

## Investment Committee Meeting February 18, 2025

### Meeting Items

- Agenda
- Investment Committee Charter
- Investment Committee Performance Assessment
- Annual Investment Committee Workplan
- Total Fund Performance Review for period ending December 31, 2024
- Asset Class Review: Diversifying Strategies for period ending December 31, 2024
- Risk Budgeting
- Approval of Minutes – November 18, 2024

Board Packet Documents are available to the public for inspection on the Employees' Retirement System's Website: <https://ers.ehawaii.gov/board-and-committee-agendas-and-meeting-packets>, and in the Employees' Retirement System's Office, 201 Merchant Street, Suite 1400, Honolulu, HI 96813

## NOTICE OF REGULAR MEETING

AGENCY: Investment Committee of the Board of Trustees of the  
Employees' Retirement System of the State of Hawaii

DATE: Tuesday, February 18, 2025; 9:00 a.m.

PLACE: City Financial Tower, 201 Merchant Street, Suite 1200, Honolulu, Hawaii 96813

The meeting will be conducted pursuant to HRS § 92-3.7, under which Members of the Investment Committee of the Board of Trustees may participate via interactive conference technology; and members of the public may also participate via interactive conference technology or in person at the meeting place stated above.

Members of the public may also attend the meeting in person to testify or provide testimony by teleconference either audio or video, at the following link and phone number:

[https://teams.microsoft.com/l/meetup-join/19%3ameeting\\_ODFhMzk2Y2UtZTQxYy00ZDc0LWFkODUtNDYwYTAzNWJiZjZh%40thread.v2/0?context=%7b%22id%22%3a%223847dec6-63b2-43f9-a6d0-58a40aaa1a10%22%2c%22oid%22%3a%228f795840-377f-479d-bb5d-6ec41c4a01bc%22%7d](https://teams.microsoft.com/l/meetup-join/19%3ameeting_ODFhMzk2Y2UtZTQxYy00ZDc0LWFkODUtNDYwYTAzNWJiZjZh%40thread.v2/0?context=%7b%22id%22%3a%223847dec6-63b2-43f9-a6d0-58a40aaa1a10%22%2c%22oid%22%3a%228f795840-377f-479d-bb5d-6ec41c4a01bc%22%7d)

*or*

[+1 808-829-4853,,976775388#](tel:+18088294853976775388) United States, Honolulu  
Phone conference ID: 976 775 388#

Individuals testifying at the meeting are requested to limit their testimony to three minutes or an amount of time otherwise designated by the Chairperson.

In the event audiovisual communication cannot be maintained with participating Trustees and quorum is lost, the meeting shall be automatically recess for up to 30 minutes, during which time, an attempt to restore audiovisual communication will be made. If such attempt is unsuccessful, all Trustees, members of the public, staff and other interested individuals may continue to participate in the meeting via telephone using the above listed telephone and conference ID numbers, whereby audio-only communication will be established for all participants and the meeting will continue. If reconvening the meeting is not possible because neither audiovisual nor audio-only communication can be re-established, the meeting will be terminated.

## AGENDA

### CALL TO ORDER/QUORUM

### PUBLIC COMMENT

Members of the public may submit written testimony on these agenda items via e-mail or postal mail with receipt recommended by 4:30 p.m. on Friday, February 14, 2025, in order to ensure it is distributed in time for consideration. Please address written testimony if by e-mail to [diana.gomes@hawaii.gov](mailto:diana.gomes@hawaii.gov) or by postal mail to: Employees' Retirement System of the State of Hawaii, Investment Committee, 201 Merchant Street, Suite 1400, Honolulu, Hawaii 96813.

NEW BUSINESS

1. Discussion and Election of Chair and Vice Chair of the Investment Committee.

Pursuant to HRS § 92-5(a)(4), the Committee may enter into Executive Session to consult with the Board of Trustees' attorneys on questions and issues pertaining to the Board's powers, duties, privileges, immunities, and liabilities with respect to this matter.

2. Review of the Investment Committee Charter to Include Investment Committee Performance Assessment, and Review of the Prior Year's Investment Committee Activity.

Pursuant to HRS § 92-5(a)(4), the Committee may enter into Executive Session to consult with the Board of Trustees' attorneys on questions and issues pertaining to the Board's powers, duties, privileges, immunities, and liabilities with respect to this matter.

PRESENTATIONS

1. Adoption of Annual Investment Committee Workplan.

Kristin Varela, ERS Chief Investment Officer

Pursuant to HRS § 88-27.5(a)(1) and HRS § 92-5(a)(4), the Board of Trustees may enter into Executive Session to conduct discussions and deliberations relating to, and if appropriate, to make a decision on investments or prospective investments by the system that require the consideration of information or records that are exempt from disclosure under Chapter 92F, including information and records that are proprietary information or confidential business information, and to consult with the Board's attorneys on questions and issues pertaining to the Board's powers, duties, privileges, immunities, and liabilities with respect to this matter.

2. Total Fund Performance Review for period ending December 31, 2024.

Kristin Varela, ERS Chief Investment Officer and Meketa Investment Group, Inc.

Pursuant to HRS § 88-27.5(a)(1), 92-5(a)(4) and (8), the Board of Trustees may enter into Executive Session to conduct discussions and deliberations relating to, and if appropriate, to make a decision on investments or prospective investments by the system that requires the consideration of information or records that are exempt from disclosure under HRS Chapter 92F, including information and records that are proprietary information or confidential business information, and to consult with the Board's attorneys on questions and issues pertaining to the Board's powers, duties, privileges, immunities, and liabilities with respect to this matter.

3. Man Group – Alternative Asset Class Review: Diversifying Strategies Quarterly Review for period ending December 31, 2024.

Christine Chang, ERS Investment Officer and Man Group

Pursuant to HRS § 88-27.5(a)(1) and HRS § 92-5(a)(4), the Board of Trustees may enter into Executive Session to conduct discussions and deliberations relating to, and if appropriate, to make a decision on investments or prospective investments by the system that requires the consideration of information or records that are exempt from disclosure under HRS Chapter 92F, including information and records that are proprietary information or confidential business information, and to consult with the Board's attorneys on questions and issues pertaining to the Board's powers, duties, privileges, immunities, and liabilities with respect to this matter.

## ERS Investment Committee Meeting Agenda

February 18, 2025

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### 4. Education: Risk Budgeting (Continued)

Lynn Kamimoto, ERS Investment Officer and Meketa Investment Group

Pursuant to HRS § 88-27.5(a)(1) and HRS § 92-5(a)(4), the Board of Trustees may enter into Executive Session to conduct discussions and deliberations relating to, and if appropriate, to make a decision on investments or prospective investments by the system that requires the consideration of information or records that are exempt from disclosure under HRS Chapter 92F, including information and records that are proprietary information or confidential business information, and to consult with the Board's attorneys on questions and issues pertaining to the Board's powers, duties, privileges, immunities, and liabilities with respect to this matter.

### REPORTS BY STAFF

1. Chief Investment Officer Update.

APPROVAL OF MINUTES – November 18,

### EXECUTIVE SESSION

1. Executive Session, pursuant to HRS § 88-27.5(a)(1), 92-5(a)(4) and (8), to conduct discussions and deliberations relating to, and if appropriate, to make a decision on investments or prospective investments by the system that require the consideration of information or records that are exempt from disclosure under HRS Chapter 92F, including information and records that are proprietary information or confidential business information, and to consult with the Board's attorneys on questions and issues pertaining to the Board's powers, duties, privileges, immunities, and liabilities with respect to Confidential ERS Investment Portfolio activity to include (1) Stanley Capital Partners Fund Investment Update, (2) Update on closure of Weiss Asset Management, (3) Annual Investment Activity Update and (4) Investment Office updates.
2. Executive Session, pursuant to HRS § 88-27.5(a)(1), 92-5(a)(4) and (8), to Review and Approval of Executive Session Minutes of November 18, 2024.

### ADJOURNMENT

If you require auxiliary aid/service or other accommodation due to a disability, contact Diana Gomes at (808) 586-0175 or [diana.gomes@hawaii.gov](mailto:diana.gomes@hawaii.gov) as soon as possible, preferably by Friday, February 14, 2025, and the ERS will try to obtain the auxiliary aid/service or accommodation, but cannot guarantee that the request can be fulfilled.

Upon request, this notice can be made available in large print.



**Employees' Retirement System of the State of Hawaii**  
**BOARD OF TRUSTEES**  
**INVESTMENT COMMITTEE CHARTER**

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**I. PURPOSE**

The Investment Committee (“Committee”) of the Employees’ Retirement System (“ERS”) of the State of Hawaii is a committee of the Board of Trustees (“Board”). Its primary function is to carry out the policy development and investment decision-making responsibilities delegated by the Board to include specified oversight, review and monitoring of investment decision-making, implementation, process compliance and reporting responsibilities of the Investment Office and its staff, consultants and advisors.

**II. COMMITTEE MEMBERSHIP**

The Investment Committee of the Board of Trustees of the Employees’ Retirement System of the State of Hawaii shall consist of no more than four (4) Board members who shall be appointed by the Board Chair and approved by the Board. The members of the Committee shall be appointed for one-year terms and shall serve for such term or terms as the Board may determine or until earlier resignation. The Board may remove any member from the Committee at any time with or without cause.

**III. MEETINGS**

The Committee shall in general meet in advance of each Board meeting, except when there is a Special Board meeting, and at such other times and places as the members of the Committee deem necessary to fulfill the Committee’s responsibilities. The Committee shall report regularly to the Board regarding its actions and those of the investment staff and make recommendations to the Board as appropriate. The Committee may invite such member of management to its meetings as it deems appropriate. The Committee shall review this Charter at least annually and recommend any proposed changes to the Board for approval.



**Employees' Retirement System of the State of Hawaii**  
**BOARD OF TRUSTEES**  
**INVESTMENT COMMITTEE CHARTER**

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**IV. AUTHORITY AND RESPONSIBILITIES**

Hawaii Revised Statutes (HRS) 88-110 vests authority for investing ERS assets with its Board. The Board, acting within its discretion, has delegated certain specified investment oversight and decision-making authority to the Investment Committee of the Board. The Board retains fiduciary responsibility for all ERS investment and non-investment decisions.

The members of the Committee shall designate from amongst its membership persons to serve as Chair and Vice-Chair.

The Committee shall have the following authority and responsibilities:

- To review and make investment policies and guideline recommendations for the Board's consideration.
- Establish the guidelines applicable to implementation and investment decision-making delegated to investment staff.  
While guidelines are intended to be durable, they may be revised at the Committee's discretion
- Establish and monitor investment office reporting requirements, process, and policy compliance.
- To review and make recommendations annually about the ERS's goals and objectives applicable to the Investment Office.
- To review and approve ongoing activities of the Investment Office in regards to the goals and objectives and any additional tasks assigned to the Investment Office from the Board.
- To assign and provide direction to the Chief Investment Officer (CIO) and, if applicable, the Executive Director (ED) on priorities and actions to successfully execute the responsibilities of the Investment Office.



**Employees' Retirement System of the State of Hawaii**  
**BOARD OF TRUSTEES**  
**INVESTMENT COMMITTEE CHARTER**

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The Committee shall consult with the ED on the goals and objectives applicable to the CIO and Investment Office.

**V. OUTSIDE ADVISORS**

The Committee shall have the authority, in its sole discretion, to obtain the advice of any ERS consultant or ERS service provider for the purposes of carrying out its duties related to the Investment Office and investment activities. The Committee shall have the authority, in its sole discretion, to obtain the advice and assistance of ERS's legal counsel and such other advisors as it deems necessary to fulfill its duties and responsibilities under this Charter. The Committee shall not be required to implement or act upon the advice or recommendations of its consultant, legal counsel or other advisor to the Committee, and the authority granted in this Charter shall not affect the ability or obligation of the Committee to exercise its own judgment in fulfillment of its duties under this Charter. The consultant(s), outside counsel and any other advisors retained by, or providing advice to, the Committee (other than the ERS's in-house counsel) shall be independent as determined in the discretion of the Committee and Board.

**VI. PERFORMANCE EVALUATION**

The Committee shall conduct an annual evaluation of the performance of its duties under this charter and shall present the results of the evaluation to the Board. The Committee shall conduct this evaluation in such manner as it and the Board deems appropriate.

*Adopted and Approved by the Board of Trustees: September 30, 2013, November 9, 2020, April 11, 2022*  
*Accepted by the Governance Policy Committee: November 5, 2020, March 28, 2022*  
*Revised and Accepted by the Investment Committee: January 24, 2022, May 22, 2023*

# INVESTMENT COMMITTEE ANNUAL PERFORMANCE ASSESSMENT

CALENDAR YEAR: 2024



**Employees' Retirement System**  

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**of the State of Hawaii**



# Summary Assessment

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## 1. Committee Management

- ✓ The Committee meetings are streamlined and appropriate in length.
- ✓ The Committee meets the right number of times over the year.

## 2. Committee Effectiveness

- ✓ Overall, the Committee is working effectively.
- ✓ The Committee makes good use of time.
- ✓ The Committee completed its adopted annual work plan.

## 3. Notable Committee Outcomes:

- ✓ Continued clean-up and streamlining of Investment Policy Statement.
- ✓ Continued and effective assessment of Total Fund Liquidity Plan.
- ✓ Continued and effective assessment of Total Fund Benchmarking.
- ✓ Continued education on key governing enhancements, like active risk budgeting.
- ✓ Successful completion of annual investment education summit
- ✓ Continued and effective oversight of Investment Implementation and performance results.

*2024 Investment Committee activity summarized, as follows.*

## February 20, 2024

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- ❖ Recurring Oversight
  - Total Portfolio Performance Review (Q4 2023)
  - Annual Investment Activity Review
  
- ❖ Rotating Oversight
  - Alternative Asset Class: Diversifying Strategies Annual Review (Q4 2023)
  
- ❖ Annual Governance
  - Investment Committee Charter Review
  - Investment Committee Annual Performance Assessment
  - Investment Committee Work Plan Adoption
  
- ❖ Educational
  - Risk Budgeting Education (Continued)

## May 28, 2024

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- ❖ Recurring Oversight
  - Total Portfolio Performance review (Q1 2024)
  
- ❖ Rotating Oversight
  - Alternative Asset Class: Private Equity Annual Review (Q4 2023)
  
- ❖ Annual Governance
  - None
  
- ❖ Educational
  - Risk Budgeting Education (Continued)

## August 19, 2024

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- ❖ Recurring Oversight
  - Total Portfolio Performance and Risk Review (Q2 2024)
  
- ❖ Rotating Oversight
  - Alternative Asset Class: Credit Annual Review (Q1 2024)
  
- ❖ Annual Governance
  - None

- ❖ Educational
  - Benchmarking Audit Review

## October 15-18, 2024, Investment Summit

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Special meeting of the Board of Trustees to adopt annual strategic implementation plans.

- ❖ Recurring Oversight
  - None
- ❖ Rotating Oversight
  - None
- ❖ Annual Governance
  - Traditional Assets Strategic Workplan, CY 2025
  - Diversifying Assets Strategic Workplan, CY 2025
  - Illiquid Assets Strategic Workplan, CY 2025
- ❖ Educational
  - Investment Summit Educational Panels and Sessions

## November 18, 2024

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- ❖ Recurring Oversight
  - Total Portfolio Performance and Risk Review (Q3 2024)
  - 2025 Investment Committee Meeting Schedule
- ❖ Rotating Oversight
  - Alternative Asset Class: Real Assets Annual Review (Q2 2024)
- ❖ Annual Governance
  - Benchmarking Review
  - Plan Liquidity Target Review
  - Investment Policy Statement Review
- ❖ Educational
  - None

# INVESTMENT COMMITTEE ANNUAL WORKPLAN

CALENDAR YEAR: 2025



**Employees' Retirement System**  

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**of the State of Hawaii**

# 2025 Investment Committee Annual Work Plan

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All items are subject to change, at the direction of the Investment Committee.

Rotating oversight introduced to allow for comprehensive reviews of various alternative asset classes (Private Equity, Real Assets, Credit, Diversifying Strategies). Off-cycle reviews to be provided as *receive and file*, quarterly.

## February 2025

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- ❖ Recurring Oversight
  - Total Portfolio Performance and Risk Review (Q4 2024)
  - Annual Investment Activity Review (CY 2024)
- ❖ Rotating Oversight
  - Alternative Asset Class: Diversifying Strategies Annual Review (Q4 2024)
- ❖ Annual Governance
  - Investment Committee Charter Review
  - Investment Committee Annual Performance Assessment
  - Investment Committee Work Plan Adoption
- ❖ Educational
  - Active Risk Budgeting (Continued)

## May 2025

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- ❖ Recurring Oversight
  - Total Portfolio Performance and Risk Review (Q1 2025)
  - Quarterly Investment Office Review
- ❖ Rotating Oversight
  - Alternative Asset Class: Private Equity Annual Review (Q4 2024)
- ❖ Annual Governance
  - Active Risk Budgeting: Actionable Active Risk and Active Return Review (*adoption, if necessary*)

- ❖ Educational
  - Topic: Investment Policy Statement Best Practices

## August 2025

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- ❖ Recurring Oversight
  - Total Portfolio Performance and Risk Review (Q2 2025)
  - Quarterly Investment Office Review
- ❖ Rotating Oversight
  - Alternative Asset Class: Credit Annual Review (Q1 2025)
- ❖ Annual Governance
  - Asset Liability Study Review (*and adoption, if necessary*)
  - Benchmark Review (*and adoption, if necessary*)
- ❖ Educational
  - Topic: Investment Policy Statement Best Practices (Continued)
  - Topic: Investment Belief Statement Best Practices

## September 2025 Investment Summit

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Special meeting of the Board of Trustees to adopt annual strategic implementation plans.

- ❖ Recurring Oversight
  - None
- ❖ Rotating Oversight
  - None
- ❖ Annual Governance
  - Total Fund Strategic Investment Update, CY 2026
  - Traditional Assets Strategic Workplan, CY 2026
  - Diversifying Assets Strategic Workplan, CY 2026
  - Illiquid Assets Strategic Workplan, CY 2026
- ❖ Educational
  - Investment Summit Educational Panels and Sessions

## November 2025

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- ❖ Recurring Oversight
  - Total Portfolio Performance and Risk Review (Q3 2025)
  - Quarterly Investment Office Review
  
- ❖ Rotating Oversight
  - Alternative Asset Class: Real Assets Annual Review (Q2 2025)
  
- ❖ Annual Governance
  - Plan Liquidity Target Review (*and adoption, if necessary*)
  - Investment Policy Statement Review (*and adoption, if necessary*)
  - Governance Matrix Review (*and adoption, if necessary*)
  - Investment Belief Statement (*and adoption, if necessary*)
  
- ❖ Educational
  - Topic: Investment cost oversight and best practices



# Employees' Retirement System of the State of Hawaii

February 18, 2025

2024 Q4 Performance Report



1. Introduction
2. ERS Portfolio Review
3. Plan Sponsor Peer Group Analysis
4. Appendix

# Introduction

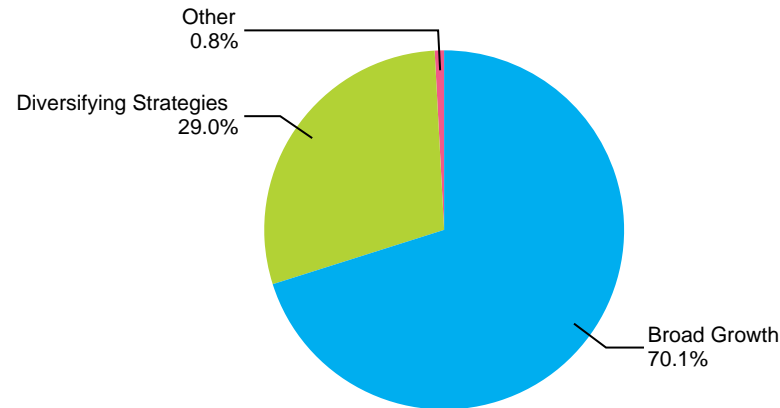
Total Fund | As of December 31, 2024

	Portfolio Valuation	
	Quarter-to-Date	One Year
<b>Total Fund</b>		
Beginning Market Value	24,036,177,827	22,880,493,536
Net Cash Flow	-95,067,005	-68,987,444
Capital Appreciation	-41,730,991	1,087,873,739
<b>Ending Market Value</b>	<b>23,899,379,832</b>	<b>23,899,379,832</b>

	ERS Total Fund Relative Performance									
	Inception	30 Yrs	20 Yrs	10 Yrs	5 Yrs	3 Yrs	1 Yr	FYTD	QTD	
<b>Total Fund</b>	7.6	7.5	6.6	6.9	7.0	3.2	5.7	2.2	-0.2	
Return Benchmark	7.7	7.7	7.5	7.1	7.0	7.0	7.0	3.4	1.7	
Excess Return	-0.1	-0.2	-0.9	-0.2	0.0	-3.8	-1.3	-1.2	-1.9	
<b>Total Fund</b>	7.6	7.5	6.6	6.9	7.0	3.2	5.7	2.2	-0.2	
Market Benchmark	8.0	7.9	6.9	7.2	8.1	6.1	16.1	6.7	3.4	
Excess Return	-0.4	-0.4	-0.3	-0.3	-1.1	-2.9	-10.4	-4.5	-3.5	
<b>Total Fund</b>	7.6	7.5	6.6	6.9	7.0	3.2	5.7	2.2	-0.2	
Peer Benchmark	7.9	7.8	6.6	6.8	6.9	2.7	9.0	3.8	-0.9	
Excess Return	-0.3	-0.3	0.0	0.1	0.1	0.5	-3.3	-1.6	0.7	
Total Fund Rank	74	80	41	44	42	38	98	99	16	

Total Fund performance consists of net of fees returns. Fiscal year begins on July 1. Inception date is June 1, 1990. Current Market Benchmark composition (effective January 1, 2024) is 70% Broad Growth Benchmark and 30% Diversifying Strategies Benchmark. Please see the Appendix for current and historical custom benchmark compositions. Return Benchmark represents the ERS's actuarial assumption rate, which is 7.0% since July 2016, 7.65% from July 2015 to July 2016, 7.75% July 2011 to July 2015, 8.00% prior to July 2011. Peer Benchmark represents the plan sponsor peer group InvMetrics Public DB >\$1B Net universe and includes BNY Mellon Total Public Fund >\$1B universe and Investment Metrics client data.

Asset Allocation vs. Target As of December 31, 2024					
	Balance (\$)	Current Allocation (%)	Policy (%)	Difference (%)	Policy Range (%)
<b>Broad Growth</b>	<b>16,756,107,925</b>	<b>70.1</b>	<b>70.0</b>	<b>0.1</b>	<b>60.0 - 80.0</b>
Global Equity	9,276,730,472	38.8	39.0	-0.2	19.0 - 59.0
Global Credit	2,796,275,283	11.7	12.0	-0.3	6.0 - 18.0
Real Assets	4,683,102,170	19.6	19.0	0.6	9.0 - 29.0
<b>Diversifying Strategies</b>	<b>6,941,826,121</b>	<b>29.0</b>	<b>30.0</b>	<b>-1.0</b>	<b>20.0 - 40.0</b>
Liquid Defensive/Diversifying	5,994,590,447	25.1	26.0	-0.9	15.0 - 30.0
Illiquid Diversifying	947,235,674	4.0	4.0	0.0	0.0 - 9.0
<b>Other</b>	<b>201,445,786</b>	<b>0.8</b>	<b>0.0</b>	<b>0.8</b>	<b>0.0 - 0.0</b>
Other	201,445,786	0.8	0.0	0.8	0.0 - 0.0
<b>Total</b>	<b>23,899,379,832</b>	<b>100.0</b>	<b>100.0</b>	<b>0.0</b>	



Policy targets effective January 1, 2024. "Other" includes ERS Operating Account, Parametric Overlay program, and transitional or residual proceeds from liquidating or terminated accounts.

**Hawaii ERS vs. Public Fund Peers**

→ On a risk-unadjusted basis, the ERS Total Portfolio outperformed the Median Public Fund Peer Group<sup>1</sup> during the most recent quarter and over the trailing 3-, 5-, and 10-year periods.

**Risk-Adjusted Performance<sup>2</sup> of Hawaii ERS vs. Median Public Fund**

	Since Inception	30 Yrs	20 Yrs	10 Yrs	5 Yrs	3 Yrs	1 Yr	CY 2024	FYTD	QTD
<b>Total Fund</b>	<b>7.6</b>	<b>7.5</b>	<b>6.6</b>	<b>6.9</b>	<b>7.0</b>	<b>3.2</b>	<b>5.7</b>	<b>5.7</b>	<b>2.2</b>	<b>(0.2)</b>
<i>Risk-Adjusted Peer Median<sup>3</sup></i>	<i>7.3</i>	<i>7.5</i>	<i>5.8</i>	<i>5.0</i>	<i>4.1</i>	<i>1.0</i>	<i>4.9</i>	<i>4.9</i>	<i>2.0</i>	<i>(0.5)</i>
Excess Return	0.3	(0.1)	0.9	1.9	2.9	2.2	0.8	0.8	0.2	0.3

→ On a risk-adjusted basis, the ERS Total Portfolio has consistently, and materially, outperformed relative to the Median Public Fund over almost all time periods. This is indicative of a more efficient (i.e., higher return per unit of risk) portfolio that was explicitly constructed by the ERS over the last several asset-liability studies.

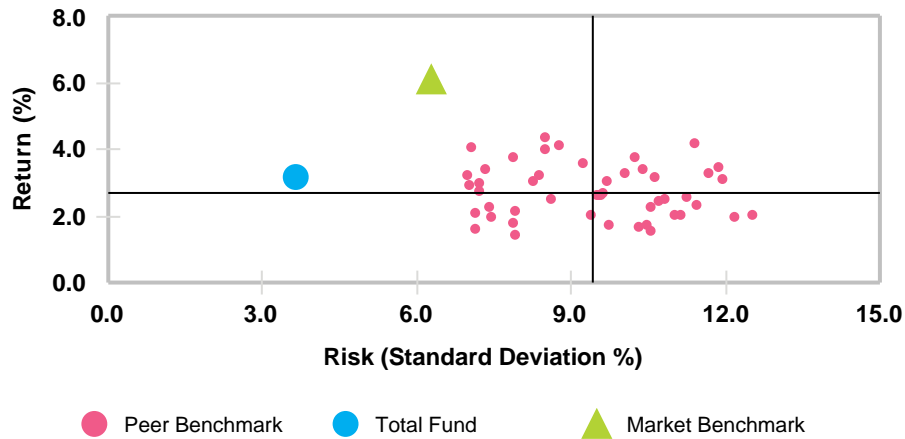
<sup>1</sup> Peer universe data from Investment Metrics (IM) Public Defined Benefit >\$1B Net Universe includes Investment Metrics client data and plan sponsor peer group data from BNY Mellon.

<sup>2</sup> Performance shown is net of fees since October 1, 2014, and a mix of net and gross of fees prior to October 1, 2014. Fiscal Year begins on July 1. Inception date is June 1, 1990.

<sup>3</sup> The risk-adjusted median normalizes the median fund to the ERS's exhibited volatility. Calculated as: risk-adjusted median return = unadjusted median return × (ERS volatility ÷ median fund volatility), where volatility is measured as standard deviation. Figures for periods greater than one year are annualized.

Total Fund | As of December 31, 2024

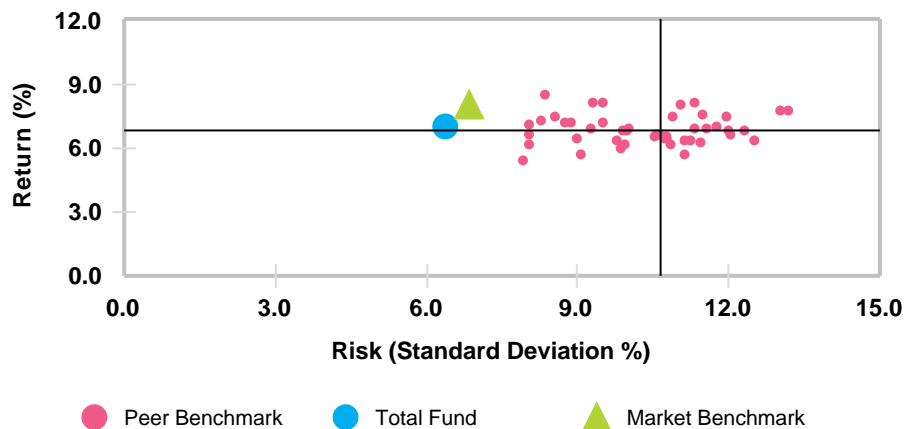
Annualized Return vs. Annualized Standard Deviation  
3 Years Ending December 31, 2024



Annualized Risk-Return

	3 Years Return	3 Years Standard Deviation	3 Years Sharpe Ratio
Total Fund	3.2	3.7	-0.2
Market Benchmark	6.1	6.3	0.4
Peer Benchmark Median	2.7	9.4	-0.1

Annualized Return vs. Annualized Standard Deviation  
5 Years Ending December 31, 2024



Annualized Risk-Return

	5 Years Return	5 Years Standard Deviation	5 Years Sharpe Ratio
Total Fund	7.0	6.4	0.7
Market Benchmark	8.1	6.9	0.8
Peer Benchmark Median	6.9	10.6	0.4

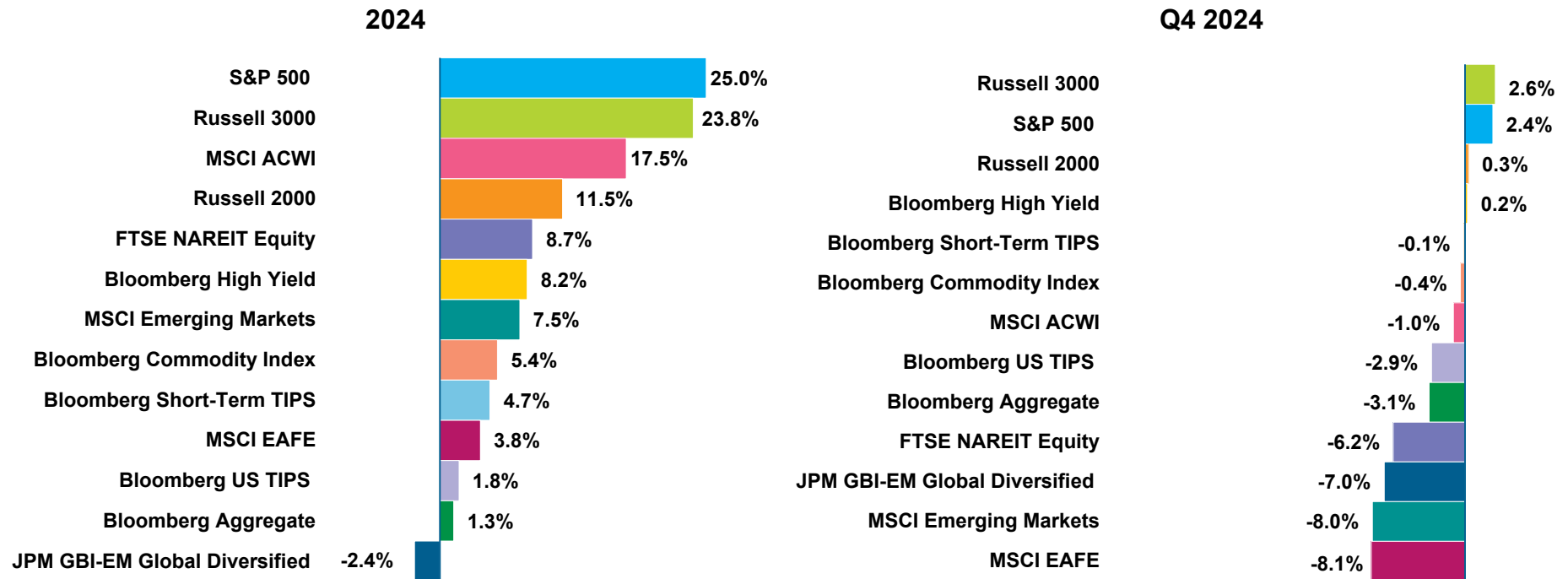
Peer Benchmark represents the plan sponsor peer group InvMetrics Public DB >\$1B Net universe and includes BNY Mellon Total Public Fund >\$1B universe and Investment Metrics client data.

#### Since Inception Growth of \$1



Inception date is June 1, 1990. Return Benchmark represents the ERS's actuarial assumption rate, which is 7.0% since July 2016, 7.65% from July 2015 to July 2016, 7.75% July 2011 to July 2015, 8.00% prior to July 2011.

### Index Returns<sup>1</sup>



→ In 2024, most major assets classes posted gains, led by the S&P 500's 25.0% return.

→ Markets had mixed returns in the fourth quarter. US equities rose on optimism over potential pro-growth policies from the incoming administration while inflation concerns and a strong dollar, respectively, weighed on bonds and international equities.

<sup>1</sup> Source: Bloomberg. Data is as of December 31, 2024.



## Summary

### Key Trends:

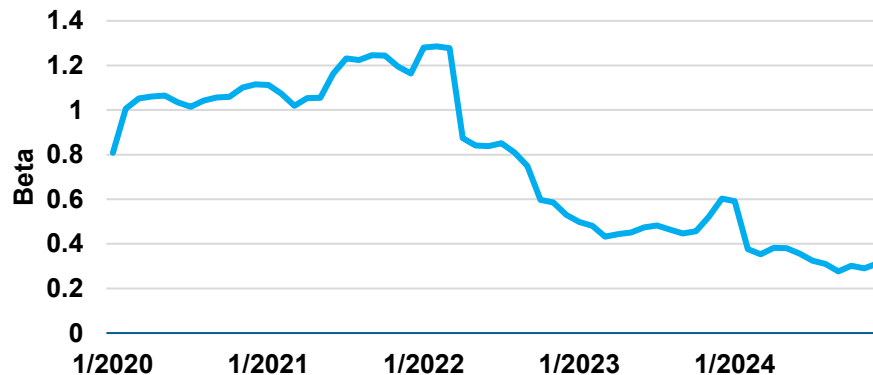
- According to the International Monetary Fund's (IMF) October report, global growth in 2025 is expected to be similar to 2024 at around 3.2% with most major economies predicted to avoid a recession.
- Questions remain about what policies will be implemented by the new administration in the US. Although deregulation and tax cuts could support growth, these policies, along with higher tariffs and restrictive immigration, could fan inflation. This will likely lead to additional uncertainty regarding the timing and pace of interest rate cuts in the coming year.
- US consumers could feel pressure as certain components of inflation (e.g., shelter) remain high, borrowing costs stay elevated, and the job market may weaken further.
- A focus for US equities going forward will be whether earnings can remain resilient if growth slows. Also, the future paths of the large technology companies that have driven market gains will be important.
- We have started to see divergences in monetary policy. Some central banks, such as the Fed, European Central Bank, and the Bank of England, have started to cut interest rates and others, like the Bank of Japan, have increased interest rates. This disparity will likely influence capital flows and currencies.
- China appears to have shifted focus to more policy support for the economy/asset prices with a suite of fiscal and financial policy stimulus measures. Thus far, these efforts have not increased weak consumer spending or helped the lingering trouble in the real estate sector. It is still not clear what the long-term impact of these policies will be on the economy and if policy makers will remain committed to these efforts.

### Macro Risk Analytics – Key Takeaways

- Projections for monetary and fiscal policy decisions are front-and-center with respect to market reactions at the moment. The Federal Reserve cut rates again in December but indicated a more hawkish outlook for future cuts as inflation and economic growth remain strong. While economic activity (i.e., corporate earnings, GDP, income growth, unemployment, etc.) remains relatively resilient, pockets of weakness have begun to show in certain data releases. With strong market moves across liquid markets in recent periods, valuations for several asset classes still exhibit elevated levels.
- Meketa’s Market Sentiment Indicator remained **green** (i.e., positive) during Q4.
- The Actual Portfolio’s beta (on a 12-month basis relative to the Policy Portfolio) ticked up in Q4 but remains at extremely low levels. Related, trailing 12-month volatility for the Actual Portfolio and Policy Portfolio remain at a relatively wide spread. Of note, a new policy benchmark was implemented on 1/1/2024.

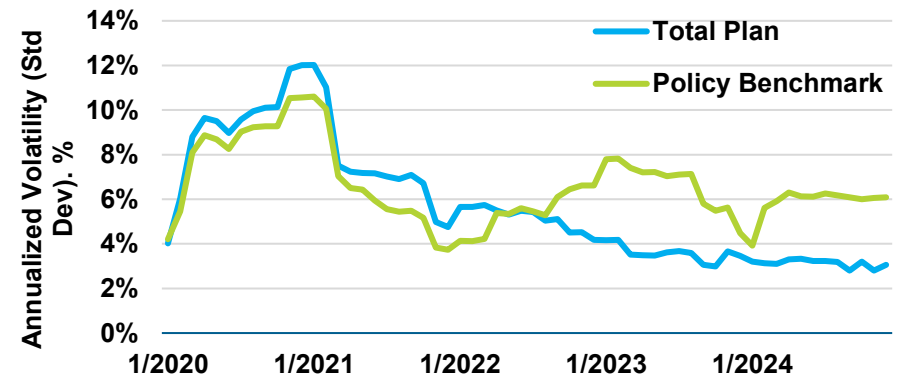
12 Month Rolling Beta vs. Policy Benchmark

Jan 20 - Dec 24

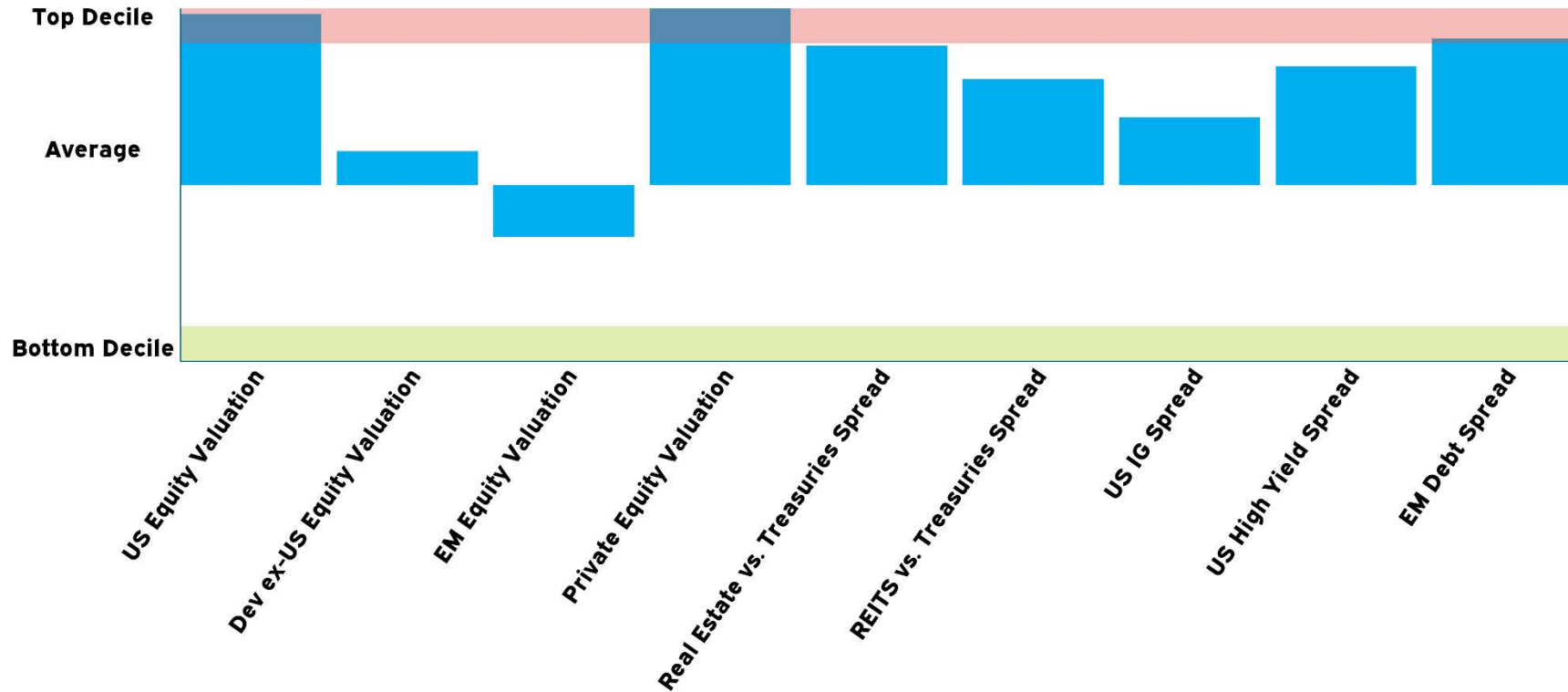


12 Month Rolling Risk

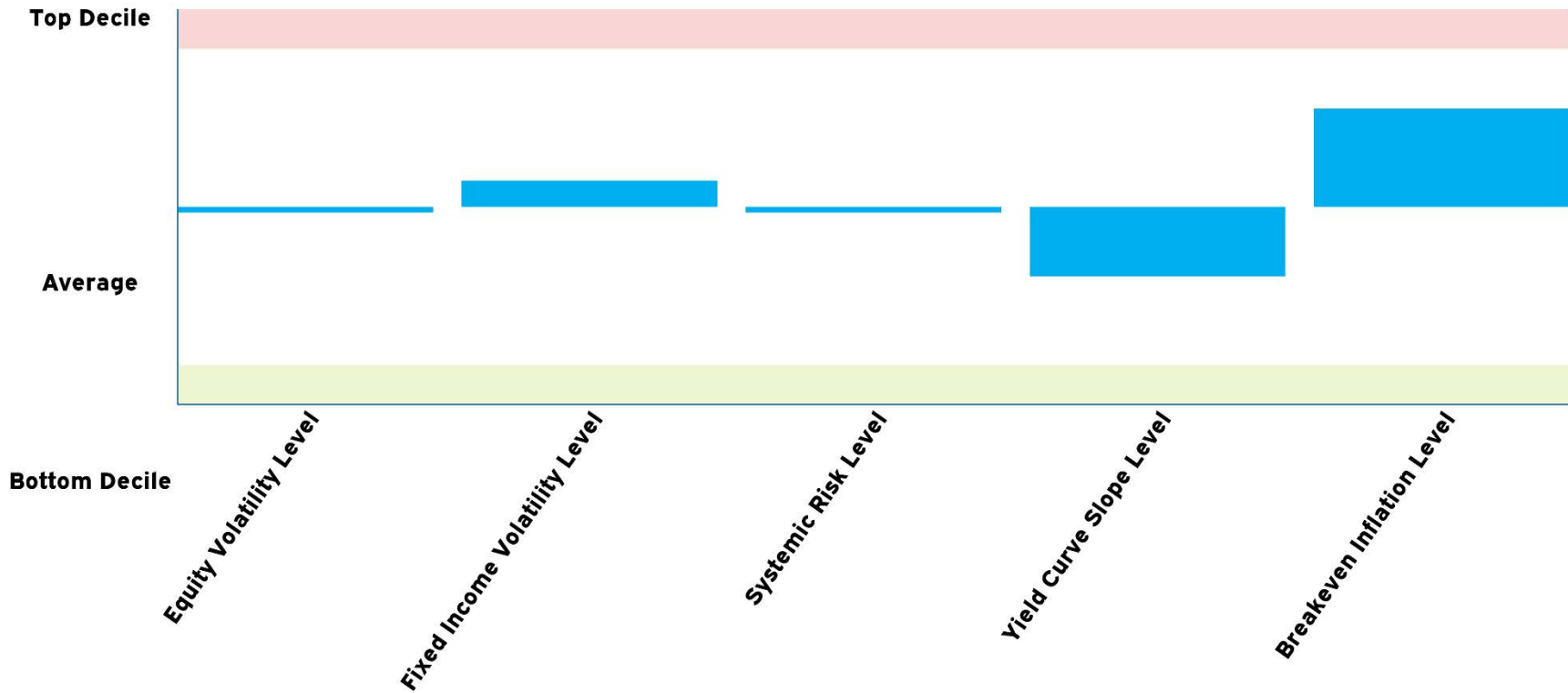
Jan 20 - Dec 24



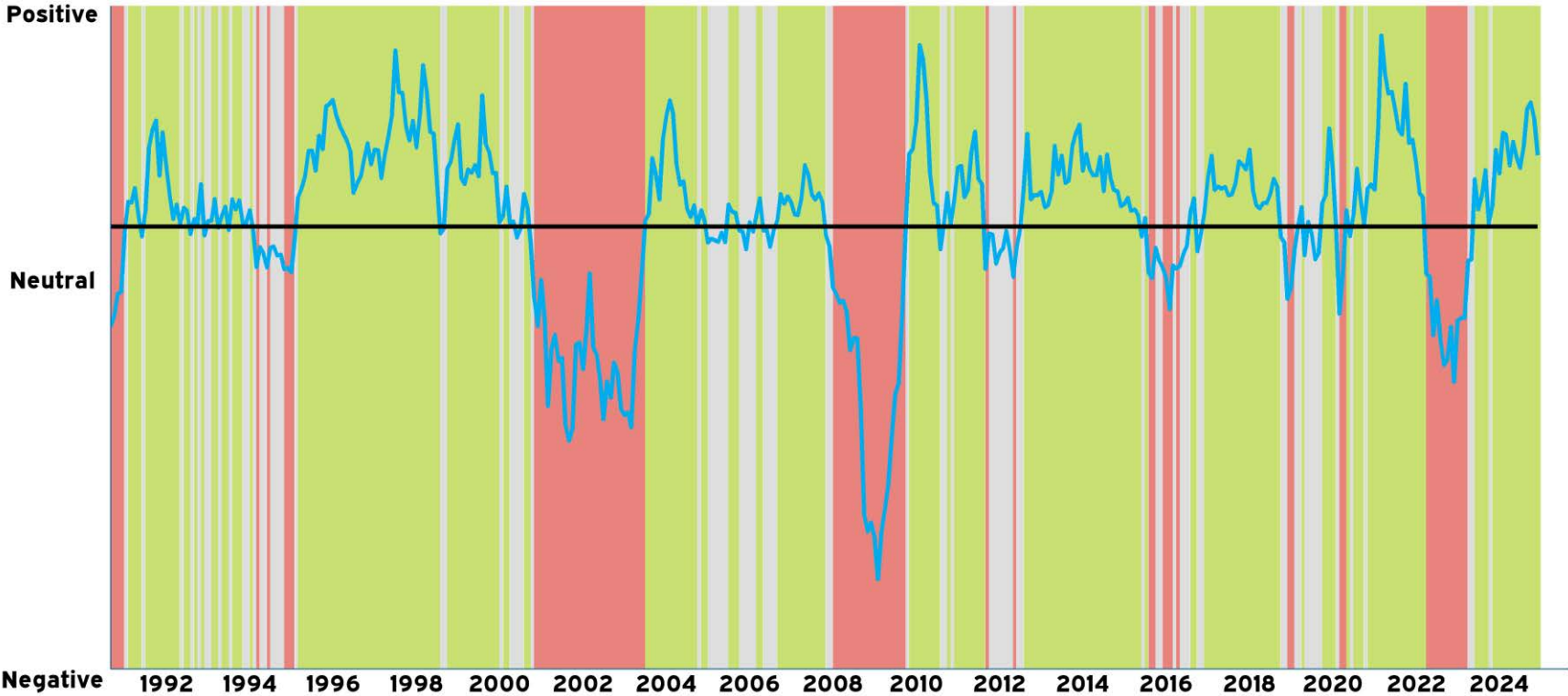
**Valuation Metrics Dashboard**  
(current measures relative to history)



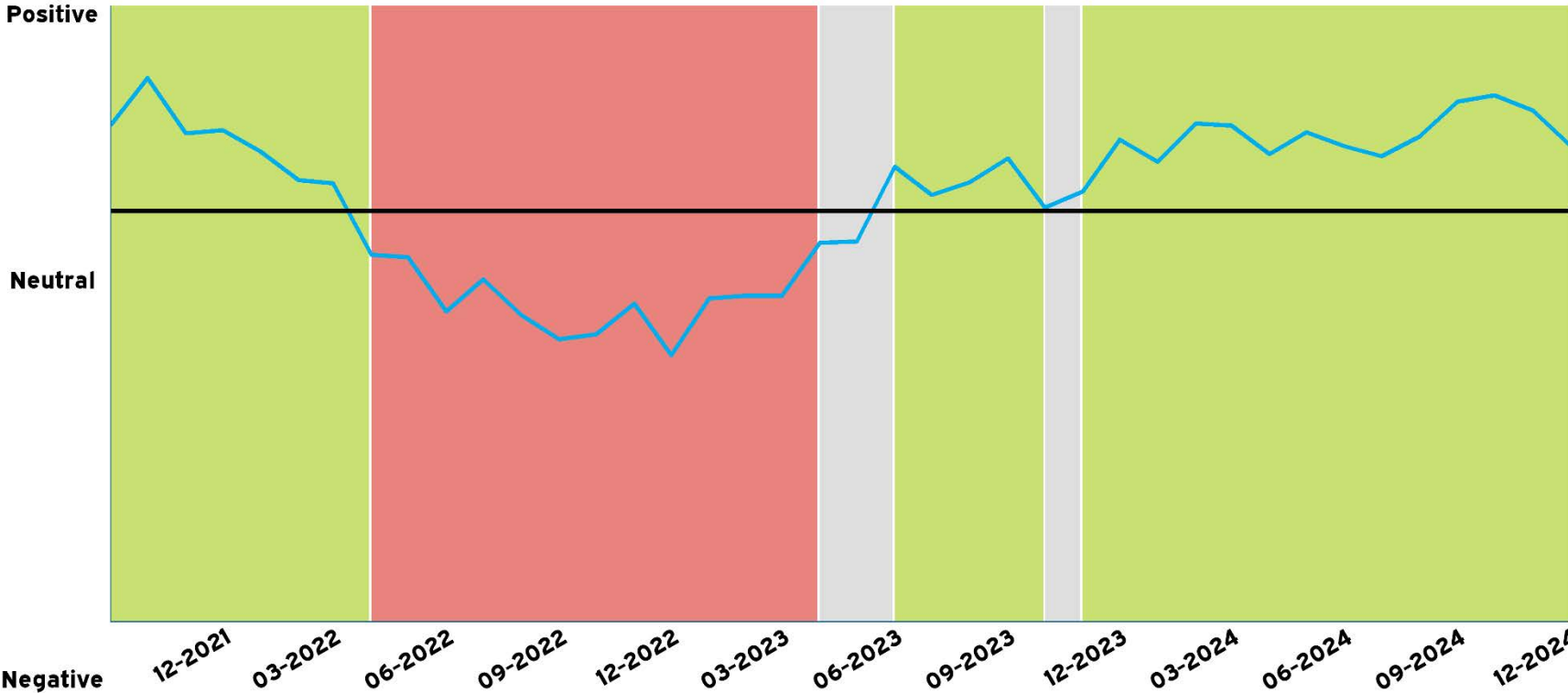
### Other Market Metrics Dashboard (current measures relative to history)



**Market Sentiment Indicator (All History)**

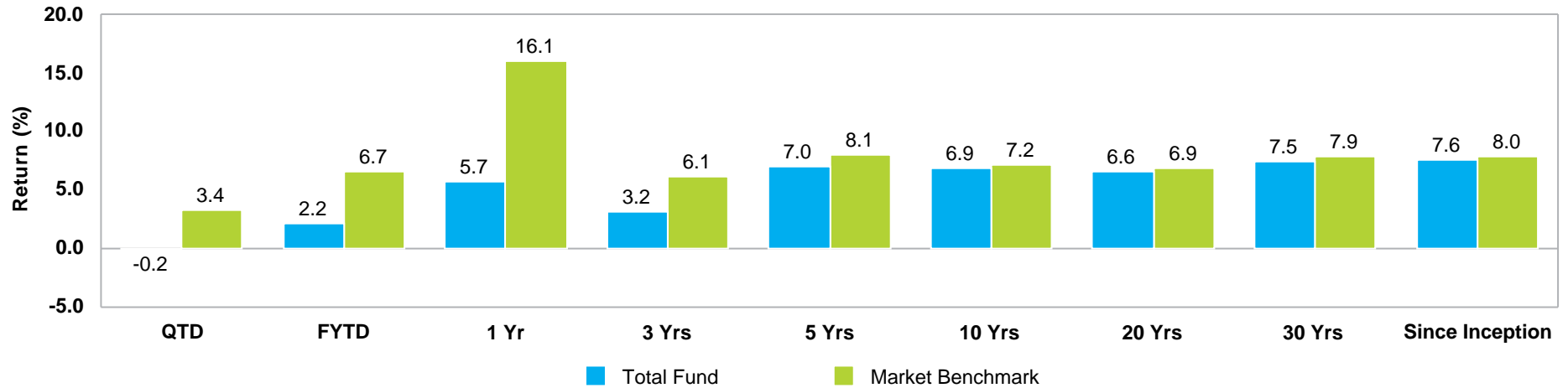


**Market Sentiment Indicator (Last Three Years)**

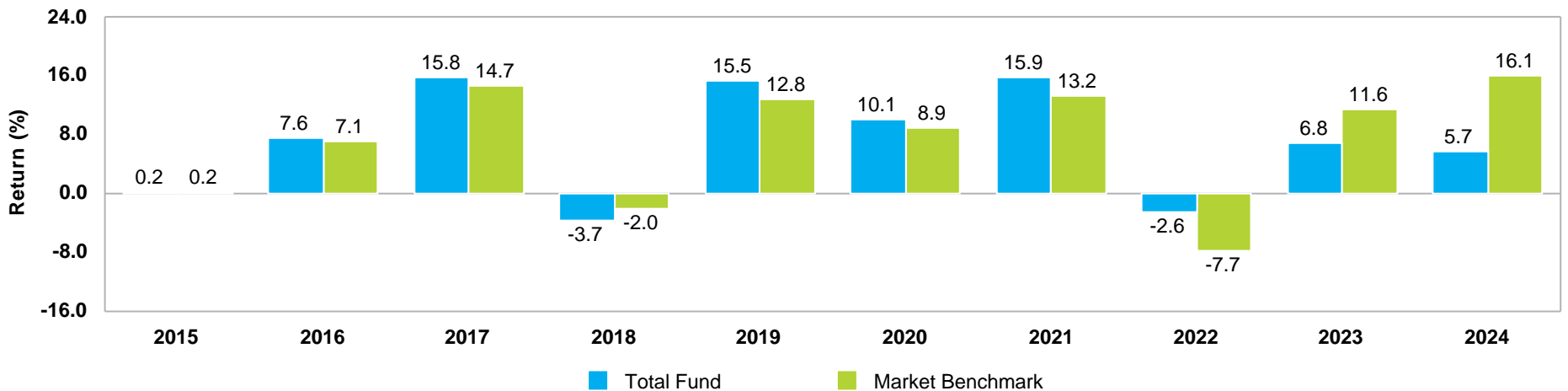


## ERS Portfolio Review

#### Trailing Performance



#### Calendar Year Performance



Performance shown is net of fees. Inception date is 6/1/1990. Please see the Appendix for the Market Benchmark's composition history.



**Performance Attribution<sup>1</sup> vs. Policy Benchmark**  
**Quarter ending December 31, 2024**

	Policy <sup>2</sup>		Portfolio <sup>3</sup>		Impact on Return		
	Allocation (%)	Return	Allocation (%)	Return	Weighting	Implementation	Total <sup>4</sup>
<b>Broad Growth</b>	<b>70.0</b>	<b>5.8</b>	<b>70.9</b>	<b>0.5</b>	<b>0.0</b>	<b>(3.8)</b>	<b>(3.7)</b>
Global Equity	39.2	2.7	40.2	(0.2)	0.0	(1.2)	(1.2)
Global Credit	11.9	3.0	11.5	2.9	0.0	0.0	0.0
Real Assets	18.9	14.1	19.3	0.6	0.0	(2.6)	(2.6)
<b>Diversifying Strategies</b>	<b>30.0</b>	<b>(2.0)</b>	<b>28.3</b>	<b>(1.9)</b>	<b>0.1</b>	<b>0.0</b>	<b>0.1</b>
Liquid Defensive/Diversifying	26.1	(2.9)	24.3	(2.7)	0.1	0.0	0.2
Illiquid Diversifying	3.9	3.8	4.0	3.1	0.0	0.0	0.0
<b>Other Assets</b>	<b>0.0</b>	<b>1.2</b>	<b>0.8</b>	<b>1.1</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>
<b>Total<sup>5</sup></b>	<b>100.0</b>	<b>3.4</b>	<b>100.0</b>	<b>(0.2)</b>	<b>0.1</b>	<b>(3.7)</b>	<b>(3.6)</b>

<sup>1</sup> The underlying data points (asset values and net-of-fees returns) for performance attribution calculation are from BNY Mellon. Performance attribution is calculated using average allocation over the period measure and the period's annualized trailing return. Total impacts may not match period excess return (difference between Portfolio Return and Policy Return) due to rounding, rebalancing, and measurement frequencies. Please see "Performance Attribution Glossary" page in the Appendix for the definition and formula of the Impact on Return factors.

<sup>2</sup> Policy Allocation and Return columns represent those of each component's corresponding primary benchmarks ("Historical Benchmarks") as shown in the other parts of this report and are used in the attribution calculations. For Other Assets, ICE BofA 3-Month US T-Bills Index is used as benchmark.

<sup>3</sup> Portfolio Allocation column illustrates the average beginning-of-month allocation of each component over the period measured.

<sup>4</sup> Total impacts may not sum to excess return due to rounding, rebalancing, and measurement frequencies.

<sup>5</sup> Policy Return and Portfolio Return values for the "Total" row are those of the Market Benchmark (policy benchmark of the total portfolio) and the Total Fund respectively. Values in the Impact on Return columns for "Total" row are the sums of calculated Impact on Return values in each column for Broad Growth, Diversifying Strategies, and Other Assets components. The sum of sub-composites (Global Equity, Global Credit, Real Assets, Liquid Defensive/Diversifying, and Illiquid Diversifying) along with Other Assets may not yield the same figure as obsolete sub-composites are excluded and the recalculated composite asset values may not contain the terminated accounts.

**Performance Attribution<sup>1</sup> vs. Policy Benchmarks  
2024 Calendar Year**

	Policy <sup>2</sup>		Portfolio <sup>3</sup>		Impact on Return		
	Allocation (%)	Return	Allocation (%)	Return	Weighting	Implementation	Total
<b>Broad Growth</b>	<b>70.0</b>	<b>22.3</b>	<b>67.9</b>	<b>8.4</b>	<b>(0.1)</b>	<b>(9.4)</b>	<b>(9.6)</b>
Global Equity	39.2	23.5	39.3	10.0	0.0	(5.3)	(5.3)
Global Credit	11.9	12.4	10.7	11.4	0.0	(0.1)	(0.1)
Real Assets	18.9	25.9	17.9	3.1	(0.1)	(4.1)	(4.2)
<b>Diversifying Strategies</b>	<b>30.0</b>	<b>2.0</b>	<b>28.2</b>	<b>0.4</b>	<b>0.3</b>	<b>(0.5)</b>	<b>(0.2)</b>
Liquid Defensive/Diversifying	26.1	(0.1)	23.9	(1.0)	0.4	(0.2)	0.1
Illiquid Diversifying	3.9	17.3	4.3	9.1	0.0	(0.4)	(0.3)
<b>Other Assets</b>	<b>0.0</b>	<b>5.3</b>	<b>3.9</b>	<b>1.2</b>	<b>(0.4)</b>	<b>(0.2)</b>	<b>(0.6)</b>
<b>Total<sup>4</sup></b>	<b>100.0</b>	<b>16.1</b>	<b>100.0</b>	<b>5.7</b>	<b>(0.3)</b>	<b>(10.1)</b>	<b>(10.3)</b>

<sup>1</sup> The underlying data points (asset values and net-of-fees returns) for performance attribution calculation are from BNY Mellon. Performance attribution is calculated using average allocation over the period measure and the period's annualized trailing return. Total impacts may not match period excess return (difference between Portfolio Return and Policy Return) due to rounding, rebalancing, and measurement frequencies. Please see "Performance Attribution Glossary" page in the Appendix for the definition and formula of the Impact on Return factors.

<sup>2</sup> Policy Allocation and Return columns represent those of each component's corresponding primary benchmarks ("Historical Benchmarks") as shown in the other parts of this report and are used in the attribution calculations. For Other Assets, ICE BofA 3-Month US T-Bills Index is used as benchmark. Policy Allocation column illustrates the average beginning-of-month target allocation of each component over the period measured; thus, the values may not match any particular set of targets.

<sup>3</sup> Portfolio Allocation column illustrates the average beginning-of-month allocation of each component over the period measured.

<sup>4</sup> Policy Return and Portfolio Return values for the "Total" row are those of the Market Benchmark (policy benchmark of the total portfolio) and the Total Fund respectively. Values in the Impact on Return columns for "Total" row are the sums of calculated Impact on Return values in each column for Broad Growth, Diversifying Strategies, and Other Assets components. The sum of sub-composites (Global Equity, Global Credit, Real Assets, Liquid Defensive/Diversifying, and Illiquid Diversifying) along with Other Assets may not yield the same figure as obsolete sub-composites are excluded and the recalculated composite asset values may not contain the terminated accounts.

**Performance Attribution<sup>1</sup> vs. Policy Benchmarks  
3-Year ending December 31, 2024**

	Policy <sup>2</sup>		Portfolio <sup>3</sup>		Impact on Return		
	Allocation (%)	Return	Allocation (%)	Return	Weighting	Implementation	Total
<b>Broad Growth</b>	<b>65.6</b>	<b>7.2</b>	<b>67.4</b>	<b>2.8</b>	<b>0.0</b>	<b>(3.0)</b>	<b>(2.9)</b>
Global Equity	39.4	6.5	40.0	3.3	0.0	(1.3)	(1.3)
Global Credit	6.6	6.1	7.2	5.8	0.0	0.0	0.0
Real Assets	13.1	11.6	14.6	4.1	0.1	(1.1)	(1.0)
<b>Diversifying Strategies</b>	<b>34.4</b>	<b>3.1</b>	<b>30.5</b>	<b>4.4</b>	<b>0.1</b>	<b>0.4</b>	<b>0.5</b>
Liquid Defensive/Diversifying	29.7	0.3	26.1	4.1	0.2	1.0	1.2
Illiquid Diversifying	4.8	10.5	4.3	5.1	0.0	(0.2)	(0.3)
<b>Other Assets</b>	<b>0.0</b>	<b>3.9</b>	<b>2.1</b>	<b>(0.5)</b>	<b>0.0</b>	<b>(0.1)</b>	<b>(0.1)</b>
<b>Total<sup>4</sup></b>	<b>100.0</b>	<b>6.1</b>	<b>100.0</b>	<b>3.2</b>	<b>0.1</b>	<b>(2.7)</b>	<b>(2.6)</b>

<sup>1</sup> The underlying data points (asset values and net-of-fees returns) for performance attribution calculation are from BNY Mellon. Performance attribution is calculated using average allocation over the period measure and the period's annualized trailing return. Total impacts may not match period excess return (difference between Portfolio Return and Policy Return) due to rounding, rebalancing, and measurement frequencies. Please see "Performance Attribution Glossary" page in the Appendix for the definition and formula of the Impact on Return factors.

The current plan structure became effective 01/01/2024. Global Equity, Global Credit, and Liquid Defensive/Diversifying composites were not used in the current form prior to 2024. To calculate performance attribution for the prior periods, reconstructed or approximated information is used; this may include but not limited to policy allocation targets reflected in the reconstructed historical benchmarks, the reconstructed historical benchmark returns, and composite asset values as reconstituted and recalculated by BNY Mellon. This reconstituted portfolio structure and asset values (and therefore Portfolio Allocation values) may not include all the underlying historical accounts such as those previously terminated.

<sup>2</sup> Policy Allocation and Return columns represent those of each component's corresponding primary benchmarks ("Historical Benchmarks") as shown in the other parts of this report and are used in the attribution calculations. For Other Assets, ICE BofA 3-Month US T-Bills Index is used as benchmark. Policy Allocation column illustrates the average beginning-of-month target allocation of each component over the period measured; thus, the values may not match any particular set of targets.

<sup>3</sup> Portfolio Allocation column illustrates the average beginning-of-month allocation of each component over the period measured.

<sup>4</sup> Policy Return and Portfolio Return values for the "Total" row are those of the Market Benchmark (policy benchmark of the total portfolio) and the Total Fund respectively. Values in the Impact on Return columns for "Total" row are the sums of calculated Impact on Return values in each column for Broad Growth, Diversifying Strategies, and Other Assets components. The sum of sub-composites (Global Equity, Global Credit, Real Assets, Liquid Defensive/Diversifying, and Illiquid Diversifying) along with Other Assets may not yield the same figure as obsolete sub-composites are excluded and the recalculated composite asset values may not contain the terminated accounts.

**Performance Attribution<sup>1</sup> vs. Policy Benchmarks**  
**5-Year ending December 31, 2024**

	Policy <sup>2</sup>		Portfolio <sup>3</sup>		Impact on Return		
	Allocation (%)	Return	Allocation (%)	Return	Weighting	Implementation	Total
<b>Broad Growth</b>	<b>71.9</b>	<b>9.6</b>	<b>75.4</b>	<b>8.1</b>	<b>0.1</b>	<b>(1.1)</b>	<b>(1.1)</b>
Global Equity	46.4	11.5	52.3	10.8	0.2	(0.4)	(0.2)
Global Credit	8.0	6.2	6.8	7.0	0.0	0.1	0.1
Real Assets	12.7	8.7	10.3	6.6	0.0	(0.2)	(0.2)
<b>Diversifying Strategies</b>	<b>28.1</b>	<b>3.6</b>	<b>21.2</b>	<b>3.5</b>	<b>0.3</b>	<b>0.0</b>	<b>0.3</b>
Liquid Defensive/Diversifying	29.4	2.3	24.5	3.2	0.3	0.2	0.5
Illiquid Diversifying	3.4	--	1.9	--	0.1	0.0	0.1
<b>Other Assets</b>	<b>0.0</b>	<b>2.5</b>	<b>3.4</b>	<b>4.2</b>	<b>(0.2)</b>	<b>0.1</b>	<b>(0.1)</b>
<b>Total<sup>4</sup></b>	<b>100.0</b>	<b>8.1</b>	<b>100.0</b>	<b>7.0</b>	<b>0.2</b>	<b>(1.1)</b>	<b>(0.9)</b>

<sup>1</sup> The underlying data points (asset values and net-of-fees returns) for performance attribution calculation are from BNY Mellon. Performance attribution is calculated using average allocation over the period measure and the period's annualized trailing return. Total impacts may not match period excess return (difference between Portfolio Return and Policy Return) due to rounding, rebalancing, and measurement frequencies. Please see "Performance Attribution Glossary" page in the Appendix for the definition and formula of the Impact on Return factors.

The current plan structure became effective 01/01/2024. Global Equity, Global Credit, and Liquid Defensive/Diversifying composites were not used in the current form prior to 2024. To calculate performance attribution for the prior periods, reconstructed or approximated information is used; this may include but not limited to policy allocation targets reflected in the reconstructed historical benchmarks, the reconstructed historical benchmark returns, and composite asset values as reconstituted and recalculated by BNY Mellon. This reconstituted portfolio structure and asset values (and therefore Portfolio Allocation values) may not include all the underlying historical accounts such as those previously terminated.

<sup>2</sup> Policy Allocation and Return columns represent those of each component's corresponding primary benchmarks ("Historical Benchmarks") as shown in the other parts of this report and are used in the attribution calculations. For Other Assets, ICE BofA 3-Month US T-Bills Index is used as benchmark. Policy Allocation column illustrates the average beginning-of-month target allocation of each component over the period measured; thus, the values may not match any particular set of targets. The major functional allocation categories of Broad Growth and Diversifying Strategies were adopted starting 07/2020; sum of their corresponding predecessors' policy allocations are assigned to for this calculation (i.e., Broad Growth [2019] and Real Returns as Broad Growth; Crisis Risk Offset and Principal Protection as Diversifying Strategies).

<sup>3</sup> Portfolio Allocation column illustrates the average beginning-of-month allocation of each component over the period measured.

<sup>4</sup> Policy Return and Portfolio Return values for the "Total" row are those of the Market Benchmark (policy benchmark of the total portfolio) and the Total Fund respectively. Values in the Impact on Return columns for "Total" row are the sums of calculated Impact on Return values in each column for Broad Growth, Diversifying Strategies, and Other Assets components. The sum of sub-composites (Global Equity, Global Credit, Real Assets, Liquid Defensive/Diversifying, and Illiquid Diversifying) along with Other Assets may not yield the same figure as obsolete sub-composites are excluded and the recalculated composite asset values may not contain the terminated accounts.

Total Fund | As of December 31, 2024

Asset Class Performance Summary					
	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	7 Yrs (%)
<b>Total Fund</b>	<b>-0.2</b>	<b>5.7</b>	<b>3.2</b>	<b>7.0</b>	<b>6.6</b>
<i>Market Benchmark</i>	<i>3.4</i>	<i>16.1</i>	<i>6.1</i>	<i>8.1</i>	<i>7.2</i>
<b>Broad Growth</b>	<b>0.5</b>	<b>8.4</b>	<b>2.8</b>	<b>8.1</b>	<b>7.6</b>
<i>Broad Growth Historical Benchmark</i>	<i>5.8</i>	<i>22.3</i>	<i>7.2</i>	<i>9.6</i>	<i>8.6</i>
<b>Global Equity</b>	<b>-0.2</b>	<b>10.0</b>	<b>3.3</b>	<b>10.8</b>	<b>10.0</b>
<i>Global Equity Historical Benchmark</i>	<i>2.7</i>	<i>23.5</i>	<i>6.5</i>	<i>11.5</i>	<i>10.0</i>
<b>Global Credit</b>	<b>2.9</b>	<b>11.4</b>	<b>5.8</b>	<b>7.0</b>	<b>6.4</b>
<i>Global Credit Historical Benchmark</i>	<i>3.0</i>	<i>12.4</i>	<i>6.1</i>	<i>6.2</i>	<i>5.9</i>
<b>Real Assets</b>	<b>0.6</b>	<b>3.1</b>	<b>4.1</b>	<b>6.6</b>	<b>6.7</b>
<i>Real Assets Historical Benchmark</i>	<i>14.1</i>	<i>25.9</i>	<i>11.6</i>	<i>8.7</i>	<i>8.0</i>
<b>Diversifying Strategies</b>	<b>-1.9</b>	<b>0.4</b>	<b>4.4</b>	<b>3.5</b>	<b>2.8</b>
<i>Diversifying Strategies Benchmark</i>	<i>-2.0</i>	<i>2.0</i>	<i>3.1</i>	<i>3.6</i>	<i>3.6</i>
<b>Liquid Defensive/Diversifying</b>	<b>-2.7</b>	<b>-1.0</b>	<b>4.1</b>	<b>3.2</b>	<b>2.6</b>
<i>Liquid Defensive Historical Benchmark</i>	<i>-2.9</i>	<i>-0.1</i>	<i>0.3</i>	<i>2.3</i>	<i>2.1</i>
<b>Illiquid Diversifying</b>	<b>3.1</b>	<b>9.1</b>	<b>5.1</b>	<b>--</b>	<b>--</b>
<i>Illiquid Diversifying Historical Benchmark</i>	<i>3.8</i>	<i>17.3</i>	<i>10.5</i>	<i>--</i>	<i>--</i>

Total Fund performance shown is net of fees.

Relevant valuations may not have been available for all underlying Global Equity, Real Assets, and Diversifying Strategies managers at the time this report was produced; in such cases, most recent available data is used.

Benchmarks for Broad Growth and its underlying components contain lagged index returns. Please see the Appendix for current and historical custom benchmark compositions.

Asset Class Performance Summary						
	Market Value (\$)	% of Portfolio	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)
<b>Global Equity</b>	<b>9,276,730,472</b>	<b>100.0</b>	<b>-0.2</b>	<b>10.0</b>	<b>3.3</b>	<b>10.8</b>
<i>Global Equity Historical Benchmark</i>			<i>2.7</i>	<i>23.5</i>	<i>6.5</i>	<i>11.5</i>
<b>Public Equity</b>	<b>4,574,222,837</b>	<b>49.3</b>	<b>-2.1</b>	<b>13.9</b>	<b>3.2</b>	<b>9.2</b>
<i>MSCI AC World IMI Index (Net)</i>			<i>-1.2</i>	<i>16.4</i>	<i>4.9</i>	<i>9.7</i>
<b>Active Public Equity</b>	<b>3,043,301,809</b>	<b>32.8</b>	<b>-2.5</b>	<b>12.0</b>	<b>2.0</b>	<b>8.4</b>
Alliance Bernstein	495,806,226	5.3	-4.8	10.8	2.3	--
Longview	680,550,106	7.3	-3.6	10.5	6.2	8.2
Wellington (Mid-Large Cap)	514,174,610	5.5	2.0	22.6	4.7	--
<i>MSCI AC World Index (Net)</i>			<i>-1.0</i>	<i>17.5</i>	<i>5.4</i>	<i>10.1</i>
Wasatch	534,754,524	5.8	-2.5	9.7	-3.0	10.7
Wellington (Small Cap)	520,174,889	5.6	-4.6	6.8	1.6	7.6
<i>MSCI ACWI Small Cap (Net)</i>			<i>-3.3</i>	<i>7.7</i>	<i>0.8</i>	<i>6.7</i>
Hillhouse China A Shares	157,584,650	1.7	2.3	7.2	--	--
<i>MSCI China A Onshore Index (Net)</i>			<i>-5.0</i>	<i>11.6</i>	<i>-10.5</i>	<i>0.9</i>
<b>Passive Public Equity</b>	<b>1,530,921,028</b>	<b>16.5</b>	<b>-1.0</b>	<b>18.0</b>	<b>6.1</b>	<b>10.8</b>
BlackRock Alpha Tilt	678,815,614	7.3	-1.0	18.4	6.6	11.0
Legal & General	852,105,414	9.2	-1.0	17.7	5.7	10.4
Parametric Equity Overlay	140,256,804	1.5	--	--	--	--
<i>MSCI AC World Index (Net)</i>			<i>-1.0</i>	<i>17.5</i>	<i>5.4</i>	<i>10.1</i>
<b>Private Equity</b>	<b>4,702,507,635</b>	<b>50.7</b>	<b>1.7</b>	<b>6.2</b>	<b>4.3</b>	<b>14.6</b>
<i>Private Equity Historical Benchmark</i>			<i>6.8</i>	<i>31.0</i>	<i>8.9</i>	<i>13.6</i>
Hamilton Lane	4,313,671,144	46.5	1.8	6.5	4.4	14.8
HITIP I Stafford	9,563,764	0.1	-1.5	-0.3	-3.1	-1.5
HITIP II Stafford	40,109,921	0.4	-2.2	-7.8	-0.9	7.5
HITIP III Stafford	44,253,521	0.5	-0.9	-3.3	-3.6	--
Other Equity	294,909,285	3.2	1.2	4.3	5.7	12.8

Performance shown is net of fees. Please see the Appendix for current and historical custom benchmark compositions.

Asset Class Performance Summary						
	Market Value \$	% of Portfolio	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)
<b>Global Credit</b>	<b>2,796,275,283</b>	<b>100.0</b>	<b>2.9</b>	<b>11.4</b>	<b>5.8</b>	<b>7.0</b>
<i>Global Credit Historical Benchmark</i>			<i>3.0</i>	<i>12.4</i>	<i>6.1</i>	<i>6.2</i>
<b>Private Credit</b>	<b>1,726,189,569</b>	<b>61.7</b>	<b>3.1</b>	<b>11.0</b>	<b>6.1</b>	<b>10.5</b>
<i>Private Credit Historical Benchmark</i>			<i>3.7</i>	<i>13.7</i>	<i>6.2</i>	<i>6.4</i>
<b>Public Credit</b>	<b>1,070,085,714</b>	<b>38.3</b>	<b>2.7</b>	<b>12.0</b>	<b>6.3</b>	<b>6.8</b>
HPS Credit	996,001,839	35.6	2.7	9.9	5.6	7.1
Parametric Credit Overlay	74,083,875	2.6	--	--	--	--
<i>Public Credit Historical Benchmark</i>			<i>1.8</i>	<i>9.7</i>	<i>5.4</i>	<i>5.6</i>

Performance shown is net of fees. Please see the Appendix for current and historical custom benchmark compositions.

Real Assets | As of December 31, 2024

Asset Class Performance Summary						
	Market Value (\$)	% of Portfolio	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)
<b>Real Assets</b>	<b>4,683,102,170</b>	<b>100.0</b>	<b>0.6</b>	<b>3.1</b>	<b>4.1</b>	<b>6.6</b>
<i>Real Assets Historical Benchmark</i>			<i>14.1</i>	<i>25.9</i>	<i>11.6</i>	<i>8.7</i>
<b>Real Estate</b>	<b>2,060,105,439</b>	<b>44.0</b>	<b>1.1</b>	<b>-4.4</b>	<b>1.7</b>	<b>5.4</b>
<i>Real Estate Historical Benchmark</i>			<i>16.2</i>	<i>30.4</i>	<i>11.5</i>	<i>8.3</i>
<b>Core Real Estate</b>	<b>1,062,835,905</b>	<b>22.7</b>	<b>0.7</b>	<b>-4.5</b>	<b>3.0</b>	<b>6.8</b>
<i>Core Real Estate Historical Benchmark</i>			<i>16.2</i>	<i>30.4</i>	<i>11.2</i>	<i>9.4</i>
<b>Non-Core Real Estate</b>	<b>997,269,534</b>	<b>21.3</b>	<b>1.6</b>	<b>-4.3</b>	<b>0.4</b>	<b>4.1</b>
<i>Non-Core Real Estate Historical Benchmark</i>			<i>16.2</i>	<i>30.4</i>	<i>11.9</i>	<i>6.4</i>
<b>Agriculture</b>	<b>388,770,545</b>	<b>8.3</b>	<b>0.5</b>	<b>2.4</b>	<b>4.4</b>	<b>--</b>
<i>Agriculture Historical Benchmark</i>			<i>3.7</i>	<i>-2.0</i>	<i>4.6</i>	<i>--</i>
<b>Timber</b>	<b>228,695,994</b>	<b>4.9</b>	<b>0.5</b>	<b>17.5</b>	<b>14.0</b>	<b>7.6</b>
<i>Timber Historical Benchmark</i>			<i>10.4</i>	<i>18.5</i>	<i>13.6</i>	<i>9.1</i>
<b>Infrastructure</b>	<b>2,005,530,192</b>	<b>42.8</b>	<b>0.1</b>	<b>11.4</b>	<b>8.3</b>	<b>13.7</b>
<b>Private Infrastructure</b>	<b>823,284,878</b>	<b>17.6</b>	<b>2.8</b>	<b>7.8</b>	<b>7.1</b>	<b>12.9</b>
<i>Infrastructure Historical Benchmark</i>			<i>14.3</i>	<i>27.2</i>	<i>14.8</i>	<i>12.2</i>
<b>Public Infrastructure</b>	<b>519,180,443</b>	<b>11.1</b>	<b>-2.8</b>	<b>15.4</b>	<b>--</b>	<b>--</b>
Morgan Stanley Infrastructure	519,180,443	11.1	-2.8	15.4	--	--
<i>Dow Jones Brookfield Global Infrastructure</i>			<i>-3.1</i>	<i>9.9</i>	<i>--</i>	<i>--</i>
<b>Other Real Assets</b>	<b>663,064,871</b>	<b>14.2</b>	<b>-0.2</b>	<b>10.9</b>	<b>--</b>	<b>--</b>
<i>Infrastructure Historical Benchmark</i>			<i>14.3</i>	<i>27.2</i>	<i>--</i>	<i>--</i>
Parametric Real Assets Overlay	18,971,434	4.1	--	--	--	--

Performance shown is net of fees. Both performance and benchmark data for Real Assets component are sourced from BNY Mellon's time-weighted data. Please see the Appendix for current and historical custom benchmark compositions.



## Liquid Defensive/Diversifying | As of December 31, 2024

Asset Class Performance Summary						
	Market Value (\$)	% of Portfolio	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)
<b>Liquid Defensive/Diversifying</b>	<b>5,994,590,447</b>	<b>100.0</b>	<b>-2.7</b>	<b>-1.0</b>	<b>4.1</b>	<b>3.2</b>
<i>Liquid Defensive Historical Benchmark</i>			<i>-2.9</i>	<i>-0.1</i>	<i>0.3</i>	<i>2.3</i>
<b>Defensive Return Capture</b>	<b>588,715,868</b>	<b>9.8</b>	<b>-0.6</b>	<b>-9.3</b>	<b>1.4</b>	<b>--</b>
P/E Global Macro	195,640,866	3.3	3.8	-9.4	12.7	3.1
Saba	188,144,386	3.1	-0.8	-8.0	--	--
36 South Cap Adv	204,930,616	3.4	-4.2	-12.0	--	--
<i>Defensive Return Capture Historical Benchmark</i>			<i>-1.7</i>	<i>2.4</i>	<i>4.7</i>	<i>3.9</i>
<b>Discretionary Alpha</b>	<b>1,055,620,097</b>	<b>17.6</b>	<b>-0.9</b>	<b>5.8</b>	<b>7.0</b>	<b>3.6</b>
Aequim Relative Value Arbitrage	296,773,445	5.0	2.4	12.5	10.7	--
Aristeia Relative Value Arbitrage	228,420,476	3.8	1.7	5.8	3.9	--
Melqart Relative Value Arbitrage	233,522,820	3.9	-1.9	6.0	--	--
Monashee Relative Value Arbitrage	156,706,460	2.6	-17.0	-21.3	-5.3	--
Myam Asian Opportunity	140,196,897	2.3	10.9	31.4	--	--
<i>Discretionary Alpha Benchmark</i>			<i>-1.7</i>	<i>2.4</i>	<i>4.7</i>	<i>3.9</i>
<b>Intermediate Duration Treasury</b>	<b>1,919,274,412</b>	<b>32.0</b>	<b>-1.8</b>	<b>2.4</b>	<b>--</b>	<b>--</b>
Bank of Hawaii	282,001,567	4.7	-1.8	2.4	-0.6	0.4
First Hawaiian Bank	173,100,281	2.9	-1.9	2.0	-0.9	0.1
SLC Intermediate Treasury	1,280,683,288	21.4	-1.5	2.7	--	--
Parametric Treasury Overlay	183,489,276	3.1	--	--	--	--
<i>Blmbg. U.S. Treasury: Intermediate</i>			<i>-1.7</i>	<i>2.4</i>	<i>-0.5</i>	<i>0.5</i>
<b>Long Duration Treasury</b>	<b>820,474,998</b>	<b>13.7</b>	<b>-8.5</b>	<b>-6.6</b>	<b>-7.8</b>	<b>-1.2</b>
SLC Long Treasury	820,474,998	13.7	-8.5	-6.6	-11.0	-3.8
<i>Long Treasury Historical Benchmark</i>			<i>-8.6</i>	<i>-6.4</i>	<i>-11.1</i>	<i>-4.0</i>

Performance shown is net of fees. Please see the Appendix for current and historical custom benchmark compositions.

### Liquid Defensive/Diversifying | As of December 31, 2024

	Market Value (\$)	% of Portfolio	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)
<b>Systematic Trend Following</b>	<b>1,610,505,071</b>	<b>26.9</b>	<b>-3.0</b>	<b>-4.1</b>	<b>8.4</b>	<b>8.2</b>
AlphaSimplex	213,775,137	3.6	-3.5	-6.0	8.2	10.3
Aspect	238,489,754	4.0	-4.4	4.3	16.0	11.0
Brevan Howard Disc Global Macro	256,554,137	4.3	-1.8	-8.3	6.0	--
Broad Reach	196,765,102	3.3	0.0	2.4	--	--
Crabel Advanced Trend	212,109,656	3.5	-5.7	-6.7	3.7	6.5
Graham Quant Macro	214,148,081	3.6	-1.4	-6.8	11.4	4.6
Mount Lucas	210,597,986	3.5	-3.6	-3.7	1.3	3.5
Parametric Trend Overlay	68,065,218	1.1	--	--	--	--
<i>MLM Global Index EV Blend 15V</i>			<i>-2.2</i>	<i>-2.0</i>	<i>3.4</i>	<i>4.5</i>

Performance shown is net of fees. Please see the Appendix for current and historical custom benchmark compositions.

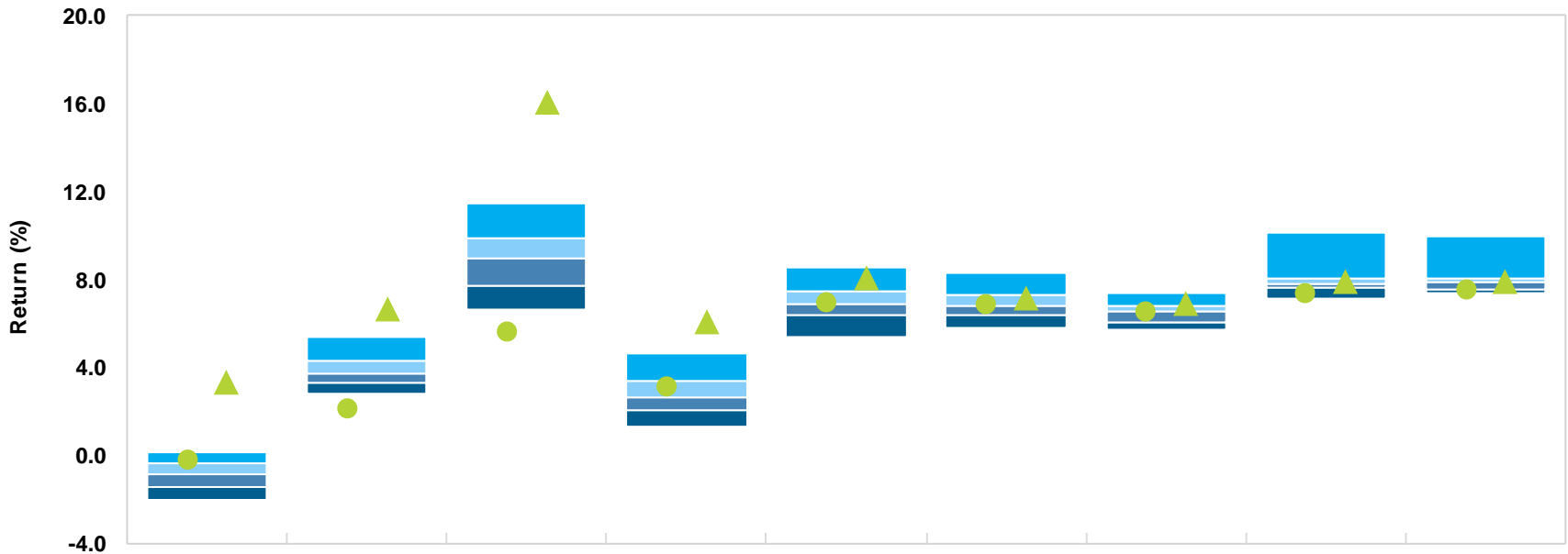
Illiquid Diversifying | As of December 31, 2024

Asset Class Performance Summary					
	Market Value (\$)	% of Portfolio	QTD (%)	1 Yr (%)	3 Yrs (%)
<b>Illiquid Diversifying</b>	<b>947,235,674</b>	<b>100.0</b>	<b>3.1</b>	<b>9.1</b>	<b>5.1</b>
<i>Illiquid Diversifying Historical Benchmark</i>			<i>3.8</i>	<i>17.3</i>	<i>10.5</i>
<b>Idiosyncratic Return Capture</b>	<b>454,584,024</b>	<b>48.0</b>	<b>3.6</b>	<b>8.2</b>	<b>4.6</b>
<i>Idiosyncratic Return Capture Historical Benchmark</i>			<i>3.8</i>	<i>17.3</i>	<i>10.2</i>
<b>Insurance Linked</b>	<b>492,651,650</b>	<b>52.0</b>	<b>2.6</b>	<b>10.2</b>	<b>5.6</b>
<i>Swiss Re Global Catastrophe Bond Index (Hedged)</i>			<i>3.8</i>	<i>17.3</i>	<i>11.2</i>

Performance shown is net of fees. Please see the Appendix for current and historical custom benchmark compositions.

## **Plan Sponsor Peer Group Analysis**

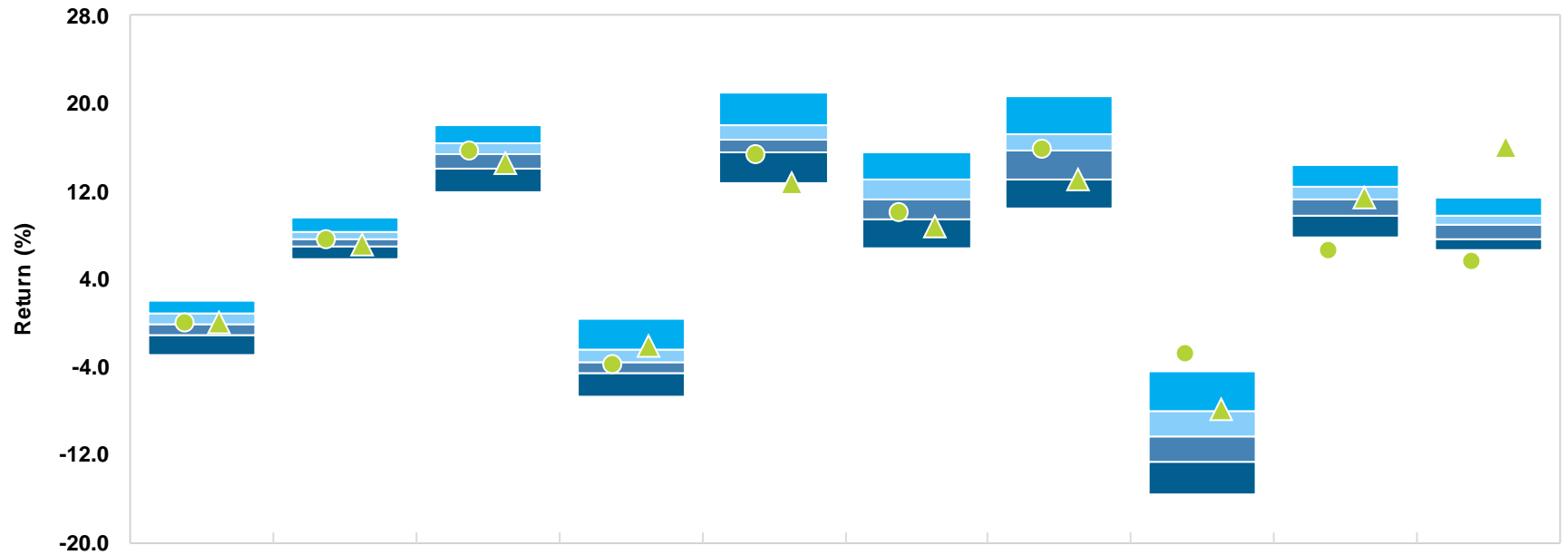
#### Peer Group Performance Comparison Trailing Periods Ending December 31, 2024



	QTD	FYTD	1 Yr	3 Yrs	5 Yrs	10 Yrs	20 Yrs	30 Yrs	Since Inception
● Total Fund	-0.2 (16)	2.2 (99)	5.7 (98)	3.2 (38)	7.0 (42)	6.9 (44)	6.6 (41)	7.5 (80)	7.6 (74)
▲ Market Benchmark	3.4 (1)	6.7 (1)	16.1 (1)	6.1 (1)	8.1 (14)	7.2 (32)	6.9 (23)	7.9 (40)	8.0 (44)
5th Percentile	0.2	5.4	11.5	4.7	8.6	8.3	7.4	10.1	10.0
1st Quartile	-0.3	4.3	9.9	3.4	7.5	7.3	6.9	8.1	8.1
Median	-0.9	3.8	9.0	2.7	6.9	6.8	6.6	7.8	7.9
3rd Quartile	-1.4	3.4	7.8	2.1	6.4	6.4	6.1	7.6	7.6
95th Percentile	-2.0	2.9	6.7	1.4	5.4	5.8	5.7	7.1	7.4
Population	69	68	68	64	62	59	40	12	6

Calculation based on monthly periodicity. Fiscal year begins on July 1. The plan sponsor peer group, InvMetrics Public DB >\$1B Net universe, includes BNY Mellon Total Public Fund >\$1B universe and Investment Metrics client data. Parenthesized numbers represent peer group percentile ranking.

#### Peer Group Performance Comparison Calendar Year Returns



	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
● Total Fund	0.2 (40)	7.6 (52)	15.8 (44)	-3.7 (55)	15.5 (77)	10.1 (71)	15.9 (46)	-2.6 (4)	6.8 (98)	5.7 (98)
▲ Market Benchmark	0.2 (41)	7.1 (72)	14.7 (63)	-2.0 (23)	12.8 (96)	8.9 (83)	13.2 (74)	-7.7 (21)	11.6 (42)	16.1 (1)
5th Percentile	2.1	9.6	18.2	0.5	21.0	15.7	20.7	-4.4	14.4	11.5
1st Quartile	1.0	8.3	16.4	-2.3	18.1	13.1	17.2	-8.0	12.5	9.9
Median	-0.1	7.7	15.5	-3.5	16.8	11.3	15.7	-10.3	11.3	9.0
3rd Quartile	-1.1	7.0	14.2	-4.4	15.6	9.5	13.2	-12.6	9.9	7.8
95th Percentile	-2.9	5.9	11.9	-6.7	12.8	6.9	10.6	-15.5	7.8	6.7
Population	182	187	192	183	206	231	223	191	193	68

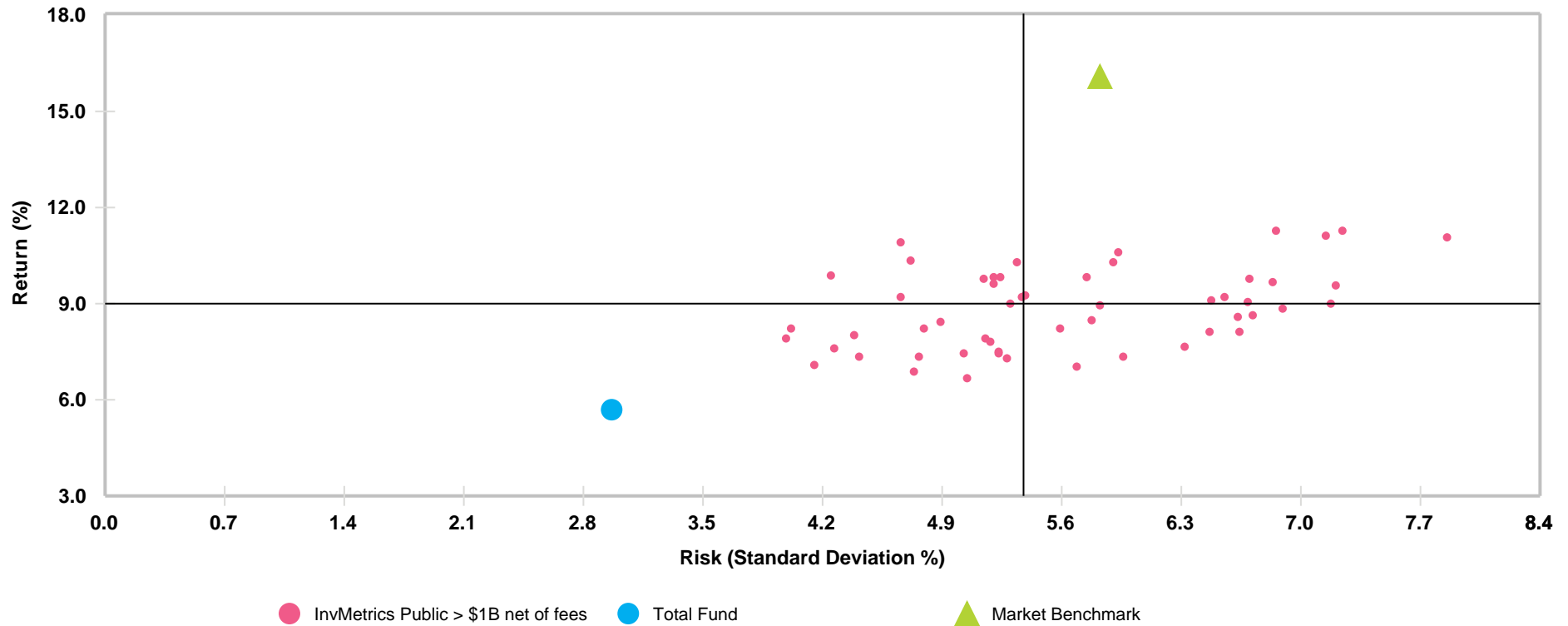
Calculation based on monthly periodicity. The plan sponsor peer group, InvMetrics Public DB >\$1B Net universe, includes BNY Mellon Total Public Fund >\$1B universe and Investment Metrics client data. Parenthesized numbers represent peer group percentile ranking.

## Risk/Return Statistics | As of December 31, 2024

	Risk/Return Statistics									
	1 Yr		3 Yrs		5 Yrs		7 Yrs		10 Yrs	
	Total Fund	Benchmark	Total Fund	Benchmark	Total Fund	Benchmark	Total Fund	Benchmark	Total Fund	Benchmark
<b>RETURN SUMMARY STATISTICS</b>										
Return	5.7	16.1	3.2	6.1	7.0	8.1	6.6	7.2	6.9	7.2
Excess Performance	-10.4	0.0	-2.9	0.0	-1.1	0.0	-0.6	0.0	-0.3	0.0
<b>RISK SUMMARY STATISTICS</b>										
Standard Deviation	3.0	5.8	3.7	6.3	6.4	6.9	6.3	6.5	6.4	6.4
Beta	0.3	1.0	0.4	1.0	0.8	1.0	0.9	1.0	0.9	1.0
<b>RISK/RETURN SUMMARY STATISTICS</b>										
Information Ratio	-2.0	-	-0.7	-	-0.3	-	-0.2	-	-0.1	-
Sharpe Ratio	0.2	1.7	-0.2	0.4	0.7	0.8	0.7	0.7	0.8	0.8
Tracking Error	4.7	0.0	4.2	0.0	3.6	0.0	3.3	0.0	2.8	0.0

Net of fees performance is shown or used in calculating the statistics on this page.

Annualized Return vs. Annualized Standard Deviation  
1 Year ending December 31, 2024

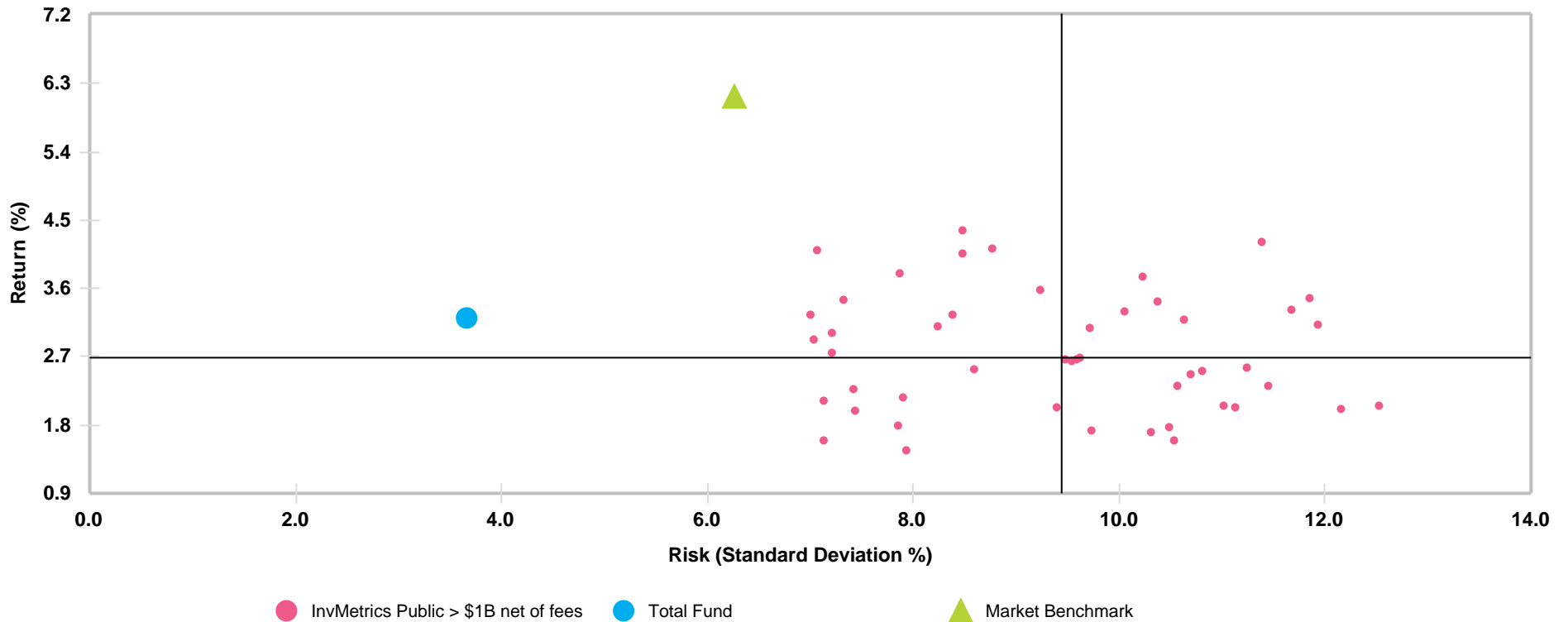


	Return	Standard Deviation	Sharpe Ratio	Information Ratio
Total Fund	5.7 (98)	3.0 (3)	0.2 (98)	-2.0 (100)
Market Benchmark	16.1 (1)	5.8 (59)	1.7 (1)	-
Peer Benchmark Median	9.0	5.4	0.6	-1.3

Peer Benchmark represents the plan sponsor peer group Peer Benchmark Net universe. Includes BNY Mellon Total Public Fund >\$1B universe and Investment Metrics client data. Parenthesized numbers represent peer group percentile rank.



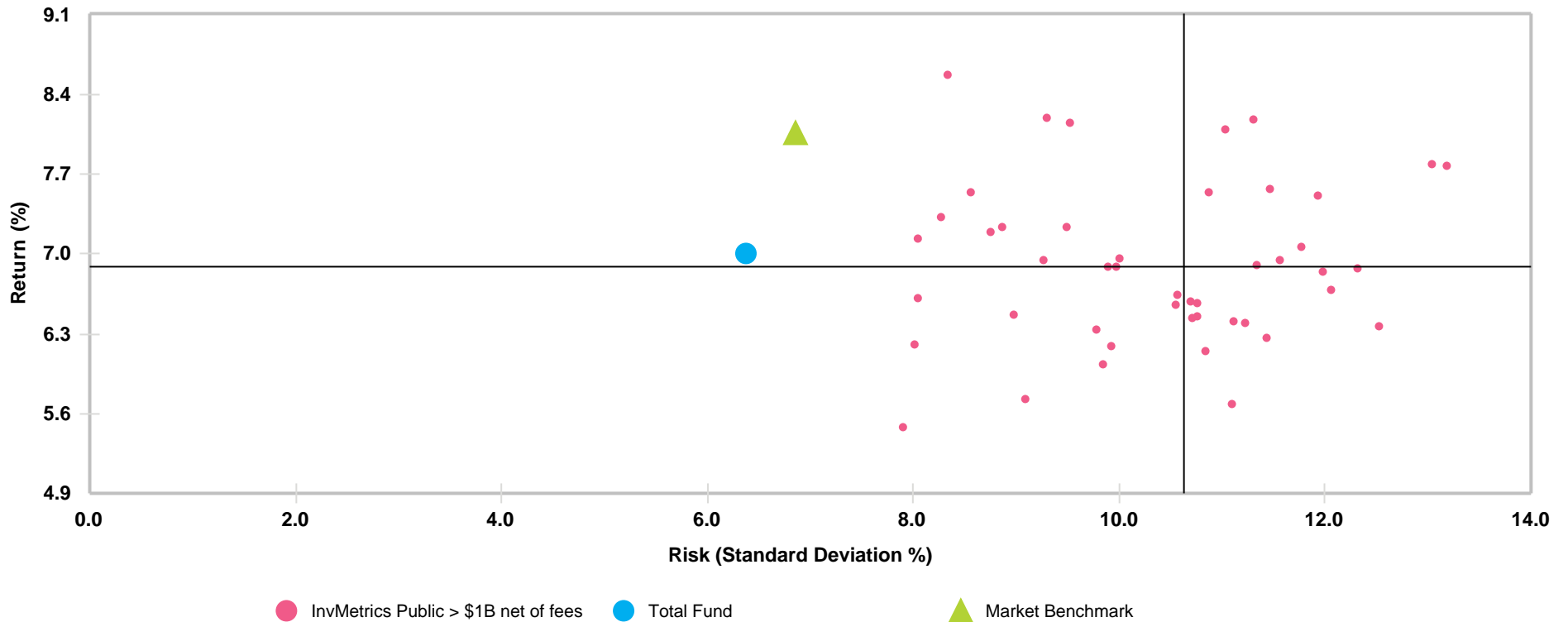
Annualized Return vs. Annualized Standard Deviation  
3 Years ending December 31, 2024



	Return	Standard Deviation	Sharpe Ratio	Information Ratio
Total Fund	3.2 (38)	3.7 (1)	-0.2 (83)	-0.7 (88)
Market Benchmark	6.1 (1)	6.3 (4)	0.4 (1)	-
Peer Benchmark Median	2.7	9.4	-0.1	-0.5

Peer Benchmark represents the plan sponsor peer group Peer Benchmark Net universe. Includes BNY Mellon Total Public Fund >\$1B universe and Investment Metrics client data. Parenthesized numbers represent peer group percentile rank.

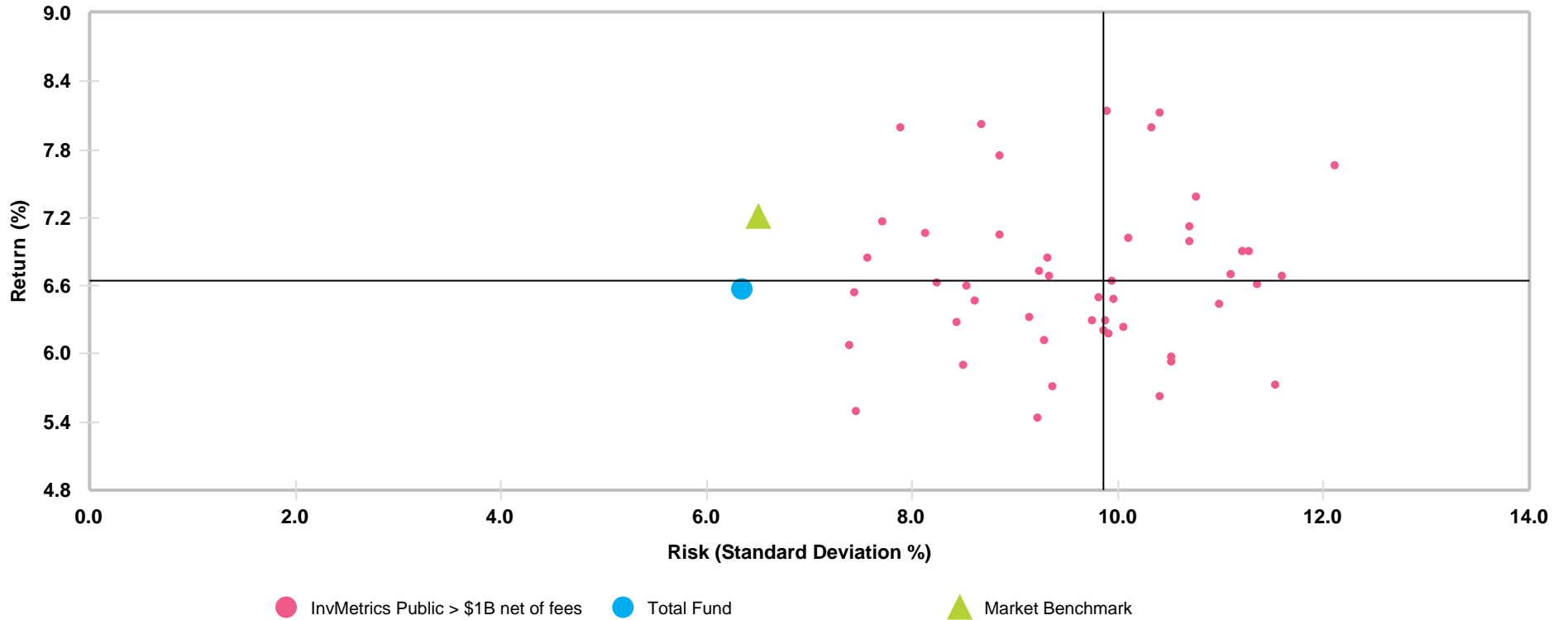
Annualized Return vs. Annualized Standard Deviation  
5 Years ending December 31, 2024



	Return	Standard Deviation	Sharpe Ratio	Information Ratio
Total Fund	7.0 (42)	6.4 (1)	0.7 (8)	-0.3 (87)
Market Benchmark	8.1 (14)	6.9 (1)	0.8 (2)	-
Peer Benchmark Median	6.9	10.6	0.4	-0.1

Peer Benchmark represents the plan sponsor peer group Peer Benchmark Net universe. Includes BNY Mellon Total Public Fund >\$1B universe and Investment Metrics client data. Parenthesized numbers represent peer group percentile rank.

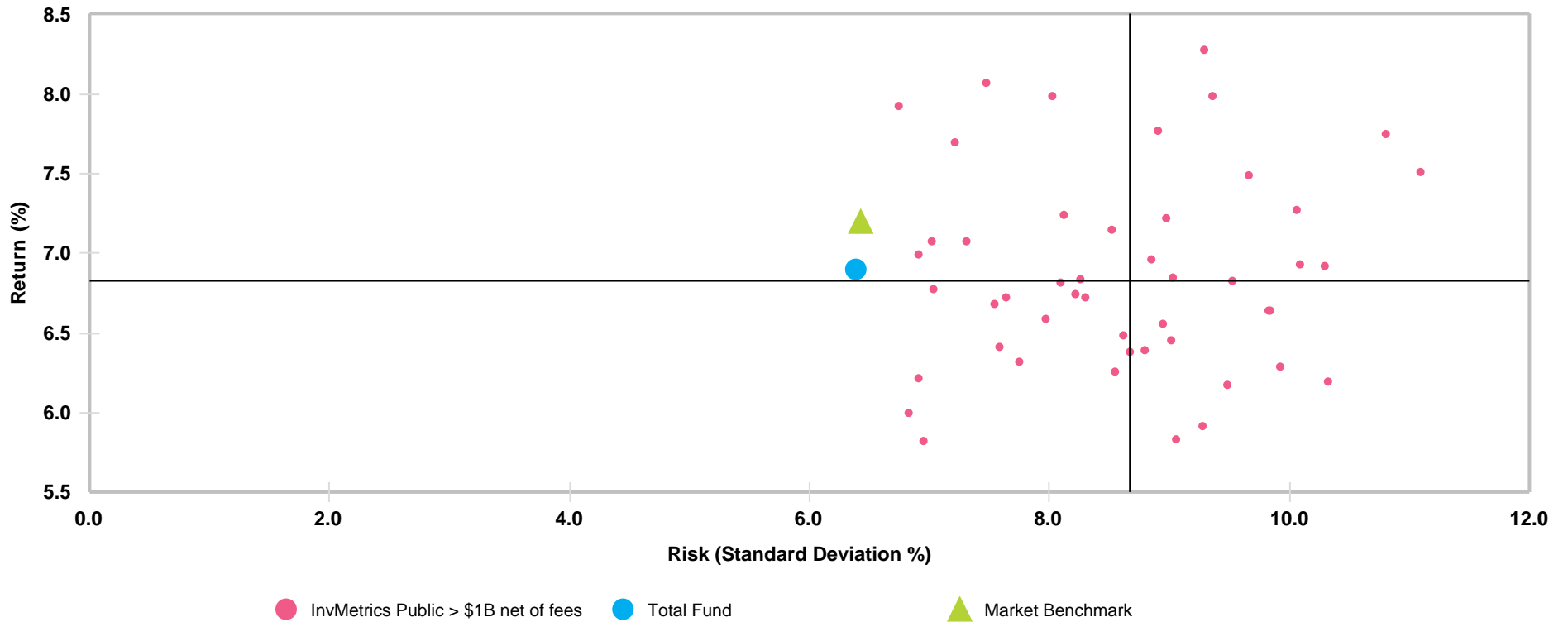
Annualized Return vs. Annualized Standard Deviation  
7 Years ending December 31, 2024



	Return	Standard Deviation	Sharpe Ratio	Information Ratio
Total Fund	6.6 (56)	6.3 (1)	0.7 (9)	-0.2 (88)
Market Benchmark	7.2 (24)	6.5 (1)	0.7 (4)	-
Peer Benchmark Median	6.6	9.8	0.5	-0.1

Peer Benchmark represents the plan sponsor peer group Peer Benchmark Net universe. Includes BNY Mellon Total Public Fund >\$1B universe and Investment Metrics client data. Parenthesized numbers represent peer group percentile rank.

Annualized Return vs. Annualized Standard Deviation  
10 Years ending December 31, 2024



	Return	Standard Deviation	Sharpe Ratio	Information Ratio
Total Fund	6.9 (44)	6.4 (1)	0.8 (10)	-0.1 (64)
Market Benchmark	7.2 (32)	6.4 (1)	0.8 (7)	-
Peer Benchmark Median	6.8	8.7	0.6	0.0

Peer Benchmark represents the plan sponsor peer group Peer Benchmark Net universe. Includes BNY Mellon Total Public Fund >\$1B universe and Investment Metrics client data. Parenthesized numbers represent peer group percentile rank.

# Appendix

## Definition of Benchmarks

**Bloomberg Aggregate** is an index comprised of approximately 6,000 publicly traded investment-grade bonds including US Government, mortgage-backed, corporate, and yankee bonds with an approximate average maturity of 10 years.

**Bloomberg Global High Yield** is a multi-currency measure of the global high yield debt market. The Index is comprised of the US High Yield, the Pan-European High Yield, and Emerging Markets Hard Currency High Yield Indices. The high yield and emerging markets sub-components are mutually exclusive.

**Bloomberg High Yield** covers the universe of fixed rate, non-investment grade debt. Eurobonds and debt issues from countries designated as emerging markets (e.g., Argentina, Brazil, Venezuela, etc.) are excluded, but Canadian and global bonds (SEC registered) of issuers in non-EMG countries are included. Original issue zeroes, step-up coupon structures, 144-As and pay-in-kind bonds (PIKs, as of October 1, 2009) are also included. Must be rated high yield (Ba1/BB+ or lower) by at least two of the following ratings agencies: Moody's, S&P, Fitch. If only two of the three agencies rate the security, the lower rating is used to determine index eligibility. All issues must have at least one year to final maturity regardless of call features and have at least \$150 million par amount outstanding.

**Bloomberg Multiverse Non-US Hedged** provides a broad-based measure of the international fixed-income bond market. The index represents the union of the BC Global Aggregate Index and the BC Global High Yield Index. In this sense, the term "Multiverse" refers to the concept of multiple universes in a single macro index.

**Bloomberg US Credit** includes publicly issued US corporate and foreign debentures and secured notes that which are rated investment grade or higher by Moody's Investor Services, Standard and Poor's Corporation, or Fitch Investors Service, with all issues having at least one year to maturity and an outstanding par value of at least \$250 million. Issues must be publicly issued, dollar-denominated and non-convertible.

**Bloomberg Universal** includes market coverage by the Aggregate Bond Index fixed rate debt issues, which are rated investment grade or higher by Moody's Investor Services, Standard and Poor's Corporation, or Fitch Investors Service, with all issues having at least one year to maturity and an outstanding par value of at least \$100 million) and includes exposures to high yield CMBS securities. All returns are market value weighted inclusive of accrued interest.

**Bloomberg World Govt Inflation-Linked Bond (WGILB)** measures the performance of the major government inflation-linked bond markets. The index is designed to include only those markets in which a global government linker fund is likely and able to invest. To be included a market must have aggregate issuance of \$4 billion or more and have minimum rating of A3/A- for G7 and euro-zone issuers, Aa3/AA- otherwise, using the middle rating from Moody's, S&P and Fitch ("two out of three" rule). The index is available in local currency and in most major currencies hedged or un-hedged.

**CBOE S&P 500 Buy Write Index (BXM)** is a benchmark index designed to track the performance of a hypothetical buy-write strategy on the S&P 500 Index. Announced in April 2002, the BXM Index was developed by the CBOE in cooperation with Standard & Poor's. To help in the development of the BXM Index, the CBOE commissioned Professor Robert Whaley to compile and analyze relevant data from the time period from June 1988 through December 2001. Data on daily BXM prices now is available from June 30, 1986, to the present time (see below). The BXM is a passive total return index based on (1) buying an S&P 500 stock index portfolio, and (2) "writing" (or selling) the near-term S&P 500 Index (SPXSM) "covered" call option, generally on the third Friday of each month. The SPX call written will have about one month remaining to expiration, with an exercise price just above the prevailing index level (i.e., slightly out of the money). The SPX call is held until expiration and cash settled, at which time a new one-month, near-the-money call is written. Please visit the BXM FAQ for more information about the construction of the index.

**CBOE S&P 500 Put Write Index (PUT)** is a benchmark index designed to track the performance of a hypothetical cash-secured put-write strategy on the S&P 500 Index. Announced in June 2007, the PUT strategy is designed to sell a sequence of one-month, at-the-money, S&P 500 Index puts and invest cash at one- and three-month Treasury Bill rates. The number of puts sold varies from month to month, but is limited so that the amount held in Treasury Bills can finance the maximum possible loss from final settlement of the S&P 500 Index puts.

**ICE BofA 3-Month US Treasury Bills (90-Day T-bills)** tracks the performance of US Treasury bills with 3-month maturity.

### Definition of Benchmarks (continued)

**MLM Global Index** is the first passive index of returns to futures investing. The objective of the Index strategy is to provide pure systematic trending following exposure in a consistent, efficient, and cost effective manner which captures the price risk premium offered by those who seek price certainty.

**MSCI ACWI** is a free float-adjusted market capitalization weighted index that is designed to measure the equity market performance of developed and emerging markets. The Index captures large and mid-cap representation across 47 country indices comprising 23 developed and 24 emerging market country indices. The developed market country indices included are Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Hong Kong, Ireland, Israel, Italy, Japan, Netherlands, New Zealand, Norway, Portugal, Singapore, Spain, Sweden, Switzerland, the United Kingdom and the United States. The emerging market country indices included are: Brazil, Chile, China, Colombia, Czech Republic, Egypt, Greece, Hungary, India, Indonesia, Korea, Malaysia, Mexico, Pakistan, Peru, Philippines, Poland, Russia, Qatar, South Africa, Taiwan, Thailand, Turkey, and the United Arab Emirates.

**MSCI ACWI ex US ND** comprises both developed and emerging markets less the United States. The index consisted of 22 countries classified as developed markets and 24 classified as emerging markets. This series approximates the minimum possible dividend reinvestment. The dividend is reinvested after deduction of withholding tax, applying the rate to non-resident individuals who do not benefit from double taxation treaties. MSCI uses withholding tax rates applicable to Luxembourg holding companies, as Luxembourg applies the highest rates.

**MSCI ACWI IMI** captures large, mid, and small cap representation across 23 developed markets and 24 emerging markets countries. The Index is comprehensive, covering approximately 99% of the global equity investment opportunity set.

**MSCI ACWI Minimum Volatility** is a global equity (developed and emerging markets) index constructed by MSCI that utilizes an estimated security co-variance matrix to produce an index that has the lowest absolute volatility for a given set of constraints. The estimated security co-variance matrix is based on the relevant Barra multi-factor equity model.

**MSCI ACWI Small Cap** is a free float-adjusted market capitalization weighted index captures the small cap representation across 23 developed markets and 24 emerging markets countries.

**MSCI EAFE Free (Europe, Australasia, Far East) ND** is a free float-adjusted market capitalization index that is designed to measure developed market equity performance, excluding the US & Canada. This series approximates the minimum possible dividend reinvestment. The dividend is reinvested after deduction of withholding tax, applying the rate to non-resident individuals who do not benefit from double taxation treaties. MSCI Barra uses withholding tax rates applicable to Luxembourg holding companies, as Luxembourg applies the highest rates.

**MSCI EM (Emerging Markets) GD** is a free float-adjusted market capitalization index that is designed to measure equity market performance in the global emerging markets. This series approximates the maximum possible dividend reinvestment. The amount reinvested is the entire dividend distributed to individuals resident in the country of the company, but does not include tax credits.

**MSCI Europe** is a free float-adjusted market capitalization weighted index that is designed to measure the equity market performance of the developed markets in Europe. As of June 2007, this index consisted of the following 16 developed market country indices: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom.

**MSCI Pacific** is a free float-adjusted market capitalization weighted index that is designed to measure the equity market performance of the developed markets in the Pacific region. As of June 2007, this index consisted of the following 5 Developed Market countries: Australia, Hong Kong, Japan, New Zealand, and Singapore.

**MSCI USA** is a free float adjusted market capitalization index that is designed to measure large- and mid-cap US equity market performance. The MSCI USA Index is member of the MSCI Global Equity Indices and represents the US equity portion of the global benchmark MSCI ACWI Index.

**MSCI World ex US ND** is a free float-adjusted market capitalization weighted index that is designed to measure the equity market performance of developed markets. The MSCI World Index consists of the following 22 developed market country indices: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Hong Kong, Ireland, Israel, Italy, Japan, Netherlands, New Zealand, Norway, Portugal, Singapore, Spain, Sweden, Switzerland, and the United Kingdom.

### Definition of Benchmarks (continued)

**Morningstar Leveraged Loan** (formerly **S&P Leveraged Loan**) is a capitalization-weighted syndicated loan index based upon market weightings, spreads, and interest payments. The Index covers the US market back to 1997.

**NAREIT Index** consists of all tax-qualified REITs listed on the New York Stock Exchange, American Stock Exchange, and the NASDAQ National Market System. The data is market weighted.

**NCREIF Property Index (NPI)** the NPI contains investment-grade, non-agricultural, income-producing properties which may be financed in excess of 5% gross market value; were acquired on behalf of tax exempt institutions; and are held in a fiduciary environment. Returns are gross of fees; including income, realized gains/losses, and appreciation/depreciation; and are market value weighted.

**NCREIF Timberland Index** is a quarterly time series composite return measure of investment performance of a large pool of individual timber properties acquired in the private market for investment purposes only. All properties in the Timberland Index have been acquired, at least in part, on behalf of tax-exempt institutional investors - the great majority being pension funds. As such, all properties are held in a fiduciary environment.

**Russell 1000** measures the performance of the 1,000 largest securities in the Russell 3000 Index. Russell 1000 is highly correlated with the S&P 500 Index and capitalization weighted.

**Russell 1000 Growth** measures the performance of those Russell 1000 securities with a greater-than-average growth orientation. Securities in this index tend to exhibit higher price-to-book and price-earnings ratios, lower dividend yields and higher forecasted growth values than the Value universe.

**Russell 1000 Value** measures the performance of those Russell 1000 securities with a less-than-average growth orientation. Securities in this index tend to exhibit lower price-to-book and price-earnings ratios, higher dividend yields and lower forecasted growth values than the Growth universe.

**Russell 2000** measures the performance of the 2,000 smallest companies in the Russell 3000 Index, which represents approximately 8% of the total market capitalization of the Russell 3000 Index.

**Russell 2000 Growth** measures the performance of those Russell 2000 securities with a greater-than-average growth orientation. Securities in this index tend to exhibit higher price-to-book and price-to-earnings ratios.

**Russell 2000 Value** measures the performance of those Russell 2000 securities with a less-than-average growth orientation. Securities in this index tend to exhibit lower price-to-book and price-to-earnings ratios.

**Russell 3000** represents the largest 3,000 US companies based on total market capitalization, representing approximately 98% of the investable US equity market.

**S&P 500** is an index of 500 stocks chosen for market size, liquidity and industry grouping, among other factors. The S&P 500 is designed to be a leading indicator of U.S. equities and is meant to reflect the risk/return characteristics of the large cap universe.



Plan Structure Evolution

Prior to 10/2014, Employees' Retirement System of the State of Hawaii ("ERS" or "Plan") had an allocation policy based asset classes (such as US Large Cap Equity, Developed International Equity, Real Estate). Since 10/2014, the ERS has adopted a risk-based, functional framework which uses strategic/functional classes designed to achieve a certain goal and/or be exposed to a specific set of macroeconomic risks through various underlying asset classes and strategies. Since then, the plan structure and the nomenclature of its components have evolved over time to fit the ERS's needs. This page summarizes this evolution since 10/2014 on a high level.

10/2014-06/2016	07/2016-03/2017	04/2017-06/2020	07/2020-12/2023	01/2024-Current
<b>Total Fund</b> → Broad Growth → Principal Protection → Real Return → Real Estate	<b>Total Fund</b> → Broad Growth → Principal Protection → Real Return	<b>Total Fund</b> → Broad Growth → Principal Protection → Real Return → Crisis Risk Offset (CRO)	<b>Total Fund</b> → Broad Growth → Diversifying Strategies	
<b>Broad Growth</b> → Growth-Oriented → Private Growth → Stabilized Growth	<b>Broad Growth</b> → Traditional Growth → Private Growth → Stabilized Growth		<b>Broad Growth</b> → Public Growth <ul style="list-style-type: none"> <li>• Traditional Growth</li> <li>• Stabilized Growth</li> </ul> → Private Growth → Real Assets	<b>Broad Growth</b> → Global Equity → Global Credit → Real Assets
<b>Real Estate</b>				
<b>Real Return</b> → Public Inflation-Linked → Private Inflation-Linked				
<b>Principal Protection</b>			<b>Diversifying Strategies</b> → Liquid Defensive <ul style="list-style-type: none"> <li>• Treasury / Agency Duration</li> <li>• Systematic Trend</li> <li>• Defensive Return</li> </ul> → Liquid Diversifying <ul style="list-style-type: none"> <li>• Alternative Return</li> <li>• Relative Value</li> </ul> → Illiquid Diversifying <ul style="list-style-type: none"> <li>• Insurance-Linked</li> <li>• Idiosyncratic Return</li> </ul>	<b>Diversifying Strategies</b> → Liquid Defensive / Diversifying <ul style="list-style-type: none"> <li>• Systematic Trend</li> <li>• Defensive Return</li> <li>• Intermediate Duration</li> <li>• Long Duration</li> <li>• Discretionary Alpha</li> </ul> → Illiquid Diversifying <ul style="list-style-type: none"> <li>• Insurance-Linked</li> <li>• Idiosyncratic Return</li> </ul>
			<b>Crisis Risk Offset (CRO)</b> → Treasury Duration Capture → Systematic Trend Following → Alternative Return Capture	

Custom Benchmarks

This section includes the compositions of custom benchmarks currently in use. Policy Benchmarks for Total Fund, Broad Growth, and Diversifying Strategies are presented first, followed by the benchmarks of their lower-level composites sorted according to the Plan structure. Discontinued custom benchmarks are listed separately afterward and are noted as such when they appear in this section.

Market Benchmark (Total Fund Policy Benchmark)

From	To	Market Benchmark (Total Fund Policy Benchmark)
01/01/2024	Current	70% Broad Growth Historical Benchmark, 30% Diversifying Strategies Historical Benchmark
07/01/2022	12/31/2023	65% Broad Growth Benchmark, 35% Diversifying Strategies Benchmark
07/01/2021	06/30/2022	67.5% Broad Growth Benchmark, 32.5% Diversifying Strategies Benchmark
07/01/2020	06/30/2021	72% Broad Growth Benchmark, 28% Diversifying Strategies Benchmark
01/01/2019	06/30/2020	68% Broad Growth Benchmark, 16% Crisis Risk Offset Benchmark, 8% Principal Protection Benchmark, 8% Real Return Benchmark
01/01/2018	12/31/2018	72% Broad Growth Benchmark, 13% Crisis Risk Offset Benchmark, 8% Principal Protection Benchmark, 7% Real Return Benchmark
04/01/2017	12/31/2017	76% Broad Growth Benchmark, 10% Crisis Risk Offset Benchmark, 9% Principal Protection Benchmark, 5% Real Return Benchmark
07/01/2016	03/31/2017	83% Broad Growth Benchmark, 12% Principal Protection Benchmark, 5% Real Return Benchmark
10/01/2014	06/30/2016	76% Broad Growth Benchmark, 12% Principal Protection Benchmark, 5% Real Return Benchmark, 7% NCREIF Property Index (Qtr Lagged)

From	To	Total Fund Asset-Based Policy Benchmarks (prior to the Functional Allocation Framework)
07/01/2013	09/30/2014	30% Russell 3000, 26% MSCI AC World ex US (Net), 15% Bloomberg Universal, 5% Bloomberg Multiverse ex US (Hedged), 7% NCREIF Property Index (Qtr Lagged), 7% ERS Private Equity Performance, 5% ERS Real Return Performance, 5% CBOE S&P 500 BuyWrite (BXM)
07/01/2012	06/30/2013	30% Russell 3000, 26% MSCI AC World ex US (Net), 15.75% Bloomberg Universal, 5.25% Bloomberg Multiverse ex US (Hedged), 7% NCREIF Property Index (Qtr Lagged), 6% ERS Private Equity Performance, 5% ERS Real Return Performance, 5% CBOE S&P 500 BuyWrite (BXM)
10/01/2011	06/30/2012	35% Russell 3000, 18% MSCI World ex US, 3% MSCI Emerging Markets, 18% Bloomberg Universal, 6% Bloomberg Multiverse ex US (Hedged), 7% NCREIF Property Index (Qtr Lagged), 5% ERS Private Equity Performance, 5% ERS Real Return Performance, 3% CBOE S&P 500 BuyWrite (BXM)
07/01/2011	09/30/2011	41% Russell 3000, 14.5% MSCI World ex US, 2.5% MSCI Emerging Markets (Net), 21% Bloomberg Universal, 7% Bloomberg Multiverse ex US (Hedged), 9% NCREIF Property Index (Qtr Lagged), 5% ERS Alternative Investments Performance
01/01/2009	06/30/2011	41% Russell 3000, 14.5% MSCI EAFE Free, 2.5% MSCI Emerging Markets (Net), 21% Bloomberg Universal, 7% Bloomberg Multiverse ex US (Hedged), 9% NCREIF Property Index (Qtr Lagged), 5% ERS Alternative Investments Performance
06/01/1990	12/31/2008	34.9% S&P 500, 4.5% S&P 400 MidCap, 4.5% Russell 2000, 14.5% MSCI EAFE Free, 2.5% MSCI Emerging Markets, 21% Bloomberg Aggregate, 7% Bloomberg Multiverse ex US (Hedged), 7.5% NCREIF Property Index (Qtr Lagged), 3.6% ERS Alternative Investments Performance

**Custom Benchmarks: Immediate Sub-Composites of Total Fund**

**Broad Growth Historical Benchmark**

From	To	Broad Growth Historical Benchmark
01/01/2024	Current	56% Global Equity Historical Benchmark, 17% Global Credit Historical Benchmark, 27% Real Assets Historical Benchmark
07/01/2022	12/31/2023	50% Public Growth Benchmark, 28% Private Growth Benchmark, 22% Real Assets Historical Benchmark
07/01/2021	06/30/2022	66% Public Growth Benchmark, 20% Private Growth Benchmark, 14% Real Assets Historical Benchmark
07/01/2020	06/30/2021	70% Public Growth Benchmark, 16% Private Growth Benchmark, 14% Real Assets Historical Benchmark
01/01/2019	06/30/2020	41% Traditional Growth Benchmark, 41% Stabilized Growth Benchmark, 18% Private Growth Benchmark
01/01/2018	12/31/2018	43% Traditional Growth Benchmark, 43% Stabilized Growth Benchmark, 14% Private Growth Benchmark
07/01/2016	12/31/2017	45% Traditional Growth Benchmark, 45% Stabilized Growth Benchmark, 10% Private Growth Benchmark
01/01/2016	06/30/2016	77% Traditional Growth Benchmark, 17% Stabilized Growth Benchmark, 6% Private Growth Benchmark
10/01/2014	12/31/2015	78% Traditional Growth Benchmark, 17% Stabilized Growth Benchmark, 5% Private Growth Benchmark

For the historical components Traditional Growth Benchmark and Private Growth Benchmark please refer to Public Equity Benchmark and Private Equity Benchmark, respectively. Public Growth Benchmark and Stabilized Growth Benchmark are no longer in use. Please see their historical compositions in the “Discontinued Custom Benchmarks” section.

**Diversifying Strategies Benchmark**

From	To	Diversifying Strategies Benchmark
01/01/2024	Current	87% Liquid Defensive Historical Benchmark, 13% Illiquid Diversifying Historical Benchmark
07/01/2022	12/31/2023	45% Liquid Defensive Historical Benchmark, 40% Liquid Diversifying Benchmark, 15% Illiquid Diversifying Historical Benchmark
04/01/2017	06/30/2022	50% Liquid Defensive Historical Benchmark, 40% Liquid Diversifying Benchmark, 10% Illiquid Diversifying Historical Benchmark

Liquid Diversifying Benchmark is no longer in use. Please see its historical compositions in the “Discontinued Custom Benchmarks” section.

**Custom Benchmarks: Global Equity Composite**

**Global Equity Historical Benchmark**

Global Equity composite was created effective on 01/01/2024 to aggregate the Public and Private Equity components which had previously existed within separate higher-level composites. Accordingly, the Global Equity Policy Benchmark was retroactively reconstructed for periods prior to 01/01/2024 reflecting the historical policy targets for the underlying Public and Private Equity components.

From	To	Global Equity Historical Benchmark
01/01/2024	Current	51.3% Public Equity Historical Benchmark, 48.7% Private Equity Historical Benchmark
07/01/2022	12/31/2023	54.3% Public Equity Historical Benchmark, 45.7% Private Equity Historical Benchmark
07/01/2021	06/30/2022	64.7% Public Equity Historical Benchmark, 35.3% Private Equity Historical Benchmark
07/01/2020	06/30/2021	70.8% Public Equity Historical Benchmark, 29.2% Private Equity Historical Benchmark
01/01/2019	06/30/2020	69.5% Public Equity Historical Benchmark, 30.5% Private Equity Historical Benchmark
01/01/2018	12/31/2018	75.4% Public Equity Historical Benchmark, 24.6% Private Equity Historical Benchmark
07/01/2016	12/31/2017	81.8% Public Equity Historical Benchmark, 18.2% Private Equity Historical Benchmark
01/01/2016	06/30/2016	92.8% Public Equity Historical Benchmark, 7.2% Private Equity Historical Benchmark
10/01/2014	12/31/2015	94.0% Public Equity Historical Benchmark, 6.0% Private Equity Historical Benchmark
07/01/2013	09/30/2014	88.9% Public Equity Historical Benchmark, 11.1% Private Equity Historical Benchmark

**Public Equity Historical Benchmark**

From 10/2014 through 12/2023, public equity assets have resided within the Broad Growth strategic class with names such as “Traditional Growth” or “Traditional Equity”. Thus, Public Equity Benchmark may be considered the successor of Traditional Growth and Traditional Equity Benchmarks. Please note that Public Equity Benchmark is different from the discontinued Public Growth Benchmark; its historical benchmark composition is included in the “Discontinued Custom Benchmarks” section.

From	To	Public Equity Historical Benchmark
10/01/2014	Current	100% MSCI All Country World Investable Market Index (Net)
07/01/2012	09/30/2014	53.6% Russell 3000, 46.4% MSCI All Country World ex US (Net)
10/01/2011	06/30/2014	62.5% Russell 3000, 32.1% MSCI World ex US (Net), 5.4% MSCI Emerging Markets (Net)
07/01/2011	09/30/2011	70.7% Russell 3000, 25.0% MSCI World ex US (Net), 4.3% MSCI Emerging Markets (Net)
01/01/2009	06/30/2011	70.7% Russell 3000, 25.0% MSCI EAFE (Net), 4.3% MSCI Emerging Markets (Net)
03/01/2008	12/31/2008	57.3% S&P 500, 7.4% S&P Mid Cap 400, 7.4% Russell 2000, 23.8% MSCI EAFE (Net), 4.1% MSCI Emerging Markets (Net)

Custom Benchmarks: Global Equity Composite (Continued)

Private Equity Historical Benchmark

From 10/2014 through 12/2023, private equity assets have resided within the Broad Growth strategic class as "Private Growth". Thus, Private Equity Benchmark may be considered the successor of Private Growth Benchmark.

From	To	Private Equity Historical Benchmark
01/01/2024	Current	100% MSCI ACWI IMI (Net) (Quarter Lagged)
10/01/2014	12/31/2023	100% MSCI ACWI IMI (Net) +2% (Quarter Lagged)
10/01/2011	09/30/2014	Private Equity Actual Performance

**Custom Benchmarks: Global Credit Composite**

**Global Credit Historical Benchmark**

From	To	Global Credit Historical Benchmark
01/01/2024	Current	33.3% Public Credit Historical Benchmark, 66.7% Private Credit Historical Benchmark
07/01/2021	12/31/2023	50% Public Credit Historical Benchmark, 50% Private Credit Historical Benchmark
07/01/2020	06/30/2021	25% Public Credit Historical Benchmark, 75% Private Credit Historical Benchmark
10/01/2014	06/30/2020	100% Public Credit Historical Benchmark

**Public Credit Historical Benchmark**

From	To	Public Credit Historical Benchmark
07/01/2021	Current	50% Bloomberg Global High Yield (Hedged), 50% Morningstar LSTA US Leveraged Loan 100 Index
07/01/2020	06/30/2021	50% Bloomberg Global High Yield (Hedged), 50% Morningstar LSTA US Leveraged Loan 100 Index*
10/01/2014	06/30/2020	50% Bloomberg Global Credit (Hedged) 33.3% Bloomberg Global High Yield (Hedged), 16.7% Morningstar LSTA US Leveraged Loan 100 Index*

**Private Credit Historical Benchmark**

From	To	Private Credit Historical Benchmark
01/01/2024	Current	50% Bloomberg Global High Yield (Hedged) (Quarter Lagged), 50% Morningstar LSTA US Leveraged Loan 100 Index (Quarter Lagged)
07/01/2021	12/31/2023	25% Bloomberg Global High Yield (Hedged) +1% (Month Lagged), 25% Morningstar LSTA US Leveraged Loan 100 Index +1% (Month Lagged), 25% Bloomberg Global High Yield (Hedged) +1% (Quarter Lagged), 25% Morningstar LSTA US Leveraged Loan 100 Index +1% (Quarter Lagged)
07/01/2020	06/30/2021	50% Bloomberg Global High Yield (Hedged) +1% (Month Lagged), 50% Morningstar LSTA US Leveraged Loan 100 Index +1% (Month Lagged)*
11/01/2019	06/30/2020	100% Public Credit Historical Benchmark

From 11/2019 to 06/2020, Private Credit Benchmark is the same as Public Credit Benchmark.

**Notes on Component Indices**

Historically, prior to 07/01/2021, Morningstar LSTA US Leveraged Loan Index (formerly known as "S&P LSTA US Leveraged Loan Index") was used in the places where Morningstar LSTA US Leveraged Loan 100 Index occurs on this page. Due to licensing issues, Morningstar LSTA US Leveraged Loan 100 Index is applied retroactively to periods prior to 07/2021. Compositions which historically used Morningstar LSTA US Leveraged Loan Index are marked on this page with an asterisk (\*).

Custom Benchmarks: Real Assets Composite

Real Assets Historical Benchmark

**Real Assets** composite contains the following asset classes: Real Estate (Core and Non-Core), Agriculture (or Farmland), Timberland, Infrastructure (Private and Public), and Other Real Assets. They existed separately under various higher level composites at different points in the Plan's history prior to the Real Asset composite's inception in 07/2020.

Prior to 07/2016, **Real Estate** was an immediate sub-composite of Total Fund. From 07/2016 through 06/2020, Core Real Estate and Non-Core Real Estate were separately subsumed into Stabilized Growth and Private Growth categories respectively (which were both contained within Broad Growth). From 10/2014 to 07/2020, **Agriculture, Timber, and Infrastructure** constituted the Private Inflation-Linked component within Real Return, an immediate subordinate of Total Fund.

The Real Assets Policy Benchmark for periods prior to 07/2020 were retroactively reconstructed using the historical policy allocation targets for the underlying components.

From	To	Real Assets Historical Benchmark
01/01/2024	Current	47% Real Estate Historical Benchmark, 7% Agriculture Historical Benchmark, 9% Timber Historical Benchmark, 37% Infrastructure Historical Benchmark
07/01/2022	12/31/2023	70% Real Estate Historical Benchmark, 10% Agriculture Historical Benchmark, 10% Timber Historical Benchmark, 10% Infrastructure Historical Benchmark
07/01/2021	06/30/2022	70% Real Estate Historical Benchmark, 8% Agriculture Historical Benchmark, 12% Timber Historical Benchmark, 10% Infrastructure Historical Benchmark
07/01/2020	06/30/2021	75% Real Estate Historical Benchmark, 5% Agriculture Historical Benchmark, 12.5% Timber Historical Benchmark, 7.5% Infrastructure Historical Benchmark
01/01/2019	06/30/2020	52% Real Estate Historical Benchmark, 48% Real Return Benchmark
01/01/2018	12/31/2018	57% Real Estate Historical Benchmark, 43% Real Return Benchmark
04/01/2017	12/31/2017	70% Real Estate Historical Benchmark, 30% Real Return Benchmark
07/01/2016	06/30/2017	75% Real Estate Historical Benchmark, 25% Real Return Benchmark
01/01/2016	06/30/2016	80% Real Estate Historical Benchmark, 20% Real Return Benchmark
10/01/2014	12/31/2015	83% Real Estate Historical Benchmark, 17% Real Return Benchmark

**Custom Benchmarks: Real Assets Composite (Continued)**

**Real Estate Historical Benchmark**

Real Estate composite became effective in 01/2024 as an aggregate of the Core and Non-Core Real Estate components. The Real Estate Policy Benchmark was retroactively reconstructed for periods prior to 01/2024 reflecting the historical policy allocation targets for the underlying Core and Non-Core components.

From	To	Real Estate Historical Benchmark
01/01/2024	Current	100% FTSE EPRA NAREIT Global REITs Index (Gross) (Quarter Lagged)
07/01/2022	12/31/2023	57.1% Core Real Estate Historical Benchmark, 42.9% Non-Core Real Estate Historical Benchmark
07/01/2021	06/30/2022	55.7% Core Real Estate Historical Benchmark, 44.3% Non-Core Real Estate Historical Benchmark
07/01/2020	06/30/2021	53.3% Core Real Estate Historical Benchmark, 46.7% Non-Core Real Estate Historical Benchmark
07/01/2019	06/30/2020	60% Core Real Estate Historical Benchmark, 40% Non-Core Real Estate Historical Benchmark
07/01/2018	06/30/2019	66% Core Real Estate Historical Benchmark, 34% Non-Core Real Estate Historical Benchmark
07/01/2017	06/30/2018	73% Core Real Estate Historical Benchmark, 27% Non-Core Real Estate Historical Benchmark
07/01/2016	06/30/2017	80% Core Real Estate Historical Benchmark, 20% Non-Core Real Estate Historical Benchmark
07/01/2013	06/30/2016	100% Core Real Estate Historical Benchmark

**Core Real Estate Historical Benchmark**

From	To	Core Real Estate Historical Benchmark
01/01/2024	Current	100% FTSE EPRA NAREIT Global REITs Index (Gross) (Quarter Lagged)
01/01/2018	12/31/2023	100% NCREIF ODCE (Net) (Quarter Lagged)
07/01/2013	12/31/2017	100% NCREIF Property Index (Net) (Quarter Lagged)

**Non-Core Real Estate Historical Benchmark**

From 07/2016-06/2020, this composite sat within Private Growth segment and was benchmarked against Private Equity Benchmark (formerly, "Private Growth Benchmark").

From	To	Non-Core Real Estate Historical Benchmark
01/01/2024	Current	100% FTSE EPRA NAREIT Global REITs Index (Gross) (Quarter Lagged)
07/01/2020	12/31/2023	100% NCREIF ODCE (Net) +1% (Quarter Lagged)
07/01/2016	06/30/2020	100% Private Equity Historical Benchmark
07/01/2013	06/30/2016	100% NCREIF Property Index (Net) (Quarter Lagged)



Custom Benchmarks: Real Assets Composite (Continued)

**Agriculture Historical Benchmark**

From	To	Agriculture Historical Benchmark
01/01/2024	Current	100% S&P GCSI Agriculture Index (Quarter Lagged)
10/01/2021	12/31/2023	100% NCREIF Farmland Index (Quarter Lagged)

**Timber Historical Benchmark**

From	To	Timber Historical Benchmark
01/01/2024	Current	100% S&P Global Timber & Forestry Index (Net) (Quarter Lagged)
09/01/1999	12/31/2023	100% NCREIF Timberland Index (Quarter Lagged)

**Infrastructure Historical Benchmark**

From	To	Infrastructure Historical Benchmark
01/01/2024	Current	100% Dow Jones Brookfield Global Infrastructure Index (Net) (Quarter Lagged)
12/01/2014	12/31/2023	100% Consumer Price Index (Seasonally Adjusted) +4%

**Custom Benchmarks: Diversifying Strategies Composite**

**Liquid Defensive Historical Benchmark**

From	To	Liquid Defensive Historical Benchmark
01/01/2024	Current	30.8% MLM Global Index EV (Blend), 15.4% Bloomberg US Treasury: Long Index, 53.8% Bloomberg US Treasury: Intermediate Index
07/01/2022	12/31/2023	40% MLM Global Index EV (Blend), 40% 90-Day T-Bill +2.5%, 15% Bloomberg US Treasury: Long Index, 5% Bloomberg US Intermediate Aggregate ex Credit
07/01/2021	06/30/2022	35% MLM Global Index EV (Blend), 20% 90-Day T-Bill +2.5%, 15% Bloomberg US Treasury: Long Index, 15% Bloomberg US Intermediate Aggregate ex Credit, 15% Bloomberg US TIPS 5+ Year Index
07/01/2016	06/30/2021	40% MLM Global Index EV (Blend), 30% Bloomberg US Treasury: Long Index, 30% Bloomberg US Intermediate Aggregate ex Credit Index

**Defensive Return Capture Historical Benchmark**

Defensive Return Capture and Discretionary Alpha Benchmarks have the same underlying components since 07/01/2020.

From	To	Defensive Return Capture Historical Benchmark
01/01/2024	Current	100% Bloomberg US Treasury: Intermediate Index
07/01/2020	12/31/2023	100% 90-Day T-Bill +2.5%

**Discretionary Alpha Benchmark**

Defensive Return Capture and Discretionary Alpha Benchmarks have the same underlying components since 07/01/2020.

From	To	Discretionary Alpha Benchmark
01/01/2024	Current	100% Bloomberg US Treasury: Intermediate Index
07/01/2020	12/31/2023	100% 90-Day T-Bill +2.5%

**Intermediate Duration Treasury Benchmark**

From	To	Intermediate Duration Treasury Benchmark
01/01/2024	Current	100% Bloomberg US Treasury: Intermediate Index
04/01/2017	12/31/2023	100% Bloomberg US Intermediate Aggregate ex Credit

**Custom Benchmarks: Diversifying Strategies Composite (Continued)**

**Long Duration Treasury Historical Benchmark**

From	To	Long Duration Treasury Historical Benchmark
04/01/2022	Current	100% Bloomberg US Treasury: Long Index
02/01/2021	03/31/2022	50% Bloomberg US Treasury: Long Index, 50% Bloomberg TIPS 5+ Year Index
04/01/2017	01/31/2021	100% Bloomberg US Treasury: Long Index

**MLM Global Index EV (Blend)**

MLM Global Index EV (Blend) is used as the benchmark for the Systematic Trend Following composite and as a component of other custom benchmarks.

From	To	MLM Global Index EV (Blend)
04/01/2019	Current	100% MLM Global Index EV (15V)
04/01/2017	03/31/2019	100% MLM Global Index LT 15V

**Illiquid Diversifying Historical Benchmark**

From	To	Illiquid Diversifying Historical Benchmark
01/01/2024	Current	100% Swiss RE Global Catastrophe Bond Hedged Index
07/01/2022	12/31/2023	65% 90-Day T-Bills +3.5%, 35% Swiss RE Global Catastrophe Bond Hedged Index
07/01/2021	06/30/2022	50% 90-Day T-Bills +3.5%, 50% Swiss RE Global Catastrophe Bond Hedged Index
04/01/2014	06/30/2021	65% 90-Day T-Bills +3.5%, 35% Swiss RE Global Catastrophe Bond Hedged Index

**Idiosyncratic Return Capture Historical Benchmark**

From	To	Idiosyncratic Return Capture Historical Benchmark
01/01/2024	Current	100% Swiss RE Global Catastrophe Bond Hedged Index
07/01/2020	12/31/2023	100% 90-Day T-Bills +3.5%

### Discontinued Custom Benchmarks

This section includes only the discontinued custom benchmarks which have been a component of current custom benchmarks' history and does not include all the discontinued historical custom benchmarks. The items in this section are ordered alphabetically.

#### Crisis Risk Offset (CRO) Benchmark

Crisis Risk Offset (CRO) Benchmark was a component of Total Fund Policy Benchmark from 2017 to 2020. The composite consisted of Systematic Trend Following, Alternative Return Capture, and Treasury Duration Capture (in the form of long duration treasuries) components.

From	To	Crisis Risk Offset (CRO) Benchmark
04/01/2019	06/30/2020	35% MLM Global Index EV (Blend), 40% 90-day T-Bills +2.5%, 25% Bloomberg US Treasury: Long Index
04/01/2017	03/31/2019	45% MLM Global Index EV (Blend), 30% 90-day T-Bills +5%, 25% Bloomberg US Treasury: Long Index

#### Liquid Diversifying Benchmark

Liquid Diversifying Benchmark was a component of Diversifying Strategies Benchmark from 2017 through 2023.

From	To	Liquid Diversifying Benchmark
04/01/2017	12/31/2023	100% 90-Day T-Bills +2.5%

#### Options-Based Equity Benchmark

Options-Based Equity Benchmark was a component of Public Growth Benchmark from 2020 to 2022.

From	To	Options-Based Equity Benchmark
07/01/2020	06/30/2022	50% CBOE S&P 500 PutWrite (PUT), 35% CBOE MSCI EAFE PutWrite (PXEA), 15% CBOE MSCI Emerging Markets PutWrite (PXEF)

#### Principal Protection Benchmark

Principal Protection Benchmark was a component of Total Fund Policy Benchmark from 2014 to 2020. The composite primarily consisted of intermediate duration bonds.

From	To	Principal Protection Benchmark
01/01/2018	06/30/2020	55% Bloomberg US Intermediate ex Credit Index, 45% Bloomberg Global Intermediate ex Credit Index (Hedged)
10/01/2014	12/31/2017	100% Bloomberg Global Intermediate ex Credit Index (Hedged)

**Discontinued Custom Benchmarks (Continued)**

**Public Growth Benchmark**

Public Growth Benchmark was a component of Broad Growth Benchmark from 2020 through 2023. Please see Global Credit Benchmark and Traditional Growth Benchmark in the Current Custom Benchmarks section under Global Credit Benchmark and Public Equity Benchmark respectively.

From	To	Public Growth Benchmark
07/01/2022	12/31/2023	66.5% Traditional Growth Benchmark, 20% Global Credit Benchmark, 8% MSCI ACWI Minimum Volatility (Net), 5.5% ICE BofA All US Convertibles All Qualities (VXA0)
07/01/2021	06/30/2022	55.5% Traditional Growth Benchmark, 16% Options-Based Equity Benchmark, 15.5% Global Credit Benchmark, 9% MSCI ACWI Minimum Volatility (Net), 4% ICE BofA All US Convertibles All Qualities (VXA0)
07/01/2020	06/30/2021	55.5% Traditional Growth Benchmark, 20% Options-Based Equity Benchmark, 15.5% Global Credit Benchmark, 9% MSCI ACWI Minimum Volatility (Net)

**Real Return Benchmark**

Real Return Benchmark was a component of Total Fund Policy Benchmark from 2014 to 2020.

From	To	Real Return Benchmark
10/01/2014	06/30/2020	100% Consumer Price Index (Seasonally Adjusted) +3%

**Stabilized Growth Benchmark**

Stabilized Growth Benchmark was a component of Broad Growth Benchmark from 2014 to 2020.

From	To	Stabilized Growth Benchmark
01/01/2018	06/30/2020	8.5% Bloomberg Global Credit (Hedged), 5.67% Bloomberg Global High Yield (Hedged), 17% CBOE S&P 500 BuyWrite (BXM), 17% CBOE S&P 500 PutWrite (PUT), 2.83% Morningstar LSTA Leveraged Loan, 8.5% MSCI ACWI ex US (Net), 8.5% 90-day T-Bills, 17% MSCI ACWI Minimum Volatility (Net), 15% NCREIF ODCE Index (Net) (Quarter Lagged)
07/01/2016	12/31/2017	8.5% Bloomberg Global Credit (Hedged), 5.67% Bloomberg Global High Yield (Hedged), 17% CBOE S&P 500 BuyWrite (BXM), 17% CBOE S&P 500 PutWrite (PUT), 2.83% Morningstar LSTA Leveraged Loan, 8.5% MSCI ACWI ex US (Net), 8.5% 90-day T-Bills, 17% MSCI ACWI Minimum Volatility (Net), 15% NCREIF Property Index (Net) (Quarter Lagged)
10/01/2014	06/30/2016	30% Bloomberg Global Credit (Hedged), 20% Bloomberg Global High Yield (Hedged), 40% CBOE S&P 500 BuyWrite (BXM), 10% Morningstar LSTA Leveraged Loan Index

Performance Attribution Glossary

**Performance Attribution** is the process of comparing a portfolio's performance with its benchmark identifying and quantifying the sources of differential returns (also called active returns).

**Differential Returns / Active Returns / Value Added** are the difference between the return on a portfolio and the return on the benchmark.

Impact on Return

Attribution Segment	Definition	Formula	Where:
<b>Weighting</b> (also called allocation, sector allocation, or pure sector allocation)	The effects of portfolio manager decisions to over/underweight each sector	$(w_i - W_i) \times (b_i - b)$	$w_i$ = portfolio segment weight $W_i$ = benchmark segment weight $b_i$ = benchmark segment return $b$ = total benchmark return
<b>Selection</b> (also called within-sector selection)	The effects of portfolio manager decision to buy specific securities	$(r_i - b_i) \times W_i$	$r_i$ = portfolio segment return $b_i$ = benchmark segment return $W_i$ = benchmark segment weight
<b>Interaction</b> (also called allocation/selection interaction)	The effects of portfolio managers decisions to security selection can inadvertently cause sector over/underweighting	$(r_i - b_i) \times (w_i - W_i)$	$r_i$ = portfolio segment return $b_i$ = benchmark segment return $w_i$ = portfolio segment weight $W_i$ = benchmark segment weight

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# Diversifying Strategies – Liquid Defensive and Liquid Diversifying (‘DS-LD’)

2024 Annual Review

February 2025



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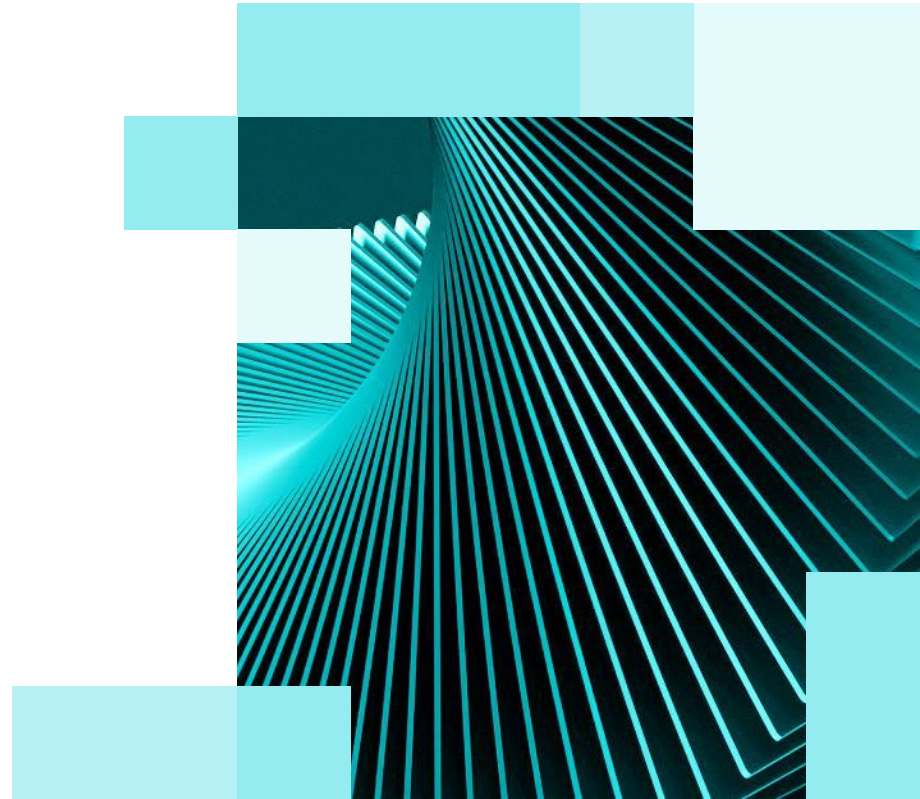
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## Diversifying Strategies – Liquid Defensive and Liquid Diversifying ('DS-LD')



# Annual Highlights: DS-LD

2024



**-0.89%**

2024 Net Performance<sup>1</sup>

**-0.06%**

2024 Benchmark Performance<sup>2</sup>

## Performance<sup>4</sup>

- DS-LD 2024 net performance was -0.89%
- Net contribution<sup>5</sup> by component:
  - IDC: +70 bp
  - DA: +2 bp
  - DRC: -35 bp
  - LDC: -62 bp
  - STF: -66 bp
- Estimate gross contribution by asset class:
  - FX: +134 bp
  - Convertible Bonds: +91 bp
  - Commodities: +7 bp
  - Fixed Income: -87 bp
  - Equity: -187 bp

## Risk & Exposures<sup>3</sup>

- Crisis risk status indicators remained **GREEN** throughout 2024
- DS-LD realized daily volatility was 3.70% (annualized)
- Correlation to the rest of the ERS portfolio was 0.06
- For the year ending December 31st, ERS volatility increased to 4.99% from 4.94% in 2023 (annualized)
- Realized volatility for ERS ex-DS-LD was 6.19%
- At year-end, DS-LD was long equities, both including and excluding SPACs (risk-additive), flat credit (risk-neutral), long interest rates (potentially risk-mitigating), long US Dollar (potentially risk-mitigating), and long commodities (risk-additive)

## Operations

- During January, ERS fully redeemed out of Credit Suisse to fund SLC Intermediate Duration. ERS also received the bulk of Shaolin redemption.
- During March, ERS fully redeemed Weiss and consolidated Aequim.
- During May, ERS fully redeemed from Lombard Odier
- During July, ERS fully redeemed Aristeia Class B and consolidated proceeds to Aristeia Class A
- In September, ERS completed the first tranche of the redemption from MY Asian Opportunities Fund. On December, ERS executed the second tranche of the redemption, proceeds went to SLC Intermediate Duration
- Full liquidation of Monashee communicated in December
- Total NAV of DS-LD at December month end was \$5.8BN.

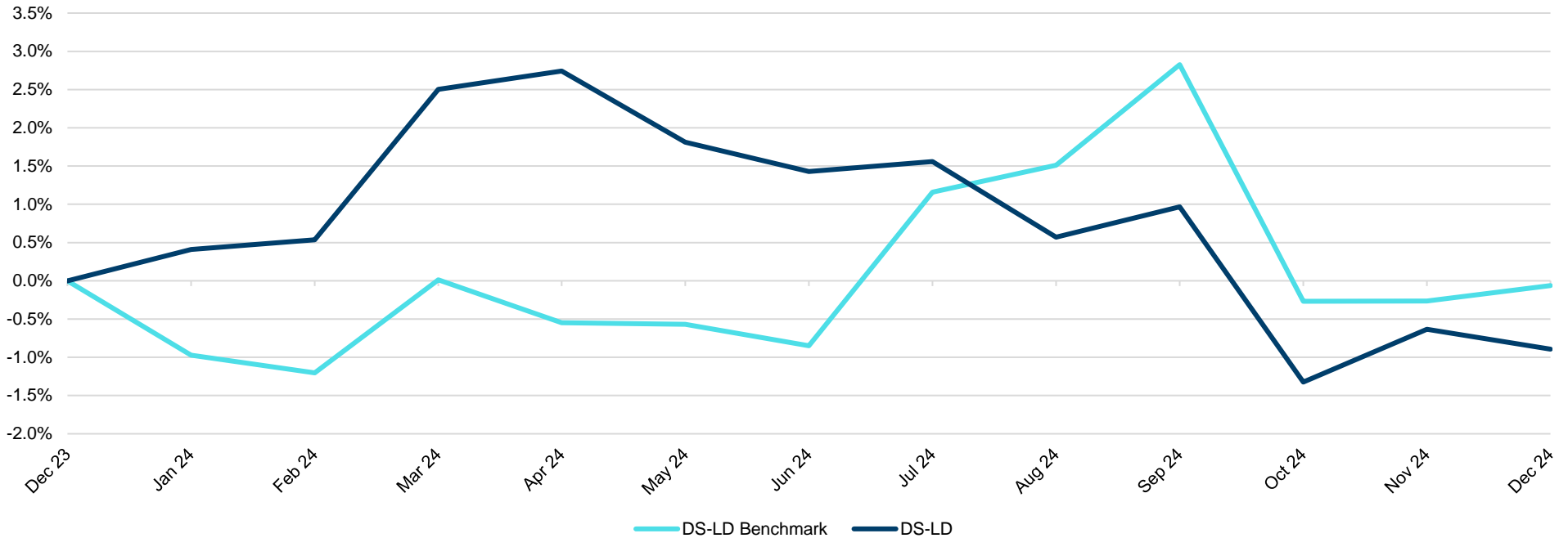
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# DS-LD - Performance vs. Benchmark<sup>1,2</sup>

January 1 to December 31, 2024

- DS-LD finished the fiscal year in slight negative territory, driven by losses in Q2, Q3 (sell-off in August driven by STF managers) and Q4 (US dollar sell-off impacting the STF manager's long greenback positioning in October), which were partially offset by gains in Q1 (driven by STF managers)
- The benchmark saw mixed performance between Q1-Q3. However, all gains were wiped out in Q4, driven by the poor performance of Trend in October, as well as surging rates in October and December. The benchmark ended the year with muted losses
- DS-LD outperformed the benchmark until the end of July. STF managers' equity and FX losses in July and August resulted in underperformance with respect to their benchmark (MLM Index). Q4 was a particularly challenging quarter for DS-LD, with most of the losses concentrated in October, driven by the STF, LDC and IDC managers



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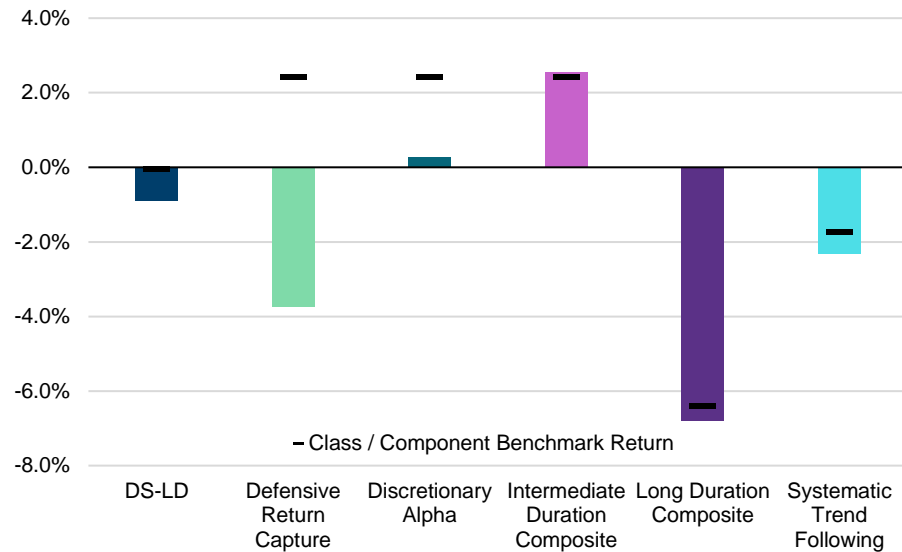
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# DS-LD - Component Performance and Contribution

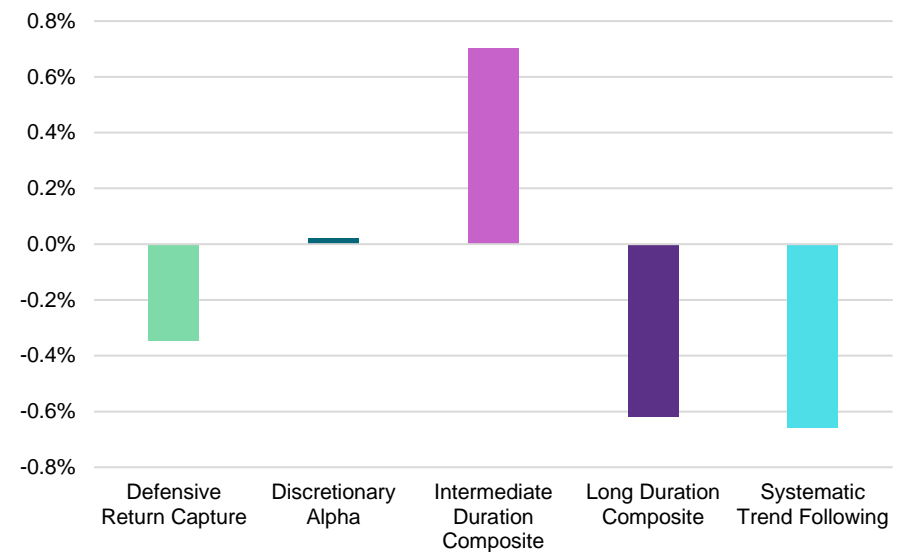
2024

- 2024 was a difficult year for STF managers which were caught by multiple asset class reversals. Despite the strong start to the year, STF managers suffered losses, with Fixed Income being the most detrimental to performance. The August sell-off erased the positive H1 equity PnL. Despite the year-end strengthening in the greenback, which erased earlier FX losses, surging yields on worries over the rising fiscal deficit and the potential for inflation to reaccelerate impacted the rates PnL and STF managers finished the year in red, underperforming their benchmark
- LDC managers detracted as long terms yields along the curve spiked (As of December 31<sup>st</sup> 2024: US10Y : 4.57%, +69bps YtD; US30Y: 4.78%, +75bps YtD)
- All the IDC managers contributed positively, driven by strong Q3 performance
- DRC managers detracted as losses on short equity positions overwhelmed the gains in long USD/short FX
- DA's positive contributions were driven by Aequim MAC's convertible bond exposure and the specials situations strategy in MYAM

Annual Component Net Performance (Jan. 1 – Dec. 31 , 2024)<sup>1,2</sup>



Annual Component Net Contribution (Jan. 1 – Dec. 31 , 2024)<sup>1</sup>

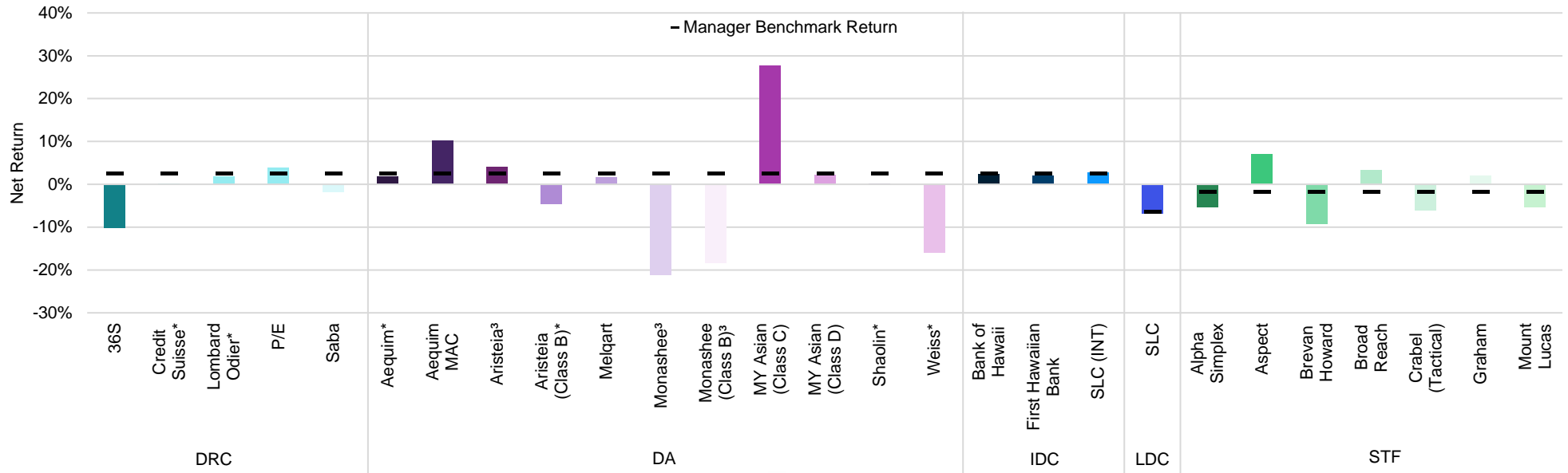


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# DS-LD - Manager Performance

2024 Manager Net Performance (Jan. 1 – Dec. 31, 2024)<sup>1,2,3</sup>



- A difficult year for STF managers as losses, driven by Brevan Howard, Crabel (Tactical), Mount Lucas and Alpha Simplex, overwhelmed the gains of the remaining managers. Managers struggled with fixed income and FX market volatility, driven in-part by ever changing central bank policy expectations. Brevan Howard's losses were concentrated in their equity positioning throughout the year, as well as their short FX positioning in Q1. Crabel Tactical suffered losses, primarily in June and August. During June, a reversal of the long-term trend created challenges for short interest rate futures positioning. Similarly in August, the risk-off sentiment driven by the August sell-off triggered a rally in Fixed Income, which worked against the manager's short rates positioning. Mount Lucas and Alpha Simplex lagged, driven by fixed income, commodities and FX positions
- DRC also detracted with losses concentrated in 36S and Saba. The dominating detractor for 36S in 2024 were highly defensive, left-tail convexity options, which suffered steady bleed, primarily as equity markets performed strongly at low vol, but also in FX markets during Q3. Saba suffered from their credit exposure due to compression in HY-IG spread. On the positive side, P/E added thanks to long greenback exposure during Q4 which contributed significantly after the US elections
- LDC managers detracted, driven by the rates spike in the long tenor of the yield curve. IDC managers had a volatile year, driven by changes in risk sentiment. Q3 was a strong quarter as yields dropped significantly on the shorter tenor of the yield curve with respect to the longer tenors
- DA contributed positively, driven by positive performance from MY Asian, Aequim MAC and Aristeia. MY Asian Opportunities had an extremely successful year, with special situations being the main contributor in Japan and Greater China. Merger arbitrage and credit also added to performance. For Aequim MAC, most of the gains came in Q3, driven by the convertible arbitrage trading

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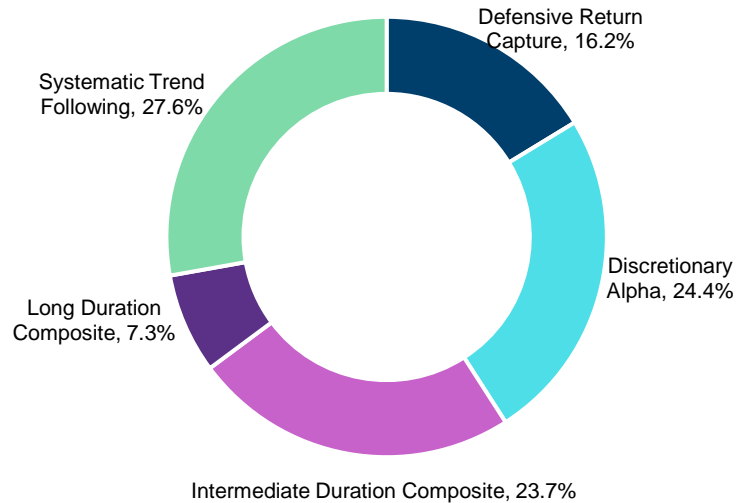
# DS-LD Component Capital Allocations

2024

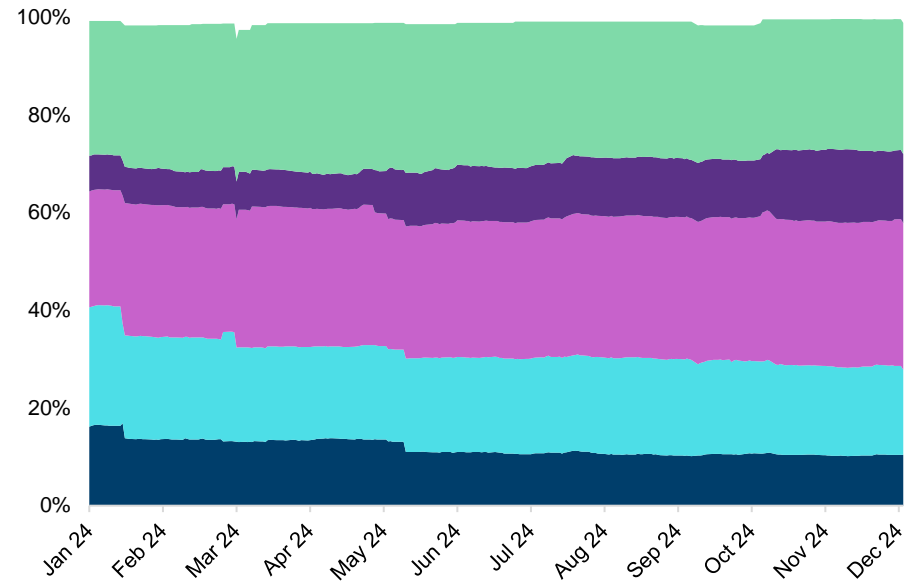


- There were five manager redemptions during FY 2024; three in DA<sup>2</sup> (\$472MM); two in DRC (\$343M) (Total of \$815MM). Redeemed managers in DA were Shaolin (1/16), Weiss (3/7) and Aristeia Class B (7/10). Redeemed from DRC were Credit Suisse (1/17) and Lombard Odier Bear Convexity (5/22)
- ERS also instructed an additional redemption from DS-LD for March and June 2024 with \$86MM from DA component (MY Asian Opportunities Fund)
- On component level, the largest capital allocation increases were LDC and IDC at six percentage points (driven by SLC and SLC INT respectively). The largest decrease was in DA at seven percentage points
- Total DS-LD strategies NAV at December month end was \$5.8BN (By component: IDC: \$1.8BN , STF: \$1.5BN , DA: \$1BN, LDC: \$800MM, DRC: \$600MN)

Year-End Component Capital Allocations<sup>1</sup>



Historical Component Capital Allocations<sup>1</sup>



■ Defensive Return Capture   ■ Discretionary Alpha   ■ Intermediate Duration Composite   ■ Long Duration Composite   ■ Systematic Trend Following

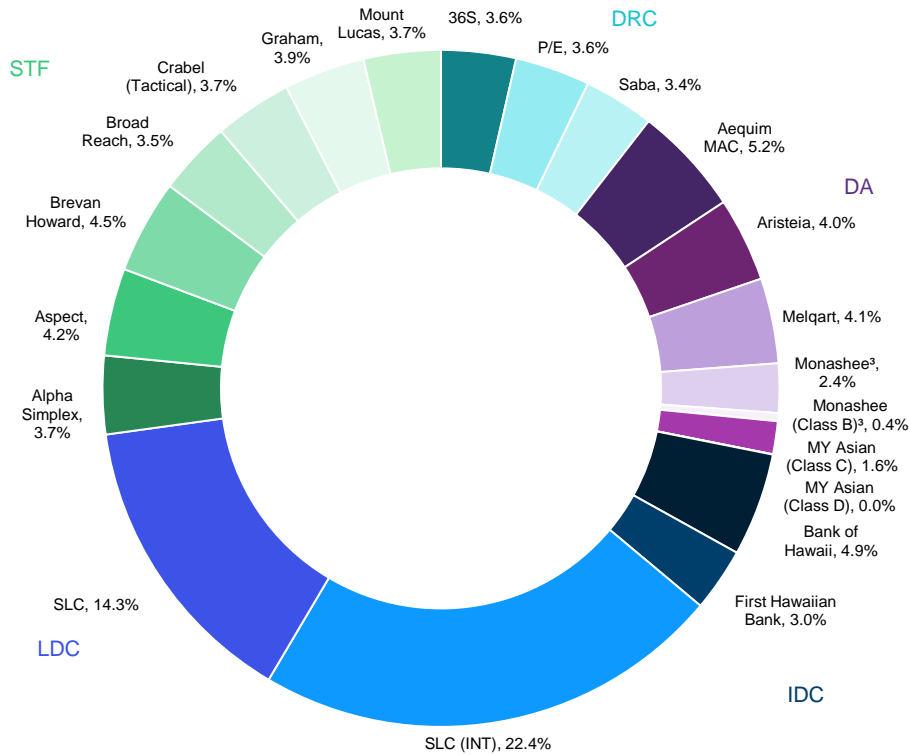
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# DS-LD Manager Capital Allocations

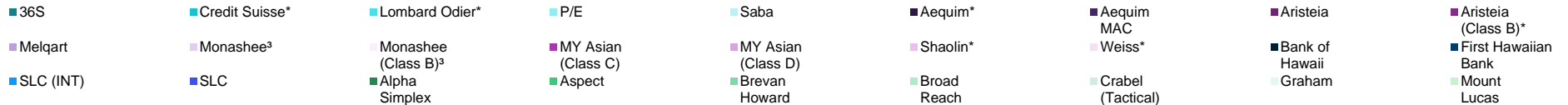
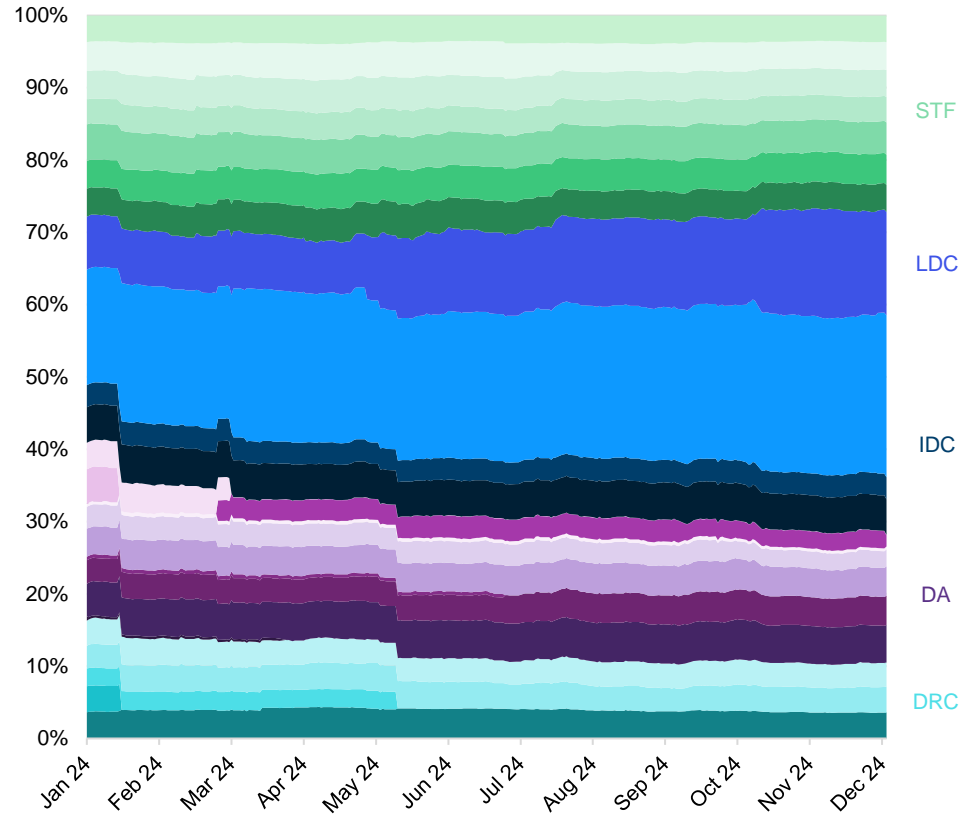
2024



Year-End Manager Capital Allocations<sup>1</sup> (% DS-LD NAV)



Historical Manager Allocations<sup>1</sup>



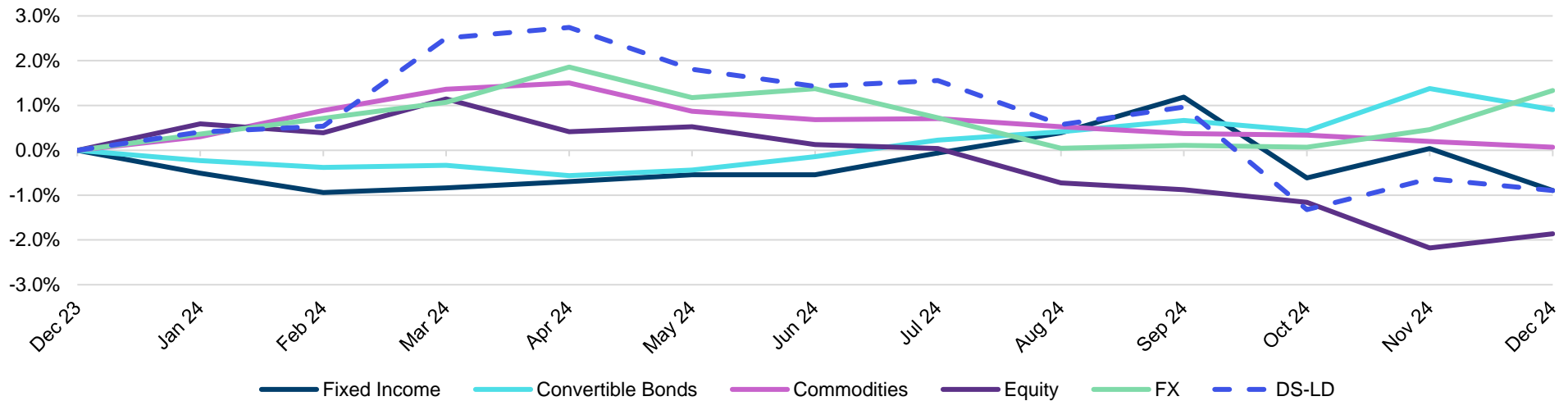
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# DS-LD - Asset Class Cumulative Contribution

2024

Cumulative Estimated Asset Class Contribution and DS-LD Net Performance (Jan. 1 – Dec. 31, 2024)<sup>1</sup>



- DS-LD finished the year in negative territory, driven by losses in Equity and Fixed Income which partially offset gains coming from FX, Convertible Bonds and Commodities
- Despite DS-LD maintaining a net long exposure to equities during the year, the asset class detracted from performance. Losses from DRC's and DA's net short positioning more than offset performance gains from STF's net long exposure. Specially within DRC, P/E and 36 South were the largest source of equity losses at the portfolio level, in addition to further losses from Weiss and Melqart. STF managers finished the year with flat equity PnL, as managers were adversely impacted from the market whipsaw during April, August and October.
- Equity losses in Weiss concentrated on long REITS positioning in February during the liquidation of the manager. P/E lagged due to short positioning in S&P, Russell and DAX during H1. Similarly, the losses in 36 South detracted due to shorts in S&P.
- Fixed Income was an additional source of losses for DS-LD, driven by STF and LDC managers. Brevan Howard, Mount Lucas and Aspect were adversely impacted by the rates spikes during Q1 and Q4. The spike in the rates in the longer tenor was detrimental for SLC
- FX was the largest positive contributor to overall performance, driven by DRC and STF managers. During H1, appreciation in the greenback generated FX gains for the long USD positioning in P/E and 36 South. Within STF managers, Graham, Brevan Howard, Broad Reach and Aspect benefitted from the FX gains

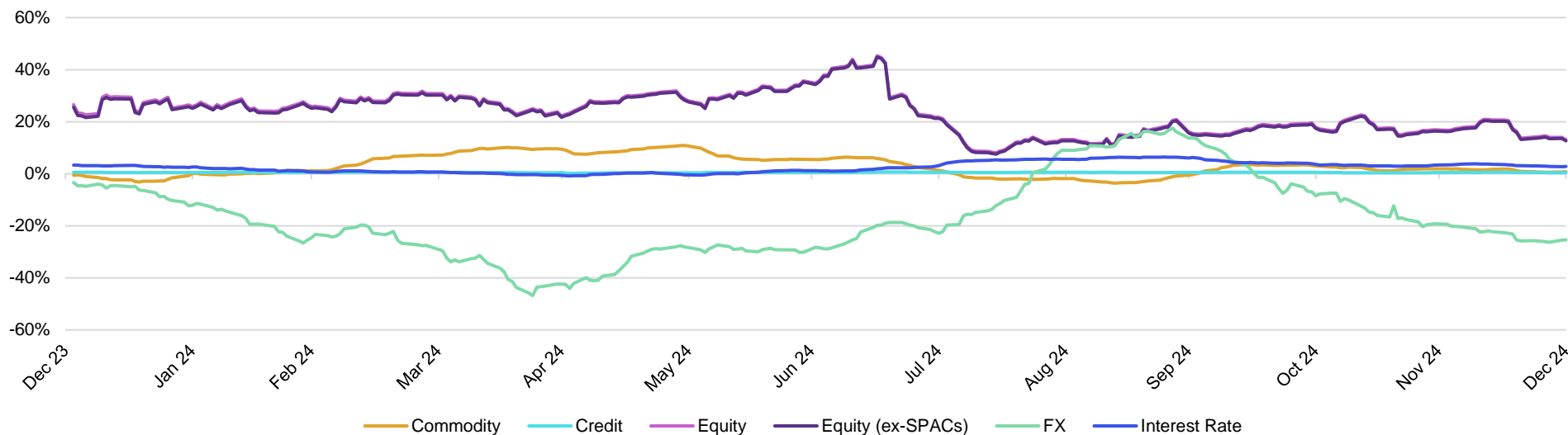
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# DS-LD Asset Class Delta

2024



Asset Class Delta Evolution (Jan. 1 – Dec. 31, 2024)<sup>1,2</sup>



- DS-LD maintained a long bias to equities throughout the year driven by DA and STF managers. However, the portfolio reached its lowest delta after the market sell-off during August (driven by Trend and Discretionary Alpha Managers). However, it increased its long exposure again from STF managers and by trimming short exposure in DRC managers
- FX exposure oscillated between net long USD (short foreign currency) and net short USD (between September and early October) throughout the year. STF managers drove most of this dynamic exposure, although P/E within DRC maintained a more constant net long USD positioning throughout the year
- Commodities were typically traded from the long side during the year, although at the underlying market level exposure remained dynamic, driven by STF managers. Exposures in energies and precious metals were largest during the year on both the long and short side.
- The portfolio maintained its long rates exposure, driven by LDC and IDC managers. During 2024, expectation of fewer rate cuts drove the changes in STF managers (which resulted in negative rate exposure between April – June mainly from Alpa Simplex, Crabel Tactical and Aspect) whereas LDC and IDC kept its long rates profile during the year
- Credit exposure remained minimal during the year, driven primarily by Broad Reach and Aequum

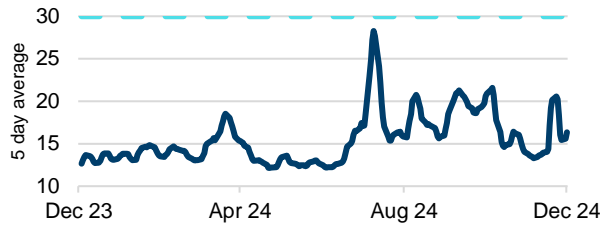
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This material is being provided at the express request of the Employees' Retirement System of the State of Hawaii and is not for forward distribution. As of December 31, 2024. 1. Based on daily trading estimates. 2. Interest Rate Delta is represented by DV01 multiplied by 1000. Source: Man Group Database.

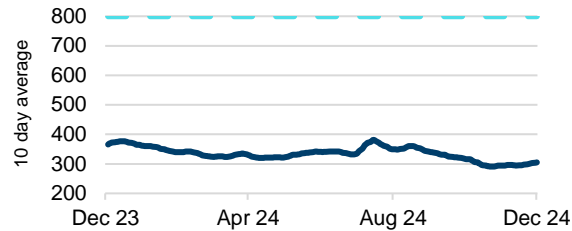
# DS-LD Crisis Risk Indicators

January 1 to December 31, 2024

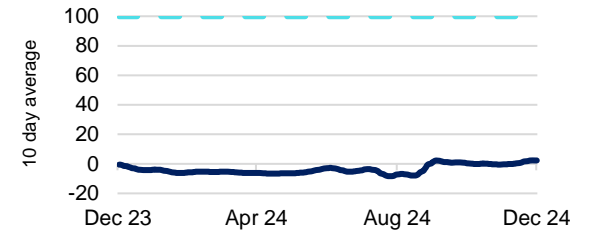
Market Risk



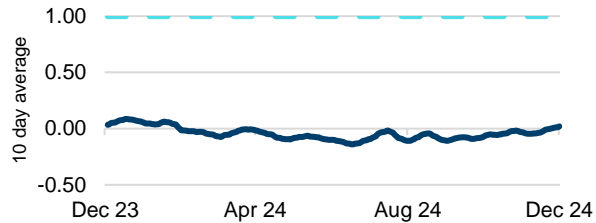
Solvency Risk



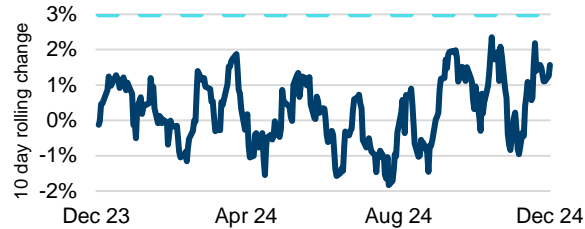
Liquidity Risk



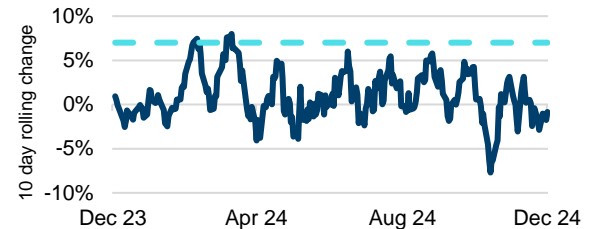
Flow Risk



Dollar Risk



Gold Risk



Overall Systemic Risk



- Gold breached its Crisis Level of 7% a total of 5 times during 2024: March 8, March 11, April 5, April 8 and April 9
  - During March and April, the breaches were driven by geopolitical tensions, the uncertainty in Middle East and concerns over inflation (Gold: 27% 2024 YtD)
- None of the other Crisis Risk Indicators breached during 2024 and all the indicators ended the fiscal year in **GREEN**

This material is being provided at the express request of the Employees' Retirement System of the State of Hawaii and is not for forward distribution. As of December 31, 2024. Market Risk: VIX Index (averaged over 5 trading days), Solvency Risk: Credit Suisse High Yield Index II STW (averaged over 10 trading days), Liquidity Risk: Ted Spread (SOFR 3 Month – 3M US T Bill yield) (averaged over 10 trading days), Flow Risk: BofA Merrill Lynch GFSI Money Market Flow (averaged over 10 trading days), Dollar: Bloomberg Dollar Spot Index (10 day rolling change), Gold: USD Gold spot price (10 day rolling change), Overall Systemic Risk: BofA Merrill Lynch Global Financial Stress Indicator (averaged over 10 trading days). Source: Bloomberg.

# DS-LD Component Equity and Benchmark Beta

2024

## Beta to Equities<sup>1</sup>

Period	Defensive Return Capture	Discretionary Alpha	Intermediate Duration Composite	Long Duration Composite	Systematic Trend Following
Last 3M	-0.34	-0.21	0.05	0.15	0.17
Last 6M	-0.50	-0.03	-0.01	-0.02	0.42
Last 12M	-0.55	0.08	0.05	0.15	0.33

## Beta to Component Benchmark

Period	Defensive Return Capture	Discretionary Alpha	Intermediate Duration Composite	Long Duration Composite	Systematic Trend Following
<i>Benchmark</i>	<i>Bloomberg US Intermediate Treasury TR Index Unhedged</i>			<i>Bloomberg US Long Treasury Total Return Index Unhedged</i>	<i>MLM Global Index EV (15V) Total Return</i>
Last 3M	-1.21	0.25	1.00	0.95	0.69
Last 6M	-0.77	0.24	1.01	0.98	0.99
Last 12M	-1.03	0.09	1.05	0.98	0.83

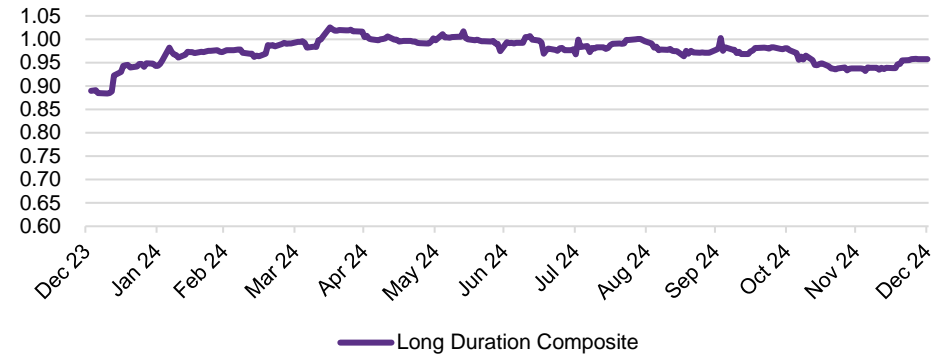
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# DS-LD Component Rolling Benchmark Beta's 2024

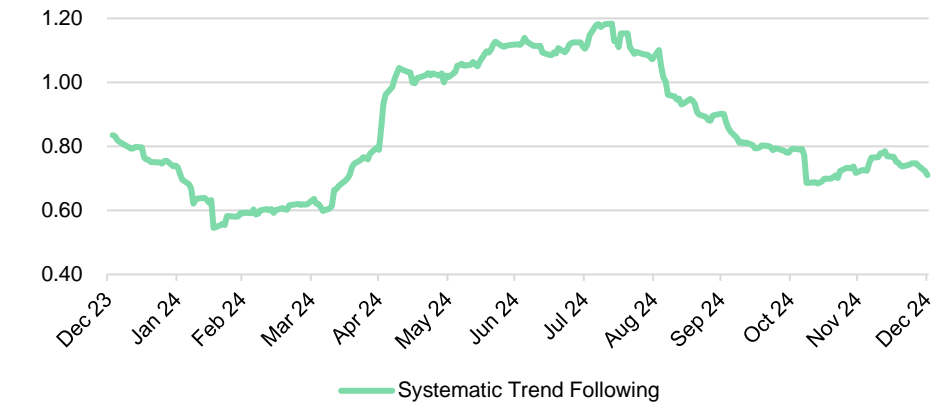
Rolling 3M Beta to Bloomberg US Intermediate Treasury TR Index Unhedged



Rolling 3M Beta to Bloomberg US Long Treasury Total Return Index Unhedged

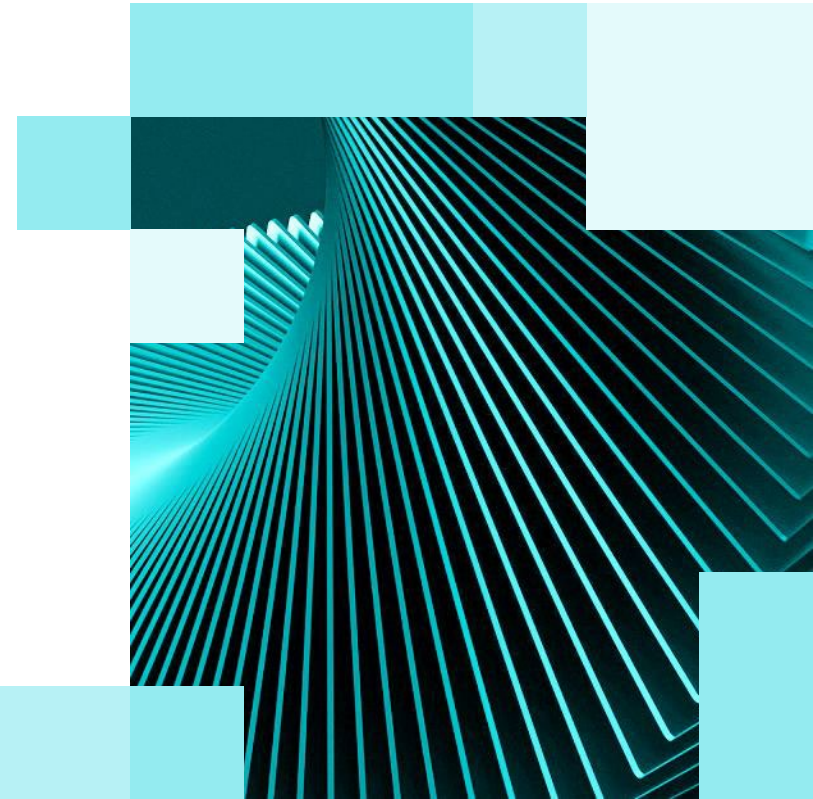


Rolling 3M Beta to MLM Global Index EV (15V) Total Return



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## Diversifying Strategies – Illiquid Diversifying ('DS-ID')



# DS-ID – Executive Summary

## Portfolio Exposures and Performance Summary

**9.26%**

2024 Net  
Performance

**17.61%**

2024 Benchmark Performance<sup>1</sup>

### Non-Drawdown Funds

Fund (Manager)	Type	NAV (US \$ m) <sup>1</sup>	Inception Date <sup>1</sup>
Mauna Loa Capital Fund LP (Blackstone)	Multi-Strategy	21.8	1/1/2021
Pillar Enso Fund – Class A (Pillar) <sup>4</sup>	Insurance-Linked Securities	274.7	7/1/2020
Ulu Fund, Ltd. (Nephila)	Insurance-Linked Securities	218.0	1/1/2021
Stable Quarry (TQ Intermediate) (Stable)	Multi-Strategy	28.9	3/1/2023
Stable Shadowfall (Stable)	Multi-Strategy	24.8	1/10/2023
Stable Tribune (Stable)	Multi-Strategy	27.0	1/2/2024
Stable Clear Alpha	Multi-Strategy	27.7	6/1/2023
<b>Total</b>		<b>622.9</b>	<b>-</b>

### Drawdown Funds

Fund (Manager)	Type	Total LP Commitment (US\$ m) <sup>2</sup>	Total Unfunded Commitment (US\$ m) <sup>2</sup>	Total Contributions (US\$ m) <sup>2</sup>	Total Distributions (US \$ m) <sup>2</sup>	NAV (US \$ m) <sup>3</sup>
Leahi Capital Fund (Cloverlay)	Private Equity	300.0	104.5	214.0	18.4	240.3
Parabellum Partners III, LP (Parabellum)	Litigation Finance	100.0	41.8	58.2	0.0	58.0
<b>Total</b>		<b>400.0</b>	<b>146.3</b>	<b>272.2</b>	<b>18.4</b>	<b>298.3</b>

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This material is being provided at the express request of the Employees' Retirement System of the State of Hawaii and is not for forward distribution. As of December 31, 2024, unless otherwise specified. 1. DS-ID Benchmark is calculated as 100% Swiss Re Cat Bond Total Return Index. 2. As reported by the underlying manager. 3. Asset values are generally reported with at least a one quarter lag. Performance is net of fees and expenses charged by the underlying investment managers, as well as those charged by Man. Please note that the DS-ID returns are based upon the NAV provided by the administrator, however they should be considered estimated returns due to the private nature of these investments. The final performance return may be materially different from the estimate provided and as such should only be taken as indicative data for information purposes only. A decision to invest should not be based on then estimated performance returns. Past Performance is not a reliable indicator of future results. 4. Pillar full redemption was submitted in September 2024. Source: Man Group Database and Employees' Retirement System of the State of Hawaii unless otherwise noted.

# DS-ID – Operations and Capital Summary

## Drawdown Funds Reconciliation as of December 31, 2024

### Contributions Summary<sup>1,2</sup>

Manager	Contributions (US \$ m)	Distributions (US \$ m)	Total (US \$ m)
Leahi	32.6	8.8	23.8
Parabellum	6.0	0.0	6.0
<b>Total</b>	<b>38.6</b>	<b>8.8</b>	<b>29.8</b>

### Leahi Capital Fund (Cloverlay)<sup>1,2</sup>

	QTD (US \$ m)	YTD (US \$ m)	ITD (US \$ m)
Beginning NAV	196.2	185.2	-
Contributions	32.6	32.6	213.9
Distributions	8.8	8.8	19.2
Appreciation	20.9	31.9	45.6
<b>Ending NAV</b>	<b>240.3</b>	<b>240.3</b>	<b>240.3</b>

### Portfolio Reconciliation<sup>1,2</sup>

	QTD (US \$ m)	YTD (US \$ m)	ITD (US \$ m)
Beginning NAV	248.9	220.1	-
Contributions	38.6	55.1	272.1
Distributions	8.8	8.8	19.2
Appreciation	19.6	31.9	45.4
<b>Ending NAV</b>	<b>298.3</b>	<b>298.3</b>	<b>298.3</b>

### Parabellum Partners III, LP (Parabellum)<sup>1,2</sup>

	QTD (US \$ m)	YTD (US \$ m)	ITD (US \$ m)
Beginning NAV	52.7	34.9	-
Contributions	8.6	16.5	52.2
Distributions	0.0	0.0	0.0
Appreciation	1.8	1.3	0.5
<b>Ending NAV</b>	<b>58.0</b>	<b>58.0</b>	<b>58.0</b>

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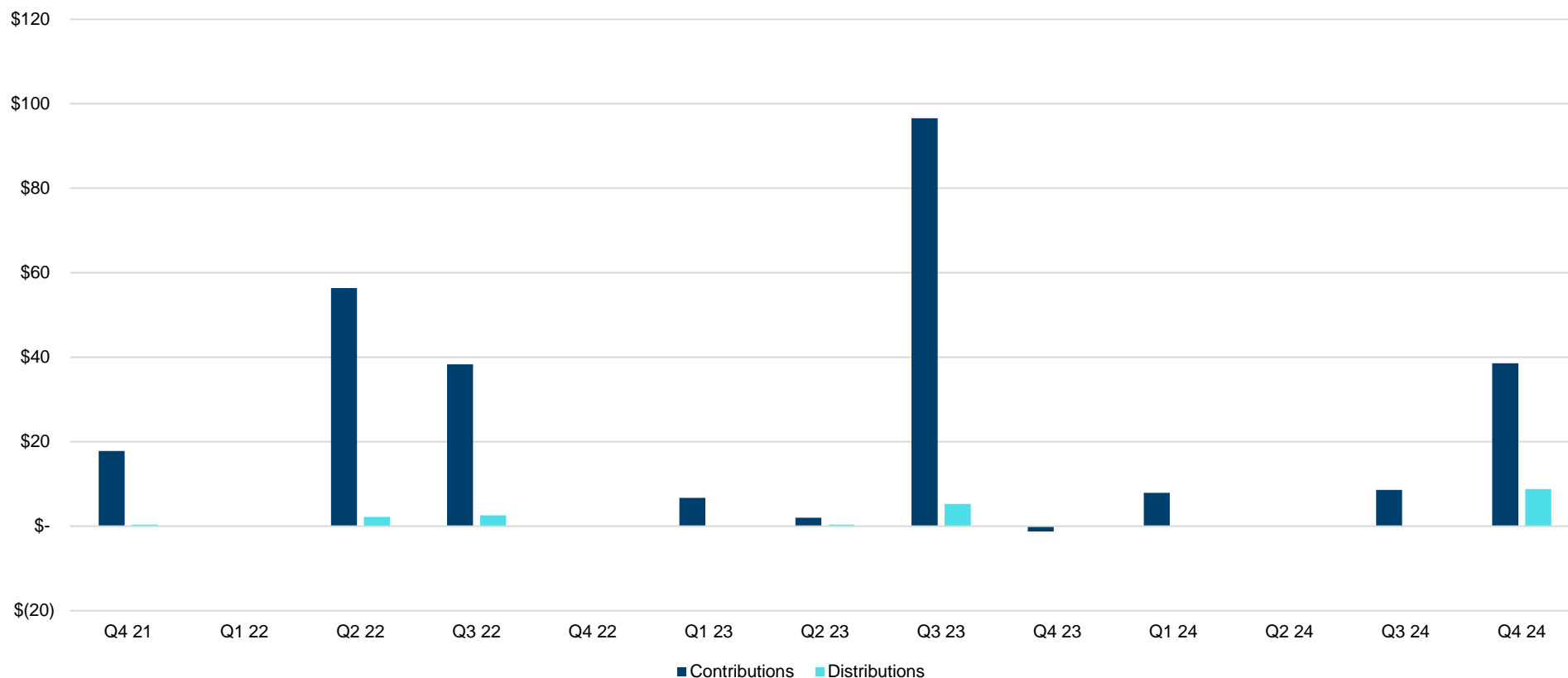


# DS-ID – Illiquid Strategies

## Drawdown Funds Commitment Summary as of Q4 2024



Quarterly Cash Flows<sup>1</sup>



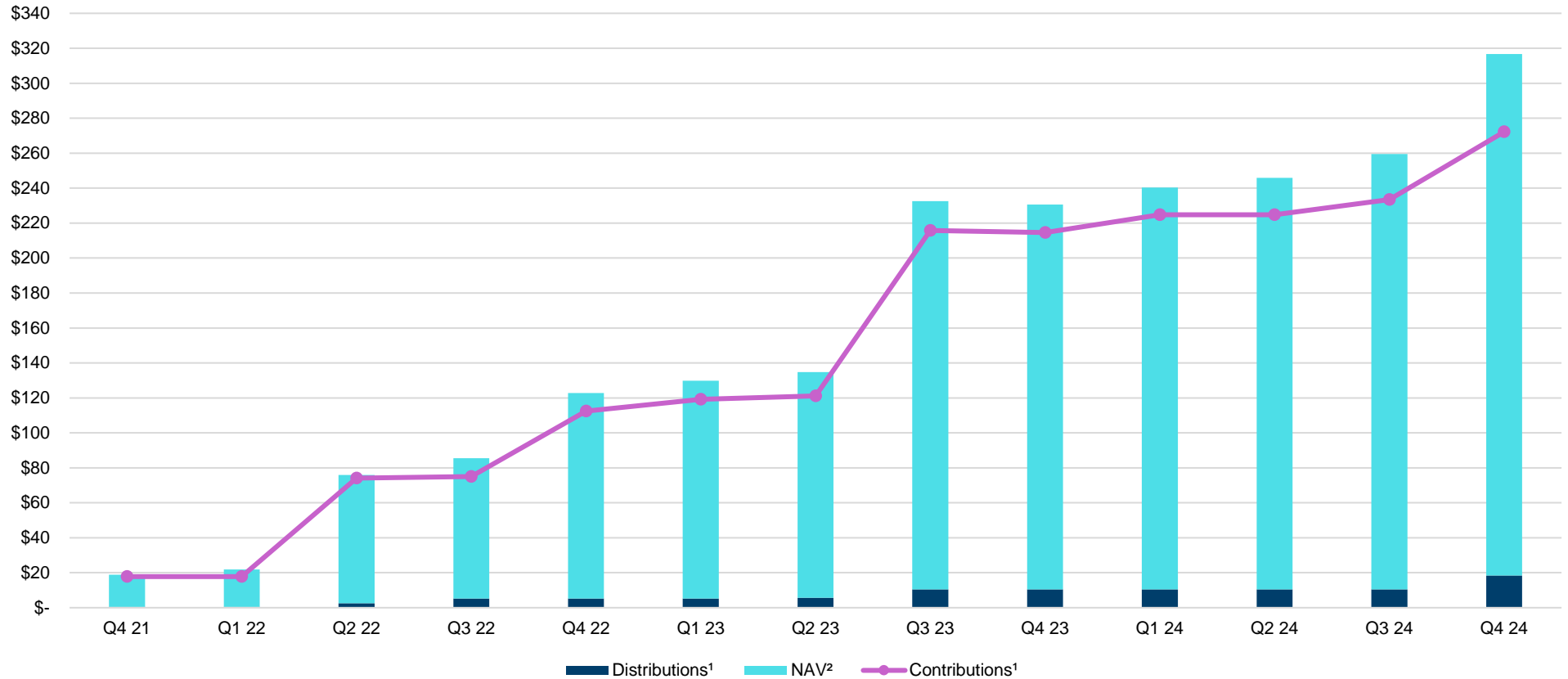
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# DS-ID – Illiquid Strategies

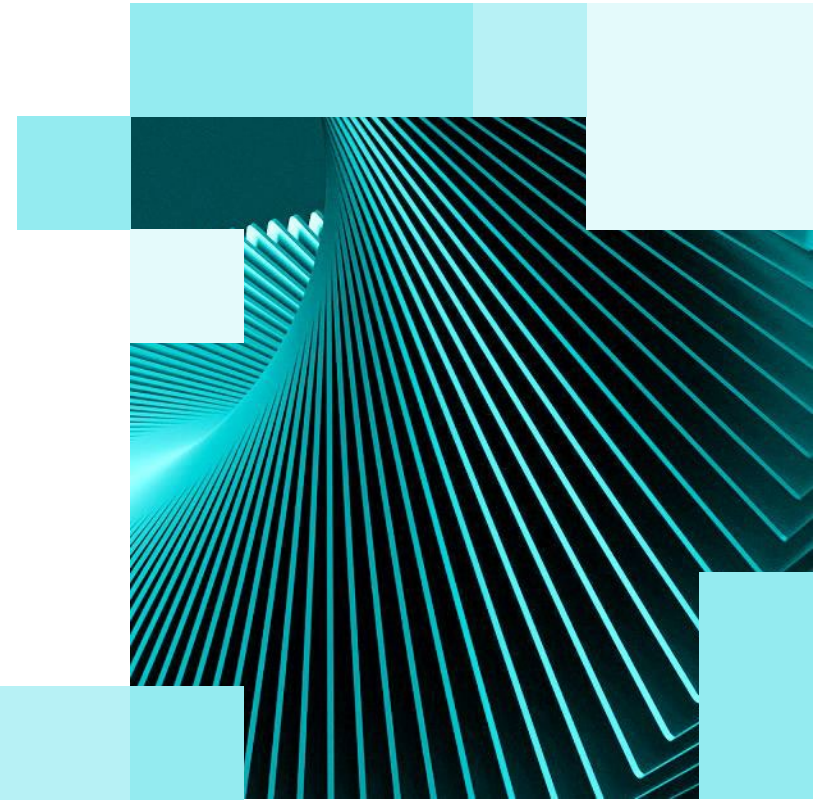
## Drawdown Funds Commitment Summary as of Q4 2024

### Cumulative Value



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## Strategy Outlook



# Man External Alpha - Hedge Fund Strategy Outlook

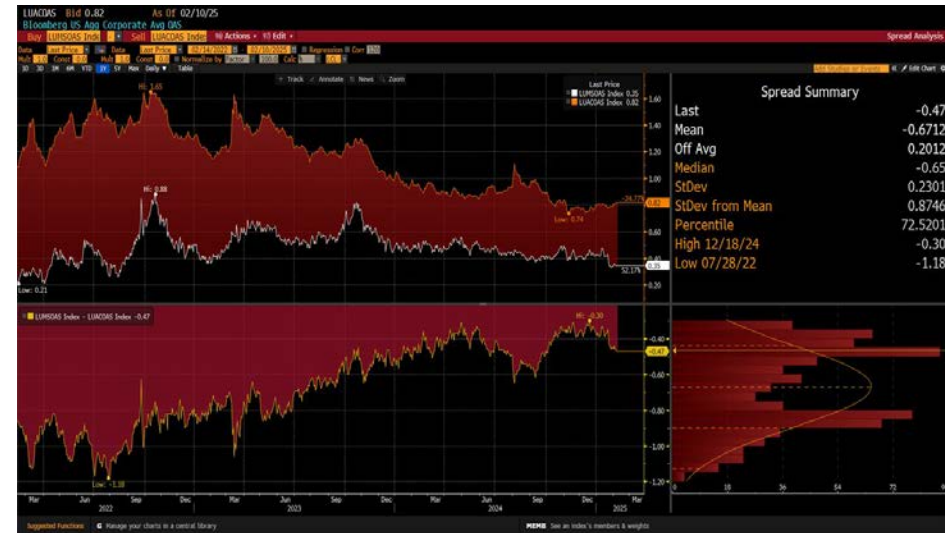
## Q1 2025 Outlook Vs Q4 2024 Outlook

- We remain constructively cautious on hedge fund returns, maintaining a Neutral stance on most strategy categories for Q1, reflecting potential short-term volatility during the early stages of the Trump presidency
- Convertible Arbitrage has been downgraded to Neutral due to tight pricing in convertible bonds and the likely realization of returns from the refinancing theme tied to Covid-era debt
- Maintain a Positive outlook on Global Macro supported by expectations of higher macroeconomic volatility, elevated rates, and market dispersion, which continue to drive alpha
- Neutral to Positive outlook on Volatility strategies as Trump policy mandates may result in market-moving events, and changes are better for vol

Strategy	Q4 2024	Q1 2025	Change	HIERS Manager Coverage
Cat Bonds / ILS	Positive	Positive	-	Nephila (Ulu), Pillar (ENSO)
Convertible Arbitrage	Positive	Neutral	Downgrade	Aequim, Aristeia
Credit Long/Short	Neutral	Neutral	-	Aequim, Aristeia
Crossovers	Neutral	Neutral	-	Monashee
Discretionary Macro	Positive	Positive	-	Brevan Howard
Hedge Fund Seeding	Neutral	Neutral	-	Stable
Intermediate Duration	Negative	Positive	Upgrade	SLC Management Intermediate Duration, Bank of Hawaii, First Hawaiian Bank
Litigation Finance	Neutral	Neutral	-	Parabellum Partners
Long Duration	Negative	Positive	Upgrade	SLC Management
Long Vol / Tail Hedge	Positive	Positive	-	36 South, Saba
Merger Arbitrage	Neutral	Neutral	-	Melqart
Niche Co-investments	Neutral	Neutral	-	Leahi Capital Fund (Cloverlay)
Special Situations	Neutral	Neutral	-	Melqart, MY Asian Opportunities
Systematic Macro	Neutral	Neutral	-	P/E, Graham
Trend-Following	Neutral	Neutral	-	Broad Reach, Aspect, MLM, Crabel, Alpha Simplex

## Intermediate Duration

- Upgrade the outlook from Negative to Positive for Q1 2025
- With the break-evens trending back to 2%, we expect The Intermediate Treasury portfolio with an ~20% weight to Agencies will benefit, as clearing levels on rates come in we expect rate volatility to be contained and serve as a tailwind for Agency mortgage spreads
- We view the opportunity set in Agency MBS as attractive as compared to corporate credit. On a 3-year basis: MBS spreads (represented as LUMSOAS) vs corporate spreads (represented as LUACOAS) are still trading in the 70+% spread percentile



## Long Duration

- Upgrade the outlook from Negative to Positive for Q1 2025
- We expect longer term break-evens will trend back towards 2% bringing down nominal yields across the curve. In this scenario, we see the long duration Treasury portfolio benefiting from the duration extension out the curve
- Key risks: Reflationary impulse which would result the interest rate cuts further priced out of the market, unforeseen large number of tariffs spanning across a wide range of industries that would lead to reflation and wane on Agency mortgage spreads. US deficit potentially weighing on Treasury yields through need for market absorption of any unforeseen large increase in issuance via coupons

## Trend-Following

- Remain Neutral - Shifts in the political and geopolitical landscape can prompt strong price trends in markets as new relationships form within and between asset classes and regions
- Rising inflation risks also serve Trend-Following strategies well given their ability to short rates and go long commodities<sup>1</sup>, while their tendency to be positively convex to risk assets is attractive given the economic pressures forming in certain DM economies. However, we are mindful of the unpredictable nature of the new Trump administration and the risk of sharp, short-lived reversals as policy actions are imposed and swiftly retracted, leaving Trend-Followers susceptible to whipsaws
- More volatile macro fundamentals may also lead to a choppy market backdrop, and as such Discretionary Macro managers may be able to navigate the market uncertainty better than Trend-Following programs

## Discretionary Macro

- Remain Positive - The new Trump administration will significantly influence global financial markets, though the specifics around the size, scope and impact of its policies remain unclear
- Shifts in US trade and immigration policy can have significant impacts on growth and inflation both domestically and internationally, with the potential to reshape global trade patterns. Adding to this, disparate economic outlooks highlight the need for tailored policy responses as growth pressures intensify
- We expect a robust opportunity set for Discretionary Macro in the year ahead driven by rising policy uncertainty, increased volatility and growing economic divergence

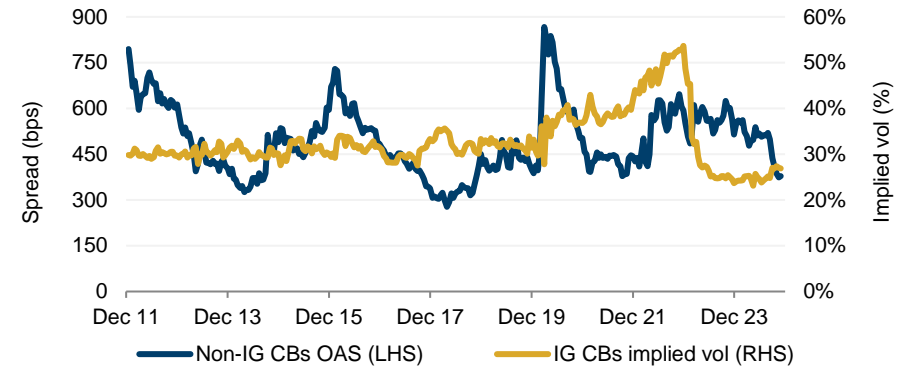
## Systematic Macro

- Remain neutral - we are wary of the business pressures we anticipate on managers in this sub-strategy peer-group. In our view, based solely on returns and statistical outcomes, there's a case to be made for a better 2025 after a difficult 2024, but we cannot afford to be short-sighted in quantitative investing, as the themes at play tend to unfold over the longer term
- Our caution reflects the relatively low Sharpe ratio of Systematic Macro strategies (due to their narrower instrument breadth compared to their Micro counterparts) and we believe that there are higher Sharpe multi-asset quant capacity options available in 2025 – and competitively priced.
- We believe this will likely be more appealing to investors than standalone Macro Quantitative strategies, particularly given their recent poor performance and their frequent role as a substitute for hard-to-access liquid multi-strategy exposure

## Convertible Arbitrage

- Moving to a neutral stance on CB arb, expecting more moderate returns after two strong years. CBs have performed well, and broad markets (US, Europe) now trade close to estimates of fair value. Spreads for credit-sensitive names that had lagged US HY have compressed meaningfully
- Key risks: Deep recession/meaningful pick-up in defaults/significant uptick in net supply/HF deleveraging

Non-IG Converts OAS & IG Converts implied vol

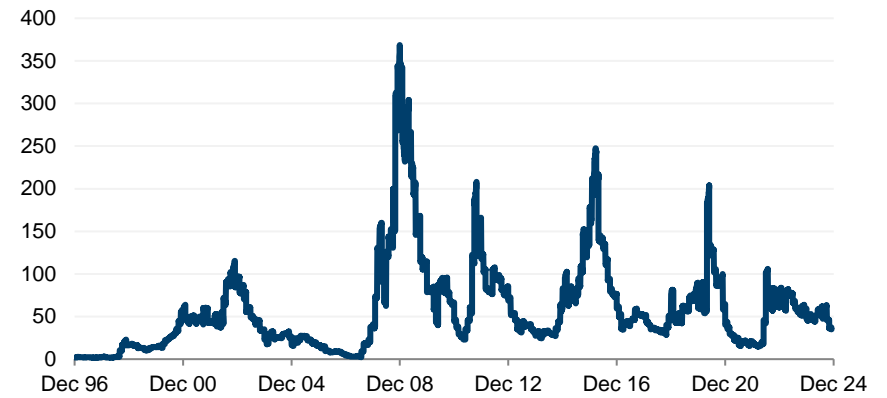


Source: Barclays

## Credit Long/Short

- Remain neutral on Credit Long-Short: HY spreads at YTD lows and post-GFC tightens reduce outright long opportunities. Hard to express shorts in lower-rated loans that might face fundamental challenges
- Key risks: Deep recession/meaningful pick-up in defaults

US HY bonds trading over 1,000bps (market value, \$bn)



Source: Bloomberg

## Special Situations

- Remain Neutral - Potential for numerous strong themes as well as catalysts benefiting from increasing corporate deal activity, lower rates and global consolidation trends, and other restructuring pressures like activism campaigns or corporate governance reforms
- Key risks: geopolitical tensions, tariff uncertainty, policy disappointments and market pullbacks extending weaker catalysts

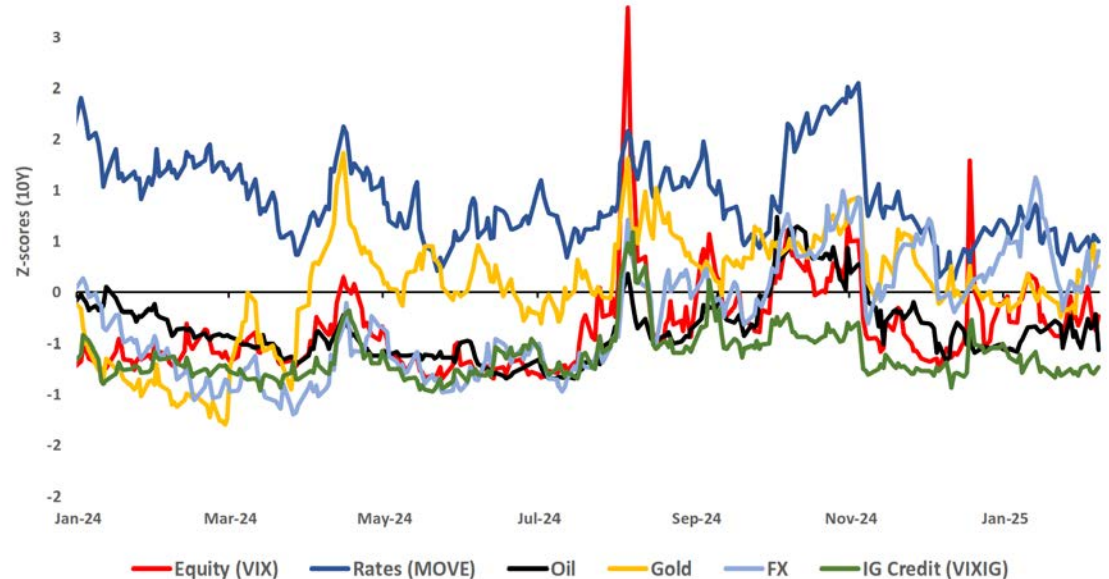
## Crossovers

- Remain Neutral - IPO activity is expected to pick up in 2025 due to:
  - a backlog of issuance and increase in filed S-1's
  - strong equity valuations and narrowing valuation spreads between public and private markets
  - a looser regulatory environment. This should serve as a tailwind for realizations in a crossover portfolio

## Long Vol / Tail Hedge

- Remain Positive: Offer portfolio benefit of highly reliable defensive protection in case of a significant drop in markets as well as good entry levels to accumulate long vol. Potential for significant vol increases across most asset classes

Cross-Asset Volatility (10yr Z-scores)



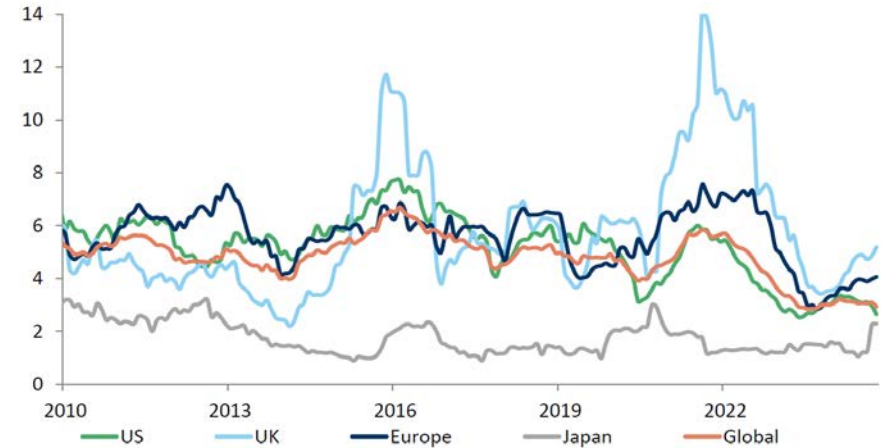
Source: CBOE



## Merger Arbitrage

- Remain Neutral, however, with a clear tilt toward optimism for 2025. Global M&A rose modestly in 2024, but still trailing historical averages and building up significant pent-up demand
- Trump administration and Republican majority are expected to adopt a more lenient antitrust stance, and encouraging business-friendly practices and deregulation

12M Aggregate M&A Deal Value (% of Market Cap)

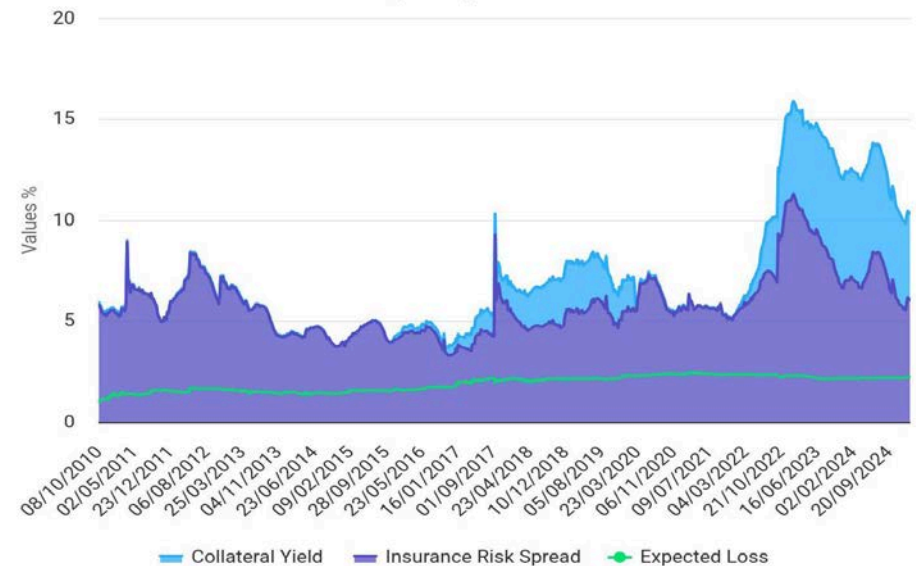


Source: Refinitiv, Morgan Stanley Research

## Cat Bonds / Private ILS

- Positive outlook across ILS. Cat Bonds continue to offer attractive spreads, as well as stable return streams with low correlations to financial markets. Some spread widening expected as a result of the January LA fires, but also sensitive to supply-demand flows
- Private reinsurance is relatively more attractively priced than Cat Bonds, as demand for risk-remote exposure has supported junior tranche yields. Even more uncorrelated asset class, but less liquid and more prone to smaller loss events

Catastrophe Bond Market Yield (USD)



Source: Artemis

## Litigation Finance

- Remain Neutral - the amount of capital being devoted to commercial litigation has grown. Sourcing ability is key to long term success and differentiation
- Performance expectations remain attractive, but lack of realizations is a concern

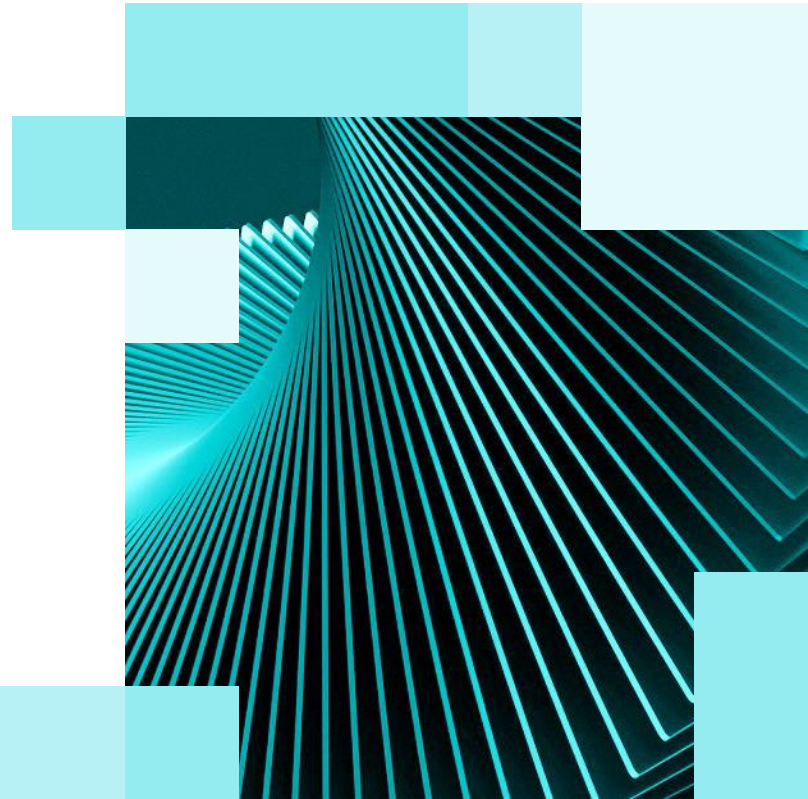
## Hedge Fund Seeding

- Remain Neutral - the number of hedge fund launches continued to fall in 2024 as multi-strat/multi-manager hedge funds posted strong returns and remained attractive for investment talent.
- However, there are signs that some of the mid-tier multi-strat firms are starting to see redemptions leading to high calibre teams exiting these businesses and looking for seed capital.
- Positive hedge fund performance across strategy types in 2024 may see allocations to hedge funds as a whole increase in 2025 - which should benefit hedge fund seeding platform

## Niche Co-Investments

- Remain Neutral - We continue to see growth in capital invested in niche and diversifying private market strategies, however as more money chases these opportunities projected returns are slightly diminished

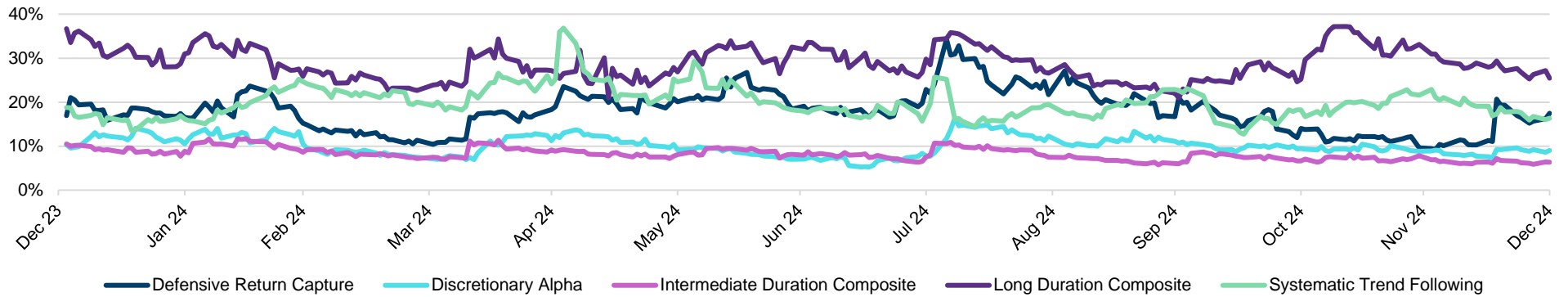
# Appendix



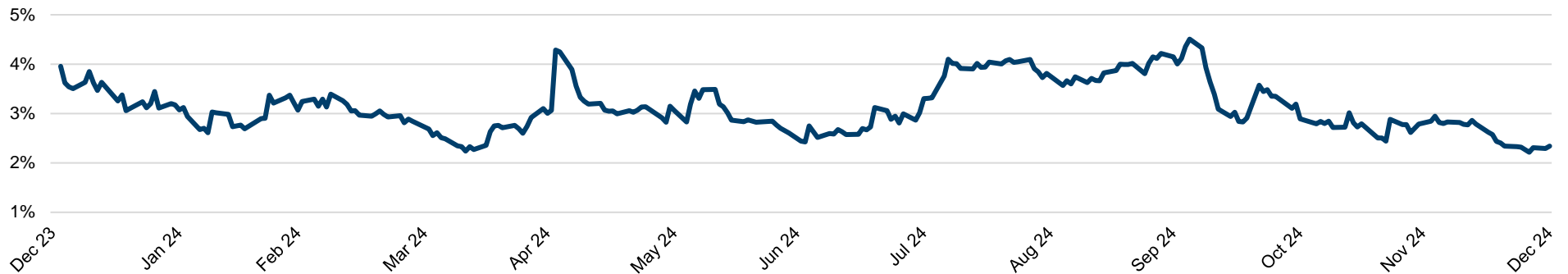
# DS-LD Component and Class risk

## 2024

Component Ex-Ante Volatility<sup>1</sup>



Class Ex-Ante Volatility<sup>1</sup>



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# Market Summary

2024



Equities & Currencies				Sectors, Factors & Hedge Funds				Rates, Credit & Commodities			
		YTD				YTD				YTD	
Equities	CSI300	3,935	14.7%	Equity Factors	Beta	163.66	6.6%	Rates	UST 2Y	4.24	-0.01
	DAX	19,909	18.8%		Dividend Yield	47.35	-12.1%		UST 10Y	4.57	0.69
	Euro Stoxx 50	4,896	8.3%		Growth	172.75	19.4%		UST 30Y	4.78	0.75
	FTSE 100	8,173	5.7%		Leverage	89.84	8.8%		GBP 2Y Swap	4.27	0.24
	GS Most Shorted	198.51	23.1%		Momentum	168	54.8%		GBP 10Y Swap	4.07	0.78
	MS Crowded Longs	211	41.8%		Momentum Longs	330	47.6%		EUR 2Y Swap	2.19	-0.60
	MSCI EM	1,075	5.1%		Momentum Shorts	106.34	-5.8%		EUR 10Y Swap	2.36	-0.13
	MSCI World	3,708	17.0%		Quality	64.58	2.6%		Yen 2Y Swap	0.65	0.46
	NASDAQ	19,311	28.6%		Size	127.58	9.4%		Yen 10Y Swap	1.05	0.20
	Nikkei 225	39,895	19.2%		Value	38.8	-16.3%		MOVE Index	98.8	-15.82
	Russell 2000	2,230	10.0%		Volatility	118.95	-4.0%		US 5Y5Y Inflation Swap	2.48	-0.04
	S&P 500	5,882	23.3%		Communications	342	38.9%		US Breakeven 2Y	2.54	0.52
S&P Equal Weight	7,101	10.9%	Consumer Discretionary	1,831	29.1%	UST Liquidity	3.08	0.14			
VIX Index	17.35	4.90	Consumer Staples	854	12.0%	Global Agg	463	-1.7%			
Currencies	AUD	1.62	-10.2%	Equity Sectors	Energy	655	2.3%	Credit Assets	HYG Index	78.65	1.6%
	Bitcoin	93,672	123.3%		Financials	804	28.4%		IG Index	318	1.2%
	BRL	6.18	-27.2%		Health Care	1,605	0.9%		LQD Index	106.84	-3.5%
	CAD	1.44	-9.1%		Industrials	1,116	15.6%		Regional Bank Index	60.35	15.1%
	CHF	0.91	-7.7%		Info Tech	4,610	35.7%		Aluminium	2,536	7.9%
	CNY	7.19	-1.5%		Materials	530	-1.8%		Copper	403	3.5%
	Currency VIX	8.5	0.77		Real Estate	256	1.7%		Dutch Nat Gas	48.79	53.0%
	DKK	7.2	-6.7%		Utilities	385	19.6%		Gold	2,625	27.2%
	DXY Index	108.49	7.1%		60/40 Index	380	15.2%		Iron Ore	779	-25.3%
	EUR	1.04	-6.3%	HFRX Equity Hedge	1,668	7.8%	Silver	28.9	21.5%		
	GBP	1.25	-1.8%	HFRX Event Driven	1,711	3.7%	US Nat Gas	3.63	44.5%		
	JPY	157.16	-11.5%	HFRX FI Credit	2,372	5.2%	WTI 12M	67.88	-2.9%		
	MXN	20.79	-22.8%	HFRX Global	1,485	5.3%	WTI 1M	71.72	0.1%		
	NOK	11.36	-11.8%	HFRX Macro/CTA	1,295	3.8%	Oil VIX	30.02	-6.20		
	NZD	1.78	-13.0%	HFRX Merger Arbitrage	1,991	-1.8%	S&P Agriculture & Livestock	368	4.3%		
	SEK	11.05	-9.6%	SG CTA	2,910	2.5%	S&P Softs	165.29	29.8%		
	TRY	35.36	-19.7%	SG Trend	3,811	2.7%	CDX EM	173	6.22		
	ZAR	18.87	-3.2%				CDX HY	312	-44.48		
						CDX IG	50	-6.79			
						ITraxx Europe	58	-0.55			
						ITraxx Xover	314	3.93			

# Description of Crisis Risk Indicators

Market Indicators	Type	Instrument (Bloomberg Ticker)	Crisis Level	Measurement	Comment
Market Risk	Volatility (Implied)	VIX	30	Average over 5 trading days	Measure of implied equity market volatility. Considered as market 'fear gauge'.
Solvency Risk	Credit Spreads	DLJHSTW	800	Average over 10 trading days	CS HY Index II. Measures average spread in basis points for U.S. high yield market.
Liquidity Risk	TED Spread (SOFR 3 Month – 3 Mo US)	BASPTDSP	100	Average over 10 trading days	Measures the risk premium financial institutions are charged for money market operations over 'risk-free'.
Flow Risk	Money Market Flows (Normalized)	GFSIFMM	1	Average over 10 trading days	Normalized measure of flows into money market. Inflows indicate investors' preference to withdraw cash from risk assets.
Dollar	Trade Weighted	BBDXY	3%	Pct move over 10 days	Value of US Dollar vs. trade weighted basket of foreign currencies. USD appreciation expected in crisis.
Gold	Spot	XAU Curncy	7%	Pct move over 10 days	Gold is considered a safe haven.
Systematic Risk Indicator	Type	Instrument (Bloomberg Ticker)	Crisis Level	Measurement	Comment
Overall Systemic Risk	BAML GFSI Indicator	GFSI	0.90	Average over 10 trading days	BoA risk indicator. Uses 24 measures, including OTC markets. Divided into three components: Risk, Flow and Skew.

## Employees' Retirement System of the State of Hawaii

February 18, 2025

Risk Budgeting

Review & Status Update



# Employees' Retirement System of the State of Hawaii

## Table of Contents

### Table of Contents

1. Goals for Today
2. Concept Review
3. Status Update



## **Goals for Today**



# Employees' Retirement System of the State of Hawaii

## Goals for Today

### Goals for Today

- The concept of *Risk Budgeting* was last discussed at the May 28, 2024, Investment Committee meeting.
  - As discussed at this meeting, the effort to incorporate risk budgeting within an institutional portfolio requires both a cultural shift as well as processes/tools for its management and monitoring.
- The purpose of this presentation is two-fold:
  1. Briefly review the concept of risk budgeting and its utility/purpose for the ERS.
  2. Update the Investment Committee on what ERS Staff and consultants have been working on.

## Concept Review



# Employees' Retirement System of the State of Hawaii

## Review

### Review

- Risk budgeting refers to the concept of managing a portfolio based on risk contributions/levels.
- While there are many definitions of risk, we are focused on the volatility of returns.
- For the purposes of this presentation and the ERS Investment Committee, we will generally focus on risk budgeting at the Total Portfolio level.
- Risk budgeting is closely related to the concept of “active risk.”
  - Active risk is the risk to be budgeted
  - Active risk and tracking error are synonymous
- At its core, active risk stems from weighting deviations compared to the benchmark:
  1. Over/underweight asset classes
    - i.e., allocation or weighting risk
  2. Within asset classes, managers holding different securities than the benchmark
    - i.e., manager or selection risk

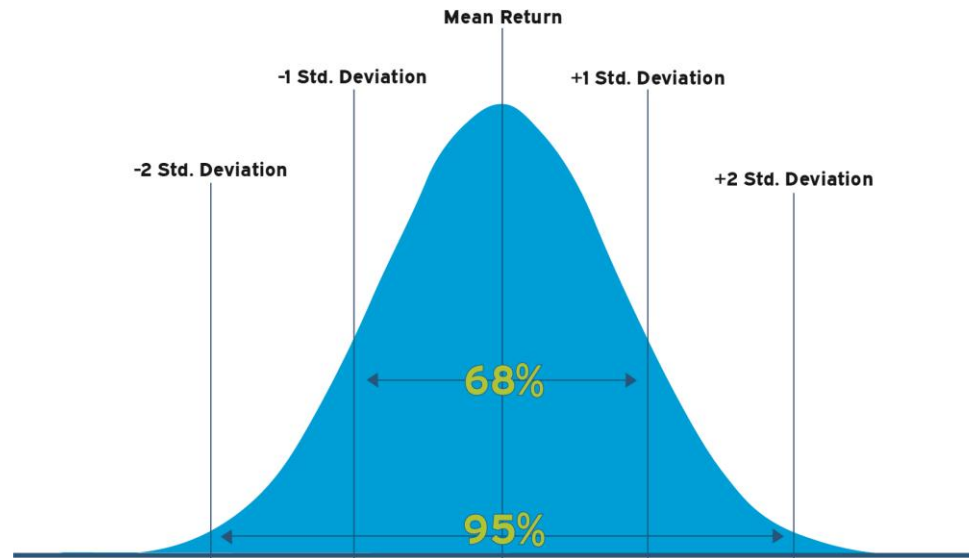


# Employees' Retirement System of the State of Hawaii

## Review

### Volatility

- Volatility is a measure of risk. It measures the variability of returns around an average.
- The higher the volatility, the greater the variation around the midpoint (e.g., average excess return).



- Volatility includes above-average returns as well as below-average; it measures dispersion.
- Returns are commonly assumed to follow a “normal distribution” as shown by the “bell curve.”
  - About 2/3rds of returns fall within one standard deviation above or below the average.



### How is Tracking Error Generated?

- Tracking error is generated by holding positions differently than a given benchmark.
- These differences can be the result of different weights or different securities (i.e., out-of-benchmark) altogether.

Levels of Tracking Error	Mechanisms to Modify Tracking Error
Individual Manager vs. Benchmark  <i>Ex: Longview vs. MSCI ACWI</i>	<ul style="list-style-type: none"><li>- Different portfolio weights of individual securities compared to the benchmark.</li><li>- Ex: higher allocation to Amazon, lower allocation to Financials, allocation to non-benchmark securities, etc.</li></ul>
ERS Asset Class vs. Class Benchmark  <i>Ex: Public Equity vs. MSCI ACWI IMI</i>	<ul style="list-style-type: none"><li>- Changes to manager/strategy weights</li><li>- Increase/decrease to passive mandates</li></ul>
ERS actual portfolio vs. policy benchmark	<ul style="list-style-type: none"><li>- Over/under allocation to asset classes compared to policy.</li><li>- Incorporation of strategies that are not held in the policy portfolio/benchmark.</li></ul>

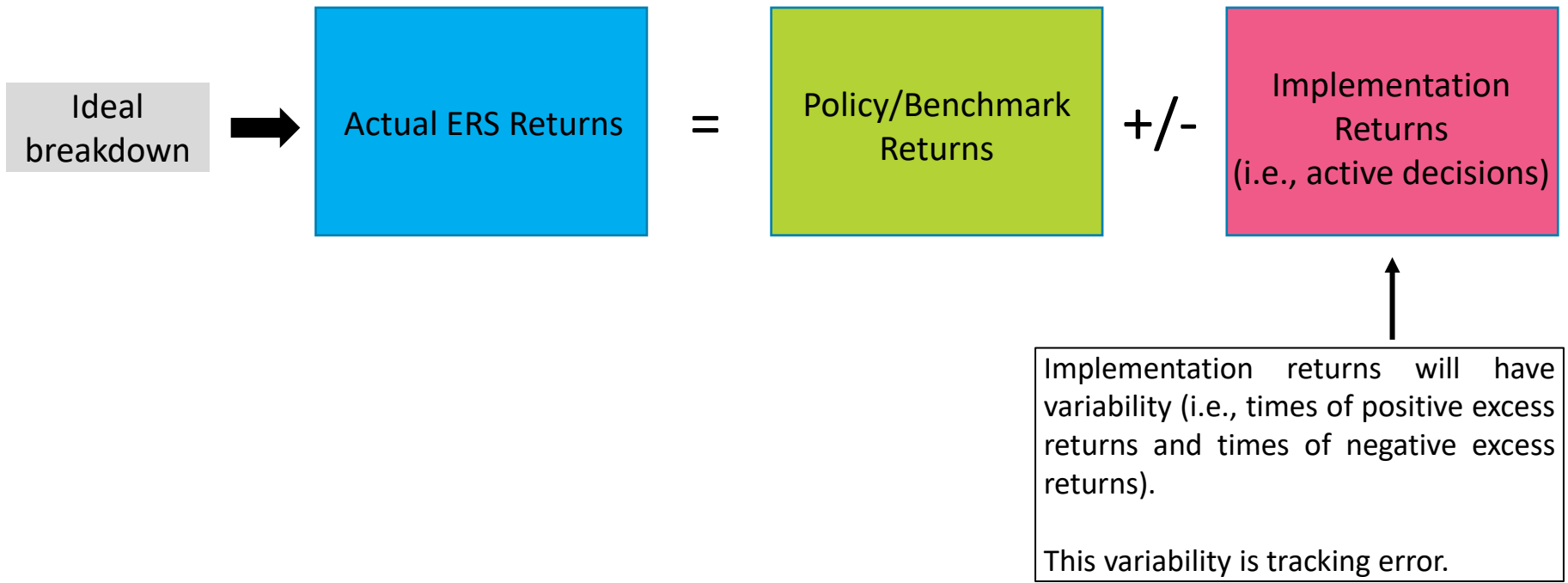
These mechanisms are additive: changes at the manager level can impact the asset class level tracking error which, in turn, can impact the total portfolio tracking error.



# Employees' Retirement System of the State of Hawaii

## Review

Implementation Decisions = Tracking Error

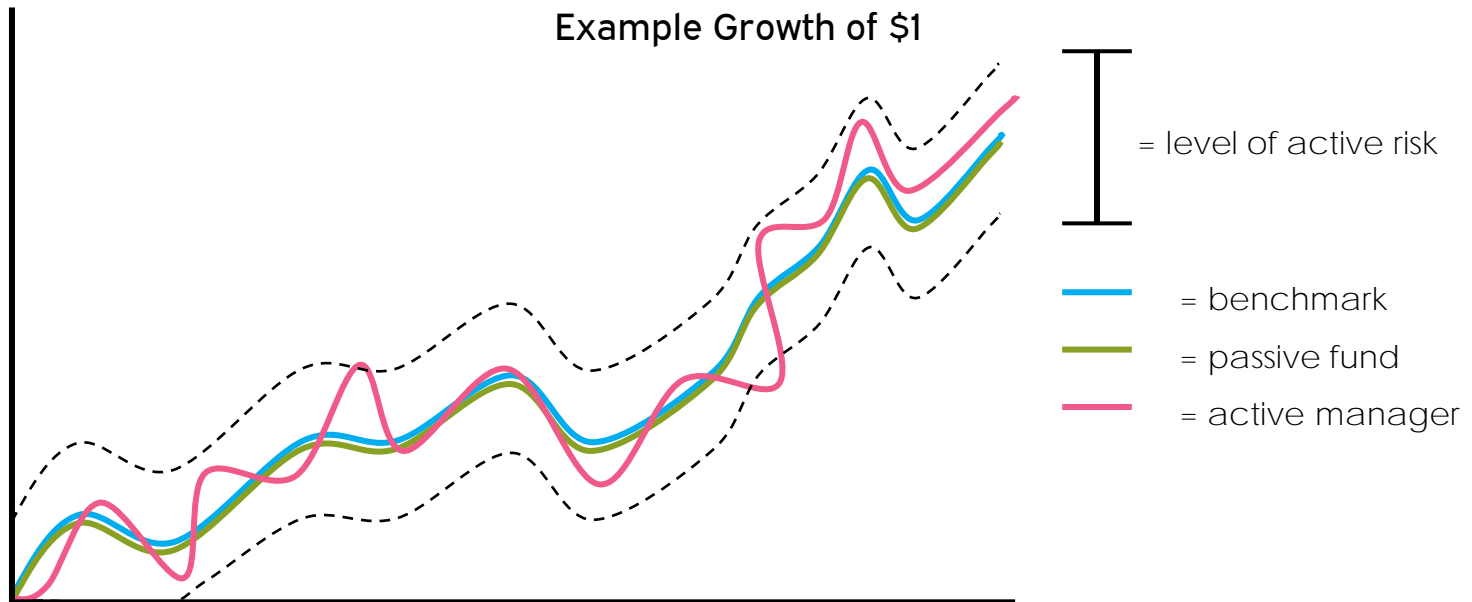


→ Thresholds (i.e., risk budgets) guide how much active risk the ERS Staff can take.



### Tracking Error

- Tracking Error = standard deviation of excess returns relative to a benchmark.
  - Also referred to as "active risk".
- The higher the tracking error, the greater the potential for positive and negative excess return outcomes.







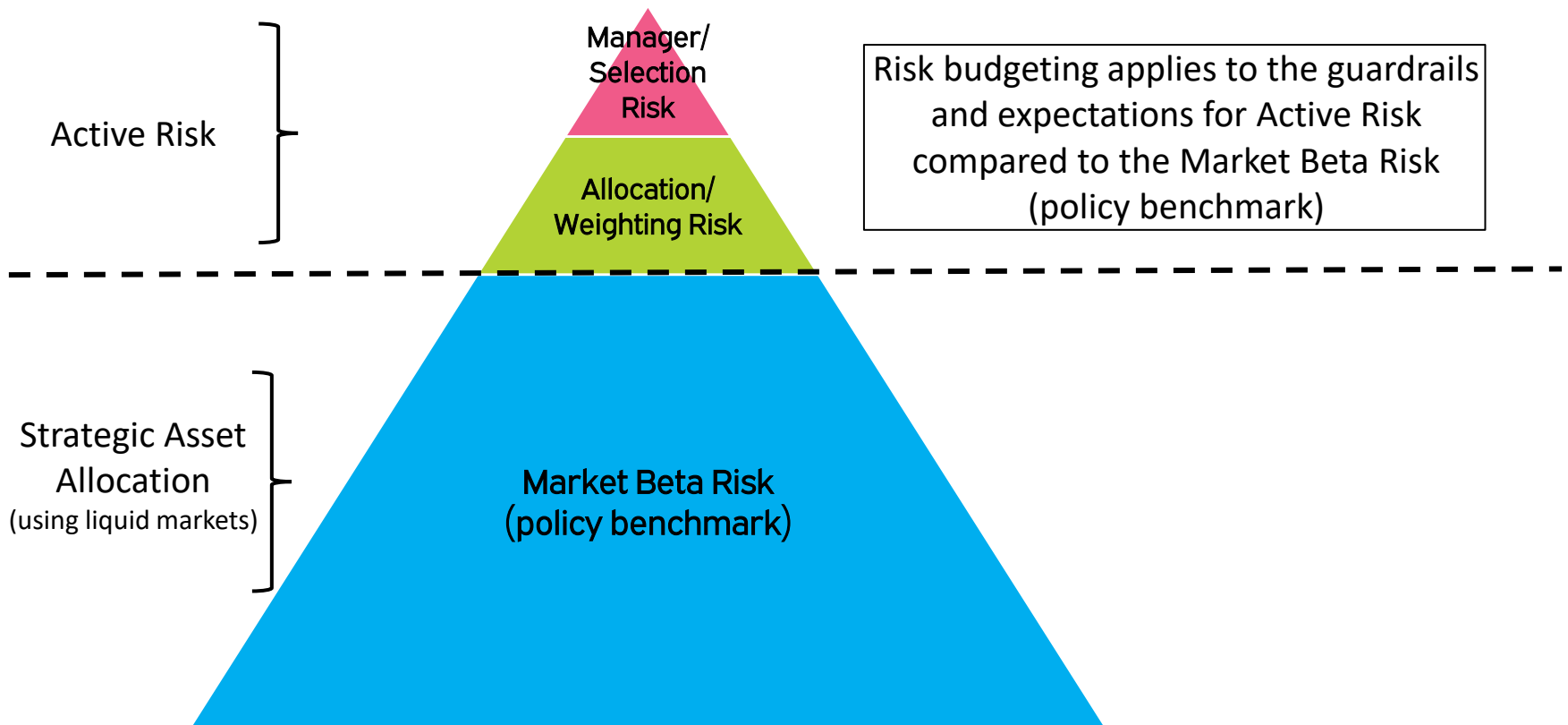
# Employees' Retirement System of the State of Hawaii

## Review

### Decomposing Total Portfolio Volatility

→ For the ERS, Total Portfolio volatility can be separated into *Market Beta Risk* (i.e., policy benchmark) and *Active Risk*.

- These components can be further separated into various sub-categories.



\*Utilizes capital market assumptions from 2022/2023 Asset-Liability Study, other Meketa assumptions, and mean-variance analysis.

## **Status Update**



# Employees' Retirement System of the State of Hawaii

## Status Update

### Actual Implementation vs. Policy Benchmark

→ With the ERS's new benchmark, there will be consistent tracking error between the actual portfolio and the benchmark purely from strategic implementation decisions (i.e., usage of private markets that are benchmarked to public market indices).

Actual Implementations		Policy Benchmark Characteristics
Global Equity	Public Equity	Public <u>Equity</u> Indices
	Private Equity	
Global Credit	Public Credit	Public <u>Credit</u> Fixed Income Indices (High Yield and Bank Loans)
	Private Credit	
Real Assets	Real Estate	Public Real Estate ( <u>REITS</u> ) Index
	Infrastructure	Public <u>Equity</u> Infrastructure Index
	Timberland	Public <u>Equity</u> Timber and Forestry Index
	Agriculture	Public <u>Commodities</u> Agriculture Index
Liquid Defensive	Systematic Trend Following	Passive-like <u>Trend Following</u> Index Public <u>Fixed Income</u> Indices (US Treasuries)
	Long US Treasuries	
	Intermediate Duration Government Bonds	
	Diversifying	
Illiquid Diversifying	Reinsurance/similar	Public Catastrophe Bond Index



Despite similar levels of volatility, the expected tracking error between the two portfolios is 4%.\*

\*Utilizes Meketa's 2025 capital market assumptions and mean-variance analysis. Actual implementation assumes passive-like implementation of all classes excluding private markets, which assume median/index returns.



# Employees' Retirement System of the State of Hawaii

## Status Update

### End Goal

- When the risk budgeting process is complete, the ERS Investment Committee will primarily be focused on one number: Total Portfolio Active Risk
  - This figure will be expressed in two forms:
    - Realized (e.g., trailing 3-years)
    - Forward-looking expected
- The IC can set a range for the active risk, and it is up to ERS Staff to manage the portfolio within that range.
- Reporting will describe what the historical generated active risk has been, where it came from, and what the IC should expect on a go-forward basis.
- While the IC will generally focus on the Total Portfolio Active Risk, the proper management and monitoring of this figure by ERS staff requires the monitoring and management of active risk at the manager and asset class levels.
  - In other words, the aggregate figure necessitates granular management.
  - As discussed in May, the first step is to develop active risk processes at granular levels that then roll-up to the Total Portfolio.

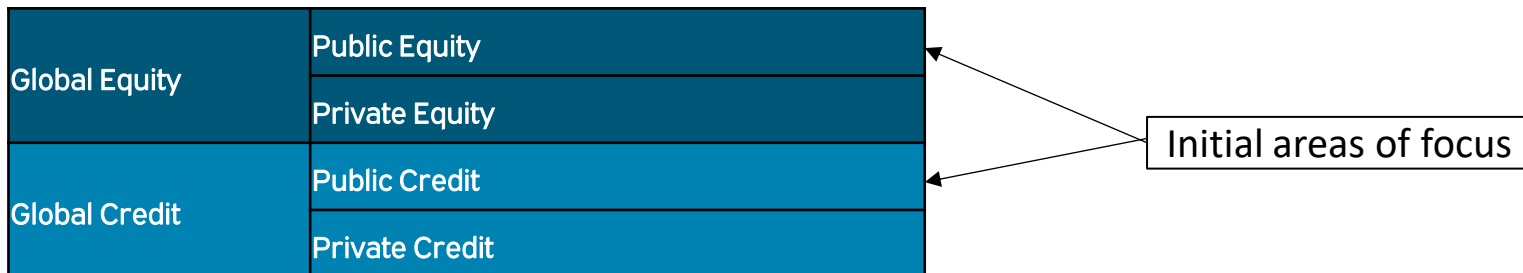


# Employees' Retirement System of the State of Hawaii

## Status Update

### Current Update

- *"You cannot manage what you do not measure."*
- ERS Staff and Meketa have begun developing appropriate processes within the Public Equity class.
  - This involves discussions with managers as well as the build-out of assumptions and tools for managing, monitoring, and reporting on active risk within the class.
  - Public Equity was chosen as the starting place given its weight within the Total Portfolio and the fact it is the easiest segment to implement.
- Additionally, ERS Staff is more actively engaging in active risk discussions when rebalancing the portfolio and underwriting managers.
  - This brings additional deliberate objectivity into portfolio management decisions.
- After Public Equity, ERS Staff and Meketa will move on to Public Credit.





# Employees' Retirement System of the State of Hawaii

## Status Update

### Next Steps

- ERS Staff and Meketa will bring risk budgeting updates to the Investment Committee regarding the progress being made throughout 2025.
- This is a long and complicated process.
- Risk budgeting will provide the Investment Committee with an additional portfolio guardrail that can be summarized in an efficient manner.
  - Formalizes expectations for active management at the IC level and provides a mechanism for oversight of uncertainty around those expectations.
    - In budgeting active risk, ERS Staff must measure the value of active decisions and determine if the risk spend will be commensurate with the return anticipated.
    - Variances should be intentional and additive.
    - Active risk opportunities should be measured and reported on for effective oversight.



# Employees' Retirement System of the State of Hawaii

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MINUTES OF THE INVESTMENT COMMITTEE OF THE  
BOARD OF TRUSTEES OF THE EMPLOYEES' RETIREMENT SYSTEM  
OF THE STATE OF HAWAII

NOVEMBER 18, 2024

CITY FINANCIAL TOWER  
201 MERCHANT STREET, SUITE 1200  
HONOLULU, HAWAII 96813

Committee Member  
Trustees present:  
(via teleconference)

Mr. Lance Mizumoto, Chair  
Mr. Emmit Kane  
Mr. Bennett Yap, Vice Chair

Absent:

Mr. Vince Barfield

Visiting Trustees  
present:  
(via teleconference)

Dr. Genevieve Ley

Attorneys present:  
(via teleconference)

Ms. Jenny Nakamoto, Deputy Attorney General  
Ms. Lori Tanigawa, Deputy Attorney General

Staff present:  
(City Financial Tower)

Ms. Kristin Varela, Chief Investment Officer  
Mr. Anthony Goo, Deputy Chief Investment Officer  
Mr. Aaron Au, Investment Officer – Illiquid Markets  
Mr. Ian Wetzel, Investment Officer – Real Assets  
Ms. Christine Chang, Investment Officer – Diversifying Strategies  
Mr. Andrew Chen, Investment Officer - Credit  
Ms. Gerri Konishi, Member Home Loan Assistant  
Ms. Masayo Zabinski, Investment Accountant  
Ms. Andrea Gaspar, Administrative Assistant  
Ms. Lori Kim, Administrative Assistant  
Ms. Diana Gomes, Administrative Assistant

Guest present:  
(via teleconference)

Mr. Colin Bebee, Meketa Investment Group, Inc.  
Mr. Jonathan Daffron, Man Group

Public present:  
(via teleconference)

Mr. Joe Ebisa, With Intelligence  
Anthony Toscano  
Jason Leong-Campbell, Meketa  
Nathan Paulsen  
Michael Barela, Voya

CALL TO ORDER

A quorum being present (Chair Mizumoto, Vice Chair Yap, Trustee Barfield, and Trustee Kane), Chair Mizumoto called the Investment Committee meeting to order at 10:01 a.m. and requested Board members to identify themselves and confirm that no other individuals are present in the room. Committee members present confirmed. Chair Mizumoto read the following statement, "Motion to hold the meeting allowing Trustees and members of the public to participate by interactive



conference technology, pursuant to HRS § 92-3.7, with at least one meeting location open to the public that has audiovisual connection.” On a motion made by Vice Chair Yap, seconded by Trustee Kane and unanimously carried, the Investment Committee meeting commenced.

## PUBLIC COMMENT PERIOD

Chair Mizumoto called for both written and public comment. There was no public comment or written testimony submitted.

## NEW BUSINESS

### DISCUSSION OF 2025 EMPLOYEES’ RETIREMENT SYSTEM INVESTMENT COMMITTEE MEETINGS

The 2025 Investment Committee meeting schedule was presented to the Investment Committee.

On a motion made by Trustee Kane, seconded by Trustee Yap and unanimously carried, the Investment Committee approved the 2025 meeting schedule.

## PRESENTATIONS

- MEKETA INVESTMENT GROUP, INC. – TOTAL FUND PERFORMANCE REVIEW FOR PERIOD ENDING SEPTEMBER 30, 2024

Mr. Colin Bebee of Meketa Investment Group presented the Total Fund Performance Review for period ending September 30, 2024. The following is a summary of the presentation:

- The ERS Total Fund continues to meet its return benchmark (7%) over the fiscal-year measurement period, and all other periods, excluding the 3-year period.
- The portfolio has lagged its market benchmark for the short-term periods of 3-years or less but has closely met or exceeded the Total Fund Policy Benchmark over the long-term horizon of 5-years or longer.
- On a risk-unadjusted basis, the portfolio tracked the Median Public Fund Peer Group for the quarter and outperformed across all long-term time periods.
- Market value for the quarter ending September 30, 2024 is \$24,036,177,828, a 2.2% net return was generated.

- TOWNSEND GROUP – REAL ASSETS PORTFOLIO REVIEW FOR PERIOD ENDING JUNE 30, 2024

IO Wetzel introduced the Rotating Alternative Asset Class Review for the Team Assets portfolio for period ending June 30, 2024, including an introduction of Real Assets portfolio and selection consultants, Mr. Jeff Leighton, Ms. Kathryn Finneran and Mr. D’metrius Grier from Townsend. The following is a summary of the presentation:

- In 2024, ERS increased the target allocation for Real Assets to 19%, from a previous target of 12%.
- Recent infrastructure, agriculture, and real estate commitments will assist the portfolio to continue to move towards its target allocation.
- The program comprises 82 active investments, across 28 GP relationships, totaling \$6.3B in commitments, and \$4.4B in net asset value.
- In 2024, \$750 million commitment for the year with seven funds. For 2025, another \$725 million will deploy with focus on infrastructure and real estate.
- ERS Real Assets has generated a since inception IRR of 7.6%, as of June 30, 2024.

- The real estate portfolio generating 7.6% net IRR and 1.4 x net equity multiple since inception. Timber portfolio generated an 8.4% net IRR and 3.1x net equity multiple since inception. Infrastructure portfolio (ex Olomana) generated a 10.8% net IRR and 1.2x net equity multiple since inception. Agriculture portfolio generated a 2.9% net IRR and 1.0x net equity multiple since inception. Olomana portfolio generated a 1.0% net IRR and 1.0x net equity multiple since inception.
  - The portfolio is following the Investment Policy Statement (IPS) and outperforming the benchmark for the current quarter and since inception and continues over the longer-term periods.
  - The portfolio is performing well over the long-term, outperforming the blended benchmark on a gross of fee basis for the five year and ten year periods.
- ANNUAL BENCHMARKING REVIEW

Mr. Colin Bebee of Meketa Investment Group presented the Annual Benchmarking Review and explained the presentation will provide a quick review of benchmarks. No changes are recommended.

Four events occurred in the last 17 months:

- 2022/2023 Asset/Liability Study & new long-term allocation targets.
- Approval of new asset class and Total Fund benchmarks.
- Implementation of new long-term allocation targets.
- Reconfiguration of asset class composites.
- Audit of historical benchmark composites.

Benchmarks:

- The ERS Board of Trustees adopted a new long-term policy portfolio in June 2023.
- In August 2023, the ERS Board of Trustees approved the new asset class and total fund benchmarks.
- The new policy structure and benchmarks were implemented on January 1, 2024.
- Better alignment between benchmarks and betas/market risks.
- Improved investability.
- Elimination of “riskless” indices.

Conclusion:

- ERS staff along with Meketa will continually review the effective benchmarks:
- Benchmark modifications may take place for the following reasons:
  - Board-directed asset allocation changes.
  - Modifications to the existing benchmarks.
  - Adjustments to ERS benchmarking philosophy or changes in industry best practices.
- No changes are proposed if ERS staff and Meketa believe current benchmarks are appropriate for the Total Portfolio.
- Benchmark reviews will occur on a regular basis with any changes proposed to the ERS Board of Trustees and Investment Committee.

On a motion made by Trustee Yap, seconded by Trustee Kane and unanimously carried, the Investment Committee accepted the Annual

Benchmark Review for recommendation to the Board of Trustees for approval.

- ANNUAL PLAN LIQUIDITY TARGET REVIEW

Mr. Colin Bebee of Meketa Investment Group presented the Annual Plan Liquidity Target Review and explained the presentation will provide a quick review of portfolio liquidity. No changes are recommended.

- Liquidity needs for a pension plan are different than other investors:
  - Consistent benefit payment outflows.
  - Private market capital calls.
  - For some closed systems, a portfolio may not have any contributions and will eventually be entirely liquidated.
  - Liquidity is important to rebalance and take advantage of investment opportunities.
- ERS conducts a comprehensive evaluation of the total portfolio's ability to meet liquidity requirements during asset-liability studies (every 3-5 years).
- Liquidity requirements include projected benefit payments over a 20-year period and private markets commitments/distributions over the first five years.
- Portfolios are examined under severe liquidity stress tests to assess the ability to meet liquidity requirements.
- Mature public pension systems require liquidity concerns.
- Liquidity is complex and it is important to examine each asset class under periods of market stress.
- During periods of market stress, liquidity should be accessed from asset classes with stable/improving values and low transaction costs.
- Based on current market values and actuarial projections, ERS staff and Meketa recommend that the 5% minimum remain unchanged for the calendar year 2025.

On a motion made by Trustee Yap, seconded by Trustee Kane and unanimously carried, the Investment Committee accepted the Annual Plan Liquidity Target Review for recommendation to the Board of Trustees for approval.

- ANNUAL INVESTMENT POLICY STATEMENT REVIEW

CIO Varela presented the Annual Investment Policy Statement (IPS) Review. CIO Varela noted upon the review of original recommended revisions, as provided on November 13, 2024. Staff and Committee Chair identified areas to further revised, focused on consistency of terminology, correction of administrative typos, and streamlining processes. Revised recommendations, as provided on November 18, 2024, include all proposed revisions. Listed below are the recommended revisions to the IPS.

### **SECTION C – ERS GENERAL INVESTMENT OVERVIEW**

*Section C.7 Responsible Investing. Page 12.*

Update definition and language for “Responsible Investing” to account for systemic risk factors, to align with ERS goals and objectives.

*Section C.7.1 Responsible Investing – Proxy Voting. Pages 13-15.*  
Update language to delete specific references to the proxy voting administrator by name and redundancy and include guidance for ERS investment managers with delegated proxy authority to eliminate reference to vendor by name in IPS and for clarity.

## **SECTION D – BROAD GROWTH PROGRAM**

*Section D.2 – Class Structure, 1. Components, a. Private Equity. Page 3.*

Changed introductory language to reference private equity, instead of public equity to correct a typo.

## **SECTION D – BROAD GROWTH APPENDIX**

*Derivatives Policy. Page 8.*

Delete prohibitive language in first paragraph. Section 4, Permitted Instruments allows for the full scope of investable derivative instruments.

*Real Assets Component – Various Sections. Pages 9-12.*

Update reference to selection consultant, from Real Estate Consultant to Real Assets Consultant to align with contracted responsibilities of selection consultant, covering total Real Asset portfolio.

*Real Estate Sub-Component Sections 1a, 1.b, 2.a, 2.c. Pages 12-13.*

Update language to align with current practice to consolidate the naming convention of Core and Non-Core Real Estate to align, Separate Account Tactical Plan with current practice and to broaden leverage expectations in alignment with market implementations.

*Real Estate Sub-Component Sections 3.c.iv, 3.c.vi, 3.d.viii. Pages 14-15.*

Update language of Value -Add and Opportunistic Real Estate general characteristics to ensure alignment with Infrastructure and Agriculture Sub-Component policies.

*Real Estate Sub-Component Sections 4.c. Pages 14-15.*

Elimination of Section C, Target Portfolio, to remove target portfolio references to legacy benchmark, no longer utilized by ERS as specific guidelines as no longer relevant.

*Real Estate Sub-Component Sections 5.a, 6.a (i-iii), 6.b.i. Pages 16-17.*

Updated reference to selection consultant from Real Estate Consultant to Real Assets Consultant to align with contracted responsibilities of selection consultant covering total Real Asset portfolio.

*Timber Sub-Component, Sections 2.a, 2.b, 2.b.ii. Page 18-19.*

Update reference to selection consultant from Real Estate Consultant to Real Assets Consultant to align with contracted responsibilities of selection consultant, covering total Real Asset portfolio.

On a motion made by Trustee Yap, seconded by Trustee Kane and unanimously carried, the Investment Committee accepted the Annual Investment Policy Statement Review for recommendation to the Board of Trustees for approval.

- CIO UPDATE

CIO Varela informed the Investment Committee that the Investment Accountant, Ms. Masayo Zabinski, joined ERS on October 1, 2024. She transferred from the Department of Transportation – Harbors Division. Ms. Zabinski is working with the accounting team and the investment team by building out the custody bank accounting book of record, strengthen portfolio reconciliation, and systematize internal processes.

APPROVAL OF MINUTES – AUGUST 19, 2024

On a motion made by Trustee Kane and seconded by Trustee Yap, and unanimously carried, the Investment Committee approved the minutes of August 19, 2024, meeting as presented.

[Before entering Executive Session, Chair Mizumoto read the names of all authorized participants. All unauthorized participants were asked to leave the meeting.]

ENTER EXECUTIVE SESSION

On a motion made by Trustee Kane, seconded by Trustee Yap, and unanimously carried, the Investment Committee entered Executive Session at 11:41 a.m.

EXECUTIVE SESSION

[At the beginning of Executive Session, Chair Mizumoto asked each participant individually to confirm no unauthorized person is present or able to hear them at their remote locations or via another audio or audiovisual connection. All responded they were by themselves.]

EXECUTIVE SESSION, PURSUANT TO HRS § 88-27.5(A)(1), AND HRS § 92-5(A)(4), TO CONDUCT DISCUSSIONS AND DELIBERATIONS RELATING TO, AND IF APPROPRIATE, TO MAKE A DECISION ON INVESTMENTS OR PROSPECTIVE INVESTMENTS BY THE SYSTEM THAT REQUIRE THE CONSIDERATION OF INFORMATION OR RECORDS THAT ARE EXEMPT FROM DISCLOSURE UNDER HRS CHAPTER 92F, INCLUDING INFORMATION AND RECORDS THAT ARE PROPRIETARY INFORMATION OR CONFIDENTIAL BUSINESS INFORMATION, AND TO CONSULT WITH THE BOARD'S ATTORNEYS ON QUESTIONS AND ISSUES PERTAINING TO THE BOARD'S POWERS, DUTIES, PRIVILEGES, IMMUNITIES, AND LIABILITIES WITH RESPECT TO UPDATES ON STATUS OR ISSUES RELATED TO CONFIDENTIAL ERS INVESTMENT

PORTFOLIO UPDATES REGARDING  
CHANGES IN (1) UPDATE ON  
CLOSURE OF WEISS ASSET  
MANAGEMENT, (2) MAN  
OPERATIONAL RISK PROCESS  
UPDATE (3) INVESTMENT OFFICE  
STAFFING UPDATES.

APPROVAL OF EXECUTIVE  
SESSION MINUTES – AUGUST 19,  
2024

On a motion made by Trustee Kane, seconded by Trustee Yap and unanimously carried, the Investment Committee approved the confidential Executive Session minutes of the August 19, 2024 as presented.

EXIT EXECUTIVE SESSION

On a motion made by Trustee Yap, seconded by Trustee Kane, and unanimously carried, the Investment Committee exited Executive Session at 12:03 a.m.

SUMMARY OF EXECUTIVE  
SESSION

Chair Mizumoto summarized what was discussed in Executive Session:

- Update on Closure of Weiss Asset Management.
- Man Operation risk process update.
- Investment office staffing update.
- Approved Executive Session minutes.

ADJOURNMENT

On a motion made by Trustee Kane, seconded by Trustee Yap, and unanimously carried, Chair Mizumoto adjourned the meeting at 12:04 a.m.

**REDACTED  
SIGNATURE**

Kristin Varela  
Chief Investment Officer  
KV/dlg