OREGON
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Oregon Investment Council

March 8, 2023

Cara Samples
Chair

Tobias Read
State Treasurer

Rex Kim
Chief Investment Officer

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OREGON INVESTMENT COUNCIL

Agenda

March 8, 2023
9:00 AM

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

Time		Presenter	Tab
9:00	**1. Review & Approval of Minutes** January 25, 2023	**Cara Samples** *OIC Chair*	**1**
	2. Committee Reports	**Rex Kim** *Chief Investment Officer*	**2**
9:05-10:00	**3. Real Estate Market Update**	**Tim Wang** *Managing Director, Head of Research, Clarion Partners*	**3**
10:00-10:40	**4. OPERF Real Estate Portfolio Review**	**Michael Langdon** *Director of Private Markets* **Austin Carmichael** *Investment Officer, Real Estate* **Christopher Ebersole** *Investment Officer, Real Estate* **Sam Spencer** *Investment Officer, Real Estate* **Christy Fields** *Managing Principal/Consultant, Meketa Investment Group*	**4**

------------------ BREAK----------------

10:50-11:10	**5. OPERF Public Equity Recommendation** (Action Item: Manager Recommendation)	**Louise Howard** *Senior Investment Officer, Public Equity*	**5**
11:10-11:40	**6. OIC Investment Beliefs Discussion**	**Allan Emkin** *Managing Principal, Meketa*	**6**
11:40-12:10	**7. ESG Regulatory Update**	**Sarah Bernstein** *Managing Principal, Meketa* **Steven Marlowe** *Assistant Attorney General, Oregon Department of Justice*	**7**
12:10-12:40	**8. OPERF 2022 Performance Review**	**Mika Malone** *Managing Principal, Meketa* **Paola Nealon** *Managing Principal, Meketa*	**8**
12:40	**9. Calendar — Future Agenda Items**	**Rex Kim**	**9**
12:40	**10. Open Discussion**	**OIC Member** **Staff** **Consultants**	
12:50	**10. Public Comments**		

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State of Oregon
Office of the State Treasurer

16290 SW Upper Boones Ferry Road
Tigard, Oregon 97224

OREGON INVESTMENT COUNCIL

January 25, 2023

Meeting Minutes

Members Present:	Cara Samples, Lorraine Arvin, Tobias Read, John Russell, Pia Wilson-Body, Kevin Olineck
Staff Present:	Rex Kim, Michael Langdon, David Randall, Karl Cheng, Mike Mueller, Chris Ebersole, Alli Gordon, Jennifer Kersgaard, Louise Howard, Wil Hiles, Claire Illo, Kenny Bao, Doug Greiner, Sara Bayes, Chuck Christopher, Eric Engleson, Angela Schaffers
Staff Participating Virtually:	Ryan Auclair, Amy Bates, Tyler Bernstein, Taylor Bowman, Tan Cao, Austin Carmichael, Andrew Coutu, Bradley Curran, Ashley Daigle, Debra Day, Will Hampson, Majed Harfouche, John Hershey, Ian Huculak, Roy Jackson, Aliese Jacobsen, Kristi Jenkins, Josh Jones, Amanda Kingsbury, Paul Koch, Krystal Korthals, Mary Krehbiel, Ericka Langone, Perrin Lim, John Lutkehaus, Ben Mahon, Michael Makale, Sommer May, Tim Miller, Dmitri Palmateer, Jen Plett, Tim Powers, Mohammed Quraishi, Raneen Jalajel, Jo Recht, Scott Robertson, Grace Roth, Faith Sedberry, Mark Selfridge, Stacey Spencer, Anna Totdahl, Andrey Voloshinov, Rachel Wray, Tiffany Zahas
Consultants Present:	Martin Escobari, Graves Tompkins, Andrea Joseph (General Atlantic); Thomas Martin, Ben Bronson (Aksia); Karen Jacobi, Derrek Ransford, Pete Veravanich (Pathway Capital Management); Colin Bebee, Allan Emkin, Paola Nealon, Mika Malone (Meketa Investment Group, Inc); Ashley Woeste (Aon)
PERS Present:	Kevin Olineck
Legal Counsel Present:	Steve Malone (Department of Justice)

The January 25, 2023, OIC meeting was called to order at 9:00 am by Cara Samples, Chair.

I. 9:00 am Review and Approval of Minutes

MOTION: Chair Samples asked for approval of the December 7, 2022, OIC regular meeting minutes. John Russell requested his statement be added to the minutes. Chair Samples moved approval at 9:01 am, and John Russell seconded the motion which then passed by a 5/0 vote.

II. 9:02 am Committee Reports

Private Equity Committee:

January 19	Hellman & Friedman XI	$250M
January 19	Alpine Investors	$200M

Real Estate Committee:
None

Opportunity Committee:
None

Alternatives Portfolio Committee:

December 7	EnCap Flatrock Midstream Fund V	$150M
	with a sidecar	$50M
December 7	Global Infrastructure Partners Fund V	$251M
	with a sidecar	$99M
December 7	Warwick Partners V	$200M

Staff Discretion:
Common School Fund

January 19	Hellman & Friedman XI	$15M

III. 9:04 am Action Item: 2024 OIC Calendar Approval

MOTION: Cara Samples moved approval at 9:04 am, the motion was seconded by Member Russell and passed by a vote of 5/0.

IV. 9:05 am Private Equity Market Review

Michael Langdon, Director of Private Markets introduced guest speakers from General Atlantic.

Martin Escobari, Co-President; Graves Tompkins, Global Head of Capital Partnering; and Andrea Joseph, Managing Director, Capital Partnering presented the Private Equity Market Review.

V. 10:05 am OPERF Private Equity Annual Review (Action Item: Liquidity Program Recycling)

Michael Langdon, Director of Private Markets, introduced the presenters from Aksia and Pathway Capital Management.

Thomas Martin, Head of Private Equity & Real Assets, Aksia; Karen Jacobi, Senior Managing Director, Pathway Capital Management; Derreck Ransford, Managing Director, Pathway Capital Management; Pete Veravanich, Managing Director, Pathway Capital Management, presented the OPERF Private Equity Annual Review.

OPERF performance has been strong, with returns exceeding both the 1 and 5 year return for the Russell 3000+300 benchmark by 10.5% and 2.8%, respectively.

MOTION: Treasurer Read moved approval of proposed Liquidity Program Recycling at 11:48 am, the motion was seconded by Member Arvin and passed by a vote of 5/0.

VI. 11:56 am OPERF Opportunity Portfolio Annual Review (Action Item: INV 703 Updates)

Mike Mueller, Investment Officer, Alternatives and Ben Bronson, Senior Portfolio Advisor, Aksai, presented the OPERF Opportunity Portfolio Annual Review.

The OPERF Opportunity Portfolio generated a gain of 1.2%, while the CPI+500 benchmark returned a gain of 12.4%.

MOTION: Treasurer Read moved approval of proposed INV 703 at 12:21 pm, the motion was seconded by Member Arvin and passed by a vote of 5/0.

VII. 12:22 pm Asset Allocation & NAV Updates

Rex Kim, Chief Investment Officer presented the asset allocation and NAV updates.

VIII. 12:24 pm Calendar – Future Agenda Items

Rex Kim presented the forward calendar for the rest of 2023. Some modest changes are being made; we've added semi-annual reviews for the larger portfolios, Common School Fund and SAIF. We are working on building out educational sessions throughout the year regarding ESG and Climate.

IX. 12:26 pm Open Discussion

None

X. 12:27 pm Public Comments

Chair Samples opened the floor to public comments. Public comments have also been submitted electronically and included with the public meeting book.

Chair Samples adjourned the meeting at 12:53 pm.

Respectfully submitted,
Jennifer Kersgaard
Executive Support Specialist

TAB 2

COMMITTEE REPORTS

OIC

OREGON STATE TREASURY

TAB 3

REAL ESTATE

MARKET UPDATE

OIC

OREGON STATE TREASURY

TAB 4

OPERF REAL ESTATE

PORTFOLIO REVIEW

March 8, 2023

OPERF Real Estate Portfolio Annual Review & 2023 Plan

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Agenda

		OIC Investment and Management Beliefs Mapping																	
Section	Pages	1A	1B	1C	1D	2A	2B	3A	4A	4B	5A	5B	6A	6B	7A	7B	8A	8B	9A
Agenda	2																		
Real Estate Portfolio Preface	3 - 5																		
Executive Summary	6																		
Investment Environment	7																		
Real Estate Year In Review	8 - 12																		
Real Estate Performance	13 - 15																		
Real Estate Portfolio Update	16 - 19																		
2023 Real Estate Plan	20 -23																		
Policy Reporting	24																		
Closing	25																		

LEGEND: OIC INVESTMENT AND MANAGEMENT BELIEFS

1 **THE OIC SETS POLICY AND IS ULTIMATELY RESPONSIBLE FOR THE INVESTMENT PROGRAM**

A. Investment management is dichotomous -- part art and part science.
B. The OIC is a policy-setting council that largely delegates investment management activities to the OST and qualified external fiduciaries.
C. The OIC is vested with the authority to set and monitor portfolio risk. Both short-term and long-term risks are critical.
D. To exploit market inefficiencies, the OIC should be long term, contrarian, innovative, and opportunistic in its investment approach.

2 **ASSET ALLOCATION DRIVES RISK AND RETURN**

A. Asset allocation is the OIC's primary policy tool for managing the investment program's long-term risk/return profile.
B. Portfolio construction, including diversification and correlation considerations, is essential to maximizing risk-adjusted returns.

3 **THE EQUITY RISK PREMIUM WILL BE REWARDED**

A. Over the long-term, equity-oriented investments provide reliable return premiums relative to risk-free investments.

4 **PRIVATE MARKET INVESTMENTS CAN ADD SIGNIFICANT VALUE AND REPRESENT A CORE OIC/OST COMPETENCY**

A. The OIC can capitalize on its status as a true, long-term investor by making meaningful allocations to illiquid, private market investments.
B. Dispersion in private market investment returns is wide; accordingly, top-quartile manager selection, diversification across vintage year, strategy type, and geography, and careful attention to costs are paramount.

5 **CAPITAL MARKETS HAVE INEFFICIENCIES THAT CAN BE EXPLOITED**

A. Inefficiencies that can be exploited by active management may exist in certain segments of the capital markets.
B. Passive investment management in public markets will outperform the median active manager in those markets over time.

6 **COSTS DIRECTLY IMPACT INVESTMENT RETURNS AND SHOULD BE MONITORED AND MANAGED CAREFULLY**

A. All fees, expenses, commissions, and transaction costs should be diligently monitored and managed in order to maximize net investment returns.
B. External incentive structures should be carefully evaluated to ensure proper alignment with investment program objectives.

7 **FAIR AND EFFICIENT CAPITAL MARKETS ARE ESSENTIAL FOR THE LONG-TERM INVESTMENT SUCCESS**

A. The OIC recognizes that the quality of regulation and corporate governance can affect the long-term value of its investments.
B. The OIC also recognizes that voting rights have economic value.

8 **THE INTEGRATION OF ENVIRONMENTAL, SOCIAL AND GOVERNANCE (ESG) FACTORS, SIMILAR TO OTHER INVESTMENT FACTORS, MAY HAVE A BENEFICIAL IMPACT ON THE ECONOMIC OUTCOME OF AN INVESTMENT AND AID IN THE ASSESSMENT OF RISKS ASSOCIATED WITH THAT INVESTMENT**

A. The consideration of ESG factors within the investment decision-making framework is important in understanding the near-term and long-term impacts of investment decisions.
B. Over time, there has been an evolution of multi-factor, or more holistic approaches, to identify opportunities and remediate risks, in a large globally-diversified investment portfolio.

9 **DIVERSITY, IN ALL ASPECTS, IS ACCRETIVE TO MEETING OIC OBJECTIVES**

A. By embracing and enhancing diversity and inclusion efforts, the OIC ensures that the investment program will be exposed to and informed by a wide range of perspectives, ideas and opinions.

Real Estate Strategic Role

The strategic role of OPERF real estate investments is outlined in OIC INV 1201 – Statement of OIC Investment and Management Beliefs and OIC Policy INV 501 – Acquiring and Managing Equity Real Estate. Return and risk objectives for the Real Estate Portfolio (outlined in OIC Policy INV 501 Acquiring and Managing Equity Real Estate) are as follows:

1) To achieve long-term, net returns to OPERF above the NFI-ODCE[1] plus 50 basis points (bps); and

2) To reduce risk among the Portfolio's investments through diversification by strategy, property type, investment size, geography, and time

Real Estate Policy Objective – The OIC's real estate policy objective of long-term, net returns above the NFI-ODCE plus 50 basis points has been achieved over all time period with the exception of the twelve months ended September 30, 2022

Period Ending 9/30/2022	Net Asset Value	3 Months	1 Year	3 Years	5 Years	10 Years	Since Inception
OPERF Real Estate Portfolio	**$13,389,405,933**	**0.91%**	**20.54%**	**13.55%**	**11.35%**	**11.21%**	**10.80%**
NFI-ODCE, Net +50bps		0.43%	21.46%	11.88%	9.76%	10.41%	
Excess		**0.48%**	**-0.92%**	**1.67%**	**1.59%**	**0.80%**	

[1]National Council of Real Estate Investment Fiduciaries – Open End Diversified Core Equity Index (NFI-ODCE) + 50 bps (net)

Real Estate Position

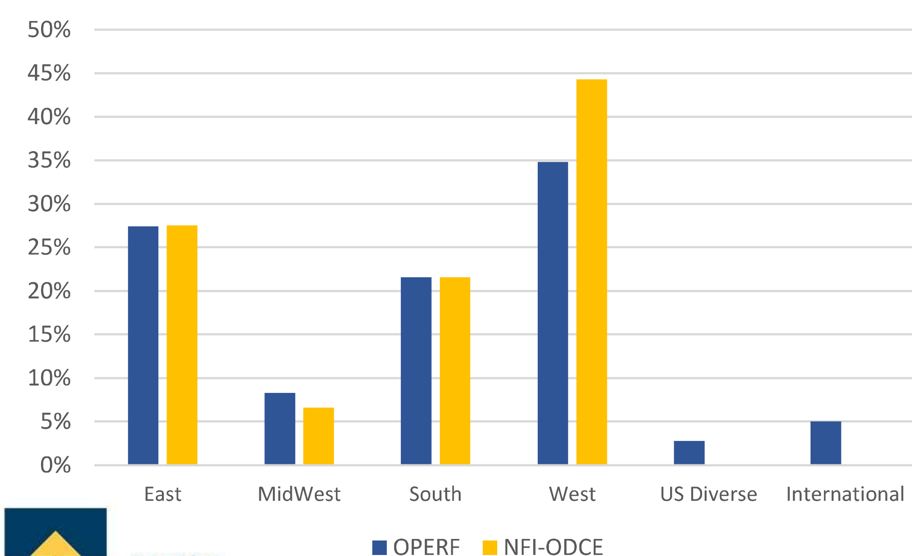
Strategic Allocation Targets

Allocation	Market Value ($mm)	Market Value (%)	OIC Target	OIC Ranges
Core	$ 10,237	76.5%	55%	45-65%
Value Added	$ 1,471	10.9%	20%	10-30%
Opportunistic	$ 1,326	9.9%	20%	10-30%
REITs	$ 356	2.7%	5%	0-10%

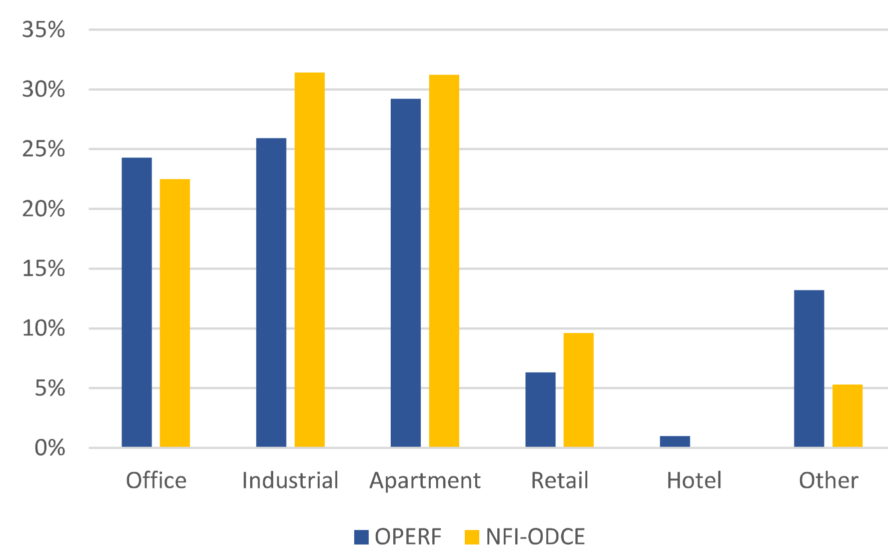
Top 10 Partnerships

Manager	Market Value ($mm)	Market Value (%)	Risk
Lincoln Advisors	$ 2,003	15.0%	Core
GID	$ 1,819	13.6%	Core
Lionstone	$ 937	7.0%	Core/Value Add
Clarion Partners	$ 919	6.9%	Core
Prologis	$ 752	5.6%	Core
Ascentris	$ 585	4.4%	Core/Value Add
Regency	$ 584	4.4%	Core
Harrison Street	$ 572	4.3%	Core/Value Add
DivcoWest	$ 487	3.6%	Core/Value Add
LBA Realty	$ 452	3.4%	Core/Value Add
Total:	$9,111	68.0%	

Geographic Weights



Property Sector Weights



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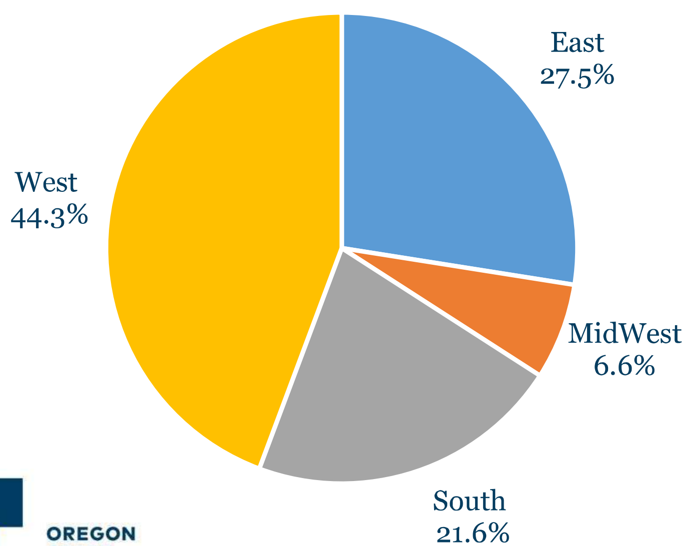
Real Estate Benchmark Composition

Real Estate Benchmark: The NCREIF Fund Index – Open End Diversified Core Equity Index (NFI-ODCE) + 50 bps (net)

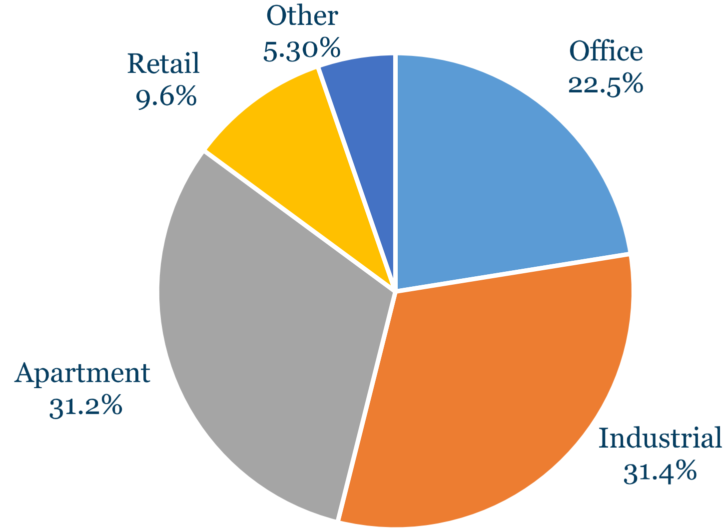
NCREIF: National Council of Real Estate Investment Fiduciaries

NFI-ODCE Benchmark Composition:
- Number of Funds in Benchmark: 26
- United States
- Open-End Core Funds Diversified across four primary property types
- Low Leverage (max 35%)

NFI-ODCE
Geographic Weights



NFI-ODCE
Property Sector Weights



Executive Summary

Key Takeaways…

1. Portfolio returns have been strong across time periods, primarily attributed to growth in the core portfolio during a time of sustained strong core performance and strategic pivot toward higher industrial and multifamily exposures

2. The private real estate market reached an inflection point in late 2022, with the fourth quarter ushering in an expected near-term trend of meaningful write-downs across sectors due primarily to rising financing costs, increased cap rates, and continuing uncertainty around commercial tenant demand

3. Overweight to core demonstrates the portfolio's long-term, income-driven focus. The emphasis over the past several years on growing the industrial and multifamily asset based has reduced relative exposure to the challenged office sector

4. Non-core strategies, while comprising a smaller component of the portfolio, provide a degree of diversification and tactical exposure to Value Add and Opportunistic opportunities during periods of market dislocation

5. Allocation is within policy bandwidth but above the target midpoint. Much of the capital committed to evergreen structures (open-ended funds and separately managed accounts) over the past 12-18 months has yet to be called, positioning the portfolio to capitalize upon potential distress and discounted buying opportunities in the current period of market dislocation

Investment Environment

- **Capital Markets**
  - Real estate financing costs have increased significantly in the U.S., and transaction volume has severely diminished, reaching GFC-era lows in many markets
  - Higher interest rates have driven somewhat of a correction in public market REIT pricing, but private market valuations have lagged due to the lack of transactional activity
  - Opportunities to capitalize on distressed or liquidity-driven decisions have the potential to provide attractive risk-adjusted returns relative to prior years; however, bid-ask spreads still persist and the window of advantageous pricing may be relatively short
- **Residential**
  - Rental housing is proving to be a viable inflation hedge in many markets with rent growth remaining above long-term averages in 2022, and home price affordability continues to be challenged due to higher mortgage rates. Renter demand in growth markets remained strong in 2022 but may temper depending upon employment and income growth trends
  - In light of persistent affordability challenges and a weaker macroeconomic backdrop, rent growth has plateaued in many markets, although this is expected to be partially offset by reduced construction starts and embedded rent growth, supporting moderate net operating income growth in 2023
- **Industrial**
  - Industrial fundamentals remain strong, as users remain focused on generating resiliency and redundancy though increasing and diversifying their supplier networks in addition to optimizing overall supply chain costs in the current inflationary environment
  - Net absorption and rent growth are expected to decelerate due to the economic slowdown, but persistently low vacancy rates, reduced supply, and strong embedded rent growth (a spread generally remains between market and in-place rents) should support fundamentals over the near to intermediate term
- **Office**
  - The office sector will be increasingly challenged as a slower economy and workforce reductions are anticipated to generate additional downward pressure on occupancy and rents
  - Older assets already suffering from outdated amenities and weaker locations will be increasingly challenged, but high quality, amenitized, well-located office buildings may still outperform on a relative basis
  - Office fundamentals are expected to remain the weakest of all property sectors over the near term, with pricing adjustments felt heaviest in many former “gateway” markets due to lower relative growth
- **Retail**
  - Retail sector fundamentals have largely rebounded for high quality assets, driven by sales growth and a lack of new supply, but slowing economic growth and uncertainty around employment growth may lead to near term softness
  - Cap rates generally remain above the other major sectors primarily due to investor anchoring that began before the pandemic, but as a result, retail cap rates may demonstrate more resilience on a relative basis in the current economic environment

Real Estate 2022 Year In Review

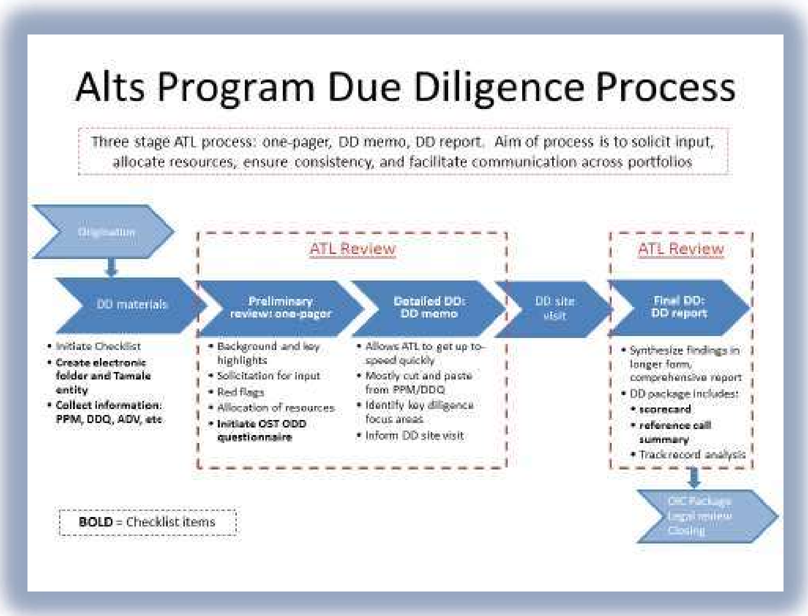
2022 was focused on capitalizing separately managed accounts in resilient, demographically-driven sectors, as well as seeking high-quality diversifying investment opportunities and continued portfolio alignment and monitoring efforts

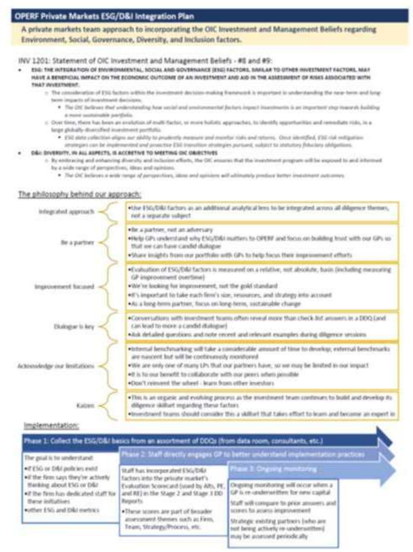
- $1.75 billion in new commitments across nine investments
- Completed renegotiation and amendment of Separate Account agreements to reflect updated terms, improved alignment and significant fee savings
- Resumption of travel to assets and in-person manager meetings to re-engage on strategic asset-level and portfolio construction initiatives
- Integration of underwriting and due diligence to further build out the Common School Fund (CSF) real estate portfolio, leveraging OPERF investment relationships to achieve favorable economics
- Supported onboarding of Insight eFront risk platform to integrate risk monitoring
- Continued refinement of internal due diligence and monitoring processes, including the integration of ESG and DEI factors
- Commencement of diligence process on further portfolio diversification via international core real estate exposures

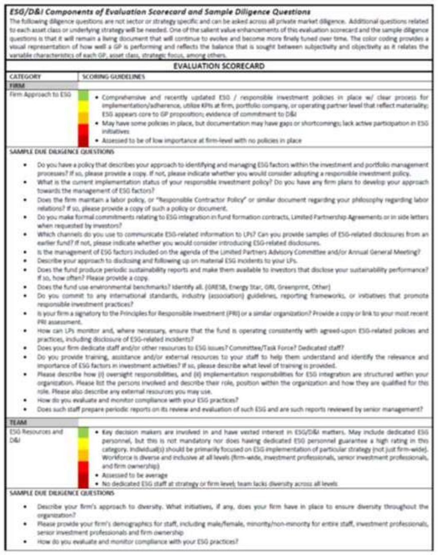
Portfolio Update – ESG/DEI Integration

ESG/DEI Factor Inclusion

- Building on work done in recent years and acknowledging the OIC's reinforced focus on Environmental, Social & Governance (ESG) and Diversity, Equity & Inclusion (DEI), the real estate team has integrated these factors into all stages and elements of both the due diligence and monitoring processes
- The primary focus of these efforts is to form a qualitative assessment of a manager's application and integration of ESG and DEI factors into the management of investments and their business
- ESG and DEI approaches, focus areas and nomenclature vary significantly from manager to manager making portfolio level aggregation challenging



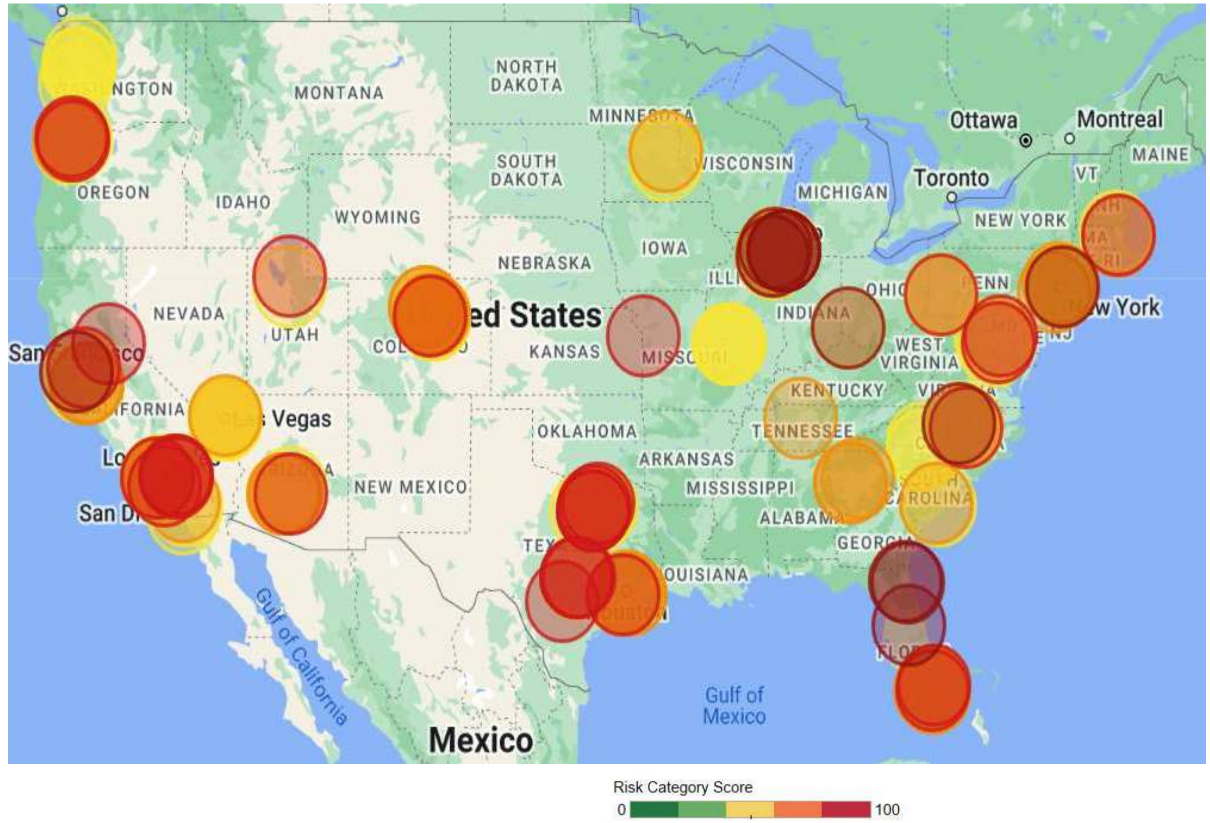




ESG Initiatives

The real estate portfolio team has integrated a physical climate risk assessment from Four Twenty Seven into the onboarding process for new property acquisitions in OPERF's separate accounts

- Heat Stress
- Wildfires
- Floods
- Hurricanes & Typhoons
- Sea level rise
- Water Stress



Summary Statistics	Floods	Heat Stress	Hurricanes & Typhoons	Sea Level Rise	Water Stress	Wildfire
Maximum	81	82	95	80	99	96
Mean	24	54	39	6	63	69
Minimum	0	33	0	0	22	31

Source: FourTwentySeven, Map represents Flood Risk

Real Estate 2022 Year In Review – Approvals

In 2022: 9 real estate commitments were approved, totaling $1.75 billion

Pacing

- The commitments conform to the team's long-term plan to strategically increase exposures to asset classes and strategies that fulfill portfolio construction needs
- All 2022 commitments represented continuations or expansions of existing manager relationships, reflecting Staff's high degree of conviction in its manager roster and the ability of these groups to execute well-aligned, accretive investments strategies

Fees

- Continued progress toward lower fees through tailored partnership structures and selective exposure to higher-fee closed-end structures
- Core commitments in 2022 included management fees that averaged a 40% discount to average fee structures for comparable open-ended vehicles. Non-core commitments included management fees that averaged a 15% discount to average fee structures for comparable closed-end vehicles.[1]

Strategy

- Thematically, 2022 commitments represent: (1) continued long-term overweight intentions to multifamily, industrial and alternative real estate assets; and (2) re-ups to existing partners with demonstrated track records

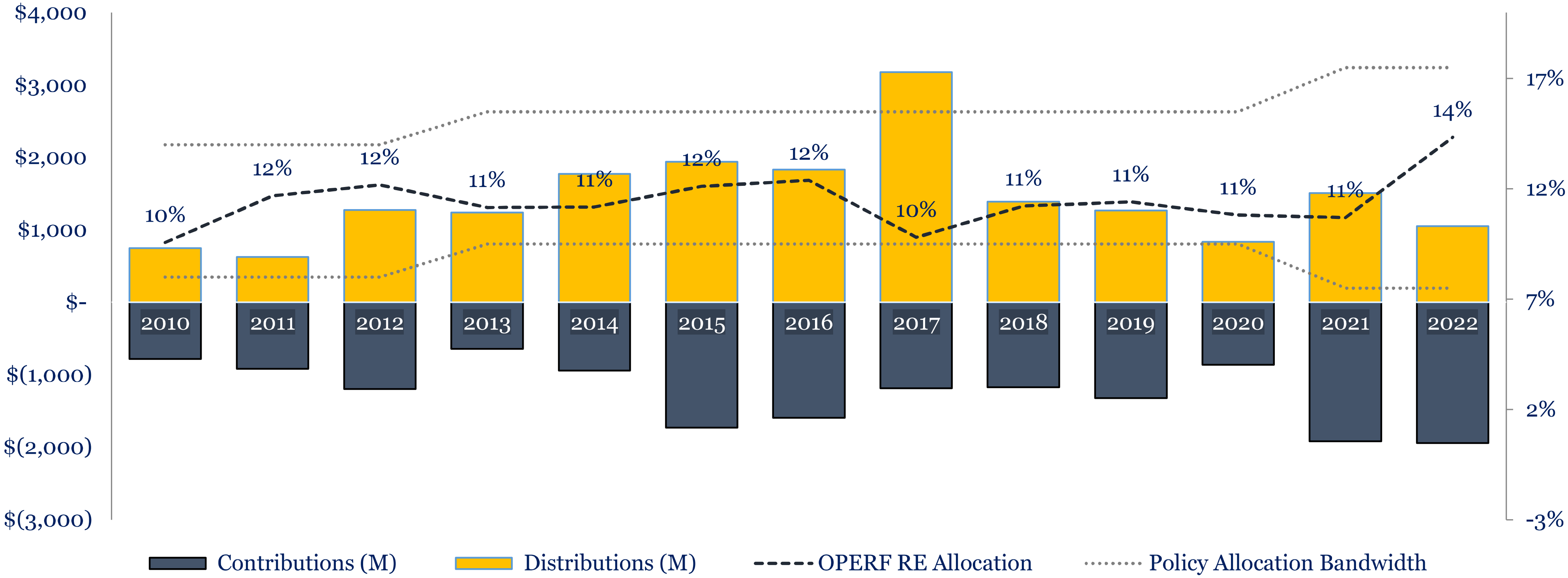
FUND NAME	STRATEGY	SUB-PORTFOLIO	GEOGRAPHY	COMMITMENT ($ MM)	FUNDING STATUS
Oregon Abacus Multifamily Associates SMA (re-up)	Multifamily	Core	Domestic	250	Partially Funded
Abacus Multifamily Value-Add Fund VI	Multifamily	Value-Add	Domestic	150	Partially Funded
GID WCRF SMA (re-up)	Multifamily	Core	Domestic	200	Unfunded
Blackstone Real Estate Partners X	Diversified	Opportunistic	Global	300	Unfunded
Harrison Street Real Estate Partners IX	Alternative/Niche	Opportunistic	Domestic	150	Partially Funded
Harrison Street-OR Life Science Partners (re-up)	Alternative/Niche	Core / Opp	Domestic	200	Partially Funded
Clarion Columbia Office Properties (re-up)	Diversified	Core	Domestic	150	Unfunded
Sculptor Diversified Real Estate Income Trust	Alternative/Niche	Core	Domestic	150	Unfunded
Oak Street Real Estate Capital Fund VI	Diversified	Value-Add	Domestic	200	Unfunded
NEW COMMITMENTS SUB-TOTAL				**1,750**	

Source: (1) PREA 2022 Management Fees and Terms Study

Real Estate 2022 Year In Review – Allocations

Portfolio allocation remains within policy bandwidth

- The real estate portfolio has generated $2.4 billion in net cash flows to OPERF since 2010
- As the core commitments made over the past few years fully invest, and with over 70% of the real estate portfolio in evergreen structures (open-ended funds and separate accounts), distributions from income will become an increasingly larger component of future portfolio cash flows
- Real Estate is currently within its policy range of 7.5% to 17.5%, but above the midpoint target of 12.5%



Portfolio strategic weightings to Core = permanent positive cash flow & yield generation

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As of estimated 12/31/2022

Source: OST, Private Edge

Performance Review

- The Core portfolio has shown continued strong long-term performance, having outperformed the policy benchmark over all time periods presented, including on a 1-, 3-, 5-, and 10-year basis
- The Value Add portfolio underperformed the policy benchmark over the 1-, 3-, and 5-year periods, although it outperformed by 11 bps over the trailing 10-years
- The Opportunistic portfolio underperformed the benchmark over the respective 1-, 3-, 5-, and 10-year periods

Summary of Portfolio Investment Returns		Q3 2022	1-Yr	3-Yr	5-Yr	10-Yr	Since Inception[1]
Total Private Real Estate	Income	0.68%	2.81%	3.06%	3.32%	3.73%	3.85%
	Appreciation	0.47%	18.62%	10.85%	8.23%	8.05%	6.84%
	Total	1.15%	21.81%	14.16%	11.76%	12.00%	10.90%
Core	Income	0.80%	3.12%	3.73%	3.99%	4.65%	6.74%
	Appreciation	0.86%	21.13%	12.66%	9.42%	8.58%	3.73%
	Total	1.66%	24.73%	16.74%	13.70%	13.53%	10.67%
Value Added	Income	0.33%	1.23%	0.00%	0.19%	1.90%	0.70%
	Appreciation	-1.53%	9.53%	4.75%	6.04%	8.51%	4.13%
	Total	-1.20%	10.85%	4.76%	6.25%	10.52%	4.58%
Opportunistic	Income	0.19%	2.20%	2.22%	2.84%	3.05%	0.39%
	Appreciation	-0.40%	10.76%	6.37%	4.49%	5.04%	10.43%
	Total	-0.21%	13.10%	8.70%	7.45%	8.22%	10.98%
Public Real Estate – REITs	Income	1.34%	3.74%	3.92%	4.25%	4.04%	5.53%
	Appreciation	-8.49%	-15.40%	-1.71%	-0.21%	1.76%	4.12%
	Total	-7.15%	-12.08%	2.15%	4.02%	5.84%	9.85%
Total Portfolio	Income	0.70%	2.84%	3.09%	3.37%	3.66%	4.69%
	Appreciation	0.21%	17.34%	10.22%	7.79%	7.35%	5.91%
	Total	**0.91%**	**20.54%**	**13.55%**	**11.35%**	**11.21%**	**10.80%**
NFI-ODCE, Net +50 bps[2]		0.43%	21.46%	11.88%	9.76%	10.41%	
NAREIT Index		-10.83%	-16.27%	-1.10%	4.02%	6.95%	

All returns represented are net of fees.

[1] Since Inception benchmark data not available due to cash flows not-verifiable for period prior to Private Edge contract commencement Q1 2006

[2] NFI-ODCE +50bps was adopted as Policy benchmark commencing April 1, 2016; net of fees, levered

OREGON STATE TREASURY

Growth of Core Portfolio

Open-End Core Portfolio

Open-End Funds	NAV	2017 and Earlier	2018	2019	2020	2021	2022
RREEF America II	$110,802,230	●					
Prologis European Logistics Fund	$244,440,597	●					
JP Morgan Strategic Property Fund	$352,527,760	●					
ASB Allegiance Real Estate Fund	$213,542,918	●					
Morgan Stanley Prime Property Fund	$334,652,245		●				
Heitman America Real Estate Trust	$199,782,736		●				
Harrison Street Core Property Fund	$188,677,188		●				
Harrison Street CPF Co-Investment	$109,352,491			●			
Prologis Targeted US Logistic Fund	$508,046,236			●			
Nuveen U.S. Cities Multifamily Fund	$148,716,528				●		
AEW Core Property Trust	$149,352,738					●	
GID Mainstay Fund	$215,973,338					●	
Walton Street Real Estate Core-Plus Fund	$271,978,880					●	
AEW Essential Housing Fund	$12,457,258						●

Open-End Funds	NAV	1-Year	3-Year	5-Year	10-Year
Total:	**$3,082,699,427**	**23.19%**	**15.04%**	**11.69%**	**10.40%**
NFI-ODCE + 50 bps		**21.46%**	**11.88%**	**9.76%**	**10.41%**
Outperformance		**1.73%**	**3.16%**	**1.93%**	**-0.01%**

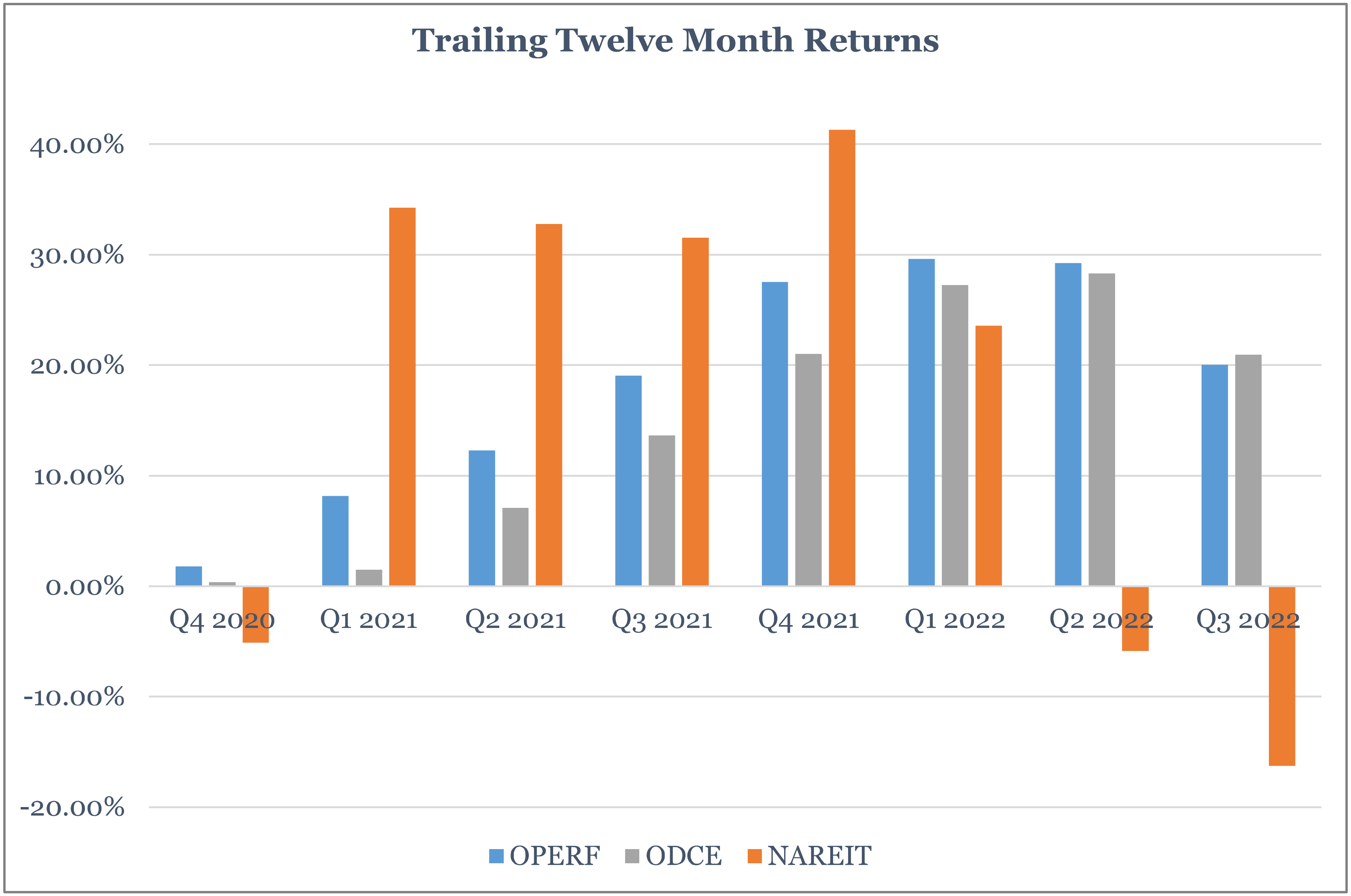
Separate Account Portfolio

Separately Managed Funds	NAV	2017 and Earlier	2018	2019	2020	2021	2022
Clarion	$911,912,394	●					
Lincoln	$2,003,202,691	●					
Regency	$583,937,135	●					
GID WCRF	$1,603,196,086	●					
Lionstone LORE	$932,329,325	●					
Waterton Fund IX PT Chicago	$237,234,477	●					
Ascentris	$584,631,149		●				
DW-Columbia Perfco	$218,336,299			●			
LBA Industrial	$417,624,611			●			
Abacus	$359,513,128				●		

Open-End Funds	NAV	1-Year	3-Year	5-Year	10-Year
Total:	**$7,851,917,295**	**23.76%**	**15.76%**	**13.50%**	**14.53%**
NFI-ODCE + 50 bps		**21.46%**	**11.88%**	**9.76%**	**10.41%**
Outperformance		**2.30%**	**3.88%**	**3.74%**	**4.12%**

Source: OST, Private Edge, SitusAMC

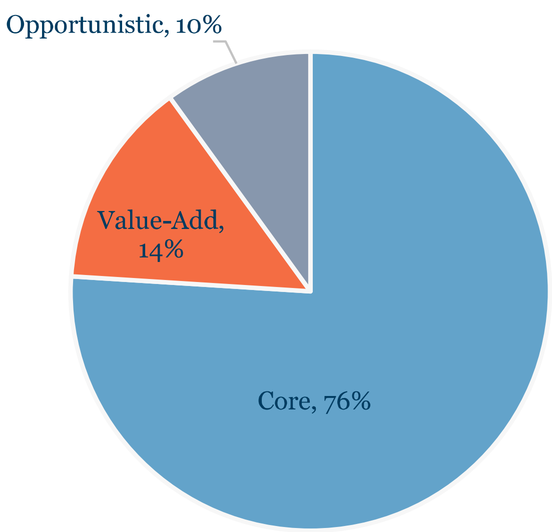
Relative Returns – Public and Private Markets



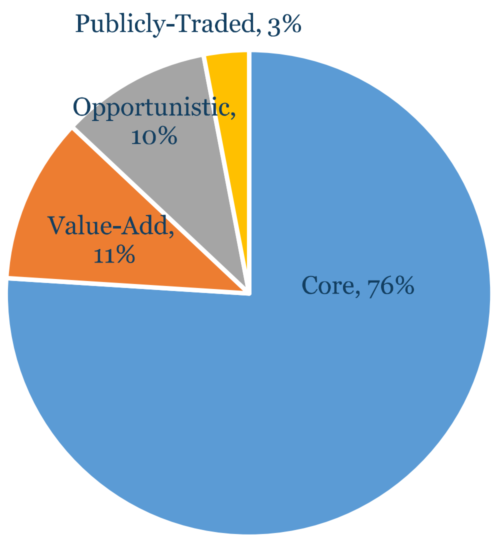
Portfolio Update – Peer Comparison

Risk Allocations

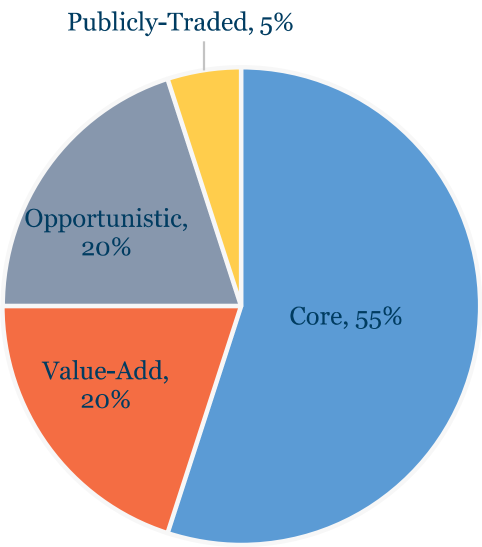
- Although OPERF's policy targets allow for a marginally riskier portfolio than the average institutional investors surveyed by Pension Real Estate Association, Staff has implemented a portfolio allocation that is more similar to the peer group



Peer Group



OPERF (9/30/2022)



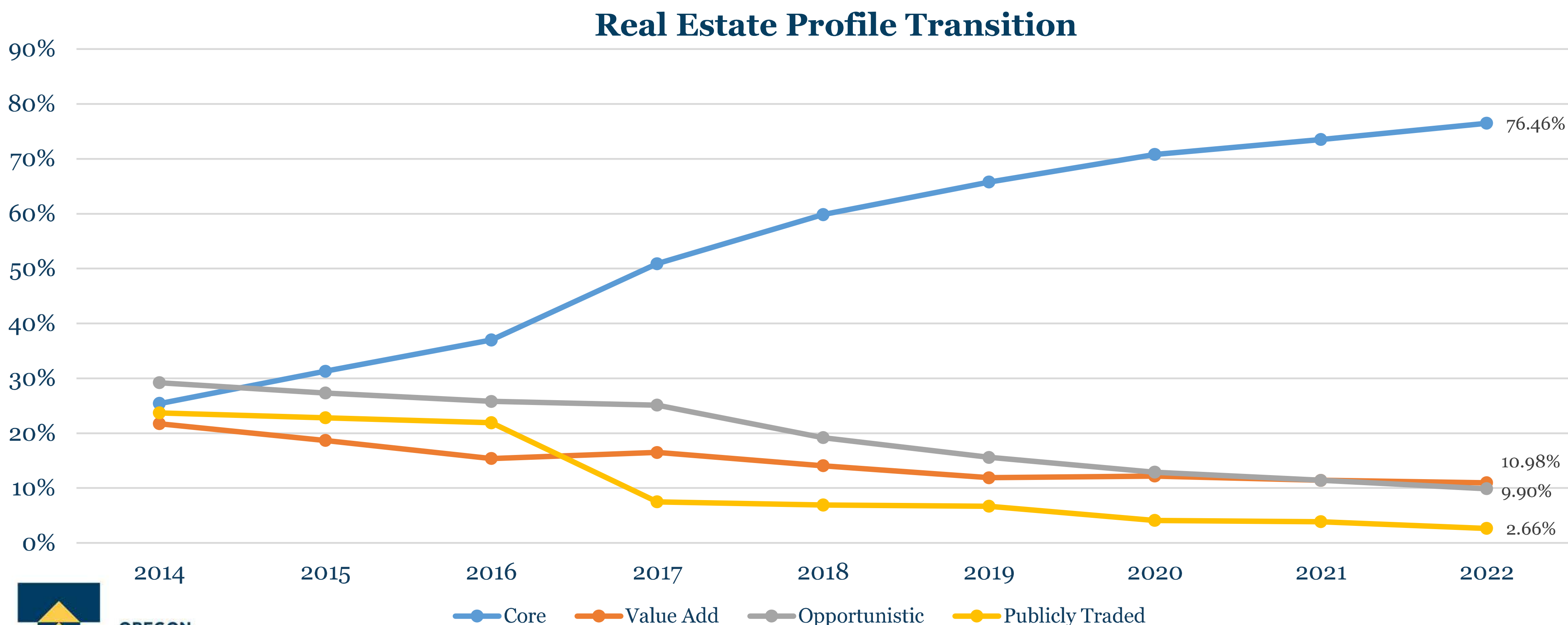
OPERF Policy (Target)

Source: 2023 PREA Investment Intentions Survey

Portfolio Update – Strategy Exposure

Portfolio Policy Change ("de-risking") – 2014 to current

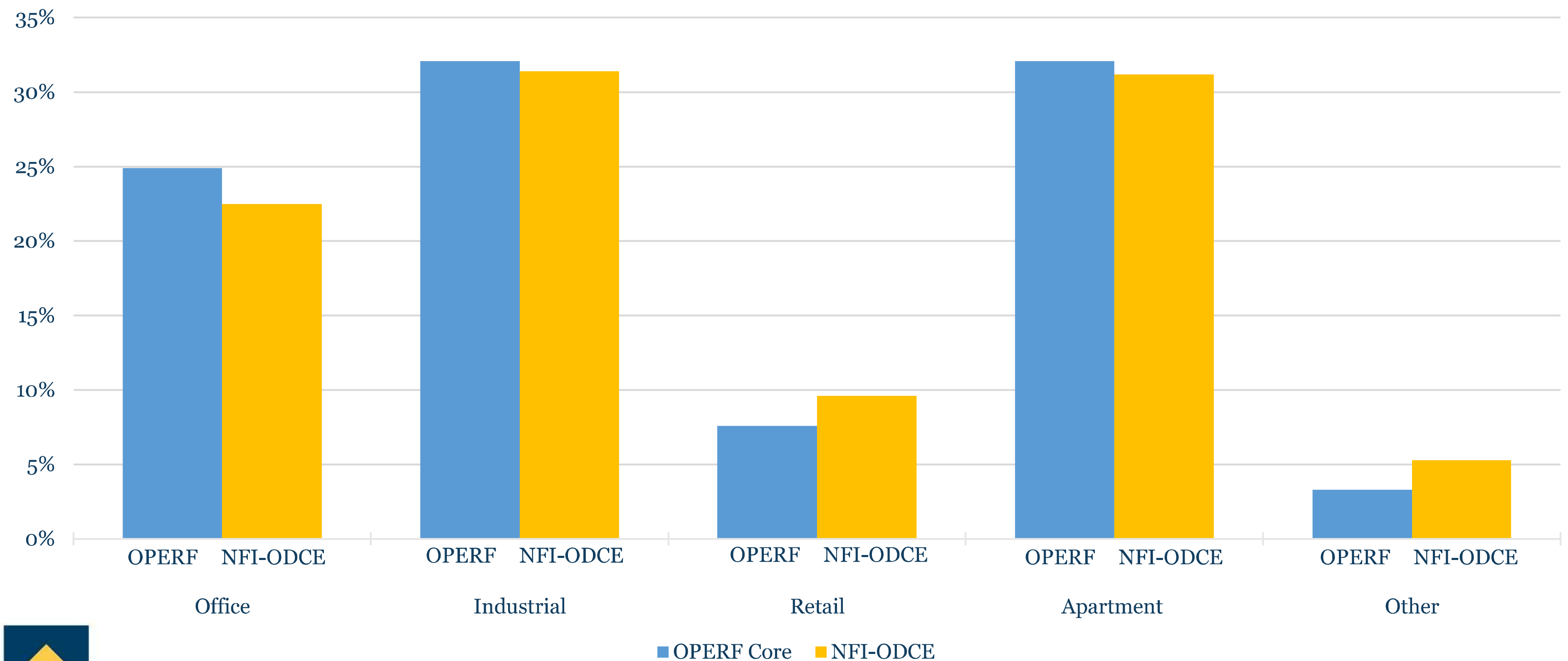
- Beginning in 2014, Staff shifted new capital commitments toward long term investment partnerships – Core/Core Plus SMAs and open-ended structures, while maintaining a baseline exposure to non-core strategies
- **Core:** Currently overweight due to increased pacing into Core SMAs relative to Value Add and Opportunistic funds, combined with outperformance of Core real estate relative to non-core strategies over the intermediate term
- **Non-Core** (Value Add, Opportunistic): Combined allocation of 20.88% is at the bottom of current policy range. Staff has allocated 15-25% non-core allowances to most SMAs, which will maintain long-term Non-Core exposures within range as this capital continues to deploy
- **Public REITs**: maintain exposure within 0-10% allocation, primarily to serve as a diversifier to the Core portfolio



Portfolio Update – Property Exposure

Core Portfolio Weightings

- Staff actively manages portfolio exposures for strategic over and underweights to the benchmark
  - Portfolio has benefited from multi-year shift toward heavier industrial and multifamily exposure as well as decreased pacing into the office and retail sectors
  - Long term intentions are to continue overweight to industrial and multifamily while reducing exposure to non-strategic office weightings through opportunistic dispositions
  - “Other” category consists of many non-traditional institutional property types which have benefited from secular market changes and attractive demand drivers

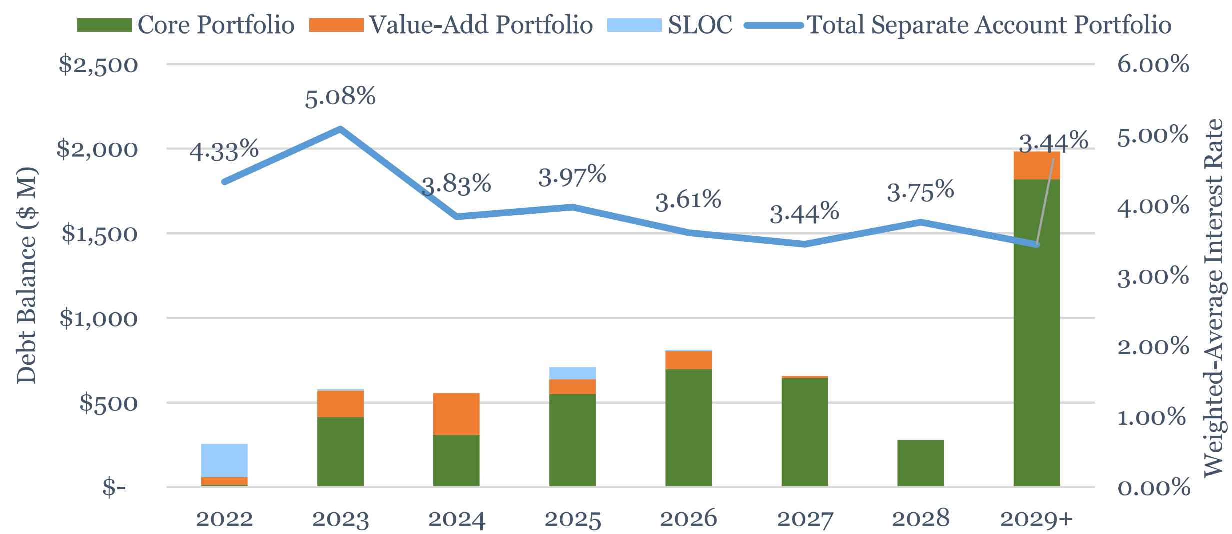


Portfolio Update – Debt Summary

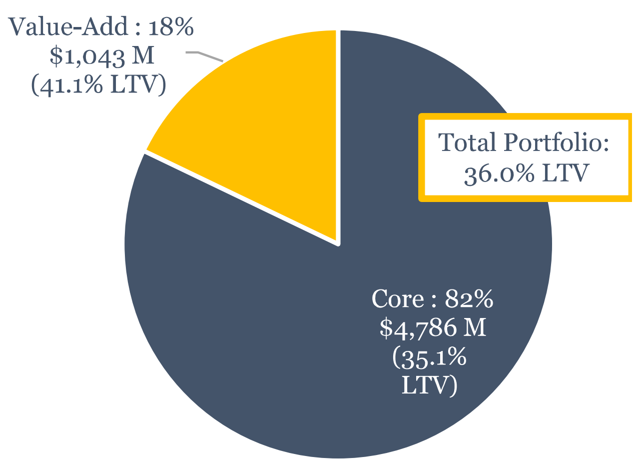
Debt Breakdown

Total Separate Account Portfolio	Debt ($ M)	Debt (%)	Weighted-Ave Years to Maturity	Weighted-Ave Interest Rate
Total Mortgage Debt	**$5,544**	**95%**	**4.8 years**	**3.77%**
Fixed[1]	$4,282	73%	5.3 years	3.52%
Floating	$1,262	22%	3.1 years	4.63%
Total Subscription Lines of Credit (SLOC)	**$285**	**5%**	**0.2 year**	**4.23%**
Fixed	$0	0%	N/A	N/A
Floating	$285	5%	0.2 year	4.23%
Total Debt	**$5,829**	**100%**	**4.6 years**	**3.79%**

Debt Maturity Schedule



Separate Account Portfolio Outstanding Debt by Strategy[2]



	Core Portfolio		Value-Add Portfolio		SLOC		Total Portfolio	
Maturity Year	Debt Balance ($ M)	Weighted-Ave Interest Rate	Debt Balance ($ M)	Weighted-Ave Interest Rate	Debt Balance ($ M)	Weighted-Ave Interest Rate	Debt Balance ($ M)	Weighted-Ave Interest Rate
2022	$15	3.17%	$44	5.49%	$197	4.15%	$255	4.33%
2023	$416	5.14%	$155	4.90%	$8	4.85%	$578	5.08%
2024	$308	3.81%	$249	3.87%	$0	N/A	$557	3.83%
2025	$551	3.94%	$86	3.79%	$73	4.42%	$709	3.97%
2026	$698	3.55%	$106	3.97%	$7	3.86%	$811	3.61%
2027	$646	3.43%	$11	4.35%	$0	N/A	$657	3.44%
2028	$278	3.75%	$0	N/A	$0	N/A	$278	3.75%
2029+	$1,819	3.42%	$165	4.05%	$0	N/A	$1,984	3.44%
Total	**$4,729**	**3.70%**	**$815**	**4.20%**	**$285**	**4.23%**	**$5,829**	**3.79%**

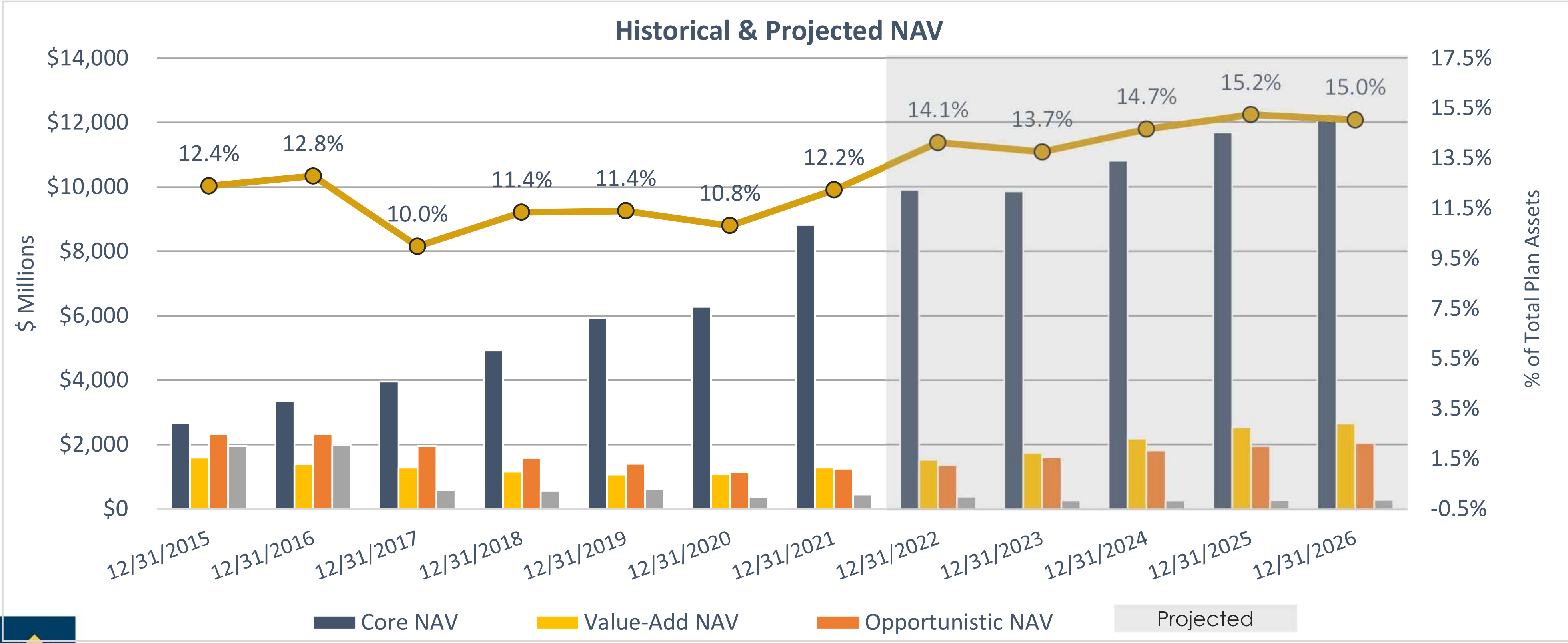
[1] Fixed rate debt includes floating rate debt that has been hedged with an interest rate swap.
[2] LTV calculations have the Subscription Lines of Credit allocated to the Core and Value-Add Portfolios, about half of which is allocated to the Value-Add portfolio and represents development activity untaken by GID. For all debt maturity calculations, SLOC debt is shown separately.
[2] Maturity Year excludes any extension options that may require certain covenants to be met.

As of 9/30/2022

OREGON STATE TREASURY

2023 Plan – Pacing

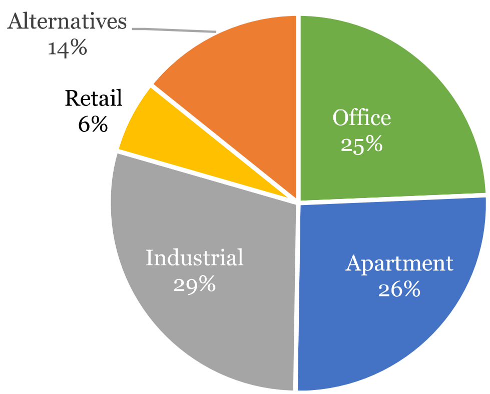
- With >70% of the portfolio weighted towards separate accounts and open-ended structures, Staff has greater control of capital pacing through scaling successful partnerships. This scalable relationship base provides improved negotiating leverage to reduce fees as partnership AUM grows
- At 20%-30% of the portfolio, closed-end funds will have a relatively smaller impact on capital pacing considerations and will be limited to select non-core strategies
- Pacing assumes a reasonable estimate for a near-term markdown but includes no assumptions for more active portfolio management using the tools available to Staff (e.g. redemptions from open-ended funds and separate accounts, recycling policies, accelerated divestitures, etc.)



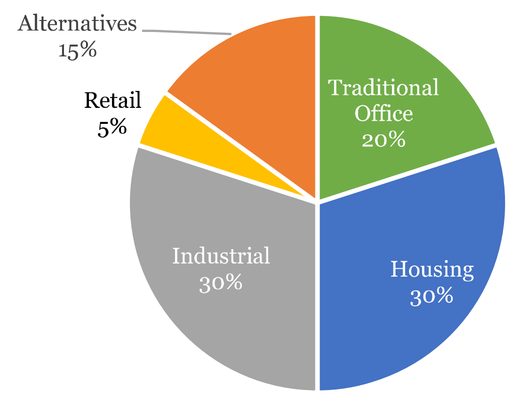
Source: OST

2023 Plan – Property Diversification

Current Real Estate Exposure



Representative Future Real Estate Portfolio



NCREIF Total Returns by Sector

2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
13.7%	17.1%	23.0%	21.2%	19.1%	20.5%	-4.1%	-10.9%	18.2%	15.5%	11.6%	12.9%	13.4%	15.3%	12.3%	13.1%	14.3%	13.4%	11.8%	43.3%	14.6%
8.8%	8.9%	13.0%	20.3%	17.0%	14.9%	-5.8%	-17.5%	12.6%	14.6%	11.2%	12.3%	13.1%	14.9%	9.0%	6.2%	6.9%	6.6%	1.8%	19.9%	7.1%
6.7%	8.2%	12.1%	20.0%	14.6%	13.5%	-7.3%	-17.9%	11.7%	13.8%	10.7%	10.4%	11.5%	12.5%	7.3%	6.0%	6.1%	5.5%	1.6%	6.1%	2.7%
2.8%	5.7%	12.0%	19.5%	13.3%	11.4%	-7.3%	-19.1%	9.4%	13.8%	9.5%	9.9%	10.3%	12.0%	6.2%	5.7%	2.2%	1.9%	-7.5%	4.2%	-3.4%

Apartment Industrial Retail Office

Asset Type Diversification

- As demonstrated above, the relative performance of different property types can vary considerably over time, hence the need for diversification of asset types in long-term portfolio construction
- Institutional real estate has expanded beyond the traditional "four food groups." Alternative, lesser correlated and demographically-driven property types will represent a larger portion of the investment portfolio over time

(1) Source: NPI as of December 2022; DWS; Nuveen; IREI

2023 Initiatives

2023 OST Real Estate Staff Priorities

1. **$700 million - $1.1 billion of new commitments**
   - 5-9 commitments of $100-250 million

2. **Strategic portfolio reviews with separate account managers to ensure underlying assets and areas of focus provide long-term alignment with Staff objectives**

3. **Continue diligence on core international partnerships**

4. **Prioritization of in-person diligence, monitoring and collaboration initiatives**

5. **Continue enhancements to due diligence and monitoring capabilities alongside development and refinement of best practices in ESG/DEI**

2023 Initiatives

2023 OST Real Estate Staff Priorities

7. Enhancement of Oregon's brand through industry participation:

- Board & Founding Member: Institute for Real Estate Operating Companies (iREOC)
- Editorial Advisory Board Member: Institutional Real Estate Americas
- Institutional Investment Mentor: Institutional Real Estate Springboard
- Board Member/President: Portland Alternative Investment Association (PAIA)

8. Extension of training and continuing education initiatives, both on an individual basis and by leveraging partner and industry relationships

9. Support potential leadership transition and onboarding

10. Continue integration of underwriting and due diligence for the Common School Fund (CSF) real estate portfolio

Policy Reporting

Responsible Contractor Policy (RCP)

- INV 504 (RCP) was approved by the OIC in January 2020
- Per policy, Staff shall "report on this Policy at a regular meeting of the OIC on an annual basis."

OPERATIONAL CONTRACTS				
	Payments to Responsible Contractors	Payments to Non-Responsible Contractors	Total Qualified Operating Expenditures	Payments as a % of Total Qualified Operating Expenditures
Total	$ 32,287,349	$ 659,443	$ 32,946,792	98.0%

TENANT IMPROVEMENTS & OTHER CAPITAL EXPENDITURES				
	Payments to Responsible Contractors	Payments to Non-Responsible Contractors	Total Qualified Operating Expenditures	Payments as a % of Total Qualified Operating Expenditures
Total	$ 212,202,689	$ 0	$ 212,202,689	100%

* Qualified expenditures are services or tenant improvements and other capital expenditures greater than $100,000. Total qualified expenditures include payments to both responsible contractors and contractors not meeting the responsible contractor definition.

Non-Mandate Activity

- There was no non-mandate activity in 2022

Closing

Key takeaways…

1. Performance remains strong, led by the core portfolio, both on an absolute basis and relative to the policy benchmark
2. As non-core, legacy fund exposures continue to liquidate, the portfolio returns for both Value-Add and Opportunistic have improved. Newer commitments to non-core real estate has been primarily through strategic partnerships which have improved capital stack flexibility, long-term investment horizons, and tailored economics for greater alignment
3. With the policy shift to lower the historic real estate portfolio volatility now completed, the real estate portfolio should remain cash flow positive to the broader OPERF portfolio
4. The market is expected to remain challenged in the near term due to higher financing costs, rising cap rates and lack of transaction activity, with value write-downs likely over multiple quarters. However, overall market fundamentals remain relatively healthy given that value changes are mostly driven by capital markets and over-supply risk remains low
5. The portfolio remains well-positioned to continue the pursuit of resilient, income producing real estate in lesser-correlated sectors to GDP growth drivers. The portfolio's uncalled capital commitments should provide ample dry powder to capitalize on near term opportunities in the current period of market dislocation

OREGON
STATE
TREASURY

Tobias Read
Oregon State Treasurer

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Portland, OR 97224

oregon.gov/treasury

TAB 5

OPERF PUBLIC EQUITY

RECOMMENDATION

March 8, 2023

OPERF Public Equity Portfolio

Manager Recommendation
Cantillon Capital Management – Global Equity

Louise Howard
Senior Investment Officer, Public Equity

OREGON STATE TREASURY

Cantillon Capital Management – Global Equity

Quality focused investment manager with a valuation discipline. Key to the investment process is Cantillon's understanding of evolving nature of moats and the impact of disruption on their portfolio companies.

Investment Highlights	Investment Considerations
Privately owned investment manager, classic investment boutique	Key man risk associated with the founder and CIO William von Mueffling. Mr. von Mueffling owns 100% of Cantillon
Experienced investment team, fully aligned with client goals – single investment strategy	Mitigants: Cantillon is a six person, long tenured investment team that co-invests alongside their clients. Firm culture is positive demonstrated by a very low turnover rate. The
Investment philosophy focused on identifying high quality, long-term compounding companies trading at a discount to their intrinsic value	client base is institutional and stable. The disciplined process and resulting long duration portfolio offset Staff concerns around key man risk
Disciplined, consistent, repeatable investment process with room to improve and refine as new information challenges convention – evolving business moats	Cantillon is a single product firm. There is a concern that a precipitous drop in assets might impact firm operations
Culture committed to excellence in all aspects, driven by first quartile performance, reporting and client engagement	Mitigants: Cantillon shuttered their higher fee hedge fund business coming out of the Great Financial Crisis and continued to operate effectively while Global Equity grew its asset base. Moreover, Cantillon's senior investors and senior management are co-invested alongside clients. They believe this alignment drives their focus on excellence in all aspects of the business

OREGON STATE TREASURY

Tobias Read
Oregon State Treasurer

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Tigard, OR 97224

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First Quarter Public Equity Portfolio Activity

Below is the list of activities conducted by the Public Equity Team as of March 8, 2023

- Rebalanced $520M from Arrowstreet in favor of Acadian and Walter Scott resulting in an 11bps decrease in ex-ante risk (Aladdin).
- Raised $2.5B to fund Fixed Income asset allocation change resulting in a 28bps reduction in ex-ante risk.
- Recommendation to retain Cantillon Global Equity Strategy which would result in a further reduction in ex-ante risk of 8bps.

OIC

OREGON STATE TREASURY

TAB 6

OIC INVESTMENT

BELIEFS DISCUSSION

MEKETA | 45
CELEBRATING A MILESTONE | YEARS

Oregon Investment Council

March 8, 2023

Investment Beliefs Discussion

Introduction

The Statement the Oregon Investment Council (OIC) of Investment and Management Beliefs was initially adopted in 2013 and revised in 2020. The Statement provides a broad framework for the management and oversight of the assets for which The Council is responsible. The Statement, in summary form, provides the Council, the Treasurer and the Treasurer's staff, stakeholders (active and retired members of the pensions system, various state and local agencies, the legislative and executive branch of government and the public) with fundamental investment and management principles. The Statement addresses major themes that impact the design and implementation of investment portfolio and the roles and responsibilities of The Council and those charged with implementation of the policies adopted by the Council.

The Statement serves as a preamble to the Investment Policy Statement (IPS). The IPS details the parameters for investing the various portfolios over which The Council has authority and identifies the investment objectives, preferences or tolerance for risk, constraints on the investment portfolio, and how the investment program will be managed and monitored in a manner consistent with the Statement of Investment and Management Beliefs.

The Investment and Management Beliefs Statement is comprised of 9 Beliefs, each of which has a subsequent expansion and rationale.

Investment Beliefs

1. The OIC Sets Policy and is Ultimately Responsible for the Investment Program
2. Asset Allocation Drives Risk and Return
3. The Equity Risk Premium Will Be Rewarded
4. Private Market Investments Can Add Significant Value and Represent a Core OIC/OST Competency
5. Capital Markets Have Inefficiencies That Can Be Exploited
6. Costs Directly Impact Investment Returns and Should Be Monitored and Managed Carefully
7. Fair and Efficient Capital Markets are Essential for Long-Term Investment Success
8. The Integration of Environmental, Social and Governance (ESG) Factors, Similar to Other Investment Factors, May Have a Beneficial Impact on the Economic Outcome of an Investment and Aid in the Assessment of Risks Associated with that Investment.
9. Diversity, in All Aspects, is Accretive to Meeting OIC Objectives

Discussion

→ Part of The Council's fiduciary oversight is a review of the Investment Policy Statement.

- That review incorporates both the latest information and conformity with the Investment Management and Beliefs Statement.
- That review is in progress with Staff and Consultants, for the Council's consideration, intended to be in line with the work done on the Common School Fund IPS.

→ There has been an ongoing discussion/debate about belief number 1.

→ The issue is the degree to which non-policy matters are delegated to the Treasurer's Office.

→ Delegation should be discussed and clarified so that roles and responsibilities are clear.

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.

INFORMATION USED TO PREPARE THIS REPORT WAS OBTAINED FROM INVESTMENT MANAGERS, CUSTODIANS, AND OTHER EXTERNAL SOURCES. WHILE WE HAVE EXERCISED REASONABLE CARE IN PREPARING THIS REPORT, WE CANNOT GUARANTEE THE ACCURACY OF ALL SOURCE INFORMATION CONTAINED HEREIN.

CERTAIN INFORMATION CONTAINED IN THIS REPORT MAY CONSTITUTE “FORWARD - LOOKING STATEMENTS,” WHICH CAN BE IDENTIFIED BY THE USE OF TERMINOLOGY SUCH AS “MAY,” “WILL,” “SHOULD,” “EXPECT,” “AIM”, “ANTICIPATE,” “TARGET,” “PROJECT,” “ESTIMATE,” “INTEND,” “CONTINUE” OR “BELIEVE,” OR THE NEGATIVES THEREOF OR OTHER VARIATIONS THEREON OR COMPARABLE TERMINOLOGY. ANY FORWARD-LOOKING STATEMENTS, FORECASTS, PROJECTIONS, VALUATIONS, OR RESULTS IN THIS PRESENTATION ARE BASED UPON CURRENT ASSUMPTIONS. CHANGES TO ANY ASSUMPTIONS MAY HAVE A MATERIAL IMPACT ON FORWARD - LOOKING STATEMENTS, FORECASTS, PROJECTIONS, VALUATIONS, OR RESULTS. ACTUAL RESULTS MAY THEREFORE BE MATERIALLY DIFFERENT FROM ANY FORECASTS, PROJECTIONS, VALUATIONS, OR RESULTS IN THIS PRESENTATION.

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

INV 1201: Statement of OIC Investment and Management Beliefs

Contents

Preamble

This Statement of Investment and Management Beliefs (the "Beliefs") enumerates fundamental investment and management principles that guide the Oregon Investment Council ("Council" or "OIC") in performing its fiduciary and statutory obligations which include establishing policies for the investment and management of "investment funds" as defined in 293.701(2). The Oregon State Treasurer, largely through the Investment Division of the Office of the State Treasurer ("Treasurer" or "OST"), provides staff support for the Council and, as the Council's statutorily designated "investment officer" (together with such other persons determined qualified by the Council to conduct investment and management functions on its behalf), invests and manages in accordance with Council policy those moneys made available by the Council for such purposes. The Treasurer may also adopt additional policies governing its investment and management functions. The OIC and OST recognize that their respective authority to establish and implement such policies is grounded in and bounded by fiduciary and statutory foundations to their authority which charge them with exercising a duty of exclusive loyalty to fund beneficiaries by ensuring that related moneys are invested as efficiently and productively as possible while adhering to applicable standards of prudent judgment and care. Accordingly, the following statements and accompanying OIC policies are intended to be in harmony with and promote the fulfillment of such obligations.

OREGON INVESTMENT COUNCIL

Statement of Investment and Management Beliefs

1.) THE OIC SETS POLICY AND IS ULTIMATELY RESPONSIBLE FOR THE INVESTMENT PROGRAM

A. **Investment management is dichotomous -- part art and part science.**
   - To calibrate both governance and daily operating activities with the appropriate balance between art and science, the Beliefs will be anchored where and whenever possible to industry best practices as illuminated by academic research and experiential rigor.

B. **The OIC is a policy-setting council that largely delegates investment management activities to the OST and qualified external fiduciaries.**
   - The OIC sets strategic policy which includes, but is not limited to, Asset Allocation, Portfolio Construction, Risk Measurement and Performance Monitoring. The OIC's purview also includes establishing and defining its philosophy as manifest in this Statement of Investment and Management Beliefs.
   - The OIC tasks OST staff, external managers, consultants and other service providers with

policy implementation.

C. **The OIC is vested with the authority to set and monitor portfolio risk. Both short-term and long-term risks are critical.**
   - The OIC must weigh the short-term risk of principal loss against the long-term risk of failing to meet return expectations.

D. **To exploit market inefficiencies, the OIC should be long term, contrarian, innovative, and opportunistic in its investment approach.**
   - The OIC should generally prepare for and accept periods of extreme price/valuation volatility and/or related market dislocations and endeavor to act expeditiously during such periods if and when deemed advantageous.

2.) ASSET ALLOCATION DRIVES RISK AND RETURN

A. **Asset allocation is the OIC's primary policy tool for managing the investment program's long-term risk/return profile.**
   - Decisions regarding strategic asset allocation will have the largest impact on the investment program's realized return and risk and hence will be made judiciously and receive special emphasis and attention.
   - The timing and magnitude of projected employer contributions and future benefit payments have significant cash flow implications and thus will receive explicit consideration during the OIC's asset allocation decision-making process.

B. **Portfolio construction, including diversification and correlation considerations, is essential to maximizing risk-adjusted returns.**
   - Empirical rigor, coupled with sound judgment, is required in the portfolio construction process to effect true diversification, while discipline is required to maintain diversification through and across successive market cycles.
   - Risk is multi-faceted and may include, but is not limited to, the following types of specific risks: principal loss; opportunity cost; concentration risk; leverage and illiquidity risk; volatility and valuation risk; interest rate and inflation risk; and environmental, social and governance (ESG) risks.[1]

3.) THE EQUITY RISK PREMIUM WILL BE REWARDED

A. **Over the long-term, equity-oriented investments provide reliable return premiums relative to risk-free investments.**
   - Although returns for risk taking are not always monotonic or consistently rewarded over time, bearing equity risk commands a positive expected return premium provided such risk is reasonably priced.

4.) PRIVATE MARKET INVESTMENTS CAN ADD SIGNIFICANT VALUE AND REPRESENT A CORE OIC/OST COMPETENCY

A. **The OIC can capitalize on its status as a true, long-term investor by making meaningful allocations to illiquid, private market investments.**
   - Private markets provide a diversifying risk/return profile relative to public market analogues.
   - Private markets offer excess return opportunities that may be exploited by patient, long-term investors.

B. **Dispersion in private market investment returns is wide; accordingly, top-quartile manager selection, diversification across vintage year, strategy type, and geography, and careful attention to costs are paramount.**
   - Private market investment success is predicated on identifying skilled managers and developing long-term investment relationships with those managers that enable the application of skill to manifest in the form of excess returns.
   - Proper investment pacing, including deliberate vintage year diversification is also an integral element of superior private market investment results.

5.) CAPITAL MARKETS HAVE INEFFICIENCIES THAT CAN BE EXPLOITED

A. **Inefficiencies that can be exploited by active management may exist in certain segments of the capital markets.**
   - While largely efficient, select segments of the capital markets can sometimes be successfully exploited by skilled active management.
   - The nature (i.e., perceived magnitude and likely duration) of such inefficiencies should inform the proposed active management strategy (e.g., discretionary or systematic).

B. **Passive investment management in public markets will outperform the median active manager in those markets over time.**
   - Active management should therefore be a deliberate choice and applied only to those public market strategies/managers in which the OIC enjoys a high degree of confidence that such strategies/managers will be sufficiently rewarded on a risk-adjusted basis and net of all fees, factor exposures and related transactions costs.

6.) COSTS DIRECTLY IMPACT INVESTMENT RETURNS AND SHOULD BE MONITORED AND MANAGED CAREFULLY

A. **All fees, expenses, commissions, and transaction costs should be diligently monitored and managed in order to maximize net investment returns.**
   - While all costs should be monitored and controlled, these costs should also be evaluated relative to both expected and realized net returns.

B. **External incentive structures should be carefully evaluated to ensure proper alignment with investment program objectives.**
   - Fee and incentive structures drive both individual and organizational behavior.
   - These structures (particularly in private market strategies) should be carefully evaluated and monitored to ensure that the goals and incentives of individual investment professionals and their respective organizations are well aligned with the specific investment objectives established by the OIC and/or OST staff.

7.) FAIR AND EFFICIENT CAPITAL MARKETS ARE ESSENTIAL FOR THE LONG-TERM SUCCESS OF OST INVESTMENT ACTIVITIES

A. **The OIC recognizes that the quality of regulation and corporate governance can affect the long-term value of its investments.**
   - The Council supports competitive and transparent market structures to ensure accurate and timely price discovery/asset valuation.

B. **The OIC also recognizes that voting rights have economic value.**
   - Voting rights should be exercised in accordance with applicable law and policy.

8.) THE INTEGRATION OF ENVIRONMENTAL, SOCIAL AND GOVERNANCE (ESG) FACTORS, SIMILAR TO OTHER INVESTMENT FACTORS, MAY HAVE A BENEFICIAL IMPACT ON THE ECONOMIC OUTCOME OF AN INVESTMENT AND AID IN THE ASSESSMENT OF RISKS ASSOCIATED WITH THAT INVESTMENT.

A. **The consideration of ESG factors within the investment decision-making framework is important in understanding the near-term and long-term impacts of investment decisions.**
   - The OIC believes that understanding how social and environmental factors impact investments is an important step towards building a more sustainable portfolio.

B. **Over time, there has been an evolution of multi-factor, or more holistic approaches, to identify opportunities and remediate risks, in a large globally-diversified investment portfolio.**
   - ESG data collection aligns our ability to prudently measure and monitor risks and returns. Once identified, ESG risk mitigation strategies can be implemented and proactive ESG transition strategies pursued, subject to statutory fiduciary obligations.

9.) DIVERSITY, IN ALL ASPECTS, IS ACCRETIVE TO MEETING OIC OBJECTIVES

A. By embracing and enhancing diversity and inclusion efforts, the OIC ensures that the

investment program will be exposed to and informed by a wide range of perspectives, ideas and opinions.

- The OIC believes a wide range of perspectives, ideas and opinions will ultimately produce better investment outcomes.

[1] Concepts of risk and associated measurement techniques are evolving. Heretofore underdeveloped, the identification and measurement of ESG risks is improving which will enable new risk management applications in both security selection and portfolio construction processes.

TAB 7

ESG REGULATORY UPDATE

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INVESTMENT GROUP

Oregon Investment Council

March 8, 2023

ESG Regulatory and Policy Changes

Current Regulatory and Policy Environment Related to ESG

Overview

→ This presentation provides a high-level informational overview of the ESG regulatory and policy environment.

→ The ESG acronym has evolved to encompass a broad range of environmental, social and governance issues.

→ For fiduciaries, making sure to understand the potential pecuniary, financial impact of E, S, and G factors on investment risk and opportunities is no different than the fiduciary responsibility to integrate any potentially financially material investment factors.

→ **ESG and Climate Specific Regulations**

- ESG regulations have emerged globally for institutional asset owners, asset managers and for companies.
- International ESG disclosure regulation for companies is expanding and consolidating internationally and has an important emphasis on climate. The US has a pending SEC climate-related disclosure rule.
- ESG regulatory frameworks in Europe and in international standards aim to improve disclosure and prevent greenwashing.
- For asset owners, the US faces a growing multitude of widely varying state regulations, with little consensus on federal regulations. A key element that is common across US states is that ESG must be seen in pecuniary terms. In Europe, ESG has evolved toward 'double bottom line' investing that seek financial returns first and then can consider social and environmental concerns.

→ **Climate-related Policies**

- The 2022 Inflation Reduction Act in the US was the largest ever stimulus to supporting energy transition towards a low carbon economy.
- Climate stimulus and low carbon support policies are being enacted across the globe, particularly in the UK, the European Union, Australia, and to some degree in Asia.

→ The rapidly changing, and sometime conflicting, regulatory and policy environment globally, and in the US are bringing fresh efforts to lessen greenwashing and increase standardization of disclosure.

Introduction to ESG

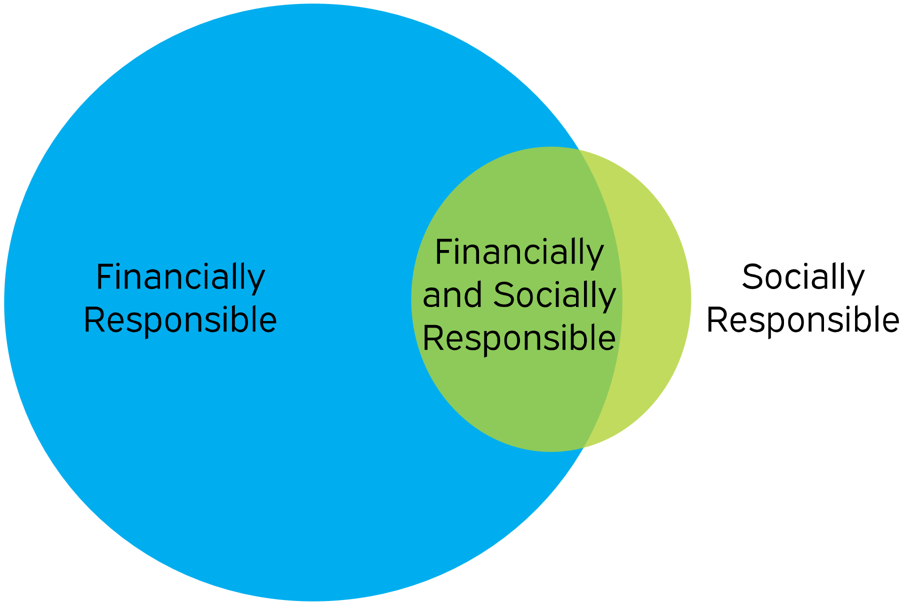
Introduction

The ESG acronym has evolved to encompass a broad range of environmental, social and governance issues. Many ESG issues are demonstrably material to investment performance (risk, return or both), while purely socially responsible approaches may or may not have a material impact on financial risk or return.

A central focus has and will continue to be on climate change physical and energy transition risks and opportunities, and on divestiture of fossil fuel companies.

ESG Investment Approaches

→ ESG currently encompasses environmental, social and governance issues material to investment performance, and socially responsible approaches that may or may not be financially material.



→ Financially Responsible - For fiduciaries, integrating potentially financially material E, S, and G factors means including such factors alongside other potentially financially material investment factors.

→ Financially and Socially Responsible investments, seek to meet or exceed market returns and achieve a quantifiable social goal.

→ Socially Responsible investments do not have explicit market return goals, and are most often invested by endowments, foundations, and faith-based organizations as mission-related investments.

ESG Investment Approaches

→ For fiduciaries, integrating potentially financially material E, S, and G factors is equivalent to integrating any other potentially material (risk and return) investment factors.

→ The management of material risk and return factors that fall under the ESG framework have been used to improve long term investments for decades. A good example is active management of proxies to align the interest of management with that of shareholders. Another example is oversight of compliance with regulatory schemes.

→ In recent years, regulations have increased surrounding ESG and specifically climate-related concerns.

→ Climate regulatory and policy changes have been driven by science-based evidence of the impact of human caused climate changes. For example, the SEC cites science-based information in its proposal for disclosure on corporate carbon emissions.

Regulatory Environment and ESG

Global ESG Regulatory Environment

The global shift to compulsory climate reporting

The framework known as the Taskforce on Climate-related Financial Disclosure, or TCFD, is shifting from a voluntary approach to being the main regulatory response to climate risk.

EUROPEAN UNION

Has not officially adopted the TCFD but is implementing the Sustainable Finance Disclosure Regulation, which has a broader reach than the climate-focused TCFD.

G-7: US, UK, CANADA, FRANCE, GERMANY, ITALY, JAPAN

In June 2021, the G-7 backed the idea of compulsory TCFD reporting.

NORTH AMERICA

CANADA

Tied pandemic bailout funding to TCFD-aligned disclosures.
The Bank of Canada has said it is "working towards aligning its future disclosures" with the guidelines.

UNITED STATES

In March 2021, the SEC asked for public input about climate change disclosures, including the TCFD.
Treasury Secretary Janet Yellen has also indicated her backing for sustainability reporting, singling out the TCFD.

LATIN AMERICA

BRAZIL

The central bank plans to require banks to disclose in line with the TCFD.

MEXICO

Banco de México recommends development of a regulatory/supervisory strategy following TCFD recommendations.

ASIA-PACIFIC

JAPAN

The Council of Experts has recommended enhanced disclosure based on TCFD recommendations for Prime Market-listed companies.

NEW ZEALAND

In April 2021, it became the first country to introduce mandatory TCFD "comply or explain" disclosures for financial institutions, requiring about 200 large financial institutions to make climate-related disclosures starting in 2022.

EUROPE, THE MIDDLE EAST AND ASIA

SOUTH AFRICA

The national treasury has recommended standards on environmental and social risks incorporating TCFD recommendations.

SWITZERLAND

Has said it will enshrine TCFD reporting into law and make it "binding."

UNITED KINGDOM

Has said it will make TCFD-aligned disclosures mandatory across the economy by 2025, with many of the requirements in place by 2023.

As of Aug. 18, 2021.
Map includes select countries that are moving to make climate reporting under the TCFD framework mandatory rather than voluntary.
Map credit: Elizabeth Thomas
Sources: Allen & Overy; S&P Global Sustainable1

S&P Global
Market Intelligence

Source: S&P Global; https://www.spglobal.com/esg/insights/featured/markets-in-motion/global-esg-regulation

US ESG Regulatory Environment

Recent developments include those of the SEC and the Department of Labor (DOL)

→ **SEC - Climate Disclosure – expected to be released in 2023**

- The proposed "Enhancement and Standardization of Climate-Related Disclosures for Investors" requires publicly traded companies to disclose to investors the climate-related impact and risks to their businesses, including reporting on carbon emissions.
- The SEC proposed climate disclosures align with international and EU definitions and disclosures.
- Legal challenges are expected after the regulation is finalized.

→ **SEC - Universal Proxy Rule**

- On November 17, 2021, the SEC voted to adopt final rules requiring the use in contested director elections of domestic issuers of "universal proxy cards," or proxy cards naming all director nominees presented for election, including those of the company and the dissident shareholders, putting both on an equal footing.
- 2023 is first proxy season where the rule will be in force.
- The rule may change board votes as institutional investors increase their focus on board and may increase the number of 'activist' individuals proposed for board seats.

US ESG Regulatory Environment

Recent developments include those of the SEC and the DOL

→ **DOL - on ESG and Proxy Voting**

In November 2022, the Department of Labor released a final rule that addresses fiduciary duties when (1) considering ESG factors in selecting investments, and (2) considering whether and how to vote proxies, for plans subject to ERISA.

- **ESG** - The Final Rule acknowledges that, in connection with investment decisions, fiduciaries must reasonably determine which factors are relevant to a risk-return analysis and clearly states that such factors may, but need not, include ESG factors.
- **Voting Proxies** - The Final Rule reemphasizes that a fiduciary's duties extend to the management of shareholder rights, including with respect to proxy voting, when an ERISA plan holds shares of stock.
- The new DOL final rule faces legal challenges. On January 26, 2023, attorneys general from 25 states, led by Ken Paxton of Texas and Sean Reyes of Utah, filed a lawsuit in the Northern District of Texas, attempting to prevent the 2022 Rule from taking effect. On February 1, 2023, every Senate Republican, led by Sen. Mike Braun (R-IN), along with Sen. Joe Manchin (D-WV) and Rep. Andy Barr (R-KY), announced their plan to reintroduce legislation seeking to overturn the 2022 Rule under the Congressional Review Act.

→ Given the ongoing political controversies over ESG in the US, the DOL Final Rule in its current form may not hold through Democratic and Republican administrations.

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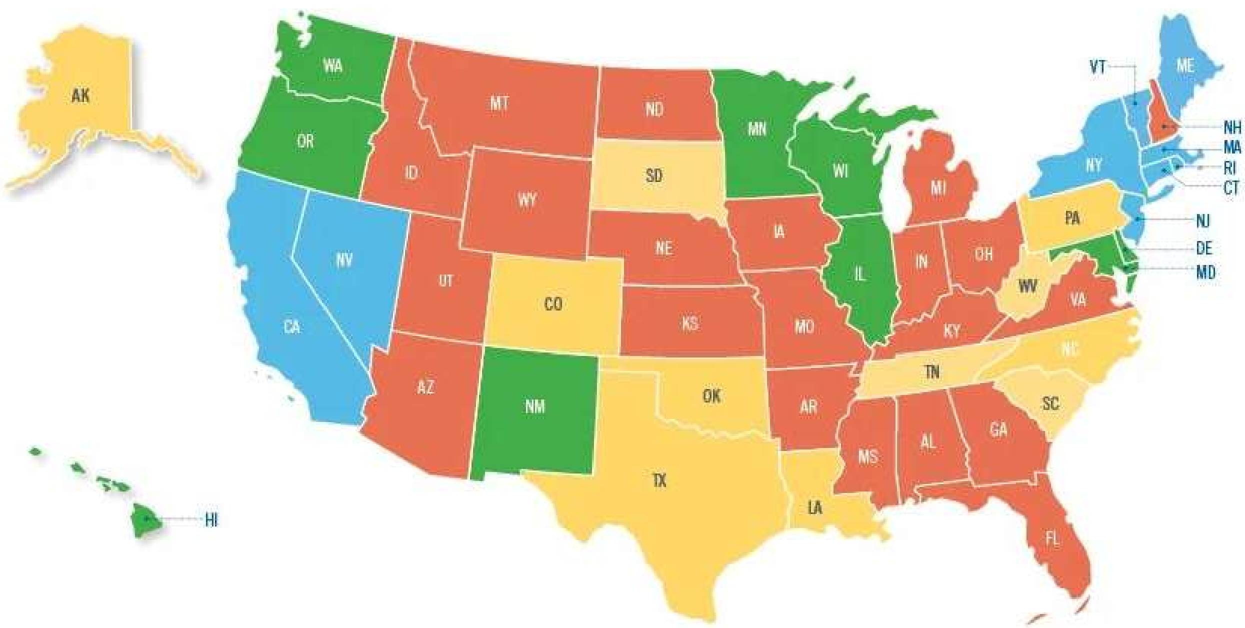
Navigating 50 States ESG Regulatory Investment Environment

→ State level regulatory actions include many states with anti-ESG legislation or pending legislation, states promoting integration of ESG, and states promoting divestment of fossil fuels. In some states there are legislative and legal challenges to anti-ESG legislation.



KEY

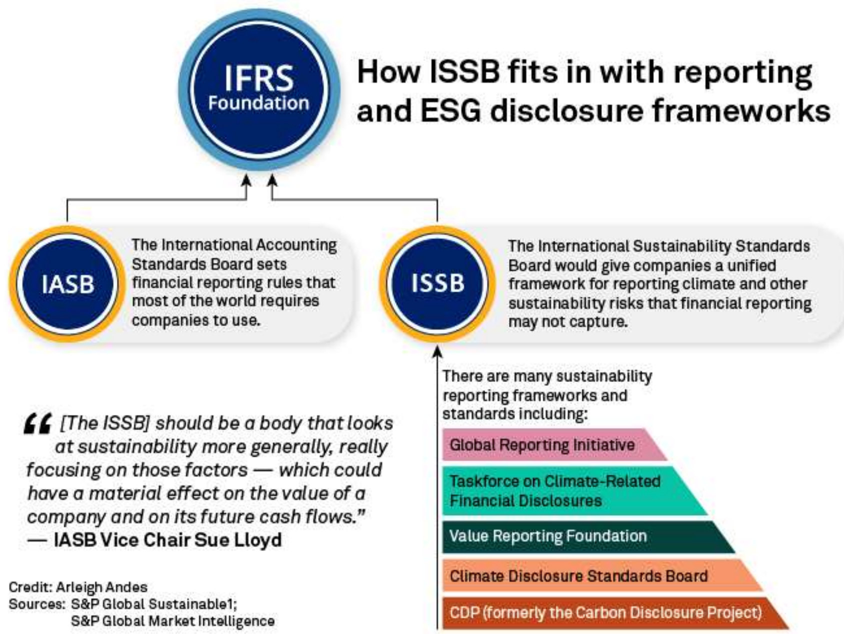
Actions Promoting Integration of ESG	Actions Restricting Use of ESG Factors	Actions Neutral on Use of ESG Factors	Actions Promoting Divestment from Certain Industries	Actions Targeting Entities Boycotting Certain Industries	No significant action	Shading denotes a state's primary ESG-related action/legislation/initiative. For additional actions by state, please refer to the "state initiatives" tab.

Source: Ropes & Gray; https://www.ropesgray.com/en/navigating-state-regulation-of-esg

As of February 13, 2023

International Regulatory Environment

→ The International Sustainability Standards Board (ISSB) consolidates key ESG disclosure frameworks under the International Financial Reporting Standards Foundation (IFRS) that is used by over 140 jurisdictions.



→ The final initial ISSB standards are planned for release in 2023.

→ International reporting standards will continue to evolve.

Source: S&P Global; https://www.spglobal.com/_division_assets/images/articles/new-global-sustainability-board-aims-to-cut-through-disclosure-confusion/

International Regulatory Environment

→ **In contrast to the US, in the European Union (EU) and the UK, 'double bottom line' – financial and social/environmentally - material investment approaches for pension funds are becoming widely accepted. In the US, many states seek to allow investments based solely on financial expected results.**

- The Sustainable Financial Disclosure Regulation (SFDR) is a European regulation introduced to prevent greenwashing and improve transparency around sustainability claims made by financial market participants. The SFDR introduces different designations for investment fund approaches to using sustainability:
  - **Article 6:** All funds. Transparency of the integration of sustainability risks requires financial market participants to describe in pre-contractual disclosures how sustainability risks are integrated into their investment decisions; and the results of the assessment of the likely impacts of sustainability risks on the returns of the financial products they make available or include a clear and concise explanation of why sustainability risks are not deemed relevant.
  - **Article 8:** Funds that Promote Use of ESG. Funds designated as Article 8 promote, among other characteristics, environmental or social characteristics, or a combination of those characteristics, provided that the companies in which the investments are made follow good governance practices, the information to be disclosed pursuant to article 6 must be disclosed.
  - **Article 9**: Positive Impact Funds. Compared to Article 8 funds, which promote environmental or social characteristics and good governance practices, funds designated as Article 9 should make a positive impact on society or the environment through sustainable investment and have a non-financial objective at the core of their offering.

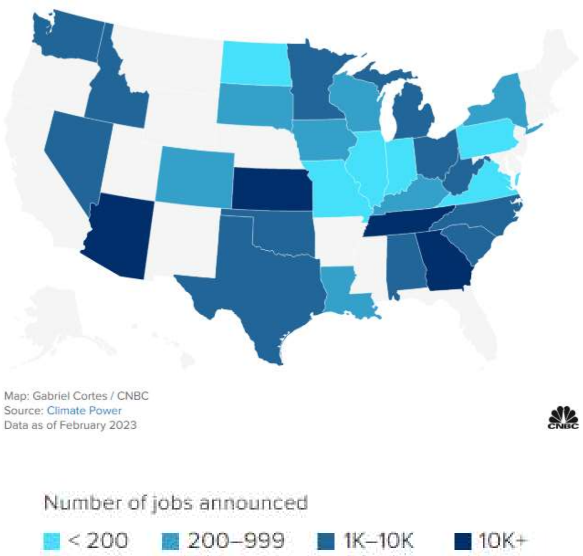
→ **The SFDR affects all asset managers that raise money in the EU. Thus, financial market participants headquartered in the US that raise money in the EU must comply with the SFDR.**

Current Policy Environment Related to Climate

US Climate Related Policy Changes

→ The Inflation Reduction Act (IRA) of 2022 includes $369 billion in support for clean energy with a focus on US manufacturing.

Number of US Clean Energy Jobs announced since IRA



→ In the six months since the Inflation Reduction Act (IRA) passed into law, as of January 31, 2023, the US saw over 100,000 new clean energy jobs created across 31 states as companies began to capitalize on the incentives the bill offers, and over 90 new projects opened across the US that represent $89.5 billion in private sector investments.

[1] Report from independent climate research organization, Climate Power.

International Climate Related Policy Changes

→ **Recent climate-related stimulus policies outside the US**

- EU - Carbon Tariff. In 2022, the European Union announced a deal to impose a carbon dioxide tariff on imports of polluting goods such as steel and cement. Known as the "Carbon Border Adjustment Mechanism" (CBAM), the agreement will cover industrial imports from the bloc's 27 member states, targeting the highest polluting products first.
- Other regions are enacting stimulus policies similar to the US IRA For example, in January 2023, the European Commission presented a Green Deal Industrial Plan to enhance the competitiveness of Europe's net-zero industry and support the fast transition to climate neutrality. The Plan aims to provide a more supportive environment for scaling up the EU's manufacturing capacity for net-zero technologies and products required to meet Europe's ambitious climate targets.
- Adopting carbon pricing is growing.

→ **As governments seek to improve the implementation of their Paris Aligned commitments, the trend toward more policies supporting energy transition efforts is expected to continue.**

Conclusions

→ Globally, the ESG policy and regulatory environment is rapidly evolving, particularly on climate.

→ In the US, the policy and regulatory environment is developing in multiple, often conflicting directions in different states.

→ A consistent focus on long term financially material investment risks and opportunities, including ESG material risks and opportunities can provide a solid grounding to managing US pension assets.

Appendix

Summary Descriptions of Institutional Investor Organizations with a Climate Focus

Year Founded	Organization Name	Abbreviation	About
1985	Council of Institutional Investors	CII	CII is a nonprofit association of US public, corporate and union employee benefit funds, other employee benefit plans, state and local entities charged with investing public assets and foundations and endowments with combined assets under management of approximately $4 trillion.
1989	Ceres	Ceres	Ceres is a nonprofit organization transforming the economy to build a just and sustainable future for people and the planet. Through powerful networks and global collaborations of investors, companies and nonprofits, Ceres drives action and inspires equitable market-based and policy solutions throughout the economy.
2000	Carbon Disclosure Project	CDP	CDP is a not-for-profit charity that runs the global disclosure system for investors, companies, cities, states, and regions to manage their environmental impacts. The world's economy looks to CDP as the gold standard of environmental reporting with the richest and most comprehensive dataset on corporate and city action.
2005	Principles for Responsible Investing	PRI	The PRI is the world's leading proponent of responsible investment. It works to understand the investment implications of environment, social and governance ("ESG") factors and to support its international network of investor signatories in incorporating these factors into their investment and ownership decisions
2009	Global Real Estate Sustainability Benchmark	GRESB	GRESB is the global ESG benchmark for financial markets, composed of an independent foundation and a benefit corporation. Working together as one, the GRESB Foundation focuses on the development, approval, and management of the GRESB Standards while GRESB BV performs ESG assessments and provides related services to GRESB Members.
2011	Sustainability Accounting Standards Board	SASB	SASB Standards guide the disclosure of financially material sustainability information by companies to their investors. Available for 77 industries, the Standards identify the subset of ESG issues most relevant to financial performance in each industry.

Summary Descriptions of Institutional Investor Organizations with a Climate Focus (continued)

Year Founded	Organization Name	Abbreviation	About
2015	The Task Force on Climate-related Financial Disclosures	TCFD	Created by the Financial Stability Board, the TCFD has set out its series of recommendations to establish a framework for businesses to manage climate risks; both transition and physical, and benefit from the related opportunities
2017	Climate Action 100+	CA100+	Climate Action 100+ is an investor-led initiative to ensure the world's largest corporate greenhouse gas emitters take necessary action on climate change.
2017	Transition Pathway Initiative	TPI	The Transition Pathway Initiative ("TPI") is a global, asset-owner led initiative which assesses companies' preparedness for the transition to a low carbon economy.
2017	The Institutional Investors Group on Climate Change	IIGCC	IIGCC is the European membership body for investor collaboration on climate change.
2019	Net Zero Asset Owner Alliance	NZAOA	Institutional investors transitioning their portfolio to Net Zero GHG emissions by 2050.
2019	Paris Aligned Investment Initiative	PAII	The Paris Aligned Investment Initiative is a collaborative investor-led global forum enabling investors to align their portfolios and activities to the goals of the Paris Agreement. The Paris Aligned Investment Initiative ("PAII") was established in May 2019 by the Institutional Investors Group on Climate Change ("IIGCC"). As of March 2021, the initiative has grown into a global collaboration supported by four regional investor networks – AIGCC (Asia), Ceres (North America), IIGCC (Europe) and IGCC (Australasia).
2021	ESG Data Convergence Project	ESG DCP	The Project's objective is to streamline the private investment industry's historically fragmented approach to collecting and reporting ESG data in order to create a critical mass of meaningful, performance-based, comparable ESG data from private companies. This allows GPs and portfolio companies to benchmark their current position and generate progress toward ESG improvements while enabling greater transparency and more comparable portfolio information for LPs.

ESG Terms and Definitions

Term	Definition
Environmental Factors	Environmental Factors relate to the ecological impact of companies' activities, such as climate change, biodiversity, deforestation, waste, pollution, and resource depletion
Social factors	Social factors affect the company's relationship with society and people—for example, human rights, modern slavery, child labor, working conditions, and employee relations.
Governance factors	Governance relates to issues tied to process and oversight regarding how the company is run. E.g., executive pay, board diversity, compliance, shareholder rights, etc.
ESG Integration	ESG Integration explicitly includes material environmental, social, and governance factors in financial analysis alongside traditional factors such as macroeconomic trends and company specific factors.
Corporate engagement and shareholder action	This approach includes employing shareholder power to influence corporate behavior, including direct corporate engagement, filing or co-filing shareholder proposals, and proxy voting.
Norms-based screening	This approach screens investments against minimum standards of business or issuer practice based on international norms such as those issued by the UN, ILO, OECD, and NGOs.
Negative/exclusionary screening	Negative screening excludes certain sectors, companies, counties, or other issuers from a fund or portfolio based on activities considered not investable.
Best-in-class/positive screening	Best-in-class/positive screening invests in sectors, companies, or projects positive ESG performance relative to industry peers.
Sustainability themed/thematic investing	Investing in themes or assets specifically contributing to sustainable solutions.
Impact Investing and community investing	Impact investing is to achieve positive, social, and environmental impacts. Community investing is where capital is specifically directed to traditionally underserved individuals or communities with a clear social or environmental purpose.
Scope 1+2 Emissions	Scope 1 + 2 carbon emissions are generated directly from a company's business and from purchased energy.
Scope 3 Emissions	Scope 3 emissions are generated by a company's suppliers and customers' use of its products and services.
Greenhouse Gases ("GHG")	Greenhouse Gas ("GHG") are gases in the earth's atmosphere that trap heat and have the effect of warming the global climate. The largest contributing GHG is carbon dioxide ("CO_2"). Methane and nitrous oxide are also critical.
Carbon Footprint	The carbon footprint is the annual amount of greenhouse gas emissions, mainly CO_2. This metric is calculated by summing the value of each investment per adjusted Enterprise Value multiplied by emissions ("tCO_2e") and then dividing by the portfolio's total market value (per million).

ESG Terms and Definitions (continued)

Term	Definition
Emissions Intensity	Carbon intensity is expressed as the issuer's total carbon emissions per million USD of revenue as a proxy of the carbon efficiency per unit of output.
Green Revenue Share	Green revenue share is the percentage of sales (reported or estimated) generated by a company's products/services that benefit the environment by contributing to mitigating climate change.
GHG targets approved by SBTi	Science Based Targets initiative ("SBTi") show companies how much and how quickly they need to reduce their greenhouse gas ("GHG") emissions to prevent the worst effects of climate change. Reduction targets are "science-based" if they align with the reduction target set by the 2015 Paris Agreement.
Paris Agreement Goal	The 2015 Paris Agreement goal is to limit the global temperature to well below 2°Celsius (3.6°Fahrenheit) above pre-industrial levels, and to limit the increase to 1.5°Celsius (2.7°Fahrenheit), since this would substantially reduce the effects on climate change.
NOx and Sox emissions	Nitrous oxide ("NOx") and sulfur oxide ("Sox") are greenhouse gases. They are major air pollutants that harm health.
Fossil Fuel Revenue	Fossil fuel revenue provides the percent of recent-year revenues for the issuers' total involvement in fossil fuel, including any exposure in production, exploration, distribution, and services.
Renewable Energy Generation	The renewable energy generation revenue provides the percent of recent-year revenues for the issuer's involvement in the generation of electric power using renewables.
Board Diversity	An essential governance factor is board diversity. Board diversity can help to avoid groupthink in the boardroom. There are various types of diversity, such as gender, race, experience, age, culture, and nationality. Most board diversity initiatives focus on visible issues of gender and race.
Board Independence	The ratio of independent directors (no ties with the company management or operations) on a board is viewed as critical to firm performance. The aim is to have a board that is includes directors that are independent of the management team, which can challenge board and management decisions.
Classification of the Chairman of the Board	An independent chairman of the board is broadly considered the best practice to avoid inherent conflict of interest between management and the board committee.
Classes of Stock with Unequal Voting Rights	The unequal voting rights metric evaluates whether the company has issued stock types with different voting rights. Dual-class capital structures allow some shareholders disproportionate control over the company by enabling multiple votes for every share owned.

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Refresher on law on Oregon Investment Council (OIC) investing authority

March 8, 2023

A. Defined Terms

a. Public Employees' Retirement Fund "PERF"
b. Oregon State Treasurer "Treasurer"
c. Public Employees' Retirement Board "PERB"

B. Main parties, roles, responsibilities, and consequences, including personal liability

"Under Oregon law, OIC is responsible for establishing investment policy for PERF. The treasurer is responsible for the investment of PERF and custody of PERF assets, and PERB and the director are responsible for the management and distribution of PERF (in the course of administration of PERS). PERB also has the duty to audit PERF. These officers and public bodies are all subject to the duties owed by fiduciaries to the beneficiaries of a trust except as those duties are otherwise defined by statute.

***

If any body or official fails to comply with fiduciary duties in accordance with the appropriate standard, the individual members of the body or the official may be liable personally to the beneficiaries of PERF for any damages resulting from the failure. A court has the authority to fashion appropriate remedies for breach of fiduciary duty under principles of equity and trust law. These remedies can include setting aside transactions that violate fiduciary principles and assessing damages against fiduciaries for violating their duties to the beneficiaries of the trust."[1]

C. Investment Objective for PERF

"Moneys in the investment funds shall be invested and reinvested to achieve the investment objective of the investment funds, which is <u>to make the moneys as productive as possible</u>, subject to the standard set forth in ORS 293.726."[2]

D. PERF is a "trust" in which the State of Oregon has "no proprietary interest".

"The foregoing cases taken together establish the proposition that the Industrial Accident Commission Fund is 'a trust fund' which the State Treasurer holds only as a 'custodian' and that the state 'has no interest' in it. Although in these cases the character of the fund was examined either in relation to the question of the immunity of the state from suit, or in relation to the applicability of Article XV, s 7, the conclusion that the state has no proprietary interest in the fund would apply equally to the case before us involving the authority to invest the fund in corporate stocks.

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[1] 46 Op Atty Gen 506 (1993).

[2] ORS 293.721 (emphasis added).; *See also* ORS § 293.726(1) ("The investment funds shall be invested and the investments of those funds managed as a prudent investor would do, under the circumstances then prevailing and in light of the purposes, terms, distribution requirements and laws governing each investment fund.")

We have reached a similar conclusion with respect to the Public Employes' Retirement Fund [PERF]. It too possesses all the characteristics of an isolated fund which made possible the results reached in the cases discussed above. Paraphrasing the language quoted from United Contracting Co. v. Duby, Supra, we may say that the retirement funds have been gathered not for the general enrichment of the state but for the benefit of contributing employees.

Since the state has no proprietary interest in these funds we can narrow the scope of the question before us."[3]

E. Trustee's Duty of Loyalty

a. A trustee owes a duty of loyalty to the beneficiaries and must administer the trust solely in their interests.[4]

b. The sole interest rule requires a trustee to exclude not only "all self-interest," but also "interests of third persons."[5] A mixed motive breaches the duty of loyalty even if "the trustee may be able to show that the action in question was taken in good faith, that the terms of the transaction were fair, and that no profit resulted to the trustee."[6] The purpose is to reflect, "the concern that a conflict of interest may prevent the trustee from exercising independent and disinterested judgment on behalf of the trust."[7]

c. "In the area of investment decisions, the obligation to exercise prudence is *essentially an obligation to give primacy to the preservation of the trust estate and the procurement of reasonable income while avoiding undue investment risks* ***. *** it appears clear that a fiduciary *cannot* properly make an imprudent investment *solely* on the basis of portfolio considerations and performance."[8]

d. "'[S]ocial investing,' in which a trustee makes an investment decision based on social causes, is deemed to be inconsistent "with the duty of loyalty if the investment activity entails sacrificing the interests of trust beneficiaries—for example, by accepting below-market returns—in favor of the interests of the persons supposedly benefitted by pursuing the particular social cause." [9]

e. "In brief, the trust law fiduciary duty of loyalty generally prohibits collateral benefits ESG. Risk-return ESG, by contrast, can be permissible under the duties of loyalty and prudence on the same terms as any other kind of active investment or active shareholding strategy that seeks to improve risk-adjusted returns. The law neither mandates nor prohibits risk-return ESG. Accordingly, a trustee or other such fiduciary

[3] *Sprague v. Straub*, 252 Or 507, 521–22, 451 P2d 49, 57 (1969) (footnote omitted).; *See also* Summary of Pension Unfunded Accrued Liability (UAL) as of December 31, 2019 available at: https://www.oregon.gov/pers/Documents/Financials/Pension-Summary-UAL.pdf. (accessed February 23, 2023).
[4] ORS 130.655(1).
[5] George Gleason Bogert et. al, *The Law of Trusts and Trustees* § 543 (2021).
[6] *Restatement* (*Third*) *of Trusts* § 78 cmt. b (2007).
[7] Bogert, supra note 5. *See Matter of Rothko's Estate*, 372 NE2d 291 (N.Y. 1977)
[8] 41 Op Atty Gen. 503 (1981) (citations omitted).
[9] *Administering Trusts in Oregon* (OSB Legal Pubs 2018) (citations omitted).

who reasonably concludes that use of ESG factors will provide risk and return benefits, and is solely motivated by that conclusion, should have no hesitation in using those factors."[10]

f. "Social factors" may be considered:

"The OIC and the Treasurer may consider statutory social factors in making an investment decision, but the OIC and Treasurer may select or reject an investment based on such factors only if the investment is equal to or superior to alternative investments when judged solely on the basis of its potential economic value."[11]

F. Precedent of Divesting: South Africa and Namibia:

a. "Oregon Laws 1987, chapter 193, known as the Oregon Anti–Apartheid Act of 1987 and codified as ORS 293.830 to 293.870, generally requires the Oregon Investment Council and the State Treasurer to divest investments related, in certain specified ways, to the Republic of South Africa and to Namibia. ORS 293.845 imposes duties on the Oregon Investment Council and the State Treasurer to implement policies and procedures consistent with the Act. It provides:

> 1) In consultation with the Oregon Investment Council, the State Treasurer shall review the investment policies of this state to determine consistency with the legislative policy, findings and provisions of ORS 293.830 to 293.870.
> (2) No later than January 15, 1988, after public hearing, the Oregon Investment Council and the State Treasurer shall adopt an investment policy and procedures that establish and implement a prudent alternative for investments in South Africa and in Namibia, consistent with the policy, findings and provisions of ORS 293.830 to 293.870."

***

We believe that the Act also permits the Investment Council and the State Treasurer to adopt an alternative procedure that permits the investment managers to purchase restricted stocks and bonds, when necessary to satisfy the fiduciary responsibilities stated in ORS 293.721 and 293.726, without prior approval by the Oregon Investment Council and the State Treasurer. However, the Act permits the investment manager to make such a purchase only when there is no alternative stock or bond which would satisfy the requirements of ORS 293.721 and 293.726."[12]

b. "In 1989, Attorney General Dave Frohnmayer addressed South African investments involving higher education funds in the context of the Anti-Apartheid Act of 1987 (Or Laws 1987, ch 193). 46 Op Atty Gen 143 (1989). The Anti-Apartheid Act mandated the

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[10] Max M. Schanzenbach & Robert H. Sitkoff, *ESG Investing: Theory, Evidence, and Fiduciary Principles*, September. 2020, http://www.law.harvard.edu/programs/olin_center/papers/pdf/Sitkoff_1038.pdf. (accessed March 1, 2023).
[11] Letter of Advice to Ted Wheeler, State Treasurer, (OP-2010-3) (August 5, 2010)
[12] Letter of Advice to Anthony Meeker, State Treasurer, (OP-6266) (December 8, 1988)

“orderly, prudent” divestiture of subject investment funds, including OPERF, “in stocks and bonds in United States business entities directly investing in South Africa and in Namibia.” ORS 293.855(2) (1987). Attorney General Frohnmayer acknowledged a legislative finding in the Anti-Apartheid Act of the risks inherent in South African investment as well as the directive for prudent divestiture without abrogation of fiduciary responsibilities. 46 Op Atty Gen at 154. He stated that “the prudent investor rule does not absolutely prohibit divestiture.” *Id.* Accordingly, he said that the OIC could “carry out divestiture * * * to the extent that such divestiture can be accomplished while complying with” the applicable statutory standards for investment. *Id.”*[13]

[13] Letter of Advice to Ted Wheeler, State Treasurer, (OP-2010-3) (August 5, 2010); *See* February 13, 2017 CalPERS agenda item:

> In California, the practice of requiring pension funds to divest began in 1986 with the passing of legislation to divest from firms doing business with South Africa. From that point, the California Legislature has introduced dozens of bills that would encourage or require divesting from various companies and countries. The South Africa, Arab League’s economic boycott, Sudan, Iran and Thermal Coal bills were the only successful divestment proposals passed by the Legislature and signed by the Governor.
>
> In October 2015, Wilshire Associates presented a review of CalPERS divestments affecting the Global Equity Program. As of December 31, 2014, the potential impacts related to all current and prior CalPERS divestment initiatives, including foregone performance and transaction costs, were estimated to exceed $8 billion dollars.

CalPERS, *Agenda*, https://www.calpers.ca.gov/docs/board-agendas/201702/invest/item06b-00.pdf. (accessed February 24, 2023)

OIC

OREGON STATE TREASURY

TAB 8

OPERF 2022

PERFORMANCE REVIEW

MEKETA

INVESTMENT GROUP

Oregon Investment Council

March 8, 2023

Q4 Performance Update
As of December 31, 2022

Table of Contents

Introduction

OPERF Executive Summary – Notable Items

→ The OIC recently adopted a new Asset Allocation policy and targets. These will be incorporated into the reporting as of April 1 (Q2 reporting).

→ OIC approved a new benchmark for the Opportunity Portfolio. This will also be updated as of April 1 in reporting.

→ Investment Policy work is underway for the OPERF portfolio.

→ ESG continues to be an important topic for discussion both at OIC and other plans around the country. Additional education will continue on this topic.

→ Governance will also continue to be a topic for discussion, along with continued alignment between policy and implementation.

Economic and Market Update

Data as of December 31, 2022

Commentary

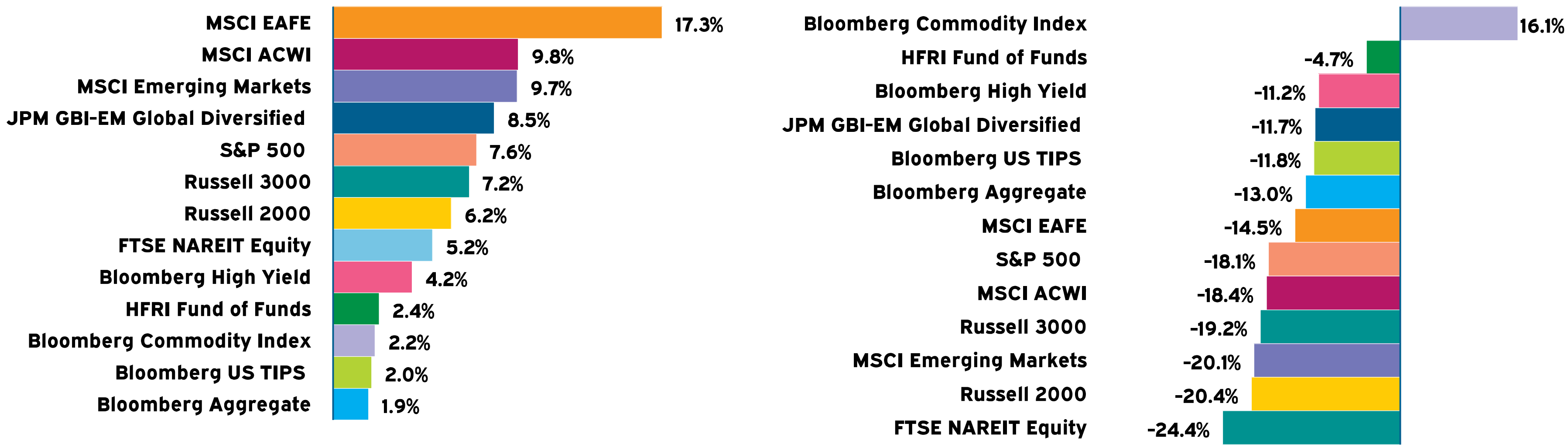
→ Ending a very tough year, most asset classes posted gains in the fourth quarter on signs that policy tightening would slow given cooling inflation.

- Chairman Powell's testimony in November reiterated previous messaging on persistent and high inflation and the need for an extended period of monetary tightening weighing on assets in December. Markets remained focused though on signs that inflation is falling and that the size of future Fed rate hikes could be lower.
- US equity markets sold off (-5.9%) in December but returned 7.2% in the fourth quarter as investors balanced the Fed's caution with improving inflation data.
- In developed equity markets outside the US, sentiment deteriorated somewhat in December, but they posted a strong fourth quarter return of 17.3% driven by a falling US dollar and results in Europe where inflation started to slow.
- Emerging market equities declined in December too (-1.4%) but less than the US and also had a strong fourth quarter (+9.7%). A weaker US dollar, declining inflation globally, and signs of China reopening its economy all contributed to the results.
- Bonds experienced one of the worst years on record given inflation levels and the rapid rise in interest rates. Optimism over declining inflation and a slower pace of policy tightening benefited bonds overall in the fourth quarter though.

→ Looking to 2023, the path of inflation and monetary policy, slowing growth globally, China reopening its economy, and the war in Ukraine will all be key.

Index Returns[1]

Fourth Quarter | **2022**



→ After broad declines in Q3 driven by expectations for further policy tightening, most major asset classes were up in the fourth quarter on hopes of inflation and policy tightening peaking.

→ Outside of commodities, all other public market asset classes declined in 2022. It was the first time since the 1960s that both stocks and bonds declined together in a calendar year.

[1] Source: Bloomberg and FactSet. Data is as of December 31, 2022.

Domestic Equity Returns[1]

Domestic Equity	December (%)	Q4 (%)	1 YR (%)	3 YR (%)	5 YR (%)	10 YR (%)
S&P 500	-5.8	7.6	-18.1	7.7	9.4	12.6
Russell 3000	-5.9	7.2	-19.2	7.1	8.8	12.1
Russell 1000	-5.8	7.2	-19.1	7.3	9.1	12.4
Russell 1000 Growth	-7.7	2.2	-29.1	7.8	11.0	14.1
Russell 1000 Value	-4.0	12.4	-7.5	6.0	6.7	10.3
Russell MidCap	-5.4	9.2	-17.3	5.9	7.1	11.0
Russell MidCap Growth	-6.0	6.9	-26.7	3.9	7.6	11.4
Russell MidCap Value	-5.1	10.5	-12.0	5.8	5.7	10.1
Russell 2000	-6.5	6.2	-20.4	3.1	4.1	9.0
Russell 2000 Growth	-6.4	4.1	-26.4	0.6	3.5	9.2
Russell 2000 Value	-6.6	8.4	-14.5	4.7	4.1	8.5

US Equities: Russell 3000 Index declined 5.9% for December but gained 7.2% for the quarter. Historic inflation and rapidly rising interest rates led to significant declines (-19.2%) for the full year.

→ US stocks fell broadly in December on the Federal Reserve signaling its continued resolve to raise rates but gained overall for the quarter on hopes that interest rates could be peaking soon given slowing inflation.

→ All sectors declined during December, led by consumer discretionary and technology with defensive sectors declining less. For the quarter though, most sectors were up led by energy and industrials.

→ In a continuation on the overall trend in 2022 value stocks outperformed growth stocks in the fourth quarter given higher interest rates and slowing growth.

[1] Source: Bloomberg. Data is as of December 31, 2022.

Foreign Equity Returns[1]

Foreign Equity	December (%)	Q4 (%)	1 YR (%)	3 YR (%)	5 YR (%)	10 YR (%)
MSCI ACWI ex. US	-0.7	14.3	-16.0	0.1	0.9	3.8
MSCI EAFE	0.1	17.3	-14.5	0.9	1.5	4.7
MSCI EAFE (Local Currency)	-3.0	8.7	-7.0	3.6	3.8	7.6
MSCI EAFE Small Cap	1.1	15.8	-21.4	-0.9	0.0	6.2
MSCI Emerging Markets	-1.4	9.7	-20.1	-2.7	-1.4	1.4
MSCI Emerging Markets (Local Currency)	-2.0	6.6	-15.5	0.1	1.3	4.6
MSCI China	5.2	13.5	-21.9	-7.5	-4.5	2.4

Developed international equities (MSCI EAFE) rose 0.1% in December and an impressive 17.3% in the fourth quarter. Emerging markets (MSCI EM) fell -1.4% in December but gained 9.7% for the quarter. Inflation and rising rates also weighed on international equities last year, as well as a strong US dollar for most of the year.

→ International developed market equities, specifically Europe, held up better relative to the rest of the world in December with the MSCI EAFE up 0.1%. In the fourth quarter, they returned a significant 17.3% due in part to the recent weakness in the US dollar (they returned only 8.7% in local terms) leading to lower declines for the year.

→ In December emerging markets outperformed the US but trailed developed market equities as China's rally was not enough to offset weakness elsewhere (e.g., India -5.5%). For the quarter, a weakening US dollar and China reopening led to strong results (+9.7%), but emerging markets remained the weakest for 2022 due to China.

→ Like the US, value outpaced growth globally in 2022.

[1] Source: Bloomberg. Data is as of December 31, 2022.

Fixed Income Returns[1]

Fixed Income	December (%)	Q4 (%)	1 YR (%)	3 YR (%)	5 YR (%)	10 YR (%)	Current Yield (%)	Duration (Years)
Bloomberg Universal	-0.3	2.2	-13.0	-2.5	0.2	1.3	5.1	6.2
Bloomberg Aggregate	-0.5	1.9	-13.0	-2.7	0.0	1.1	4.7	6.4
Bloomberg US TIPS	-1.0	2.0	-11.8	1.2	2.1	1.1	4.4	6.7
Bloomberg High Yield	-0.6	4.2	-11.2	0.0	2.3	4.0	9.0	4.4
JPM GBI-EM Global Diversified (USD)	2.2	8.5	-11.7	-6.1	-2.5	-2.0	5.8	4.9

Fixed Income: The Bloomberg Universal fell -0.3% in December but rose 2.2% for the fourth quarter. Last year was one of the worst on record, with the broad bond market declining 13%.

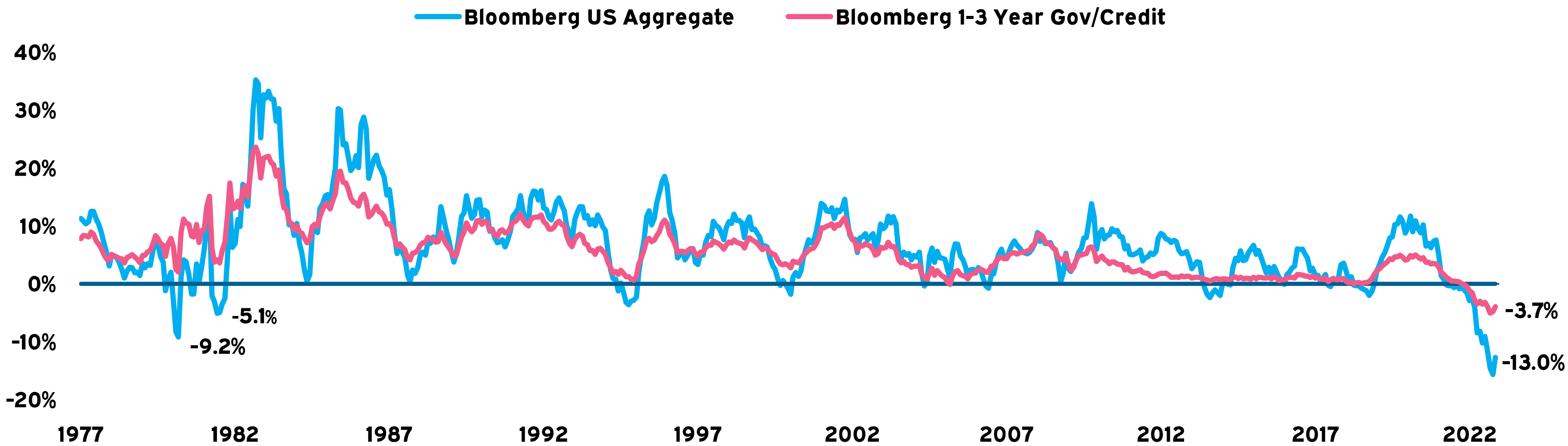
→ The Federal Reserve reconfirming its commitment to tighten policy in the face of high inflation weighed on US fixed income in December. For the quarter though the broad US bond market (Bloomberg Aggregate) was up 1.9% on hopes that inflation would continue to decline and corresponding expectations for the slowing of policy rate hikes.

→ TIPS produced similar results to the broad US bond market for the quarter but outperformed for the year given their inflation adjustment.

→ Riskier bonds outperformed for the quarter due to improving risk sentiment with emerging market bonds performing particularly well.

[1] Source: Bloomberg. JPM GBI-EM data is from InvestorForce. Data is as of December 31, 2022. The yield and duration data from Bloomberg is defined as the index's yield to worst and modified duration respectively.

Fixed Income
Rolling One-year Returns[1]



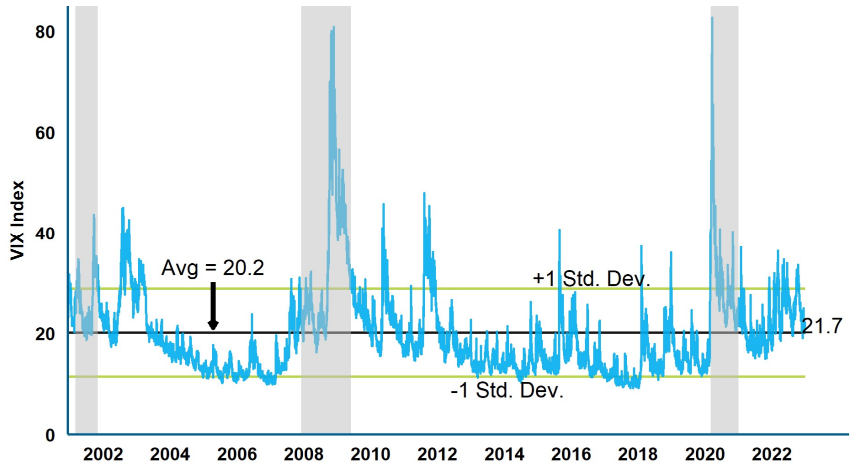
→ Last year was one of the worst return periods for the US bond market given the historic inflation levels and the corresponding rapid rise in interest rates.

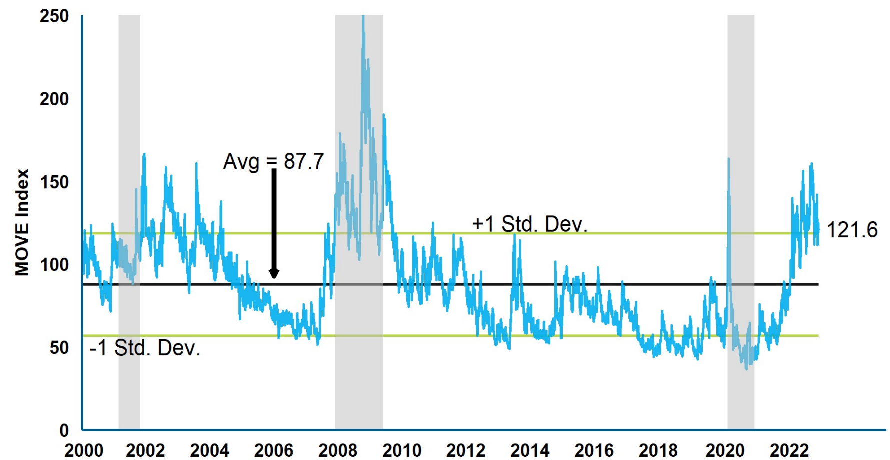
→ The broad bond market (Bloomberg US Aggregate) declined 13% in 2022 making it one of the worst periods on record.

→ Short-term bond declines were far smaller (-3.7%) last year, but also were one of the worst on record.

[1] Source: Bloomberg. Data is as of December 31, 2022.

Equity and Fixed Income Volatility[1]

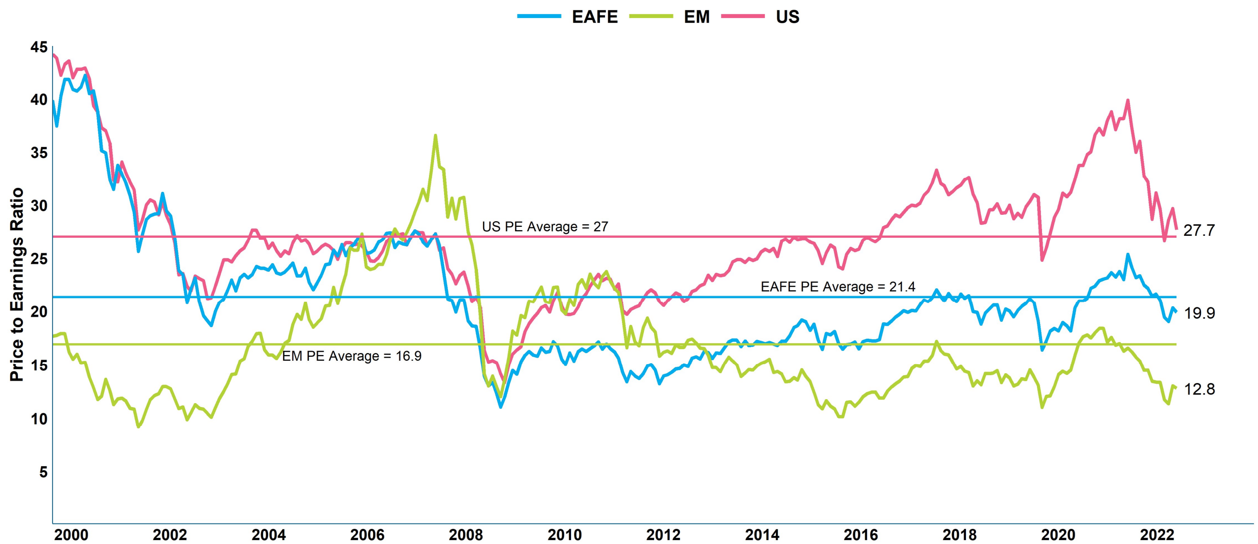




- → Volatility in equities (VIX) finished the year down from its highs and near its long run average as investors anticipated the potential end of Fed rate hikes this year.
- → Fixed income (MOVE) remained elevated and well above its long-run average at year-end due to the uncertain path of US interest rates as the Federal Reserve continues its hawkish stance on inflation.

[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 December 2022. The average line indicated is the average of the VIX and MOVE values between January 2000 and the recent month-end respectively.

Equity Cyclically Adjusted P/E Ratios[1]



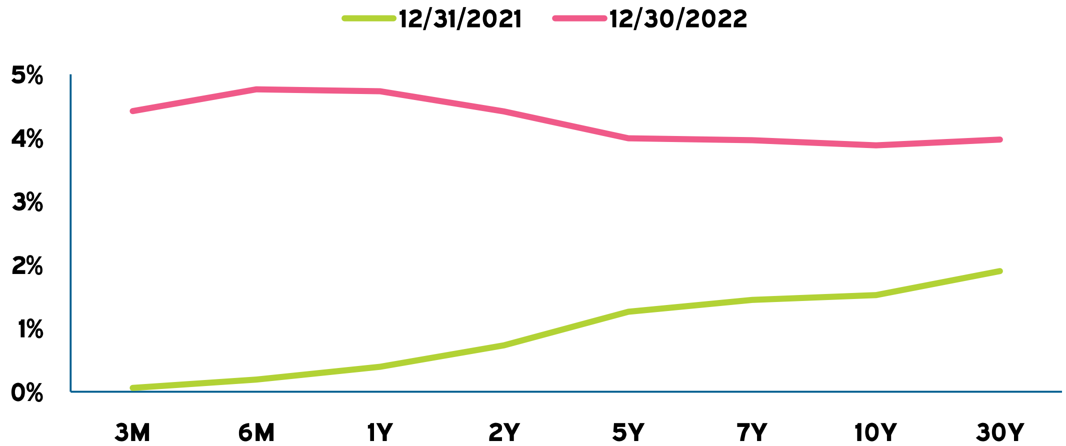
→ After December's sell-off, US equity price-to-earnings ratio finished the year near its long-term (21st century) average.

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

→ Price declines have been the main driver of recent multiple compression as earnings have remained resilient. Concerns remain over whether earnings strength will continue in the face of slowing growth.

[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 December 2022. 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]



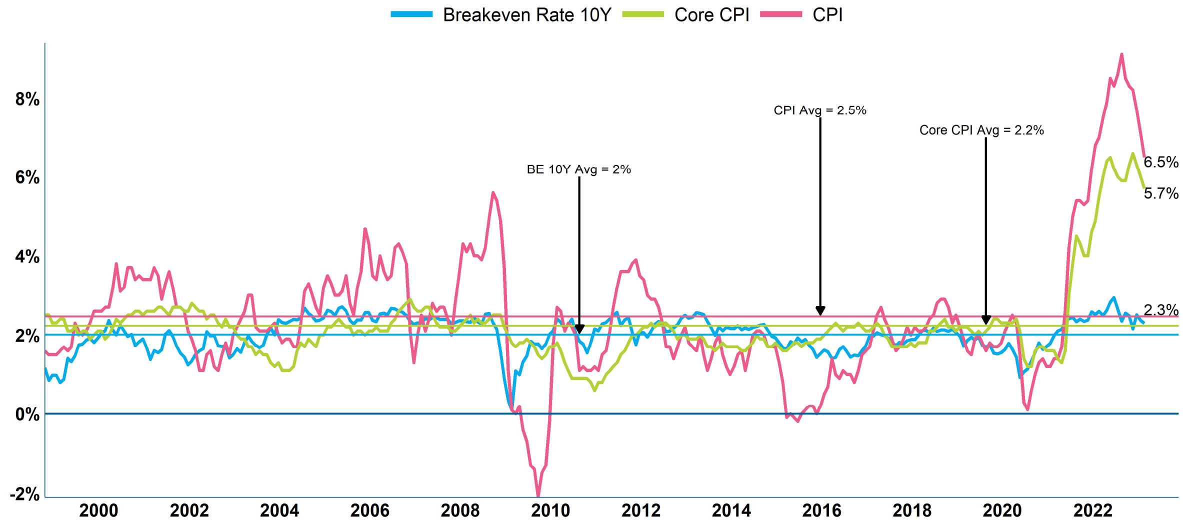
→ In December, policy-sensitive interest rates at the front-end of the curve continued to rise with the two-year Treasury yield increasing from 4.3% to 4.4%. Longer dated ten-year Treasury yields also increased (3.6% to 3.9%). For the year, the yield curve rose dramatically across maturities and moved from steep to inverted.

→ The Fed remains strongly committed to fighting inflation, as it increased rates another 50 basis points to a range of 4.0% to 4.5% at its December meeting. This brought the total number of increases for 2022 to seven.

→ The yield spread between two-year and ten-year Treasuries narrowed somewhat to -0.54% after finishing November at -0.70%. The more closely watched measure by the Fed of three-month and ten-year Treasuries also remained inverted. Historically, inversions in the yield curve have often preceded recessions.

[1] Source: Bloomberg. Data is as of December 31, 2022.

Ten-Year Breakeven Inflation and CPI[1]

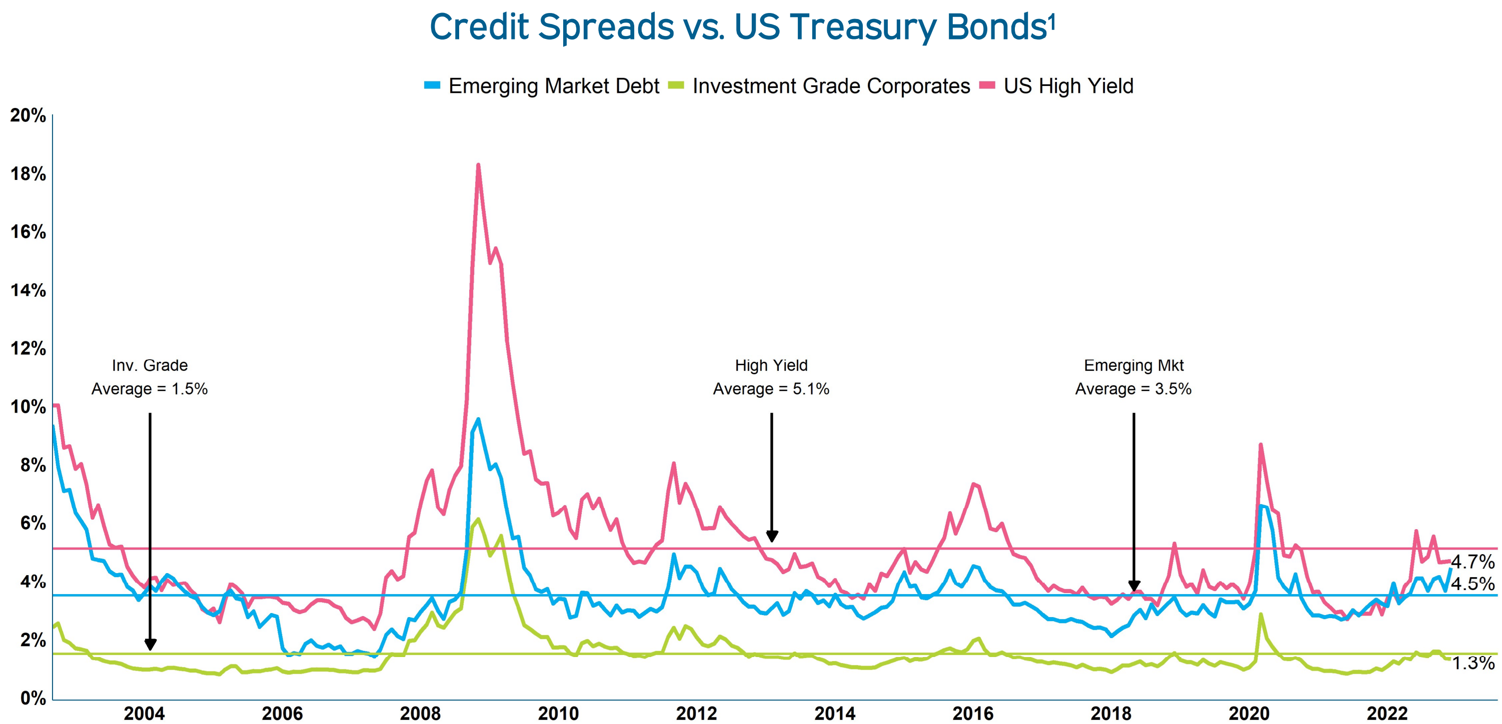


→ In December inflation continued to decline (6.5% versus 7.1%) matching expectations and providing support for the Fed to slow the pace of policy tightening. Energy prices fell again for the month but remain up 7.3% from a year prior, while food prices fell slightly, and stickier service prices continued to increase.

→ Core inflation – excluding food and energy – also continued to decline in December (5.7% versus 6.0%) and matched estimates.

→ Inflation expectations (breakevens) declined slightly for the month (2.3% versus 2.4%) and remain well below current inflation levels as investors anticipate a significant moderation in inflation.

[1] Source: Bloomberg. Data is as of December 2022. 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.

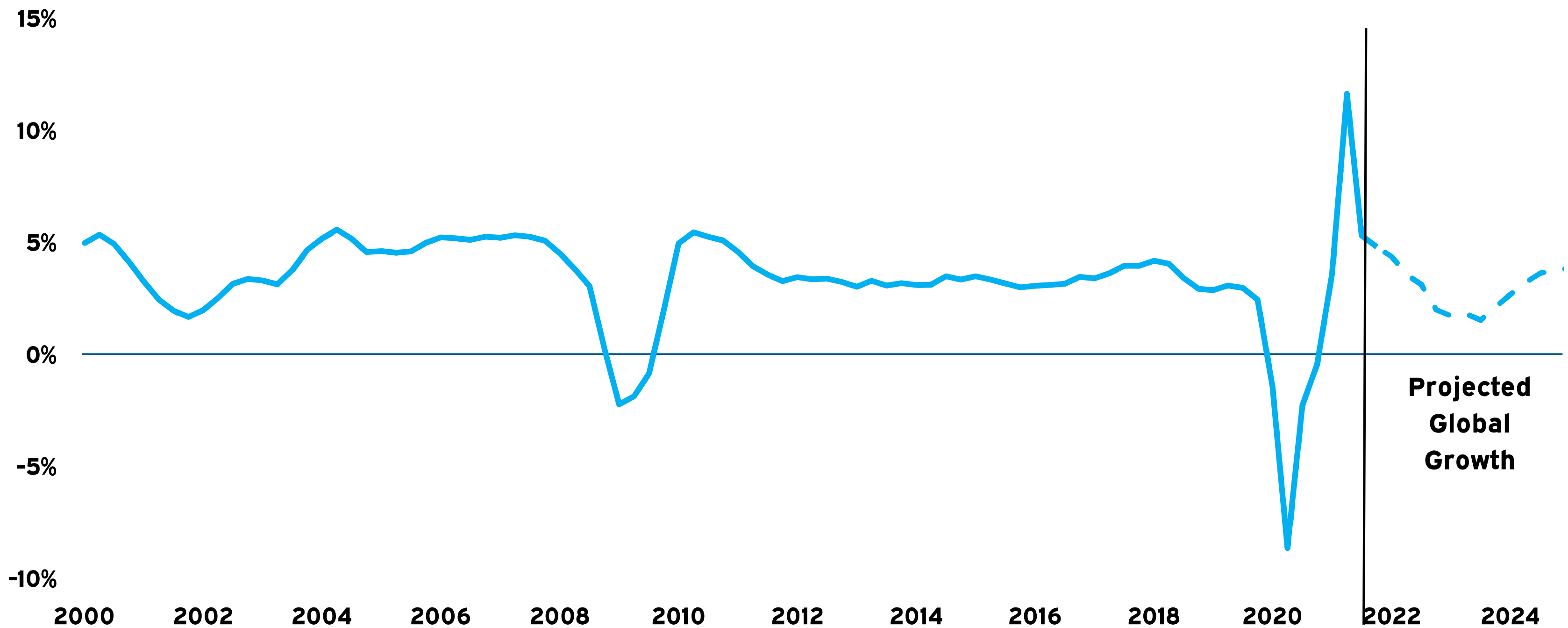


→ High yield spreads (the added yield above a comparable maturity Treasury) finished December at 4.7% (the same as the end of November) remaining below their long-run average.

→ Investment grade spreads also held steady at 1.3% as attractive yields and strong balance sheets continued to attract investors, while emerging market spreads rose (4.5% versus 3.6%) due to concerns regarding slower growth and lower commodity prices.

[1] Sources: Bloomberg. Data is as of December 31, 2022. 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]



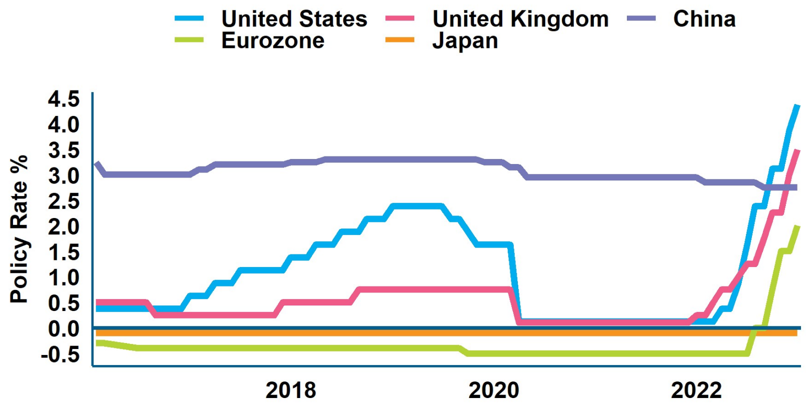
→ Global economies are expected to slow in 2023 compared to 2022, with risks of recession increasing given persistently high inflation and related tighter monetary policy.

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

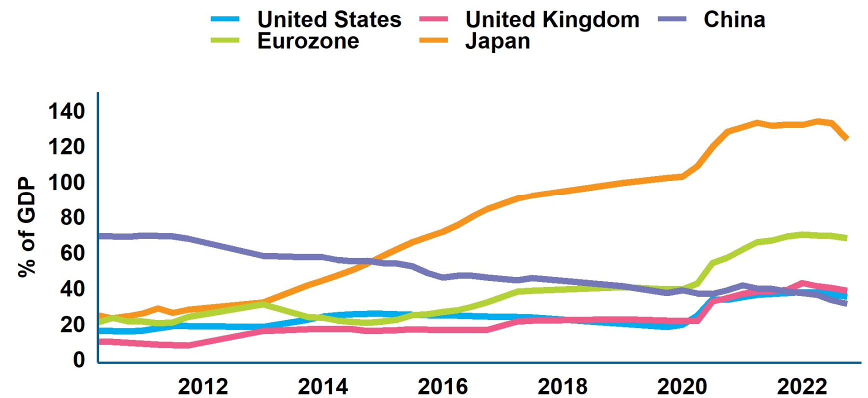
[1] Source: Oxford Economics (World GDP, US$ prices & PPP exchange rate, real, % change YoY). Updated December 2022.

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 a more aggressive approach.

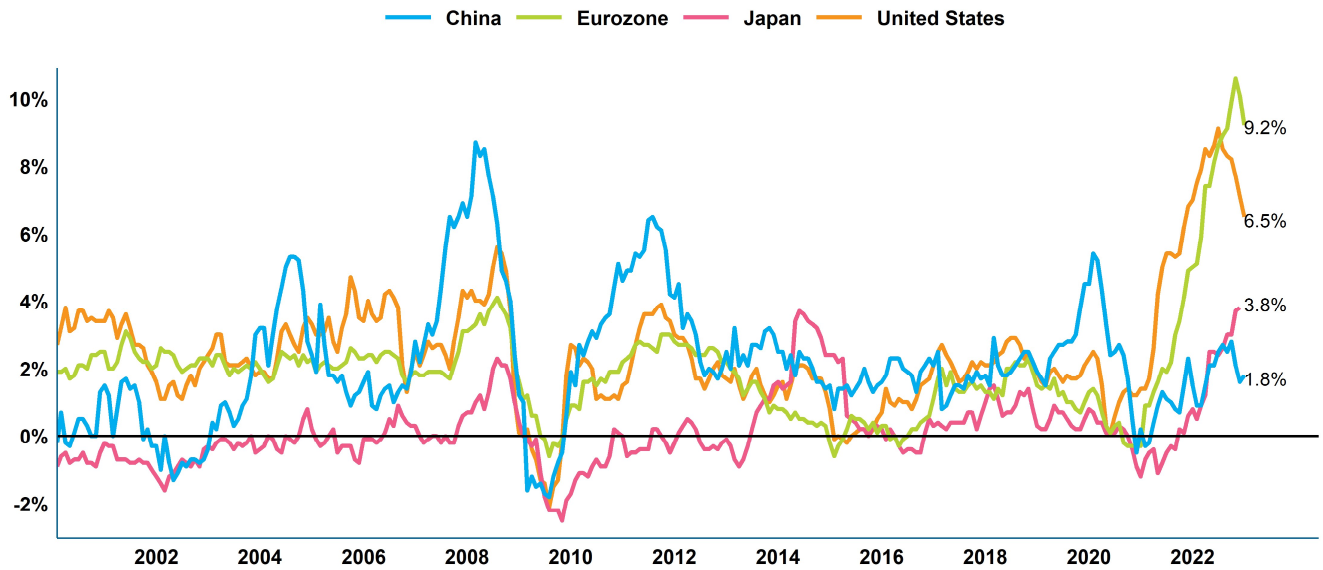
→ In December, the Bank of Japan relaxed its target yield for the 10-year bond which may mark an incremental step toward policy normalization after eight years of quantitative easing.

→ The one notable central bank outlier is China, where the central bank has lowered rates and reserve requirements in response to slowing growth.

→ The risk remains for a policy error, particularly overtightening, as record inflation and aggressive tightening to date could heavily weigh on global growth. The Federal Reserve's policy rate path could diverge from others this year given their strong early start to tightening.

[1] Source: Bloomberg. Policy rate data is as of December 31, 2022. 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 December 31, 2022.

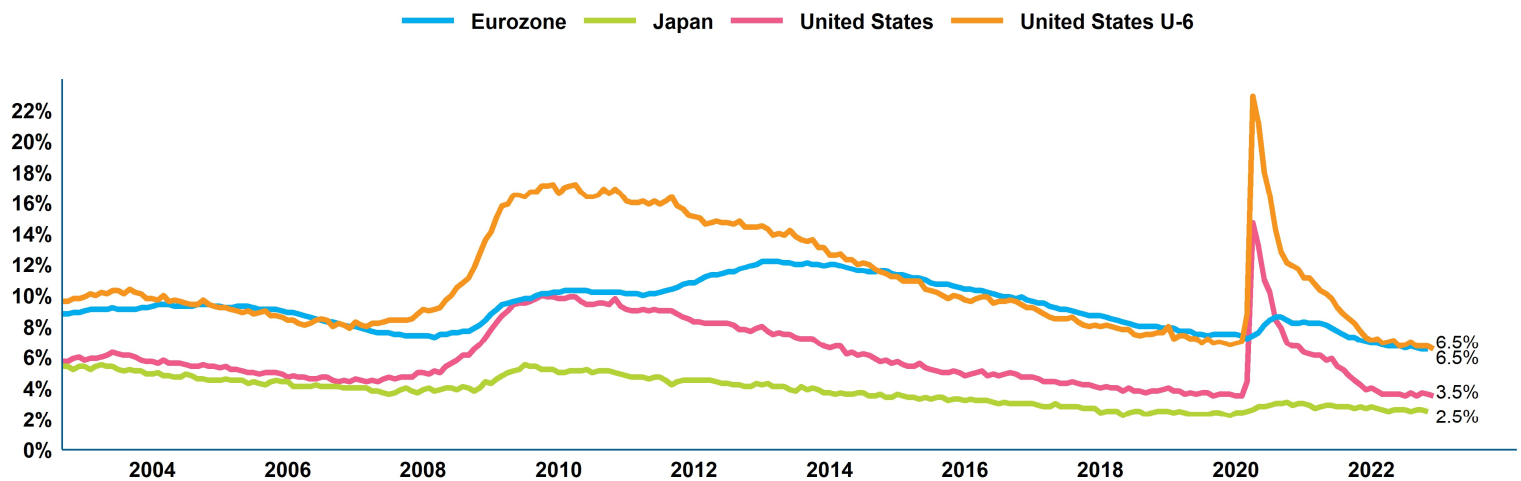
Inflation (CPI Trailing Twelve Months)[1]



- → Inflation increased dramatically from the lows of the pandemic, particularly in the US and Eurozone where it has reached levels not seen in many decades.
- → Inflation pressures are slowly declining in the US, but they remain elevated, while in Europe they have reached historic levels due to skyrocketing energy prices and a weak euro.
- → Supply issues related to the pandemic, record monetary and fiscal stimulus, strict COVID-19 restrictions in China, and higher commodity prices driven by the war in Ukraine have been key global drivers of inflation.

[1] Source: Bloomberg. Data is as of December 2022. The most recent Japanese inflation data is as of November 2022.

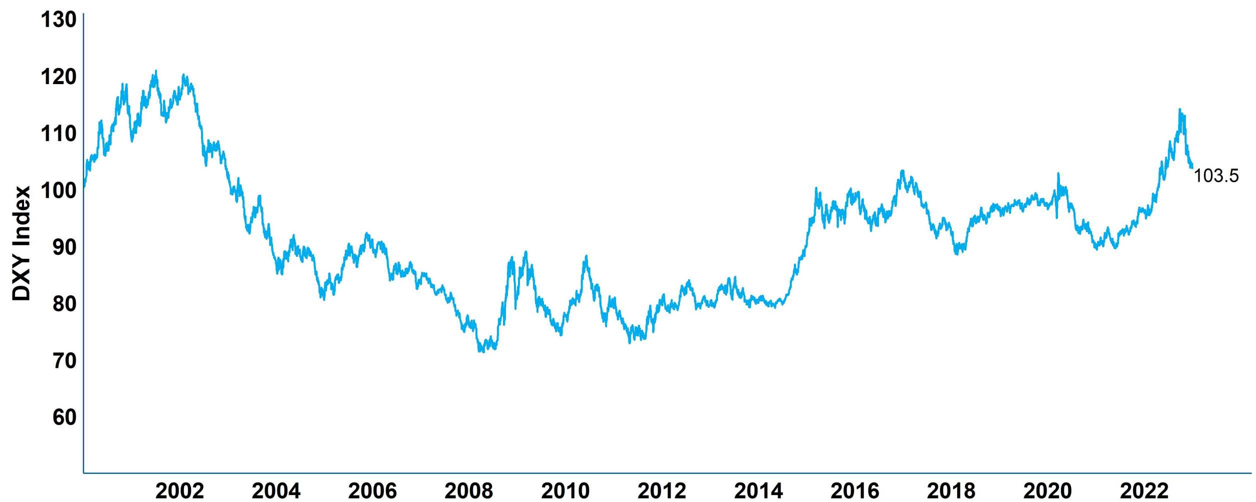
Unemployment[1]



- → As economies have largely reopened, helped by vaccines for the virus, improvements have been seen in the labor market.
- → Despite slowing growth and high inflation, the US labor market remains a bright spot. Unemployment in the US, which experienced the steepest rise from the pandemic, has remained in a tight 3.5%-3.7% range for most of the year.
- → The strong labor market and higher wages, although beneficial for workers, motivates the Fed's efforts to fight inflation, likely leading to higher unemployment.

[1] Source: Bloomberg. Data is as December 31, 2022, for the US. The most recent data for Eurozone and Japanese unemployment is as of November 30, 2022.

US Dollar versus Broad Currencies[1]



- → Overall, the US dollar continued to weaken from its recent peak in December as declining inflation supported the case for the Federal Reserve to slow its tightening.
- → The dollar finished the year much higher than it started though due to the increased pace of policy tightening, stronger relative growth, and safe-haven flows.
- → As we look to 2023, the track of inflation across economies and the corresponding monetary policy will likely be key drivers of currency moves.

[1] Source: Bloomberg. Data as of December 31, 2022.

Summary

Key Trends:

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

→ Monetary policy could diverge in 2023 with the Fed pausing and others continuing to tighten. The risk of policy errors in both directions remains.

→ Growth will continue to slow globally next year, with many economies likely falling into recessions. Inflation, monetary policy, and the war will all be key.

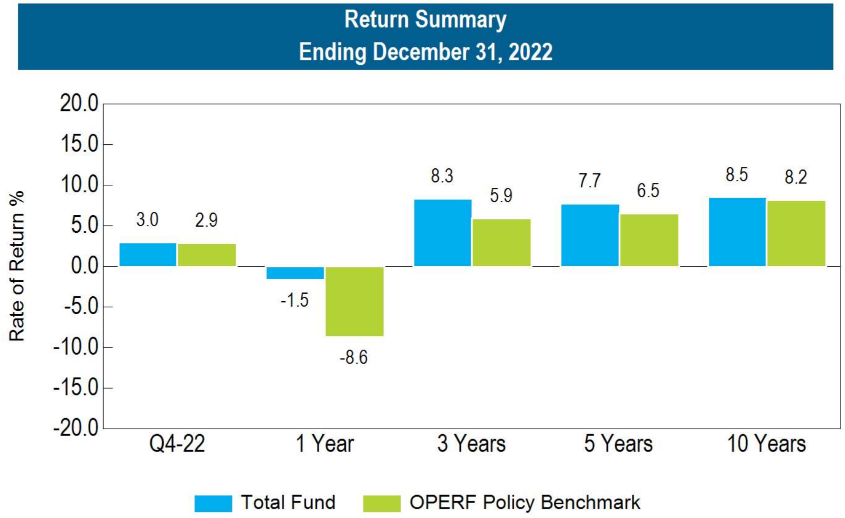
→ In the US the end of many fiscal programs is expected to put the burden of continued growth on consumers. Higher energy and food prices could weigh on consumer spending.

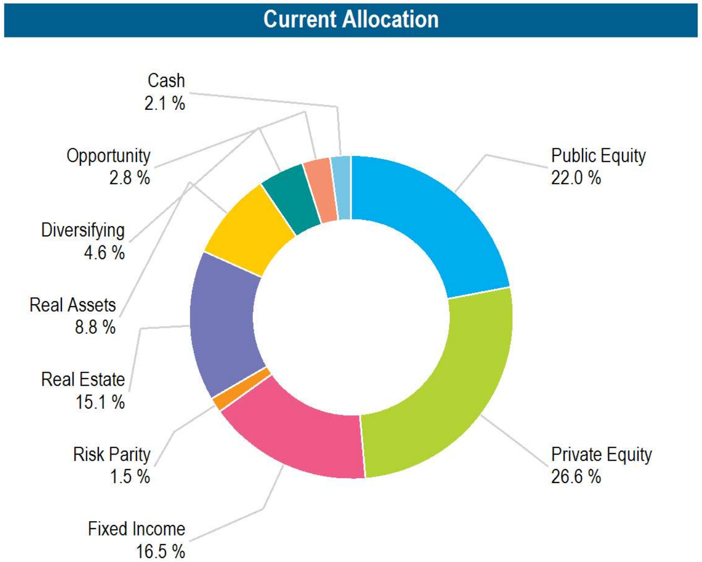
→ Valuations have significantly declined in the US to around long-term averages, largely driven by price declines. The key going forward will be whether earnings can remain resilient if growth continues to slow.

→ Outside the US, equity valuations remain lower in both emerging and developed markets, but risks remain, including potential continued strength in the US dollar, higher inflation particularly weighing on Europe, and China's rushed exit from COVID-19 restrictions and on-going weakness in the real estate sector.

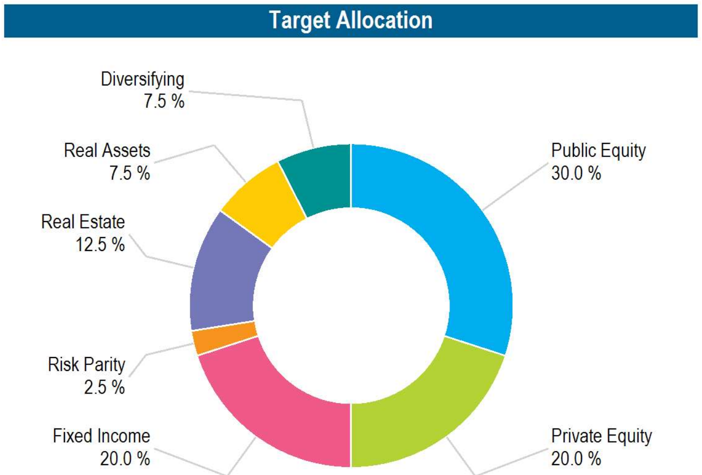
Executive Summary

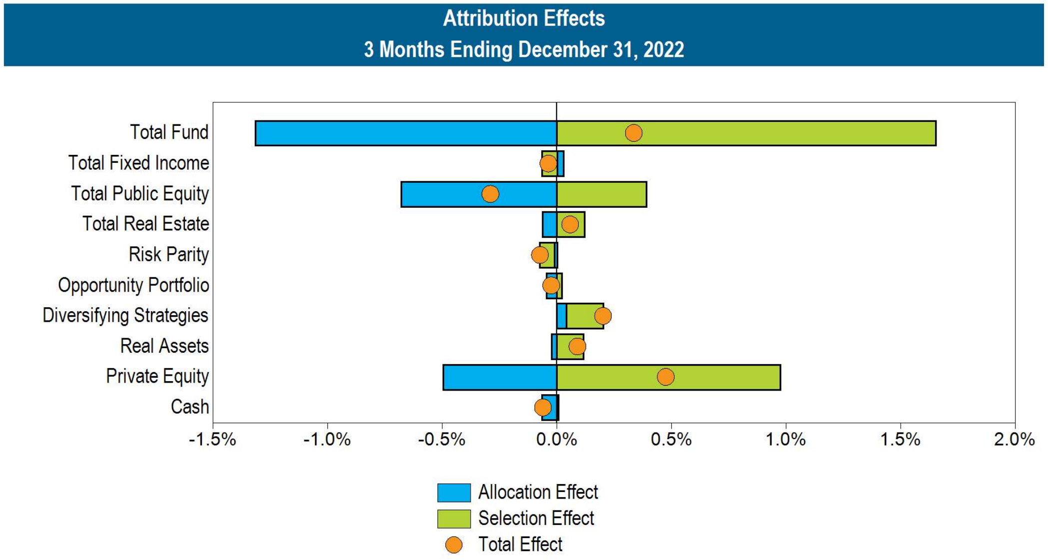
Q4 2022



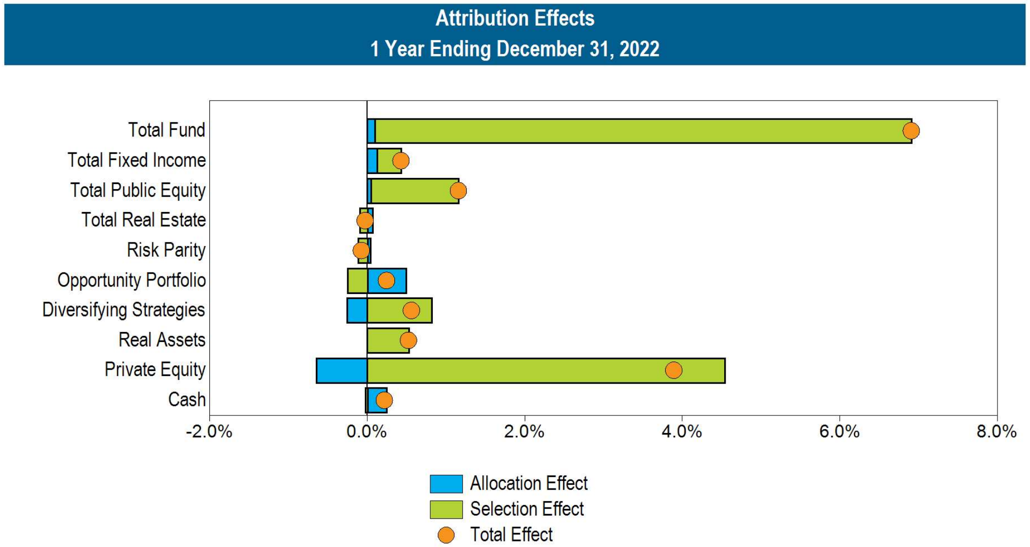


	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)
Total Fund	**3.0**	**-1.5**	**8.3**	**7.7**	**8.5**
OPERF Policy Benchmark	*2.9*	*-8.6*	*5.9*	*6.5*	*8.2*
Excess Return	0.1	7.1	2.4	1.2	0.3
InvMetrics All DB > $10B Net Rank	*92*	*1*	*1*	*1*	*1*
Median	*4.6*	*-10.0*	*5.1*	*5.8*	*7.4*





- → The Total Fund returned 3.0% for the fourth quarter, outperforming the OPERF Policy Benchmark (+2.9%) by 10bps.
- → Compared to peers the Total Fund underperformed the peer median return of 4.6%.
- → Public Equities returned 11.8% for the quarter driven by Non-US Equity which returned 15.0% for the quarter.
  - International Small-Cap returned 17.5% for the fourth quarter and was the strongest performing asset class.
  - Within International Small-Cap Harris Associates and DFA International SmallCap returned 26.4% and 18.9% respectively.
- → The underweight to Public Equities was a slight detractor on a relative basis.
- → Total Fixed Income returned 1.5% for the quarter trailing the Oregon Custom FI Benchmark (+1.9%) by 40bps.
- → Private Equity returned -0.3% for the quarter outperforming the Russell 3000 +300bps QTR Lag benchmark (-3.7%) by 340bps.
  - Private Equity's outperformance of the benchmark was the largest driver of relative returns.



→ The Total Fund returned -1.5% for the calendar year ending December 31, 2022. The Fund outperformed the OPERF Policy Benchmark (-8.6%) by 710bps and outperformed the peer median return of -10.0% by 850bps. This return ranks in the top percentile of peer universe returns.

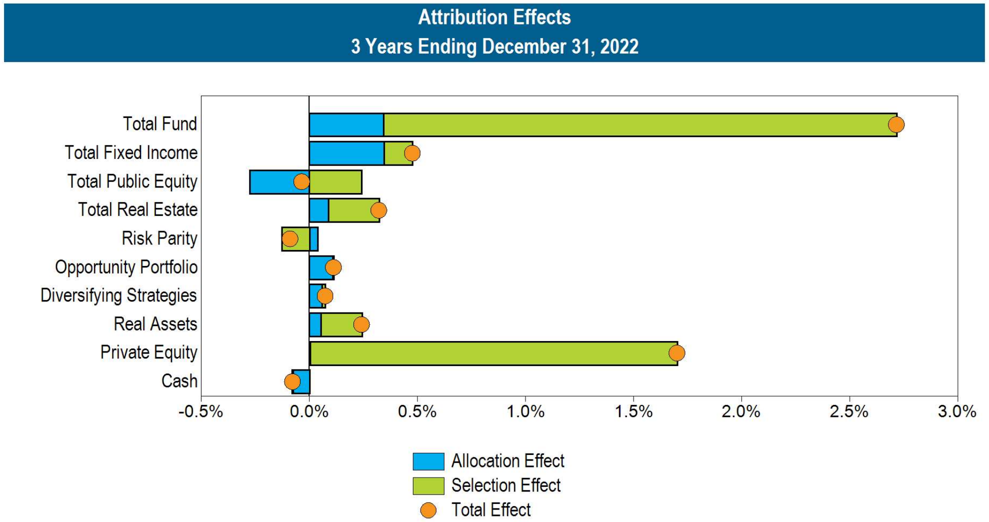
→ Private Equity continues to drive returns on a relative basis. The trailing 1-Year return of the Private Equity portfolio was 1.2% compared to the Russell 3000 +300bps QTR Lag which returned -15.1% over the same period.

→ Total Fixed Income returned -11.3% versus a -13.0% return for the Oregon Custom FI Benchmark.

- Within Fixed Income Non-Core manager Oak Hill has posted a 2.8% return in a year when most Fixed Income investments experienced historic losses.

→ Total Public Equities were down -14.3% for the year though still outperformed the MSCI ACWI IMI benchmark return of -18.4%.

- The US Small Cap Value portfolio drove relative outperformance, returning -7.2% as value stocks outperformed their growth counterparts in a rising rate environment.



→ The Total Fund returned 8.3% annualized over the trailing 3-Year period and has outperformed the OPERF Policy Benchmark (+5.9%) and the peer median return of 5.1% by 240bps and 320bps respectively.

→ The Private Equity portfolio's strong returns have driven benchmark and peer relative performance over the trailing 3-year period. Private Equity has returned 17.0% over the period.

→ Total Fixed Income returned -1.8% over the period compared to the benchmark return of -2.6%.

- Over this period Total Fixed Income returns have been driven by the Non-Core Fixed Income portfolio which has returned 3.4%.

→ Total Public Equities have also performed their respective benchmark, returning 5.1% versus a 3.9% trailing 3-year return for the MSCI ACWI IMI Index.

- Within Public Equities both Small Cap Growth and Small Cap Value portfolios have driven returns, both returning 8.1% over the period.

→ The Real Estate portfolio has performed well and help drive positive outperformance returning 13.6% for the trailing 3-year period.

→ The Diversifying Strategies, Real Assets, and Opportunities portfolio have also performed well on an absolute basis, returning 5.3%, 11.3%, and 11.0% respectively.

- Diversifying Strategies has outperformed the HFRI FOF Conservative Index (+4.8%) by 50bps.
- Real Assets have outperformed the CPI+4% (+9.0%) by 230bps.
- The Opportunities portfolio has outperformed the CPI+5% (+10.1%) benchmark by 90bs over the period.

Statistics Summary

1 Year Ending December 31, 2022

	Anlzd Return	Anlzd Standard Deviation	Information Ratio	Beta	Sharpe Ratio	Tracking Error
Total Fund	-1.55%	6.20%	2.31	0.70	-0.48	3.04%
OPERF Policy Benchmark	-8.58%	8.53%	--	1.00	-1.18	0.00%

Statistics Summary

3 Years Ending December 31, 2022

	Anlzd Return	Anlzd Standard Deviation	Information Ratio	Beta	Sharpe Ratio	Tracking Error
Total Fund	8.34%	7.20%	0.79	0.83	1.07	3.08%
OPERF Policy Benchmark	5.90%	8.06%	--	1.00	0.65	0.00%

Statistics Summary

5 Years Ending December 31, 2022

	Anlzd Return	Anlzd Standard Deviation	Information Ratio	Beta	Sharpe Ratio	Tracking Error
Total Fund	7.73%	6.27%	0.47	0.84	1.04	2.61%
OPERF Policy Benchmark	6.50%	6.94%	--	1.00	0.77	0.00%

Statistics Summary

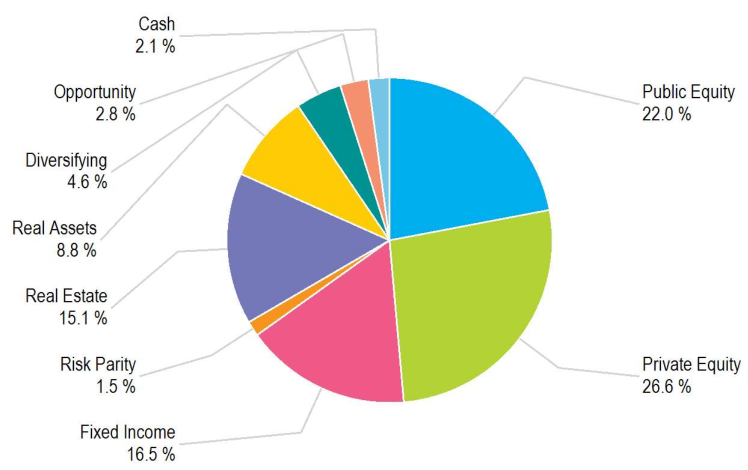
10 Years Ending December 31, 2022

	Anlzd Return	Anlzd Standard Deviation	Information Ratio	Beta	Sharpe Ratio	Tracking Error
Total Fund	8.54%	5.46%	0.18	0.86	1.43	2.07%
OPERF Policy Benchmark	8.17%	5.98%	--	1.00	1.25	0.00%

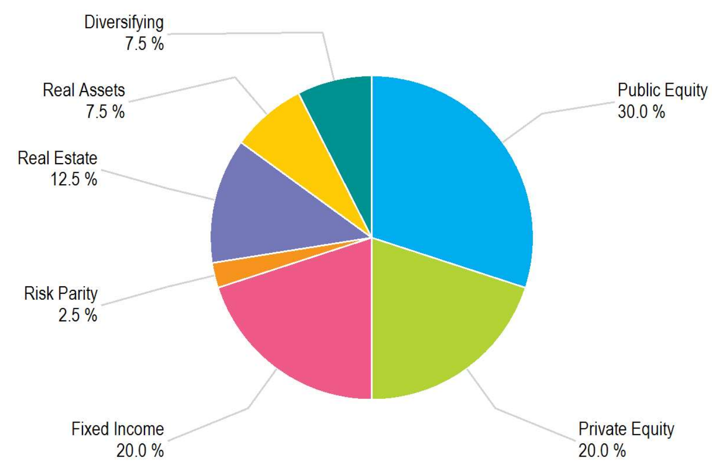
Performance Update

As of December 31, 2022

Actual Asset Allocation

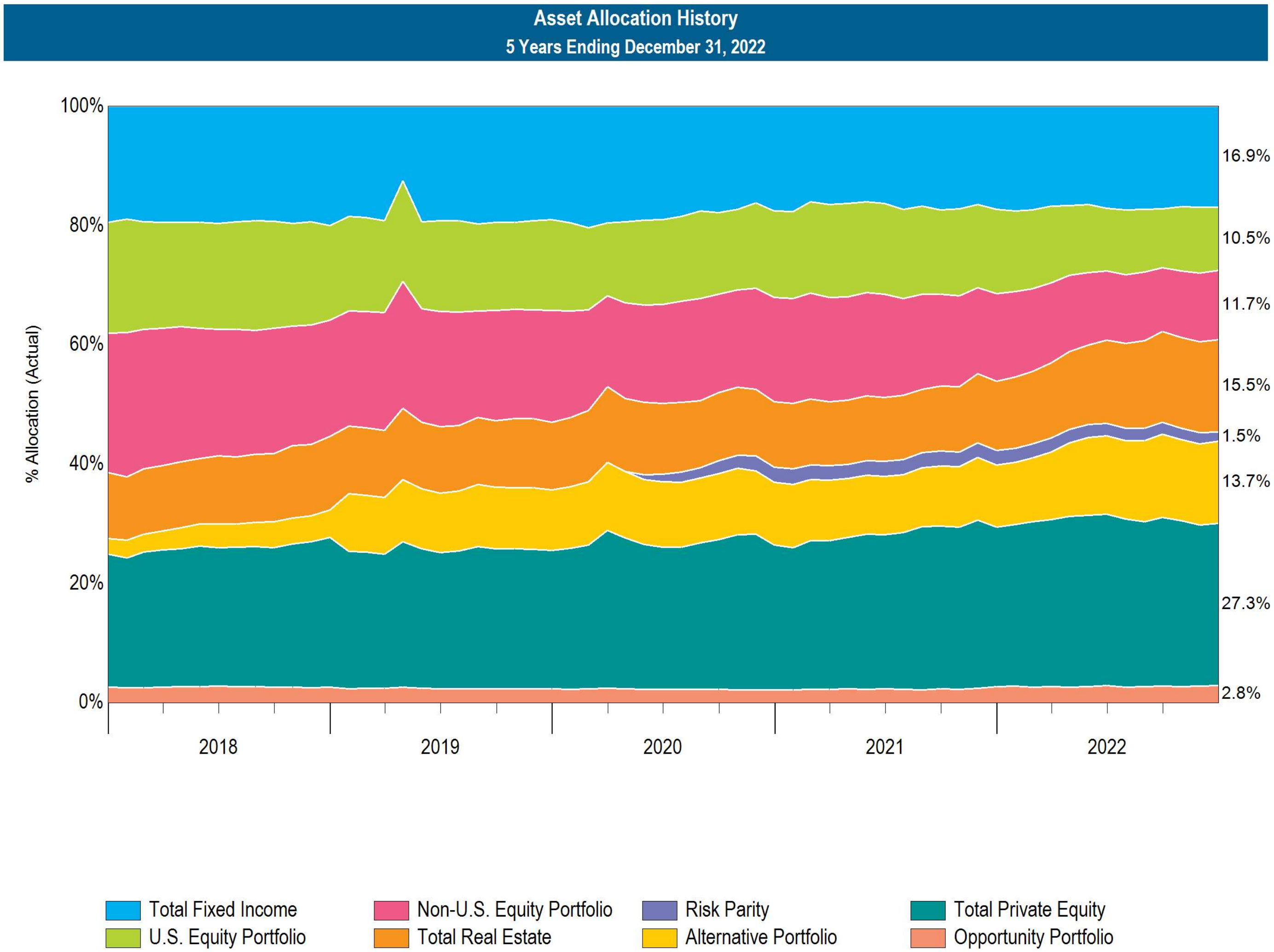


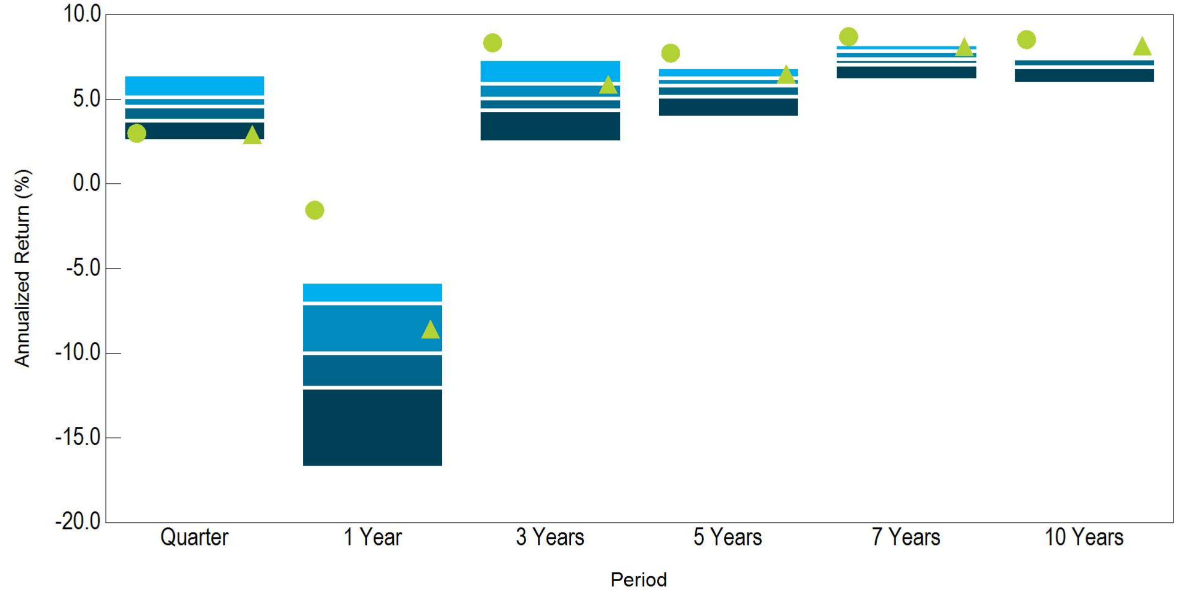
Target Asset Allocation



Asset Allocation vs. Target
As Of December 31, 2022

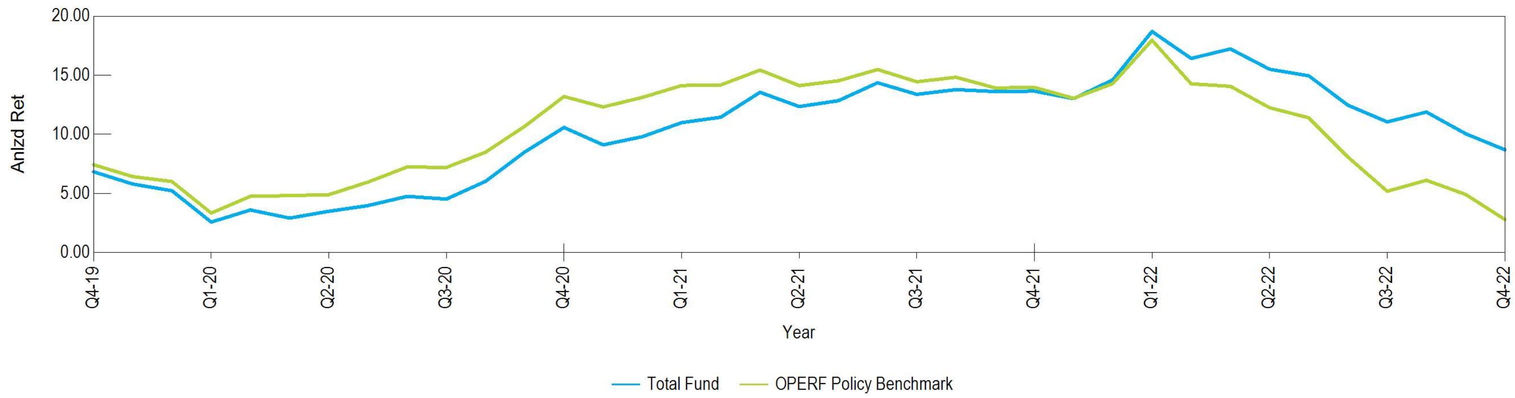
	Current	Current	Policy	Difference	Policy Range	Within Range
Public Equity	$20,206,445,933	22.0%	30.0%	-8.0%	25.0% - 35.0%	No
Private Equity	$24,443,147,587	26.6%	20.0%	6.6%	15.0% - 27.5%	Yes
Fixed Income	$15,182,680,795	16.5%	20.0%	-3.5%	15.0% - 25.0%	Yes
Risk Parity	$1,362,483,918	1.5%	2.5%	-1.0%	0.0% - 3.5%	Yes
Real Estate	$13,891,032,260	15.1%	12.5%	2.6%	7.5% - 17.5%	Yes
Real Assets	$8,061,620,185	8.8%	7.5%	1.3%	2.5% - 10.0%	Yes
Diversifying	$4,262,856,478	4.6%	7.5%	-2.9%	2.5% - 10.0%	Yes
Opportunity	$2,552,966,310	2.8%	0.0%	2.8%	0.0% - 5.0%	Yes
Cash	$1,933,786,732	2.1%	0.0%	2.1%		
Total	**$91,897,020,198**	**100.0%**	**100.0%**			


Asset Allocation History
5 Years Ending December 31, 2022
100%
80%
60%
40%
20%
0%
% Allocation (Actual)
16.9%
10.5%
11.7%
15.5%
1.5%
13.7%
27.3%
2.8%
2018
2019
2020
2021
2022
Total Fixed Income
U.S. Equity Portfolio
Non-U.S. Equity Portfolio
Total Real Estate
Risk Parity
Alternative Portfolio
Total Private Equity
Opportunity Portfolio

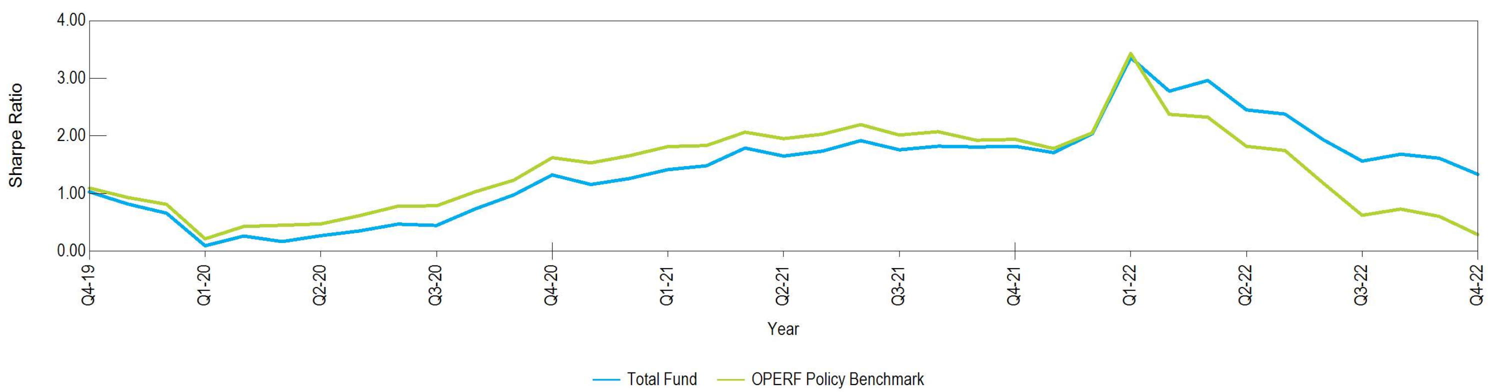


	Return (Rank)											
5th Percentile	6.4		-5.8		7.4		6.9		8.2		7.8	
25th Percentile	5.1		-7.0		6.0		6.3		7.9		7.6	
Median	4.6		-10.0		5.1		5.8		7.4		7.4	
75th Percentile	3.7		-12.0		4.4		5.2		7.1		6.9	
95th Percentile	2.6		-16.7		2.5		4.0		6.2		6.0	
# of Portfolios	21		21		21		20		19		18	
● Total Fund	3.0	(92)	-1.5	(1)	8.3	(1)	7.7	(1)	8.7	(1)	8.5	(1)
▲ OPERF Policy Benchmark	2.9	(92)	-8.6	(30)	5.9	(31)	6.5	(15)	8.1	(14)	8.2	(1)

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	1 Mo (%)	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)
Total Fund	91,897,020,198	100.0	--	-0.9	3.0	-1.5	8.3	7.7	8.5
OPERF Policy Benchmark				-1.6	2.9	-8.6	5.9	6.5	8.2
InvMetrics All DB > $10B Net Median				-1.6	4.6	-10.0	5.1	5.8	7.4
InvMetrics All DB > $10B Net Rank				9	92	1	1	1	1
Total Fixed Income	15,182,680,795	16.5	16.5	-0.6	1.5	-11.3	-1.8	0.6	1.5
Oregon Custom FI Benchmark				-0.5	1.9	-13.0	-2.6	0.1	1.0
Core Fixed Income	4,178,859,349	4.5	27.5	-0.7	2.3	-13.9	-2.6	0.3	1.5
Oregon Custom External FI BM				-0.5	1.9	-13.0	-2.7	0.0	1.1
U.S. Government	6,492,872,055	7.1	42.8	-0.7	0.6	-12.5	-2.6	-0.1	--
Government Blended Index				-0.5	0.7	-12.5	-2.6	-0.1	0.3
Non-Core Fixed Income	1,550,618,841	1.7	10.2	0.1	2.8	0.3	3.4	4.1	4.6
Custom Non-Core Fixed Income Index				0.1	3.1	-3.3	1.9	3.0	3.8
Global Sovereign	1,057,612,620	1.2	7.0	-1.9	0.5	-9.3	--	--	--
BbgBarc Global Treasury Ex-U.S.				-2.1	-0.2	-10.1	-2.9	0.4	2.1
Emerging Markets Debt	315,797,528	0.3	2.1	0.7	10.1	-18.4	--	--	--
JP Morgan EMBI Global Diversified				0.3	8.1	-17.8	-5.3	-1.3	1.6
Structured Credit Products	1,586,920,403	1.7	10.5	-0.1	1.1	-9.3	--	--	--
Oregon Structured Credit Products FI BM				0.3	1.0	-9.0	--	--	--
Total Public Equity	20,217,093,062	22.0	22.0	-3.0	11.8	-14.3	5.1	5.4	8.6
MSCI ACWI IMI Net (Daily)				-3.8	9.8	-18.4	3.9	5.0	7.9
U.S. Equity	9,459,102,015	10.3	46.8	-5.3	10.0	-16.0	6.7	7.6	11.4
Russell 3000 TR				-5.9	7.2	-19.2	7.1	8.8	12.1
Small Cap Growth	227,627,593	0.2	2.4	-1.9	7.7	-23.9	8.1	10.0	12.2
Russell 2000 Growth TR				-6.4	4.1	-26.4	0.6	3.5	9.2
Small Cap Value	358,904,397	0.4	3.8	-5.3	12.1	-7.2	8.1	5.6	9.5
Russell 2000 Value TR				-6.6	8.4	-14.5	4.7	4.1	8.5

	Market Value ($)	% of Portfolio	% of Sector	1 Mo (%)	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)
Market Oriented (CORE)	8,872,570,024	9.7	93.8	-5.4	10.0	-16.3	6.9	8.1	11.6
Russell 1000 TR				-5.8	7.2	-19.1	7.4	9.1	12.4
Non-U.S. Equity	6,797,983,338	7.4	33.6	0.0	15.0	-14.3	3.1	2.7	5.8
Oregon MSCI ACWI Ex US IMI (Net)				-0.6	14.1	-16.6	0.2	0.8	4.0
Total International Overlay Accounts	-12,378,436	0.0	-0.2						
International Market Oriented (Core)	4,035,155,737	4.4	59.4	0.2	15.3	-13.5	3.3	3.0	6.2
MSCI World ex USA IMI Net Return				-0.3	16.0	-15.3	1.1	1.6	4.7
International Value	883,373,815	1.0	13.0	0.1	16.5	-10.9	3.3	2.6	6.0
Oregon MSCI ACWI Ex US Value IMI (Net)				0.2	15.6	-9.3	0.2	0.0	3.0
International Growth	519,847,877	0.6	7.6	-0.3	14.8	-21.0	2.1	5.0	6.7
Oregon MSCI WORLD Ex US (Net)				-0.5	16.2	-14.3	1.3	1.8	4.6
International Small Cap	552,655,017	0.6	8.1	0.8	17.5	-15.0	3.1	0.6	6.1
MSCI World Ex US Small Cap Value (Net)				1.5	16.8	-14.0	0.0	0.0	5.3
Emerging Markets	806,950,891	0.9	11.9	-1.8	10.7	-16.9	2.3	1.5	3.4
ORE MSCI Emerging Markets IMI (Net)				-1.4	9.5	-19.8	-1.8	-1.1	1.7
Global Equity	3,960,007,744	4.3	19.6	-2.1	10.6	-9.8	3.8	4.6	8.9
MSCI ACWI IMI Net (Daily)				-3.8	9.8	-18.4	3.9	5.0	7.9
Global Equity Low Volatility	3,660,326,284	4.0	92.4	-2.1	10.3	-9.2	4.1	5.4	--
MSCI AC World (Daily Const)				-3.9	9.8	-18.4	4.0	5.2	8.0
Other Equity	1,731,273	0.0	0.0						
Total Real Estate	13,891,032,260	15.1	15.1	0.0	1.1	20.0	13.6	11.2	11.1
NCREIF ODCE (Custom) (Adj.)				0.1	0.3	21.0	11.4	9.3	9.7
Real Estate excluding REITS	13,524,090,279	14.7	97.4	0.1	1.1	21.6	14.1	11.6	12.0
NCREIF ODCE (Custom) (Adj.)				0.1	0.3	21.0	11.4	9.3	9.7
Total REITS	366,941,980	0.4	2.6	-2.9	2.6	-16.4	2.0	2.2	4.7

	Market Value ($)	% of Portfolio	% of Sector	1 Mo (%)	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)
Risk Parity	1,362,483,918	1.5	1.5	0.3	1.6	-22.6	--	--	--
S&P Risk Parity - 12% Target Volatility				-6.7	4.5	-19.7	2.5	5.3	6.1
Opportunity Portfolio	2,552,966,310	2.8	2.8	0.7	2.0	1.3	11.0	9.0	8.7
CPI + 5%				0.1	1.2	11.7	10.1	9.0	7.7
Alternative Portfolio	12,324,476,663	13.4	13.4	0.4	3.0	19.1	8.5	4.2	4.2
CPI +4%				0.0	1.0	10.4	9.0	7.9	6.7
Diversifying Strategies	4,262,856,478	4.6	34.6	0.9	4.5	21.4	5.3	0.1	3.5
HFRI FOF Conservative Index				0.7	1.5	0.1	4.8	5.3	5.4
Real Assets	8,061,620,185	8.8	65.4	0.1	2.3	18.2	11.3	7.6	--
CPI +4%				0.0	1.0	10.4	9.0	7.9	6.7
Private Equity	24,443,147,587	26.6	26.6	-0.2	-0.3	1.2	17.4	16.2	14.4
Russell 3000 + 300 BPS QTR LAG (Adj.)				-1.3	-3.7	-15.1	10.9	11.9	14.7
Cash	1,614,738,390	1.8	1.8	0.4	1.0	0.5	0.7	1.5	1.2
ICE BofA US 3-Month Treasury Bill				0.4	0.8	1.5	0.7	1.3	0.8

Trailing Net Performance

	Market Value ($)	% of Portfolio	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)
Total Fund	**91,897,020,198**	**100.0**	**3.0**	**-1.5**	**8.3**	**7.7**	**8.5**
OPERF Policy Benchmark			*2.9*	*-8.6*	*5.9*	*6.5*	*8.2*
60% MSCI ACWI / 40% Bloomberg Aggregate			*6.6*	*-16.0*	*1.6*	*3.5*	*5.4*
70% MSCI ACWI/30% Barclays Agg			*7.4*	*-16.6*	*2.3*	*3.9*	*6.1*
InvMetrics All DB > $10B Net Median			*4.6*	*-10.0*	*5.1*	*5.8*	*7.4*
InvMetrics All DB > $10B Net Rank			*92*	*1*	*1*	*1*	*1*
Total Fixed Income	**15,182,680,795**	**16.5**	**1.5**	**-11.3**	**-1.8**	**0.6**	**1.5**
Oregon Custom FI Benchmark			*1.9*	*-13.0*	*-2.6*	*0.1*	*1.0*
Bloomberg US Aggregate TR			*1.9*	*-13.0*	*-2.7*	*0.0*	*1.1*
Fixed Income Weighted BM			*1.5*	*-11.7*	*-2.2*	*0.3*	*1.2*
Core Fixed Income	**4,178,859,349**	**4.5**	**2.3**	**-13.9**	**-2.6**	**0.3**	**1.5**
Oregon Custom External FI BM			*1.9*	*-13.0*	*-2.7*	*0.0*	*1.1*
Alliance Bernstein	19,260	0.0	0.0	3.2	5.4	5.0	3.8
Oregon Custom External FI BM			*1.9*	*-13.0*	*-2.7*	*0.0*	*1.1*
Blackrock	1,210,088,347	1.3	2.2	-13.2	-2.3	0.3	1.4
Oregon Custom External FI BM			*1.9*	*-13.0*	*-2.7*	*0.0*	*1.1*
Wellington	1,233,176,379	1.3	2.0	-14.3	-2.3	0.4	1.6
Oregon Custom External FI BM			*1.9*	*-13.0*	*-2.7*	*0.0*	*1.1*
Western Asset	1,247,830,834	1.4	2.3	-14.9	-2.7	0.4	1.7
Oregon Custom External FI BM			*1.9*	*-13.0*	*-2.7*	*0.0*	*1.1*
Fidelity	487,744,529	0.5	3.4	--	--	--	--
Oregon Custom External FI BM			*1.9*	*-13.0*	*-2.7*	*0.0*	*1.1*

	Market Value ($)	% of Portfolio	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)
U.S. Government	**6,492,872,055**	**7.1**	**0.6**	**-12.5**	**-2.6**	**-0.1**	**--**
Government Blended Index			*0.7*	*-12.5*	*-2.6*	*-0.1*	*0.3*
Government Portfolio	6,492,872,055	7.1	0.6	-12.5	-2.6	-0.1	--
Government Blended Index			*0.7*	*-12.5*	*-2.6*	*-0.1*	*0.3*
Non-Core Fixed Income	**1,550,618,841**	**1.7**	**2.8**	**0.3**	**3.4**	**4.1**	**4.6**
Custom Non-Core Fixed Income Index			*3.1*	*-3.3*	*1.9*	*3.0*	*3.8*
KKR Asset Management	25,014,228	0.0	-0.1	-31.9	-7.4	-2.6	1.0
KKR Custom Leveraged Loans & Bond Index			*3.2*	*-4.4*	*1.6*	*2.9*	*3.8*
Oak Hill	1,525,604,613	1.7	2.8	1.3	4.0	4.5	5.0
Oakhill Custom Lev Loan & Bond Index			*2.9*	*-2.2*	*2.2*	*3.1*	*3.7*
Global Sovereign	**1,057,612,620**	**1.2**	**0.5**	**-9.3**	**--**	**--**	**--**
BbgBarc Global Treasury Ex-U.S.			*-0.2*	*-10.1*	*-2.9*	*0.4*	*2.1*
MSIM Global Sovereign	527,610,198	0.6	0.3	-9.3	--	--	--
BbgBarc Global Treasury Ex-U.S.			*-0.2*	*-10.1*	*-2.9*	*0.4*	*2.1*
PIMCO Global Sovereign	530,002,422	0.6	0.7	-9.3	--	--	--
BbgBarc Global Treasury Ex-U.S.			*-0.2*	*-10.1*	*-2.9*	*0.4*	*2.1*
Emerging Markets Debt	**315,797,528**	**0.3**	**10.1**	**-18.4**	**--**	**--**	**--**
JP Morgan EMBI Global Diversified			*8.1*	*-17.8*	*-5.3*	*-1.3*	*1.6*
Ashmore EMD	99,560,380	0.1	10.9	-21.1	--	--	--
JP Morgan EMBI Global Diversified			*8.1*	*-17.8*	*-5.3*	*-1.3*	*1.6*
Global Evolution EMD	108,653,568	0.1	10.8	-16.6	--	--	--
JP Morgan EMBI Global Diversified			*8.1*	*-17.8*	*-5.3*	*-1.3*	*1.6*
PGIM EMD	107,583,580	0.1	8.6	-17.6	--	--	--
JP Morgan EMBI Global Diversified			*8.1*	*-17.8*	*-5.3*	*-1.3*	*1.6*

	Market Value ($)	% of Portfolio	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)
Structured Credit Products	**1,586,920,403**	**1.7**	**1.1**	**-9.3**	**--**	**--**	**--**
Oregon Structured Credit Products FI BM			*1.0*	*-9.0*	*--*	*--*	*--*
Schroders SCP	543,333,484	0.6	1.7	-6.5	--	--	--
ICE BofA AA-BBB US Asset Backed Sec Idx			*0.5*	*-7.6*	*-0.7*	*1.2*	*2.1*
Putnam SCP	494,721,949	0.5	2.0	-14.9	--	--	--
Bloomberg US MBS TR USD			*2.1*	*-11.8*	*-3.2*	*-0.5*	*0.7*
Guggenheim SCP	548,864,970	0.6	-0.3	-5.9	--	--	--
ICE BofA AA-BBB US Asset Backed Sec Idx			*0.5*	*-7.6*	*-0.7*	*1.2*	*2.1*
Total Public Equity	**20,217,093,062**	**22.0**	**11.8**	**-14.3**	**5.1**	**5.4**	**8.6**
MSCI ACWI IMI Net (Daily)			*9.8*	*-18.4*	*3.9*	*5.0*	*7.9*
U.S. Equity	**9,459,102,015**	**10.3**	**10.0**	**-16.0**	**6.7**	**7.6**	**11.4**
Russell 3000 TR			*7.2*	*-19.2*	*7.1*	*8.8*	*12.1*
Small Cap Growth	**227,627,593**	**0.2**	**7.7**	**-23.9**	**8.1**	**10.0**	**12.2**
Russell 2000 Growth TR			*4.1*	*-26.4*	*0.6*	*3.5*	*9.2*
EAM MicroCap Growth	227,627,593	0.2	7.7	-23.9	8.1	10.0	12.7
Russell Microcap Growth Index (Daily)			*2.7*	*-29.8*	*-0.2*	*1.0*	*7.2*
Small Cap Value	**358,904,397**	**0.4**	**12.1**	**-7.2**	**8.1**	**5.6**	**9.5**
Russell 2000 Value TR			*8.4*	*-14.5*	*4.7*	*4.1*	*8.5*
AQR Capital Management	64,849,822	0.1	19.0	-1.8	10.1	4.7	8.6
Russell 2000 Value TR			*8.4*	*-14.5*	*4.7*	*4.1*	*8.5*
Mellon Asset Management	148,509,750	0.2	8.5	-11.2	5.5	6.1	9.6
Russell 2000 Value TR			*8.4*	*-14.5*	*4.7*	*4.1*	*8.5*

	Market Value ($)	% of Portfolio	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)
DFA MicroCap Value	145,544,786	0.2	12.9	-4.2	11.1	6.5	--
Russell Microcap Value (Daily)			*6.1*	*-16.7*	*6.1*	*5.0*	*9.7*
Callan US Microcap Value							
Russell Microcap Value (Daily)			*6.1*	*-16.7*	*6.1*	*5.0*	*9.7*
Market Oriented (CORE)	**8,872,570,024**	**9.7**	**10.0**	**-16.3**	**6.9**	**8.1**	**11.6**
Russell 1000 TR			*7.2*	*-19.1*	*7.4*	*9.1*	*12.4*
DFA Large Cap Core	2,245,670,016	2.4	10.8	-12.9	7.8	8.1	--
Russell 1000 TR			*7.2*	*-19.1*	*7.4*	*9.1*	*12.4*
Russell 2000 Synthetic - OST managed	291,184,423	0.3	9.2	-16.2	6.0	5.4	10.1
S&P 600 Custom			*9.2*	*-16.1*	*5.8*	*5.3*	*9.6*
S&P 500 - OST managed	2,484,757,770	2.7	7.6	-18.2	7.6	9.5	12.6
S&P 500 Index (Daily)			*7.6*	*-18.1*	*7.7*	*9.4*	*12.6*
S&P 400 - OST managed	611,116,127	0.7	10.8	-13.0	7.1	6.8	11.0
S&P 400 Midcap Index (Daily)			*10.8*	*-13.1*	*7.2*	*6.7*	*10.8*
OST Risk Premia Strategy	3,239,841,680	3.5	11.4	-17.6	5.9	8.0	--
Risk Premia Custom Index			*11.4*	*-17.5*	*5.9*	*8.0*	*--*
Non-U.S. Equity	**6,797,983,338**	**7.4**	**15.0**	**-14.3**	**3.1**	**2.7**	**5.8**
Oregon MSCI ACWI Ex US IMI (Net)			*14.1*	*-16.6*	*0.2*	*0.8*	*4.0*
Total International Overlay Accounts	**-12,378,436**	**0.0**					
PERS-Adrian Lee Active Currency	-22,918,409	0.0					
PERS-P/E Global Active Currency	6,729,337	0.0					
PERS-Aspect Cap Active Currency	3,810,636	0.0					

	Market Value ($)	% of Portfolio	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)
International Market Oriented (Core)	**4,035,155,737**	**4.4**	**15.3**	**-13.5**	**3.3**	**3.0**	**6.2**
MSCI World ex USA IMI Net Return			*16.0*	*-15.3*	*1.1*	*1.6*	*4.7*
Arrowstreet Capital	1,283,737,401	1.4	15.9	-5.5	8.7	7.2	9.9
Oregon MSCI ACWI Ex US IMI (Net)			*14.1*	*-16.6*	*0.2*	*0.8*	*4.0*
Lazard Asset Management	425,529,662	0.5	14.2	-14.5	-0.7	0.5	4.0
Oregon MSCI ACWI Ex US (Net)			*14.3*	*-16.0*	*0.1*	*0.9*	*3.8*
Lazard International CEF	858,166,336	0.9	17.3	-25.7	0.4	1.6	--
Oregon MSCI ACWI Ex US (Net)			*14.3*	*-16.0*	*0.1*	*0.9*	*3.8*
AQR Capital Management	295,372,069	0.3	16.9	-11.9	-0.3	-1.2	3.9
Oregon MSCI WORLD Ex US (Net)			*16.2*	*-14.3*	*1.3*	*1.8*	*4.6*
OST Int'l Risk Premia	1,172,350,270	1.3	13.2	-11.5	3.3	3.5	--
MSCI World x US Custom Div Multiple-Factor			*13.2*	*-11.8*	*2.9*	*3.2*	*--*
MSCI World ex USA Net Index			*16.2*	*-14.3*	*1.3*	*1.8*	*4.6*
International Value	**883,373,815**	**1.0**	**16.5**	**-10.9**	**3.3**	**2.6**	**6.0**
Oregon MSCI ACWI Ex US Value IMI (Net)			*15.6*	*-9.3*	*0.2*	*0.0*	*3.0*
Acadian Asset Management	454,818,066	0.5	12.8	-13.9	5.3	3.4	6.9
Oregon MSCI ACWI Ex US Value IMI (Net)			*15.6*	*-9.3*	*0.2*	*0.0*	*3.0*
Brandes Investment Partners	428,555,749	0.5	20.7	-7.4	1.4	1.9	5.2
Oregon MSCI ACWI Ex US Value (Net)			*15.7*	*-8.6*	*0.1*	*-0.1*	*2.7*
International Growth	**519,847,877**	**0.6**	**14.8**	**-21.0**	**2.1**	**5.0**	**6.7**
Oregon MSCI WORLD Ex US (Net)			*16.2*	*-14.3*	*1.3*	*1.8*	*4.6*
Walter Scott Management	519,847,877	0.6	14.8	-21.0	2.1	5.0	6.8
Oregon MSCI WORLD Ex US (Net)			*16.2*	*-14.3*	*1.3*	*1.8*	*4.6*

	Market Value ($)	% of Portfolio	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)
International Small Cap	**552,655,017**	**0.6**	**17.5**	**-15.0**	**3.1**	**0.6**	**6.1**
MSCI World Ex US Small Cap Value (Net)			*16.8*	*-14.0*	*0.0*	*0.0*	*5.3*
DFA International Small Cap	138,351,006	0.2	18.9	-8.4	2.7	0.1	6.0
MSCI World Ex US Small Cap Value (Net)			*16.8*	*-14.0*	*0.0*	*0.0*	*5.3*
Harris Associates	167,647,144	0.2	26.4	-13.8	2.8	1.9	6.3
MSCI ACWI ex USA Small Cap Value (Net)			*14.9*	*-13.6*	*1.1*	*0.3*	*5.0*
EAM International Micro Cap	131,786,237	0.1	7.6	-25.2	6.8	-0.5	--
Oregon FTSE Global Ex US Micro Cap			*10.4*	*-21.1*	*6.0*	*2.1*	*--*
DFA International Micro Cap	114,870,630	0.1	16.4	-10.3	3.5	0.5	--
Oregon FTSE Global Ex US Micro Cap			*10.4*	*-21.1*	*6.0*	*2.1*	*--*
Emerging Markets	**806,950,891**	**0.9**	**10.7**	**-16.9**	**2.3**	**1.5**	**3.4**
ORE MSCI Emerging Markets IMI (Net)			*9.5*	*-19.8*	*-1.8*	*-1.1*	*1.7*
Genesis Emerging Markets	158,718,756	0.2	12.6	-22.8	-5.4	-1.6	1.6
ORE MSCI Emerging Markets IMI (Net)			*9.5*	*-19.8*	*-1.8*	*-1.1*	*1.7*
Arrowstreet Emerging Markets	381,482,848	0.4	15.4	-10.5	9.0	5.2	5.0
ORE MSCI Emerging Markets IMI (Net)			*9.5*	*-19.8*	*-1.8*	*-1.1*	*1.7*
Westwood Global Investment	121,666,746	0.1	8.2	-4.1	3.0	1.7	3.6
MSCI Emerging Markets IMI Net			*9.5*	*-19.8*	*-1.8*	*-1.1*	*1.6*
William Blair and Company	90,060,672	0.1	1.4	-33.3	-0.5	-0.1	3.4
MSCI Emerging Markets Growth Net			*9.6*	*-24.0*	*-2.9*	*-1.3*	*1.5*
William Blair Emerging Mkt Small Cap	54,899,110	0.1	-1.6	-28.6	3.8	0.6	--
MSCI Emerging Markets Small Cap Gr Net			*6.8*	*-23.3*	*5.1*	*0.8*	*3.1*
OST EM Risk Premia ESG	122,760	0.0					

	Market Value ($)	% of Portfolio	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)
Global Equity	**3,960,007,744**	**4.3**	**10.6**	**-9.8**	**3.8**	**4.6**	**8.9**
MSCI ACWI IMI Net (Daily)			*9.8*	*-18.4*	*3.9*	*5.0*	*7.9*
Alliance Bernstein Global Value	299,681,460	0.3	14.5	-15.8	1.2	0.1	6.5
Oregon MSCI ACWI Value (Net)			*14.2*	*-7.5*	*3.3*	*3.5*	*6.4*
Global Equity Low Volatility	**3,660,326,284**	**4.0**	**10.3**	**-9.2**	**4.1**	**5.4**	**--**
MSCI AC World (Daily Const)			*9.8*	*-18.4*	*4.0*	*5.2*	*8.0*
MSCI ACWI Minimum Volatility Index (Net)			*8.5*	*-10.3*	*1.6*	*4.6*	*7.8*
LACM Global Equity Low Volatility	866,139,623	0.9	9.5	-14.9	4.1	5.4	--
MSCI AC World (Daily Const)			*9.8*	*-18.4*	*4.0*	*5.2*	*8.0*
MSCI ACWI Minimum Volatility Index (Net)			*8.5*	*-10.3*	*1.6*	*4.6*	*7.8*
Arrowstreet Global Low Volatility	937,433,494	1.0	8.7	-2.7	8.0	8.4	--
MSCI ACWI IMI Net (Daily)			*9.8*	*-18.4*	*3.9*	*5.0*	*7.9*
AQR Global Low Volatility	610,739,371	0.7	11.1	-11.0	1.9	3.6	--
MSCI AC World (Daily Const)			*9.8*	*-18.4*	*4.0*	*5.2*	*8.0*
MSCI ACWI Minimum Volatility Index (Net)			*8.5*	*-10.3*	*1.6*	*4.6*	*7.8*
Acadian Global Low Volatility	691,496,592	0.8	10.6	-7.7	2.1	3.5	--
MSCI ACWI IMI Net (Daily)			*9.8*	*-18.4*	*3.9*	*5.0*	*7.9*
DFA Global Low Volatility	554,517,204	0.6	12.7	-9.3	3.9	--	--
MSCI AC World (Daily Const)			*9.8*	*-18.4*	*4.0*	*5.2*	*8.0*
Other Equity	**1,731,273**	**0.0**					
Transitional & Closed Accounts	1,731,308	0.0					
PERS- Equity Distribution	-34	0.0					

	Market Value ($)	% of Portfolio	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)
Total Real Estate	**13,891,032,260**	**15.1**	**1.1**	**20.0**	**13.6**	**11.2**	**11.1**
NCREIF ODCE (Custom) (Adj.)			*0.3*	*21.0*	*11.4*	*9.3*	*9.7*
Real Estate excluding REITS	**13,524,090,279**	**14.7**	**1.1**	**21.6**	**14.1**	**11.6**	**12.0**
NCREIF ODCE (Custom) (Adj.)			*0.3*	*21.0*	*11.4*	*9.3*	*9.7*
Total REITS	**366,941,980**	**0.4**	**2.6**	**-16.4**	**2.0**	**2.2**	**4.7**
ABKB - LaSalle Advisors	260,270,294	0.3	4.9	-18.6	4.5	8.9	9.1
Nareit Equity Share Price Index			*4.1*	*-24.9*	*0.2*	*4.4*	*7.1*
Woodbourne Investment Management	106,671,687	0.1	-2.6	-10.3	-0.3	2.3	5.1
Nareit Equity Share Price Index			*4.1*	*-24.9*	*0.2*	*4.4*	*7.1*
Risk Parity	**1,362,483,918**	**1.5**	**1.6**	**-22.6**	**--**	**--**	**--**
S&P Risk Parity - 12% Target Volatility			*4.5*	*-19.7*	*2.5*	*5.3*	*6.1*
Man AHL Target Risk	417,877,054	0.5	2.0	-19.3	--	--	--
S&P Risk Parity - 12% Target Volatility			*4.5*	*-19.7*	*2.5*	*5.3*	*6.1*
PanAgora Risk Parity	339,506,264	0.4	4.5	-28.8	--	--	--
S&P Risk Parity - 12% Target Volatility			*4.5*	*-19.7*	*2.5*	*5.3*	*6.1*
Bridgewater All Weather	605,100,600	0.7	-1.5	-19.9	--	--	--
S&P Risk Parity - 12% Target Volatility			*4.5*	*-19.7*	*2.5*	*5.3*	*6.1*
Opportunity Portfolio	**2,552,966,310**	**2.8**	**2.0**	**1.3**	**11.0**	**9.0**	**8.7**
CPI + 5%			*1.2*	*11.7*	*10.1*	*9.0*	*7.7*
Portfolio Holdings - Opportunity	157,593,285	0.2	14.6	-15.5	-6.4	-24.6	-18.3

	Market Value ($)	% of Portfolio	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)
Alternative Portfolio	**12,324,476,663**	**13.4**	**3.0**	**19.1**	**8.5**	**4.2**	**4.2**
CPI +4%			*1.0*	*10.4*	*9.0*	*7.9*	*6.7*
Diversifying Strategies	**4,262,856,478**	**4.6**	**4.5**	**21.4**	**5.3**	**0.1**	**3.5**
HFRI FOF Conservative Index			*1.5*	*0.1*	*4.8*	*5.3*	*5.4*
Diversifiying Strategies	4,262,856,478	4.6	4.5	21.4	5.3	0.1	3.5
HFRI FOF Conservative Index			*1.5*	*0.1*	*4.8*	*5.3*	*5.4*
Real Assets	**8,061,620,185**	**8.8**	**2.3**	**18.2**	**11.3**	**7.6**	**--**
CPI +4%			*1.0*	*10.4*	*9.0*	*7.9*	*6.7*
Infrastructure	5,529,303,515	6.0	2.0	13.9	11.9	--	--
CPI +4%			*1.0*	*10.4*	*9.0*	*7.9*	*6.7*
Natural Resources	2,532,316,670	2.8	2.8	27.7	11.3	--	--
CPI +4%			*1.0*	*10.4*	*9.0*	*7.9*	*6.7*
Private Equity	**24,443,147,587**	**26.6**	**-0.3**	**1.2**	**17.4**	**16.2**	**14.4**
Russell 3000 + 300 BPS QTR LAG (Adj.)			*-3.7*	*-15.1*	*10.9*	*11.9*	*14.7*
MSCI ACWI+3% (1 quarter lagged)			*-6.1*	*-18.2*	*6.9*	*7.6*	*10.5*
Cash	**1,614,738,390**	**1.8**	**1.0**	**0.5**	**0.7**	**1.5**	**1.2**
ICE BofA US 3-Month Treasury Bill			*0.8*	*1.5*	*0.7*	*1.3*	*0.8*
PERS-Russell Overlay Cash Balance	319,048,342	0.3					

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*
Alliance Bernstein	3.2	6.3	6.8	8.8	0.2	3.7	3.3	0.4	7.3	-1.8
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
Oakhill 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*
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*
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*

	2022 (%)	2021 (%)	2020 (%)	2019 (%)	2018 (%)	2017 (%)	2016 (%)	2015 (%)	2014 (%)	2013 (%)
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*
DFA MicroCap Value	-4.2	41.6	1.1	18.5	-15.7	7.3	33.3	-6.3	0.2	--
Russell Microcap Value (Daily)	*-16.7*	*34.9*	*6.3*	*21.3*	*-12.0*	*11.1*	*30.6*	*-6.5*	*3.1*	*--*
Callan US Microcap Value										
Russell Microcap Value (Daily)	*-16.7*	*34.9*	*6.3*	*21.3*	*-12.0*	*11.1*	*30.6*	*-6.5*	*3.1*	*--*
Market Oriented (CORE)	**-16.3**	**26.6**	**15.2**	**30.1**	**-7.1**	**22.0**	**14.8**	**-1.7**	**11.1**	**33.1**
Russell 1000 TR	*-19.1*	*26.5*	*21.0*	*31.4*	*-4.8*	*21.7*	*12.1*	*0.9*	*13.2*	*33.1*
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	-14.5	7.1	6.9	21.0	-13.4	24.8	0.9	-1.1	-2.8	19.1
Oregon MSCI ACWI Ex US (Net)	*-16.0*	*7.8*	*10.7*	*21.5*	*-14.2*	*27.2*	*4.5*	*-5.5*	*-3.9*	*15.3*
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	-11.9	6.1	5.9	19.6	-20.3	26.8	2.1	2.4	-4.9	23.1
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*
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	-8.4	16.9	1.1	20.9	-23.3	27.4	9.6	2.5	-6.6	32.9
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*
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	-15.8	18.1	4.2	20.1	-19.1	21.8	9.3	-3.3	6.9	35.6
Oregon MSCI ACWI Value (Net)	*-7.5*	*19.6*	*-0.3*	*20.6*	*-10.8*	*18.3*	*12.6*	*-6.3*	*2.9*	*22.4*
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	-11.0	11.4	6.8	19.6	-5.7	--	--	--	--	--
MSCI AC World (Daily Const)	*-18.4*	*18.5*	*16.3*	*26.6*	*-9.4*	*--*	*--*	*--*	*--*	*--*
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	-9.3	17.2	5.5	--	--	--	--	--	--	--
MSCI AC World (Daily Const)	*-18.4*	*18.5*	*16.3*	*--*	*--*	*--*	*--*	*--*	*--*	*--*

	2022 (%)	2021 (%)	2020 (%)	2019 (%)	2018 (%)	2017 (%)	2016 (%)	2015 (%)	2014 (%)	2013 (%)
Other Equity										
Transitional & Closed Accounts										
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*
Risk Parity	**-22.6**	**13.7**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**
S&P Risk Parity - 12% Target Volatility	*-19.7*	*18.2*	--	--	--	--	--	--	--	--
Man AHL Target Risk	-19.3	17.0	--	--	--	--	--	--	--	--
S&P Risk Parity - 12% Target Volatility	*-19.7*	*18.2*	--	--	--	--	--	--	--	--
PanAgora Risk Parity	-28.8	9.0	--	--	--	--	--	--	--	--
S&P Risk Parity - 12% Target Volatility	*-19.7*	*18.2*	--	--	--	--	--	--	--	--
Bridgewater All Weather	-19.9	15.5	--	--	--	--	--	--	--	--
S&P Risk Parity - 12% Target Volatility	*-19.7*	*18.2*	--	--	--	--	--	--	--	--

	2022 (%)	2021 (%)	2020 (%)	2019 (%)	2018 (%)	2017 (%)	2016 (%)	2015 (%)	2014 (%)	2013 (%)
Opportunity Portfolio	**1.3**	**22.7**	**10.2**	**6.2**	**5.8**	**10.5**	**6.1**	**2.1**	**8.8**	**15.0**
CPI + 5%	*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	2.7	-5.5	-44.4	-46.6	-28.9	45.1	-48.9	-12.0	17.1
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**	**-11.6**	**-1.0**	**-13.1**	**8.8**	**0.8**	**8.1**	**9.4**	**7.9**
HFRI FOF Conservative Index	*0.1*	*9.1*	*5.4*	*6.4*	*6.0*	*6.2*	*6.2*	*4.8*	*4.8*	*5.6*
Diversifiying Strategies	21.4	8.7	-11.6	-1.0	-13.1	8.8	0.8	8.1	9.4	7.9
HFRI FOF Conservative Index	*0.1*	*9.1*	*5.4*	*6.4*	*6.0*	*6.2*	*6.2*	*4.8*	*4.8*	*5.6*
Real Assets	**18.2**	**19.0**	**-2.0**	**-1.6**	**6.5**	**10.5**	**--**	**--**	**--**	**--**
CPI +4%	*10.4*	*11.3*	*5.4*	*6.4*	*6.0*	*6.2*	--	--	--	--
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

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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%.

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

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

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: **Fourth Quarter 2022 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 December 31, 2022, OPERF has an estimated return volatility of 15.7%, higher than that for the target allocation presented by Meketa Investment Group ("Meketa") at the September 2022 meeting.

The realized tracking errors for the liquid portion of the Fund, mainly the Public Equity and Fixed Income Portfolios, are at the upper limit of the OIC guidelines. While the predicted active risk for the Fixed Income Portfolio is also at the upper limit, that for the Public Equity Portfolio exceeds its respective policy limit. The Public Equity Portfolio's active risk rose steadily through 2022 due to the increasing correlations of the performances of the active factor tilts. That has worked to the Portfolio's benefit, outperforming its benchmark by over 4% in 2022. However, the Public Equity team proposed a restructuring of the Portfolio at the December 2022 meeting that would reduce the active factor tilts and therefore the predicted active risk.

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 June 2021 meeting. (The OIC approved a change in target asset allocation for OPERF at the December 2022 meeting that will be reflected in the next quarter's report.)

Table 1. OPERF Target Asset Allocation

Asset Class	Target Allocation (%)	Rebalancing Range (%)
Public Equity	30.0	25.0 – 35.0
Private Equity	20.0	15.0 – 27.5
Fixed Income	20.0	15.0 – 25.0
Real Estate	12.5	9.0 – 16.5
Real Assets	7.5	5.0 – 10.0
Diversifying Strategies	7.5	5.0 – 10.0
Risk Parity	2.5	0.0 – 5.0
Total Fund	**100.0**	

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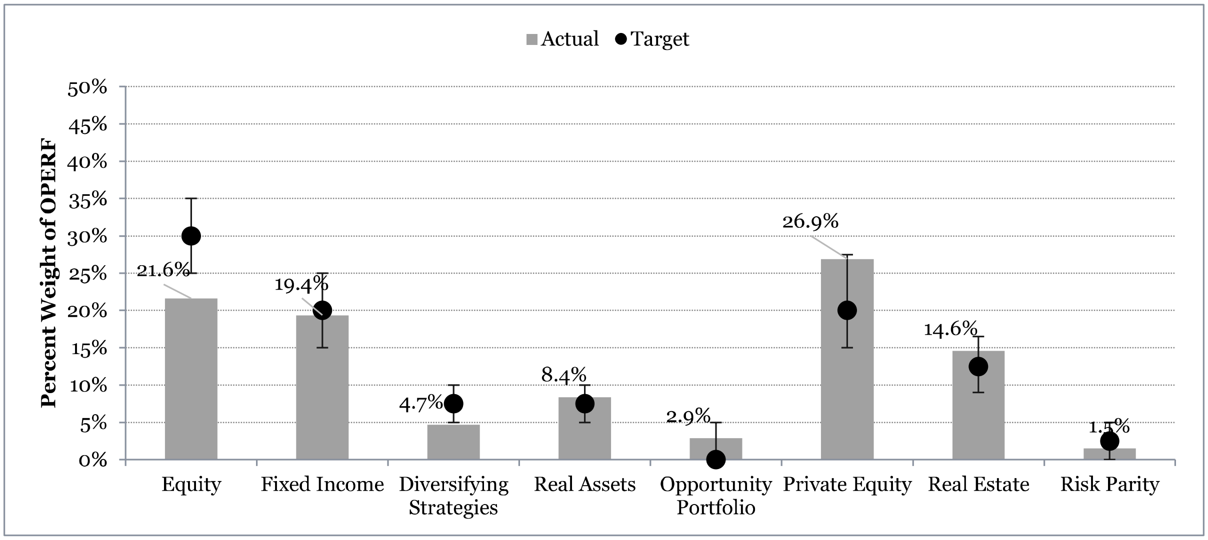
Including the synthetic overlays exposures managed by Russell Investments, Figure 1 below shows OPERF's allocation.

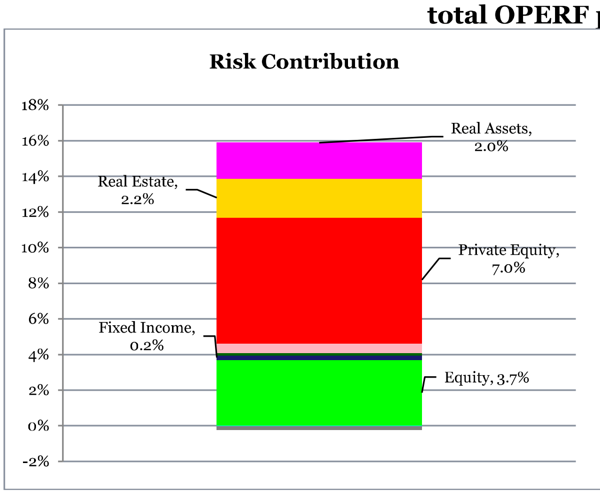
Figure 1. OPERF Actual Allocation versus Target

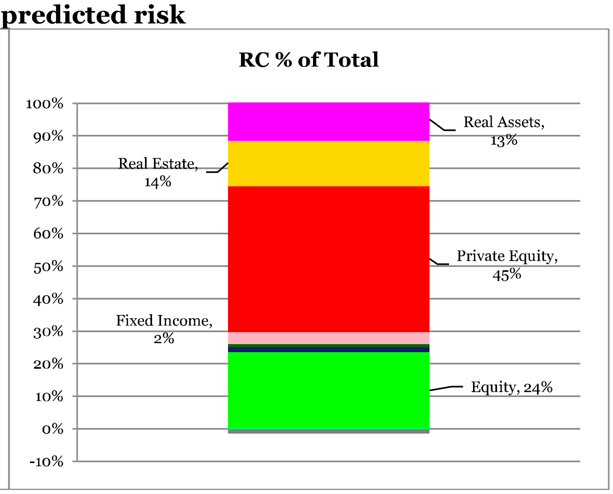


OPERF Predicted Risk

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



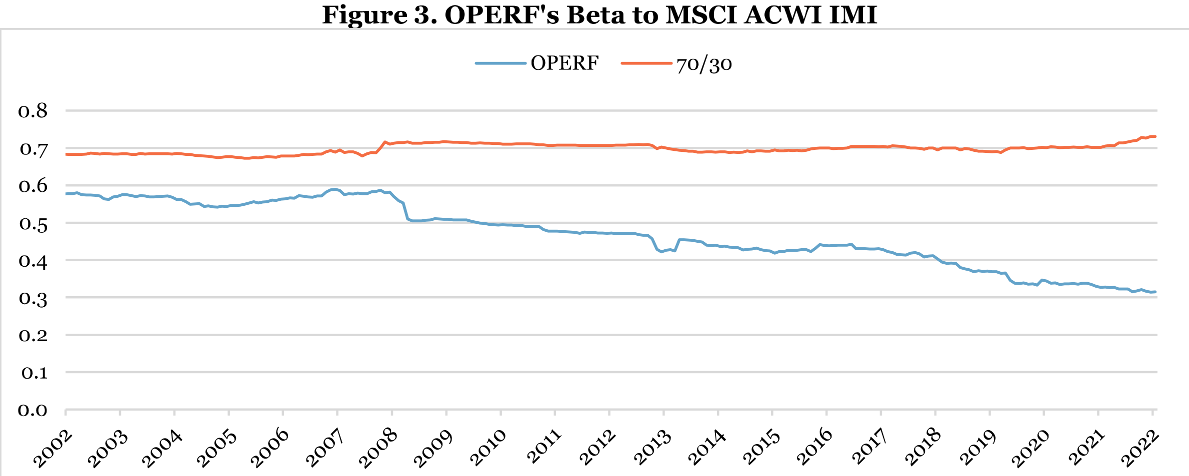


The total predicted **standard deviation**, or **volatility**, for OPERF is 15.7% as of December 31, 2022. To put that in context, Meketa, the OIC's investment consultant, estimates OPERF's long-term volatility to be 11.9% using their 2022 Capital Market Assumptions, which are a blend of assumptions 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.*" However, public equity allocation declined from 26.6% a year ago to 21.6% while those of Real Assets and Real Estate increased, mainly due to a concerted effort to diversify the Fund from equity risk and partly due to the broader decline in equity valuations in 2022.

The OIC-approved changes have reduced OPERF's volatility over time. Figure 3 below plots OPERF's rolling 20-quarter realized beta to MSCI ACWI IMI as well as that of the 70% MSCI ACWI IMI & 30% Bloomberg U.S. Aggregate Index blend, or the "Reference Portfolio". OPERF's realized beta hovered around +0.60 in the earlier portion of the analysis period before starting a steady decline. Part of that decline is due to an increasing allocation to illiquid investments, which tend to have performance smoothing, but the other cause is the aforementioned diversification.

Figure 3. OPERF's Beta to MSCI ACWI IMI



Capital Markets

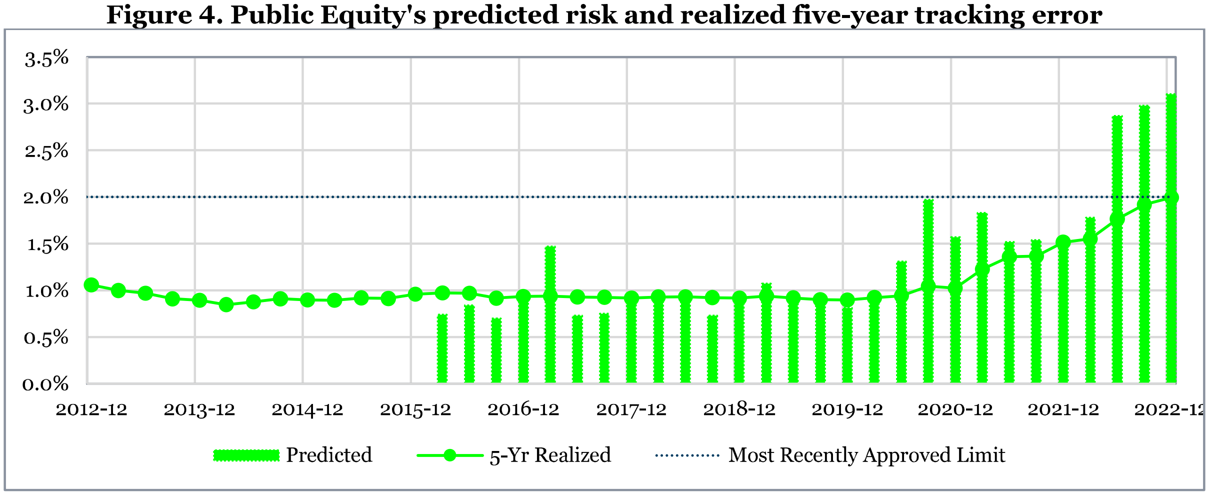
Public Equity

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 December 31, 2022 for the Portfolio is 2.0%, within the approved range. However, Aladdin estimates an *ex ante* active risk of 3.1%.

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, in conjunction with the moderation of factor correlations, should lower the predicted active risk of the Portfolio.

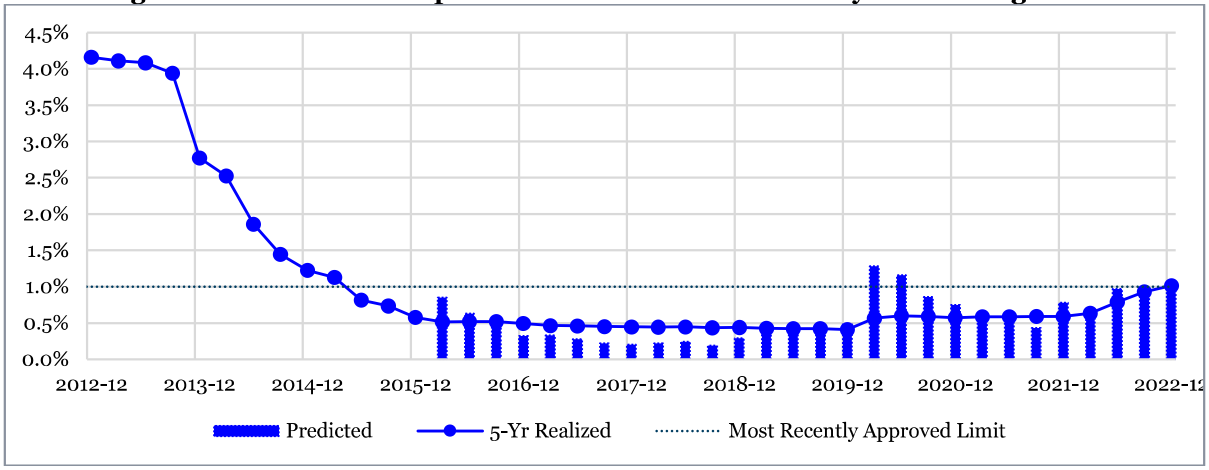
Figure 4. Public Equity's predicted risk and realized five-year tracking error



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 December 31, 2022 for the Portfolio is 1.0%, within the approved range. The predicted active risk is 1.1%. To say the least, interest rate volatility picked up significantly in 2022. The U.S. 10-Year interest rate ended 2021 at 1.51%, reached a high of 4.24% in late October, and was at 3.77% at the end of 2022. The Portfolio has been short duration for some time – approximately -0.60 during the quarter – so the combination with an increase in interest rate volatility resulted in a rising active risk.

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 2022 and for the past five years.

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

	Net Cash Flow ($M)					
Asset Class	**YTD 2022**	**2021**	**2020**	**2019**	**2018**	**2017**
Public Equity	3,285	4,220	3,062	2,752	3,432	1,451
Private Equity	506	2,730	494	347	1,216	1,434
Fixed Income	-1,544	-3,053	3,154	327	61	21
Real Estate	-883	-396	15	-48	-28	508
Real Assets	-706	-572	-564	-578	-524	-306
Diversifying Strategies	-11	381	-621	-490	-1,349	-395
Opportunity	-165	-248	71	26	156	-2
Risk Parity	400	0	-1,800	0	0	0
Other	263	-227	-449	283	-15	0
Total Fund	**1,144**	**2,836**	**3,362**	**2,617**	**2,948**	**2,711**
Net Pension	*-2,605*	*-1,743*	*-3,041*	*-2,659*	*-2,774*	*-3,195*

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	$8.1
Real Assets	$2.9
Real Estate	$3.6
Opportunity	$1.1
Total	**$15.7**

OREGON STATE TREASURY

Tobias Read
Oregon State Treasurer

Michael Kaplan
Deputy State Treasurer

To: **The Oregon Investment Council**

From: **Jen Plett, Investment Officer, Portfolio Risk & Research**

Re: **Fourth Quarter 2022 Risk Report for the Common School Fund (CSF)**

Executive Summary

This memo summarizes CSF's predicted volatility, as estimated by Aladdin, Treasury's end-to-end investment analytics platform built by BlackRock. As of December 31, 2022, Aladdin estimated a return volatility of 12.3% for CSF, in-line with staff's expectation. Therefore, staff recommends no additional action at this point.

CSF Asset Allocation

Investment Belief #2 in INV 1201: Statement of OIC Investment and Management Beliefs states: "*Asset Allocation Drives Risk and Return*". On July 20, 2022, OIC approved CSF's new Strategic Asset Allocation (SAA) recommendations presented by staff and the consultant AON.

Applying AON's 10-Year Capital Market Assumptions to CSF's new approved target allocations produces an estimated return volatility of 12.5%. A "Reference Portfolio" can be constructed with 70% in the MSCI ACWI IMI and 30% in the Bloomberg U.S. Aggregate Bond Index that would reach a similar level of estimated volatility. Prior to the recent change in allocations, CSF's Reference Portfolio was approximated to be a 65/35 split between public equity and fixed income indices.

Shown in the table below are CSF'S target allocations as of 12/31/2022.

Table 1. CSF Target Asset Allocation as of 12/31/2022

Asset Class	Target Allocation (%)	Interim Target (%)	Rebalancing Range (%)
Global Equity	45	47.5	40 - 50
Private Equity	15	12.5	10 - 20
Fixed Income	20	22.5	15 - 25
Real Estate	10	10.0	5 - 15
Real Assets	5	2.5	0 - 10
Diversifying Strategies	5	5.0	0 - 10
Cash	0	0	0 - 3
Total Fund	**100**	**100.0**	

Figure 1 below shows CSF's actual allocation as of 12/31/2022.

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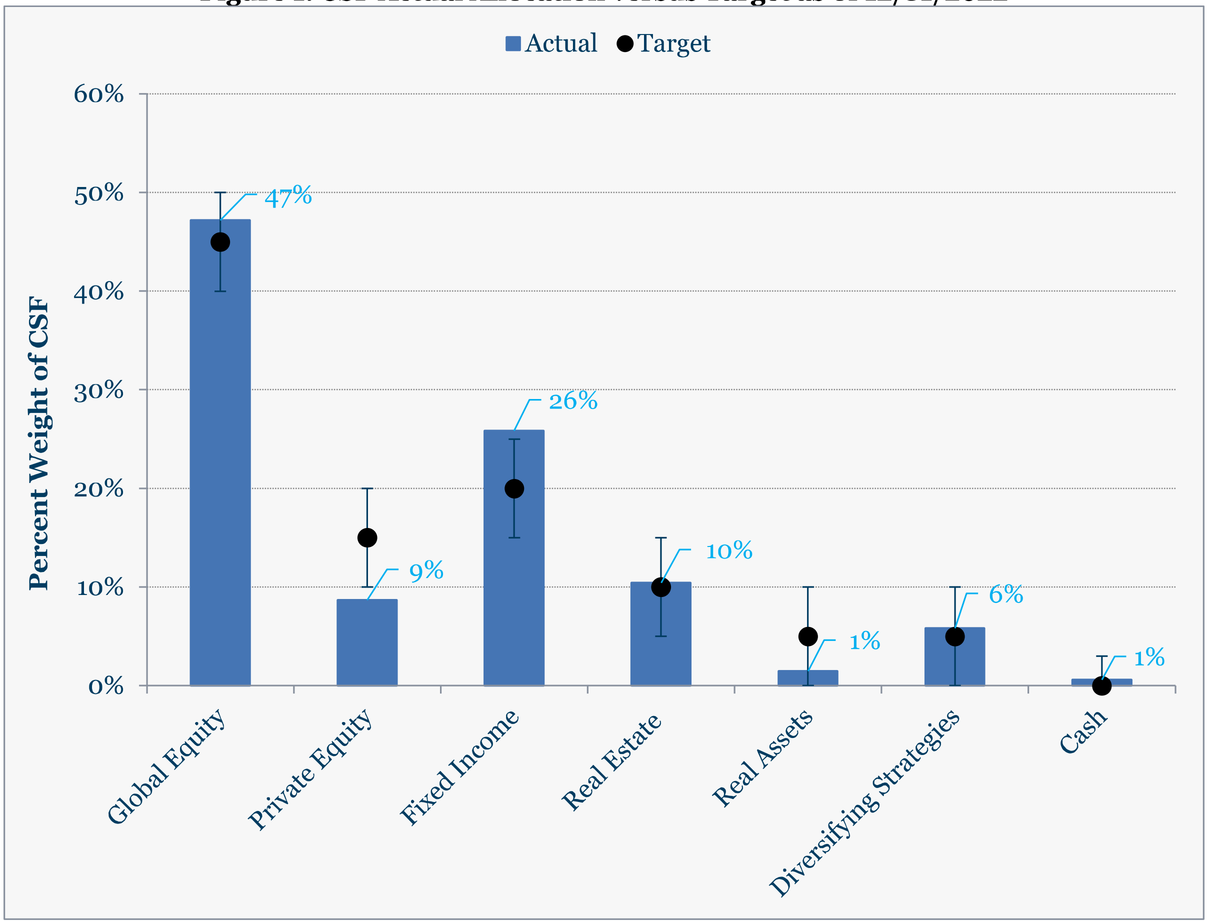
Figure 1. CSF Actual Allocation versus Target as of 12/31/2022

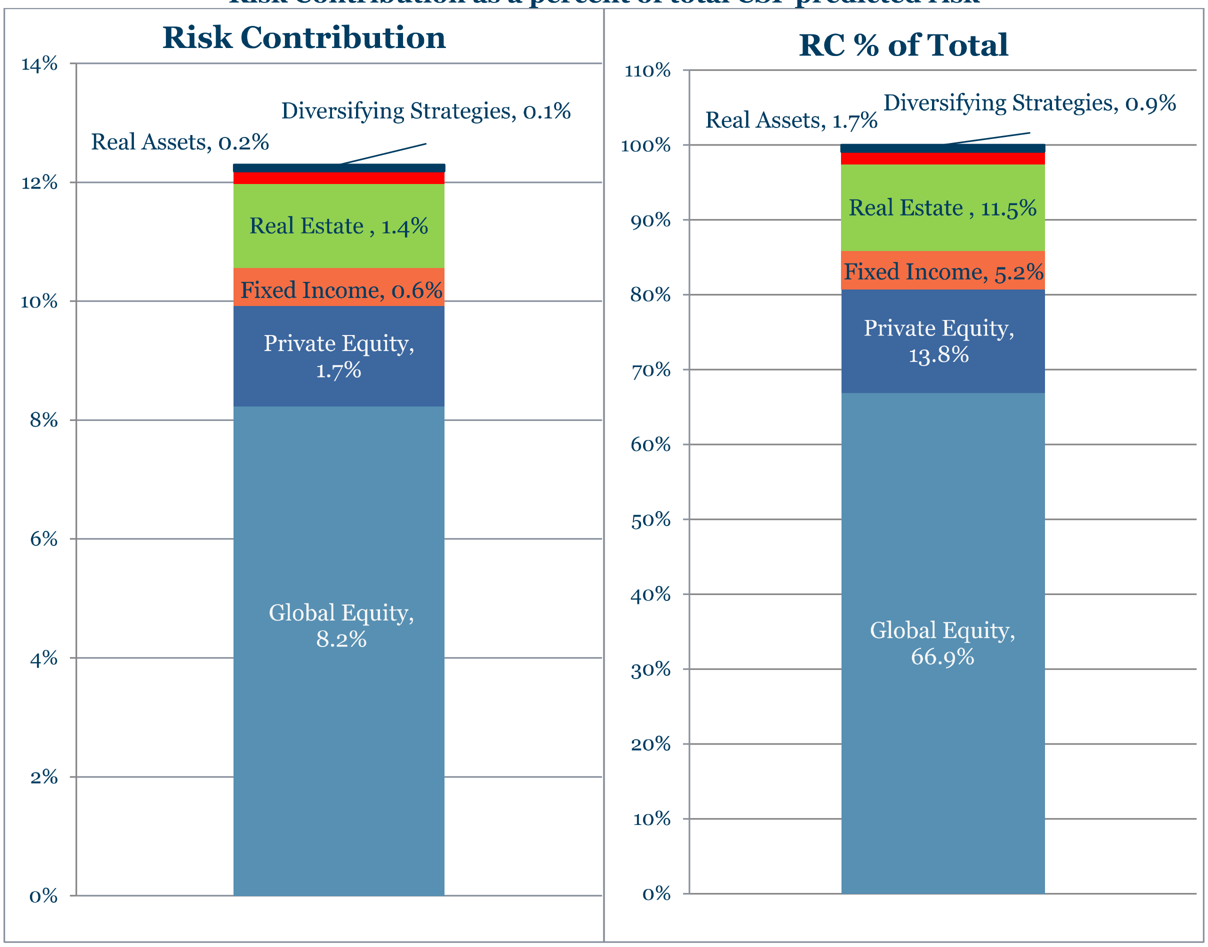


As of December 31, 2022, actual CSF asset allocations were within the policy tolerances relative to the established targets, except for Fixed Income and Private Equity, which the OIC recently approved lowering Fixed Income's allocation from 25% to 20% and increasing Private Equity's allocation from 10% to 15%.

CSF Predicted Risk

The risk estimates are shown in the charts below.

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



The total predicted **standard deviation**, or **volatility**, for CSF is 12.3% as of December 31, 2022. Aladdin's risk model uses a medium-term, five-year lookback.

Another item of note from Figure 2 is that "equity" risk, that is the predicted risk contributions from Global Equity and Private Equity, is estimated to be 81% of CSF's predicted risk. Equity risk has always been the largest risk contributor to CSF. 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*." However, equity investments are much more volatile than investment grade fixed income and U.S. Treasuries.

Until the approval of SAA on July 20, 2022, the OIC-approved asset allocation changes have reduced CSF's volatility over time. Figure 3 below plots CSF's rolling 20-quarter realized beta to MSCI ACWI IMI as well as that of the Reference Portfolio of 70% MSCI ACWI IMI and 30% Bloomberg U.S. Aggregate Bond Index. CSF's realized beta was elevated during the Great Financial Crisis from 2007 to 2009 before steadily trending down. Part of that decline is due to an increasing allocation to illiquid investments, which have smoothed performances, but the other cause is the improved diversification.

Figure 3. CSF's Beta to MSCI ACWI IMI

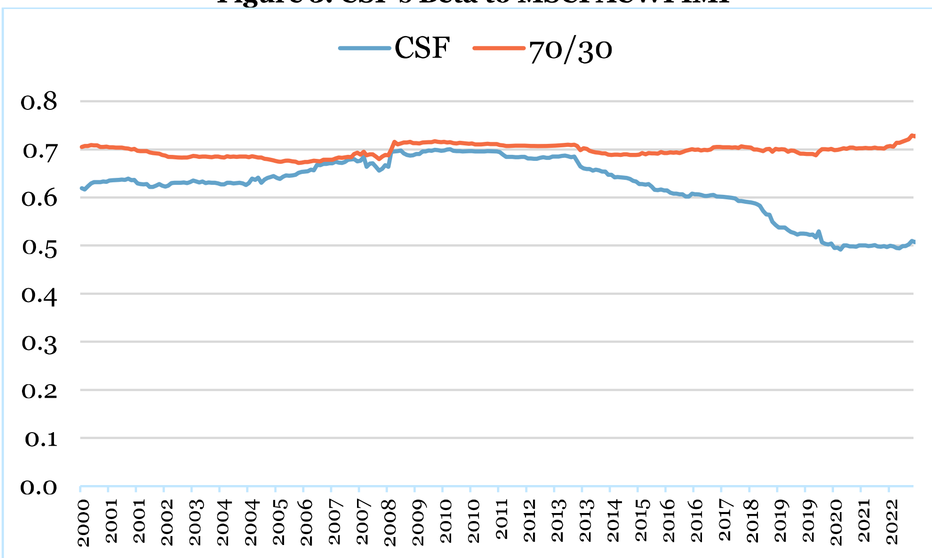
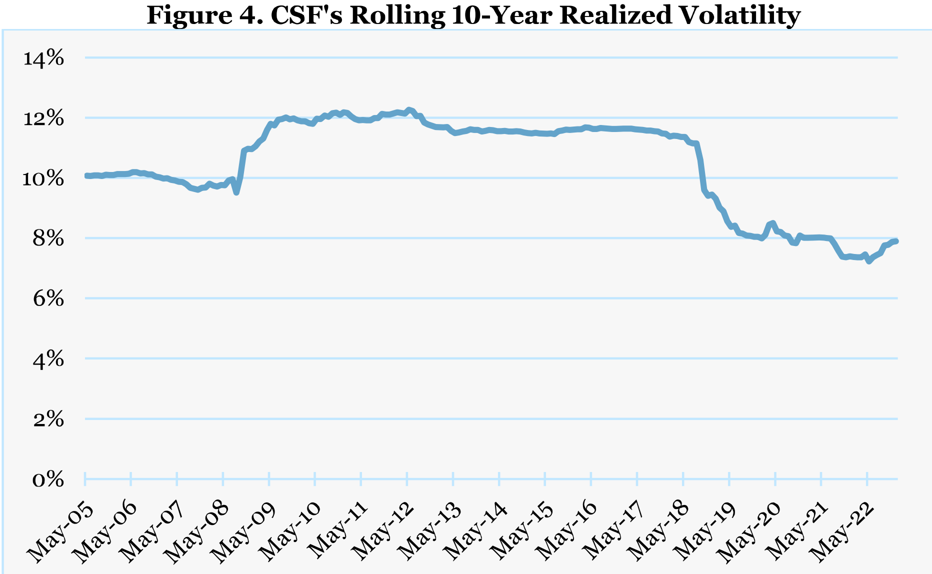


Figure 4. CSF's Rolling 10-Year Realized Volatility



TAB 9

ASSET ALLOCATION

& NAV UPDATES

Asset Allocations at January 31, 2023

OPERF	Policy	Target[1]	Regular Account $ Thousands	Pre-Overlay	Overlay	Net Position	Actual	Target Date Funds $ Thousands	Variable Fund $ Thousands	Total Fund $ Thousands
Public Equity	25.0-35.0%	30.0%	21,457,584	23.0%	(2,111,666)	19,345,918	20.7%	1,249,925	264,630	20,860,472
Private Equity	15.0-27.5%	20.0%	24,774,364	26.5%		24,774,364	26.5%			24,774,364
Total Equity	**45.0-55.0%**	**50.0%**	**46,231,948**	**49.5%**	**(2,111,666)**	**44,120,282**	**47.3%**			**45,634,837**
Opportunity Portfolio	**0-5%**	**0.0%**	**2,568,785**	**2.8%**		**2,568,785**	2.8%			**2,568,785**
Fixed Income	**15-25%**	**20.0%**	**15,637,440**	**16.8%**	**3,792,855**	**19,430,296**	20.8%	2,183,752		**21,614,048**
Risk Parity	**0.0-3.5%**	**2.5%**	**780,167**	**0.8%**		**780,167**	0.8%			**780,167**
Real Estate	**7.5-17.5%**	**12.5%**	**14,032,650**	**15.0%**	**(1,100)**	**14,031,550**	15.0%			**14,031,550**
Real Assets	**2.5-10.0%**	**7.5%**	**8,349,769**	**8.9%**		**8,349,769**	8.9%			**8,349,769**
Diversifying Strategies	**2.5-10.0%**	**7.5%**	**4,213,801**	**4.5%**		**4,213,801**	4.5%			**4,213,801**
Cash[2]	**0-3%**	**0.0%**	**1,502,997**	**1.6%**	**(1,680,089)**	**(177,092)**	-0.2%		6,336	**(170,756)**
TOTAL OPERF		**100%**	**$ 93,317,556**	**100.0%**	**$ -**	**$ 93,317,556**	**100.0%**	**$ 3,433,677**	**$ 270,966**	**$ 97,022,199**

[1] Targets established in October 2021. Interim policy benchmark effective October 1, 2021, consists of: 30% MSCI ACWI IMI Net, 20% Bloomberg U.S. Aggregate, 20% Russell 3000+300bps (1 quarter lagged), 12.5% NCREIF ODCE net (1 quarter lagged), 7.5% CPI+400bps, 7.5% HFRI FOF Conservative & 2.5% S&P Risk Parity - 12% Target Volatility.

[2] Includes cash held in the policy implementation overlay program.

SAIF	Policy	Target	$ Thousands	Actual
Total Equity	**7-13%**	**10.0%**	**459,815**	**10.4%**
Fixed Income	**80-90%**	**85.0%**	**3,598,392**	**81.4%**
Real Estate	**0-7%**	**5.0%**	**302,552**	**6.8%**
Cash	**0-3%**	**0.0%**	**61,614**	**1.4%**
TOTAL SAIF			**$ 4,422,373**	**100.0%**

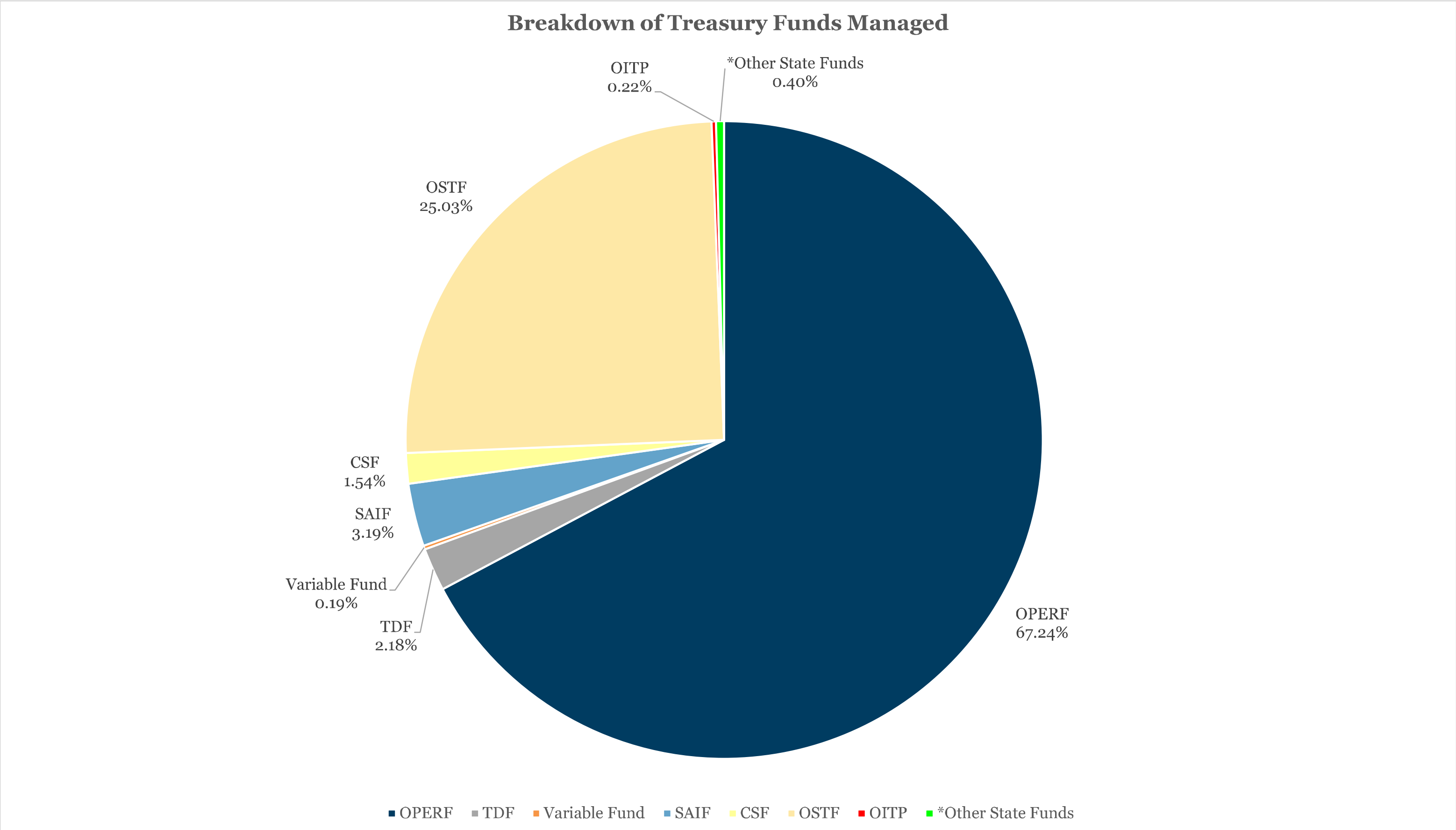
CSF	Policy	Target	$ Thousands	Actual
Global Equities	40-50%	45.0%	1,035,405	48.0%
Private Equity	8-12%	10.0%	183,598	8.5%
Total Equity	**58-62%**	**55.0%**	**1,219,003**	**56.5%**
Fixed Income	**20-30%**	**25.0%**	**555,006**	**25.7%**
Real Estate	**0-12%**	**10.0%**	**213,810**	**9.9%**
Alternative Investments	**0-12%**	**10.0%**	**115,412**	**5.4%**
Cash	**0-3%**	**0.0%**	**53,662**	**2.5%**
TOTAL CSF			**$ 2,156,894**	**100.0%**

SOUE	Policy	Target	$ Thousands	Actual
Global Equities	**0-65%**	**N/A**	2,016	**75.3%**
Fixed Income	**35-100%**	**N/A**	661	**24.7%**
Cash	**0-3%**	**N/A**	1	**0.0%**
TOTAL SOUE			**$ 2,678**	**100.0%**

WOUE	Policy	Target	$ Thousands	Actual
Global Equities	**30-65%**	**55.0%**	1,605	**56.4%**
Fixed Income	**35-60%**	**40.0%**	1,107	**38.9%**
Cash	**0-25%**	**5.0%**	134	**4.7%**
TOTAL WOUE			**$ 2,847**	**100.0%**

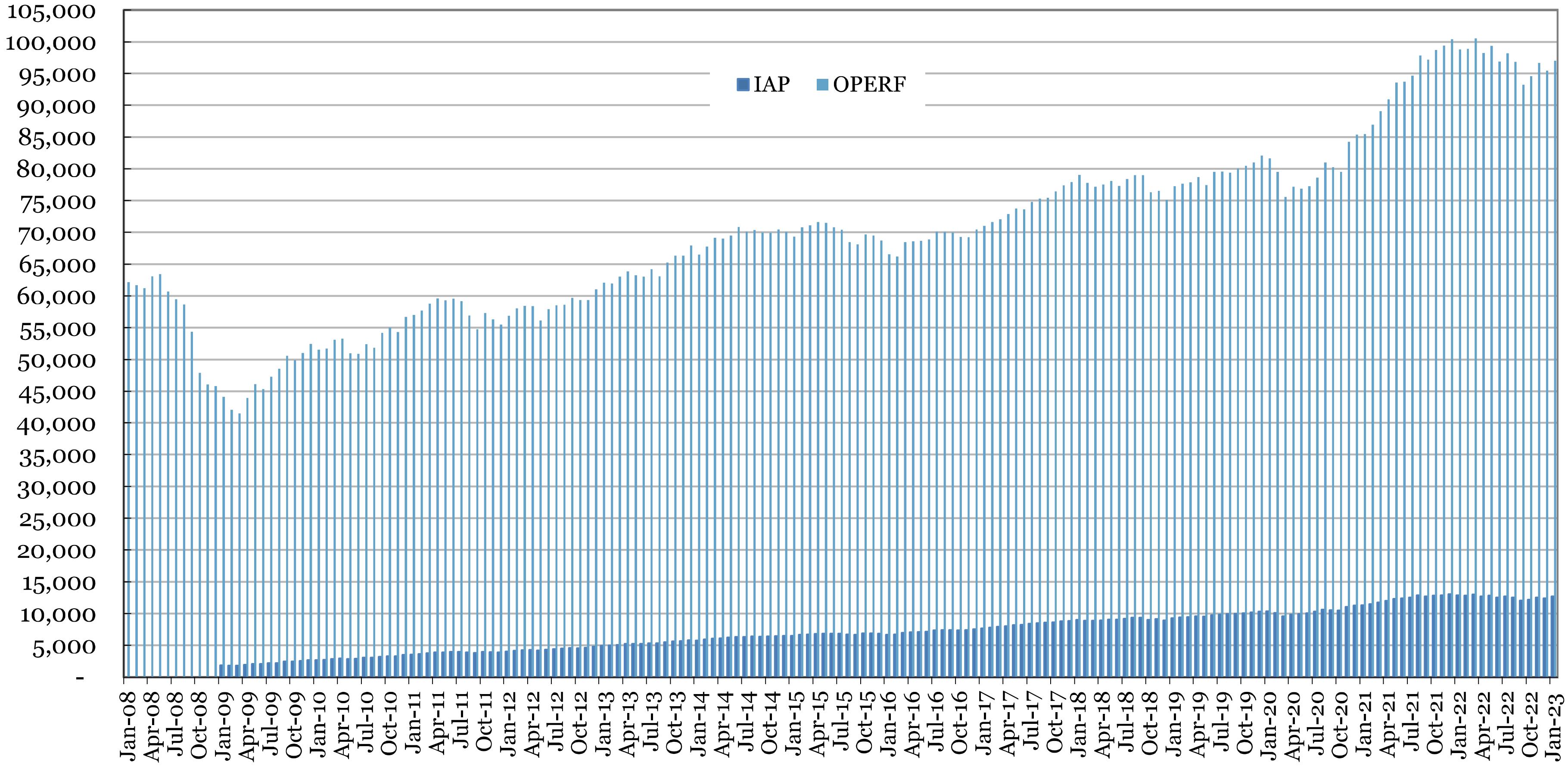
Oregon State Treasury Funds Managed as of January 31, 2023

OSTF, OITP & Other State Funds*	$ Thousands	Actual
OSTF	34,243,494	94.5%
OITP	307,906	0.8%
DAS Insurance Fund	105,370	0.3%
DCBS Operating Fund	224,604	0.6%
DCBS Workers Benefit Fund	144,389	0.4%
DCHS - Elderly Housing Bond Sinking Fund	1,338	0.0%
DCHS - Other Fund	13,786	0.0%
Oregon Lottery Fund	105,781	0.3%
DVA Bond Sinking Fund	100,769	0.3%
ODOT Fund	373,397	1.0%
OLGIF	235,575	0.7%
OPUF	385,191	1.1%
Total OSTF & Other State Funds	**$ 36,241,600**	**100.0%**
Total of All Treasury Funds**	**$ 136,783,694**	

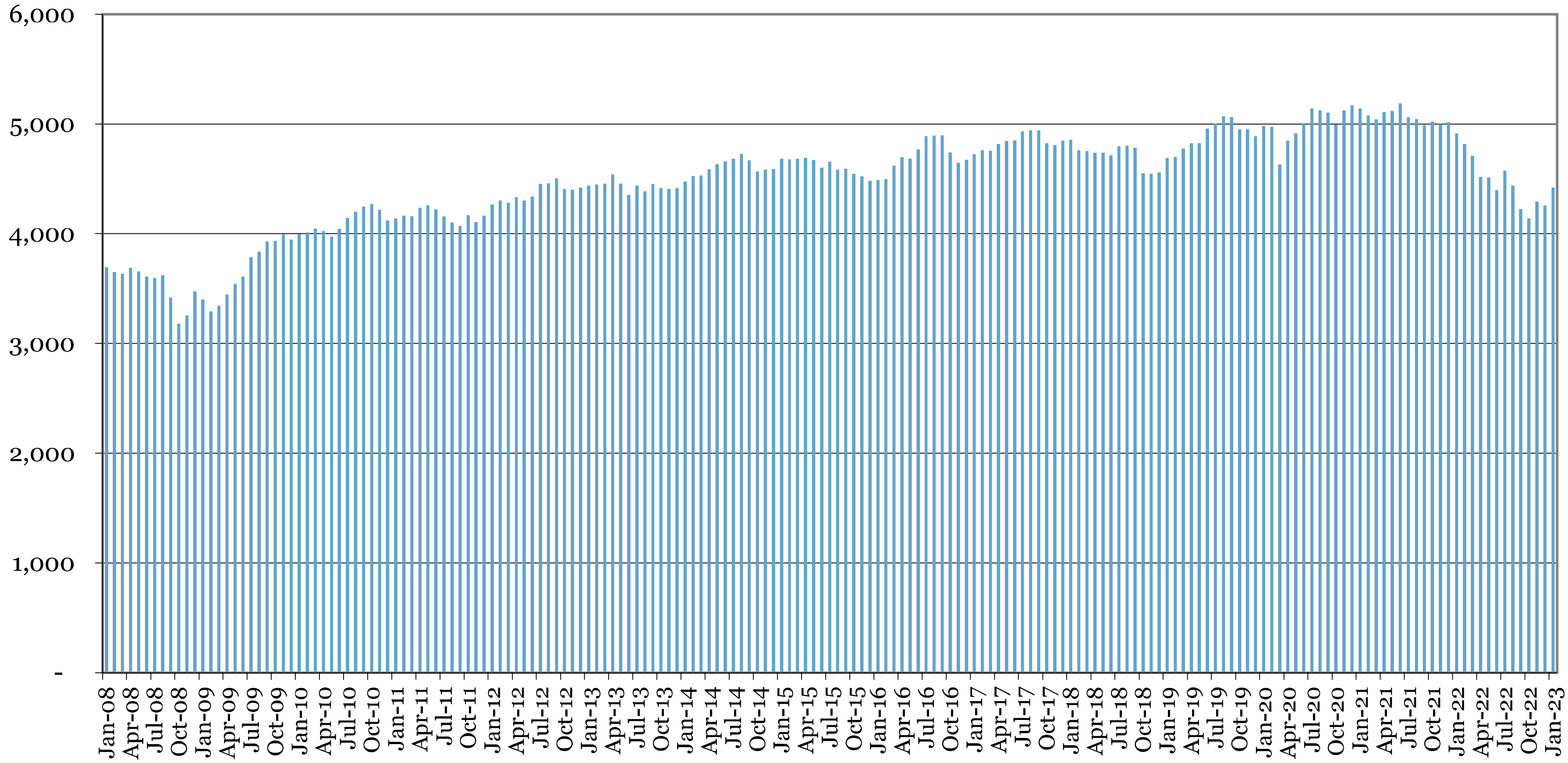


*Other State Funds include DAS Insurance Fund, DCBS Operating Fund, DCBS Workers Benefit Fund, DCHS - Elderly Housing Bond Sinking Fund, DCHS - Other Fund, Oregon Lottery Fund, DVA Bond Sinking Fund, ODOT Fund, OLGIF, & OPUF.

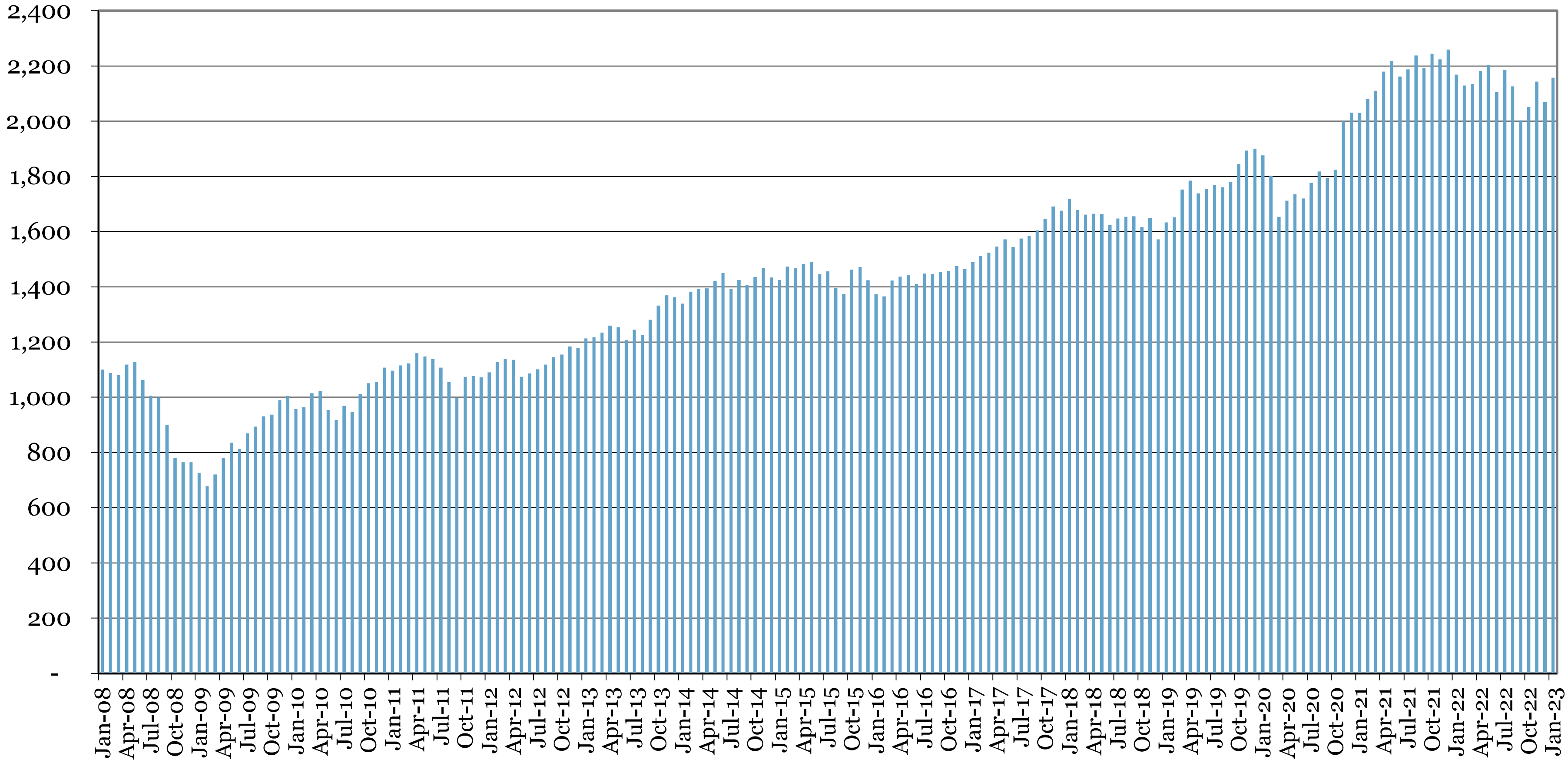
OPERF NAV
15 years ending January 31, 2023
($ in Millions)



SAIF NAV
15 years ending January 31, 2023
($ in Millions)



CSF NAV
15 years ending January 31, 2023
($ in Millions)



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OREGON STATE TREASURY

TAB 11

OPEN DISCUSSION

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OREGON STATE TREASURY

TAB 12

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