonald Consulting. "6.8% Scenario"

● Key Act 12 characteristics:

- Plan is closed to new hires effective 1/1/2024
- The discount rate is set to 6.80%
- One-year contribution lag put in place
- 1/1/2024 UAAL is amortized over 30 years
 - Future increases in the UAAL are amortized over 10 years
 - Future decreases in the UAAL are amortized over the remaining amortization period for the 1/1/2024 UAAL, or 10 years if greater.
 - The UAAL payments will be calculated as level-dollar amounts.
- Actuarial cost method is Entry Age Normal (no change)
- No change in determination of Actuarial Value of Assets - Returns that differ from the assumed 6.8% are phased in over 5 years

New funding policy and lower funded status is expected to increase contribution risk

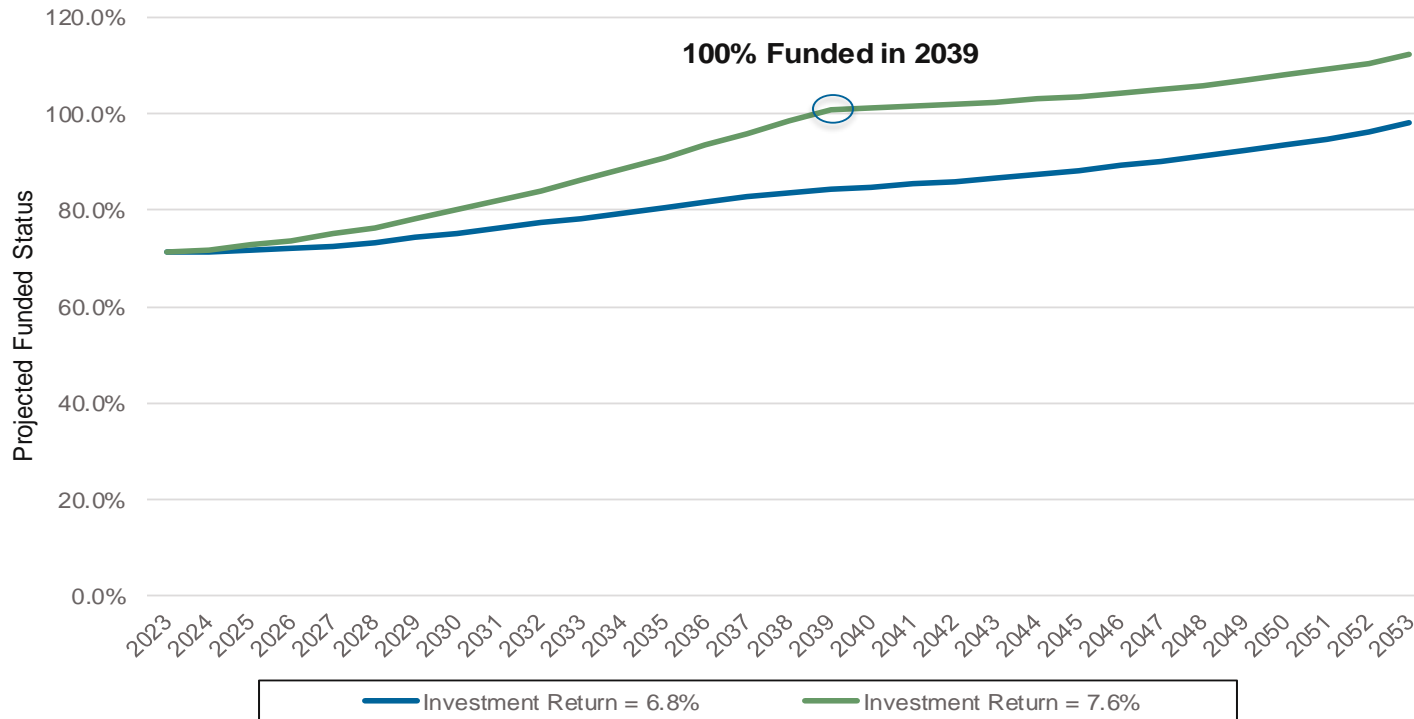
Current Target Allocation



- The current Target Allocation is shown above
 - The REITs portion of Liquid Real Assets is included in Public Equity while TIPS and Commodities are included in Real Assets
- Callan 30-year expected return of 7.6% is above the actuarial assumed return of 6.8%

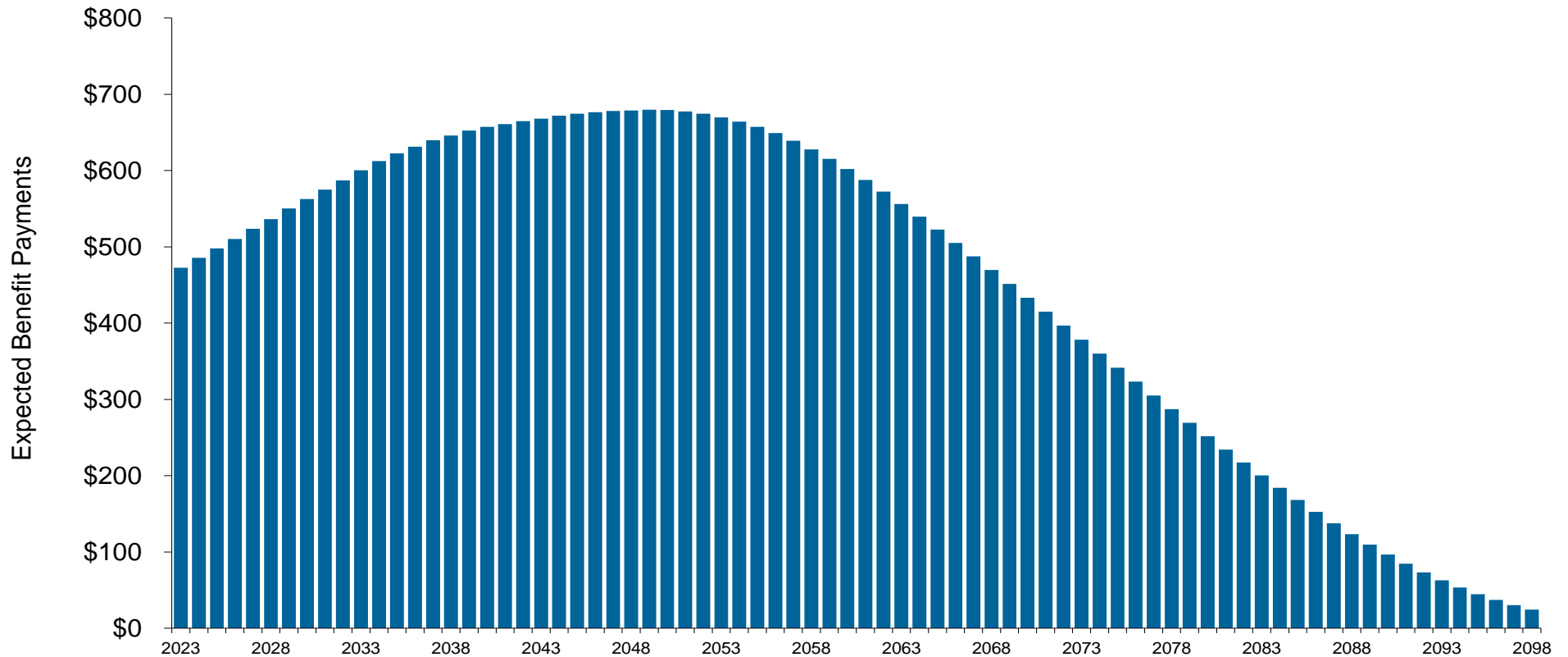
Projected Funded Status

6.8% Actuarial Return Assumption vs. 7.6% Current Allocation Projection



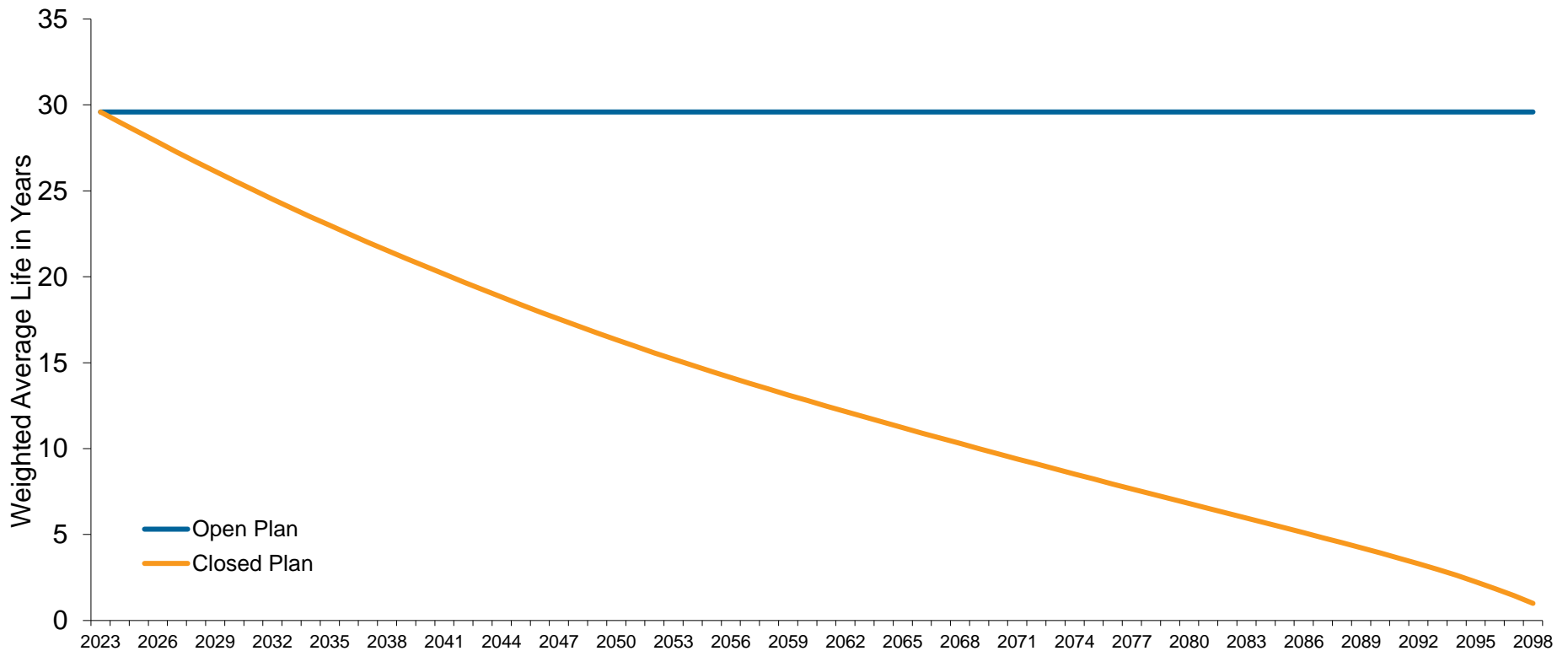
- Callan’s projection on the CMERS Target exceeds the actuarial assumed return
 - The impact of earning 0.8% more per year is significant
- Under the 7.6% return scenario, the Plan would become fully funded in 2039 – 15 years from now
 - Contributions from sales tax revenue would cease in 2040 under this scenario
- **Projections assume constant asset allocation (no de-risking) and constant discount rate**

CMERS Expected Benefit Payments



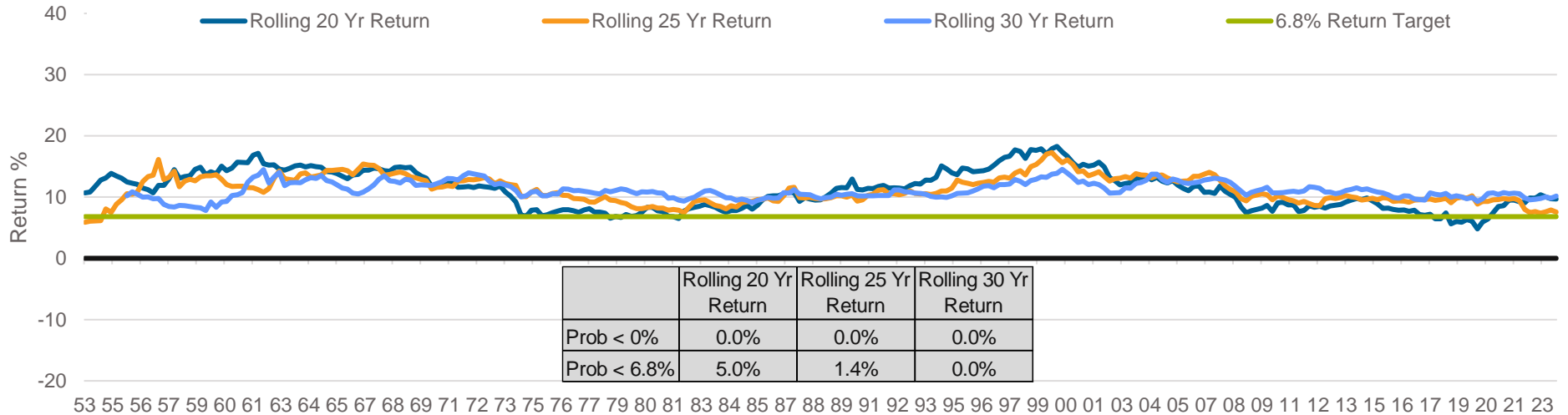
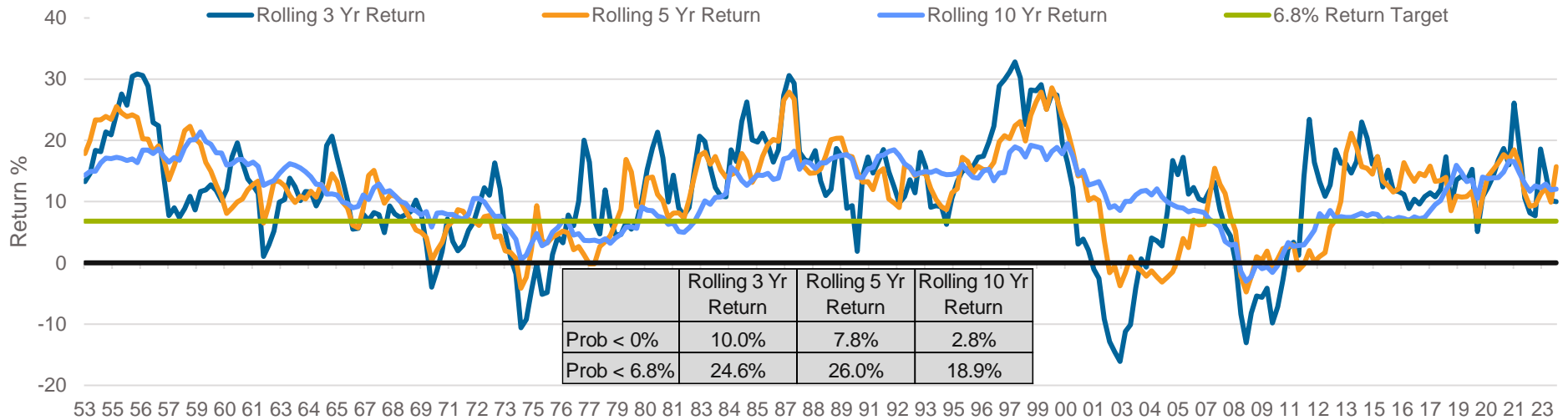
- An Open Plan has an indefinite time horizon as new hires join the Plan to replace exits
- When a Plan is closed, the time horizon becomes definite. However, the time horizon is still very long initially as many active participants are still accruing benefits
- Indeed, benefit payments are expected to increase for the next 25 years (until 2049)

Time Horizon



- The above graph depicts the Weighted Average Life (WAL) of CMERS on an open vs. closed basis using the present value of benefits from the 2023 asset-liability study
- The WAL is an estimate of the expected time horizon of a Plan
 - For an open plan it consistently measures around 30 years and does not decrease
 - A closed plan has a gradually shortening time horizon
 - A short time horizon typically warrants a more conservative asset allocation

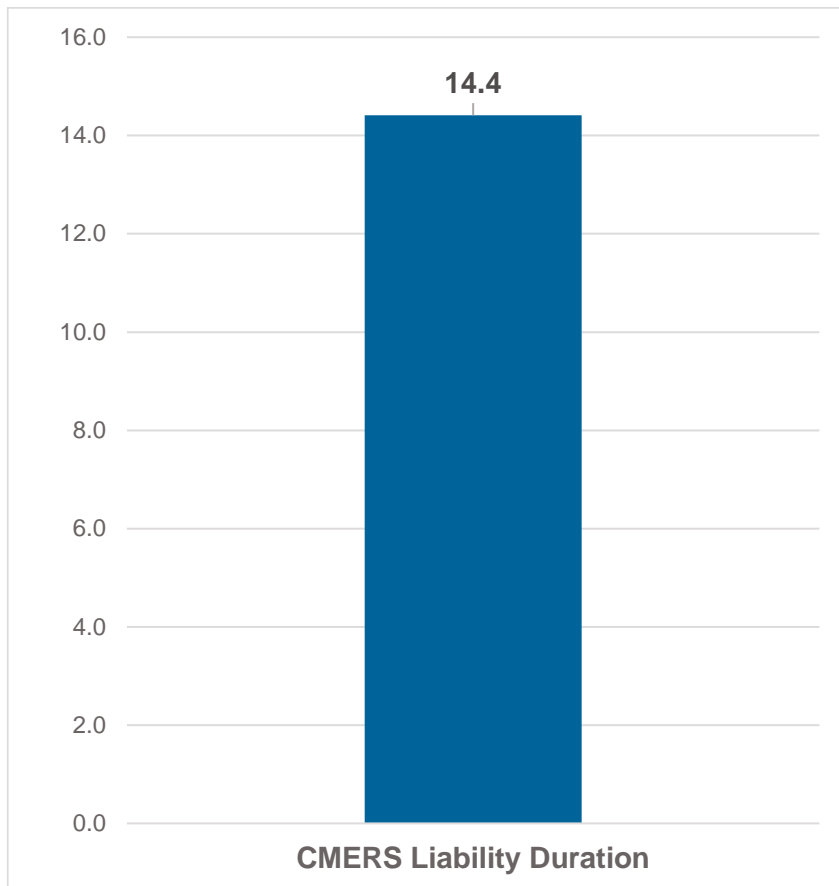
S&P 500 Rolling Returns for 70 Years Ending 12/31/2023



- The probability of a negative return or falling below the actuarially assumed discount rate (<6.8%) increases over shorter time horizons. The probability is very low over 20+ years.

Source: Ibbotson S&P 500 Index

Liability Duration



- Liability Duration measures how sensitive the liability is to a change in the discount rate, i.e., it is the approximate percentage change in value for a 1.0% change in the discount rate
- CMERS liability duration is very long but it will gradually decline as the Plan matures
- Future de-risking to a more conservative asset allocation may result in a drop in the discount rate which will in turn cause the liability to increase and funded status to fall

Hypothetical Example with 14.4% Liability Duration

- Initial Funded Status = 90%
- Plan adopts a more conservative asset allocation and lowers the discount rate by 1.0%
- Liability would increase 14.4%
- Funded status would fall to 79% which could trigger higher contributions
- Assumes all else is held constant

De-Risking Glide Path Strategies

- A Glide Path utilizes a trigger or combination of triggers to gradually de-risk the portfolio over time
- Examples of Triggers:

Funded Status

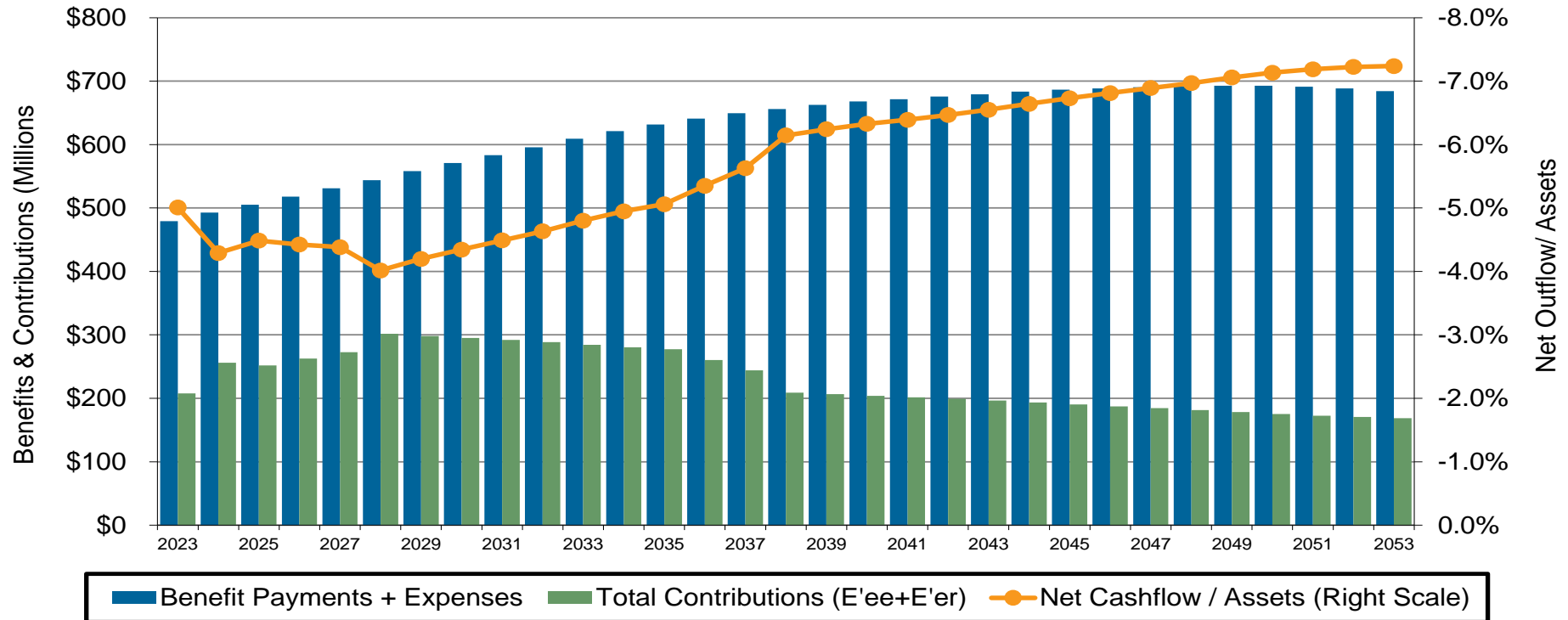
- The de-risking path reduces return seeking assets and increases cash and fixed income as the Plan approaches full funding
- Illiquid assets are gradually wound down

Weighted Average Life

- Increase highly liquid assets like cash and fixed income as weighted average life declines
- Illiquid assets are gradually wound down

- **The Glide Path is a road map for future changes in asset allocation and may or may not be formalized into a written policy**

Liquidity



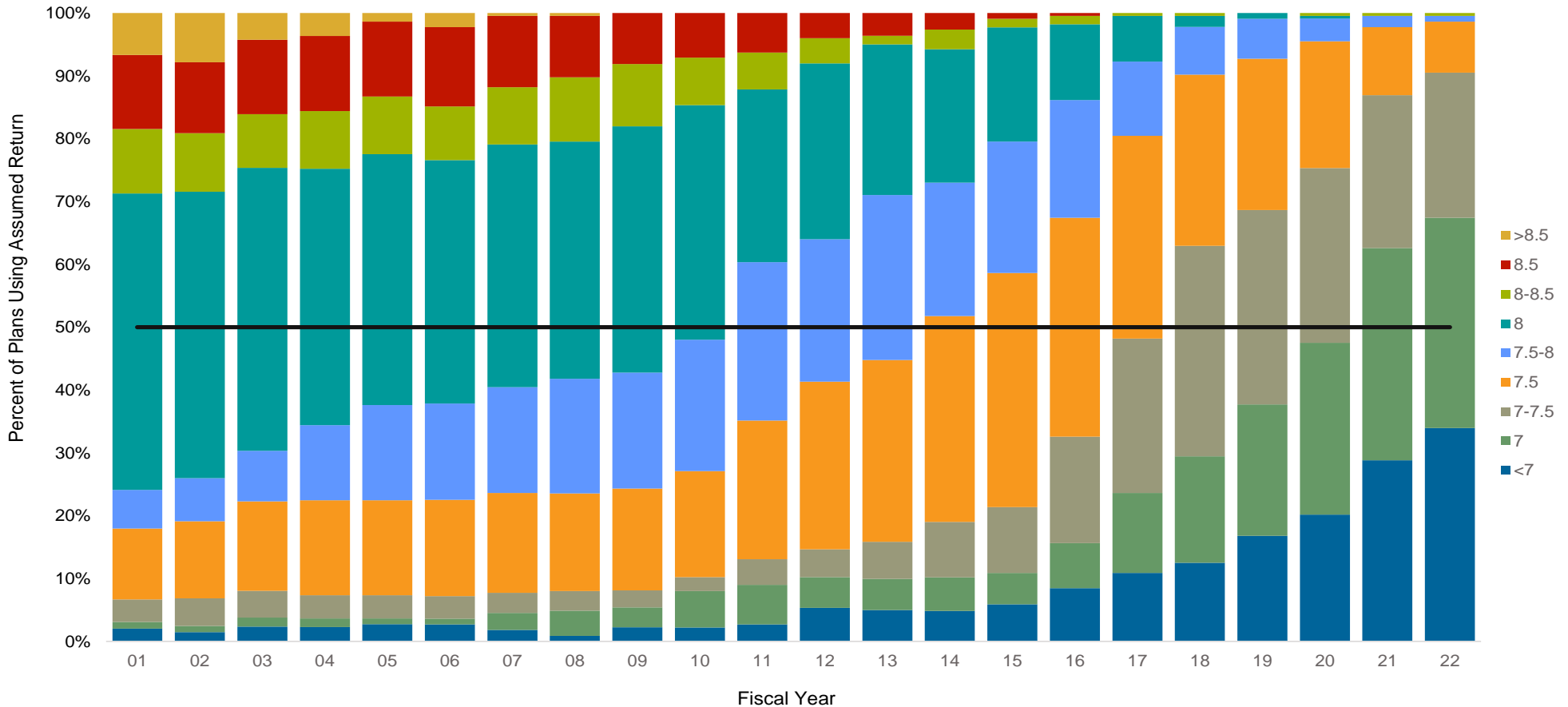
Source: Cavanaugh Macdonald Consulting. "6.8% Scenario"

- Liquidity is an important consideration for CMERS given the net cash outflow position of the Plan
- The higher the net cash outflow, the less a plan can typically invest in illiquid or risky assets
- The target allocation to fixed income + cash was increased from 23% to 29% as a result of the 2023 asset/liability study
- **Liquidity needs should be re-evaluated in light of the Plan closure; net outflow as % of assets is expected to rise as the Plan gradually winds down**
- Cash flow matching strategies may be employed to address liquidity needs



Peer Group Comparison

Public Fund Return Assumptions



- Industry consensus has trended toward lower return expectations, leading to a steady decline in return assumptions (aka actuarial discount rates) over the last 20 years
- The 2022 median assumed return is 7.0%
 - The median discount rate may increase in 2023 when the survey is updated
 - Industry forward-looking return expectations have increased across the board in recent years

Source: Public Plans Database. 2022 is the most current data available. For 2022 there are 212 open plans and 16 closed plans in the database. Not all plans supplied data for every data point.

Funded Status and Return Assumption

Funded Status vs. Return Assumption
2022 Fiscal Year
Crosshairs Represent Medians



- Lowering the assumed return to 6.8% dropped CMERS to below median on both funded status and return assumption

Source: Public Plans Database. 2022 is the most current data available. For 2022 there are 212 open plans and 16 closed plans in the database. Not all plans supplied data for every data point.

Public Equity Target Allocation and Return Assumption

Public Equity Target Allocation vs. Return Assumption
2022 Fiscal Year
Crosshairs Represent Medians



- The newly adopted target allocation has 39% in public equity, which is further below the peer median than the prior target of 44%
- Some closed plans still have equity allocations well above median

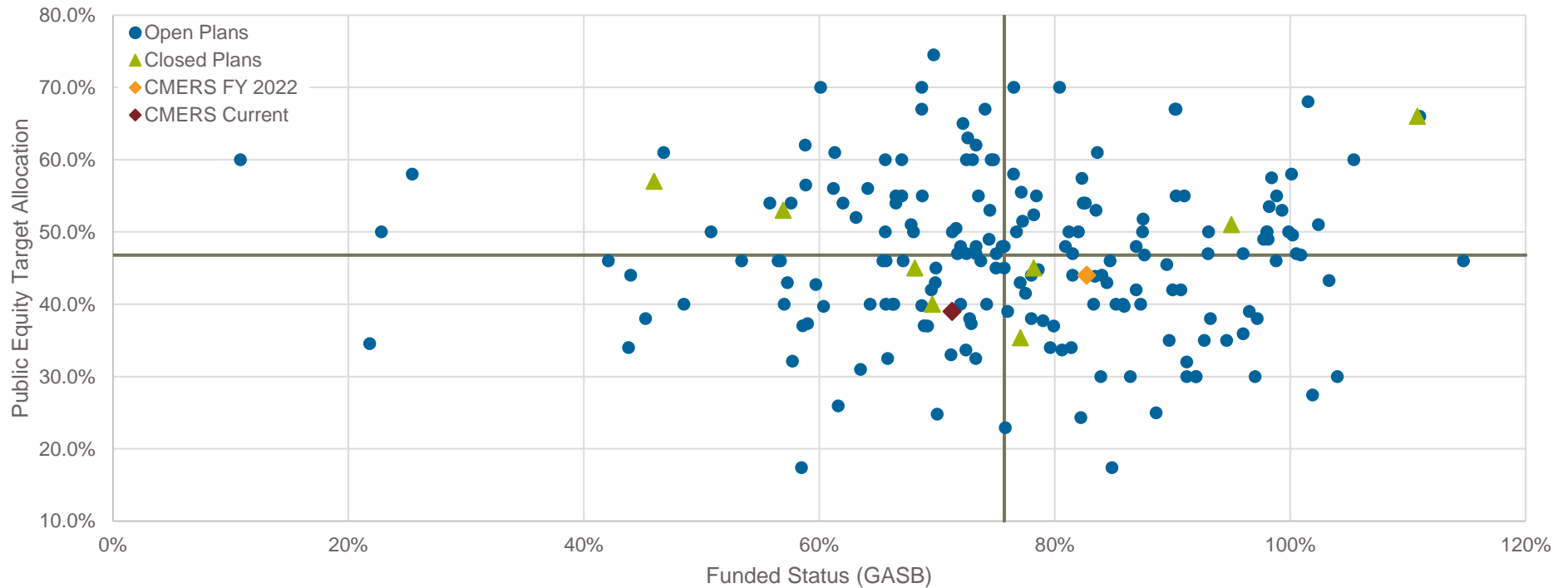
Source: Public Plans Database. 2022 is the most current data available. For 2022 there are 212 open plans and 16 closed plans in the database. Not all plans supplied data for every data point.

Funded Status and Public Equity Target Allocation

Funded Status vs. Public Equity Target Allocation

2022 Fiscal Year

Crosshairs Represent Medians

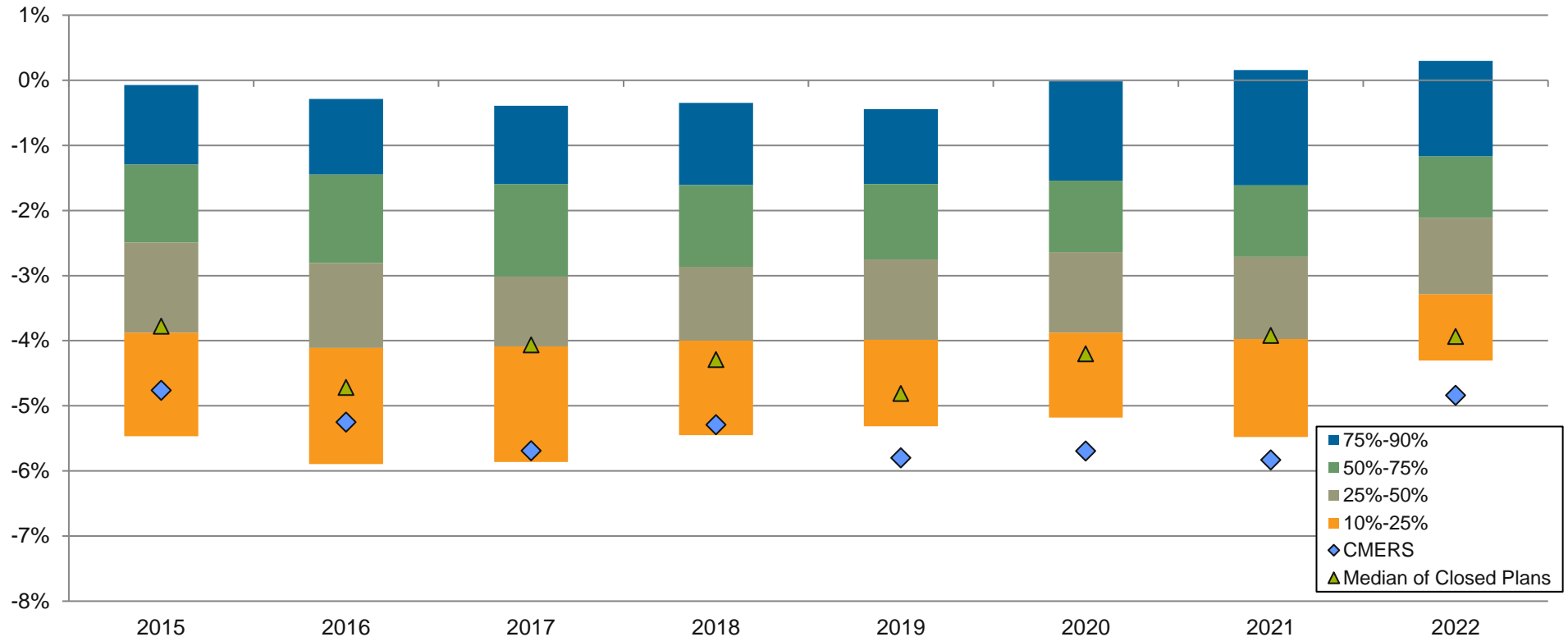


- CMERS has below median funded status and public equity target allocation
- There is not a strong correlation between funded status and public equity target allocation among peer plans

Source: Public Plans Database. 2022 is the most current data available. For 2022 there are 212 open plans and 16 closed plans in the database. Not all plans supplied data for every data point.

Public Fund Net Cashflows

Range of Net Cashflows Among Plans by Fiscal Year



- We calculated net cashflows for CMERS using the Public Plans Database for consistent comparison with peers
 - The calculation uses contributions minus benefits and expenses as reported to the database
 - A negative number represents money flowing out of the Plan
- CMERS has a high level of net cash outflows vs. peers, although closed plan peers also have high net cash outflows

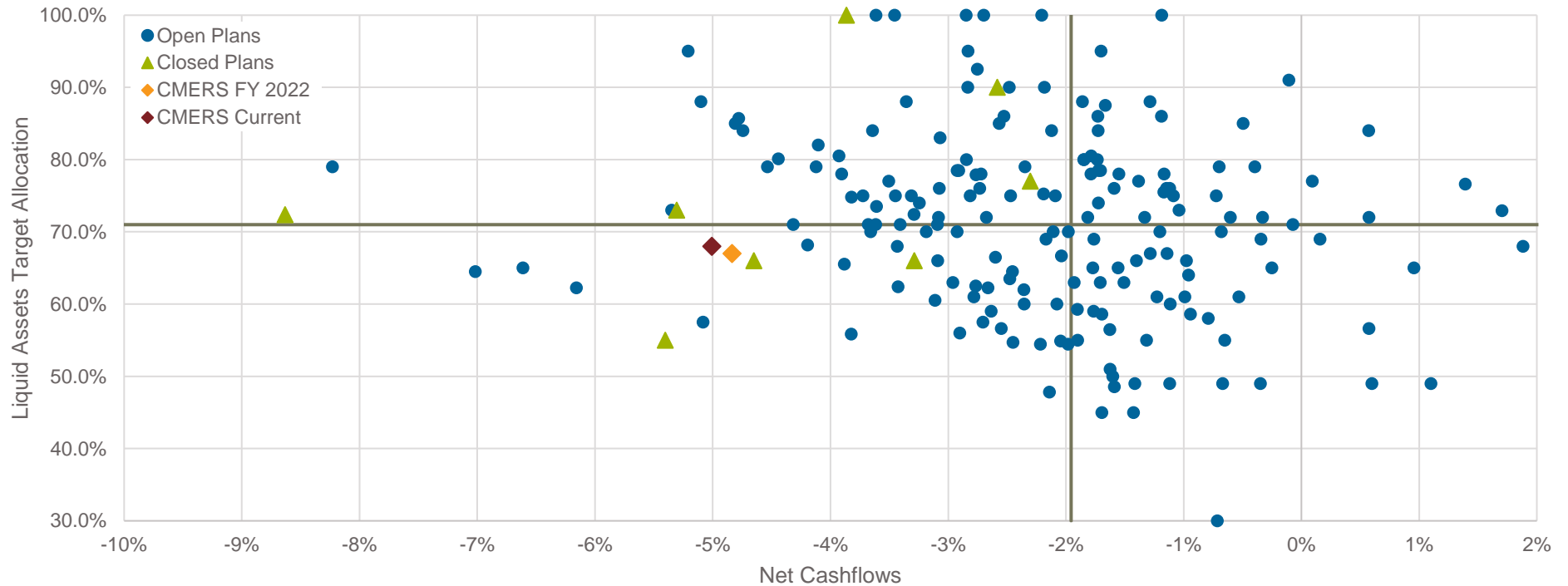
Source: Public Plans Database. 2022 is the most current data available. For 2022 there are 212 open plans and 16 closed plans in the database. Not all plans supplied data for every data point.

Net Cashflows and Liquid Assets Target Allocation

Net Cashflows vs. Liquid Assets Target Allocation

2022 Fiscal Year

Crosshairs Represent Medians



- Liquid assets include public equity, fixed income, and cash
- CMERS liquid assets are just below median while net outflows are high relative to peers

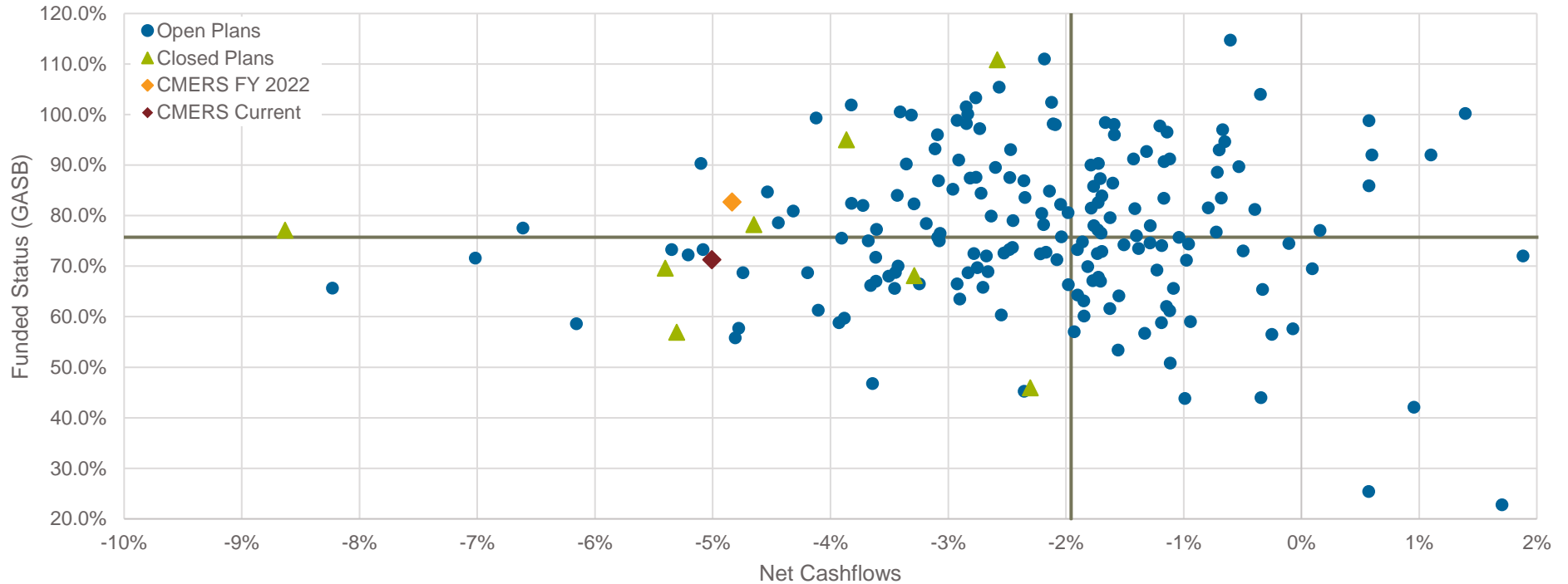
Source: Public Plans Database. 2022 is the most current data available. For 2022 there are 212 open plans and 16 closed plans in the database. Not all plans supplied data for every data point.

Net Cashflows and Funded Status

Net Cashflows vs. Funded Status

2022 Fiscal Year

Crosshairs Represent Medians

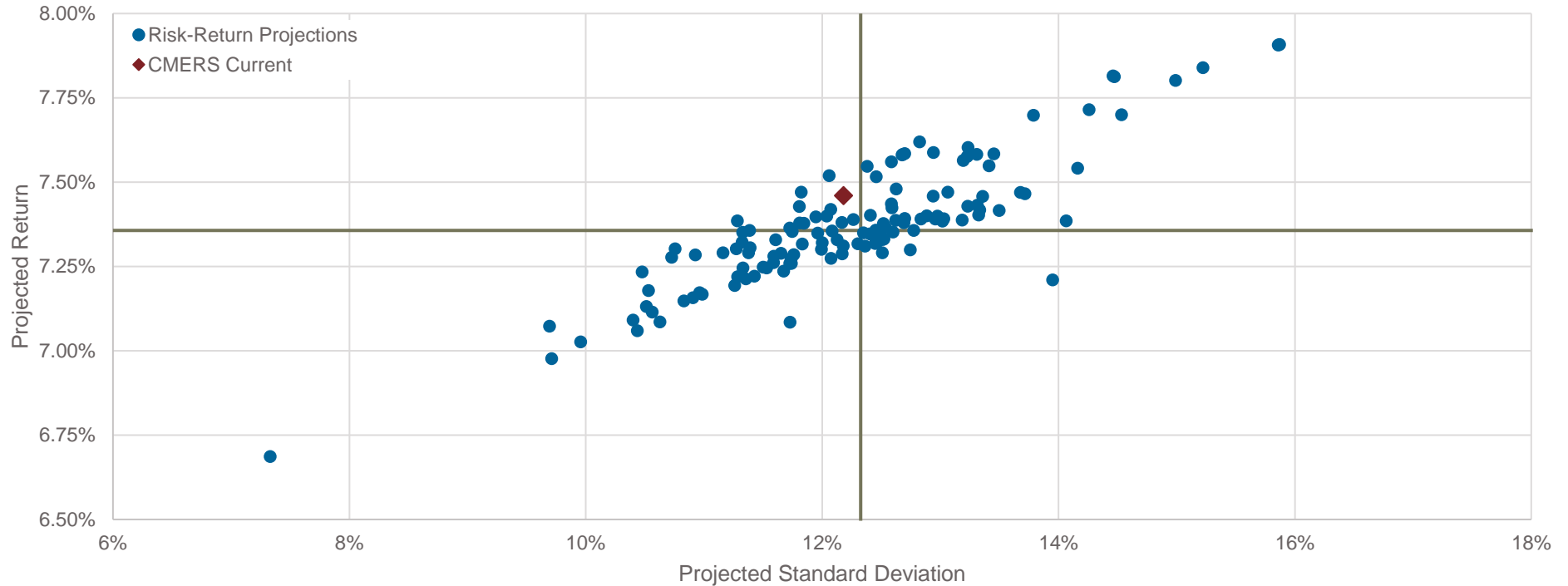


- CMERS has higher net outflows than median while funded status is slightly below median
- All of the closed plans with complete data in the database have higher outflows than median

Source: Public Plans Database. 2022 is the most current data available. For 2022 there are 212 open plans and 16 closed plans in the database. Not all plans supplied data for every data point.

Callan Public Plan Universe Projected Risk and Return

Peer Public Plan Risk and Return Projections
Callan 2024 10 Year Capital Markets Assumptions
Crosshairs Represent Medians



- We calculate projected risk and return for public plans in Callan’s Public Plan Database using our 2024 - 2033 capital market assumptions
- CMERS is in the upper-left quadrant, which is preferable
 - Return projections are above median while risk projections are below median

Source: Callan. There are 131 plans in the universe.



Appendix

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Past performance is no guarantee of future results.

Preliminary
1st Quarter 2024 Performance Report

April 18, 2024

Employees' Retirement System

Presentation Agenda

- Fund Overview
- Public Equity
- Fixed Income
- Absolute Return
- Recent Performance Update

Market Environment

Asset Class	Benchmark	Target Weight	Benchmark Return Q1 2024
Public Equity	MSCI ACWI IMI	39%	7.7%
Fixed Income	Bloomberg U.S. Agg.	29%	-0.8%
Real Assets ⁽¹⁾	Blended Benchmark	13%	-3.5%
Private Equity ⁽¹⁾	Russell 3000 + 2%	12%	12.4%
Absolute Return	90-Day T-Bill + 3%	7%	2.1%

	Q1 2024
CMERS Benchmark	3.9%

⁽¹⁾Real Estate and Private Equity benchmark returns are reported on a 1-quarter lag.

Relative Performance Expectations

		Q1 2024		Q1 2024	Q1 2024
Value Equity Bias	Russell 3000 Value	8.6%	Russell 3000 Growth	11.2%	↓
Small Cap Equity Bias	Russell 2000	5.2%	Russell 1000	10.3%	↓
Fixed Income Credit	Loomis Sayles (net)	0.6%	Bloomberg US Agg.	-0.8%	↑
Private Equity⁽¹⁾⁽²⁾	CMERS PE (net)	-0.1%	PE Benchmark	12.4%	↓↓

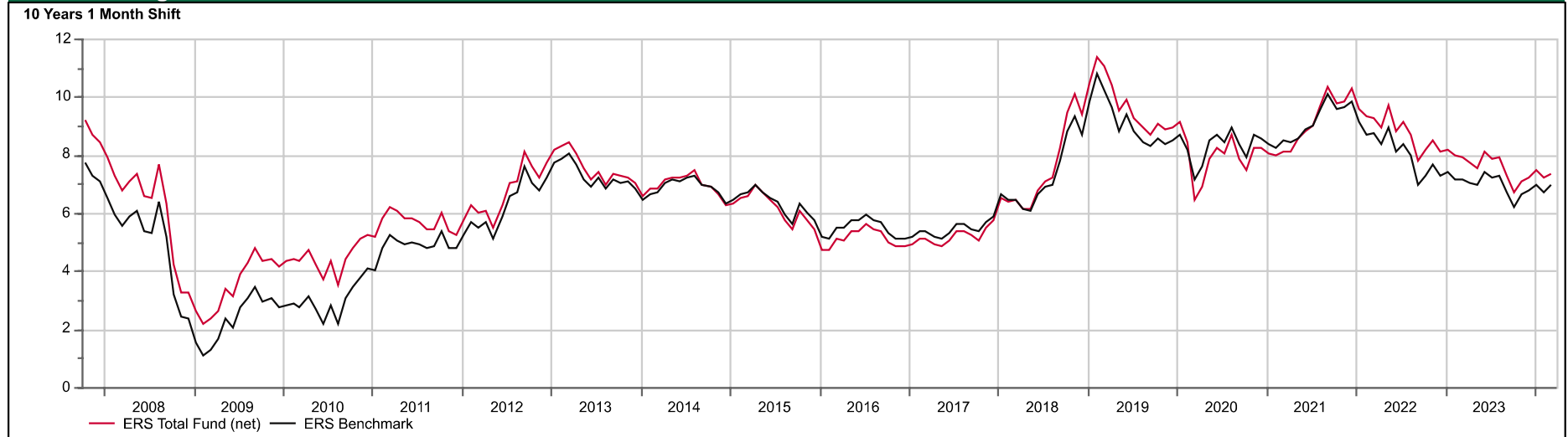
	Q1 2024
CMERS Total Fund (net)	2.8%
CMERS Benchmark	3.9%

(1) Private Equity benchmark return is reported on a 1-quarter lag.

(2) Private Equity returns are not typically reported during this time period because of the extra time these investment managers spend finalizing their year-end financial statements. Both Q4 2023 and Q1 2024 Private Equity returns are expected to be reported during the April-June time period.

Total Fund Performance - Preliminary

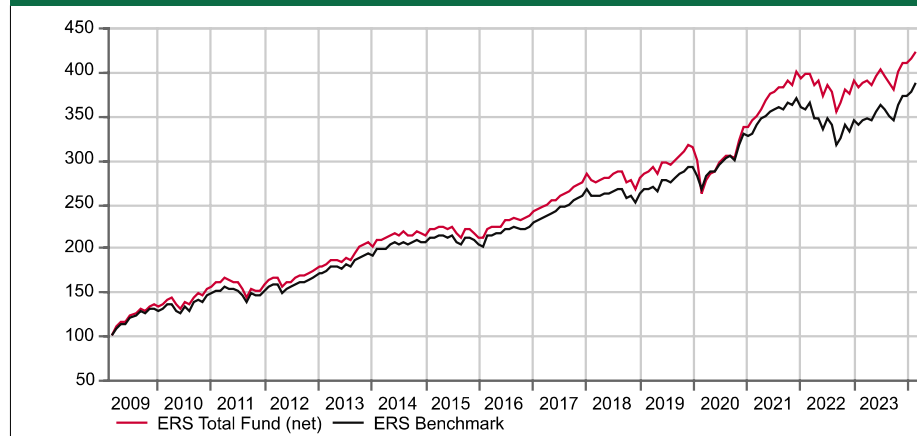
10 Year Rolling Returns – 11/1/1997 to 3/28/2024



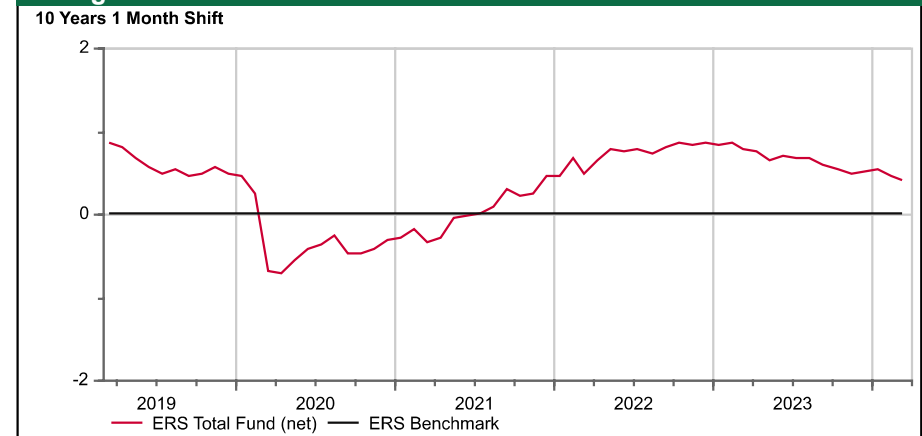
Trailing Returns

	Annualized Return						
	QTR	1 Year	3 Year	5 Year	7 Year	10 Year	15 Year
ERS Total Fund (net)	2.8	9.4	6.7	8.1	8.1	7.3	10.1
ERS Benchmark	3.9	12.0	4.5	7.8	7.5	6.9	9.4

Investment Growth – 4/1/2009 to 3/28/2024



Rolling Excess Returns – 4/1/2009 to 3/31/2024



Preliminary ERS Fund Attribution – 1st Quarter 2024

Asset Class	Benchmark	Average Weight %	Policy Weight %	+/-	Portfolio Return	Benchmark Return	+/-	Attribution Effect(%)			Total Active Return
								Broad Category Group Allocation	Manager Selection	Style Bias	
Public Equity	MSCI ACWI IMI NR USD	38.9	39.0	-0.1	7.5	7.7	-0.2	0.0	0.2	-0.3	-0.1
Fixed Income	Bbg US Agg Bond TR USD	30.2	29.0	1.2	-0.1	-0.8	0.6	0.0	0.1	0.1	0.2
Private Equity⁽²⁾	Russell 3000 (Qtr Lag) + 200bps ⁽¹⁾	12.8	12.0	0.8	-0.1	12.4	-12.4	0.1	-1.6	0.0	-1.5
Real Assets⁽²⁾	Real Assets Benchmark ⁽¹⁾	10.8	13.0	-2.2	-2.6	-3.5	0.9	0.2	0.1	0.0	0.3
Absolute Return	90 Day T-Bill +3%	7.3	7.0	0.3	3.3	2.1	1.2	0.0	0.1	0.0	0.1
Total		100.0	100.0	0.0	2.8	3.9	-1.1	0.2	-1.1	-0.2	-1.1

Main Drivers of Q1 2024 Relative Performance

Manager Performance

Private Equity
DFA Strategies, Loomis Sayles, Morgan Stanley, Blair, AQR, Aptitude outperformed

Impact %

-1.61%
0.57%

Attribution Category

Manager Performance
Manager Performance

Style Bias

Primarily small cap and value in public equity

-0.30%

Style Bias

Overall Allocation

Underweight Real Assets

0.17%

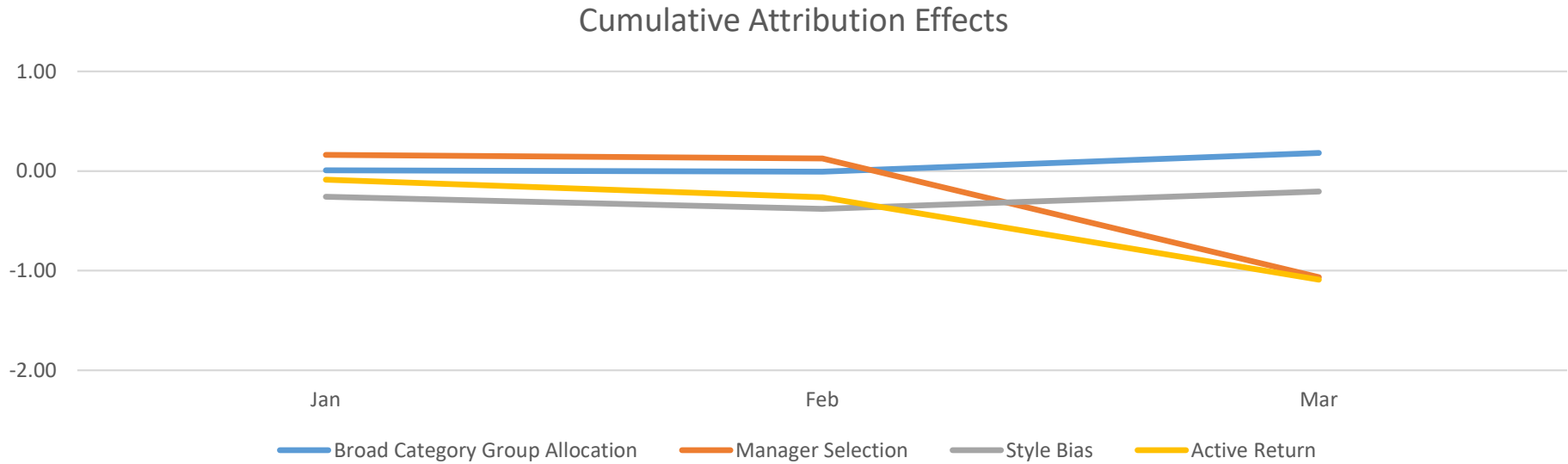
Overall Allocation

⁽¹⁾Real Estate and Private Equity benchmark returns are reported on a 1-quarter lag.

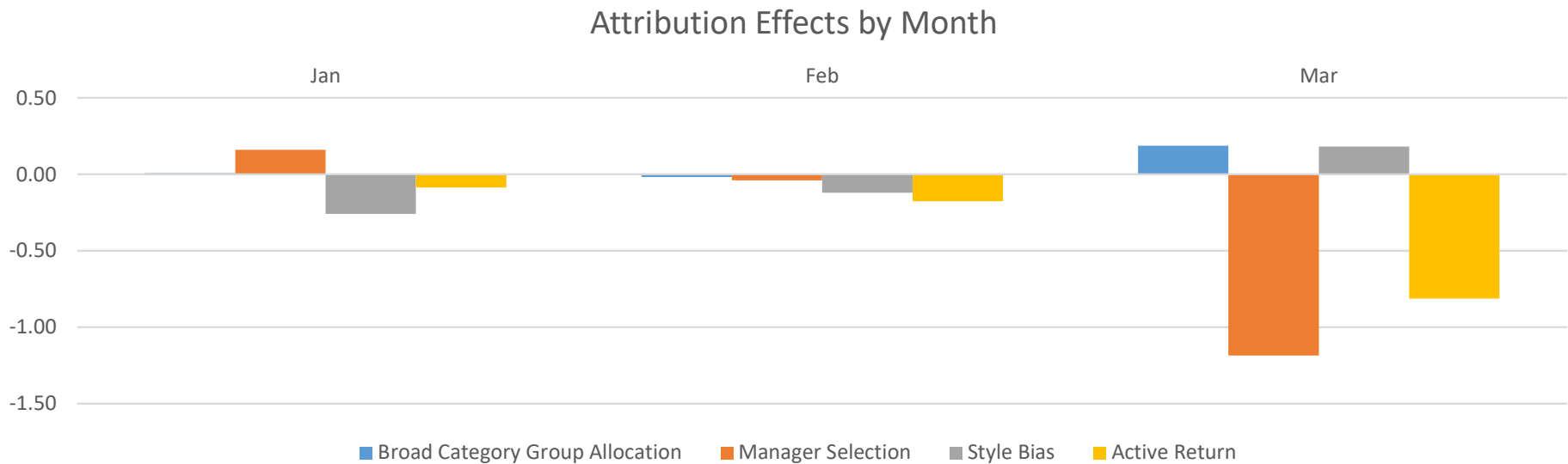
⁽²⁾ Private Equity returns are not typically reported during this time period because of the extra time these investment managers spend finalizing their year-end financial statements. Both Q4 2023 and Q1 2024 Private Equity returns are expected to be reported during the April-June time period.

Preliminary YTD 2024 Attribution

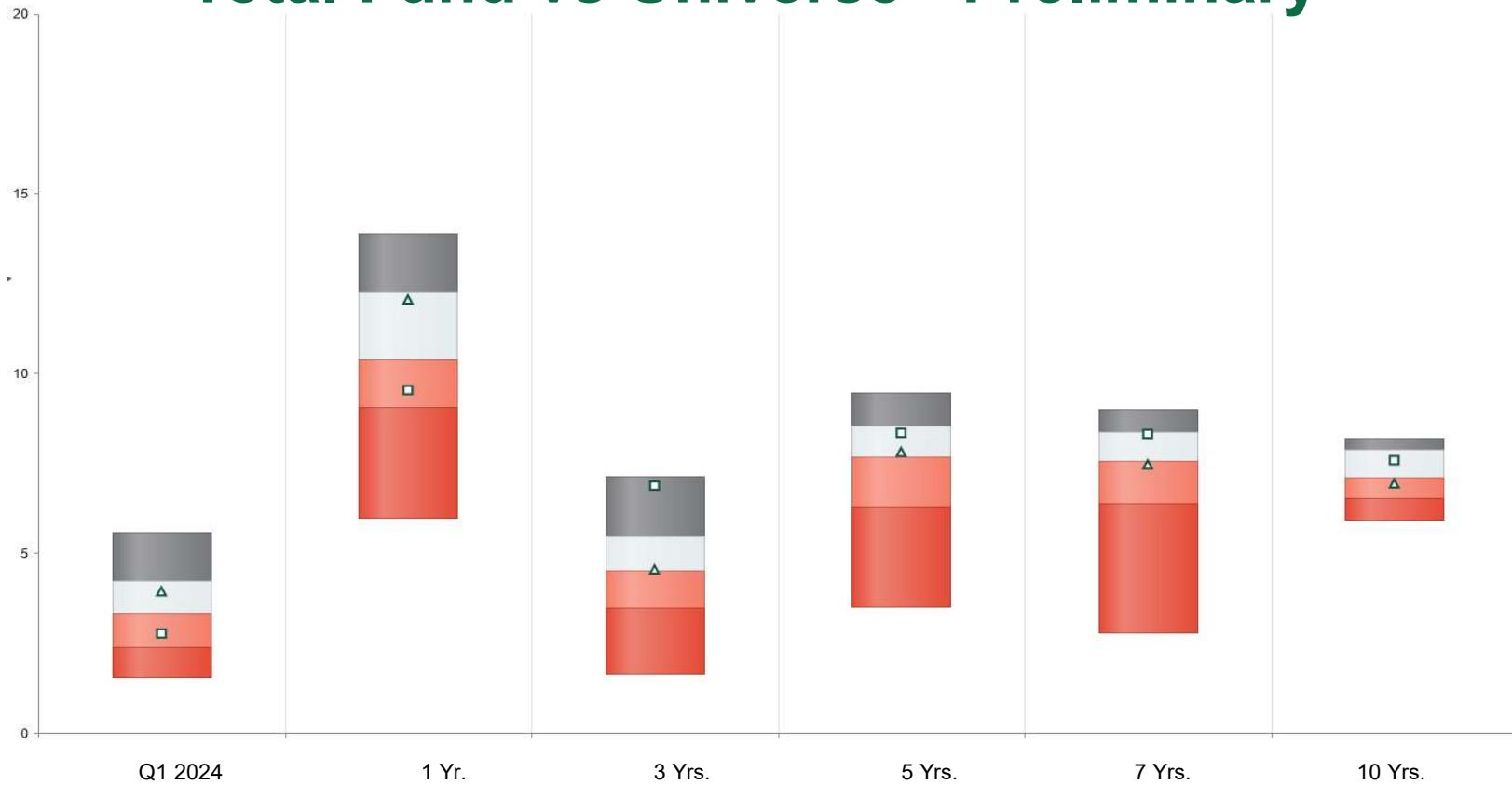
Cumulative Attribution Effects



Monthly Attribution Effects



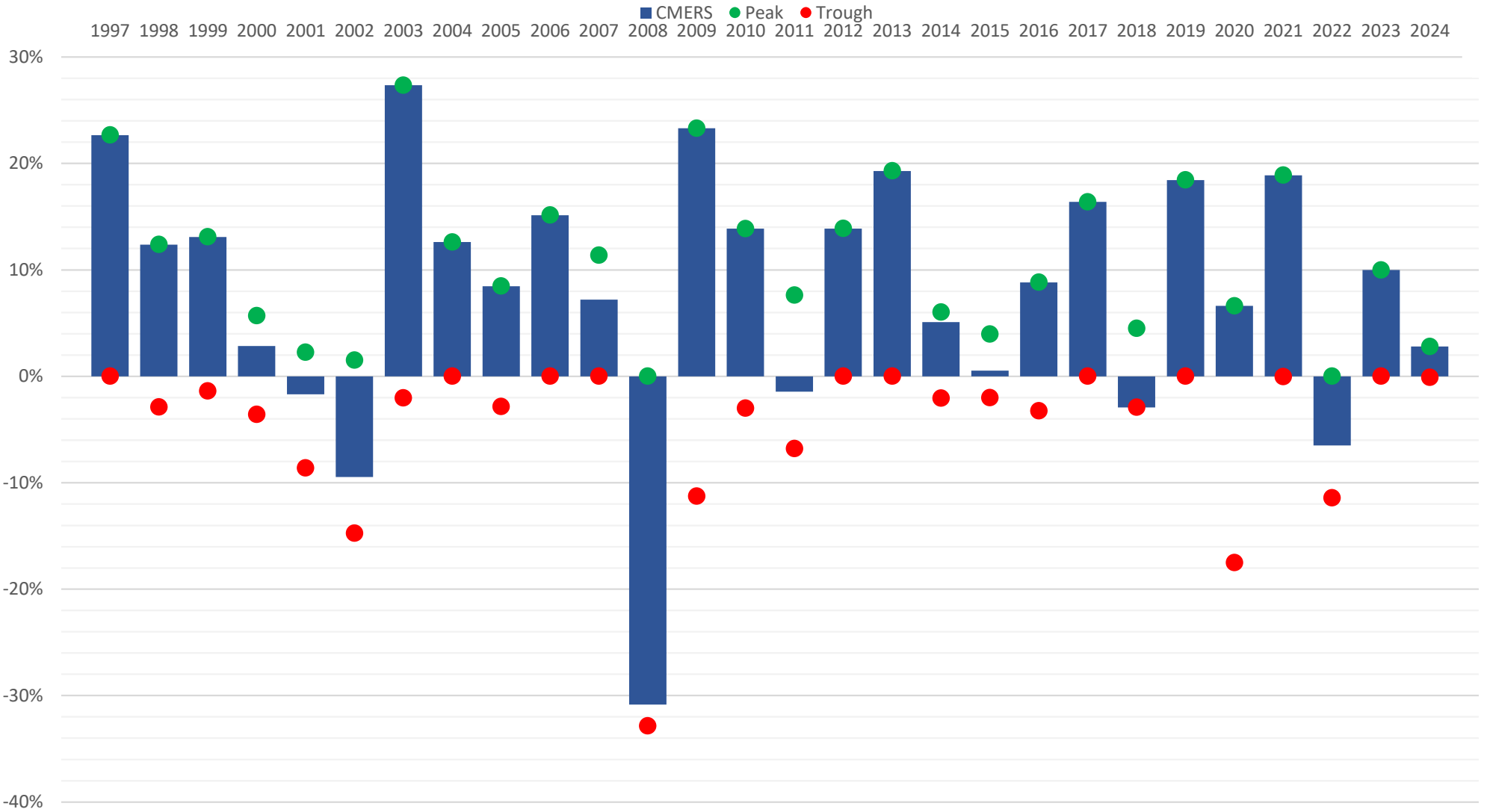
Total Fund vs Universe - Preliminary



■ Account
 ▲ Index

	Q1 2024	1 Yr.	3 Yrs.	5 Yrs.	7 Yrs.	10 Yrs.
Account Return	2.9	9.7	6.9	8.4	8.3	7.6
Percentile Rank	3rd quartile	3rd quartile	1st quartile	2nd quartile	2nd quartile	2nd quartile
Index Return	3.9	12.0	4.5	7.8	7.5	6.9
Percentile Rank	34	29	50	41	54	62
1st Quartile	4.2	12.3	5.5	8.6	8.4	7.9
Median	3.3	10.4	4.5	7.7	7.6	7.1
3rd Quartile	2.4	9.1	3.5	6.3	6.4	6.5
Observations	50	48	48	44	41	26

Annual Returns, Peaks, and Troughs

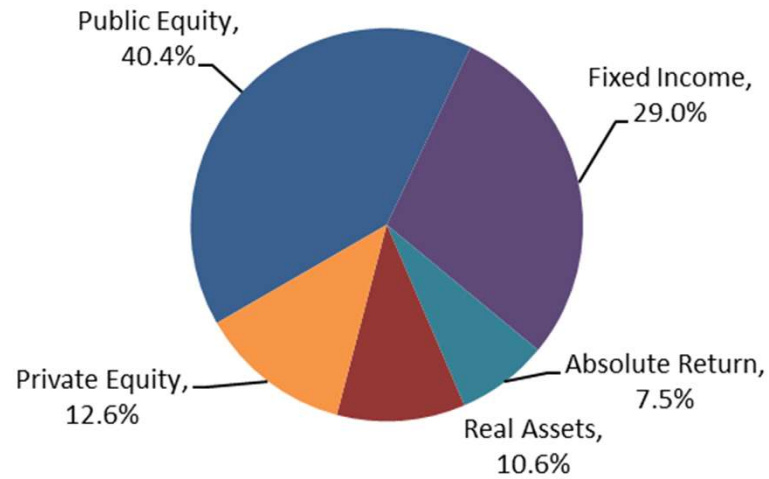


	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
CMERS	22.7%	12.4%	13.1%	2.8%	-1.7%	-9.4%	27.3%	12.6%	8.5%	15.1%	7.2%	-30.8%	23.3%	13.9%	-1.4%	13.9%	19.3%	5.1%	0.5%	8.8%	16.4%	-2.9%	18.4%	6.6%	18.9%	-6.5%	10.0%	2.8%
Peak	22.7%	12.4%	13.1%	5.7%	2.3%	1.5%	27.3%	12.6%	8.5%	15.1%	11.4%	0.0%	23.3%	13.9%	7.6%	13.9%	19.3%	6.0%	4.0%	8.8%	16.4%	4.5%	18.4%	6.6%	18.9%	0.0%	10.0%	2.8%
Trough	0.0%	-2.9%	-1.4%	-3.6%	-8.6%	-14.7%	-2.0%	0.0%	-2.9%	0.0%	0.0%	-32.9%	-11.3%	-3.0%	-6.8%	0.0%	0.0%	-2.1%	-2.0%	-3.3%	0.0%	-2.9%	0.0%	-17.5%	0.0%	-11.4%	0.0%	-0.1%

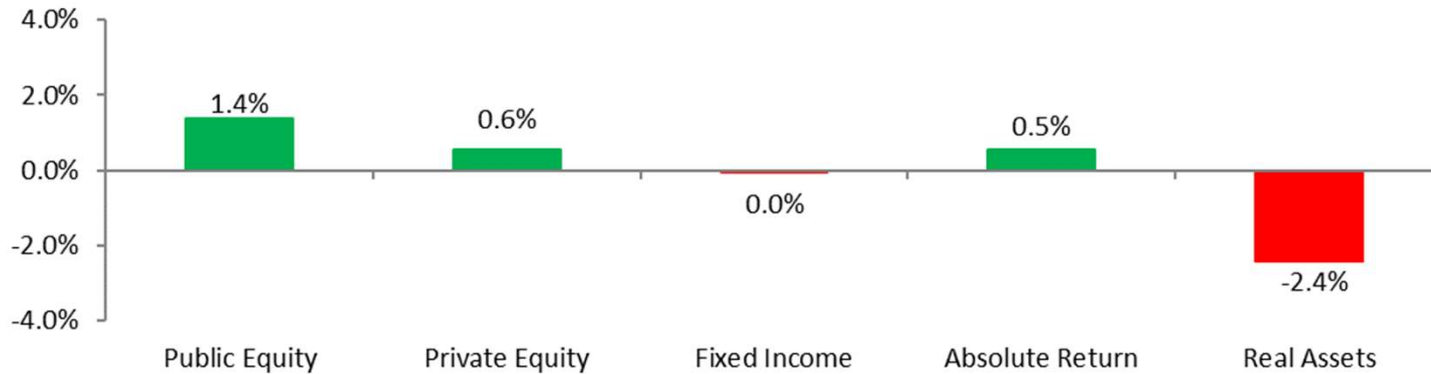
*Net of Fees

Preliminary Asset Allocation as of March 31, 2024

Actual Asset Allocation*



Actual Asset Allocation vs. Policy Target



YTD 2024 Market Value Change - Preliminary

December 31, 2023 Market Value including City Reserve & PABF Accounts			\$ 5,797,273,012
Monthly Cash Outflows thru	<u>March 31, 2024</u>		
Retiree Payroll Expense		\$ (116,611,163)	
PABF Payroll Expense		\$ (3,500)	
Expenses Paid		\$ (5,377,343)	
GPS Benefit Payments		\$ (2,369,572)	
Sub-Total Monthly Cash Outflows			\$ (124,361,578)
Monthly Cash Inflows thru	<u>March 31, 2024</u>		
Contributions		\$ 214,421,626	
PABF Contribution		\$ 1,000	
Sub-Total Monthly Contributions			\$ 214,422,626
Capital Market Gain/(Loss)			<u>\$ 166,659,430</u>
Value including City Reserve & PABF Accounts as of	<u>March 31, 2024</u>		<u>\$ 6,053,993,490</u>
Less City Reserve Account ¹			\$ 85,928,564
Less PABF Fund ²			\$ 2,687
Net Projected ERS Fund Value as of	<u>March 31, 2024</u>		<u><u>\$ 5,968,062,239</u></u>

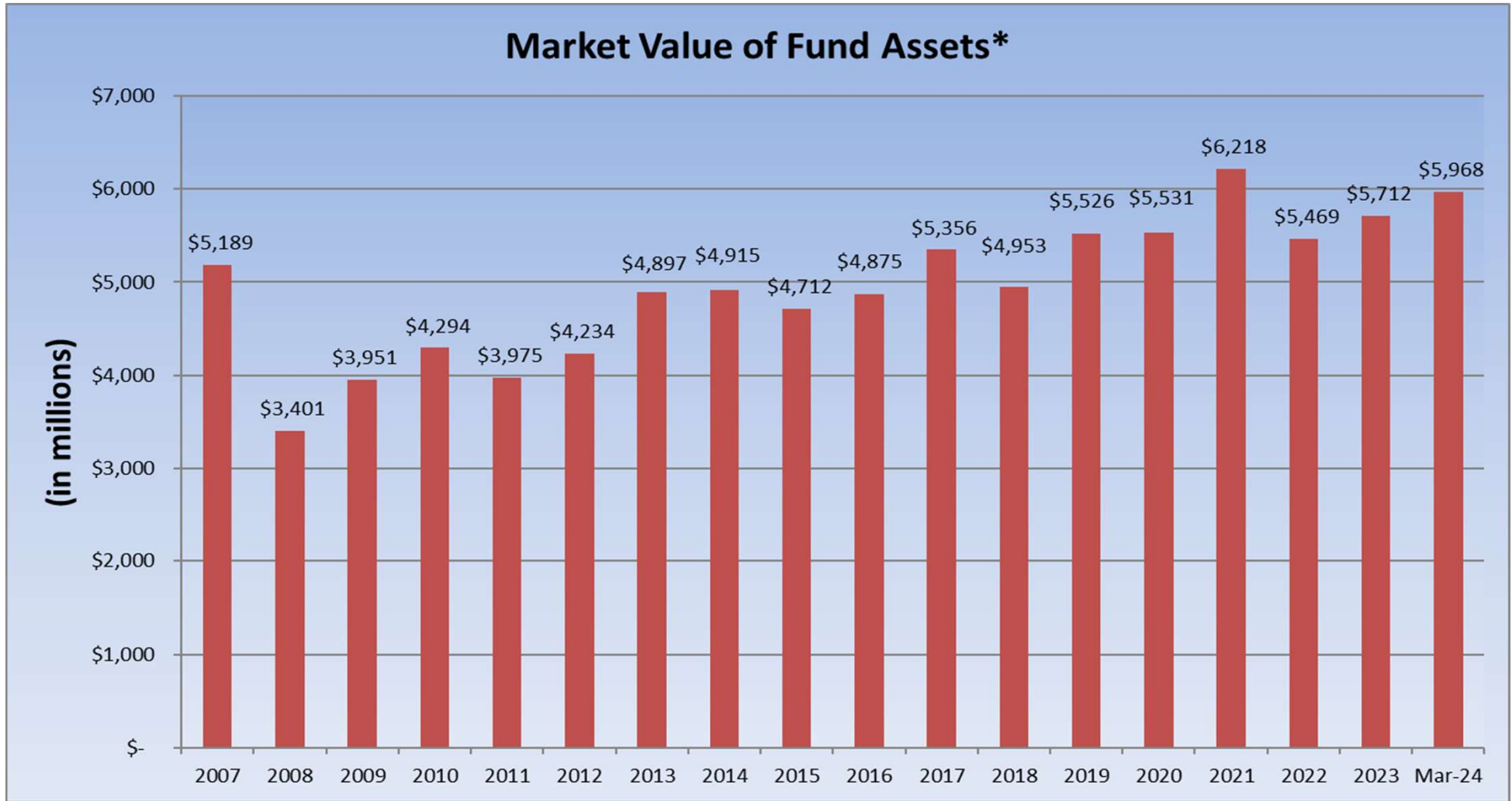
1 The City Reserve Account balance equals the market value currently held in the Baird account.

2 PABF Fund balance equals the market value currently held in the PABF account.

Monthly Cash Outflows, Monthly Cash Inflows, and Capital Market Gain/(Loss) amounts are calculated using estimates of cash flows into and out of the Fund. These amounts are not audited and may not tie to CMERS Financial Statements.

Fund Value of Assets: 2007 – March 31, 2024 - Preliminary

(Year Ended Dates Reflect 12/31 Fund Values)



Most recent Actuarial valuation projects benefit payments to total \$5.4 billion in next 10 years.

Benefit Payments	\$5.8 billion
Expenses	\$287 million
Contributions	\$1.8 billion
Investment Gain	\$5.0 billion

16 1/4 Year Estimates (1/1/2008 - 3/31/2024)

Benefit Payments, Expenses, Contributions, and Investment Gain amounts are calculated using estimates of cash flows into and out of the Fund. These amounts are not audited and may not tie to CMERS Financial Statements.

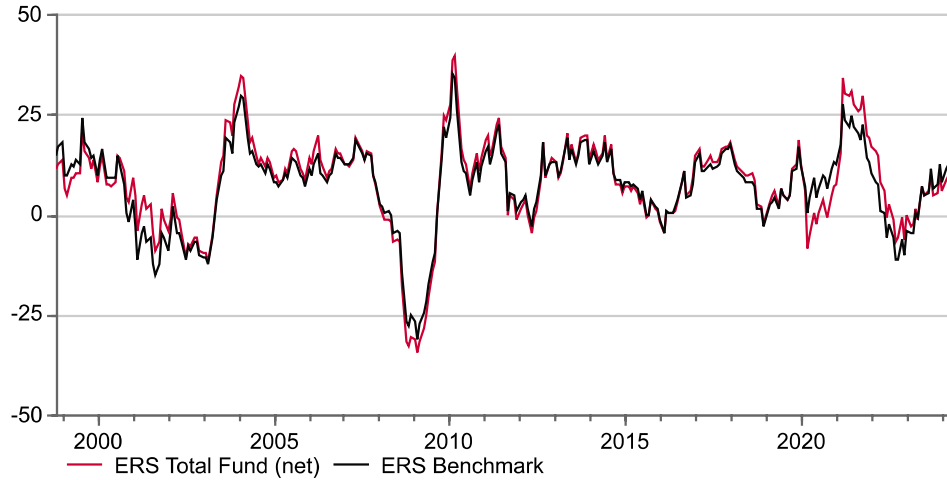


*Private Equity and some Real Estate values are reported on a 1-quarter lag.

Preliminary Total Fund Rolling Returns as of March 31, 2024

1 Year Rolling Returns – 12/1/1997 to 3/31/2024

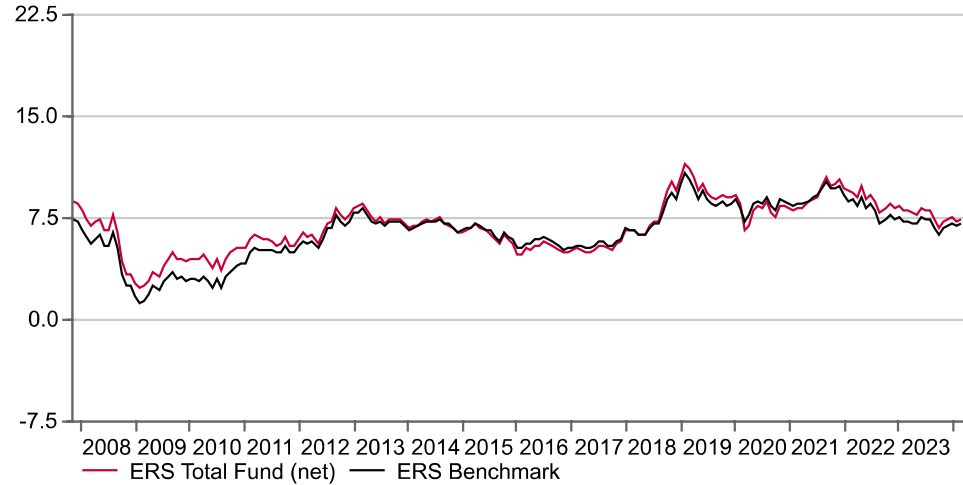
1 Year 1 Month Shift



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10 Year Rolling Returns – 12/1/1997 to 3/31/2024

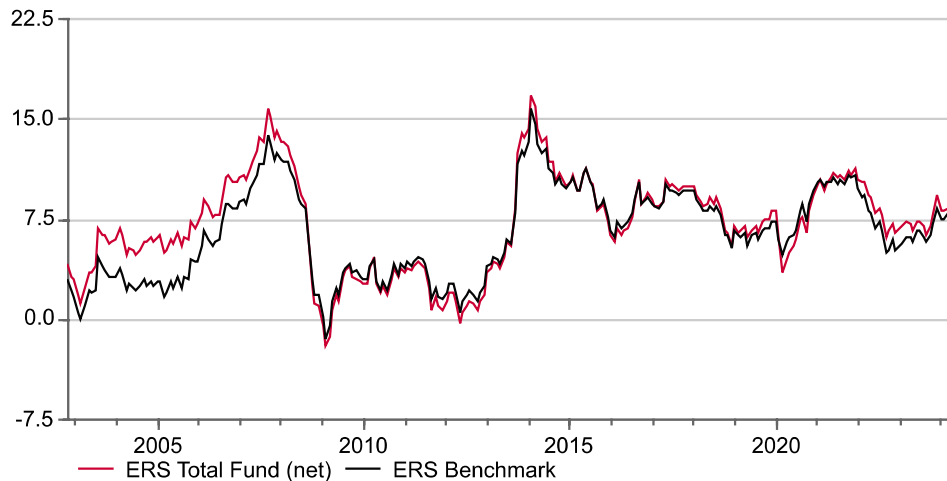
10 Years 1 Month Shift



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5 Year Rolling Returns – 12/1/1997 to 3/31/2024

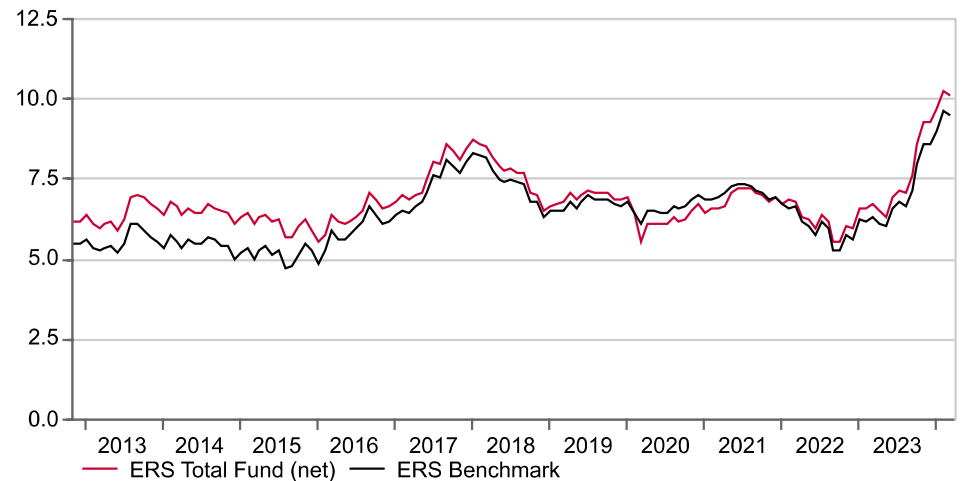
5 Years 1 Month Shift



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15 Year Rolling Returns – 12/1/1997 to 3/31/2024

15 Years 1 Month Shift

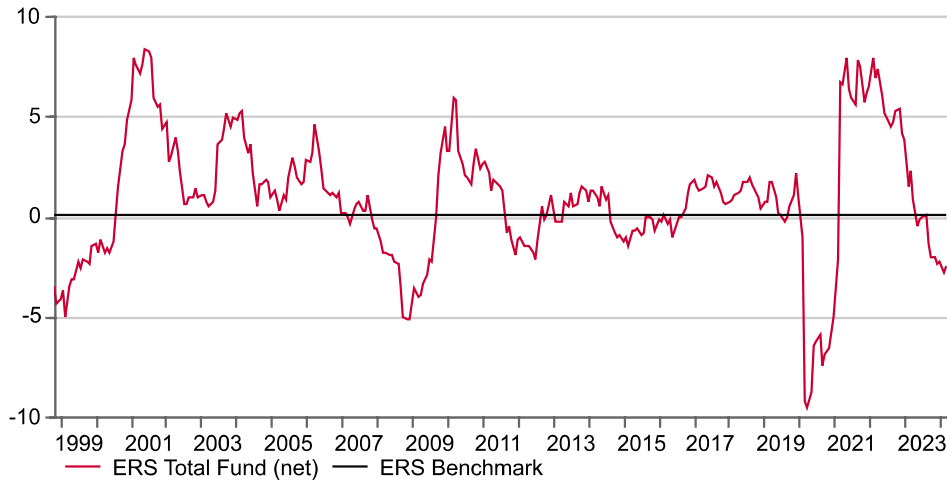


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Preliminary Total Fund Rolling Excess Returns as of March 31, 2024

1 Year Rolling Excess Returns – 12/1/1997 to 3/31/2024

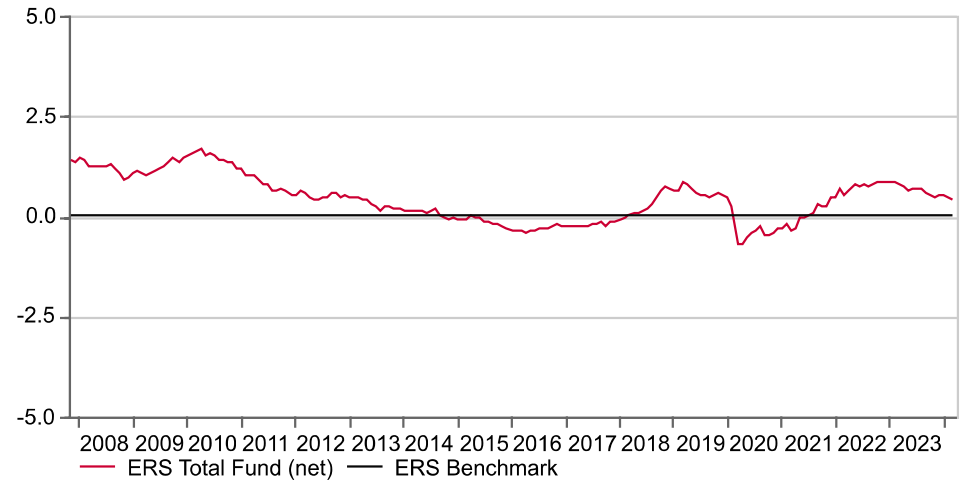
1 Year 1 Month Shift



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10 Year Rolling Excess Returns – 12/1/1997 to 3/31/2024

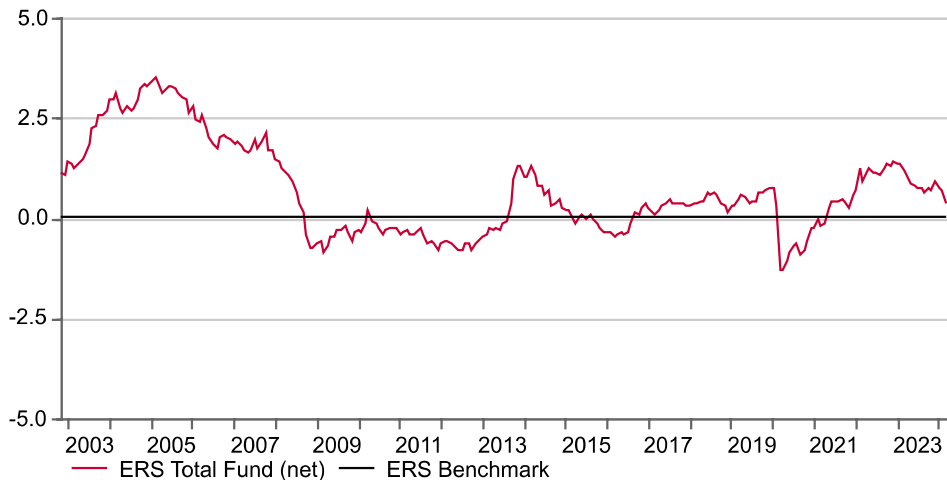
10 Years 1 Month Shift



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5 Year Rolling Excess Returns – 12/1/1997 to 3/31/2024

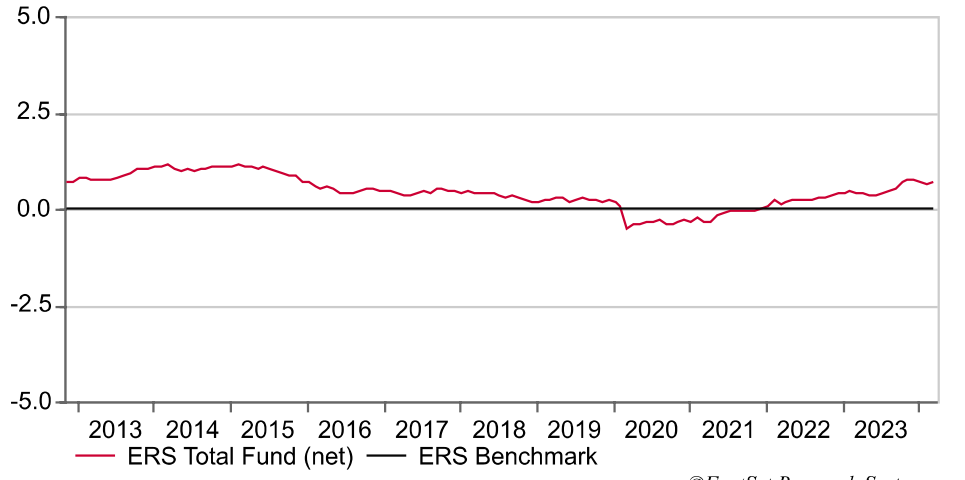
5 Years 1 Month Shift



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15 Year Rolling Excess Returns – 12/1/1997 to 3/31/2024

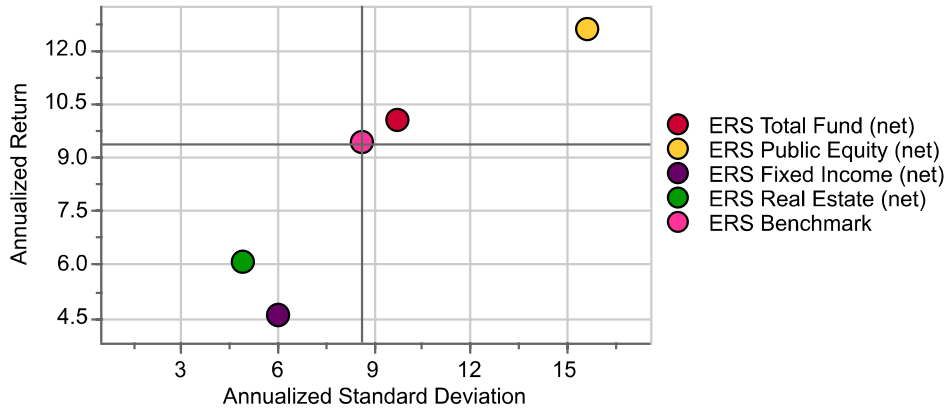
15 Years 1 Month Shift



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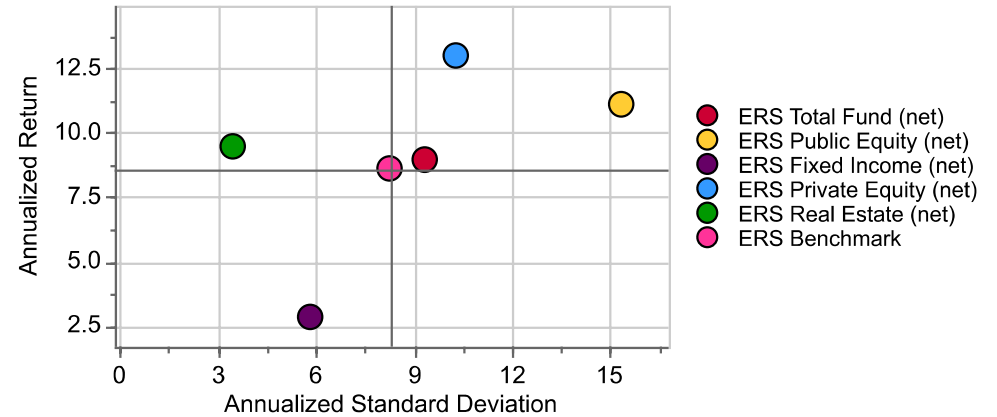
Total Fund Statistics - Preliminary

15 Year Risk-Reward –4/1/2009 to 3/31/2024



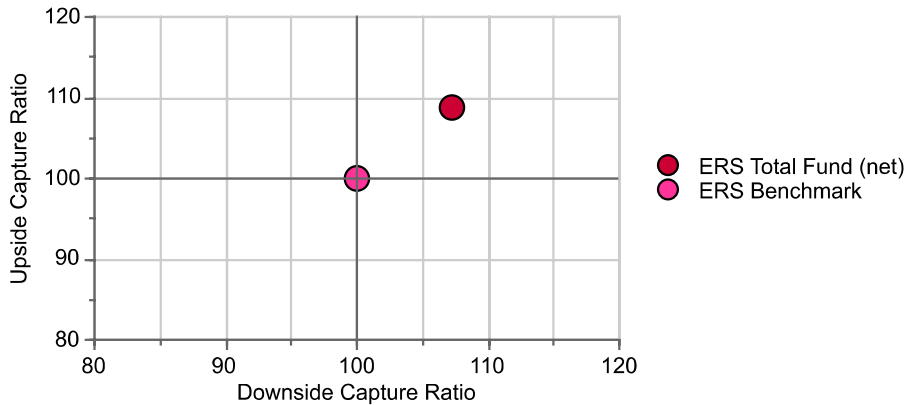
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Risk-Reward Since Private Equity Inception – 7/1/2010 to 3/31/2024



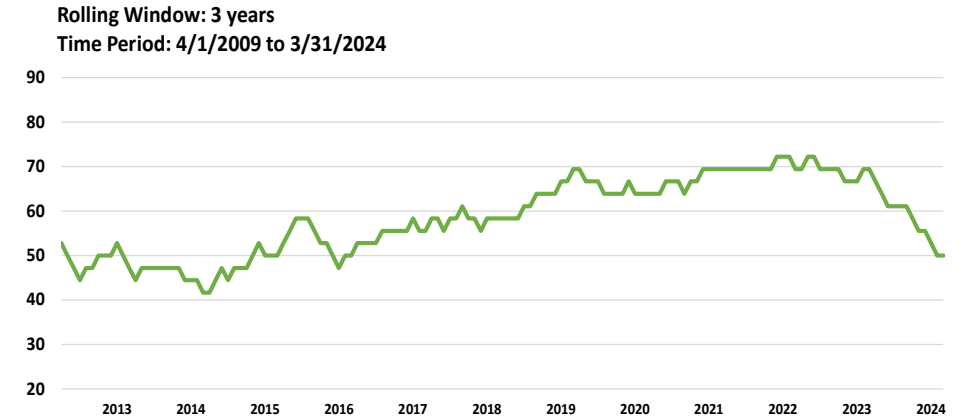
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15 Year Upside-Downside –4/1/2009 to 3/31/2024



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Batting Average



15 Year Risk –4/1/2009 to 3/31/2024

	Annualized Return	Standard Deviation	Sharpe Ratio	Information Ratio	Tracking Error	Alpha	Beta
ERS Total Fund (net)	10.1	9.7	0.0	0.9	0.1	2.7	1.1
ERS Benchmark	9.4	8.6	0.0	1.0	--	--	1.0

Risk – 7/1/2013 to 3/31/2024

	Annualized Return	Standard Deviation	Sharpe Ratio	Information Ratio	Tracking Error	Alpha	Beta
ERS Total Fund (net)	8.2	8.9	0.0	0.8	0.1	3.0	1.1
ERS Benchmark	7.7	7.8	0.0	0.8	--	--	1.0



* Real Estate returns calculated by Northern Trust

Public Equity

Public Equity Performance - Preliminary

10 Year Rolling Returns – 7/1/2000 to 3/31/2024



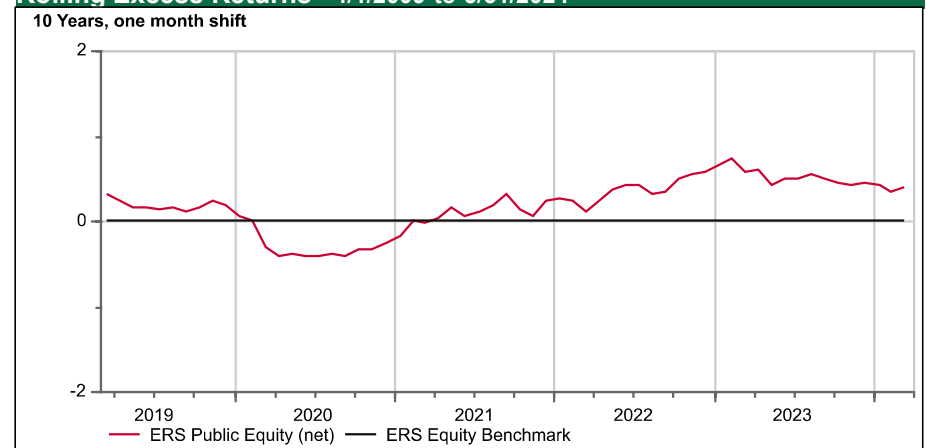
Trailing Returns

	QTR	1 Year	3 Year	5 Year	7 Year	10 Year	15 Year
ERS Public Equity (Gross)	7.5	22.3	7.3	11.6	10.8	9.5	13.0
ERS Public Equity (Net)	7.5	22.0	7.0	11.2	10.4	9.1	12.6
ERS Public Equity Benchmark	7.7	22.5	6.3	10.6	9.9	8.7	12.2
MSCI AC World IMI	7.7	22.5	6.3	10.6	9.9	8.4	11.7

Investment Growth – 4/1/2009 to 3/31/2024



Rolling Excess Returns – 4/1/2009 to 3/31/2024

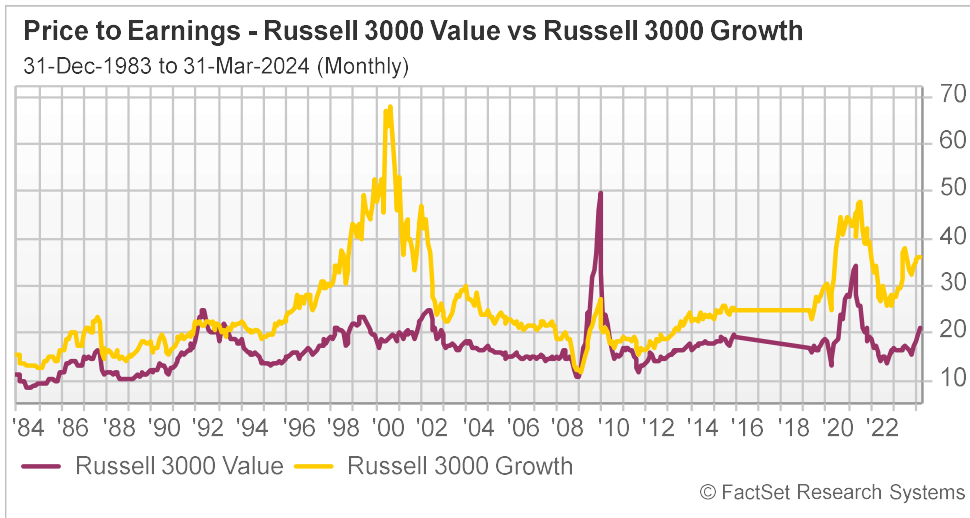


P/E Ratio Comparisons in the U.S. Since 1980 - As of March 31, 2024

Value vs. Growth



Large vs. Small



Price to Earnings ratios for Value vs. Growth charts include companies with negative earnings in calculations.

Price to Earnings ratios for Large vs Small: Top chart includes companies with negative earnings in calculations; bottom chart excludes companies with negative earnings from calculation.

Relative Investment Performance – Active Equity Managers

Preliminary as of March 31, 2024

Outperforming Equity Managers

	1st Qtr	1 Year	3 Year	5 Year	7 Year	10 Year
AQR	6.1%	18.2%	-1.8%	4.9%	4.7%	N/A
<i>MSCI EM</i>	3.8%	10.1%	3.2%	2.7%	0.9%	
DFA International	5.3%	16.2%	6.2%	7.8%	5.3%	4.5%
<i>MSCI EAFE Small Cap</i>	2.9%	5.8%	7.6%	2.8%	0.2%	0.2%
DFA U.S. Large Value	11.5%	23.9%	9.6%	11.1%	N/A	N/A
<i>Russell 1000 Value</i>	2.5%	3.6%	1.4%	0.7%		
William Blair	6.8%	14.0%	-0.1%	8.3%	8.0%	5.9%
<i>MSCI ACWI ex US</i>	1.9%	0.2%	2.5%	1.8%	1.7%	1.2%
BlackRock Global Alpha Tilts	9.0%	24.8%	8.0%	11.5%	10.9%	N/A
<i>MSCI ACWI</i>	0.8%	1.6%	1.0%	0.6%	0.7%	
DFA U.S. Small Value	3.4%	24.4%	10.6%	13.7%	10.1%	9.2%
<i>Russell 2000 Value</i>	0.5%	5.6%	8.4%	5.6%	3.6%	2.3%
ERS Public Equity	7.5%	22.0%	7.0%	11.2%	10.4%	9.1%
<i>ERS Equity Benchmark</i>	0.2%	0.5%	0.7%	0.7%	0.5%	0.4%

Relative outperformance in blue

Relative underperformance in red

*Returns net of fees

Relative Investment Performance – Active Equity Managers

Preliminary as of March 31, 2024

Underperforming Equity Managers

	1st Qtr	1 Year	3 Year	5 Year	7 Year	10 Year
Polen <i>S&P 500</i>	7.6% 2.9%	30.4% 0.5%	4.2% 7.3%	12.8% 2.2%	15.3% 1.2%	14.9% 1.9%
MFS <i>MSCI ACWI</i>	6.4% 1.8%	18.6% 4.6%	6.4% 0.6%	12.5% 1.6%	13.3% 3.1%	11.2% 2.5%
Brandes <i>MSCI EAFE</i>	5.2% 0.6%	24.0% 8.7%	10.2% 5.4%	9.0% 1.7%	7.4% 0.7%	5.4% 0.6%
Earnest <i>Russell MidCap</i>	8.0% 0.6%	21.0% 1.3%	7.0% 0.9%	13.2% 2.1%	12.9% 2.3%	12.0% 2.0%
ERS Public Equity <i>ERS Equity Benchmark</i>	7.5% 0.2%	22.0% 0.5%	7.0% 0.7%	11.2% 0.7%	10.4% 0.5%	9.1% 0.4%

Relative outperformance in blue

Relative underperformance in red

*Returns net of fees

Relative Investment Performance – Passive Equity Managers & Other

Preliminary as of March 31, 2024

Passive Equity Managers

	1st Qtr	1 Year	3 Year	5 Year	7 Year	10 Year
Northern Trust S&P 500 Index <i>S&P 500</i>	10.5%	29.9%	11.5%	15.0%	14.1%	13.0%
	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
BlackRock Russell 1000 Value Index <i>Russell 1000 Value</i>	9.0%	20.3%	8.1%	10.4%	9.2%	N/A
	0.0%	0.0%	0.0%	0.1%	0.1%	

Real Assets Manager

	1st Qtr	1 Year	3 Year	5 Year	7 Year	10 Year
Principal Diversified Real Assets <i>Blended Benchmark</i>	1.7%	3.7%	3.7%	5.0%	4.6%	N/A
	1.0%	0.1%	0.2%	0.5%	0.2%	

Relative outperformance in blue

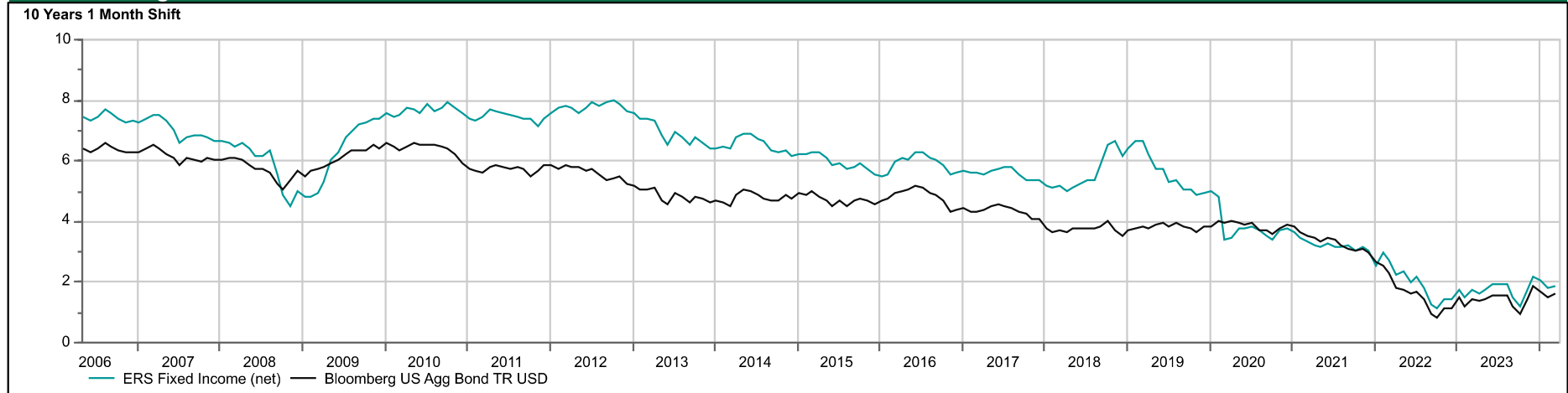
Relative underperformance in red

*Returns net of fees

Fixed Income

Fixed Income Performance - Preliminary

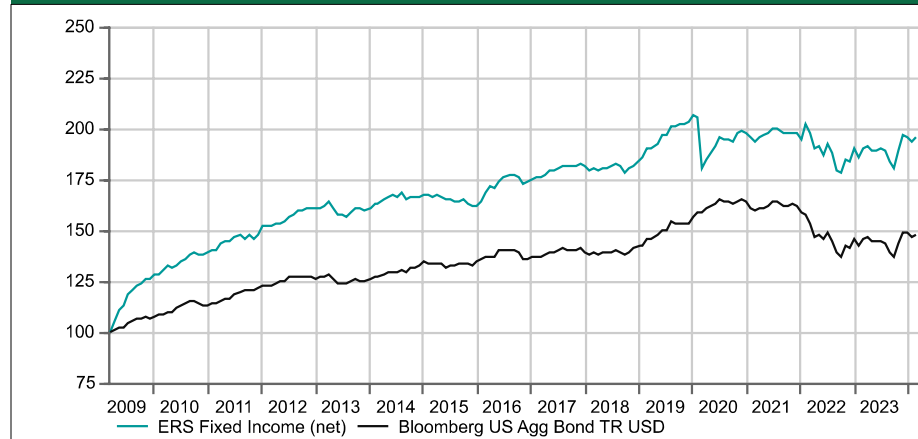
10 Year Rolling Returns – 6/1/1996 to 3/31/2024



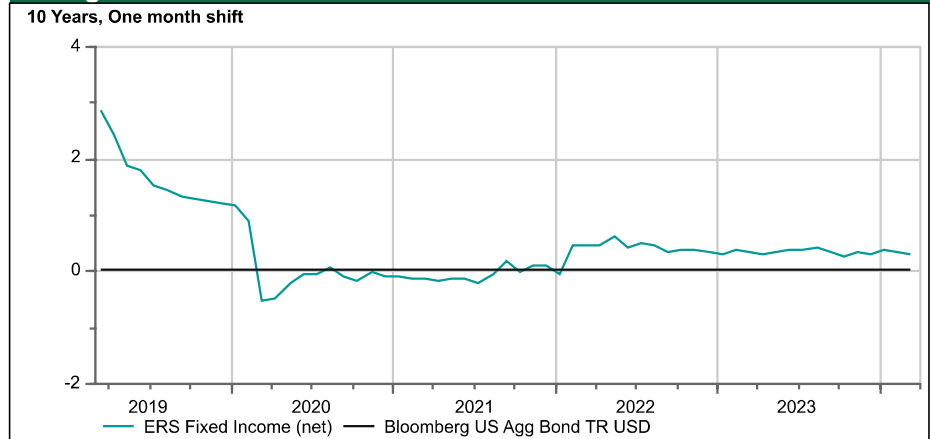
Trailing Returns

	QTR	1 Year	3 Year	5 Year	7 Year	10 Year	15 Year
Total Fixed Income (Gross)	-0.3	2.7	0.4	0.7	1.6	2.0	4.7
Total Fixed Income (Net)	-0.3	2.6	0.3	0.6	1.5	1.8	4.6
Bloomberg US Aggregate	-0.8	1.7	-2.5	0.4	1.1	1.5	2.6

Investment Growth –4/1/2009 to 3/31/2024



Rolling Excess Return –4/1/2009 to 3/31/2024



Relative Investment Performance – Fixed Income Managers

Preliminary as of March 31, 2024

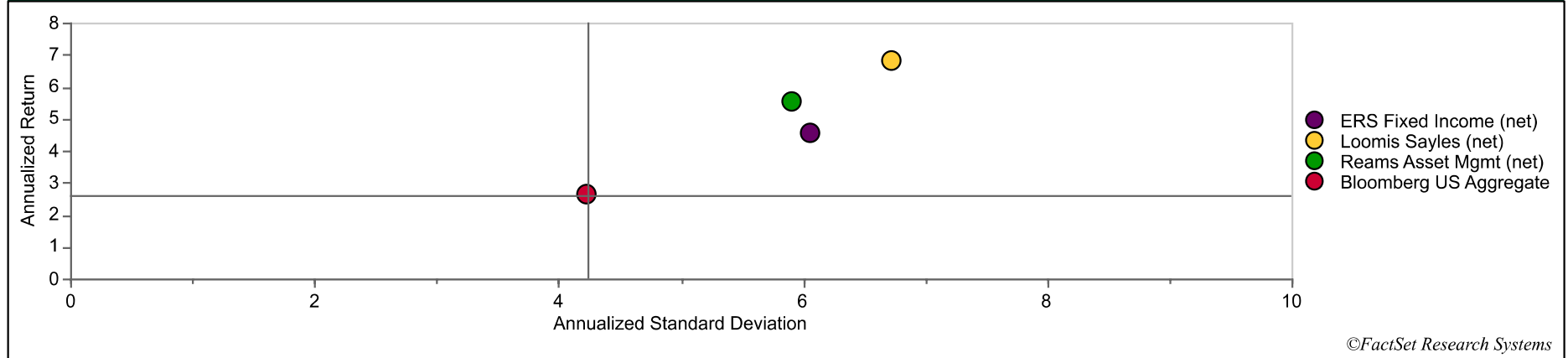
	1st Qtr	1 Year	3 Year	5 Year	7 Year	10 Year
Reams	-0.7%	1.9%	-1.4%	2.7%	2.9%	2.8%
<i>Bloomberg U.S. Agg.</i>	0.1%	0.2%	1.1%	2.3%	1.9%	1.3%
Loomis Sayles	0.6%	5.6%	-0.6%	2.5%	3.0%	3.3%
<i>Bloomberg U.S. Agg.</i>	1.4%	3.9%	1.9%	2.1%	1.9%	1.7%
BlackRock Index	-0.9%	0.1%	N/A	N/A	N/A	N/A
<i>Bloomberg U.S. Government</i>	0.0%	0.0%				
ERS Fixed Income	-0.3%	2.6%	0.3%	0.6%	1.5%	1.8%
<i>Bloomberg U.S. Agg.</i>	0.4%	0.9%	2.8%	0.3%	0.5%	0.3%

Relative outperformance in blue
Relative underperformance in red

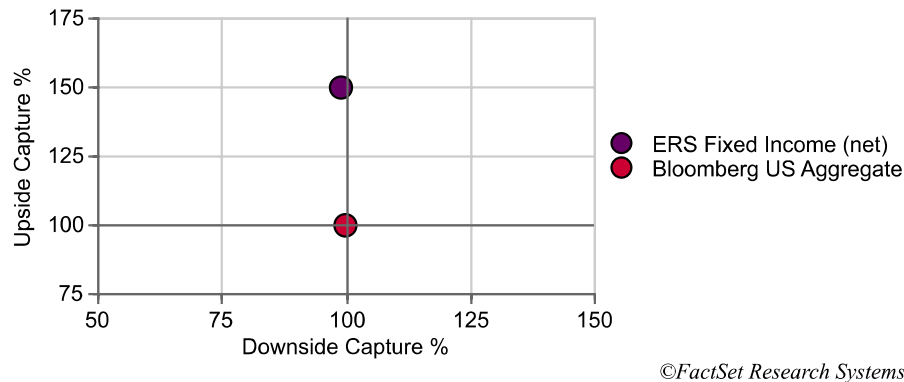
*Returns net of fees

Fixed Income Statistics - Preliminary

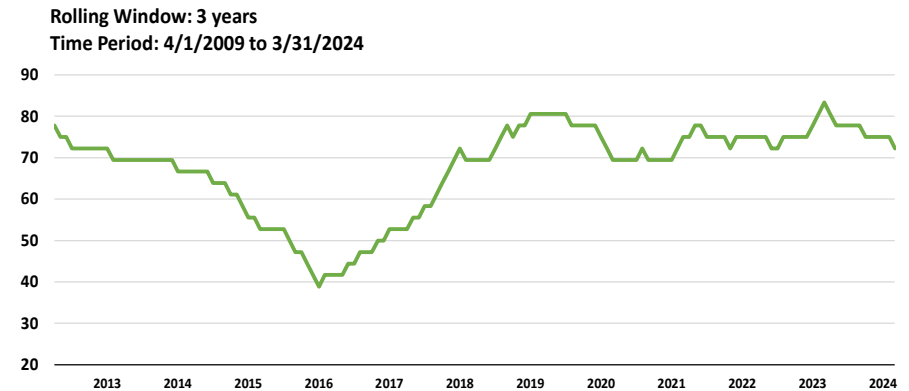
Risk – Reward –4/1/2009 to 3/31/2024



15 Year Upside-Downside –4/1/2009 to 3/31/2024



Batting Average



15 Year Risk –4/1/2009 to 3/31/2024

Risk – 7/1/2013 to 3/31/2024

	Annualized Return	Standard Deviation	Sharpe Ratio	Information Ratio	Tracking Error	Beta		Annualized Return	Standard Deviation	Sharpe Ratio	Information Ratio	Tracking Error	Beta		
Total Fixed Income (Net)	4.6	6.1	0.2	0.6	0.1	4.3	1.0	Total Fixed Income (Net)	2.1	6.3	0.0	0.1	0.0	4.3	1.0
Bloomberg US Aggregate	2.6	4.2	0.0	0.4	--	--	1.0	Bloomberg US Aggregate	1.6	4.6	0.0	0.1	--	--	1.0

Absolute Return

Relative Investment Performance – Absolute Return Managers

Preliminary as of March 31, 2024

	1st Qtr	1 Year	3 Year	5 Year	7 Year
UBS A&Q <i>1 Year Libor / SOFR + 4%</i>	2.4%	8.4%	8.0%	9.2%	7.6%
	0.1%	0.9%	1.6%	2.7%	1.1%
Aptitude <i>SOFR + 4%</i>	4.8%	10.1%	N/A	N/A	N/A
	2.5%	0.8%			
ERS Absolute Return <i>3 Month T-Bill + 3%</i>	3.3%	9.0%	13.2%	6.5%	6.0%
	1.2%	0.5%	7.3%	1.4%	1.0%

Relative outperformance in blue

Relative underperformance in red

Risk Adjusted Returns (6/30/14 - 3/31/24)

	Return	Std Dev	Sharpe Ratio	Max Drawdown
ERS Public Equity (net)	8.9%	15.6%	0.5	-25.3%
ERS Fixed Income (net)	1.6%	6.5%	0.0	-13.6%
ERS Absolute Return (net)	5.9%	9.4%	0.5	-27.1%

*Returns net of fees

Performance Update

Performance Update

Estimated ERS Total Fund Market Value is \$5.82 billion as of April 17, 2024

Period	ERS Fund*	Benchmark
YTD through March 31, 2024 (Estimate)	2.8%	3.9%
April MTD (Estimate)	-2.6%	-2.5%
YTD Through April 17, 2024 (Estimate)	0.2%	1.4%

*Returns Net of Fees