OREGON
STATE
TREASURY

Oregon Investment Council

September 6, 2023

Cara Samples
Chair

Tobias Read
State Treasurer

Rex Kim
Chief Investment Officer

Investment Division
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Oregon Investment Council

Oregon State Treasury
Investment Division
16290 SW Upper Boones Ferry Road
Tigard, OR 97224

Agenda
September 6, 2023
9:00 AM

Time	Tab		Presenter
9:00	1	**Review & Approval of Minutes** July 19, 2023	Cara Samples OIC Chair
	2	**Committee Reports**	Rex Kim Chief Investment Officer
9:05 – 9:15	3	**Consultant Contracts** (Action Item: Contract Recommendation)	David Randall Chief Investment Operating Officer Ben Mahon Senior Investment Officer, Alternatives
9:15 – 10:15	4	**OPERF Q2 Performance Review**	Paola Nealon Principal, Meketa Eric Larsen Vice President, Meketa

--- BREAK ---

10:30 – 11:00	5	**OPERF Leverage**	Karl Cheng Senior Investment Officer, Portfolio Risk & Research Allan Emkin Managing Principal, Meketa Mika Malone Managing Principal, Meketa
11:00 – 11:45	6	**Roles & Responsibilities**	Mika Malone Managing Principal, Meketa Raneen Jalajel Associate Partner, Aon
11:45	7	**Calendar – Future Agenda Items**	Rex Kim
11:45	8	**Open Discussion**	OIC Members, Staff, Consultants
		Public Comments	

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TAB 1

REVIEW & APPROVAL OF MINUTES

State of Oregon
Office of the State Treasurer

16290 SW Upper Boones Ferry Road

Tigard, Oregon 97224

OREGON INVESTMENT COUNCIL

July 19, 2023

Meeting Minutes

Members Present:	Cara Samples, Lorraine Arvin, Pia Wilson-Body, Alline Akintore, Tobias Read, Kevin Olineck
Staff Present:	Rex Kim, Michael Langdon, David Randall, Karl Cheng, Mike Mueller, Ben Mahon, Jen Plett, Rupa Raman, Louise Howard, Claire Illo, Wil Hiles, Ian Huculak, Angela Schaffers, Taylor Bowman, Ahman Dirks, Faith Sedberry, Amanda Kingsbury, Kenny Bao, Sara Bayes, Chuck Christopher, Angela Schaffers, Dmitri Palmateer, Jennifer Kersgaard
Staff Participating Virtually:	Aaron Schaffer, Aliese Jacobsen, Alli Gordon, Andrew Coutu, Andrew Robertson, Andrey Voloshinov, Anna Totdahl, Annie Gregori, Ashley Daigle, Austin Carmichael, Bradley Curran, Chris Ebersole, Debra Day, Dmitri Palmateer, Ericka Langone, Jacqueline Knights, John Lutkehaus, Josh Jones, Kaia Todd, Krystal Korthals, Loren Terry, Mark Selfridge, Michael Makale, Mohammed Quraishi, Odalis De La Cruz, Perrin Lim, Philip Larrieu, Roy Jackson, Scott Robertson, Sommer may, Tan Cao, Taylor Marks, Tiffany Zahas, Tim Miller, Tyler Bernstein, Will Hampson, Young Kim
Consultants Present:	Allan Emkin, Mika Malone, Colin Bebee, Ashley Woeste, Tom Martin, Wil VanLoh, Stephen Kennedy, Ryan Fitzgerald, Christy Fields, Eric Larsen
PERS Present:	Kevin Olineck
Legal Counsel Present:	Steve Marlowe (Department of Justice)

The July 19, 2023, OIC meeting was called to order at 9:25 am by Cara Samples, Chair.

Time	Tab		Presenter
9:00	1	**Review & Approval of Minutes** May 31, 2023 Chair Samples opened the meeting and asked for approval of the May 31, 2023, OIC regular meeting minutes. Treasurer Read moved approval at 9:25 am; Member Pia Wilson-Body seconded the motion which then passed by a 5/0 vote.	Cara Samples OIC Chair
	2	**Committee Reports** Private Equity Committee: June 7th:	Rex Kim Chief Investment Officer

KPS Special Situations Fund VI: $150M

Real Estate Committee:
None

Opportunity Committee:
June 9th:
Arctos Sports Partners Fund II: $150M

Alternatives Portfolio Committee:
July 11th:
Hudson Northern Shipping Fund V: $150M
Quantum Capital Solutions II: $160M + $40M side-car

Staff Discretion
CSF:
July 11th
Quantum Capital Solutions II: $7.4M

9:05 – 9:55 3 **Energy Market Review**

Michele Della Vigna presented on the topic of the energy transition, in particular, the cost to upgrade the global energy system. He highlighted the effects of the Inflation Reduction Act on the cost curve for the development of clean energy technologies.

Michele Della Vigna
Head of Natural Resources Research in EMEA, Goldman Sachs

--- BREAK ---

10:05 – 10:55 4 **Energy Transition Investment Landscape**

Wil VanLoh discussed the challenges and opportunities associated with investing in the Energy Transition. He went through in detail the various energy sources, highlighting the amount of each source that will be needed and how the sources work together.

Ben Mahon
Senior Investment Officer, Alternatives
Wil VanLoh
Founder & CEO, Quantum Capital Group

--- BREAK ---

11:05 – 11:45 5 **OPERF Public Equity Progress Update**
(Action Item: Manager Recommendation,)

Louise Howard and Wil Hiles from OST and Mika Malone from Meketa provided a progress report on the changes to the public equity portfolio. The results of the changes to the portfolio in 2023 has led to an overall reduction in active risk from more than 2% to

Louise Howard
Senior Investment Officer, Public Equity
Wil Hiles
Investment Officer, Public Equity
Mika Malone
Managing Principal, Meketa

below 2%, now below the limit set by policy. The changes have led to an increase in the proportion of active risk coming from security selection as planned.

In addition to the update, the Public Equity team recommended an investment in GQG Global Equity.

Treasurer Read moved approval at 11:35 am; Member Alline Akintore seconded the motion which then passed by a 5/0 vote.

11:45 – 12:15	6	**OPERF Diversifying Strategies Annual Review** The Diversifying Strategies Portfolio returned 16.5% in CY 2022, significantly outperforming the HFRI FOF Conservative benchmark (+0.1). The portfolio is now outperforming its benchmark on a three-year basis. Project Pathfinder has received approval for 8 new strategies in past 16 months, totaling $2.45 billion in commitments.	Ben Mahon Senior Investment Officer, Alternatives Stephen Kennedy Partner/Portfolio Analyst, Albourne Ryan Fitzgerald Portfolio Analyst, Albourne
12:15	7	**Calendar – Future Agenda Items**	Rex Kim
12:15	8	**Open Discussion**	OIC Members, Staff, Consultants
12:15	9	**Public Comments**	

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TAB 2

COMMITTEE REPORTS

TAB 3

CONSULTANT

CONTRACTS

OIC Consultant Contract Extension Recommendation
General Consultants

Policy
Under INV 210 (attached), consultant contracts are generally awarded for a three-year period, can be renewed no more than twice, and are limited to a final expiration date not more than four years beyond the original expiration date. At the end of seven years, contracts must be re-bid and a new seven-year cycle can begin. Additionally, the OIC retains the contractual right to terminate such contracts, at any time, upon written notice.

Purpose
To address the OIC's General Consultant contracts with Meketa and Aon, both of which are set to expire on December 31, 2023.

Background
The current General Consultant contracts were both approved by the OIC in December of 2020, and services began on January 1, 2021. In addition to the initial three-year contract term, two pre-negotiated two-year extensions are available at the Council's discretion.

Recommendation
Staff proposes that the OIC extend its current contracts with both Meketa and Aon, subject to the existing terms and conditions, for an additional two-year period beginning January 1, 2024 and ending December 31, 2025.

OIC Consultant Contract Extension Recommendation
OPERF Real Assets and Diversifying Strategies Portfolios

Policy
Under INV 210 (attached), consultant contracts are generally awarded for a three-year period, can be renewed no more than twice, and are limited to a final expiration date not more than four years beyond the original expiration date. At the end of seven years, contracts must be re-bid and a new seven-year cycle can begin. Additionally, the OIC retains the contractual right to terminate such contracts, at any time, upon written notice.

Purpose
To address the OIC's consultant contracts for the Real Assets Portfolio and Diversifying Strategies Portfolio, both of which are set to expire on December 31, 2023.

Background
Real Assets Portfolio: The current Real Assets Portfolio consultant contract with Aksia was approved by the OIC on October 31, 2018 and began on January 1, 2019. The first two-year extension was approved by the OIC on October 27, 2021. The terms of the contract allow for one additional, pre-negotiated two-year extension.

Diversifying Strategies Portfolio: The current Diversifying Strategies Portfolio consultant contract with Albourne was approved by the OIC on October 28, 2020 and began on January 1, 2021. In addition to the initial three-year contract term, two pre-negotiated two-year extensions are available at the Council's discretion.

Recommendation

1. Real Assets Portfolio: Staff proposes that the OIC extend its current contract, subject to the existing terms and conditions, for a final two-year period beginning January 1, 2024 and ending December 31, 2025, on behalf of the Real Assets Portfolio.

2. Diversifying Strategies Portfolio: Staff proposes that the OIC extend its current contract, subject to the existing terms and conditions, for an additional two-year period beginning January 1, 2024 and ending December 31, 2025, on behalf of the Diversifying Strategies Portfolio.

Status Active PolicyStat ID 14188512

Origination	12/2010	Owner	Rex Kim: Chief Investment Officer
Last Approved	08/2023	Policy Area	Investments
Last Revised	09/2015		
Next Review	08/2024		

INV 210: Consulting Contracts

OREGON INVESTMENT COUNCIL POLICY

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INTRODUCTION & OVERVIEW

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Summary Policy Statement

This policy outlines the requirements and limitations of written contracts between the Oregon Investment Council (OIC) and external consultants.

Purpose and Goals

The goal of this policy is to establish the parameters within which the OIC may engage and enter into contractual agreements with external consultants.

Applicability

Classified represented, management service, unclassified executive service

POLICY PROVISIONS

Definitions

Placement Agent: includes any third party, affiliated or unaffiliated with an investment manager, investment advisory firm, or a general partnership, that is a party to an agreement or arrangement (whether oral or written) with an investment manager, investment advisory firm, or a general partnership for the direct or indirect payment of a Placement Fee in connection with an OIC investment.

Placement Fee: includes any compensation or payment, directly or indirectly, of a commission, finder's fee, or any other consideration or benefit paid to Placement Agent.

Policy Statements

1. The OIC shall engage consultants using written contracts. Consultants include, but are not limited to, full-service consultants and specific asset class advisors (e.g., real estate, private equity, etc.).
2. Consulting contracts shall have specified expiration dates, termination clauses and renewal/ extension terms. Staff shall undertake a formal "request for proposal" (RFP) process before the end of the contract term (including any renewals or extensions) for the purpose of identifying new candidates, upgrading services, ensuring competitive pricing and acquiring any other information or benefits considered relevant to staff and the Council.
3. Consulting contracts shall be negotiated and executed in compliance with Council policy INV 208: Negotiation and Execution of Contracts.
4. Consulting contracts shall expire on a date not to exceed three years from the effective date of the contract.
5. Consulting contracts shall include a "no-cause" termination clause with a maximum 90-day notice period.
6. The Council directs staff to regularly review and evaluate the work of all contractors on an annual basis.
7. Consulting contracts are limited to a) two renewals or extensions beyond the original expiration date, and b) a final expiration date no more than four years beyond the original expiration date.
8. Upon final expiration of the original contract, or whenever directed by the Council, staff shall undertake and complete an RFP process to include the following:
    a. Identification of potential consulting candidates qualified to provide the required services;
    b. Creation of an RFP which shall include, but not be limited to:
        1. Description of services requested;
        2. Description of the potential or preliminary standards required of the candidates; and
        3. Request for pricing or fee schedule information.
9. Consultants under contract with the Council shall disclose, in written recommendations delivered to the Council, any Placement Agent contact Consultants may have had in connection with such Council recommendations.

Exceptions

None.

Failure to Comply

Failure to comply with this policy may be cause for disciplinary action up to and including dismissal.

PROCEDURES and FORMS

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ADMINISTRATION

Feedback

Your comments are extremely important to improving the effectiveness of this policy. If you would like to comment on the provisions of this policy, you may do so by e-mailing the Policy Analyst. To ensure your comments are received without delay, *please list the policy number and name in your e-mail's subject*. Your comments will be reviewed during the policy revisions process and may result in changes to the policy.

Approval Signatures

Step Description	Approver	Date
Oregon Investment Council	Rex Kim: Chief Investment Officer	08/2023
	Deena Bothello: General Counsel	08/2023
	Rex Kim: Chief Investment Officer	08/2023

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TAB 4

OPERF Q2 PERFORMANCE

REVIEW

MEKETA | 45 YEARS
CELEBRATING A MILESTONE

Oregon Investment Council

September 6, 2023

Q2 Performance Update
As of June 30, 2023

Table of Contents

Introduction

OPERF Executive Summary – Notable Items

→ The transition to the new long-term policy allocation is now complete. Policy targets were shifted on 4/1/23 and benchmarks have been updated to reflect the new targets.

→ Investment Policy work is underway for the OPERF portfolio- a joint Aon-Meketa discussion on Roles and Responsibilities as it relates to manager selection will take place at this meeting.

→ A general educational item on leverage within the OPERF program will be conducted as a joint effort between Staff and Meketa at this meeting.

→ The public equity program continues to evolve, adjusting risk exposures and manager transitions. The council heard a status update at the August meeting, and has recently approved a variety of manager/strategy changes to support these efforts.

→ Conversations are taking place between Staff and consultants regarding additional portfolio-level concerns, such as the overlay, pacing within private markets, internal index management, and securities lending programs. Meketa continues to support the Council and Staff on both education and recommendations regarding these topics.

Economic and Market Update

Data as of June 30, 2023

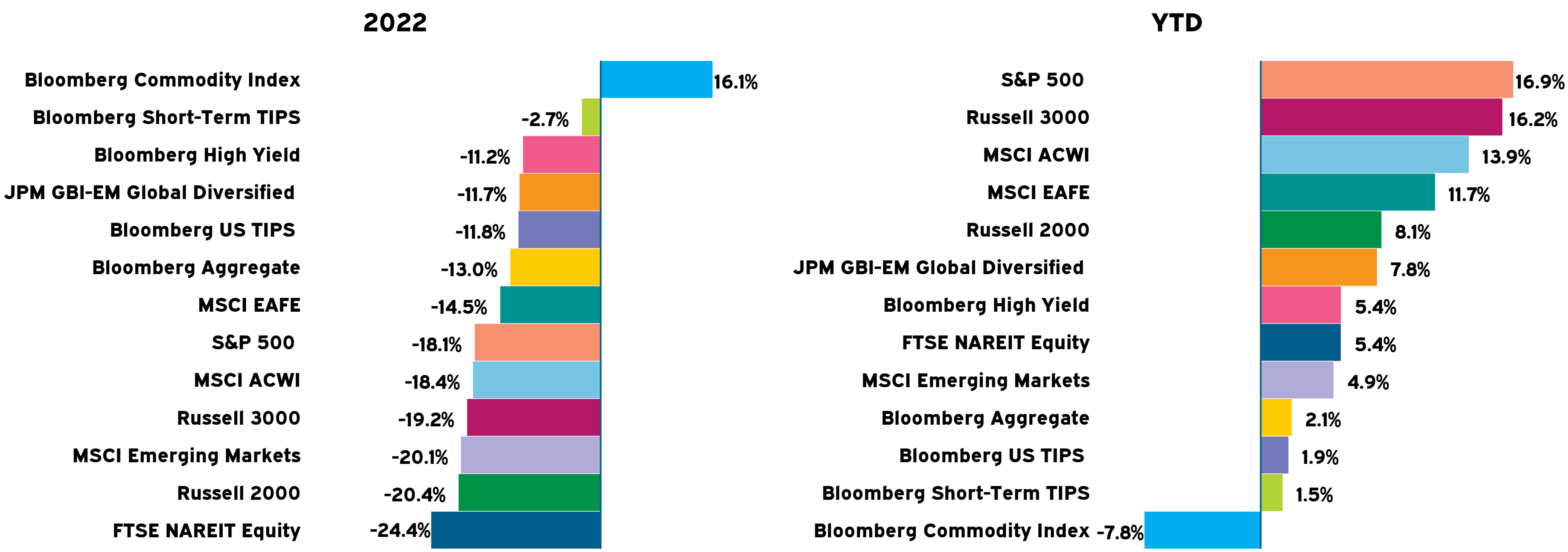
Commentary

→ Asset returns were positive in June with US and Non-US equities posting gains, while most fixed income sectors sold-off on expectations for further interest rate hikes later this year. Except for commodities, most public market asset classes remain up for the year.

- Although the Fed skipped a rate-hike in June, Fed comments signaled further rate hikes in the 2H 2023; the US economy appears to be resilient supporting domestic demand and low unemployment.
- US equity markets (Russell 3000) rose in June (+6.8%) adding to YTD gains (+16.2%). Some of the largest technology names drove positive results. Growth stocks continued to outpace value stocks, particularly in the large cap space.
- Non-US developed equity markets rose in June (MSCI EAFE 4.6%) falling behind US equities in 2023 (+16.2% versus +11.7%). A strengthening US dollar weighed on returns.
- Emerging market equities rose in June (+3.8%) supported by positive returns in China (+4.0%). They significantly trail developed market equities YTD returning +4.9%, due partly to higher US-China tensions.
- Rates generally rose in June leading to bond markets declining, with the broad US bond market (Bloomberg Aggregate) falling 0.4% for the month. It remains positive (+2.1%) year-to-date, though, on declining inflation and expectations for the Fed to end their rate hikes soon.

→ This year, the paths of inflation and monetary policy, slowing global growth and the war in Ukraine will all be key.

Index Returns[1]



→ After a particularly difficult 2022, most public market assets are up thus far in 2023, building on gains from the fourth quarter of last year.

→ Risk sentiment has been supported by expectations that policy tightening could be ending soon, as inflation continues to fall, and growth has slowed.

1 Source: Bloomberg and FactSet. Data is as of June 30, 2023.

Domestic Equity Returns[1]

Domestic Equity	June (%)	Q2 (%)	YTD (%)	1 YR (%)	3 YR (%)	5 YR (%)	10 YR (%)
S&P 500	6.6	8.7	16.9	19.6	14.6	12.3	12.8
Russell 3000	6.8	8.4	16.2	19.0	13.9	11.4	12.3
Russell 1000	6.8	8.6	16.7	19.4	14.1	11.9	12.6
Russell 1000 Growth	6.8	12.8	29.0	27.1	13.7	15.1	15.7
Russell 1000 Value	6.6	4.1	5.1	11.5	14.3	8.1	9.2
Russell MidCap	8.3	4.8	9.0	14.9	12.5	8.4	10.3
Russell MidCap Growth	7.7	6.2	15.9	23.1	7.6	9.7	11.5
Russell MidCap Value	8.7	3.9	5.2	10.5	15.0	6.8	9.0
Russell 2000	8.1	5.2	8.1	12.3	10.8	4.2	8.2
Russell 2000 Growth	8.3	7.1	13.6	18.5	6.1	4.2	8.8
Russell 2000 Value	7.9	3.2	2.5	6.0	15.4	3.5	7.3

US Equities: Russell 3000 Index rose 8.4% in the second quarter and 16.2% YTD.

→ US stocks rose sharply in the second quarter of 2023. Most of the gains came in the month of June when the Fed kept its target rate unchanged for the first time since early 2022. Investors are expressing optimism that the Fed can tame inflation without widespread disruptions to the equity markets.

→ With the exception of energy and utilities, each sector of the Russell 3000 index appreciated during the second quarter. Technology led all sectors and was driven by enthusiasm for growth stocks, particularly those with exposure to artificial intelligence (e.g., NVIDIA).

→ Large cap stocks continue to outperform small cap stocks, driven by technology and the underperformance of small cap biotechnology stocks. Growth stocks continue to broadly outperform value stocks.

[1] Source: Bloomberg. Data is as of June 30, 2023.

Foreign Equity Returns[1]

Foreign Equity	June (%)	Q2 (%)	YTD (%)	1 YR (%)	3 YR (%)	5 YR (%)	10 YR (%)
MSCI ACWI ex. US	4.5	2.4	9.5	12.7	7.2	3.5	4.7
MSCI EAFE	4.6	3.0	11.7	18.8	8.9	4.4	5.4
MSCI EAFE (Local Currency)	3.6	4.3	12.1	17.5	11.7	6.4	7.7
MSCI EAFE Small Cap	2.9	0.6	5.5	10.2	5.7	1.3	6.2
MSCI Emerging Markets	3.8	0.9	4.9	1.8	2.3	0.9	2.9
MSCI Emerging Markets (Local Currency)	3.4	1.7	5.6	3.3	3.9	3.0	5.7
MSCI China	4.0	-9.7	-5.5	-16.8	-10.3	-5.3	3.0

Foreign Equity: Developed international equities (MSCI EAFE) rose 3.0% in the second quarter bringing the YTD results to +11.7%. Emerging market equities (MSCI EM) rose 0.9%. in the quarter, rising 4.9% YTD.

→ Eurozone and Japan markets continued their strength in June, wrapping up a strong second quarter. In Europe, financials and IT led returns whereas energy and communication services lagged. Enthusiasm for AI helped company fundamentals and prices for semiconductor stocks. Headline inflation was down in June, although core inflation was up slightly month over month. Energy and materials were the main drivers for falling UK equities, along with Bank of England rate hikes. Optimism continues to build for Japanese investors, while the Yen remains weak, and Bank of Japan remains dovish.

→ Emerging markets were laggards as China equities struggled from weak export demands and rising negative sentiments. Brazil, India, and Taiwan are bright spots in EM, the former due to good earnings and macro, the latter from AI and IT strength.

[1] Source: Bloomberg. Data is as of June 30, 2023.

Fixed Income Returns[1]

Fixed Income	June (%)	Q2 (%)	YTD (%)	1 YR (%)	3 YR (%)	5 YR (%)	10 YR (%)	Current Yield (%)	Duration (Years)
Bloomberg Universal	-0.2	-0.6	2.3	0.0	-3.4	1.0	1.8	5.2	6.3
Bloomberg Aggregate	-0.4	-0.8	2.1	-0.9	-4.0	0.8	1.5	4.8	6.5
Bloomberg US TIPS	-0.3	-1.4	1.9	-1.4	-0.1	2.5	2.1	4.6	6.8
Bloomberg Short-term TIPS	-0.2	-0.7	1.5	0.1	2.3	2.7	1.7	5.3	2.5
Bloomberg High Yield	1.7	1.7	5.4	9.1	3.1	3.4	4.4	8.5	4.1
JPM GBI-EM Global Diversified (USD)	3.3	2.5	7.8	11.4	-1.4	0.3	-0.6	6.6	5.0

Fixed Income: The Bloomberg Universal declined 0.6% in the second quarter as global sovereign debt yields generally rose. Bonds retained a positive start to the year (+2.3% YTD) though as inflation continues to decline.

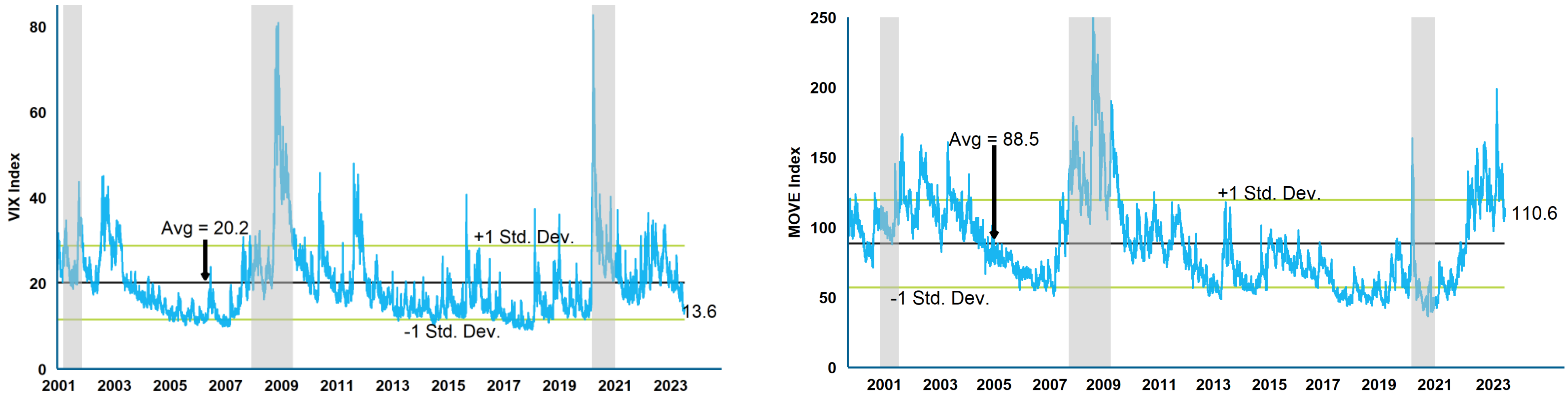
→ US Treasury yields generally rose over the month, with 1-year to 10-year maturity sector rising the most due to higher policy expectations.

→ The TIPS index and the short-term TIPS index posted negative returns for the month as inflation concerns continued to ease.

→ Continued risk appetite drove high yield bond performance (1.7%) and outperformance versus the broad US bond market (Bloomberg Aggregate). Emerging market bonds (3.3%) also performed well on investor risk sentiment.

[1] Source: Bloomberg. JPM GBI-EM data is from InvestorForce. Data is as of June 30, 2023. The yield and duration data from Bloomberg is defined as the index's yield to worst and modified duration respectively.

Equity and Fixed Income Volatility[1]

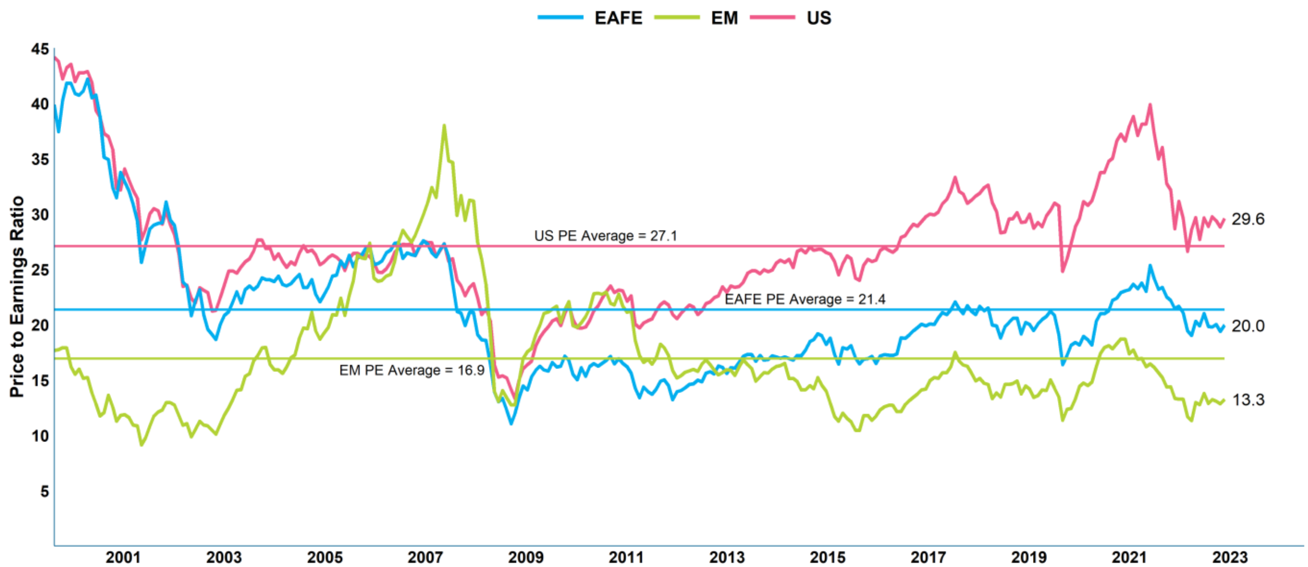


→ Volatility in equities (VIX) declined in June and remains low as investors continue to anticipate the end of the Fed's policy tightening.

→ In comparison, the bond market remains on edge after last year's historic losses and continued volatility in interest rates this year due to policy uncertainty and issues in the banking sector. The MOVE (fixed income volatility) remains well above (110.6) its long-run average (88.4), but off its recent peak during the heart of the banking crisis.

[1] Equity and Fixed Income Volatility – Source: Bloomberg. Implied volatility as measured using VIX Index for equity markets and the MOVE Index to measure interest rate volatility for fixed income markets. Data is as of June 2023. The average line indicated is the average of the VIX and MOVE values between January 2000 and June 2023.

Equity Cyclically Adjusted P/E Ratios[1]

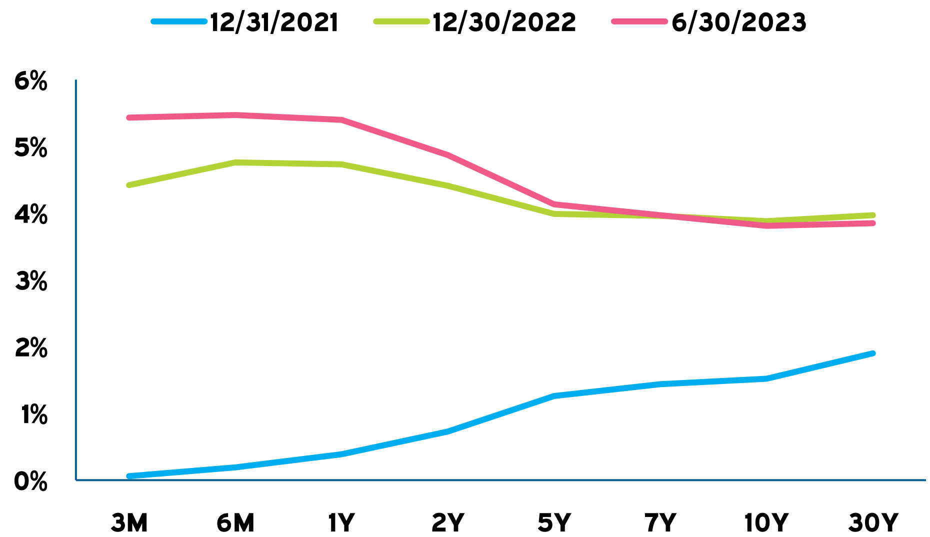


→ After its dramatic decline last year the US equity price-to-earnings ratio remains above its long-run (21st century) average.

→ International developed market valuations are below their own long-term average, with those for emerging markets the lowest and well under the long-term average.

[1] US Equity Cyclically Adjusted P/E on S&P 500 Index. Source: Robert Shiller, Yale University, and Meketa Investment Group. Developed and Emerging Market Equity (MSCI EAFE and EM Index) Cyclically Adjusted P/E – Source: MSCI and Bloomberg. Earnings figures represent the average of monthly "as reported" earnings over the previous ten years. Data is as of June 2023. The average line is the long-term average of the US, EM, and EAFE PE values from December 1999 to the recent month-end respectively.

US Yield Curve[1]

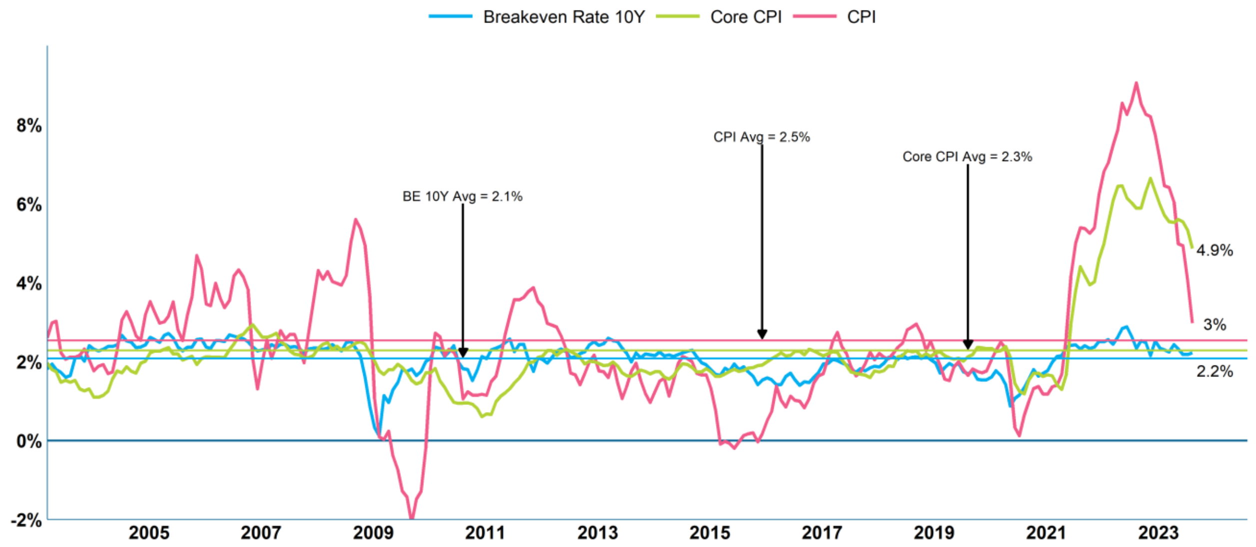


→ Interest rates have started rising again across the curve given policy maker guidance that policy rates are likely to rise further and potentially stay longer at the terminal rate than market participants expect. The rise in rates was particularly acute at the very front-end (< 1 year). Maturities from two years out also drifted higher as market participants considered the possibility of additional policy rate increases as economic data (mainly inflation and labor markets) remains strong.

→ The yield curve remains inverted with the spread between two-year and ten-year Treasuries finishing the month at -1.06%. The more closely watched measure (by the Fed) of the three-month and ten-year Treasuries spread also remained inverted at -1.62%. Inversions in the yield curve have often preceded recessions.

[1] Source: Bloomberg. Data is as of June 30, 2023.

Ten-Year Breakeven Inflation and CPI[1]



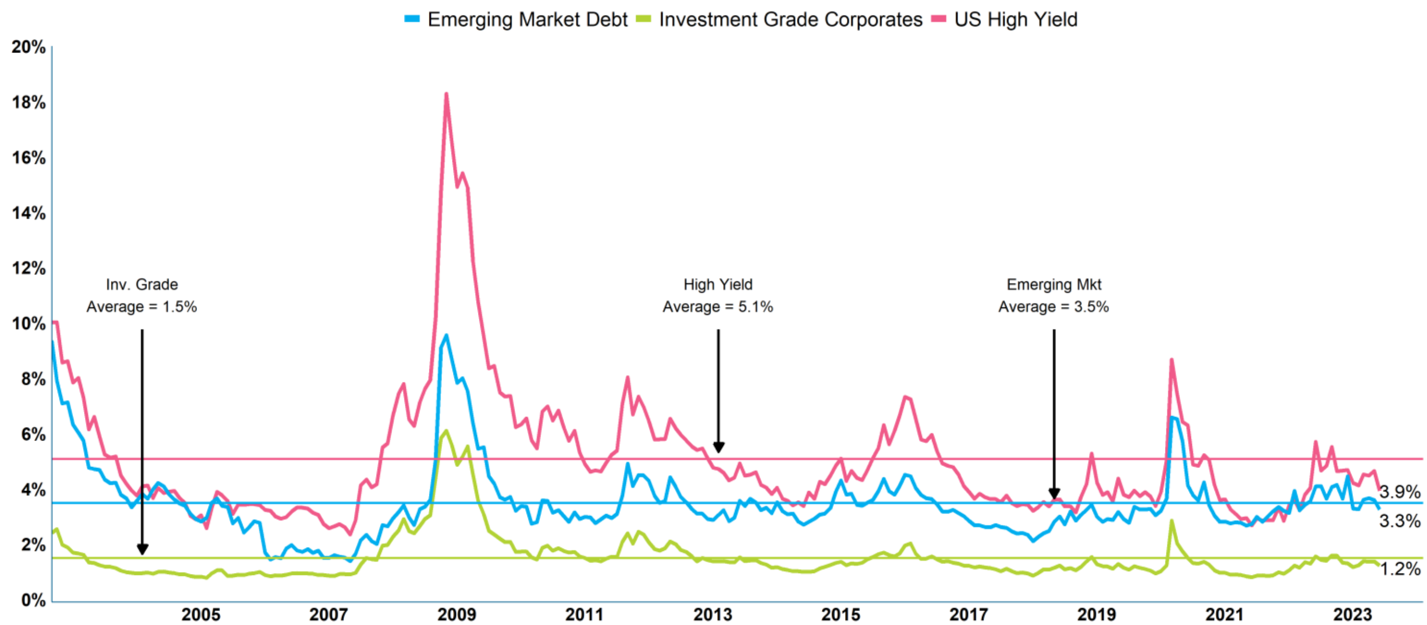
→ Headline inflation continued to decline in June, with the year-over-year reading falling from 4.0% to 3.0% and coming in slightly below estimates. The month-over-month rate of price increases rose slightly (0.2% versus 0.1%), with food prices ticking up slightly (0.1%) and energy prices rose (0.6%).

→ Core inflation – excluding food and energy - fell (5.3% to 4.9%), coming in slightly above forecasts. It remains stubbornly high driven by shelter costs.

→ Inflation expectations (breakevens) remain well below current inflation as investors continue to expect inflation to track back toward the Fed's 2% average target.

[1] Source: Bloomberg. Data is as June 30, 2023. The CPI and 10 Year Breakeven average lines denote the average values from August 1998 to the present month-end, respectively. Breakeven values represent month-end values for comparative purposes.

Credit Spreads vs. US Treasury Bonds[1]

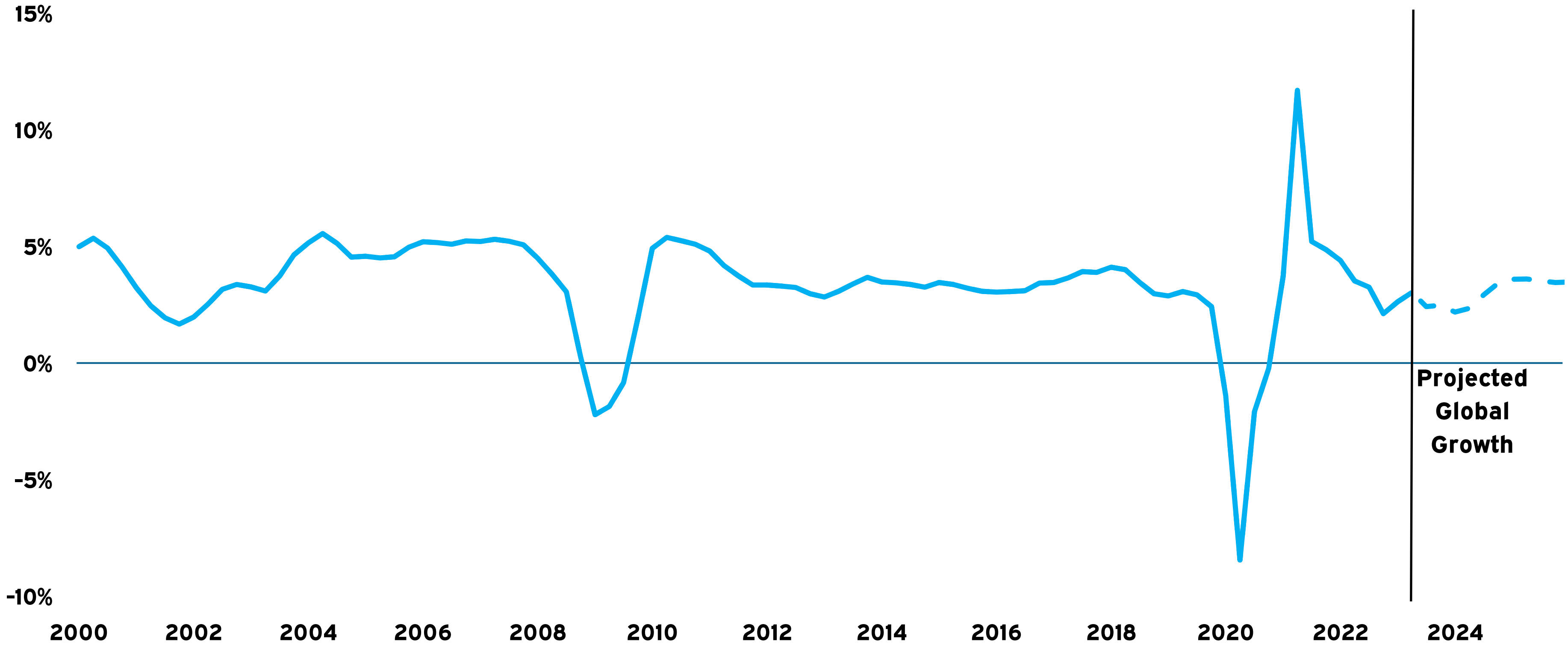


→ Spreads (the added yield above a comparable maturity Treasury) declined in June as risk appetite remained robust for respective credit exposures.

→ High yield spreads remain below their long-term average. Investment grade spreads and emerging market spreads are narrower than high yield spreads and close to their respective long-term averages.

[1] Sources: Bloomberg. Data is as of June 30, 2023. Average lines denote the average of the investment grade, high yield, and emerging market spread values from August 2000 to the recent month-end, respectively.

Global Real Gross Domestic Product (GDP) Growth[1]



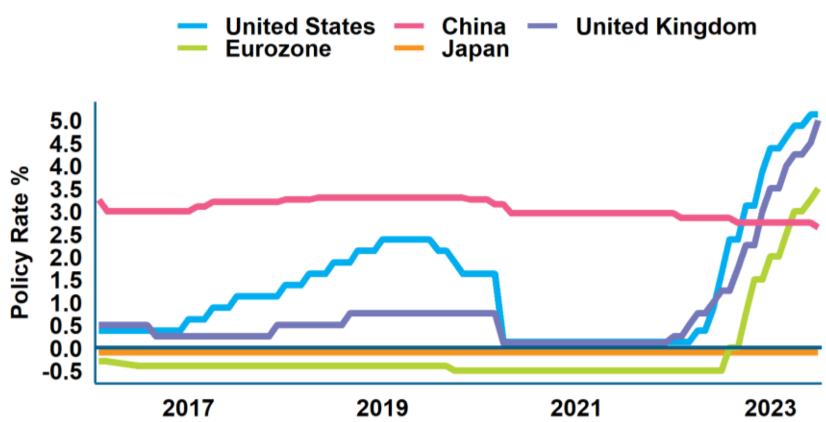
→ Global economies are expected to slow this year compared to 2022, with risks of recession as the impacts of policymakers' aggressive tightening to fight inflation flow through economies.

→ The delicate balancing act of central banks trying to reduce inflation without dramatically depressing growth will remain key.

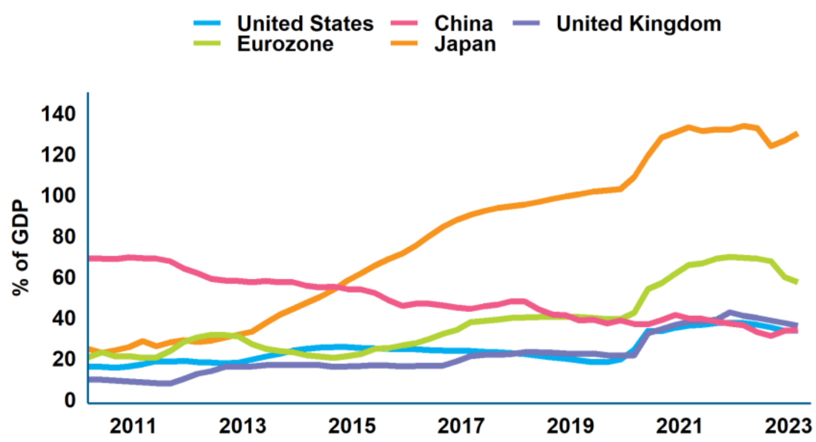
[1] Source: Oxford Economics (World GDP, US$ prices & PPP exchange rate, real, % change YoY). Updated June 2023.

Central Bank Response[1]

Policy Rates



Balance Sheet as % of GDP



→ In 2022, many central banks aggressively reduced pandemic-era policy support in the face of high inflation, with the US taking the most aggressive approach. Slowing inflation and growth have led to expectations for reductions in policy tightening going forward.

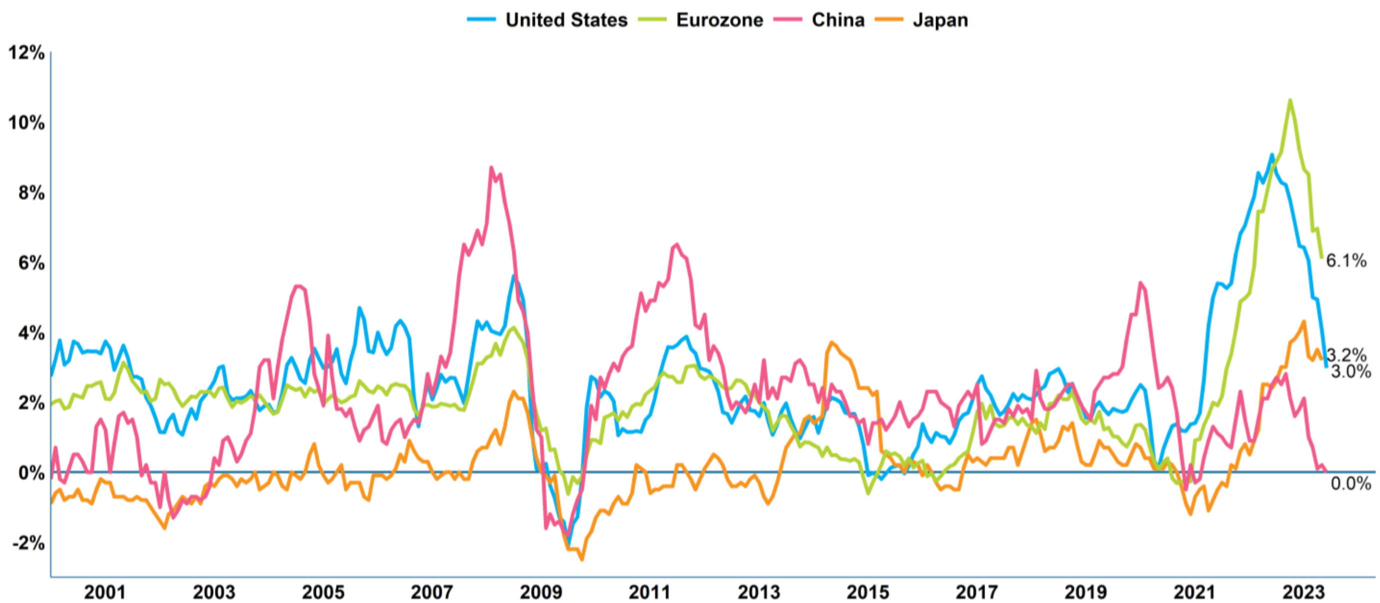
→ In May the Fed raised rates another 25 basis points to a range of 5.0% to 5.25%. After month-end, the FOMC paused its tightening campaign but hinted that one or two additional rate hikes could come later this year.

→ In China, the central bank has continued to cut interest rates and inject liquidity into the banking system, as weaker than expected economic data appears to indicate a widespread slowdown.

→ Looking ahead, risks remain for a policy error as central banks attempt to balance multiple goals, bringing down inflation, maintaining financial stability, and supporting growth.

[1] Source: Bloomberg. Policy rate data is as of June 30, 2023. China policy rate is defined as the medium-term lending facility 1 year interest rate. Balance sheet as % of GDP is based on quarterly data and is as of March 31, 2023.

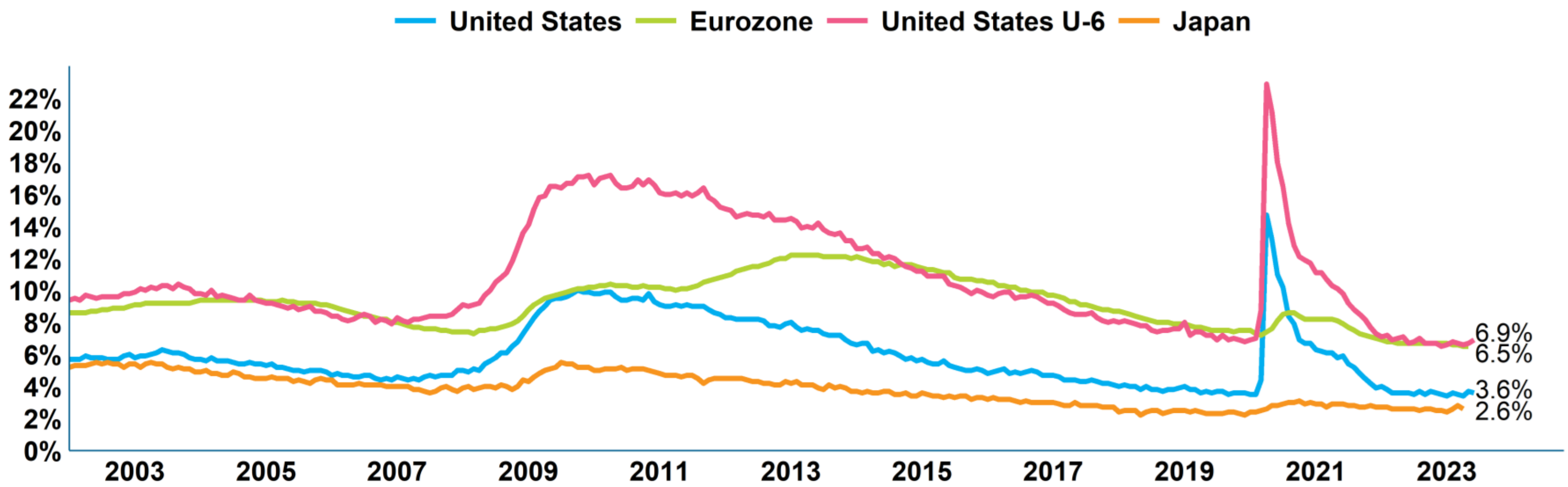
Inflation (CPI Trailing Twelve Months)[1]



- → Inflation pressures continued to decline globally due to the easing of supply chain issues from the pandemic, declining energy prices, and tighter monetary policy.
- → In the US, inflation fell to 3.0% at month-end, while eurozone inflation also fell (6.1% from 7.0%) a level well off its peak. Despite 2023's significant declines in the US and Europe, inflation levels remain elevated compared to central bank targets.
- → Inflation remains lower in China and Japan. In China, inflation levels were only slightly above 0% at month-end as the reopening of their economy has led to an uneven economic recovery.

[1] Source: Bloomberg. Data is as June 30, 2023. The most recent Japanese inflation data is as of May 2023.

Unemployment[1]



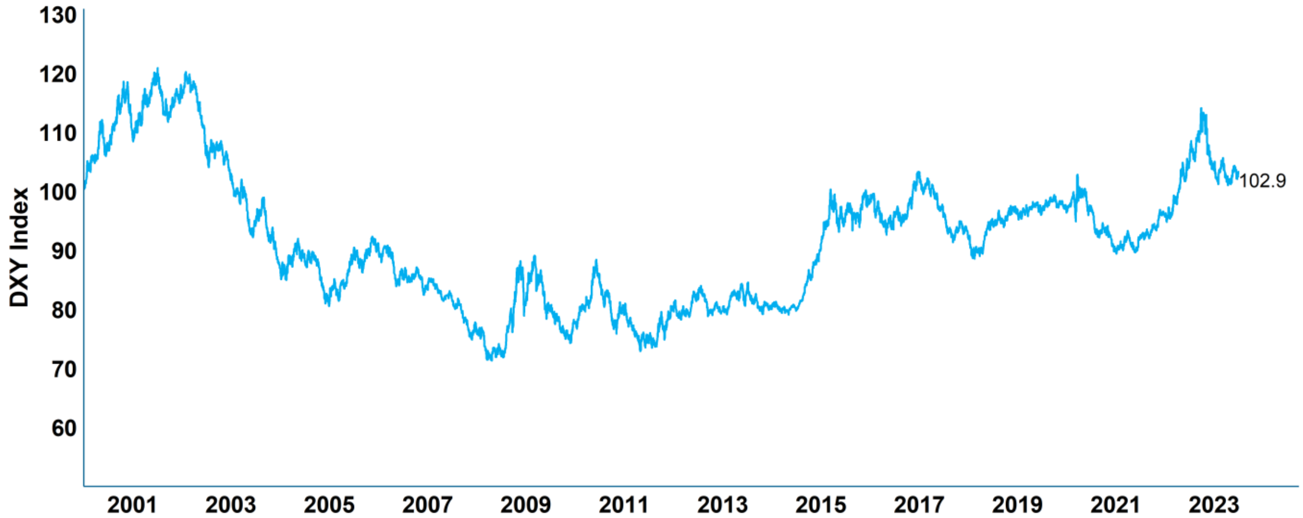
→ Despite slowing growth and high inflation, the US labor market still shows signs of resiliency. Unemployment in the US, which experienced the steepest rise, recently returned to pre-pandemic levels. Broader measures of unemployment (U-6) remain higher at 6.9% but also declined dramatically from their peak.

→ The strong labor market and higher wages, although beneficial for workers, motivates the Fed's efforts to fight inflation, leading to higher unemployment.

→ Unemployment in Europe has also declined but remains higher than the US, while levels in Japan have been flat through the pandemic given less layoffs.

[1] Source: Bloomberg. Data is as June 30, 2023, for the US. The most recent data for Eurozone and Japanese unemployment is as of May 2023.

US Dollar versus Broad Currencies[1]



- → The dollar finished 2022 much higher than it started, due to the increased pace of policy tightening, stronger relative growth, and safe-haven flows.
- → Late last year and into this year, the dollar declined, as weaker economic data and lower inflation led to investors anticipating the end of Fed tightening. In June, we did see a slight decline in the dollar though.
- → This year, the track of inflation across economies and the corresponding monetary policies will be key drivers of currency moves.

[1] Source: Bloomberg. Data as of June 30, 2023.

Summary

Key Trends:

→ The impacts of still relatively high inflation will remain key, with bond market volatility likely to stay high.

→ Recent issues related to the banking sector seem to have subsided for now but are a reminder that there is a delicate balance for central banks to continue to fight inflation but also to try to maintain financial stability.

→ Global monetary policies could diverge in 2023. The risk of policy errors remains elevated as central banks try to reduce persistent inflation while not tipping their economies into recession.

→ Growth is expected to slow globally this year, with many economies forecast to tip into recession. Inflation, monetary policy, and the war will all be key.

→ In the US, consumers could feel pressure as certain components of inflation remain high (e.g., shelter), borrowing cost are elevated, and the job market may weaken.

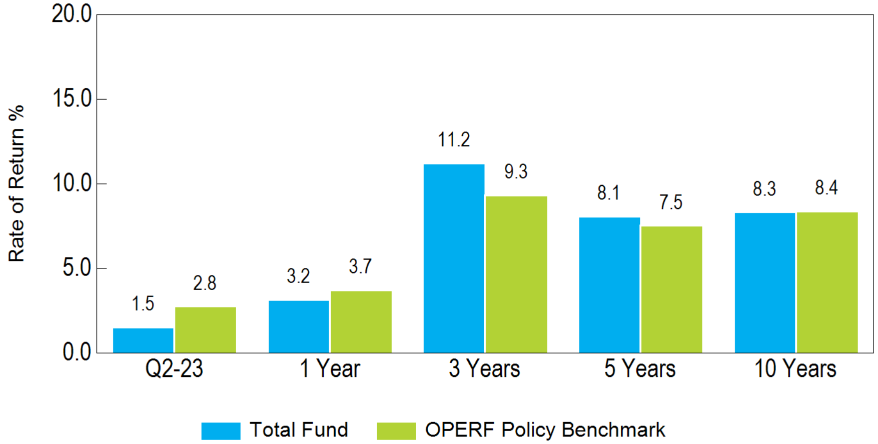
→ The key for US equities going forward will be whether earnings can remain resilient if growth continues to slow.

→ Equity valuations remain lower in both emerging and developed markets, but risks remain, including potential continued strength in the US dollar, higher inflation weighing particularly on Europe, and China's sluggish economic reopening and on-going weakness in the real estate sector.

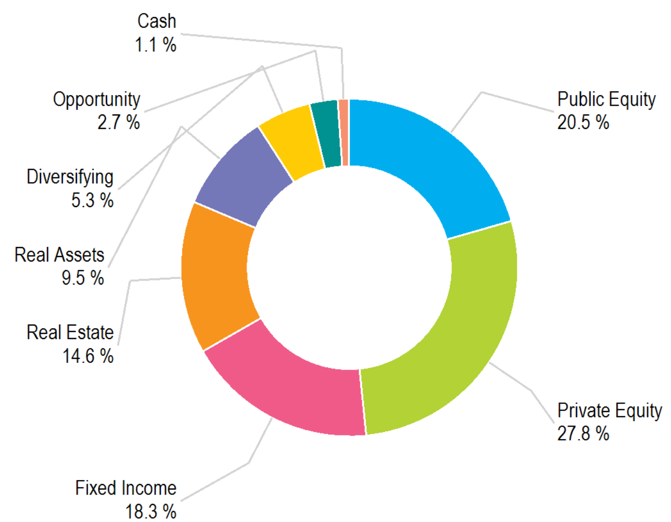
Executive Summary

Q2 2023

Return Summary
Ending June 30, 2023

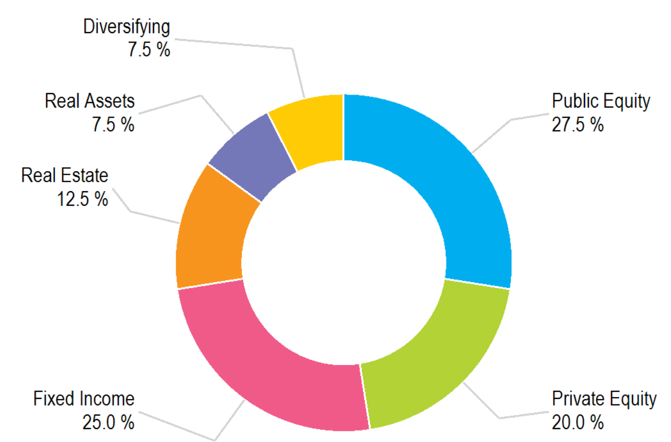


Current Allocation



	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)
Total Fund	**1.5**	**3.2**	**11.2**	**8.1**	**8.3**
OPERF Policy Benchmark	*2.8*	*3.7*	*9.3*	*7.5*	*8.4*
Excess Return	-1.3	-0.5	1.9	0.6	-0.1
InvMetrics All DB > $10B Net Rank	*81*	*95*	*9*	*4*	*1*
Median	*2.5*	*6.5*	*8.6*	*6.9*	*7.5*

Target Allocation



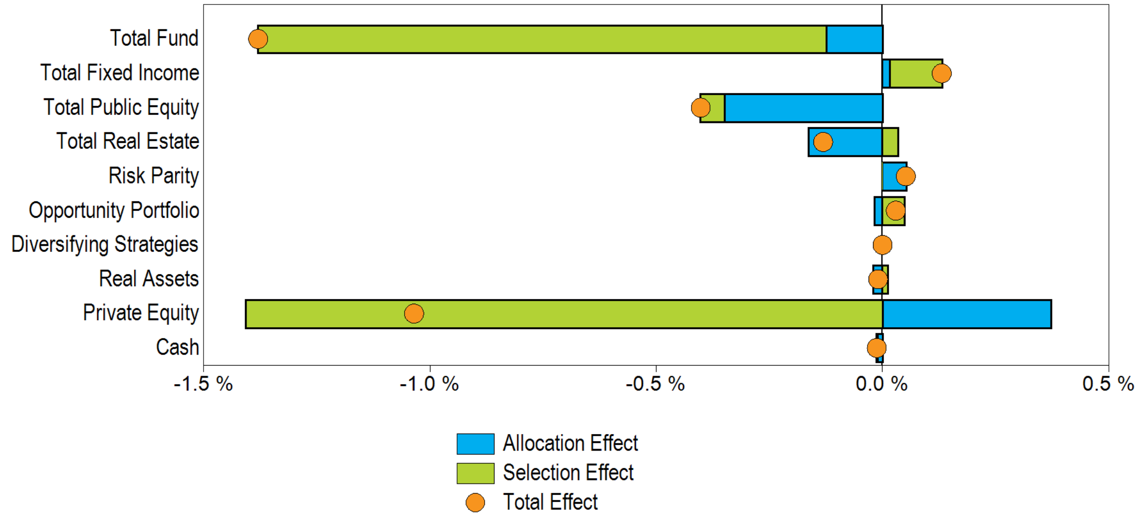
Performance Review Summary

Category	QTD Results	5 Year Results
Performance vs. OPERF Policy Benchmark	Underperform 1.5% vs. 2.8%	Outperform 8.1% vs. 7.5%
Performance vs. 6.9% Actuarial Rate	NA	Outperform 8.1% vs. 6.9%
Performance vs. InvMetrics All DB > $10B Net Median	Underperform 1.5% vs. 2.5%	Outperform 8.1% vs. 6.9%
Actively Managed Public Markets vs. Benchmarks	19 of the 30 actively managed stock and bond portfolios outperformed their respective benchmarks (after fees)	16 of the 25 actively managed stock and bond portfolios outperformed their respective benchmarks (after fees)

Category	Quarter-End	Notes
Compliance with Targets	Out of Compliance	Private Equity remains well above target, while public equity and fixed income are underweight

Quarterly Commentary

Attribution Effects
3 Months Ending June 30, 2023



→ The Total Fund returned 1.5% for the third quarter, underperforming the OPERF Policy Benchmark (+2.8%) by 130 basis points.

- Compared to peers the Total Fund underperformed the peer median return of 2.5%
- The underweight to and selection (performance) within Public Equities detracted from benchmark relative returns

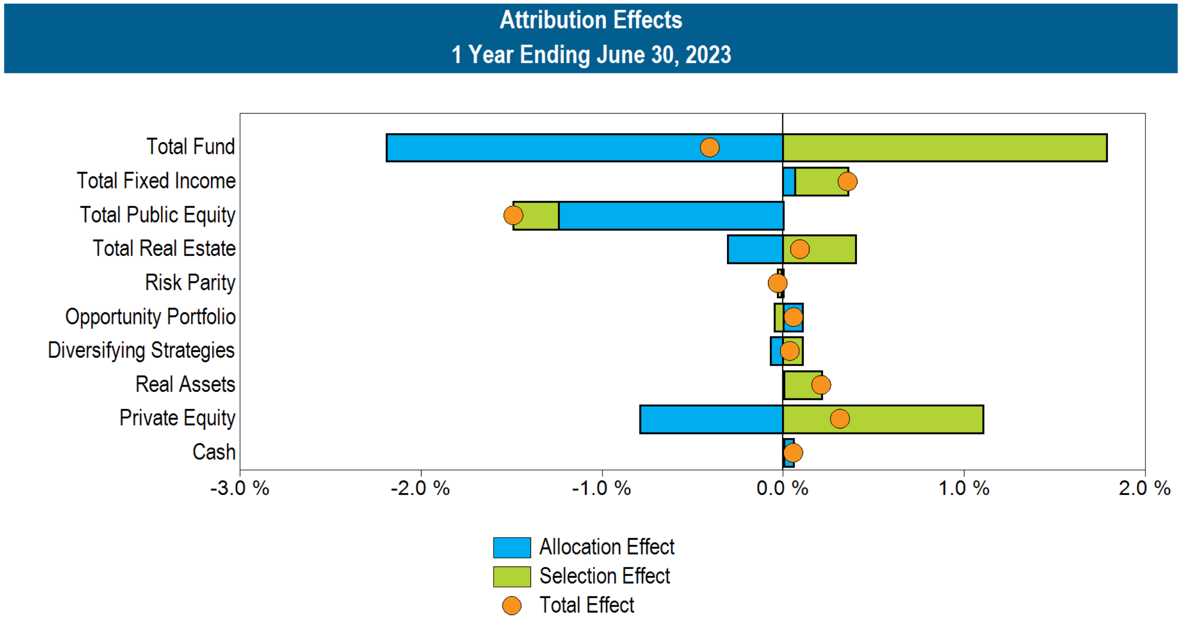
→ Public Equities returned 5.6% for the quarter driven by US Equity which returned 6.6% for the quarter and accounts for over 50% of the Public Equities exposure.

- A majority of US Equities are held within the Market Oriented (Core) portfolio (+6.7%) which underperformed the Russell 3000 Index (+8.4%) by 170 basis points.
- All active managers within the US Equity portfolio underperformed their respective benchmarks and the broad Russell 3000 Index for the quarter.
- US equity market returns have been driven by a few large tech names which has been a headwind for active managers who don't hold similar portfolios to the index.

→ Private Equity returned 2.8% for the quarter underperforming the Russell 3000 +300 basis points QTR Lag benchmark (+8.0%) by 520 basis points.

- Private Equity's underperformance of the benchmark was the largest detractor of relative returns in the third quarter.

One Year Commentary



→ The Total Fund returned 3.7% for the trailing 12-month period ending June, 2023. The Fund underperformed the OPERF Policy Benchmark (+3.9%) by 20 basis points and underperformed the peer median return of 6.3% by 260 basis points.

- Relative underperformance was driven primarily by the underweight to the Total Public Equity portfolio.

→ U.S. Equity (+16.2%) underperformed the Russell 3000 index (+19.0%) over the trailing one year period. Underperformance has been largely driven by the small- and mid-cap strategies as 2023 market returns have been dominated by a small number of large-cap tech stocks.

→ Non- U.S. Equities returned 15.0% for the period and outperformed the Oregon MSCI ACWI Ex US IMI index (+12.5%) by 250 basis points.

- International Growth (+21.4%) and International Small Cap (+18.7%) led the strong performance of the asset class.

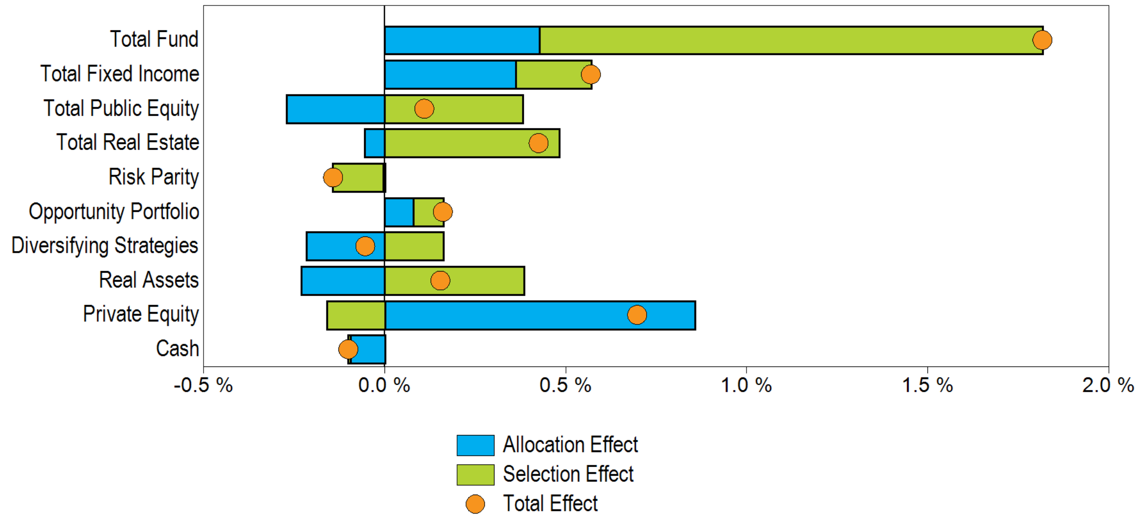
→ Total Fixed Income (+0.7%) was the largest positive contributor to relative returns largely driven by selection within Core (+0.3%) and Non-Core (+11.0%) Fixed Income portfolios.

- All Core Fixed Income managers outperformed the Oregon Custom External FI BM (-0.9%) over the trailing one-year period. Fidelity was the strongest performing manager and returned 1.4% outperforming the index by 230 basis points.

→ Private Equity (-1.8%) continues to outperform the Russell 3000 + 300bps Qtr Lag benchmark (-5.8%) over longer trailing periods. In recent periods the overweight to the asset class has been a headwind as public equity markets recover.

Three Year Commentary

Attribution Effects
3 Years Ending June 30, 2023



→ The Total Fund returned 11.2% annualized over the trailing 3-year period and has outperformed the OPERF Policy Benchmark (+9.3%) and the peer median return of 8.6% by 190 basis points and 260 basis points respectively.

- Drivers of outperformance over the 3-year period are Total Fixed Income (-2.5%), Total Real Estate (+11.4%), and Private Equity (+20.7%) portfolios.

→ A slight underweight to and selection within Fixed Income have both been positive contributors to Total Fund performance versus the policy benchmark even though performance of the portfolio has been a headwind on an absolute basis of the 3-year period.

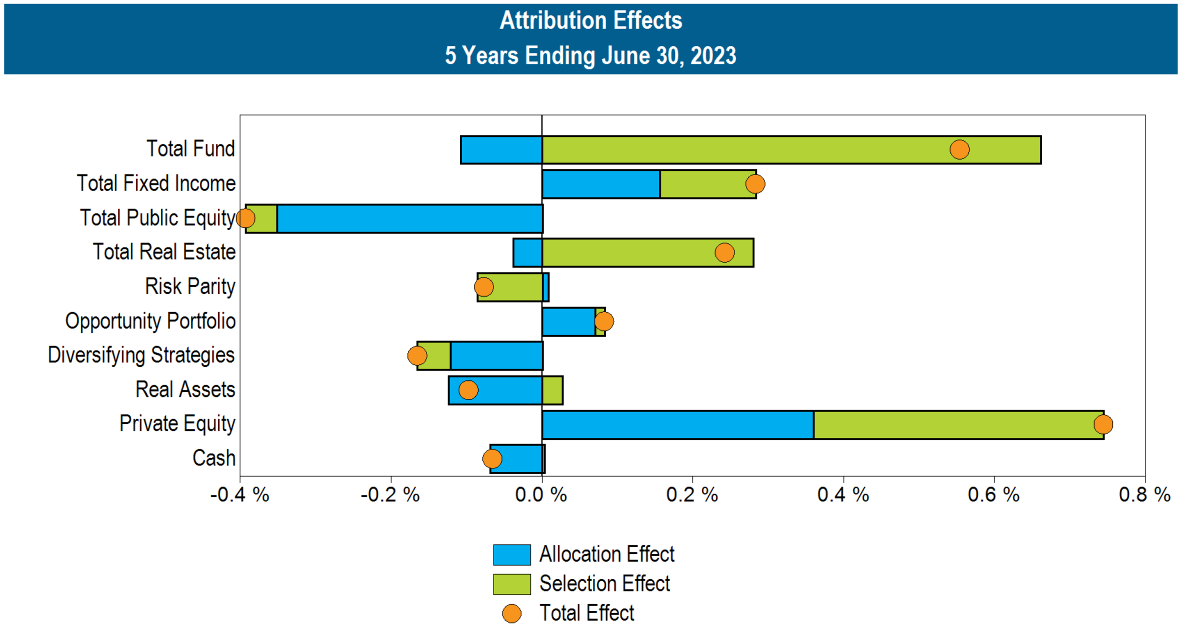
- Over the same period Non-Core Fixed Income has returned 7.6% versus the Custom Non-Core Fixed Income Index return 5.6%.

→ Total Real Estate has contributed positively to 3-year returns on an absolute and relative basis.

- The Real Estate excluding REITS (+11.5%) and Total REITS (+9.2%) portfolios have outperformed the NCREIF ODCE (Custom) (Adj.) return of 7.5% over the same period.

→ The overweight to Private Equity has been the strongest contributor to benchmark relative performance while selection (performance) has been a minor headwind.

Five Year Commentary



→ The Total Fund returned 8.1% annualized over the trailing 5-year period and has outperformed the OPERF Policy Benchmark (+7.5%) and the peer median return of 6.9% by 60basis points and 120 basis points respectively.

→ Selection within Real Estate (+8.9%) and Private Equity (+15.4%), in addition to the Private Equity overweight have been the primary drivers of outperformance.

→ Benchmark relative outperformance within Total Fixed Income (+1.4%) has also been a contributor to trailing 5-year outperformance.

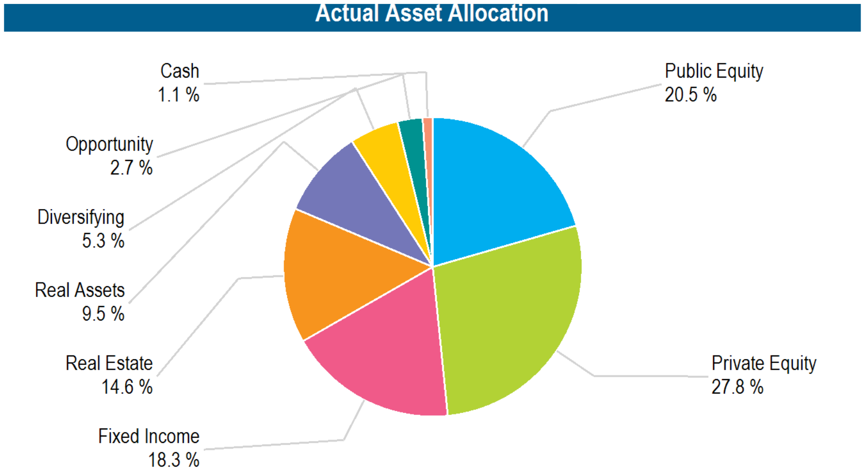
- Both Core (+1.2%) and Non-Core (+5.1%) Fixed Income portfolios have outperformed their respective benchmarks over this period.

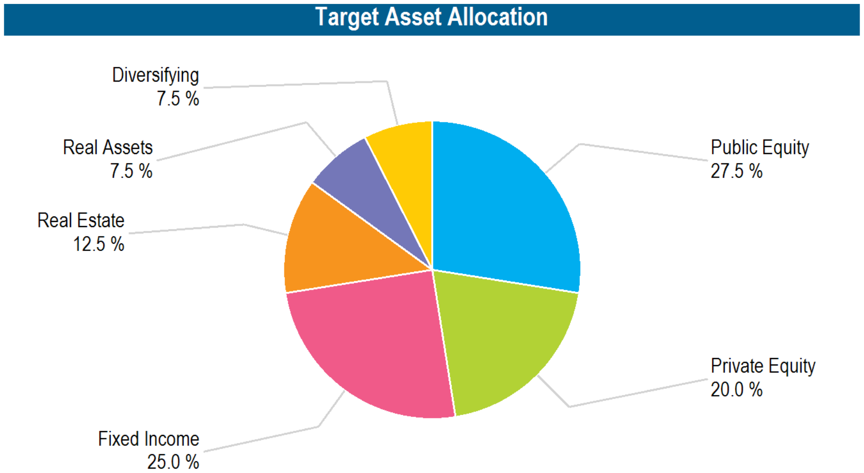
→ Total Public Equity (+7.7%) has been the largest detractor over the period on a relative basis due primarily to being underweight versus the Policy.

- The Market Oriented (Core) (+10.0%) portfolio has been a strong contributor to absolute returns even though it has trailed the Russell 3000 benchmark (+11.4%) by 140 basis points.

Performance Update

As of June 30, 2023



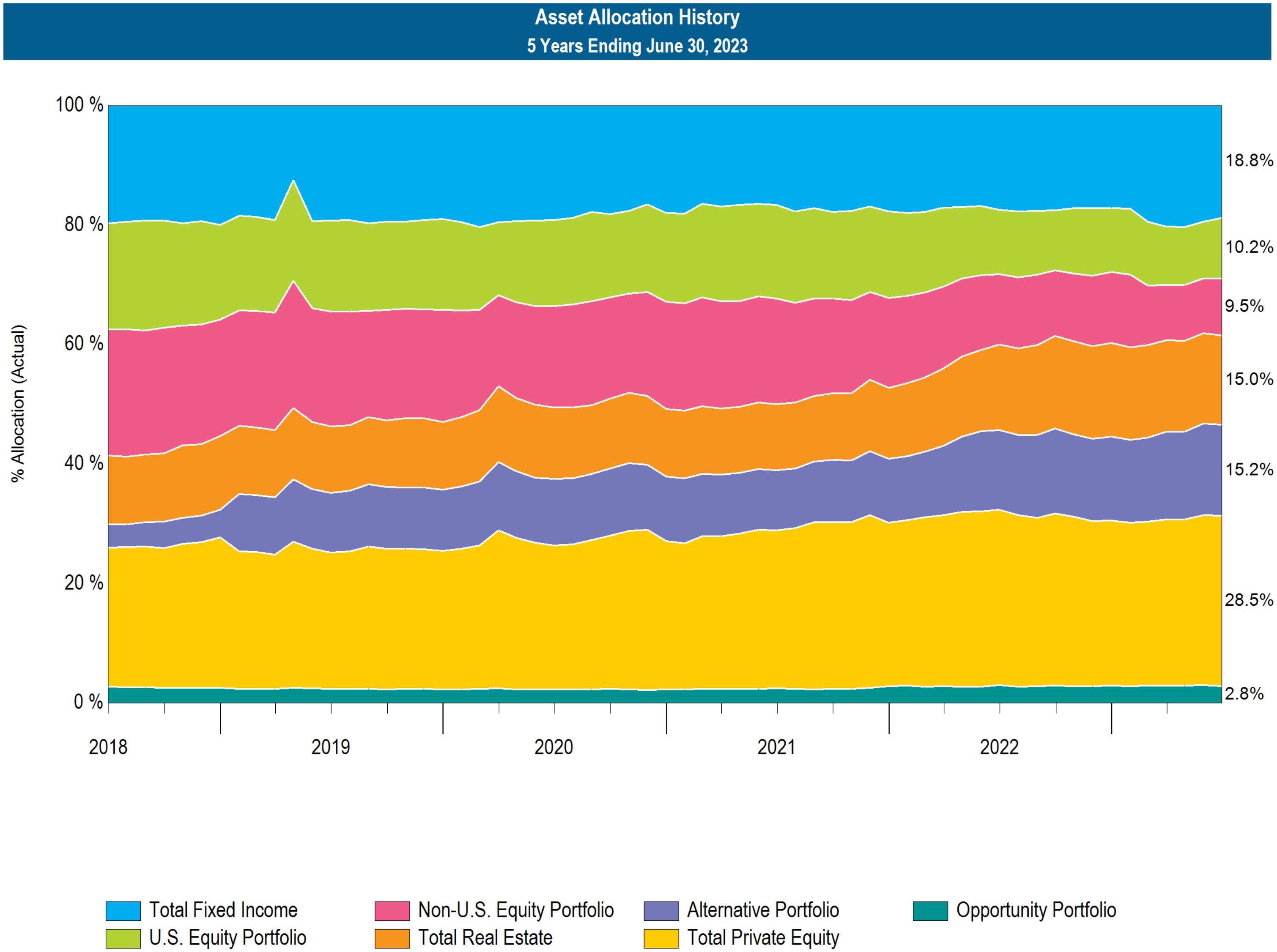


Asset Allocation vs. Target
As Of June 30, 2023

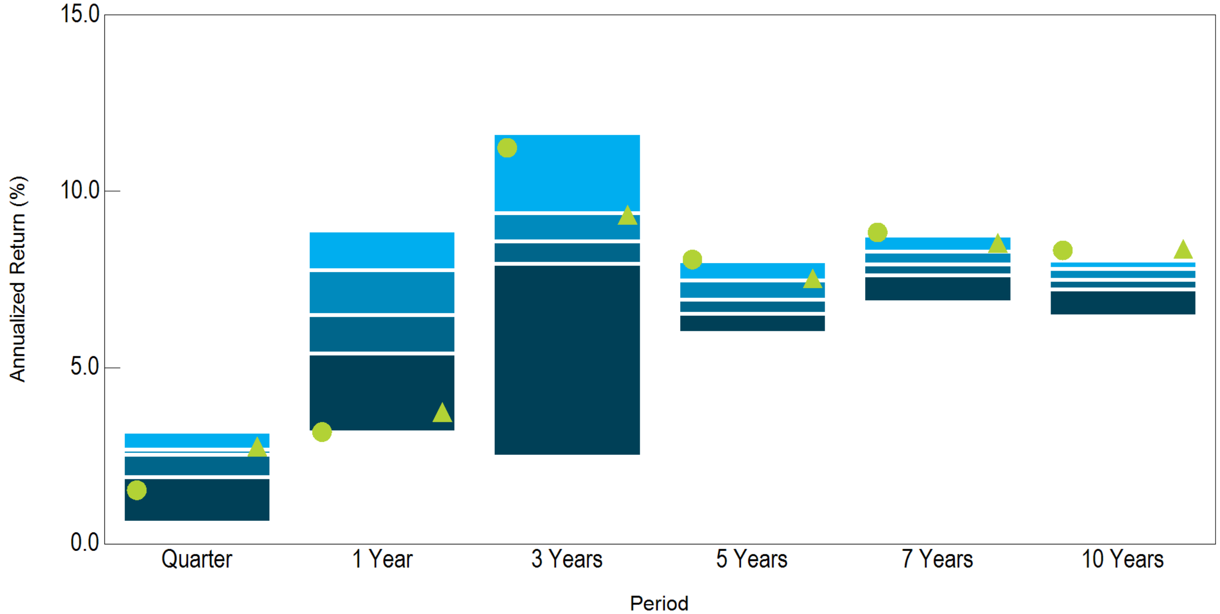
	Current	Current	Policy	Difference	Policy Range	Within Range
Public Equity	$19,071,722,786	20.5%	27.5%	-7.0%	22.5% - 32.5%	No
Private Equity	$25,884,129,366	27.8%	20.0%	7.8%	17.5% - 27.5%	No
Fixed Income	$17,065,446,296	18.3%	25.0%	-6.7%	20.0% - 30.0%	No
Real Estate	$13,609,909,402	14.6%	12.5%	2.1%	9.0% - 16.5%	Yes
Real Assets	$8,855,365,833	9.5%	7.5%	2.0%	2.5% - 10.0%	Yes
Diversifying	$4,972,943,692	5.3%	7.5%	-2.2%	2.5% - 10.0%	Yes
Opportunity	$2,543,947,590	2.7%	0.0%	2.7%	0.0% - 5.0%	Yes
Cash	$1,003,092,936	1.1%	0.0%	1.1%		
Total	**$93,006,557,886**	**100.0%**	**100.0%**			

Total Public Equity includes Other Equity and Cash included Russell Overlay Cash Balance for allocation purposes.

Please note, the target allocation was revised effective 4/1/2023. Plan rebalancing is currently underway.

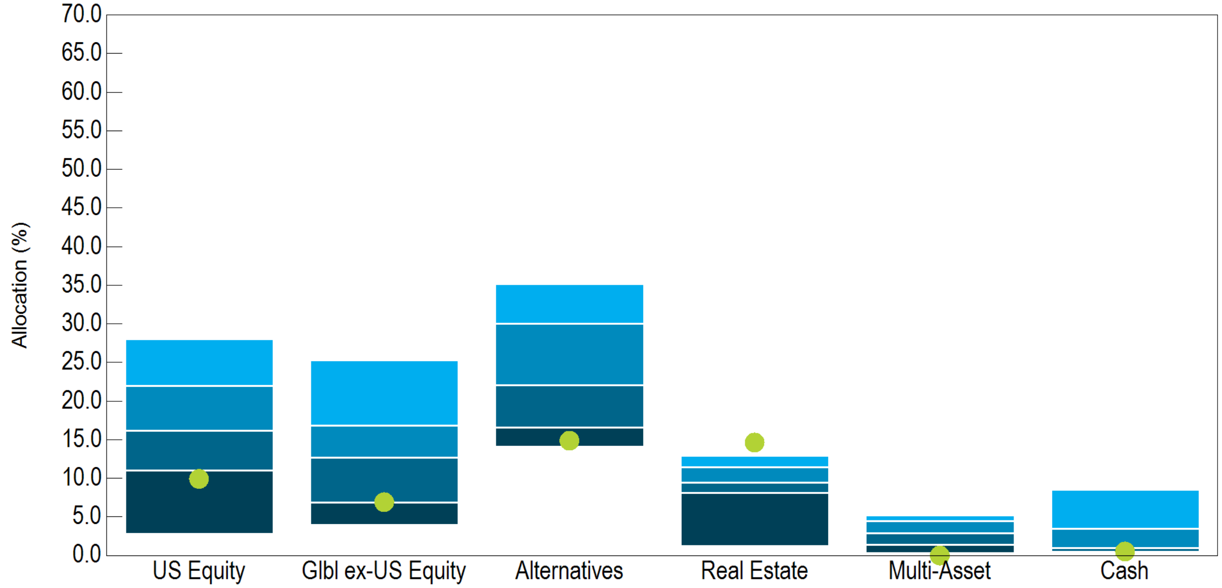

Asset Allocation History
5 Years Ending June 30, 2023
100 %
80 %
60 %
40 %
20 %
0 %
% Allocation (Actual)
2018
2019
2020
2021
2022
18.8%
10.2%
9.5%
15.0%
15.2%
28.5%
2.8%
Total Fixed Income
U.S. Equity Portfolio
Non-U.S. Equity Portfolio
Total Real Estate
Alternative Portfolio
Total Private Equity
Opportunity Portfolio

InvMetrics All DB > $10B Net Return Comparison
Ending June 30, 2023



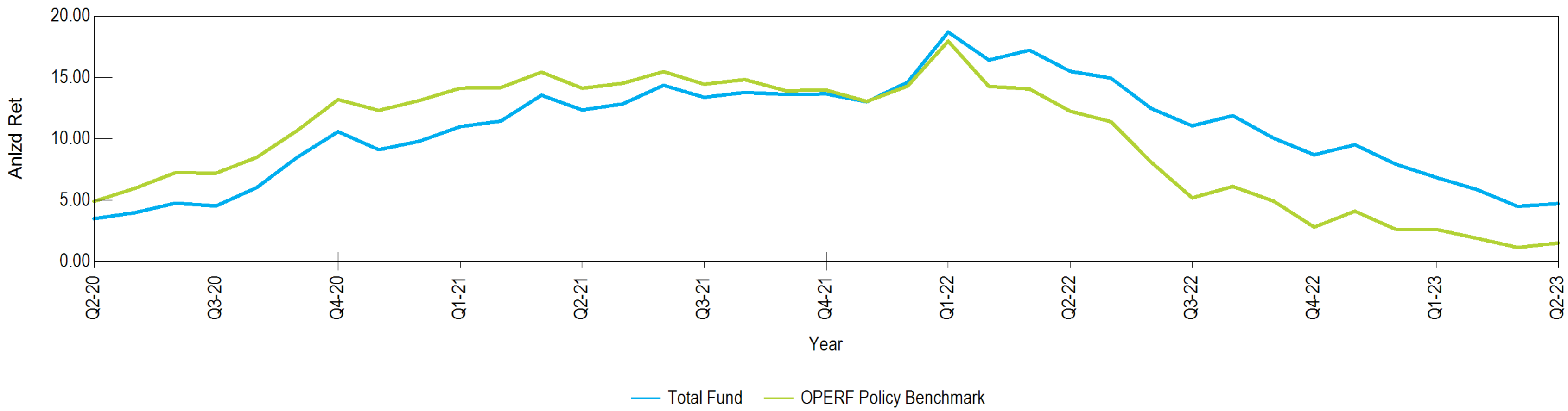
Return (Rank)	Quarter		1 Year		3 Years		5 Years		7 Years		10 Years	
5th Percentile	3.2		8.9		11.6		8.0		8.7		8.0	
25th Percentile	2.7		7.8		9.4		7.5		8.3		7.8	
Median	2.5		6.5		8.6		6.9		7.9		7.5	
75th Percentile	1.9		5.4		8.0		6.5		7.6		7.2	
95th Percentile	0.6		3.2		2.5		6.0		6.9		6.5	
# of Portfolios	22		22		22		21		21		20	
● Total Fund	1.5	(81)	3.2	(95)	11.2	(9)	8.1	(4)	8.8	(2)	8.3	(1)
▲ OPERF Policy Benchmark	2.8	(17)	3.7	(91)	9.3	(30)	7.5	(20)	8.5	(19)	8.4	(1)

Total Plan Allocation vs. InvMetrics All DB > $10B Net
As of June 30, 2023

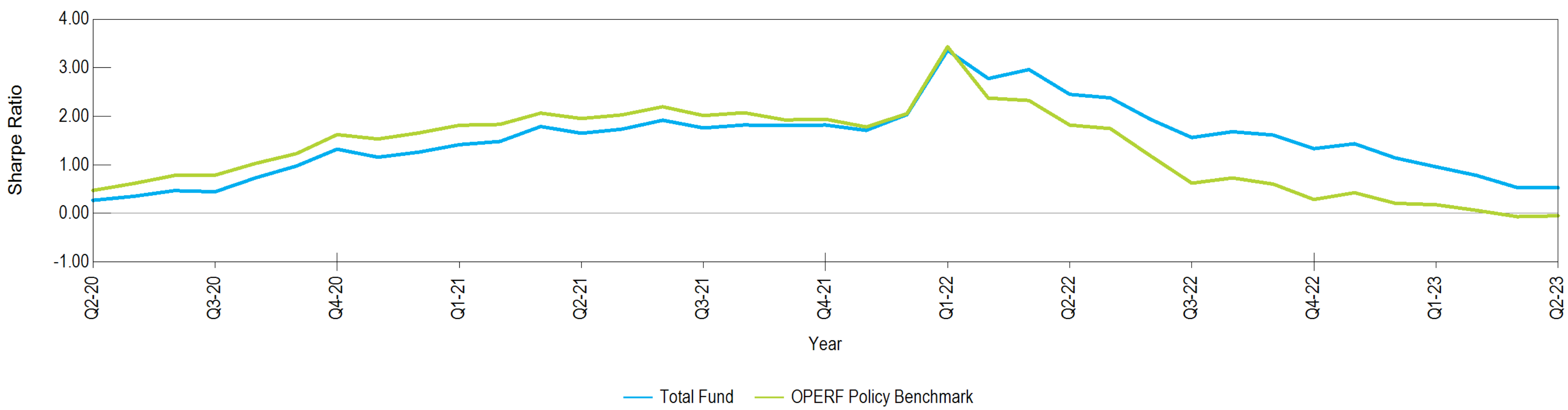


	Allocation (Rank)											
5th Percentile	28.1		25.3		35.1		12.9		5.2		8.5	
25th Percentile	22.0		16.9		30.1		11.5		4.5		3.5	
Median	16.2		12.7		22.1		9.5		3.0		1.0	
75th Percentile	11.1		6.9		16.6		8.2		1.5		0.6	
95th Percentile	2.9		4.0		14.1		1.3		0.4		0.4	
# of Portfolios	20		21		21		21		11		20	
● Total Fund	9.9	(81)	6.9	(76)	14.9	(87)	14.6	(1)	0.0	(99)	0.5	(85)

Rolling 3 Year Annualized Return (%)
Total Fund vs. OPERF Policy Benchmark



Rolling 3 Year Sharpe Ratio
Total Fund vs. OPERF Policy Benchmark



Asset Class Trailing Net Performance

	Market Value ($)	% of Portfolio	% of Sector	QTD (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)
Total Fund	93,006,557,886	100.0	--	1.5	3.4	3.2	11.2	8.1	8.3
OPERF Policy Benchmark				*2.8*	*7.0*	*3.7*	*9.3*	*7.5*	*8.4*
InvMetrics All DB > $10B Net Median				*2.5*	*6.3*	*6.5*	*8.6*	*6.9*	*7.5*
InvMetrics All DB > $10B Net Rank				*81*	*99*	*95*	*9*	*4*	*1*
Total Fixed Income	17,065,446,296	18.3	18.3	-0.3	3.0	0.7	-2.5	1.4	1.9
Oregon Custom FI Benchmark				*-0.8*	*2.1*	*-0.9*	*-3.6*	*0.7*	*1.3*
Core Fixed Income	3,802,133,230	4.1	22.3	-0.5	3.0	0.3	-3.5	1.2	2.1
Oregon Custom External FI BM				*-0.8*	*2.1*	*-0.9*	*-4.0*	*0.8*	*1.6*
U.S. Government	7,769,785,497	8.4	45.5	-1.4	1.8	-2.1	-4.7	0.5	--
Government Blended Index				*-1.4*	*1.6*	*-2.1*	*-4.8*	*0.4*	*0.4*
Non-Core Fixed Income	1,918,743,628	2.1	11.2	3.1	6.9	11.0	7.6	5.1	5.0
Custom Non-Core Fixed Income Index				*2.8*	*6.2*	*10.4*	*5.6*	*3.9*	*4.2*
Global Sovereign	1,097,252,903	1.2	6.4	0.5	3.7	1.8	--	--	--
BbgBarc Global Treasury Ex-U.S.				*0.7*	*3.9*	*1.1*	*-2.4*	*0.8*	*2.5*
Emerging Markets Debt	327,606,377	0.4	1.9	1.9	3.7	8.3	--	--	--
JP Morgan EMBI Global Diversified				*2.2*	*4.1*	*7.4*	*-3.1*	*0.6*	*2.8*
Structured Credit Products	1,646,331,184	1.8	9.6	1.1	3.7	1.8	--	--	--
Oregon Structured Credit Products FI BM				*-0.1*	*2.9*	*0.7*	*--*	*--*	*--*
Total Public Equity	17,777,152,676	19.1	19.1	5.6	11.0	14.9	12.4	7.7	8.9
MSCI ACWI IMI Net (Daily)				*5.9*	*13.2*	*16.1*	*11.0*	*7.6*	*8.6*
U.S. Equity	9,224,780,622	9.9	51.9	6.6	11.4	16.2	14.1	9.4	11.1
Russell 3000 TR				*8.4*	*16.2*	*19.0*	*13.9*	*11.4*	*12.3*
Small Cap Growth	239,869,005	0.3	2.6	5.4	5.4	11.1	11.3	7.3	10.2
Russell 2000 Growth TR				*7.1*	*13.6*	*18.5*	*6.1*	*4.2*	*8.8*
Small Cap Value	155,295,404	0.2	1.7	2.4	2.9	10.1	20.1	5.2	8.4
Russell 2000 Value TR				*3.2*	*2.5*	*6.0*	*15.4*	*3.5*	*7.3*
Market Oriented (CORE)	8,829,616,213	9.5	95.7	6.7	11.7	16.3	13.7	10.0	11.4
Russell 3000 TR				*8.4*	*16.2*	*19.0*	*13.9*	*11.4*	*12.3*

	Market Value ($)	% of Portfolio	% of Sector	QTD (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)
Non-U.S. Equity	6,427,249,432	6.9	36.2	4.0	11.5	15.0	11.2	5.7	6.7
Oregon MSCI ACWI Ex US IMI (Net)				*2.4*	*9.1*	*12.5*	*7.3*	*3.4*	*4.9*
Total International Overlay Accounts	94,434,715	0.1	1.5						
International Market Oriented (Core)	3,258,717,941	3.5	50.7	3.4	10.4	13.4	10.8	5.8	6.9
MSCI World ex USA IMI Net Return				*2.7*	*10.5*	*16.3*	*8.9*	*4.2*	*5.5*
International Value	1,282,411,875	1.4	20.0	3.7	11.6	16.7	14.5	5.0	6.7
Oregon MSCI ACWI Ex US Value IMI (Net)				*2.9*	*8.0*	*12.1*	*10.5*	*2.6*	*3.9*
International Growth	845,451,711	0.9	13.2	3.6	16.3	21.4	7.6	8.2	8.0
Oregon MSCI WORLD Ex US (Net)				*3.0*	*11.3*	*17.4*	*9.3*	*4.6*	*5.4*
International Small Cap	332,870,621	0.4	5.2	4.1	10.8	18.7	14.1	3.7	6.4
MSCI World Ex US Small Cap Value (Net)				*0.7*	*5.3*	*10.6*	*9.8*	*1.9*	*5.4*
Emerging Markets	707,797,284	0.8	11.0	7.6	12.9	13.5	9.7	5.7	5.4
ORE MSCI Emerging Markets IMI (Net)				*1.6*	*5.6*	*3.2*	*3.6*	*1.4*	*3.2*
Global Equity	2,125,124,201	2.3	12.0	6.0	9.4	12.1	10.1	6.7	8.7
MSCI ACWI IMI Net (Daily)				*5.9*	*13.2*	*16.1*	*11.0*	*7.6*	*8.6*
Global Equity Low Volatility	1,583,091,411	1.7	74.5	5.2	8.4	11.1	9.7	7.1	--
MSCI AC World (Daily Const)				*6.2*	*13.9*	*16.5*	*11.0*	*8.1*	*8.8*
Other Equity	1,200,133,802	1.3	6.8						
Total Real Estate	13,609,909,402	14.6	14.6	-3.2	-5.4	-1.4	11.4	8.9	9.7
NCREIF ODCE (Custom) (Adj.)				*-3.4*	*-8.4*	*-3.9*	*7.5*	*6.6*	*8.2*
Real Estate excluding REITS	13,304,614,112	14.3	97.8	-3.3	-5.7	-1.4	11.5	9.2	10.4
NCREIF ODCE (Custom) (Adj.)				*-3.4*	*-8.4*	*-3.9*	*7.5*	*6.6*	*8.2*
Total REITS	305,295,290	0.3	2.2	2.7	6.6	2.4	9.2	3.5	5.1
Opportunity Portfolio	2,543,947,590	2.7	2.7	4.0	6.9	6.1	15.3	9.6	8.5
Opportunity Custom Benchmark				*2.8*	*5.8*	*8.6*	*11.2*	*9.2*	*7.9*
Alternative Portfolio	13,828,309,525	14.9	14.9	2.0	3.4	8.0	13.2	5.0	4.2
CPI +4%				*2.1*	*4.8*	*7.1*	*9.9*	*8.0*	*6.8*

	Market Value ($)	% of Portfolio	% of Sector	QTD (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)
Diversifying Strategies	**4,972,943,692**	**5.3**	**36.0**	**1.6**	**0.2**	**5.8**	**10.1**	**1.6**	**2.7**
HFRI FOF Conservative Index				*0.8*	*1.7*	*3.4*	*6.0*	*3.9*	*3.4*
Real Assets	**8,855,365,833**	**9.5**	**64.0**	**2.2**	**5.2**	**9.5**	**15.5**	**7.6**	**5.6**
CPI +4%				*2.1*	*4.8*	*7.1*	*9.9*	*8.0*	*6.8*
Private Equity	**25,884,129,366**	**27.8**	**27.8**	**2.8**	**3.5**	**-1.8**	**20.7**	**15.4**	**13.9**
Russell 3000 + 300 BPS QTR LAG (Adj.)				*8.0*	*16.6*	*-5.8*	*22.0*	*13.7*	*15.1*
Cash	**483,382,372**	**0.5**	**0.5**	**1.1**	**2.4**	**3.6**	**1.1**	**1.8**	**1.4**
ICE BofA US 3-Month Treasury Bill				*1.2*	*2.3*	*3.6*	*1.3*	*1.6*	*1.0*

Trailing Net Performance

	Market Value ($)	% of Portfolio	QTD (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)
Total Fund	**93,006,557,886**	**100.0**	**1.5**	**3.4**	**3.2**	**11.2**	**8.1**	**8.3**
OPERF Policy Benchmark			*2.8*	*7.0*	*3.7*	*9.3*	*7.5*	*8.4*
60% MSCI ACWI / 40% Bloomberg Aggregate			*3.4*	*9.1*	*9.4*	*5.0*	*5.4*	*6.0*
70% MSCI ACWI/30% Barclays Agg			*4.1*	*10.3*	*11.2*	*6.5*	*6.1*	*6.7*
InvMetrics All DB > $10B Net Median			*2.5*	*6.3*	*6.5*	*8.6*	*6.9*	*7.5*
InvMetrics All DB > $10B Net Rank			*81*	*99*	*95*	*9*	*4*	*1*
Total Fixed Income	**17,065,446,296**	**18.3**	**-0.3**	**3.0**	**0.7**	**-2.5**	**1.4**	**1.9**
Oregon Custom FI Benchmark			*-0.8*	*2.1*	*-0.9*	*-3.6*	*0.7*	*1.3*
Bloomberg US Aggregate TR			*-0.8*	*2.1*	*-0.9*	*-4.0*	*0.8*	*1.5*
Fixed Income Weighted BM			*-0.5*	*2.5*	*0.0*	*-3.3*	*1.0*	*1.7*
Core Fixed Income	**3,802,133,230**	**4.1**	**-0.5**	**3.0**	**0.3**	**-3.5**	**1.2**	**2.1**
Oregon Custom External FI BM			*-0.8*	*2.1*	*-0.9*	*-4.0*	*0.8*	*1.6*
Blackrock	1,240,854,109	1.3	-0.8	2.5	-0.4	-3.6	1.1	1.9
Oregon Custom External FI BM			*-0.8*	*2.1*	*-0.9*	*-4.0*	*0.8*	*1.6*
Wellington	1,269,597,726	1.4	-0.6	3.0	0.2	-3.6	1.3	2.2
Oregon Custom External FI BM			*-0.8*	*2.1*	*-0.9*	*-4.0*	*0.8*	*1.6*
Western Asset	1,289,684,778	1.4	-0.3	3.4	0.6	-3.2	1.5	2.3
Oregon Custom External FI BM			*-0.8*	*2.1*	*-0.9*	*-4.0*	*0.8*	*1.6*
Fidelity	503,593,806	0.5	-0.2	3.2	1.4	--	--	--
Oregon Custom External FI BM			*-0.8*	*2.1*	*-0.9*	*-4.0*	*0.8*	*1.6*
U.S. Government	**7,769,785,497**	**8.4**	**-1.4**	**1.8**	**-2.1**	**-4.7**	**0.5**	**--**
Government Blended Index			*-1.4*	*1.6*	*-2.1*	*-4.8*	*0.4*	*0.4*
Government Portfolio	7,769,785,497	8.4	-1.4	1.8	-2.1	-4.7	0.5	--
Government Blended Index			*-1.4*	*1.6*	*-2.1*	*-4.8*	*0.4*	*0.4*

	Market Value ($)	% of Portfolio	QTD (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)
Non-Core Fixed Income	**1,918,743,628**	**2.1**	**3.1**	**6.9**	**11.0**	**7.6**	**5.1**	**5.0**
Custom Non-Core Fixed Income Index			*2.8*	*6.2*	*10.4*	*5.6*	*3.9*	*4.2*
KKR Asset Management	30,983,064	0.0	6.4	23.9	25.6	2.0	1.1	2.8
KKR Custom Leveraged Loans & Bond Index			*2.6*	*6.1*	*10.2*	*5.3*	*3.9*	*4.2*
Oak Hill	1,632,256,540	1.8	3.3	7.0	11.1	7.3	5.6	5.4
Oak Hill Custom Lev Loan & Bond Index			*2.9*	*6.3*	*10.6*	*5.9*	*4.0*	*4.1*
Beach Point	255,504,025	0.3						
Global Sovereign	**1,097,252,903**	**1.2**	**0.5**	**3.7**	**1.8**	**--**	**--**	**--**
BbgBarc Global Treasury Ex-U.S.			*0.7*	*3.9*	*1.1*	*-2.4*	*0.8*	*2.5*
MSIM Global Sovereign	547,082,324	0.6	0.5	3.7	1.6	--	--	--
BbgBarc Global Treasury Ex-U.S.			*0.7*	*3.9*	*1.1*	*-2.4*	*0.8*	*2.5*
PIMCO Global Sovereign	550,170,578	0.6	0.6	3.8	2.0	--	--	--
BbgBarc Global Treasury Ex-U.S.			*0.7*	*3.9*	*1.1*	*-2.4*	*0.8*	*2.5*
Emerging Markets Debt	**327,606,377**	**0.4**	**1.9**	**3.7**	**8.3**	**--**	**--**	**--**
JP Morgan EMBI Global Diversified			*2.2*	*4.1*	*7.4*	*-3.1*	*0.6*	*2.8*
Ashmore EMD	102,481,826	0.1	1.5	2.9	5.9	--	--	--
JP Morgan EMBI Global Diversified			*2.2*	*4.1*	*7.4*	*-3.1*	*0.6*	*2.8*
Global Evolution EMD	113,500,305	0.1	2.2	4.5	10.3	--	--	--
JP Morgan EMBI Global Diversified			*2.2*	*4.1*	*7.4*	*-3.1*	*0.6*	*2.8*
PGIM EMD	111,624,247	0.1	2.0	3.8	8.5	--	--	--
JP Morgan EMBI Global Diversified			*2.2*	*4.1*	*7.4*	*-3.1*	*0.6*	*2.8*

	Market Value ($)	% of Portfolio	QTD (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)
Structured Credit Products	**1,646,331,184**	**1.8**	**1.1**	**3.7**	**1.8**	--	--	--
Oregon Structured Credit Products FI BM			*-0.1*	*2.9*	*0.7*	--	--	--
Schroders SCP	562,131,501	0.6	0.3	3.5	2.9	--	--	--
ICE BofA AA-BBB US Asset Backed Sec Idx			*0.1*	*3.4*	*1.7*	*0.6*	*1.7*	*2.4*
Putnam SCP	513,723,999	0.6	2.0	3.8	0.5	--	--	--
Bloomberg US MBS TR USD			*-0.6*	*1.9*	*-1.5*	*-3.7*	*0.0*	*1.1*
Guggenheim SCP	570,475,684	0.6	1.0	3.9	2.0	--	--	--
ICE BofA AA-BBB US Asset Backed Sec Idx			*0.1*	*3.4*	*1.7*	*0.6*	*1.7*	*2.4*
Total Public Equity	**17,777,152,676**	**19.1**	**5.6**	**11.0**	**14.9**	**12.4**	**7.7**	**8.9**
MSCI ACWI IMI Net (Daily)			*5.9*	*13.2*	*16.1*	*11.0*	*7.6*	*8.6*
U.S. Equity	**9,224,780,622**	**9.9**	**6.6**	**11.4**	**16.2**	**14.1**	**9.4**	**11.1**
Russell 3000 TR			*8.4*	*16.2*	*19.0*	*13.9*	*11.4*	*12.3*
Small Cap Growth	**239,869,005**	**0.3**	**5.4**	**5.4**	**11.1**	**11.3**	**7.3**	**10.2**
Russell 2000 Growth TR			*7.1*	*13.6*	*18.5*	*6.1*	*4.2*	*8.8*
EAM MicroCap Growth	239,869,005	0.3	5.4	5.4	11.1	11.3	7.3	10.7
Russell Microcap Growth Index (Daily)			*6.4*	*7.2*	*12.4*	*1.5*	*0.3*	*5.8*
Small Cap Value	**155,295,404**	**0.2**	**2.4**	**2.9**	**10.1**	**20.1**	**5.2**	**8.4**
Russell 2000 Value TR			*3.2*	*2.5*	*6.0*	*15.4*	*3.5*	*7.3*
AQR Capital Management	1,257,550	0.0	0.0	-6.0	0.7	19.8	3.1	6.5
Russell 2000 Value TR			*3.2*	*2.5*	*6.0*	*15.4*	*3.5*	*7.3*
Mellon Asset Management	154,037,854	0.2	2.0	3.7	8.5	16.5	5.4	8.5
Russell 2000 Value TR			*3.2*	*2.5*	*6.0*	*15.4*	*3.5*	*7.3*

	Market Value ($)	% of Portfolio	QTD (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)
Market Oriented (CORE)	**8,829,616,213**	**9.5**	**6.7**	**11.7**	**16.3**	**13.7**	**10.0**	**11.4**
Russell 3000 TR			*8.4*	*16.2*	*19.0*	*13.9*	*11.4*	*12.3*
DFA Large Cap Core	1,695,464,291	1.8	6.7	11.7	17.7	16.0	10.3	--
Russell 1000 TR			*8.6*	*16.7*	*19.4*	*14.1*	*11.9*	*12.6*
Russell 2000 Synthetic - OST managed	309,025,242	0.3	3.4	6.1	9.9	15.3	5.1	9.1
S&P 600 Custom			*3.4*	*6.0*	*9.8*	*15.2*	*5.0*	*8.6*
S&P 500 - OST managed	2,904,654,070	3.1	8.7	16.9	19.6	14.6	12.3	12.9
S&P 500 Index (Daily)			*8.7*	*16.9*	*19.6*	*14.6*	*12.3*	*12.9*
S&P 400 - OST managed	665,400,778	0.7	4.8	8.9	17.7	15.4	7.8	10.4
S&P 400 Midcap Index (Daily)			*4.9*	*8.8*	*17.6*	*15.4*	*7.8*	*10.2*
OST Risk Premia Strategy	3,255,071,833	3.5	5.7	8.8	13.1	10.8	9.1	--
Risk Premia Custom Index			*5.8*	*8.8*	*13.1*	*10.8*	*9.1*	--

	Market Value ($)	% of Portfolio	QTD (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)
Non-U.S. Equity	**6,427,249,432**	**6.9**	**4.0**	**11.5**	**15.0**	**11.2**	**5.7**	**6.7**
Oregon MSCI ACWI Ex US IMI (Net)			*2.4*	*9.1*	*12.5*	*7.3*	*3.4*	*4.9*
Total International Overlay Accounts	**94,434,715**	**0.1**						
PERS-Adrian Lee Active Currency	54,650,611	0.1						
PERS-P/E Global Active Currency	24,689,531	0.0						
PERS-Aspect Cap Active Currency	15,096,155	0.0						
International Market Oriented (Core)	**3,258,717,941**	**3.5**	**3.4**	**10.4**	**13.4**	**10.8**	**5.8**	**6.9**
MSCI World ex USA IMI Net Return			*2.7*	*10.5*	*16.3*	*8.9*	*4.2*	*5.5*
Arrowstreet Capital	1,033,094,165	1.1	5.4	13.4	18.0	18.5	10.3	10.7
Oregon MSCI ACWI Ex US IMI (Net)			*2.4*	*9.1*	*12.5*	*7.3*	*3.4*	*4.9*
Lazard Asset Management	1,695,643	0.0						
Lazard International CEF	909,567,447	1.0	0.8	6.0	8.4	5.1	3.6	--
Oregon MSCI ACWI Ex US (Net)			*2.4*	*9.5*	*12.7*	*7.2*	*3.5*	*4.8*
AQR Capital Management	3,688,533	0.0						
OST Int'l Risk Premia	1,310,672,154	1.4	3.8	11.8	12.6	10.3	6.3	--
MSCI World x US Custom Div Multiple-Factor			*3.7*	*11.5*	*12.1*	*9.9*	*5.9*	*--*
MSCI World ex USA Net Index			*3.0*	*11.3*	*17.4*	*9.3*	*4.6*	*5.4*
International Value	**1,282,411,875**	**1.4**	**3.7**	**11.6**	**16.7**	**14.5**	**5.0**	**6.7**
Oregon MSCI ACWI Ex US Value IMI (Net)			*2.9*	*8.0*	*12.1*	*10.5*	*2.6*	*3.9*
Acadian Asset Management	780,062,918	0.8	3.0	7.0	11.0	13.4	5.3	7.2
Oregon MSCI ACWI Ex US Value IMI (Net)			*2.9*	*8.0*	*12.1*	*10.5*	*2.6*	*3.9*
Brandes Investment Partners	502,348,957	0.5	5.0	17.2	23.6	15.9	5.0	6.1
Oregon MSCI ACWI Ex US Value (Net)			*3.0*	*8.3*	*12.2*	*10.4*	*2.7*	*3.7*

	Market Value ($)	% of Portfolio	QTD (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)
International Growth	**845,451,711**	**0.9**	**3.6**	**16.3**	**21.4**	**7.6**	**8.2**	**8.0**
Oregon MSCI WORLD Ex US (Net)			*3.0*	*11.3*	*17.4*	*9.3*	*4.6*	*5.4*
Walter Scott Management	845,451,711	0.9	3.6	16.3	21.4	7.6	8.2	8.2
Oregon MSCI WORLD Ex US (Net)			*3.0*	*11.3*	*17.4*	*9.3*	*4.6*	*5.4*
International Small Cap	**332,870,621**	**0.4**	**4.1**	**10.8**	**18.7**	**14.1**	**3.7**	**6.4**
MSCI World Ex US Small Cap Value (Net)			*0.7*	*5.3*	*10.6*	*9.8*	*1.9*	*5.4*
DFA International Small Cap	1,254,062	0.0						
Harris Associates	186,878,266	0.2	3.9	11.5	26.3	16.4	5.0	6.6
MSCI ACWI ex USA Small Cap Value (Net)			*2.3*	*6.1*	*11.2*	*11.0*	*2.6*	*5.4*
EAM International Micro Cap	143,873,811	0.2	4.4	8.9	9.2	9.6	2.6	--
Oregon FTSE Global Ex US Micro Cap			*3.0*	*6.6*	*7.6*	*11.3*	*4.5*	*--*
DFA International Micro Cap	864,482	0.0	0.0	7.3	13.7	14.1	3.3	--
Oregon FTSE Global Ex US Micro Cap			*3.0*	*6.6*	*7.6*	*11.3*	*4.5*	*--*
Emerging Markets	**707,797,284**	**0.8**	**7.6**	**12.9**	**13.5**	**9.7**	**5.7**	**5.4**
ORE MSCI Emerging Markets IMI (Net)			*1.6*	*5.6*	*3.2*	*3.6*	*1.4*	*3.2*
Genesis Emerging Markets	4,043,416	0.0	0.0	0.1	-2.2	-1.3	-0.5	2.3
ORE MSCI Emerging Markets IMI (Net)			*1.6*	*5.6*	*3.2*	*3.6*	*1.4*	*3.2*
Arrowstreet Emerging Markets	416,494,096	0.4	2.8	9.2	13.3	14.8	9.5	6.8
ORE MSCI Emerging Markets IMI (Net)			*1.6*	*5.6*	*3.2*	*3.6*	*1.4*	*3.2*
Westwood Global Investment	132,346,899	0.1	5.2	8.8	10.0	13.4	4.3	5.5
MSCI Emerging Markets IMI Net			*1.6*	*5.6*	*3.2*	*3.6*	*1.4*	*3.2*

	Market Value ($)	% of Portfolio	QTD (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)
William Blair and Company	154,740,190	0.2	1.5	5.2	-2.1	0.1	2.5	4.6
MSCI Emerging Markets Growth Net			*-0.7*	*3.3*	*-0.5*	*-1.4*	*0.5*	*2.8*
William Blair Emerging Mkt Small Cap	47,691	0.0	-0.5	4.6	3.7	5.0	3.8	--
MSCI Emerging Markets Small Cap Gr Net			*6.1*	*12.6*	*13.5*	*12.5*	*4.9*	*4.7*
OST EM Risk Premia ESG	124,991	0.0						
Global Equity	**2,125,124,201**	**2.3**	**6.0**	**9.4**	**12.1**	**10.1**	**6.7**	**8.7**
MSCI ACWI IMI Net (Daily)			*5.9*	*13.2*	*16.1*	*11.0*	*7.6*	*8.6*
Alliance Bernstein Global Value	710,269	0.0						
Global Equity Low Volatility	**1,583,091,411**	**1.7**	**5.2**	**8.4**	**11.1**	**9.7**	**7.1**	**--**
MSCI AC World (Daily Const)			*6.2*	*13.9*	*16.5*	*11.0*	*8.1*	*8.8*
MSCI ACWI Minimum Volatility Index (Net)			*2.2*	*3.8*	*5.8*	*5.7*	*5.4*	*7.2*
LACM Global Equity Low Volatility	783,274,479	0.8	3.9	8.6	10.0	8.4	7.1	--
MSCI AC World (Daily Const)			*6.2*	*13.9*	*16.5*	*11.0*	*8.1*	*8.8*
MSCI ACWI Minimum Volatility Index (Net)			*2.2*	*3.8*	*5.8*	*5.7*	*5.4*	*7.2*
Arrowstreet Global Low Volatility	795,685,985	0.9	6.5	9.5	12.3	13.3	10.1	--
MSCI ACWI IMI Net (Daily)			*5.9*	*13.2*	*16.1*	*11.0*	*7.6*	*8.6*
AQR Global Low Volatility	1,877,627	0.0						
Acadian Global Low Volatility	936,585	0.0	0.0	2.2	4.9	7.2	4.4	--
MSCI ACWI IMI Net (Daily)			*5.9*	*13.2*	*16.1*	*11.0*	*7.6*	*8.6*
DFA Global Low Volatility	1,316,735	0.0						
Cantillion	541,322,521	0.6	8.3	--	--	--	--	--
MSCI ACWI IMI Net (Daily)			*5.9*	*13.2*	*16.1*	*11.0*	*7.6*	*8.6*

	Market Value ($)	% of Portfolio	QTD (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)
Other Equity	**1,200,133,802**	**1.3**						
Transitional & Closed Accounts	1,200,133,797	1.3						
PERS- Equity Distribution	4	0.0						
Total Real Estate	**13,609,909,402**	**14.6**	**-3.2**	**-5.4**	**-1.4**	**11.4**	**8.9**	**9.7**
NCREIF ODCE (Custom) (Adj.)			*-3.4*	*-8.4*	*-3.9*	*7.5*	*6.6*	*8.2*
Real Estate excluding REITS	**13,304,614,112**	**14.3**	**-3.3**	**-5.7**	**-1.4**	**11.5**	**9.2**	**10.4**
NCREIF ODCE (Custom) (Adj.)			*-3.4*	*-8.4*	*-3.9*	*7.5*	*6.6*	*8.2*
Total REITS	**305,295,290**	**0.3**	**2.7**	**6.6**	**2.4**	**9.2**	**3.5**	**5.1**
ABKB - LaSalle Advisors	275,356,562	0.3	3.2	7.9	3.2	10.9	9.5	9.5
Nareit Equity Share Price Index			*1.2*	*3.0*	*-4.4*	*6.1*	*4.8*	*6.8*
Woodbourne Investment Management	29,938,728	0.0	-2.9	-0.9	-4.0	3.7	3.0	4.6
Nareit Equity Share Price Index			*1.2*	*3.0*	*-4.4*	*6.1*	*4.8*	*6.8*
Opportunity Portfolio	**2,543,947,590**	**2.7**	**4.0**	**6.9**	**6.1**	**15.3**	**9.6**	**8.5**
Opportunity Custom Benchmark			*2.8*	*5.8*	*8.6*	*11.2*	*9.2*	*7.9*
OPERF Policy Benchmark			*2.8*	*7.0*	*3.7*	*9.3*	*7.5*	*8.4*
Portfolio Holdings - Opportunity	143,502,713	0.2	8.4	19.2	21.2	--	--	--
Alternative Portfolio	**13,828,309,525**	**14.9**	**2.0**	**3.4**	**8.0**	**13.2**	**5.0**	**4.2**
CPI +4%			*2.1*	*4.8*	*7.1*	*9.9*	*8.0*	*6.8*
Diversifying Strategies	**4,972,943,692**	**5.3**	**1.6**	**0.2**	**5.8**	**10.1**	**1.6**	**2.7**
HFRI FOF Conservative Index			*0.8*	*1.7*	*3.4*	*6.0*	*3.9*	*3.4*

Other Equity represents Transitional and Closed Accounts and is not included in the Total Public Equity aggregate market value.

	Market Value ($)	% of Portfolio	QTD (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)
Diversifiying Strategies	4,972,943,692	5.3	1.6	0.2	5.8	10.1	1.6	--
HFRI FOF Conservative Index			*0.8*	*1.7*	*3.4*	*6.0*	*3.9*	*3.4*
Real Assets	**8,855,365,833**	**9.5**	**2.2**	**5.2**	**9.5**	**15.5**	**7.6**	**5.6**
CPI +4%			*2.1*	*4.8*	*7.1*	*9.9*	*8.0*	*6.8*
Infrastructure	6,137,676,386	6.6	2.3	5.8	8.0	14.2	--	--
CPI +4%			*2.1*	*4.8*	*7.1*	*9.9*	*8.0*	*6.8*
Natural Resources	2,717,689,447	2.9	2.0	3.8	12.9	18.1	--	--
CPI +4%			*2.1*	*4.8*	*7.1*	*9.9*	*8.0*	*6.8*
Private Equity	**25,884,129,366**	**27.8**	**2.8**	**3.5**	**-1.8**	**20.7**	**15.4**	**13.9**
Russell 3000 + 300 BPS QTR LAG (Adj.)			*8.0*	*16.6*	*-5.8*	*22.0*	*13.7*	*15.1*
MSCI ACWI+3% (1 quarter lagged)			*8.1*	*19.5*	*-4.6*	*18.8*	*10.1*	*11.3*
Cash	**483,382,372**	**0.5**	**1.1**	**2.4**	**3.6**	**1.1**	**1.8**	**1.4**
ICE BofA US 3-Month Treasury Bill			*1.2*	*2.3*	*3.6*	*1.3*	*1.6*	*1.0*
PERS-Russell Overlay Cash Balance	519,710,564	0.6						

The Opportunity Portfolio benchmark changed from CPI +5% to 100% OPERF Policy benchmark beginning April 1st.

Calendar Year Performance

	2022 (%)	2021 (%)	2020 (%)	2019 (%)	2018 (%)	2017 (%)	2016 (%)	2015 (%)	2014 (%)	2013 (%)
Total Fund	**-1.5**	**20.0**	**7.7**	**13.6**	**0.5**	**15.4**	**7.1**	**2.0**	**7.3**	**15.6**
OPERF Policy Benchmark	*-8.6*	*15.6*	*12.4*	*14.0*	*1.2*	*15.6*	*9.0*	*1.6*	*8.2*	*15.6*
InvMetrics All DB > $10B Net Median	*-10.0*	*16.7*	*10.7*	*17.9*	*-2.6*	*15.4*	*8.2*	*0.3*	*6.6*	*14.0*
InvMetrics All DB > $10B Net Rank	*1*	*14*	*94*	*92*	*8*	*51*	*82*	*3*	*34*	*29*
Total Fixed Income	**-11.3**	**-0.9**	**7.7**	**8.8**	**0.3**	**3.7**	**2.8**	**0.6**	**3.5**	**1.0**
Oregon Custom FI Benchmark	*-13.0*	*-0.9*	*7.3*	*8.3*	*0.3*	*3.3*	*2.5*	*0.1*	*3.0*	*0.3*
Core Fixed Income	**-13.9**	**-1.1**	**8.7**	**9.8**	**-0.2**	**4.6**	**3.4**	**0.6**	**6.9**	**-1.4**
Oregon Custom External FI BM	*-13.0*	*-1.5*	*7.5*	*8.7*	*0.0*	*3.5*	*2.7*	*0.6*	*6.0*	*-1.9*
Blackrock	-13.2	-1.4	9.1	8.9	0.1	3.8	2.8	0.9	6.7	-1.7
Oregon Custom External FI BM	*-13.0*	*-1.5*	*7.5*	*8.7*	*0.0*	*3.5*	*2.7*	*0.6*	*6.0*	*-1.9*
Wellington	-14.3	-0.9	9.6	9.8	-0.4	4.6	4.0	0.8	6.5	-1.2
Oregon Custom External FI BM	*-13.0*	*-1.5*	*7.5*	*8.7*	*0.0*	*3.5*	*2.7*	*0.6*	*6.0*	*-1.9*
Western Asset	-14.9	-1.2	9.4	11.6	-0.7	5.6	3.7	0.4	7.0	-1.0
Oregon Custom External FI BM	*-13.0*	*-1.5*	*7.5*	*8.7*	*0.0*	*3.5*	*2.7*	*0.6*	*6.0*	*-1.9*
Fidelity	--	--	--	--	--	--	--	--	--	--
Oregon Custom External FI BM	--	--	--	--	--	--	--	--	--	--
U.S. Government	**-12.5**	**-2.3**	**8.1**	**6.9**	**0.9**	**2.3**	**-1.6**	**0.9**	**1.0**	--
Government Blended Index	*-12.5*	*-2.3*	*8.0*	*6.9*	*0.9*	*2.3*	*-1.3*	*0.8*	*0.8*	--
Government Portfolio	-12.5	-2.3	8.1	6.9	0.9	--	--	--	--	--
Government Blended Index	*-12.5*	*-2.3*	*8.0*	*6.9*	*0.9*	--	--	--	--	--

	2022 (%)	2021 (%)	2020 (%)	2019 (%)	2018 (%)	2017 (%)	2016 (%)	2015 (%)	2014 (%)	2013 (%)
Non-Core Fixed Income	**0.3**	**6.4**	**3.7**	**10.5**	**0.1**	**4.9**	**10.1**	**0.2**	**2.4**	**8.1**
Custom Non-Core Fixed Income Index	*-3.3*	*5.3*	*3.9*	*10.1*	*-0.2*	*5.0*	*12.0*	*-1.7*	*1.8*	*5.8*
KKR Asset Management	-31.9	13.8	2.6	10.5	-0.4	3.4	9.3	-0.2	2.5	9.0
KKR Custom Leveraged Loans & Bond Index	*-4.4*	*5.2*	*4.3*	*10.6*	*-0.5*	*5.3*	*12.7*	*-2.1*	*1.9*	*6.0*
Oak Hill	1.3	5.7	4.9	10.5	0.5	6.3	11.2	0.9	2.2	6.5
Oak Hill Custom Lev Loan & Bond Index	*-2.2*	*5.2*	*3.6*	*9.5*	*0.0*	*4.6*	*11.2*	*-1.3*	*1.7*	*5.6*
Beach Point										
Global Sovereign	**-9.3**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**
BbgBarc Global Treasury Ex-U.S.	*-10.1*	*--*	*--*	*--*	*--*	*--*	*--*	*--*	*--*	*--*
MSIM Global Sovereign	-9.3	--	--	--	--	--	--	--	--	--
BbgBarc Global Treasury Ex-U.S.	*-10.1*	*--*	*--*	*--*	*--*	*--*	*--*	*--*	*--*	*--*
PIMCO Global Sovereign	-9.3	--	--	--	--	--	--	--	--	--
BbgBarc Global Treasury Ex-U.S.	*-10.1*	*--*	*--*	*--*	*--*	*--*	*--*	*--*	*--*	*--*
Emerging Markets Debt	**-18.4**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**
JP Morgan EMBI Global Diversified	*-17.8*	*--*	*--*	*--*	*--*	*--*	*--*	*--*	*--*	*--*
Ashmore EMD	-21.1	--	--	--	--	--	--	--	--	--
JP Morgan EMBI Global Diversified	*-17.8*	*--*	*--*	*--*	*--*	*--*	*--*	*--*	*--*	*--*
Global Evolution EMD	-16.6	--	--	--	--	--	--	--	--	--
JP Morgan EMBI Global Diversified	*-17.8*	*--*	*--*	*--*	*--*	*--*	*--*	*--*	*--*	*--*
PGIM EMD	-17.6	--	--	--	--	--	--	--	--	--
JP Morgan EMBI Global Diversified	*-17.8*	*--*	*--*	*--*	*--*	*--*	*--*	*--*	*--*	*--*

	2022 (%)	2021 (%)	2020 (%)	2019 (%)	2018 (%)	2017 (%)	2016 (%)	2015 (%)	2014 (%)	2013 (%)
Structured Credit Products	**-9.3**	--	--	--	--	--	--	--	--	--
Oregon Structured Credit Products FI BM	*-9.0*	--	--	--	--	--	--	--	--	--
Schroders SCP	-6.5	--	--	--	--	--	--	--	--	--
ICE BofA AA-BBB US Asset Backed Sec Idx	*-7.6*	--	--	--	--	--	--	--	--	--
Putnam SCP	-14.9	--	--	--	--	--	--	--	--	--
Bloomberg US MBS TR USD	*-11.8*	--	--	--	--	--	--	--	--	--
Guggenheim SCP	-5.9	--	--	--	--	--	--	--	--	--
ICE BofA AA-BBB US Asset Backed Sec Idx	*-7.6*	--	--	--	--	--	--	--	--	--
Total Public Equity	**-14.3**	**20.0**	**12.7**	**25.3**	**-10.5**	**24.5**	**9.8**	**-1.7**	**3.3**	**26.7**
MSCI ACWI IMI Net (Daily)	*-18.4*	*18.2*	*16.3*	*26.4*	*-10.1*	*24.0*	*8.3*	*-2.1*	*3.8*	*23.5*
U.S. Equity	**-16.0**	**27.2**	**13.6**	**29.0**	**-7.9**	**20.3**	**14.9**	**-0.8**	**9.8**	**35.4**
Russell 3000 TR	*-19.2*	*25.7*	*20.9*	*31.0*	*-5.3*	*21.1*	*12.8*	*0.5*	*12.6*	*33.6*
Small Cap Growth	**-23.9**	**19.6**	**38.9**	**33.9**	**-4.7**	**26.8**	**6.3**	**-5.0**	**-3.6**	**57.9**
Russell 2000 Growth TR	*-26.4*	*2.8*	*34.6*	*28.5*	*-9.3*	*22.2*	*11.3*	*-1.4*	*5.6*	*43.3*
EAM MicroCap Growth	-23.9	19.6	38.9	33.9	-4.7	26.8	6.3	-5.7	1.8	57.5
Russell Microcap Growth Index (Daily)	*-29.8*	*0.9*	*40.1*	*23.3*	*-14.2*	*16.7*	*6.9*	*-3.9*	*4.3*	*52.8*

	2022 (%)	2021 (%)	2020 (%)	2019 (%)	2018 (%)	2017 (%)	2016 (%)	2015 (%)	2014 (%)	2013 (%)
Small Cap Value	**-7.2**	**35.6**	**0.3**	**21.3**	**-14.1**	**7.5**	**31.4**	**-5.2**	**3.0**	**36.8**
Russell 2000 Value TR	*-14.5*	*28.3*	*4.7*	*22.4*	*-12.9*	*7.8*	*31.7*	*-7.5*	*4.3*	*34.5*
AQR Capital Management	-1.8	46.3	-7.1	15.2	-18.1	-1.2	31.7	-2.5	4.7	36.9
Russell 2000 Value TR	*-14.5*	*28.3*	*4.7*	*22.4*	*-12.9*	*7.8*	*31.7*	*-7.5*	*4.3*	*34.5*
Mellon Asset Management	-11.2	25.8	5.2	24.2	-8.0	10.8	26.8	-5.8	2.6	36.7
Russell 2000 Value TR	*-14.5*	*28.3*	*4.7*	*22.4*	*-12.9*	*7.8*	*31.7*	*-7.5*	*4.3*	*34.5*
Market Oriented (CORE)	**-16.3**	**26.6**	**15.2**	**30.1**	**-7.1**	**22.0**	**14.8**	**-1.7**	**11.1**	**33.1**
Russell 3000 TR	*-19.2*	*25.7*	*20.9*	*31.0*	*-5.3*	*21.1*	*12.8*	*0.5*	*12.6*	*33.6*
DFA Large Cap Core	-12.9	27.8	12.7	29.1	-9.0	21.1	15.6	-4.6	--	--
Russell 1000 TR	*-19.1*	*26.5*	*21.0*	*31.4*	*-4.8*	*21.7*	*12.1*	*0.9*	*--*	*--*
Russell 2000 Synthetic - OST managed	-16.2	27.1	11.8	23.4	-11.3	14.5	23.4	-3.6	5.8	39.9
S&P 600 Custom	*-16.1*	*26.8*	*11.3*	*22.8*	*-11.0*	*14.7*	*21.3*	*-4.4*	*4.9*	*38.8*
S&P 500 - OST managed	-18.2	28.7	18.4	31.7	-4.4	21.8	12.0	1.5	13.7	32.5
S&P 500 Index (Daily)	*-18.1*	*28.7*	*18.4*	*31.5*	*-4.4*	*21.8*	*12.0*	*1.4*	*13.7*	*32.4*
S&P 400 - OST managed	-13.0	24.6	13.5	26.6	-10.9	16.7	21.1	-2.0	10.0	33.9
S&P 400 Midcap Index (Daily)	*-13.1*	*24.8*	*13.7*	*26.2*	*-11.1*	*16.3*	*20.7*	*-2.2*	*9.8*	*33.5*
OST Risk Premia Strategy	-17.6	24.3	15.8	31.3	-5.5	27.1	10.8	4.5	13.0	--
Non-U.S. Equity	**-14.3**	**12.7**	**13.5**	**22.6**	**-14.9**	**30.4**	**4.6**	**-2.6**	**-2.9**	**18.6**
Oregon MSCI ACWI Ex US IMI (Net)	*-16.6*	*8.5*	*11.1*	*21.6*	*-14.8*	*27.8*	*4.4*	*-4.6*	*-3.9*	*15.8*

	2022 (%)	2021 (%)	2020 (%)	2019 (%)	2018 (%)	2017 (%)	2016 (%)	2015 (%)	2014 (%)	2013 (%)
Total International Overlay Accounts										
PERS-Adrian Lee Active Currency										
PERS-P/E Global Active Currency										
PERS-Aspect Cap Active Currency										
International Market Oriented (Core)	**-13.5**	**13.1**	**12.5**	**23.2**	**-14.3**	**31.0**	**2.5**	**-1.2**	**-2.6**	**21.3**
MSCI World ex USA IMI Net Return	*-15.3*	*12.4*	*8.3*	*22.9*	*-14.7*	*25.2*	*2.9*	*-1.9*	*-4.5*	*21.6*
Arrowstreet Capital	-5.5	24.5	9.1	23.2	-10.3	35.4	4.7	0.4	0.8	26.2
Oregon MSCI ACWI Ex US IMI (Net)	*-16.6*	*8.5*	*11.1*	*21.6*	*-14.8*	*27.8*	*4.4*	*-4.6*	*-3.9*	*15.8*
Lazard Asset Management										
Lazard International CEF	-25.7	4.5	30.2	29.0	-17.2	39.8	0.1	-0.2	0.6	--
Oregon MSCI ACWI Ex US (Net)	*-16.0*	*7.8*	*10.7*	*21.5*	*-14.2*	*27.2*	*4.5*	*-5.5*	*-3.9*	*--*
AQR Capital Management										
OST Int'l Risk Premia	-11.5	15.6	7.7	22.8	-12.0	--	--	--	--	--
MSCI World x US Custom Div Multiple-Factor	*-11.8*	*15.0*	*7.3*	*22.4*	*-12.3*	*--*	*--*	*--*	*--*	*--*
International Value	**-10.9**	**18.0**	**4.9**	**17.8**	**-12.4**	**25.7**	**9.8**	**-4.5**	**-4.3**	**25.0**
Oregon MSCI ACWI Ex US Value IMI (Net)	*-9.3*	*11.0*	*-0.1*	*16.3*	*-14.6*	*23.6*	*8.8*	*-8.9*	*-5.0*	*15.7*
Acadian Asset Management	-13.9	21.7	11.5	19.4	-15.4	35.1	11.8	-7.2	-3.7	21.9
Oregon MSCI ACWI Ex US Value IMI (Net)	*-9.3*	*11.0*	*-0.1*	*16.3*	*-14.6*	*23.6*	*8.8*	*-8.9*	*-5.0*	*15.7*
Brandes Investment Partners	-7.4	14.1	-1.3	16.4	-9.4	16.3	7.9	-1.6	-5.0	28.3
Oregon MSCI ACWI Ex US Value (Net)	*-8.6*	*10.5*	*-0.8*	*15.7*	*-14.0*	*22.7*	*8.9*	*-10.1*	*-5.1*	*15.0*

	2022 (%)	2021 (%)	2020 (%)	2019 (%)	2018 (%)	2017 (%)	2016 (%)	2015 (%)	2014 (%)	2013 (%)
International Growth	**-21.0**	**12.4**	**19.9**	**28.1**	**-6.4**	**27.5**	**1.3**	**1.9**	**-4.3**	**18.8**
Oregon MSCI WORLD Ex US (Net)	*-14.3*	*12.6*	*7.6*	*22.5*	*-14.1*	*24.2*	*2.8*	*-3.0*	*-4.3*	*21.0*
Walter Scott Management	-21.0	12.4	19.9	28.0	-6.3	27.5	6.4	1.2	-3.1	13.1
Oregon MSCI WORLD Ex US (Net)	*-14.3*	*12.6*	*7.6*	*22.5*	*-14.1*	*24.2*	*2.8*	*-3.0*	*-4.3*	*21.0*
International Small Cap	**-15.0**	**18.1**	**9.3**	**24.1**	**-24.3**	**30.2**	**4.9**	**6.1**	**-6.5**	**29.1**
MSCI World Ex US Small Cap Value (Net)	*-14.0*	*13.3*	*2.6*	*22.8*	*-18.4*	*27.9*	*7.9*	*1.1*	*-5.9*	*27.7*
DFA International Small Cap										
Harris Associates	-13.8	20.1	5.0	33.4	-24.1	27.2	7.1	1.0	-6.7	30.9
MSCI ACWI ex USA Small Cap Value (Net)	*-13.6*	*14.1*	*4.7*	*20.3*	*-18.2*	*29.9*	*8.2*	*-1.2*	*-4.5*	*20.9*
EAM International Micro Cap	-25.2	17.8	38.4	20.3	-33.6	45.3	2.2	23.5	--	--
Oregon FTSE Global Ex US Micro Cap	*-21.1*	*18.0*	*27.9*	*16.6*	*-20.0*	*31.4*	*6.0*	*2.9*	--	--
DFA International Micro Cap	-10.3	17.1	5.7	18.5	-22.0	30.9	11.9	-1.8	--	--
Oregon FTSE Global Ex US Micro Cap	*-21.1*	*18.0*	*27.9*	*16.6*	*-20.0*	*31.4*	*6.0*	*2.9*	--	--
Emerging Markets	**-16.9**	**4.3**	**23.5**	**22.1**	**-17.4**	**35.7**	**10.3**	**-14.5**	**1.2**	**-0.1**
ORE MSCI Emerging Markets IMI (Net)	*-19.8*	*-0.3*	*18.4*	*17.6*	*-15.0*	*37.0*	*9.9*	*-13.9*	*-1.8*	*-2.2*
Genesis Emerging Markets	-22.8	-6.6	17.5	29.3	-15.9	33.6	12.0	-14.9	-1.0	0.7
ORE MSCI Emerging Markets IMI (Net)	*-19.8*	*-0.3*	*18.4*	*17.6*	*-15.0*	*37.0*	*9.9*	*-13.9*	*-1.8*	*-2.2*
Arrowstreet Emerging Markets	-10.5	9.6	32.1	23.7	-19.5	35.4	11.2	-15.8	1.1	-1.0
ORE MSCI Emerging Markets IMI (Net)	*-19.8*	*-0.3*	*18.4*	*17.6*	*-15.0*	*37.0*	*9.9*	*-13.9*	*-1.8*	*-2.2*
Westwood Global Investment	-4.1	3.6	10.1	9.8	-9.3	29.5	19.0	-16.1	0.2	0.6
MSCI Emerging Markets IMI Net	*-19.8*	*-0.3*	*18.4*	*17.6*	*-15.0*	*37.3*	*11.2*	*-14.9*	*-2.2*	*-2.6*

	2022 (%)	2021 (%)	2020 (%)	2019 (%)	2018 (%)	2017 (%)	2016 (%)	2015 (%)	2014 (%)	2013 (%)
William Blair and Company	-33.3	4.4	41.4	29.1	-21.6	50.2	1.9	-14.1	5.7	0.9
MSCI Emerging Markets Growth Net	*-24.0*	*-8.4*	*31.3*	*25.1*	*-18.3*	*37.3*	*11.2*	*-14.9*	*-2.2*	*-2.6*
William Blair Emerging Mkt Small Cap	-28.6	17.9	33.0	21.7	-24.4	38.5	-4.3	-5.9	14.9	--
MSCI Emerging Markets Small Cap Gr Net	*-23.3*	*20.4*	*25.6*	*12.0*	*-20.0*	*33.8*	*2.3*	*-6.8*	*1.0*	--
OST EM Risk Premia ESG										
Global Equity	**-9.8**	**15.5**	**7.4**	**21.6**	**-7.9**	**22.3**	**9.4**	**-3.3**	**6.9**	**35.6**
MSCI ACWI IMI Net (Daily)	*-18.4*	*18.2*	*16.3*	*26.4*	*-10.1*	*24.0*	*8.3*	*-2.1*	*3.8*	*23.5*
Alliance Bernstein Global Value										
Global Equity Low Volatility	**-9.2**	**15.2**	**7.9**	**21.7**	**-5.5**	**22.5**	--	--	--	--
MSCI AC World (Daily Const)	*-18.4*	*18.5*	*16.3*	*26.6*	*-9.4*	*24.0*	--	--	--	--
LACM Global Equity Low Volatility	-14.9	15.4	15.0	23.1	-6.6	22.7	--	--	--	--
MSCI AC World (Daily Const)	*-18.4*	*18.5*	*16.3*	*26.6*	*-9.4*	*24.0*	--	--	--	--
Arrowstreet Global Low Volatility	-2.7	15.1	12.6	22.3	-2.7	--	--	--	--	--
MSCI ACWI IMI Net (Daily)	*-18.4*	*18.2*	*16.3*	*26.4*	*-10.1*	--	--	--	--	--
AQR Global Low Volatility										
Acadian Global Low Volatility	-7.7	17.5	-1.9	20.2	-7.0	--	--	--	--	--
MSCI ACWI IMI Net (Daily)	*-18.4*	*18.2*	*16.3*	*26.4*	*-10.1*	--	--	--	--	--
DFA Global Low Volatility										
Cantillion	--	--	--	--	--	--	--	--	--	--
MSCI ACWI IMI Net (Daily)	--	--	--	--	--	--	--	--	--	--
Other Equity										
Transitional & Closed Accounts										

	2022 (%)	2021 (%)	2020 (%)	2019 (%)	2018 (%)	2017 (%)	2016 (%)	2015 (%)	2014 (%)	2013 (%)
PERS- Equity Distribution										
Total Real Estate	**20.0**	**19.0**	**2.7**	**7.2**	**8.0**	**10.0**	**7.9**	**9.9**	**14.2**	**12.8**
NCREIF ODCE (Custom) (Adj.)	*21.0*	*13.6*	*0.6*	*4.7*	*7.7*	*6.7*	*8.9*	*13.5*	*11.3*	*11.0*
Real Estate excluding REITS	**21.6**	**18.6**	**3.0**	**7.3**	**8.9**	**11.2**	**10.0**	**12.7**	**12.0**	**15.8**
NCREIF ODCE (Custom) (Adj.)	*21.0*	*13.6*	*0.6*	*4.7*	*7.7*	*6.7*	*8.9*	*13.5*	*11.3*	*11.0*
Total REITS	**-16.4**	**28.2**	**-0.9**	**7.2**	**-2.0**	**9.8**	**1.1**	**2.0**	**22.2**	**2.2**
ABKB - LaSalle Advisors	-18.6	36.2	3.0	29.9	3.2	7.4	5.4	2.9	32.1	1.6
Nareit Equity Share Price Index	*-24.9*	*41.3*	*-5.2*	*28.7*	*-4.0*	*8.7*	*8.6*	*2.8*	*28.0*	*2.8*
Woodbourne Investment Management	-10.3	9.9	0.6	18.5	-4.8	10.6	4.3	8.6	19.5	-1.8
Nareit Equity Share Price Index	*-24.9*	*41.3*	*-5.2*	*28.7*	*-4.0*	*8.7*	*8.6*	*2.8*	*28.0*	*2.8*
Opportunity Portfolio	**1.3**	**22.7**	**10.2**	**6.2**	**5.8**	**10.5**	**6.1**	**2.1**	**8.8**	**15.0**
Opportunity Custom Benchmark	*11.7*	*12.4*	*6.4*	*7.4*	*7.0*	*7.2*	*7.2*	*5.8*	*5.8*	*6.6*
Portfolio Holdings - Opportunity	-15.5	--	--	--	--	--	--	--	--	--
Alternative Portfolio	**19.1**	**14.8**	**-6.6**	**-1.3**	**-2.4**	**8.3**	**6.6**	**-4.3**	**4.4**	**6.0**
CPI +4%	*10.4*	*11.3*	*5.4*	*6.4*	*6.0*	*6.2*	*6.2*	*4.8*	*4.8*	*5.6*
Diversifying Strategies	**21.4**	**8.7**	**-12.1**	**-1.0**	**-11.5**	**8.0**	**0.5**	**6.4**	**9.0**	**6.8**
HFRI FOF Conservative Index	*0.1*	*7.6*	*6.5*	*6.3*	*-0.9*	*4.1*	*1.9*	*0.4*	*3.1*	*7.7*

	2022 (%)	2021 (%)	2020 (%)	2019 (%)	2018 (%)	2017 (%)	2016 (%)	2015 (%)	2014 (%)	2013 (%)
Diversifiying Strategies	21.4	8.7	-12.1	-1.0	-11.5	8.0	--	--	--	--
HFRI FOF Conservative Index	*0.1*	*7.6*	*6.5*	*6.3*	*-0.9*	*4.1*	--	--	--	--
Real Assets	**18.2**	**19.0**	**-2.0**	**-1.6**	**4.9**	**8.4**	**9.0**	**-7.9**	**3.1**	**5.4**
CPI +4%	*10.4*	*11.3*	*5.4*	*6.4*	*6.0*	*6.2*	*6.2*	*4.8*	*4.8*	*5.6*
Infrastructure	13.9	16.6	5.6	8.9	--	--	--	--	--	--
CPI +4%	*10.4*	*11.3*	*5.4*	*6.4*	--	--	--	--	--	--
Natural Resources	27.7	23.9	-12.8	-12.5	--	--	--	--	--	--
CPI +4%	*10.4*	*11.3*	*5.4*	*6.4*	--	--	--	--	--	--
Private Equity	**1.2**	**41.8**	**12.7**	**11.1**	**18.1**	**17.3**	**6.3**	**7.3**	**15.9**	**16.2**
Russell 3000 + 300 BPS QTR LAG (Adj.)	*-15.1*	*35.7*	*18.4*	*6.0*	*21.1*	*22.2*	*18.4*	*2.5*	*21.2*	*25.2*
Cash	**0.5**	**0.1**	**1.6**	**3.3**	**2.0**	**1.3**	**1.2**	**0.5**	**0.5**	**0.7**
ICE BofA US 3-Month Treasury Bill	*1.5*	*0.1*	*0.7*	*2.3*	*1.9*	*0.9*	*0.3*	*0.0*	*0.0*	*0.1*
PERS-Russell Overlay Cash Balance										

Disclaimer, Glossary, and Notes

WE HAVE PREPARED THIS REPORT (THIS "REPORT") FOR THE SOLE BENEFIT OF THE INTENDED RECIPIENT (THE "RECIPIENT").

SIGNIFICANT EVENTS MAY OCCUR (OR HAVE OCCURRED) AFTER THE DATE OF THIS REPORT AND THAT IT IS NOT OUR FUNCTION OR RESPONSIBILITY TO UPDATE THIS REPORT. ANY OPINIONS OR RECOMMENDATIONS PRESENTED HEREIN REPRESENT OUR GOOD FAITH VIEWS AS OF THE DATE OF THIS REPORT AND ARE SUBJECT TO CHANGE AT ANY TIME. ALL INVESTMENTS INVOLVE RISK. THERE CAN BE NO GUARANTEE THAT THE STRATEGIES, TACTICS, AND METHODS DISCUSSED HERE WILL BE SUCCESSFUL.

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PERFORMANCE DATA CONTAINED HEREIN REPRESENT PAST PERFORMANCE. PAST PERFORMANCE IS NO GUARANTEE OF FUTURE RESULTS.

Credit Risk: Refers to the risk that the issuer of a fixed income security may default (i.e., the issuer will be unable to make timely principal and/or interest payments on the security).

Duration: Measure of the sensitivity of the price of a bond to a change in its yield to maturity. Duration summarizes, in a single number, the characteristics that cause bond prices to change in response to a change in interest rates. For example, the price of a bond with a duration of three years will rise by approximately 3% for each 1% decrease in its yield to maturity. Conversely, the price will decrease 3% for each 1% increase in the bond's yield. Price changes for two different bonds can be compared using duration. A bond with a duration of six years will exhibit twice the percentage price change of a bond with a three-year duration. The actual calculation of a bond's duration is somewhat complicated, but the idea behind the calculation is straightforward. The first step is to measure the time interval until receipt for each cash flow (coupon and principal payments) from a bond. The second step is to compute a weighted average of these time intervals. Each time interval is measured by the present value of that cash flow. This weighted average is the duration of the bond measured in years.

Information Ratio: This statistic is a measure of the consistency of a portfolio's performance relative to a benchmark. It is calculated by subtracting the benchmark return from the portfolio return (excess return), and dividing the resulting excess return by the standard deviation (volatility) of this excess return. A positive information ratio indicates outperformance versus the benchmark, and the higher the information ratio, the more consistent the outperformance.

Jensen's Alpha: A measure of the average return of a portfolio or investment in excess of what is predicted by its beta or "market" risk. Portfolio Return- [Risk Free Rate+Beta*(market return-Risk Free Rate)].

Market Capitalization: For a firm, market capitalization is the total market value of outstanding common stock. For a portfolio, market capitalization is the sum of the capitalization of each company weighted by the ratio of holdings in that company to total portfolio holdings; thus it is a weighted-average capitalization. Meketa Investment Group considers the largest 65% of the broad domestic equity market as large capitalization, the next 25% of the market as medium capitalization, and the smallest 10% of stocks as small capitalization.

Market Weighted: Stocks in many indices are weighted based on the total market capitalization of the issue. Thus, the individual returns of higher market-capitalization issues will more heavily influence an index's return than the returns of the smaller market-capitalization issues in the index.

Maturity: The date on which a loan, bond, mortgage, or other debt/security becomes due and is to be paid off.

Prepayment Risk: The risk that prepayments will increase (homeowners will prepay all or part of their mortgage) when mortgage interest rates decline; hence, investors' monies will be returned to them in a lower interest rate environment. Also, the risk that prepayments will slow down when mortgage interest rates rise; hence, investors will not have as much money as previously anticipated in a higher interest rate environment. A prepayment is any payment in excess of the scheduled mortgage payment.

Price-Book Value (P/B) Ratio: The current market price of a stock divided by its book value per share. Meketa Investment Group calculates P/B as the current price divided by Compustat's quarterly common equity. Common equity includes common stock, capital surplus, retained earnings, and treasury stock adjusted for both common and nonredeemable preferred stock. Similar to high P/E stocks, stocks with high P/B's tend to be riskier investments.

Price-Earnings (P/E) Ratio: A stock's market price divided by its current or estimated future earnings. Lower P/E ratios often characterize stocks in low growth or mature industries, stocks in groups that have fallen out of favor, or stocks of established blue chip companies with long records of stable earnings and regular dividends. Sometimes a company that has good fundamentals may be viewed unfavorably by the market if it is an industry that is temporarily out of favor. Or a business may have experienced financial problems causing investors to be skeptical about is future. Either of these situations would result in lower relative P/E ratios. Some stocks exhibit above-average sales and earnings growth or expectations for above average growth. Consequently, investors are willing to pay more for these companies' earnings, which results in elevated P/E ratios. In other words, investors will pay more for shares of companies whose profits, in their opinion, are expected to increase faster than average. Because future events are in no way assured, high P/E stocks tend to be riskier and more volatile investments. Meketa Investment Group calculates P/E as the current price divided by the I/B/E/S consensus of twelve-month forecast earnings per share.

Quality Rating: The rank assigned a security by such rating services as Fitch, Moody's, and Standard & Poor's. The rating may be determined by such factors as (1) the likelihood of fulfillment of dividend, income, and principal payment of obligations; (2) the nature and provisions of the issue; and (3) the security's relative position in the event of liquidation of the company. Bonds assigned the top four grades (AAA, AA, A, BBB) are considered investment grade because they are eligible bank investments as determined by the controller of the currency.

Sharpe Ratio: A commonly used measure of risk-adjusted return. It is calculated by subtracting the risk free return (usually three-month Treasury bill) from the portfolio return and dividing the resulting excess return by the portfolio's total risk level (standard deviation). The result is a measure of return per unit of total risk taken. The higher the Sharpe ratio, the better the fund's historical risk adjusted performance.

STIF Account: Short-term investment fund at a custodian bank that invests in cash-equivalent instruments. It is generally used to safely invest the excess cash held by portfolio managers.

Standard Deviation: A measure of the total risk of an asset or a portfolio. Standard deviation measures the dispersion of a set of numbers around a central point (e.g., the average return). If the standard deviation is small, the distribution is concentrated within a narrow range of values. For a normal distribution, about two thirds of the observations will fall within one standard deviation of the mean, and 95% of the observations will fall within two standard deviations of the mean.

Style: The description of the type of approach and strategy utilized by an investment manager to manage funds. For example, the style for equities is determined by portfolio characteristics such as price-to-book value, price-to-earnings ratio, and dividend yield. Equity styles include growth, value, and core.

Tracking Error: A divergence between the price behavior of a position or a portfolio and the price behavior of a benchmark, as defined by the difference in standard deviation.

Yield to Maturity: The yield, or return, provided by a bond to its maturity date; determined by a mathematical process, usually requiring the use of a "basis book." For example, a 5% bond pays $5 a year interest on each $100 par value. To figure its current yield, divide $5 by $95—the market price of the bond—and you get 5.26%. Assume that the same bond is due to mature in five years. On the maturity date, the issuer is pledged to pay $100 for the bond that can be bought now for $95. In other words, the bond is selling at a discount of 5% below par value. To figure yield to maturity, a simple and approximate method is to divide 5% by the five years to maturity, which equals 1% pro rata yearly. Add that 1% to the 5.26% current yield, and the yield to maturity is roughly 6.26%.

$$\frac{5\% \text{ (discount)}}{5 \text{ (yrs. to maturity)}} = \begin{array}{l}1\% \text{ pro rata, plus} \\ 5.26\% \text{ (current yield)}\end{array} = 6.26\% \text{ (yield to maturity)}$$

Yield to Worst: The lowest potential yield that can be received on a bond without the issuer actually defaulting. The yield to worst is calculated by making worst-case scenario assumptions on the issue by calculating the returns that would be received if provisions, including prepayment, call, or sinking fund, are used by the issuer.

NCREIF Property Index (NPI): Measures unleveraged investment performance of a very large pool of individual commercial real estate properties acquired in the private market by tax-exempt institutional investors for investment purposes only. The NPI index is capitalization-weighted for a quarterly time series composite total rate of return.

NCREIF Fund Index - Open End Diversified Core Equity (NFI-ODCE): Measures the investment performance of 28 open-end commingled funds pursuing a core investment strategy that reflects funds' leverage and cash positions. The NFI-ODCE index is equal-weighted and is reported gross and net of fees for a quarterly time series composite total rate of return.

Sources: Investment Terminology, International Foundation of Employee Benefit Plans, 1999.
The Handbook of Fixed Income Securities, Fabozzi, Frank J., 1991

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Throughout this report, numbers may not sum due to rounding.

Returns for periods greater than one year are annualized throughout this report.

Values shown are in millions of dollars, unless noted otherwise.

OREGON STATE TREASURY

Tobias Read
Oregon State Treasurer

Michael Kaplan
Deputy State Treasurer

To: **The Oregon Investment Council**

From: **Karl Cheng, Senior Investment Officer, Portfolio Risk & Research**

Re: **Second Quarter 2023 Risk Report for the Oregon Public Employees Retirement Fund**

Executive Summary

This memo summarizes OPERF's predicted volatility, as estimated by Aladdin, Treasury's end-to-end investment analytics platform built by BlackRock. As of June 30, 2023, OPERF has an estimated return volatility of 15.7%, higher than that for the latest OIC-approved target allocation presented by Meketa Investment Group ("Meketa") at the December 2022 meeting. This is driven by: higher levels of predicted volatility by asset class than what Meketa used; and overallocations to private market asset classes versus the OIC-approved targets.

The realized tracking errors for the liquid portion of the Fund, mainly the Public Equity and Fixed Income Portfolios, remain at their upper limits of the OIC guidelines. While the predicted active risks for both Portfolios also exceed their respective policy limits, they have declined since Q1 2023. The Public Equity Portfolio's active risk rose through 2022 due to the increasing correlations of the performances of the active factor tilts and has declined in 2023 as those correlations decrease. However, the biggest driver for the decrease in active risk is the restructuring of the Portfolio. As for the Fixed Income Portfolio, it continues to have a short duration of -0.5 relative to its benchmark, the Bloomberg U.S. Aggregate. Volatilities of U.S. interest rates that spiked in early March when Silicon Valley Bank failed have begun to moderate. **Therefore, staff recommends no action at this time.**

OPERF Asset Allocation

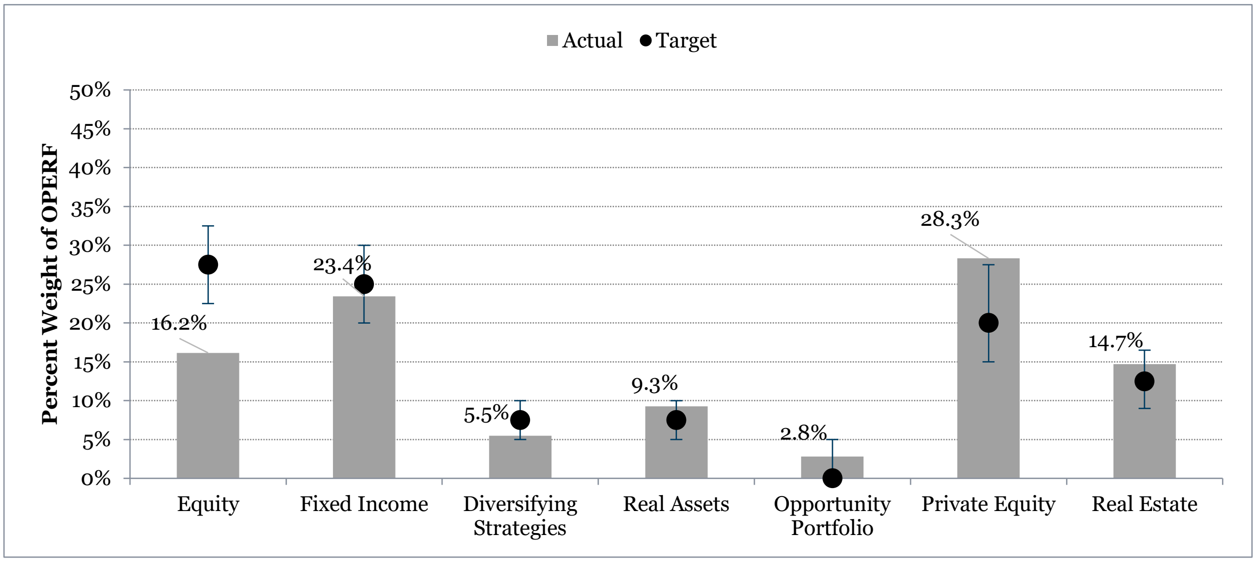
Investment Belief #2 in INV 1201: Statement of OIC Investment and Management Beliefs states: "*Asset Allocation Drives Risk and Return*". Shown in the table below are OPERF's target allocations approved by the Council at the December 2022 meeting.

Table 1. OPERF Target Asset Allocation

Asset Class	Target Allocation (%)	Rebalancing Range (%)
Public Equity	27.5	22.5 – 32.5
Private Equity	20.0	15.0 – 27.5
Fixed Income	25.0	20.0 – 30.0
Real Estate	12.5	9.0 – 16.5
Real Assets	7.5	5.0 – 10.0
Diversifying Strategies	7.5	5.0 – 10.0
Total Fund	**100.0**	

Including the synthetic overlays exposures managed by Russell Investments, Figure 1 below shows OPERF's allocation.

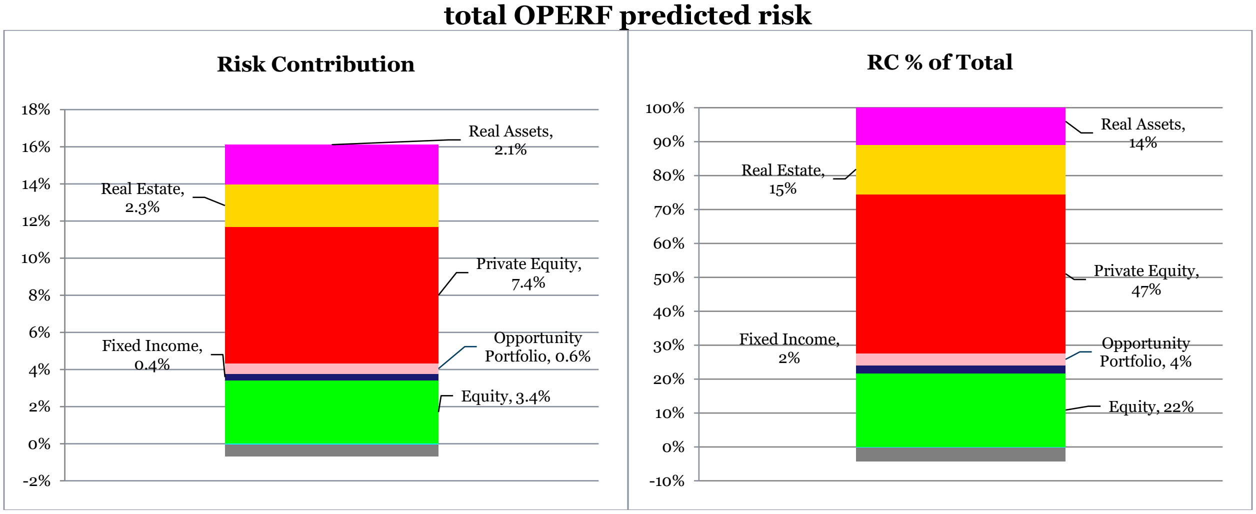
Figure 1. OPERF Actual Allocation versus Target



OPERF Predicted Risk

The risk estimates are shown in the charts below.

Figure 2. OPERF Risk Contribution by Asset Class and Risk Contribution as a percent of total OPERF predicted risk

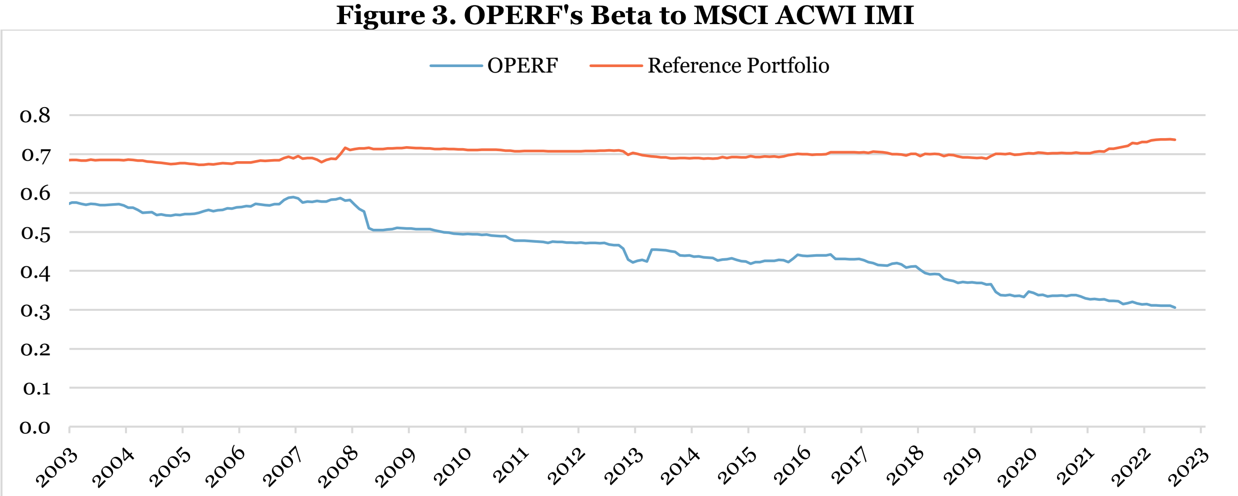


The total predicted **standard deviation**, or **volatility**, for OPERF is 15.7% as of June 30, 2023. To put that in context, Meketa, the OIC's investment consultant, estimates OPERF's long-term volatility to be 11.4% using their 2022 Capital Market Assumptions, which are a blend of 10- to 20-year assumptions from staff, Meketa, and Aon Investments, the Council's secondary investment consultant. Aladdin's model uses a medium-term, five-year lookback period so there will almost always be some difference between the two estimates.

Another item of note from Figure 2 is that "equity" risk, that is the predicted risk contributions from the Public Equity and Private Equity Portfolios, is estimated to be 69% of OPERF's predicted risk. This is down from 81% of then predicted risk a year ago. Equity risk has always been the largest risk contributor to OPERF. OIC Investment Belief #3 summarizes the Council's objective for investing in equity: "*Over the long-term, equity-oriented investments provide reliable return premiums relative to risk-free investments.*"

Over the years, the OIC-approved changes to asset allocation, mainly lowering the allocation to Public Equity and raising those of Real Assets and Diversifying Strategies, have reduced OPERF's realized volatility. Figure 3 below plots OPERF's rolling 20-quarter realized beta to MSCI ACWI IMI as well as that of the "Reference Portfolio", which was recently updated to 67.5% MSCI ACWI IMI & 32.5% Bloomberg U.S. Aggregate Index blend from a previous 70/30 blend. OPERF's realized beta hovered around +0.60 in the earlier portion of the analysis period before starting a steady decline. A significant contributor to that decline is the increasing allocation to illiquid investments, which have performance smoothing, but also provide diversification.

Figure 3. OPERF's Beta to MSCI ACWI IMI



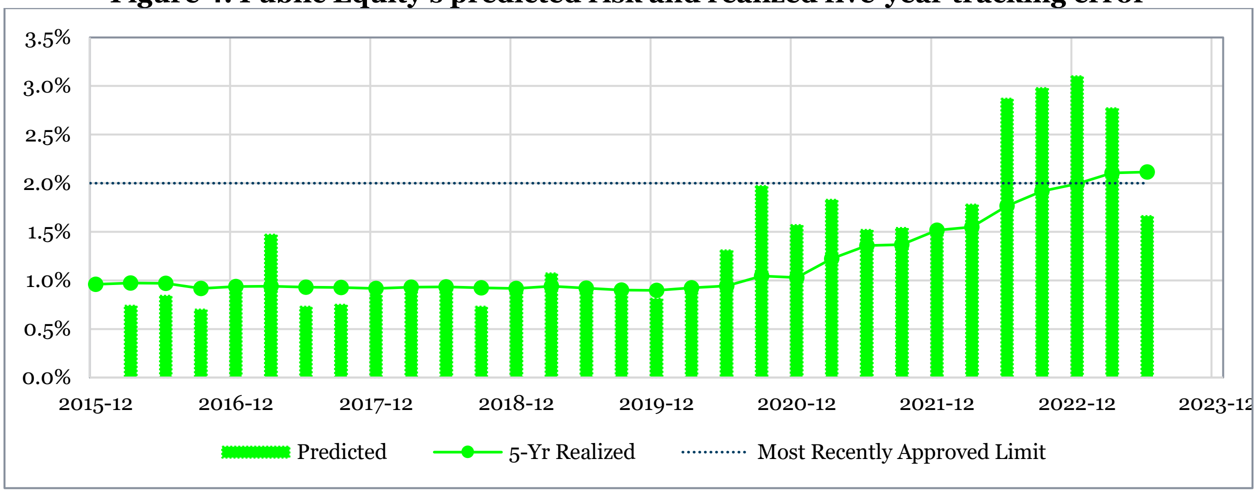
Capital Markets

Public Equity

The Public Equity Portfolio has an OIC-approved **tracking error** range of 0.75% to 2.00%. Using monthly performance data from State Street, the five-year *ex post* tracking error through June 30, 2023 for the Portfolio is 2.1%, slightly above the upper end of the approved range. However, Aladdin estimates an *ex* *ante* active risk of 1.7%, down from 3.1% the end of 2022. Equity market volatility ramped up since the beginning of 2022 due to geopolitical, inflation, and recession concerns. While the global low volatility strategies contributed positive relative performances to the Public Equity Portfolio year to date, the active risk due to the low volatility tilt also became more meaningful, consistent with staff's expectation of how this portion of the Portfolio would behave in a "risk off" market. Furthermore, the sector rotation that occurred in 2022 – significant sell-off of large growth firms – was specifically reflected in the active factor exposures in the Portfolio. The returns to value, low volatility, and size became more correlated – all of which the Portfolio is tilted to – resulting in a higher estimated active risk.

At the December 2022 meeting, the Public Equity team presented a strategic rebalancing of the Portfolio that would reduce the active factor exposures. That implementation, in conjunction with the moderation of factor correlations, lowered the predicted active risk of the Portfolio.

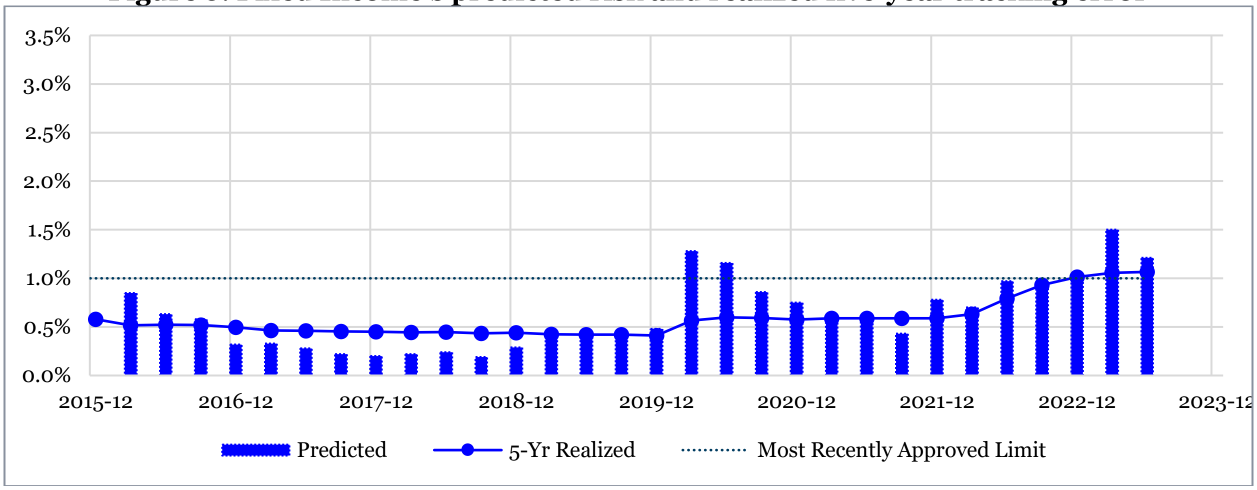
Figure 4. Public Equity's predicted risk and realized five-year tracking error



Fixed Income

The Fixed Income Portfolio has an OIC-approved **tracking error** of up to 1.0%. Using monthly performance data from State Street, the five-year tracking error through June 30, 2023 for the Portfolio is 1.1%, slightly above the upper end of the approved range. The predicted active risk of 1.2% also exceeds the approved range but it is down from the previous quarter's estimate of 1.5%. This elevation in predicted active risk is mainly due to the Portfolio's short duration exposure relative to its benchmark, the Bloomberg U.S. Aggregate, exacerbated by the pickup in interest rate volatility. Interest rate volatilities spiked in March 2023 due to several U.S. bank failures. While those volatilities have moderated, the Portfolio's short duration warrants further consideration at the next Fixed Income Annual Review.

Figure 5. Fixed Income's predicted risk and realized five-year tracking error



OPERF Cash Flow

Table 2 below summarizes approximate net investment cash flow and pension cash flow for Year-to-Date 2023 and for the past five years.

Table 2. OPERF Net Cash Flow by Portfolio by Time Period

	Net Cash Flow ($M)					
Asset Class	YTD (2023)	2022	2021	2020	2019	2018
Public Equity	2,824	3,285	4,220	3,062	2,752	3,432
Private Equity	-633	506	2,730	494	347	1,216
Fixed Income	-1,365	-1,544	-3,053	3,154	327	61
Real Estate	-511	-883	-396	15	-48	-28
Real Assets	-386	-706	-572	-564	-578	-524
Diversifying Strategies	-453	-11	381	-621	-490	-1,349
Opportunity	126	-165	-248	71	26	156
Other	846	663	-227	-2,249	283	-15
Total Fund	**447**	**1,144**	**2,836**	**3,362**	**2,617**	**2,948**
Net Pension	*-2,036*	*-2,605*	*-1,743*	*-3,041*	*-2,659*	*-2,774*

The estimated uncalled commitments from the private market portfolios are tabulated below.

Table 3. OPERF Uncalled Commitments

Asset Class Portfolio	**Uncalled Commitment ($B)**
Private Equity	$7.1
Real Assets	$3.3
Real Estate	$3.8
Opportunity	$1.4
Total	**$15.7**

OIC

OREGON STATE TREASURY

TAB 5

OPERF LEVERAGE

MEKETA | 45 YEARS
CELEBRATING A MILESTONE

Oregon Investment Council

September 6, 2023

Leverage: A Primer

Introduction

- Given OPERF's portfolio, which includes an overlay and private market investments, coupled with announcements of public plans adopting total portfolio leverage, Meketa and OPERF Staff have developed this educational presentation for discussion.
- Leverage exists in institutional portfolios in a variety of ways. It is embedded in various asset classes and investment strategies and also may be utilized explicitly at the total portfolio level.
- Over the last several years, the conversation around leverage has focused on explicit total portfolio leverage.
- In this presentation, we discuss what leverage is, its pros and cons, and how it can be implemented across portfolios.

What is Leverage?

→ Leverage is the use of borrowed funds (i.e., debt) to make an investment.

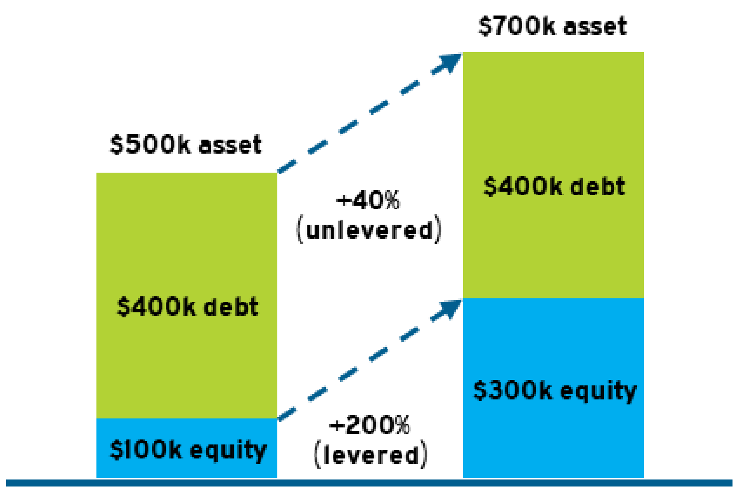
→ Doing so creates economic exposures that exceed the value of the capital put up for the investment.

- Using leverage magnifies investment gains and investment losses.

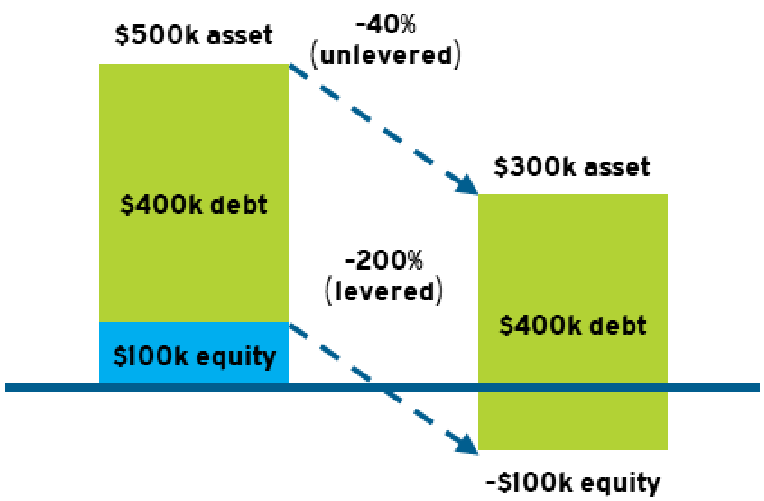
→ If the expected rate of return is higher than the cost of borrowing, leverage is theoretically advantageous.

- The practice of extending and using credit is centuries old and is one of the pillars of modern societies (e.g., banking, mortgages, etc.).

Example: Good Case[1]



Example: Bad Case



[1] Note: in the graphical examples shown we consider an immediate sale of the asset, before incurring financing costs. For investments that take longer to be realized, the loan interest must also be deducted from the return: Levered return = Unlevered return + Leverage factor × (Unlevered return – Financing cost).

What are the different types of leverage?

→ Leverage can be often found in a portfolio in three ways:

System Level (explicit)	Manager/Strategy Level (implicit)	Security Level (embedded)
Leverage at the total portfolio level. Buy investments using borrowed funds. Buy investments using derivatives, putting down only a portion of the value as collateral ("margin"). Exposures exceed asset pool's capital. Can incur losses that exceed total invested capital.	Common practice in hedge funds, private equity, and real estate. Hence, leverage is embedded in many of these vehicles by the GPs. Buy investments using borrowed funds, including from short sales. Buy investments using derivatives. Due to fund structures, investors cannot lose more than amount they invested.	Most corporations finance their operations with debt as well as with shareholder equity. Most investments in shares of *public equities* thus have embedded leverage. Managers can choose to invest in more or less leveraged companies.

→ This is the form of leverage that is receiving the most attention right now.

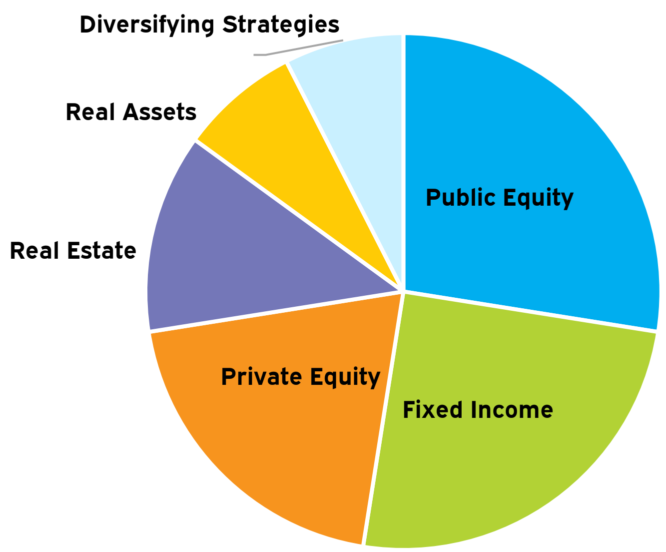
→ Leverage is far more prevalent than most investors realize.

→ Public plans have implicit/embedded leverage throughout their portfolios, but it is typically in a form where they cannot lose more than the amount they invested.

→ Standard capital market assumptions (i.e., forward-looking expected returns, volatilities, etc.) account for this.

Leverage within the OPERF Portfolio

Long-term Policy – Strategies/Asset Classes



Strategy/ Class	Public Equity	Fixed Income	Private Equity	Real Estate	Real Assets	Diversifying	Overlay Program
Leverage Type(s)	Embedded Implicit	Explicit*	Embedded Implicit	Embedded Implicit	Embedded Implicit	Embedded Implicit	Embedded Explicit**

*The OPERF Fixed Income Portfolio can utilize up to 25% leverage. At this point, this has not been utilized.

** Explicit leverage comes in the form of the overlay program address total portfolio over/underweights.

Leverage in Private Markets

→ Private market managers have been using leverage in their strategies for decades.

- These asset classes have the benefit of not having to be marked-to-market or dealing with margin calls.
- Likewise, they generally have (or can have) long-term holding periods.
  - The longer the time frame, the higher the likelihood of a successful execution of leverage usage.

→ Leverage in the buyout space peaked in 2007, sometimes reaching up to 70% leverage.[2]

- Post-GFC, leverage levels declined and then rebounded, though not to the prior peak.
- For the past decade, leverage in buyouts has hovered around 50-60%.

→ The use of leverage in real estate depends on the strategy.

- Core real estate tends to be 15-35% levered and non-core real estate about 50-75%.

→ Infrastructure leverage usually depends on the level and security of the underlying revenue streams.

- Core infrastructure tends to have leverage levels in the range of 40-75%.
- Non-core strategies tend to have less leverage, usually in the range of 25-50%.

[2] The debt multiple peaked at 6.2x in 2007. Source: S&P LTSA,

Leverage in Liquid Alternatives

→ Several strategies within the *Diversifying Strategies* class are commonly referred to as "liquid alternatives."

- Ex: Systematic Trend Following ("STF") and Alternative Risk Premia ("STF").

→ These managers tend to be systematic and target a specific level of annualized volatility (e.g., 15%, 10%, etc.).

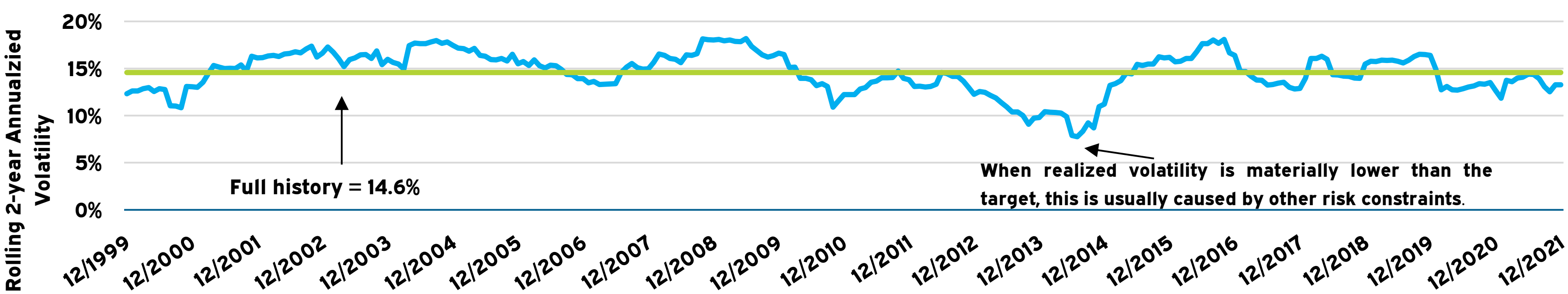
→ Managers will utilize forms of leverage in order to achieve their targeted levels of volatility.

- Achieving a targeted level of volatility is materially easier than achieving a targeted return.

→ Typical forms of leverage:

- STF = Futures (volatility targets typically range from 12% to 20%).
- ARP = Margin, short sales, futures, total return swaps (volatility targets typically range from 6% to 12%).

Example Systematic Trend Following Strategy* (15% Targeted Volatility)
Rolling 2-year Realized Volatility



*Credit Suisse Managed Futures Index (15% Volatility)

Who Uses Leverage?

→ Some leverage is already in your portfolio:

- Most public companies have debt on their balance sheet.
- Most private equity funds use leverage to purchase companies.
- Most real estate funds use leverage to purchase properties.
- Hedge funds/liquid alternatives and 130/30 strategies use leverage.
- Overlay strategies (e.g., equitizing cash, rebalancing over/underweights, etc.) may act like leverage.

→ Some prominent investors use leverage explicitly:

- Wisconsin (SWIB)
- Texas Teachers (TRS)
- Indiana (INPRS)
- Pennsylvania (PSERS)
- Missouri (MOSERS)
- Ohio Police and Fire (OP&F)

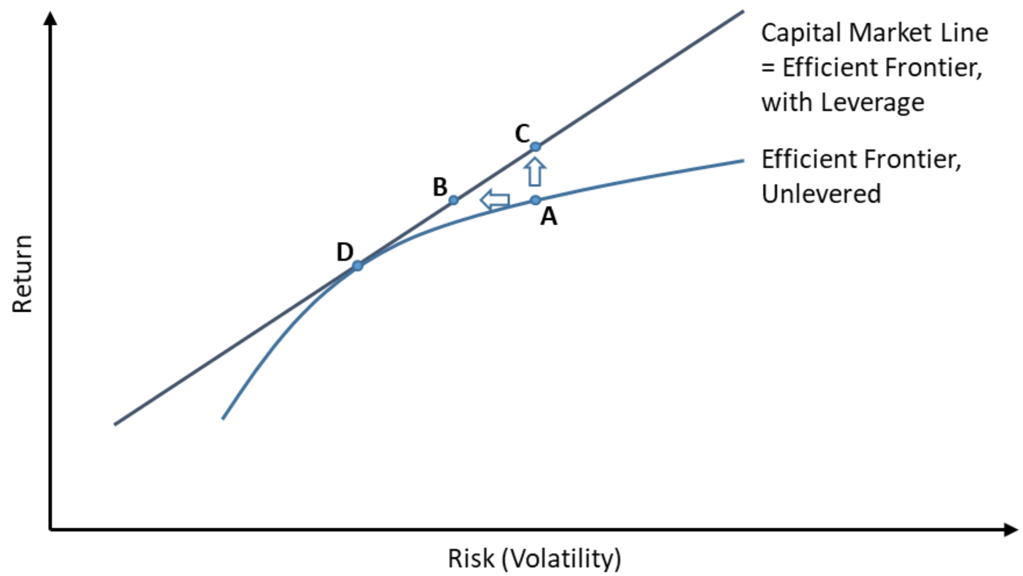
→ **Most public pensions with portfolio level leverage either began utilizing shortly after the GFC (e.g., 2009-2012) or within the last few years (2018-2021).**

→ **Policy targets are typically 105%-120% total exposure, but some are as high as 140%.**

→ **Implementation tends to be fairly strategic, rather than continual changes to the leverage level.**

What are the Benefits of Portfolio Level Leverage?

→ Explicit leverage magnifies gains and can make a portfolio more efficient (i.e., a better risk-return profile).



→ If A is an unlevered portfolio on the efficient frontier, using leverage could achieve B (same return, lower risk) or C (higher return, same risk).

→ Compared to A, both B and C have a much greater share of their portfolios in assets such as bonds, which have a lower volatility and lower correlation to equities.

→ If unlevered, these bond-heavy portfolios' returns would be too low (D), but adding leverage – borrowing to buy assets with expected return greater than cash – magnifies their returns, as well as their risks.

The Benefits of Leverage (continued)

→ Using leverage at the portfolio level allows you the spread out the risks in your portfolio more evenly.

- That is, it reduces the need to rely so heavily on equities and other growth-oriented asset classes.
- It likewise reduces the reliance on alpha as a necessity for achieving your target return.
- And it likely reduces the need to invest more in the highest fee strategies (e.g., private equity).

What are the Concerns Around Using Leverage?

→ Leveraged portfolios can decrease in value, even for extended periods of time.

- Leverage magnifies losses and volatility.

→ Leverage always poses a risk because the economic exposure exceeds the capital assets to cover the exposure.

→ It becomes a problem when either periodic financing payments cannot be met or the amount of equity relative to the debt declines to a level unacceptable to the financier.

- Borrowing costs may exceed the return generated by the investment.
- A broker may require additional margin if a derivatives contract declines and will sell the contract and force the investor to realize losses if that margin is not provided.
- A loan's covenant may require a maximum debt-to-equity ratio. If exceeded, the loan may be called early, or may not be renewed.

→ In times of market shocks or fluctuations in rates, the effects on the leveraged investment can be magnified.

- If there is a small increase in borrowing rate from an already low point, the investor experiences a major impact on their borrowing cost.
- Managing the potential mismatch in borrowing cost is essential in safely managing a levered portfolio.
- During a liquidity shock, debt providers tend to pull back and require more margin on investments.

The Concerns of Leverage (continued)

→ Leverage introduces risks that are not easily measured via traditional metrics.

- These include illiquidity, mark-to-market, counterparty, headline, and model risks.
- Because leverage magnifies volatility, a high degree of pain tolerance may be required to avoid unwinding the program at an inopportune time.

→ Managing a portfolio with explicit leverage is complex and requires dedicated resources and/or additional monitoring costs.

- Using a turn-key approach (e.g., portable "alpha") mitigates this concern, but it is more expensive.

→ Even if a plan is tax-exempt, leverage can still expose investors to UBTI (Unrelated Business Taxable Income) taxation in certain cases.

Implementation

→ Portfolio Level Leverage can be achieved in multiple ways:

- Investment staff can implement leverage.
  - Requires qualified staff and sufficient resources.
- Or third parties can provide a turnkey solution:
  - Overlay managers.
  - Risky parity and "portable alpha" strategies.

→ There are several crucial operational aspects that investors must manage:

- Identify the correct beta source to mitigate basis risk or undesired market risk.
- Manage margins to avoid margin calls at inopportune times.
- Ensure liquidity is available (e.g., for settling swaps, etc.).

→ Best practices if managing leverage in house:

- Leave a margin buffer – do not fully lever to the maximum.
- Determine your tail risk exposure and maintain adequate liquidity to cover (some multiple of) this.
  - VaR, CVaR, and left tail event simulations are a good way to determine this.
- Collateralize more frequently if you are leveraged in a volatile asset class (e.g., equities).

Summary

→ Leverage is common in nearly all investment portfolios. Recognizing its prevalence, it is important to understand its different forms, purposes, and impacts for a portfolio.

→ The global capital markets are highly indebted/financialized, and this implies that certain asset classes (e.g., public equity) are generally inaccessible without elements of leverage.

→ Leverage can allow for the construction of more efficient portfolios.

- You can create portfolios with higher expected risk-adjusted returns.

→ Leverage can reduce the reliance on an investor's biggest sources of risk in their portfolio.

→ But leverage also introduces new risks to the portfolio.

- These include Illiquidity, mark-to-market, headline, and counterparty risks.

→ Leverage works so long as the return on the portfolio exceeds the borrowing cost.

- Those costs are as low as they have ever been.
- But there is no guarantee returns will exceed these costs.
- Leverage amplifies gains, as well as losses.

→ Implementing and managing leverage requires appropriate resources and processes.

→ Any consideration of leverage should include a thorough vetting of the potential risks and challenges.

Appendix A

Appendix: Sample Portfolio[3]

	Portfolio A (%)	Portfolio B (%)	Portfolio C (%)
Growth/Equity	**45**	**54**	**50**
Global Equity	35	44	39
Private Equity	10	10	11
Credit	**10**	**10**	**11**
High Yield Bonds	5	5	5.5
Private Debt	5	5	5.5
Rate Sensitive	**25**	**16**	**27.5**
Investment Grade Bonds	20	11	22
TIPS	5	5	5.5
Real Assets	**15**	**15**	**16.5**
Real Estate	10	10	11
Infrastructure (Core Private)	5	5	5.5
Other	**5**	**5**	**5.5**
Hedge Funds	5	5	5.5
Expected Return (20 years)	*6.5*	*7.0*	*7.0*
Standard Deviation	*10.9*	*12.3*	*12.0*

Portfolio B increases expected return by taking on more equity risk and reducing exposure to investment grade bonds.

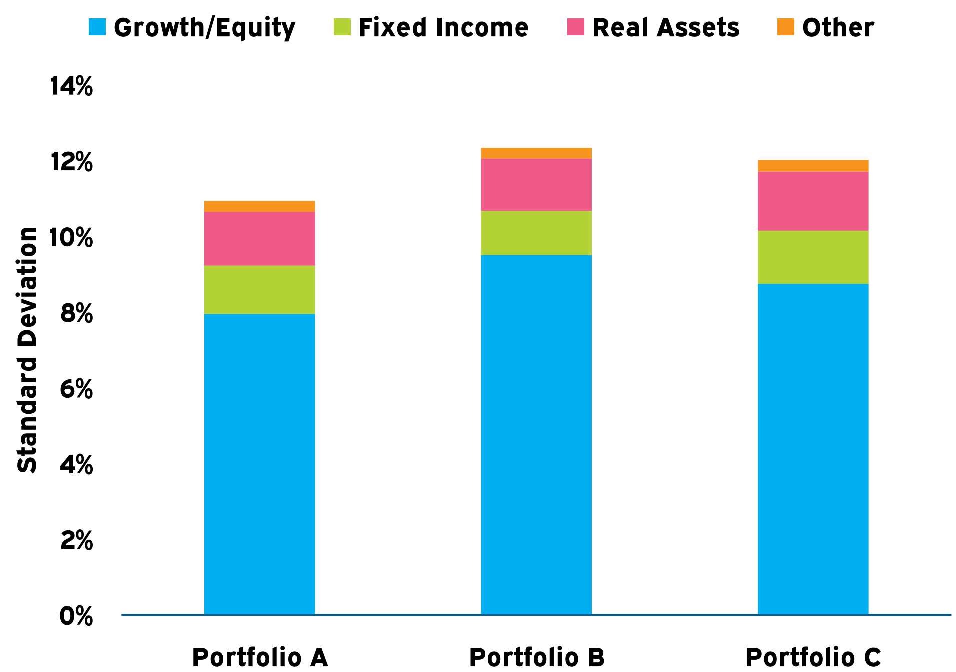
Portfolio C uses 10.5% leverage, applied pro rata, to increase expected return.

It achieves the same higher return, but with less volatility than Portfolio B.

→ By using leverage, a plan can increase its expected return.

[3] Expected return and standard deviation are based upon Meketa Investment Group's 2020 Interim Asset Study.

Appendix: Absolute Contribution to Risk for Sample Portfolio[4]



→ A leveraged portfolio can achieve the same return but with less absolute risk than a portfolio that increases equity exposure.

- It can do so without adding as much equity risk as would otherwise be needed.

[4] Contribution to risk is calculated by multiplying the weight of the asset class by its standard deviation and its correlation with the total portfolio.

Appendix: Long Term Capital Management, a Cautionary Tale

→ Long Term Capital Management (LTCM) was a relative value hedge fund founded in 1994 by a group of extremely well regarded traders and academics, including several Nobel Prize winners.

→ One of LTCM's main strategies involved finding arbitrage opportunities between US Treasury bonds of different maturities.

→ This difference in yield was a matter of basis points, so to magnify the strategy's returns, the hedge fund implemented leverage.

- In 1998, the level of leverage reached amounts of 25 to 1 (if not higher). This represented a tremendous amount of borrowing risk.

→ These risks began to turn into an issue in 1998. After the Asian Financial Crisis and the Russian Financial Crisis, market behavior caused LTCM's tactical strategy to fall apart.

→ Because of LTCM's heavy use of leverage, their losses were magnified, and they were forced to liquidate their other positions at unfavorable prices, thus further amplifying their losses.

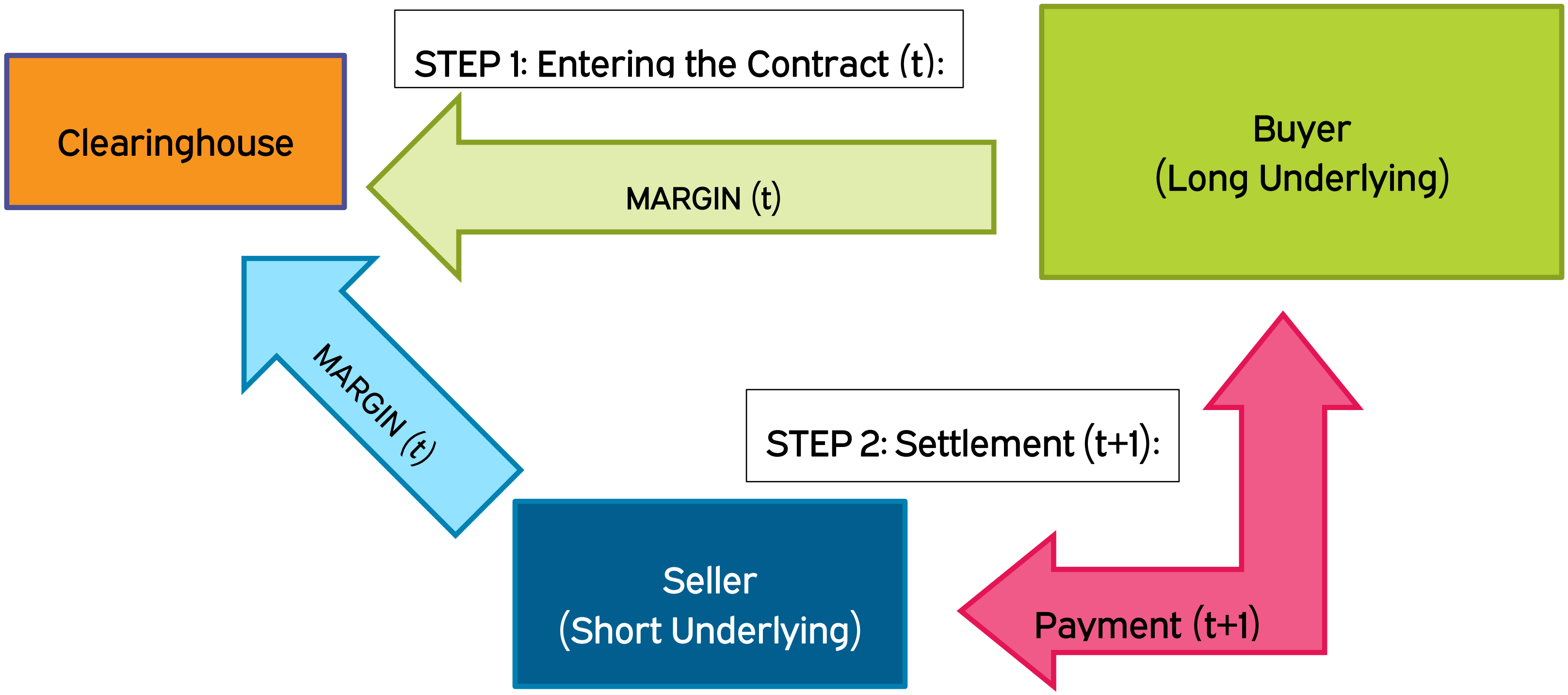
→ To prevent a global financial crisis, LTCM was bailed out by the Federal Reserve so that it could prevent LTCM from fully defaulting.

- The hedge fund was finally fully dissolved in 2000.

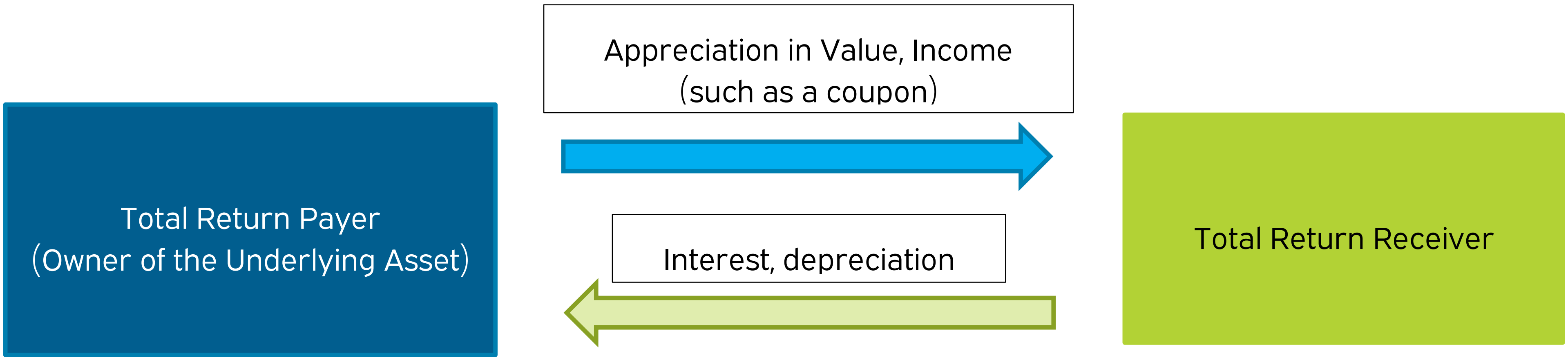
→ While LTCM is an example of extreme leverage, it is important to remember the errors of LTCM as a reminder of the risks involved with taking on leverage.

Appendix B

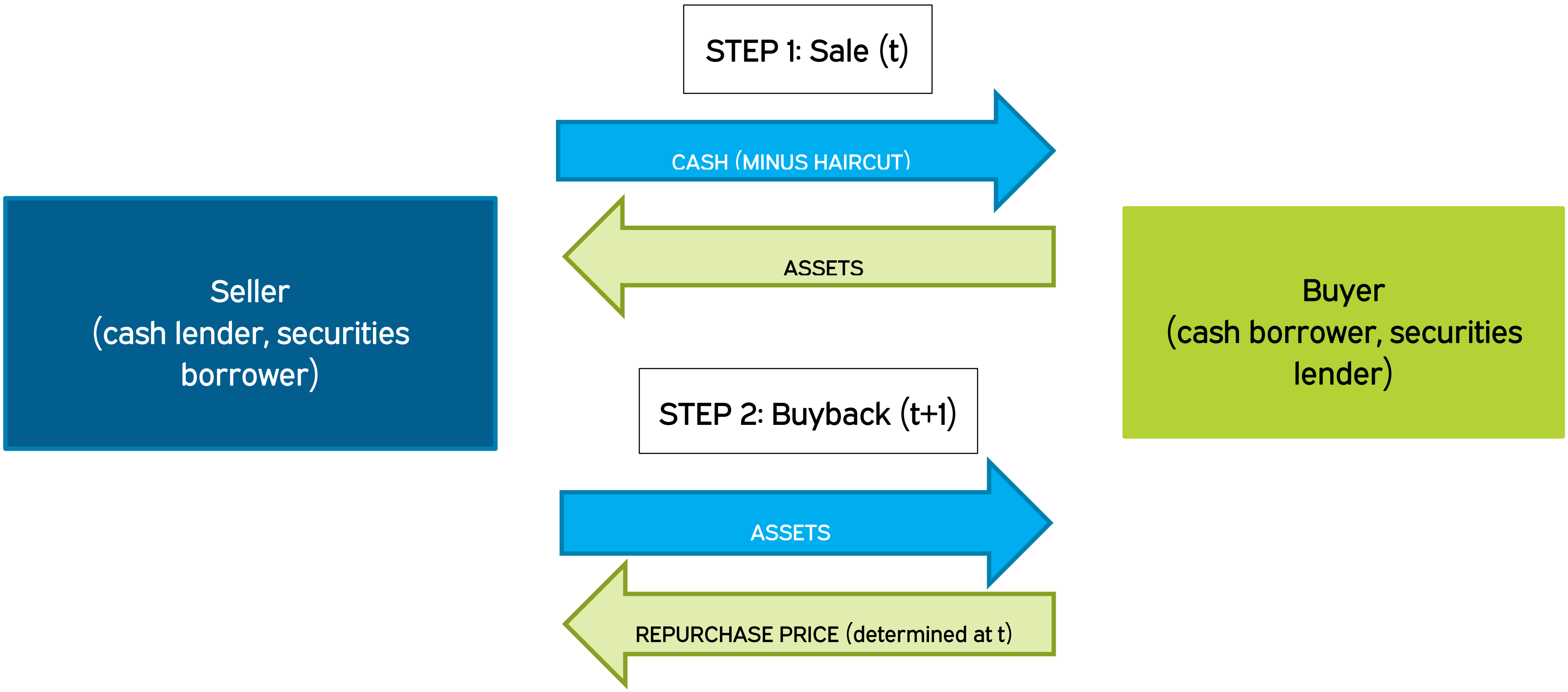
Mechanics of a Futures Contract



Mechanics of a Total Return Swap



Mechanics of a Repo[5]



[5] Some repo markets are intermediated by clearing banks (e.g., tri-party repos), while others are direct transactions (bilateral repos). The former case is used to finance general collateral while the latter transacts in either general or specific collateral.

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PERFORMANCE DATA CONTAINED HEREIN REPRESENT PAST PERFORMANCE. PAST PERFORMANCE IS NO GUARANTEE OF FUTURE RESULTS.

September 6, 2023

OPERF Leverage

OREGON STATE TREASURY

Leverage Definitions

- *Gross leverage*. Additional long AND short exposures through leverage (see Meketa's definitions). For example, a "130/30" public equity strategy would have $130 of long exposures and $30 of short exposures for every $100 of net asset value for a gross leverage of 60%.
- *Net leverage*. Remaining leverage after netting long and short exposures. In the same "130/30" strategy, the net leverage would be 0%.

Leverage ≠ Volatility!

The details matter. A portfolio could have: (1) high gross, low net or (2) high net leverage and not be "overly" risky. Example of (1) is a portfolio that is long Russell 1000 & short S&P 500 and (2) is a portfolio of 2-Year U.S. Treasury notes with a net leverage of +100%. Both would be less risky than an unlevered equity index fund.

System-Level Leverage in OPERF

Asset Class	System-Level
Public Equity	No
Fixed Income	**Yes**
Private Equity	No
Real Estate	No
Real Assets	No
Diversifying Strategies	No
Synthetic Overlay	**Yes**

OPERF has only two sources of "System-Level" leverage: the Fixed Income Portfolio and the Synthetic Overlay Program.

Leverage in the OPERF Fixed Income Portfolio

- The OPERF Fixed Income Portfolio ("FIP") received OIC approval for *System-Level Leverage* at the December 2019 meeting that has not been implemented.
- FIP is allowed to utilize up to 25% of *gross* leverage as follows.
  - Up to 12.5%: used to allocate across other fixed income asset classes. To say it differently, if leverage is implemented, the objective would be to maintain the same level of total risk while changing the balance/sources of risk.
  - Additional 12.5%: reserved for scenarios such as extended market downturns or private market capital calls, subject to governance and control restrictions as outlined in the Appendix.

OREGON STATE TREASURY

Leverage in the Synthetic Overlay Program

Although OPERF does not have a strategic allocation to cash, a cash balance (typically between 1-2%) is maintained for regularly scheduled PERS pension payments and episodic capital calls associated with private market investments.

To minimize cash drag, the OIC retained Russell Investments to implement the "Synthetic Overlay Program" to:

1. Equitize and/or bondize the cash balance using highly-liquid futures contracts; and
2. Rebalance OPERF back to its OIC-established strategic targets using the same futures contracts.

Leverage in the Synthetic Overlay Program

Asset Allocations at May 31, 2023

			Regular Account				
OPERF	**Policy**	**Target**[1]	**$ Thousands**	**Pre-Overlay**	**Overlay**	**Net Position**	**Actual**
Public Equity	22.5-32.5%	27.5%	17,879,695	19.2%	(2,438,210)	15,441,485	16.6%
Private Equity	17.5-27.5%	20.0%	25,702,482	27.7%		25,702,482	27.7%
Total Equity	**45.0-55.0%**	**47.5%**	**43,582,177**	**46.9%**	**(2,438,210)**	**41,143,967**	**44.3%**
Opportunity Portfolio	**0-5%**	**0.0%**	**2,686,663**	**2.9%**		**2,686,663**	2.9%
Fixed Income	**20-30%**	**25.0%**	**17,576,983**	**18.9%**	**3,999,775**	**21,576,758**	23.2%
Risk Parity	**0.0%**	**0.0%**	**4,722**	**0.0%**		**4,722**	0.0%
Real Estate	**9.0-16.5%**	**12.5%**	**13,648,819**	**14.7%**	**(1,100)**	**13,647,719**	14.7%
Real Assets	**2.5-10.0%**	**7.5%**	**8,823,442**	**9.5%**		**8,823,442**	9.5%
Diversifying Strategies	**2.5-10.0%**	**7.5%**	**4,986,152**	**5.4%**		**4,986,152**	5.4%
Cash[2]	**0-3%**	**0.0%**	**1,581,804**	**1.7%**	**(1,560,465)**	**21,339**	0.0%
TOTAL OPERF		**100%**	**$ 92,890,761**	**100.0%**	**$ -**	**$ 92,890,761**	**100.0%**

From July 2023 OIC board book

2. OPERF was <u>overallocated</u> to "Total Equity" – Public + Private – and underallocated to FIP. The "overallocation" is imputed once the misweights to the other asset classes are considered.

1. OPERF had $1.6 billion in Cash or 1.7% of OPERF with a target allocation of 0.0%.

While the Synthetic Overlay Program resulted in a *net* leverage of 0%, there was a *gross* leverage of approximately 5.9% as of May 31, 2023.

Appendix

Additional Leverage Guidelines from 12/2019 Fixed Income Strategic Review

Strategic Review: Additional Leverage Guidelines

- Utilization of Additional Leverage beyond 12.5%
  - Remaining leverage of ~12.5% to be reserved for scenarios such as the following:
    - extended down market timeframes; and
    - capital calls associated with OST Private Markets activities.
  - For governance and control purposes, use of leverage above 12.5% would require the approval of:
    - Chief Investment Officer; and
    - Director of Capital Markets.

- Leveraging Sequencing Guidelines
  - Given the uncertainty surrounding forecasting down markets (e.g., timing, depth, duration, etc.), OPERF plan needs at the time as well as future fixed income and OPERF portfolio composition, a pre-set proscribed leveraging sequence is not advisable.

  - However, in an extended down market scenario, the following factors would need to be considered:
    - Expected length and/or severity of the downturn;
    - Amount of US treasuries (most liquid, easily sold assets) as well as leverage to hold in reserve in case market downturn extends and/or becomes more severe;
    - Ease and practicality of selling cash securities vs. leveraging via US treasury futures; and
    - Maintaining a reasonable risk level at the asset class and total plan level.

OREGON
STATE
TREASURY

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OIC

OREGON STATE TREASURY

TAB 6

ROLES AND RESPONSIBILITIES

AON

Oregon Investment Council

Roles and Responsibilities — Governance Discussion

September 6, 2023

Executive Summary

The purpose of this presentation is to facilitate a discussion around Policy making at the Council level. The Council sets policy around various components of the oversight of the OPERF portfolio, including around responsibilities for manager selection. Based partially on today's conversation, Aon and Meketa will work with Staff to develop a refined Investment Policy Statement for the Council's review later this year.

Topics for discussion today include:

Overview of current and alternative manager selection oversight model.	Outline of current and potential future state monitoring structure and reporting examples.	Examples of peer public funds manager selection processes and reporting structures.

1

Manager Selection Oversight Models

Manager Selection Oversight Models for Consideration

Models	Allocation of Responsibility			Private Markets & Alternatives Thresholds	Public Markets Thresholds
	Asset Allocation Decisions	**Investment Policy Setting**	**Manager Selection**		
Current Hybrid Approach[1]	OIC	OIC	• OST through the Treasurer's Asset Class Committees approve investments below thresholds • OIC approve investments above threshold	Up to $250 million for new commitments & $350 million for existing relationships	None – all new manager mandates require OIC approval
Full Implementation	OIC	OIC	• OST to approve investments below thresholds • OIC approve investments above threshold	1% of plan assets (approximately $1B)	1% of plan assets (approximately $1B)

[1]OST is also allowed to approve investments below $50 million.

AON

Committee Structure for External Manager Due Diligence — Current State

Broad Overview

Oregon Investment Council

Treasurer's Asset Class Committees

- **Private Equity**
- **Real Estate**
- **Alternatives**
  - Real Assets
  - Diversifying Strategies
- **Opportunity Portfolio**

OST Investment Division Committees

- **Alternative Team Leads**
- **Capital Market Leads**

Illustrative Example

Committee Structure for External Manager Due Diligence — Future State

Treasurer's Asset Class Committees

Asset Class Role:	Growth	Real Assets	Risk Mitigation	Opportunistic
Private Markets:	Private Equity	Real Estate	Fixed Income	Opportunity Portfolio
Public Markets:	Public Equity	Real Assets	Diversifying Strategies	

Each Committee would be Comprised of:

1. Deputy State Treasurer
2. CIO
3. One OIC Member invited by the OST as a voting member

Primary Duties:

- Annual Strategic Plan & Pacing Review
- Quarterly Meetings:
  - Portfolio Construction
  - Performance and Risk Review
  - Market Outlook & Opportunities
  - Review of Strategic Relationships
  - Annual Investment Manager Fee Review

AON

Manager Selection Process Overview — Current State

Private Markets

1. Proposed investment agreed upon by **OST asset class team and Consultant**

2. Proposed investment reviewed and approved by **Alternatives Team Leads Committee**

3.A Proposed investment is **below** policy threshold amount

Approved by the **Treasurer's Asset Class Committee**

3.B Proposed investment is **above** policy threshold amount

Approved by the **OIC**

Public Markets

1. Proposed investment agreed upon by **OST asset class team and Consultant**

2. Proposed investment reviewed and approved by **Capital Markets Leads Committee**

3. Reviewed and Approved by **OIC**

Note: The manager selection process for Diversifying Strategies aligns with the process for Private Markets with an exception to step 2, the committee responsible for reviewing and approving the strategy is the Capital Markets Leads Committee instead of the Alternative Team Leads Committee.

AON

Illustrative Example

Manager Selection Process Overview — Future State

Private Markets

1. Proposed investment agreed upon by **OST asset class team and Consultant**
2. Proposed investment reviewed and approved by **Alternatives Team Leads Committee**

3.A Proposed investment is **below** policy threshold amount

Approved by the **OST**

3.B Proposed investment is **above** policy threshold amount

Approved by the **OIC**

Public Markets

1. Proposed investment agreed upon by **OST asset class team and Consultant**
2. Proposed investment reviewed and approved by **Capital Markets Leads Committee**

3.A Proposed investment is **below** policy threshold amount

Approved by the **OST**

3.B Proposed investment is **above** policy threshold amount

Approved by the **OIC**

OIC Member can participate in the review of a proposed investment based on the Treasurer's Asset Class Committee they are designated to.

Illustrative Example

Manager Selection Process Detail

1

Manager Due Diligence

- Staff and consultant are involved in the sourcing of investments based on the asset classes portfolio construction and objectives

2

Write-up

- Staff to prepare internal due diligence reports supplemented with consultant's manager evaluation report/concurrence memo on any new strategy

3

OST Committee Deliberation

- OST Staff presents proposed investment to OST Investment Division Committee*
- OIC Designee can attend meeting

4

Manager Approval

- OST Investment Division Committee* approves strategy

5

CIO Manager Update

- In the CIO's **Manager Update Report**, it includes the approved manager and commitment amount

6

OIC Manager Portal

- Due Diligence Report can be accessed on the **OIC's Manager Portal**

7

Ongoing Monitoring

- Monitor consultant's manager rating
- Monitor material changes to the manager's firm, team, investment process
- Review performance is meeting objectives
- Periodic manager meetings/calls
- Any manager concerns highlighted in the **Exceptions Report and Asset Class RFI**

*OST Investment Division Committees are Alternative Team Leads Committee and the Capital Market Leads Committee. The strategy will be proposed to one of these two committees based on its respective asset class.

2

Monitoring and Reporting

Illustrative Example

Monitoring/Reporting Options for Consideration at the OIC Level

Action	Responsible Party/Parties	Comments on Deliverables	Frequency
Update IPS to reflect updated manager selection process	Consultant ➡ OIC	IPS should reflect updated manager selection process, delegation parameters, and expected reporting for monitoring	Review Annually
Due Diligence of Investment Managers	OST Staff ➡ Consultants	Staff to prepare internal reports for OST Investment Division Committee review. Ensure General/Asset Class Consultant provides manager evaluation report/concurrence memo on any new strategy, and is involved in the sourcing of investments.	As Needed
Treasurer's Asset Class Committee Meetings	OST Staff ➡ OIC Designee	Staff provides an overview on the asset class strategic plan, performance review, portfolio construction, manager activity, peer fee review, market opportunities, etc. All reports created by Staff to be available to full OIC.	Quarterly
Capital Markets Leads Committee Meetings	OST Staff	Approves each investment across public market asset classes. Reports on managers available to OIC.	Quarterly /As Needed
Alternatives Team Leads Committee Meetings	OST Staff	Approves each investment across private market asset classes. Reports on managers available to OIC.	Monthly /As Needed
Semi-Annual Monitoring RFI for Each Asset Class	Consultant ➡ OST Staff ➡ OIC	Consultants send RFI to each Asset Class lead, to receive updates on program. Sample Report included.	Semi-Annual
Exceptions Report	OST Staff ➡ OIC	Staff completes an Exceptions Report to ensure all underlying exposures are being managed effectively and within policy. Sample Report included.	Quarterly
Asset Class Review Presentation	OST Staff ➡ OIC	Staff presents an overview of the annual strategic plan, portfolio construction and portfolio performance	Annually
Brief Asset Class Updates	OST Staff ➡ OIC	Staff presents a 5–10-minute update to the OIC meeting to serve as check in on progress towards annual plan	Semi-Annually
CIO's Manager Update	CIO ➡ OIC	Report includes a summary of manager commitments, redemptions, and rebalancing activity	Quarterly
CIO's Staffing Update	CIO ➡ OIC	Report provides a staffing update on departures and additions to the investment team along with a schematic of the full team	Quarterly
Quarterly Performance Report	Consultant ➡ OIC	Consultant presents quarterly performance of the investment program	Quarterly

Illustrative Example

Sample A Reporting Exhibits – Quarterly Manager Update Report

To: OIC

From: CIO

Subject: Quarterly Manager Update Report – Q1 2023

Rebalancing

Fixed Income

Period	Action Taken	Purpose	Amount
Q1 2023	Net Cash Reallocated **into** internally managed Long-Term Bonds	Rebalancing	$400M

Public Equity

Period	Action Taken	Purpose	Amount
Q1 2023	Net Cash Reallocated **out of** internally managed Domestic Equity Portfolio	Rebalancing	$750M
Q1 2023	Net Cash Reallocated **out of** externally managed International Equity Portfolio	Rebalancing	Manager A: $750M Manager B: $750M Total: $1.5B

Real Estate

Period	Action Taken	Purpose	Amount
Q1 2023	Net Cash Reallocated **out of** externally managed REIT accounts	Rebalancing	U.S. REIT Manager A: $150M U.S. REIT Manager B: $50M Global REIT Manager C: $100M Global REIT Manager D: $50M Total: $400M

New Commitments / Termination

Public Equity

Period	Action Taken	Investment Name	Amount	Reason for Termination
March 31, 2023	Termination	International Equity Manager A	$500M	Restructuring/ Reducing Structural Biases

Real Estate

Period	Action Taken	New or Renew	Investment Name	Amount	Strategy Type
February 1, 2023	New Commitment	Renew	Real Estate Fund A	$150M	Core Real Estate
February 1, 2023	New Commitment	Renew	Real Estate Fund B	$150M	Core Real Estate

Illustrative Example

Sample B Reporting Exhibits – Quarterly Exceptions Report

To: OIC
From: CIO
Subject: Exceptions Report

Exception Report	Yes/No	If out of compliance, please explain plans to rectify
Asset Allocation - Is the asset allocation in line within policy ranges?		
Rebalancing - Is rebalancing executed in accordance with OIC policies?		
Active Risk - Is the active risk for public equity and fixed income within their target range?		
Performance Objective - Is the Total Fund performance meeting or exceeding its policy benchmarks over a market cycle of 3 to 5 years - Is each asset class meeting or exceeding its performance benchmark over a market cycle of 3 to 5 years		
Asset Class – Portfolio Construction - Is each asset class within its target ranges for each underlying sub-asset class?		
Investment Manager - Are any investment managers on "watch" by the OST due to deviation from investment strategy and investment objectives, material investment team turnover, outsized underperformance amongst other factors?		
Internally Managed Equity and Fixed Income Portfolios - Are the underlying strategies tracking their respective benchmarks closely in a cost-efficient manner?		
Overlay Portfolio - Is the overlay portfolio being executed in accordance with investment guidelines? - Are there any notable concerns around the impact the overlay portfolio has to the Plan's risk and return profile?		
Manager concentration - Is manager concentration in accordance with investment guidelines?		
Investment Management Fess - Are investment management fees competitive at the strategy and Total Fund level relative to their respective universes?		

Illustrative Example

Sample C Reporting Exhibits – Semi-Annual Asset Class RFI

To: Treasurer's Asset Class Committee & OIC
From: Senior Investment Officer of Asset Class
Subject: Semi-Annual Asset Class Questionnaire

I. Conflicts of Interest

1. Is Staff aware of any conflicts of interest related to the implementation of the Portfolio and Advisors/Consultants to Client X Investment Committee and Staff?
   If yes, please provide details of the conflict and efforts by Staff to eliminate or mitigate them.
2. Is Staff aware of any conflicts of interest from the Managers selected for the Portfolio?
   If yes, please provide details of the conflict and efforts by Staff to eliminate or mitigate them.

II. Policy

3. Please provide an outline of the procedures in place to ensure adherence to the stated Portfolio policy, and ongoing monitoring of underlying assets. Have any of the underlying funds deviated from their respective investment objective statements or Staff's intended goals?
   Please identify any breaches of policy during the period (trailing six months).

III. Performance

4. Please provide trailing performance history for the Portfolio versus the benchmark (QTD, one-, three-, five-, ten-year, since inception).
5. Please provide a brief discussion of the Portfolio's current performance (over/under) relative to the benchmark. Please provide performance attribution for the trailing six-month and one-year time periods. Highlight any issues or concerns, as well as outperforming asset classes/strategies.

IV. Portfolio Positioning & Monitoring

6. Please describe the allocation of the Portfolio & underlying asset classes in comparison to the policy targets.
7. Were there any changes to the Portfolio lineup (hires/terminations) over the past six months? Please explain why such changes were made.
8. Were there any changes to the manager/strategy monitoring procedures over the past six months? Please explain why such changes were made.

Semi-Annual Asset Class Review

V. Portfolio/Market Outlook

9. Provide an update on the outlook for the Portfolio, as well as any planned strategy additions/changes.
10. Provide a brief discussion on the outlook for the Portfolio's market/opportunity set. Does the team foresee any adjustments in positioning due to this?

VI. Fees/Collaboration

11. How has the team negotiated lower fees and/or entered into collaborative arrangements that reduced fees over the past six months?

VII. Staffing

12. Provide an update regarding personnel additions/departures/promotions for the team and the staffing status relative to Targets.
13. Are there currently any open positions on the team?

3

Public Fund Peer Examples

Peer Public Pension Funds Models — Manager Selection

The following table outlines examples of public pension funds that delegate manager selection to staff with a brief description of their approval process and associated reporting

Peer Plan	Threshold	Internal Staff / Committee Monitoring & Approval Process	Full Committee / Board Reporting
Fund A >$300 B	Board approves if investments exceed: • 2% of PE NAV for new PE; 4% follow on • 3% RE NAV • $500 mil for Infrastructure	• Manager selection fully delegated to Staff. Consultant/advisor concurrence utilized. Consultants utilized for sourcing as needed at Staff level. Board retains its own Consultants for oversight and monitoring. • Asset class policies contain detailed guidance on delegation.	• Report on delegation provided annually to Board • Semi-Annual Reporting on manager ratings in public and private markets
Fund B $157 B	Board approves when investment exceeds: - 0.5% of plan assets (approx. $1B) for initial investments - 1% of all plan assets for follow-on investments	• Internal Investment Committee (IIC) meetings composed of CIO, CRO, & Investment Division SMDs to review & approve managers threshold • Board members & the IC Chair may sit in on these meetings • IIC may delegate investment discretion to asset class investment committees	• No reporting on manager selection/ termination • Prudence letter required for recommendations above threshold • The Board has access to full due diligence & other details through an online confidential reporting link
Fund C $150 B	None	• Staff prepares due diligence memo • Executive Director (ED)/ CIO has ultimate approval	• 5–10-minute updates on asset classes at each quarterly Board meeting • No reporting on manager selection/ termination • Annual deep dive

[1]Source: 2022 Delegation of Authority Review

Peer Public Pension Funds Models — Manager Selection (cont'd.)

Peer Plan	Threshold	Internal Staff / Committee Monitoring & Approval Process	Full Committee / Board Reporting
Fund D $122 B	Board approves when investment exceeds: - $1B for initial investment in public markets - $300M for private assets	• Internal Investment Committee prepares due diligence memo (Staff only, no Board members) • ED/CIO has ultimate approval	• ED/CIO circulates manager hiring plan to Board/Committee with option to have it brought to Board for approval • Board responsible for manager terminations • ED/CIO provides quarterly Investment Discretion Exercised Report
Fund I $60 B	Board approves when investment exceeds: - 1% of plan assets (applies to all asset class investments except US Equity) - 1.5% of plan assets for US Equity	• Manager selection delegated to Bureau of Investments (BOI) with CIO serving as senior executive administrator • Investment divisions of BOI for each asset class consist of internal staff members	• 10–15-minute updates on asset classes at Board meetings • No reporting on manager selection/ termination (strategy level only)

Public Pension Fund Survey Results

Survey Public Pension Funds	Delegation of Search, Selection & Termination of Investment Managers for Public Markets	Delegation Thresholds	Delegation of Selection of Private Equity Funds	Delegation of Selection of Real Estate Funds	Internal Asset Management	Fund Size
Fund A	Yes	Yes	Yes	Yes	Yes	>$300 B
Fund B	Yes	Yes	Yes	Yes	Yes	$157 B
Fund C	Yes	No	Yes	Yes	Yes	$150 B
Fund D	Yes	Yes	Yes	Yes	Yes	$122 B
Fund E	Yes	No	Yes	Yes	Yes	$117 B
Fund F	No	No	No	No	No	$136 B
Fund G	Yes	No	Yes	Yes	Yes	$80 B
Fund H	Yes	No	No	No	Yes	$80 B
Fund I	Yes	Yes	Yes	Yes	Yes	$60 B
Fund J	Yes	Yes	Yes	Yes	Yes	$52 B
Fund K	No	No	No	No	No	$28 B
Fund L	Yes	Yes	Yes	Yes	Yes	$27 B
Fund M	No	No	No	No	No	$21 B
Fund N	No	No	No	No	No	$17 B
Fund O	No	No	No	No	No	$16 B

Appendix

Oregon Investment Council

Roles and Responsibilities — Governance Discussion

May 31, 2023

Executive Summary

The purpose of this presentation is to facilitate a discussion around Policy making at the Council level. The Council sets policy around various components of the oversight of the OPERF portfolio, including around responsibilities for manager selection. Based partially on today's conversation, Aon and Meketa will work with Staff to develop a refined Investment Policy Statement for the Council's review later this year.

Topics for discussion today include:

Review of current roles and responsibilities.	Discussion of how those roles relate specifically to manager selection for the OIC and OST Staff.	Overview of current and alternative manager selection oversight models.	Education on the prudence of monitoring when assigning implementation duties.	Outline of current and potential future state monitoring structure.	Examples of peer public funds manager selection processes and reporting structures.

1

Roles and Responsibilities

OIC — Roles and Responsibilities

- The OIC is a **policy-setting council** that largely **oversees and assigns investment management activities** of the OST and qualified external fiduciaries.
  - The OIC is responsible for setting asset allocation, investment policies, and guidelines which guide staff in their work, and provide Council the ability to oversee the program as fiduciaries
  - The OIC tasks OST staff, external managers, consultants and other service providers with policy implementation
- As part of that policy setting and implementation, the OIC outlined roles and responsibilities for selection of investment managers in its Statement of Fund Governance as shown on the following slide.
  - [Among other responsibilities], the **OIC retains direct approval of retaining investment managers within each asset class, including alternative investment commitments over the specified threshold amounts**

Source: Statements of OIC Investment Management Beliefs INV 1201 and Statement of Fund Governance — INV 1202

Key Takeaway:

The OIC retains direct approval for most manager hirings today. Focusing more of the manager selection process at OST staff level would allow the OIC more time to spend on policy level decisions. Furthermore, OIC is already practiced in its monitoring and oversight role.

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OST Staff — Roles & Responsibilities

- The Council has created policy language which delegates to qualified Treasury staff the following investment management and implementation decisions:
  - **Recommending retaining investment managers** within each asset class. Before recommending a manager change, Treasury staff will satisfy the Council that the manager change is supported by a satisfactory level of analysis and due diligence
  - **Terminating investment managers**
  - Preparing, negotiating and **executing investment manager mandates**, guidelines and fee agreements
  - **Overseeing individual investment managers** to ensure their portfolios comply with their respective portfolio mandates and guidelines

Source□□xcerpts from Statement of □und □overnance —IN□ 1202

Key Takeaway:

The OIC has already created policy which assigns many of the key investment implementation responsibilities to OST staff. As part of its oversight role, the OIC requires timely reports to ensure assigned responsibilities are being carried out in accordance with fiduciary duties and in compliance with relevant policies, guidelines and approvals.

2

Manager Selection Oversight Models

Manager Selection Oversight Models for Consideration

Models	Allocation of Responsibility			Private Markets & Alternatives Thresholds	Public Markets Thresholds
	Asset Allocation Decisions	Investment Policy Setting	Manager Selection		
Current Hybrid Approach[1]	OIC	OIC	• OST through the Treasurer's Asset Class Committees approve investments below thresholds • OIC approve investments above threshold	Up to **$250 million** for new commitments & **$350 million** for existing relationships	None – all new manager mandates require OIC approval
Apply Thresholds to all Asset Classes	OIC	OIC	• OST to approve investments **below** thresholds • Treasurer's asset class committees or the OIC approve investments **above** threshold	Up to **$250 million** for new commitments & **$350 million** for existing relationships	Illustrative Up to **$750 million** for new manager mandates
No Thresholds	OIC	OIC	OST to approve all investments. No council approval necessary. Possible consultant concurrence/additional reporting added.	--	--

[1]OST is also allowed to approve investments below $50 million.

A. Current Hybrid Approach

Benefits	Considerations
• Greater OIC control • Enhanced transparency	• Requires more time commitment on the part of the members of the OIC • Brings the OIC below policy adoption and oversight • Requires expertise and knowledge on the part of the OIC • Decision-making process can be protracted • Misalignment of Private and Public Market decision making

B. Apply Thresholds to all Asset Classes

Benefits	Considerations
• OIC members have more time to focus on broader investment strategies and policy development • More investment decisions can be implemented expeditiously • Increased comfort level by assigning selection of all asset class managers to a deep and experienced team of OST professionals	• Reduced control • Governing fiduciaries can become complacent in oversight and monitoring. • OIC still below policy adoption and oversight without full implementation of selection process • Need to determine appropriate threshold level for each asset class and periodically revisit

C. Full Implementation — No Thresholds

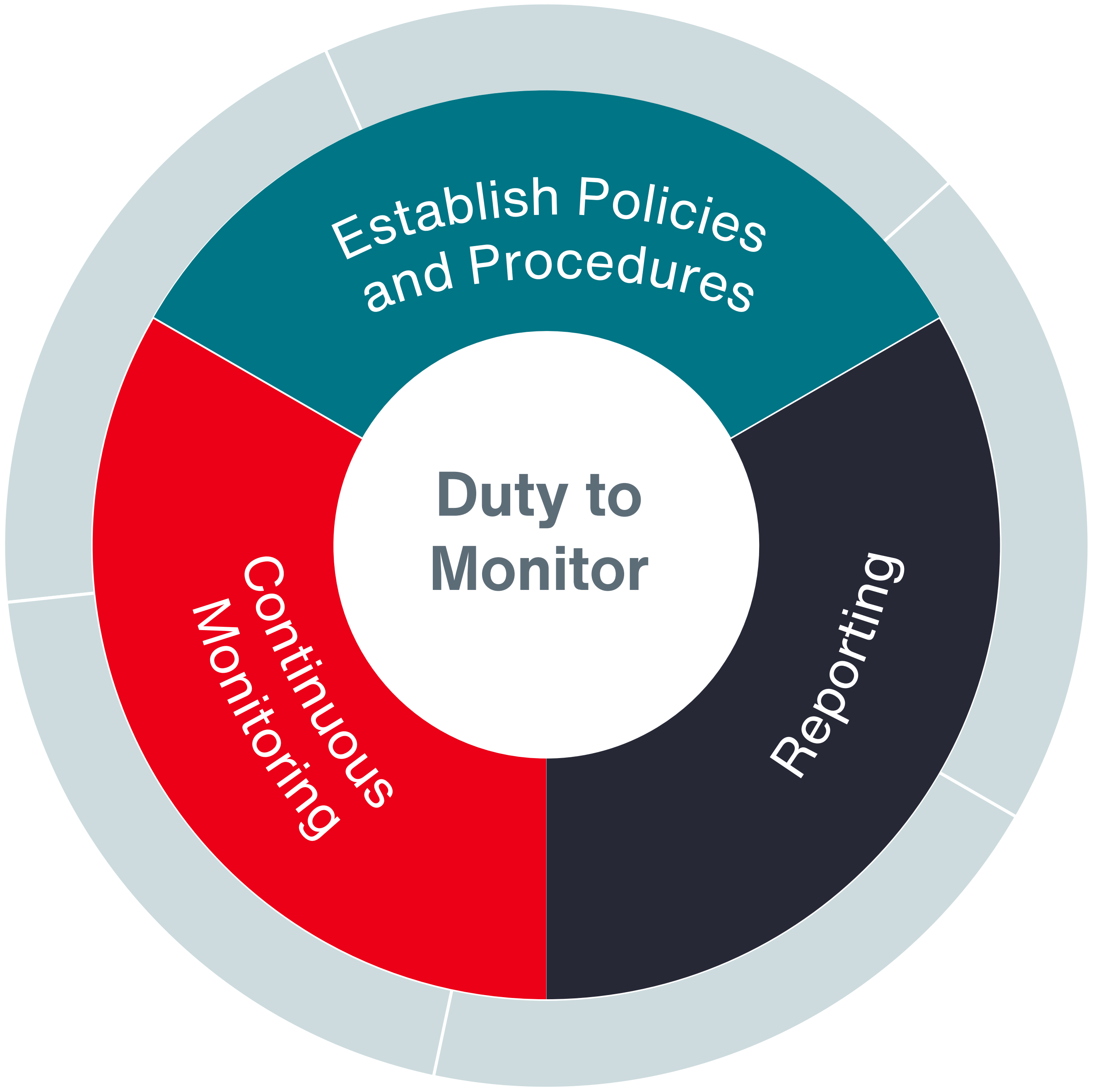
Benefits	Considerations
• OIC members have more time to focus on broader investment strategies and policy development • Investment decisions can be implemented more expeditiously • Increased comfort level by assigning selection of all asset class managers to a deep and experienced team of OST professionals • Enhancement of fiduciary oversight and risk management	• Reduced control on part of OIC members • Governing fiduciaries can become complacent in oversight and monitoring • Additional monitoring, reporting, and policy language needed

3

Duty to Monitor

Duty to Monitor

U.S. Supreme court opinion held fiduciaries have a continuing duty – separate and apart from the duty to exercise prudence in selecting investments at the outset – to monitor and remove imprudent investment options. Tibble v. Edison International, 135 S.Ct. 1823 (2015), Hughes v. Northwestern Univ., 595 U.S.__2022.



Staff implements policies and procedures and ensures compliance controls are in place to protect the funds and ensures the highest level of services from external advisors.

Adequate reporting is necessary for prudent monitoring.

Oversight

- Any assignment of implementation must be accompanied by diligent oversight.
  - Trustees must periodically review the agent's performance and compliance with the terms of the delegation.
  - The duty to monitor requires proactive monitoring, trustees must actively seek out knowledge and information about the actions of those to whom they have delegated responsibilities.
  - Trustees are obligated to act with appropriate prudence and reasonableness to determine whether those who have delegated duties are performing their fiduciary obligations.
  - The duty to monitor is a lasting duty-trustees cannot simply delegate and walk away.

Key Takeaway:

The OIC must have a sound process in place for ongoing monitoring of OST staff. This includes ensuring the reporting processes in place are adequate.

Prudent Monitoring

To be prudent, when monitoring:

Ensure the delegated duty is carried out consistent with specified parameters.	Evaluate compliance with scope of authority.	Evaluate performance against relevant standards/benchmarks.
Require regular reporting and notification of any material changes.	Ensure the delegation matches current roles and responsibilities and continues to be prudent.	Make changes, if necessary, by refining or rescinding delegations where appropriate.
Require sufficient reporting to the Board to fulfill its oversight responsibility.	Utilize independent verifications or reviews needed to assist the Board.	Hold professionals/service providers appropriately accountable.

4

Current and Future State Monitoring Structure for Discussion

Committee Structure for External Manager Due Diligence — Current State

Broad Overview

Oregon Investment Council

Treasurer's Asset Class Committees

- **Private Equity**
- **Real Estate**
- **Alternatives**
  - Real Assets
  - Diversifying Strategies
- **Opportunity Portfolio**

OST Investment Division Committees

- **Alternative Team Leads**
- **Capital Market Leads**

Committee Structure for External Manager Due Diligence — Current State

Treasurer's Asset Class Committees

Private Equity	Real Estate	Alternatives - Real Assets - Diversifying Strategies	Opportunity Portfolio

Each Committee is Comprised of:

1. Deputy State Treasurer
2. CIO
3. One OIC Member invited by the OST as a voting member

Primary Duty:

- Manager Selection for OPERF capital up to:
  - $250m for new GP/Manager
  - $350m for existing relationship

Committee Structure for External Manager Due Diligence — Current State

OST Investment Division Committees

ATL Committee is Comprised of:

1. Director of Private Markets
2. SIOs for each Private Markets Portfolio
3. Investment Officers of Private Markets Portfolio (participate on rotating basis)

Alternative Team Leads

Primary Duties:

- Policy/Guidelines Review
- Manager Due Diligence
- Portfolio Construction
- Performance Monitoring

Private Markets Portfolios:

- Private Equity
- Real Estate
- Real Assets
- Opportunity Portfolio

Capital Market Leads

Primary Duties:

- Policy/Guidelines Review
- Manager Due Diligence
- Portfolio Construction
- Performance Monitoring

Public Markets Portfolios:

- Public Equity
- Fixed Income
- Diversifying Strategies
- Currency Overlay Program

CML Committee is Comprised of:

1. CIO
2. SIOs for Public Market Portfolios
3. SIO for Portfolio Risk and Research
4. Director of Investments

Manager Selection Process Overview — Current State

Private Markets

1. Proposed investment agreed upon by **OST asset class team and Consultant**

2. Proposed investment reviewed and approved by **Alternatives Team Leads Committee**

3.A Proposed investment is **below** policy threshold amount

Approved by the **Treasurer's Asset Class Committee**

3.B Proposed investment is **above** policy threshold amount

Approved by the **OIC**

Public Markets

1. Proposed investment agreed upon by **OST asset class team and Consultant**

2. Proposed investment reviewed and approved by **Capital Markets Leads Committee**

3. Reviewed and Approved by **OIC**

Note: The manager selection process for Diversifying Strategies aligns with the process for Private Markets with an exception to step 2, the committee responsible for reviewing and approving the strategy is the Capital Markets Leads Committee instead of the Alternative Team Leads Committee.

Illustrative Example

Manager Selection Process Overview — Future State

Private Markets

1. Proposed investment agreed upon by **OST asset class team and Consultant**

2. Proposed investment reviewed and approved by **Alternatives Team Leads Committee**

3.A Proposed investment is **below** policy threshold amount

Approved by the **OST**

3.B Proposed investment is **above** policy threshold amount

Approved by the **Treasurer's Asset Class Committee** or the **OIC**

Public Markets

1. Proposed investment agreed upon by **OST asset class team and Consultant**

2. Proposed investment reviewed and approved by **Capital Markets Leads Committee**

3.A Proposed investment is **below** policy threshold amount

Approved by the **OST**

3.B Proposed investment is **above** policy threshold amount

Approved by the **Treasurer's Asset Class Committee** or the **OIC**

Note: The manager selection process for Diversifying Strategies aligns with the process for Private Markets with an exception to step 2, the committee responsible for reviewing and approving the strategy is the Capital Markets Leads Committee instead of the Alternative Team Leads Committee.

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Illustrative Example

Committee Structure for External Manager Due Diligence — Future State

Treasurer's Asset Class Committees

Asset Class Role:	Growth	Real Assets	Risk Mitigation	Opportunistic
Private Markets:	Private Equity	Real Estate	Fixed Income	Opportunity Portfolio
Public Markets:	Public Equity	Real Assets	Diversifying Strategies	

Each Committee would be Comprised of:

1. Deputy State Treasurer
2. CIO
3. One OIC Member invited by the OST as a voting member

Primary Duties:

- Annual Strategic Plan & Pacing Review
- Quarterly Meetings:
  - Portfolio Construction
  - Performance and Risk Review
  - Market Outlook
  - Review of Strategic Relationships
- Ad Hoc Meetings:
  - Manager Selection for OPERF capital above policy approved threshold amounts

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Illustrative Example

Monitoring/Reporting Options for Consideration at the OIC Level

	Reporting	Currently In Place?		Presentations	Currently In Place?
1.	Quarterly Manager Update Report - Manager Additions - Termination - Rebalancing		1.	CIO reports outcome of executed decisions related to investment managers at next regularly scheduled OIC meeting	Yes
2.	Access to a portal with full Due Diligence Reports		2.	Annual Asset Class Review - Annual Strategic Plan - Portfolio Construction - Performance Review	Yes
3.	Total Fund Quarterly Performance Report	Yes	3.	5–10-minute updates on asset classes semi-annually at OIC meeting to serve as check in on progress towards annual plan	
			4.	OIC periodically reviews appropriateness of manager selection oversight model and threshold amounts	

5

Public Fund Peer Examples

Aon

Peer Public Pension Funds Models — Manager Selection

The following table outlines examples of public pension funds that delegate manager selection to staff with a brief description of their approval process and associated reporting

Peer Plan	Threshold	Internal Staff / Committee Monitoring & Approval Process	Full Committee / Board Reporting
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Fund C $150 B	None	• Staff prepares due diligence memo • Executive Director (ED)/ CIO has ultimate approval	• 5–10-minute updates on asset classes at each quarterly Board meeting • No reporting on manager selection/ termination • Annual deep dive

[1]Source: 2022 Delegation of Authority Review

Peer Public Pension Funds Models — Manager Selection (cont'd.)

Peer Plan	Threshold	Internal Staff / Committee Monitoring & Approval Process	Full Committee / Board Reporting
Fund D $122 B	Board approves when investment exceeds: - $1B for initial investment in public markets - $300M for private assets	• Internal Investment Committee prepares due diligence memo (Staff only, no Board members) • ED/CIO has ultimate approval	• ED/CIO circulates manager hiring plan to Board/Committee with option to have it brought to Board for approval • Board responsible for manager terminations • ED/CIO provides quarterly Investment Discretion Exercised Report
Fund J $60 B	Board approves when investment exceeds: - 1% of plan assets (applies to all asset class investments except US Equity) - 1.5% of plan assets for US Equity	• Manager selection delegated to Bureau of Investments (BOI) with CIO serving as senior executive administrator • Investment divisions of BOI for each asset class consist of internal staff members	• 10–15-minute updates on asset classes at Board meetings • No reporting on manager selection/ termination (strategy level only)

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Appendix – Public Fund Peer Summary

Public Pension Fund Survey Results

Survey Public Pension Funds	Delegation of Search, Selection & Termination of Investment Managers	Delegation Thresholds	Delegation of Selection of Private Equity Funds	Delegation of Selection of Real Estate Funds	Internal Asset Management	Fund Size
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Fund C	Yes	No	Yes	Yes	Yes	$150 B
Fund D	Yes	Yes	Yes	Yes	Yes	$122 B
Fund E	Yes	No	Yes	Yes	Yes	$117 B
Fund F	No	No	No	No	No	$136 B
Fund G	Yes	Yes	Yes	Yes	Yes	$82 B
Fund H	Yes	No	Yes	Yes	Yes	$80 B
Fund I	Yes	No	No	No	Yes	$80 B
Fund J	Yes	No	Yes	Yes	Yes	$60 B
Fund K	Yes	Yes	Yes	Yes	Yes	$52 B
Fund L	No	No	No	No	No	$28 B
Fund M	Yes	Yes	Yes	Yes	Yes	$27 B
Fund N	No	No	No	No	No	$21 B
Fund O	No	No	No	No	No	$17 B
Fund P	No	No	No	No	No	$16 B

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OREGON STATE TREASURY

TAB 7

CALENDAR – FUTURE

AGENDA ITEMS

2023-24 OIC Forward Calendar and Planned Agenda Topics

October 25, 2023	Operations Annual Review CEM Benchmarking CSF, SAIF Update
December 6, 2023	Q3 OPERF Performance Public Equity Portfolio Review Fixed Income Portfolio Review: OPERF, OSTF
January 24, 2024	Private Equity Portfolio Review Opportunity Portfolio Review 2025 OIC Calendar Approval
March 6, 2024	2023 Performance Review: OPERF, CSF, SAIF Fixed Income Portfolio Review Real Estate Portfolio Review
April 17, 2024	Real Assets Portfolio Review Individual Account Program (IAP) Review OSGP Annual Review
May 29, 2024	Q1 Performance Review: OPERF
July 17, 2024	Diversifying Strategies Portfolio Review
September 4, 2024	Q2 Performance Review: OPERF, CSF, SAIF

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OREGON STATE TREASURY

TAB 8

OPEN

DISCUSSION

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OREGON STATE TREASURY

TAB 9

PUBLIC COMMENTS

Public comments can now be found at the OIC website at:

https://www.oregon.gov/treasury/invested-for-oregon/pages/oregon-investment-council.aspx