



**County Employees Retirement System
Investment Committee – Regular Meeting
February 28, 2024 at 2:00 PM ET
Live Video Conference/Facebook Live**

AGENDA

- | | |
|--|---|
| 1. Call to Order | Dr. Merl Hackbart |
| 2. Opening Statement | Legal Services |
| 3. Roll Call | Sherry Rankin |
| 4. Public Comment | Sherry Rankin |
| 5. Approval of Minutes* -- January 24, 2024 | Dr. Merl Hackbart |
| 6. Asset Allocation Recommendation* | Steve Willer
David Lindberg
Craig Morton
Chris Tessman |
| 7. Investment Office Quarterly Update | Steve Willer |
| 8. Strategic Planning Process | Dr. Merl Hackbart |
| 9. ADJOURN | Dr. Merl Hackbart |

****Committee Action May Be Taken***

**MINUTES OF MEETING
COUNTY EMPLOYEES RETIREMENT SYSTEM
SPECIAL CALLED INVESTMENT COMMITTEE MEETING
JANUARY 24, 2024, AT 2:00 P.M., E.T.
VIA LIVE VIDEO TELECONFERENCE**

At the special called meeting of the County Employees Retirement System Investment Committee held on January 24, 2024, the following Committee members were present: Dr. Merl Hackbart (Chair), George Cheatham, Dr. Martin Milkman, and William O'Mara. Staff members present were Rebecca Adkins, Erin Surratt, Victoria Hale, Steve Willer, Anthony Chiu, Joseph Gilbert, Brian Caldwell, Ashley Gabbard, Shaun Case, Katie Park, and Sherry Rankin. Also in attendance were CERS CEO Ed Owens, III, Eric Branco with Johnson Bowman Branco, LLP and David Lindberg, Chris Tessman, and Craig Morton with Wilshire Advisors.

Dr. Hackbart called the meeting to order.

Mr. Branco read the Opening Statement.

Ms. Rankin took Roll Call.

Ms. Rankin advised that three (3) **Public Comments** were submitted and read each comment aloud:

Submitted by Mark Doran

I'm a retired CERS member. My employer and I both contributed to a plan that was 100% funded during the majority of my career, then the unfunded liability exploded when it was my turn to benefit. I totally understand the underfunding concerns and the necessity to address them, but our last COLA was 2011. No one can really expect retirees to live on a stagnated benefit forever. I

understand the legislative responsibilities and legislative actions regarding CERS in the past 15 years, the funding responsibilities and the CERS Board relationship. In short, it's built a red-tape system of no accountability to the CERS retirees. My question to you is how do you plan to represent retirees regarding a cost-of-living adjustment. Currently, a COLA would require funding from the contributing participants. Politically, that's a move CERS doesn't want to make, so other options to tweak legislation for COLA funding should be explored. The legislature won't move without your input and we're depending on you to represent us all. What help do you offer us.

Submitted by Ezell Michael

We need to stand up and let the legislators know that the retirees of both KERS and CERS need some relief from the effects of inflation, even if it is just a one time adjustment. I do realize that it will take a separate bill for CERS to get some relief, but we need to do what we need to do

Submitted by Karla Shuttlrworth

We deserve an increase in our retirement.

Dr. Hackbart introduced agenda item ***Approval of Minutes – November 28, 2023*** (Video 00:08:46 to 00:09:26). Mr. O'Mara made a motion to approve the minutes of the November 28, 2023, Investment Committee Meeting as presented. Mr. Cheatham seconded the motion and the motion passed unanimously.

Dr. Hackbart introduced agenda item ***Preliminary Quarterly Performance Update*** (Video 00:09:27 to 00:21:24). Mr. Willer presented preliminary performance data for the six months ending December 31, 2023.

Dr. Hackbart introduced agenda item ***Real Assets Investment Manager Recommendation – Saba Capital Management*** (Video 00: 00:21:25 to 01:13:25). Mr. Willer and Mr. Chiu presented a real return investment opportunity with Saba Capital Management (Saba).

Saba is a New York-based investment firm founded in 2009 focused on relative value and arbitrage strategies. Saba utilizes its credit analysis and trading background to arbitrage dislocations and hedge risk across capital structures and markets.

The KPPA Office of Investments recommended an investment of \$175 million to be shared among all CERS plans pending successful investment management agreement negotiations. When fully funded, this would represent an additional ~1.0-1.1% of plan assets, said Mr. Willer and Mr. Chiu.

Dr. Milkman made a motion for KRS to investment \$175 million with Saba Capital pending successful contract negotiations and to forward the recommendation to the CERS Board of Trustees for ratification. Mr. O'Mara seconded the motion. Mr. Cheatham stated that he had significant questions unanswered; however, the motion passed unanimously.

Mr. Cheatham expressed concern regarding the lack of choices presented and language in the CERS Investment Policy Statement (IPS) about the termination of investment managers without

the involvement of the Board of Trustees. The Committee requested that Mr. Willer and Mr. Chiu provide additional information at the next meeting of the CERS Board of Trustees.

Dr. Hackbart requested a motion to *adjourn*. A motion was made by Dr. Milkman and seconded by Mr. O'Mara to adjourn the meeting. The motion passed unanimously.

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CERTIFICATION

I do certify that I was present at this meeting, and I have recorded above the action of the Committee on the various items considered by it at this meeting. Further, I certify that all requirements of KRS 61.805-61.850 were met in connection with this meeting.

Recording Secretary

I, as Chair of the County Employees Retirement System Investment Committee of the Board of Trustees of the County Employees Retirement System, do certify that the Minutes of the meeting held on January 24, 2024, were approved by the County Employees Retirement System Investment Committee on February 28, 2024.

Committee Chair

I have reviewed the Minutes of the County Employees Retirement System Investment Committee Meeting on January 24, 2024, for form, content, and legality.

Office of Legal Services

Wilshire



County Employees Retirement System – CERS

Asset Allocation Analysis

November 2023

Contents

Background & Overview

Asset Allocation Approach

Asset Allocation Inputs

Asset Liability Projections

Observations & Recommendations

Appendix

Wilshire

Background & Overview

Background & Overview

- The asset allocation decision is the most important decision an investor can make
 - The asset allocation decision drives 90% of return variability among portfolios
- Wilshire recommends revisiting the asset allocation decision every three to five years, or sooner, as market conditions warrant
 - KRS (pre-separation) last reviewed asset allocation in February of 2022; The last full asset-liability study was conducted in November 2020
 - In order to meet the then 6.25% discount rate, given the capital market assumptions at the time, increased exposure to public equities were approved by reducing allocations to fixed income and diversifying asset classes.
- The market environment in 2023 is much different than that of 2020, largely driven by a regime change that resulted in significantly higher interest rates allowing fixed income to once again play a prominent role in client portfolios
- What have we done to date regarding the study?
 - Worked with staff to confirm policies to model as a component of a mean-variance analysis
 - Collected most recent CERS actuarial data

Opportunity

CERS has the opportunity to look forward and reduce risk in a meaningful way without compromising returns

- Fixed income assets provide utility again
- Forward-looking returns on equities are subdued due to high valuations and recent strong returns
- Expected returns for several policy options are comfortably above CERS' actuarial assumed return of 6.50%

Focus of the 2023 Asset Liability Study

- Review liability characteristics and model various asset policies to complement CERS' liability structure
- Consider alternative strategic asset allocation policies that can reduce risk, as measured by expected volatility and the portfolio's economic factor exposures to growth and inflationary environments, while maintaining similar expected returns as the current asset allocation policy
 - Improve ability to withstand market drawdowns
 - Back off additional growth exposure/risk previously needing to be underwritten to reach return hurdles

Wilshire

Observations & Recommendation

Observations and Recommendations

Wilshire recommends that The Board adopt one of the two lower risk policies set forth in this presentation based on The Board's desired risk profile

Overview of Recommended Policies

Lower Risk A

- Public Equity constrained to minimum of 45%
- Slight reduction in Private Equity to 8%
- Increased allocation to Specialty Credit (23%)
- Modest cash allocation of 2%
- Core Fixed Income remains at 10%
- Same expected return as Current Policy (6.95%)
- Lower Expected Risk by just over 1%
- Sharpe Ratio of .26

Lower Risk B

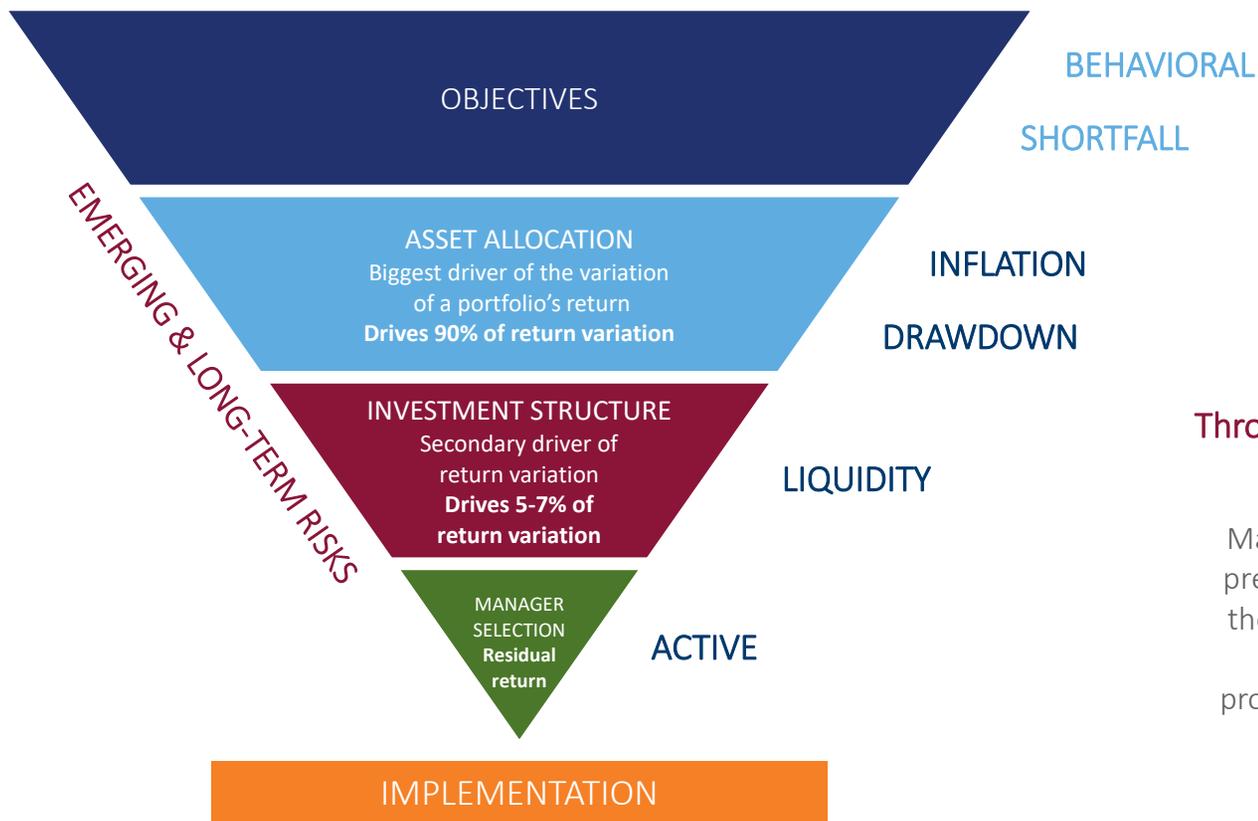
- Public Equity constrained to minimum of 40%
- Slight reduction in Private Equity to 7.5%
- Increased allocation to Specialty Credit (20%*)
- Modest cash allocation of 2%
- Increased Core Fixed Income Allocation to 15.5%
- Slightly reduced expected return when compared to Current Policy (6.86%, or 9 bps less)
- Lower Expected Risk by 1.94%
- Sharpe Ratio of .28

* Lower Risk B used a maximum of 20% to Specialty Credit

Wilshire

Asset Allocation Approach

Focus on Decisions That are Most Impactful



Address Key Risks Throughout the Investment Process

Many of the six key risks are present at multiple points in the investment process, but each distinct step in the process is focused on one or two primary risks.

Risk Assessment Framework

Wilshire’s multi-dimensional view of risk integrates organizational and investment considerations into a comprehensive framework for evaluating strategic decisions.

Shortfall: Support distributions and long-term growth

Behavioral: Instill strong governance

Drawdown: Limit portfolio losses

Inflation: Preserve long-term purchasing power

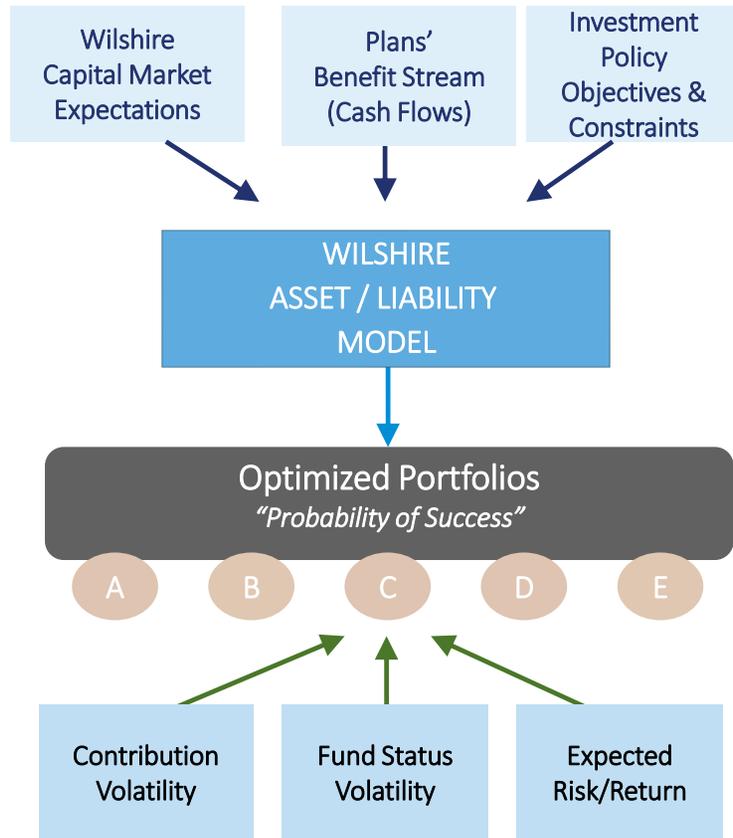
Liquidity: Balance near-term needs, long-term opportunities

Active: Ensure unique exposures

Emerging & Long-Term: Environmental, Social & Governance risks, such as externalities, intangibles and reputation may be linked to various risk lenses



Asset Allocation Process



- The mission of a defined benefit plan is to fund benefits promised to participants
- The role of asset allocation is to manage risk in order to fulfill that core mission
 - **Maximize safety** of promised benefits
 - **Minimize cost** of funding these benefits
- Wilshire’s Asset Liability Model provides methodology for selecting a target portfolio that considers both goals
- Rigorously developed capital market assumptions for risk and return (see appendix)
- Given that short-term volatility is also important, we identify the impact of the asset allocation decision on funded ratios, annual contribution requirements, and other metrics
- Strategic asset allocation is not a guide to outperforming in every market ... but it should provide a roadmap for success over a market cycle

Wilshire

Asset Allocation Inputs

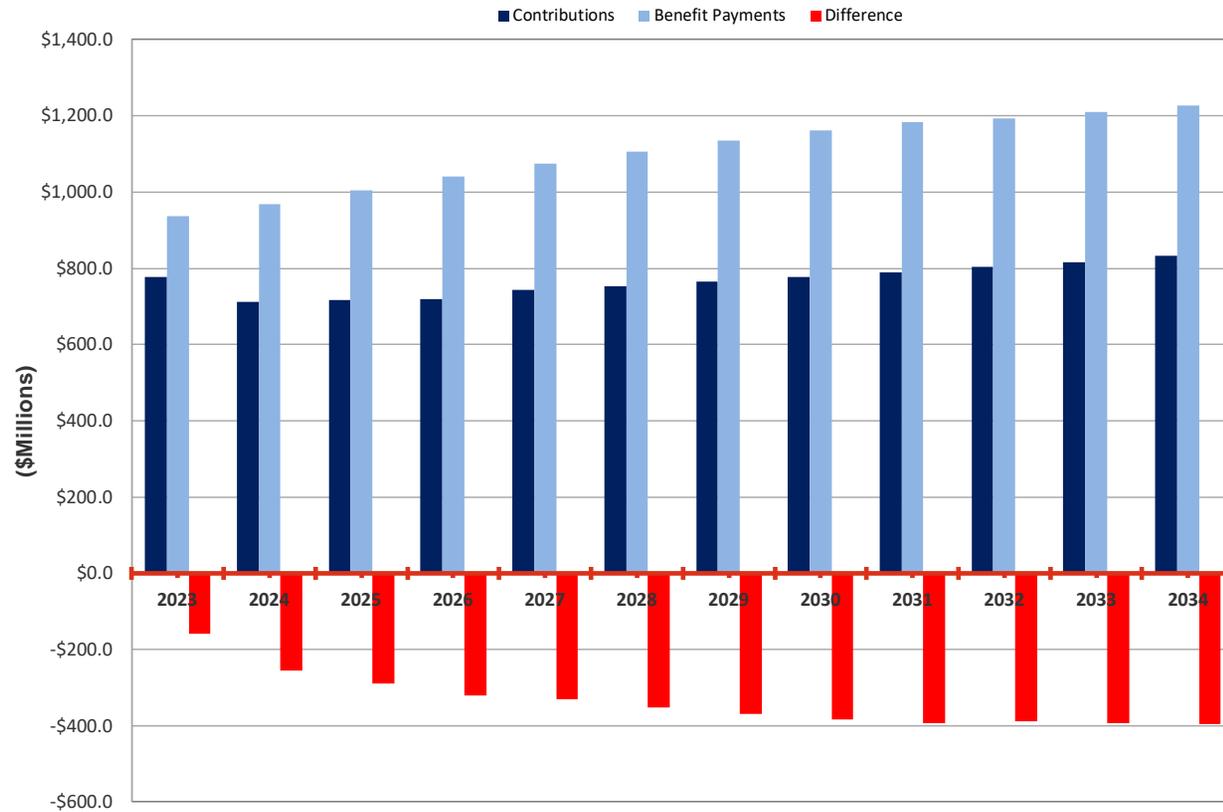
CERS NON-HAZARDOUS RETIREMENT PLAN

Plan Status

	June 30, 2022	June 30, 2023
Asset and Liability Data (\$ - Millions)		
1. Actuarial Accrued Liability (AAL)	15,674.0	15,111.0
<u>2. Market Value of Assets (MVA)</u>	<u>7,963.6</u>	<u>8,693.8</u>
3. AAL MVA Funded Status (Unfunded Liability) (1. - 2.)	7,710.4	6,417.2
<u>4. AAL MVA Funded Ratio (2. / 1.)</u>	<u>50.8%</u>	<u>57.5%</u>
5. Actuarial Value of Assets (AVA)	8,149.0	8,570.1
6. AAL AVA Funded Status (Unfunded Liability) (1. - 5.)	7,525.0	6,540.9
<u>7. AAL AVA Funded Ratio (5. / 1.)</u>	<u>52.0%</u>	<u>56.7%</u>
Economic Assumptions		
Discount Rate	6.25%	6.50%

- June 30, 2022, data was provided in the actuarial valuation report by the plan actuary.
- June 30, 2023, data was projected by Wilshire using data from the report and additional metrics provided by the actuary.

Projected Cashflow



• *Benefit payments and contributions (both employer and member) were provided by plan actuary.*

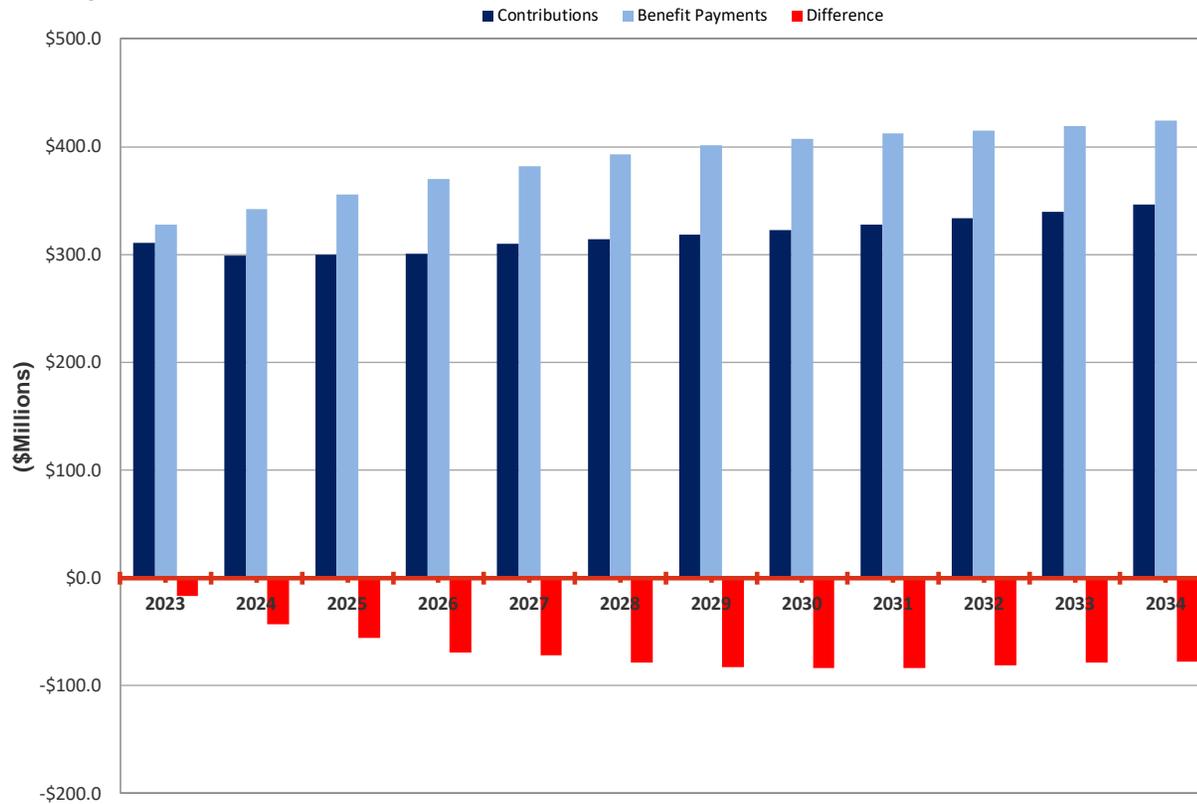
CERS HAZARDOUS RETIREMENT PLAN

Plan Status

	June 30, 2022	June 30, 2023
Asset and Liability Data (\$ - Millions)		
1. Actuarial Accrued Liability (AAL)	5,861.7	5,747.0
<u>2. Market Value of Assets (MVA)</u>	<u>2,718.2</u>	<u>3,006.3</u>
3. AAL MVA Funded Status (Unfunded Liability) (1. - 2.)	3,143.5	2,740.7
<u>4. AAL MVA Funded Ratio (2. / 1.)</u>	<u>46.4%</u>	<u>52.3%</u>
5. Actuarial Value of Assets (AVA)	2,788.7	2,983.7
6. AAL AVA Funded Status (Unfunded Liability) (1. - 5.)	3,073.0	2,763.3
<u>7. AAL AVA Funded Ratio (5. / 1.)</u>	<u>47.6%</u>	<u>51.9%</u>
Economic Assumptions		
Discount Rate	6.25%	6.50%

- June 30, 2022, data was provided in the actuarial valuation report by the plan actuary.
- June 30, 2023, data was projected by Wilshire using data from the report and additional metrics provided by the actuary.

Projected Cashflow



- Benefit payments and contributions (both employer and member) were provided by plan actuary.

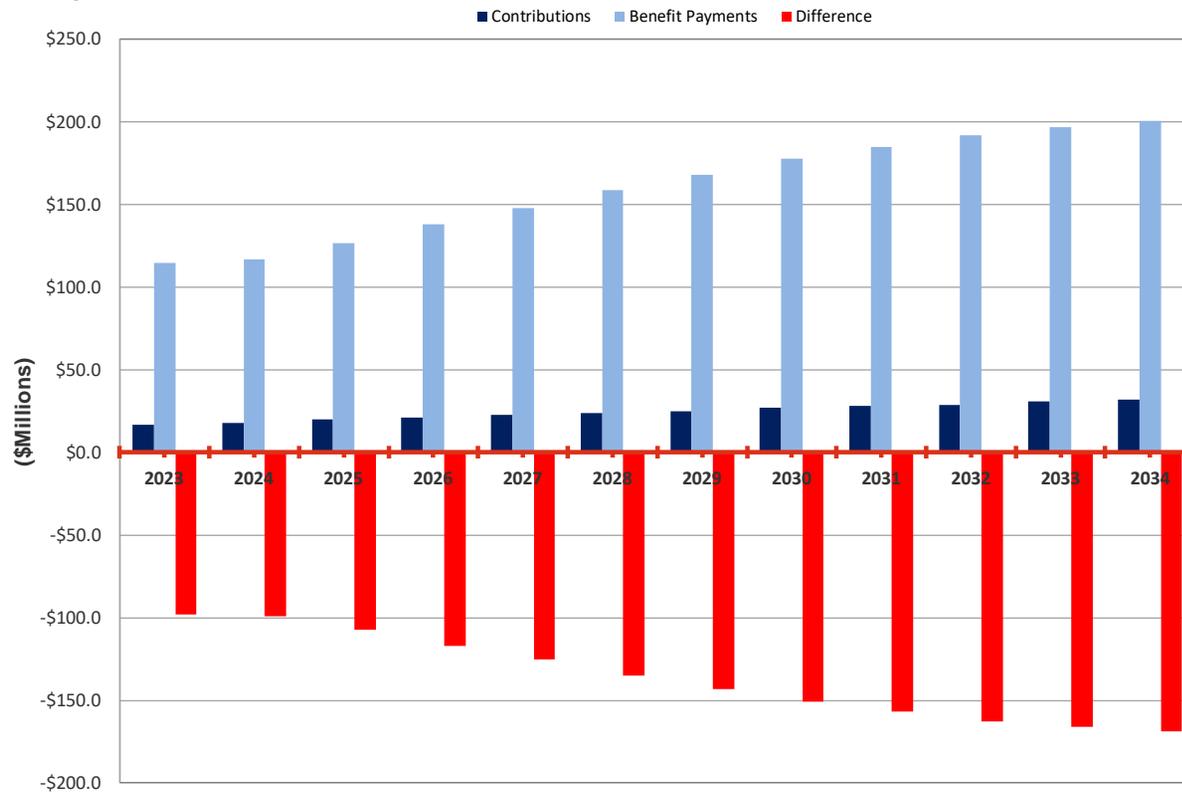
CERS NON-HAZARDOUS INSURANCE PLAN

Plan Status

	June 30, 2022	June 30, 2023
Asset and Liability Data (\$ - Millions)		
1. Actuarial Accrued Liability (AAL)	2,392.0	2,350.0
<u>2. Market Value of Assets (MVA)</u>	<u>3,080.0</u>	<u>3,274.9</u>
3. AAL MVA Funded Status (Unfunded Liability) (1. - 2.)	(688.0)	(924.9)
<u>4. AAL MVA Funded Ratio (2. / 1.)</u>	<u>128.8%</u>	<u>139.4%</u>
5. Actuarial Value of Assets (AVA)	3,160.1	3,277.4
6. AAL AVA Funded Status (Unfunded Liability) (1. - 5.)	(768.1)	(927.4)
<u>7. AAL AVA Funded Ratio (5. / 1.)</u>	<u>132.1%</u>	<u>139.5%</u>
Economic Assumptions		
Discount Rate	6.25%	6.50%

- June 30, 2022, data was provided in the actuarial valuation report by the plan actuary.
- June 30, 2023, data was projected by Wilshire using data from the report and additional metrics provided by the actuary.

Projected Cashflow



- *Benefit payments and contributions (both employer and member) were provided by plan actuary.*

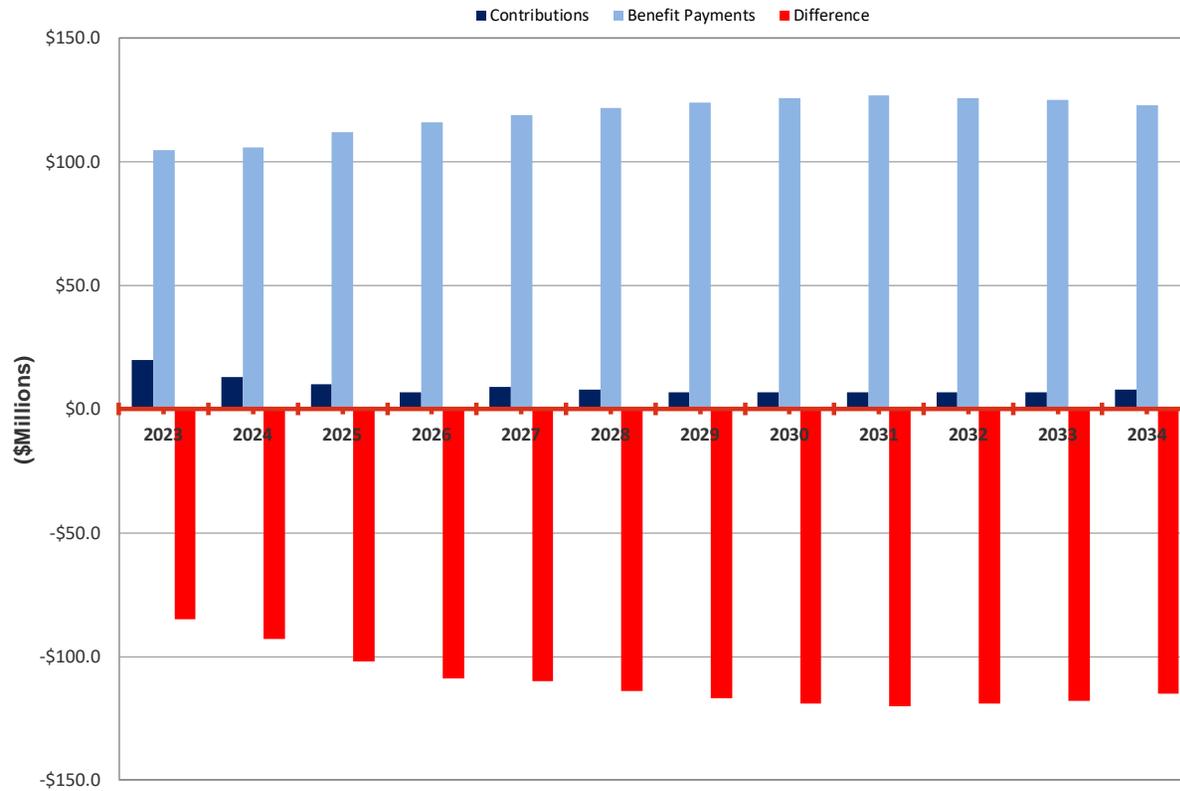
CERS HAZARDOUS INSURANCE PLAN

Plan Status

	June 30, 2022	June 30, 2023
Asset and Liability Data (\$ - Millions)		
1. Actuarial Accrued Liability (AAL)	1,538.1	1,506.0
<u>2. Market Value of Assets (MVA)</u>	<u>1,522.7</u>	<u>1,606.0</u>
3. AAL MVA Funded Status (Unfunded Liability) (1. - 2.)	15.5	(100.0)
<u>4. AAL MVA Funded Ratio (2. / 1.)</u>	<u>99.0%</u>	<u>106.6%</u>
5. Actuarial Value of Assets (AVA)	1,553.8	1,579.8
6. AAL AVA Funded Status (Unfunded Liability) (1. - 5.)	(15.6)	(73.8)
<u>7. AAL AVA Funded Ratio (5. / 1.)</u>	<u>101.0%</u>	<u>104.9%</u>
Economic Assumptions		
Discount Rate	6.25%	6.50%

- June 30, 2022, data was provided in the actuarial valuation report by the plan actuary.
- June 30, 2023, data was projected by Wilshire using data from the report and additional metrics provided by the actuary.

Projected Cashflow



- *Benefit payments and contributions (both employer and member) were provided by plan actuary.*

BOTH PLANS

Plan Status – As of June 30, 2023

	CERS Non-Hazardous Pension	CERS Hazardous Pension	CERS Non-Hazardous Insurance	CERS Hazardous Insurance
Asset and Liability Data (\$ - Millions)				
1. Actuarial Accrued Liability (AAL)	15,111.0	5,747.0	2,350.0	1,506.0
<u>2. Market Value of Assets (MVA)</u>	<u>8,693.8</u>	<u>3,006.3</u>	<u>3,274.9</u>	<u>1,606.0</u>
3. AAL MVA Funded Status (Unfunded Liability) (1. - 2.)	6,417.2	2,740.7	(924.9)	(100.0)
<u>4. AAL MVA Funded Ratio (2. / 1.)</u>	<u>57.5%</u>	<u>52.3%</u>	<u>139.4%</u>	<u>106.6%</u>
5. Actuarial Value of Assets (AVA)	8,570.1	2,983.7	3,277.4	1,579.8
6. AAL AVA Funded Status (Unfunded Liability) (1. - 5.)	6,540.9	2,763.3	(927.4)	(73.8)
<u>7. AAL AVA Funded Ratio (5. / 1.)</u>	<u>56.7%</u>	<u>51.9%</u>	<u>139.5%</u>	<u>104.9%</u>
Economic Assumptions				
Discount Rate	6.50%	6.50%	6.50%	6.50%

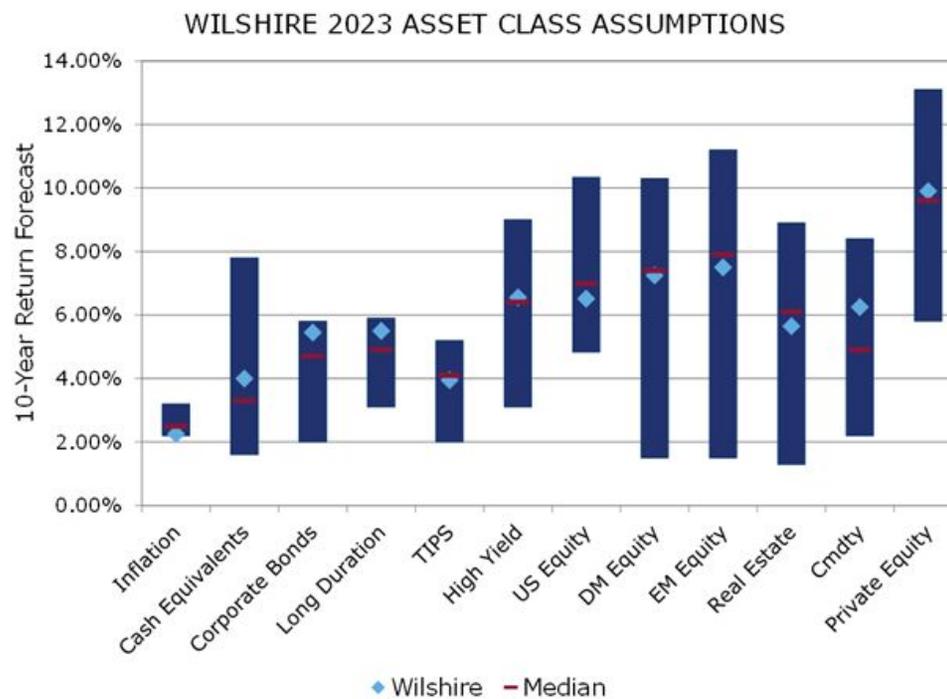
- June 30, 2023, data was projected by Wilshire using data from the report and additional metrics provided by the actuary.

Self Assessment

Wilshire participates in an annual survey of other industry service providers to compare our capital market assumptions against others.

The chart to the right shows the distribution of expected returns over 10 years from the participants with Wilshire's ranking represented by the blue diamond.

Wilshire's CMAs vs. Peers



Capital Market Assumptions – KPPA Bucketing

Wilshire’s Capital Market Assumptions as of **June 30, 2023**

Wilshire’s asset class return, risk and correlation assumptions are developed on multi-year forward looking expected rates of return and historical risk and correlation, adjusted to incorporate recent trends

Public market return expectations represent a passive investment in the asset class (beta). They do not reflect value added from active management (alpha).

Asset Classes	Expected Return 10 Years	Expected Return 30 Years	Risk	Cash Yield	Factor Exposure Growth	Factor Exposure Inflation	Liquidity Market Level	Liquidity Stressed Metric
Public Equity	6.15	7.15	17.10	2.05	8.00	-1.30	90	0
Private Equity	9.15	9.95	27.80	0.00	13.35	-3.80	0	0
Core Fixed Income	4.85	4.80	4.70	4.95	-0.95	-2.50	100	85
Specialty Credit	7.40	7.40	9.05	9.70	3.50	-0.50	30	0
Cash	3.85	3.55	0.75	3.85	0.00	0.00	100	100
Real Estate	6.00	6.95	13.95	2.30	3.70	1.00	0	0
Real Return	6.85	7.35	10.65	3.60	2.15	5.80	0	0

Capital Market Assumptions – Wilshire Bucketing

Wilshire’s Capital Market Assumptions as of **June 30, 2023**

Wilshire’s asset class return, risk and correlation assumptions are developed on multi-year forward looking expected rates of return and historical risk and correlation, adjusted to incorporate recent trends

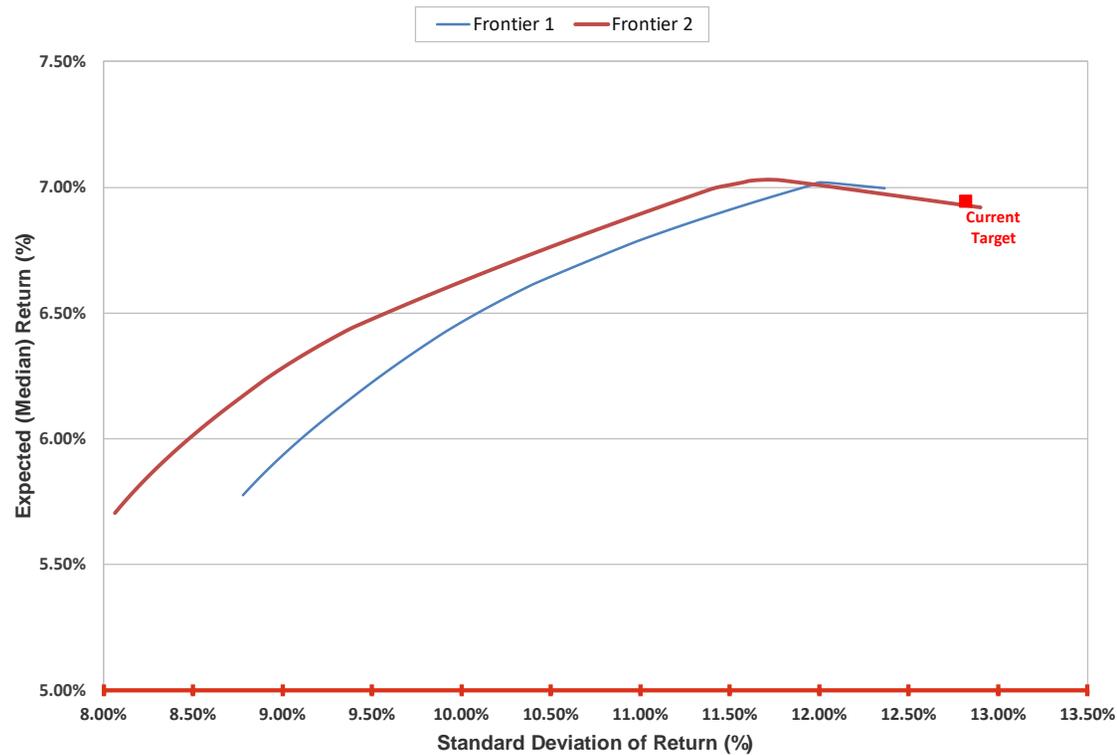
Public market return expectations represent a passive investment in the asset class (beta). They do not reflect value added from active management (alpha).

Asset Classes	Expected Return 10 Years	Expected Return 30 Years	Risk	Cash Yield	Factor Exposure Growth	Factor Exposure Inflation	Liquidity Market Level	Liquidity Stressed Metric
Public Equity	6.15	7.15	17.10	2.05	8.00	-1.30	90	0
Private Equity	9.15	9.95	27.80	0.00	13.35	-3.80	0	0
Specialty Credit	7.40	7.40	9.05	9.70	3.50	-0.50	30	0
Core Fixed Income	4.85	4.80	4.70	4.95	-0.95	-2.50	100	85
Cash	3.85	3.55	0.75	3.85	0.00	0.00	100	100
Real Estate	6.00	6.95	13.95	2.30	3.70	1.00	0	0
Real Return	6.85	7.35	10.65	3.60	2.15	5.80	0	0

- Growth – Assets with significant growth factor exposure, high expected returns and high risk
- Defensive Growth – Assets with positive growth factor exposure with moderate risk
- Defensive/Rate Sensitive – Assets whose value/return is sensitive to changes in interest rates
- Real Assets/Inflation Sensitive – Assets whose value/return is sensitive to inflation

Asset Only Efficient Frontier

Given the asset classes and constraints, opportunities to enhance portfolio efficiency do exist



Portfolios Modeled – KPPA Bucketing

Asset Class	Current Target	Optimization Constraints	Lower Risk A	Optimization Constraints	Lower Risk B
Public Equity	50.00%	45% - 80%	45.00%	40% - 80%	40.00%
Private Equity	10.00%	0% - 10% ¹	8.00%	0% - 10% ¹	7.50%
Total Equity	60.00%		53.00%		47.50%
Core Fixed Income	10.00%	10% - 50%	10.00%	10% - 50%	15.50%
Specialty Credit	10.00%	0% - 25% ¹	23.00%	0% - 20% ¹	20.00%
Cash	0.00%	2% - 5%	2.00%	2% - 5%	2.00%
Total Fixed Income	20.00%		35.00%		37.50%
Real Estate	7.00%	5% - 10% ¹	5.00%	5% - 10% ¹	5.00%
Real Return	13.00%	0% - 10% ¹	7.00%	0% - 10% ¹	10.00%
Total Inflation Protected	20.00%		12.00%		15.00%
Total Assets	100.0%		100.0%		100.0%
Total Illiquid Assets¹	28.50%	0% - 35%	28.00%	0% - 35%	27.50%
Expected Return - 10 Years (%)	6.95		6.95		6.86
Expected Return - 30 Years (%)	7.65		7.53		7.40
Standard Deviation of Return (%)	12.82		11.73		10.88
+ / (-) in Expected Return - 10 Years (bps)			0		(9)
+ / (-) in Expected Return - 30 Years (bps)			(12)		(25)
+ / (-) in SD of Return (bps)			(109)		(194)
Sharpe Ratio	0.24		0.26		0.28

¹ Total Illiquid Assets are constrained to not exceed 35%. Illiquid Assets are defined as total of Private Equity, 50% of Specialty Credit, Real Estate and 50% of Real Return.

Portfolios Modeled – KPPA Bucketing

Asset Class	Current Target	Lower Risk A	Lower Risk B
Total Equity	60.00%	53.00%	47.50%
Total Fixed Income	20.00%	35.00%	37.50%
Total Inflation Protected	20.00%	12.00%	15.00%
Total Assets	100.0%	100.0%	100.0%
Expected Return - 10 Years (%)	6.95	6.95	6.86
Expected Return - 30 Years (%)	7.65	7.53	7.40
Standard Deviation of Return (%)	12.82	11.73	10.88
Contribution to Asset Volatility (%):			
Equity	82.8	78.9	76.0
Fixed Income	5.5	13.3	13.5
Inflation Protected	11.7	7.8	10.5
Cash Yield	3.1	4.1	4.1
Growth Factor	6.1	5.7	5.2
Inflation Factor	-0.5	-0.8	-0.7
Liquidity			
Market	58.0	59.4	59.5
Stressed	8.5	10.5	15.2

Portfolios Modeled – Wilshire Bucketing

Asset Class	Current Target	Optimization Constraints	Lower Risk A	Optimization Constraints	Lower Risk B
Public Equity	50.00%	45% - 80%	45.00%	40% - 80%	40.00%
Private Equity	<u>10.00%</u>	0% - 10% ¹	<u>8.00%</u>	0% - 10% ¹	<u>7.50%</u>
Total Growth Assets	60.00%		53.00%		47.50%
Specialty Credit	<u>10.00%</u>	0% - 25% ¹	<u>23.00%</u>	0% - 20% ¹	<u>20.00%</u>
Total Defensive Growth Assets	10.00%		23.00%		20.00%
Core Fixed Income	10.00%	10% - 50%	10.00%	10% - 50%	15.50%
Cash	<u>0.00%</u>	2% - 5%	<u>2.00%</u>	2% - 5%	<u>2.00%</u>
Total Defensive / Rate Sensitive Assets	10.00%		12.00%		17.50%
Real Estate	7.00%	5% - 10% ¹	5.00%	5% - 10% ¹	5.00%
Real Return	<u>13.00%</u>	0% - 10% ¹	<u>7.00%</u>	0% - 10% ¹	<u>10.00%</u>
Total RA / Inflation Sensitive Assets	20.00%		12.00%		15.00%
Total Assets	100.0%		100.0%		100.0%
Total Illiquid Assets¹	28.50%	0% - 35%	28.00%	0% - 35%	27.50%
Expected Return - 10 Years (%)	6.95		6.95		6.86
Expected Return - 30 Years (%)	7.65		7.53		7.40
Standard Deviation of Return (%)	12.82		11.73		10.88
+ / (-) in Expected Return - 10 Years (bps)			0		(9)
+ / (-) in Expected Return - 30 Years (bps)			(12)		(25)
+ / (-) in SD of Return (bps)			(109)		(194)
Sharpe Ratio	0.24		0.26		0.28

¹ Total Illiquid Assets are constrained to not exceed 35%. Illiquid Assets are defined as total of Private Equity, 50% of Specialty Credit, Real Estate and 50% of Real Return.

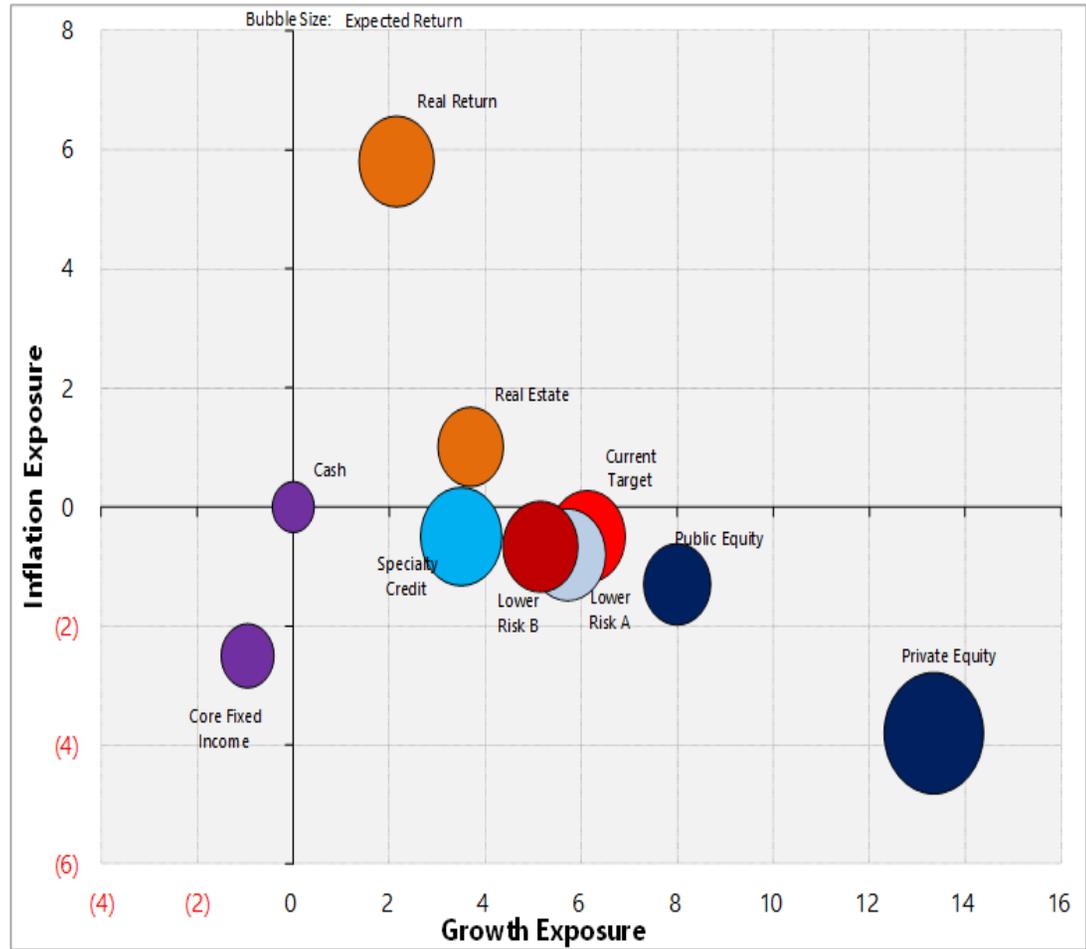
Portfolios Modeled – Wilshire Bucketing

Asset Class	Current Target	Lower Risk A	Lower Risk B
Total Growth Assets	60.00%	53.00%	47.50%
Total Defensive Growth Assets	10.00%	23.00%	20.00%
Total Defensive / Rate Sensitive Assets	10.00%	12.00%	17.50%
Total RA / Inflation Sensitive Assets	20.00%	12.00%	15.00%
Total Assets	100.0%	100.0%	100.0%
Total Illiquid Assets ¹	28.50%	28.00%	27.50%
Expected Return - 10 Years (%)	6.95	6.95	6.86
Expected Return - 30 Years (%)	7.65	7.53	7.40
Standard Deviation of Return (%)	12.82	11.73	10.88
Contribution to Asset Volatility (%):			
Growth	82.8	78.9	76.0
Defensive Growth	4.5	12.2	11.5
Defensive/Rate Sensitive	1.0	1.1	2.0
RA/Inflation Sensitive	11.7	7.8	10.5
Cash Yield	3.1	4.1	4.1
Growth Factor	6.1	5.7	5.2
Inflation Factor	-0.5	-0.8	-0.7
Liquidity			
Market	58.0	59.4	59.5
Stressed	8.5	10.5	15.2

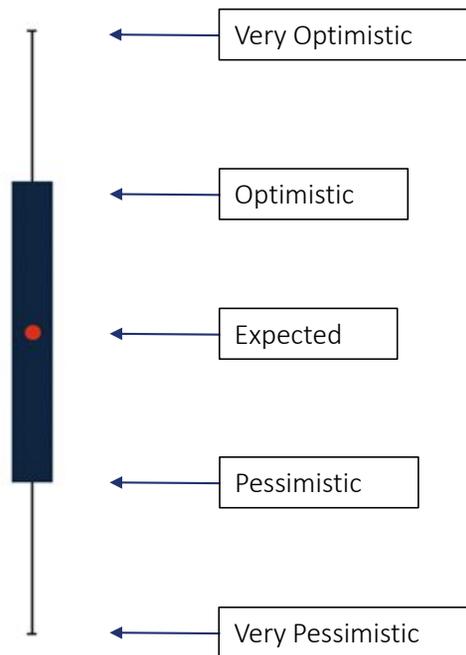
Economic Factor Exposure – Asset Classes

Concentrated factor tilts can represent portfolio vulnerability (e.g., reliance on growth markets)

To the extent possible, a portfolio with factor neutrality is desirable for weathering unexpected future market environments



Box and Whisker Graphs



In each year of the simulation, there are 5,000 independent economic trial results.

Expected: 50% of the potential scenarios result in higher than this value and 50% results in lower

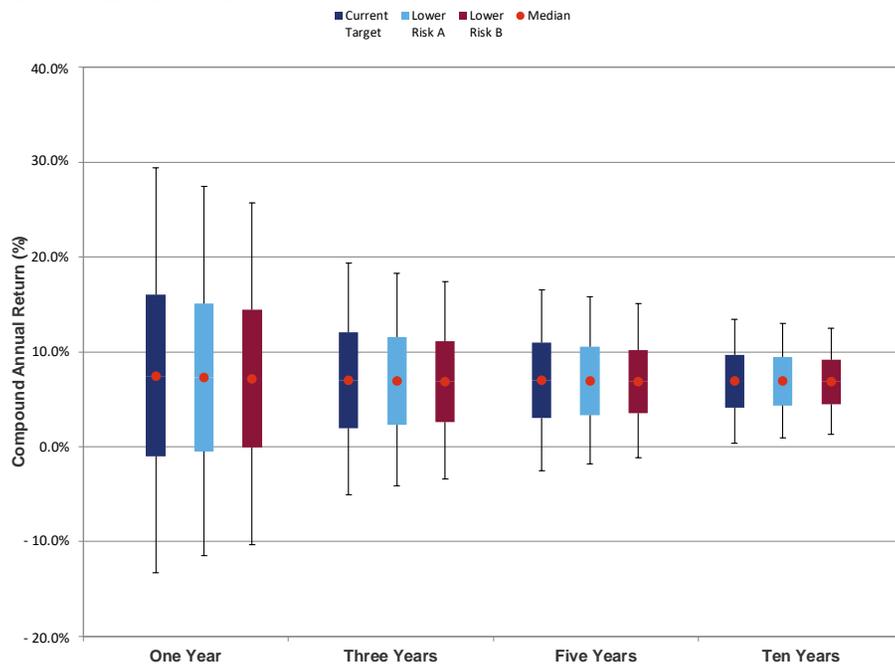
Very optimistic: Only 5% of the scenarios result in higher than this value and 95% result in lower

Optimistic: Only 25% of the scenarios result in higher than this value and 75% result in lower

Pessimistic: 75% of the scenarios results in higher than this value and 25% result in lower

Very pessimistic: 95% of the scenarios result in higher than this value and 5% result in lower

Distribution of Returns*



(%)	One Year			Three Years			Five Years			Ten Years		
	Current Target	Lower Risk A	Lower Risk B	Current Target	Lower Risk A	Lower Risk B	Current Target	Lower Risk A	Lower Risk B	Current Target	Lower Risk A	Lower Risk B
Very Optimistic	29.39	27.43	25.73	19.37	18.30	17.39	16.57	15.82	15.11	13.47	12.98	12.46
Optimistic	16.03	15.07	14.44	12.06	11.52	11.11	11.00	10.54	10.21	9.68	9.47	9.19
Median (Expected)	7.45	7.28	7.13	6.98	6.94	6.83	6.99	6.94	6.85	6.94	6.95	6.86
Pessimistic	-1.02	-0.54	-0.09	1.98	2.33	2.62	3.01	3.33	3.52	4.12	4.36	4.48
Very Pessimistic	-13.32	-11.49	-10.33	-5.09	-4.13	-3.42	-2.52	-1.81	-1.17	0.33	0.95	1.30

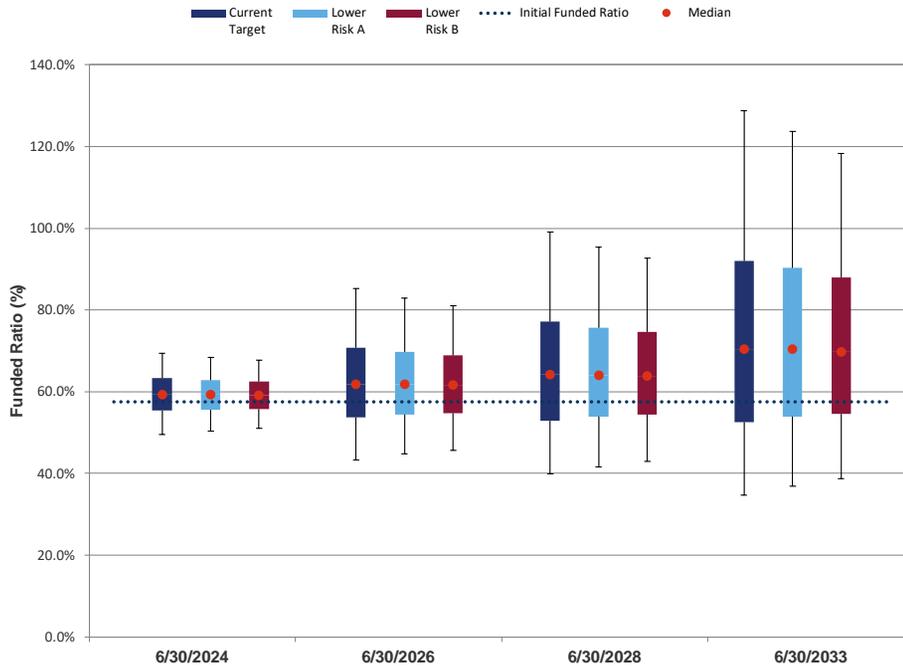
*For periods longer than one year, returns are compound annual.

Wilshire

Asset Liability Projections

CERS RETIREMENT PLAN

AAL MVA Funded Ratio



Shortfall Risk:
The potential for the current policy to have a lower median funded ratio than the alternative policies.

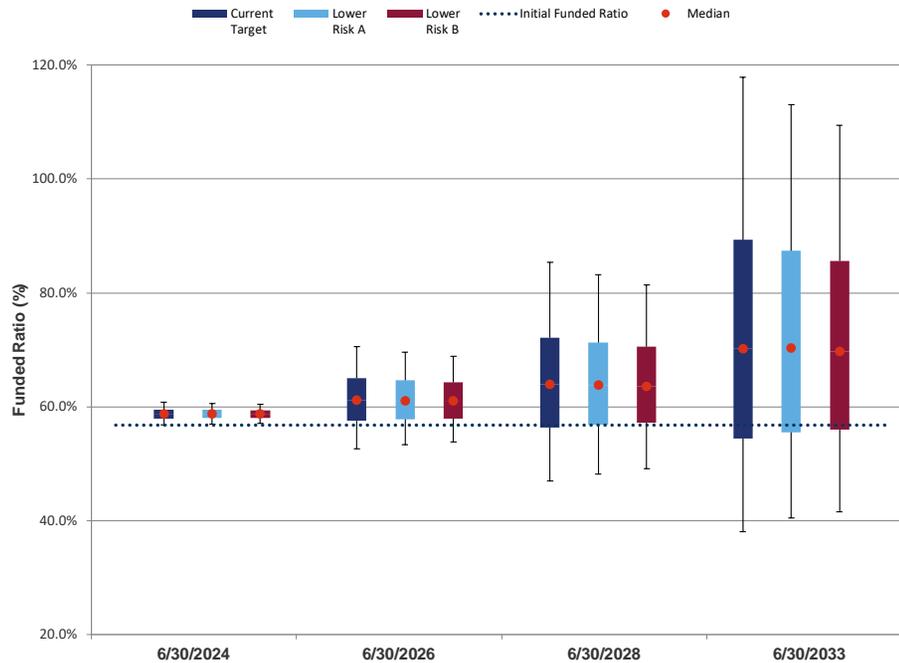
Drawdown Risk:
The potential for the current policy to have a lower “very pessimistic” funded ratio than the alternative policies.

Initial Funded Ratio = 57.5%

One Year Simulation (6/30/2024) reflects 8/31/2023 Fiscal Year to Date Return of 0.61%.

(%)	6/30/2024			6/30/2026			6/30/2028			6/30/2033		
	Current Target	Lower Risk A	Lower Risk B	Current Target	Lower Risk A	Lower Risk B	Current Target	Lower Risk A	Lower Risk B	Current Target	Lower Risk A	Lower Risk B
Very Optimistic	69.35	68.46	67.70	85.22	82.85	81.11	99.02	95.36	92.65	128.82	123.66	118.32
Optimistic	63.28	62.84	62.55	70.75	69.73	68.95	77.24	75.66	74.60	91.97	90.25	87.91
Median (Expected)	59.33	59.25	59.18	61.84	61.76	61.61	64.14	64.07	63.87	70.44	70.40	69.73
Pessimistic	55.37	55.59	55.81	53.82	54.39	54.72	52.96	53.91	54.37	52.63	53.85	54.54
Very Pessimistic	49.53	50.40	50.96	43.33	44.73	45.64	39.94	41.64	42.87	34.69	36.96	38.68

AAL AVA Funded Ratio



Shortfall Risk:
The potential for the current policy to have a lower median funded ratio than the alternative policies.

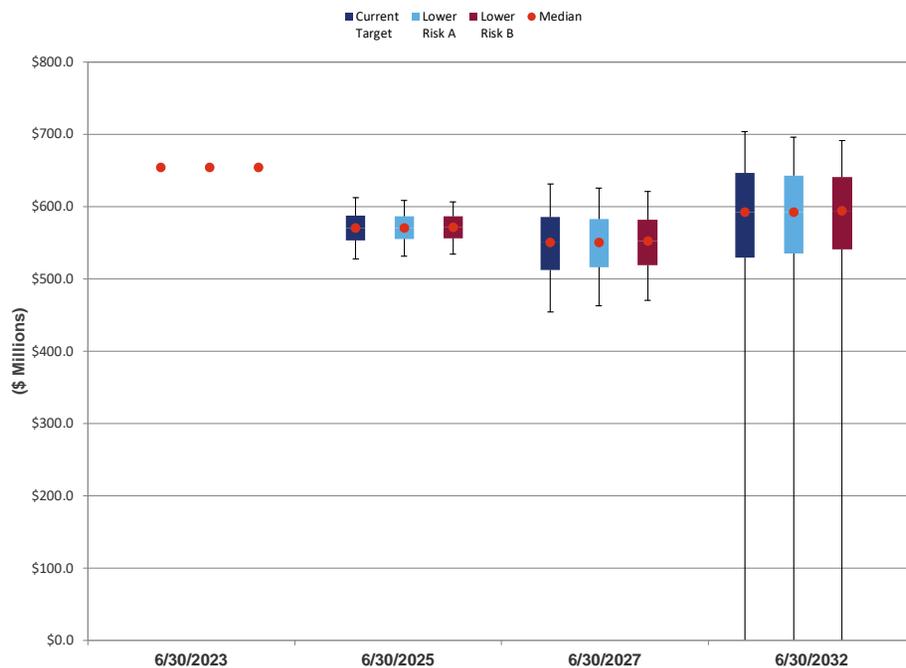
Drawdown Risk:
The potential for the current policy to have a lower “very pessimistic” funded ratio than the alternative policies.

Initial Funded Ratio = 56.7%

One Year Simulation (6/30/2024) reflects 8/31/2023 Fiscal Year to Date Return of 0.61%.

(%)	6/30/2024			6/30/2026			6/30/2028			6/30/2033		
	Current Target	Lower Risk A	Lower Risk B	Current Target	Lower Risk A	Lower Risk B	Current Target	Lower Risk A	Lower Risk B	Current Target	Lower Risk A	Lower Risk B
Very Optimistic	60.74	60.56	60.41	70.53	69.59	68.88	85.41	83.21	81.42	117.87	113.08	109.42
Optimistic	59.53	59.44	59.38	65.00	64.61	64.25	72.16	71.25	70.53	89.33	87.39	85.56
Median (Expected)	58.74	58.72	58.71	61.18	61.09	61.02	63.88	63.81	63.61	70.20	70.31	69.68
Pessimistic	57.94	57.99	58.03	57.51	57.76	57.93	56.34	56.80	57.13	54.36	55.48	55.99
Very Pessimistic	56.78	56.95	57.06	52.62	53.32	53.83	46.95	48.16	49.06	38.01	40.39	41.53

Employer Contributions

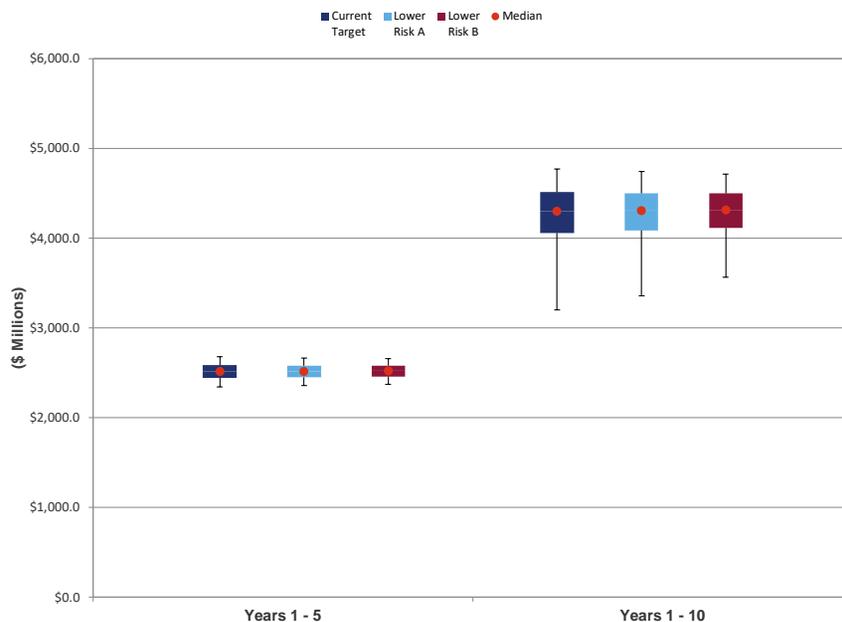


Shortfall Risk:
The potential for the current policy to have higher median contributions than the alternative policies.

Drawdown Risk:
The potential for the current policy to have higher “very pessimistic” contributions than the alternative policies.

(\$ Millions)	6/30/2023			6/30/2025			6/30/2027			6/30/2032		
	Current Target	Lower Risk A	Lower Risk B	Current Target	Lower Risk A	Lower Risk B	Current Target	Lower Risk A	Lower Risk B	Current Target	Lower Risk A	Lower Risk B
Very Pessimistic	653.7	653.7	653.7	611.7	608.1	606.0	631.6	625.2	620.5	703.6	696.2	691.1
Pessimistic	653.7	653.7	653.7	587.8	586.8	585.9	585.3	583.0	581.5	646.5	642.7	640.7
Median (Expected)	653.7	653.7	653.7	570.2	570.6	570.9	550.3	550.6	551.7	592.3	592.4	594.0
Optimistic	653.7	653.7	653.7	552.9	554.6	556.1	512.0	515.7	519.2	529.0	535.0	540.9
Very Optimistic	653.7	653.7	653.7	527.4	531.2	534.4	453.6	462.4	470.1	0.0	0.0	0.0

Present Value of Contributions



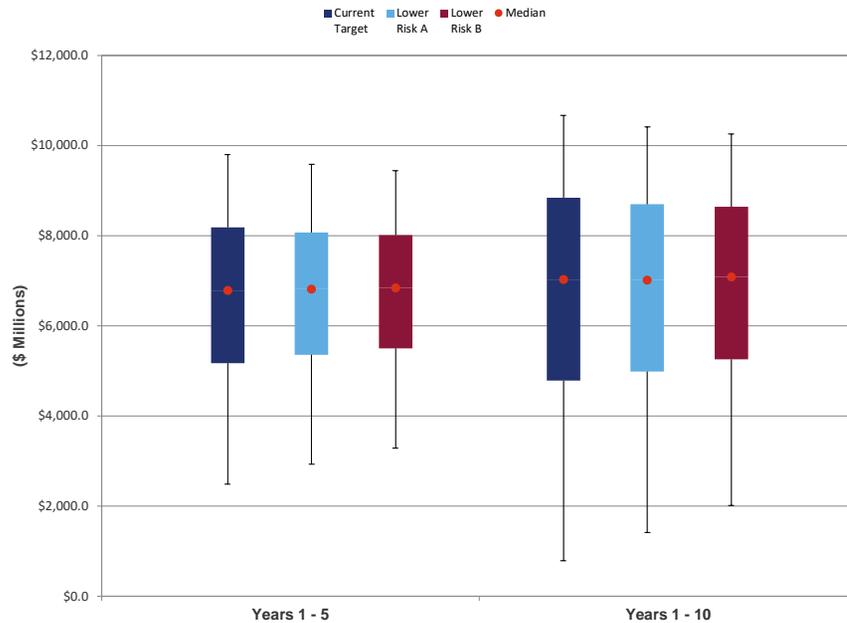
(\$ Millions)	Years 1 - 5			Years 1 - 10		
	Current Target	Lower Risk A	Lower Risk B	Current Target	Lower Risk A	Lower Risk B
Very Pessimistic	2,673.2	2,660.2	2,651.6	4,772.3	4,737.6	4,715.4
Pessimistic	2,581.3	2,576.5	2,574.2	4,515.4	4,500.9	4,495.1
Median (Expected)	2,513.7	2,514.8	2,516.6	4,300.0	4,303.3	4,309.5
Optimistic	2,443.1	2,450.6	2,457.0	4,056.3	4,087.2	4,111.1
Very Optimistic	2,340.6	2,356.4	2,371.0	3,201.5	3,353.2	3,562.9

Shortfall Risk:
The potential for the current allocation to have higher median present value of contributions than the alternative policies.

Drawdown Risk:
The potential for the current allocation to have higher “very pessimistic” present value of contributions than the alternative policies.

EROA = 6.50%

MVA Economic Cost



(\$ Millions)	Years 1 - 5			Years 1 - 10		
	Current Target	Lower Risk A	Lower Risk B	Current Target	Lower Risk A	Lower Risk B
Very Pessimistic	9,794.1	9,583.5	9,437.1	10,664.5	10,413.2	10,250.9
Pessimistic	8,179.2	8,065.9	8,006.3	8,833.6	8,690.6	8,640.9
Median (Expected)	6,787.7	6,806.3	6,836.1	7,023.6	7,015.5	7,076.7
Optimistic	5,168.7	5,354.6	5,496.6	4,783.2	4,983.2	5,247.3
Very Optimistic	2,488.0	2,920.4	3,288.4	783.4	1,403.5	2,005.5

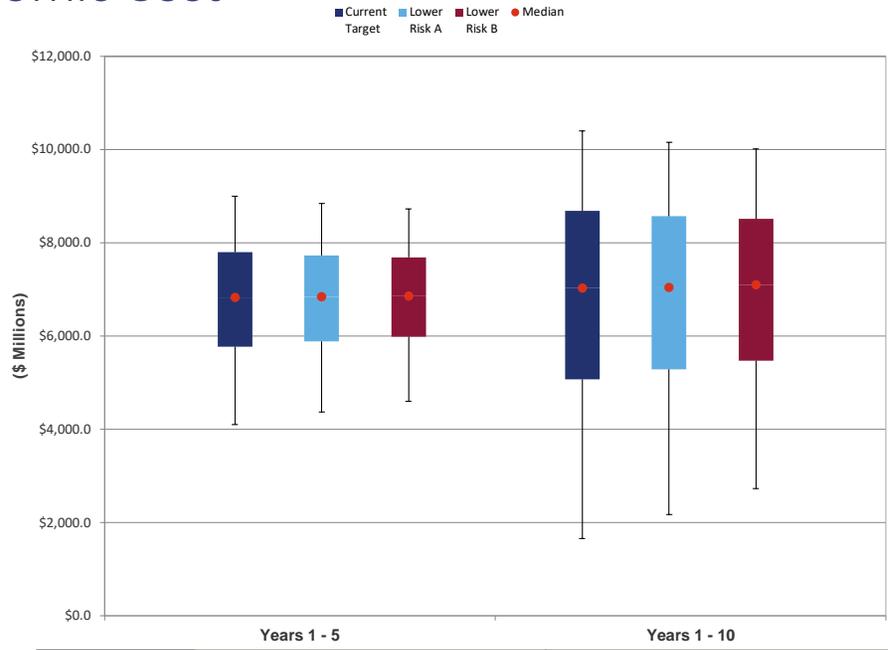
Shortfall Risk:
The potential for the current allocation to have a higher median economic cost than the alternative policies.

Drawdown Risk:
The potential for the current allocation to have a higher “very pessimistic” economic cost than the alternative policies.

EROA = 6.50%

Economic Cost is defined as the present value of contributions plus contributions necessary to fully fund the plan at the end of the projection period.

AVA Economic Cost



(\$ Millions)	Years 1 - 5			Years 1 - 10		
	Current Target	Lower Risk A	Lower Risk B	Current Target	Lower Risk A	Lower Risk B
Very Pessimistic	8,995.4	8,838.2	8,720.3	10,400.7	10,151.9	10,007.0
Pessimistic	7,790.3	7,729.0	7,685.2	8,679.8	8,566.2	8,515.2
Median (Expected)	6,830.4	6,835.1	6,857.5	7,031.1	7,043.1	7,097.9
Optimistic	5,773.4	5,888.2	5,985.3	5,064.5	5,286.4	5,462.3
Very Optimistic	4,100.8	4,369.3	4,598.6	1,659.8	2,165.5	2,718.7

Shortfall Risk:
The potential for the current allocation to have a higher median economic cost than the alternative policies.

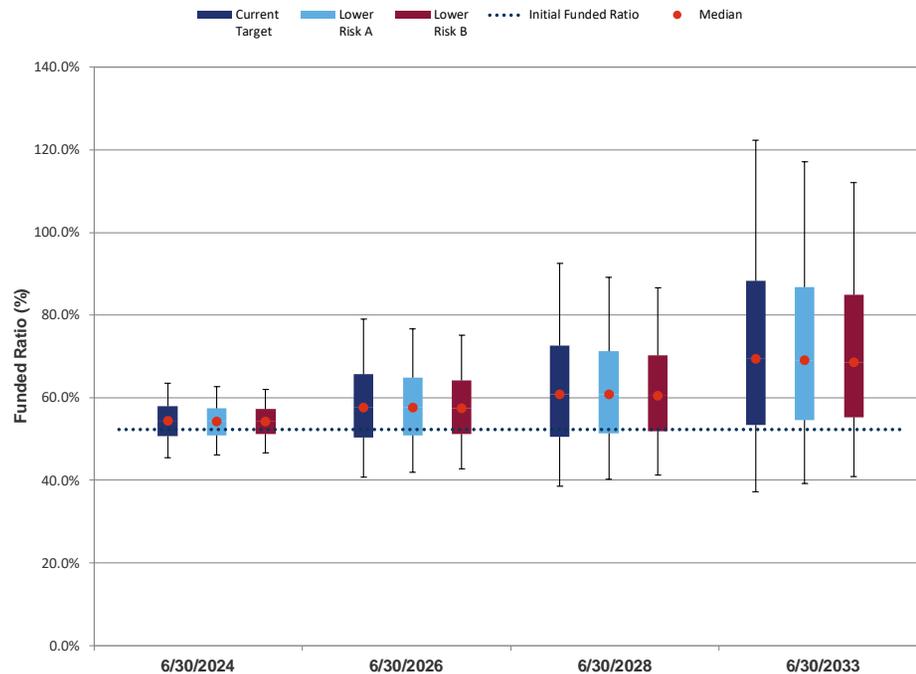
Drawdown Risk:
The potential for the current allocation to have a higher “very pessimistic” economic cost than the alternative policies.

EROA = 6.50%

Economic Cost is defined as the present value of contributions plus contributions necessary to fully fund the plan at the end of the projection period.

CERS HAZARDOUS RETIREMENT PLAN

AAL MVA Funded Ratio



Shortfall Risk:
The potential for the current policy to have a lower median funded ratio than the alternative policies.

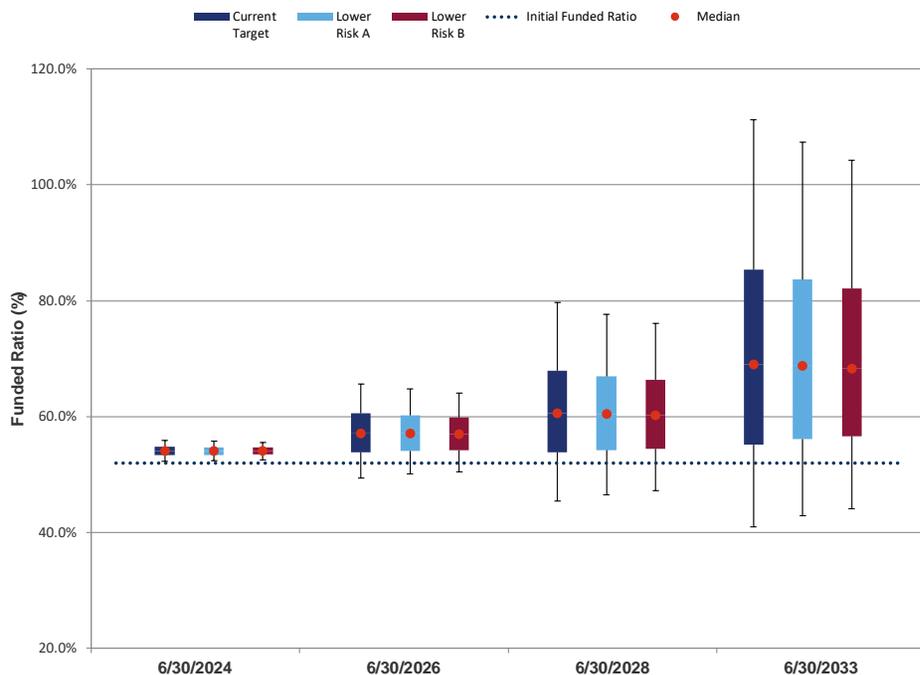
Drawdown Risk:
The potential for the current policy to have a lower “very pessimistic” funded ratio than the alternative policies.

Initial Funded Ratio = 52.3%

(%)	6/30/2024			6/30/2026			6/30/2028			6/30/2033		
	Current Target	Lower Risk A	Lower Risk B	Current Target	Lower Risk A	Lower Risk B	Current Target	Lower Risk A	Lower Risk B	Current Target	Lower Risk A	Lower Risk B
Very Optimistic	63.44	62.63	61.94	78.98	76.71	75.18	92.47	89.10	86.59	122.36	117.13	112.12
Optimistic	57.92	57.52	57.26	65.78	64.82	64.13	72.63	71.21	70.23	88.28	86.82	84.89
Median (Expected)	54.33	54.26	54.19	57.69	57.54	57.41	60.79	60.74	60.50	69.35	69.04	68.51
Pessimistic	50.73	50.93	51.13	50.30	50.87	51.14	50.54	51.43	51.82	53.34	54.62	55.19
Very Pessimistic	45.42	46.21	46.72	40.73	42.01	42.85	38.61	40.22	41.20	37.21	39.24	40.96

One Year Simulation (6/30/2024) reflects 8/31/2023 Fiscal Year to Date Return of 0.62%.

AAL AVA Funded Ratio



Shortfall Risk:
The potential for the current policy to have a lower median funded ratio than the alternative policies.

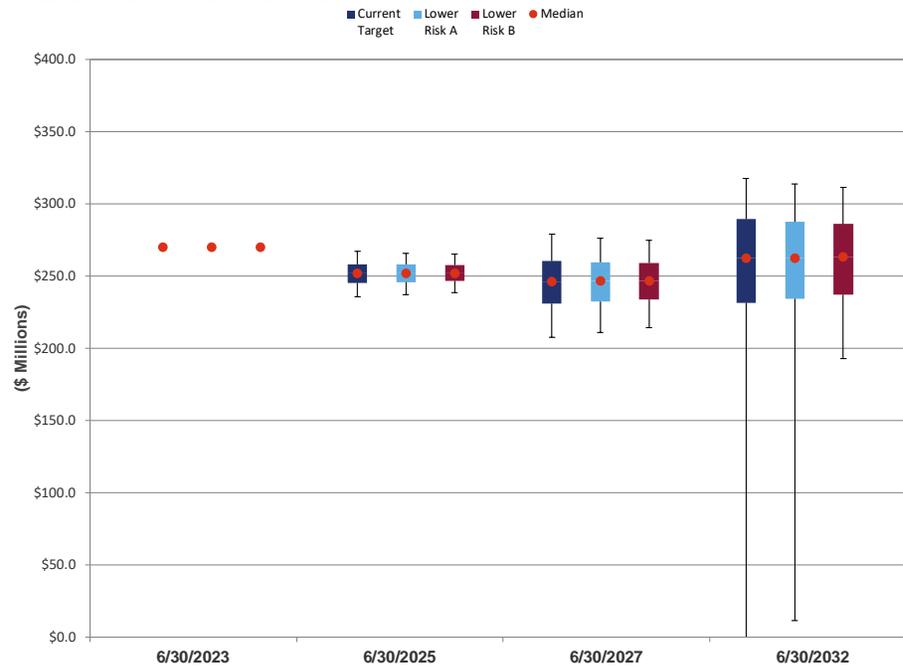
Drawdown Risk:
The potential for the current policy to have a lower “very pessimistic” funded ratio than the alternative policies.

Initial Funded Ratio = 51.9%

One Year Simulation (6/30/2024) reflects 8/31/2023 Fiscal Year to Date Return of 0.62%.

(%)	6/30/2024			6/30/2026			6/30/2028			6/30/2033		
	Current Target	Lower Risk A	Lower Risk B	Current Target	Lower Risk A	Lower Risk B	Current Target	Lower Risk A	Lower Risk B	Current Target	Lower Risk A	Lower Risk B
Very Optimistic	55.85	55.69	55.55	65.55	64.71	64.07	79.67	77.71	76.11	111.23	107.41	104.21
Optimistic	54.75	54.67	54.61	60.54	60.19	59.89	67.92	67.00	66.37	85.31	83.72	82.09
Median (Expected)	54.03	54.01	54.00	57.10	57.03	56.96	60.50	60.41	60.23	68.98	68.78	68.31
Pessimistic	53.31	53.35	53.39	53.78	54.02	54.17	53.77	54.22	54.43	55.19	56.12	56.61
Very Pessimistic	52.25	52.40	52.51	49.36	50.02	50.47	45.36	46.43	47.20	40.88	42.84	44.06

Employer Contributions

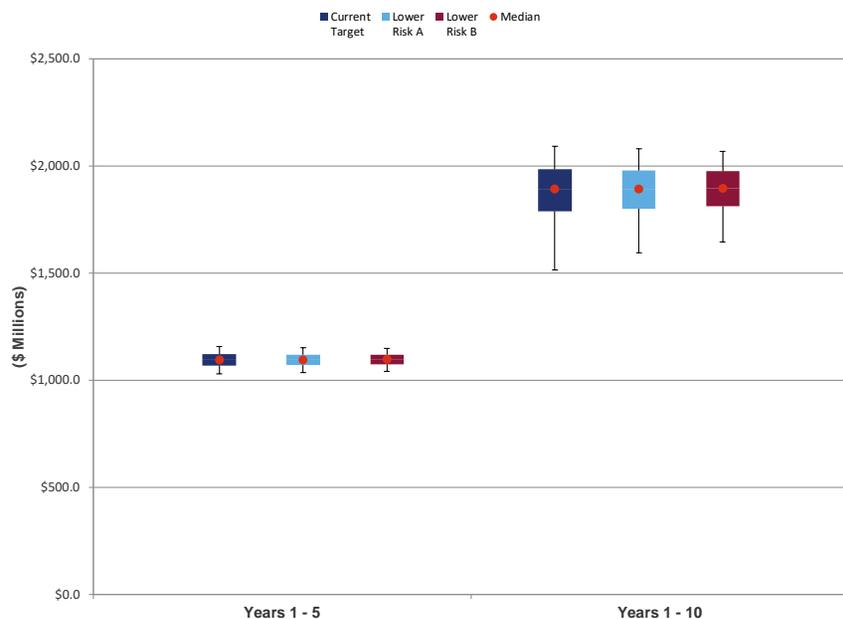


Shortfall Risk:
The potential for the current policy to have higher median contributions than the alternative policies.

Drawdown Risk:
The potential for the current policy to have higher “very pessimistic” contributions than the alternative policies.

(\$ Millions)	6/30/2023			6/30/2025			6/30/2027			6/30/2032		
	Current Target	Lower Risk A	Lower Risk B	Current Target	Lower Risk A	Lower Risk B	Current Target	Lower Risk A	Lower Risk B	Current Target	Lower Risk A	Lower Risk B
Very Pessimistic	269.9	269.9	269.9	267.0	265.7	264.9	278.7	276.1	274.7	317.5	313.7	311.4
Pessimistic	269.9	269.9	269.9	258.1	257.7	257.5	260.3	259.3	258.7	289.4	287.4	286.2
Median (Expected)	269.9	269.9	269.9	251.6	251.7	251.8	246.2	246.3	246.7	262.1	262.4	263.3
Optimistic	269.9	269.9	269.9	245.2	245.8	246.4	230.9	232.4	233.8	231.1	234.0	237.0
Very Optimistic	269.9	269.9	269.9	235.7	237.1	238.3	207.5	211.0	214.1	0.0	11.5	192.7

Present Value of Contributions



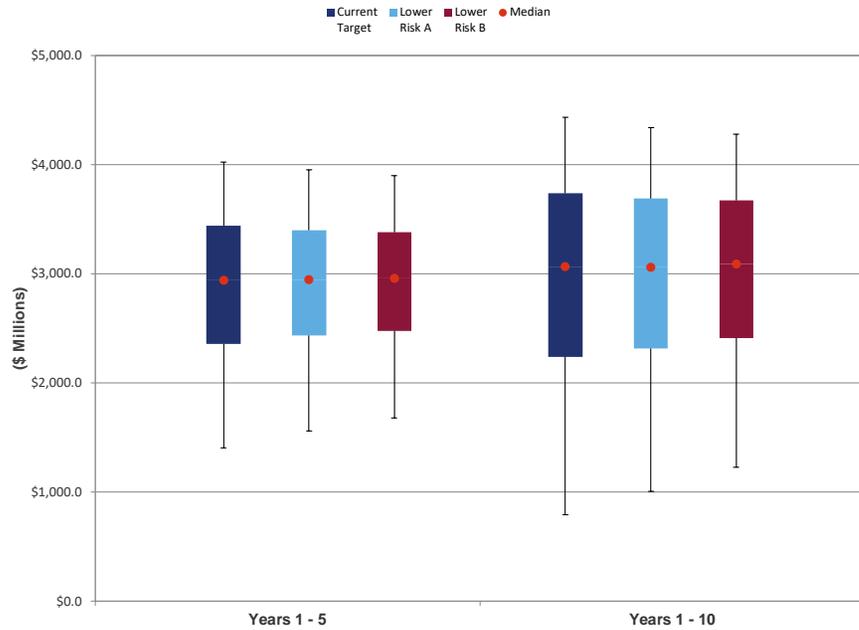
Shortfall Risk:
The potential for the current allocation to have higher median present value of contributions than the alternative policies.

Drawdown Risk:
The potential for the current allocation to have higher “very pessimistic” present value of contributions than the alternative policies.

EROA = 6.50%

(\$ Millions)	Years 1 - 5			Years 1 - 10		
	Current Target	Lower Risk A	Lower Risk B	Current Target	Lower Risk A	Lower Risk B
Very Pessimistic	1,156.2	1,151.1	1,147.9	2,091.2	2,078.1	2,068.0
Pessimistic	1,120.8	1,119.2	1,118.1	1,983.5	1,977.0	1,974.4
Median (Expected)	1,094.9	1,095.2	1,096.0	1,891.5	1,892.8	1,895.5
Optimistic	1,067.4	1,070.4	1,072.9	1,789.4	1,799.9	1,810.4
Very Optimistic	1,027.9	1,034.0	1,039.9	1,515.2	1,593.7	1,644.7

MVA Economic Cost



(\$ Millions)	Years 1 - 5			Years 1 - 10		
	Current Target	Lower Risk A	Lower Risk B	Current Target	Lower Risk A	Lower Risk B
Very Pessimistic	4,020.0	3,952.7	3,895.7	4,430.8	4,339.2	4,280.0
Pessimistic	3,440.7	3,398.4	3,380.0	3,736.4	3,687.6	3,668.5
Median (Expected)	2,939.3	2,945.6	2,957.7	3,065.0	3,056.0	3,086.3
Optimistic	2,357.3	2,432.3	2,477.0	2,236.1	2,313.2	2,410.5
Very Optimistic	1,400.8	1,555.9	1,679.2	791.2	1,005.6	1,222.2

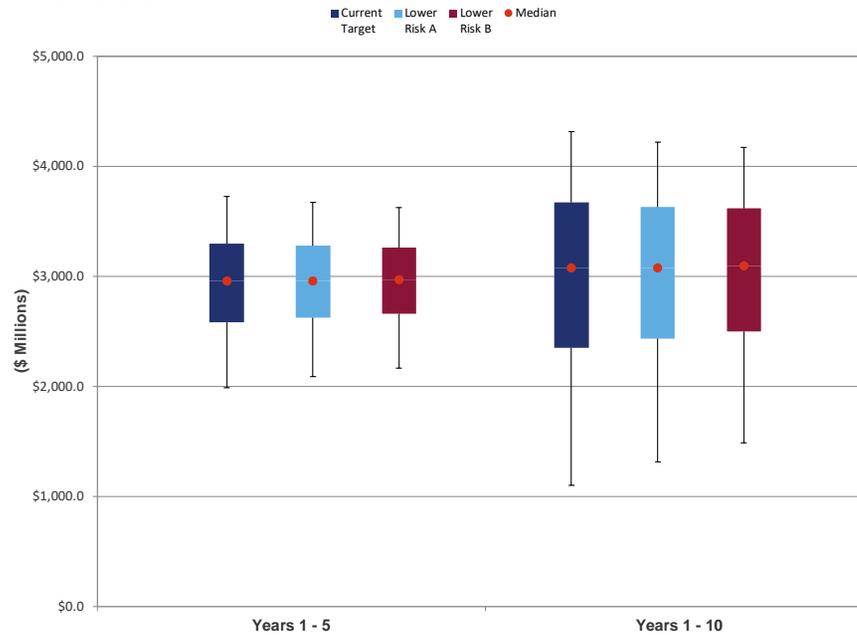
Shortfall Risk:
The potential for the current allocation to have a higher median economic cost than the alternative policies.

Drawdown Risk:
The potential for the current allocation to have a higher “very pessimistic” economic cost than the alternative policies.

EROA = 6.50%

Economic Cost is defined as the present value of contributions plus contributions necessary to fully fund the plan at the end of the projection period.

AVA Economic Cost



(\$ Millions)	Years 1 - 5			Years 1 - 10		
	Current Target	Lower Risk A	Lower Risk B	Current Target	Lower Risk A	Lower Risk B
Very Pessimistic	3,722.1	3,668.1	3,625.5	4,312.9	4,219.4	4,172.9
Pessimistic	3,296.0	3,275.5	3,260.1	3,671.0	3,631.2	3,614.7
Median (Expected)	2,954.6	2,958.2	2,966.3	3,076.9	3,077.2	3,095.5
Optimistic	2,582.8	2,624.2	2,657.5	2,352.2	2,435.0	2,500.3
Very Optimistic	1,988.5	2,084.7	2,164.2	1,099.8	1,312.3	1,489.2

Shortfall Risk:
The potential for the current allocation to have a higher median economic cost than the alternative policies.

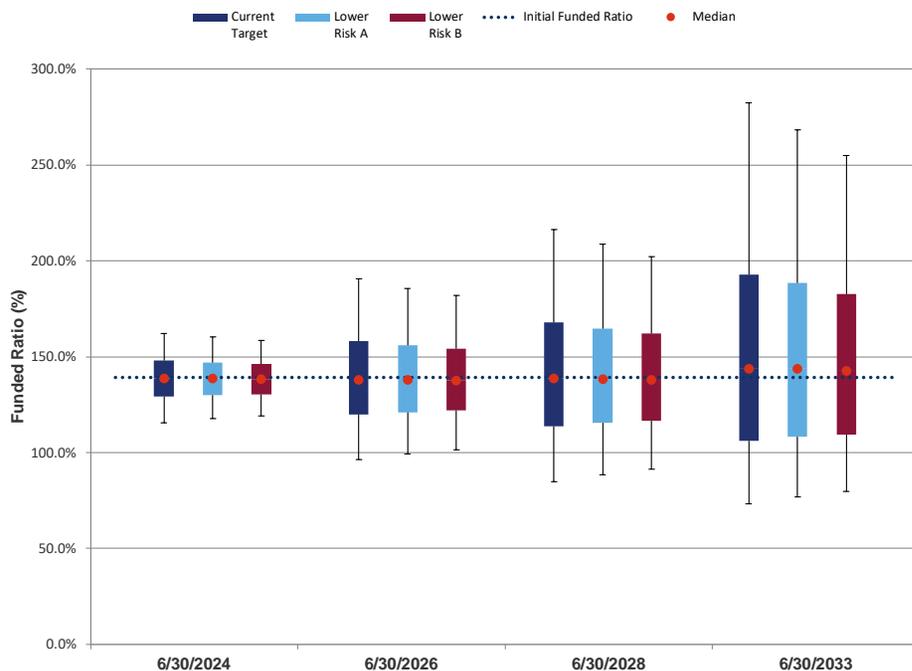
Drawdown Risk:
The potential for the current allocation to have a higher “very pessimistic” economic cost than the alternative policies.

EROA = 6.50%

Economic Cost is defined as the present value of contributions plus contributions necessary to fully fund the plan at the end of the projection period.

CERS NON-HAZARDOUS INSURANCE PLAN

AAL MVA Funded Ratio



Shortfall Risk:
The potential for the current policy to have a lower median funded ratio than the alternative policies.

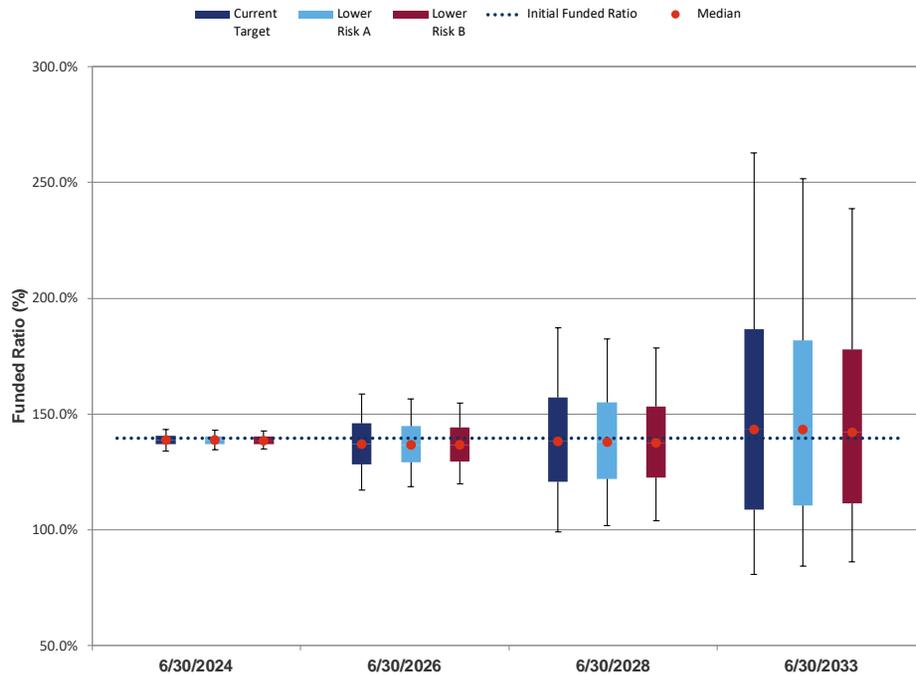
Drawdown Risk:
The potential for the current policy to have a lower “very pessimistic” funded ratio than the alternative policies.

Initial Funded Ratio = 139.4%

One Year Simulation (6/30/2024) reflects 8/31/2023 Fiscal Year to Date Return of 0.63%.

(%)	6/30/2024			6/30/2026			6/30/2028			6/30/2033		
	Current Target	Lower Risk A	Lower Risk B	Current Target	Lower Risk A	Lower Risk B	Current Target	Lower Risk A	Lower Risk B	Current Target	Lower Risk A	Lower Risk B
Very Optimistic	162.26	160.19	158.38	190.73	185.45	181.84	216.36	208.77	202.25	282.50	268.38	254.98
Optimistic	147.99	146.95	146.27	158.18	155.93	154.11	167.98	164.52	161.97	192.94	188.45	182.74
Median (Expected)	138.68	138.49	138.33	137.97	137.84	137.38	138.64	138.35	137.79	143.59	143.57	142.43
Pessimistic	129.37	129.90	130.40	119.81	121.06	121.84	113.59	115.68	116.76	106.17	108.25	109.37
Very Pessimistic	115.63	117.69	118.99	96.31	99.23	101.45	84.97	88.51	91.30	73.23	76.93	79.78

AAL AVA Funded Ratio



Shortfall Risk:
The potential for the current policy to have a lower median funded ratio than the alternative policies.

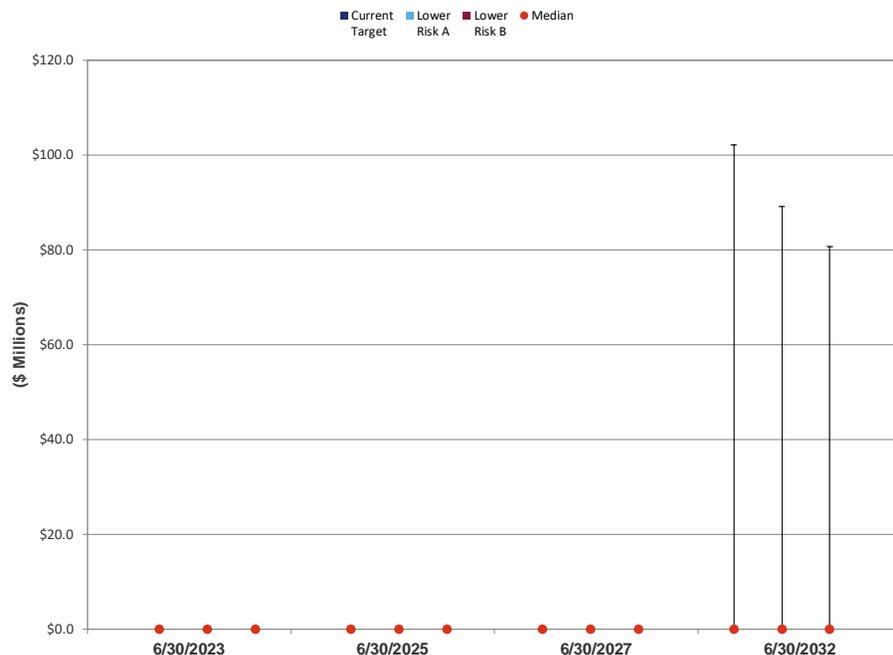
Drawdown Risk:
The potential for the current policy to have a lower “very pessimistic” funded ratio than the alternative policies.

Initial Funded Ratio = 139.5%

One Year Simulation (6/30/2024) reflects 8/31/2023 Fiscal Year to Date Return of 0.63%.

(%)	6/30/2024			6/30/2026			6/30/2028			6/30/2033		
	Current Target	Lower Risk A	Lower Risk B	Current Target	Lower Risk A	Lower Risk B	Current Target	Lower Risk A	Lower Risk B	Current Target	Lower Risk A	Lower Risk B
Very Optimistic	143.36	142.95	142.59	158.59	156.54	154.75	187.33	182.47	178.37	262.76	251.50	238.70
Optimistic	140.51	140.30	140.16	145.83	144.86	144.11	157.05	154.96	153.27	186.50	181.94	177.97
Median (Expected)	138.65	138.61	138.58	136.88	136.68	136.49	137.99	137.86	137.44	143.30	143.26	142.04
Pessimistic	136.78	136.89	136.99	128.33	128.96	129.31	120.59	121.79	122.50	108.63	110.35	111.36
Very Pessimistic	134.04	134.45	134.71	117.00	118.51	119.75	98.87	101.83	103.91	80.57	84.30	85.93

Employer Contributions

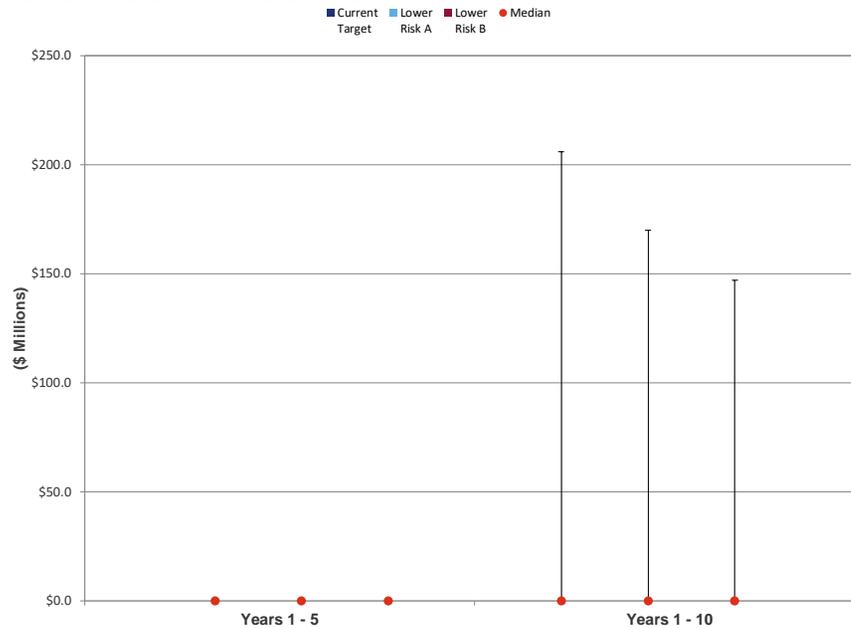


Shortfall Risk:
The potential for the current policy to have higher median contributions than the alternative policies.

Drawdown Risk:
The potential for the current policy to have higher “very pessimistic” contributions than the alternative policies.

(\$ Millions)	6/30/2023			6/30/2025			6/30/2027			6/30/2032		
	Current Target	Lower Risk A	Lower Risk B	Current Target	Lower Risk A	Lower Risk B	Current Target	Lower Risk A	Lower Risk B	Current Target	Lower Risk A	Lower Risk B
Very Pessimistic	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	102.1	89.1	80.6
Pessimistic	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Median (Expected)	0.0	0.0	0.0									
Optimistic	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Very Optimistic	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Present Value of Contributions



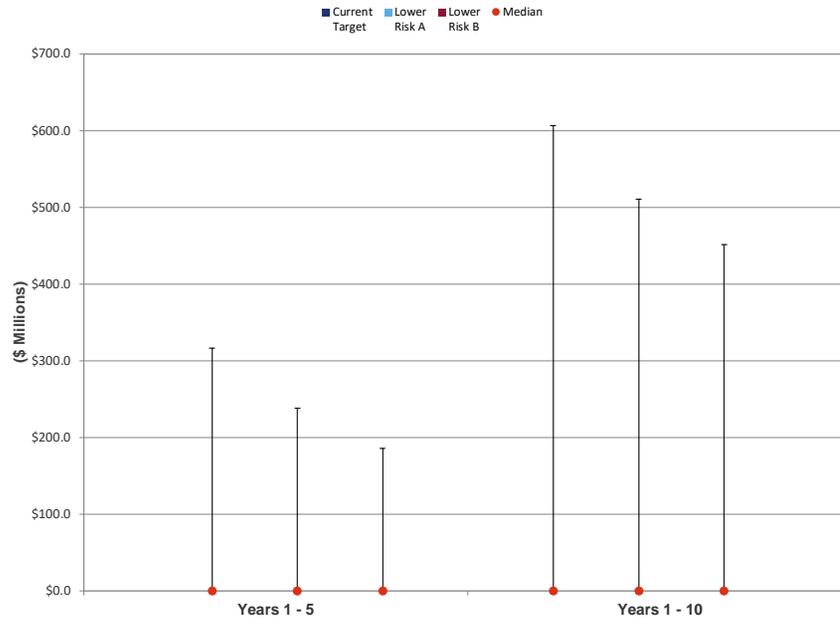
Shortfall Risk:
The potential for the current allocation to have higher median present value of contributions than the alternative policies.

Drawdown Risk:
The potential for the current allocation to have higher “very pessimistic” present value of contributions than the alternative policies.

EROA = 6.50%

(\$ Millions)	Years 1 - 5			Years 1 - 10		
	Current Target	Lower Risk A	Lower Risk B	Current Target	Lower Risk A	Lower Risk B
Very Pessimistic	0.0	0.0	0.0	206.0	169.9	146.9
Pessimistic	0.0	0.0	0.0	0.0	0.0	0.0
Median (Expected)	0.0	0.0	0.0	0.0	0.0	0.0
Optimistic	0.0	0.0	0.0	0.0	0.0	0.0
Very Optimistic	0.0	0.0	0.0	0.0	0.0	0.0

MVA Economic Cost



(\$ Millions)	Years 1 - 5			Years 1 - 10		
	Current Target	Lower Risk A	Lower Risk B	Current Target	Lower Risk A	Lower Risk B
Very Pessimistic	316.1	238.3	185.2	606.4	510.7	451.1
Pessimistic	0.0	0.0	0.0	0.0	0.0	0.0
Median (Expected)	0.0	0.0	0.0	0.0	0.0	0.0
Optimistic	0.0	0.0	0.0	0.0	0.0	0.0
Very Optimistic	0.0	0.0	0.0	0.0	0.0	0.0

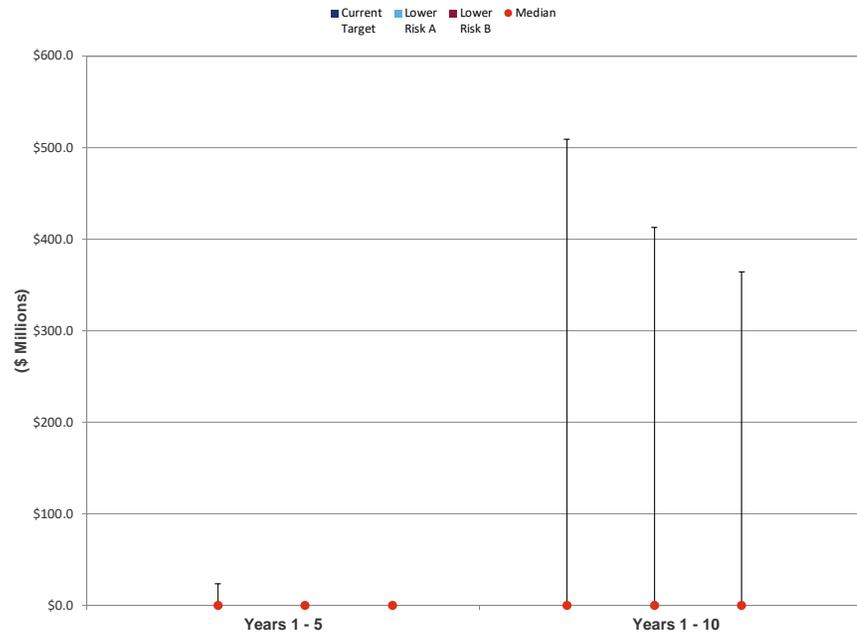
Shortfall Risk:
The potential for the current allocation to have a higher median economic cost than the alternative policies.

Drawdown Risk:
The potential for the current allocation to have a higher “very pessimistic” economic cost than the alternative policies.

EROA = 6.50%

Economic Cost is defined as the present value of contributions plus contributions necessary to fully fund the plan at the end of the projection period.

AVA Economic Cost



(\$ Millions)	Years 1 - 5			Years 1 - 10		
	Current Target	Lower Risk A	Lower Risk B	Current Target	Lower Risk A	Lower Risk B
Very Pessimistic	23.3	0.0	0.0	508.8	412.5	363.9
Pessimistic	0.0	0.0	0.0	0.0	0.0	0.0
Median (Expected)	0.0	0.0	0.0	0.0	0.0	0.0
Optimistic	0.0	0.0	0.0	0.0	0.0	0.0
Very Optimistic	0.0	0.0	0.0	0.0	0.0	0.0

Shortfall Risk:
The potential for the current allocation to have a higher median economic cost than the alternative policies.

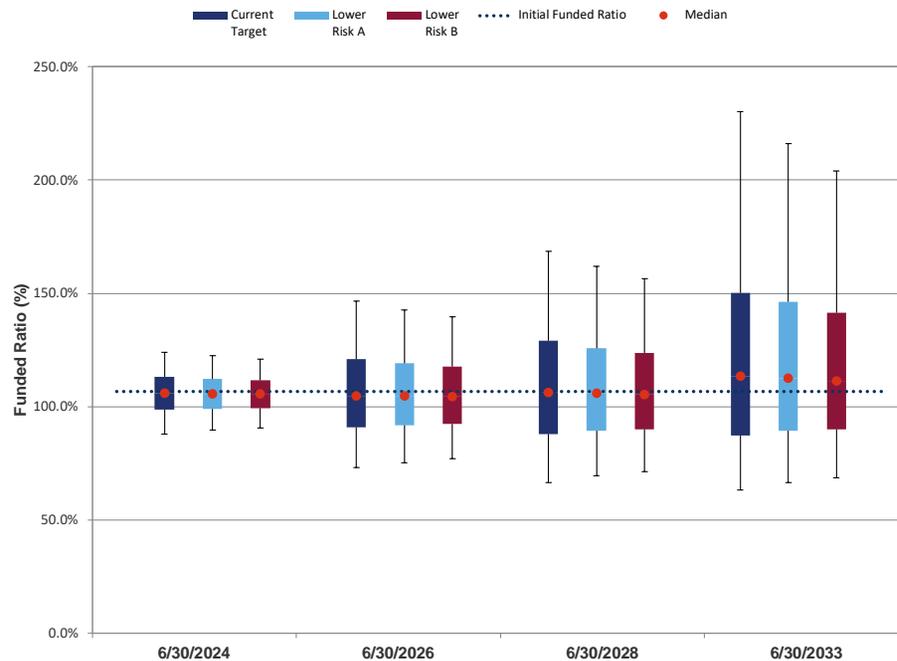
Drawdown Risk:
The potential for the current allocation to have a higher “very pessimistic” economic cost than the alternative policies.

EROA = 6.50%

Economic Cost is defined as the present value of contributions plus contributions necessary to fully fund the plan at the end of the projection period.

CERS HAZARDOUS INSURANCE PLAN

AAL MVA Funded Ratio



Shortfall Risk:
The potential for the current policy to have a lower median funded ratio than the alternative policies.

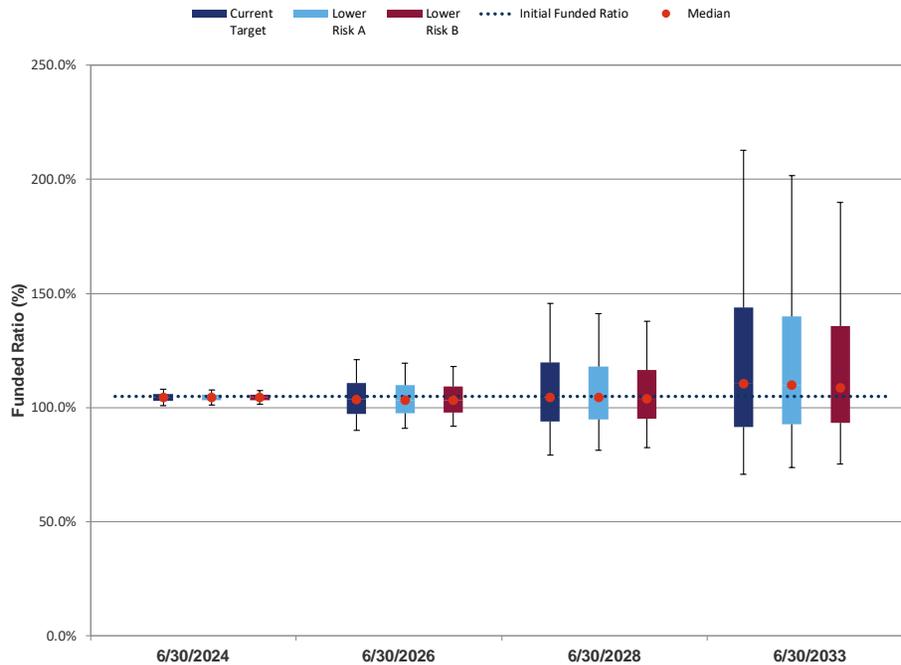
Drawdown Risk:
The potential for the current policy to have a lower “very pessimistic” funded ratio than the alternative policies.

Initial Funded Ratio = 106.6%

One Year Simulation (6/30/2024) reflects 8/31/2023 Fiscal Year to Date Return of 0.62%.

(%)	6/30/2024			6/30/2026			6/30/2028			6/30/2033		
	Current Target	Lower Risk A	Lower Risk B	Current Target	Lower Risk A	Lower Risk B	Current Target	Lower Risk A	Lower Risk B	Current Target	Lower Risk A	Lower Risk B
Very Optimistic	124.11	122.50	121.10	146.50	142.70	139.57	168.44	161.83	156.36	230.13	216.06	204.05
Optimistic	113.02	112.22	111.69	120.83	119.00	117.59	128.96	125.80	123.70	150.18	146.27	141.32
Median (Expected)	105.80	105.65	105.53	104.84	104.79	104.32	106.21	106.03	105.36	113.55	112.66	111.36
Pessimistic	98.58	98.99	99.38	90.88	91.78	92.30	87.81	89.21	89.90	87.31	89.47	89.96
Very Pessimistic	87.93	89.52	90.53	73.07	75.30	76.86	66.31	69.50	71.20	63.09	66.48	68.71

AAL AVA Funded Ratio



Shortfall Risk:
The potential for the current policy to have a lower median funded ratio than the alternative policies.

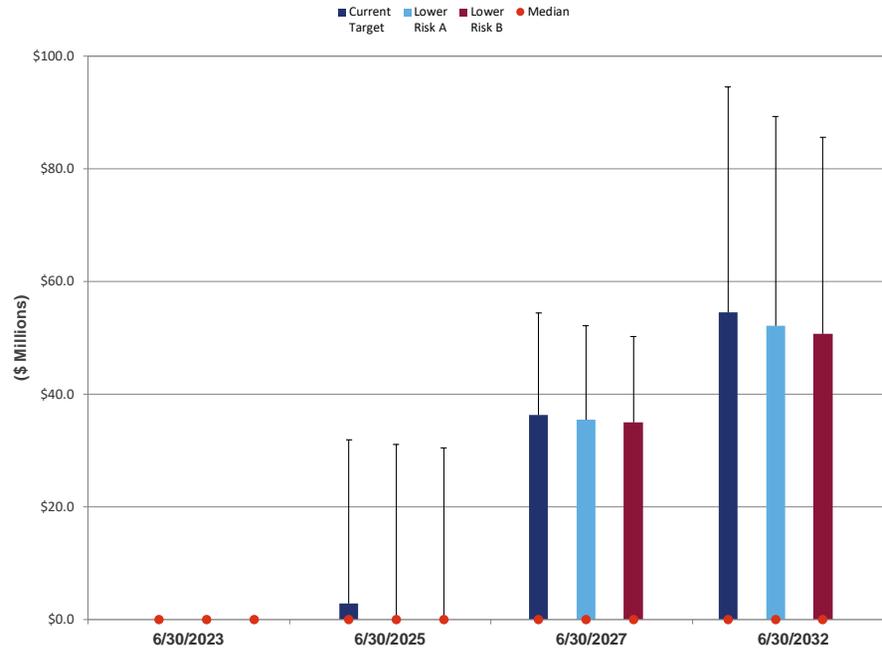
Drawdown Risk:
The potential for the current policy to have a lower “very pessimistic” funded ratio than the alternative policies.

Initial Funded Ratio = 104.9%

One Year Simulation (6/30/2024) reflects 8/31/2023 Fiscal Year to Date Return of 0.62%.

(%)	6/30/2024			6/30/2026			6/30/2028			6/30/2033		
	Current Target	Lower Risk A	Lower Risk B	Current Target	Lower Risk A	Lower Risk B	Current Target	Lower Risk A	Lower Risk B	Current Target	Lower Risk A	Lower Risk B
Very Optimistic	108.12	107.80	107.52	121.00	119.37	117.90	145.66	141.07	137.87	212.82	201.75	189.97
Optimistic	105.90	105.74	105.63	110.66	109.93	109.29	119.74	117.86	116.32	143.85	139.92	135.78
Median (Expected)	104.46	104.43	104.40	103.42	103.21	103.06	104.53	104.25	103.86	110.54	109.78	108.58
Pessimistic	103.01	103.09	103.17	97.21	97.55	97.70	93.88	94.62	94.98	91.33	92.55	93.28
Very Pessimistic	100.88	101.20	101.40	89.87	90.90	91.69	79.11	81.06	82.31	70.52	73.58	75.27

Employer Contributions

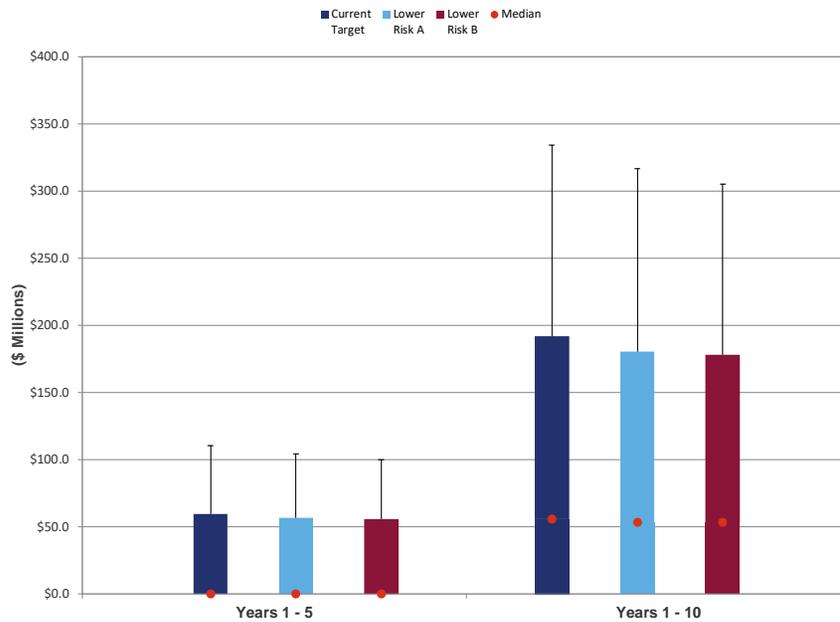


Shortfall Risk:
The potential for the current policy to have higher median contributions than the alternative policies.

Drawdown Risk:
The potential for the current policy to have higher “very pessimistic” contributions than the alternative policies.

(\$ Millions)	6/30/2023			6/30/2025			6/30/2027			6/30/2032		
	Current Target	Lower Risk A	Lower Risk B	Current Target	Lower Risk A	Lower Risk B	Current Target	Lower Risk A	Lower Risk B	Current Target	Lower Risk A	Lower Risk B
Very Pessimistic	0.0	0.0	0.0	31.9	31.1	30.5	54.4	52.1	50.1	94.5	89.3	85.6
Pessimistic	0.0	0.0	0.0	2.8	0.0	0.0	36.3	35.5	35.0	54.5	52.1	50.7
Median (Expected)	0.0	0.0	0.0									
Optimistic	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Very Optimistic	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Present Value of Contributions



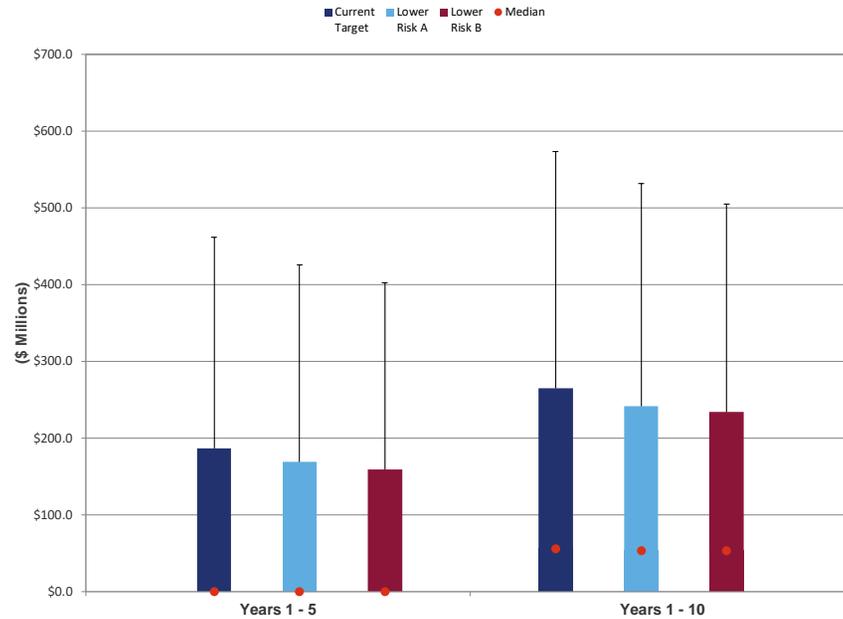
(\$ Millions)	Years 1 - 5			Years 1 - 10		
	Current Target	Lower Risk A	Lower Risk B	Current Target	Lower Risk A	Lower Risk B
Very Pessimistic	110.2	104.0	99.9	334.3	316.6	304.9
Pessimistic	59.2	56.6	55.4	191.8	180.6	177.8
Median (Expected)	0.0	0.0	0.0	55.4	53.0	53.2
Optimistic	0.0	0.0	0.0	0.0	0.0	0.0
Very Optimistic	0.0	0.0	0.0	0.0	0.0	0.0

Shortfall Risk:
The potential for the current allocation to have higher median present value of contributions than the alternative policies.

Drawdown Risk:
The potential for the current allocation to have higher “very pessimistic” present value of contributions than the alternative policies.

EROA = 6.50%

MVA Economic Cost



(\$ Millions)	Years 1 - 5			Years 1 - 10		
	Current Target	Lower Risk A	Lower Risk B	Current Target	Lower Risk A	Lower Risk B
Very Pessimistic	461.2	425.5	402.2	573.2	531.8	504.5
Pessimistic	186.6	169.0	159.2	264.4	241.5	234.2
Median (Expected)	0.0	0.0	0.0	55.4	53.0	53.2
Optimistic	0.0	0.0	0.0	0.0	0.0	0.0
Very Optimistic	0.0	0.0	0.0	0.0	0.0	0.0

Shortfall Risk:

The potential for the current allocation to have a higher median economic cost than the alternative policies.

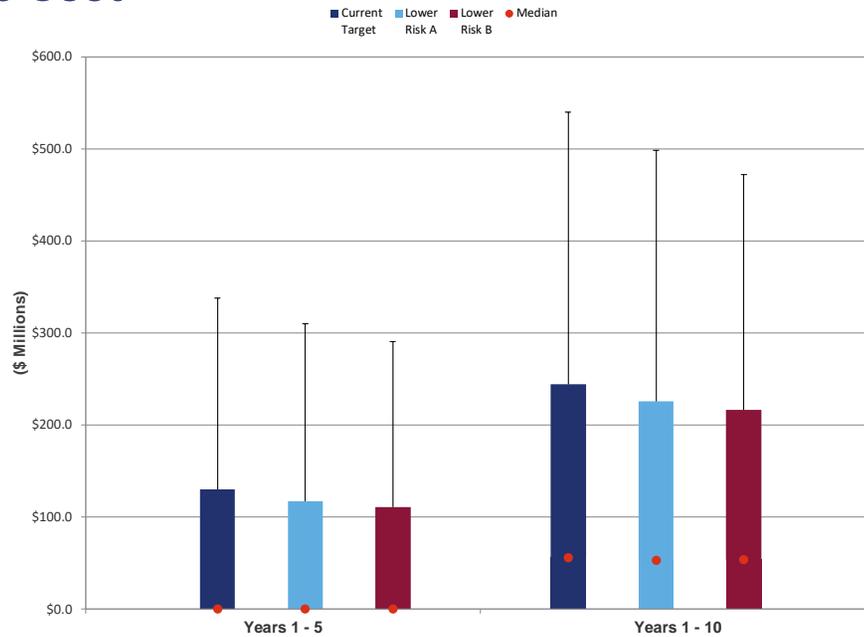
Drawdown Risk:

The potential for the current allocation to have a higher “very pessimistic” economic cost than the alternative policies.

EROA = 6.50%

Economic Cost is defined as the present value of contributions plus contributions necessary to fully fund the plan at the end of the projection period.

AVA Economic Cost



(\$ Millions)	Years 1 - 5			Years 1 - 10		
	Current Target	Lower Risk A	Lower Risk B	Current Target	Lower Risk A	Lower Risk B
Very Pessimistic	337.8	309.6	290.2	539.5	498.5	471.9
Pessimistic	129.6	116.7	110.5	244.4	225.7	216.1
Median (Expected)	0.0	0.0	0.0	55.4	53.0	53.2
Optimistic	0.0	0.0	0.0	0.0	0.0	0.0
Very Optimistic	0.0	0.0	0.0	0.0	0.0	0.0

Shortfall Risk:
The potential for the current allocation to have a higher median economic cost than the alternative policies.

Drawdown Risk:
The potential for the current allocation to have a higher “very pessimistic” economic cost than the alternative policies.

EROA = 6.50%

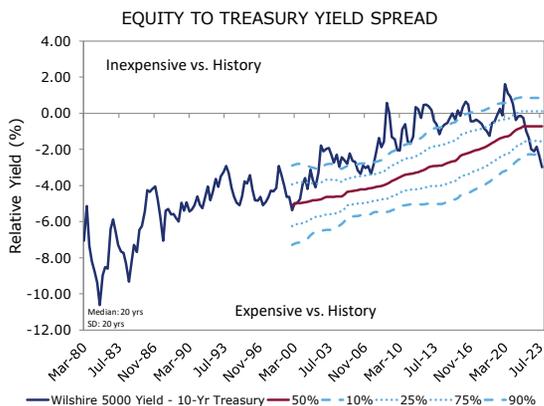
Economic Cost is defined as the present value of contributions plus contributions necessary to fully fund the plan at the end of the projection period.

Wilshire

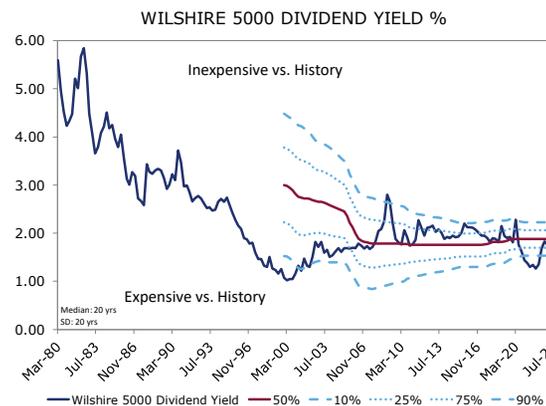
Appendix – Market Valuations

US Equity Market Valuation Observations

Expensive: Equity yields have moved into the 90th percentile when compared to Treasury Yields



Expensive: Dividend yields under 2% have are well below median and near 90th percentile levels

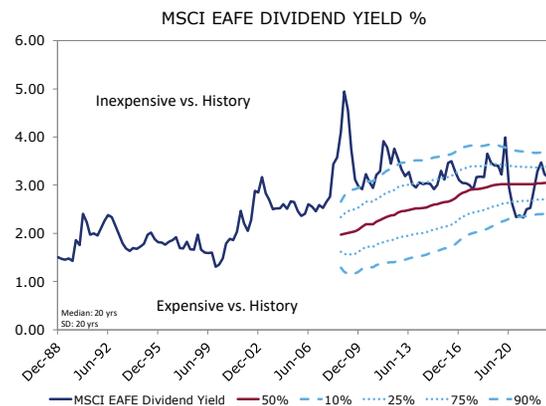
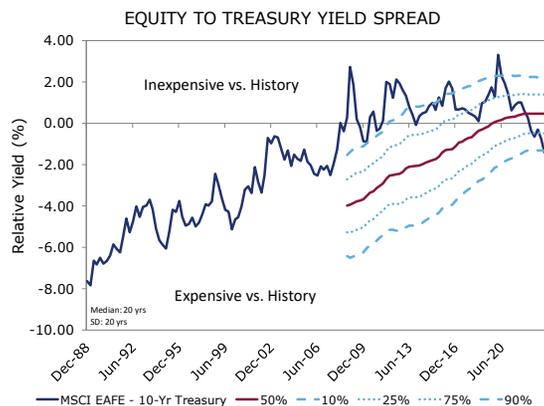


Data Source: Wilshire Atlas

Developed Equity Market Valuation Observations

Expensive: Developed Market yields have moved into the 90th percentile when compared to Treasury Yields

Median: Dividend yields around 3% are close to median historical levels

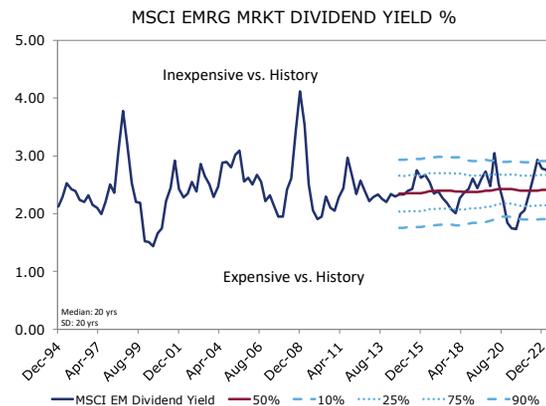
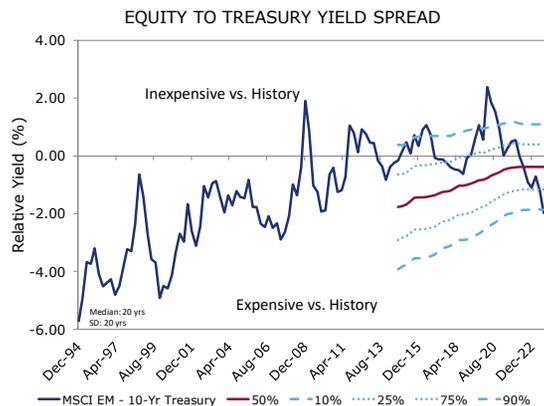


Data Source: Wilshire Atlas

Emerging Market Equity Valuation Observations

Expensive: Emerging Market yields have moved into the 90th percentile when compared to Treasury Yields

Inexpensive: Dividend yields around 2.5% are slightly above median historical levels



Data Source: Wilshire Atlas

Equity Valuations: Stocks are Expensive, Even if you Assume EPS of \$248 in 2024

		US 10 Year Treasury Yield (%)														
		2.00	2.25	2.50	2.75	3.00	3.25	3.50	3.75	4.00	4.25	4.50	4.75	5.00	5.25	5.50
US Equity 2024 EPS (\$)	275	28%	21%	16%	11%	6%	2%	-2%	-6%	-9%	-12%	-15%	-18%	-20%	-23%	-25%
	270	25%	19%	14%	9%	4%	0%	-4%	-7%	-11%	-14%	-17%	-19%	-22%	-24%	-26%
	265	23%	17%	12%	7%	2%	-2%	-5%	-9%	-12%	-15%	-18%	-21%	-23%	-26%	-28%
	260	21%	15%	10%	5%	0%	-4%	-7%	-11%	-14%	-17%	-20%	-22%	-25%	-27%	-29%
	250	16%	10%	5%	1%	-3%	-7%	-11%	-14%	-17%	-20%	-23%	-25%	-28%	-30%	-32%
	245	14%	8%	3%	-1%	-5%	-9%	-13%	-16%	-19%	-22%	-24%	-27%	-29%	-31%	-33%
	240	11%	6%	1%	-3%	-7%	-11%	-14%	-18%	-21%	-23%	-26%	-28%	-30%	-33%	-35%
	235	9%	4%	-1%	-5%	-9%	-13%	-16%	-19%	-22%	-25%	-27%	-30%	-32%	-34%	-36%
	230	7%	2%	-3%	-7%	-11%	-15%	-18%	-21%	-24%	-26%	-29%	-31%	-33%	-35%	-37%
	225	4%	-1%	-5%	-9%	-13%	-17%	-20%	-23%	-25%	-28%	-30%	-33%	-35%	-37%	-39%
	220	2%	-3%	-7%	-11%	-15%	-18%	-22%	-24%	-27%	-30%	-32%	-34%	-36%	-38%	-40%
	215	0%	-5%	-9%	-13%	-17%	-20%	-23%	-26%	-29%	-31%	-34%	-36%	-38%	-40%	-41%
	210	-3%	-7%	-11%	-15%	-19%	-22%	-25%	-28%	-30%	-33%	-35%	-37%	-39%	-41%	-43%
	205	-5%	-9%	-14%	-17%	-21%	-24%	-27%	-30%	-32%	-34%	-37%	-39%	-41%	-42%	-44%
	200	-7%	-12%	-16%	-19%	-23%	-26%	-29%	-31%	-34%	-36%	-38%	-40%	-42%	-44%	-45%
	195	-10%	-14%	-18%	-21%	-25%	-28%	-30%	-33%	-35%	-38%	-40%	-42%	-43%	-45%	-47%
190	-12%	-16%	-20%	-23%	-27%	-30%	-32%	-35%	-37%	-39%	-41%	-43%	-45%	-47%	-48%	
185	-14%	-18%	-22%	-25%	-29%	-31%	-34%	-36%	-39%	-41%	-43%	-45%	-46%	-48%	-50%	
180	-17%	-21%	-24%	-27%	-30%	-33%	-36%	-38%	-40%	-42%	-44%	-46%	-48%	-49%	-51%	

Data Source: Wilshire, Bloomberg

Cross Asset Class Valuation

- In reviewing Equity markets vs. Interest Rate Sensitive asset classes, valuations are at historical lows
- US Markets are also facing valuation headwinds vs. Developed and Emerging Markets

ASSET CLASS RELATIONSHIP RELATIVE TO EACH OF THE FOLLOWING:

As of September 30, 2023	Inflation	Cash	Treasury	Core Bonds	High Yield	REITs	MLPs	U.S. Stocks	Non-U.S. Dev.	Emrg Mrkt
Cash	100%		98%	97%	78%	99%	92%	100%	99%	100%
Treasury	98%	2%		73%	60%	96%	79%	99%	97%	98%
Core Bonds	96%	3%	27%		55%	97%	74%	98%	97%	97%
High Yield	70%	22%	40%	45%		76%	59%	75%	71%	74%
REITs	50%	1%	4%	3%	24%		41%	76%	60%	56%
MLPs	59%	8%	21%	26%	41%	59%		69%	58%	59%
U.S. Stocks	26%	0%	1%	2%	25%	24%	31%		9%	7%
Non-U.S. Dev.	43%	1%	3%	3%	29%	40%	42%	91%		34%
Emrg Mrkt	49%	0%	2%	3%	26%	44%	41%	93%	66%	

Data Source: Bloomberg, Wilshire Atlas

Appendix – Correlation Matrix

Capital Market Assumptions

- Wilshire's Capital Market Assumptions as of **June 30, 2023**
- Wilshire's asset class return, risk and correlation assumptions are developed on multi-year forward looking expected rates of return and historical risk and correlation, adjusted to incorporate recent trends
- Public market return expectations represent a passive investment in the asset class (beta). They do not reflect value added from active management (alpha).

	Public Equity	Private Equity	Specialty Credit	Core Fixed Income	Cash	Real Estate	Real Return
Return - 10-Year (%)	6.15	9.15	7.40	4.85	3.85	6.00	6.85
Return - 30-Year (%)	7.15	9.95	7.40	4.80	3.55	6.95	7.35
Risk (%)	17.10	27.80	9.05	4.70	0.75	13.95	10.65
Correlations							
Public Equity	1.00						
Private Equity	0.74	1.00					
Specialty Credit	0.57	0.31	1.00				
Core Fixed Income	0.20	0.31	0.15	1.00			
Cash	-0.06	0.00	-0.09	0.18	1.00		
Real Estate	0.54	0.52	0.63	0.19	-0.05	1.00	
Real Return	0.50	0.44	0.58	0.15	0.01	0.49	1.00

Appendix – Asset Allocation Ranges

Allowable Asset Allocation Ranges

Wilshire's Asset Allocation Committee (WAAC) maintains standard asset allocation parameters which reflect generally observed market practices for institutional asset owners. While Wilshire expects most client portfolios will fall within these asset allocation ranges. Wilshire recognizes and occasionally recommends portfolio allocations that may diverge from these general ranges based on a client's particular circumstances, goals or needs.

Asset Segment	Corporate DB	Public DB	E&F
Total Equity (Public+Private)		0% - 80%	
Private Equity (Aggregate)	0% - 15%	0% - 20%	0% - 30%
Fixed Income (Core/High-quality - Liquid IG)	10% - 100%	10% - 50%	
Other Fixed Income/Credit (Aggregate)		0% - 25%	
Private/Illiquid Credit (Aggregate)		0% - 15%	
High Yield		0% - 10%	
Other: EMD, Loans, Convertibles		0% - 7.5%	
Total Real Assets (Public + Private)		0% - 25%	
Total Real Estate (Public + Private)		0% - 25%	
RA Other: Commodities, Gold, Infra, GLI, MLPs, O&G, Timber		0% - 5%	
Marketable Alternatives (Aggregate)	0% - 12.5%		0% - 20%
Cash		0% - 5%	
Leverage		0% - 20%	
Total Private/Illiquid	0% - 25%	0% - 35%	0% - 50%

These thresholds were informed by allocation information from Greenwich Associates, and Wilshire Advisors, LLC, universe data and will be reviewed for reasonableness from time to time.

**Last Updated 12/2021*

Appendix – Efficient Frontier

Efficient Frontier 1 Portfolios – KPPA Bucketing

“Lower Risk A”
is close to
Portfolio 8.

Asset Class	Current Target	Optimization Constraints	Minimum Risk	Portfolio 2	Portfolio 3	Portfolio 4	Portfolio 5	Portfolio 6	Portfolio 7	Portfolio 8	Portfolio 9	Maximum Risk
Public Equity	50.00%	45% - 80%	45.00%	45.00%	45.00%	45.00%	45.00%	45.00%	45.00%	45.00%	45.00%	48.00%
Private Equity	10.00%	0% - 10% ¹	0.00%	0.00%	0.00%	0.00%	0.00%	2.00%	4.50%	7.00%	9.50%	10.00%
Total Equity	60.00%		45.00%	45.00%	45.00%	45.00%	45.00%	47.00%	49.50%	52.00%	54.50%	58.00%
Core Fixed Income	10.00%	10% - 50%	45.00%	34.50%	29.50%	21.50%	13.50%	11.00%	10.00%	10.00%	10.00%	10.00%
Specialty Credit	10.00%	0% - 25% ¹	0.00%	10.50%	18.50%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%
Cash	0.00%	2% - 5%	5.00%	5.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
Total Fixed Income	20.00%		50.00%	50.00%	50.00%	48.50%	40.50%	38.00%	37.00%	37.00%	37.00%	37.00%
Real Estate	7.00%	5% - 10% ¹	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%
Real Return	13.00%	0% - 10% ¹	0.00%	0.00%	0.00%	1.50%	9.50%	10.00%	8.50%	6.00%	3.50%	0.00%
Total Inflation Protected	20.00%		5.00%	5.00%	5.00%	6.50%	14.50%	15.00%	13.50%	11.00%	8.50%	5.00%
Total Assets	100.0%		100.0%									
Expected Return - 10 Years (%)	6.95		5.77	6.04	6.26	6.45	6.60	6.72	6.84	6.92	7.01	7.00
Standard Deviation of Return (%)	12.82		8.78	9.17	9.57	9.96	10.36	10.76	11.19	11.56	11.96	12.37
+ / (-) in Expected Return - 10 Years (bps)			(118)	(91)	(69)	(50)	(35)	(23)	(11)	(3)	6	5
+ / (-) in SD of Return (bps)			(404)	(365)	(325)	(286)	(246)	(206)	(163)	(126)	(86)	(45)
Sharpe Ratio	0.24		0.22	0.24	0.25	0.26	0.27	0.27	0.27	0.27	0.26	0.25

¹ Total Illiquid Assets are constrained to not exceed 35%. Illiquid Assets are defined as total of Private Equity, 50% of Specialty Credit, Real Estate and 50% of Real Return.

Efficient Frontier 1 Portfolios – Wilshire Bucketing

“Lower Risk A”
is close to
Portfolio 8.

Asset Class	Current Target	Optimization Constraints	Minimum Risk	Portfolio 2	Portfolio 3	Portfolio 4	Portfolio 5	Portfolio 6	Portfolio 7	Portfolio 8	Portfolio 9	Maximum Risk
Public Equity	50.00%	45% - 80%	45.00%	45.00%	45.00%	45.00%	45.00%	45.00%	45.00%	45.00%	45.00%	48.00%
Private Equity	10.00%	0% - 10% ¹	0.00%	0.00%	0.00%	0.00%	0.00%	2.00%	4.50%	7.00%	9.50%	10.00%
Total Growth Assets	60.00%		45.00%	45.00%	45.00%	45.00%	45.00%	47.00%	49.50%	52.00%	54.50%	58.00%
Specialty Credit	10.00%	0% - 25% ¹	0.00%	10.50%	18.50%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%
Total Defensive Growth Assets	10.00%		0.00%	10.50%	18.50%	25.00%						
Core Fixed Income	10.00%	10% - 50%	45.00%	34.50%	29.50%	21.50%	13.50%	11.00%	10.00%	10.00%	10.00%	10.00%
Cash	0.00%	2% - 5%	5.00%	5.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
Total Defensive / Rate Sensitive Assets	10.00%		50.00%	39.50%	31.50%	23.50%	15.50%	13.00%	12.00%	12.00%	12.00%	12.00%
Real Estate	7.00%	5% - 10% ¹	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%
Real Return	13.00%	0% - 10% ¹	0.00%	0.00%	0.00%	1.50%	9.50%	10.00%	8.50%	6.00%	3.50%	0.00%
Total RA / Inflation Sensitive Assets	20.00%		5.00%	5.00%	5.00%	6.50%	14.50%	15.00%	13.50%	11.00%	8.50%	5.00%
Total Assets	100.0%		100.0%									
Expected Return - 10 Years (%)	6.95		5.77	6.04	6.26	6.45	6.60	6.72	6.84	6.92	7.01	7.00
Standard Deviation of Return (%)	12.82		8.78	9.17	9.57	9.96	10.36	10.76	11.19	11.56	11.96	12.37
+ / (-) in Expected Return - 10 Years (bps)			(118)	(91)	(69)	(50)	(35)	(23)	(11)	(3)	6	5
+ / (-) in SD of Return (bps)			(404)	(365)	(325)	(286)	(246)	(206)	(163)	(126)	(86)	(45)
Sharpe Ratio	0.24		0.22	0.24	0.25	0.26	0.27	0.27	0.27	0.27	0.26	0.25

¹ Total Illiquid Assets are constrained to not exceed 35%. Illiquid Assets are defined as total of Private Equity, 50% of Specialty Credit, Real Estate and 50% of Real Return.

Efficient Frontier 2 Portfolios – KPPA Bucketing

“Lower Risk B”
is close to
Portfolio 6.

Asset Class	Current Target	Optimization Constraints	Minimum Risk	Portfolio 2	Portfolio 3	Portfolio 4	Portfolio 5	Portfolio 6	Portfolio 7	Portfolio 8	Portfolio 9	Maximum Risk
Public Equity	50.00%	40% - 80%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	42.00%	42.00%	53.00%
Private Equity	10.00%	0% - 10% ¹	0.00%	0.00%	0.00%	1.50%	4.00%	7.00%	9.50%	10.00%	10.00%	10.00%
Total Equity	60.00%		40.00%	40.00%	40.00%	41.50%	44.00%	47.00%	49.50%	52.00%	52.00%	63.00%
Core Fixed Income	10.00%	10% - 50%	50.00%	35.50%	27.50%	21.50%	19.00%	16.00%	13.50%	10.00%	10.00%	10.00%
Specialty Credit	10.00%	0% - 20% ¹	0.00%	14.50%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%
Cash	0.00%	2% - 5%	5.00%	5.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
Total Fixed Income	20.00%		55.00%	55.00%	49.50%	43.50%	41.00%	38.00%	35.50%	32.00%	32.00%	32.00%
Real Estate	7.00%	5% - 10% ¹	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	6.00%	6.00%	5.00%
Real Return	13.00%	0% - 10% ¹	0.00%	0.00%	5.50%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	0.00%
Total Inflation Protected	20.00%		5.00%	5.00%	10.50%	15.00%	15.00%	15.00%	15.00%	16.00%	16.00%	5.00%
Total Assets	100.0%		100.0%									
Expected Return - 10 Years (%)	6.95		5.70	6.07	6.35	6.52	6.68	6.83	6.96	7.03	7.03	6.92
Standard Deviation of Return (%)	12.82		8.06	8.60	9.15	9.66	10.19	10.75	11.28	11.80	11.80	12.90
+ / (-) in Expected Return - 10 Years (bps)			(125)	(88)	(60)	(43)	(27)	(12)	1	8	8	(3)
+ / (-) in SD of Return (bps)			(476)	(422)	(367)	(316)	(263)	(207)	(154)	(102)	(102)	8
Sharpe Ratio	0.24		0.23	0.26	0.27	0.28	0.28	0.28	0.28	0.27	0.27	0.24

¹ Total Illiquid Assets are constrained to not exceed 35%. Illiquid Assets are defined as total of Private Equity, 50% of Specialty Credit, Real Estate and 50% of Real Return.

Efficient Frontier 2 Portfolios – Wilshire Bucketing

“Lower Risk B”
is close to
Portfolio 6.

Asset Class	Current Target	Optimization Constraints	Minimum Risk	Portfolio 2	Portfolio 3	Portfolio 4	Portfolio 5	Portfolio 6	Portfolio 7	Portfolio 8	Portfolio 9	Maximum Risk
Public Equity	50.00%	40% - 80%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	42.00%	42.00%	53.00%
Private Equity	10.00%	0% - 10% ¹	0.00%	0.00%	0.00%	1.50%	4.00%	7.00%	9.50%	10.00%	10.00%	10.00%
Total Growth Assets	60.00%		40.00%	40.00%	40.00%	41.50%	44.00%	47.00%	49.50%	52.00%	52.00%	63.00%
Specialty Credit	10.00%	0% - 20% ¹	0.00%	14.50%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%
Total Defensive Growth Assets	10.00%		0.00%	14.50%	20.00%							
Core Fixed Income	10.00%	10% - 50%	50.00%	35.50%	27.50%	21.50%	19.00%	16.00%	13.50%	10.00%	10.00%	10.00%
Cash	0.00%	2% - 5%	5.00%	5.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
Total Defensive / Rate Sensitive Assets	10.00%		55.00%	40.50%	29.50%	23.50%	21.00%	18.00%	15.50%	12.00%	12.00%	12.00%
Real Estate	7.00%	5% - 10% ¹	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	6.00%	6.00%	5.00%
Real Return	13.00%	0% - 10% ¹	0.00%	0.00%	5.50%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	0.00%
Total RA / Inflation Sensitive Assets	20.00%		5.00%	5.00%	10.50%	15.00%	15.00%	15.00%	15.00%	16.00%	16.00%	5.00%
Total Assets	100.0%		100.0%									
Expected Return - 10 Years (%)	6.95		5.70	6.07	6.35	6.52	6.68	6.83	6.96	7.03	7.03	6.92
Standard Deviation of Return (%)	12.82		8.06	8.60	9.15	9.66	10.19	10.75	11.28	11.80	11.80	12.90
+ / (-) in Expected Return - 10 Years (bps)			(125)	(88)	(60)	(43)	(27)	(12)	1	8	8	(3)
+ / (-) in SD of Return (bps)			(476)	(422)	(367)	(316)	(263)	(207)	(154)	(102)	(102)	8
Sharpe Ratio	0.24		0.23	0.26	0.27	0.28	0.28	0.28	0.28	0.27	0.27	0.24

¹ Total Illiquid Assets are constrained to not exceed 35%. Illiquid Assets are defined as total of Private Equity, 50% of Specialty Credit, Real Estate and 50% of Real Return.

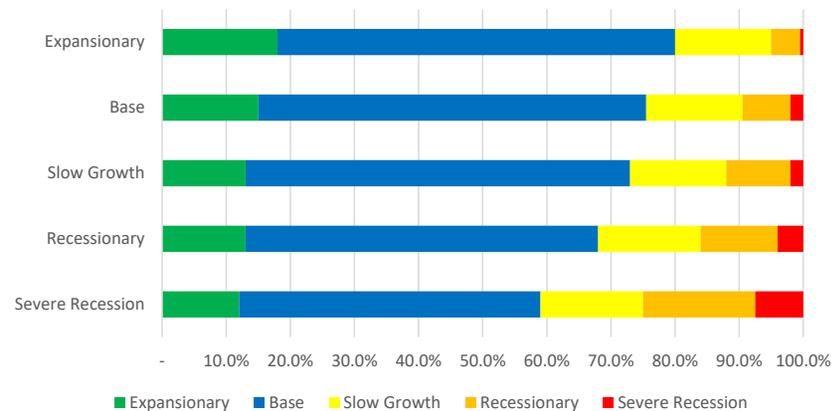
Appendix – Regimes

Efficient Frontier Portfolios

Managing drawdown risk – the “uncertainty around the uncertainty”

- Most simulation models assume returns are log-normally distributed
- Though reasonable in most years, left-tail events occur more frequently than predicted
- A regime switching model can help us pre-experience uncomfortable return paths that fall outside a normal distribution’s field of view

	expansionary	base	slow growth	recessionary	severe recession
expansionary	18.0%	62.0%	15.0%	4.5%	0.5%
base	15.0%	60.5%	15.0%	7.5%	2.0%
slow growth	13.0%	60.0%	15.0%	10.0%	2.0%
recessionary	13.0%	55.0%	16.0%	12.0%	4.0%
severe recession	12.0%	47.0%	16.0%	17.5%	7.5%



Stress Testing: Regime Assumptions

- In below trend and worse environments, the portfolio's return expectations is materially lower and the volatility is materially higher
- Volatility in the below trend and worse environments are left-skewed, i.e. negative-skewed

	US Stocks	Dev xUS Stocks	EM Stocks	Prvt Mkts	Cash	Core Bonds	LT Bonds	US TIPS	HY	US RES	Private RE	Commodities	Current Target
Expansionary/Above Trend Growth													
Return (%)	10.50	11.50	11.75	16.50	4.10	4.35	4.30	3.55	8.20	10.75	11.00	9.10	10.97
Risk (%)	12.00	13.00	21.00	22.15	0.75	5.20	10.85	6.50	8.00	13.50	10.90	16.00	9.54
Baseline/Trend Growth													
Return (%)	5.50	6.50	6.75	9.00	3.85	4.85	4.80	4.05	6.20	5.75	6.00	6.10	6.95
Risk (%)	17.00	18.00	26.00	29.65	0.75	4.70	9.85	6.00	10.00	17.50	13.90	16.00	12.82
Slow Growth/Below Trend													
Return (%)	3.50	4.50	4.75	6.00	3.85	5.85	6.30	4.55	5.20	3.75	4.00	5.10	5.51
Risk (%)	22.00	23.00	31.00	37.15	0.75	5.70	11.85	7.50	12.00	21.50	16.90	18.00	16.75
Recessionary/Negative Growth													
Return (%)	(4.50)	(3.50)	(3.25)	(6.00)	3.35	6.85	7.80	6.55	1.20	(4.25)	(4.00)	2.10	(0.94)
Risk (%)	27.00	28.00	36.00	44.65	0.75	6.70	13.85	9.00	15.00	27.50	21.90	21.00	20.78
Severe Recession/Deflation													
Return (%)	(44.50)	(43.50)	(43.25)	(41.00)	2.85	14.85	19.80	16.55	(13.80)	(44.25)	(34.00)	(1.90)	(28.90)
Risk (%)	42.00	43.00	51.00	54.65	0.75	14.70	29.85	21.00	20.00	42.50	33.90	26.00	31.04

Stress Testing: Regime Descriptions

Regime Descriptions

- **Expansionary/Above Trend Growth** – Regime when the economy is coming out of a recession or the economy is running above long-run capacity. Wilshire does not project the economy to remain in this regime over longer periods.
- **Baseline/Trend Growth** – The long term expected state of the economy. Wilshire’s capital market assumptions are based on this regime.
- **Slow Growth/Below Trend** – Regime when the economy is running at less than full capacity.
- **Recessionary/Negative Growth** – Regime when the economy has below zero growth. Wilshire expects the economy would be in a recession.
- **Severe Recession/Deflation** – Regime when the economy defined by significantly negative growth. Wilshire does not project the economy to remain in this regime over longer periods.

Wilshire

Appendix – Economic Factor Exposures

Why Introduce Factors?

- **Risk Assessment:** Including factors within the asset allocation process provides an opportunity to measure asset class (and portfolio) exposures to key economic factors
- **Economic Efficiency:** If the underlying economic activity that drives asset performance can be identified, perhaps it can be used to assist in building economically-efficient portfolios
- **Portfolio Stability:** Macroeconomic risk factors – when separated from the valuation component inherent in investment pricing – may exhibit more stable correlations and, therefore, can better inform the allocation process

Growth Proxy

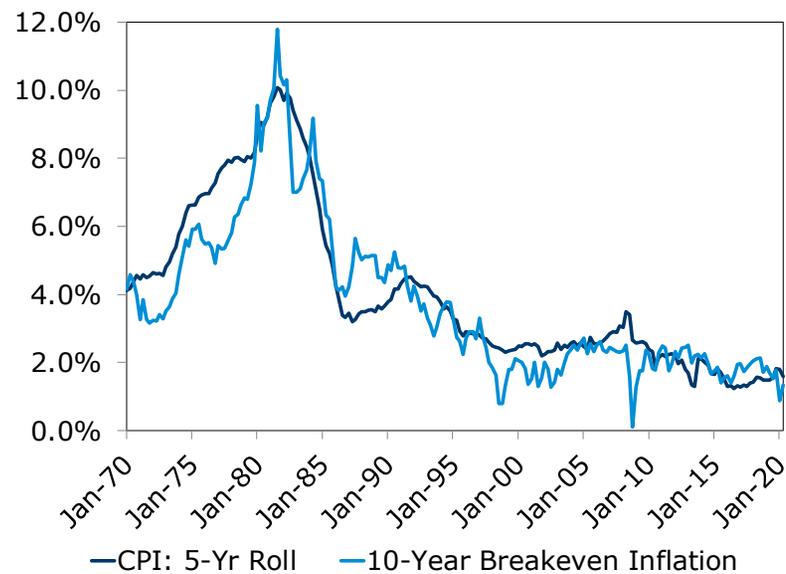
- Interest rates contain information and can reflect economic factors
- Nominal yields aggregate two important and distinct sources of economic information – real yields and expected inflation
- Disaggregating these factors should prove beneficial in developing a set of factors with improved explanatory power



Data Source: Federal Reserve, Bridgewater

Inflation Proxy

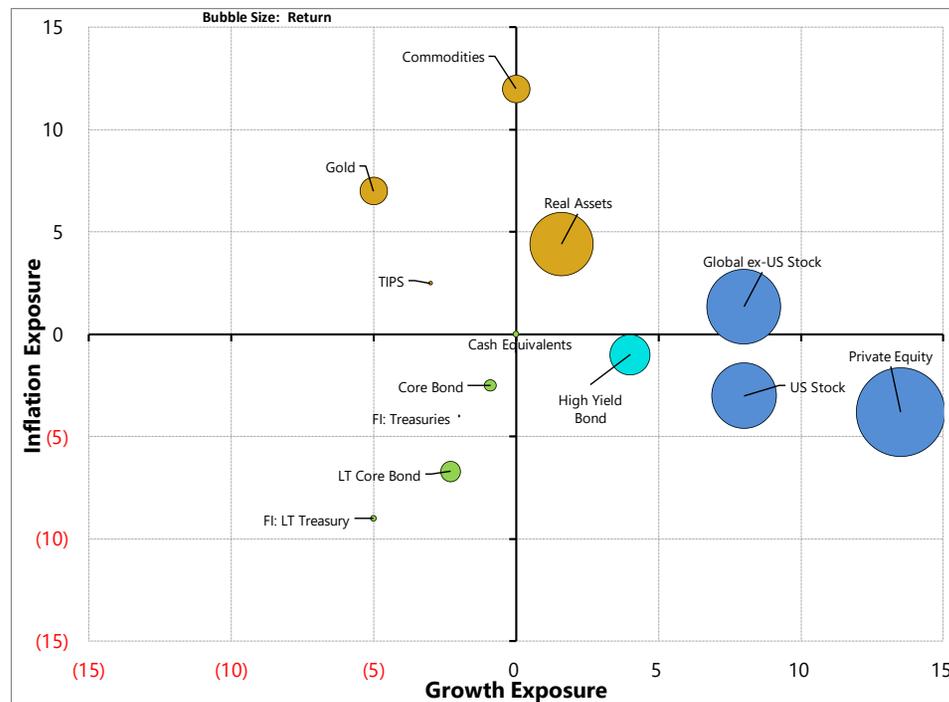
- Breakeven inflation is the market's expectation for inflation
- Tends to follow closely with actual, recent inflation and can act as a timely signal of trends in consumer prices



Data Source: Federal Reserve, Bridgewater

Wilshire's Approach

- Employ a 2-factor regression model (growth and inflation) to formulate factor assumptions
- Growth proxy is enhanced by high yield bond spreads to better capture shifts in growth forecasts



Wilshire

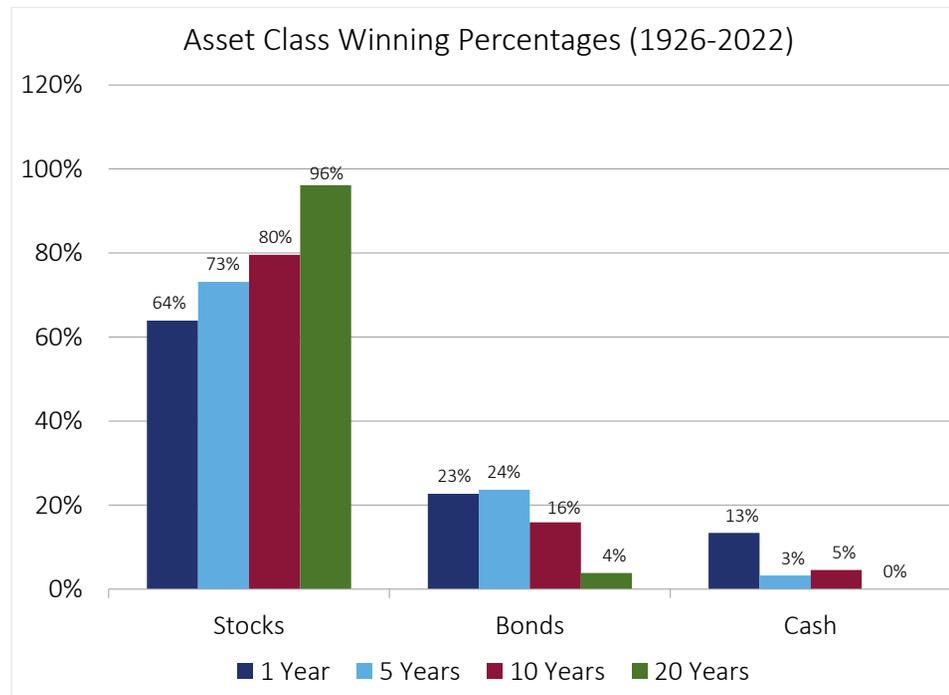
Appendix – Liquidity

Liquidity Risk: What Are The Consequences?

Default/Insolvency is the most severe outcome from having insufficient liquidity, but...

There are many other, more likely, disruptive impacts that a lack of liquidity can impose on an investment portfolio

- Liquidity breaches can rob an investor of their biggest advantage: a long-term investment horizon
- The timing and price of such sales dictated by liquidity needs rather than by explicit investment rationale
- Can destroy portfolio value and effectively strip a portfolio from its ability to recover from market sell-offs



Wilshire Liquidity Metric

Wilshire's Liquidity Metric framework has two levels:

- **Market Level of Liquidity**
- **Stressed Level of Liquidity**

Market Level of Liquidity

- Quantified on scale from 0% (low liquidity) to 100% (high liquidity)
- Designed to capture general notion of marketable versus private/off-market transactions
 - Marketable asset classes typically reflect a 90% or 100%
 - Private asset classes reflect 0%
- Goal is to reflect the tradability of assets, which is helpful in connecting these values back to our definitional framework (i.e., to quantify the differences between Convertible Liquidity and Delayed Liquidity)

Wilshire Liquidity Metric

Wilshire's Liquidity Metric framework has two levels:

- **Market Level of Liquidity**
- **Stressed Level of Liquidity**

Stressed Liquidity Metric

Includes a penalty process to reflect the loss in practical liquidity due to asset class volatility and sensitivity to particular economic environments

Penalty components:

1. **Growth Penalty:**
 - Impacts asset classes with vulnerability to slowing growth
 - Recognizes the hit to liquidity that can occur during growth related bear markets
2. **Inflation Penalty:**
 - Impacts asset classes with vulnerability to rising inflation
 - Recognizes the hit to liquidity that can occur during inflation driven bear markets
3. **Volatility Penalty:**
 - Impacts higher volatility asset classes
 - Recognizes the hit to liquidity that can occur from any form of volatility

Wilshire Stressed Liquidity Metric

Stressed Level of Liquidity Metric

Asset Class	Market Liquidity	Liquidity Penalty Components			Applied Penalty	Stressed Liquidity
		Growth	Inflation	Volatility		
US Equity	100	50		24	50	0
Dev ex-US Equity	100	50		26	50	0
EM Equity	90	50		40	50	0
Private Equity	0	50		40	0	0
Cash Equivalents	100				0	100
Core Bonds	100		8		8	86
High Yield Bonds	80	40		10	40	0
US Real Estate Securities	90	50		24	50	0
Private Real Estate	0	50		18	0	0
Commodities	90			20	20	55

Applied Penalty = $\text{Min}(\text{Max}(\text{Growth} + \text{Inflation}, \text{Volatility}), \text{Market Liquidity})$

Stressed Liquidity * = $\text{Market Liquidity} - (1.75 \times \text{Applied Penalty})$

* If less than 20, Stressed Liquidity is assumed to be 0

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County Employees Retirement System

Investment Office Quarterly Update

Quarter Ending: December 31, 2023

County Employees Retirement System

Economic and Market Update

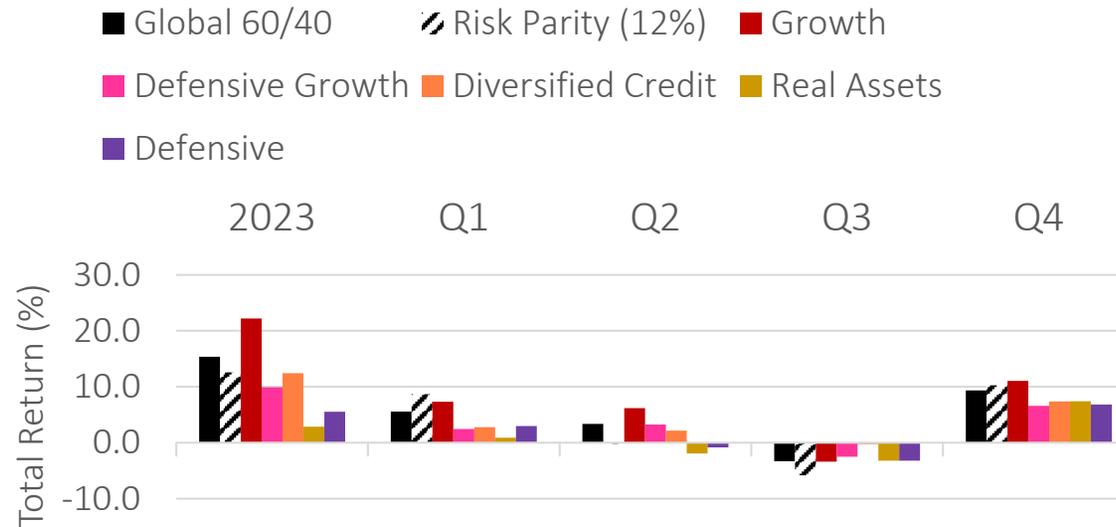
Quarter Ending: December 31, 2023

December 2023 Asset Class Assumptions

	EQUITY						FIXED INCOME / CREDIT						REAL ASSETS						
	US Stock	Dev ex-US Stock	Emg Stock	Global ex-US Stock	Global Stock	Private Equity	Cash	Core Bond	LT Core Bond	TIPS	High Yield	Private Credit	Dev ex-US Bond (Hdg)	Real Estate US RES	Global RES	Private RE	Comdty	Real Assets	US CPI
Compound Reurun (%)	5.00	6.00	6.25	6.35	5.60	8.65	3.80	4.75	4.70	4.15	5.90	8.40	2.85	5.60	5.75	6.30	6.05	6.90	2.25
Arithmetic Return (%)	6.35	7.50	9.20	8.00	6.95	12.35	3.80	4.85	5.15	4.30	6.35	9.15	2.95	7.00	7.00	7.20	7.20	7.65	2.25
Risk (%)	17.00	18.00	26.00	19.00	17.05	29.65	0.75	4.70	9.85	6.00	10.00	12.75	4.00	17.50	16.45	13.90	16.00	12.60	1.75
Cash Yield (%)	1.45	3.10	2.50	2.95	2.00	0.00	3.80	5.10	5.25	4.35	9.20	4.95	3.65	3.90	3.90	2.50	3.80	3.40	0.00
Growth Factor Exposure	8.00	8.00	8.00	8.00	8.00	14.00	0.00	-0.90	-2.40	-3.00	4.00	5.10	-1.00	6.00	6.00	3.50	0.00	2.70	0.00
Inflation Factor Exposure	-3.00	0.00	5.00	1.40	-1.35	-3.75	0.00	-2.55	-6.85	2.50	-1.00	-1.50	-3.00	1.00	1.80	1.00	12.00	5.25	1.00
CORRELATIONS																			
US Stock	1.00																		
Dev ex-US Stock (USD)	0.81	1.00																	
Emerging Mkt Stock	0.74	0.74	1.00																
Global ex-US Stock	0.84	0.95	0.89	1.00															
Global Stock	0.95	0.91	0.84	0.94	1.00														
Private Equity	0.72	0.63	0.61	0.67	0.73	1.00													
Cash Equivalents	-0.05	-0.09	-0.05	-0.08	-0.06	0.00	1.00												
Core Bond	0.28	0.13	0.00	0.08	0.20	0.30	0.18	1.00											
LT Core Bond	0.31	0.15	0.01	0.11	0.24	0.31	0.11	0.94	1.00										
TIPS	-0.05	0.00	0.15	0.06	-0.01	-0.03	0.20	0.60	0.48	1.00									
High Yield Bond	0.54	0.39	0.49	0.46	0.53	0.31	-0.10	0.24	0.32	0.05	1.00								
Private Credit	0.67	0.55	0.57	0.59	0.67	0.44	0.00	0.24	0.30	0.00	0.75	1.00							
Dev ex-US Bond (Hdg)	0.16	0.25	-0.01	0.16	0.17	0.26	0.10	0.67	0.65	0.39	0.26	0.22	1.00						
US RE Securities	0.57	0.47	0.44	0.49	0.56	0.49	-0.05	0.17	0.22	0.10	0.56	0.61	0.05	1.00					
Global RE Securities	0.63	0.56	0.54	0.59	0.64	0.55	-0.05	0.17	0.21	0.11	0.60	0.67	0.04	0.97	1.00				
Private Real Estate	0.55	0.45	0.45	0.49	0.54	0.50	-0.05	0.19	0.25	0.09	0.57	0.62	0.05	0.78	0.77	1.00			
Commodities	0.25	0.34	0.39	0.38	0.32	0.28	0.00	-0.03	-0.03	0.25	0.29	0.29	-0.10	0.25	0.28	0.25	1.00		
Real Assets	0.61	0.62	0.66	0.68	0.66	0.56	-0.03	0.24	0.26	0.32	0.64	0.69	0.05	0.78	0.83	0.76	0.62	1.00	
Inflation (CPI)	-0.10	-0.15	-0.13	-0.15	-0.13	-0.10	0.10	-0.12	-0.12	0.15	-0.08	0.00	-0.08	0.05	0.04	0.05	0.44	0.21	1.00

Thematic Return Stacks

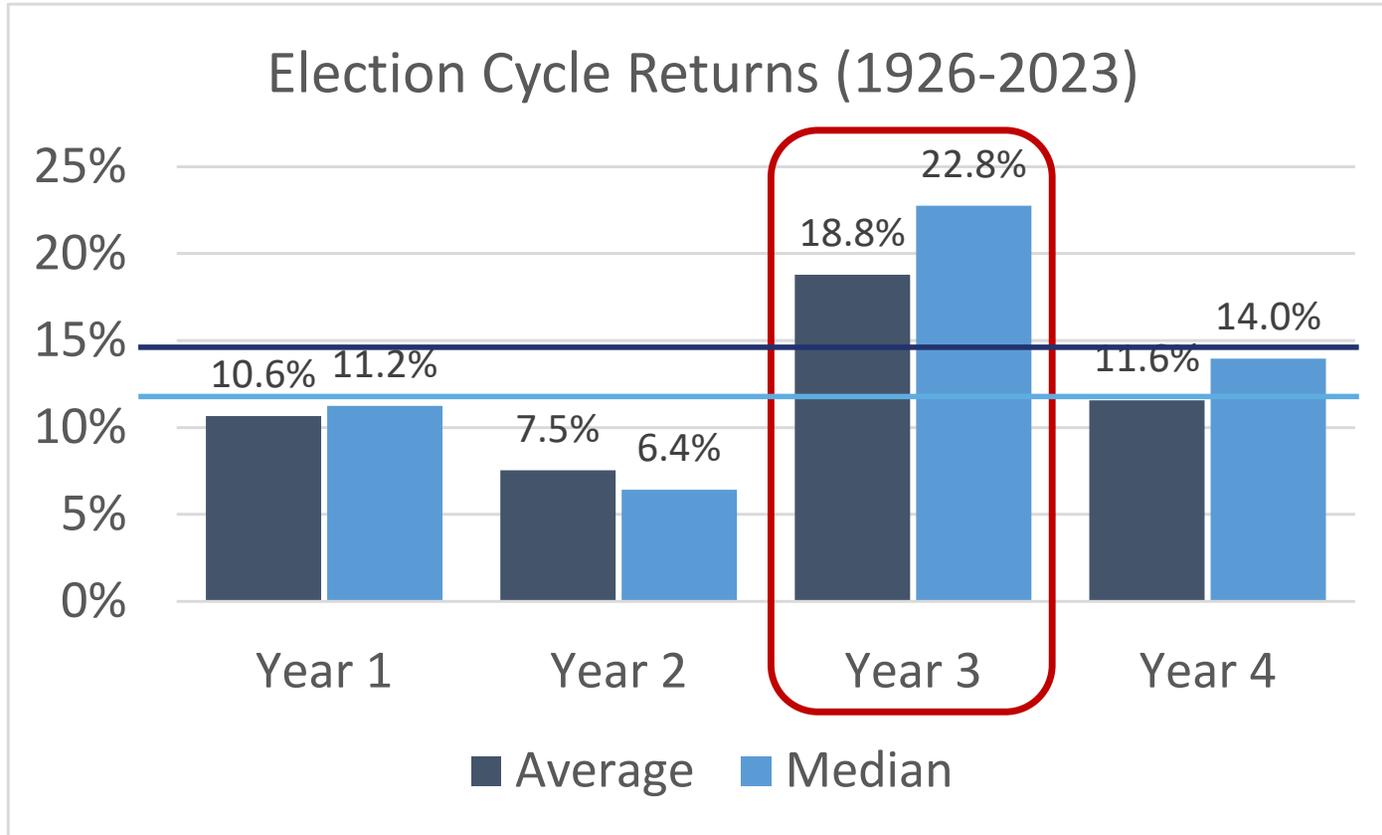
Asset Allocation & Thematic Returns



	2023	Q1	Q2	Q3	Q4
Global 60/40	15.36	5.56	3.36	(3.31)	9.36
Risk Parity (12%)	12.58	8.66	(0.20)	(5.82)	10.24
Growth	22.20	7.31	6.18	(3.40)	11.03
Defensive Growth	9.89	2.46	3.23	(2.51)	6.58
Diversified Credit	12.42	2.78	2.14	(0.26)	7.36
Real Assets	2.86	0.90	(1.92)	(3.22)	7.39
Defensive	5.53	2.96	(0.84)	(3.23)	6.82

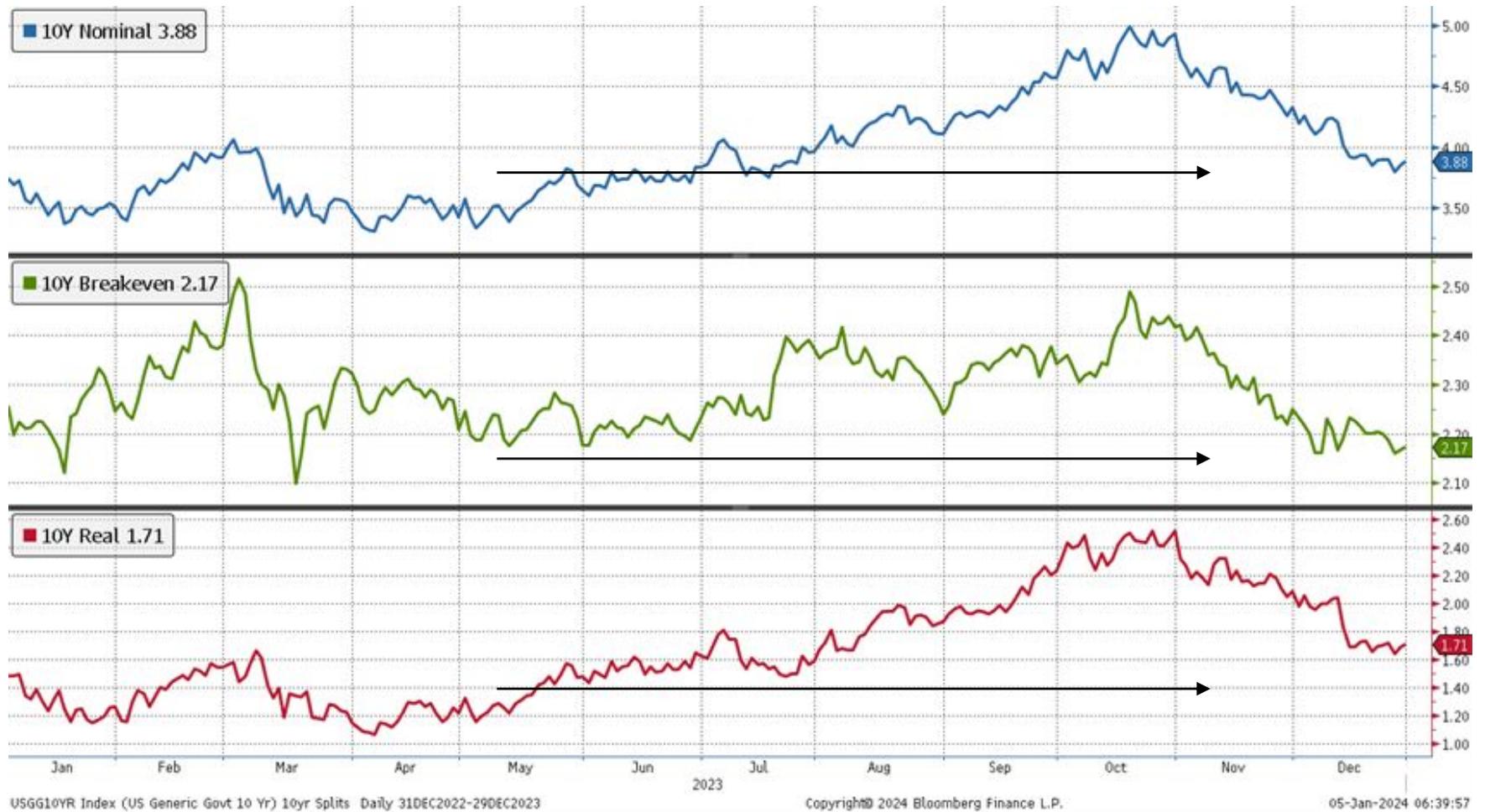
Data Source: Wilshire, Bloomberg

Election Cycles



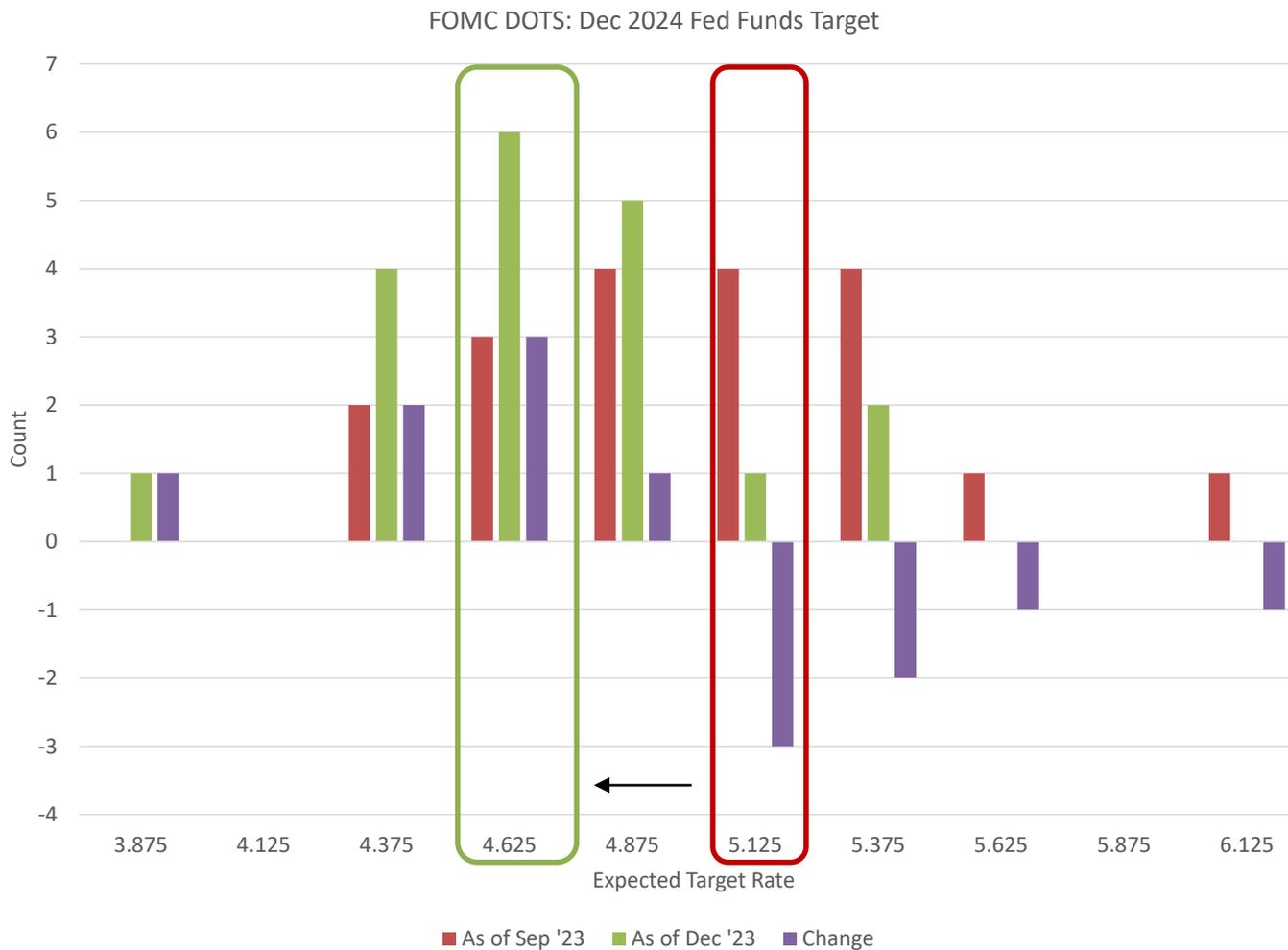
Data Source: Wilshire Compass

Yield Whiplash



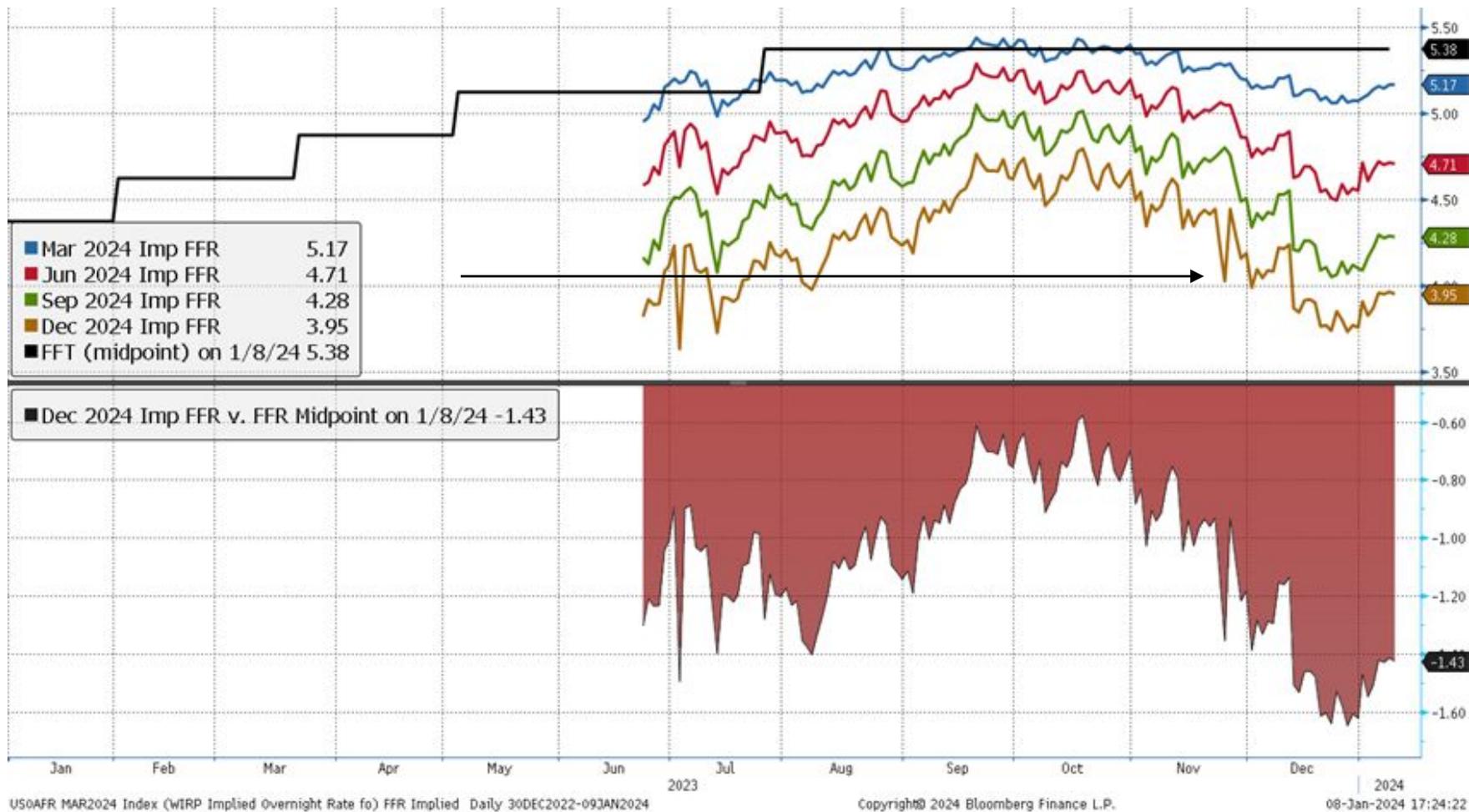
Data Source: Bloomberg

Fed Pivot: Hinting at “Mission Accomplished”



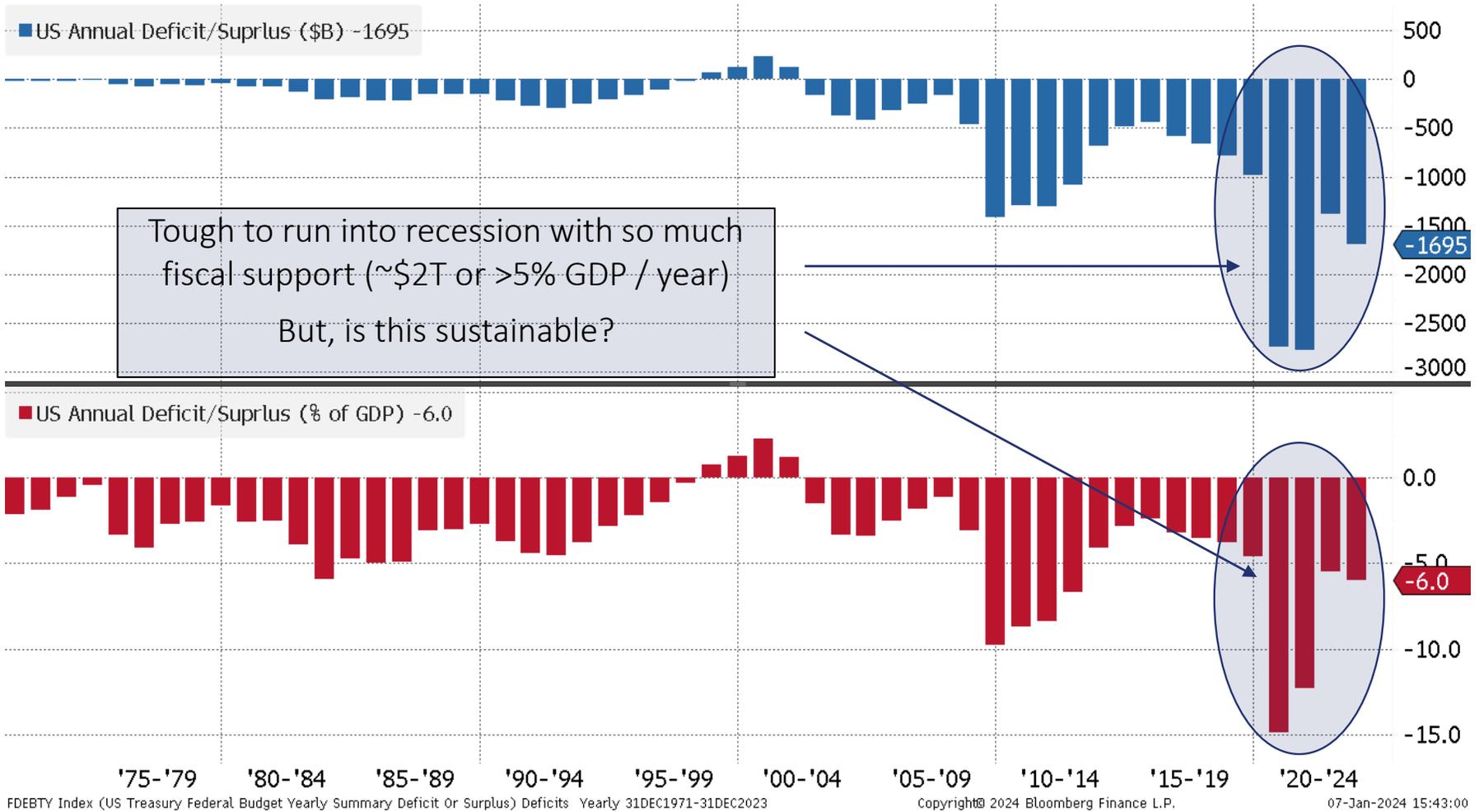
Data Source: Bloomberg

Markets Expect More in Rate Cuts



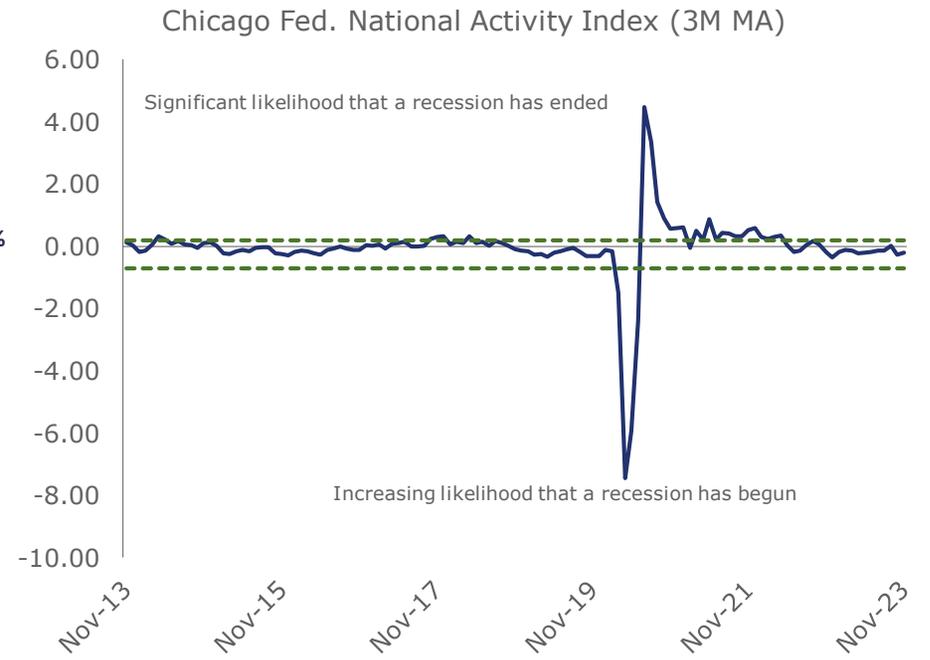
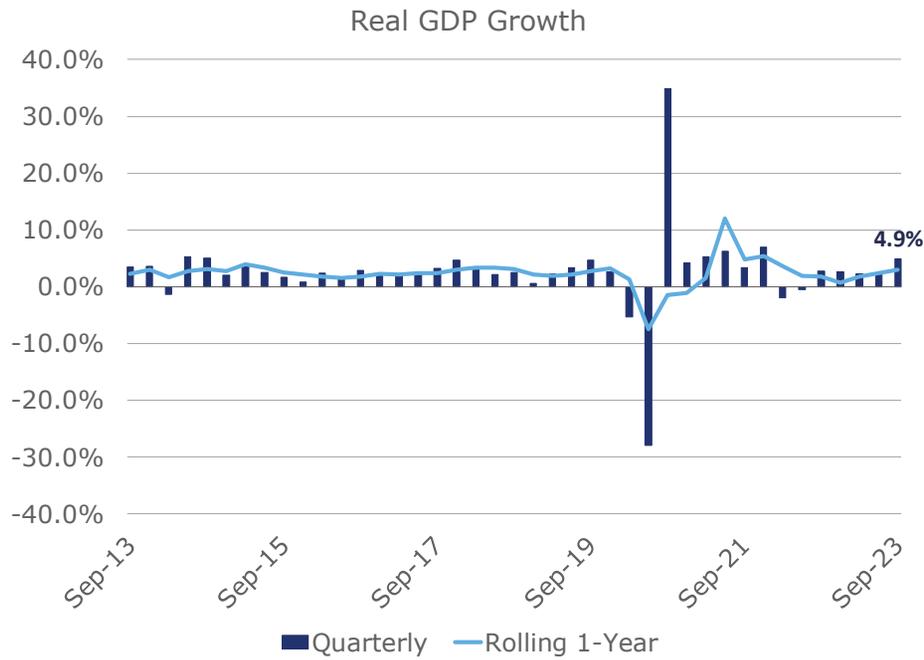
Data Source: Bloomberg

Recession Risks: How Did We All Get It So Wrong?



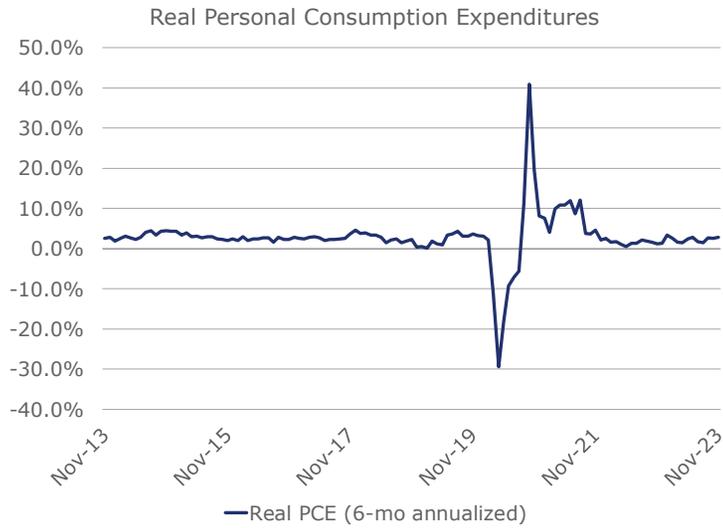
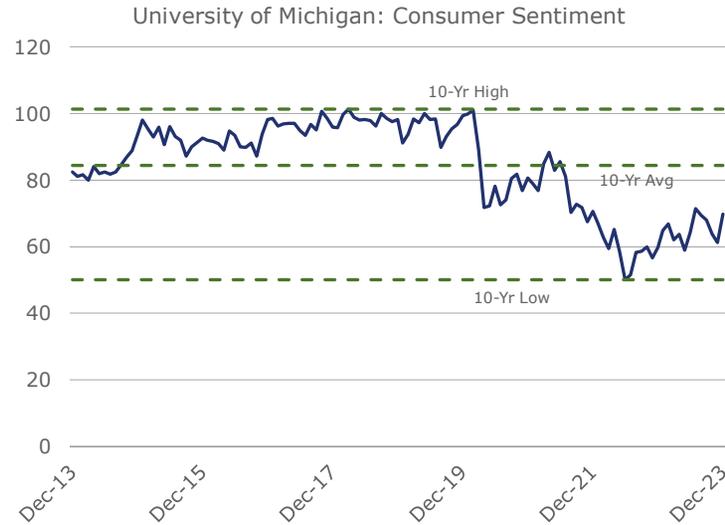
Data Source: Bloomberg

Economic Growth



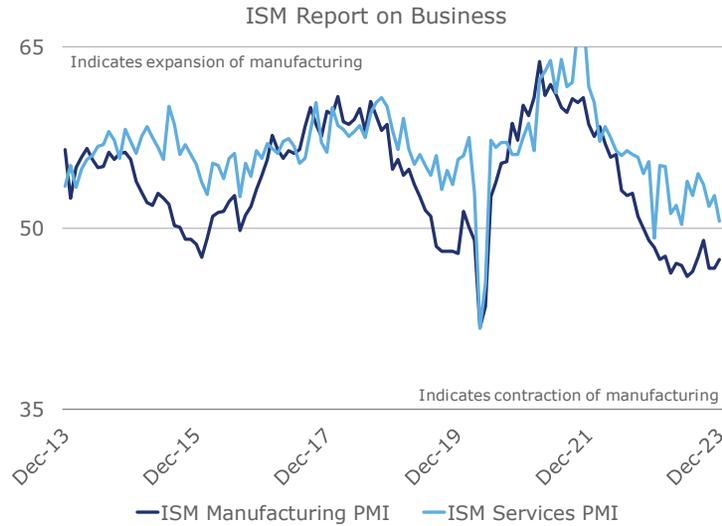
Data Sources: Bloomberg

Consumer Activity



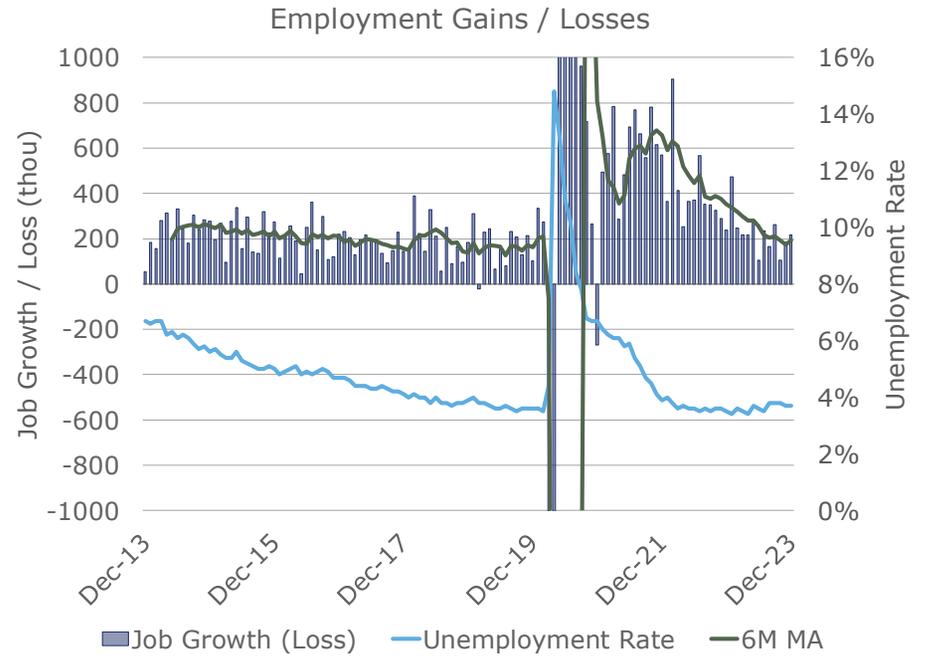
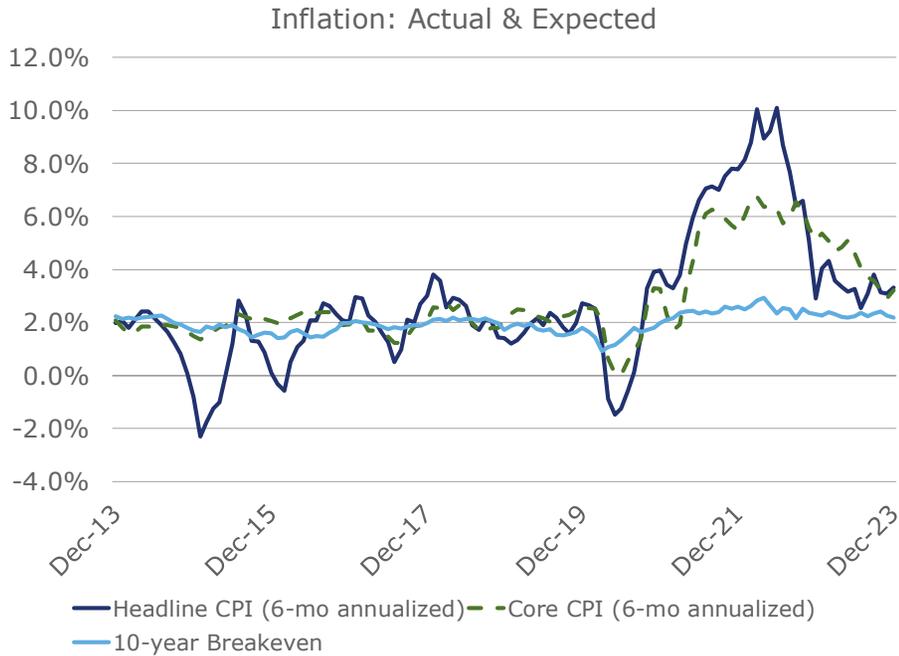
Data Sources: Bloomberg

Business Activity



Data Sources: Bloomberg

Inflation and Employment

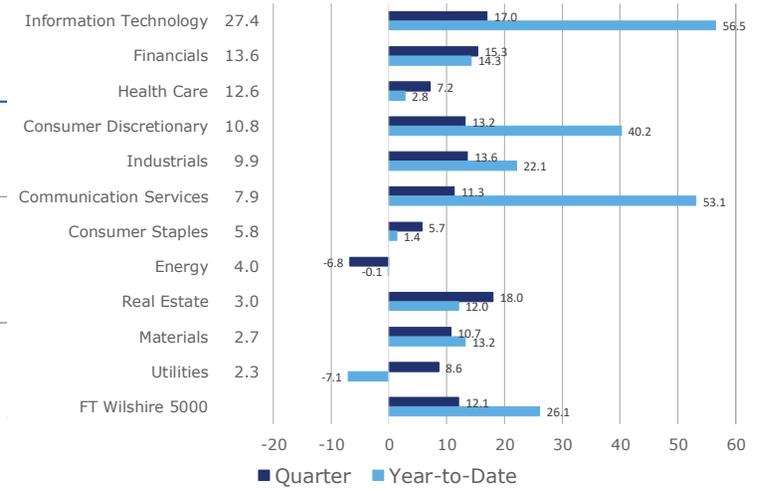


Data Sources: Bloomberg

U.S. Equity Market

As of 12/31/2023	Quarter	YTD	1 Year	3 Year	5 Year	10 Year
FT Wilshire 5000	12.1	26.1	26.1	9.0	15.4	11.7
Wilshire U.S. Large Cap	11.9	27.3	27.3	9.5	15.9	12.2
Wilshire U.S. Small Cap	13.5	19.5	19.5	5.5	12.0	8.7
Wilshire U.S. Large Growth	14.7	46.1	46.1	8.7	19.2	n/a
Wilshire U.S. Large Value	9.1	11.1	11.1	10.0	12.2	n/a
Wilshire U.S. Small Growth	12.9	21.8	21.8	0.6	11.6	n/a
Wilshire U.S. Small Value	14.2	17.2	17.2	10.3	12.1	n/a
Wilshire REIT Index	16.3	16.1	16.1	7.5	7.6	7.7
MSCI USA Min. Vol. Index	7.8	9.8	9.8	6.5	10.3	10.4
FTSE RAFI U.S. 1000 Index	11.2	16.1	16.1	12.3	14.3	10.4

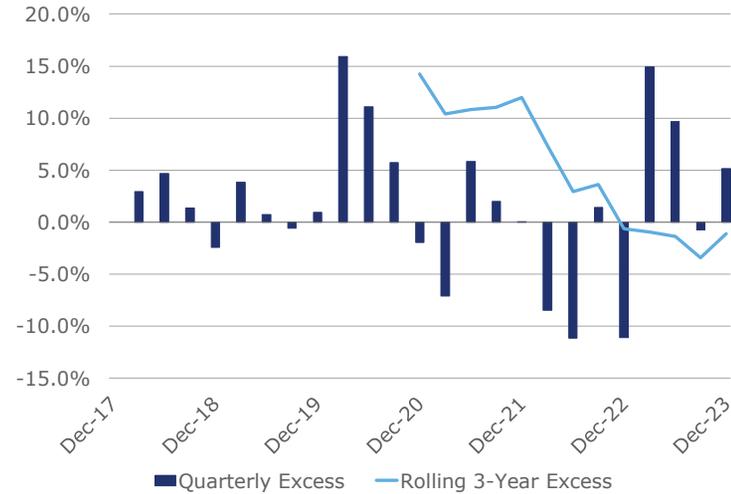
U.S. Sector Weight and Return (%)



Large Cap vs Small Cap



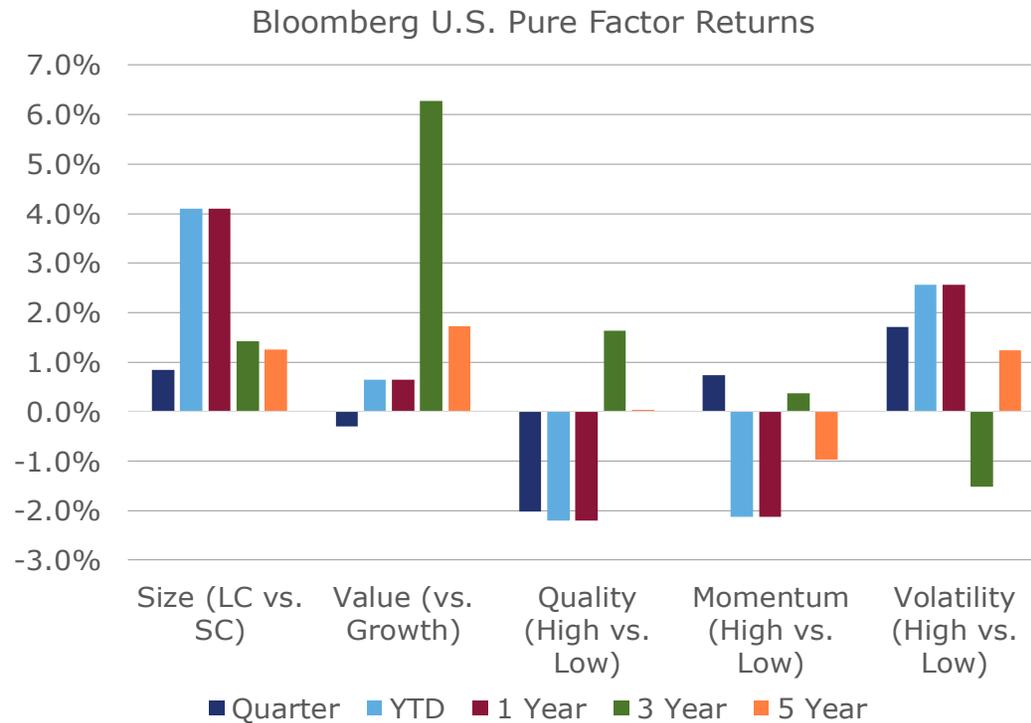
Large Growth vs Large Value



Data Sources: Bloomberg, Wilshire Atlas

U.S. Factor Returns

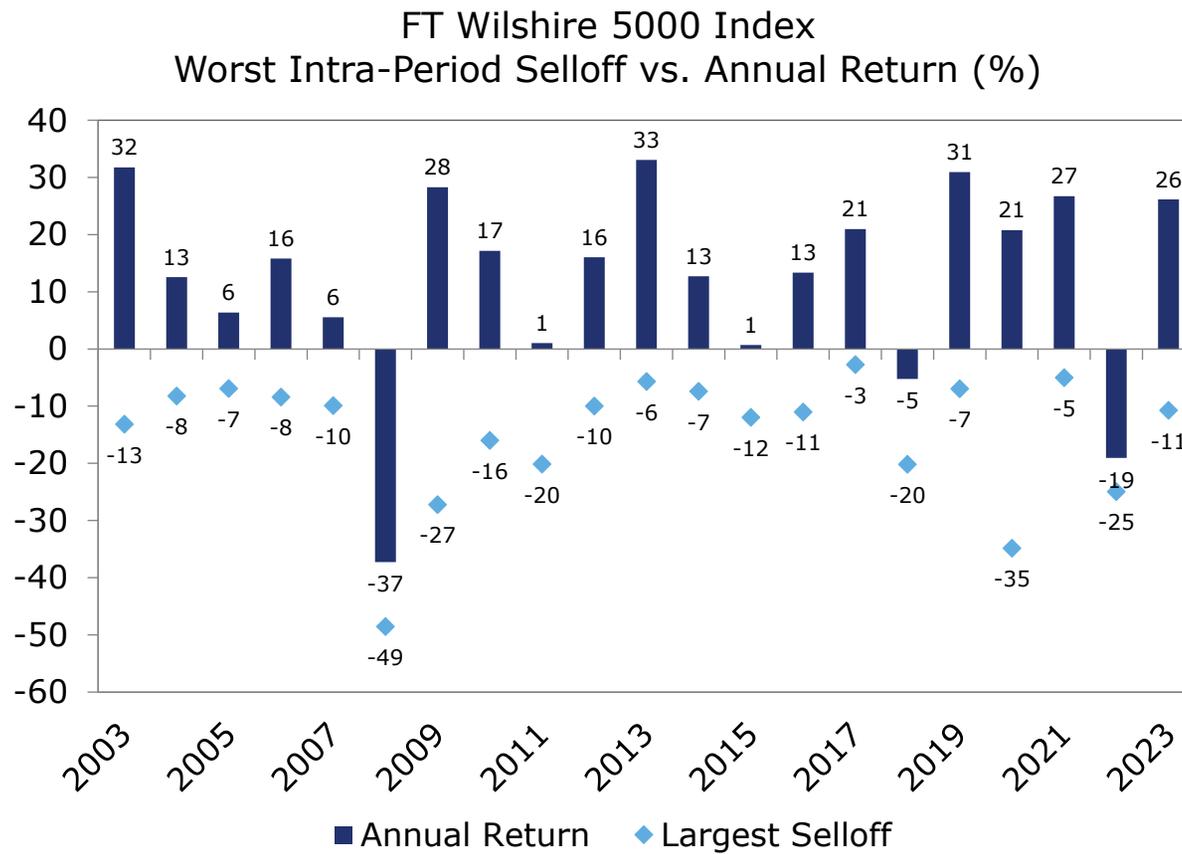
- Factor returns represent the contribution from large cap, value, etc. stocks within Bloomberg’s Portfolio & Risk Analytics module
- Large cap and high volatility have mostly outperformed this year



Data Sources: Bloomberg

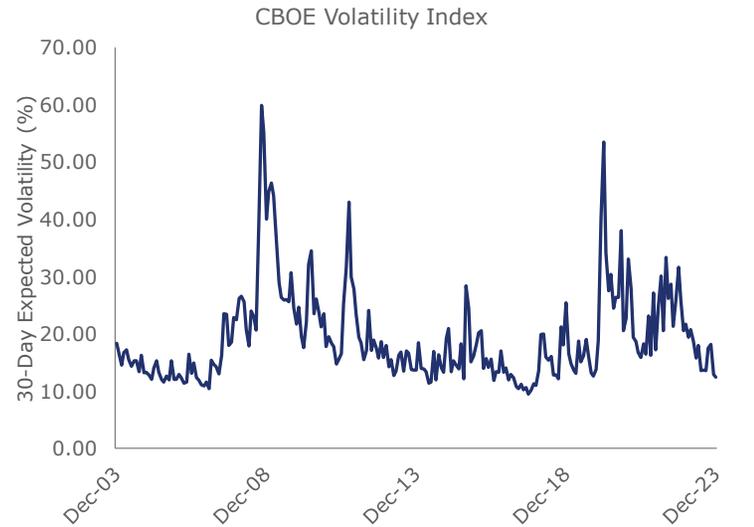
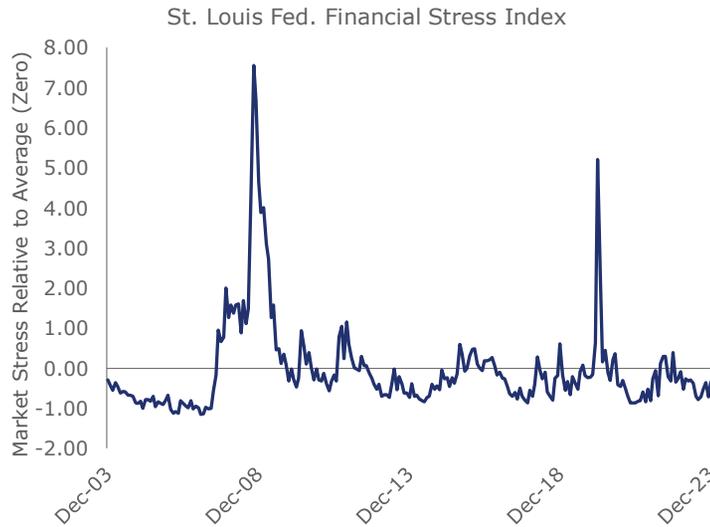
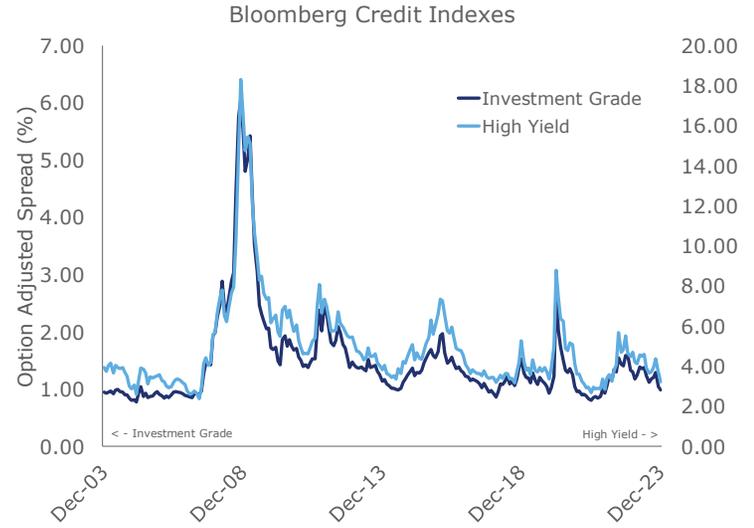
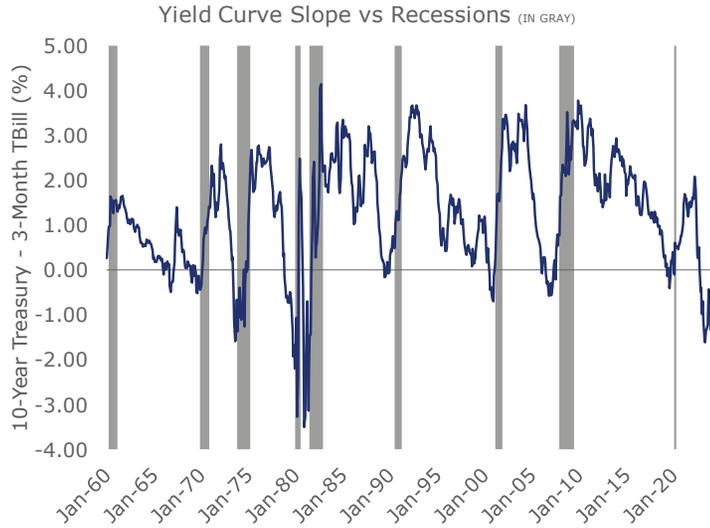
Annual Equity Market Selloffs

U.S. equity suffered a meaningful selloff in Feb.-Mar. but generally rebounded strongly from 2022



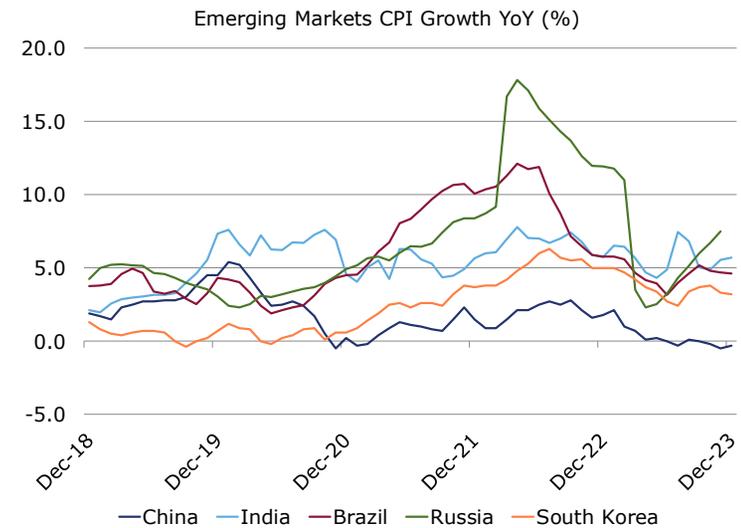
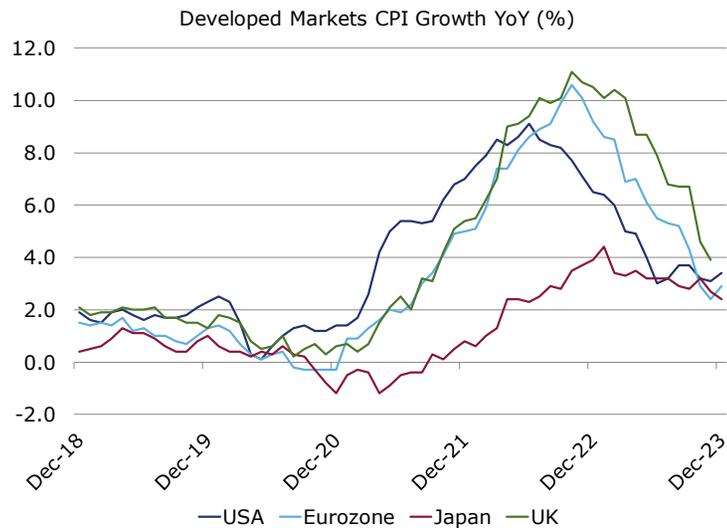
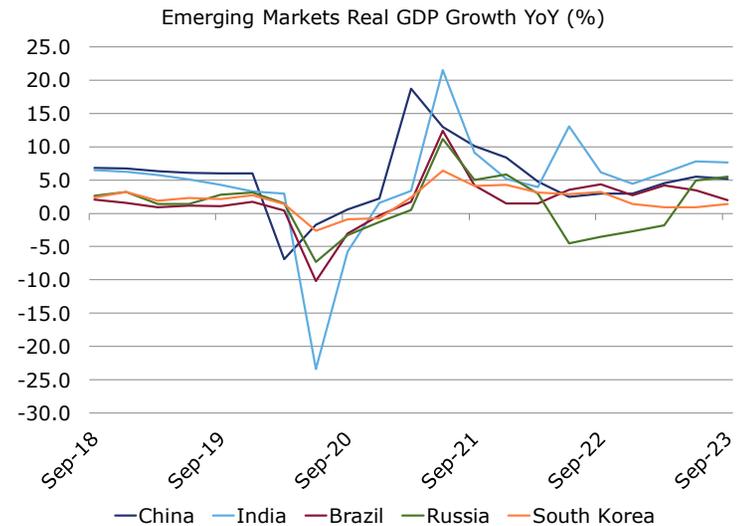
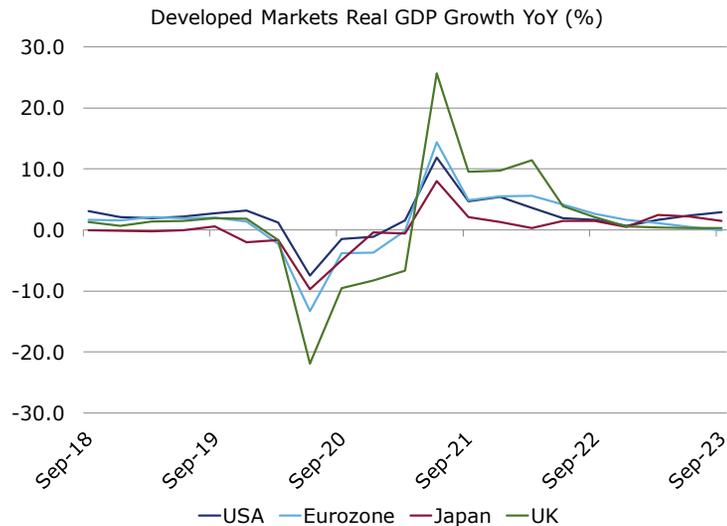
Data Sources: Wilshire Web, Bloomberg

Risk Monitor



Data Sources: Bloomberg

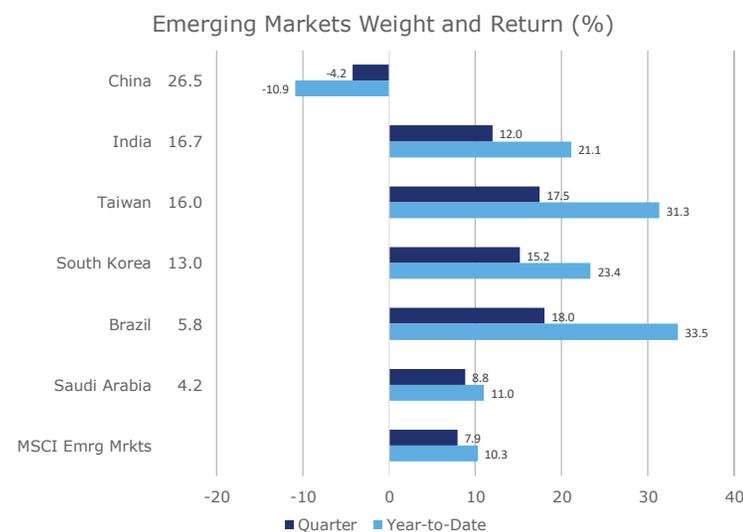
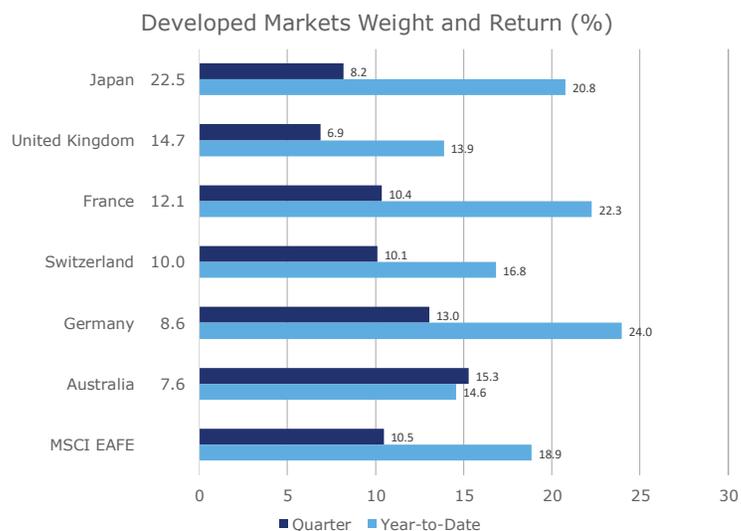
Non-U.S. Growth and Inflation



Data Sources: Bloomberg

Non-U.S. Equity Market

As of 12/31/2023	Quarter	YTD	1 Year	3 Year	5 Year	10 Year
MSCI ACWI ex-US (\$G)	9.8	16.2	16.2	2.0	7.6	4.3
MSCI EAFE (\$G)	10.5	18.9	18.9	4.5	8.7	4.8
MSCI Emerging Markets (\$G)	7.9	10.3	10.3	-4.7	4.1	3.0
MSCI Frontier Markets (\$G)	7.6	12.5	12.5	-1.1	1.6	0.9
MSCI ACWI ex-US Growth (\$G)	11.2	14.4	14.4	-2.4	7.8	4.9
MSCI ACWI ex-US Value (\$G)	8.7	18.1	18.1	6.4	7.2	3.8
MSCI ACWI ex-US Small (\$G)	10.2	16.2	16.2	2.0	8.4	5.3
MSCI ACWI Minimum Volatility	6.6	8.4	8.4	3.8	7.1	7.5
MSCI EAFE Minimum Volatility	7.3	12.4	12.4	1.1	4.1	4.7
FTSE RAFI Developed ex-US	9.5	19.0	19.0	7.7	8.8	4.5
MSCI EAFE LC (G)	5.0	16.8	16.8	9.2	10.0	7.1
MSCI Emerging Markets LC (G)	5.6	10.3	10.3	-2.1	5.8	5.6

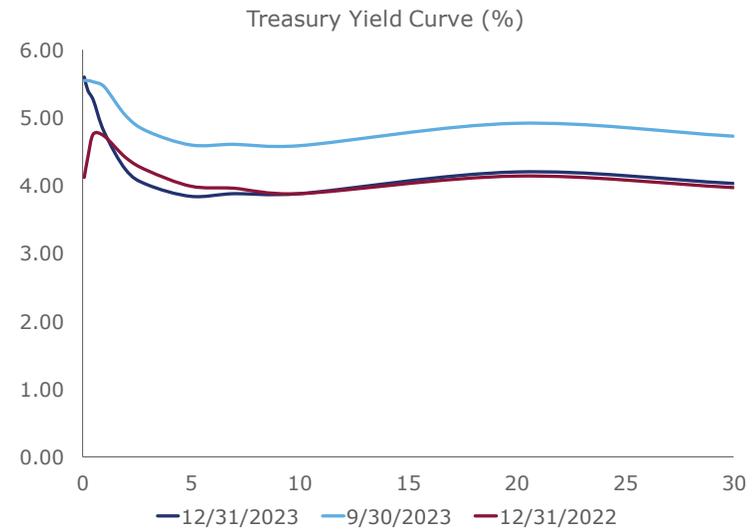
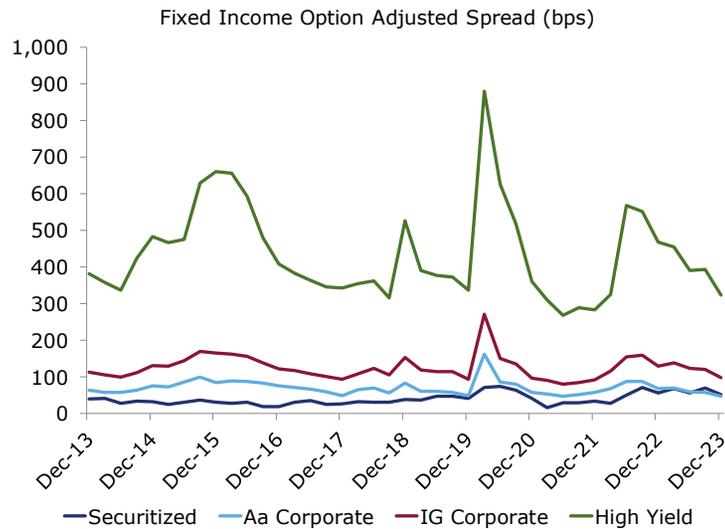


Data Sources: Bloomberg

U.S. Fixed Income

As of 12/31/2023	YTW	DUR.	QTR	YTD	1 YR	3 YR	5 YR	10 YR
Bloomberg Aggregate	4.5	6.2	6.8	5.5	5.5	-3.3	1.1	1.8
Bloomberg Treasury	4.1	6.2	5.7	4.1	4.1	-3.8	0.5	1.3
Bloomberg Gov't-Rel.	4.6	5.3	5.5	5.8	5.8	-2.4	1.4	2.0
Bloomberg Securitized	4.7	5.8	7.3	5.1	5.1	-2.8	0.4	1.4
Bloomberg Corporate	5.1	7.1	8.5	8.5	8.5	-3.3	2.6	3.0
Bloomberg LT Gov't/Credit	4.7	14.3	13.2	7.1	7.1	-8.7	1.1	3.2
Bloomberg LT Treasury	4.1	15.7	12.7	3.1	3.1	-11.4	-1.2	2.3
Bloomberg LT Gov't-Rel.	5.2	11.8	11.2	8.9	8.9	-6.1	1.5	3.5
Bloomberg LT Corporate	5.2	13.1	14.0	10.9	10.9	-6.6	2.9	3.9
Bloomberg U.S. TIPS *	3.9	7.3	4.7	3.9	3.9	-1.0	3.2	2.4
Bloomberg High Yield	7.6	3.2	7.2	13.4	13.4	2.0	5.4	4.6
S&P/LSTA Leveraged Loan	9.4	0.3	2.9	13.3	13.3	5.8	5.8	4.4
Treasury Bills	5.2	0.3	1.4	5.1	5.1	2.1	1.9	1.3

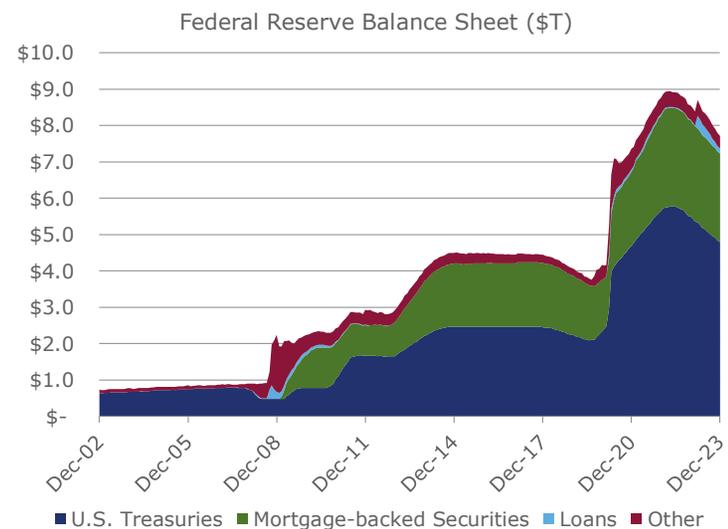
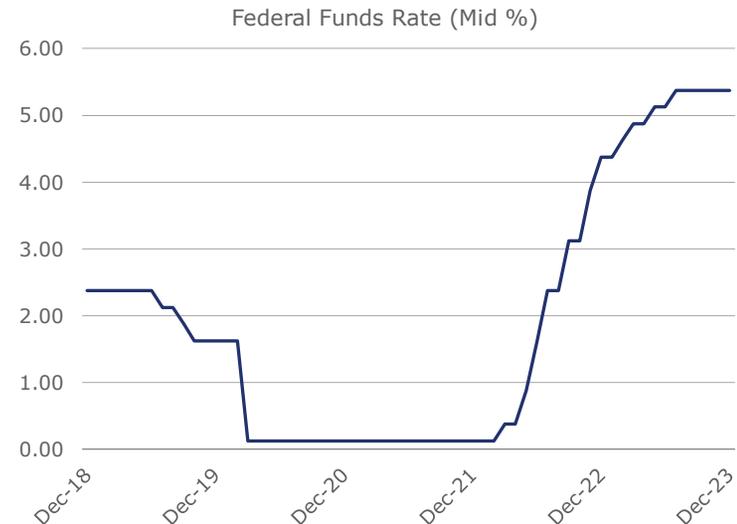
* Yield and Duration statistics are for a proxy index based on similar maturity, the Bloomberg Barclays U.S. Treasury 7-10 Year Index



Data Sources: Bloomberg

Federal Reserve

- The Federal Open Market Committee has left their overnight rate unchanged since July of 2023
- QE4 was larger than the 3 phases of quantitative easing – combined – following the global financial crisis
- The Fed’s balance sheet has begun to shrink again during the past nine months



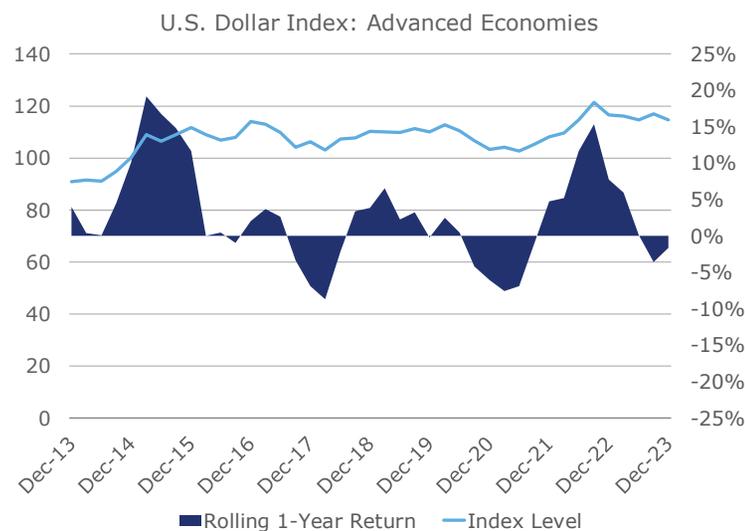
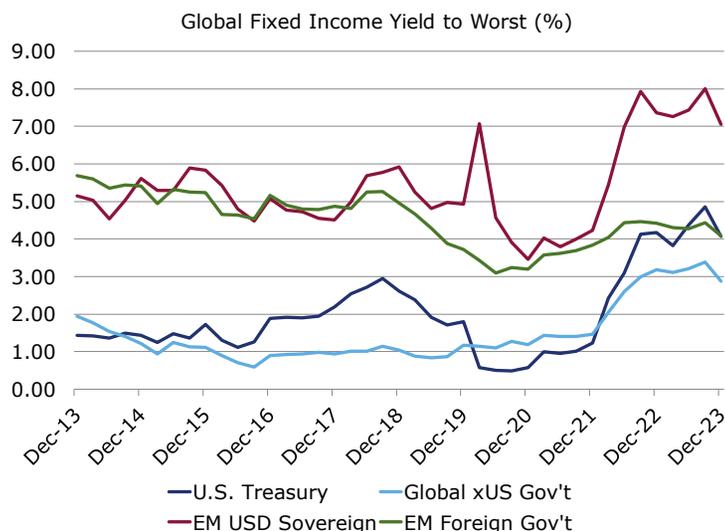
	Announced	Closed	Amount (bil)
QE1	11/25/2008	3/31/2010	\$1,403
QE2	11/3/2010	6/29/2012	\$568
QE3	9/13/2012	10/29/2014	\$1,674
QE4	3/23/2020	3/15/2022	\$4,779

Data Sources: Bloomberg

Non-U.S. Fixed Income

As of 12/31/2023	Quarter	YTD	1 Year	3 Year	5 Year	10 Year
Developed Markets						
Bloomberg Global Aggregate xUS	9.2	5.7	5.7	-7.2	-1.6	-0.8
Bloomberg Global Aggregate xUS *	5.4	8.3	8.3	-1.2	1.5	2.8
Bloomberg Global Inflation Linked xUS	11.9	7.4	7.4	-8.7	-1.4	-0.2
Bloomberg Global Inflation Linked xUS *	7.6	5.3	5.3	-4.5	0.4	3.3
Emerging Markets (Hard Currency)						
Bloomberg EM USD Aggregate	8.1	9.1	9.1	-3.1	1.8	3.0
Emerging Markets (Foreign Currency)						
Bloomberg EM Local Currency Gov't	7.0	6.9	6.9	-1.2	2.1	1.3
Bloomberg EM Local Currency Gov't *	3.9	8.6	8.6	1.4	3.1	3.0
Euro vs. Dollar	4.4	3.1	3.1	-3.3	-0.8	-2.2
Yen vs. Dollar	5.9	-7.0	-7.0	-9.9	-4.9	-2.9
Pound vs. Dollar	4.4	5.4	5.4	-2.3	0.0	-2.6

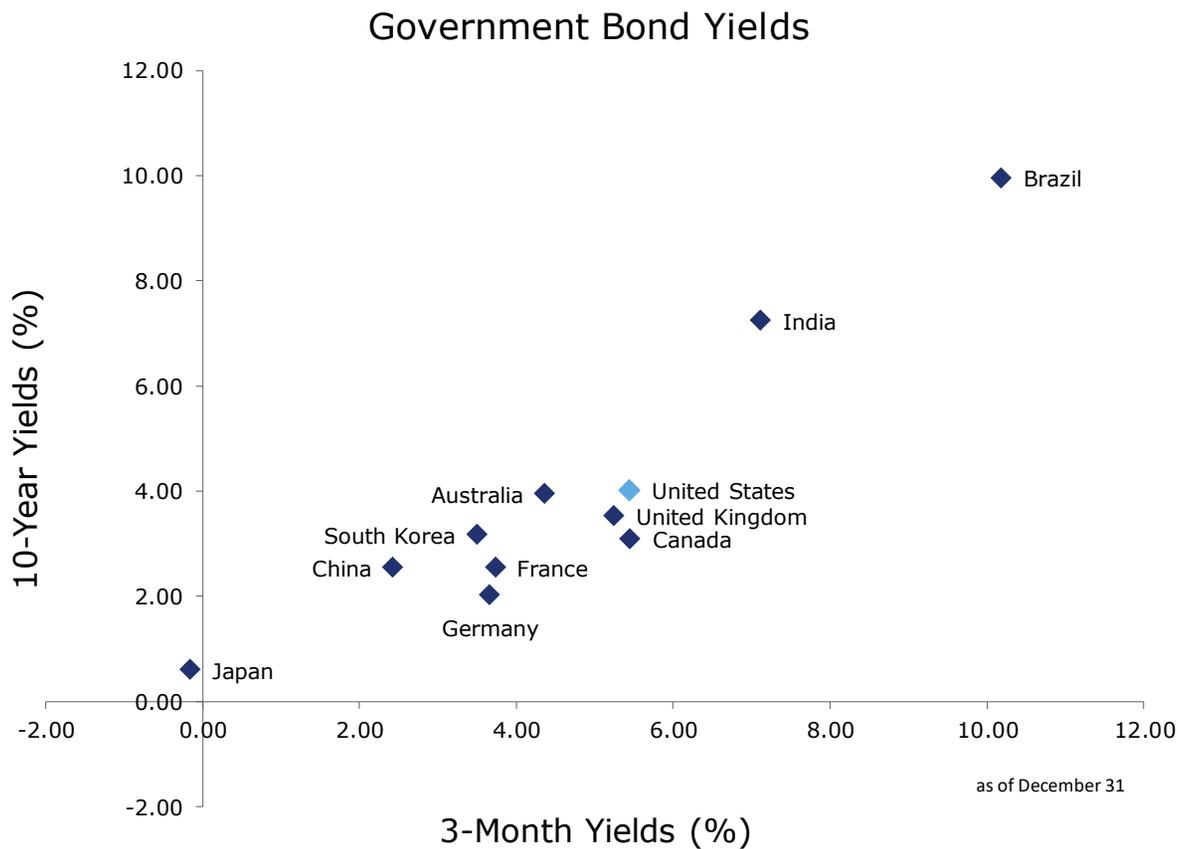
* Returns are reported in terms of local market investors, which removes currency effects.



Data Sources: Bloomberg

Global Interest Rates

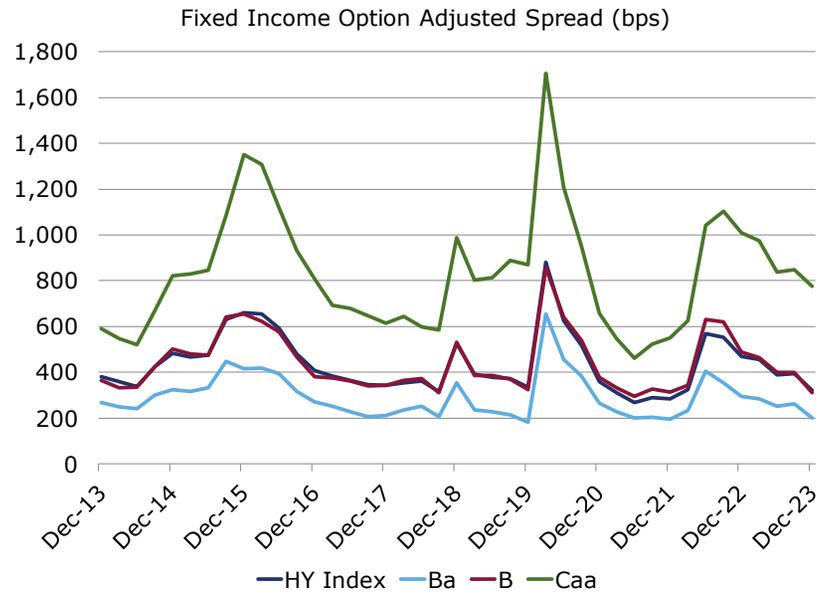
Short-term rates have turned positive in most larger countries; longer-term rates near 4.0% in the U.K. and Australia



Data Sources: Bloomberg

High Yield Bond Market

As of 12/31/2023		YTW	QTR	YTD	1 YR	3 YR	5 YR	10 YR
Bloomberg High Yield		7.6	7.2	13.4	13.4	2.0	5.4	4.6
S&P LSTA Leveraged Loan		9.4	3.2	13.2	13.2	5.2	5.8	4.0
High Yield Quality Distribution	Weight							
Ba U.S. High Yield	46.1%	6.3	7.4	11.6	11.6	1.4	5.8	5.0
B U.S. High Yield	41.1%	7.5	7.0	13.8	13.8	2.3	5.1	4.2
Caa U.S. High Yield	11.7%	12.1	6.9	19.8	19.8	2.9	4.1	4.0
Ca to D U.S. High Yield	1.1%	15.3	5.1	16.4	16.4	5.5	3.7	-4.0



Data Sources: Bloomberg

Asset Class Performance

Asset Class Returns - Best to Worst

2018	2019	2020	2021	2022	2023 YTD	Annualized 5-Year as of 12/23
T-Bills 1.9%	U.S. Equity 31.0%	U.S. Equity 20.8%	REITs 46.2%	Commodities 16.1%	U.S. Equity 26.1%	U.S. Equity 15.4%
Core Bond 0.0%	REITs 25.8%	Emrg Mrkts 18.7%	Commodities 27.1%	T-Bills 1.3%	Developed 18.9%	Developed 8.7%
U.S. TIPS -1.3%	Developed 22.7%	U.S. TIPS 11.0%	U.S. Equity 26.7%	High Yield -11.2%	REITs 16.1%	REITs 7.6%
High Yield -2.1%	Emrg Mrkts 18.9%	Developed 8.3%	Developed 11.8%	U.S. TIPS -11.8%	High Yield 13.4%	Commodities 6.1%
REITs -4.8%	High Yield 14.3%	Core Bond 7.5%	U.S. TIPS 6.0%	Core Bond -13.0%	Emrg Mrkts 10.3%	High Yield 5.4%
U.S. Equity -5.3%	Core Bond 8.7%	High Yield 7.1%	High Yield 5.3%	Developed -14.0%	Core Bond 5.5%	Emrg Mrkts 4.1%
Commodities -11.2%	U.S. TIPS 8.4%	T-Bills 0.7%	T-Bills 0.0%	U.S. Equity -19.0%	T-Bills 5.1%	U.S. TIPS 3.2%
Developed -13.4%	Commodities 7.7%	Commodities -3.1%	Core Bond -1.5%	Emrg Mrkts -19.7%	U.S. TIPS 3.9%	T-Bills 1.9%
Emrg Mrkts -14.2%	T-Bills 2.3%	REITs -7.9%	Emrg Mrkts -2.2%	REITs -26.8%	Commodities -1.3%	Core Bond 1.1%

Data Sources: Bloomberg Note: Developed asset class is developed equity markets ex-U.S., ex-Canada

County Employees Retirement System

Performance and Asset Allocations

Quarter Ending: December 31, 2023

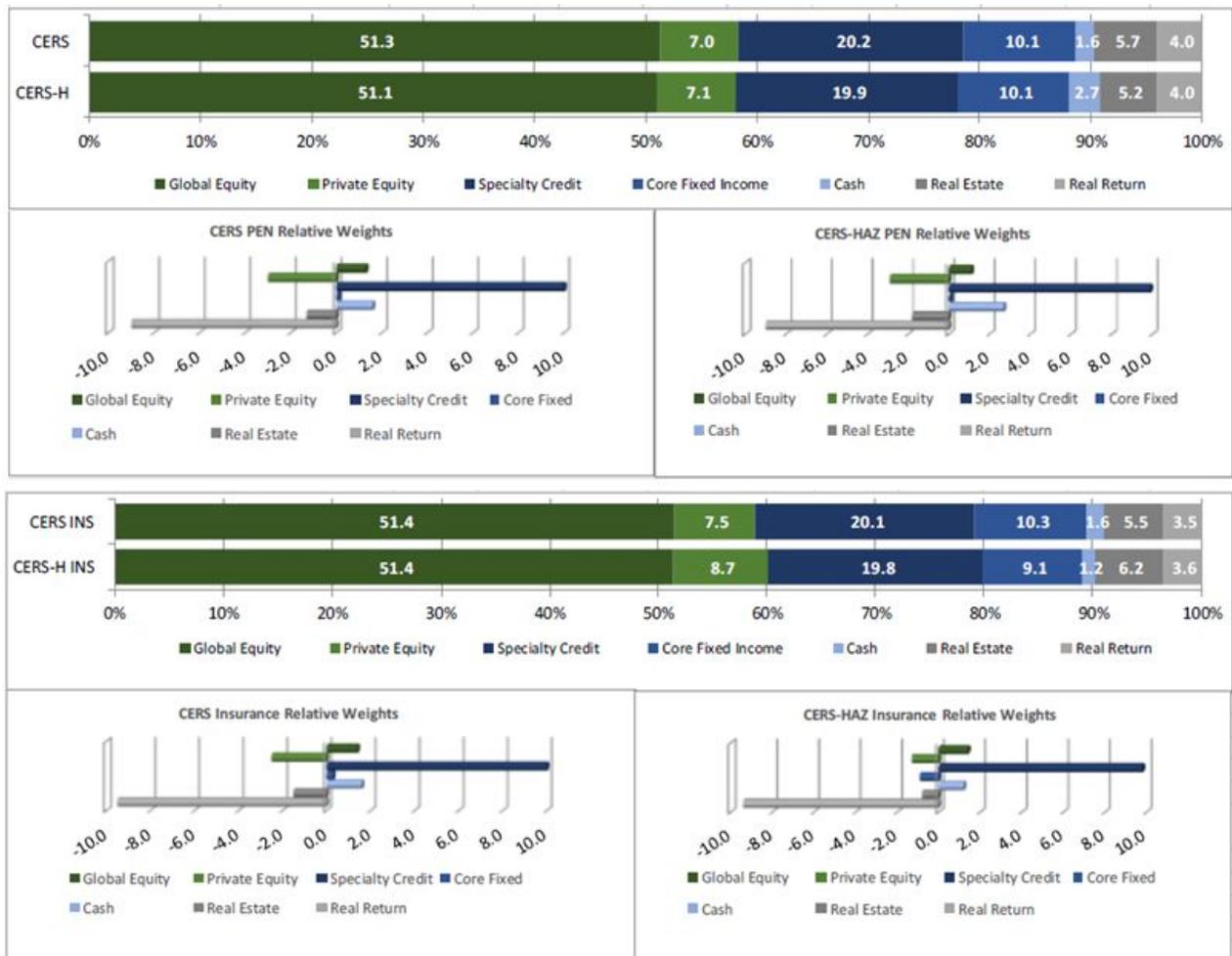
Pension Portfolios Performance

CERS & CERS-HAZ - PENSION FUND PLAN NET RETURNS - 12/31/23											
Plan	Market Value	Month	3 Months	Fiscal YTD	1 Year	3 Years	5 Years	10 Years	20 Years	30 Years	ITD
CERS	9,108,214,619.80	3.30	6.78	5.26	13.50	6.25	8.64	6.90	6.65	7.79	8.88
KY Ret. CERS Plan IPS Index		2.48	6.45	5.50	15.21	5.76	8.30	6.61	6.57	7.70	8.89
CERS- H	3,199,189,826.80	3.32	6.85	5.33	13.63	6.20	8.59	6.89	6.65	7.78	8.87
KY Ret. CERS Haz Plan IPS Index		2.48	6.45	5.50	15.21	5.76	8.30	6.61	6.57	7.70	8.89
KPPA PENSION FUND UNIT - NET RETURNS - 12/31/23 - PROXY PLAN ASSET PERFORMANCE											
Structure		Month	3 Months	Fiscal YTD	1 Year	3 Years	5 Years	10 Years	20 Years	30 Years	ITD
PUBLIC EQUITY		5.33	11.17	6.67	21.12	5.06	11.49	7.66	7.30	8.70	10.25
MSCI ACWI		4.80	11.03	7.26	22.20	5.25	11.31	7.66	7.24	8.47	10.11
PRIVATE EQUITY		0.06	0.22	2.93	7.79	15.44	12.40	12.85	11.50		11.68
Russell 3000 + 3%(Qtr Lag)		-4.32	-2.35	6.58	23.46	12.44	12.18	14.51	11.64		11.87
SPECIALTY CREDIT		1.83	3.45	6.19	11.24	6.82	6.77				6.23
50% BB US HY / 50% Morningstar LSTA Lev'd Ln		2.69	5.02	7.07	13.42	3.91	5.62				4.53
CORE FIXED INCOME		3.74	6.62	5.40	7.31	0.50	3.00	2.84			2.79
Bloomberg US Aggregate		3.83	6.82	3.37	5.53	-3.31	1.10	1.81			1.76
CASH		0.46	1.41	2.55	4.53	2.07	1.89	1.41	1.79	2.73	3.34
FTSE Treasury Bill-3 Month		0.47	1.41	2.80	5.26	2.25	1.91	1.26	1.42	2.37	2.96
REAL ESTATE		-1.54	-2.32	-4.89	-10.92	8.10	8.19	9.00	7.77	6.42	6.42
NCREIF NFI-ODCE Net 1 Qtr in Arrears Index^		-2.10	-2.10	-4.93	-12.88	6.19	4.72	7.19	6.64	7.45	6.25
REAL RETURN		-1.10	1.53	6.31	11.31	10.87	8.53	5.29			5.14
US CPI +3%		0.05	0.75	2.44	6.14	9.54	7.75	4.34			4.17

Insurance Portfolios Performance

CERS INS & CERS HAZ INS - INSURANCE FUND - PLAN NET RETURNS - 12/31/23											
Plan	Market Value	Month	3 Months	Fiscal YTD	1 Year	3 Years	5 Years	10 Years	20 Years	30 Years	ITD
CERS INS	3,427,603,471.08	3.35	6.87	5.38	13.64	6.32	8.48	6.87	6.49	6.91	7.42
KY Ins. CERS Plan IPS Index		2.48	6.45	5.50	15.21	5.63	8.07	6.59	6.43	7.11	7.61
CERS - H INS	1,661,501,697.63	3.28	6.71	5.30	13.45	6.43	8.54	6.93	6.51	6.93	7.43
KY Ins. CERS Haz Plan IPS Index		2.48	6.45	5.50	15.21	5.63	8.07	6.59	6.43	7.11	7.61
KPPA INSURANCE FUND UNIT - NET RETURNS - 12/31/23 - PROXY PLAN ASSET PERFORMANCE											
Structure		Month	3 Months	Fiscal YTD	1 Year	3 Years	5 Years	10 Years	20 Years	30 Years	ITD
PUBLIC EQUITY		5.35	11.18	6.66	20.98	5.06	11.46	7.72	7.25		8.65
MSCI ACWI		4.80	11.03	7.26	22.20	5.23	11.28	7.66	7.05		8.47
PRIVATE EQUITY		0.58	0.71	3.93	8.77	17.76	12.35	13.96	11.08		10.89
Russell 3000 + 3%(Qtr Lag)		-4.32	-2.35	6.58	23.46	12.44	12.18	14.51	11.34		11.44
SPECIALTY CREDIT		1.79	3.40	6.24	11.35	6.96	6.68				6.11
50% BB US HY / 50% Morningstar LSTA Lev'd Ln		2.69	5.02	7.07	13.42	3.91	5.62				4.53
CORE FIXED INCOME		3.73	6.64	5.29	7.16	0.34	2.81	2.56			2.51
Bloomberg US Aggregate		3.83	6.82	3.37	5.53	-3.31	1.10	1.81			1.76
CASH		0.48	1.42	2.55	4.54	2.05	1.78	1.27	1.63		2.50
FTSE Treasury Bill-3 Month		0.47	1.41	2.80	5.26	2.25	1.91	1.26	1.42		2.41
REAL ESTATE		-1.55	-2.32	-4.73	-11.04	7.87	8.14	8.88			8.90
NCREIF NFI-ODCE Net 1 Qtr in Arrears Index^		-2.10	-2.10	-4.93	-12.88	6.19	4.72	7.19			5.60
REAL RETURN		-0.95	1.29	5.53	10.20	9.57	8.12	5.05			4.86
US CPI +3%		0.05	0.75	2.44	6.14	8.78	7.65	4.40			4.21

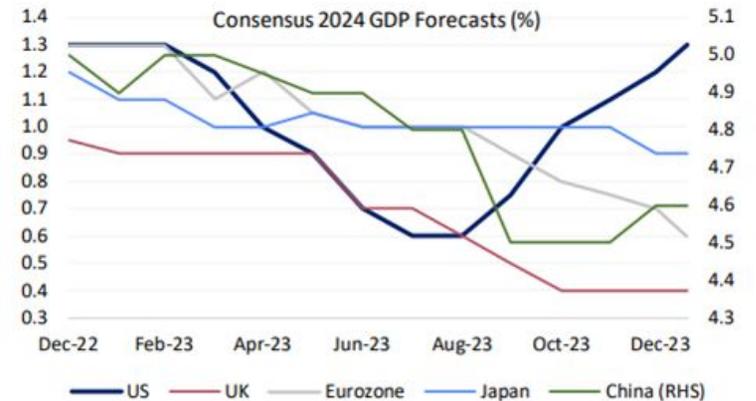
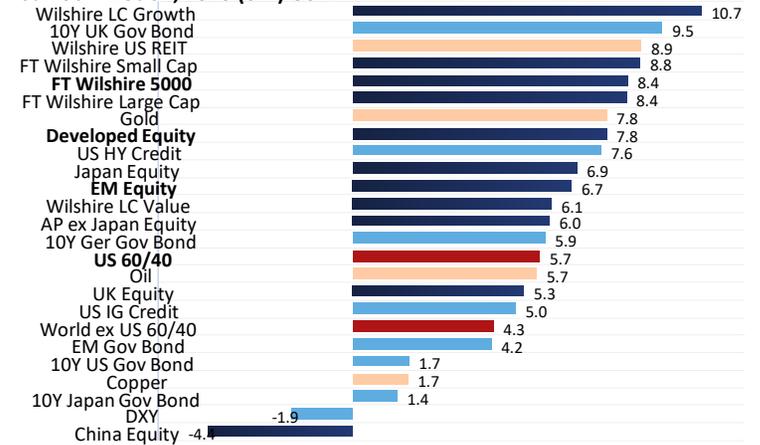
Allocations



Performance Highlights

- The CERS and CERS-H Pension portfolios performed well during the quarter with returns of 6.78% and 6.85% respectively outperforming the benchmark's return of 6.45%
- The Insurance portfolios produced similar performance with the CERS portfolio returning 6.87% and the CERS-H portfolio returning 6.71%
- Across portfolios, for the quarter the largest contributors to outperformance were the underweight positioning in Real Return Private Equity as well as the relative outperformance of the Private Equity portfolio
- The most significant detractors of performance were the overweight to Specialty Credit, the proxy for Real Return, as well as relative underperformance in the Specialty Credit portfolio
- Markets across the board rebounded sharply during the quarter on optimism that earlier and larger cuts in interest rates that had previously been anticipated would usher in a "goldilocks" period of steady growth, moderate inflation and easing financial conditions
- Monetary policy will continue to have an unduly high impact via the valuations discounting mechanism and the interaction between fiscal and monetary policy will be crucial to outcomes for 2024

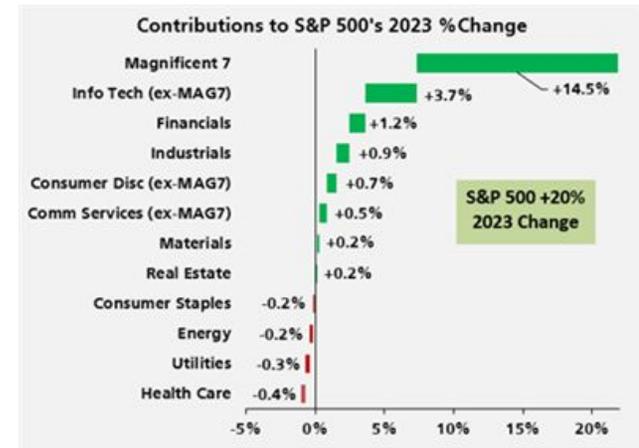
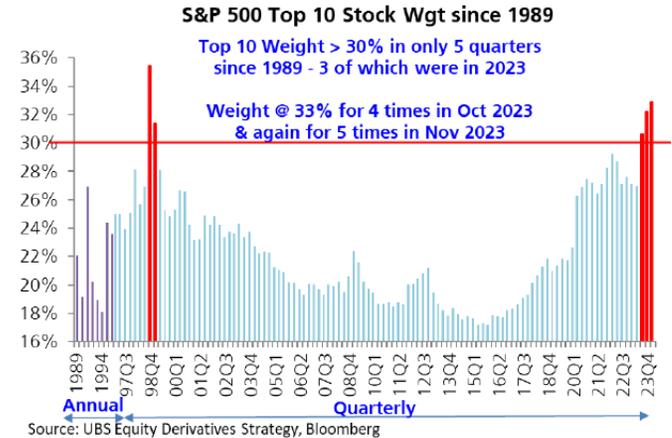
Jun 30 – Dec 31, 2023 (6M) USD TR



Performance Highlights

Public Equities

- Public Equity markets experienced a strong rally during the quarter accelerating towards the end of October bolstered by signs of weakening inflation, better-than-expected growth, and a change in central bank posture that hinted at softening rates
 - In the US almost every sector was positive for the quarter with the real estate and information technology sectors posting the best performance while energy was the only sector with negative performance
 - Dispersion within US markets continued to be high with index level performance largely driven by a handful of megacap stocks
 - Smallcap outperformed large-cap during the quarter and growth stocks generally outperformed value with large-cap growth stocks continuing to extend their massive advantage over largecap value stocks
 - NonUS public equity markets produced positive performance during the quarter but failed to keep pace with their US counterparts, especially emerging markets which were the worst performing segment during the quarter

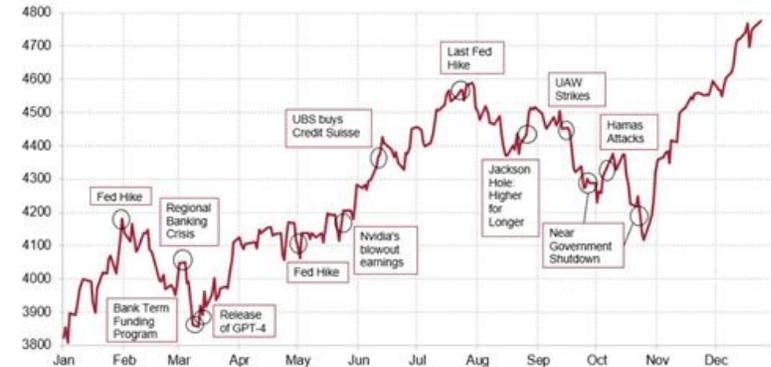


Performance Highlights

Public Equities

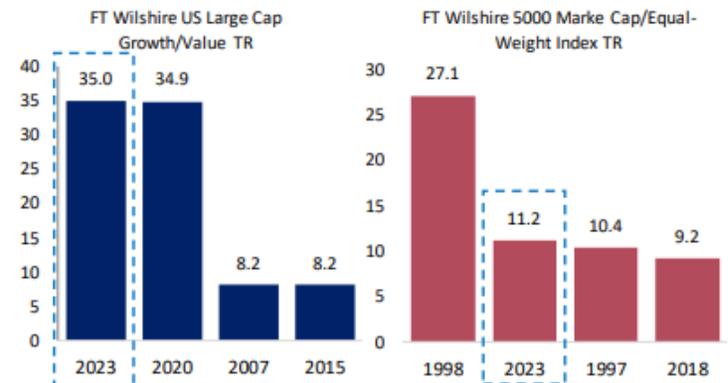
- The Public Equity portfolio returned 11.17% during the quarter versus its benchmark return of 11.03%, relative outperformance was primarily the result of a slight overweight to US markets combined with good stock selection within the NonUS portion of the portfolio
 - FYTD the Public Equity Portfolio has produced a return of 6.67%, trailing the benchmark which returned 7.26%
- Within the US equity allocation, the portfolio trailed its index by 26bps (11.81% vs 12.07%), primarily resulting from stock selection
 - Stock selection amongst the individual strategies was mixed during the quarter and biased to the downside as the Fed's shifting tone created a market leadership whipsaw which proved challenging to navigate
- The NonUS equity allocation outperformed during the quarter, returning 10.19% versus a benchmark return of 9.81%
 - Outperformance was driven by the strong performance of the growth strategies within the allocation, benefiting from a style tailwind

S&P 500 in 2023



Source: Haver Analytics, Rosenberg Research

Largest outperformance of Growth relative to Value in over two decades

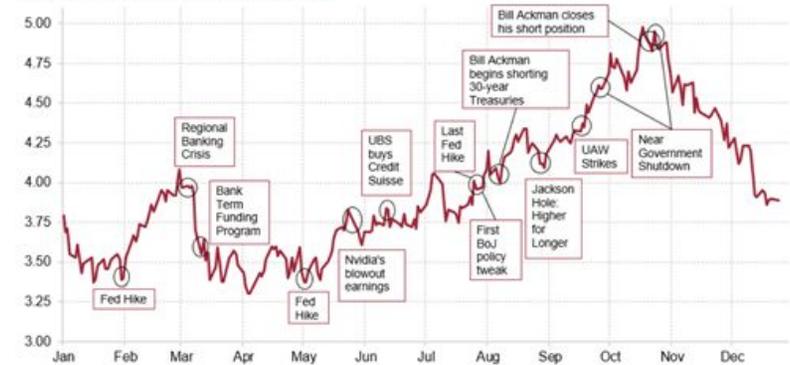


Performance Highlights

Core Fixed Income

- Core Fixed Income staged a remarkable recovery in the 2nd quarter following the significant selloff experienced during the 1st quarter
- The rally in rates that started in November picked up steam to close the year as the FOMC offered a surprising lack of pushback against dovish market expectations at their December meeting with the FED’s communication about the likely course of monetary policy becoming decidedly less hawkish causing the yield curve to remain inverted
- The Treasury curve fell across all maturities during the with the 10-year Treasury closing at 3.88%, down 69 basis points and the 10-year real yield falling 52 basis points to 1.71%
- Corporate bonds were the top performing spread sector, outgaining same duration Treasuries by 203 basis points for the quarter

10-year Treasury Yield in 2023



Source: Haver Analytics, Rosenberg Research

Investment grade credit spreads are at their lowest level since early 2022

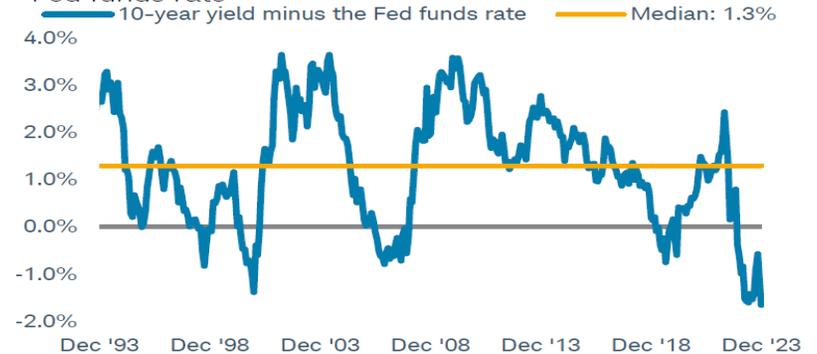


Performance Highlights

Core Fixed Income

- The Core Fixed Income Portfolio produced a return of 6.62% for the quarter, slightly underperforming the benchmark's return of 6.82%
- The portfolio's relative underperformance was driven by its shorter duration profile as staff rebalanced the portfolio over several legs during the quarter to extend the overall duration to be inline with the benchmark's duration
- Despite losing ground during the quarter, FYTD the portfolio continued to deliver strong relative performance producing a return of 5.40% and outperforming the Bloomberg Aggregate Index by 203 basis points
- The internally managed Core Portfolio was the strongest performer in the overall Core allocation for the quarter, producing 21 basis points of excess return

Historical spread between the 10-year Treasury yield and Fed funds rate



10yr US Govt. yields back to average for the first time since 2007

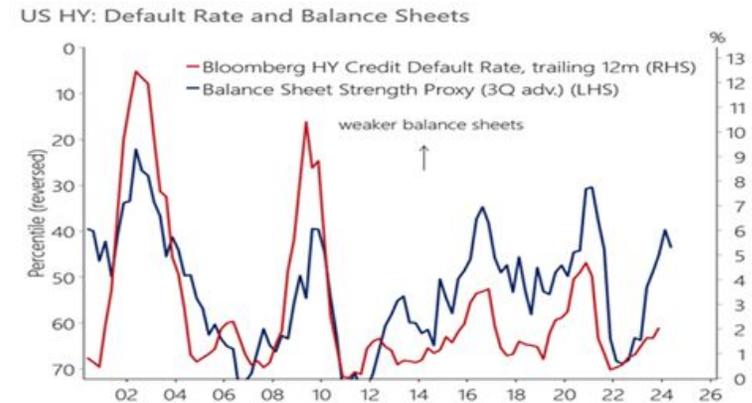
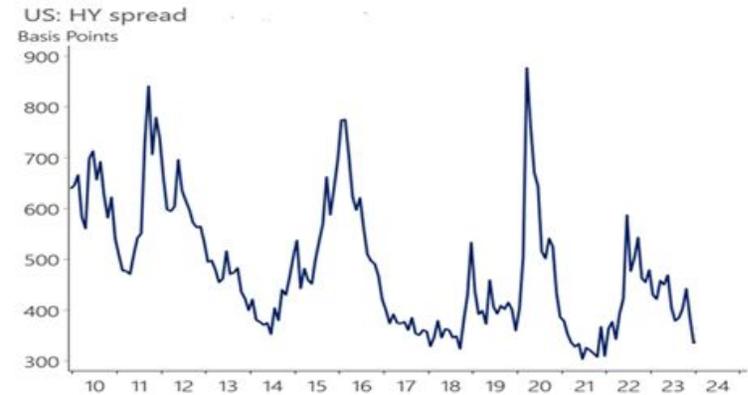


Source : GFD, Deutsche Bank

Performance Highlights

Specialty Credit Fixed Income

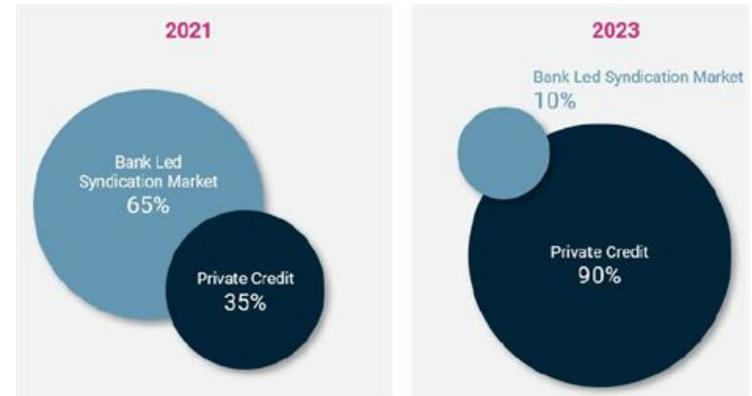
- The Specialty Credit portfolio produced a return of 3.45% for the quarter, trailing the blended benchmark which returned 5.02%. Fiscal Year to Date the portfolio has continued to perform well, returning 6.19% compared to the benchmark's return of 7.07%
- The public High Yield Bond and Private Credit components of the portfolio were all positive contributors to relative performance, mandates with structured credit and mortgage-backed exposures were a drag on overall performance as they failed to keep pace in the rally over the last three months
- Over longer periods the portfolio has contributed significant outperformance, beating the benchmark by 291 and 115 basis point over three- and five-year periods respectively
- Leveraged Loans trailed High Yield Bonds as they benefited less from the rally in rates and failed to keep pace with spread tightening
- The High Yield option adjusted spread (OAS) tightened 71 basis points for the quarter and 67 basis points fiscal year-to-date to 323



Performance Highlights

Specialty Credit Fixed Income

- Consistent with the risk on environment, lower quality bonds outperformed with CCCs returning 9.60% FYTD while Bs returned 7.91% and BBs produced returns of 6.94%
- The most recent balance sheet data continued to show modest improvements in High Yield fundamentals, driven by stronger profitability, liquidity positions and default rates remaining subdued
- Private credit markets continued their growth as banks and public lenders have accelerated their move away from the middle market
- Despite the continued growth, structuring and economic terms remain favorable to lenders
- The higher prevailing cost of capital is likely to impact sectors and firms differently which will be an important driver of dispersion, with a more defensive approach to investing, including structural protections, granularity in underwriting and credit selectivity becoming critical



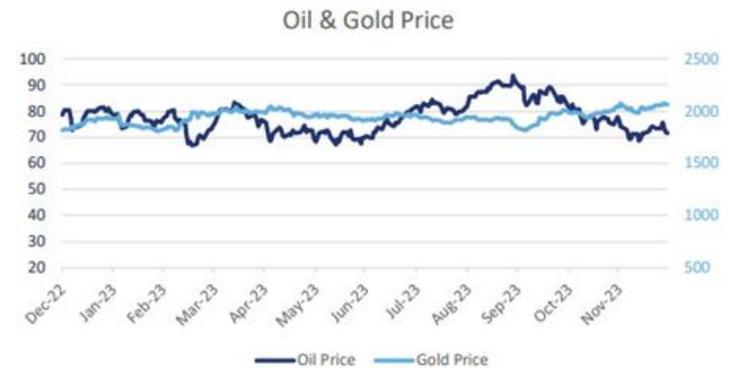
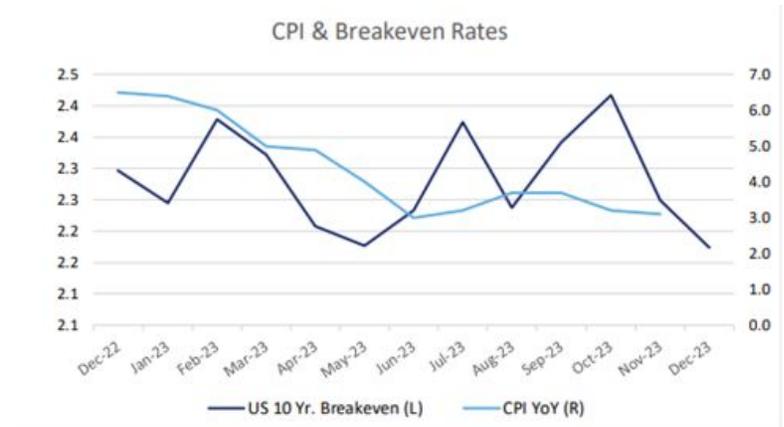
Net debt to EBITDA for new direct loan deals



Performance Highlights

Real Return- Real Estate

- Real Estate and Real Return performance was mixed during the quarter and through the first six months of the fiscal year but were largely able to end the period well bid with expectations that inflation had been beaten and rates were poised to continue their downward trajectory
- The Real Return portfolio produced a return of 1.53% for the quarter, outperforming the benchmark which produced a return of 0.75%
- FYTD the Real Return Portfolio has significantly outperformed the benchmark, producing a return of 6.31% compared to the benchmark's return of 2.44%
 - Outperformance has been paced by the portfolio's MLP exposure which returned over 12% FYTD as strong cash flows, disciplined capex and consolidation have continued to benefit the industry
- Broad commodities were down for the quarter and FYTD with the Bloomberg Commodities Index falling almost 6% for the first six months of the Fiscal Year and almost 13% during the LTM.
 - Despite declining 21% during the quarter Oil was able to return almost 6% FYTD, Gold rallied 12% during the quarter on rising rate cut optimism reversing 6 months of declines, ending up almost 8% FYTD



Performance Highlights

Real Return- Real Estate

- Globally, Real Estate valuations continued to adjust down from their 2022 peaks, as a result of higher inflation, interest rates and volatility
- The pool of distressed U.S. commercial properties grew to USD 85.8 billion by the end of 2023, led by distressed office assets, as weaker prices and higher lending rates challenged the market
- The Real Estate portfolio produced a return of -2.32% for the quarter, modestly underperforming the benchmark's -2.10% return
- Fiscal Year to Date, the Real Estate portfolio has performed inline with the benchmark returning -4.89% compared to the benchmark's performance of -4.93%
- The Real Estate portfolio has been more affected by higher cap rates than declining property-level performance with the portfolio's exposures to industrial, self-storage, student housing, medical office, and senior living continuing to experience positive rent growth and pricing



Source: BLS; Federal Reserve; Green Street. As of December 31, 2023.

Performance Highlights

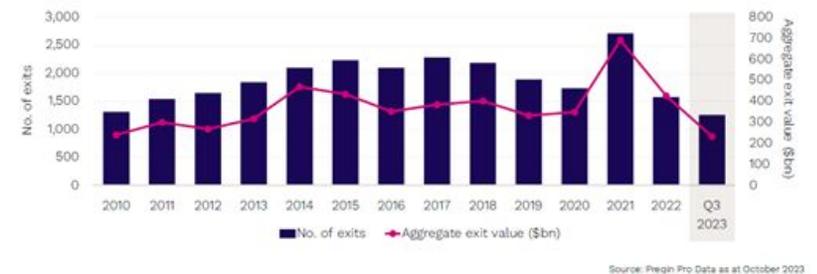
Private Equity

- The Private Equity portfolio produced a return of 0.22% for the quarter, outperforming the benchmark's return of -2.35%
- Performance relative to the benchmark (Russell 3000 + 3% based on a quarter lag) continues to be volatile given the market and timing misalignments
- Capital remained scarce as GPs faced a more arduous fundraising environment with constrained capital allocations from LPs as a result of limited distributions and already full allocations
- 2023 proved to be the worst year for Private Equity deal activity since 2016, with selling activity falling to its lowest point in over a decade
 - Private Equity capital deployment in the US declined by 29.5% YOY
 - Value derived from US exits fell by 26.4% YOY and by 73% from 2021 levels

PE deal activity



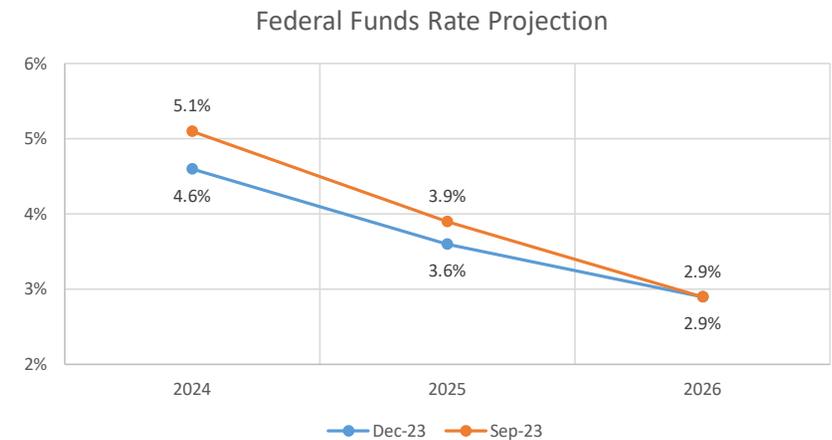
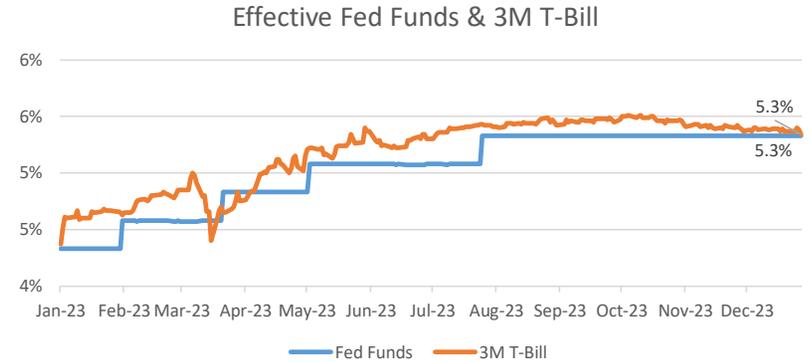
Annual global private equity-backed exits



Performance Highlights

Liquidity

- After increasing rates four times during the first half of 2023, the FOMC held rates the same during the final quarter of the calendar year
- The 3-month Bill also remained steady since mid-year finishing the quarter at 5.3%. Coincidentally, the same rate for the effective Fed funds rate
- Cash produced a return of 2.55% for the 6-month period ending December 31st, slightly underperforming the 3-Month Treasury Bill benchmark which returned 2.80%. The underperformance is due to deposit rates (Fed funds) lagging market rates (T-Bills)
- For the quarter, cash returned 1.41%, matching the benchmark as deposit and market rates compressed over the time period
- With inflation continuing to recede, the Federal Reserve’s economic projections for the Federal funds rate changed in December
- Rate projections shifted downward for 2024 and 2025 compared to the September projection
- Chair Powell stated, inflation has eased from its highs, and this has come without significant rise in unemployment



Investment Highlights Fiscal YTD

- Investment activity occurred across asset classes for the first half of the Fiscal Year as managers called committed capital and Staff rebalanced portfolios
 - Across a number of legs Staff was able to rebalanced the Core Fixed Income during the period, moving the duration of the overall portfolio from 3 years short to flat relative to the benchmark index
 - The benchmark for the Loomis portfolio was updated to the Bloomberg US Aggregate Index from the Bloomberg US Intermediate Aggregate Index
 - A total of \$1,925MM was transferred from the Lord Abbett Short Duration Credit portfolio, \$996.5MM to the existing external Core portfolios and \$928MM to the new internally managed Core Portfolio
 - The Lord Abbett account is in wind down, holding a single CMBS security and will be closed and the agreement terminated once the security is sold or matures
 - Specialty Credit managers continued to find compelling opportunities, deploying over \$150MM during the period including the first capital calls for the new Adams Street Fund and Co-Investment vehicle approved in 2023
 - A total of almost \$300MM was called and invested by Real Return managers, the majority of which was the initial investment for Arctos and Maritime Partners, managers approved in 2023
 - Rebalancing and investing activity in Public Equities totaled \$150MM as Staff managed exposures across cap weights and geographies while aligning individual portfolios
- The first Proxy Voting Report was posted to the KPPA website



MEMORANDUM

To: County Employees Retirement System Investment Committee

From: Steve Willer
Chief Investment Officer, Office of Investments

Date: February 28, 2024

Subject: Investment Update – Lord Abbett Short Duration Credit Portfolio Termination

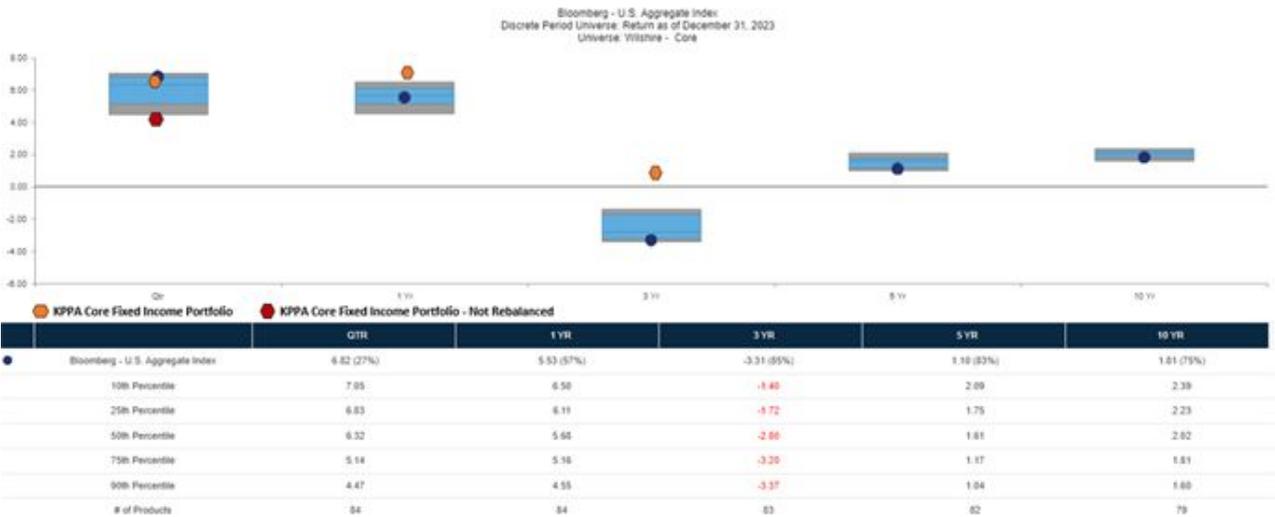
As per the Investment Policy Statement, this memo serves as notification that following approval from the Investment Committee Chair, KPPA staff terminated the investment management agreement with Lord Abbett for the management of the Short Duration Credit strategy. This termination was the result of the rebalancing of the Core Fixed Income allocation with no performance or firm related concerns. The Lord Abbett strategy was implemented to take advantage of the short maturity anomaly and yield advantage during a period of historically low and flat rates while providing downside protection to a rising rate environment. The strategy performed well, delivering 15bps of excess return to the stated benchmark, the ICE BofA 1-3 Year US Corporate Index, since inception. The portfolios were effectively wound down by the end of December, holding a single remaining security. At that time there was insufficient liquidity in the market to sell the remaining security at a value the manager believed appropriate. No fees will be charged while the manager continues their efforts to sell the security manager or until the security matures.

As Staff has presented to the Investment Committee and the Board, yields in Fixed Income markets have risen notably over the past 2 years from historically low levels which had persisted over the previous decade. As market yields reached our strategic objectives, staff began unwinding the tactical short duration positioning of approximately 3 years in the Core Fixed Income allocation by rebalancing away from the short corporate credit allocation managed by Lord Abbett. This capital was redeployed to the existing Core Fixed Income mandates, the Loomis Sayles Core Disciplined Alpha portfolio and the Nisa Aggregate Bond portfolio and was also used to establish the internally managed passive Core Fixed Income portfolio consistent with the IPS and our strategic mandates. Following completion of the rebalancing the overall duration of the Core Fixed Income allocation is inline with the index and each portfolio represents approximately 1/3 of the total allocation with expected savings of \$1.5MM to 2.0MM per year.

Staff and Wilshire are undertaking a review of the Core Fixed Income portfolio to ensure the appropriate allocation amongst strategies, styles and managers consistent with the allocation's objectives of providing diversification, downside protection, liquidity and excess returns.

Performance					
	Month	YTD	1 Year	3 Year	Since Inception
Kentucky Retirement Systems (Gross)	0.69%	2.53%	1.56%	0.58%	2.01%
Kentucky Retirement Systems (Net)	0.69%	2.47%	1.45%	0.46%	1.89%
ICE BofA 1-3 Year U.S. Corporate Index	0.68%	2.31%	1.68%	-0.28%	1.75%
Excess Return (Net)	0.00%	0.16%	-0.23%	0.74%	0.15%

Performance					
	Month	YTD	1 Year	3 Year	Since Inception
Kentucky Retirement Systems Insurance Portfolio (Gross)	0.66%	2.41%	1.46%	0.63%	2.00%
Kentucky Retirement Systems Insurance Portfolio (Net)	0.65%	2.34%	1.34%	0.52%	1.88%
ICE BofA 1-3 Year U.S. Corporate Index	0.68%	2.31%	1.68%	-0.28%	1.75%
Excess Return (Net)	-0.03%	0.03%	-0.34%	0.79%	0.14%



County Employees Retirement System
1270 Louisville Road
Frankfort, KY 40601

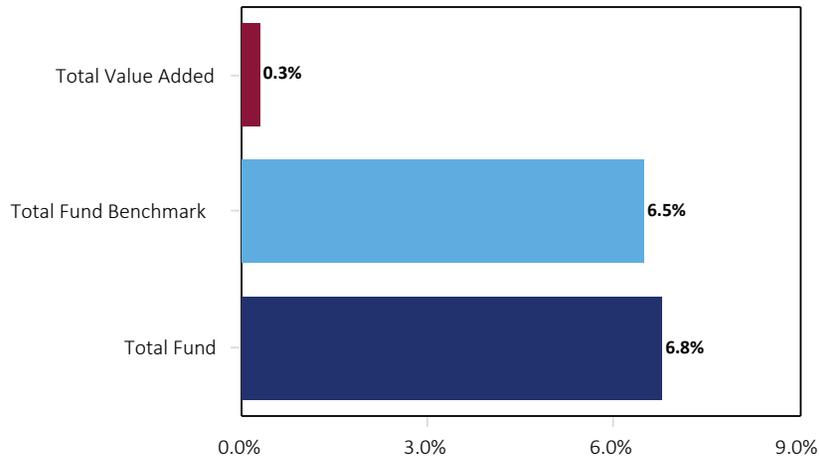
Betty A. Pendergrass, Chair
Lisle Cheatham, Vice-Chair
Ed Owens, CEO

Total Fund Attribution

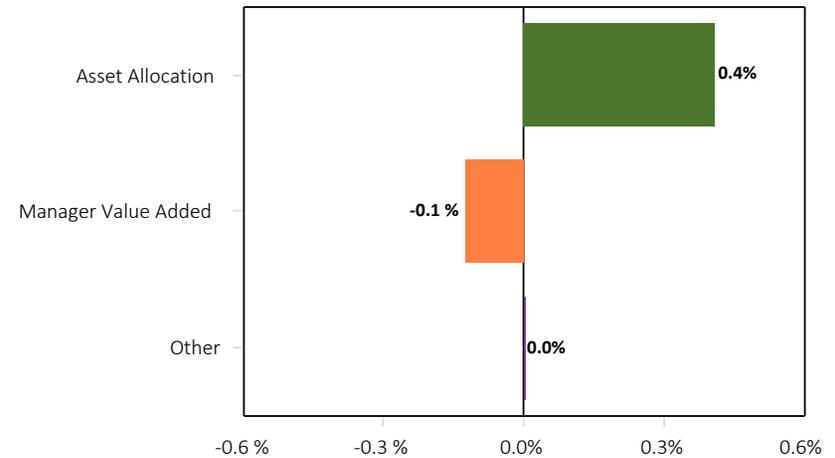
CERS Pension Plan

Periods Ended 1 Quarter Ending December 31, 2023

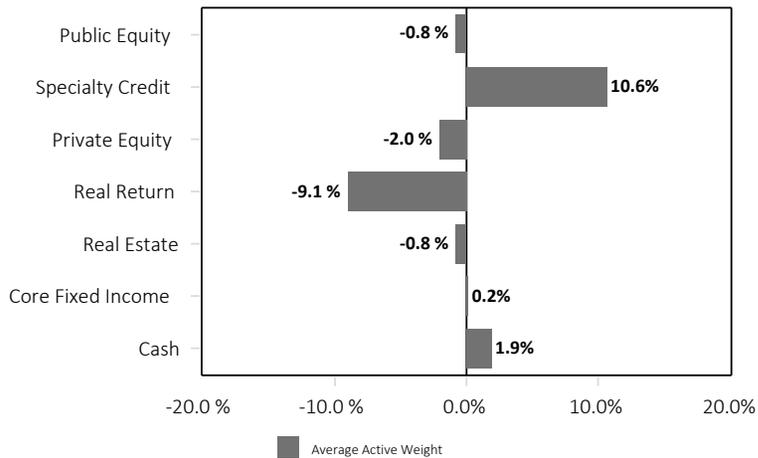
Total Fund Performance



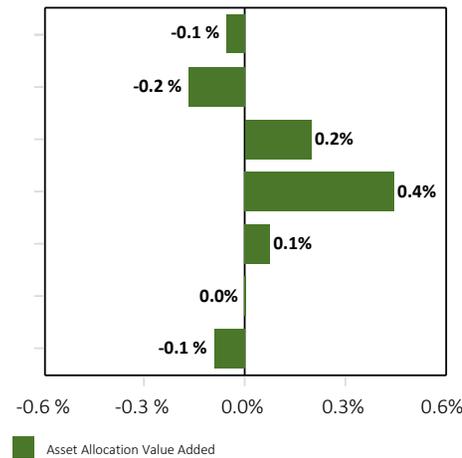
Total Value Added:0.3%



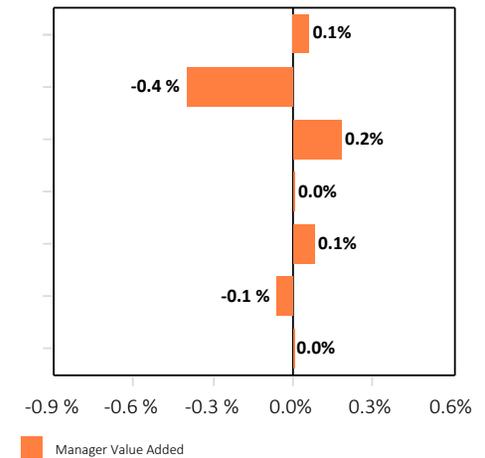
Total Asset Allocation:0.4%



Asset Allocation Value Added:0.4%



Total Manager Value Added:-0.1%

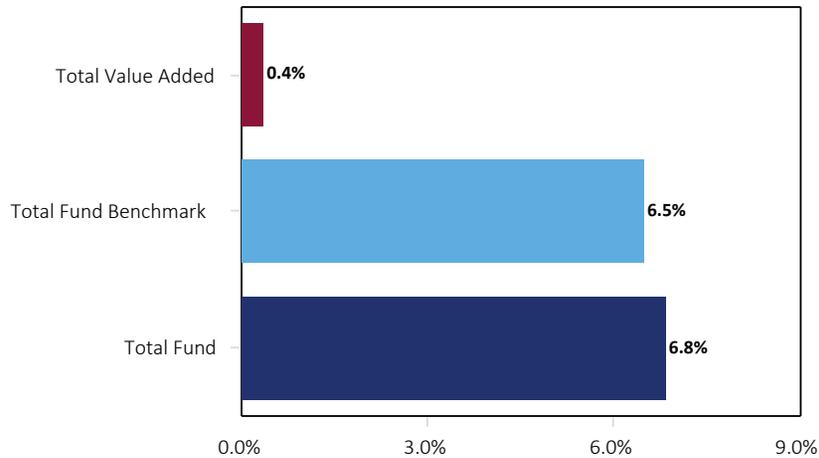


Total Fund Attribution

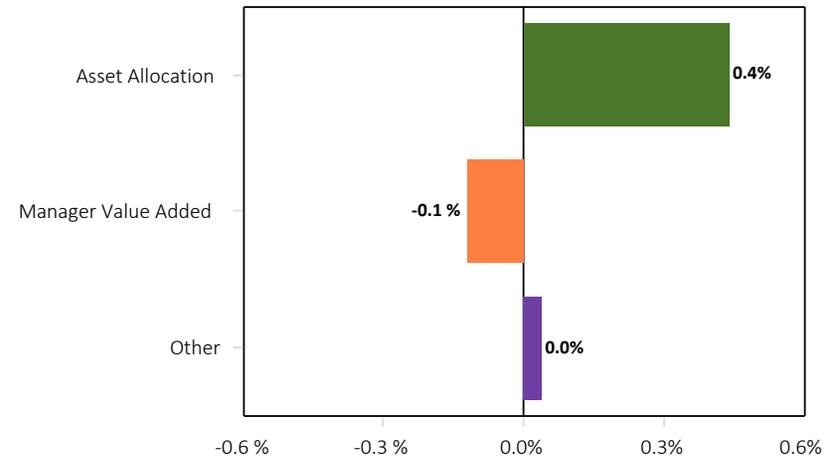
CERS (H) Pension Plan

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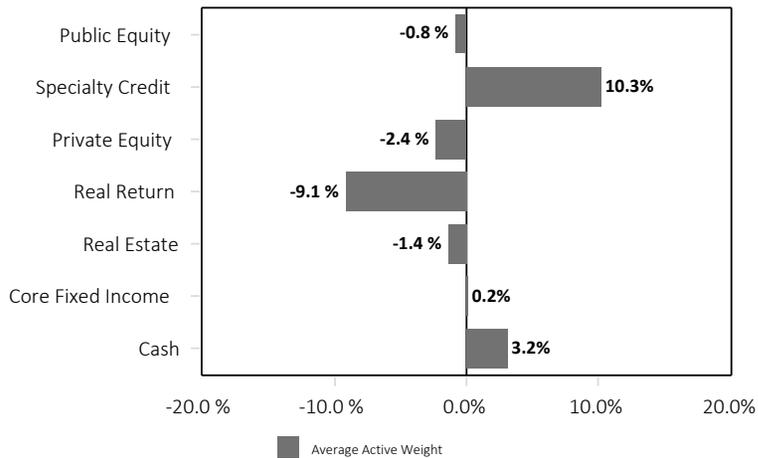
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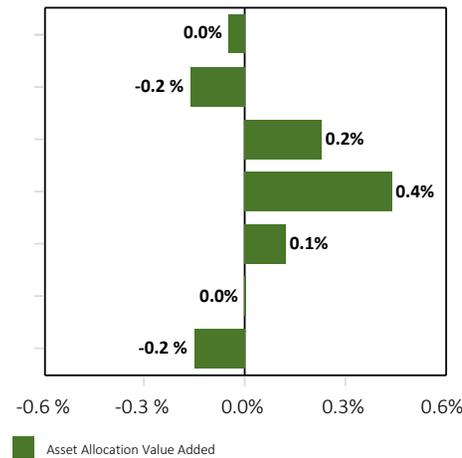
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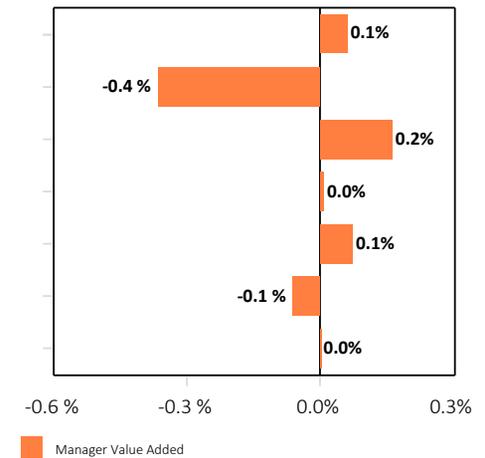
Total Asset Allocation:0.4%



Asset Allocation Value Added:0.4%



Total Manager Value Added:-0.1%

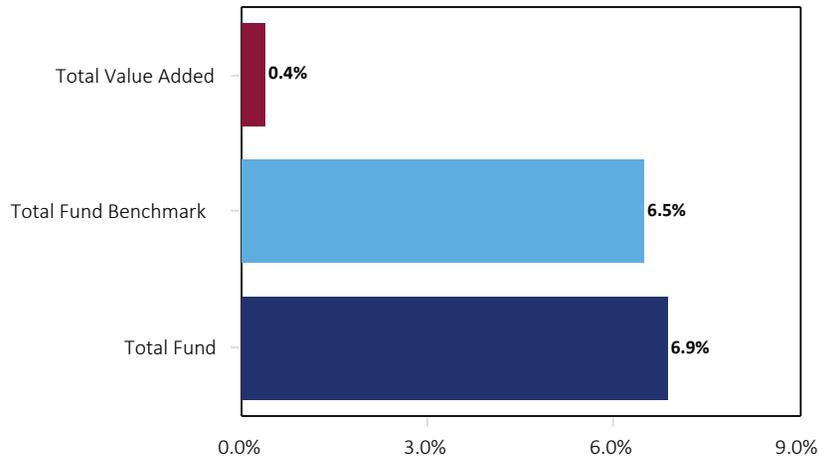


Total Fund Attribution

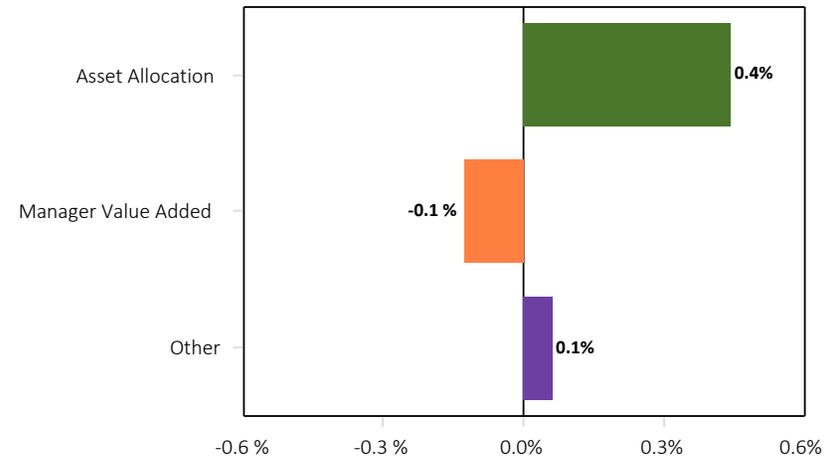
CERS Insurance Plan

Periods Ended 1 Quarter Ending December 31, 2023

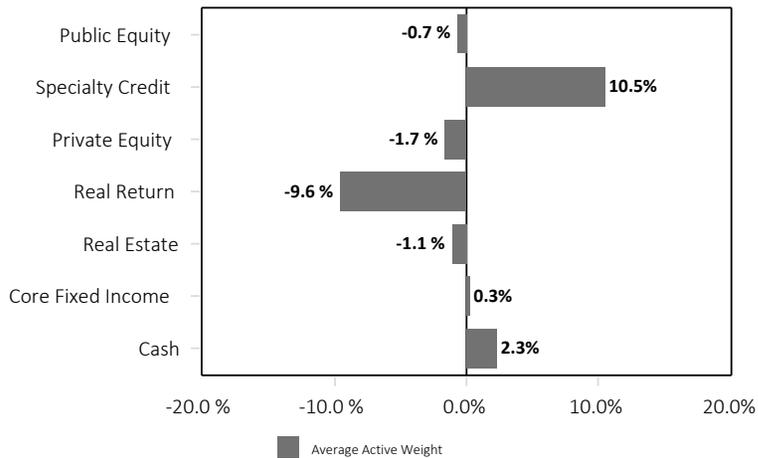
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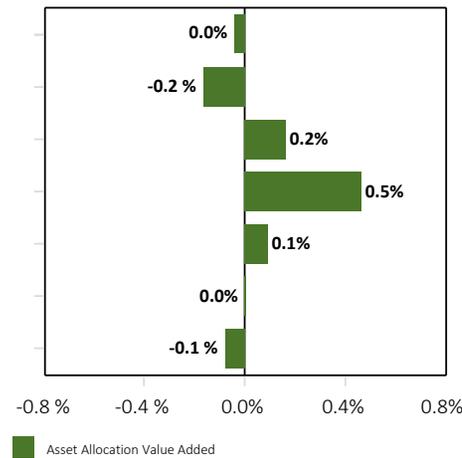
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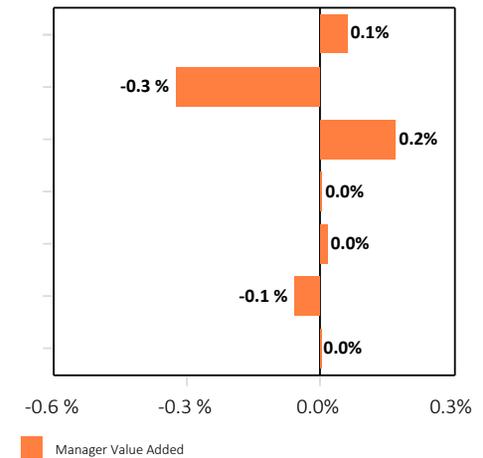
Total Asset Allocation:0.4%



Asset Allocation Value Added:0.4%



Total Manager Value Added:-0.1%

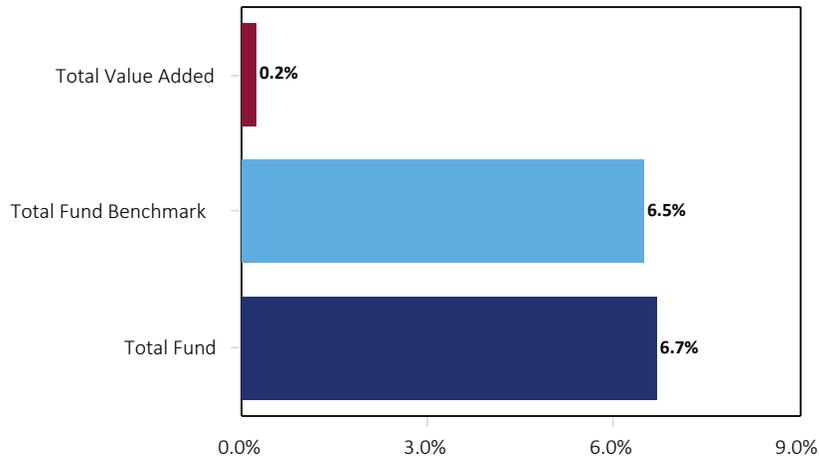


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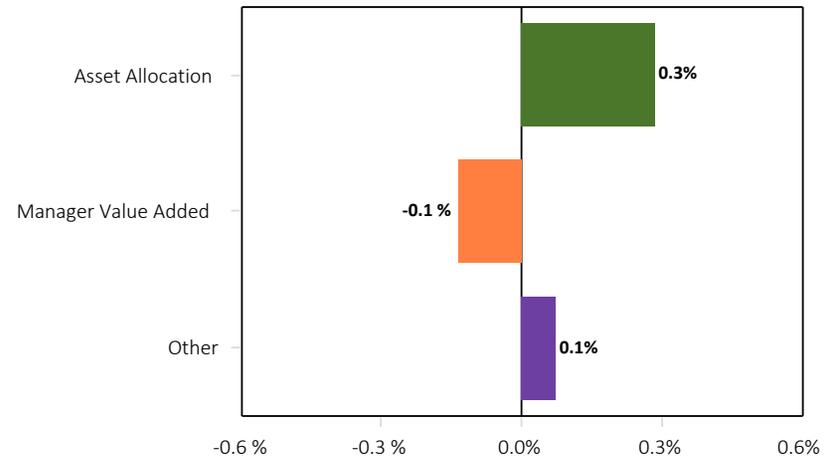
CERS (H) Insurance Plan

Periods Ended 1 Quarter Ending December 31, 2023

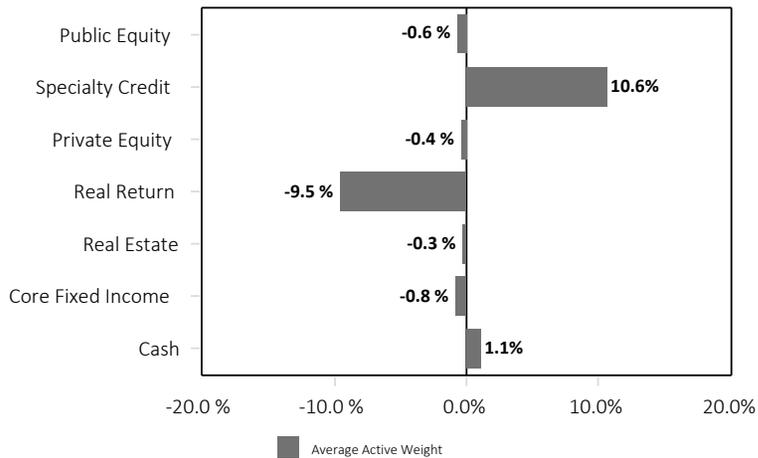
Total Fund Performance



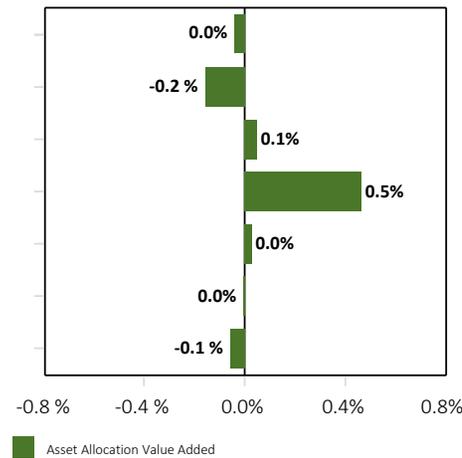
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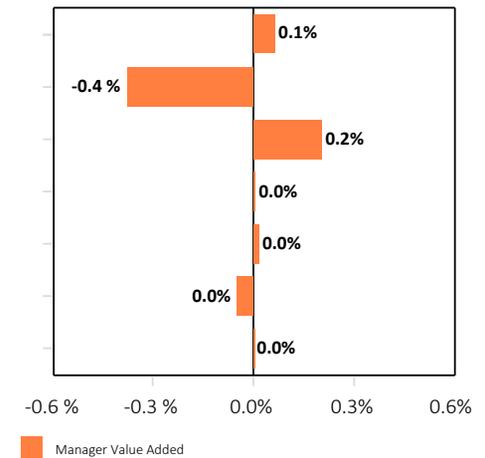
Total Asset Allocation:0.3%



Asset Allocation Value Added:0.3%



Total Manager Value Added:-0.1%

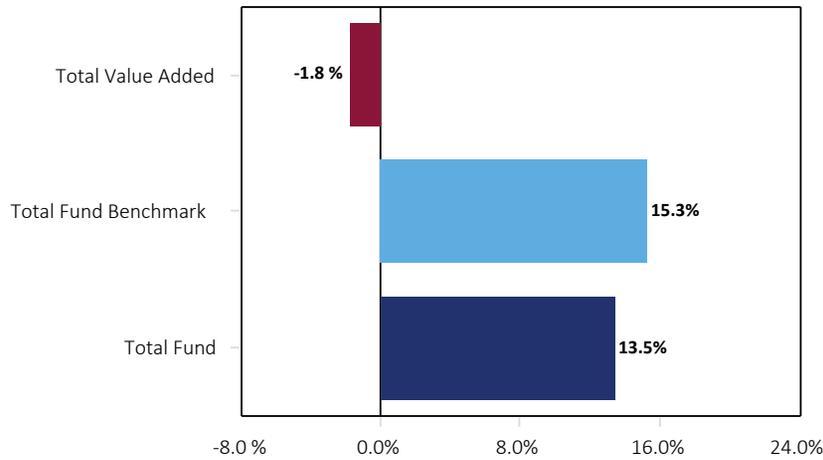


Total Fund Attribution

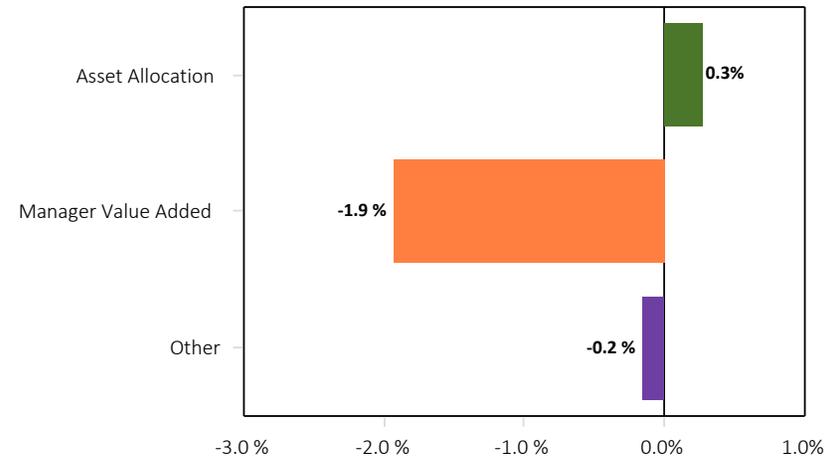
CERS Pension Plan

Periods Ended 1 Year Ending December 31, 2023

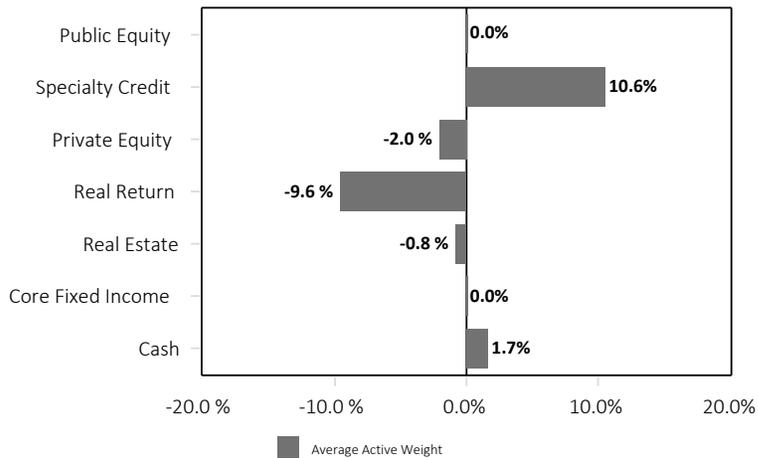
Total Fund Performance



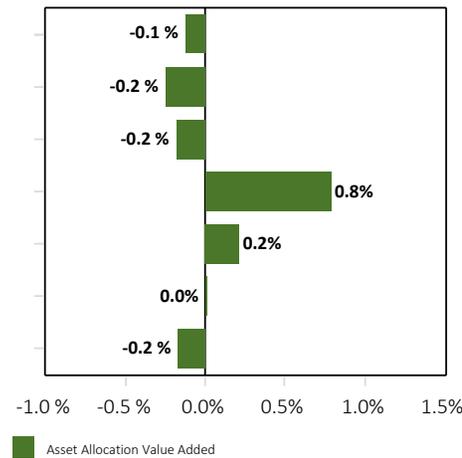
Total Value Added:-1.8 %



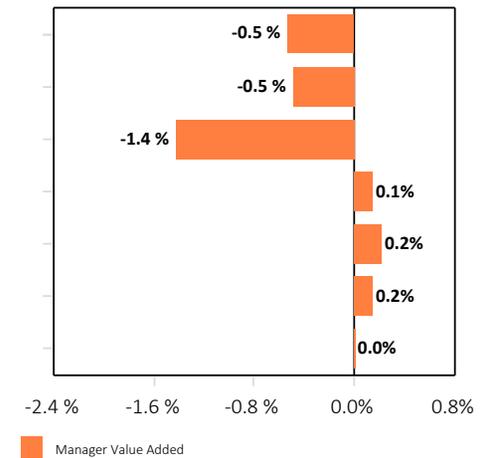
Total Asset Allocation:0.3%



Asset Allocation Value Added:0.3%



Total Manager Value Added:-1.9%

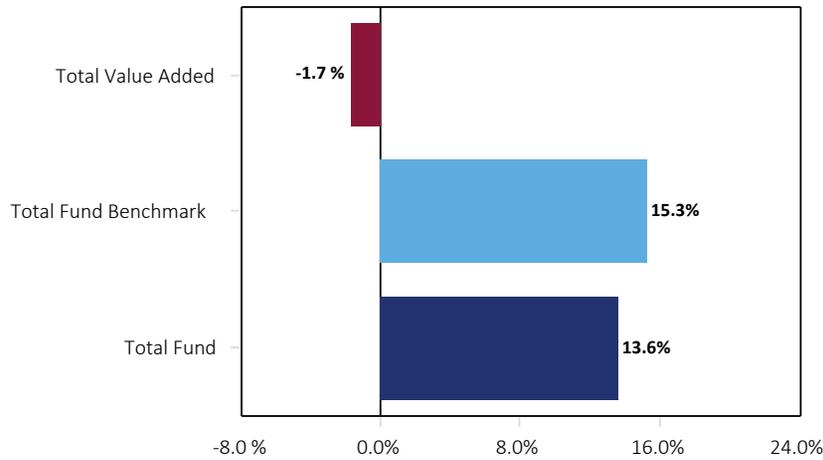


Total Fund Attribution

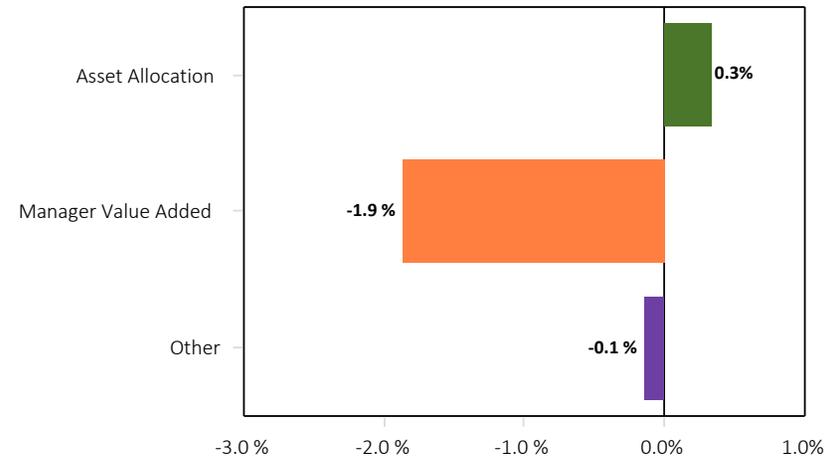
CERS (H) Pension Plan

Periods Ended 1 Year Ending December 31, 2023

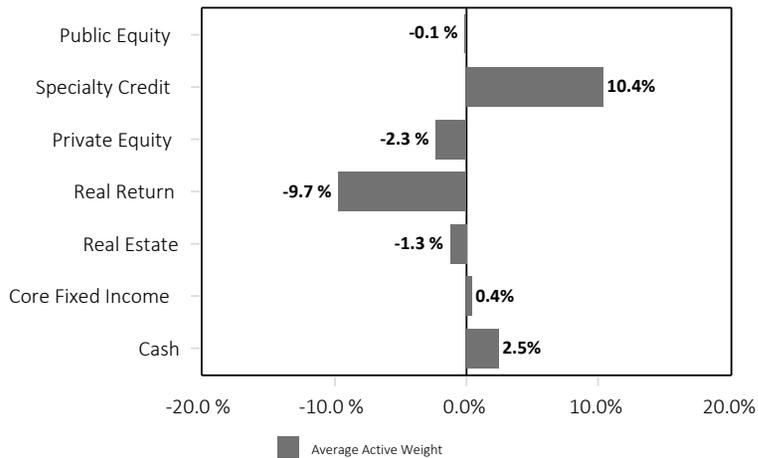
Total Fund Performance



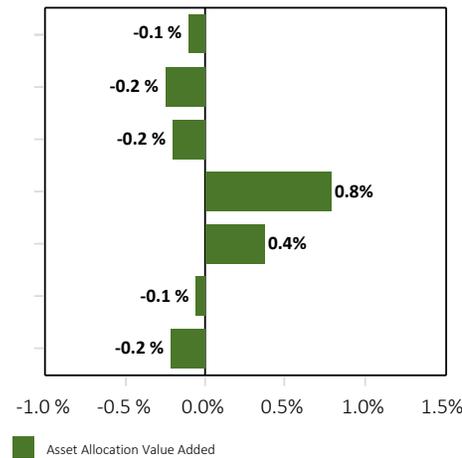
Total Value Added:-1.7 %



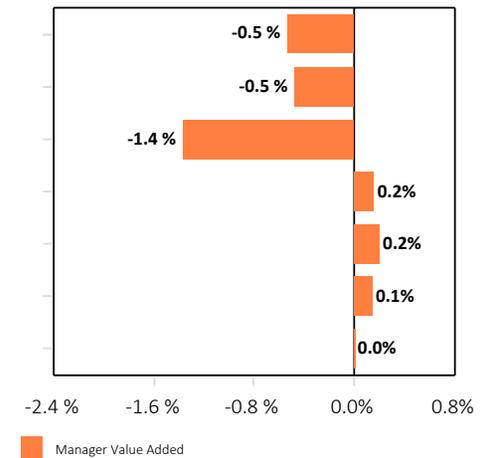
Total Asset Allocation:0.3%



Asset Allocation Value Added:0.3%



Total Manager Value Added:-1.9%

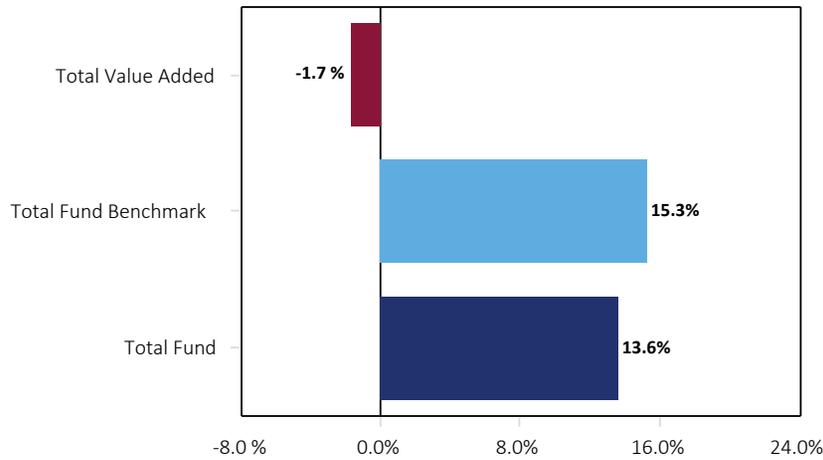


Total Fund Attribution

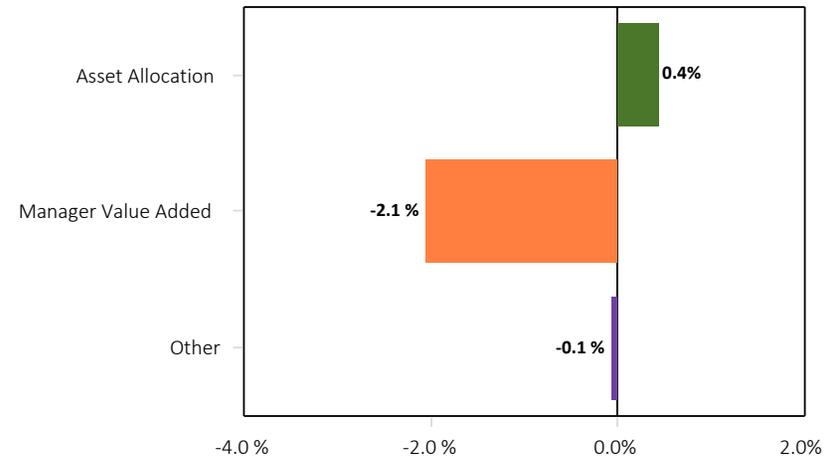
CERS Insurance Plan

Periods Ended 1 Year Ending December 31, 2023

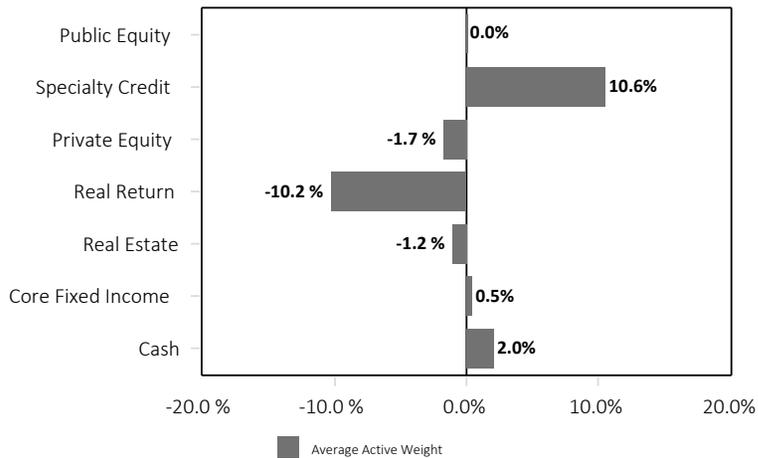
Total Fund Performance



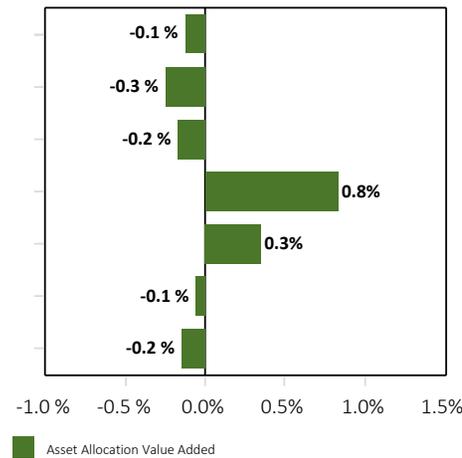
Total Value Added:-1.7 %



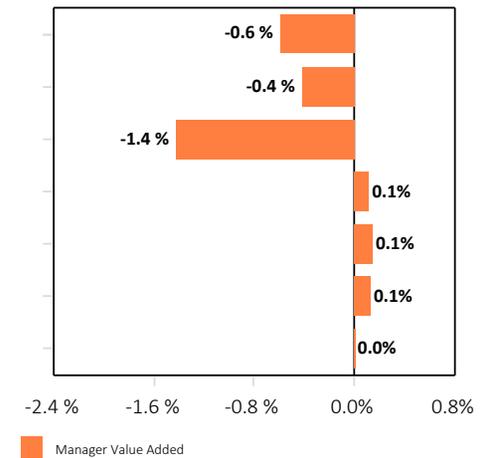
Total Asset Allocation:0.4%



Asset Allocation Value Added:0.4%



Total Manager Value Added:-2.1 %

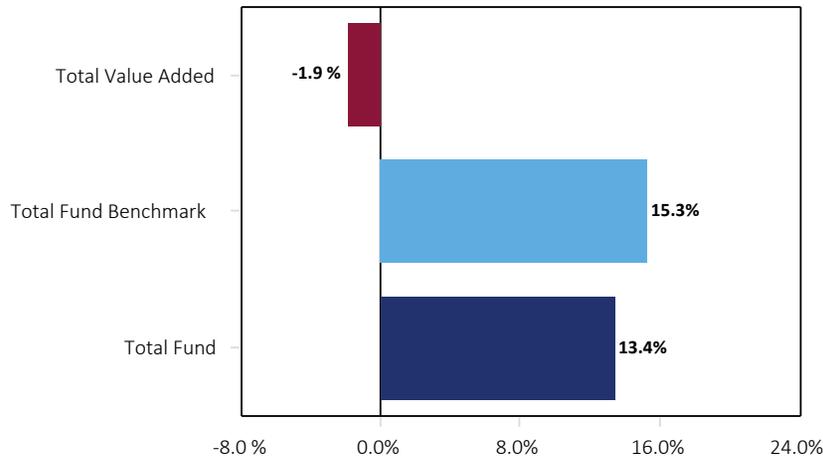


Total Fund Attribution

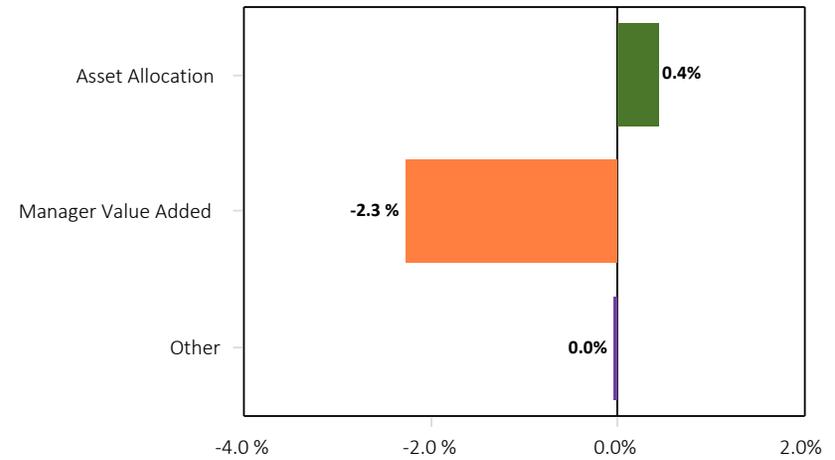
CERS (H) Insurance Plan

Periods Ended 1 Year Ending December 31, 2023

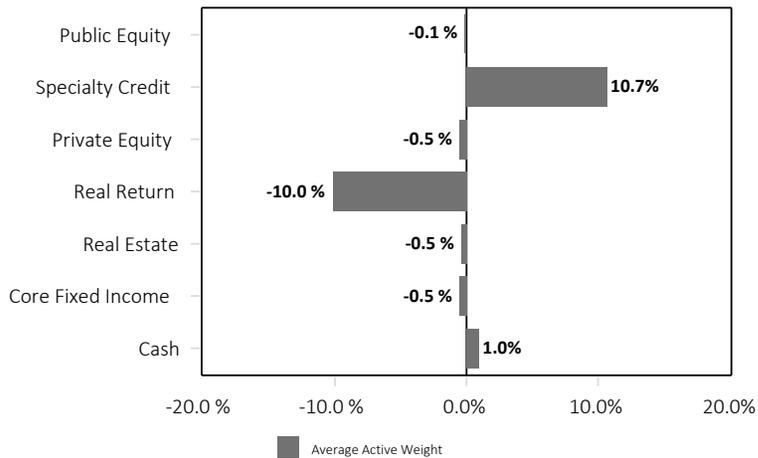
Total Fund Performance



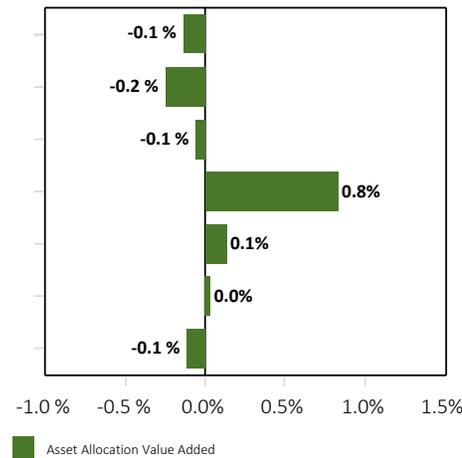
Total Value Added:-1.9 %



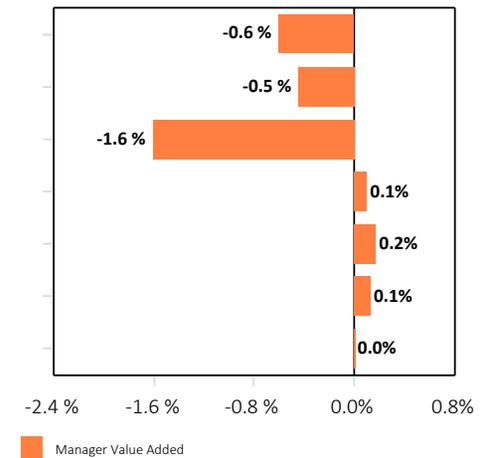
Total Asset Allocation:0.4%



Asset Allocation Value Added:0.4%



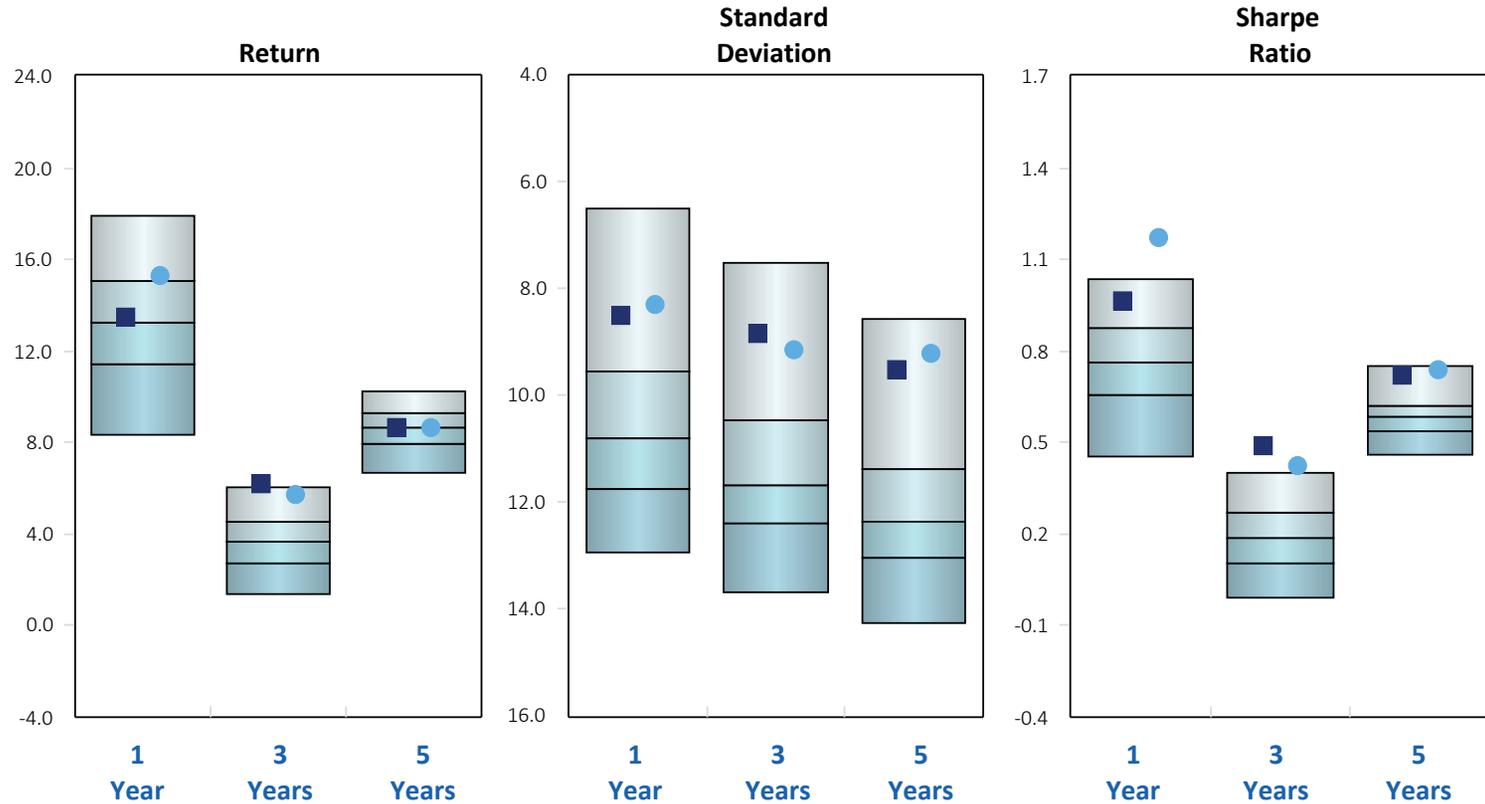
Total Manager Value Added:-2.3 %



Plan Sponsor Peer Group Analysis - Multi Statistics

CERS Pension Plan vs All Public Plans-Total Fund

Periods Ended December 31, 2023



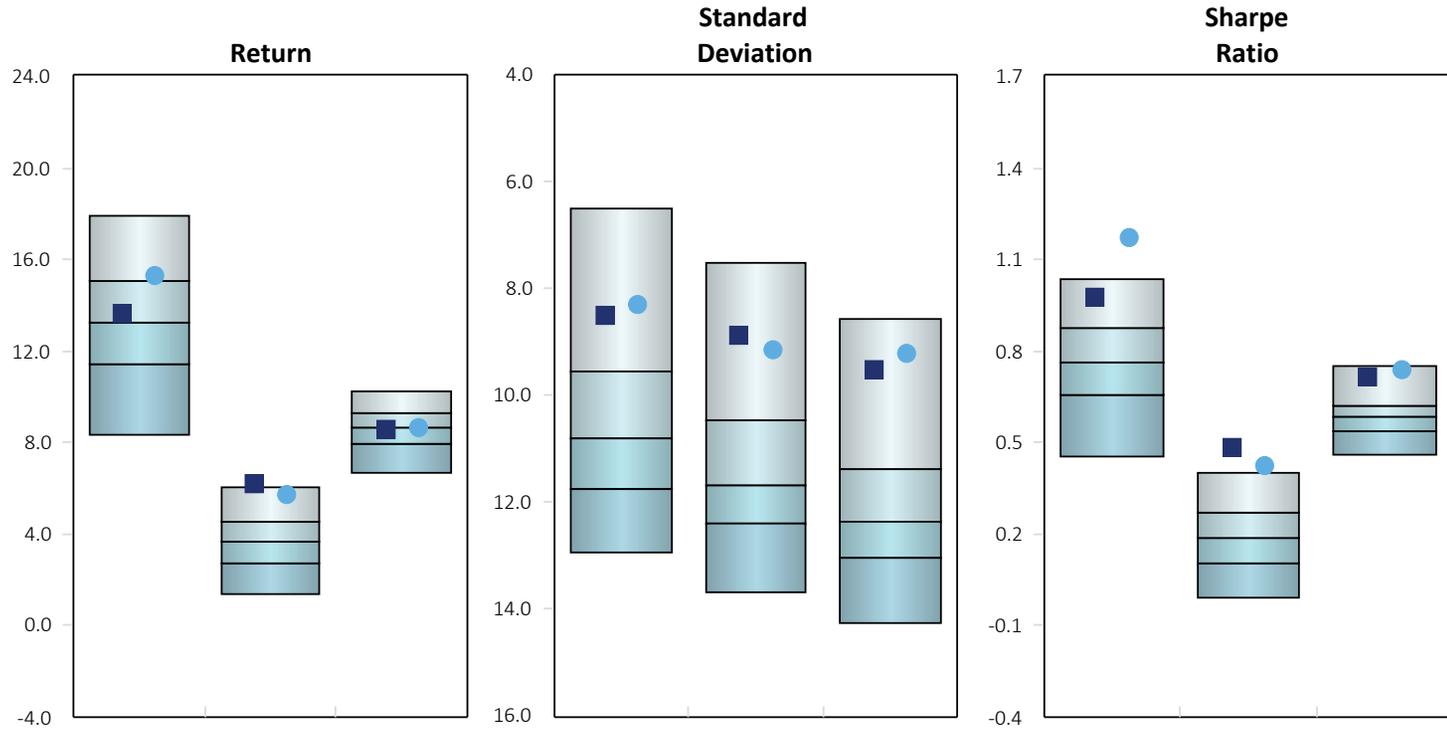
	1 Year	3 Years	5 Years	1 Year	3 Years	5 Years	1 Year	3 Years	5 Years
■ CERS Pension Plan	13.50 (46)	6.24 (4)	8.63 (53)	8.49 (14)	8.86 (9)	9.51 (7)	0.96 (13)	0.49 (3)	0.72 (7)
● CERS Pension IPS Index	15.31 (22)	5.72 (8)	8.63 (53)	8.32 (12)	9.14 (11)	9.23 (6)	1.17 (2)	0.42 (4)	0.74 (6)
5th Percentile	17.92	6.02	10.26	6.51	7.54	8.58	1.03	0.40	0.75
1st Quartile	15.03	4.55	9.25	9.56	10.48	11.39	0.87	0.27	0.62
Median	13.22	3.67	8.67	10.83	11.69	12.38	0.76	0.19	0.58
3rd Quartile	11.42	2.71	7.91	11.75	12.42	13.06	0.66	0.11	0.54
95th Percentile	8.32	1.34	6.65	12.96	13.70	14.27	0.45	-0.01	0.46

Parentheses contain percentile rankings.
Calculation based on monthly periodicity.

Plan Sponsor Peer Group Analysis - Multi Statistics

CERS (H) Pension Plan vs All Public Plans-Total Fund

Periods Ended December 31, 2023



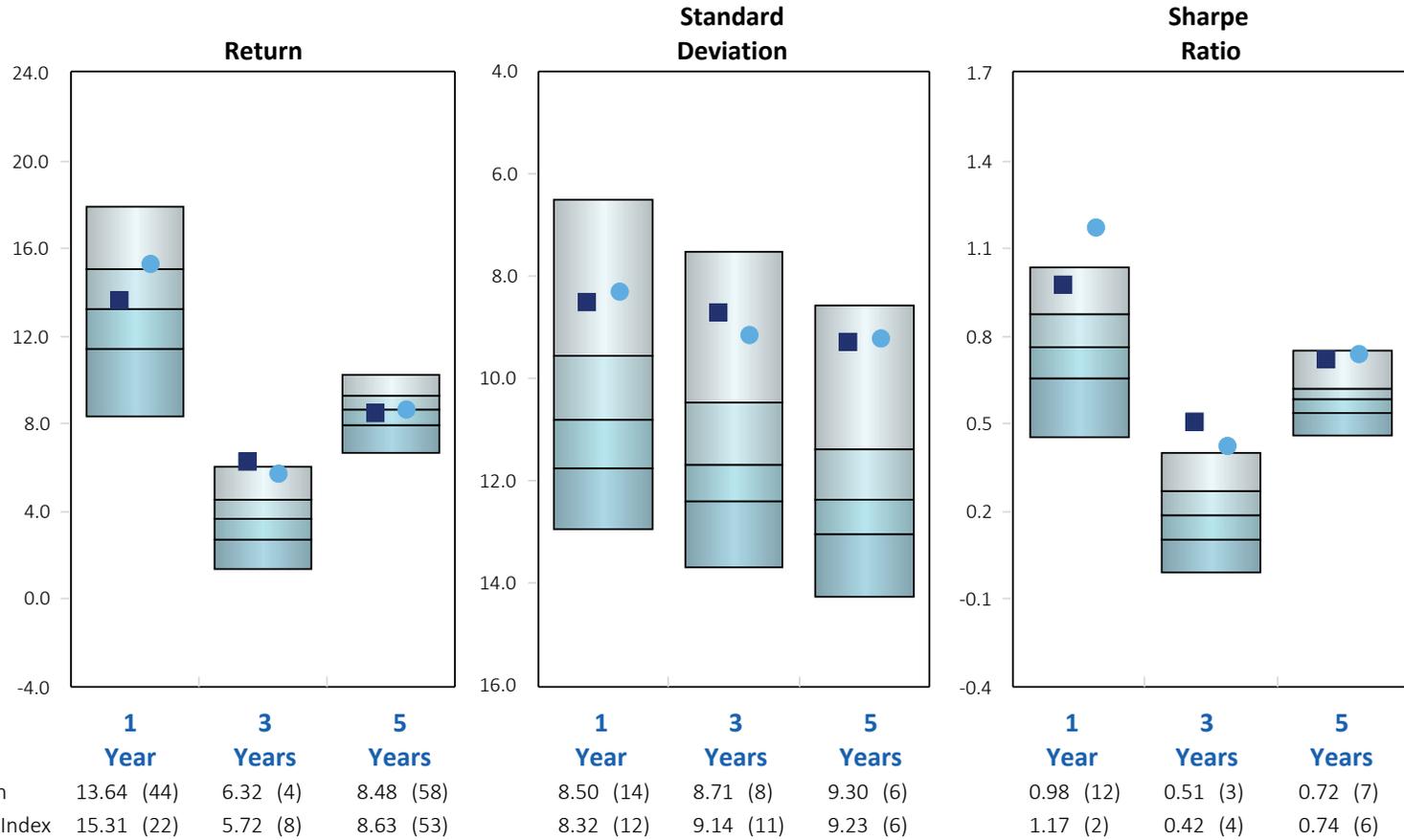
	1 Year	3 Years	5 Years	1 Year	3 Years	5 Years	1 Year	3 Years	5 Years
■ CERS (H) Pension Plan	13.63 (44)	6.20 (5)	8.58 (54)	8.52 (14)	8.88 (9)	9.52 (8)	0.97 (13)	0.48 (3)	0.72 (7)
● CERS (H) Pension IPS Index	15.31 (22)	5.72 (8)	8.63 (53)	8.32 (12)	9.14 (11)	9.23 (6)	1.17 (2)	0.42 (4)	0.74 (6)
5th Percentile	17.92	6.02	10.26	6.51	7.54	8.58	1.03	0.40	0.75
1st Quartile	15.03	4.55	9.25	9.56	10.48	11.39	0.87	0.27	0.62
Median	13.22	3.67	8.67	10.83	11.69	12.38	0.76	0.19	0.58
3rd Quartile	11.42	2.71	7.91	11.75	12.42	13.06	0.66	0.11	0.54
95th Percentile	8.32	1.34	6.65	12.96	13.70	14.27	0.45	-0.01	0.46

Parentheses contain percentile rankings.
Calculation based on monthly periodicity.

Plan Sponsor Peer Group Analysis - Multi Statistics

CERS Insurance Plan vs All Public Plans-Total Fund

Periods Ended December 31, 2023



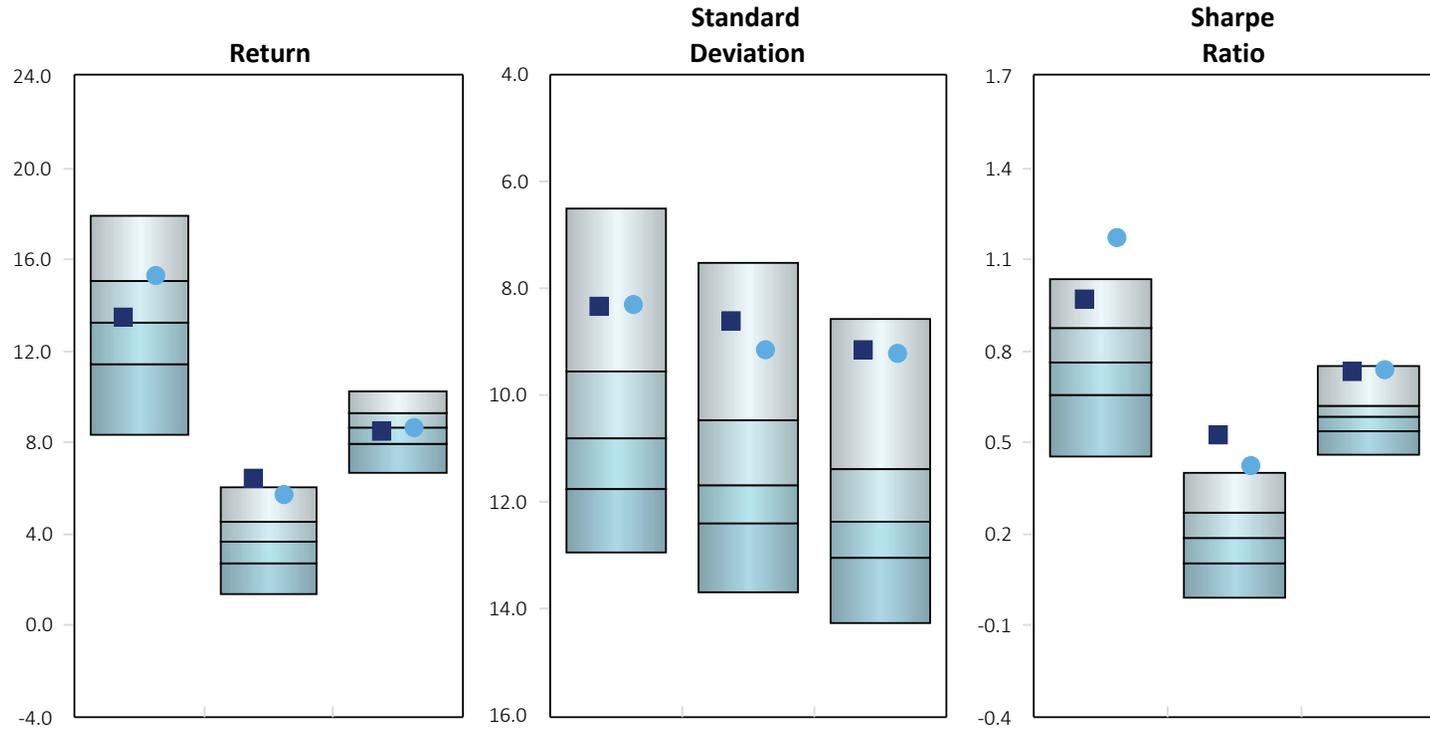
	1 Year	3 Years	5 Years
5th Percentile	17.92	6.02	10.26
1st Quartile	15.03	4.55	9.25
Median	13.22	3.67	8.67
3rd Quartile	11.42	2.71	7.91
95th Percentile	8.32	1.34	6.65

Parentheses contain percentile rankings.
Calculation based on monthly periodicity.

Plan Sponsor Peer Group Analysis - Multi Statistics

CERS (H) Insurance Plan vs All Public Plans-Total Fund

Periods Ended December 31, 2023



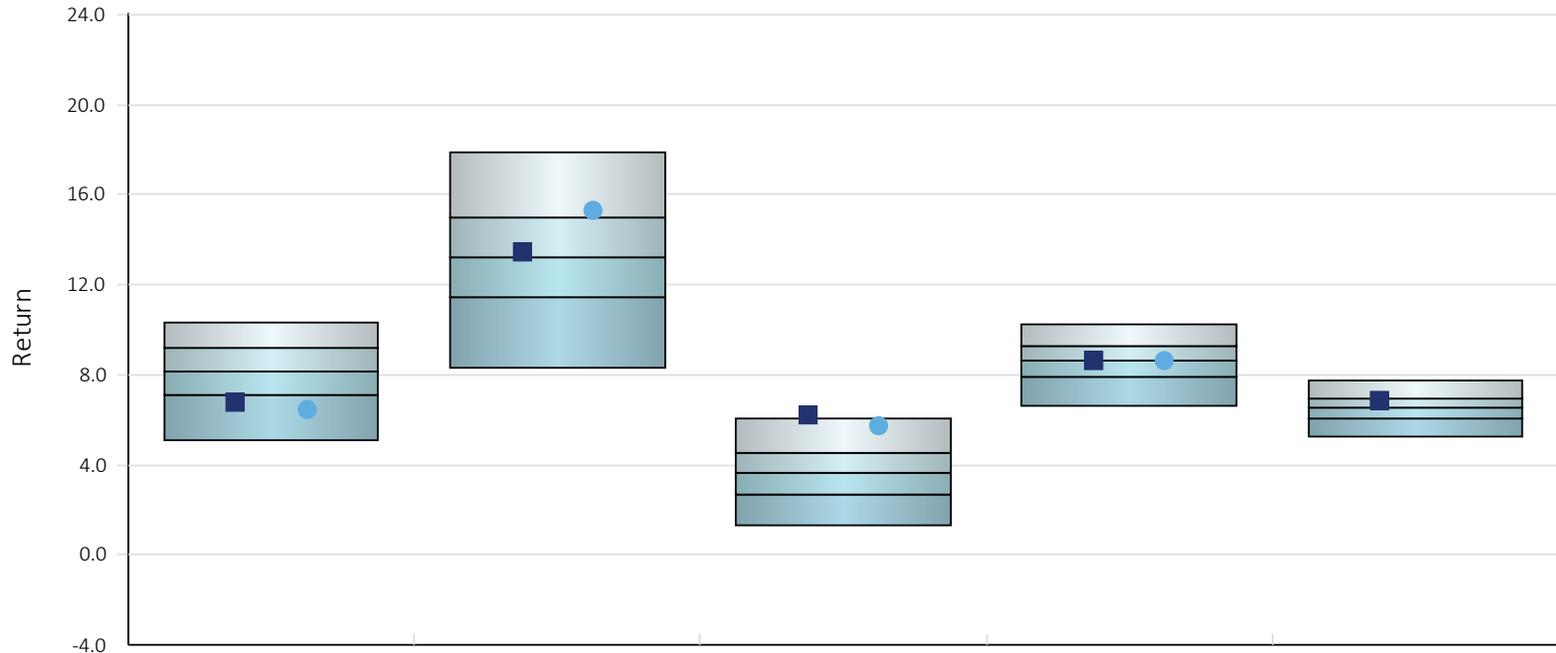
	1 Year	3 Years	5 Years	1 Year	3 Years	5 Years	1 Year	3 Years	5 Years
■ CERS (H) Insurance Plan	13.45 (46)	6.43 (4)	8.53 (56)	8.36 (12)	8.60 (8)	9.17 (5)	0.97 (13)	0.52 (3)	0.73 (6)
● CERS (H) Insurance IPS Index	15.31 (22)	5.72 (8)	8.63 (53)	8.32 (12)	9.14 (11)	9.23 (6)	1.17 (2)	0.42 (4)	0.74 (6)
5th Percentile	17.92	6.02	10.26	6.51	7.54	8.58	1.03	0.40	0.75
1st Quartile	15.03	4.55	9.25	9.56	10.48	11.39	0.87	0.27	0.62
Median	13.22	3.67	8.67	10.83	11.69	12.38	0.76	0.19	0.58
3rd Quartile	11.42	2.71	7.91	11.75	12.42	13.06	0.66	0.11	0.54
95th Percentile	8.32	1.34	6.65	12.96	13.70	14.27	0.45	-0.01	0.46

Parentheses contain percentile rankings.
Calculation based on monthly periodicity.

Plan Sponsor Peer Group Analysis

CERS Pension Plan vs All Public Plans-Total Fund

Periods Ended December 31, 2023



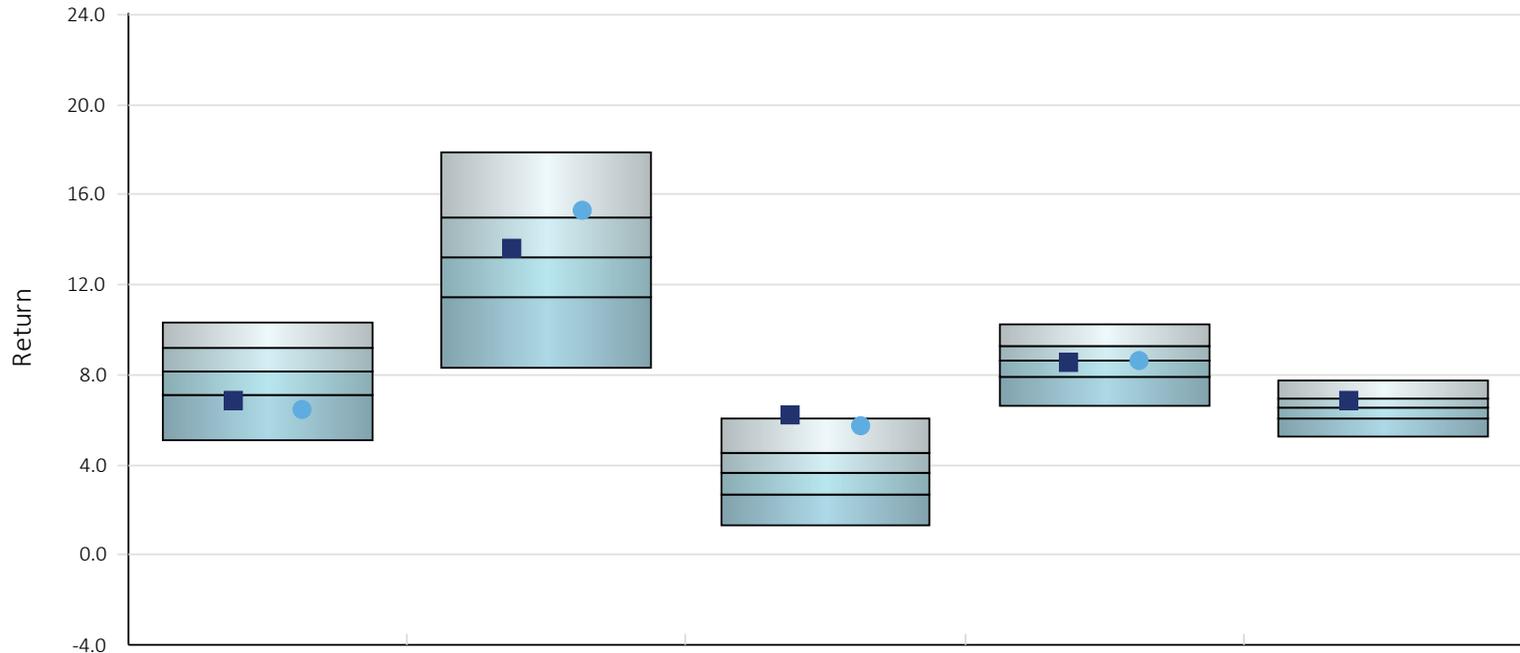
	QTD	1 Year	3 Years	5 Years	10 Years
■ CERS Pension Plan	6.78 (81)	13.50 (46)	6.24 (4)	8.63 (53)	6.89 (28)
● CERS Pension IPS Index	6.49 (85)	15.31 (22)	5.72 (8)	8.63 (53)	
5th Percentile	10.28	17.92	6.02	10.26	7.75
1st Quartile	9.16	15.03	4.55	9.25	6.95
Median	8.19	13.22	3.67	8.67	6.53
3rd Quartile	7.10	11.42	2.71	7.91	6.05
95th Percentile	5.08	8.32	1.34	6.65	5.27
Population	632	595	554	537	445

Parentheses contain percentile rankings.
Calculation based on monthly periodicity.

Plan Sponsor Peer Group Analysis

CERS (H) Pension Plan vs All Public Plans-Total Fund

Periods Ended December 31, 2023



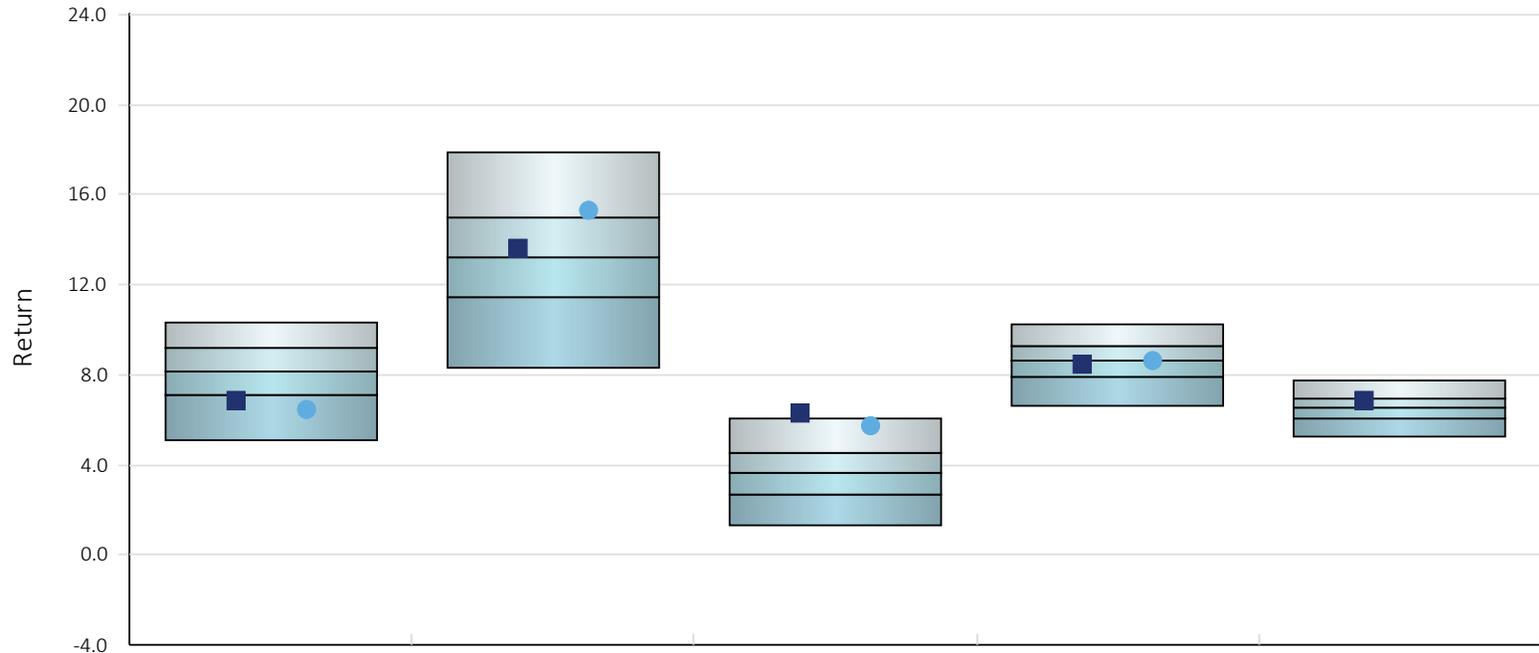
	QTD	1 Year	3 Years	5 Years	10 Years
■ CERS (H) Pension Plan	6.85 (81)	13.63 (44)	6.20 (5)	8.58 (54)	6.88 (29)
● CERS (H) Pension IPS Index	6.49 (85)	15.31 (22)	5.72 (8)	8.63 (53)	
5th Percentile	10.28	17.92	6.02	10.26	7.75
1st Quartile	9.16	15.03	4.55	9.25	6.95
Median	8.19	13.22	3.67	8.67	6.53
3rd Quartile	7.10	11.42	2.71	7.91	6.05
95th Percentile	5.08	8.32	1.34	6.65	5.27
Population	632	595	554	537	445

Parentheses contain percentile rankings.
Calculation based on monthly periodicity.

Plan Sponsor Peer Group Analysis

CERS Insurance Plan vs All Public Plans-Total Fund

Periods Ended December 31, 2023



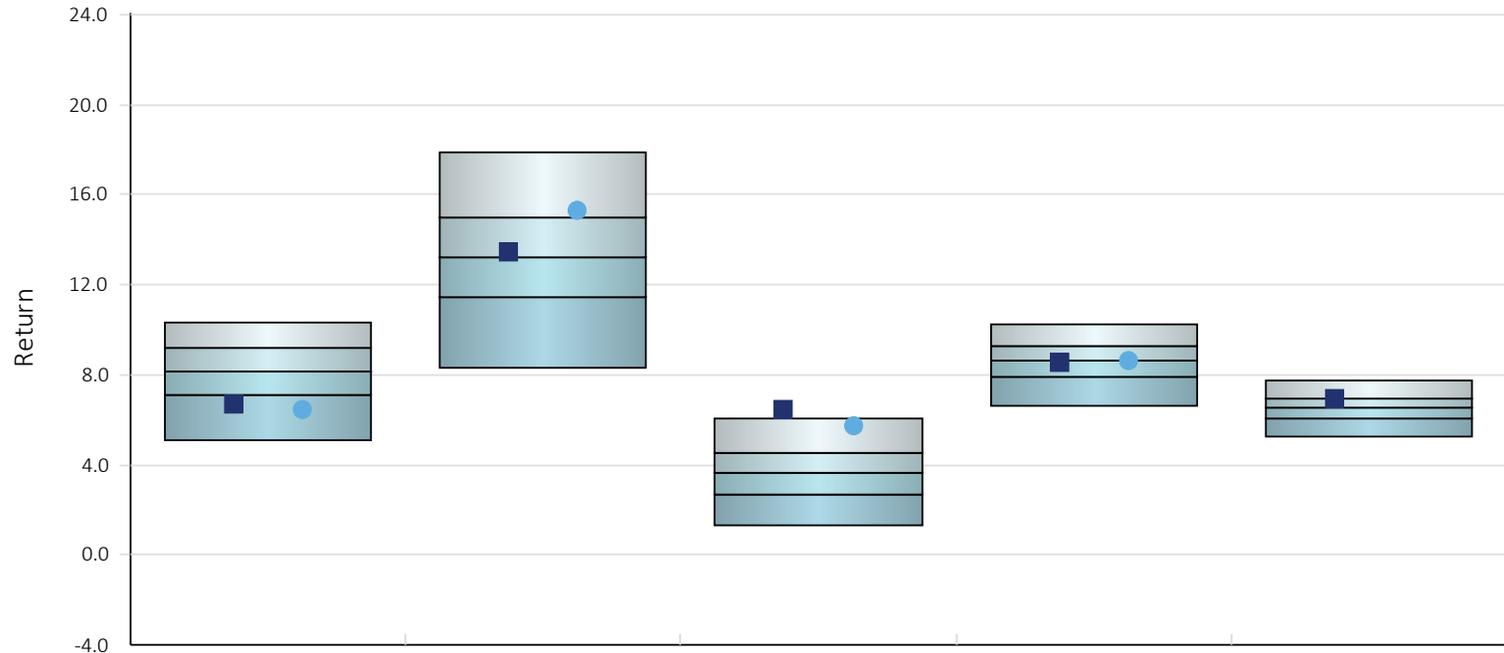
	QTD	1 Year	3 Years	5 Years	10 Years
■ CERS Insurance Plan	6.87 (80)	13.64 (44)	6.32 (4)	8.48 (58)	6.87 (30)
● CERS Insurance IPS Index	6.49 (85)	15.31 (22)	5.72 (8)	8.63 (53)	
5th Percentile	10.28	17.92	6.02	10.26	7.75
1st Quartile	9.16	15.03	4.55	9.25	6.95
Median	8.19	13.22	3.67	8.67	6.53
3rd Quartile	7.10	11.42	2.71	7.91	6.05
95th Percentile	5.08	8.32	1.34	6.65	5.27
Population	632	595	554	537	445

Parentheses contain percentile rankings.
Calculation based on monthly periodicity.

Plan Sponsor Peer Group Analysis

CERS (H) Insurance Plan vs All Public Plans-Total Fund

Periods Ended December 31, 2023



	QTD	1 Year	3 Years	5 Years	10 Years
■ CERS (H) Insurance Plan	6.71 (82)	13.45 (46)	6.43 (4)	8.53 (56)	6.93 (26)
● CERS (H) Insurance IPS Index	6.49 (85)	15.31 (22)	5.72 (8)	8.63 (53)	
5th Percentile	10.28	17.92	6.02	10.26	7.75
1st Quartile	9.16	15.03	4.55	9.25	6.95
Median	8.19	13.22	3.67	8.67	6.53
3rd Quartile	7.10	11.42	2.71	7.91	6.05
95th Percentile	5.08	8.32	1.34	6.65	5.27
Population	632	595	554	537	445

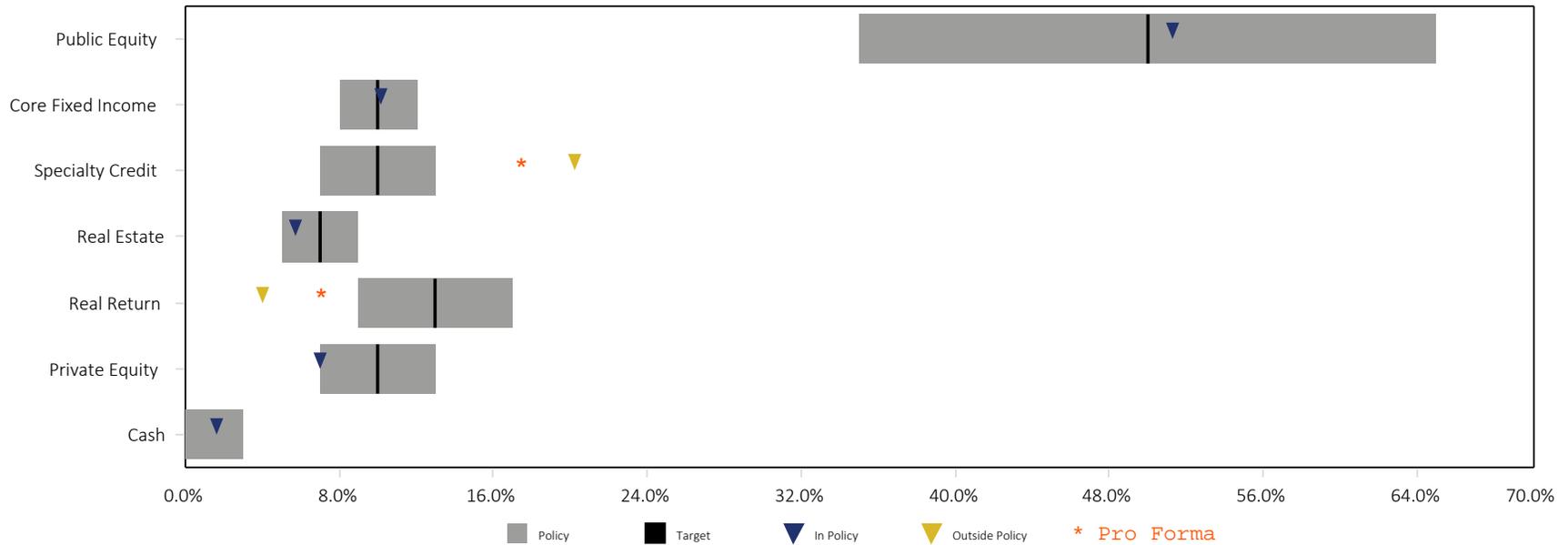
Parentheses contain percentile rankings.
Calculation based on monthly periodicity.

Asset Allocation Compliance

CERS Pension Plan

Periods Ended As of December 31, 2023

Executive Summary



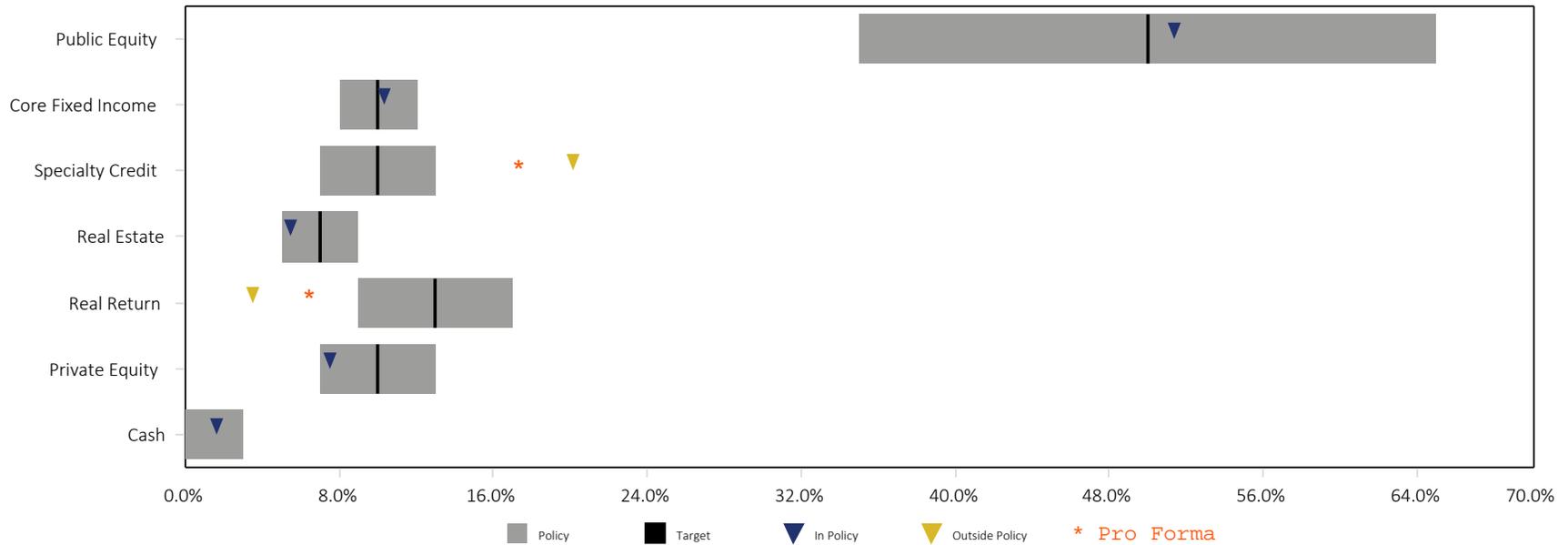
	Asset Allocation \$	Asset Allocation (%)	Minimum Allocation (%)	Maximum Allocation (%)	Target Allocation (%)	Target Rebalance \$
Public Equity	4,673,824,560	51.31	35.00	65.00	50.00	-119,717,250
Core Fixed Income	922,172,153	10.12	8.00	12.00	10.00	-11,350,691
Specialty Credit	1,843,339,638	20.24	7.00	13.00	10.00	-932,518,176
Real Estate	521,611,246	5.73	5.00	9.00	7.00	115,963,777
Real Return	362,660,962	3.98	9.00	17.00	13.00	821,406,939
Private Equity	640,614,004	7.03	7.00	13.00	10.00	270,207,458
Cash	143,992,058	1.58	0.00	3.00	0.00	-143,992,058
Total Fund	9,108,214,620	100.00			100.00	

Asset Allocation Compliance

CERS Insurance Plan

Periods Ended As of December 31, 2023

Executive Summary



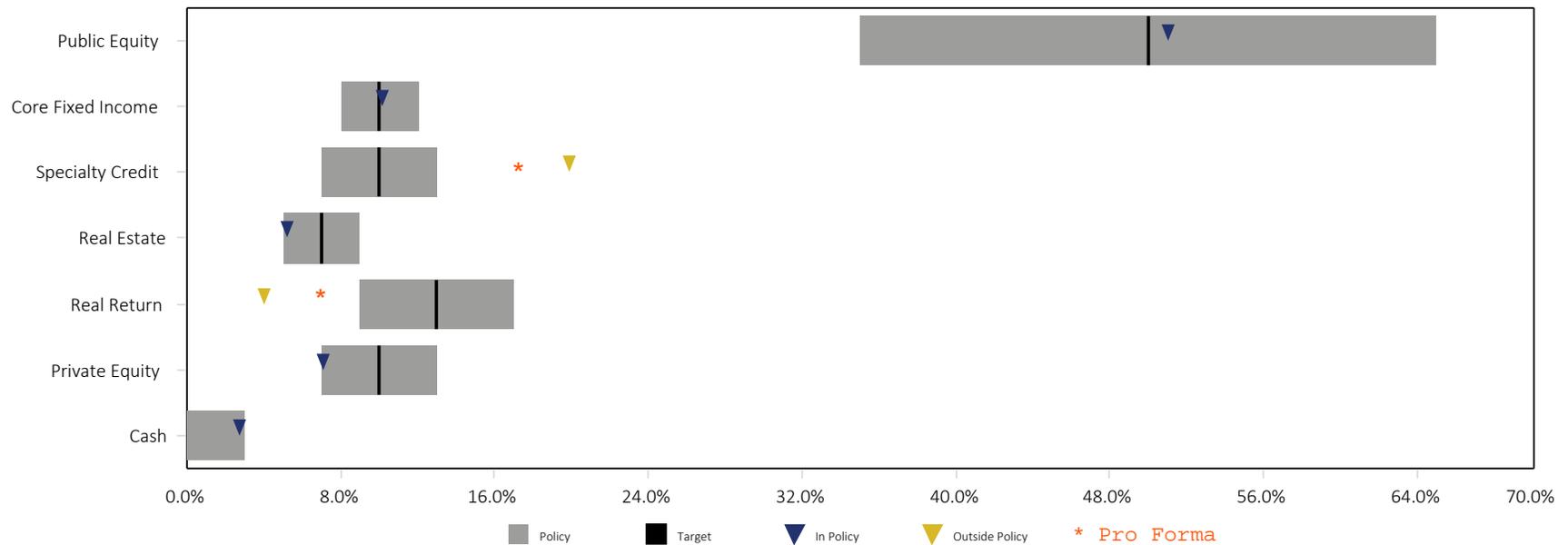
	Asset Allocation \$	Asset Allocation (%)	Minimum Allocation (%)	Maximum Allocation (%)	Target Allocation (%)	Target Rebalance \$
Public Equity	1,762,400,978	51.42	35.00	65.00	50.00	-48,599,242
Core Fixed Income	352,883,322	10.30	8.00	12.00	10.00	-10,122,975
Specialty Credit	690,549,055	20.15	7.00	13.00	10.00	-347,788,708
Real Estate	188,638,589	5.50	5.00	9.00	7.00	51,293,654
Real Return	121,311,894	3.54	9.00	17.00	13.00	324,276,557
Private Equity	257,657,256	7.52	7.00	13.00	10.00	85,103,091
Cash	54,162,377	1.58	0.00	3.00	0.00	-54,162,377
Total Fund	3,427,603,471	100.00			100.00	

Asset Allocation Compliance

CERS (H) Pension Plan

Periods Ended As of December 31, 2023

Executive Summary



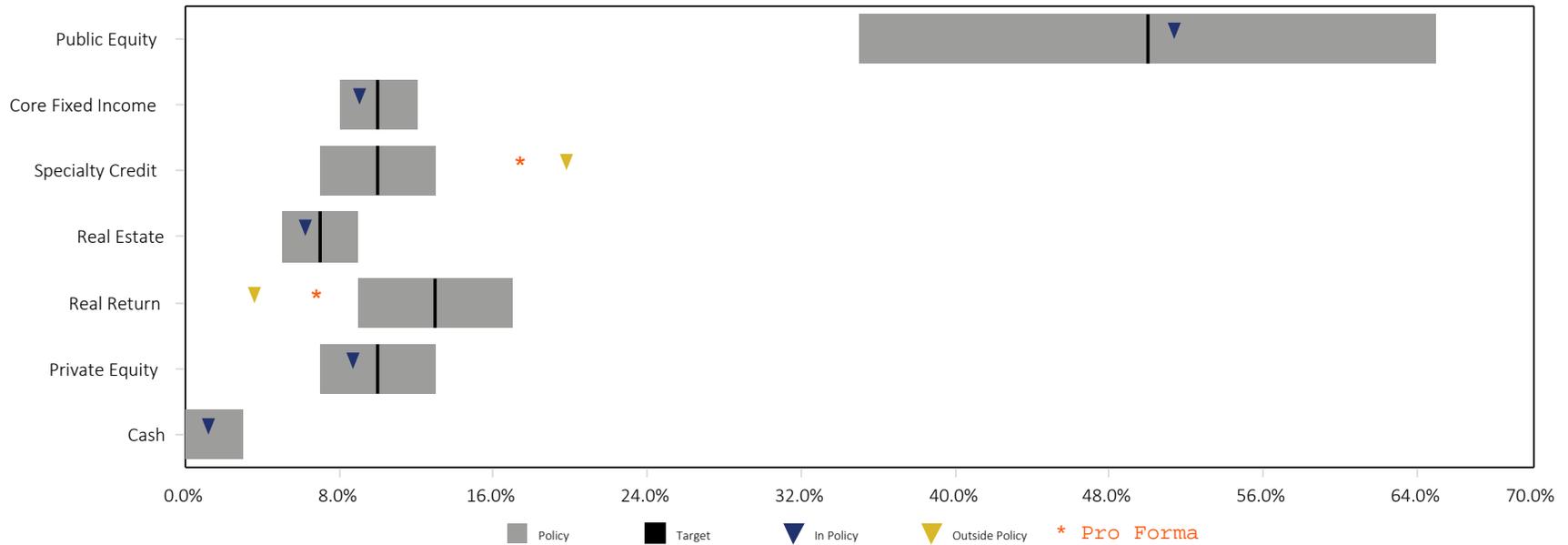
	Asset Allocation \$	Asset Allocation (%)	Minimum Allocation (%)	Maximum Allocation (%)	Target Allocation (%)	Target Rebalance \$
Public Equity	1,633,625,678	51.06	35.00	65.00	50.00	-34,030,765
Core Fixed Income	324,604,644	10.15	8.00	12.00	10.00	-4,685,661
Specialty Credit	635,454,609	19.86	7.00	13.00	10.00	-315,535,627
Real Estate	166,031,122	5.19	5.00	9.00	7.00	57,912,166
Real Return	127,122,645	3.97	9.00	17.00	13.00	288,772,032
Private Equity	226,314,184	7.07	7.00	13.00	10.00	93,604,798
Cash	86,036,944	2.69	0.00	3.00	0.00	-86,036,944
Total Fund	3,199,189,827	100.00			100.00	

Asset Allocation Compliance

CERS (H) Insurance Plan

Periods Ended As of December 31, 2023

Executive Summary



	Asset Allocation \$	Asset Allocation (%)	Minimum Allocation (%)	Maximum Allocation (%)	Target Allocation (%)	Target Rebalance \$
Public Equity	854,175,733	51.41	35.00	65.00	50.00	-23,424,885
Core Fixed Income	150,931,637	9.08	8.00	12.00	10.00	15,218,533
Specialty Credit	329,638,801	19.84	7.00	13.00	10.00	-163,488,632
Real Estate	103,503,236	6.23	5.00	9.00	7.00	12,801,882
Real Return	59,012,357	3.55	9.00	17.00	13.00	156,982,864
Private Equity	144,705,200	8.71	7.00	13.00	10.00	21,444,970
Cash	19,534,733	1.18	0.00	3.00	0.00	-19,534,733
Total Fund	1,661,501,698	100.00			100.00	

Asset Allocation & Performance

Total Fund

Periods Ended December 31, 2023

	Market Value \$	Performance (%) net of fees									
		QTD	FYTD	1 Year	3 Years	5 Years	10 Years	20 Years	30 Years	Since Inception	Inception Date
CERS Pension Plan	9,108,214,620	6.78	5.26	13.50	6.24	8.63	10.09	6.65	7.79	8.88	4/1/1984
CERS Pension IPS Index		6.49	5.57	15.31	5.72	8.63					
Value Added		0.29	-0.31	-1.81	0.52	0.00					
Assumed Rate 6.25%		1.53	3.08	6.25	6.25	6.25					
Value Added		5.25	2.18	7.25	-0.01	2.38					
CERS Insurance Plan	3,427,603,471	6.87	5.38	13.64	6.32	8.48	7.77	6.48	6.91	7.42	4/1/1987
CERS Insurance IPS Index		6.49	5.57	15.31	5.72	8.63					
Value Added		0.38	-0.19	-1.67	0.60	-0.15					
Assumed Rate 6.50%		1.59	3.20	6.50	6.50	6.50					
Value Added		5.28	2.18	7.14	-0.18	1.98					
CERS (H) Pension Plan	3,199,189,827	6.85	5.33	13.63	6.20	8.58	10.09	6.64	7.78	8.87	4/1/1984
CERS (H) Pension IPS Index		6.49	5.57	15.31	5.72	8.63					
Value Added		0.36	-0.24	-1.68	0.48	-0.05					
Assumed Rate 6.25%		1.53	3.08	6.25	6.25	6.25					
Value Added		5.32	2.25	7.38	-0.05	2.33					
CERS (H) Insurance Plan	1,661,501,698	6.71	5.30	13.45	6.43	8.53	7.77	6.51	6.93	7.43	4/1/1987
CERS (H) Insurance IPS Index		6.49	5.57	15.31	5.72	8.63					
Value Added		0.22	-0.27	-1.86	0.71	-0.10					
Assumed Rate 6.50%		1.59	3.20	6.50	6.50	6.50					
Value Added		5.12	2.10	6.95	-0.07	2.03					

Asset Allocation & Performance

Insurance Plan Accounts

Periods Ended December 31, 2023

	Performance (%) net of fees							Inception Date
	1 Month	QTD	FYTD	1 Year	3 Years	5 Years	Since Inception	
Public Equity	5.35	11.18	6.66	20.97			1.30	12/1/2021
Public Equity Policy Index	4.80	11.03	7.26	22.20			1.78	
Value Added	0.55	0.15	-0.60	-1.23			-0.48	
US Equity Composite	5.52	11.79	7.87	24.10	8.62	14.85	10.03	7/1/1992
Russell 3000 Index	5.30	12.07	8.43	25.96	8.54	15.16	10.24	
Value Added	0.22	-0.28	-0.56	-1.86	0.08	-0.31	-0.21	
S&P 500 Index	4.55	11.66	8.07	26.24	10.00	15.90	8.72	7/1/2001
S&P 500 Index	4.54	11.69	8.04	26.29	10.00	15.69	8.31	
value added	0.01	-0.03	0.03	-0.05	0.00	0.21	0.41	
Scientific Beta	5.12	10.48	7.02	13.44	7.24	11.78	9.98	7/1/2016
S&P 500 Index	4.54	11.69	8.04	26.29	10.00	15.69	13.60	
Value Added	0.58	-1.21	-1.02	-12.85	-2.76	-3.91	-3.62	
River Road FAV	5.07	8.46	6.67	12.08	2.26	8.13	8.92	7/1/2016
Russell 3000 Value Index	5.93	9.83	6.36	11.66	8.81	10.84	9.15	
Value Added	-0.86	-1.37	0.31	0.42	-6.55	-2.71	-0.23	
Westfield Capital	5.66	14.82	12.21	44.08	8.69	19.89	14.25	7/1/2011
Russell 3000 Growth Index	4.77	14.09	10.28	41.21	8.08	18.85	14.84	
Value Added	0.89	0.73	1.93	2.87	0.61	1.04	-0.59	
Internal US Mid Cap	8.78	11.89	7.70	17.89	8.66	13.21	10.05	8/1/2014
S&P MidCap 400 Index	8.72	11.67	6.98	16.44	8.09	12.62	9.54	
Value Added	0.06	0.22	0.72	1.45	0.57	0.59	0.51	
NTGI Structured	10.89	13.63	9.62	17.67	6.58	11.78	10.31	7/1/2011
Russell 2000 Index	12.22	14.03	8.18	16.93	2.22	9.97	8.92	
Value Added	-1.33	-0.40	1.44	0.74	4.36	1.81	1.39	

Asset Allocation & Performance

Insurance Plan Accounts

Periods Ended December 31, 2023

	Performance (%) net of fees							Inception Date
	1 Month	QTD	FYTD	1 Year	3 Years	5 Years	Since Inception	
Next Century Growth	9.03	9.82	-8.68	11.02	1.06		21.00	11/1/2019
Russell Microcap Growth Index	13.68	15.64	1.82	9.11	-8.22		5.39	
Value Added	-4.65	-5.82	-10.50	1.91	9.28		15.61	
Non-US Equity Composite	5.09	10.26	4.87	16.60	1.06	7.82	2.94	4/1/2000
MSCI ACWI ex US IMI (10/17)	5.21	9.81	5.98	15.62	1.53	7.19	3.03	
Value Added	-0.12	0.45	-1.11	0.98	-0.47	0.63	-0.09	
BlackRock World Ex US	5.47	10.53	5.99	18.16	4.63	8.26	6.82	6/1/2012
MSCI World ex US (11/19)	5.47	10.51	5.97	17.94	4.42	8.12	6.71	
value added	0.00	0.02	0.02	0.22	0.21	0.14	0.11	
American Century	4.63	10.50	-1.34	9.19	-4.18	9.39	5.36	7/1/2014
MSCI ACWI ex US IMI (10/17)	5.21	9.81	5.98	15.62	1.53	7.19	3.61	
Value Added	-0.58	0.69	-7.32	-6.43	-5.71	2.20	1.75	
Franklin Templeton	7.07	14.65	2.18	13.61	-7.54	5.84	4.23	7/1/2014
MSCI ACWI ex US IMI (10/17)	5.21	9.81	5.98	15.62	1.53	7.19	3.61	
Value Added	1.86	4.84	-3.80	-2.01	-9.07	-1.35	0.62	
Lazard Asset Mgmt	4.70	10.01	5.00	18.96	2.20	7.57	4.44	7/1/2014
MSCI ACWI ex US IMI (10/17)	5.21	9.81	5.98	15.62	1.53	7.19	3.61	
Value Added	-0.51	0.20	-0.98	3.34	0.67	0.38	0.83	
LSV Asset Mgmt	4.37	9.13	9.73	21.12	7.45	7.63	4.01	7/1/2014
MSCI ACWI ex US IMI (10/17)	5.21	9.81	5.98	15.62	1.53	7.19	3.61	
Value Added	-0.84	-0.68	3.75	5.50	5.92	0.44	0.40	
Axiom	4.52	7.27	3.19	10.09			-11.76	12/1/2021
MSCI AC World ex USA Small Cap (Net)	6.35	10.12	8.25	15.66			-1.71	
Value Added	-1.83	-2.85	-5.06	-5.57			-10.05	

Asset Allocation & Performance

Insurance Plan Accounts

Periods Ended December 31, 2023

	Performance (%) net of fees							Inception Date
	1 Month	QTD	FYTD	1 Year	3 Years	5 Years	Since Inception	
JP Morgan Emerging Markets	4.69	10.15	3.22	7.72	-8.90		1.87	11/1/2019
MSCI Emerging Markets IMI Index	4.02	8.09	5.94	12.13	-3.32		3.42	
Value Added	0.67	2.06	-2.72	-4.41	-5.58		-1.55	
Pzena Emerging Markets	4.36	5.84	7.33	23.13	6.89		8.73	11/1/2019
MSCI Emerging Markets (Net)	3.91	7.86	4.71	9.83	-5.08		2.00	
Value Added	0.45	-2.02	2.62	13.30	11.97		6.73	
Private Equity Composite	0.56	0.70	3.91	8.75	17.77	12.37	10.91	7/1/2002
Russell 3000 +3% 1 Quarter Lag	-4.53	-2.54	6.42	24.07	12.66	12.42	11.73	
Value Added	5.09	3.24	-2.51	-15.32	5.11	-0.05	-0.82	
Core Fixed Income Composite	3.73	6.64	5.30	7.17	0.34	2.82	2.86	10/1/2018
Blmbg. U.S. Aggregate Index	3.83	6.82	3.37	5.53	-3.31	1.10	1.36	
Value Added	-0.10	-0.18	1.93	1.64	3.65	1.72	1.50	
NISA	3.92	6.88	3.87	6.28	-2.96	1.30	2.17	7/1/2011
Blmbg. U.S. Aggregate Index	3.83	6.82	3.37	5.53	-3.31	1.10	2.01	
Value Added	0.09	0.06	0.50	0.75	0.35	0.20	0.16	
Loomis Sayles	3.88	6.81	3.79	5.80	-1.88		1.49	2/1/2019
Blmbg. U.S. Aggregate Index (Since 8/1/23)	3.83	6.82	3.39	6.54	-8.11		0.94	
Value Added	0.05	-0.01	0.40	-0.74	6.23		0.55	
Lord Abbett	0.06	1.79	2.48	4.18	0.39	2.00	2.01	10/1/2018
ICE BofA 1-3 Year U.S. Corporate Index	1.32	3.03	3.97	5.61	0.44	2.16	2.21	
Value Added	-1.26	-1.24	-1.49	-1.43	-0.05	-0.16	-0.20	
Internal Core Fixed Income	3.84	7.02					4.27	9/1/2023
Blmbg. U.S. Aggregate Index	3.83	6.82					4.10	
value added	0.01	0.20					0.17	

Asset Allocation & Performance

Insurance Plan Accounts

Periods Ended December 31, 2023

	Performance (%) net of fees							
	1 Month	QTD	FYTD	1 Year	3 Years	5 Years	Since Inception	Inception Date
Specialty Credit Composite	1.77	3.38	6.23	11.33	6.96	6.82	6.29	10/1/2018
Specialty Credit Policy Index	2.69	5.02	7.07	13.42	3.91	5.62	4.53	
Value Added	-0.92	-1.64	-0.84	-2.09	3.05	1.20	1.76	
Adams St SPC II A	3.74	3.74	7.70	14.96	16.83		15.08	6/1/2020
Adams St SPC II B	3.06	3.06	6.14	11.08	10.56		10.06	6/1/2020
Blue Torch	2.18	2.18	4.99	12.67	11.49		10.42	8/1/2020
BSP Coinvestment	2.83	2.83	5.81	11.55	8.08		7.38	10/1/2019
Morningstar LSTA U.S. Leveraged Loan	1.65	2.87	6.43	13.32	5.76		5.21	
Value Added	1.18	-0.04	-0.62	-1.77	2.32		2.17	
BSP Private Credit	3.26	3.26	5.94	10.63	10.23	7.17	6.47	2/1/2018
Morningstar LSTA U.S. Leveraged Loan	1.65	2.87	6.43	13.32	5.76	5.80	4.78	
Value Added	1.61	0.39	-0.49	-2.69	4.47	1.37	1.69	
CapitalSpring	4.33	4.33	27.15	53.06	20.68		18.23	2/1/2020
Morningstar LSTA U.S. Leveraged Loan	1.65	2.87	6.43	13.32	5.76		5.06	
Value Added	2.68	1.46	20.72	39.74	14.92		13.17	
Cerberus Capital Mgmt	0.89	1.54	3.42	7.58	11.81	10.43	9.47	9/1/2014
Morningstar LSTA U.S. Leveraged Loan	1.65	2.87	6.43	13.32	5.76	5.80	4.44	
Value Added	-0.76	-1.33	-3.01	-5.74	6.05	4.63	5.03	
Columbia	3.40	7.05	7.51	13.36	2.24	5.57	5.76	11/1/2011
Blmbg. U.S. Corp: High Yield Index	3.73	7.16	7.66	13.45	1.98	5.37	5.68	
Value Added	-0.33	-0.11	-0.15	-0.09	0.26	0.20	0.08	
Manulife Asset Mgmt	2.88	6.02	4.93	9.49	0.71	4.70	3.92	12/1/2011
Policy Index	3.79	6.83	3.76	6.17	-2.97	1.44	1.26	
Value Added	-0.91	-0.81	1.17	3.32	3.68	3.26	2.66	

Asset Allocation & Performance

Insurance Plan Accounts

Periods Ended December 31, 2023

	Performance (%) net of fees							Inception Date
	1 Month	QTD	FYTD	1 Year	3 Years	5 Years	Since Inception	
Marathon Bluegrass	-0.17	0.86	2.89	4.02	4.68	4.21	5.39	1/1/2016
Blmbg. U.S. Corp: High Yield Index	3.73	7.16	7.66	13.45	1.98	5.37	6.06	
Value Added	-3.90	-6.30	-4.77	-9.43	2.70	-1.16	-0.67	
Shenkman Capital	1.90	3.35	5.53	11.73	4.83	5.32	4.25	7/1/2011
Morningstar LSTA U.S. Leveraged Loan	1.65	2.87	6.43	13.32	5.76	5.80	4.63	
Value Added	0.25	0.48	-0.90	-1.59	-0.93	-0.48	-0.38	
Waterfall	0.11	0.48	7.13	8.09	7.64	4.83	7.86	7/1/2011
Policy Index	2.57	4.91	6.35	11.64	2.56	4.45	4.21	
Value Added	-2.46	-4.43	0.78	-3.55	5.08	0.38	3.65	
White Oak Yield Spectrum	1.88	1.88	3.44	6.08	6.09	5.85	5.49	3/1/2018
Morningstar LSTA U.S. Leveraged Loan	1.65	2.87	6.43	13.32	5.76	5.80	4.82	
Value Added	0.23	-0.99	-2.99	-7.24	0.33	0.05	0.67	
Arrowmark	1.21	4.26	7.89	16.45	12.80	10.71	10.47	6/1/2018
Morningstar LSTA U.S. Leveraged Loan	1.65	2.87	6.43	13.32	5.76	5.80	4.88	
Value Added	-0.44	1.39	1.46	3.13	7.04	4.91	5.59	
Cash Composite	0.48	1.43	2.55	4.54	2.05	1.81	2.51	7/1/1992
FTSE 3 Month T-Bill	0.47	1.41	2.80	5.26	2.25	1.91	2.41	
Value Added	0.01	0.02	-0.25	-0.72	-0.20	-0.10	0.10	

Asset Allocation & Performance

Insurance Plan Accounts

Periods Ended December 31, 2023

	Performance (%) net of fees							
	1 Month	QTD	FYTD	1 Year	3 Years	5 Years	Since Inception	Inception Date
Real Estate Composite	-1.55	-2.29	-4.70	-11.01	7.90	7.96	8.68	5/1/2009
NCREIF ODCE NOF 1 Quarter Lag	-2.10	-2.10	-4.93	-12.88	6.19	4.72		
Value Added	0.55	-0.19	0.23	1.87	1.71	3.24		
Baring	-3.23	-0.39	-21.88	-42.49	-12.18	2.80	2.80	1/1/2019
Barings Euro RE II	-16.46	-13.96	-21.26	-41.53	-25.95		-24.80	12/1/2020
Divcowest IV	2.14	2.14	2.07	-1.85	12.45	9.94	16.32	3/1/2014
Fundamental Partners III	-2.45	-2.45	-1.78	2.28	15.09	14.42	12.30	5/1/2017
Greenfield Acq VI	-1.88	-1.88	-2.98	-26.62	-35.32	-39.55	-17.96	12/1/2012
Greenfield Acq VII	2.63	2.63	5.57	-6.28	18.39	15.24	13.58	7/1/2014
Harrison Street	0.00	-1.81	-1.56	-2.58	5.59	5.65	7.28	5/1/2012
Lubert Adler VII	-4.55	-4.55	-11.37	-19.95	-4.27	-4.07	-2.79	7/1/2014
Lubert Adler VII B	-2.93	-2.93	0.70	10.15	24.92	19.60	14.64	7/1/2017
Mesa West IV	-0.67	-0.67	-8.03	-19.08	-3.33	0.55	1.75	3/1/2017
Mesa West Core Lend	-0.34	-0.34	-0.19	-5.12	1.95	3.50	5.20	5/1/2013
Patron Capital	-3.13	-0.20	-9.53	-7.15	2.10	3.59	2.56	8/1/2016
Prologis Targeted US	0.00	-1.44	-5.68	-11.60	18.11	15.38	15.51	10/1/2014
Rubenstein PF II	-21.35	-21.35	-28.79	-55.99	-26.40	-17.21	-2.03	7/1/2013
Stockbridge Sm/Mkts	-2.92	-2.92	-3.96	-13.42	7.32	6.21	7.72	5/1/2014
Walton St RE VI	1.63	1.63	2.67	10.37	12.35	4.40	-10.23	5/1/2009
Walton St RE VII	-7.01	-7.01	-11.37	-17.71	-1.35	-5.30	3.38	7/1/2013

Asset Allocation & Performance

Insurance Plan Accounts

Periods Ended December 31, 2023

	Performance (%) net of fees							
	1 Month	QTD	FYTD	1 Year	3 Years	5 Years	Since Inception	Inception Date
Real Return Composite	-0.95	1.21	5.47	10.14	9.57	8.11	4.86	7/1/2011
US CPI +3%	0.48	1.22	3.07	6.42	8.79	7.20	5.65	
Value Added	-1.43	-0.01	2.40	3.72	0.78	0.91	-0.79	
Tortoise Capital	-2.97	3.36	12.34	21.09	31.49	11.88	10.12	8/1/2009
Alerian MLP Index	-2.17	4.98	15.37	26.56	32.43	12.03	7.80	
Value Added	-0.80	-1.62	-3.03	-5.47	-0.94	-0.15	2.32	
Internal Real Return	-0.43						-0.43	12/1/2023
Arctos Sports II	3.06	3.06	0.41				74.28	5/1/2023
Arctos Sports II Co-Inv	0.00						0.00	11/1/2023
Amerra AGRI Fund II	-4.68	-4.68	0.53	0.23	8.75	8.79	5.95	12/1/2012
Amerra AGRI Holdings	-5.94	-5.94	-3.34	-9.85	-6.32	-3.37	-2.68	8/1/2015
BTG Pactual	0.81	0.81	10.26	14.24	16.66	7.32	-0.33	12/1/2014
IFM Infrastructure	2.70	5.19	4.98	10.14	7.53		5.55	7/1/2019
Magnetar MTP EOF II	-1.11	-1.11	-2.20	15.24	75.37	43.48	25.50	8/1/2015
Oberland Capital	1.58	1.58	4.93	11.95	12.18	13.46	13.49	8/1/2018
Taurus Mine Finance	-4.99	-4.99	-3.69	4.03	24.90	14.32	14.22	4/1/2015
TPF II	-1.54	-1.54	-2.92	-7.87	2.68	4.25	-1.02	10/1/2008
Blackstone Strat Opp	-0.65	-0.65	-1.20	-6.70	-2.73	-5.23	-2.81	8/1/2017
Luxor Capital	-0.13	-0.18	-2.62	-2.81	4.83	-3.73	-0.31	4/1/2014
Myriad Opportunities	0.00	0.00	0.00	-0.30	-24.06	-14.85	-8.37	5/1/2016
Pine River	0.35	0.02	0.16	-7.23	-4.43	3.29	1.55	5/1/2014

Asset Allocation & Performance

Insurance Plan Accounts

Periods Ended December 31, 2023

	Performance (%) net of fees							
	1 Month	QTD	FYTD	1 Year	3 Years	5 Years	Since Inception	Inception Date
PRISMA Capital	0.22	1.32	2.60	4.32	1.03	1.00	2.53	9/1/2011
Tricadia Select	0.00	0.00	0.00	0.00	0.00	0.44	-3.96	9/1/2017
Maritime Partners	0.00	0.00					0.00	10/1/2023

County Employees Retirement System

Compliance Report

Quarter Ending: December 31, 2023



<p style="text-align: center;">Compliance Review Period Ended December 31, 2023</p>	<p style="text-align: center;">Legend</p>
	<p>● In Compliance ● To be determined ● Not In Compliance</p>
<p>Total assets assigned to the selected manager shall not exceed 25% of that firm's total assets under management and shall not exceed 25% of a firm's total assets under management in a commingled product. Separate accounts or funds of one are not included in this 25% limitation for commingled products.</p>	<p style="text-align: center;">●</p>
<p>The assets managed by any one active or passive investment manager shall not exceed 15% of the overall assets in the Pension and Insurance funds per KRS 61.650(5).*</p>	<p style="text-align: center;">●</p>
<p>Cash holdings do not exceed five percent (5%) of the manager's allocation for any given quarter.**</p>	<p style="text-align: center;">●</p>
<p>The KPPA Investment Staff may passively manage up to twenty (20%) percent of the overall portfolio dedicated to these efficient markets (Public Equiy)</p>	<p style="text-align: center;">●</p>
<p>CERS Pension - 21.4%</p>	
<p>CERSH Pension - 21.0%</p>	
<p>CERS Insurance - 21.3%</p>	
<p>CERSH Insurance - 20.7%</p>	
<p>No more than fifteen (15) percent of the CERS Pension or Insurance total allocation to private equity investments may be committed to any one partnership, without the approval of the Board.</p>	<p style="text-align: center;">●</p>

<p style="text-align: center;">Compliance Review Period Ended December 31, 2023</p>	<p style="text-align: center;">Legend</p>
	<p>● In Compliance ● To be determined ● Not In Compliance</p>
<p>Maximum of thirteen (13%) percent of CERS Pan assets allocated to Private Equity</p>	
<p>All instruments in the Liquidity allocation shall have a maturity at the time of purchase that does not exceed 397 days. Repurchase agreements shall be deemed to have a maturity equal to the period remaining until the date on which the repurchase of the underlying securities is scheduled to occur. Variable rate securities shall be deemed to have a maturity equal to the time left until the next interest rate reset occurs, but in no case will any security have a stated final maturity of more than three years.</p>	
<p>No more than 50% of the total net assets of the Real Return allocation may be invested in any one registered investment vehicle, mutual fund, or separately managed account.</p>	
<p>No more than 20% of the total net assets of the Real Return allocation may be invested in any single closed-end or open-end limited partnership or other unregistered investment vehicle.</p>	
<p>The maximum investment in any co-investment vehicle shall not exceed 50 percent of the total capital committed by all partners at the time of the final closing.</p>	
<p>The maximum investment in any single direct co-investment shall not exceed 20 percent of the original partnership commitment.</p>	
<p>Total investment in direct co-investments shall not exceed 20 percent of the asset class portfolio on a cost basis at the time of investment.</p>	
<p>The amount of stock in the domestic or international equity allocation in any single corporation shall not exceed 5% of the aggregate market value of CERS' assets.</p>	

<p style="text-align: center;">Compliance Review Period Ended December 31, 2023</p>	<p style="text-align: center;">Legend</p>
<p style="text-align: right;">Compliance Status</p>	<p>● In Compliance ● To be determined ● Not In Compliance</p>
<p>The amount of stock held in the domestic or international equity allocation shall not exceed 3% of the outstanding shares of any single corporation.</p>	●
<p>Investment in "frontier" markets (those countries not included in the MSCI EM Index) shall not exceed 5% of CERS' international equity assets.</p>	●
<p>The duration of the core fixed income portfolios combined shall not vary from that of CERS' Fixed Income Index by more than +/- 25% duration as measured by effective duration, modified duration, or dollar duration except when the Investment Committee has determined a target duration to be used for an interim basis.</p>	●
<p>The amount invested in the debt of a single issuer shall not exceed 5% of the total market value of CERS' fixed income assets, with the exception of U.S. Government issued, guaranteed or agency obligations (or securities collateralized by same).</p>	●
<p>50% of the core fixed income assets must have stated liquidity that is trade date plus three days or better.</p>	●
<p>CERS permits external managers and Staff to invest in derivative securities, or strategies which make use of derivative investments, for exposure, cost efficiency and risk management purposes, if such investments do not cause the portfolio to be leveraged beyond a 100% invested position.</p>	●
<p>Except for investments in Real Return investments, derivatives may not be used for any activity for which the primary purpose is speculation or to profit while materially increasing risk to CERS.</p>	●
<p>External Investment Managers shall manage assets in accordance with this IPS and any additional guidelines established by contract, as may be modified in writing from time to time.</p>	●

<p style="text-align: center;">Compliance Review Period Ended December 31, 2023</p>	<p style="text-align: center;">Compliance Status</p>	<p style="text-align: center;">Legend</p> <ul style="list-style-type: none"> ● In Compliance ● To be determined ● Not In Compliance
<p>IPS Asset Allocation Guidelines</p> <p>CERS Pension - Specialty Credit allocation 20.2% > maximum 13.0%</p> <p>CERS Pension - Real Return allocation 4.0% < minimum 9.0%</p> <p>CERSH Pension - Specialty Credit allocation 19.9% > maximum 13.0%</p> <p>CERSH Pension - Real Return allocation 4.0% < minimum 9.0%</p> <p>CERS Insurance - Specialty Credit allocation 20.1% > maximum 13.0%</p> <p>CERS Insurance - Real Return allocation 3.5% < minimum 9.0%</p> <p>CERSH Insurance - Specialty Credit allocation 19.8% > maximum 13.0%</p> <p>CERSH Insurance - Real Return allocation 3.6% < minimum 9.0%</p> <p><i>* Only applies to external manager and not assets managed by KPPA Investment Staff</i></p> <p><i>** Excludes cash holdings that are an integral part of a fixed income manager's investment strategy.</i></p>		

County Employees Retirement System

Investment Budget Update

Quarter Ending: December 31, 2023

KENTUCKY PUBLIC PENSIONS AUTHORITY									
Investment Budget									
For the six month period ending December 31, 2023									
Account Name	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	Investment Budget FY 2024	FY24 Expenditures	Remaining	Percentage Spent
CONSULTING SERVICES									
Wilshire Associates	\$ 1,021,799	\$ 1,238,170	\$ 1,225,671	\$ 1,021,175	\$ 838,172	\$ 1,200,000	\$ 563,753	\$ 636,247	47%
Albourne	-	-	-	-	306,750	275,000	135,000	140,000	49%
MercerInsight	-	-	-	-	153,548	165,000	80,000	85,000	48%
SUBTOTAL	1,021,799	1,238,170	1,225,671	1,021,175	1,298,471	1,640,000	778,753	861,247	47%
LEGAL & AUDITING SERVICES									
Faegre Drinker			96,039	202,502	16,428	100,000	3,380	96,620	3%
Intelligent Management Solutions (IMS)	620,001	202,140	155,700	69,884	81,880	350,000	-	350,000	0%
McClain/Goldberg			891	-	-	100,000	-	100,000	0%
Reinhart	317,909	671,269	663,689	619,509	109,508	2,500,000	22,150	2,477,850	1%
Stoll-Keenon-Ogden	10,314	135,353	254,211	463,560	750,438	750,000	79,626	670,374	11%
Haystack			-	-	120,175	100,000	117,409	(17,409)	117%
Umberg Zipser			289,100	498,058	606,701	850,000	378,342	471,658	45%
Swansburg & Smith	-	-	-	-	5,288	50,000	-	50,000	0%
Eddins Domine	-	-	-	-	40,305	50,000	-	50,000	0%
Taft	-	-	-	-	142,720	50,000	1,060	48,940	2%
Miscellaneous					-	50,000	3,160	46,840	6%
SUBTOTAL	948,225	1,008,762	1,459,630	1,853,513	1,873,441	4,950,000	605,127	4,344,873	12%
CONTRACTURAL SERVICES									
Bloomberg	68,722	71,810	98,163	102,243	104,153	150,000	55,067	94,933	37%
BNYM Custodial Fees	2,056,390	2,088,475	2,379,838	2,565,169	2,333,981	2,600,000	619,478	1,980,522	24%
eVestment (Solovis RMS)			-	30,000	33,800	35,000	-	35,000	0%
Solovis (Reporting & Analytics)			-	245,000	266,017	275,000	306,319	(31,319)	111%
FactSet	222,476	162,295	109,662	140,098	146,411	150,000	64,580	85,420	43%
Russell Index Subscription	1,075	1,250	1,000	1,000	750	1,500	500	1,000	33%
S&P Global		94,500	26,250	68,250	27,563	75,000	-	75,000	0%
TradeWeb			-	6,000	7,700	7,500	2,800	4,700	37%
State Street/Elkins McSherry	10,000	5,000	15,000	10,000	10,000	10,000	-	10,000	0%
ISS	32,050	32,050	28,288	35,813	39,875	60,000	31,438	28,563	52%
MSCI	1,000	1,000	1,000	1,000	1,000	1,000	1,000	-	100%
KPMG Tax Guarantor Services		7,606	22,050	7,350	-	7,500	9,450	(1,950)	126%
Jayant Ghevaria and CO		10,050	-	52,085	-	55,000	-	55,000	0%
India Renewal Fee (SEBI)			-	3,000	-	3,000	2,950	50	98%
With Intelligence	-	-	-	-	9,520	9,520	9,520	-	100%
Miscellaneous & New Services	-	-	-	-	-	250,000	32,753	217,247	13%
SUBTOTAL	2,391,713	2,474,036	2,681,251	3,267,008	2,980,769	3,690,020	1,135,855	2,554,165	31%

KENTUCKY PUBLIC PENSIONS AUTHORITY Investment Budget For the six month period ending December 31, 2023									
Account Name	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	Investment Budget FY 2024	FY24 Expenditures	Remaining	Percentage Spent
INACTIVE CONTRACTURAL SERVICES									
Dean Dorton	9,719		-	-	250	-	-	-	
Hirschler		4,794	-	-					
INFORMA	12,904		-	-					
Lighthouse Solutions	3,093		-	-					
London Stock Exchange GBP (GREAT BRITISH POUNDS)	6,467	3,544	-	-					
Deutsche Bank Trust	3,000		3,000	-					
Morris James LLP	94,192	20,154	-	-					
Calcaterra Pollack			1,200,000	-					
Manatt		90,798	30,757	-					
ORG	162,344		-	-					
SUBTOTAL	291,718	119,290	1,233,757	-	250	-		-	
TOTAL	\$ 4,653,455	\$ 4,840,258	\$ 6,600,309	\$ 6,141,696	\$ 6,152,931	\$ 10,280,020	2,519,735	\$ 7,760,285	25%

INVESTMENT BUDGET	
CONSULTING SERVICES	
Wilshire Associates	General Investment Consulting Services, Manager Research and Due Dilligence, Reporting, Asset Allocation
Albourne	Investment Consultant Research database - Private Markets Manager Research, Private Markets Research, Pension Markets Research
MercerInsight	Investment Consultant Research database - Public Markets Manager Research, Public Markets Research, Pension Markets Research
LEGAL & AUDITING SERVICES	
Faegre Drinker	Delaware litigation counsel
Intelligent Management Solutions (IMS)	IMS is an expert witness in the Bay Hills case.
McClain/Goldberg	Blackstone litigation counsel for the Trustees and Officers
Reinhart	Bay Hills counsel and investment counsel for contract negotiations
Stoll-Keenon-Ogden	Mayberry counsel
Haystack	Conduct Mayberry eDiscovery
Umberg Zipser	PAAMCO-Prisma (California litigation)
Frost Brown Todd	Currently has no investment-related cases
Swansburg & Smith	Reimbursement of Fiduciary Legal Expenses (KKR)
Eddins Domine	Reimbursement of Fiduciary Legal Expenses (KKR)
Taft	Reimbursement of Fiduciary Legal Expenses (Calcaterra Pollack)
CONTRACTURAL SERVICES	
Bloomberg	Bloomberg Professional Services, Data Analytics and Tools, Market Information and News, Research Portal
BNYM Custodial Fees	Full Service Custodial Services, Investment Accounting, Investment Operations, Transaction Services, Performance and Attribution, Reporting
eVestment (Solovis RMS)	Research Management Program organizing internal and external research
Solovis (Reporting & Analytics)	Portfolio and Risk Analytics, Performance Measurement and Attribution, Reporting
FactSet	Workstation and Quant/Risk Applications for managing Public Equity Portfolios
Russell Index Subscription	Access to Russell Indexes for Portfolio Management, Reporting and Performance
S&P Global	Data on the S & P US Index / License to 10,000 Identifiers for Portfolio Management, Reporting and Performance
TradeWeb	Electronic Trading Platform for Internal Management
State Street/Elkins McSherry	Public Equity Trade Cost Analysis
ISS	Portfolio Monitoring and Proxy Voting Services
MSCI	International Public Equity Data Package
KPMG Tax Guarantor Services	Tax Accounting Services - Taiwan
Jayant Ghevaria and CO	Tax Accounting Services - India
India Renewal Fee (SEBI)	Registration of India Local Market Accounts
Oxford Economics	Global macroeconomics and markets research
With Intelligence	Portfolio Management Research provider

KENTUCKY PUBLIC PENSIONS AUTHORITY								
Investment Fees and Expenses								
For the six month period ending December 31, 2023								
Pension								
	2024		2023		2022		2021	
	FYTD Fees	Market Value	FYTD Fees	Market Value	FYTD Fees	Market Value	FYTD Fees	Market Value
Core Fixed Income	1,014,583	2,287,704,103	1,412,142	1,982,992,065	1,591,391	2,344,396,966	1,401,242	2,282,848,163
<i>Investment Advisory Fees</i>	989,977		1,073,446		1,558,075		1,375,451	
<i>Performance Fees</i>			313,985				-	
<i>Miscellaneous Fees and Expenses</i>	24,606		24,711		33,316		25,791	
Public Equity	7,003,749	8,229,412,149	6,326,122	6,860,008,005	7,390,244	7,258,279,054	5,850,569	6,295,655,905
<i>Investment Advisory Fees</i>	6,885,398		6,216,244		7,204,226		5,712,166	
<i>Miscellaneous Fees and Expenses</i>	118,350		109,877		186,018		138,403	
Specialty Credit Fixed Income	43,867,219	3,449,111,420	26,763,395	3,169,416,226	25,775,685	3,159,992,882	17,264,718	2,435,764,675
<i>Investment Advisory Fees</i>	9,314,024		8,272,318		8,375,883		7,320,545	
<i>Performance Fees</i>	15,712,746		7,246,973		12,762,781		8,459,198	
<i>Miscellaneous Fees and Expenses</i>	18,840,449		11,244,103		4,637,021		1,484,975	
Real Estate	2,347,363	1,007,031,285	5,120,746	980,167,711	16,451,186	780,082,609	980,198	584,165,093
<i>Investment Advisory Fees</i>	3,803,771		4,590,896		2,401,864		2,324,269	
<i>Performance Fees</i>	(3,707,401)		(380,882)		12,653,860		(2,070,445)	
<i>Miscellaneous Fees and Expenses</i>	2,250,993		910,732		1,395,462		726,374	
Real Return	2,496,799	873,036,117	2,108,571	451,152,401	2,632,576	1,021,821,360	3,216,441	847,105,839
<i>Investment Advisory Fees</i>	2,099,651		1,176,185		2,001,915		1,985,069	
<i>Performance Fees</i>	147,085		493,101		679,897		1,259,862	
<i>Miscellaneous Fees and Expenses</i>	250,063		439,285		(49,236)		(28,490)	
Private Equity	8,028,455	1,162,891,960	(1,217,614)	1,143,362,622	39,968,415	1,262,539,645	24,365,092	1,139,236,934
<i>Investment Advisory Fees</i>	2,925,557		3,652,032		3,928,841		4,294,168	
<i>Performance Fees</i>	2,383,986		(6,838,180)		33,350,556		17,523,541	
<i>Miscellaneous Fees and Expenses</i>	2,718,912		1,968,535		2,689,018		2,547,383	
Administrative Expense/Cash	2,118,142	737,649,280	1,574,490	813,973,145	1,878,932	612,903,688	1,435,169	266,674,138
Total Investment Fees and Expenses	66,876,308	17,746,836,314	42,087,852	15,401,072,174	95,688,429	16,440,016,204	54,513,429	13,851,450,747

* Absolute Return was absorbed by Real Return in December 2020

** Opportunistic was absorbed by Specialty Credit in December 2021

KENTUCKY PUBLIC PENSIONS AUTHORITY								
Investment Fees and Expenses								
For the six month period ending December 31, 2023								
Insurance								
	2024		2023		2022		2021	
	FYTD Fees	Market Value						
Core Fixed Income	342,823	780,518,762	526,658	755,273,150	587,743	855,261,654	568,510	873,074,122
<i>Investment Advisory Fees</i>	334,225		406,870		457,920		558,897	
<i>Performance Fees</i>			112,040		117,337		-	
<i>Miscellaneous Fees and Expenses</i>	8,598		7,748		12,486		9,613	
Public Equity	3,225,651	3,720,705,634	2,916,264	3,159,950,145	3,221,274	3,246,444,061	2,616,659	2,840,620,347
<i>Investment Advisory Fees</i>	3,171,832		2,866,269		3,161,508		2,557,467	
<i>Miscellaneous Fees and Expenses</i>	53,819		49,995		59,766		59,192	
Specialty Credit Fixed Income	19,604,727	1,527,908,553	12,006,819	1,440,474,508	11,449,880	1,449,432,096	7,239,534	1,085,313,532
<i>Investment Advisory Fees</i>	4,026,821		3,715,203		3,748,168		3,373,550	
<i>Performance Fees</i>	7,206,526		3,460,460		5,702,991		3,344,830	
<i>Miscellaneous Fees and Expenses</i>	8,371,380		4,831,156		1,998,721		521,154	
Real Estate	1,223,228	451,520,869	2,141,670	414,400,346	6,801,703	330,413,444	536,259	246,753,396
<i>Investment Advisory Fees</i>	1,719,862		1,913,144		1,021,218		1,015,005	
<i>Performance Fees</i>	(1,461,607)		(161,966)		5,182,012		(795,199)	
<i>Miscellaneous Fees and Expenses</i>	964,973		390,492		598,473		316,453	
Real Return	1,116,868	342,016,500	938,266	175,390,319	1,140,159	432,244,515	1,245,054	361,358,291
<i>Investment Advisory Fees</i>	936,352		530,992		889,226		842,984	
<i>Carried Interest</i>	64,072		201,933		266,344		419,601	
<i>Miscellaneous Fees and Expenses</i>	116,444		205,341		(15,411)		(17,531)	
Private Equity	4,902,486	587,662,239	275,237	573,107,746	22,563,618	595,876,977	16,438,474	548,052,248
<i>Investment Advisory Fees</i>	1,826,381		2,427,153		2,772,848		2,892,530	
<i>Performance Fees</i>	1,279,105		(3,062,207)		18,845,205		12,027,941	
<i>Miscellaneous Fees and Expenses</i>	1,797,000		910,292		945,565		1,518,003	
Administrative Expense/Cash	1,050,278	142,324,349	821,924	223,048,022	963,210	401,003,570	842,635	108,497,980
Total Investment Fees and Expenses	\$ 31,466,061	\$ 7,552,656,905	\$ 19,626,840	\$ 6,741,644,236	\$ 46,727,587	\$ 7,310,676,317	\$ 29,487,125	\$ 6,063,669,916

* Absolute Return was absorbed by Real Return in December 2020

** Opportunistic was absorbed by Specialty Credit in December 2021

KENTUCKY PUBLIC PENSIONS AUTHORITY				
Investment Fees and Expenses				
For the six month period ending December 31, 2023				
Pension				
	CERS		CERS Hazardous	
	FYTD Fees	Market Value	FYTD Fees	Market Value
Core Fixed Income	415,852	922,172,153	145,040	324,604,644
<i>Investment Advisory Fees</i>	405,762		141,520	
<i>Performance Fees</i>	10,090		3,520	
<i>Miscellaneous Fees and Expenses</i>				
Public Equity	3,989,052	4,674,544,256	1,399,323	1,633,849,943
<i>Investment Advisory Fees</i>	3,922,336		1,376,271	
<i>Miscellaneous Fees and Expenses</i>	66,716		23,052	
Specialty Credit Fixed Income	24,569,334	1,843,339,638	8,228,270	635,454,609
<i>Investment Advisory Fees</i>	5,079,661		1,720,956	
<i>Performance Fees</i>	8,881,533		2,944,692	
<i>Miscellaneous Fees and Expenses</i>	10,608,140		3,562,622	
Real Estate	2,653,577	520,891,549	1,023,054	165,806,858
<i>Investment Advisory Fees</i>	2,389,484		937,396	
<i>Performance Fees</i>	99,620		53,262	
<i>Miscellaneous Fees and Expenses</i>	164,473		32,396	
Real Return	165,376	362,660,962	(81,519)	127,122,645
<i>Investment Advisory Fees</i>	975,269		174,797	
<i>Performance Fees</i>	(2,081,498)		(658,291)	
<i>Miscellaneous Fees and Expenses</i>	1,271,605		401,975	
Private Equity	4,730,817	640,614,004	1,537,424	226,314,184
<i>Investment Advisory Fees</i>	1,894,780		627,128	
<i>Performance Fees</i>	1,193,318		367,499	
<i>Miscellaneous Fees and Expenses</i>	1,642,719		542,797	
Administrative Expenses/Cash	1,304,131	143,992,058	384,357	86,036,944
Total Investment Mgmt Fees & Expenses	37,828,139	9,108,214,620	12,635,949	3,199,189,827

KENTUCKY PUBLIC PENSIONS AUTHORITY				
Investment Fees and Expenses				
For the six month period ending September 30, 2023				
Insurance				
	CERS		CERS Hazardous	
	FYTD Fees	Market Value	FYTD Fees	Market Value
Core Fixed Income	150,924	352,883,322	66,485	150,931,637
<i>Investment Advisory Fees</i>	147,138		64,822	
<i>Performance Fees</i>	-		-	
<i>Miscellaneous Fees and Expenses</i>	3,786		1,663	
Public Equity	1,487,359	1,762,400,978	736,495	854,175,733
<i>Investment Advisory Fees</i>	1,462,174		724,291	
<i>Miscellaneous Fees and Expenses</i>	25,186		12,204	
Specialty Credit Fixed Income	8,813,731	690,549,055	4,682,230	329,638,801
<i>Investment Advisory Fees</i>	1,796,613		914,001	
<i>Performance Fees</i>	3,237,038		1,757,118	
<i>Miscellaneous Fees and Expenses</i>	3,780,080		2,011,110	
Real Estate	548,341	188,638,589	300,676	103,503,236
<i>Investment Advisory Fees</i>	776,329		425,867	
<i>Performance Fees</i>	(671,141)		(368,343)	
<i>Miscellaneous Fees and Expenses</i>	443,152		243,152	
Real Return	522,906	121,311,894	245,814	59,012,357
<i>Investment Advisory Fees</i>	444,839		204,413	
<i>Performance Fees</i>	25,226		12,814	
<i>Miscellaneous Fees and Expenses</i>	52,841		28,587	
Private Equity	2,174,190	257,657,256	1,217,430	144,705,200
<i>Investment Advisory Fees</i>	841,505		471,645	
<i>Performance Fees</i>	538,900		300,548	
<i>Miscellaneous Fees and Expenses</i>	793,785		445,237	
Administrative Expenses/Cash	484,398	54,162,377	272,659	19,534,733
Total Investment Mgmt Fees & Expenses	\$ 14,181,848	\$ 3,427,603,471	\$ 7,521,789	\$ 1,661,501,698

County Employees Retirement System

Capital Calls and Distributions

Quarter Ending: December 31, 2023

**Kentucky Public Pensions Authority
Capital Calls and Distributions
For the period October 1, 2023 thru December 31, 2023
County Employees Retirement System**

Pension Funds Managers	Total Pension Fund Commitment	CERS	CERS Beginning	CERS Period	CERS Period	CERS Ending	CERS Haz	CERS Haz	CERS Haz	CERS Haz	CERS Haz
		Commitment	Valuation	Contributions	Distributions	Valuation	Commitment	Beginning Valuation	Period Contributions	Period Distributions	Ending Valuation
Adams Street SPC II A1	175,000,000	97,124,912	81,091,109	2,402,341	5,240,262	78,253,188	32,749,407	27,342,993	810,042	1,766,956	26,386,078
Adams Street SPC II B1	175,000,000	97,124,911	79,261,788	3,123,735	2,814,696	79,570,827	32,749,407	26,726,167	1,053,288	949,083	26,830,371
AMERRA Agri Fund II, LP	40,100,000	27,641,371	15,957,868	0	2,992,668	12,965,200	8,727,285	5,038,421	0	944,883	4,093,538
AMERRA-KRS Agri Holding Company, LP	65,000,000	44,805,214	23,073,804	0	1,497,738	21,576,065	14,146,472	7,285,155	0	472,885	6,812,270
Arcano KRS Fund I, L.P.	36,000,000	15,587,717	7,543,455	0	1,714,649	5,828,806	4,852,329	2,348,216	0	533,756	1,814,460
Arcos Sports Partners Fund II	85,000,000	42,000,000	10,803,748	1,354,503	0	12,158,251	18,000,000	4,630,178	580,501	0	5,210,679
Ares Special Situations Fund IV, L.P.	26,192,000	17,935,797	12,901,084	0	0	12,901,084	6,121,833	4,403,389	0	0	4,403,389
Barings Euro Real Estate II	164,316,688	92,444,570	13,024,116	3,888,015	0	17,606,239	29,231,933	4,118,361	1,229,431	0	5,567,275
Barings Real Estate European Value Add I SCSp	115,988,250	65,254,991	8,871,638	1,415,260	0	10,683,066	20,634,305	2,805,304	447,520	0	3,378,097
Bay Hills Capital I, L.P.	67,500,000	29,226,970	2,253,720	0	0	2,253,720	9,098,116	701,565	0	0	701,565
Bay Hills Capital III, L.P.	51,250,000	35,095,051	36,158,030	0	0	36,158,030	11,978,618	12,341,433	0	0	12,341,433
Bay Hills Emerging Partners II LP	45,000,000	19,484,647	42,509,357	0	0	42,509,357	6,065,411	13,232,815	0	0	13,232,815
Bay Hills Emerging Partners II-B LP	45,000,000	19,484,647	28,358,486	0	0	28,358,486	6,065,411	8,827,764	0	0	8,827,764
BDCM Opportunity Fund IV, L.P.	35,580,000	24,364,524	42,283,616	0	2,179,696	40,103,920	8,316,082	14,432,213	0	743,972	13,688,241
Blackstone Capital Partners V, L.P.	47,174,735	20,426,290	10,362	0	0	10,362	6,358,537	3,226	0	0	3,226
Blackstone Capital Partners VI, L.P.	60,000,000	38,220,311	12,820,730	0	1,561,177	11,259,553	18,479,695	6,198,881	0	754,836	5,444,045
Blue Torch Credit Opportunities Fund II LP	140,000,000	77,659,705	74,905,957	8,229,610	0	83,135,567	26,221,374	25,291,586	2,778,683	0	28,070,268
BSP Co-Invest Vehicle K LP	37,262,028	21,962,420	22,958,894	0	617,365	22,341,529	7,274,035	7,604,072	0	204,474	7,399,598
BSP Private Credit Fund	100,000,000	58,940,485	54,954,054	0	1,803,973	53,150,081	19,521,309	18,200,988	0	597,482	17,603,505
BTG Pactual Brazil Timberland Fund I	34,500,000	23,847,150	19,775,272	0	3,653,973	16,121,300	7,642,335	6,337,414	0	1,170,995	5,166,420
Camelot Opportunities Fund, L.P.	23,400,000	10,132,016	2,919,833	0	0	2,919,833	3,154,014	908,920	0	0	908,920
Cerberus KRS Levered Loan Opportunities Fund, L.P.	140,000,000	82,516,679	111,656,721	0	0	112,927,969	27,329,832	36,981,123	0	0	37,402,165
Ceres Farms	100,000,000										
Columbia Capital Equity Partners IV, L.P.	27,000,000	11,690,788	1,594,119	0	0	1,594,119	3,639,247	496,236	0	0	496,236
Crestview Partners II, L.P.	67,500,000	29,226,970	12,668,086	0	2,037,511	10,630,575	9,098,116	3,943,471	0	634,260	3,309,211
Crestview Partners III, L.P.	39,000,000	26,706,479	20,002,945	3,391,998	233,022	23,161,921	9,115,436	6,827,391	1,157,754	79,535	7,905,610
CS Adjacent Investment Partners Parallel LP	140,000,000	82,516,679	44,075,471	24,449,248	2,419,963	66,104,755	27,329,832	14,597,960	8,097,682	801,501	21,894,142
CVC European Equity Partners VI, L.P.	24,214,778	16,581,832	14,339,155	158,345	317,876	14,793,552	5,659,699	4,894,230	54,046	108,497	5,049,325
DAG Ventures II, L.P.	27,000,000	11,690,788	900,970	0	0	900,970	3,639,247	280,465	0	0	280,465
DAG Ventures III, L.P.	27,000,000	11,690,788	137,136	0	30,015	107,121	3,639,247	42,689	0	9,344	33,346
DAG Ventures IV, L.P.	90,000,000	38,969,294	9,051,750	0	0	9,051,750	12,130,822	2,817,736	0	0	2,817,736
DAG Ventures V, L.P.	8,000,000	5,096,042	9,262	0	0	9,262	2,463,959	4,478	0	0	4,478
DCM VI, L.P.	13,500,000	5,845,394	1,164,092	0	0	1,164,092	1,819,623	362,372	0	0	362,372
DicovWest Fund IV	20,800,000	14,568,740	719,696	0	0	719,696	4,539,761	224,264	0	0	224,264
Fundamental Partners III LP	70,000,000	39,382,001	33,469,167	0	991,490	32,477,677	12,452,997	10,583,298	0	313,520	10,269,779
Green Equity Investors V, L.P.	90,000,000	38,969,294	450,586	0	0	450,586	12,130,822	140,264	0	0	140,264
Green Equity Investors VI, L.P.	32,000,000	20,384,166	21,685,731	0	1,005,140	20,680,591	9,855,837	10,485,150	0	485,990	9,999,160
Green Equity Investors VII LP	25,000,000	17,900,000	20,425,158	0	1,447,136	18,978,022	5,575,000	6,361,467	0	450,714	5,910,753
Greenfield Acquisition Partners VII, L.P.	27,800,000	19,471,678	1,367,904	0	0	1,367,904	6,067,572	426,253	0	0	426,253
H.I.G. BioVentures II, L.P.	13,500,000	8,599,570	4,412,176	0	0	4,412,176	4,157,931	2,133,307	0	0	2,133,307
H.I.G. Capital Partner V, L.P.	13,100,000	8,970,638	5,596,357	0	474,938	5,121,418	3,061,852	1,910,144	0	162,106	1,748,039
H.I.G. Ventures II, L.P.	18,000,000	7,793,859	1,181,579	0	0	1,181,579	2,426,164	367,816	0	0	367,816
H&F Spock I LP	3,250,153	1,407,291	4,534,600	0	0	4,534,600	438,078	1,411,584	0	0	1,411,584
Harvest Partners VI, L.P.	28,400,000	20,768,921	3,398,258	0	0	3,398,258	5,782,239	946,103	0	0	946,103
Harvest Partners VII LP	20,000,000	14,320,000	19,446,902	-4,106	40,810	19,401,986	4,460,000	6,056,787	-1,279	12,710	6,042,798
Horsley Bridge International Fund V, L.P.	45,000,000	19,484,647	37,851,161	0	1,235,585	36,615,576	6,065,411	11,782,756	0	384,627	11,398,129
IFM US Infrastructure Debt Fund	70,000,000	39,669,146	40,766,227	2,903,788	2,903,788	41,726,345	13,660,943	14,038,747	999,983	999,983	14,369,385

**Kentucky Public Pensions Authority
Capital Calls and Distributions
For the period October 1, 2023 thru December 31, 2023
County Employees Retirement System**

Pension Funds Managers	Total Pension Fund Commitment	CERS	CERS Beginning	CERS Period	CERS Period	CERS Ending	CERS Haz	CERS Haz	CERS Haz	CERS Haz	CERS Haz
		Commitment	Valuation	Contributions	Distributions	Valuation	Commitment	Beginning Valuation	Period Contributions	Period Distributions	Ending Valuation
Institutional Venture Partners XII, L.P.	27,000,000	11,690,788	2,214	0	0	2,214	3,639,247	689	0	0	689
Kayne Anderson Energy Fund VII LP	50,000,000	35,800,000	22,528,913	55,145	2,785,222	19,743,691	11,150,000	7,016,687	17,175	867,464	6,149,223
KCP IV Co-Invest	13,101,149	8,971,424	1,547,512	0	0	1,614,602	3,062,120	528,196	0	0	551,095
Keyhaven Capital Partners Fund III, L.P.	27,872,740	12,068,678	3,733,114	0	0	3,894,956	3,756,880	1,162,088	0	0	1,212,468
Keyhaven Capital Partners IV LP	13,101,149	8,971,424	8,425,890	35,237	0	8,826,595	3,062,120	2,875,919	12,027	0	3,012,687
Levine Leichtman Capital Partners V, L.P.	46,000,000	31,499,949	11,029,532	0	10,038,217	991,291	10,751,540	3,764,592	0	3,426,237	338,347
Levine Leichtman Capital Partners VI LP	37,500,000	26,849,987	40,197,728	0	1,207,138	38,990,589	8,362,509	12,519,702	0	375,967	12,143,735
Lubert Adler VII	34,750,000	24,338,900	10,922,921	0	0	10,922,921	7,585,925	3,404,446	0	0	3,404,446
Lubert-Adler Real Estate Fund VII-B LP	36,750,000	20,675,550	5,792,401	0	0	5,792,401	6,537,824	1,831,617	0	0	1,831,617
Magentar MTP Energy Opportunities Fund II LLC	37,500,000	26,265,000	94,967	0	0	94,967	8,186,251	29,599	0	0	29,599
Maritime Partners LP	175,000,000	87,500,000		66,890,284	1,413,079		35,000,000		26,756,114	565,231	
MatlinPatterson Global Opportunities Partners II	45,000,000	19,484,647	158,725	0	131,672	27,052	6,065,411	49,410	0	40,988	8,421
Merit Mezzanine Fund IV, L.P.	27,000,000	11,690,788	173,373	0	175,472	65,477,206	3,639,247	53,970	0	54,623	26,190,882
Mesa West Core Lending Fund, LP	57,500,000	36,357,250	35,984,247	352,502	352,502	35,984,247	11,459,750	11,342,180	111,108	111,108	11,342,180
Mesa West Real Estate Income Fund IV LP	36,000,000	15,587,717	6,406,784	0	0	6,406,784	4,852,329	1,994,379	0	0	1,994,379
MiddleGround Partners I LP	50,000,000	35,875,000	64,483,108	17,974,578	50,245,367	32,212,319	11,200,000	20,131,312	5,611,575	15,686,358	10,056,529
MiddleGround Partners II LP	50,000,000	27,301,556	31,571,850	-1,117,679	1,871,531	28,588,156	9,256,264	10,704,056	-378,936	634,520	9,692,470
MiddleGround Partners II-X LP	25,000,000	13,650,778	16,641,653	-547,684	935,766	15,160,937	4,628,132	5,642,152	-185,686	317,260	5,140,133
Mill Road Capital I, L.P.	27,000,000	11,690,788	755,421	0	0	755,421	3,639,247	235,156	0	0	235,156
New Mountain Partners III, L.P.	32,337,197	14,001,752	577,033	0	0	577,033	4,358,631	179,626	0	0	179,626
New Mountain Partners IV, L.P.	32,800,000	22,460,833	7,553,240	712,710	2,105,962	6,159,989	7,666,315	2,578,067	243,262	718,805	2,102,523
New State Capital Partners Fund III LP	17,500,000	9,555,545	2,712,215	0	0	2,712,215	3,239,692	919,544	0	0	919,544
Oak Hill Capital Partners II, L.P.	67,500,000	29,226,970	67,348	0	81,439	0	9,098,116	20,965	0	25,351	0
Oberland Capital Healthcare LP	3,450,000	2,475,375	4,442,369	0	121,861	4,320,508	772,800	1,386,885	0	38,044	1,348,841
Patron Capital V LP	39,767,400	22,373,140	8,821,150	0	404,042	8,779,733	7,074,619	2,789,339	0	127,762	2,776,243
Riverside Capital Appreciation Fund VI, L.P.	35,500,000	25,961,146	8,525,158	336,995	3,066	8,859,086	7,227,806	2,373,477	93,822	854	2,466,445
Rubenstein Properties Fund II	20,800,000	14,568,738	5,830,499	0	0	5,830,499	4,539,767	1,816,843	0	0	1,816,843
Secondary Opportunities Fund III, L.P.	25,000,000	19,411,552	3,945,132	0	105,638	3,839,494	5,588,448	1,135,776	0	30,413	1,105,363
Strategic Value Special Situations Fund IV LP	43,300,000	31,067,750	39,306,004	0	3,750,927	35,555,077	9,699,200	12,271,143	0	1,171,021	11,100,122
Strategic Value Special Situations Fund V LP	70,000,000	38,222,178	23,116,516	926,888	0	24,043,404	12,958,769	7,837,377	314,250	0	8,151,627
Taurus Mining Finance Fund LLC	45,100,000	30,883,643	2,243,663	0	153,779	2,089,885	10,541,186	765,806	0	52,488	713,318
Tenaska Power Fund II, L.P.	27,000,000	12,131,225	34,385	0	0	34,385	4,055,317	11,494	0	0	11,494
Triton Fund IV, L.P.	27,791,804	19,031,313	9,355,013	73,582	0	9,834,652	6,495,754	3,193,046	25,115	0	3,356,756
VantagePoint Venture Partners 2006, L.P.	27,000,000	11,690,788	2,339,331	0	481,388	1,857,944	3,639,247	728,215	0	149,852	578,363
VantagePoint Venture Partners IV, L.P.	36,000,000	15,587,717	27,242	0	0	27,242	4,852,329	8,480	0	0	8,480
Vista Equity Partners III, L.P.	45,000,000	19,484,647	866,892	0	0	866,892	6,065,411	269,856	0	0	269,856
Vista Equity Partners IV, L.P.	27,000,000	17,199,140	12,362,037	0	0	12,362,037	8,315,863	5,977,101	0	0	5,977,101
Vista Equity Partners VI LP	25,000,000	17,900,000	19,422,781	54,713	115,422	19,362,072	5,575,000	6,049,274	17,041	35,948	6,030,366
Walton Street Real Estate Fund VI, LP	36,000,000	17,056,796	7,627,959	0	362,013	7,265,945	6,030,018	2,696,681	0	127,981	2,568,700
Walton Street Real Estate Fund VII, LP	38,120,000	26,700,008	4,935,086	0	626,656	4,308,430	8,319,997	1,537,824	0	195,272	1,342,551
Warburg, Pincus Private Equity IX, L.P.	50,000,000	21,649,608	24,609	0	0	24,609	6,739,345	7,660	0	0	7,660
Warburg, Pincus Private Equity X, L.P.	38,750,000	16,778,446	307,202	0	0	307,202	5,222,993	95,630	0	0	95,630
Wayzata Opportunities Fund III, L.P.	35,500,000	25,961,146	2,748,493	0	150,462	2,598,031	7,227,806	765,204	0	41,890	723,314
White Oak Yield Spectrum Parallel Fund LP	170,000	100,199	0	0	0	81,897,382	33,186	0	0	0	27,124,719

CERS Investment Committee Meeting - Investment Office Quarterly Update

Kentucky Public Pensions Authority
 Capital Calls and Distributions
 For the period October 1, 2023 thru December 31, 2023
 County Employees Retirement System

Insurance Funds Managers	Total Insurance Fund Commitment	CERS	CERS Beginning	CERS Period	CERS Period	CERS Ending	CERS Haz	CERS Haz	CERS Haz	CERS Haz	CERS Haz
		Commitment	Valuation	Contributions	Distributions	Valuation	Commitment	Beginning Valuation	Period Contributions	Period Distributions	Ending Valuation
Adams Street SPC II A1	75,000,000	34,007,112	28,393,070	841,151	1,834,814	27,399,407	17,965,829	14,999,952	444,377	969,325	14,475,004
Adams Street SPC II B1	75,000,000	34,007,113	27,752,555	1,093,738	985,532	27,860,762	17,965,828	14,661,570	577,817	520,653	14,718,734
AMERRA Agri Fund II, LP	16,200,000	7,502,182	4,323,763	0	810,859	3,512,903	4,141,562	2,386,923	0	447,633	1,939,290
AMERRA-KRS Agri Holding Company, LP	35,000,000	16,208,417	8,347,016	0	541,811	7,805,205	8,947,820	4,607,951	0	299,106	4,308,846
Arcano KRS Fund I, L.P.	4,000,000	1,611,501	779,863	0	177,265	602,598	862,625	417,455	0	94,889	322,567
Arcos Sports Partners Fund II	40,000,000	20,500,000	5,273,260	661,125	0	5,934,385	7,000,000	1,800,625	225,750	0	2,026,375
Ares Special Situations Fund IV, L.P.	13,808,000	7,867,793	5,659,244	0	0	5,659,244	4,255,629	3,061,042	0	0	3,061,042
Barings Euro Real Estate II	70,421,438	32,337,527	4,555,895	1,360,045	0	6,158,742	17,746,199	2,500,185	746,366	0	3,379,796
Barings Real Estate European Value Add I SCSp	49,709,250	22,826,489	3,103,339	495,064	0	3,736,985	12,526,728	1,703,051	271,681	0	2,050,784
Bay Hills Capital I, L.P.	75,000,000	30,215,638	232,996	0	0	232,996	16,174,225	124,721	0	0	124,721
Bay Hills Capital III, L.P.	48,750,000	27,777,730	25,739,773	0	0	25,739,773	15,024,764	13,922,448	0	0	13,922,448
Bay Hills Emerging Partners II LP	5,000,000	2,014,376	4,394,733	0	0	4,394,733	1,078,282	2,352,470	0	0	2,352,470
Bay Hills Emerging Partners II-B LP	5,000,000	2,070,000	3,012,734	0	0	3,012,734	1,250,000	1,819,284	0	0	1,819,284
BDCM Opportunity Fund IV, L.P.	24,420,000	13,914,506	24,148,052	0	1,244,818	22,903,234	7,526,253	13,061,503	0	673,313	12,388,190
Blackstone Capital Partners V, L.P.	12,414,403	5,001,455	2,443	0	0	2,443	2,677,245	1,308	0	0	1,308
Blackstone Capital Partners VI, L.P.	40,000,000	21,919,994	7,352,907	0	895,362	6,457,546	13,120,008	4,401,014	0	535,910	3,865,104
Blue Torch Credit Opportunities Fund II LP	60,000,000	27,169,450	26,206,045	2,879,151	0	29,085,195	14,281,092	13,774,696	1,513,369	0	15,288,066
BSP Co-Invest Vehicle K LP	17,252,566	7,709,915	7,995,694	0	215,576	7,780,118	4,204,913	4,360,775	0	117,573	4,243,202
BSP Private Credit Fund	50,000,000	22,344,255	20,833,004	0	683,883	20,149,120	12,186,342	11,362,120	0	372,983	10,989,136
BTG Pactual Brazil Timberland Fund I	15,500,000	7,016,381	5,818,341	0	1,075,083	4,743,258	3,855,131	3,196,871	0	590,701	2,606,170
Camelot Opportunities Fund, L.P.	2,600,000	1,047,475	301,858	0	0	301,858	560,706	161,583	0	0	161,583
Cerberus KRS Levered Loan Opportunities Fund, L.P.	60,000,000	26,813,106	36,281,920	0	0	36,695,001	14,623,610	19,787,810	0	0	20,013,100
Ceres Farms	50,000,000	0	0	0	0	0	0	0	0	0	0
Columbia Capital Equity Partners IV, L.P.	3,000,000	1,208,626	164,805	0	0	164,805	646,969	88,219	0	0	88,219
Crestview Partners II, L.P.	7,500,000	3,021,564	1,309,652	0	210,646	1,099,006	1,617,422	701,048	0	112,757	588,290
Crestview Partners III, L.P.	21,000,000	11,965,793	8,962,281	1,519,779	104,406	10,377,654	6,472,206	4,847,629	822,037	56,472	5,613,194
CS Adjacent Investment Partners Parallel LP	60,000,000	26,813,106	14,321,957	7,944,579	786,347	21,480,189	14,623,610	7,811,057	4,332,897	428,866	11,715,088
CVC European Equity Partners VI, L.P.	13,366,486	7,616,218	6,304,557	69,620	139,762	6,504,344	4,119,555	3,410,087	37,657	75,596	3,518,151
DAG Ventures II, L.P.	3,000,000	1,208,626	93,141	0	0	93,141	646,969	49,858	0	0	49,858
DAG Ventures III, L.P.	3,000,000	1,208,626	14,172	0	3,103	11,069	646,969	7,586	0	1,661	5,925
DAG Ventures IV, L.P.	10,000,000	4,028,752	935,794	0	0	935,794	2,156,563	500,924	0	0	500,924
DAG Ventures V, L.P.	7,000,000	3,835,999	6,967	0	0	6,967	2,296,001	4,170	0	0	4,170
DCM VI, L.P.	1,500,000	604,313	120,347	0	0	120,347	323,484	64,421	0	0	64,421
DivcoWest Fund IV	9,200,000	4,244,869	209,699	0	0	209,699	2,306,449	113,940	0	0	113,940
Fundamental Partners III LP	30,000,000	13,776,001	11,707,669	0	346,828	11,360,840	7,559,998	6,424,938	0	190,333	6,234,606
Green Equity Investors V, L.P.	10,000,000	4,028,752	46,583	0	0	46,583	2,156,563	24,935	0	0	24,935
Green Equity Investors VI, L.P.	28,000,000	15,343,995	16,323,742	0	756,609	15,567,133	9,184,005	9,770,424	0	452,861	9,317,563
Green Equity Investors VII LP	25,000,000	10,349,999	11,810,076	0	836,751	10,973,325	6,250,000	7,131,690	0	505,285	6,626,405
Greenfield Acquisition Partners VII, L.P.	12,200,000	5,628,527	395,410	0	0	395,410	3,058,186	214,841	0	0	214,841
H.I.G. BioVentures II, L.P.	11,500,000	6,301,998	3,233,362	0	0	3,233,362	3,772,002	1,935,299	0	0	1,935,299
H.I.G. Capital Partner V, L.P.	6,900,000	3,931,617	2,452,750	0	208,154	2,244,596	2,126,582	1,326,674	0	112,589	1,214,085
H.I.G. Ventures II, L.P.	2,000,000	805,750	122,155	0	0	122,155	431,313	65,389	0	0	65,389
H&F Spock I LP	1,794,672	723,029	1,582,197	0	0	1,582,197	387,032	846,939	0	0	846,939
Harvest Partners VI, L.P.	11,600,000	6,609,681	1,081,492	0	0	1,081,492	3,575,121	584,970	0	0	584,970
Harvest Partners VII LP	20,000,000	8,279,999	11,244,437	-2,374	23,597	11,218,466	5,000,000	6,790,120	-1,434	14,249	6,774,437
Horsley Bridge International Fund V, L.P.	5,000,000	2,014,376	3,913,146	0	127,738	3,785,408	1,078,282	2,094,680	0	68,377	2,026,303
IFM US Infrastructure Debt Fund	30,000,000	13,890,494	14,274,647	1,016,786	1,016,786	14,610,840	7,156,853	7,354,781	523,883	523,883	7,527,999

**Kentucky Public Pensions Authority
Capital Calls and Distributions
For the period October 1, 2023 thru December 31, 2023
County Employees Retirement System**

Insurance Funds Managers	Total Insurance Fund Commitment	CERS	CERS Beginning	CERS Period	CERS Period	CERS Ending	CERS Haz	CERS Haz	CERS Haz	CERS Haz	CERS Haz
		Commitment	Valuation	Contributions	Distributions	Valuation	Commitment	Beginning Valuation	Period Contributions	Period Distributions	Ending Valuation
Institutional Venture Partners XII, L.P.	3,000,000	1,208,626	229	0	0	229	646,969	122	0	0	122
Kayne Anderson Energy Fund VII LP	50,000,000	20,699,998	13,026,494	31,885	1,610,450	11,416,044	12,500,001	7,866,241	19,255	972,494	6,893,747
KCP IV Co-Invest	8,991,851	5,123,553	883,780	0	0	922,094	2,771,292	478,030	0	0	498,754
Keyhaven Capital Partners Fund III, L.P.	3,093,020	1,246,101	385,940	0	0	402,671	667,029	206,591	0	0	215,547
Keyhaven Capital Partners IV LP	8,991,851	5,123,553	4,812,001	20,124	0	5,040,843	2,771,292	2,602,776	10,885	0	2,726,554
Levine Leichtman Capital Partners V, L.P.	24,000,000	13,675,190	4,788,293	0	4,357,929	430,354	7,396,807	2,589,951	0	2,357,171	232,775
Levine Leichtman Capital Partners VI LP	37,500,000	15,525,007	23,253,242	0	697,983	22,555,259	9,374,983	14,041,782	0	421,486	13,620,295
Lubert Adler VII	15,250,000	7,036,350	3,157,804	0	0	3,157,804	3,823,174	1,715,781	0	0	1,715,781
Lubert-Adler Real Estate Fund VII-B LP	15,750,000	7,232,401	2,026,208	0	0	2,026,208	3,968,999	1,111,943	0	0	1,111,943
Magentar MTP Energy Opportunities Fund II LLC	12,500,000	5,764,587	20,843	0	0	20,843	3,188,762	11,530	0	0	11,530
Maritime Partners LP	75,000,000	37,500,000	0	28,667,265	605,605	28,061,660	15,000,000	0	11,466,906	242,242	11,224,664
MatlinPatterson Global Opportunities Partners II	5,000,000	2,014,376	16,409	0	13,612	2,797	1,078,282	8,784	0	7,287	1,497
Merit Mezzanine Fund IV, L.P.	3,000,000	1,208,626	17,924	0	18,141	0	646,969	9,595	0	9,711	0
Mesa West Core Lending Fund, LP	29,600,000	13,790,640	20,193,710	197,826	197,826	20,193,710	7,619,040	11,156,602	109,295	109,295	11,156,602
Mesa West Real Estate Income Fund IV LP	14,000,000	6,428,800	2,642,332	0	0	2,642,332	3,527,999	1,450,060	0	0	1,450,060
MiddleGround Partners I LP	25,000,000	3,750,000	6,740,396	1,878,876	5,252,129	3,367,142	1,999,999	3,594,876	1,002,067	2,801,135	1,795,808
MiddleGround Partners II LP	25,000,000	11,262,207	13,023,753	-542,144	690,940	11,792,924	5,794,817	6,701,196	-278,953	355,514	6,067,890
MiddleGround Partners II-X LP	12,500,000	5,631,103	6,864,872	-225,926	386,014	6,254,059	2,897,408	3,532,227	-116,247	198,618	3,217,942
Mill Road Capital I, L.P.	3,000,000	1,208,626	78,097	0	0	78,097	646,969	41,805	0	0	41,805
New Mountain Partners II, L.P.	5,000,000	2,014,376	16	0	0	16	1,078,282	9	0	0	9
New Mountain Partners III, L.P.	7,186,045	2,895,079	119,310	0	0	119,310	1,549,716	63,866	0	0	63,866
New Mountain Partners IV, L.P.	17,200,000	9,800,553	3,295,774	310,984	918,915	2,687,842	5,301,045	1,782,659	168,209	497,034	1,453,833
New State Capital Partners Fund III LP	7,500,000	3,378,662	958,990	0	0	958,990	1,738,445	493,435	0	0	493,435
Oak Hill Capital Partners II, L.P.	7,500,000	3,021,564	6,963	0	8,419	0	1,617,422	3,727	0	4,507	0
Oberland Capital Healthcare LP	15,500,000	4,840,652	868,715	0	23,830	844,885	2,631,898	472,327	0	12,957	459,370
Patron Capital V LP	15,465,100	7,101,574	2,800,019	0	128,249	2,786,875	3,897,204	1,536,595	0	70,381	1,529,382
Riverside Capital Appreciation Fund VI, L.P.	18,712,500	10,748,972	3,529,729	139,529	1,269	3,667,988	5,705,349	1,873,512	74,059	674	1,946,898
Rubenstein Properties Fund II	9,200,000	4,244,871	1,698,824	0	0	1,698,824	2,306,445	923,054	0	0	923,054
Secondary Opportunities Fund III, L.P.	75,000,000	34,884,827	7,089,864	0	189,845	6,900,019	18,849,301	3,830,862	0	102,579	3,728,284
Strategic Value Special Situations Fund IV LP	21,700,000	6,776,910	8,573,935	0	818,202	7,755,733	3,684,660	4,661,717	0	444,863	4,216,854
Strategic Value Special Situations Fund V LP	30,000,000	13,514,648	8,173,563	327,730	0	8,501,293	6,953,780	4,205,597	168,629	0	4,374,226
Taurus Mining Finance Fund LLC	19,900,000	11,339,013	823,767	0	56,460	767,306	6,133,188	445,569	0	30,539	415,030
Tenaska Power Fund II, L.P.	3,000,000	1,278,755	3,625	0	0	3,625	678,044	1,922	0	0	1,922
Triton Fund IV, L.P.	14,298,590	8,147,331	4,103,227	32,274	0	4,313,602	4,406,829	2,219,404	17,457	0	2,333,195
VantagePoint Venture Partners 2006, L.P.	3,000,000	1,208,626	241,847	0	49,767	192,080	646,969	129,459	0	26,640	102,819
VantagePoint Venture Partners IV, L.P.	4,000,000	1,611,501	2,817	0	0	2,817	862,625	1,508	0	0	1,508
Vista Equity Partners III, L.P.	5,000,000	2,014,376	89,624	0	0	89,624	1,078,282	47,975	0	0	47,975
Vista Equity Partners IV, L.P.	23,000,000	12,603,996	9,059,236	0	0	9,059,236	7,544,005	5,422,321	0	0	5,422,321
Vista Equity Partners VI LP	25,000,000	10,349,999	11,230,490	31,636	66,738	11,195,387	6,250,000	6,781,698	19,104	40,301	6,760,500
Walton Street Real Estate Fund VI, LP	4,000,000	1,712,019	765,631	0	36,336	729,295	917,457	410,295	0	19,472	390,823
Walton Street Real Estate Fund VII, LP	16,755,000	7,730,005	1,428,772	0	181,425	1,247,347	4,199,996	776,305	0	98,575	677,730
Warburg, Pincus Private Equity IX, L.P.	10,000,000	4,028,752	4,579	0	0	4,579	2,156,563	2,451	0	0	2,451
Warburg, Pincus Private Equity X, L.P.	7,500,000	3,021,564	55,299	0	0	55,299	1,617,422	29,601	0	0	29,601
Wayzata Opportunities Fund III, L.P.	18,712,500	10,748,972	1,137,988	0	62,297	1,075,691	5,705,349	604,022	0	33,066	570,956
White Oak Yield Spectrum Parallel Fund LP	50,000,000	22,344,255	29,870,554	0	647,064	29,223,490	12,186,342	16,291,112	0	352,902	15,938,210

Kentucky Public Pensions Authority

CERS & CERS-Hazardous Unit Holdings

Quarter Ending: December 31, 2023

CERS Investment Committee Meeting - Investment Office Quarterly Update

Kentucky Public Pensions Authority									
Pension: CERS & CERS-H Unit Holdings									
Quarter Ended December 31, 2023									
UNIT OF PARTICIPATION	CERS				CERS-H				
	Shares/Par	Base Cost	Base Market Value	Base Market Unrealized G/L	Shares/Par	Base Cost	Base Market Value	Base Market Unrealized G/L	
Grand Total	45,227,403.959	7,292,179,469.240	9,090,530,179.090	1,798,350,709.850	16,151,870.596	2,597,736,300.770	3,194,445,613.330	596,709,312.560	
KRS ABSOLUTE RETURN UNIT	464,367.131	57,931,755.67	58,584,380.79	652,625.12	147,094.799	18,417,087.57	18,557,423.95	140,336.38	
KRS ADAMS STREET A1 UNIT	475,181.620	72,487,744.87	75,428,743.73	2,940,998.86	160,225.798	24,442,036.56	25,433,708.18	991,671.62	
KRS ADAMS STREET B1 UNIT	568,752.701	75,952,072.33	77,277,564.15	1,325,491.82	191,776.895	25,610,167.30	26,057,109.32	446,942.02	
KRS ADAMS STREET III A1 UNIT	428.473	42,847.30	42,847.30	0.00	156.976	15,697.63	15,697.60	-0.03	
KRS ADAMS STREET III B1 UNIT	428.473	42,847.30	42,847.30	0.00	156.976	15,697.63	15,697.60	-0.03	
KRS AMERRA AGRU UNIT	271,024.308	26,456,551.05	22,939,276.82	-3,517,274.23	85,571.242	8,353,197.55	7,242,680.27	-1,110,517.28	
KRS AMERRA UNIT	66,690.677	10,160,398.22	13,649,792.14	3,489,393.92	21,056.427	3,207,971.60	4,309,685.62	1,101,714.02	
KRS ARCTOS SPORTS II UNIT	119,730.422	16,283,685.30	20,245,857.49	3,962,172.19	51,313.038	7,006,016.38	8,676,796.07	1,670,779.69	
KRS ARROWMARK UNIT	1,387,072.461	184,581,300.82	319,496,043.03	134,914,742.21	458,544.662	61,019,434.21	105,620,441.02	44,601,006.81	
KRS BLACKROCK UNIT	2,925,438.069	333,554,728.27	533,233,934.41	199,679,206.14	1,024,153.712	122,563,627.76	186,677,516.46	64,113,888.70	
KRS BLUE TORCH UNIT	483,961.906	81,827,524.64	81,358,468.21	-469,056.43	163,407.083	27,628,614.16	27,470,240.53	-158,373.63	
KRS BNYM CUSTODY FEE UNIT	-330,408.266	-330,408.27	-330,408.27	0.00	-115,705.414	-115,705.41	-115,705.41	0.00	
KRS BTG UNIT	162,323.547	9,621,602.95	15,988,438.09	6,366,835.14	52,020.095	3,083,450.03	5,123,841.14	2,040,391.11	
KRS CASH UNIT	1,332,045.344	133,182,444.24	137,915,047.68	4,732,603.44	816,196.891	82,895,492.01	84,506,006.98	1,610,514.97	
KRS DB PRIVATE EQ UNIT	14,017.547	5,175,466.39	3,928,992.60	-1,246,473.79	4,035.553	1,489,980.72	1,131,129.28	-358,851.44	
KRS DIVCOWEST IV UNIT	1,339.798	0.00	704,584.86	704,584.86	417.494	0.00	219,555.45	219,555.45	
KRS DOMESTIC EQUITY UNIT	2,845,599.454	641,813,765.92	817,543,628.41	175,729,862.49	1,035,896.481	236,567,711.06	297,614,116.64	61,046,405.58	
KRS GLOBAL FIXED UNIT	1,294,177.960	192,090,373.26	182,395,461.29	-9,694,911.97	505,234.827	73,074,599.73	71,205,461.83	-1,869,137.90	
KRS GREENFIELD UNIT	1,396.112	572,201.47	13,294.47	-558,907.00	435.043	178,304.13	4,142.69	-174,161.44	
KRS GREENFIELD VII UNIT	4,427.832	1,214,271.53	1,332,888.39	118,616.86	1,379.758	378,378.97	415,341.73	36,962.76	
KRS HARRISON UNIT	639,390.832	124,039,427.55	142,716,225.55	18,676,798.00	199,992.765	38,800,683.99	44,639,696.30	5,839,012.31	
KRS IFM INFRAST DEBT UNIT	267,825.438	43,401,523.94	40,629,421.32	-2,772,102.62	92,231.578	14,946,271.21	13,991,634.51	-954,636.70	
KRS INTERNAL EQUITY UNIT	5,735,491.753	1,357,381,322.47	2,006,006,823.67	648,625,501.20	1,974,811.028	476,541,075.82	690,696,555.43	214,155,479.61	
KRS INTERNAL PRIVATE EQUITY	-	-	-	-	126,241.912	12,750,000.00	12,719,013.02	-30,986.98	
KRS INTERNATIONAL EQUITY UNIT	7,299,919.848	1,159,021,045.90	1,316,854,214.84	157,833,168.94	2,542,151.374	407,100,813.75	458,586,234.00	51,485,420.25	
KRS L-A VII UNIT	142,596.532	15,110,377.74	11,443,255.33	-3,667,122.41	44,444.354	4,709,588.48	3,566,623.14	-1,142,965.34	
KRS LIQUID CORE FIXED UNIT	6,995,641.253	897,181,026.80	922,264,991.94	25,083,965.14	2,462,466.068	315,221,910.39	324,637,322.90	9,415,412.51	
KRS LIQUID HY FI UNIT	1,171,987.900	210,396,790.63	198,791,365.21	-11,605,425.42	459,898.482	82,284,057.12	78,007,500.84	-4,276,556.28	
KRS MAGNETAR MTP UNIT	113.929	97,494.40	70,403.09	-27,091.31	36.025	30,829.20	22,261.86	-8,567.34	
KRS MARITIME PARTNERS UNIT	654,772.056	65,477,205.64	65,477,205.60	-0.04	261,908.822	26,190,882.23	26,190,882.20	-0.03	
KRS MESA WEST CORE UNIT	205,495.934	40,012,311.36	36,106,008.58	-3,906,302.78	64,772.004	12,611,820.76	11,380,558.66	-1,231,262.10	
KRS MESA WEST IV UNIT	105,087.787	10,989,639.58	8,380,399.18	-2,609,240.40	33,229.849	3,475,038.38	2,649,969.20	-825,069.18	
KRS MULTI SECTOR CREDIT FI	1,492,072.539	176,267,268.38	250,770,705.36	74,503,436.98	490,250.072	57,911,018.01	82,395,696.69	24,484,678.68	
KRS OBERLAND UNIT	52,782.627	3,396,276.38	4,253,131.98	856,855.60	16,478.469	1,060,299.54	1,327,806.28	267,506.74	
KRS PE 2010 UNIT	511,329.737	131,259,173.95	159,676,221.76	28,417,047.81	159,172.760	40,860,844.32	49,705,900.29	8,845,055.97	
KRS PE 2011 UNIT	153,031.423	33,427,536.68	51,279,842.64	17,852,305.96	73,991.391	16,160,918.11	24,794,037.81	8,633,119.70	
KRS PE 2012 A UNIT	6,977.987	2,845,569.92	3,837,845.51	992,275.59	1,942.729	792,229.48	1,068,487.77	276,258.29	
KRS PE 2012 B UNIT	65,680.522	9,037,603.83	11,489,921.75	2,452,317.92	18,286.019	2,516,146.29	3,198,892.47	682,746.18	
KRS PE 2013 UNIT	193,996.745	49,836,646.31	73,316,859.07	23,480,212.76	66,214.828	17,000,882.48	25,024,457.05	8,023,574.57	
KRS PE 2014 UNIT	229,875.670	19,380,384.33	39,053,068.17	19,672,683.84	78,460.997	6,614,901.24	13,329,564.91	6,714,663.67	
KRS PE 2015 UNIT	145,283.327	18,149,702.38	49,598,530.12	31,448,827.74	49,587.999	6,194,843.87	16,928,934.06	10,734,090.19	
KRS PE 2016 UNIT	300,243.683	26,163,119.23	76,026,241.72	49,863,122.49	93,511.656	8,148,569.64	23,678,565.66	15,529,996.02	
KRS PE 2017 UNIT	198,209.225	22,305,372.17	36,546,338.00	14,240,965.83	61,732.854	6,947,074.81	11,382,465.92	4,435,391.11	
KRS PE 2018 UNIT	199,950.553	33,924,175.48	34,456,243.70	532,068.22	62,423.588	10,590,962.36	10,757,071.33	166,108.97	
KRS PE 2019 UNIT	158,718.585	3,041,211.48	32,483,638.60	29,442,427.12	49,551.168	949,450.72	10,141,233.51	9,191,782.79	
KRS PE 2021 UNIT	544,179.390	55,615,834.65	66,818,990.08	11,203,155.43	184,497.471	18,855,880.30	22,654,174.18	3,798,293.88	
KRS PERIMETER PARK UNIT	16,232.813	2,200,034.97	1,682,488.55	-517,546.42	17,672.730	2,395,186.73	1,831,732.18	-563,454.55	
KRS POST-2015 REAL ESTATE UNIT	612,359.123	60,962,913.79	80,939,600.13	19,976,686.34	193,634.316	19,279,560.63	25,593,942.38	6,314,381.75	
KRS PRIVATE CREDIT FI UNIT	1,565,499.155	315,872,214.03	328,919,426.96	13,047,212.93	518,499.165	104,611,460.43	108,939,342.24	4,327,881.81	
KRS PROLOGIS UNIT	741,098.600	91,672,838.64	169,960,907.94	78,288,069.30	234,343.128	28,987,909.52	53,743,416.60	24,755,507.08	
KRS REAL RETURN UNIT	581,699.442	87,389,259.64	118,998,770.82	31,609,511.18	200,320.999	29,944,284.73	40,979,844.45	11,035,559.72	
KRS RUBENSTEIN PF II UNIT	72,479.805	12,516,917.95	7,412,765.22	-5,104,152.73	22,585.445	3,900,397.83	2,309,893.10	-1,590,504.73	
KRS SHENKMAN UNIT	827,134.489	141,521,311.97	141,806,722.58	285,410.61	278,793.840	47,658,953.48	47,797,354.91	138,401.43	
KRS STOCKBRIDGE UNIT	280,090.753	53,100,801.73	58,893,106.28	5,792,304.55	89,313.398	16,932,415.71	18,779,425.54	1,847,009.83	
KRS TAURUS UNIT	6,569.889	217,705.62	2,205,217.79	1,987,512.17	2,242.430	74,306.55	752,683.42	678,376.87	
KRS TPF II UNIT	351.766	3,984,996.54	34,923.55	-3,950,072.99	117.591	1,332,137.14	11,674.51	-1,320,462.63	
KRS WALTON VI UNIT	37,111.482	6,874,871.25	7,145,301.53	270,430.28	13,119.868	2,430,443.16	2,526,048.76	95,605.60	
KRS WALTON VII UNIT	30,571.455	9,289,862.00	4,651,470.94	-4,638,391.06	9,526.379	2,894,815.78	1,449,446.06	-1,445,369.72	
KRS WATERFALL UNIT	897,554.343	156,156,526.67	167,739,901.14	11,583,374.47	300,046.709	52,195,676.99	56,074,382.24	3,878,705.25	

CERS Investment Committee Meeting - Investment Office Quarterly Update

Kentucky Public Pensions Authority									
Insurance: CERS & CERS-H Unit Holdings									
Quarter Ended December 31, 2023									
UNIT OF PARTICIPATION	CERS INS				CERS-H INS				
	Shares/Par	Base Cost	Base Market Value	Base Market Unrealized G/L	Shares/Par	Base Cost	Base Market Value	Base Market Unrealized G/L	Base Market Unrealized G/L
Grand Total	18,775,097.815	2,747,729,884.620	3,423,326,346.430	675,596,461.810	8,974,339.062	1,306,210,246.820	1,659,243,856.800	353,033,609.980	353,033,609.980
KR3 ARROWMARK UNIT	554,115.798	74,519,658.76	129,005,693.75	54,486,034.99	301,875.792	40,597,611.82	70,280,789.89	29,683,178.07	29,683,178.07
KRS INS PE 2014 UNIT	102,197.468	8,653,444.86	17,377,159.45	8,723,714.59	55,277.830	4,680,580.89	9,399,172.84	4,718,591.95	4,718,591.95
KRS INS ABSOLUTE RETURN UNIT	151,068.332	15,635,488.48	19,072,411.51	3,436,923.03	84,638.610	8,955,075.34	10,685,643.89	1,730,568.55	1,730,568.55
KRS INS ADAMS STREET A1 UNIT	166,379.094	25,380,709.10	26,410,462.34	1,029,753.24	87,897.449	13,408,532.69	13,952,547.83	544,015.14	544,015.14
KRS INS ADAMS STREET B1 UNIT	199,114.316	26,593,699.51	27,057,803.69	464,104.18	105,191.337	14,049,350.05	14,294,534.94	245,184.89	245,184.89
KRS INS ADAMS STREET III A1	176.485	17,648.52	17,648.50	-0.02	90.056	9,005.62	9,005.60	-0.02	-0.02
KRS INS ADAMS STREET III B1	176.485	17,648.52	17,648.50	-0.02	90.056	9,005.62	9,005.60	-0.02	-0.02
KRS INS AMERRA AGRI UNIT	98,034.777	9,570,735.74	8,298,351.14	-1,272,384.60	54,119.873	5,283,502.75	4,581,085.65	-702,417.10	-702,417.10
KRS INS AMERRA UNIT	17,994.413	2,752,946.22	3,698,392.69	945,446.47	9,933.776	1,519,757.79	2,041,689.53	521,931.74	521,931.74
KRS INS ARCTOS SPORTS II UNIT	58,439.838	7,949,104.13	9,881,906.38	1,932,802.25	19,955.065	2,724,562.22	3,374,309.22	649,747.00	649,747.00
KRS INS BLACKROCK UNIT	3,012,626.063	151,682,365.33	218,615,072.45	66,932,707.12	1,497,643.560	73,617,115.10	108,678,424.91	35,061,309.81	35,061,309.81
KRS INS BLUE TORCH UNIT	169,315.339	28,627,572.27	28,463,472.96	-164,099.31	88,997.305	15,047,527.05	14,961,269.31	-86,257.74	-86,257.74
KRS INS BNYM CUSTODY FEE UNIT	-175,682.837	-175,682.84	-175,682.84	0.00	-85,578.910	-85,578.91	-85,578.91	0.00	0.00
KRS INS BTG UNIT	47,759.328	2,830,897.20	4,704,166.96	1,873,269.76	26,241.228	1,555,428.69	2,584,691.26	1,029,262.57	1,029,262.57
KRS INS CASH UNIT	579,618.978	62,139,935.56	61,747,365.00	-392,570.56	127,473.021	13,941,049.13	13,579,823.05	-361,226.08	-361,226.08
KRS INS DB PRIVATE EQ UNIT	25,211.823	10,080,822.82	7,060,859.56	-3,019,963.26	13,622.690	5,446,963.52	3,815,190.23	-1,631,773.29	-1,631,773.29
KRS INS DIVCOWEST IV UNIT	388.165	0.00	205,296.03	205,296.03	210.909	0.00	111,547.36	111,547.36	111,547.36
KRS INS DOMESTIC EQUITY UNIT	1,077,479.779	238,189,668.92	309,853,714.29	71,664,045.37	547,953.374	119,600,544.17	157,576,403.29	37,975,859.12	37,975,859.12
KRS INS GLOBAL FIXED UNIT	415,073.721	59,535,520.13	57,358,214.00	-2,177,306.13	180,252.661	26,837,281.87	24,908,757.60	-1,928,524.27	-1,928,524.27
KRS INS GREENFIELD UNIT	406.081	165,654.10	3,848.68	-161,805.42	220.639	90,006.68	2,091.13	-87,915.55	-87,915.55
KRS INS GREENFIELD VII UNIT	1,279.863	524,538.89	385,288.25	-139,250.64	695.397	285,000.79	209,341.38	-75,659.41	-75,659.41
KRS INS HARRISON UNIT	244,840.322	47,175,650.69	53,490,659.10	6,315,008.41	133,920.349	25,798,214.98	29,257,794.12	3,459,579.14	3,459,579.14
KRS INS IFM INFRAST DEBT UNIT	94,964.510	15,197,419.52	14,226,743.02	-970,676.50	48,928.929	7,830,223.80	7,330,099.42	-500,124.38	-500,124.38
KRS INS INTERNAL EQUITY UNIT	2,146,606.268	517,984,255.32	751,816,377.95	233,832,122.63	1,004,154.548	234,404,155.98	351,689,942.60	117,285,786.62	117,285,786.62
KRS INS INTL EQ UNIT	2,703,662.320	425,650,937.52	481,940,131.83	56,289,194.31	1,324,798.033	205,369,761.87	236,151,287.81	30,781,525.94	30,781,525.94
KRS INS L-A-VII UNIT	41,214.677	4,368,393.12	3,308,231.85	-1,060,161.27	22,393.841	2,373,550.05	1,797,515.44	-576,034.61	-576,034.61
KRS INS LIQUID CORE FIXED UNIT	2,707,471.908	342,823,750.41	352,912,884.93	10,089,134.52	1,158,012.126	148,059,232.00	150,944,280.89	2,885,048.89	2,885,048.89
KRS INS LIQUID HY FI UNIT	517,405.258	87,838,567.74	87,678,947.61	-159,620.13	175,841.834	30,526,680.17	29,797,971.15	-728,709.02	-728,709.02
KRS INS MAGNETAR MTP	33.855	29,186.97	21,075.62	-8,111.35	18.727	16,142.78	11,658.05	-4,484.73	-4,484.73
KRS INS MARITIME PARTNERS UNIT	280,616.595	28,061,659.52	28,061,659.50	-0.02	112,246.638	11,224,663.79	11,224,663.80	0.01	0.01
KRS INS MESA WEST CORE UNIT	117,798.214	22,622,110.90	20,262,031.64	-2,360,079.26	65,081.046	12,499,534.39	11,194,348.10	-1,305,186.29	-1,305,186.29
KRS INS MESA WEST IV UNIT	34,504.073	3,469,143.26	2,660,065.73	-809,077.53	18,935.158	1,903,799.85	1,459,791.86	-444,007.99	-444,007.99
KRS INS MULTI SECTOR CREDIT FI	531,206.774	61,972,055.76	87,886,274.44	25,914,218.68	290,366.710	33,829,852.31	48,040,141.08	14,210,288.77	14,210,288.77
KRS INS OBERLAND UNIT	9,994.386	664,150.22	831,708.90	167,558.68	5,434.022	361,102.57	452,206.31	91,103.74	91,103.74
KRS INS PE 2010 UNIT	58,956.510	15,503,163.05	18,044,850.26	2,541,687.21	31,559.016	8,298,627.03	9,659,284.75	1,360,657.72	1,360,657.72
KRS INS PE 2011 UNIT	105,832.138	22,362,121.27	36,280,237.12	13,918,115.85	63,344.842	13,385,073.59	21,715,198.54	8,330,124.95	8,330,124.95
KRS INS PE 2012 A UNIT	2,213.500	815,384.81	1,221,389.78	406,004.97	1,197.264	441,034.31	660,639.72	219,605.41	219,605.41
KRS INS PE 2012 B UNIT	27,067.528	3,698,619.91	4,757,260.66	1,058,640.75	14,366.926	1,962,834.36	2,525,062.94	562,228.58	562,228.58
KRS INS PE 2013 UNIT	111,976.420	24,940,864.83	42,031,417.28	17,090,552.45	60,567.196	13,490,328.19	22,734,474.71	9,244,146.52	9,244,146.52
KRS INS PE 2015 UNIT	83,503.370	10,522,766.71	28,325,575.28	17,802,808.57	45,166.357	5,691,685.58	15,321,094.77	9,629,409.19	9,629,409.19
KRS INS PE 2016 UNIT	173,611.255	17,046,200.27	43,959,303.97	26,913,103.70	104,837.728	10,293,601.67	26,545,476.86	16,251,875.19	16,251,875.19
KRS INS PE 2017 UNIT	115,230.599	15,645,310.75	21,118,554.90	5,473,244.15	69,583.541	9,447,630.88	12,752,722.31	3,305,091.43	3,305,091.43
KRS INS PE 2018 UNIT	42,391.443	4,371,838.19	7,516,041.63	3,144,203.44	23,048.568	2,377,003.23	4,086,532.20	1,709,528.97	1,709,528.97
KRS INS PE 2019 UNIT	13,973.370	209,468.96	3,395,503.23	3,186,034.27	7,452.461	111,717.68	1,810,934.33	1,699,216.65	1,699,216.65
KRS INS PE 2021 UNIT	212,058.396	21,968,626.24	26,074,316.76	4,105,690.52	109,111.791	11,303,660.76	13,416,188.44	2,112,527.68	2,112,527.68
KRS INS POST-2015 REAL ESTATE	212,788.643	21,005,535.69	28,015,892.75	7,010,357.06	116,774.223	11,529,262.99	15,374,571.04	3,845,308.05	3,845,308.05
KRS INS PRIVATE CREDIT FI UNIT	546,510.134	108,819,670.13	112,735,930.87	3,916,260.74	298,061.368	59,342,439.99	61,485,091.83	2,142,651.84	2,142,651.84
KRS INS PROLOGIS UNIT	150,318.422	30,186,660.14	54,863,834.57	24,677,174.43	82,491.818	16,565,851.32	30,108,202.28	13,542,350.96	13,542,350.96
KRS INS REAL RETURN UNIT	154,802.578	23,439,219.09	31,768,760.45	8,329,541.36	79,776.147	12,122,920.23	16,371,751.27	4,248,831.04	4,248,831.04
KRS INS RUBENSTEIN PF II UNIT	21,246.598	3,647,035.90	2,159,845.74	-1,487,190.16	11,544.310	1,981,609.63	1,173,549.23	-808,060.40	-808,060.40
KRS INS SHENKMAN UNIT	327,684.976	55,782,521.52	55,849,147.16	66,625.64	121,413.013	20,716,691.46	20,693,085.51	-23,605.95	-23,605.95
KRS INS STOCKBRIDGE UNIT	117,767.220	22,698,334.58	24,655,371.62	1,957,037.04	64,874.850	12,503,912.86	13,581,992.81	1,078,079.95	1,078,079.95
KRS INS TAURUS UNIT	2,407.420	201,142.59	809,649.61	608,507.02	1,302.155	115,383.62	437,933.26	322,549.64	322,549.64
KRS INS TPF II UNIT	37.089	82,233.00	3,681.96	-78,551.04	19.666	43,603.44	1,952.32	-41,651.12	-41,651.12
KRS INS WALTON VI UNIT	3,747.298	690,042.06	717,185.67	27,143.61	2,008.147	369,785.83	384,334.06	14,548.23	14,548.23
KRS INS WALTON VII UNIT	8,850.842	2,685,591.02	1,346,662.48	-1,338,928.54	4,808.988	1,459,178.86	731,691.26	-727,487.60	-727,487.60
KRS INS WATERFALL UNIT	350,629.597	58,857,876.74	63,520,047.27	4,662,170.53	184,095.008	30,887,171.89	33,350,646.13	2,463,474.24	2,463,474.24

Kentucky Public Pensions Authority

Security Litigation Report

Quarter Ending: December 31, 2023

Claims Filed during the Quarter (pg 3):

17

Proceeds Received during the Quarter (pg 4):

\$77,286.43

Kentucky Retirement Systems	
Quarterly Securities Litigation Report	
Quarter Ended 12/31/23	
Total Claims Filed	
No Claim on File	9
Fiscal Year 1997	1
Fiscal Year 1998	2
Fiscal Year 1999	5
Fiscal Year 2000	9
Fiscal Year 2001	8
Fiscal Year 2002	33
Fiscal Year 2003	45
Fiscal Year 2004	38
Fiscal Year 2005	89
Fiscal Year 2006	150
Fiscal Year 2007	70
Fiscal Year 2008	73
Fiscal Year 2009	85
Fiscal Year 2010	65
Fiscal Year 2011	69
Fiscal Year 2012	54
Fiscal Year 2013	48
Fiscal Year 2014	65
Fiscal Year 2015	80
Fiscal Year 2016	224
Fiscal Year 2017	140
Fiscal Year 2018	74
Fiscal Year 2019	55
Fiscal Year 2020	42
Fiscal Year 2021	43
Fiscal Year 2022	49
Fiscal Year 2023	49
Fiscal Year 2024	31
Total Filed	1,705
Proceeds Received	
Fiscal Year 1998	\$67,682
Fiscal Year 1999	\$233,370
Fiscal Year 2000	\$303,918
Fiscal Year 2001	\$415,502
Fiscal Year 2002	\$387,318
Fiscal Year 2003	\$519,059
Fiscal Year 2004	\$1,080,920
Fiscal Year 2005	\$1,645,440
Fiscal Year 2006	\$797,535
Fiscal Year 2007	\$5,398,363
Fiscal Year 2008	\$5,402,336
Fiscal Year 2009	\$3,504,682
Fiscal Year 2010	\$2,776,544
Fiscal Year 2011	\$1,292,484
Fiscal Year 2012	\$468,657
Fiscal Year 2013	\$1,070,427
Fiscal Year 2014	\$308,704
Fiscal Year 2015	\$23,639,565
Fiscal Year 2016	\$2,417,957
Fiscal Year 2017	\$1,886,532
Fiscal Year 2018	\$2,247,966
Fiscal Year 2019	\$1,702,272
Fiscal Year 2020	\$1,743,474
Fiscal Year 2021	\$286,420
Fiscal Year 2022	\$616,557
Fiscal Year 2023	\$259,261
Fiscal Year 2024	\$172,961
Total Proceeds	\$60,645,908

CERS Investment Committee Meeting - Investment Office Quarterly Update

Class Action Name	TNT Status Code	Status as of Date	Class Period Start Date	Class Period End Date	Class Account Id	Claimed Account Name
RYANAIR HOLDINGS PLC, Securities Litigation	FILED	10/13/2023	5/30/2017	9/28/2018	956779	KRS INS AMERICAN CENTURY
RYANAIR HOLDINGS PLC, Securities Litigation	FILED	10/13/2023	5/30/2017	9/28/2018	956626	KRS LAZARD ASSET MGMT
RYANAIR HOLDINGS PLC, Securities Litigation	FILED	10/13/2023	5/30/2017	9/28/2018	956802	KRS INS LAZARD ASSET MGMT
RYANAIR HOLDINGS PLC, Securities Litigation	FILED	10/13/2023	5/30/2017	9/28/2018	956623	KRS AMERICAN CENTURY
MAXAR TECHNOLOGIES INC Securities Litigation	FILED	10/18/2023	5/9/2018	10/30/2018	956765	KRS INS NTGI STRUCTURED
MAXAR TECHNOLOGIES INC Securities Litigation	FILED	10/18/2023	5/9/2018	10/30/2018	956588	KRS NTGI STRUCTURED
COMMUNITY HEALTH SYSTEMS, INC., Securities Litigation	FILED	10/24/2023	2/21/2017	2/27/2018	956765	KRS INS NTGI STRUCTURED
COMMUNITY HEALTH SYSTEMS, INC., Securities Litigation	FILED	10/24/2023	2/21/2017	2/27/2018	956588	KRS NTGI STRUCTURED
BIOMARIN PHARMACEUTICAL INC, Securities Litigation	FILED	10/27/2023	3/3/2020	8/18/2020	140454	KRS ABEL NOSER TRANSITION
BIOMARIN PHARMACEUTICAL INC, Securities Litigation	FILED	10/27/2023	3/3/2020	8/18/2020	956772	KRS INS KRS INTERNAL EQUITY
BIOMARIN PHARMACEUTICAL INC, Securities Litigation	FILED	10/27/2023	3/3/2020	8/18/2020	140455	KRS INS ABEL NOSER TRANSITION
BIOMARIN PHARMACEUTICAL INC, Securities Litigation	FILED	10/27/2023	3/3/2020	8/18/2020	956596	KRS KRS INTERNAL EQUITY
Imperial Metals Corporation Securities Litigation	FILED	11/3/2023	8/15/2011	8/4/2014	KR2F3007002	COLUMBIA
Imperial Metals Corporation Securities Litigation	FILED	11/3/2023	8/15/2011	8/4/2014	KR3F3007002	COLUMBIA
AAC HOLDINGS, INC., Securities Litigation	FILED	11/22/2023	3/8/2017	4/15/2019	956588	KRS NTGI STRUCTURED
AAC HOLDINGS, INC., Securities Litigation	FILED	11/22/2023	3/8/2017	4/15/2019	956765	KRS INS NTGI STRUCTURED
PRECIGEN INC., Securities Litigation	FILED	11/23/2023	5/10/2017	9/25/2020	956588	KRS NTGI STRUCTURED
PRECIGEN INC., Securities Litigation	FILED	11/23/2023	5/10/2017	9/25/2020	956765	KRS INS NTGI STRUCTURED
THE GEO GROUP, INC Securities Litigation	FILED	11/23/2023	11/9/2018	8/5/2020	956588	KRS NTGI STRUCTURED
THE GEO GROUP, INC Securities Litigation	FILED	11/23/2023	11/9/2018	8/5/2020	956773	KRS INS TRANSITION
THE GEO GROUP, INC Securities Litigation	FILED	11/23/2023	11/9/2018	8/5/2020	956598	KRS TRANSITION
THE GEO GROUP, INC Securities Litigation	FILED	11/23/2023	11/9/2018	8/5/2020	956765	KRS INS NTGI STRUCTURED
THE GEO GROUP, INC Securities Litigation	FILED	11/23/2023	11/9/2018	8/5/2020	956592	KRS RIVER ROAD
THE GEO GROUP, INC Securities Litigation	FILED	11/23/2023	11/9/2018	8/5/2020	956769	KRS INS RIVER ROAD
PROASSURANCE CORPORATION Securities Litigation	FILED	11/28/2023	8/8/2018	5/7/2020	956765	KRS INS NTGI STRUCTURED
PROASSURANCE CORPORATION Securities Litigation	FILED	11/28/2023	8/8/2018	5/7/2020	956588	KRS NTGI STRUCTURED
THE KRAFT HEINZ COMPANY, Securities Litigation	FILED	11/28/2023	11/6/2015	8/7/2019	956596	KRS KRS INTERNAL EQUITY
THE KRAFT HEINZ COMPANY, Securities Litigation	FILED	11/28/2023	11/6/2015	8/7/2019	956592	KRS RIVER ROAD
THE KRAFT HEINZ COMPANY, Securities Litigation	FILED	11/28/2023	11/6/2015	8/7/2019	956769	KRS INS RIVER ROAD
THE KRAFT HEINZ COMPANY, Securities Litigation	FILED	11/28/2023	11/6/2015	8/7/2019	956597	KRS RIVER ROAD FAV
THE KRAFT HEINZ COMPANY, Securities Litigation	FILED	11/28/2023	11/6/2015	8/7/2019	909181	KRS INS RIVER ROAD FAV
THE KRAFT HEINZ COMPANY, Securities Litigation	FILED	11/28/2023	11/6/2015	8/7/2019	956772	KRS INS KRS INTERNAL EQUITY
THE KRAFT HEINZ COMPANY, Securities Litigation	FILED	11/28/2023	11/6/2015	8/7/2019	956599	KRS S P 500 INDEX
MagnaChip Semiconductor Corporation and Margaret Hye-Ryoung Sakai, CPA, FAIR FUND	FILED	12/4/2023	2/1/2012	2/12/2015	KR2F1002002	NTGI STRUCTURED
MagnaChip Semiconductor Corporation and Margaret Hye-Ryoung Sakai, CPA, FAIR FUND	FILED	12/4/2023	2/1/2012	2/12/2015	KR3F1002002	NTGI STRUCTURED
WELLS FARGO & COMPANY Securities Litigation	FILED	12/4/2023	2/2/2018	3/12/2020	956772	KRS INS KRS INTERNAL EQUITY
WELLS FARGO & COMPANY Securities Litigation	FILED	12/4/2023	2/2/2018	3/12/2020	956596	KRS KRS INTERNAL EQUITY
WELLS FARGO & COMPANY Securities Litigation	FILED	12/4/2023	2/2/2018	3/12/2020	956774	KRS INS S P 500 INDEX
WELLS FARGO & COMPANY Securities Litigation	FILED	12/4/2023	2/2/2018	3/12/2020	956599	KRS S P 500 INDEX
JAGGED PEAK ENERGY INC, Securities Litigation	FILED	12/8/2023	12/19/2016	7/26/2017	956765	KRS INS NTGI STRUCTURED
ALEXION PHARMACEUTICALS, INC. Securities Litigation	FILED	12/13/2023	1/30/2014	5/26/2017	956599	KRS S P 500 INDEX
ALEXION PHARMACEUTICALS, INC. Securities Litigation	FILED	12/13/2023	1/30/2014	5/26/2017	KR3F1011002	KRS INTERNAL EQUITY
ALEXION PHARMACEUTICALS, INC. Securities Litigation	FILED	12/13/2023	1/30/2014	5/26/2017	KR2F1009002	INVESCO
SHATTUCK LABS, INC., et al., Securities Litigation	FILED	12/18/2023	9/18/2020	11/8/2021	956765	KRS INS NTGI STRUCTURED
SHATTUCK LABS, INC., et al., Securities Litigation	FILED	12/18/2023	9/18/2020	11/8/2021	956588	KRS NTGI STRUCTURED
OCLARO INC Securities Litigation	FILED	12/19/2023	3/12/2018	12/11/2018	956588	KRS NTGI STRUCTURED
OCLARO INC Securities Litigation	FILED	12/19/2023	3/12/2018	12/11/2018	956765	KRS INS NTGI STRUCTURED
CELSIUS HOLDINGS INC Securities Litigation	FILED	12/25/2023	8/12/2021	3/1/2022	956765	KRS INS NTGI STRUCTURED
CELSIUS HOLDINGS INC Securities Litigation	FILED	12/25/2023	8/12/2021	3/1/2022	956588	KRS NTGI STRUCTURED



Transaction Detail
Reported By Transaction Category

Report ID: IACS0008

Base Currency: USD

KR2G00000000 - TOTAL FUND

9/30/2023 - 12/31/2023

Status: REVISED

Trans Code	Shares/Par	Description	Trade Date	Price	Cost	Amount	Net Gain/Loss
Link Ref	Security Id	Broker	C. Settle Date	Local/Base	Local/Base	Local/Base	Local/Base
		Transaction No./Client Ref No.	Reported Date				
CLASS ACTIONS							
CASH & CASH EQUIVALENTS							
U.S. DOLLAR							
CD	0.000	22365COVETRUS, INC., Securitie NA9123459 s Litigation Distribution 1ST 20231002S000730 / 000000006064 KR2F10020002 : NTGI STRUCTURED	10/2/2023 10/2/2023	0.000000 0.000000	3,549.51 3,549.51	3,549.51 3,549.51	3,549.51 3,549.51
						Gain/Loss Local Amounts: 3,549.51 Long Gain/Loss Base Amounts: 3,549.51 Long	
CD	0.000	21022PERRIGO COMPANY PLC. (201 NA9123459 9) Distribution 2ND DISTRIBUTI 20231005S000180 / 000000000000 KR2F19020002 : S&P 500 INDEX	10/5/2023 10/5/2023	0.000000 0.000000	12.75 12.75	12.75 12.75	12.75 12.75
						Gain/Loss Local Amounts: 12.75 Long Gain/Loss Base Amounts: 12.75 Long	
CD	0.000	13-CV-1620-JPOITT EDUCATIONAL NA9123459 SERVICES, INC. (2013) Distribu 20231010S000220 / 000000000081 KR2F10020002 : NTGI STRUCTURED	10/10/2023 10/10/2023	0.000000 0.000000	123.56 123.56	123.56 123.56	123.56 123.56
						Gain/Loss Local Amounts: 123.56 Long Gain/Loss Base Amounts: 123.56 Long	
CD	0.000	14-CV-09662 (JSR)PETROBRAS - P NA9123459 ETROLEO BRASILEIRO S.A (2014) 20231012S000010 / 000000009312 KR2F90010002 : CASH ACCOUNT KR2	10/12/2023 10/12/2023	0.000000 0.000000	5,411.26 5,411.26	5,411.26 5,411.26	5,411.26 5,411.26
						Gain/Loss Local Amounts: 5,411.26 Long Gain/Loss Base Amounts: 5,411.26 Long	
CD	0.000	16-CV-00212-JPO-JLCTHE BANK OF NA9123459 NEW YORK MELLON ADR FX Distri 20231016S000010 / 000000000012 KR2F90010002 : CASH ACCOUNT KR2	10/16/2023 10/16/2023	0.000000 0.000000	14.13 14.13	14.13 14.13	14.13 14.13
						Gain/Loss Local Amounts: 14.13 Long Gain/Loss Base Amounts: 14.13 Long	
CD	0.000	16-CV-00212-JPO-JLCTHE BANK OF NA9123459 NEW YORK MELLON ADR FX Distri 20231016S000090 / 000000000012 KR2F10120002 : RIVER ROAD FAV	10/16/2023 10/16/2023	0.000000 0.000000	42.65 42.65	42.65 42.65	42.65 42.65
						Gain/Loss Local Amounts: 42.65 Long Gain/Loss Base Amounts: 42.65 Long	



Transaction Detail
Reported By Transaction Category

Report ID: IACS0008
 Base Currency: USD

KR2G00000000 - TOTAL FUND

9/30/2023 - 12/31/2023

Status: REVISED

Trans Code	Shares/Par	Description	Trade Date	Price	Cost	Amount	Net Gain/Loss
Link Ref	Security Id	Broker	C. Settle Date	Local/Base	Local/Base	Local/Base	Local/Base
		Transaction No./Client Ref No.	Reported Date				
CD	0.000	20584CITI SPONSORED AMERICAN D	10/24/2023	0.000000	8.88	8.88	8.88
	NA9123459	EPOSITARY RECEIPTS (CITIBANK N		0.000000	8.88	8.88	8.88
		20231024S000010 / 000000000009	10/24/2023				Gain/Loss Local Amounts: 8.88 Long
		KR2F90010002 : CASH ACCOUNT KR2					Gain/Loss Base Amounts: 8.88 Long
CD	0.000	20274NIELSEN HOLDINGS PLC, Sec	10/30/2023	0.000000	16,120.72	16,120.72	16,120.72
	NA9123459	urities Litigation Distributio		0.000000	16,120.72	16,120.72	16,120.72
		20231030S000010 / 000000000000	10/30/2023				Gain/Loss Local Amounts: 16,120.72 Long
		KR2F10120002 : RIVER ROAD FAV					Gain/Loss Base Amounts: 16,120.72 Long
CD	0.000	20274NIELSEN HOLDINGS PLC, Sec	10/30/2023	0.000000	317.18	317.18	317.18
	NA9123459	urities Litigation Distributio		0.000000	317.18	317.18	317.18
		20231030S000070 / 000000000000	10/30/2023				Gain/Loss Local Amounts: 317.18 Long
		KR2F10110002 : KRS INTERNAL EQUITY					Gain/Loss Base Amounts: 317.18 Long
CD	0.000	16-CV-00212-JPO-JLCTHE BANK OF	10/30/2023	0.000000	41.92	41.92	41.92
	NA9123459	NEW YORK MELLON ADR FX Distri		0.000000	41.92	41.92	41.92
		20231030S000070 / 000000000012	10/30/2023				Gain/Loss Local Amounts: 41.92 Long
		KR2F90010002 : CASH ACCOUNT KR2					Gain/Loss Base Amounts: 41.92 Long
CD	0.000	20274NIELSEN HOLDINGS PLC, Sec	10/30/2023	0.000000	17.62	17.62	17.62
	NA9123459	urities Litigation Distributio		0.000000	17.62	17.62	17.62
		20231030S000090 / 000000000000	10/30/2023				Gain/Loss Local Amounts: 17.62 Long
		KR2F19020002 : S&P 500 INDEX					Gain/Loss Base Amounts: 17.62 Long
CD	0.000	17049Cognizant Technology Solu	11/2/2023	0.000000	5,297.63	5,297.63	5,297.63
	NA9123459	tions Corporation Distribution		0.000000	5,297.63	5,297.63	5,297.63
		20231102S000100 / 000000000000	11/2/2023				Gain/Loss Local Amounts: 5,297.63 Long
		KR2F19020002 : S&P 500 INDEX					Gain/Loss Base Amounts: 5,297.63 Long
CD	0.000	17733OVASCIENCE, INC., Securit	11/9/2023	0.000000	429.76	429.76	429.76
	NA9123459	ies Litigation Distribution 1S		0.000000	429.76	429.76	429.76
		20231109S000300 / 000000000000	11/9/2023				Gain/Loss Local Amounts: 429.76 Long
		KR2F10020002 : NTGI STRUCTURED					Gain/Loss Base Amounts: 429.76 Long



Transaction Detail
Reported By Transaction Category

Report ID: IACS0008

Base Currency: USD

KR2G0000000 - TOTAL FUND

9/30/2023 - 12/31/2023

Status: REVISED

Trans Code	Shares/Par	Description	Trade Date	Price	Cost	Amount	Net Gain/Loss
Link Ref	Security Id	Broker	C. Settle Date	Local/Base	Local/Base	Local/Base	Local/Base
		Transaction No./Client Ref No.	Reported Date				
CD	0.000	115-cv-00374-LYDell, Inc. (201	11/30/2023	0.000000	183.80	183.80	183.80
	NA9123459	4) Distribution 2ND DISTRIBUTI		0.000000	183.80	183.80	183.80
		20231130S000020 / 000000000000	11/30/2023				
		KR2F90010002 : CASH ACCOUNT KR2					Gain/Loss Local Amounts: 183.80 Long Gain/Loss Base Amounts: 183.80 Long
CD	0.000	WAMU TIA SETTLEMENT (2012)	12/1/2023	0.000000	147.42	147.42	147.42
	NA9123459	AS PER DOCUMENT		0.000000	147.42	147.42	147.42
		20231207A000010	12/1/2023				
		KR2F90010002 : CASH ACCOUNT KR2					Gain/Loss Local Amounts: 147.42 Long Gain/Loss Base Amounts: 147.42 Long
CD	0.000	ITT EDUCATIONAL SERVICES INC	12/1/2023	0.000000	48.56	48.56	48.56
	NA9123459	AS PER DOCUMENT		0.000000	48.56	48.56	48.56
		20231207A000380	12/1/2023				
		KR2F10020002 : NTGI STRUCTURED					Gain/Loss Local Amounts: 48.56 Long Gain/Loss Base Amounts: 48.56 Long
CD	0.000	24000GTT Communications, Inc.	12/11/2023	0.000000	81.15	81.15	81.15
	NA9123459	(2021) Distribution 2ND DISTRI		0.000000	81.15	81.15	81.15
		20231211S000500 / 000000000009	12/11/2023				
		KR2F10020002 : NTGI STRUCTURED					Gain/Loss Local Amounts: 81.15 Long Gain/Loss Base Amounts: 81.15 Long
CD	0.000	24874HRG GROUP Securities Liti	12/28/2023	0.000000	909.26	909.26	909.26
	NA9123459	gation Distribution 1ST DISTRI		0.000000	909.26	909.26	909.26
		20231228S000830 / 000000000001	12/28/2023				
		KR2F10020002 : NTGI STRUCTURED					Gain/Loss Local Amounts: 909.26 Long Gain/Loss Base Amounts: 909.26 Long
TOTAL U.S. DOLLAR CASH & CASH EQUIVALENTS:					<u>32,757.76</u>	<u>32,757.76</u>	<u>32,757.76</u>
					<u>32,757.76</u>	<u>32,757.76</u>	<u>32,757.76</u>
TOTAL CASH & CASH EQUIVALENTS CLASS ACTIONS:					<u>32,757.76</u>	<u>32,757.76</u>	<u>32,757.76</u>
TOTAL CLASS ACTIONS:					<u>32,757.76</u>	<u>32,757.76</u>	<u>32,757.76</u>
TOTAL TRANSACTIONS BASE:					<u>32,757.76</u>	<u>32,757.76</u>	<u>32,757.76</u>



Transaction Detail
Reported By Transaction Category

Report ID: IACS0008
 Base Currency: USD
 Status: REVISED

KR3G00000000 - TOTAL FUND

9/30/2023 - 12/31/2023

Trans Code	Shares/Par	Description	Trade Date	Price	Cost	Amount	Net Gain/Loss
Link Ref	Security Id	Broker	C. Settle Date	Local/Base	Local/Base	Local/Base	Local/Base
		Transaction No./Client Ref No.	Reported Date				
CLASS ACTIONS							
CASH & CASH EQUIVALENTS							
U.S. DOLLAR							
CD	0.000	22365COVETRUS, INC., Securitie NA9123459 s Litigation Distribution 1ST 20231002S000590 / 000000006064 KR3F10020002 : NTGI STRUCTURED	10/2/2023 10/2/2023	0.000000 0.000000	1,572.57 1,572.57	1,572.57 1,572.57	1,572.57 1,572.57
						Gain/Loss Local Amounts: 1,572.57 Long Gain/Loss Base Amounts: 1,572.57 Long	
CD	0.000	21022PERRIGO COMPANY PLC. (201 NA9123459 9) Distribution 2ND DISTRIBUTI 20231005S000180 / 000000000000 KR3F19020002 : S&P 500 INDEX	10/5/2023 10/5/2023	0.000000 0.000000	14.14 14.14	14.14 14.14	14.14 14.14
						Gain/Loss Local Amounts: 14.14 Long Gain/Loss Base Amounts: 14.14 Long	
CD	0.000	13-CV-1620-JPOITT EDUCATIONAL NA9123459 SERVICES, INC. (2013) Distribu 20231010S000210 / 000000000081 KR3F10020002 : NTGI STRUCTURED	10/10/2023 10/10/2023	0.000000 0.000000	45.03 45.03	45.03 45.03	45.03 45.03
						Gain/Loss Local Amounts: 45.03 Long Gain/Loss Base Amounts: 45.03 Long	
CD	0.000	14-CV-09662 (JSR)PETROBRAS - P NA9123459 ETROLEO BRASILEIRO S.A (2014) 20231012S000010 / 000000009312 KR3F29010002 : NON-US TRANS ACCT	10/12/2023 10/12/2023	0.000000 0.000000	2,624.83 2,624.83	2,624.83 2,624.83	2,624.83 2,624.83
						Gain/Loss Local Amounts: 2,624.83 Long Gain/Loss Base Amounts: 2,624.83 Long	
CD	0.000	16-CV-00212-JPO-JLCTHE BANK OF NA9123459 NEW YORK MELLON ADR FX Distri 20231016S000010 / 000000000012 KR3F90010002 : CASH ACCOUNT KR3	10/16/2023 10/16/2023	0.000000 0.000000	5.18 5.18	5.18 5.18	5.18 5.18
						Gain/Loss Local Amounts: 5.18 Long Gain/Loss Base Amounts: 5.18 Long	
CD	0.000	16-CV-00212-JPO-JLCTHE BANK OF NA9123459 NEW YORK MELLON ADR FX Distri 20231016S000020 / 000000000012 KR3F90010002 : CASH ACCOUNT KR3	10/16/2023 10/16/2023	0.000000 0.000000	17.54 17.54	17.54 17.54	17.54 17.54
						Gain/Loss Local Amounts: 17.54 Long Gain/Loss Base Amounts: 17.54 Long	



Transaction Detail
Reported By Transaction Category

Report ID: IACS0008
Base Currency: USD

KR3G00000000 - TOTAL FUND

9/30/2023 - 12/31/2023

Status: REVISED

Trans Code	Shares/Par	Description	Trade Date	Price	Cost	Amount	Net Gain/Loss
Link Ref	Security Id	Broker	C. Settle Date	Local/Base	Local/Base	Local/Base	Local/Base
		Transaction No./Client Ref No.	Reported Date				
CD	0.000	19486TEVA PHARMACEUTICAL INDUS	10/16/2023	0.000000	667.62	667.62	667.62
	NA9123459	TRIES LIMITED Securities Litig		0.000000	667.62	667.62	667.62
		20231016S000030 / 000000000000	10/16/2023				Gain/Loss Local Amounts: 667.62 Long
		KR3F90010002 : CASH ACCOUNT KR3					Gain/Loss Base Amounts: 667.62 Long
CD	0.000	20274NIELSEN HOLDINGS PLC, Sec	10/30/2023	0.000000	7,150.05	7,150.05	7,150.05
	NA9123459	urities Litigation Distributio		0.000000	7,150.05	7,150.05	7,150.05
		20231030S000010 / 000000000000	10/30/2023				Gain/Loss Local Amounts: 7,150.05 Long
		KR3F10120002 : RIVER ROAD FAV					Gain/Loss Base Amounts: 7,150.05 Long
CD	0.000	20274NIELSEN HOLDINGS PLC, Sec	10/30/2023	0.000000	123.27	123.27	123.27
	NA9123459	urities Litigation Distributio		0.000000	123.27	123.27	123.27
		20231030S000070 / 000000000000	10/30/2023				Gain/Loss Local Amounts: 123.27 Long
		KR3F10110002 : KRS INTERNAL EQUITY					Gain/Loss Base Amounts: 123.27 Long
CD	0.000	20274NIELSEN HOLDINGS PLC, Sec	10/30/2023	0.000000	34.68	34.68	34.68
	NA9123459	urities Litigation Distributio		0.000000	34.68	34.68	34.68
		20231030S000090 / 000000000000	10/30/2023				Gain/Loss Local Amounts: 34.68 Long
		KR3F19020002 : S&P 500 INDEX					Gain/Loss Base Amounts: 34.68 Long
CD	0.000	17049Cognizant Technology Solu	11/2/2023	0.000000	2,733.79	2,733.79	2,733.79
	NA9123459	tions Corporation Distribution		0.000000	2,733.79	2,733.79	2,733.79
		20231102S000090 / 000000000000	11/2/2023				Gain/Loss Local Amounts: 2,733.79 Long
		KR3F10110002 : KRS INTERNAL EQUITY					Gain/Loss Base Amounts: 2,733.79 Long
CD	0.000	17733OVASCIENCE, INC., Securit	11/9/2023	0.000000	184.18	184.18	184.18
	NA9123459	ies Litigation Distribution 1S		0.000000	184.18	184.18	184.18
		20231109S000330 / 000000000000	11/9/2023				Gain/Loss Local Amounts: 184.18 Long
		KR3F10020002 : NTGI STRUCTURED					Gain/Loss Base Amounts: 184.18 Long
CD	0.000	20274NIELSEN HOLDINGS PLC, Sec	11/28/2023	0.000000	1,041.58	1,041.58	1,041.58
	NA9123459	urities Litigation Distributio		0.000000	1,041.58	1,041.58	1,041.58
		20231128S000030 / 000000000000	11/28/2023				Gain/Loss Local Amounts: 1,041.58 Long
		KR3F90010002 : CASH ACCOUNT KR3					Gain/Loss Base Amounts: 1,041.58 Long



Transaction Detail
Reported By Transaction Category

Report ID: IACS0008
 Base Currency: USD
 Status: REVISED

KR3G0000000 - TOTAL FUND

9/30/2023 - 12/31/2023

Trans Code	Shares/Par	Description	Trade Date	Price	Cost	Amount	Net Gain/Loss
Link Ref	Security Id	Broker	C. Settle Date	Local/Base	Local/Base	Local/Base	Local/Base
		Transaction No./Client Ref No.	Reported Date				
CD	0.000	22310PROPETRO HOLDING CORP., S	12/8/2023	0.000000	964.04	964.04	964.04
	NA9123459	ecurities Litigation Distribut		0.000000	964.04	964.04	964.04
		20231208S000330 / 000000000001	12/8/2023				Gain/Loss Local Amounts: 964.04 Long
		KR3F10020002 : NTGI STRUCTURED					Gain/Loss Base Amounts: 964.04 Long
CD	0.000	24000GTT Communications, Inc.	12/11/2023	0.000000	35.79	35.79	35.79
	NA9123459	(2021) Distribution 2ND DISTRI		0.000000	35.79	35.79	35.79
		20231211S000440 / 000000000009	12/11/2023				Gain/Loss Local Amounts: 35.79 Long
		KR3F10020002 : NTGI STRUCTURED					Gain/Loss Base Amounts: 35.79 Long
CD	0.000	24874HRG GROUP Securities Liti	12/12/2023	0.000000	405.21	405.21	405.21
	NA9123459	gation Distribution 1ST DISTRI		0.000000	405.21	405.21	405.21
		20231212S000220 / 000000000001	12/12/2023				Gain/Loss Local Amounts: 405.21 Long
		KR3F10020002 : NTGI STRUCTURED					Gain/Loss Base Amounts: 405.21 Long
CD	0.000	22275VENATOR MATERIALS PLC, Se	12/14/2023	0.000000	26,848.85	26,848.85	26,848.85
	NA9123459	curities Litigation Distributi		0.000000	26,848.85	26,848.85	26,848.85
		20231214S000010 / 000000000001	12/14/2023				Gain/Loss Local Amounts: 26,848.85 Long
		KR3F90010002 : CASH ACCOUNT KR3					Gain/Loss Base Amounts: 26,848.85 Long
CD	0.000	412-CV-01332 (HARMON, J.)HOUST	12/22/2023	0.000000	60.32	60.32	60.32
	NA9123459	ON AMERICAN ENERGY CORP Distri		0.000000	60.32	60.32	60.32
		20231222S000340 / 0000000000081	12/22/2023				Gain/Loss Local Amounts: 60.32 Long
		KR3F10020002 : NTGI STRUCTURED					Gain/Loss Base Amounts: 60.32 Long
TOTAL U.S. DOLLAR CASH & CASH EQUIVALENTS:					<u>44,528.67</u>	<u>44,528.67</u>	<u>44,528.67</u>
					<u>44,528.67</u>	<u>44,528.67</u>	<u>44,528.67</u>
TOTAL CASH & CASH EQUIVALENTS CLASS ACTIONS:					<u>44,528.67</u>	<u>44,528.67</u>	<u>44,528.67</u>
TOTAL CLASS ACTIONS:					<u>44,528.67</u>	<u>44,528.67</u>	<u>44,528.67</u>
TOTAL TRANSACTIONS BASE:					<u>44,528.67</u>	<u>44,528.67</u>	<u>44,528.67</u>

Kentucky Public Pensions Authority

Internal Asset Holdings Report & Internal Asset Transaction Report

Quarter Ending: December 31, 2023

Reports can be found:

<https://kyret.ky.gov/Investments/Investments-Library/Pages/Internal-Reports.aspx>

Kentucky Public Pensions Authority

Commissions Report

Quarter Ending: December 31, 2023

Reports can be found:

<https://kyret.ky.gov/Investments/Investments-Library/Pages/Commissions-Reports.aspx>



STRATEGIC PLANNING PROCESS
INVESTMENT COMMITTEE

1. GOVERNANCE

- a. **Work with the Office of Investments and the Office of the CFO to establish a Senior Risk Officer (SRO) Department for increased transparency on CERS investment related issues. Fourth Quarter 2025**
- b. **Establish through the Investment Policy Statement (IPS) guidelines for the ratio between CERS assets managed internally and the size of the Investment office staffing levels. Third Quarter 2024**
- c. **Better define the role of the CERS Investment Consultant related to new investment strategies/managers and asset allocation. First Quarter 2025**

2. ORGANIZATIONAL EXCELLENCE

- a. **Strengthen and standardize CERS quarterly investment performance reporting for enhanced transparency. First Quarter 2025**
- b. **Develop and establish quantitative scoring against relevant benchmarks for CERS assets that are managed internally. First Quarter 2025**

3. CUSTOMER SERVICE DELIVERY

4. INFRASTRUCTURE AND KEY RESOURCES

- a. **Establishment of Senior Risk Management Department. Fourth Quarter 2025**