



**County Employees Retirement System
Investment Committee – Regular Meeting
November 28, 2023 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* -- August 30, 2023 | Dr. Merl Hackbart |
| 6. Investment Office Quarterly Update | Steve Willer |
| 7. Asset Allocation Study Update* | Steve Willer
David Lindberg
Craig Morton
Chris Tessman |
| 8. ADJOURN | Dr. Merl Hackbart |

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

**MINUTES OF MEETING
COUNTY EMPLOYEES RETIREMENT SYSTEM
INVESTMENT COMMITTEE MEETING
AUGUST 30, 2023, 2:00 P.M., E.T.
VIA LIVE VIDEO TELECONFERENCE**

At the August 30, 2023, County Employees Retirement System (CERS) Investment Committee Meeting, the following Committee members were present: Dr. Merl Hackbart (Chair), George Cheatham, and William O'Mara. Staff members present were Rebecca Adkins, Erin Surratt, Victoria Hale, Michael Lamb, Steve Willer, Anthony Chiu, Jared Crawford, Brian Caldwell, Joseph Gilbert, Ashley Gabbard, Katie Park, Sherry Rankin, and Shaun Case. Also in attendance were CERS CEO Ed Owens, III, KRS CEO John Chilton, Eric Branco with Johnson, Bowman, Branco LLP and David Lindberg and Craig Morton with Wilshire.

Dr. Hackbart called the meeting to order.

Mr. Branco read the Legal Opening Statement.

****Due to technical difficulties, Dr. Hackbart exited the meeting****

Dr. Hackbart was unable to continue the meeting. Therefore, Mr. Cheatham (Vice-Chair) led the meeting.

Ms. Rankin called roll.

There was no quorum present; therefore, the meeting began with the informational agenda items which require no action by the CERS Investment Committee.

There being no **Public Comment**, Mr. Cheatham introduced agenda item **Wilshire Market Overview** (Video 00:10:05 to 00:40:05). David Lindberg and Craig Morton with Wilshire reviewed the Wilshire Market Overview.

Mr. Cheatham introduced agenda item **Investment Office Quarterly Update** (Video 00:40:06 to 01:08:08). KPPA Chief Investment Officer Steve Willer presented the Investment Office Quarterly Update. He presented plan performance data for the quarter and fiscal year ended June 30, 2023, for CERS Nonhazardous and CERS Hazardous. Mr. Willer also discussed staffing and the search for a new office space for the KPPA Office of Investments.

****Dr. Hackbart reentered the meeting****

Dr. Hackbart introduced agenda item **Approval of Minutes – June 9, 2023** (Video 01:08:09 to 01:08:41). A motion was made by Mr. O’Mara and seconded by Mr. Cheatham to approve the June 9, 2023 minutes as presented. The motion passed unanimously.

Dr. Hackbart requested a motion to **adjourn** the meeting. Mr. O’Mara made a motion to adjourn and was seconded by Mr. Cheatham. 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 August 30, 2023, were approved by the County Employees Retirement System Investment Committee on November 28, 2023.

CERS Investment Committee Chair

I have reviewed the Minutes of the County Employees Retirement System Investment Committee Meeting on August 30, 2023, for form, content, and legality.

Office of Legal Services

County Employees Retirement System

Investment Office Quarterly Update

Quarter Ending: September 30, 2023

County Employees Retirement System

Economic and Market Update

Quarter Ending: September 30, 2023

Asset Class Performance



Data Sources: Bloomberg

Asset Class Performance

Asset Class Returns - Best to Worst

Annualized 5-Year as of 9/23

2018	2019	2020	2021	2022	2023 YTD	
T-Bills 1.9%	U.S. Equity 31.0%	U.S. Equity 20.8%	REITs 46.2%	Commodities 16.1%	U.S. Equity 12.5%	U.S. Equity 9.4%
Core Bond 0.0%	REITs 25.8%	Emrg Mrkts 18.7%	Commodities 27.1%	T-Bills 1.3%	Developed 7.6%	Commodities 6.1%
U.S. TIPS -1.3%	Developed 22.7%	U.S. TIPS 11.0%	U.S. Equity 26.7%	High Yield -11.2%	High Yield 5.9%	Developed 3.7%
High Yield -2.1%	Emrg Mrkts 18.9%	Developed 8.3%	Developed 11.8%	U.S. TIPS -11.8%	T-Bills 3.6%	High Yield 3.0%
REITs -4.8%	High Yield 14.3%	Core Bond 7.5%	U.S. TIPS 6.0%	Core Bond -13.0%	Emrg Mrkts 2.2%	REITs 2.9%
U.S. Equity -5.3%	Core Bond 8.7%	High Yield 7.1%	High Yield 5.3%	Developed -14.0%	REITs -0.2%	U.S. TIPS 2.1%
Commodities -11.2%	U.S. TIPS 8.4%	T-Bills 0.7%	T-Bills 0.0%	U.S. Equity -19.0%	U.S. TIPS -0.8%	T-Bills 1.7%
Developed -13.4%	Commodities 7.7%	Commodities -3.1%	Core Bond -1.5%	Emrg Mrkts -19.7%	Core Bond -1.2%	Emrg Mrkts 0.9%
Emrg Mrkts -14.2%	T-Bills 2.3%	REITs -7.9%	Emrg Mrkts -2.2%	REITs -26.8%	Commodities -3.4%	Core Bond 0.1%

Data Sources: Bloomberg

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

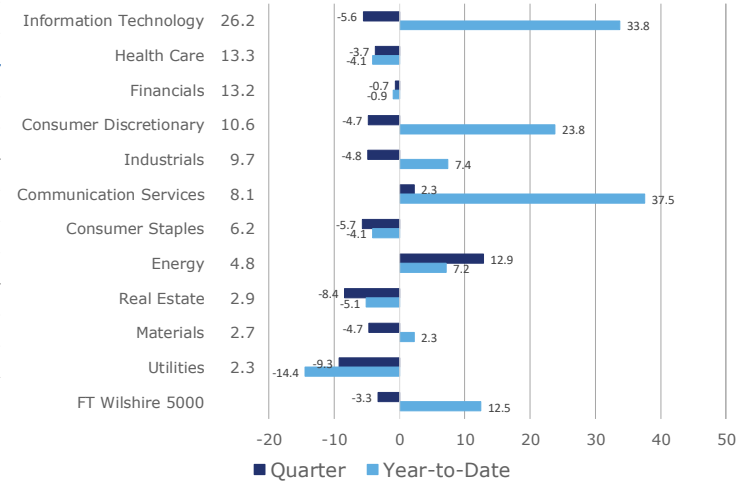
September 2023 Asset Class Assumptions

	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 Return (%)	6.00	7.00	7.25	7.35	6.65	9.65	4.25	5.60	5.55	4.85	6.85	8.95	3.50	6.20	6.35	6.20	6.60	7.05	2.35
Arithmetic Return (%)	7.30	8.45	10.20	9.00	8.00	13.35	4.25	5.70	6.00	5.00	7.30	9.70	3.60	7.60	7.60	7.10	7.75	7.75	2.35
Risk (%)	17.00	18.00	26.00	19.05	17.10	29.65	0.75	4.70	9.85	6.00	10.00	12.75	4.00	17.50	16.45	13.90	16.00	12.35	1.75
Cash Yield (%)	1.60	3.15	2.60	3.00	2.15	0.00	4.25	5.90	5.95	5.15	10.15	5.20	4.45	4.45	4.45	2.30	4.25	3.50	0.00
Growth Factor Exposure	8.00	8.00	8.00	8.00	8.00	14.00	0.00	-0.95	-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	1.45	-1.30	-3.75	0.00	-2.50	-6.80	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	0.68	0.55	0.58	0.60	0.68	0.44	0.00	0.24	0.30	0.00	0.76	1.00							
Dev ex-US Bond (Hdg)	0.16	0.25	-0.01	0.16	0.17	0.26	0.10	0.68	0.66	0.39	0.26	0.22	1.00						
US RE Securities	0.58	0.47	0.44	0.49	0.57	0.49	-0.05	0.17	0.22	0.10	0.56	0.62	0.05	1.00					
Global RE Securities	0.64	0.57	0.54	0.60	0.65	0.55	-0.05	0.17	0.21	0.11	0.61	0.68	0.04	0.96	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	0.58	0.63	0.05	0.79	0.78	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	0.62	0.63	0.65	0.69	0.67	0.57	-0.03	0.22	0.24	0.30	0.64	0.69	0.04	0.78	0.84	0.76	0.64	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	0.22	1.00

U.S. Equity Market

As of 9/30/2023	Quarter	YTD	1 Year	3 Year	5 Year	10 Year
FT Wilshire 5000	-3.3	12.5	20.5	9.7	9.4	11.5
Wilshire U.S. Large Cap	-3.2	13.3	21.3	9.8	10.0	11.9
Wilshire U.S. Small Cap	-4.9	3.5	11.7	9.5	3.6	7.4
Wilshire U.S. Large Growth	-3.4	27.6	28.6	9.3	12.1	14.1
Wilshire U.S. Large Value	-2.9	-0.3	13.4	10.1	7.5	9.6
Wilshire U.S. Small Growth	-5.0	7.8	15.4	5.8	4.0	7.6
Wilshire U.S. Small Value	-4.7	-0.4	8.3	13.5	3.2	7.1
Wilshire REIT Index	-6.4	-0.2	3.9	5.7	2.9	6.0
MSCI USA Min. Vol. Index	-2.0	1.9	11.8	6.2	7.0	10.4
FTSE RAFI U.S. 1000 Index	-2.2	4.4	17.4	14.3	8.7	10.4

U.S. Sector Weight and Return (%)



Large Cap vs Small Cap



Large Growth vs Large Value

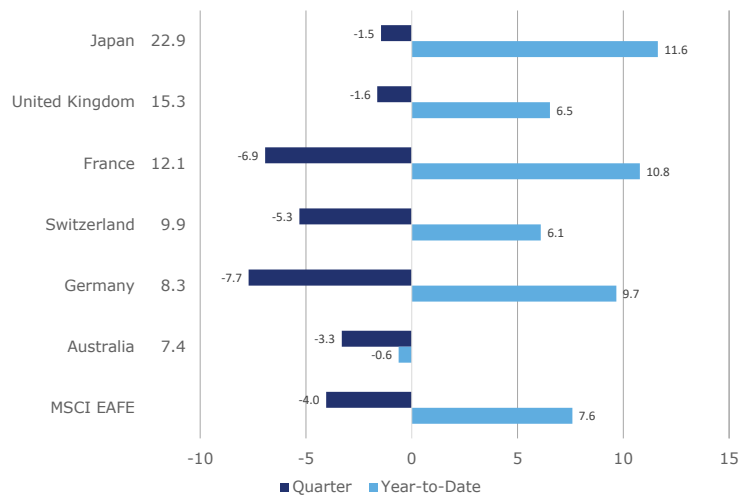


Data Sources: Bloomberg, Wilshire Atlas

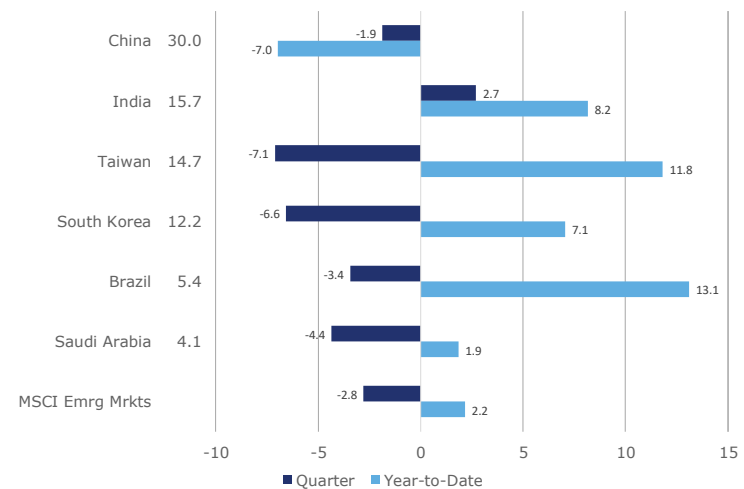
Non-U.S. Equity Market

As of 9/30/2023	Quarter	YTD	1 Year	3 Year	5 Year	10 Year
MSCI ACWI ex-US (\$G)	-3.7	5.8	21.0	4.2	3.1	3.8
MSCI EAFE (\$G)	-4.0	7.6	26.3	6.3	3.7	4.3
MSCI Emerging Markets (\$G)	-2.8	2.2	12.2	-1.3	0.9	2.5
MSCI Frontier Markets (\$G)	-0.2	4.6	14.2	1.8	-0.7	0.3
MSCI ACWI ex-US Growth (\$G)	-7.3	2.9	16.2	-1.6	2.9	4.3
MSCI ACWI ex-US Value (\$G)	0.1	8.6	25.7	10.1	3.0	3.4
MSCI ACWI ex-US Small (\$G)	-1.6	5.5	19.6	4.5	3.0	4.8
MSCI ACWI Minimum Volatility	-2.3	1.7	10.4	3.8	4.3	7.2
MSCI EAFE Minimum Volatility	-2.7	4.8	17.9	1.3	1.1	4.2
FTSE RAFI Developed ex-US	-1.6	8.7	28.6	11.4	3.9	4.2
MSCI EAFE LC (G)	-1.2	11.2	21.0	11.4	6.2	7.3
MSCI Emerging Markets LC (G)	-1.3	4.4	11.3	1.0	3.1	5.3

Developed Markets Weight and Return (%)



Emerging Markets Weight and Return (%)

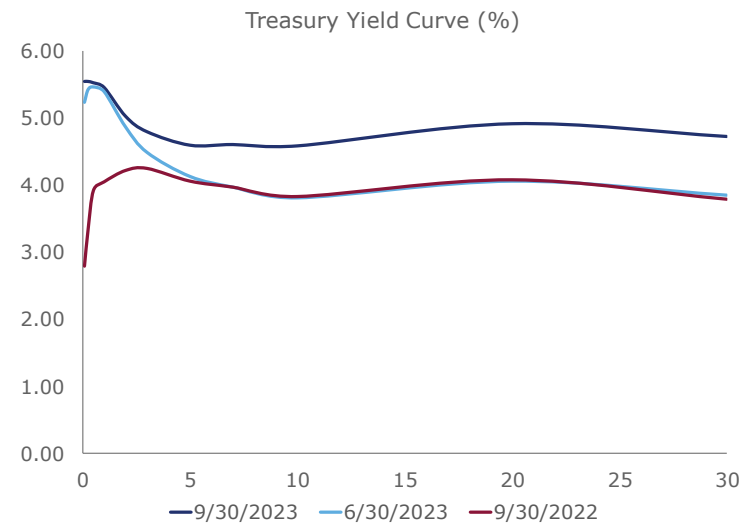
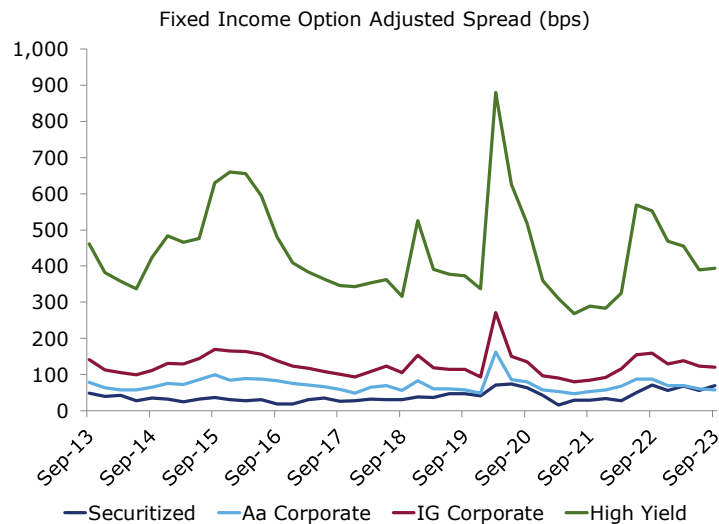


Data Sources: Bloomberg

U.S. Fixed Income

As of 9/30/2023	YTW	DUR.	QTR	YTD	1 YR	3 YR	5 YR	10 YR
Bloomberg Aggregate	5.4	6.1	-3.2	-1.2	0.6	-5.2	0.1	1.1
Bloomberg Treasury	4.9	5.9	-3.1	-1.5	-0.8	-5.8	-0.1	0.6
Bloomberg Gov't-Rel.	5.4	5.1	-2.0	0.4	2.2	-3.8	0.6	1.4
Bloomberg Securitized	5.6	6.2	-3.8	-2.1	0.0	-4.9	-0.6	0.7
Bloomberg Corporate	6.0	6.8	-3.1	0.0	3.6	-4.9	0.9	2.2
Bloomberg LT Gov't/Credit	5.5	13.7	-9.4	-5.4	-2.9	-11.9	-1.2	1.9
Bloomberg LT Treasury	4.9	15.3	-11.8	-8.6	-9.1	-15.7	-2.8	0.8
Bloomberg LT Gov't-Rel.	6.0	11.3	-7.2	-2.1	2.0	-8.5	-0.6	2.4
Bloomberg LT Corporate	6.1	12.5	-7.2	-2.7	2.6	-9.1	-0.2	2.7
Bloomberg U.S. TIPS *	4.6	7.4	-2.6	-0.8	1.2	-2.0	2.1	1.7
Bloomberg High Yield	8.9	3.5	0.5	5.9	10.3	1.8	3.0	4.2
S&P/LSTA Leveraged Loan	9.5	0.3	3.5	10.2	13.1	6.1	4.5	4.3
Treasury Bills	5.5	0.3	1.3	3.6	4.6	1.7	1.7	1.1

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

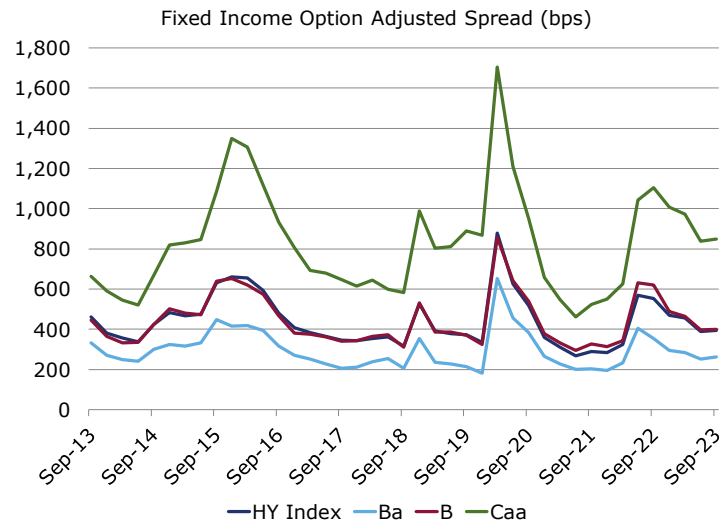


Data Sources: Bloomberg

High Yield Bond Market

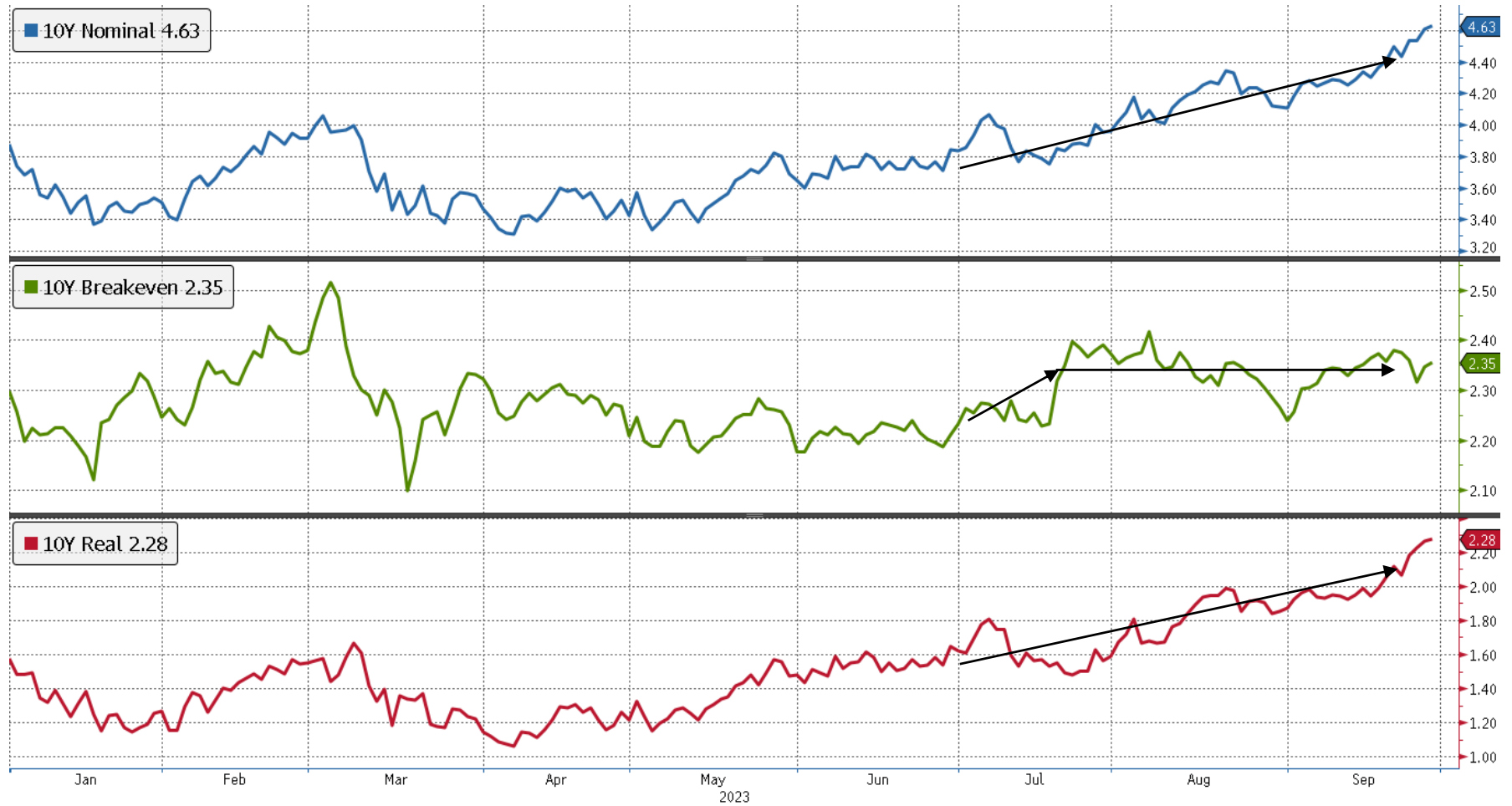
As of 9/30/2023

		YTW	QTR	YTD	1 YR	3 YR	5 YR	10 YR
Bloomberg High Yield		8.9	0.5	5.9	10.3	1.8	3.0	4.2
S&P LSTA Leveraged Loan		9.5	3.1	9.7	13.8	5.2	4.2	3.9
High Yield Quality Distribution	Weight							
Ba U.S. High Yield	47.8%	7.6	-0.4	3.9	8.4	0.8	3.7	4.6
B U.S. High Yield	40.0%	9.0	0.8	6.3	11.6	1.9	2.8	3.9
Caa U.S. High Yield	11.4%	13.3	2.5	12.1	12.7	3.8	0.7	3.7
Ca to D U.S. High Yield	0.9%	15.6	3.0	10.8	26.1	14.4	-2.8	-3.6



Data Sources: Bloomberg

2023 Rate Environment

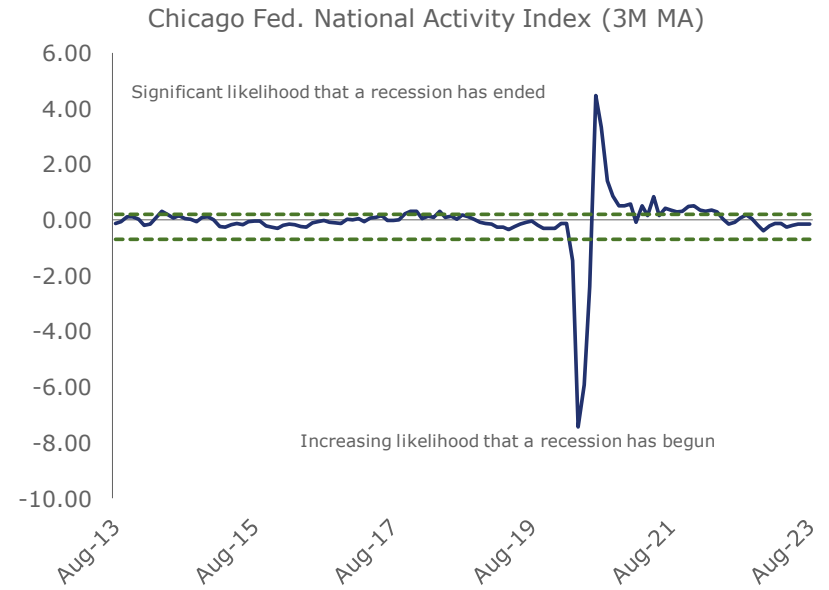


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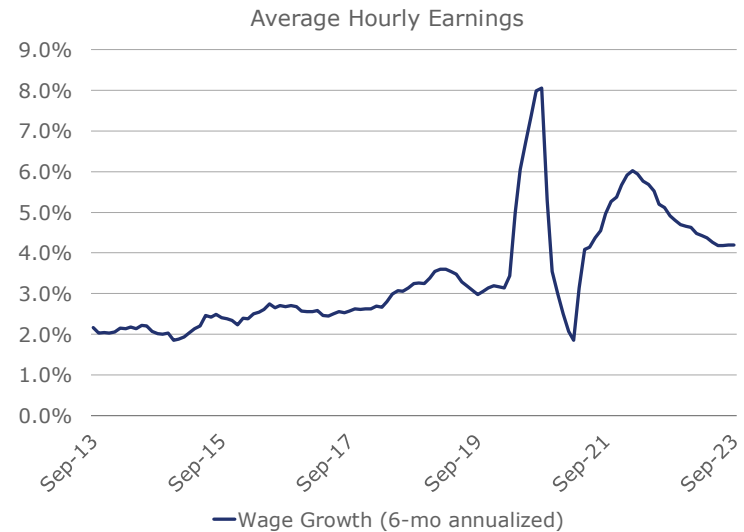
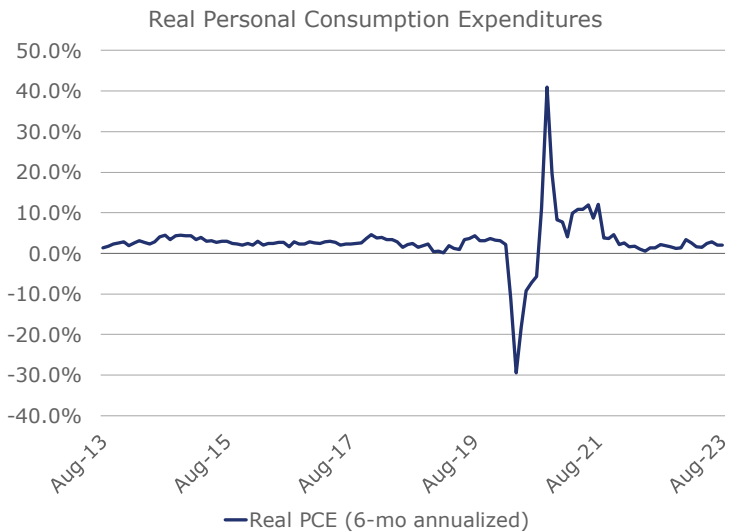
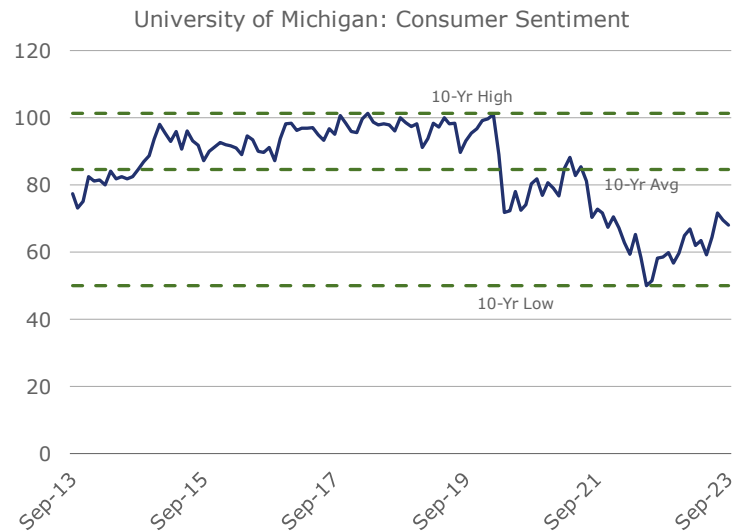
Data Sources: Wilshire, Bloomberg

Economic Growth



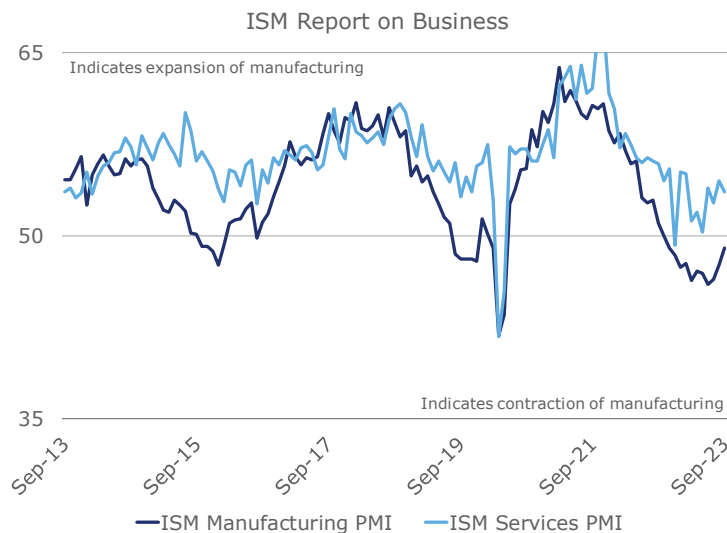
Data Sources: Bloomberg

Consumer Activity



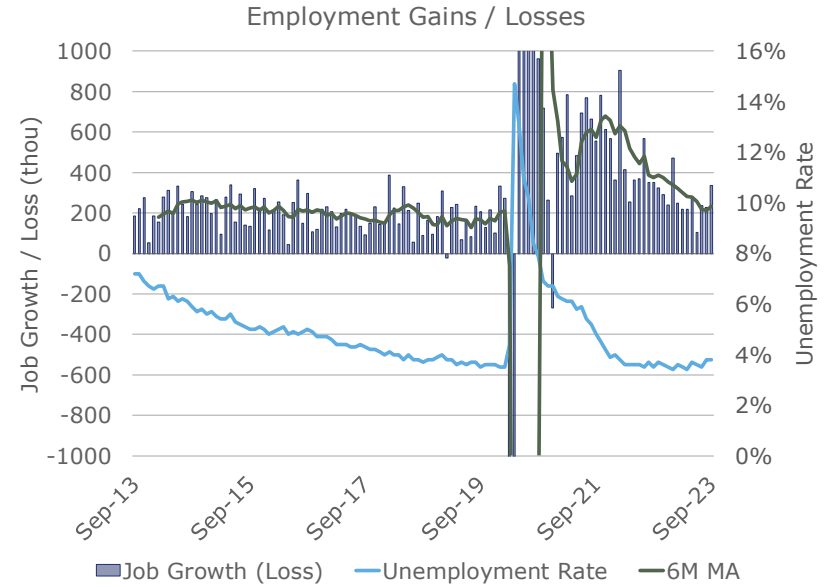
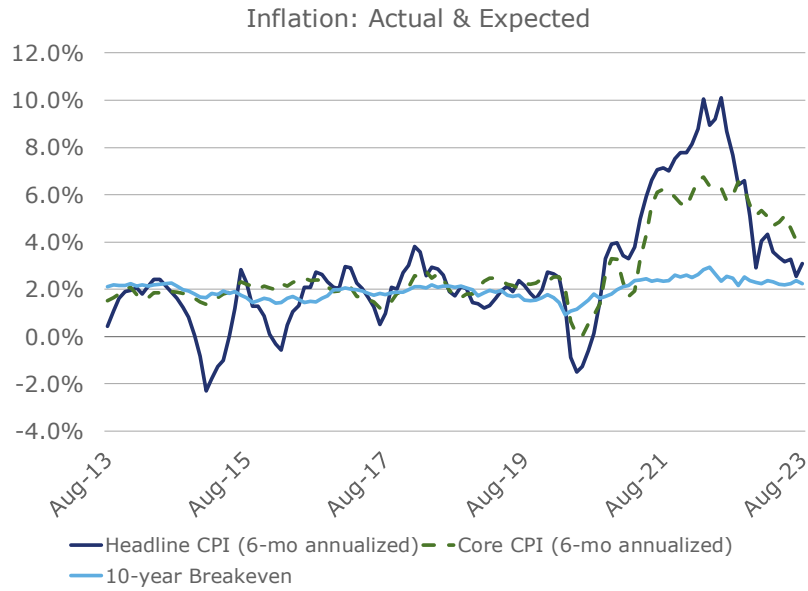
Data Sources: Bloomberg

Business Activity



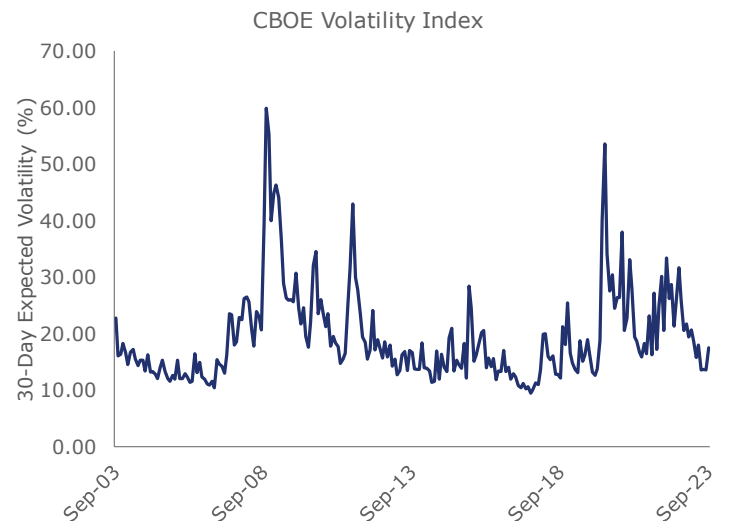
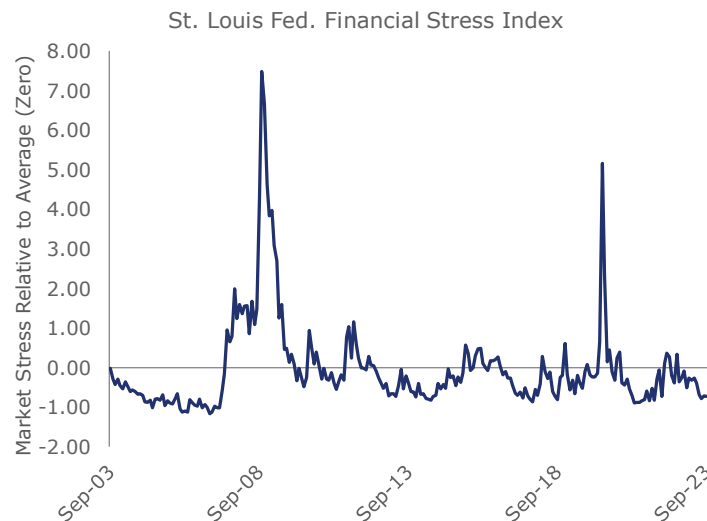
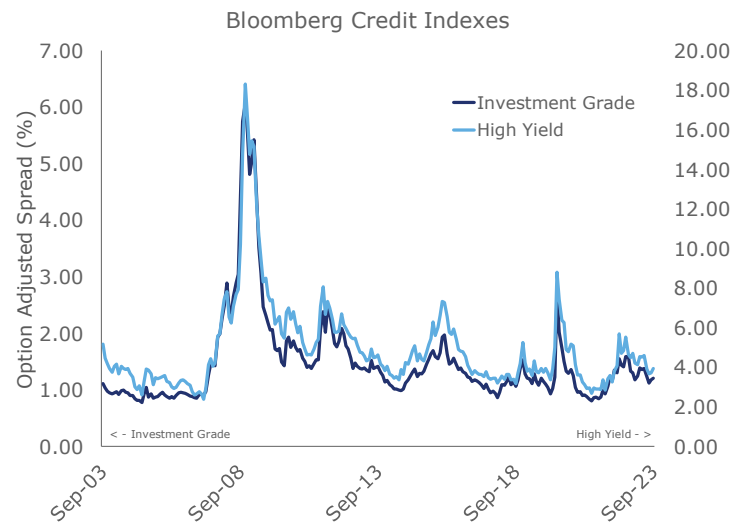
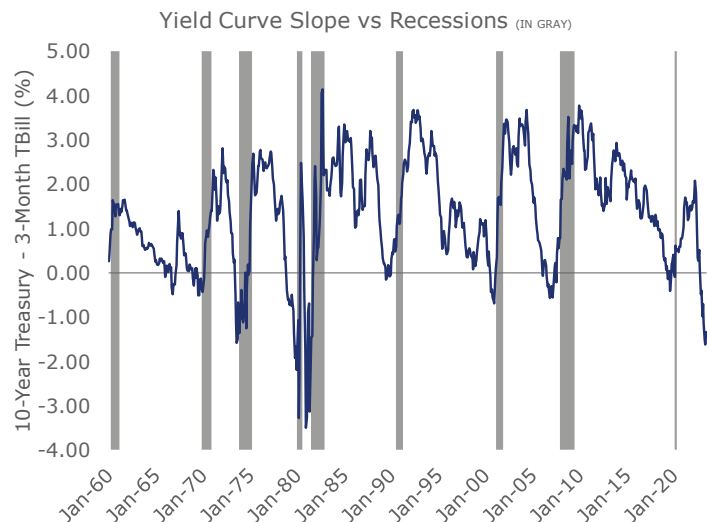
Data Sources: Bloomberg

Inflation And Employment



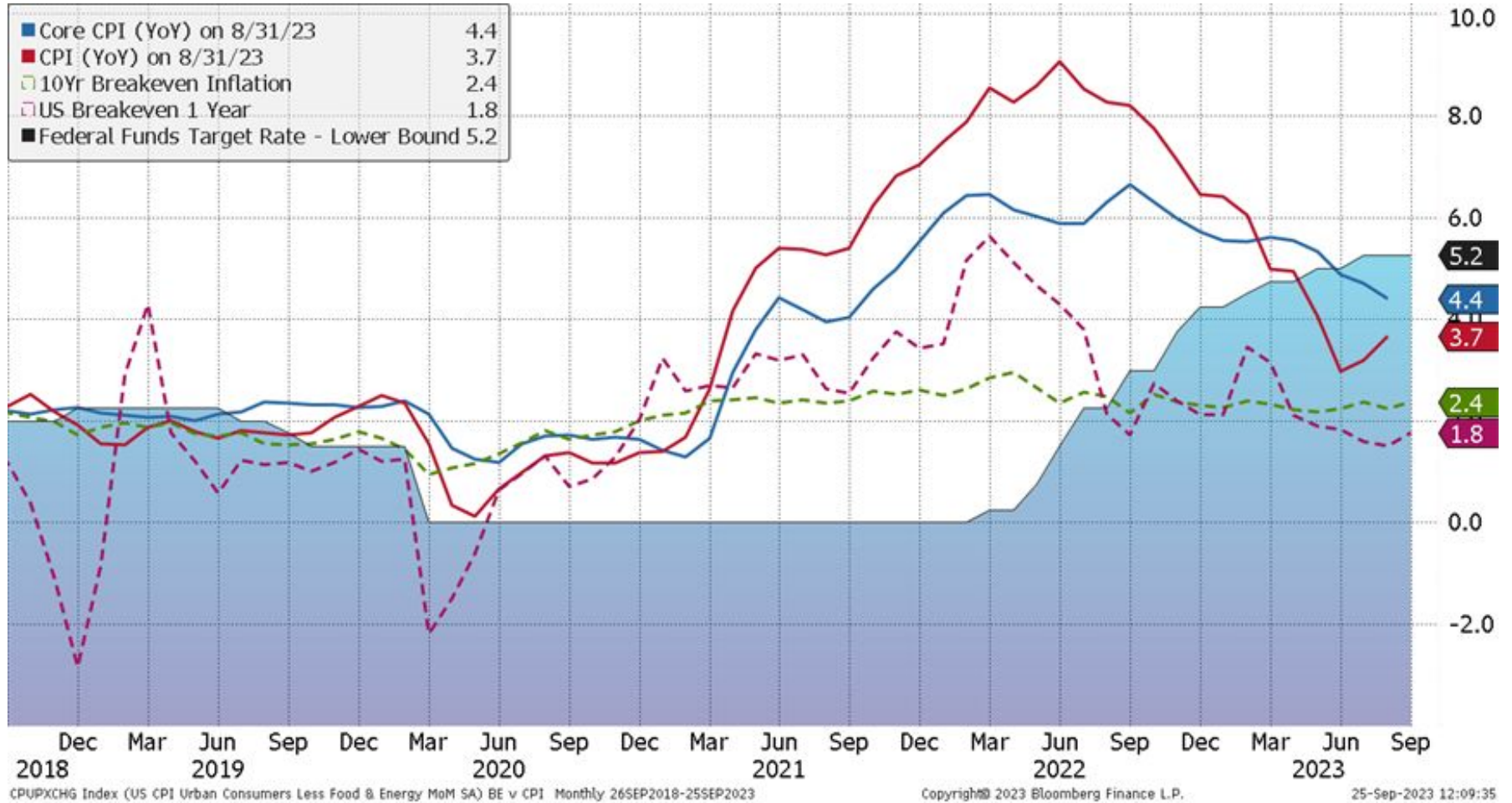
Data Sources: Bloomberg

Risk Monitor



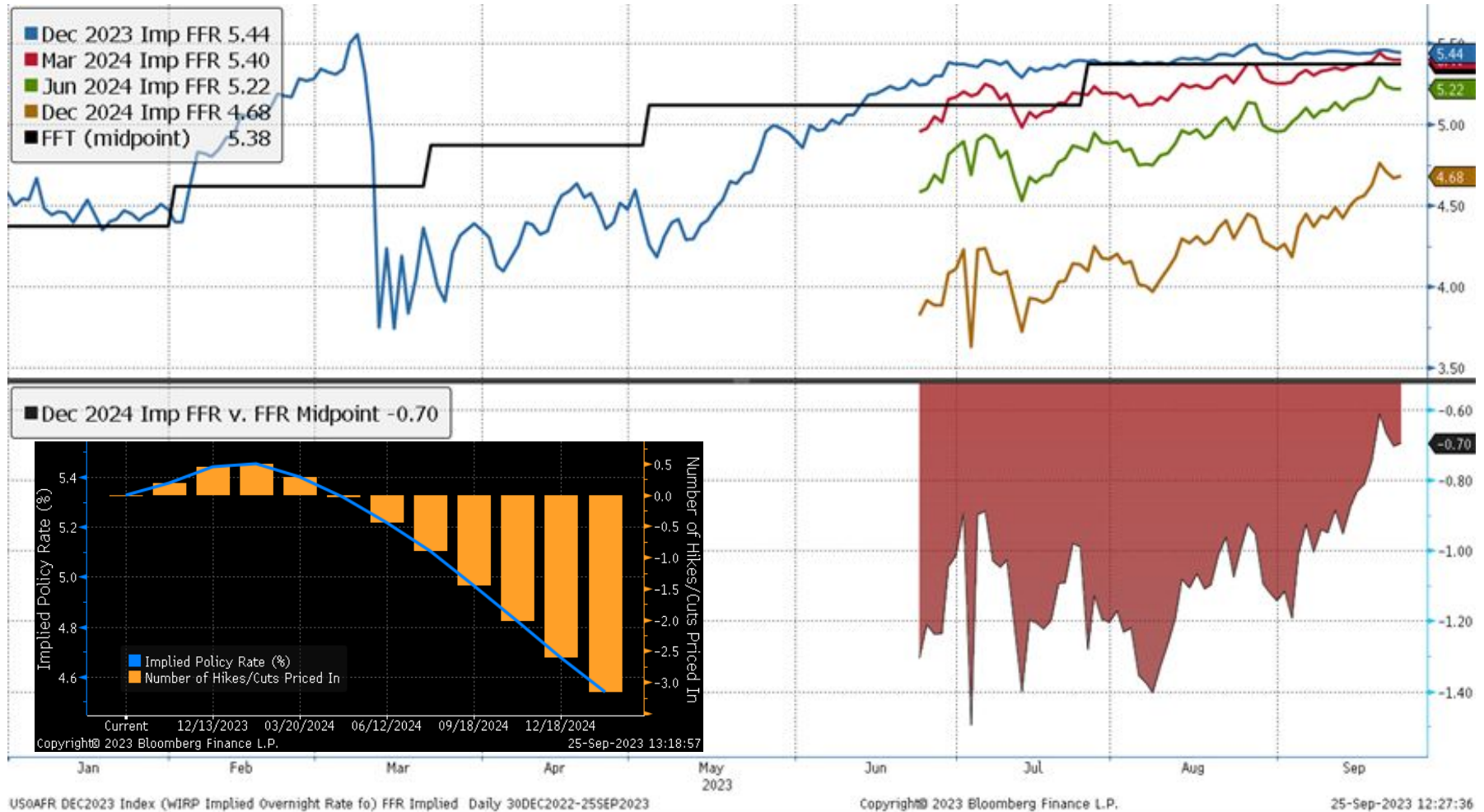
Data Sources: Bloomberg

Inflation Update v. Fed Policy: At/Near the Neutral Rate?



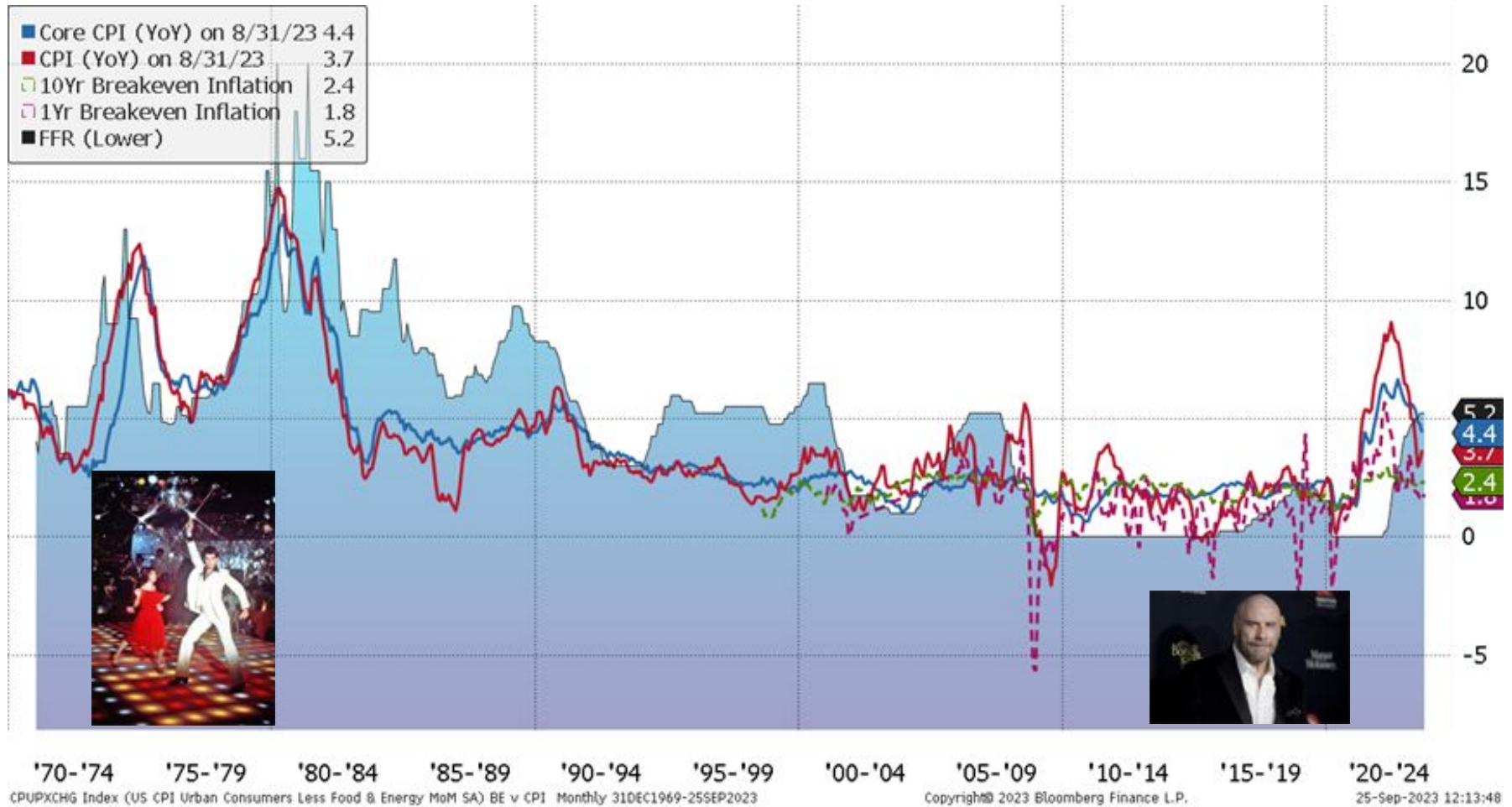
Data Sources: Bloomberg

At/Near Neutral Rate?: The Market Thinks So (and that we'll be Lower Next Year)...



Data Sources: Bloomberg

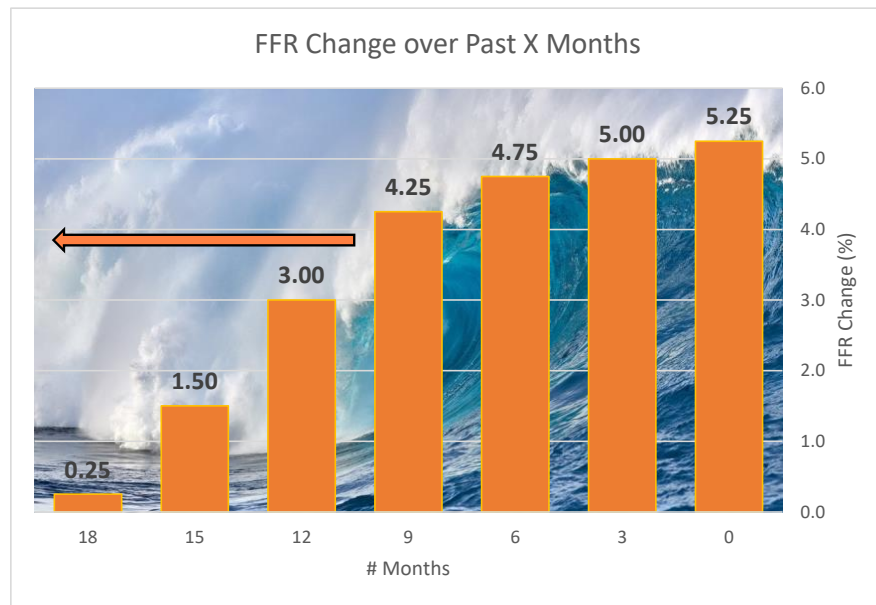
Inflation: I Know, It's Not the 70s, But the Path Back to Target Might Be Bumpy....



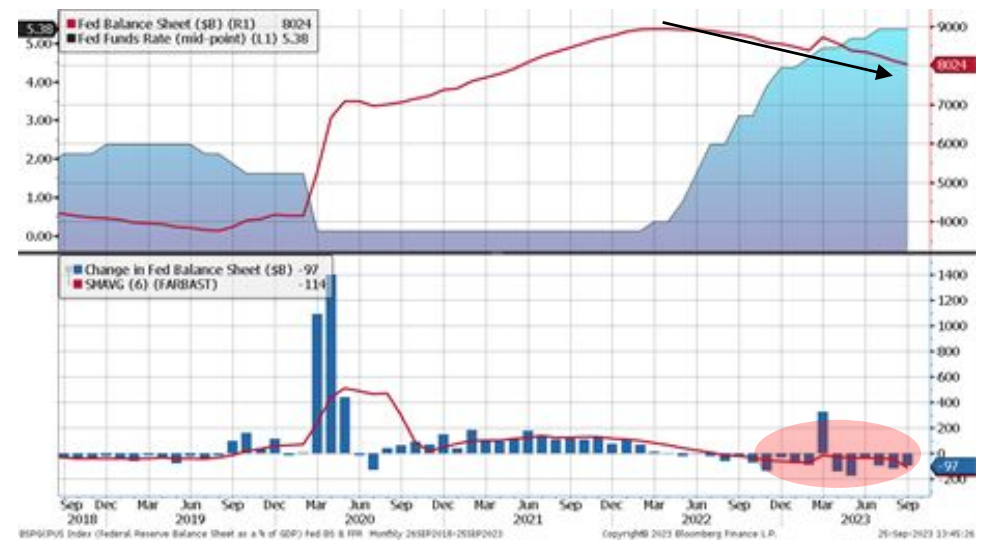
Data Sources: Bloomberg

Tightening Continues, Even If the FFR Target Rate Remains Unchanged

Impact of Fed tightening known to have long & variable lag



Fed BS run-off (~\$1T/year)



Data Sources: Bloomberg

County Employees Retirement System

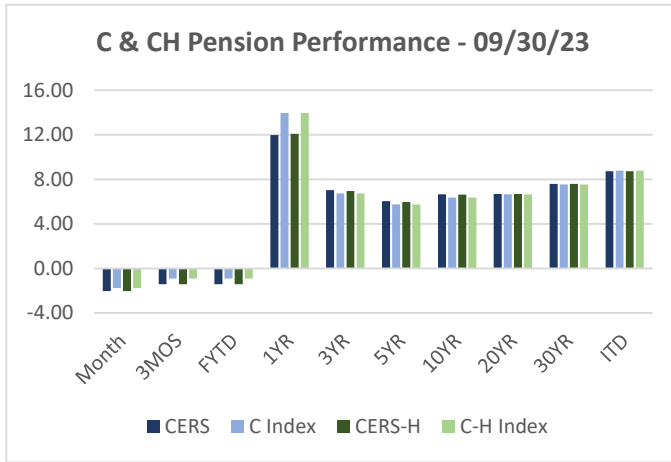
Performance and Asset Allocations

Quarter Ending: September 30, 2023

September
2023

KPPA MONTHLY PERFORMANCE UPDATE

CERS/CERS-H



CERS & CERS-HAZ - PENSION FUND PLAN NET RETURNS - 09/30/23

Plan	Market Value	Month	3 Months	Fiscal YTD	1 Year	3 Years	5 Years	10 Years	20 Years	30 Years	ITD
CERS	8,545,416,917.22	-2.02	-1.42	-1.42	11.99	7.02	6.04	6.66	6.69	7.59	8.75
KY Ret. CKERS Plan IPS Index		-1.75	-0.89	-0.89	13.96	6.73	5.76	6.37	6.65	7.53	8.78
CERS- H	2,991,683,835.41	-2.03	-1.42	-1.42	12.10	6.95	5.97	6.64	6.68	7.58	8.75
KY Ret. CERS Haz Plan IPS Index		-1.75	-0.89	-0.89	13.96	6.73	5.76	6.37	6.65	7.53	8.78

KPPA PENSION FUND UNIT - NET RETURNS - 09/30/23 - PROXY PLAN ASSET PERFORMANCE

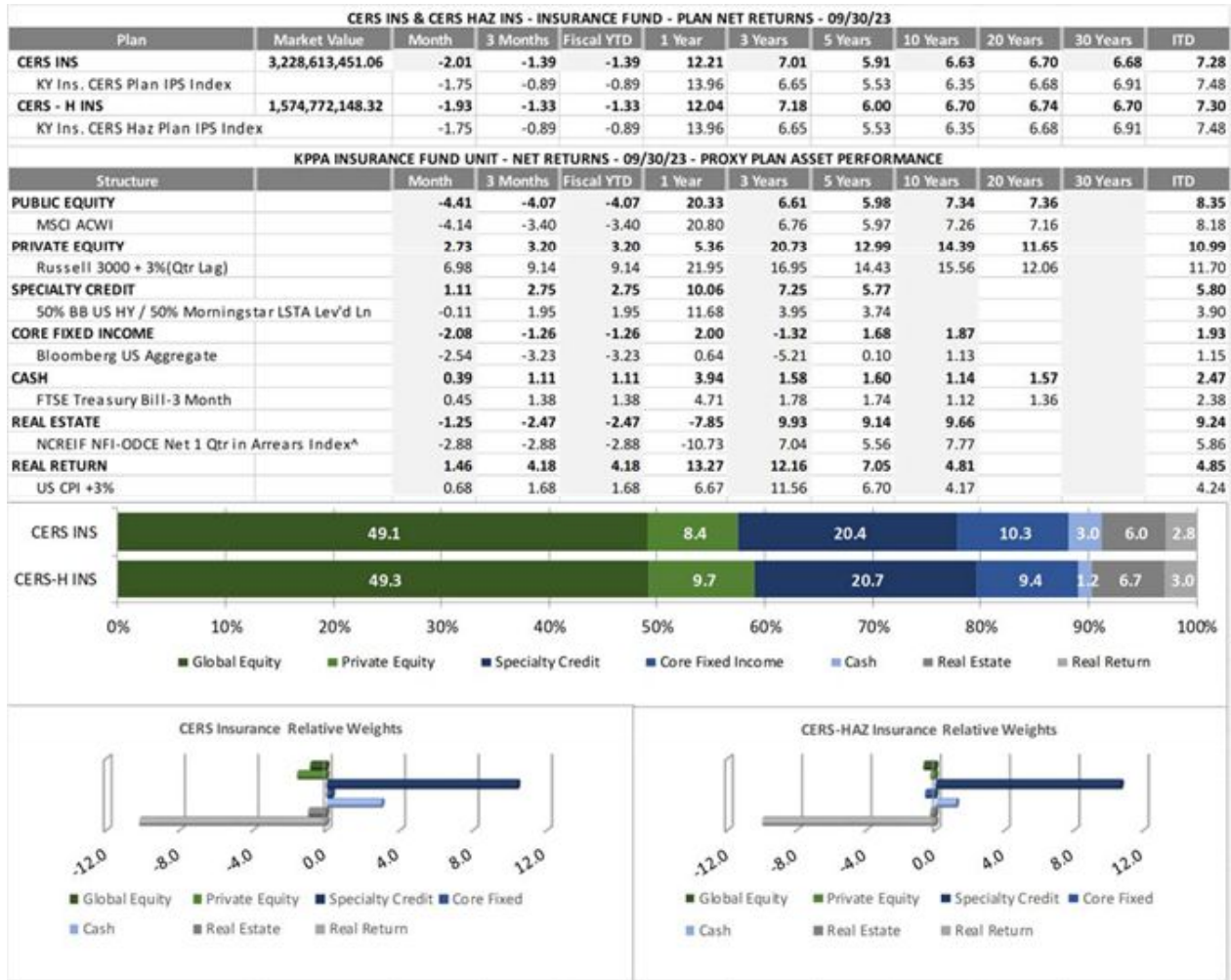
Structure	Month	3 Months	Fiscal YTD	1 Year	3 Years	5 Years	10 Years	20 Years	30 Years	ITD
PUBLIC EQUITY	-4.39	-4.04	-4.04	20.48	6.63	6.01	7.27	7.39	8.36	10.02
MSCI ACWI	-4.14	-3.40	-3.40	20.80	6.78	5.99	7.25	7.37	8.18	9.88
PRIVATE EQUITY	2.40	2.71	2.71	3.07	17.97	13.31	13.41	11.87		11.81
Russell 3000 + 3%(Qtr Lag)	6.98	9.14	9.14	21.95	16.95	14.43	15.56	12.30		12.14
SPECIALTY CREDIT	1.07	2.64	2.64	9.63	7.15	5.78				5.91
50% BB US HY / 50% Morningstar LSTA Lev'd Ln	-0.11	1.95	1.95	11.68	3.95	3.74				3.90
CORE FIXED INCOME	-2.02	-1.14	-1.14	2.13	-1.15	1.87	2.18			2.22
Bloomberg US Aggregate	-2.54	-3.23	-3.23	0.64	-5.21	0.10	1.13			1.15
CASH	0.39	1.12	1.12	3.96	1.60	1.72	1.28	1.73	2.71	3.32
FTSE Treasury Bill-3 Month	0.45	1.38	1.38	4.71	1.78	1.74	1.12	1.36	2.35	2.94
REAL ESTATE	-1.28	-2.63	-2.63	-7.75	10.24	9.19	9.33	7.97	6.52	6.53
NCREIF NFI-ODCE Net 1 Qtr in Arrears Index^	-2.88	-2.88	-2.88	-10.73	7.04	5.56	7.77	6.86	7.53	6.35
REAL RETURN	1.40	4.71	4.71	14.98	13.61	7.27	5.04			5.12
US CPI +3%	0.68	1.68	1.68	6.67	12.54	6.67	4.11			4.19



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Overview

Markets continued to struggle for direction in the first quarter of Fiscal 2024 as all major global equity markets produced negative performance during the quarter and finished on the back foot with September marking the largest monthly decline of 2023. Realized rates and expectations for the future path of rates weighed heavily on markets as the US 10Y bond yield spiked to its highest level since 2007 during the quarter and the Treasury curve inverted to a level not seen in decades as markets reassessed the higher for longer narrative and the potential impacts on growth and markets.

After a strong first quarter of 2023, real GDP moderated to a 2.1% during the second quarter before surprisingly rebounding to 4.9% in the third quarter, the best quarterly growth rate in nearly two years

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fueled by consumer spending on goods and services, inventory investments and government spending. While this acceleration and the strength of recent data suggest a recession may not be imminent, expectations remain for a sharp slowdown in growth over the coming quarters as global central banks are intensifying their monetary policy tightening, with money, credit, and liquidity all decisively retreating. Over the past year and a half, the Fed, European Central Bank, Bank of Japan, and Bank of England have withdrawn a total of \$4.7trn from circulation, a significant drain but less than half of the amount added during the post-pandemic quantitative easing programs. Although equities have derated in absolute terms over the past three months, valuations remain relatively expensive relative to safe haven assets with the equity risk premium still quite low from an asset allocation perspective. Although the Q3 reporting season is delivering a relatively high proportion of EPS beats, it has not driven further upward EPS revisions and EPS revisions ratio has fallen sharply as earnings momentum appears to be stalling. Given the numerous headwinds, risk markets are likely to trade range bound with a mild bias toward the downside.

The CERS and CERS-H Pension portfolios both produced a return of -1.42% during the quarter while the CERS Insurance portfolio returned -1.39% and the CERS-H Insurance portfolio produced a return of -1.33% compared to their benchmark performance of -0.89%. Across portfolios, underperformance in the Public Equity and Private Equity portfolios were the primary drivers of relative performance during the quarter. While the Public Equity portfolio suffered from stock selection and style bias, the relative underperformance of the Private Equity portfolio is primarily due to the misalignment and timing of the benchmark. The current specified benchmark of Russell 3000 + 3% based on a quarter lag benefitted from the strong performance of the Public Equity markets during the quarter that ended June 2023 and was not reflective of the actual performance of Private Equity markets for the quarter ending September 2023. The underweight to Real Return was also a modest drag on performance as it was on of the few assets classes that in aggregate posted positive performance for the quarter. The overweight in the Specialty Credit portfolio was a positive contributor to performance as it outperformed on a relative basis and was one of the best performing asset classes during the quarter. The portfolios also continued to benefit from strong relative performance in the Core Fixed Income portfolio as Staff maintained an overall short duration profile which outperformed as rates rose. Since the end of the quarter, staff has been rebalancing the Core portfolio to lengthen duration as all in yields have become more compelling and rates may be nearing their cycle peaks.

Public Equity

Global equity markets were notably weaker during the quarter, falling -3.40% per the MSCI ACWI. This brought the asset class return to 20.80% for the one-year period. US markets held up slightly better than

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international markets during the period (-3.25% versus -3.49%), contributing to them edging out their counterparts for the twelve-month period (20.46% versus 20.19%).

After a good start to the quarter, US markets turned lower in July as thoughts of a potential soft landing began to slide and concerns about extended policy rates and their impact took hold. Interest rates spiked with the 10-year Treasury gaining 100bps to reach new 15-year highs. As yields pushed higher, risk assets sensitive to higher borrowing costs re-priced to the downside (smaller caps and those perceived to be lower quality in particular). With the policy rate now firmly above neutral it follows that slowing economic activity is likely, as businesses and consumers start to feel the costs. The narrow market storyline continued as mega-cap tech dominated, while the average stock lost ground during the quarter (the S&P 500 has returned approximately 13% YTD, while the “magnificent 7” have returned an average 83%), the market now at historically high concentration. Despite value holding up slightly better than growth during the quarter (-3.15% versus -3.34%), market winners this year have been large cap, growth, and quality. Large cap growth has returned 24.98% YTD, while small cap growth has returned 5.24%. On the other hand, large cap value has returned less than 2%, while small cap value has fallen roughly 50bps.

Most Non-US developed markets were weaker during the quarter. This was primarily caused by slowing economic growth and persistently high inflation in the face of continued rate hikes. Underpinning the slower growth is the financial tightening that has caused a deceleration in consumption (increasing but at a slower rate), inventory destocking, and weaker manufacturing. Despite the growth deceleration, company earnings have come in ahead of expectations as they had assumed a hard landing recession. Supply chains appear to have normalized, which has led to reduced input costs which has helped to bolster earnings.

The KPPA global equity returned -4.11% during the quarter versus its benchmark return of -3.40%. Relative underperformance is primarily the result of allocation within the US equity portion of the portfolio, and weaker stock selection within the NonUS mandates, particularly those with a growth style bias.

Within the US equity allocation, the portfolio trailed its index by 24bps (-3.49% vs -3.25%). This was primarily due to allocation. The portfolio tilts towards value and smaller in market cap. The value tilt in the portfolio was slightly beneficial; however, the smaller size bent hampered relative performance. Small caps underperformed their large cap counterparts by just under 2%.

The international equity allocation underperformed during the quarter, falling -5.05% versus a benchmark return of -3.49%. Weakness was most pronounced in the growth portion of the portfolio as any strategy whether developed or emerging market with a growth bias struggled. This was partially

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offset by the value portion of the portfolio which held up better, with two of the three mandates providing positive absolute performance.

For the trailing 12 months, the KPPA global equity portfolio returned 20.39%, trailing its benchmark by 41bps. The US equity portion of the portfolio returned 19.46% versus 20.46%. Underperformance can be attributed to the factor tilts in the portfolio (value and smaller) as stock selection among most mandates was positive. The NonUS equity portion of the portfolio returned 21.62% versus 20.19%. While stock selection was mixed, relative outperformance was driven by strong performance in the value biased mandates.

Core Fixed Income

Rates across the U.S. Treasury curve finished the quarter higher, with the long end rising the most. The yield on the 2-year Treasury, which is highly sensitive to expectations for the Fed Funds rate, started the quarter at 4.90% and closed September at 5.04%. The 10-year Treasury, which is often used as a benchmark for pricing home mortgages, began the quarter trading at 3.84% closing at 4.57%. Lastly, the yield on the 30-year bond, which tends to be highly sensitive to changes in long-term economic expectations, increased from 3.86% to 4.70%.

The Bloomberg U.S. Aggregate Bond Index returned -2.54% for September resulting in a quarterly loss of 3.23% as U.S. Treasury yields rose across the curve and credit spreads rose. Corporate bonds were the best performing spread sector for the quarter, generating 84 basis points of excess returns. Commercial mortgage-backed securities (CMBS) were next, outperforming similar duration Treasuries by 35 basis points. Asset-backed securities (ABS) rounded out the top three closing the quarter generating 29 basis points of excess returns.

The Core Fixed Income portfolio posted a loss of 2.02% for the month and a loss of 1.14% for the quarter, outperforming the benchmark by 0.52% for the month and 2.09% for the quarter. The relative outperformance is directly attributable to the underweight overall duration as rates rose and allocations to the Corporate and ABS sectors within our mandates.

Specialty Credit - Private Equity – Real Return – Real Estate

The Bloomberg US High Yield Index returned -1.18% in September and 0.46% over the quarter. Lower rated issues outperformed for the sixth consecutive month. BB, B and CCC-rated issues returned -1.46%, -1.03% and -0.81%, respectively in September. BB, B and CCC-rated issues returned -0.43%, 0.83% and 2.39% during the quarter, respectively. This continued the year-to-date trend of risk outperforming

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quality, as CCC-rated issues have outperformed BB-rated issues by 8.33% year-to-date. U.S. high yield bonds saw their worst monthly total return since February as resilient economic data and hawkish Federal Reserve commentary drove interest rates sharply higher. Overall spreads ended the month 23 basis points wider and 4 basis points wider over the quarter.

Leveraged loans outperformed high yield bonds for the fifth time in six months as rising rates and steady CLO issuance provided a tailwind for the asset class. The Morningstar LSTA US Leveraged Loan Index returned 0.96% in September, ending the quarter with a gain of 3.46%. Primary issuance jumped 40% versus the prior month to the highest issuance since November 2021. Despite persistent concerns about maturity walls in the leveraged finance market, just 10% of leveraged loans mature before 2026, down from 20% at the start of the year.

Default and distressed exchange activity moderated in September with one default and one distressed exchange completed. The quarter saw five defaults and four distressed exchanges. There have been seventeen defaults thus far year-to-date, surpassing the seven defaults during all of 2022. However, as of September, bond and leveraged loan default rates ended the quarter at 1.32% and 1.90%, respectively, both below historical averages.

The Specialty Credit portfolio returned 1.07% for the month ending September and 2.64% for the quarter outperforming the custom benchmark for both time periods by 1.18% and 0.69%, respectively. However, the portfolio has performed better over longer time periods as represented by the 3-Year and 5-Year returns outperforming the benchmark by 3.20% and 2.04%, respectively.

Markdowns in Real Estate continued during the quarter, with the portfolio still seemingly affected more by higher cap rates than declining property-level performance. The portfolio's exposures to industrial, self-storage, student housing, medical office, and senior living continued to experience positive rent growth and pricing. From a valuation perspective, a look at the secondaries market suggests that there still may be more room to fall, with real estate funds pricing at significantly wider discounts than other strategies like private equity, credit, and infrastructure. Public markets sent a similarly bearish signal, with the US REIT index RMZ falling 7% during the quarter. That pushed the benchmark to a -2% YTD return and extends the 25% drop it had in 2022. While starting to pick up, real estate deal volume and price discovery remain muted, with new deals remaining concentrated in the industrial and multifamily sectors. However, even those sectors have seen new construction starts drop to 10-year lows because of higher financing and construction costs. The Real Estate portfolio returned -2.63% for the quarter and -7.75% for the trailing twelve months, outperforming the custom benchmark for both time periods by 0.25% and 2.98%, respectively.

Commodities were mixed during the quarter. Oil prices rose driven by supply cuts from the world's largest producers along with data showing US oil inventories fell to their lowest level in over 12 months.

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Natural gas prices moved higher for the second straight quarter after six months of significant declines. Prices were up 4.7% for the third quarter but are still down a massive -56.7% for the past twelve months. Gold declined for the second straight quarter and other precious metals slumped as the DXY dollar index rose and prices were down across the agricultural complex. The Real Return portfolio returned 4.71% for the quarter and 14.98% for the trailing twelve months, outperforming the custom benchmark for both time periods by 3.03% and 8.31%, respectively. MLP exposure has been the main driver of performance in the Real Return portfolio, returning nearly 30% over the last year. Strong cash flows, disciplined capex, and consolidation have contributed to the industry's 40% annualized returns for the past 3 years since its crash during the early months of COVID.

Liquidity

Federal Reserve officials left interest rates unchanged at the September meeting following a 25 basis point hike in July, continuing the alternate-meeting pace of hikes they have followed since May. The surprise came in the dot plot, where the median projection indicated one more hike in 2023 and just two cuts in 2024 (down from four 2024 cuts in the June projection). The Federal Reserve is sticking to the higher-for-longer message they have been signaling for the last several months, despite downside risks to growth from labor strikes and rising oil prices. Short rate markets are pricing roughly 50% odds of one more rate hike this year.

As of September, the benchmark 3-month T-Bill returned 0.45% for the month and finished the quarter returning 1.38%. The cash portfolio returned 0.39% and 1.12% for the month and quarter, respectively. The underperformance is attributable to lower rates offered by overnight repurchase agreements which is tied to the Fed Funds rate relative to market yields of the 3-month T-Bill. Since the Federal Reserve has begun to slow interest rate hikes, the difference in deposit rates compared to market rates will continue to compress going forward.

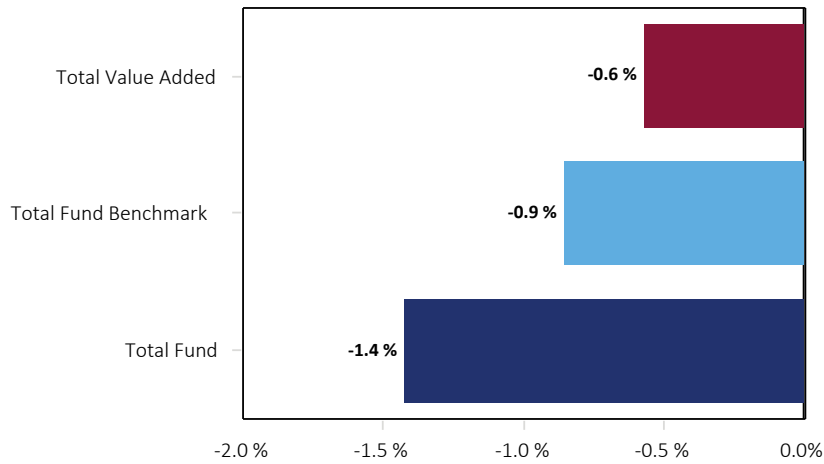
End of September key cash market interest rates: Fed Funds Effective 5.33%, 1M T-Bill 5.34% and 3M T-Bill 5.45%.

Total Fund Attribution

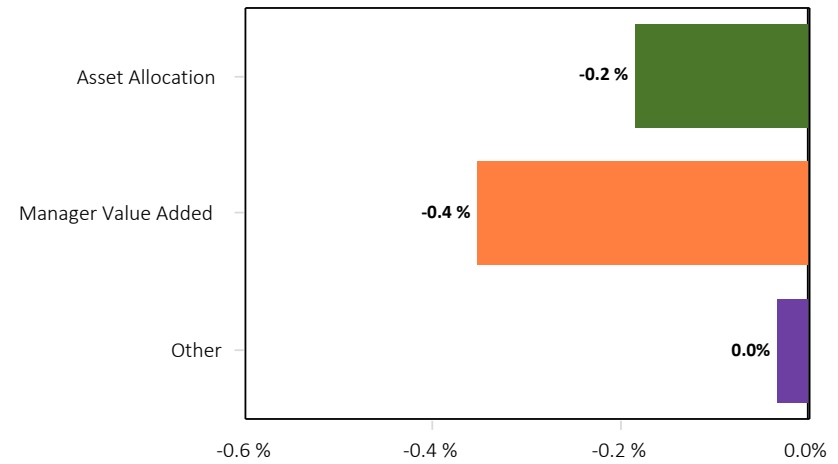
CERS Pension Plan

Periods Ended 1 Quarter Ending September 30, 2023

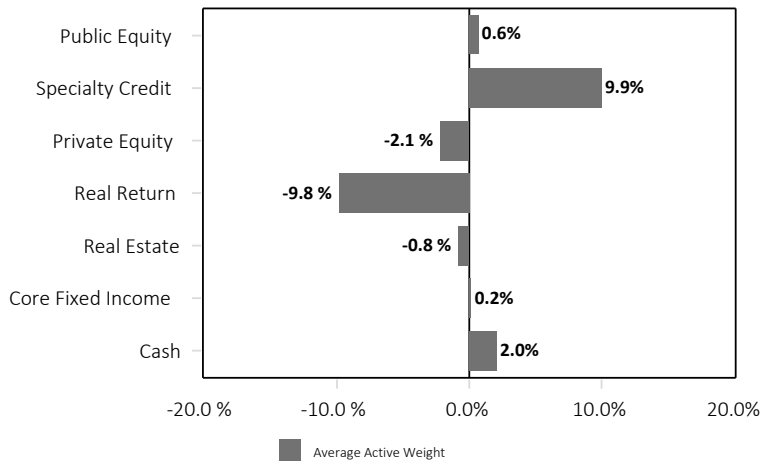
Total Fund Performance



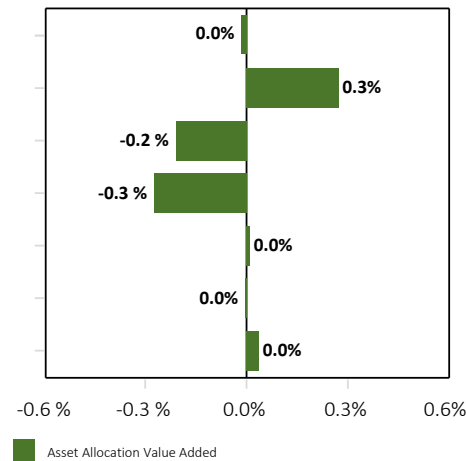
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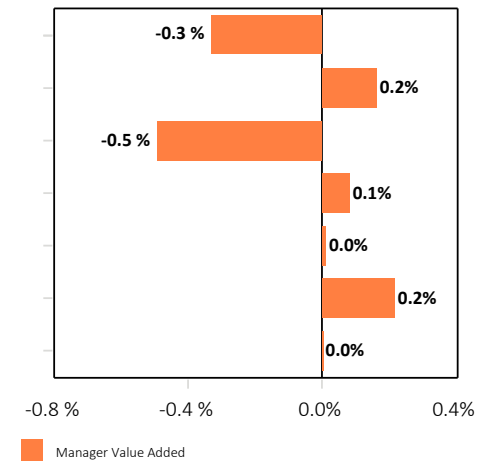
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Asset Allocation Value Added:-0.2 %



Total Manager Value Added:-0.4 %

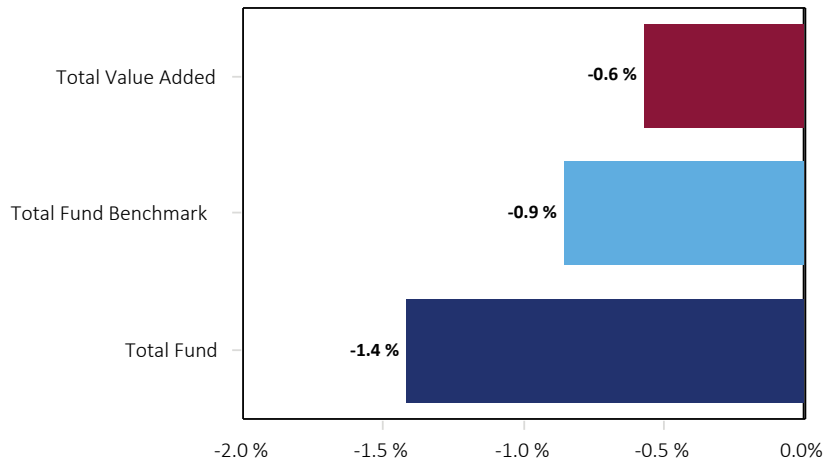


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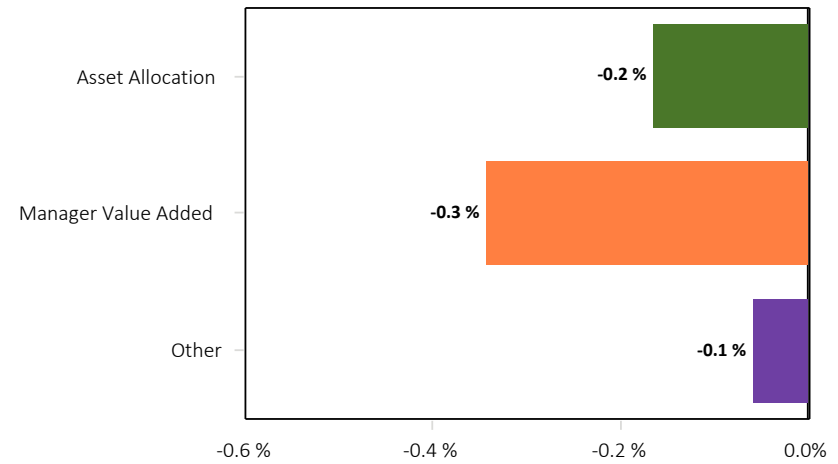
CERS (H) Pension Plan

Periods Ended 1 Quarter Ending September 30, 2023

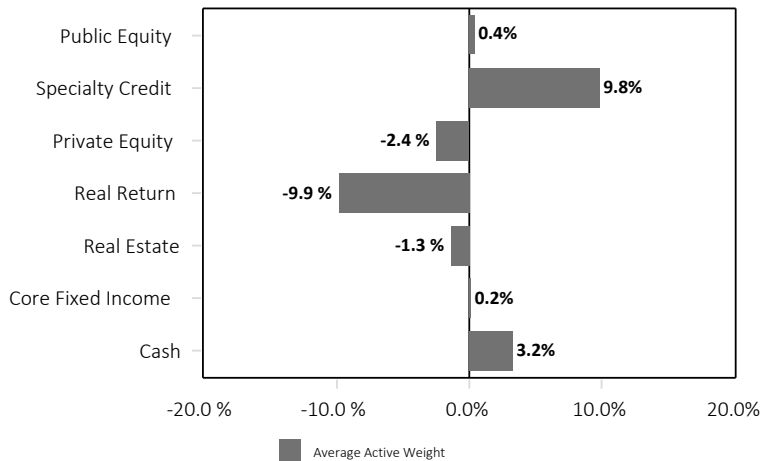
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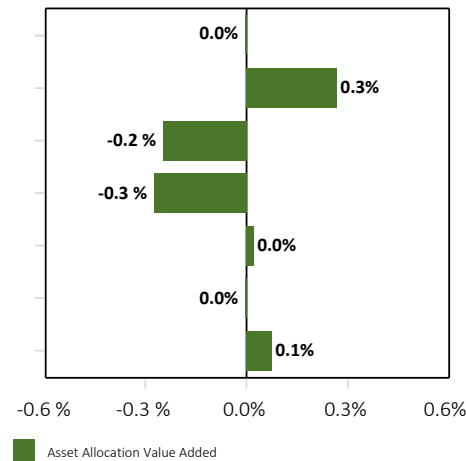
Total Value Added:-0.6 %



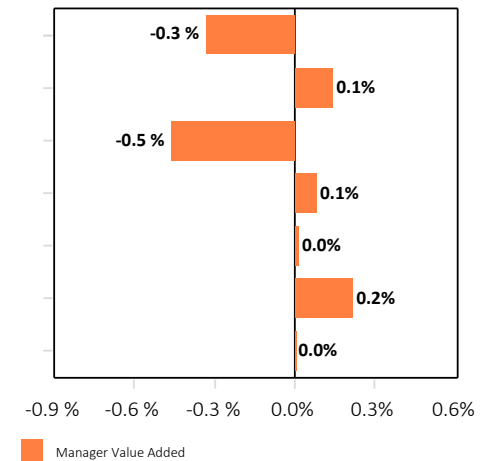
Total Asset Allocation:-0.2 %



Asset Allocation Value Added:-0.2 %



Total Manager Value Added:-0.3 %

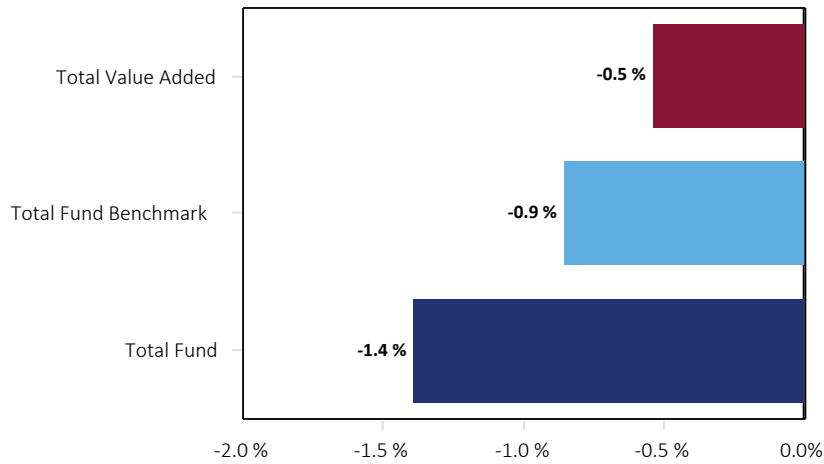


Total Fund Attribution

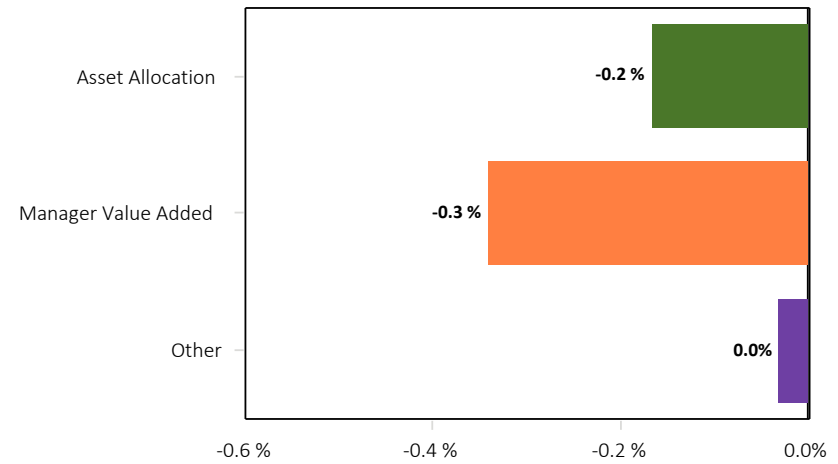
CERS Insurance Plan

Periods Ended 1 Quarter Ending September 30, 2023

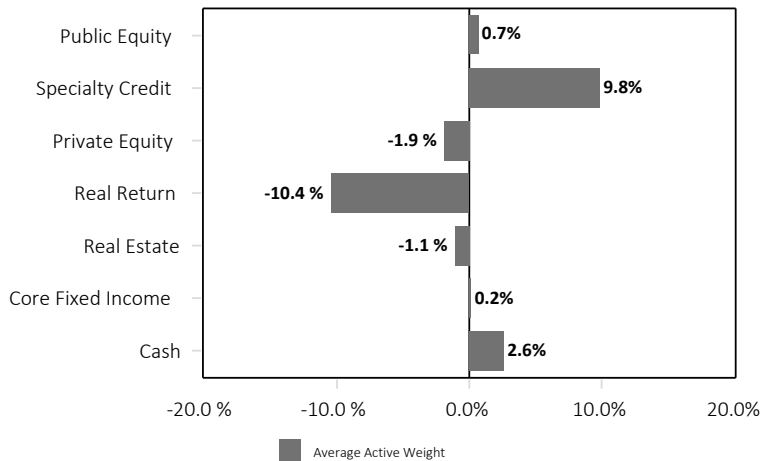
Total Fund Performance



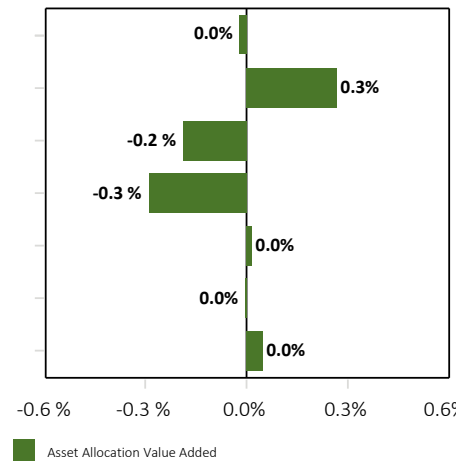
Total Value Added:-0.5 %



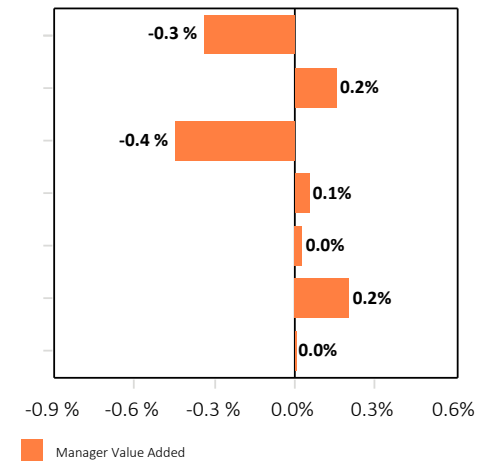
Total Asset Allocation:-0.2 %



Asset Allocation Value Added:-0.2 %



Total Manager Value Added:-0.3 %

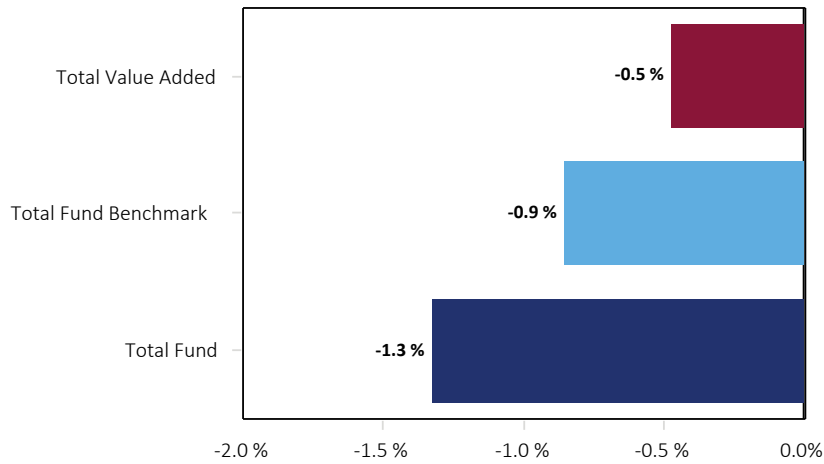


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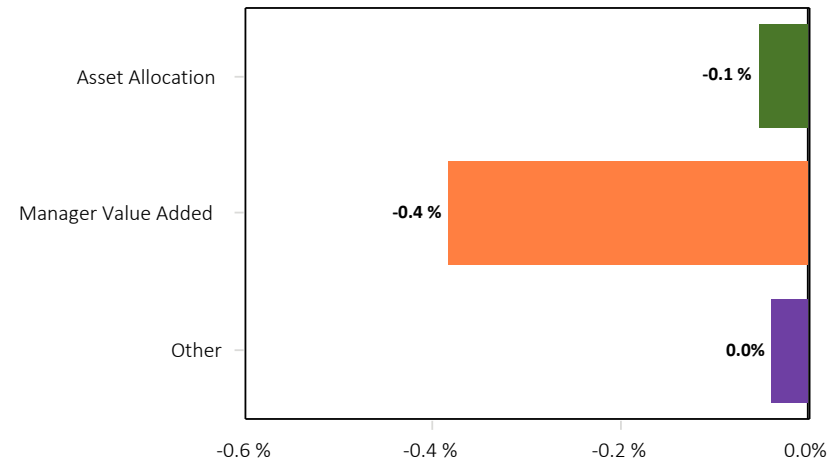
CERS (H) Insurance Plan

Periods Ended 1 Quarter Ending September 30, 2023

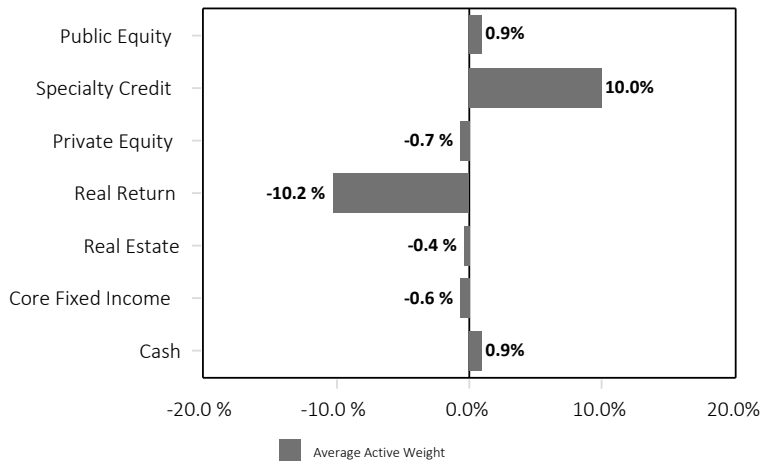
Total Fund Performance



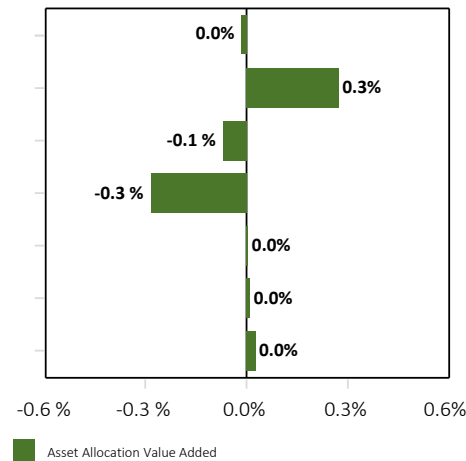
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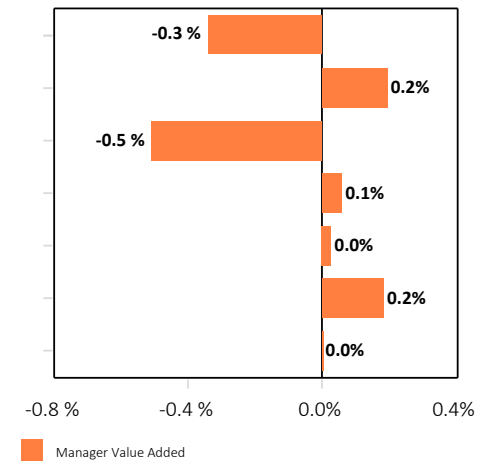
Total Asset Allocation:-0.1 %



Asset Allocation Value Added:-0.1 %



Total Manager Value Added:-0.4 %

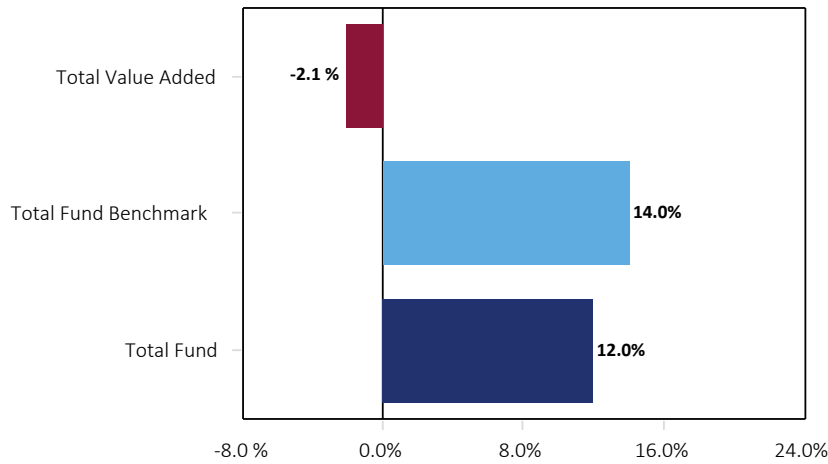


Total Fund Attribution

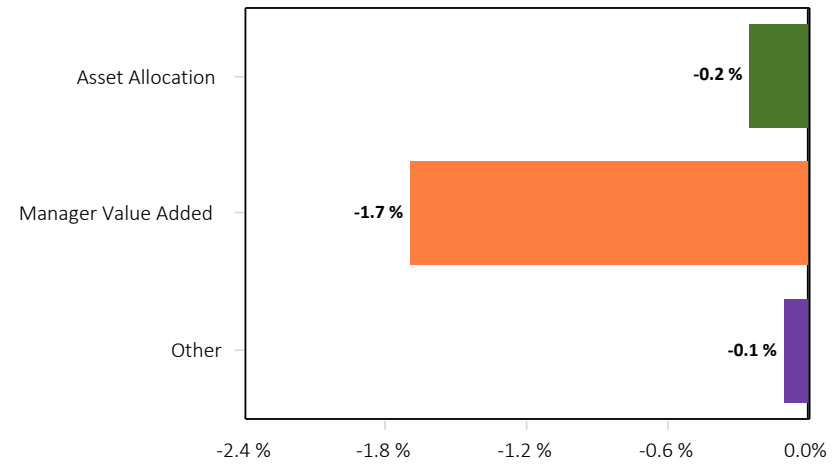
CERS Pension Plan

Periods Ended 1 Year Ending September 30, 2023

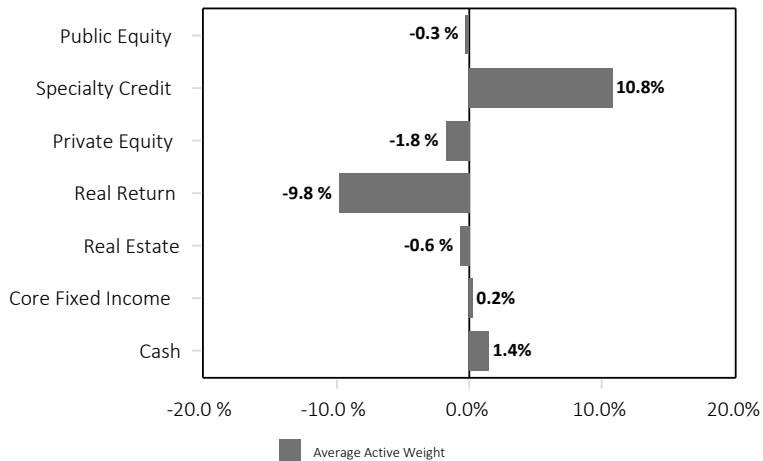
Total Fund Performance



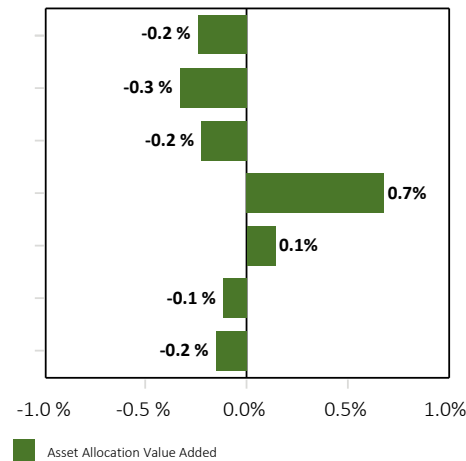
Total Value Added:-2.1 %



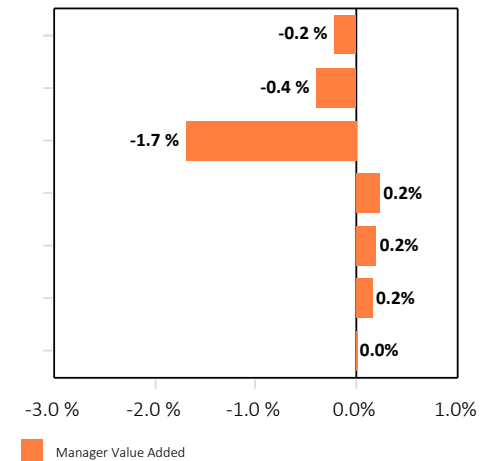
Total Asset Allocation:-0.2 %



Asset Allocation Value Added:-0.2 %



Total Manager Value Added:-1.7 %

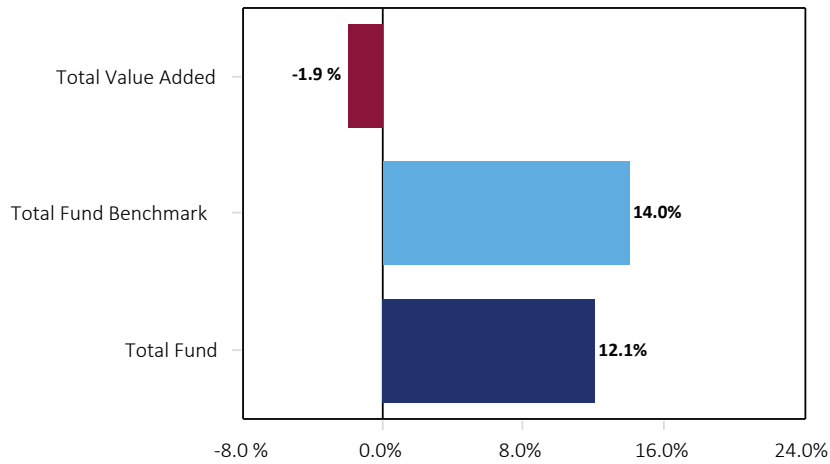


Total Fund Attribution

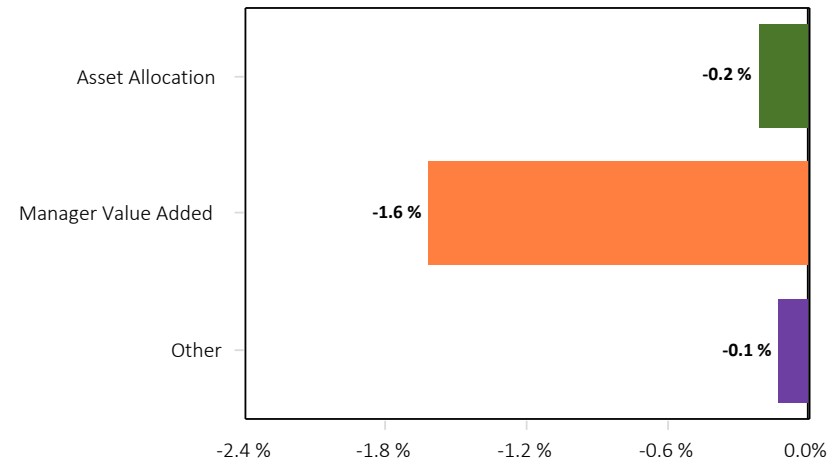
CERS (H) Pension Plan

Periods Ended 1 Year Ending September 30, 2023

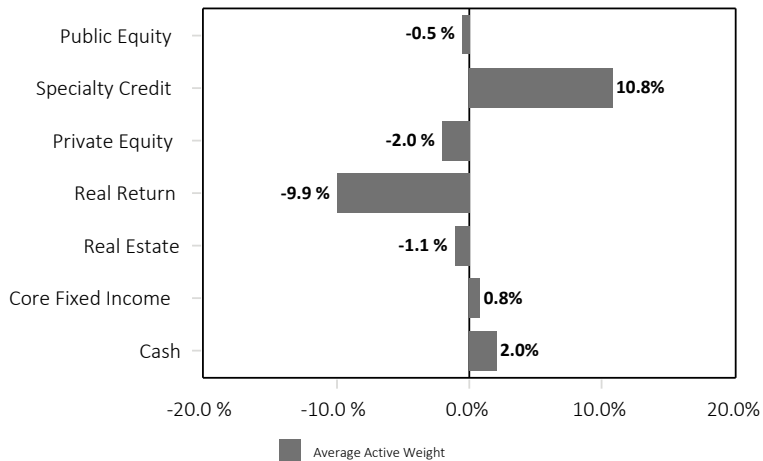
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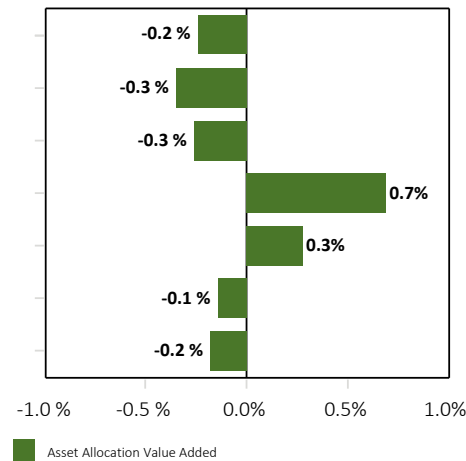
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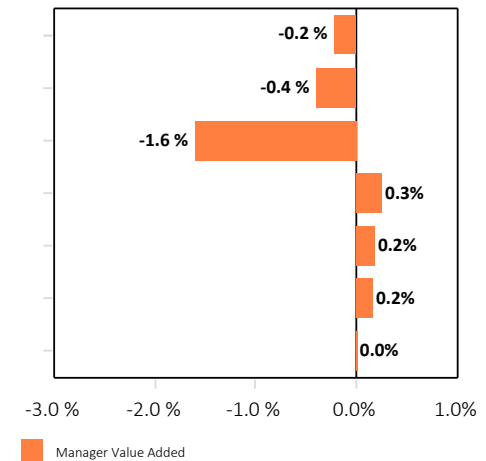
Total Asset Allocation:-0.2 %



Asset Allocation Value Added:-0.2 %



Total Manager Value Added:-1.6 %

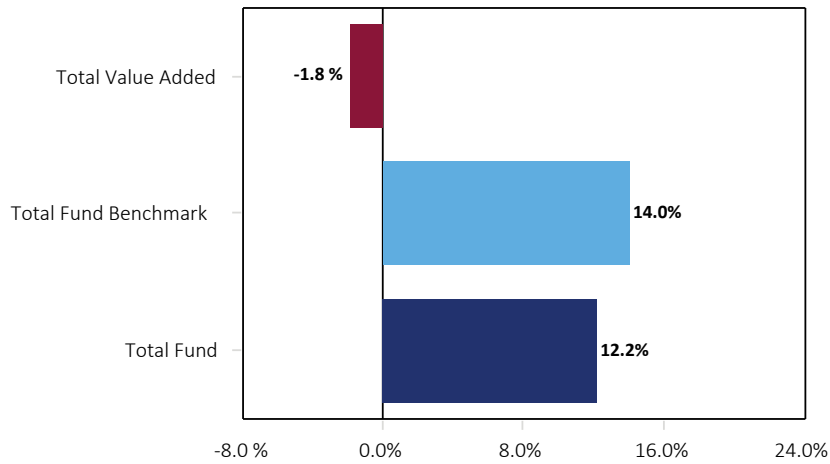


Total Fund Attribution

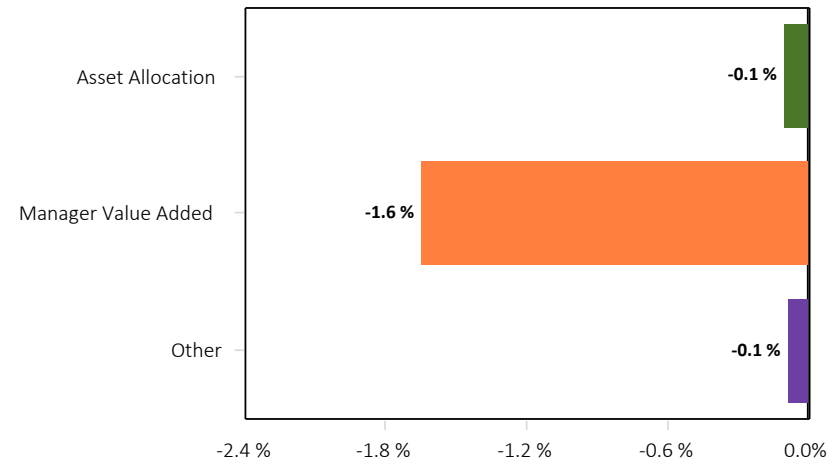
CERS Insurance Plan

Periods Ended 1 Year Ending September 30, 2023

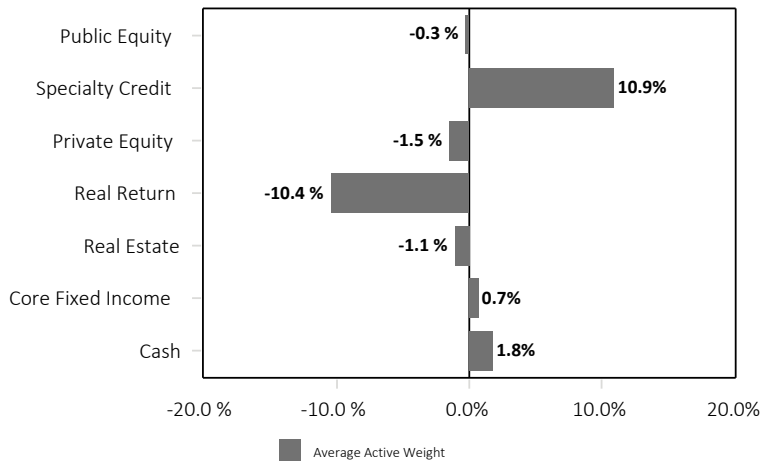
Total Fund Performance



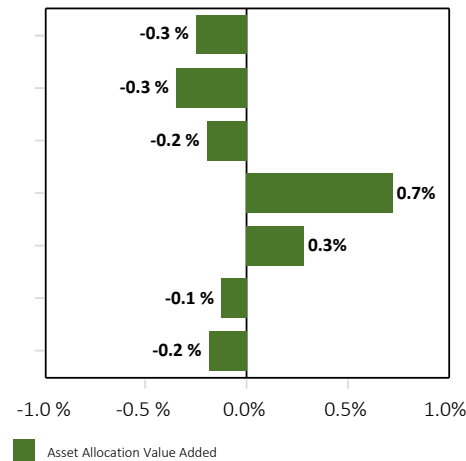
Total Value Added:-1.8 %



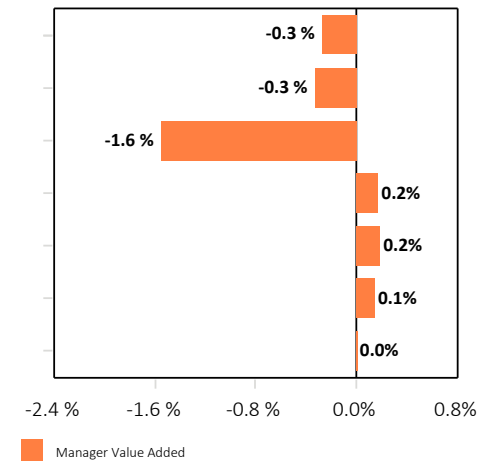
Total Asset Allocation:-0.1 %



Asset Allocation Value Added:-0.1 %



Total Manager Value Added:-1.6 %

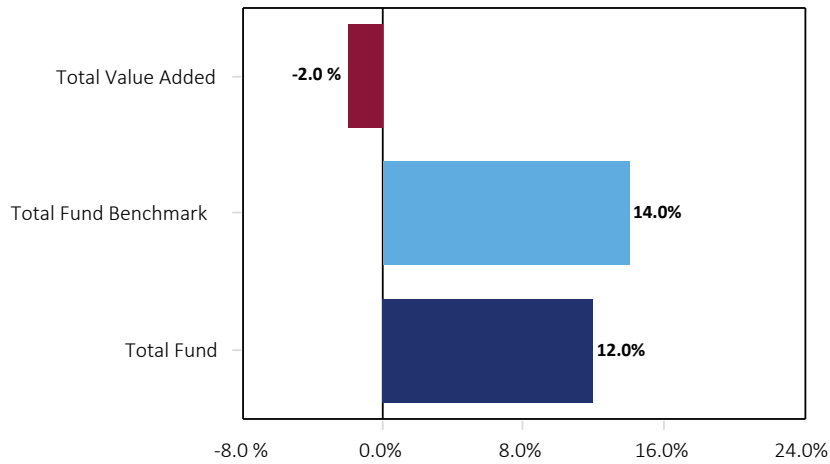


Total Fund Attribution

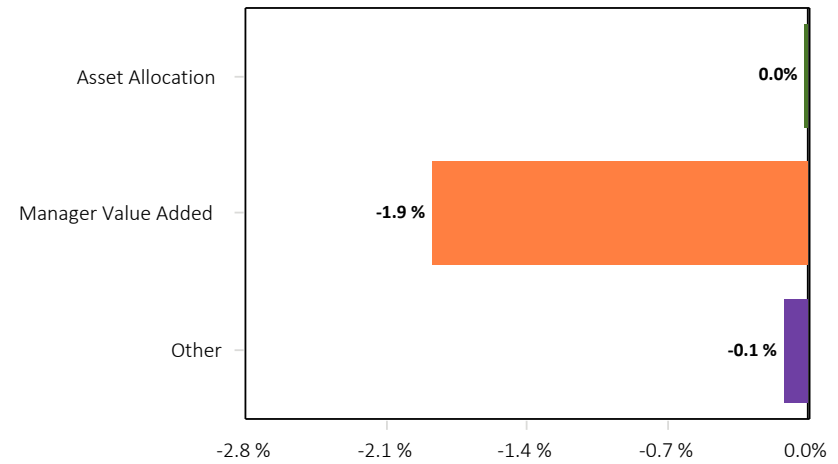
CERS (H) Insurance Plan

Periods Ended 1 Year Ending September 30, 2023

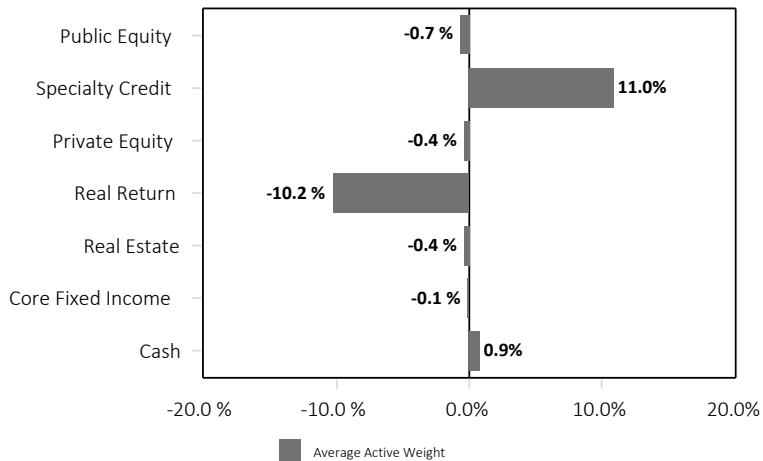
Total Fund Performance



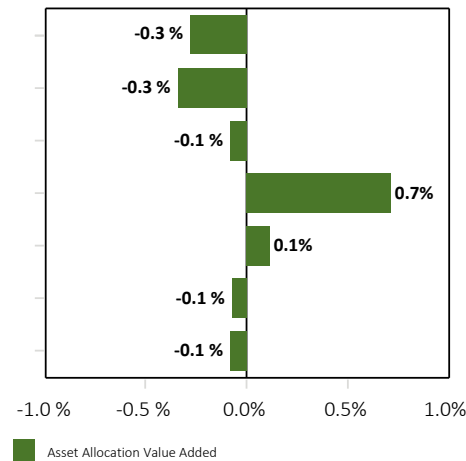
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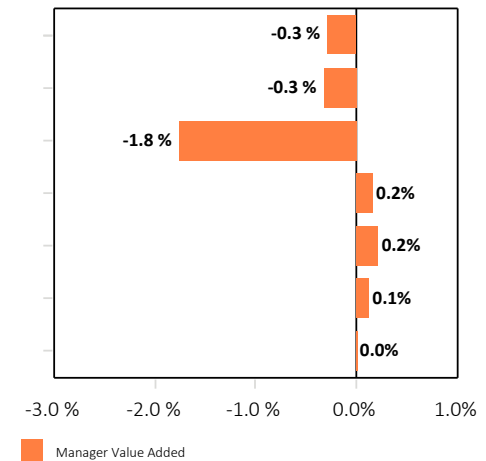
Total Asset Allocation:0.0%



Asset Allocation Value Added:0.0%



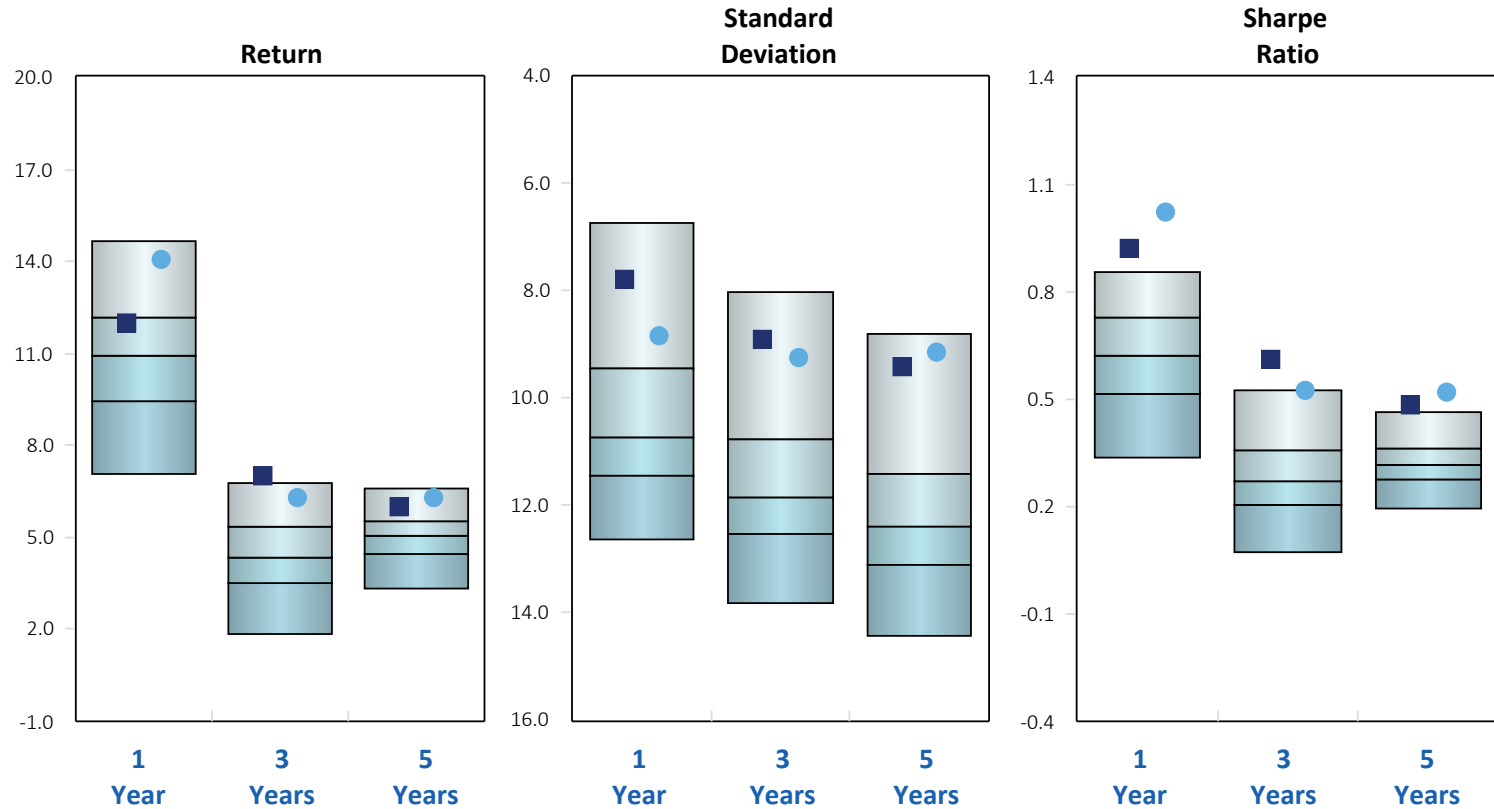
Total Manager Value Added:-1.9%



Plan Sponsor Peer Group Analysis - Multi Statistics

CERS Pension Plan vs All Public Plans-Total Fund

Periods Ended September 30, 2023



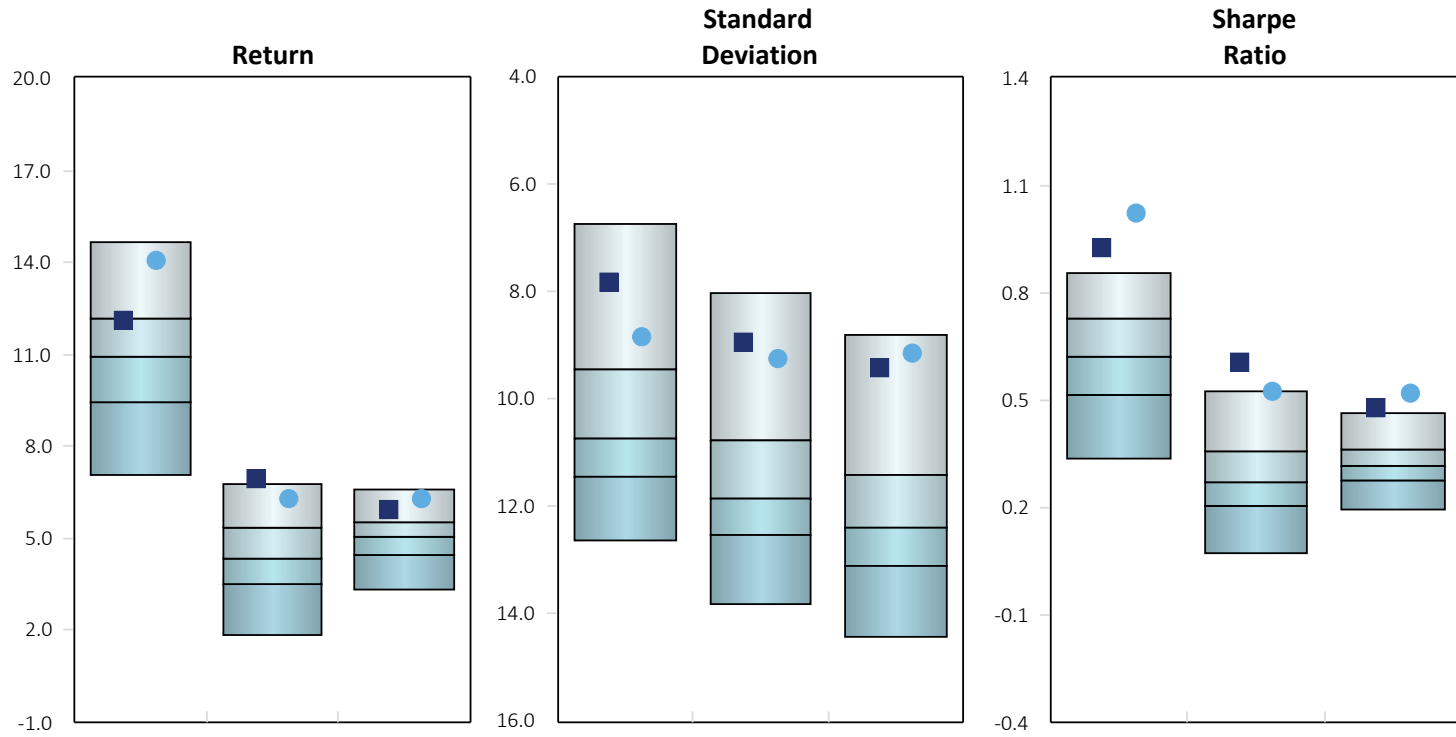
	1 Year	3 Years	5 Years	1 Year	3 Years	5 Years	1 Year	3 Years	5 Years
■ CERS Pension Plan	11.99 (30)	7.01 (4)	6.03 (11)	7.81 (9)	8.93 (7)	9.42 (6)	0.92 (3)	0.61 (3)	0.48 (4)
● CERS Pension IPS Index	14.04 (9)	6.32 (9)	6.29 (8)	8.85 (18)	9.26 (10)	9.16 (5)	1.03 (2)	0.53 (6)	0.52 (3)
5th Percentile	14.64	6.78	6.61	6.74	8.02	8.81	0.86	0.53	0.46
1st Quartile	12.19	5.37	5.53	9.45	10.79	11.41	0.73	0.36	0.36
Median	10.90	4.33	5.06	10.73	11.85	12.39	0.62	0.27	0.32
3rd Quartile	9.43	3.49	4.47	11.47	12.53	13.10	0.52	0.21	0.28
95th Percentile	7.05	1.86	3.36	12.63	13.84	14.44	0.34	0.08	0.19

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 September 30, 2023



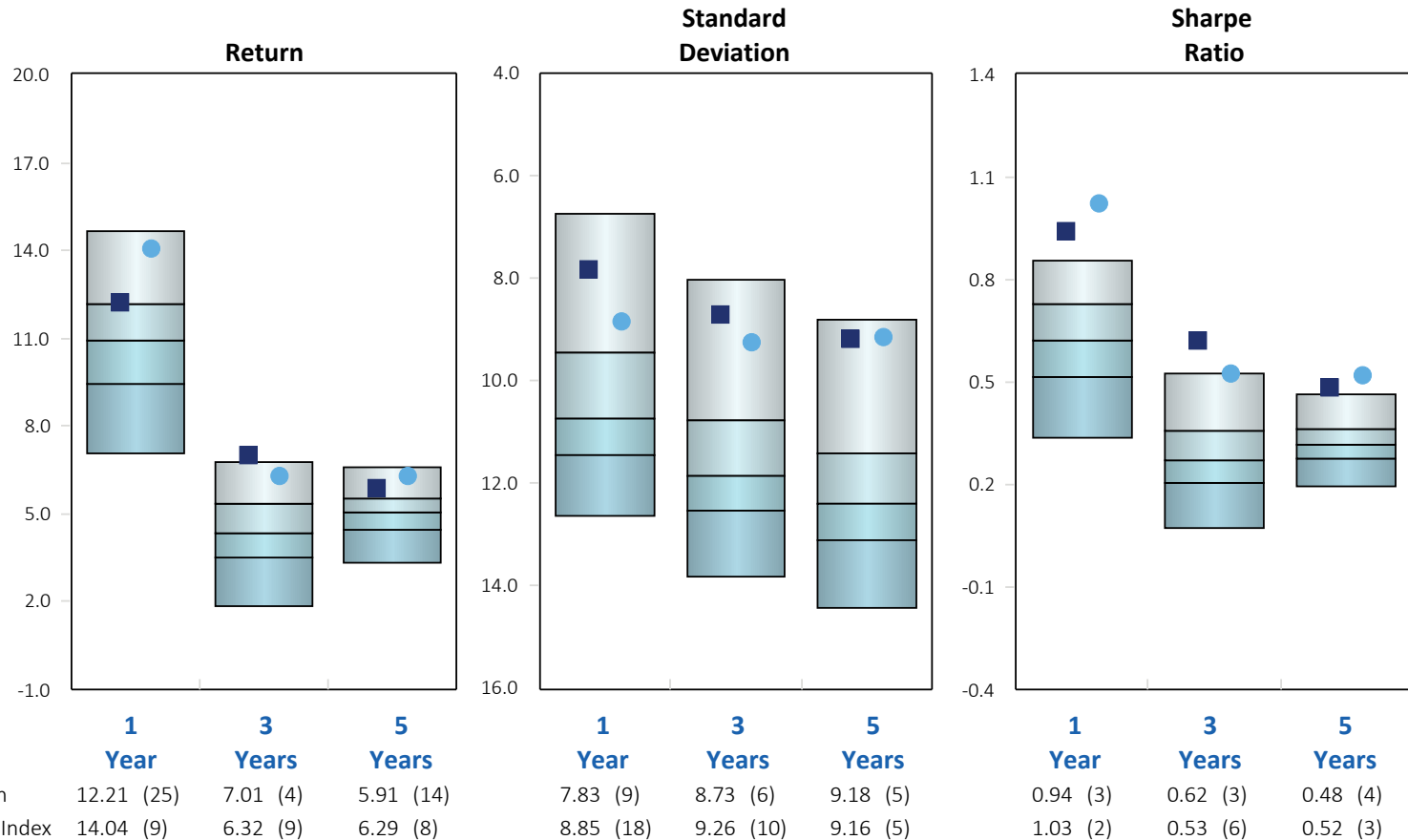
	1 Year	3 Years	5 Years	1 Year	3 Years	5 Years	1 Year	3 Years	5 Years
■ CERS (H) Pension Plan	12.10 (27)	6.94 (5)	5.97 (12)	7.84 (9)	8.95 (7)	9.42 (6)	0.93 (3)	0.60 (3)	0.48 (5)
● CERS (H) Pension IPS Index	14.04 (9)	6.32 (9)	6.29 (8)	8.85 (18)	9.26 (10)	9.16 (5)	1.03 (2)	0.53 (6)	0.52 (3)
5th Percentile	14.64	6.78	6.61	6.74	8.02	8.81	0.86	0.53	0.46
1st Quartile	12.19	5.37	5.53	9.45	10.79	11.41	0.73	0.36	0.36
Median	10.90	4.33	5.06	10.73	11.85	12.39	0.62	0.27	0.32
3rd Quartile	9.43	3.49	4.47	11.47	12.53	13.10	0.52	0.21	0.28
95th Percentile	7.05	1.86	3.36	12.63	13.84	14.44	0.34	0.08	0.19

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 September 30, 2023



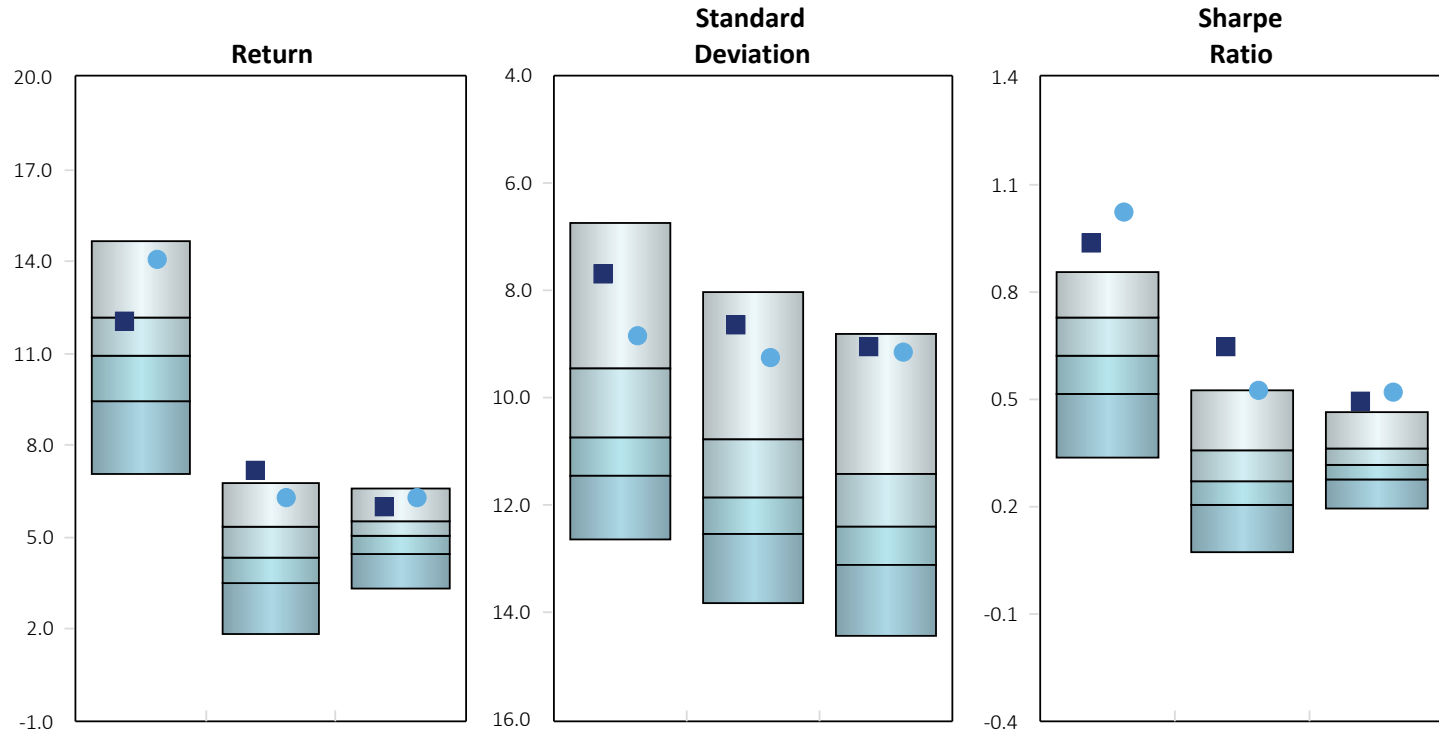
5th Percentile	14.64	6.78	6.61	6.74	8.02	8.81	0.86	0.53	0.46
1st Quartile	12.19	5.37	5.53	9.45	10.79	11.41	0.73	0.36	0.36
Median	10.90	4.33	5.06	10.73	11.85	12.39	0.62	0.27	0.32
3rd Quartile	9.43	3.49	4.47	11.47	12.53	13.10	0.52	0.21	0.28
95th Percentile	7.05	1.86	3.36	12.63	13.84	14.44	0.34	0.08	0.19

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 September 30, 2023



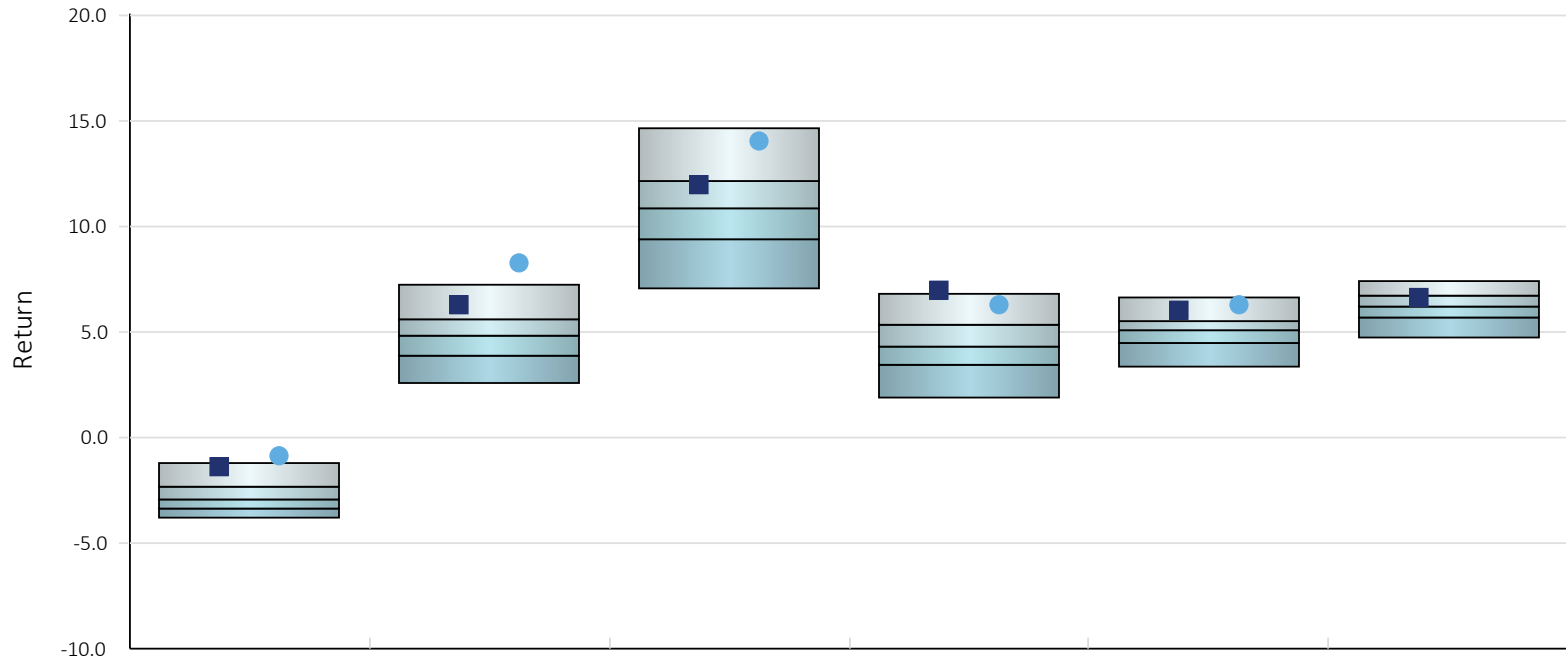
	1 Year	3 Years	5 Years	1 Year	3 Years	5 Years	1 Year	3 Years	5 Years
■ CERS (H) Insurance Plan	12.04 (29)	7.18 (3)	5.99 (12)	7.69 (8)	8.64 (6)	9.06 (5)	0.94 (3)	0.65 (3)	0.50 (4)
● CERS (H) Insurance IPS Index	14.04 (9)	6.32 (9)	6.29 (8)	8.85 (18)	9.26 (10)	9.16 (5)	1.03 (2)	0.53 (6)	0.52 (3)
5th Percentile	14.64	6.78	6.61	6.74	8.02	8.81	0.86	0.53	0.46
1st Quartile	12.19	5.37	5.53	9.45	10.79	11.41	0.73	0.36	0.36
Median	10.90	4.33	5.06	10.73	11.85	12.39	0.62	0.27	0.32
3rd Quartile	9.43	3.49	4.47	11.47	12.53	13.10	0.52	0.21	0.28
95th Percentile	7.05	1.86	3.36	12.63	13.84	14.44	0.34	0.08	0.19

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 September 30, 2023



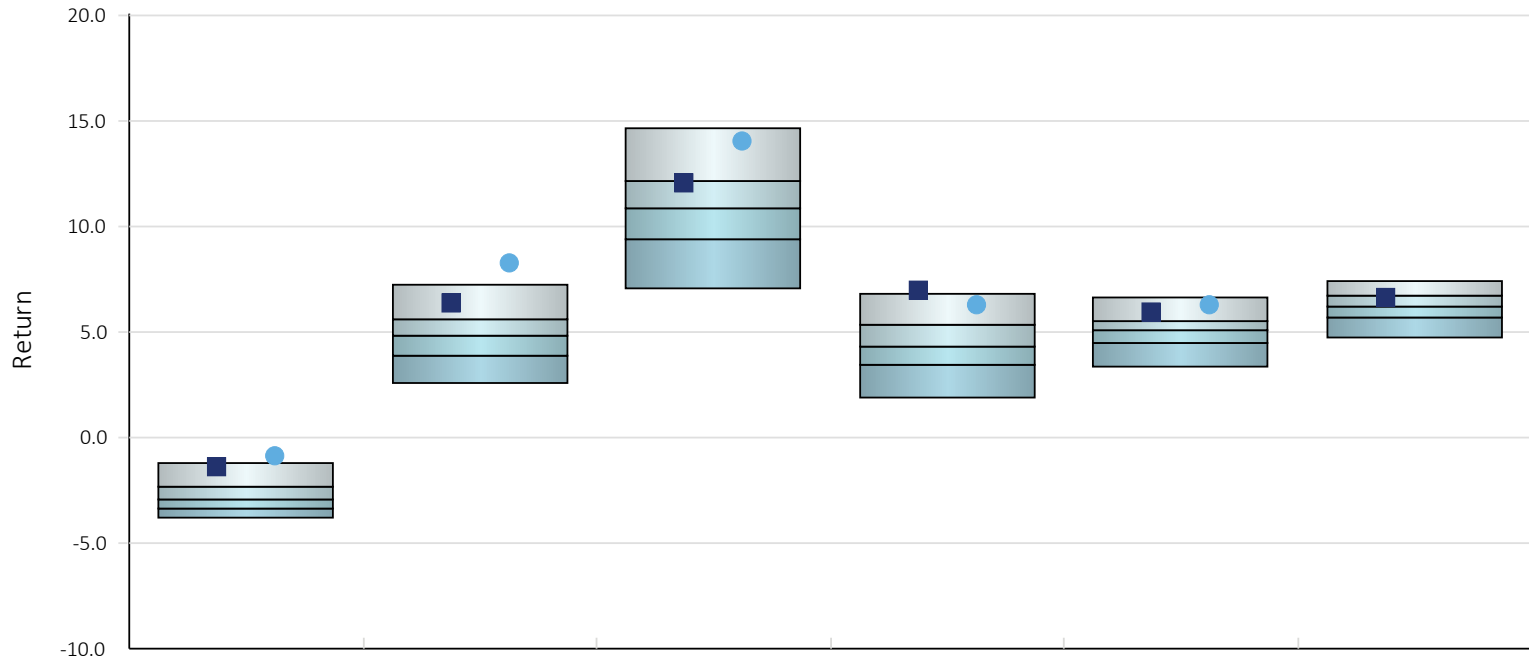
	QTD	YTD	1 Year	3 Years	5 Years	10 Years
■ CERS Pension Plan	-1.42 (8)	6.29 (16)	11.99 (30)	7.01 (4)	6.03 (11)	6.65 (30)
● CERS Pension IPS Index	-0.85 (5)	8.28 (2)	14.04 (9)	6.32 (9)	6.29 (8)	
5th Percentile	-1.20	7.23	14.64	6.78	6.61	7.44
1st Quartile	-2.31	5.60	12.19	5.37	5.53	6.75
Median	-2.93	4.82	10.90	4.33	5.06	6.22
3rd Quartile	-3.36	3.90	9.43	3.49	4.47	5.70
95th Percentile	-3.83	2.56	7.05	1.86	3.36	4.77
Population	541	524	517	497	478	395

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 September 30, 2023



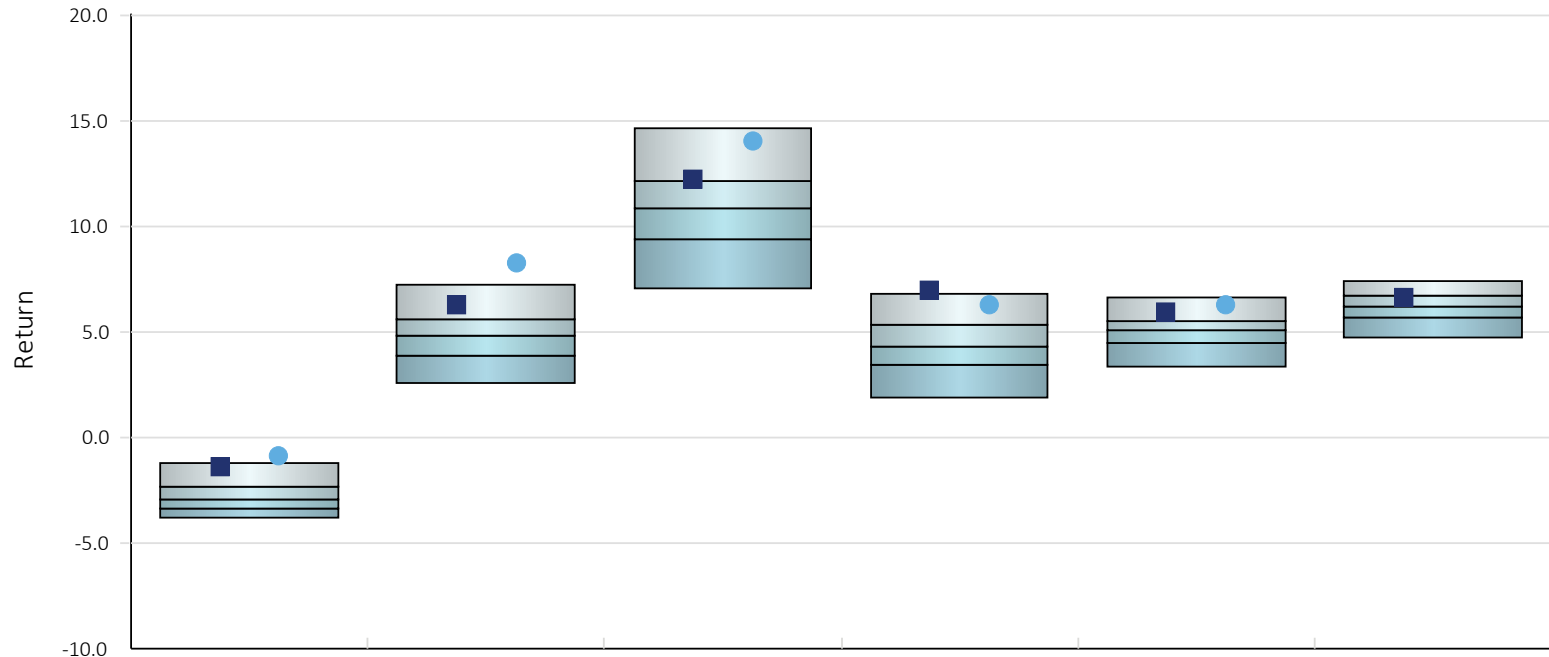
	QTD	YTD	1 Year	3 Years	5 Years	10 Years
■ CERS (H) Pension Plan	-1.42 (8)	6.34 (15)	12.10 (27)	6.94 (5)	5.97 (12)	6.64 (31)
● CERS (H) Pension IPS Index	-0.85 (5)	8.28 (2)	14.04 (9)	6.32 (9)	6.29 (8)	
5th Percentile	-1.20	7.23	14.64	6.78	6.61	7.44
1st Quartile	-2.31	5.60	12.19	5.37	5.53	6.75
Median	-2.93	4.82	10.90	4.33	5.06	6.22
3rd Quartile	-3.36	3.90	9.43	3.49	4.47	5.70
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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 September 30, 2023



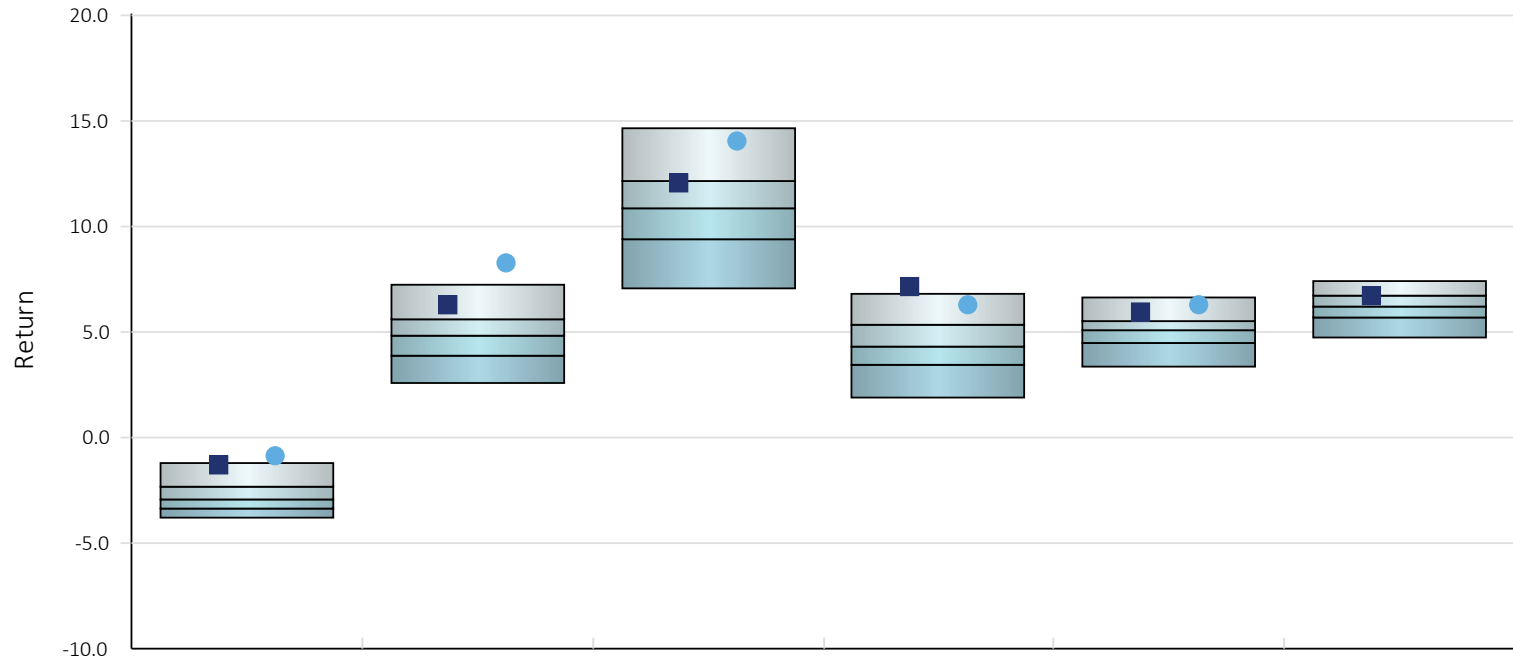
	QTD	YTD	1 Year	3 Years	5 Years	10 Years
■ CERS Insurance Plan	-1.39 (8)	6.33 (15)	12.21 (25)	7.01 (4)	5.91 (14)	6.62 (31)
● CERS Insurance IPS Index	-0.85 (5)	8.28 (2)	14.04 (9)	6.32 (9)	6.29 (8)	
5th Percentile	-1.20	7.23	14.64	6.78	6.61	7.44
1st Quartile	-2.31	5.60	12.19	5.37	5.53	6.75
Median	-2.93	4.82	10.90	4.33	5.06	6.22
3rd Quartile	-3.36	3.90	9.43	3.49	4.47	5.70
95th Percentile	-3.83	2.56	7.05	1.86	3.36	4.77
Population	541	524	517	497	478	395

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 September 30, 2023



	QTD	YTD	1 Year	3 Years	5 Years	10 Years
■ CERS (H) Insurance Plan	-1.33 (7)	6.31 (15)	12.04 (29)	7.18 (3)	5.99 (12)	6.70 (28)
● CERS (H) Insurance IPS Index	-0.85 (5)	8.28 (2)	14.04 (9)	6.32 (9)	6.29 (8)	
5th Percentile	-1.20	7.23	14.64	6.78	6.61	7.44
1st Quartile	-2.31	5.60	12.19	5.37	5.53	6.75
Median	-2.93	4.82	10.90	4.33	5.06	6.22
3rd Quartile	-3.36	3.90	9.43	3.49	4.47	5.70
95th Percentile	-3.83	2.56	7.05	1.86	3.36	4.77
Population	541	524	517	497	478	395

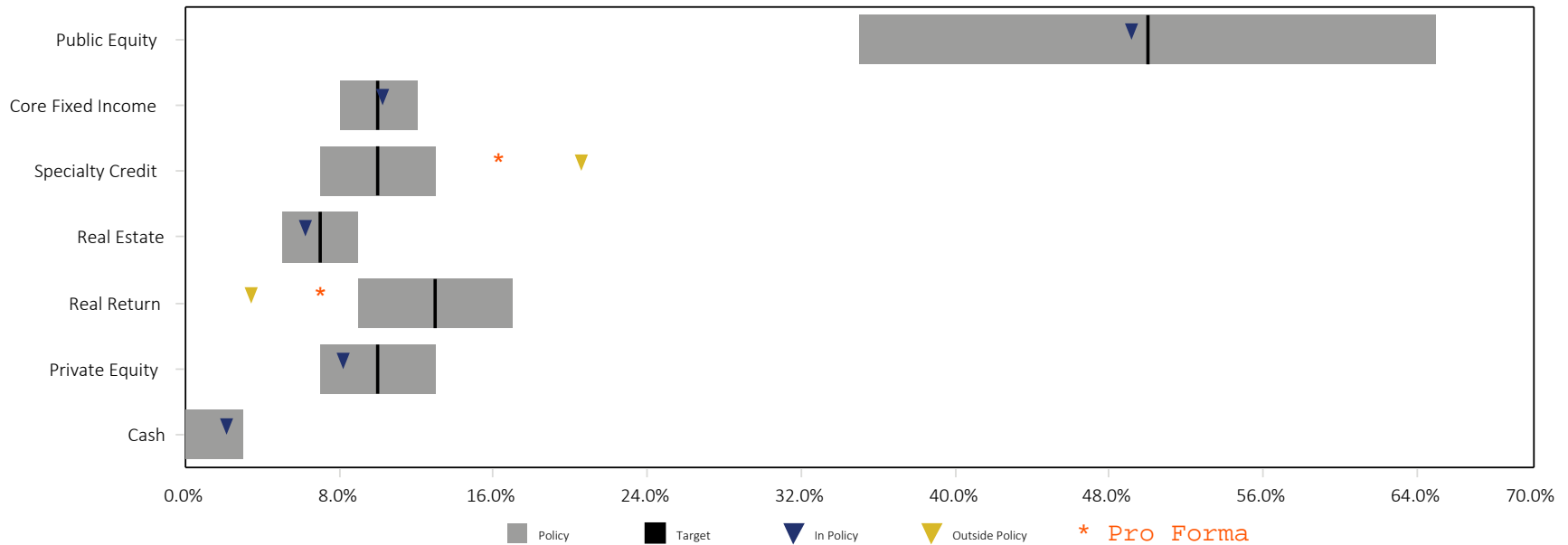
Parentheses contain percentile rankings.
Calculation based on monthly periodicity.

Asset Allocation Compliance

CERS Pension Plan

Periods Ended As of September 30, 2023

Executive Summary



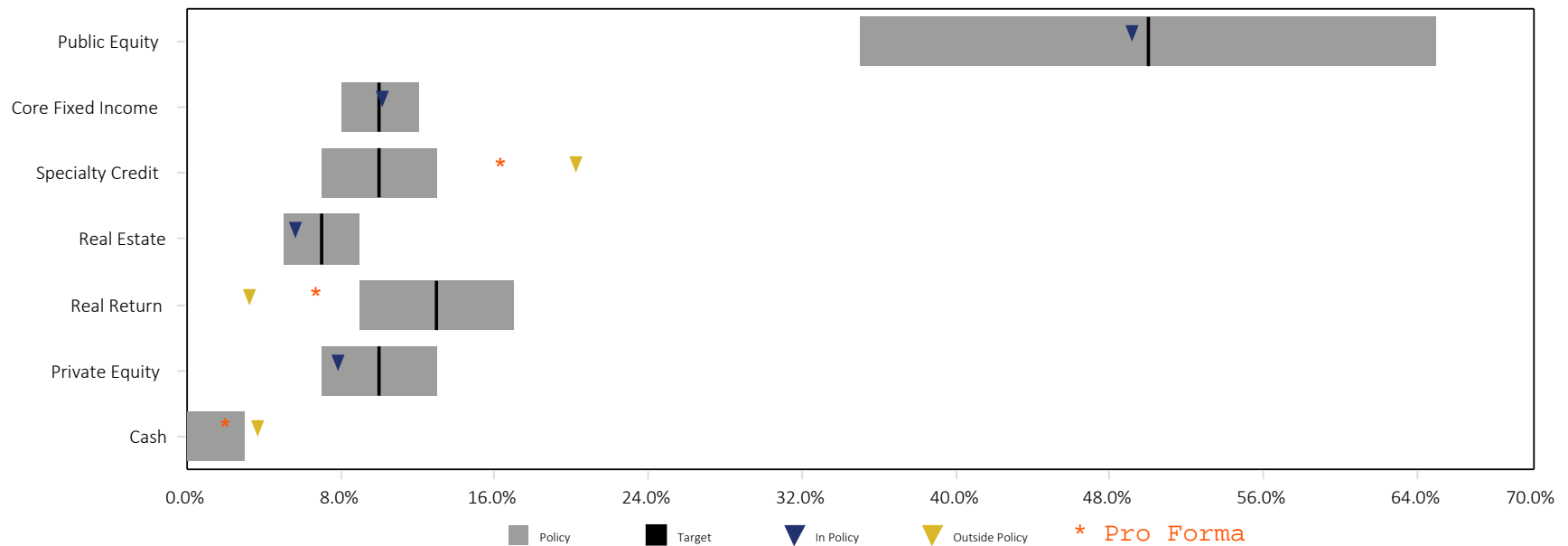
	Asset Allocation \$	Asset Allocation (%)	Minimum Allocation (%)	Maximum Allocation (%)	Target Allocation (%)	Target Rebalance \$
Public Equity	4,201,221,831	49.16	35.00	65.00	50.00	71,486,626
Core Fixed Income	877,873,128	10.27	8.00	12.00	10.00	-23,331,436
Specialty Credit	1,760,475,733	20.60	7.00	13.00	10.00	-905,934,041
Real Estate	532,052,128	6.23	5.00	9.00	7.00	66,127,056
Real Return	291,059,259	3.41	9.00	17.00	13.00	819,844,939
Private Equity	700,541,631	8.20	7.00	13.00	10.00	154,000,060
Cash	182,193,203	2.13	0.00	3.00	0.00	-182,193,203
Total Fund	8,545,416,914	100.00			100.00	

Asset Allocation Compliance

CERS (H) Pension Plan

Periods Ended As of September 30, 2023

Executive Summary



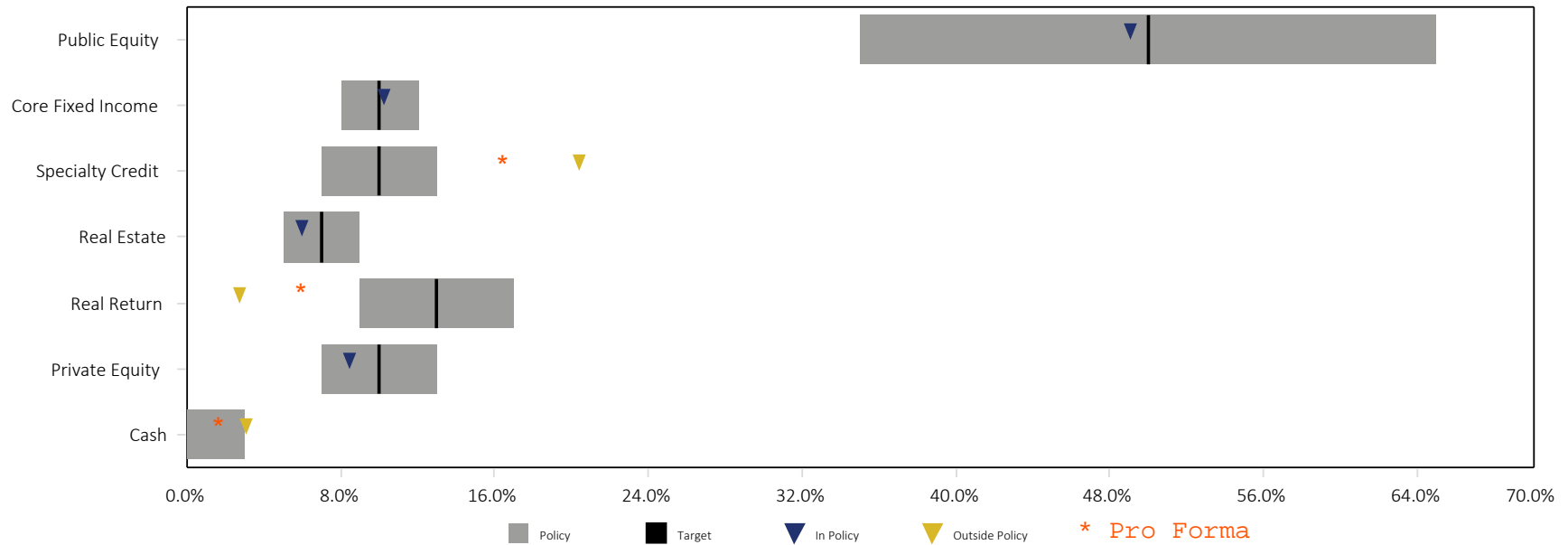
	Asset Allocation \$	Asset Allocation (%)	Minimum Allocation (%)	Maximum Allocation (%)	Target Allocation (%)	Target Rebalance \$
Public Equity	1,471,095,867	49.17	35.00	65.00	50.00	24,746,050
Core Fixed Income	304,514,639	10.18	8.00	12.00	10.00	-5,346,255
Specialty Credit	606,523,795	20.27	7.00	13.00	10.00	-307,355,411
Real Estate	169,250,594	5.66	5.00	9.00	7.00	40,167,274
Real Return	97,714,353	3.27	9.00	17.00	13.00	291,204,545
Private Equity	233,967,869	7.82	7.00	13.00	10.00	65,200,515
Cash	108,616,718	3.63	0.00	3.00	0.00	-108,616,718
Total Fund	2,991,683,834	100.00			100.00	

Asset Allocation Compliance

CERS Insurance Plan

Periods Ended As of September 30, 2023

Executive Summary



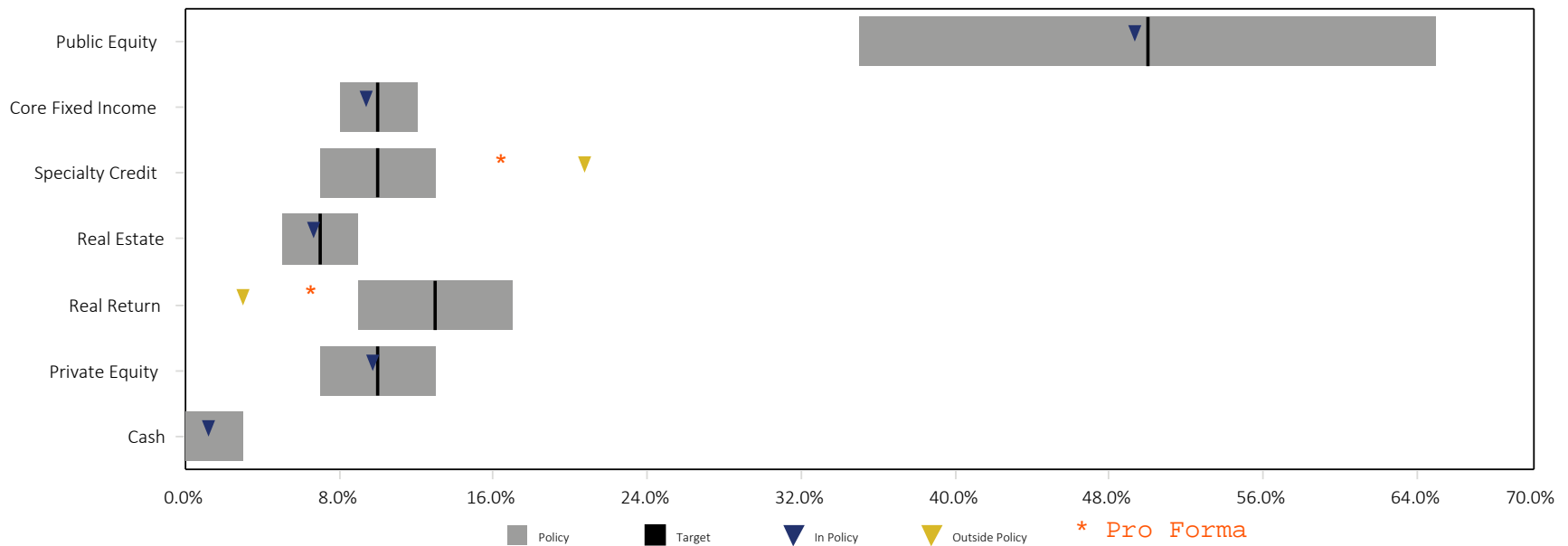
	Asset Allocation \$	Asset Allocation (%)	Minimum Allocation (%)	Maximum Allocation (%)	Target Allocation (%)	Target Rebalance \$
Public Equity	1,585,099,586	49.10	35.00	65.00	50.00	29,207,136
Core Fixed Income	331,029,447	10.25	8.00	12.00	10.00	-8,168,102
Specialty Credit	660,051,790	20.44	7.00	13.00	10.00	-337,190,446
Real Estate	192,132,243	5.95	5.00	9.00	7.00	33,870,698
Real Return	89,567,075	2.77	9.00	17.00	13.00	330,152,673
Private Equity	272,727,622	8.45	7.00	13.00	10.00	50,133,722
Cash	98,005,682	3.04	0.00	3.00	0.00	-98,005,682
Total Fund	3,228,613,446	100.00			100.00	

Asset Allocation Compliance

CERS (H) Insurance Plan

Periods Ended As of September 30, 2023

Executive Summary



	Asset Allocation \$	Asset Allocation (%)	Minimum Allocation (%)	Maximum Allocation (%)	Target Allocation (%)	Target Rebalance \$
Public Equity	776,610,535	49.32	35.00	65.00	50.00	10,775,538
Core Fixed Income	147,846,745	9.39	8.00	12.00	10.00	9,630,469
Specialty Credit	326,568,851	20.74	7.00	13.00	10.00	-169,091,637
Real Estate	105,415,370	6.69	5.00	9.00	7.00	4,818,680
Real Return	46,852,338	2.98	9.00	17.00	13.00	157,868,041
Private Equity	153,092,675	9.72	7.00	13.00	10.00	4,384,539
Cash	18,385,631	1.17	0.00	3.00	0.00	-18,385,631
Total Fund	1,574,772,145	100.00			100.00	

Asset Allocation & Performance

Total Fund

Periods Ended September 30, 2023

	Market Value \$	Performance (%) net of fees										
		QTD	YTD	FYTD	1 Year	3 Years	5 Years	10 Years	20 Years	30 Years	Since Inception	Inception Date
CERS Pension Plan	8,545,416,914	-1.42	6.29	-1.42	11.99	7.01	6.03	9.40	6.69	7.58	8.75	4/1/1984
CERS Pension IPS Index		-0.85	8.28	-0.85	14.04	6.32	6.29					
Value Added		-0.57	-1.99	-0.57	-2.05	0.69	-0.26					
Assumed Rate 6.25%		1.53	4.65	1.53	6.25	6.25	6.25					
Value Added		-2.95	1.64	-2.95	5.74	0.76	-0.22					
CERS Insurance Plan	3,228,613,446	-1.39	6.33	-1.39	12.21	7.01	5.91	6.63	6.70	6.68	7.28	4/1/1987
CERS Insurance IPS Index		-0.85	8.28	-0.85	14.04	6.32	6.29					
Value Added		-0.54	-1.95	-0.54	-1.83	0.69	-0.38					
Assumed Rate 6.50%		1.59	4.84	1.59	6.50	6.50	6.50					
Value Added		-2.98	1.49	-2.98	5.71	0.51	-0.59					
CERS (H) Pension Plan	2,991,683,834	-1.42	6.34	-1.42	12.10	6.94	5.97	9.40	6.68	7.58	8.75	4/1/1984
CERS (H) Pension IPS Index		-0.85	8.28	-0.85	14.04	6.32	6.29					
Value Added		-0.57	-1.94	-0.57	-1.94	0.62	-0.32					
Assumed Rate 6.25%		1.53	4.65	1.53	6.25	6.25	6.25					
Value Added		-2.95	1.69	-2.95	5.85	0.69	-0.28					
CERS (H) Insurance Plan	1,574,772,145	-1.33	6.31	-1.33	12.04	7.18	5.99	6.63	6.74	6.70	7.29	4/1/1987
CERS (H) Insurance IPS Index		-0.85	8.28	-0.85	14.04	6.32	6.29					
Value Added		-0.48	-1.97	-0.48	-2.00	0.86	-0.30					
Assumed Rate 6.50%		1.59	4.84	1.59	6.50	6.50	6.50					
Value Added		-2.92	1.47	-2.92	5.54	0.68	-0.51					

Asset Allocation & Performance

Pension Plan Accounts

Periods Ended September 30, 2023

	Performance (%) net of fees								
	1 Month	QTD	YTD	FYTD	1 Year	3 Years	5 Years	Since Inception	Inception Date
Public Equity	-4.39	-4.04	8.95	-4.04	20.43			-4.18	12/1/2021
Public Equity Policy Index	-4.14	-3.40	10.06	-3.40	20.80			-3.63	
Value Added	-0.25	-0.64	-1.11	-0.64	-0.37			-0.55	
US Equity Composite	-4.78	-3.50	11.10	-3.50	19.46	9.68	8.80	11.13	4/1/1984
Russell 3000 Index	-4.76	-3.25	12.39	-3.25	20.46	9.38	9.14	11.05	
Value Added	-0.02	-0.25	-1.29	-0.25	-1.00	0.30	-0.34	0.08	
S&P 500 Index	-4.71	-3.21	13.15	-3.21	21.70	10.14	10.18	8.24	7/1/2001
S&P 500 Index	-4.77	-3.27	13.07	-3.27	21.62	10.15	9.92	7.87	
Value Added	0.06	0.06	0.08	0.06	0.08	-0.01	0.26	0.37	
Scientific Beta	-3.81	-3.14	2.70	-3.14	14.04	8.27	6.64	9.03	7/1/2016
S&P 500 Index	-4.77	-3.27	13.07	-3.27	21.62	10.15	9.92	12.38	
Value Added	0.96	0.13	-10.37	0.13	-7.58	-1.88	-3.28	-3.35	
River Road FAV	-3.51	-1.65	3.39	-1.65	15.63	5.27	3.53	8.03	7/1/2016
Russell 3000 Value Index	-3.94	-3.15	1.67	-3.15	14.05	11.19	5.98	8.08	
Value Added	0.43	1.50	1.72	1.50	1.58	-5.92	-2.45	-0.05	
Westfield Capital	-5.18	-2.27	25.56	-2.27	26.78	7.79	12.48	13.23	7/1/2011
Russell 3000 Growth Index	-5.50	-3.34	23.77	-3.34	26.63	7.54	11.70	13.93	
Value Added	0.32	1.07	1.79	1.07	0.15	0.25	0.78	-0.70	
Internal US Mid Cap	-5.09	-3.83	5.26	-3.83	16.88	12.50	6.67	8.94	8/1/2014
S&P MidCap 400 Index	-5.26	-4.20	4.27	-4.20	15.51	12.05	6.06	8.50	
Value Added	0.17	0.37	0.99	0.37	1.37	0.45	0.61	0.44	
NTGI Structured	-5.01	-3.41	3.88	-3.41	13.49	11.46	4.86	9.42	10/1/1999
Russell 2000 Index	-5.89	-5.13	2.54	-5.13	8.93	7.16	2.40	7.56	
Value Added	0.88	1.72	1.34	1.72	4.56	4.30	2.46	1.86	

Asset Allocation & Performance

Pension Plan Accounts

Periods Ended September 30, 2023

	Performance (%) net of fees								
	1 Month	QTD	YTD	FYTD	1 Year	3 Years	5 Years	Since Inception	Inception Date
Next Century Growth	-9.51	-16.67	1.63	-16.67	-2.96	8.55		19.80	11/1/2019
Russell Microcap Growth Index	-7.57	-11.95	-5.65	-11.95	-3.10	-4.65		1.90	
Value Added	-1.94	-4.72	7.28	-4.72	0.14	13.20		17.90	
Non-US Equity Composite	-3.78	-4.86	5.86	-4.86	21.85	3.17	3.00	3.32	7/1/2000
MSCI ACWI ex US IMI (10/17)	-3.24	-3.49	5.30	-3.49	20.19	3.77	2.57	3.31	
Value Added	-0.54	-1.37	0.56	-1.37	1.66	-0.60	0.43	0.01	
BlackRock World Ex US	-3.34	-4.06	7.36	-4.06	24.90	6.67	3.86	6.05	7/1/2009
MSCI World ex US (11/19)	-3.37	-4.10	6.73	-4.10	24.00	6.07	3.43	5.75	
Value Added	0.03	0.04	0.63	0.04	0.90	0.60	0.43	0.30	
American Century	-5.98	-10.79	-1.24	-10.79	12.46	-3.20	3.64	4.38	7/1/2014
MSCI ACWI ex US IMI (10/17)	-3.24	-3.49	5.30	-3.49	20.19	3.77	2.57	2.66	
Value Added	-2.74	-7.30	-6.54	-7.30	-7.73	-6.97	1.07	1.72	
Franklin Templeton	-7.91	-10.75	-0.81	-10.75	11.20	-7.35	-0.99	2.86	7/1/2014
MSCI ACWI ex US IMI (10/17)	-3.24	-3.49	5.30	-3.49	20.19	3.77	2.57	2.66	
Value Added	-4.67	-7.26	-6.11	-7.26	-8.99	-11.12	-3.56	0.20	
Lazard Asset Mgmt	-3.31	-4.57	8.10	-4.57	23.19	4.56	3.14	3.52	7/1/2014
MSCI ACWI ex US IMI (10/17)	-3.24	-3.49	5.30	-3.49	20.19	3.77	2.57	2.66	
Value Added	-0.07	-1.08	2.80	-1.08	3.00	0.79	0.57	0.86	
LSV Asset Mgmt	-0.89	0.62	11.28	0.62	33.20	9.98	3.60	3.40	7/1/2014
MSCI ACWI ex US IMI (10/17)	-3.24	-3.49	5.30	-3.49	20.19	3.77	2.57	2.66	
Value Added	2.35	4.11	5.98	4.11	13.01	6.21	1.03	0.74	
Axiom	-5.49	-3.80	2.64	-3.80	12.16			-16.52	12/1/2021
MSCI AC World ex USA Small Cap (Net)	-3.76	-1.70	5.03	-1.70	19.01			-6.96	
Value Added	-1.73	-2.10	-2.39	-2.10	-6.85			-9.56	

Asset Allocation & Performance

Pension Plan Accounts

Periods Ended September 30, 2023

	Performance (%) net of fees								
	1 Month	QTD	YTD	FYTD	1 Year	3 Years	5 Years	Since Inception	Inception Date
JP Morgan Emerging Markets	-3.69	-6.33	-2.25	-6.33	9.63	-5.56		-0.69	11/1/2019
MSCI Emerging Markets IMI Index	-2.50	-1.99	3.73	-1.99	13.69	0.11		1.61	
Value Added	-1.19	-4.34	-5.98	-4.34	-4.06	-5.67		-2.30	
Pzena Emerging Markets	-1.81	1.70	16.59	1.70	31.98	14.56		7.61	11/1/2019
MSCI Emerging Markets (Net)	-2.62	-2.93	1.82	-2.93	11.70	-1.73		0.17	
Value Added	0.81	4.63	14.77	4.63	20.28	16.29		7.44	
Private Equity Composite	2.40	2.71	7.55	2.71	3.07	17.98	13.34	11.82	7/1/2002
Russell 3000 +3% 1 Quarter Lag	7.09	9.19	27.30	9.19	22.52	17.30	14.73	12.01	
Value Added	-4.69	-6.48	-19.75	-6.48	-19.45	0.68	-1.39	-0.19	
Core Fixed Composite	-2.02	-1.14	0.68	-1.14	2.13	-1.15	1.87	1.87	10/1/2018
Blmbg. U.S. Aggregate Index	-2.54	-3.23	-1.21	-3.23	0.64	-5.21	0.10	0.10	
Value Added	0.52	2.09	1.89	2.09	1.49	4.06	1.77	1.77	
Loomis Sayles Intmd	-2.46	-2.00	-0.09	-2.00	1.73	-3.47		0.33	2/1/2019
Blmbg. U.S. Intermediate Aggregate Index	-1.76	-1.89	-0.30	-1.89	1.42	-3.66		-0.11	
Value Added	-0.70	-0.11	0.21	-0.11	0.31	0.19		0.44	
Lord Abbett	-0.09	0.58	2.35	0.58	3.66	0.30	1.68	1.68	10/1/2018
ICE BofA 1-3 Year U.S. Corporate Index	-0.07	0.91	2.50	0.91	3.93	-0.31	1.71	1.71	
Value Added	-0.02	-0.33	-0.15	-0.33	-0.27	0.61	-0.03	-0.03	
NISA	-2.54	-2.24	0.02	-2.24	2.03	-4.58	0.69	2.68	2/1/2009
Blmbg. U.S. Aggregate Index	-2.54	-3.23	-1.21	-3.23	0.64	-5.21	0.10	2.34	
Value Added	0.00	0.99	1.23	0.99	1.39	0.63	0.59	0.34	

Asset Allocation & Performance

Pension Plan Accounts

Periods Ended September 30, 2023

	Performance (%) net of fees								
	1 Month	QTD	YTD	FYTD	1 Year	3 Years	5 Years	Since Inception	Inception Date
High Yield / Specialty Credit Composite	1.08	2.65	7.53	2.65	9.66	7.16	5.90	5.90	10/1/2018
Policy Index	-0.12	1.94	7.99	1.94	11.66	3.94	3.74	3.74	
Value Added	1.20	0.71	-0.46	0.71	-2.00	3.22	2.16	2.16	
Adams St SPC II A	3.81	3.81	10.81	3.81	13.77	16.83		15.02	6/1/2020
Adams St SPC II B	2.99	2.99	7.79	2.99	9.73	11.01		9.85	6/1/2020
Arrowmark	0.89	3.48	11.69	3.48	15.81	13.32	10.26	10.12	6/1/2018
Morningstar LSTA US Leveraged Loan	0.94	3.43	10.13	3.43	13.02	6.07	4.46	4.55	
Value Added	-0.05	0.05	1.56	0.05	2.79	7.25	5.80	5.57	
Blue Torch	2.74	2.74	10.26	2.74	13.99	11.15		10.53	8/1/2020
BSP Coinvestment	2.73	2.73	8.38	2.73	8.99	7.47		7.08	10/1/2019
Morningstar LSTA US Leveraged Loan	0.94	3.43	10.13	3.43	13.02	6.07	4.80	4.80	
Value Added	1.79	-0.70	-1.75	-0.70	-4.03	1.40	2.28	2.28	
BSP Private Credit	2.60	2.60	7.14	2.60	9.06	10.72	7.00	6.16	2/1/2018
Morningstar LSTA US Leveraged Loan	0.94	3.43	10.13	3.43	13.02	6.07	4.46	4.47	
Value Added	1.66	-0.83	-2.99	-0.83	-3.96	4.65	2.54	1.69	
Capital Springs	21.87	21.87	46.70	21.87	48.77	21.33		18.25	2/1/2020
Morningstar LSTA US Leveraged Loan	0.94	3.43	10.13	3.43	13.02	6.07	4.59	4.59	
Value Added	20.93	18.44	36.57	18.44	35.75	15.26	13.66	13.66	
Cerberus Capital Mgmt	0.82	1.85	5.94	1.85	8.52	12.35	10.69	9.56	9/1/2014
Morningstar LSTA US Leveraged Loan	0.94	3.43	10.13	3.43	13.02	6.07	4.46	4.23	
Value Added	-0.12	-1.58	-4.19	-1.58	-4.50	6.28	6.23	5.33	
Columbia	-1.12	0.44	5.94	0.44	10.41	1.88	3.51	5.42	11/1/2011
Blmbg. U.S. Corp: High Yield Index	-1.18	0.46	5.86	0.46	10.28	1.76	2.96	5.19	
Value Added	0.06	-0.02	0.08	-0.02	0.13	0.12	0.55	0.23	

Asset Allocation & Performance

Pension Plan Accounts

Periods Ended September 30, 2023

	Performance (%) net of fees								
	1 Month	QTD	YTD	FYTD	1 Year	3 Years	5 Years	Since Inception	Inception Date
Manulife Asset Mgmt	-1.44	-1.05	3.51	-1.05	7.69	0.58	3.32	3.54	12/1/2011
Policy Index	-2.38	-2.88	-0.62	-2.88	1.61	-4.68	0.34	0.72	
Value Added	0.94	1.83	4.13	1.83	6.08	5.26	2.98	2.82	
Marathon Bluegrass	0.45	1.95	2.97	1.95	0.93	5.80	4.16	5.49	1/1/2016
Blmbg. U.S. Corp: High Yield Index	-1.18	0.46	5.86	0.46	10.28	1.76	2.96	5.32	
Value Added	1.63	1.49	-2.89	1.49	-9.35	4.04	1.20	0.17	
Shenkman Capital	0.35	2.14	7.79	2.14	11.13	4.88	3.94	4.47	10/1/2010
Morningstar LSTA US Leveraged Loan	0.94	3.43	10.13	3.43	13.02	6.07	4.46	4.67	
Value Added	-0.59	-1.29	-2.34	-1.29	-1.89	-1.19	-0.52	-0.20	
Waterfall	1.41	6.74	8.02	6.74	6.99	9.26	5.13	9.37	2/1/2010
Policy Index	-0.35	1.37	6.41	1.37	8.99	2.35	2.90	4.39	
Value Added	1.76	5.37	1.61	5.37	-2.00	6.91	2.23	4.98	
White Oak Yield Spectrum	1.53	1.53	4.12	1.53	5.45	5.98	5.67	5.36	3/1/2018
Morningstar LSTA US Leveraged Loan	0.94	3.43	10.13	3.43	13.02	6.07	4.46	4.50	
Value Added	0.59	-1.90	-6.01	-1.90	-7.57	-0.09	1.21	0.86	
H/2 Credit Partner	0.00	0.00	0.00	0.00	0.00	7.37	0.93	3.96	7/1/2011
Cash Composite	0.39	1.12	3.08	1.12	3.96	1.60	1.73	3.32	1/1/1988
FTSE 3 Month T-Bill	0.45	1.38	3.80	1.38	4.71	1.78	1.74	2.94	
Value Added	-0.06	-0.26	-0.72	-0.26	-0.75	-0.18	-0.01	0.38	

Asset Allocation & Performance

Pension Plan Accounts

Periods Ended September 30, 2023

	Performance (%) net of fees								
	1 Month	QTD	YTD	FYTD	1 Year	3 Years	5 Years	Since Inception	Inception Date
Real Estate Composite	-1.28	-2.63	-8.80	-2.63	-7.72	10.27	8.93	6.45	7/1/1984
NCREIF ODCE NOF 1 Quarter Lag	-2.88	-2.88	-11.01	-2.88	-10.73	7.04	5.56		
Value Added	1.60	0.25	2.21	0.25	3.01	3.23	3.37		
Baring	-21.16	-21.57	-42.26	-21.57	-37.45	-9.05		3.04	1/1/2019
Barings Euro RE II	-8.01	-8.49	-32.05	-8.49	-29.08			-22.67	12/1/2020
Divcowest IV	-0.07	-0.07	-3.91	-0.07	-4.71	15.48	10.06	16.53	3/1/2014
Fundamental Partners III	0.68	0.68	4.84	0.68	3.72	16.89	15.74	13.24	5/1/2017
Greenfield Acq VI	-1.12	-1.12	-25.21	-1.12	-27.23	-34.06	-39.37	-18.19	12/1/2012
Greenfield Acq VII	2.87	2.87	-8.68	2.87	-1.08	17.89	14.74	13.66	7/1/2014
Harrison Street	0.00	0.25	-0.78	0.25	1.34	6.81	6.25	7.82	5/1/2012
Lubert Adler VII	-7.15	-7.15	-16.14	-7.15	-15.69	-3.80	-3.13	-2.38	7/1/2014
Lubert Adler VII B	3.74	3.74	13.48	3.74	15.83	28.04	20.40	15.81	7/1/2017
Mesa West Core Lend	0.14	0.14	-4.80	0.14	-3.01	2.69	4.10	5.57	5/1/2013
Mesa West IV	-7.45	-7.45	-18.57	-7.45	-18.00	-2.69	1.20	1.92	3/1/2017
Patron Capital	-8.84	-9.35	-6.96	-9.35	-7.71	4.34	4.21	2.74	8/1/2016
Prologis Targeted US	0.00	-4.24	-10.23	-4.24	-10.18	20.83	16.50	16.19	10/1/2014
Rubenstein PF II	-9.46	-9.46	-44.04	-9.46	-46.94	-21.10	-12.47	0.24	7/1/2013
Stockbridge Sm/Mkts	-1.08	-1.08	-10.82	-1.08	-10.25	8.81	7.57	8.29	5/1/2014
Walton St RE VI	1.02	1.02	8.60	1.02	11.54	11.83	4.51	-10.50	5/1/2009
Walton St RE VII	-4.68	-4.68	-11.51	-4.68	-13.42	0.50	-3.93	4.20	7/1/2013

Asset Allocation & Performance

Pension Plan Accounts

Periods Ended September 30, 2023

	Performance (%) net of fees								
	1 Month	QTD	YTD	FYTD	1 Year	3 Years	5 Years	Since Inception	Inception Date
Real Return Composite	1.40	4.73	9.67	4.73	15.04	13.61	7.28	5.13	7/1/2011
US CPI + 3%	0.64	1.95	5.14	1.95	6.80	8.92	7.17	5.67	
Value Added	0.76	2.78	4.53	2.78	8.24	4.69	0.11	-0.54	
Tortoise Capital	1.13	8.71	17.19	8.71	29.57	40.82	7.36	9.99	8/1/2009
Alerian MLP Index	3.24	9.90	20.56	9.90	32.74	43.10	6.81	7.58	
Value Added	-2.11	-1.19	-3.37	-1.19	-3.17	-2.28	0.55	2.41	
Amerra AGRI Fund II	5.47	5.47	5.15	5.47	9.01	10.60	10.16	6.65	12/1/2012
Amerra AGRI Holdings	2.77	2.77	-4.15	2.77	-6.38	-4.25	-2.28	-2.03	8/1/2015
BTG Pactual	9.37	9.37	13.32	9.37	21.57	17.01	8.19	-0.43	12/1/2014
IFM Infrastructure	-0.19	-0.19	4.71	-0.19	6.34	6.30		4.74	7/1/2019
Magnetar MTP EOF II	-1.10	-1.10	16.52	-1.10	20.12	77.22	44.60	26.54	8/1/2015
Oberland Capital	3.29	3.29	10.21	3.29	12.13	12.22	17.54	13.44	8/1/2018
Taurus Mine Finance	1.37	1.37	9.50	1.37	18.61	26.08	16.01	15.37	4/1/2015
TPF II	-1.40	-1.40	-6.43	-1.40	-7.62	3.18	4.52	-0.94	10/1/2008
Blackstone Strat Opp	-0.46	-0.55	-6.09	-0.55	-8.90	-1.94	-5.04	-3.16	8/1/2017
Luxor Capital	-0.70	-2.44	-2.63	-2.44	0.73	6.16	-1.93	-0.30	4/1/2014
Myriad Opportunities	0.00	0.00	-0.28	0.00	-7.04	-22.51	-15.83	-9.07	5/1/2016
Pine River	0.49	0.15	-7.24	0.15	-8.34	-4.68	4.23	1.59	5/1/2014
PRISMA Capital	0.44	1.26	2.97	1.26	3.17	0.28	0.48	2.46	9/1/2011
SRS Partners US	0.00	0.00	0.00	0.00	0.00	5.86	7.33	7.28	8/1/2017
Tricadia Select	0.00	0.00	0.00	0.00	0.00	0.00	-0.21	-4.12	9/1/2017

County Employees Retirement System

Investment Budget Update

Quarter Ending: September 30, 2023

KENTUCKY PUBLIC PENSIONS AUTHORITY									
Investment Budget									
For the three month period ending September 30, 2023									
Account Name	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	Trust Budget FY 2024	Q1 2024	Remaining	Percentage Spent
CONSULTING SERVICES									
Wilshire Associates	\$ 1,021,799	\$ 1,238,170	\$ 1,225,671	\$ 1,021,175	\$ 838,172	\$ 1,200,000	\$ 274,600	\$ 925,400	23%
Albourne	-	-	-	-	306,750	275,000	67,500	207,500	25%
MercerInsight	-	-	-	-	153,548	165,000	40,000	125,000	24%
SUBTOTAL	1,021,799	1,238,170	1,225,671	1,021,175	1,298,471	1,640,000	382,100	1,257,900	23%
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	12,347	2,487,653	0%
Stoll-Keenon-Ogden	10,314	135,353	254,211	463,560	750,438	750,000	26,960	723,040	4%
Haystack			-	-	120,175	100,000	55,008	44,992	55%
Umberg Zipser			289,100	498,058	606,701	850,000	255,459	594,541	30%
Swansburg & Smith	-	-	-	-	5,288	50,000	-	50,000	0%
Eddins Domine	-	-	-	-	40,305	50,000	-	50,000	0%
Taft	-	-	-	-	142,720	50,000	478	49,522	1%
Miscellaneous					-	50,000	-	50,000	0%
SUBTOTAL	948,225	1,008,762	1,459,630	1,853,513	1,873,441	4,950,000	353,632	4,596,368	7%
CONTRACTURAL SERVICES									
Bloomberg	68,722	71,810	98,163	102,243	104,153	150,000	27,533	122,467	18%
BNYM Custodial Fees	2,056,390	2,088,475	2,379,838	2,565,169	2,333,981	2,600,000	590,273	2,009,727	23%
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	31,657	118,343	21%
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	2,100	5,400	28%
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	15,719	44,281	26%
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	0%
Miscellaneous & New Services	-	-	-	-	-	250,000	19,500	230,500	8%
SUBTOTAL	2,391,713	2,474,036	2,681,251	3,267,008	2,980,769	3,690,020	1,007,001	2,683,019	27%

KENTUCKY PUBLIC PENSIONS AUTHORITY Investment Budget For the three month period ending September 30, 2023									
Account Name	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	Trust Budget FY 2024	Q1 2024	Remaining	Percentage Spent
INACTIVE CONTRACTUAL 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	1,742,733	\$ 8,537,287	17%

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 three month period ending September 30, 2023 Pension								
	2024		2023		2022		2021	
	FYTD Fees	Market Value	FYTD Fees	Market Value	FYTD Fees	Market Value	FY Fees	Market Value
Core Fixed Income	538,998	2,131,936,660	879,295	2,084,448,991	964,078	2,367,680,815	2,648,483	2,380,760,174
<i>Investment Advisory Fees</i>	525,105		552,736		618,246		2,579,704	
<i>Carried Interest</i>	-		313,985		327,140		-	
<i>Miscellaneous Fees and Expenses</i>	13,893		12,575		18,692		68,779	
Public Equity	3,672,514	7,378,700,486	3,142,570	6,065,660,923	3,636,256	6,871,426,987	12,690,120	6,952,113,563
<i>Investment Advisory Fees</i>	3,567,463		3,040,804		3,523,547		12,466,655	
<i>Miscellaneous Fees and Expenses</i>	105,051		101,766		112,709		223,465	
Specialty Credit Fixed Income	22,856,573	3,275,957,851	12,036,439	3,083,985,656	13,440,821	3,152,469,147	44,112,571	3,048,523,710
<i>Investment Advisory Fees</i>	4,074,866		4,746,299		3,964,000		15,415,716	
<i>Carried Interest</i>	9,400,428		1,673,157		7,358,655		24,234,258	
<i>Miscellaneous Fees and Expenses</i>	9,381,280		5,616,983		2,118,166		4,462,596	
Real Estate	849,546	946,221,229	4,455,872	969,436,952	7,779,711	677,700,443	9,191,005	610,213,834
<i>Investment Advisory Fees</i>	1,924,845		1,579,279		1,114,665		4,772,617	
<i>Carried Interest</i>	(2,524,451)		2,231,775		6,615,761		2,414,707	
<i>Miscellaneous Fees and Expenses</i>	1,449,153		644,817		49,285		2,003,680	
Real Return	1,385,926	507,885,793	998,699	426,178,862	1,718,873	1,010,028,940	8,313,392	1,033,884,979
<i>Investment Advisory Fees</i>	1,044,249		488,379		1,085,377		4,663,221	
<i>Carried Interest</i>	167,367		285,096		380,418		3,021,470	
<i>Miscellaneous Fees and Expenses</i>	174,310		225,224		253,079		628,701	
Private Equity	7,960,728	1,178,285,116	(274,776)	1,209,741,651	24,096,611	1,305,498,399	58,785,850	1,236,163,938
<i>Investment Advisory Fees</i>	1,360,253		1,804,660		1,673,732		8,081,476	
<i>Carried Interest</i>	5,008,292		(2,822,439)		20,395,224		48,458,818	
<i>Miscellaneous Fees and Expenses</i>	1,592,184		743,004		2,027,655		2,245,555	
Administrative Expense/Cash	1,036,738	1,175,409,476	666,582	799,782,744	858,178	572,193,644	4,248,561	526,326,268
Total Investment Mgmt Fees	38,301,024	16,594,396,612	21,904,681	14,639,235,779	52,494,529	15,956,998,375	139,989,981	15,787,986,466

KENTUCKY PUBLIC PENSIONS AUTHORITY Investment Fees and Expenses For the three month period ending September 30, 2023 Insurance								
	2024		2023		2022		2021	
	FYTD Fees	Market Value	FYTD Fees	Market Value	FYTD Fees	Market Value	FY Fees	Market Value
Core Fixed Income	184,881	754,337,920	324,043	767,219,317	354,733	862,879,050	1,050,510	865,995,148
<i>Investment Advisory Fees</i>	180,211		208,100		230,338		995,622	
<i>Performance</i>	-		112,040		117,337		28,448	
<i>Miscellaneous Fees and Expenses</i>	4,670		3,903		7,058		26,440	
Public Equity	1,705,220	3,360,758,473	1,436,037	2,807,242,353	1,625,181	3,080,276,960	5,708,928	3,116,599,040
<i>Investment Advisory Fees</i>	1,657,228		1,389,622		1,574,855		5,612,577	
<i>Miscellaneous Fees and Expenses</i>	47,991		46,415		50,326		96,351	
Specialty Credit Fixed Income	10,206,292	1,472,221,495	5,558,434	1,371,584,870	5,969,311	1,429,342,653	19,174,439	1,383,567,012
<i>Investment Advisory Fees</i>	1,741,424		2,178,608		1,781,734		6,978,722	
<i>Carried Interest</i>	4,295,204		964,003		3,271,465		10,392,111	
<i>Miscellaneous Fees and Expenses</i>	4,169,664		2,415,823		916,112		1,803,605	
Real Estate	511,795	418,297,047	1,799,878	428,984,339	3,228,037	286,774,553	3,945,135	258,214,840
<i>Investment Advisory Fees</i>	870,090		604,578		482,095		2,048,449	
<i>Carried Interest</i>	(979,568)		919,660		2,722,999		1,043,274	
<i>Miscellaneous Fees and Expenses</i>	621,274		275,640		22,943		853,412	
Real Return	603,897	197,048,651	487,514	166,445,599	740,678	426,269,531	3,278,267	435,909,260
<i>Investment Advisory Fees</i>	466,172		266,024		484,286		2,005,961	
<i>Carried Interest</i>	59,893		116,876		140,229		91,499	
<i>Miscellaneous Fees and Expenses</i>	77,832		104,614		116,163		1,180,807	
Private Equity	4,590,785	600,831,793	(393,210)	598,395,346	16,466,674	616,691,355	35,821,138	585,420,005
<i>Investment Advisory Fees</i>	887,506		1,238,396		1,410,084		5,232,127	
<i>Carried Interest</i>	3,008,749		(1,963,029)		14,392,982		29,557,732	
<i>Miscellaneous Fees and Expenses</i>	694,529		331,423		663,608		1,031,279	
Administrative Expense/Cash	503,596	304,679,290	359,092	272,226,093	453,829	337,944,259	2,183,105	291,596,737
Total Investment Mgmt Fees	\$ 18,306,465	\$ 7,108,174,671	\$ 9,571,788	\$ 6,412,097,917	\$ 28,838,443	\$ 7,040,178,361	\$ 71,161,521	\$ 6,937,302,042

KENTUCKY PUBLIC PENSIONS AUTHORITY				
Investment Fees and Expenses				
For the three month period ending September 30, 2023				
Pension				
	CERS		CERS Hazardous	
	FYTD Fees	Market Value	FYTD Fees	Market Value
Core Fixed Income	221,945	877,873,131	76,988	304,514,640
<i>Investment Advisory Fees</i>	216,224		75,003	
<i>Performance Fees</i>	-		-	
<i>Miscellaneous Fees and Expenses</i>	5,721		1,984	
Public Equity	2,099,600	4,201,221,831	731,440	1,471,095,867
<i>Investment Advisory Fees</i>	2,040,386		711,011	
<i>Miscellaneous Fees and Expenses</i>	59,213		20,430	
Specialty Credit Fixed Income	12,793,027	1,760,475,733	4,280,674	606,523,795
<i>Investment Advisory Fees</i>	2,217,615		752,769	
<i>Performance Fees</i>	5,292,432		1,753,760	
<i>Miscellaneous Fees and Expenses</i>	5,282,980		1,774,145	
Real Estate	502,526	532,052,128	157,674	169,250,594
<i>Investment Advisory Fees</i>	1,102,853		347,611	
<i>Performance Fees</i>	(1,418,413)		(448,560)	
<i>Miscellaneous Fees and Expenses</i>	818,086		258,623	
Real Return	866,717	291,059,259	291,539	97,714,353
<i>Investment Advisory Fees</i>	605,846		216,623	
<i>Performance Fees</i>	145,474		37,620	
<i>Miscellaneous Fees and Expenses</i>	115,397		37,296	
Private Equity	4,903,488	700,541,631	1,725,829	233,967,869
<i>Investment Advisory Fees</i>	887,737		294,694	
<i>Performance Fees</i>	3,034,843		1,111,605	
<i>Miscellaneous Fees and Expenses</i>	980,908		319,530	
Administrative Expenses/Cash	750,663	182,193,203	189,803	108,616,718
Total Investment Fees and Expenses	22,137,964	8,545,416,917	7,453,948	2,991,683,835

KENTUCKY PUBLIC PENSIONS AUTHORITY				
Investment Fees and Expenses				
For the three month period ending September 30, 2023				
Insurance				
	CERS		CERS Hazardous	
	FYTD Fees	Market Value	FYTD Fees	Market Value
Core Fixed Income	81,059	331,029,452	36,369	147,846,748
<i>Investment Advisory Fees</i>	79,011		35,453	
<i>Performance Fees</i>	-		-	
<i>Miscellaneous Fees and Expenses</i>	2,049		916	
Public Equity	788,356	1,585,099,586	390,217	776,610,535
<i>Investment Advisory Fees</i>	765,902		379,334	
<i>Miscellaneous Fees and Expenses</i>	22,454		10,884	
Specialty Credit Fixed Income	4,587,794	660,051,790	2,444,504	326,568,851
<i>Investment Advisory Fees</i>	776,073		395,223	
<i>Performance Fees</i>	1,928,994		1,047,533	
<i>Miscellaneous Fees and Expenses</i>	1,882,728		1,001,749	
Real Estate	235,320	192,132,243	128,978	105,415,370
<i>Investment Advisory Fees</i>	399,817		219,288	
<i>Performance Fees</i>	(449,805)		(246,859)	
<i>Miscellaneous Fees and Expenses</i>	285,308		156,550	
Real Return	278,131	89,567,075	140,010	46,852,338
<i>Investment Advisory Fees</i>	221,508		101,709	
<i>Performance Fees</i>	21,013		19,000	
<i>Miscellaneous Fees and Expenses</i>	35,610		19,301	
Private Equity	2,116,734	272,727,622	1,201,160	153,092,675
<i>Investment Advisory Fees</i>	432,845		242,975	
<i>Performance Fees</i>	1,456,865		836,249	
<i>Miscellaneous Fees and Expenses</i>	227,024		121,936	
Administrative Expenses/Cash	236,515	98,005,682	152,496	18,385,631
Total Investment Fees and Expenses	\$ 8,323,909	\$ 3,228,613,451	\$ 4,493,735	\$ 1,574,772,148

County Employees Retirement System

Compliance Report

Quarter Ending: September 30, 2023



Compliance Guideline Review Period Ended September 30, 2023	Compliance Status	Legend
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.	●	<p>Legend</p> <ul style="list-style-type: none"> ● In Compliance ● To be determined ● Not In Compliance
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.	● ¹	
No more than 20% of the total net assets of the Real Return portfolio may be invested in any single closed-end or open-end limited partnership or other unregistered investment vehicle.	●	
An investment in any single domestic or international equity allocation in any single corporation cannot exceed 5% of the market value of total assets.	●	
The systems in aggregate shall not hold in excess of 3% of the outstanding shares of any single corporation.	●	

The amount of stock in any one industry in the domestic equity allocation shall not exceed 10% of the aggregate market value of the System's assets.



Investment in "frontier" markets shall not exceed 5% of the System's international equity assets.



The duration of the total fixed income portfolio shall not deviate from the Barclays Aggregate Index by more than 25%.



The amount invested in the debt of a single corporation shall not exceed 5% of the total market value of the System's Assets.



50% of the fixed income assets must have liquidity that is T+3 (trade date plus three days) or better.



No public fixed income manager shall invest more than 5% of the total market value of assets held in any single issue, short-term instruments, with the exception of U.S. Government issued, guaranteed, or agency obligations.



No more than 50% of the total net assets of the Real Return portfolio may be invested in any one registered investment vehicle, mutual fund, or separately managed account.



No more than 20% of the total net assets of the Real Return portfolio may be invested in any single closed-end or open-end limited partnership or other unregistered investment vehicle.



Derivatives Applications not Permitted: Derivatives may not be used for any activity for which the primary purpose is speculation or cause the portfolio to be leveraged beyond a 100% invested position.



All instruments in the Liquidity allocation shall have a maturity at the time of purchase that does not exceed 397 days.



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- 1. Interpretation that this restrictions only applies to external manager and not assets managed by KPPA Investment Staff.*

Kentucky Public Pensions Authority

CERS & CERS-Hazardous Unit Holdings

Quarter Ending: September 30, 2023

CERS Investment Committee Meeting - Investment Office Quarterly Update

Kentucky Public Pensions Authority								
Pension: CERS & CERS-H Unit Holdings								
Quarter Ended September 30, 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	45,230,401.494	7,182,090,850.04	8,531,918,849.16	1,349,827,999.12	16,061,287.587	2,550,107,230.27	2,987,183,353.81	437,076,123.54
KRS ABSOLUTE RETURN UNIT	465,018.762	58,019,204.71	57,809,964.36	-209,240.35	147,301.212	18,444,792.76	18,312,116.66	-132,676.10
KRS ADAMS STREET A1 UNIT	493,059.791	72,867,545.87	78,266,664.90	5,399,119.03	166,254.112	24,570,101.14	26,390,622.62	1,820,521.48
KRS ADAMS STREET B1 UNIT	566,478.217	73,607,620.53	76,968,525.47	3,360,904.94	191,009.965	24,819,645.19	25,952,905.01	1,133,259.82
KRS AMERRA AGRU UNIT	288,719.874	27,416,808.33	24,437,015.12	-2,979,793.21	91,158.311	8,656,382.13	7,715,565.24	-940,816.89
KRS AMERRA UNIT	81,312.370	11,493,419.34	16,642,460.20	5,149,040.86	25,672.974	3,628,850.37	5,254,568.87	1,625,718.50
KRS ARCTOS SPORTS II UNIT	61,846.071	6,684,799.17	10,457,882.96	3,773,083.79	26,505.459	2,892,208.25	4,481,949.84	1,589,741.59
KRS ARROWMARK UNIT	1,387,072.461	186,039,677.74	307,432,901.31	121,393,223.57	458,544.662	61,501,551.45	101,632,553.30	40,131,001.85
KRS BLACKROCK UNIT	2,925,438.069	333,585,958.20	477,954,616.77	144,368,658.57	1,024,153.712	122,574,561.03	167,325,023.94	44,750,462.91
KRS BLUE TORCH UNIT	435,007.963	70,459,753.78	73,128,858.05	2,669,104.27	146,878.053	23,790,349.17	24,691,557.86	901,208.69
KRS BNYM CUSTODY FEE UNIT	-322,583.986	-322,583.99	-322,583.99	0.00	-111,520.064	-111,520.06	-111,520.06	0.00
KRS BTG UNIT	199,420.716	13,189,056.48	19,642,410.86	6,453,354.38	63,908.686	4,226,717.92	6,294,835.83	2,068,117.91
KRS CASH UNIT	1,820,314.733	178,721,188.54	182,578,525.21	3,857,336.67	1,084,253.358	108,303,466.48	108,751,182.12	447,715.64
KRS DB PRIVATE EQ UNIT	14,394.435	5,175,840.99	4,034,631.01	-1,141,209.98	4,144.056	1,490,088.35	1,161,541.72	-328,546.63
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	2,848,033.647	642,788,827.11	730,552,189.52	87,763,362.41	1,036,782.611	236,924,730.22	265,946,228.31	29,021,498.09
KRS GLOBAL FIXED UNIT	1,294,230.689	190,052,952.81	172,176,811.02	-17,876,141.79	505,255.412	72,279,229.52	67,216,197.49	-5,063,032.03
KRS GREENFIELD UNIT	3,105.533	1,273,148.24	29,572.43	-1,243,575.81	967.716	396,726.40	9,215.07	-387,511.33
KRS GREENFIELD VII UNIT	4,427.832	1,230,597.35	1,332,888.39	102,291.04	1,379.758	383,466.26	415,341.73	31,875.47
KRS HARRISON UNIT	639,390.832	123,004,797.92	145,440,454.41	22,435,656.49	199,992.765	38,477,065.71	45,491,798.07	7,014,732.36
KRS IFM INFRAST DEBT UNIT	267,825.438	41,359,409.31	39,669,303.55	-1,690,105.76	92,231.578	14,243,023.98	13,660,996.85	-582,027.13
KRS INTERNATIONAL EQUITY UNIT	5,761,731.928	1,292,259,527.04	1,804,608,099.89	512,348,572.85	1,983,802.691	454,321,018.97	621,338,592.20	167,017,573.23
KRS INTERNAL EQUITY UNIT	7,218,592.358	1,143,403,877.95	1,184,826,139.88	41,422,261.93	2,530,471.152	404,501,163.62	415,339,753.02	10,838,589.40
KRS L-A VII UNIT	142,596.532	14,069,493.52	11,443,255.33	-2,626,238.19	44,444.354	4,385,166.66	3,566,623.14	-818,543.52
KRS LIQUID CORE FIXED UNIT	7,099,169.274	913,337,094.29	877,920,322.99	-35,416,771.30	2,462,543.731	316,420,117.33	304,531,009.79	-11,889,107.54
KRS LIQUID CREDIT FIXED UNIT	44,070.529	3.36	3.35	-0.01	13,249.620	1.01	1.01	0.00
KRS LIQUID HY FI UNIT	1,172,101.735	208,485,268.04	186,024,316.76	-22,460,951.28	459,943.152	81,533,957.44	72,997,597.43	-8,536,360.01
KRS MAGNETAR MTP UNIT	113.929	98,279.70	70,403.09	-27,876.61	36.025	31,077.30	22,261.86	-8,815.44
KRS MESA WEST CORE UNIT	205,495.934	39,279,287.96	36,106,008.58	-3,173,279.38	64,772.004	12,380,773.06	11,380,558.66	-1,000,214.40
KRS MESA WEST IV UNIT	105,087.787	11,055,825.38	8,380,399.18	-2,675,426.20	33,229.849	3,495,966.98	2,649,969.20	-845,997.78
KRS MULTI SECTOR CREDIT FI	1,492,072.539	177,410,298.71	247,202,407.92	69,792,109.21	490,250.072	58,286,583.25	81,223,261.68	22,936,678.43
KRS OBERLAND UNIT	54,294.957	3,504,168.92	4,374,992.89	870,823.97	16,950.611	1,093,983.41	1,365,850.66	271,867.25
KRS PE 2010 UNIT	527,632.303	138,367,606.06	164,257,654.40	25,890,048.34	164,247.615	43,073,648.41	51,132,062.67	8,058,414.26
KRS PE 2011 UNIT	160,689.933	34,465,727.87	53,846,047.13	19,380,319.26	77,694.315	16,662,926.11	26,034,809.21	9,371,883.10
KRS PE 2012 A UNIT	6,977.987	2,834,394.72	3,837,845.51	1,003,450.79	1,942.729	789,118.48	1,068,487.77	279,369.29
KRS PE 2012 B UNIT	64,631.763	8,873,398.75	11,306,455.51	2,433,056.76	17,994.036	2,470,430.44	3,147,813.98	677,383.54
KRS PE 2013 UNIT	219,623.383	45,122,948.36	82,259,778.00	37,136,829.64	74,961.695	15,391,952.25	28,076,848.22	12,684,895.97
KRS PE 2014 UNIT	211,281.185	16,535,730.34	35,894,092.11	19,358,361.77	72,114.341	5,643,966.38	12,251,345.51	6,607,379.13
KRS PE 2015 UNIT	151,589.841	18,518,249.46	51,322,631.00	32,804,381.54	51,740.534	6,320,636.17	17,517,402.99	11,196,766.82
KRS PE 2016 UNIT	316,988.501	25,646,757.78	79,665,330.72	54,018,572.94	98,726.872	7,987,747.41	24,811,969.15	16,824,221.74
KRS PE 2017 UNIT	204,756.143	23,367,324.76	36,249,137.28	12,881,812.52	63,771.911	7,277,823.11	11,289,901.84	4,012,078.73
KRS PE 2018 UNIT	221,717.289	37,863,729.15	38,207,170.87	343,441.72	69,219.057	11,820,871.70	11,928,092.53	107,220.83
KRS PE 2019 UNIT	266,481.053	28,073,713.17	64,754,427.94	36,680,714.77	83,194.085	8,764,475.82	20,216,016.57	11,451,540.75
KRS PE 2021 UNIT	548,518.497	56,987,532.64	70,356,512.14	13,368,979.50	185,968.593	19,320,938.19	23,853,528.45	4,532,590.26
KRS PERIMETER PARK UNIT	16,232.813	2,106,517.23	1,588,987.96	-517,529.27	17,672.730	2,293,373.45	1,729,937.70	-563,435.75
KRS POST-2015 REAL ESTATE UNIT	582,177.302	57,489,710.94	75,388,018.10	17,898,307.16	184,090.510	18,181,328.26	23,838,474.38	5,657,146.12
KRS PRIVATE CREDIT FI UNIT	1,480,670.457	292,917,722.86	310,406,798.09	17,489,075.23	490,403.584	97,008,857.93	102,807,890.55	5,799,032.62
KRS PROLOGIS UNIT	741,098.600	90,156,955.71	172,546,646.17	82,389,690.46	234,343.128	28,508,571.71	54,561,054.07	26,052,482.36
KRS REAL RETURN UNIT	581,790.595	80,954,765.73	115,356,807.93	34,402,042.20	200,352.390	27,728,435.97	39,725,654.51	11,997,218.54
KRS RUBENSTEIN PF II UNIT	72,479.805	12,548,932.75	7,412,765.22	-5,136,167.53	22,585.445	3,910,374.03	2,309,893.10	-1,600,480.93
KRS SHENKMAN UNIT	827,185.252	139,136,139.78	137,239,210.10	-1,896,929.68	278,810.950	46,855,009.00	46,257,829.73	-597,179.27
KRS STOCKBRIDGE UNIT	280,090.753	53,740,926.94	59,533,231.29	5,792,304.35	89,313.398	17,136,534.40	18,983,544.17	1,847,009.77
KRS TAURUS UNIT	7,028.034	118,783.60	2,358,996.26	2,240,212.66	2,398.804	40,542.86	805,171.07	764,628.21
KRS TPF II UNIT	351.766	3,985,492.04	34,923.55	-3,950,568.49	-117.591	1,332,302.74	11,674.51	-1,320,628.23
KRS WALTON VI UNIT	38,991.717	7,033,548.42	7,507,314.76	473,766.34	13,784.580	2,486,539.73	2,654,029.85	167,490.12
KRS WALTON VII UNIT	34,690.105	9,879,893.26	5,278,126.78	-4,601,766.48	10,809.793	3,078,675.30	1,644,718.51	-1,433,956.79
KRS WATERFALL UNIT	897,545.670	155,813,200.42	165,415,914.07	9,602,713.65	300,043.810	52,080,905.12	55,297,488.20	3,216,583.08

CERS Investment Committee Meeting - Investment Office Quarterly Update

Kentucky Public Pensions Authority									
Insurance: CERS & CERS-H Unit Holdings									
Quarter Ended September 30, 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	
Grand Total	24,466,710.652	2,723,649,390.01	3,222,628,889.56	498,979,499.55	12,029,595.398	1,301,207,068.66	1,571,522,235.98	270,315,167.32	
KR3 ARROWMARK UNIT	554,115.798	75,108,520.65	124,134,854.08	49,026,333.43	301,875.792	40,918,416.92	67,627,213.53	26,708,796.61	
KRS INS PE 2014 UNIT	93,873.463	7,372,342.16	15,961,786.11	8,589,443.95	50,775.439	3,987,642.14	8,633,608.17	4,645,966.03	
KRS INS ABSOLUTE RETURN UNIT	151,358.489	15,673,335.44	18,828,641.55	3,155,306.11	84,801.175	8,976,291.48	10,549,067.57	1,572,776.09	
KRS INS ADAMS STREET A1 UNIT	172,638.916	25,513,691.53	27,404,125.60	1,890,434.07	91,204.490	13,478,786.89	14,477,496.48	998,709.59	
KRS INS ADAMS STREET B1 UNIT	198,318.043	25,772,818.51	26,949,597.52	1,176,779.01	104,770.669	13,615,681.57	14,237,370.03	621,688.46	
KRS INS AMERRA AGRU UNIT	104,435.608	9,918,111.28	8,840,162.27	-1,077,949.01	57,653.438	5,475,270.50	4,880,191.32	-595,079.18	
KRS INS AMERRA UNIT	21,939.624	3,114,126.41	4,509,252.02	1,395,125.61	12,111.721	1,719,146.27	2,489,322.62	770,176.35	
KRS INS ARCTOS SPORTS II UNIT	30,186.776	3,263,934.16	5,104,444.27	1,840,510.11	10,307.679	1,124,747.90	1,742,980.87	618,232.97	
KRS INS BLACKCROCK UNIT	3,012,626.063	151,641,479.06	195,910,232.35	44,268,753.29	1,497,643.560	73,596,789.40	97,391,342.86	23,794,553.46	
KRS INS BLUE TORCH UNIT	152,188.673	24,650,527.78	25,584,322.15	933,794.37	79,995.007	12,957,070.69	13,447,899.83	490,829.14	
KRS INS BNYM CUSTODY FEE UNIT	-165,048.917	-165,048.92	-165,048.92	0.00	-80,707.080	-80,707.08	-80,707.08	0.00	
KRS INS BTG UNIT	58,674.170	3,880,524.10	5,779,249.91	1,898,725.81	32,238.357	2,132,143.48	3,175,392.54	1,043,249.06	
KRS INS CASH UNIT	927,389.535	96,724,565.30	98,203,369.12	1,478,803.82	174,539.095	19,842,283.61	18,482,338.36	-1,359,945.25	
KRS INS DB PRIVATE EQ UNIT	25,889.690	10,059,485.97	7,250,703.94	-2,808,782.03	13,988.962	5,435,434.78	3,917,768.88	-1,517,665.90	
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	
KRS INS DOMESTIC EQUITY UNIT	1,078,352.654	238,438,013.70	276,913,883.24	38,475,869.54	548,397.275	119,725,744.75	140,824,820.54	21,099,075.79	
KRS INS GLOBAL FIXED UNIT	415,098.604	58,934,757.21	54,138,174.02	-4,796,583.19	180,263.467	26,576,377.14	23,510,401.75	-3,065,975.39	
KRS INS GREENFIELD UNIT	903.324	368,593.15	8,561.36	-360,031.79	490.809	200,271.65	4,651.70	-195,619.95	
KRS INS GREENFIELD VII UNIT	1,279.863	515,669.09	385,288.25	-130,380.84	695.397	280,181.57	209,341.38	-70,840.19	
KRS INS HARRISON UNIT	244,840.322	46,804,374.98	54,464,944.35	7,660,569.37	133,920.349	25,595,138.60	29,790,699.08	4,195,560.48	
KRS INS IFM INFRASTR DEBT UNIT	94,964.510	14,482,355.23	13,890,549.47	-591,805.76	48,928.929	7,461,799.02	7,156,881.12	-304,917.90	
KRS INS INTERNAL EQUITY UNIT	2,142,615.214	490,770,410.47	672,532,113.18	181,761,702.71	1,028,756.715	228,328,169.75	322,910,022.74	94,581,852.99	
KRS INS INTL EQ UNIT	2,703,697.479	425,411,525.46	438,461,902.46	13,050,377.00	1,324,815.260	205,252,449.53	214,846,899.04	9,594,449.51	
KRS INS I-A-VII UNIT	41,214.677	4,067,474.71	3,308,231.85	-759,242.86	22,393.841	2,210,047.14	1,797,515.44	-412,531.70	
KRS INS LIQUID CORE FIXED UNIT	2,707,568.848	344,197,791.44	331,047,419.61	-13,150,371.83	1,209,273.813	154,907,891.31	147,854,772.26	-7,053,119.05	
KRS INS LIQUID CREDIT FIXED UN	5,562,779.296	4.36	5.56	1.20	2,995,343.950	2.38	3.00	0.62	
KRS INS LIQUID HY FI UNIT	578,159.003	97,321,281.59	89,291,342.42	-8,029,939.17	216,559.576	36,489,677.45	33,445,635.46	-3,044,041.99	
KRS INS MAGNETAR MTP	33.855	29,422.17	21,075.62	-8,346.55	18.727	16,272.98	11,658.05	-4,614.93	
KRS INS MESA WEST CORE UNIT	117,798.214	22,210,751.90	20,262,031.64	-1,948,720.26	65,081.046	12,272,266.69	11,194,348.10	-1,077,918.59	
KRS INS MESA WEST IV UNIT	34,504.073	3,490,151.96	2,660,065.73	-830,086.23	18,935.158	1,915,328.55	1,459,791.86	-455,536.69	
KRS INS MULTI SECTOR CREDIT FI	531,206.774	62,379,870.21	86,590,120.88	24,210,250.67	290,366.710	34,052,770.50	47,331,641.37	13,278,870.87	
KRS INS OBERLAND UNIT	10,280.748	685,249.39	855,539.24	170,289.85	5,589.719	372,574.32	465,163.03	92,588.71	
KRS INS PE 2010 UNIT	60,673.968	16,265,633.05	18,523,653.82	2,258,020.77	32,478.360	8,706,771.13	9,915,585.17	1,208,814.04	
KRS INS PE 2011 UNIT	110,651.058	22,918,350.57	37,932,122.66	15,013,772.09	66,229.162	13,717,988.85	22,703,919.35	8,985,930.50	
KRS INS PE 2012 A UNIT	2,213.500	811,828.11	1,221,389.78	409,561.67	1,197.264	439,110.71	660,639.72	221,529.01	
KRS INS PE 2012 B UNIT	26,635.323	3,631,198.67	4,681,298.39	1,050,099.72	14,137.520	1,927,052.26	2,484,743.64	557,691.38	
KRS INS PE 2013 UNIT	123,242.005	26,372,243.19	45,583,368.43	19,211,125.24	66,660.666	14,264,550.69	24,655,698.34	10,391,147.65	
KRS INS PE 2015 UNIT	87,128.117	10,733,244.07	29,310,204.47	18,576,960.40	47,126.956	5,805,530.71	15,853,673.46	10,048,142.75	
KRS INS PE 2016 UNIT	183,293.687	16,831,844.83	46,063,470.13	29,231,625.30	110,684.607	10,164,159.92	27,816,108.52	17,651,948.60	
KRS INS PE 2017 UNIT	119,039.049	16,340,170.85	20,959,715.44	4,619,544.59	71,883.325	9,867,231.20	12,656,805.05	2,789,573.85	
KRS INS PE 2018 UNIT	47,006.210	5,069,394.56	8,334,244.04	3,264,849.48	25,557.654	2,756,270.33	4,531,395.44	1,775,125.11	
KRS INS PE 2019 UNIT	27,855.176	2,865,343.56	6,768,756.57	3,903,413.01	14,856.088	1,528,183.81	3,610,002.08	2,081,818.27	
KRS INS PE 2021 UNIT	214,265.731	22,436,060.37	27,588,227.51	5,152,167.14	110,247.545	11,544,172.48	14,195,150.76	2,650,978.28	
KRS INS POST-2015 REAL ESTATE	202,089.638	19,790,779.42	26,073,114.22	6,282,334.80	110,902.818	10,862,651.68	14,308,412.20	3,445,760.52	
KRS INS PRIVATE CREDIT FI UNIT	519,264.396	101,357,146.37	106,890,845.93	5,533,699.56	283,201.805	55,272,462.62	58,297,238.82	3,024,776.20	
KRS INS PROLOGIS UNIT	150,318.422	29,697,138.20	55,667,883.00	25,970,744.80	82,491.818	16,297,211.83	30,549,448.37	14,252,236.54	
KRS INS REAL RETURN UNIT	154,824.683	21,859,193.92	30,798,750.11	8,939,556.19	79,787.539	11,308,664.61	15,871,865.05	4,563,200.44	
KRS INS RUBENSTEIN PF II UNIT	21,246.598	3,656,364.10	2,159,845.74	-1,496,518.36	11,544.310	1,986,678.13	1,173,549.23	-813,128.90	
KRS INS SHENKMAN UNIT	327,705.332	54,862,367.41	54,018,456.02	-843,911.39	121,420.554	20,375,758.58	20,014,782.23	-360,976.35	
KRS INS STOCKBRIDGE UNIT	117,767.220	22,966,320.52	24,923,357.53	1,957,037.01	64,874.850	12,651,539.24	13,729,619.17	1,078,079.93	
KRS INS TAURUS UNIT	2,575.300	173,275.74	866,109.89	692,834.15	1,392.960	100,770.23	468,472.19	367,701.96	
KRS INS TPF II UNIT	37.089	82,285.20	3,734.39	-78,550.81	19.666	43,631.34	1,980.12	-41,651.22	
KRS INS WALTON VI UNIT	3,937.153	705,968.60	753,521.50	47,552.90	2,109.889	378,320.59	403,806.18	25,485.59	
KRS INS WALTON VII UNIT	10,043.246	2,856,209.73	1,528,087.59	-1,328,122.14	5,456.865	1,551,881.95	830,266.20	-721,615.75	
KRS INS WATERFALL UNIT	350,626.197	58,730,918.52	62,646,495.52	3,915,577.00	184,093.223	30,820,513.89	32,891,995.43	2,071,481.54	

Kentucky Public Pensions Authority

Security Litigation Report

Quarter Ending: September 30, 2023

Claims Filed during the Quarter (pg 3):

14

Proceeds Received during the Quarter (pg 4):

\$95,674.83

Kentucky Retirement Systems	
Quarterly Securities Litigation Report	
Quarter Ended 09/30/23	
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	14
Total Filed	1,688
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	\$95,675
Total Proceeds	\$60,568,622

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
ARCONIC INC., Securities Litigation	FILED	8/21/2023	11/4/2013	6/27/2017	956589	KRS SYSTEMATIC
ARCONIC INC., Securities Litigation	FILED	8/22/2023	11/4/2013	6/27/2017	KR3F1005002	SASCO CAPITAL
ARCONIC INC., Securities Litigation	FILED	8/22/2023	11/4/2013	6/27/2017	KR2F1005002	SASCO CAPITAL
ARCONIC INC., Securities Litigation	FILED	8/21/2023	11/4/2013	6/27/2017	956766	KRS INS SYSTEMATIC
ARCONIC INC., Securities Litigation	FILED	8/21/2023	11/4/2013	6/27/2017	KR2F3006002	LOOMIS
ARCONIC INC., Securities Litigation	FILED	8/21/2023	11/4/2013	6/27/2017	956599	KRS S P 500 INDEX
ARCONIC INC., Securities Litigation	FILED	8/21/2023	11/4/2013	6/27/2017	KR3F1002002	NTGI STRUCTURED
ARCONIC INC., Securities Litigation	FILED	8/21/2023	11/4/2013	6/27/2017	KR2F1002002	NTGI STRUCTURED
ARCONIC INC., Securities Litigation	FILED	8/21/2023	11/4/2013	6/27/2017	KR2F1009002	INVESCO
ARCONIC INC., Securities Litigation	FILED	8/21/2023	11/4/2013	6/27/2017	KR3F3006002	LOOMIS
ARCONIC INC., Securities Litigation	FILED	8/22/2023	11/4/2013	6/27/2017	956772	KRS INS KRS INTERNAL EQUITY
ARCONIC INC., Securities Litigation	FILED	8/22/2023	11/4/2013	6/27/2017	956774	KRS INS S P 500 INDEX
ARCONIC INC., Securities Litigation	FILED	8/21/2023	11/4/2013	6/27/2017	956596	KRS KRS INTERNAL EQUITY
BUMBLE INC., Securities Litigation	FILED	9/20/2023	9/7/2021	1/24/2022	956588	KRS NTGI STRUCTURED
BUMBLE INC., Securities Litigation	FILED	9/20/2023	9/7/2021	1/24/2022	956765	KRS INS NTGI STRUCTURED
CARDINAL HEALTH, INC., Securities Litigation	FILED	7/24/2023	3/2/2015	5/2/2018	KR2F1006002	WESTFIELD CAPITAL
CARDINAL HEALTH, INC., Securities Litigation	FILED	7/24/2023	3/2/2015	5/2/2018	909181	KRS INS RIVER ROAD FAV
CARDINAL HEALTH, INC., Securities Litigation	FILED	7/24/2023	3/2/2015	5/2/2018	956597	KRS RIVER ROAD FAV
CARDINAL HEALTH, INC., Securities Litigation	FILED	7/24/2023	3/2/2015	5/2/2018	956599	KRS S P 500 INDEX
CARDINAL HEALTH, INC., Securities Litigation	FILED	7/24/2023	3/2/2015	5/2/2018	KR2F1009002	INVESCO
CARDINAL HEALTH, INC., Securities Litigation	FILED	7/24/2023	3/2/2015	5/2/2018	KR3F1008002	WESTWOOD MGMT
CARDINAL HEALTH, INC., Securities Litigation	FILED	7/24/2023	3/2/2015	5/2/2018	956596	KRS KRS INTERNAL EQUITY
CARDINAL HEALTH, INC., Securities Litigation	FILED	7/24/2023	3/2/2015	5/2/2018	KR2F1008002	WESTWOOD MGMT
CARDINAL HEALTH, INC., Securities Litigation	FILED	7/24/2023	3/2/2015	5/2/2018	956769	KRS INS RIVER ROAD
CARDINAL HEALTH, INC., Securities Litigation	FILED	7/24/2023	3/2/2015	5/2/2018	KR3F1006002	WESTFIELD CAPITAL
CARDINAL HEALTH, INC., Securities Litigation	FILED	7/24/2023	3/2/2015	5/2/2018	956592	KRS RIVER ROAD
CARDINAL HEALTH, INC., Securities Litigation	FILED	7/24/2023	3/2/2015	5/2/2018	956774	KRS INS S P 500 INDEX
CARDINAL HEALTH, INC., Securities Litigation	FILED	7/24/2023	3/2/2015	5/2/2018	956772	KRS INS KRS INTERNAL EQUITY
CBL & ASSOCIATES PROPERTIES, INC., Securities Litigation	FILED	9/20/2023	7/29/2014	3/26/2019	956765	KRS INS NTGI STRUCTURED
CBL & ASSOCIATES PROPERTIES, INC., Securities Litigation	FILED	9/20/2023	7/29/2014	3/26/2019	KR2F1003002	SYSTEMATIC
CBL & ASSOCIATES PROPERTIES, INC., Securities Litigation	FILED	9/20/2023	7/29/2014	3/26/2019	956816	KRS INS NUVEEN REAL ASSET
CBL & ASSOCIATES PROPERTIES, INC., Securities Litigation	FILED	9/20/2023	7/29/2014	3/26/2019	KR3F1003002	SYSTEMATIC
CBL & ASSOCIATES PROPERTIES, INC., Securities Litigation	FILED	9/20/2023	7/29/2014	3/26/2019	956642	KRS NUVEEN REAL ASSET
CBL & ASSOCIATES PROPERTIES, INC., Securities Litigation	FILED	9/20/2023	7/29/2014	3/26/2019	956588	KRS NTGI STRUCTURED
D-MARKET Electronic Services & Trading, Securities Litigation	FILED	9/25/2023	5/28/2021	11/23/2021	412207	KRS JP MORGAN EMERGING MARKETS
D-MARKET Electronic Services & Trading, Securities Litigation	FILED	9/25/2023	5/28/2021	11/23/2021	412211	KRS INS JP MORGAN EMERGING MARKETS
EXELON CORPORATION Securities Litigation	FILED	9/26/2023	2/8/2019	10/31/2019	956599	KRS S P 500 INDEX
EXELON CORPORATION Securities Litigation	FILED	9/26/2023	2/8/2019	10/31/2019	956774	KRS INS S P 500 INDEX
EXELON CORPORATION Securities Litigation	FILED	9/26/2023	2/8/2019	10/31/2019	956596	KRS KRS INTERNAL EQUITY
EXELON CORPORATION Securities Litigation	FILED	9/26/2023	2/8/2019	10/31/2019	956772	KRS INS KRS INTERNAL EQUITY
FIFTH THIRD BANCORP, Securities Litigation	FILED	9/1/2023	5/21/2018	5/22/2019	956596	KRS KRS INTERNAL EQUITY
FIFTH THIRD BANCORP, Securities Litigation	FILED	9/1/2023	5/21/2018	5/22/2019	956765	KRS INS NTGI STRUCTURED
FIFTH THIRD BANCORP, Securities Litigation	FILED	9/1/2023	5/21/2018	5/22/2019	904032	KRS PUTNAM
FIFTH THIRD BANCORP, Securities Litigation	FILED	9/1/2023	5/21/2018	5/22/2019	956599	KRS S P 500 INDEX
FIFTH THIRD BANCORP, Securities Litigation	FILED	9/1/2023	5/21/2018	5/22/2019	956588	KRS NTGI STRUCTURED
FIFTH THIRD BANCORP, Securities Litigation	FILED	9/1/2023	5/21/2018	5/22/2019	956629	KRS MANULIFE ASSET MGMT
FIFTH THIRD BANCORP, Securities Litigation	FILED	9/1/2023	5/21/2018	5/22/2019	956805	KRS INS MANULIFE ASSET MGMT
FIFTH THIRD BANCORP, Securities Litigation	FILED	9/1/2023	5/21/2018	5/22/2019	956772	KRS INS KRS INTERNAL EQUITY
FIFTH THIRD BANCORP, Securities Litigation	FILED	9/1/2023	5/21/2018	5/22/2019	904033	KRS INS PUTNAM
FIFTH THIRD BANCORP, Securities Litigation	FILED	9/1/2023	5/21/2018	5/22/2019	956774	KRS INS S P 500 INDEX
FIFTH THIRD BANCORP, Securities Litigation	FILED	9/1/2023	5/21/2018	5/22/2019	140455	KRS INS ABEL NOSER TRANSITION
FIFTH THIRD BANCORP, Securities Litigation	FILED	9/1/2023	5/21/2018	5/22/2019	140454	KRS ABEL NOSER TRANSITION
INTERFACE, INC., Securities Litigation	FILED	9/11/2023	5/12/2016	9/28/2020	KR3F1011002	KRS INTERNAL EQUITY
INTERFACE, INC., Securities Litigation	FILED	9/11/2023	5/12/2016	9/28/2020	956588	KRS NTGI STRUCTURED
INTERFACE, INC., Securities Litigation	FILED	9/11/2023	5/12/2016	9/28/2020	KR2F1011002	KRS INTERNAL EQUITY
INTERFACE, INC., Securities Litigation	FILED	9/11/2023	5/12/2016	9/28/2020	956765	KRS INS NTGI STRUCTURED
KRAFT HEINZ COMPANY, Fair Fund	FILED	9/21/2023	2/26/2016	2/21/2019	956596	KRS KRS INTERNAL EQUITY
KRAFT HEINZ COMPANY, Fair Fund	FILED	9/21/2023	2/26/2016	2/21/2019	956599	KRS S P 500 INDEX
KRAFT HEINZ COMPANY, Fair Fund	FILED	9/21/2023	2/26/2016	2/21/2019	956592	KRS RIVER ROAD
KRAFT HEINZ COMPANY, Fair Fund	FILED	9/21/2023	2/26/2016	2/21/2019	956772	KRS INS KRS INTERNAL EQUITY
KRAFT HEINZ COMPANY, Fair Fund	FILED	9/21/2023	2/26/2016	2/21/2019	956597	KRS RIVER ROAD FAV
KRAFT HEINZ COMPANY, Fair Fund	FILED	9/21/2023	2/26/2016	2/21/2019	909181	KRS INS RIVER ROAD FAV
KRAFT HEINZ COMPANY, Fair Fund	FILED	9/21/2023	2/26/2016	2/21/2019	956769	KRS INS RIVER ROAD
MAXAR TECHNOLOGIES INC., Securities Litigation	FILED	9/25/2023	2/24/2017	9/27/2023	956588	KRS NTGI STRUCTURED
MAXAR TECHNOLOGIES INC., Securities Litigation	FILED	9/25/2023	2/24/2017	9/27/2023	956765	KRS INS NTGI STRUCTURED
MOHAWK INDUSTRIES, INC Securities Litigation	FILED	7/17/2023	4/28/2017	7/25/2019	956774	KRS INS S P 500 INDEX
MOHAWK INDUSTRIES, INC Securities Litigation	FILED	7/17/2023	4/28/2017	7/25/2019	956599	KRS S P 500 INDEX
MOHAWK INDUSTRIES, INC Securities Litigation	FILED	7/17/2023	4/28/2017	7/25/2019	956596	KRS KRS INTERNAL EQUITY
MOHAWK INDUSTRIES, INC Securities Litigation	FILED	7/17/2023	4/28/2017	7/25/2019	956772	KRS INS KRS INTERNAL EQUITY
SHATTUCK LABS, INC., et al., Securities Litigation	FILED	9/28/2023	9/18/2020	11/8/2021	956588	KRS NTGI STRUCTURED
SHATTUCK LABS, INC., et al., Securities Litigation	FILED	9/28/2023	9/18/2020	11/8/2021	956765	KRS INS NTGI STRUCTURED
TACTILE SYSTEMS TECHNOLOGY, INC., Securities Litigation	FILED	8/21/2023	5/7/2018	6/8/2020	412224	KRS NEXT CENTURY GROWTH
TACTILE SYSTEMS TECHNOLOGY, INC., Securities Litigation	FILED	8/21/2023	5/7/2018	6/8/2020	956588	KRS NTGI STRUCTURED
TACTILE SYSTEMS TECHNOLOGY, INC., Securities Litigation	FILED	8/21/2023	5/7/2018	6/8/2020	412227	KRS INS NEXT CENTURY GROWTH
TACTILE SYSTEMS TECHNOLOGY, INC., Securities Litigation	FILED	8/21/2023	5/7/2018	6/8/2020	956765	KRS INS NTGI STRUCTURED
WELLS FARGO & COMPANY, Securities Litigation (18CV03948WHQ)	FILED	8/25/2023	11/3/2016	8/3/2017	956596	KRS KRS INTERNAL EQUITY
WELLS FARGO & COMPANY, Securities Litigation (18CV03948WHQ)	FILED	8/25/2023	11/3/2016	8/3/2017	956599	KRS S P 500 INDEX
WELLS FARGO & COMPANY, Securities Litigation (18CV03948WHQ)	FILED	8/25/2023	11/3/2016	8/3/2017	956772	KRS INS KRS INTERNAL EQUITY
WELLS FARGO & COMPANY, Securities Litigation (18CV03948WHQ)	FILED	8/25/2023	11/3/2016	8/3/2017	909181	KRS INS RIVER ROAD FAV
WELLS FARGO & COMPANY, Securities Litigation (18CV03948WHQ)	FILED	8/25/2023	11/3/2016	8/3/2017	956774	KRS INS S P 500 INDEX
WELLS FARGO & COMPANY, Securities Litigation (18CV03948WHQ)	FILED	8/25/2023	11/3/2016	8/3/2017	956597	KRS RIVER ROAD FAV



Transaction Detail
Reported By Transaction Category

Report ID: IACS0008

Base Currency: USD

KR2G00000000 - TOTAL FUND

6/30/2023 - 9/30/2023

Status: PRELIMINARY

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	04-cv-9866 (LTS)(HBP)Pfizer, I	6/30/2023	0.000000	90.23	90.23	90.23
	NA9123459	nc. (2004) Distribution 4TH DI		0.000000	90.23	90.23	90.23
		20230630S000470 / 000000008745	6/30/2023				Gain/Loss Local Amounts: 90.23 Long
		KR2F19020002 : S&P 500 INDEX					Gain/Loss Base Amounts: 90.23 Long
CD	0.000	24274NAVIENT CORPORATION Secur	7/5/2023	0.000000	5,343.07	5,343.07	5,343.07
	NA9123459	ities Litigation Distribution		0.000000	5,343.07	5,343.07	5,343.07
		20230705S000020 / 000000000009	7/5/2023				Gain/Loss Local Amounts: 5,343.07 Long
		KR2F30060002 : LOOMIS					Gain/Loss Base Amounts: 5,343.07 Long
CD	0.000	24274NAVIENT CORPORATION Secur	7/5/2023	0.000000	2,349.64	2,349.64	2,349.64
	NA9123459	ities Litigation Distribution		0.000000	2,349.64	2,349.64	2,349.64
		20230705S000110 / 000000000009	7/5/2023				Gain/Loss Local Amounts: 2,349.64 Long
		KR2F19020002 : S&P 500 INDEX					Gain/Loss Base Amounts: 2,349.64 Long
CD	0.000	24274NAVIENT CORPORATION Secur	7/5/2023	0.000000	190.56	190.56	190.56
	NA9123459	ities Litigation Distribution		0.000000	190.56	190.56	190.56
		20230705S000120 / 000000000009	7/5/2023				Gain/Loss Local Amounts: 190.56 Long
		KR2F30070002 : COLUMBIA					Gain/Loss Base Amounts: 190.56 Long
CD	0.000	18385DEPOMED, INC., Securities	7/18/2023	0.000000	43.41	43.41	43.41
	NA9123459	Litigation (17CV04830) Distri		0.000000	43.41	43.41	43.41
		20230718S000380 / 000000000010	7/18/2023				Gain/Loss Local Amounts: 43.41 Long
		KR2F10020002 : NTGI STRUCTURED					Gain/Loss Base Amounts: 43.41 Long
CD	0.000	24219INTRUSION INC., Security	7/18/2023	0.000000	37.61	37.61	37.61
	NA9123459	Litigation Distribution 1ST DI		0.000000	37.61	37.61	37.61
		20230718S000410 / 000000000000	7/18/2023				Gain/Loss Local Amounts: 37.61 Long
		KR2F10020002 : NTGI STRUCTURED					Gain/Loss Base Amounts: 37.61 Long



Transaction Detail
Reported By Transaction Category

Report ID: IACS0008

Base Currency: USD

KR2G00000000 - TOTAL FUND

6/30/2023 - 9/30/2023

Status: PRELIMINARY

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	17866SYNCHRONOSS TECHNOLOGIES, INC, Securities Litigation (1	7/19/2023	0.000000	152.01	152.01	152.01
	NA9123459	20230719S041230 / 000000000000	7/19/2023	0.000000	152.01	152.01	152.01
		KR2F10020002 : NTGI STRUCTURED					Gain/Loss Local Amounts: 152.01 Long Gain/Loss Base Amounts: 152.01 Long
CD	0.000	14-CV-09662 (JSR)PETROBRAS - P ETROLEO BRASILEIRO S.A (2014)	7/21/2023	0.000000	8,568.01	8,568.01	8,568.01
	NA9123459	20230721S000050 / 000000000009	7/21/2023	0.000000	8,568.01	8,568.01	8,568.01
		KR2F90010002 : CASH ACCOUNT KR2					Gain/Loss Local Amounts: 8,568.01 Long Gain/Loss Base Amounts: 8,568.01 Long
CD	0.000	18145HD SUPPLY HOLDINGS, INC. Distribution 2ND DISTRIBUTION	7/25/2023	0.000000	131.13	131.13	131.13
	NA9123459	20230725S000020 / 000000000008	7/25/2023	0.000000	131.13	131.13	131.13
		KR2F10060002 : WESTFIELD CAPITAL					Gain/Loss Local Amounts: 131.13 Long Gain/Loss Base Amounts: 131.13 Long
CD	0.000	15861VALEANT PHARMACEUTICALS I NTERNATIONAL, INC., Securities	7/25/2023	0.000000	17,796.03	17,796.03	17,796.03
	NA9123459	20230725S000140 / 000000000003	7/25/2023	0.000000	17,796.03	17,796.03	17,796.03
		KR2F30070002 : COLUMBIA					Gain/Loss Local Amounts: 17,796.03 Long Gain/Loss Base Amounts: 17,796.03 Long
CD	0.000	19486TEVA PHARMACEUTICAL INDUS TRIES LIMITED Securities Litig	8/18/2023	0.000000	479.48	479.48	479.48
	NA9123459	20230818S000880 / 000000000006	8/18/2023	0.000000	479.48	479.48	479.48
		KR2F30080002 : NISA					Gain/Loss Local Amounts: 479.48 Long Gain/Loss Base Amounts: 479.48 Long
CD	0.000	25093SCANA CORPORATION Securit ies Litigation Distribution 1S	8/25/2023	0.000000	5,481.85	5,481.85	5,481.85
	NA9123459	20230825S000170 / 000000000000	8/25/2023	0.000000	5,481.85	5,481.85	5,481.85
		KR2F19020002 : S&P 500 INDEX					Gain/Loss Local Amounts: 5,481.85 Long Gain/Loss Base Amounts: 5,481.85 Long
CD	0.000	22102EVOLENT HEALTH, INC., Sec urities Litigation Distributio	8/25/2023	0.000000	2,005.26	2,005.26	2,005.26
	NA9123459	20230825S000420 / 000000006055	8/25/2023	0.000000	2,005.26	2,005.26	2,005.26
		KR2F10020002 : NTGI STRUCTURED					Gain/Loss Local Amounts: 2,005.26 Long Gain/Loss Base Amounts: 2,005.26 Long



Transaction Detail
Reported By Transaction Category

Report ID: IACS0008

Base Currency: USD

KR2G0000000 - TOTAL FUND

6/30/2023 - 9/30/2023

Status: PRELIMINARY

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	APPLIED MICRO CIRCUITS CORPS	8/25/2023	0.000000	45.67	45.67	45.67
	NA9123459	SEC LIT PROCEEDS		0.000000	45.67	45.67	45.67
		20230831A000010	8/25/2023				
		KR2F90010002 : CASH ACCOUNT KR2					Gain/Loss Local Amounts: 45.67 Long Gain/Loss Base Amounts: 45.67 Long
CD	0.000	VALEANT PHARMACEUTICALS INTL	8/25/2023	0.000000	21,578.44	21,578.44	21,578.44
	NA9123459	INC (2015) SEC LIT PROCEEDS		0.000000	21,578.44	21,578.44	21,578.44
		20230831A000020	8/25/2023				
		KR2F90010002 : CASH ACCOUNT KR2					Gain/Loss Local Amounts: 21,578.44 Long Gain/Loss Base Amounts: 21,578.44 Long
CD	0.000	FUQI INTERNATIONAL INC SEC LIT	8/25/2023	0.000000	216.96	216.96	216.96
	NA9123459	PROCEEDS		0.000000	216.96	216.96	216.96
		20230831A000030	8/25/2023				
		KR2F90010002 : CASH ACCOUNT KR2					Gain/Loss Local Amounts: 216.96 Long Gain/Loss Base Amounts: 216.96 Long
CD	0.000	21392HEALTHCARE SERVICES GROUP	9/1/2023	0.000000	58.81	58.81	58.81
	NA9123459	, INC., Securities Litigation		0.000000	58.81	58.81	58.81
		20230901S000790 / 000000000000	9/1/2023				
		KR2F10020002 : NTGI STRUCTURED					Gain/Loss Local Amounts: 58.81 Long Gain/Loss Base Amounts: 58.81 Long
CD	0.000	1-18-cv-01428-MKB-VMSHENRY SCH	9/7/2023	0.000000	131.03	131.03	131.03
	NA9123459	EIN, INC. Distribution 2ND DIS		0.000000	131.03	131.03	131.03
		20230907S000200 / 000000000000	9/7/2023				
		KR2F10110002 : KRS INTERNAL EQUITY					Gain/Loss Local Amounts: 131.03 Long Gain/Loss Base Amounts: 131.03 Long
CD	0.000	HARBORVIEW MORTGAGE LOAN	8/25/2023	0.000000	1,157.23	1,157.23	1,157.23
	NA9123459	TRUSTSEC LIT PROCEEDS		0.000000	1,157.23	1,157.23	1,157.23
		20230915A000020	8/25/2023				
		KR2F90010002 : CASH ACCOUNT KR2					Gain/Loss Local Amounts: 1,157.23 Long Gain/Loss Base Amounts: 1,157.23 Long
CD	0.000	HARBORVIEW MORTGAGE LOAN	8/25/2023	0.000000	833.97	833.97	833.97
	NA9123459	TRUSTSEC LIT PROCEEDS		0.000000	833.97	833.97	833.97
		20230915A000030	8/25/2023				
		KR2F90010002 : CASH ACCOUNT KR2					Gain/Loss Local Amounts: 833.97 Long Gain/Loss Base Amounts: 833.97 Long
TOTAL U.S. DOLLAR CASH & CASH EQUIVALENTS:					66,690.40	66,690.40	66,690.40
					66,690.40	66,690.40	66,690.40



Transaction Detail
Reported By Transaction Category

Report ID: IACS0008

Base Currency: USD

KR2G00000000 - TOTAL FUND

6/30/2023 - 9/30/2023

Status: PRELIMINARY

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				
TOTAL CASH & CASH EQUIVALENTS CLASS ACTIONS:					66,690.40	66,690.40	66,690.40
EQUITY							
CANADIAN DOLLAR							
CD	0.000	ORD INST: BSDTUS33GBL THE BANK	8/2/2023	0.000000	1,703.81	1,703.81	1,703.81
	NCB63VJ03	OF NEW YORK MELLON 02149,MA,U		0.000000	1,276.79	1,276.79	1,274.69
		20230828A000010	8/2/2023				Gain/Loss Local Amounts: 1,703.81 Long
		KR2F20010002 : KRS NONUS ACWI-EX US					Gain/Loss Base Amounts: 1,276.79 Long
U.S. DOLLAR							
CD	0.000	PFIZER, INC (2004)	7/6/2023	0.000000	28.07	28.07	28.07
	717081103	PFIZER INC		0.000000	28.07	28.07	28.07
		20230712A000070	7/6/2023				Gain/Loss Local Amounts: 28.07 Long
		KR2F90010002 : CASH ACCOUNT KR2					Gain/Loss Base Amounts: 28.07 Long
TOTAL EQUITY CLASS ACTIONS:					1,304.86	1,304.86	1,302.76
TOTAL CLASS ACTIONS:					67,995.26	67,995.26	67,993.16
TOTAL TRANSACTIONS BASE:					67,995.26	67,995.26	67,993.16



Transaction Detail
Reported By Transaction Category

Report ID: IACS0008

Base Currency: USD

KR3G00000000 - TOTAL FUND

6/30/2023 - 9/30/2023

Status: PRELIMINARY

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	04-cv-9866 (LTS)(HBP)Pfizer, I	6/30/2023	0.000000	30.01	30.01	30.01
	NA9123459	nc. (2004) Distribution 4TH DI		0.000000	30.01	30.01	30.01
		20230630S000460 / 000000008745	6/30/2023				
		KR3F19020002 : S&P 500 INDEX					Gain/Loss Local Amounts: 30.01 Long Gain/Loss Base Amounts: 30.01 Long
CD	0.000	24274NAVIENT CORPORATION Secur	7/5/2023	0.000000	1,806.65	1,806.65	1,806.65
	NA9123459	ities Litigation Distribution		0.000000	1,806.65	1,806.65	1,806.65
		20230705S000020 / 000000000009	7/5/2023				
		KR3F30060002 : LOOMIS					Gain/Loss Local Amounts: 1,806.65 Long Gain/Loss Base Amounts: 1,806.65 Long
CD	0.000	24274NAVIENT CORPORATION Secur	7/5/2023	0.000000	2,301.85	2,301.85	2,301.85
	NA9123459	ities Litigation Distribution		0.000000	2,301.85	2,301.85	2,301.85
		20230705S000110 / 000000000009	7/5/2023				
		KR3F19020002 : S&P 500 INDEX					Gain/Loss Local Amounts: 2,301.85 Long Gain/Loss Base Amounts: 2,301.85 Long
CD	0.000	2-17-CV-3711-TJSEndo Internati	7/12/2023	0.000000	840.14	840.14	840.14
	NA9123459	onal plc (2017) (E.D. Pa.) Dis		0.000000	840.14	840.14	840.14
		20230712S000010 / 000000000000	7/12/2023				
		KR3F90010002 : CASH ACCOUNT KR3					Gain/Loss Local Amounts: 840.14 Long Gain/Loss Base Amounts: 840.14 Long
CD	0.000	2-17-CV-3711-TJSEndo Internati	7/14/2023	0.000000	439.94	439.94	439.94
	NA9123459	onal plc (2017) (E.D. Pa.) Dis		0.000000	439.94	439.94	439.94
		20230717S000040 / 000000000000	7/14/2023				
		KR3F90010002 : CASH ACCOUNT KR3					Gain/Loss Local Amounts: 439.94 Long Gain/Loss Base Amounts: 439.94 Long
CD	0.000	25914DEUTSCHE BANK AKTIENGESEL	7/19/2023	0.000000	3,218.96	3,218.96	3,218.96
	NA9123459	LSCHAFT, Securities Litigation		0.000000	3,218.96	3,218.96	3,218.96
		20230719S000010 / 000000006051	7/19/2023				
		KR3F20070002 : LSV ASSET MGMT					Gain/Loss Local Amounts: 3,218.96 Long Gain/Loss Base Amounts: 3,218.96 Long



Transaction Detail
Reported By Transaction Category

Report ID: IACS0008

Base Currency: USD

Status: PRELIMINARY

KR3G0000000 - TOTAL FUND

6/30/2023 - 9/30/2023

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	20479MICROCHIP TECHNOLOGY INC. NA9123459 , Securities Litigation Distri	7/24/2023	0.000000	2,641.97	2,641.97	2,641.97
		20230724S000040 / 000000006040	7/24/2023	0.000000	2,641.97	2,641.97	2,641.97
		KR3F90010002 : CASH ACCOUNT KR3					Gain/Loss Local Amounts: 2,641.97 Long Gain/Loss Base Amounts: 2,641.97 Long
CD	0.000	18145HD SUPPLY HOLDINGS, INC. NA9123459 Distribution 2ND DISTRIBUTION	7/25/2023	0.000000	55.50	55.50	55.50
		20230725S000020 / 000000000008	7/25/2023	0.000000	55.50	55.50	55.50
		KR3F10060002 : WESTFIELD CAPITAL					Gain/Loss Local Amounts: 55.50 Long Gain/Loss Base Amounts: 55.50 Long
CD	0.000	15861VALEANT PHARMACEUTICALS I NA9123459 NTERNATIONAL, INC., Securities	7/25/2023	0.000000	4,763.88	4,763.88	4,763.88
		20230725S000140 / 000000000003	7/25/2023	0.000000	4,763.88	4,763.88	4,763.88
		KR3F30070002 : COLUMBIA					Gain/Loss Local Amounts: 4,763.88 Long Gain/Loss Base Amounts: 4,763.88 Long
CD	0.000	23064LIBERTY OILFIELD SERVICES NA9123459 INC Securities Litigation Dis	8/15/2023	0.000000	29.76	29.76	29.76
		20230815S000370 / 000000000000	8/15/2023	0.000000	29.76	29.76	29.76
		KR3F10020002 : NTGI STRUCTURED					Gain/Loss Local Amounts: 29.76 Long Gain/Loss Base Amounts: 29.76 Long
CD	0.000	19486TEVA PHARMACEUTICAL INDUS NA9123459 TRIES LIMITED Securities Litig	8/18/2023	0.000000	162.31	162.31	162.31
		20230818S000470 / 000000000006	8/18/2023	0.000000	162.31	162.31	162.31
		KR3F30080002 : NISA					Gain/Loss Local Amounts: 162.31 Long Gain/Loss Base Amounts: 162.31 Long
CD	0.000	25093SCANA CORPORATION Securit NA9123459 ies Litigation Distribution 1S	8/25/2023	0.000000	2,431.71	2,431.71	2,431.71
		20230825S000170 / 000000000000	8/25/2023	0.000000	2,431.71	2,431.71	2,431.71
		KR3F19020002 : S&P 500 INDEX					Gain/Loss Local Amounts: 2,431.71 Long Gain/Loss Base Amounts: 2,431.71 Long
CD	0.000	VALEANT PHARMACEUTICALS INTL NA9123459 INC (2015) SEC LIT PROCEEDS	8/25/2023	0.000000	8,621.97	8,621.97	8,621.97
		20230831A000010	8/25/2023	0.000000	8,621.97	8,621.97	8,621.97
		KR3F90010002 : CASH ACCOUNT KR3					Gain/Loss Local Amounts: 8,621.97 Long Gain/Loss Base Amounts: 8,621.97 Long



Transaction Detail
Reported By Transaction Category

Report ID: IACS0008

Base Currency: USD

KR3G00000000 - TOTAL FUND

6/30/2023 - 9/30/2023

Status: PRELIMINARY

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	VALEANT PHARMACEUTICALS INTL	8/25/2023	0.000000	67.91	67.91	67.91
	NA9123459	INC (2015) SEC LIT PROCEEDS		0.000000	67.91	67.91	67.91
		20230831A000020	8/25/2023				
		KR3F90010002 : CASH ACCOUNT KR3					Gain/Loss Local Amounts: 67.91 Long Gain/Loss Base Amounts: 67.91 Long
CD	0.000	1-18-cv-01428-MKB-VMSHENRY SCH	9/7/2023	0.000000	267.01	267.01	267.01
	NA9123459	EIN, INC. Distribution 2ND DIS		0.000000	267.01	267.01	267.01
		20230907S000200 / 000000000000	9/7/2023				
		KR3F10110002 : KRS INTERNAL EQUITY					Gain/Loss Local Amounts: 267.01 Long Gain/Loss Base Amounts: 267.01 Long
TOTAL U.S. DOLLAR CASH & CASH EQUIVALENTS:					<u>27,679.57</u>	<u>27,679.57</u>	<u>27,679.57</u>
					27,679.57	27,679.57	27,679.57
TOTAL CASH & CASH EQUIVALENTS CLASS ACTIONS:					<u>27,679.57</u>	<u>27,679.57</u>	<u>27,679.57</u>
					27,679.57	27,679.57	27,679.57
TOTAL CLASS ACTIONS:					<u>27,679.57</u>	<u>27,679.57</u>	<u>27,679.57</u>
					27,679.57	27,679.57	27,679.57
TOTAL TRANSACTIONS BASE:					<u>27,679.57</u>	<u>27,679.57</u>	<u>27,679.57</u>
					27,679.57	27,679.57	27,679.57

County Employees Retirement System

Capital Calls and Distributions

Quarter Ending: September 30, 2023

**Kentucky Public Pensions Authority
Capital Calls and Distributions
For the period July 1, 2023 thru September 30, 2023**

Pension Funds Managers	Total Pension Fund Commitment	County Employees Retirement System					County Employees Hazardous Retirement System				
		Commitment	Beginning Valuation	Period Contributions	Period Distributions	Ending Valuation	Commitment	Beginning Valuation	Period Contributions	Period Distributions	Ending Valuation
Adams Street SPC II A1	175,000,000	97,124,912	80,937,595	0	2,670,930	78,266,665	32,749,407	27,291,230	0	900,607	26,390,622
Adams Street SPC II B1	175,000,000	97,124,911	79,077,584	0	2,109,057	76,968,526	32,749,407	26,664,055	0	711,150	25,952,905
AMERRA Agri Fund II, LP	40,100,000	27,641,371	16,787,038	0	144,578	16,642,460	8,727,285	5,300,217	0	45,648	5,254,569
AMERRA-KRS Agri Holding Company, LP	65,000,000	44,805,214	25,876,615	0	1,439,602	24,437,013	14,146,472	8,170,094	0	454,529	7,715,565
Arcano KRS Fund I, L.P.	36,000,000	15,587,717	7,278,370	0	0	7,278,370	4,852,329	2,265,697	0	0	2,265,697
Arctos Sports Partners Fund II	85,000,000	42,000,000	5,077,267	5,380,616	0	10,457,883	18,000,000	2,175,972	2,305,978	0	4,481,950
Ares Special Situations Fund IV, L.P.	26,192,000	17,935,797	13,039,673	0	198,892	12,840,781	6,121,833	4,450,692	0	67,886	4,382,806
Barings Euro Real Estate II	157,489,063	88,603,348	17,105,941	0	0	16,600,289	28,017,299	5,409,076	0	0	5,249,184
Barings Real Estate European Value Add I SCSp	111,168,750	62,543,540	8,621,753	952,812	0	9,320,021	19,776,917	2,726,288	301,289	0	2,947,087
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	44,677,663	0	3,047,040	41,630,622	8,316,082	15,249,348	0	1,040,014	14,209,334
Blackstone Capital Partners V, L.P.	47,174,735	20,426,290	20,003	0	0	20,003	6,358,537	6,227	0	0	6,227
Blackstone Capital Partners VI, L.P.	60,000,000	38,220,311	13,519,387	0	880,672	12,638,715	18,479,695	6,536,685	0	425,809	6,110,876
Blue Torch Credit Opportunities Fund II LP	140,000,000	77,659,705	80,856,192	0	7,727,334	73,128,858	26,221,374	27,300,650	0	2,609,092	24,691,558
BSP Co-Invest Vehicle K LP			22,759,352	0	413,370	22,345,982	0	7,537,983	0	136,910	7,401,073
BSP Private Credit Fund	100,000,000	58,940,485	54,525,943	0	1,249,367	53,276,577	19,521,309	18,059,196	0	413,795	17,645,401
BTG Pactual Brazil Timberland Fund I	34,500,000	23,847,150	19,642,411	0	0	19,642,411	7,642,335	6,294,836	0	0	6,294,836
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	109,569,263	0	0	111,211,715	27,329,832	36,289,749	0	0	36,833,735
Ceres Farms	100,000,000										
Columbia Capital Equity Partners IV, L.P.	27,000,000	11,690,788	1,332,335	0	0	1,332,335	3,639,247	414,745	0	0	414,745
Crestview Partners II, L.P.	67,500,000	29,226,970	14,989,371	111,320	796,336	14,304,355	9,098,116	4,666,068	34,653	247,893	4,452,828
Crestview Partners III, L.P.	39,000,000	26,706,479	23,053,309	0	0	23,053,309	9,115,436	7,868,539	0	0	7,868,539
CS Adjacent Investment Partners Parallel LP	140,000,000	82,516,679	52,441,696	4,916,734	15,980,218	41,378,213	27,329,832	17,368,886	1,628,441	5,292,708	13,704,619
CVC European Equity Partners VI, L.P.	23,208,615	15,892,830	14,964,563	53,056	105,754	14,469,755	5,424,529	5,107,694	18,109	36,096	4,938,806
DAG Ventures II, L.P.	27,000,000	11,690,788	987,889	0	0	987,889	3,639,247	307,522	0	0	307,522
DAG Ventures III, L.P.	27,000,000	11,690,788	139,291	0	0	139,291	3,639,247	43,360	0	0	43,360
DAG Ventures IV, L.P.	90,000,000	38,969,294	9,025,944	0	0	9,025,944	12,130,822	2,809,703	0	0	2,809,703
DAG Ventures V, L.P.	8,000,000	5,096,042	25,437	0	16,397	9,040	2,463,959	12,299	0	7,928	4,371
DCM VI, L.P.	13,500,000	5,845,394	1,556,355	0	278,863	1,277,492	1,819,623	484,481	0	86,808	397,673
DivcoWest Fund IV	20,800,000	14,568,740	704,585	0	0	704,585	4,539,761	219,556	0	0	219,556
Fundamental Partners III LP	70,000,000	39,382,001	34,696,168	0	396,596	34,299,572	12,452,997	10,971,289	0	125,408	10,845,881
Green Equity Investors V, L.P.	90,000,000	38,969,294	573,273	0	0	573,273	12,130,822	178,455	0	0	178,455
Green Equity Investors VI, L.P.	32,000,000	20,384,166	23,629,196	778,171	23,429	24,383,938	9,855,837	11,424,824	376,249	11,328	11,789,745
Green Equity Investors VII LP	25,000,000	17,900,000	22,484,599	1,476,912	2,842,145	21,119,366	5,575,000	7,002,885	459,988	885,193	6,577,680
Greenfield Acquisition Partners VII, L.P.	27,800,000	19,471,678	1,442,862	0	109,973	1,332,889	6,067,572	449,610	0	34,269	415,342
H.I.G. BioVentures II, L.P.	13,500,000	8,599,570	5,809,794	0	1,581,374	4,228,421	4,157,931	2,809,062	0	764,601	2,044,461
H.I.G. Capital Partner V, L.P.	13,100,000	8,970,638	6,993,705	0	1,440,346	5,553,359	3,061,852	2,387,086	0	491,618	1,895,468
H.I.G. Ventures II, L.P.	18,000,000	7,793,859	1,172,483	0	0	1,172,483	2,426,164	364,984	0	0	364,984
H&F Spock I LP	3,250,153	1,407,291	4,534,079	0	0	4,534,079	438,078	1,411,422	0	0	1,411,422
Harvest Partners VI, L.P.	28,400,000	20,768,921	3,837,845	0	0	3,837,845	5,782,239	1,068,488	0	0	1,068,488
Harvest Partners VII LP	20,000,000	14,320,000	20,184,307	0	0	20,184,307	4,460,000	6,286,453	0	0	6,286,453

**Kentucky Public Pensions Authority
Capital Calls and Distributions
For the period July 1, 2023 thru September 30, 2023**

Pension Funds Managers	Total Pension Fund Commitment	County Employees Retirement System					County Employees Hazardous Retirement System				
		Commitment	Beginning Valuation	Period Contributions	Period Distributions	Ending Valuation	Commitment	Beginning Valuation	Period Contributions	Period Distributions	Ending Valuation
Hellman and Friedman Capital Partners VI, L.P.	20,000,000	8,659,843	132	0	0	132	2,695,738	41	0	0	41
Horsley Bridge International Fund V, L.P.	45,000,000	19,484,647	39,794,415	0	1,450,496	38,343,919	6,065,411	12,387,675	0	451,527	11,936,148
IFM US Infrastructure Debt Fund	70,000,000	39,669,146	39,669,303	2,783,608	2,783,608	39,669,303	13,660,943	13,660,997	958,597	958,597	13,660,997
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	19,415,352	117,332	296,750	19,235,934	11,150,000	6,046,960	36,543	92,423	5,991,080
KCP IV Co-Invest	12,556,775	8,598,647	1,679,010	0	0	1,629,379	2,934,884	573,079	0	0	556,138
Keyhaven Capital Partners Fund III, L.P.	26,714,582	11,567,204	4,040,425	0	0	3,920,990	3,600,776	1,257,751	0	0	1,220,572
Keyhaven Capital Partners IV LP	12,556,775	8,598,647	8,308,222	0	0	8,062,631	2,934,884	2,835,757	0	0	2,751,931
Levine Leichtman Capital Partners V, L.P.	46,000,000	31,499,949	11,449,717	58,093	24,279	11,483,531	10,751,540	3,908,009	19,828	8,287	3,919,550
Levine Leichtman Capital Partners VI LP	37,500,000	26,849,987	37,127,679	781,491	155,693	37,753,477	8,362,509	11,563,526	243,398	48,491	11,758,433
Lubert Adler VII	34,750,000	24,338,900	12,310,991	0	867,735	11,443,256	7,585,925	3,837,078	0	270,455	3,566,623
Lubert-Adler Real Estate Fund VII-B LP	36,750,000	20,675,550	5,967,259	0	0	5,967,259	6,537,824	1,886,909	0	0	1,886,909
Magentar MTP Energy Opportunities Fund II LLC	37,500,000	26,265,000	96,028	0	0	96,028	8,186,251	29,930	0	0	29,930
Maritime Partners LP	175,000,000										
MatlinPatterson Global Opportunities Partners II	45,000,000	19,484,647	296,390	0	97,250	199,140	6,065,411	92,264	0	30,273	61,991
MatlinPatterson Global Opportunities Partners III	45,000,000	19,484,647	4,803	0	4,481	323	6,065,411	1,495	0	1,395	100
Merit Mezzanine Fund IV, L.P.	27,000,000	11,690,788	173,373	0	0	173,373	3,639,247	53,970	0	0	53,970
Mesa West Core Lending Fund, LP	57,500,000	36,357,250	36,106,009	735,140	735,140	36,106,009	11,459,750	11,380,559	231,715	231,715	11,380,559
Mesa West Real Estate Income Fund IV LP	36,000,000	15,587,717	6,449,781	0	0	6,449,781	4,852,329	2,007,764	0	0	2,007,764
MiddleGround Partners I LP	50,000,000	35,875,000	62,913,822	3,813,099	1,635,447	64,754,428	11,200,000	19,641,388	1,190,431	510,578	20,216,017
MiddleGround Partners II LP	50,000,000	27,301,556	27,346,247	3,070,660	311,413	30,228,773	9,256,264	9,271,416	1,041,070	105,581	10,248,702
MiddleGround Partners II-X LP	25,000,000	13,650,778	13,579,188	2,297,808	124,722	15,782,929	4,628,132	4,603,860	779,044	42,286	5,351,012
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	701,569	0	0	701,569	4,358,631	218,393	0	0	218,393
New Mountain Partners IV, L.P.	32,800,000	22,460,833	7,706,873	0	0	7,706,873	7,666,315	2,630,504	0	0	2,630,504
New State Capital Partners Fund III LP	17,500,000	9,555,545	1,896,705	298,286	0	2,194,991	3,239,692	643,055	101,130	0	744,185
Oak Hill Capital Partners II, L.P.	67,500,000	29,226,970	67,348	0	0	67,348	9,098,116	20,965	0	0	20,965
Oberland Capital Healthcare LP	3,450,000	2,475,375	4,374,993	0	0	4,374,993	772,800	1,365,851	0	0	1,365,851
Patron Capital V LP	38,115,000	21,443,499	9,627,876	98,203	240,800	9,200,876	6,780,657	3,044,434	31,053	76,143	2,909,412
Riverside Capital Appreciation Fund VI, L.P.	35,500,000	25,961,146	8,266,130	0	0	8,266,130	7,227,806	2,301,361	0	0	2,301,361
Rubenstein Properties Fund II	20,800,000	14,568,738	5,489,125	1,923,639	0	7,412,765	4,539,767	1,710,467	599,426	0	2,309,893
Secondary Opportunities Fund III, L.P.	25,000,000	19,411,552	4,263,514	0	228,802	4,034,631	5,588,448	1,227,436	0	65,871	1,161,542
Strategic Value Special Situations Fund IV LP	43,300,000	31,067,750	38,231,122	0	23,951	38,207,171	9,699,200	11,935,570	0	7,477	11,928,092
Strategic Value Special Situations Fund V LP	70,000,000	38,222,178	22,178,486	-28,667	0	22,149,819	12,958,769	7,519,349	-9,719	0	7,509,630
Taurus Mining Finance Fund LLC	45,100,000	30,883,643	2,539,912	0	180,916	2,358,996	10,541,186	866,921	0	61,750	805,171
Tenaska Power Fund II, L.P.	27,000,000	12,131,225	34,924	0	0	34,924	4,055,317	11,675	0	0	11,675
Triton Fund IV, L.P.	26,637,009	18,240,531	9,202,451	0	0	8,930,426	6,225,845	3,140,974	0	0	3,048,127
VantagePoint Venture Partners 2006, L.P.	27,000,000	11,690,788	2,491,982	0	0	2,491,982	3,639,247	775,734	0	0	775,734
VantagePoint Venture Partners IV, L.P.	36,000,000	15,587,717	27,573	0	0	27,573	4,852,329	8,583	0	0	8,583
Vista Equity Partners III, L.P.	45,000,000	19,484,647	844,769	0	0	844,769	6,065,411	262,970	0	0	262,970
Vista Equity Partners IV, L.P.	27,000,000	17,199,140	12,522,760	63,284	0	12,586,044	8,315,863	6,054,812	30,598	0	6,085,410
Vista Equity Partners VI LP	25,000,000	17,900,000	24,043,918	0	4,219,300	19,824,618	5,575,000	7,488,539	0	1,314,112	6,174,427
Walton Street Real Estate Fund VI, LP	36,000,000	17,056,796	7,507,315	0	0	7,507,315	6,030,018	2,654,030	0	0	2,654,030
Walton Street Real Estate Fund VII, LP	38,120,000	26,700,008	5,695,901	29,227	446,997	5,278,131	8,319,997	1,774,901	9,107	139,289	1,644,720
Warburg, Pincus Private Equity IX, L.P.	50,000,000	21,649,608	24,292	0	0	24,292	6,739,345	7,562	0	0	7,562

**Kentucky Public Pensions Authority
Capital Calls and Distributions
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Pension Funds Managers	Total Pension Fund Commitment	County Employees Retirement System					County Employees Hazardous Retirement System				
		Commitment	Beginning Valuation	Period Contributions	Period Distributions	Ending Valuation	Commitment	Beginning Valuation	Period Contributions	Period Distributions	Ending Valuation
Warburg, Pincus Private Equity X, L.P.	38,750,000	16,778,446	306,736	0	0	306,736	5,222,993	95,484	0	0	95,484
Wayzata Opportunities Fund II, L.P.	67,500,000	29,226,970	632	0	0	632	9,098,116	197	0	0	197
Wayzata Opportunities Fund III, L.P.	35,500,000	25,961,146	3,341,281	0	300,955	3,040,325	7,227,806	930,241	0	83,789	846,453
White Oak Yield Spectrum Parallel Fund LP	100,000,000	58,940,485	80,328,283	7,013,637	5,147,609	82,194,311	19,521,309	26,605,027	2,322,943	1,704,907	27,223,063

**Kentucky Public Pensions Authority
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Insurance Funds Managers	Total Insurance Fund Commitment	County Employees Retirement System					County Employees Hazardous Retirement System				
		Commitment	Beginning Valuation	Period Contributions	Period Distributions	Ending Valuation	Commitment	Beginning Valuation	Period Contributions	Period Distributions	Ending Valuation
Adams Street SPC II A1	75,000,000	34,007,112	28,339,319	0	935,194	27,404,125	17,965,829	14,971,556	0	494,059	14,477,497
Adams Street SPC II B1	75,000,000	34,007,113	27,688,059	0	738,461	26,949,598	17,965,828	14,627,496	0	390,126	14,237,370
AMERRA Agri Fund II, LP	16,200,000	7,502,182	4,548,425	0	39,173	4,509,252	4,141,562	2,510,948	0	21,626	2,489,322
AMERRA-KRS Agri Holding Company, LP	35,000,000	16,208,417	9,360,941	0	520,780	8,840,161	8,947,820	5,167,687	0	287,496	4,880,191
Arcano KRS Fund I, L.P.	4,000,000	1,611,501	752,458	0	0	752,458	862,625	402,786	0	0	402,786
Arctos Sports Partners Fund II	40,000,000	20,500,000	2,478,190	2,626,254	0	5,104,444	7,000,000	846,211	896,770	0	1,742,981
Ares Special Situations Fund IV, L.P.	13,808,000	7,867,793	5,720,039	0	87,247	5,632,792	4,255,629	3,093,925	0	47,191	3,046,734
Barings Euro Real Estate II	67,495,313	30,993,850	5,983,735	0	0	5,806,855	17,008,815	3,283,756	0	0	3,186,688
Barings Real Estate European Value Add I SCSp	47,643,750	21,878,012	3,015,928	333,298	0	3,260,186	12,006,222	1,655,082	182,907	0	1,789,126
Bay Hills Capital I, L.P.	7,500,000	3,021,564	232,996	0	0	232,996	1,617,422	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	25,515,285	0	1,740,155	23,775,130	7,526,253	13,801,029	0	941,237	12,859,792
Blackstone Capital Partners V, L.P.	12,414,403	5,001,455	4,785	0	0	4,785	2,677,245	2,561	0	0	2,561
Blackstone Capital Partners VI, L.P.	40,000,000	21,919,994	7,753,599	0	505,080	7,248,519	13,120,008	4,640,845	0	302,311	4,338,533
Blue Torch Credit Opportunities Fund II LP	60,000,000	27,169,450	28,287,750	0	2,703,428	25,584,322	14,281,092	14,868,904	0	1,421,004	13,447,900
BSP Co-Invest Vehicle K LP			7,916,936	0	135,424	7,781,512		4,317,821	0	73,859	4,243,962
BSP Private Credit Fund	50,000,000	22,344,255	20,670,708	0	473,633	20,197,075	12,186,342	11,273,605	0	258,315	11,015,290
BTG Pactual Brazil Timberland Fund I	15,500,000	7,016,381	5,779,250	0	0	5,779,250	3,855,131	3,175,393	0	0	3,175,393
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	35,603,618	0	0	36,137,319	14,623,610	19,417,871	0	0	19,708,946
Ceres Farms	50,000,000										
Columbia Capital Equity Partners IV, L.P.	3,000,000	1,208,626	137,741	0	0	137,741	646,969	73,732	0	0	73,732
Crestview Partners II, L.P.	7,500,000	3,021,564	1,549,633	11,509	82,327	1,478,815	1,617,422	829,508	6,160	44,069	791,599
Crestview Partners III, L.P.	21,000,000	11,965,793	10,328,993	0	0	10,328,993	6,472,206	5,586,873	0	0	5,586,873
CS Adjacent Investment Partners Parallel LP	60,000,000	26,813,106	17,040,492	1,597,652	5,192,639	13,445,505	14,623,610	9,293,720	871,344	2,832,015	7,333,049
CVC European Equity Partners VI, L.P.	12,811,087	7,299,752	6,579,533	23,328	46,497	6,361,979	3,948,381	3,558,820	12,618	25,150	3,441,146
DAG Ventures II, L.P.	3,000,000	1,208,626	102,127	0	0	102,127	646,969	54,668	0	0	54,668
DAG Ventures III, L.P.	3,000,000	1,208,626	14,395	0	0	14,395	646,969	7,706	0	0	7,706
DAG Ventures IV, L.P.	10,000,000	4,028,752	933,127	0	0	933,127	2,156,563	499,496	0	0	499,496
DAG Ventures V, L.P.	7,000,000	3,835,999	19,143	0	12,343	6,800	2,296,001	11,458	0	7,388	4,070
DCM VI, L.P.	1,500,000	604,313	160,901	0	28,830	132,071	323,484	86,129	0	15,432	70,697
DivcoWest Fund IV	9,200,000	4,244,869	205,296	0	0	205,296	2,306,449	111,547	0	0	111,547
Fundamental Partners III LP	30,000,000	13,776,001	12,136,879	0	138,731	11,998,148	7,559,998	6,660,480	0	76,133	6,584,348
Green Equity Investors V, L.P.	10,000,000	4,028,752	59,267	0	0	59,267	2,156,563	31,725	0	0	31,725
Green Equity Investors VI, L.P.	28,000,000	15,343,995	17,786,669	585,761	17,636	18,354,794	9,184,005	10,646,045	350,602	10,556	10,986,091
Green Equity Investors VII LP	25,000,000	10,349,999	13,000,870	853,968	1,643,363	12,211,476	6,250,000	7,850,768	515,682	992,369	7,374,081
Greenfield Acquisition Partners VII, L.P.	12,200,000	5,628,527	417,077	0	31,789	385,288	3,058,186	226,613	0	17,272	209,341
H.I.G. BioVentures II, L.P.	11,500,000	6,301,998	4,257,575	0	1,158,873	3,098,701	3,772,002	2,548,332	0	693,633	1,854,699
H.I.G. Capital Partner V, L.P.	6,900,000	3,931,617	3,065,175	0	631,270	2,433,906	2,126,582	1,657,930	0	341,449	1,316,481
H.I.G. Ventures II, L.P.	2,000,000	805,750	121,214	0	0	121,214	431,313	64,885	0	0	64,885
H&F Spock I LP	1,794,672	723,029	1,582,015	0	0	1,582,015	387,032	846,842	0	0	846,842
Harvest Partners VI, L.P.	11,600,000	6,609,681	1,221,390	0	0	1,221,390	3,575,121	660,640	0	0	660,640
Harvest Partners VII LP	20,000,000	8,279,999	11,670,813	0	0	11,670,813	5,000,000	7,047,594	0	0	7,047,594

**Kentucky Public Pensions Authority
Capital Calls and Distributions
For the period July 1, 2023 thru September 30, 2023**

Insurance Funds Managers	Total Insurance Fund Commitment	County Employees Retirement System					County Employees Hazardous Retirement System				
		Commitment	Beginning Valuation	Period Contributions	Period Distributions	Ending Valuation	Commitment	Beginning Valuation	Period Contributions	Period Distributions	Ending Valuation
Hellman and Friedman Capital Partners VI, L.P.	7,500,000	3,021,564	46	0	0	46	1,617,422	25	0	0	25
Horsley Bridge International Fund V, L.P.	5,000,000	2,014,376	4,114,056	0	149,956	3,964,100	1,078,282	2,202,226	0	80,271	2,121,955
IFM US Infrastructure Debt Fund	30,000,000	13,890,494	13,890,549	974,705	974,705	13,890,549	7,156,853	7,156,881	502,201	502,201	7,156,881
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	11,226,194	67,843	171,584	11,122,453	12,500,001	6,779,104	40,968	103,614	6,716,458
KCP IV Co-Invest	8,618,225	4,910,661	958,878	0	0	930,533	2,656,140	518,650	0	0	503,318
Keyhaven Capital Partners Fund III, L.P.	2,964,500	1,194,323	417,710	0	0	405,363	639,313	223,597	0	0	216,988
Keyhaven Capital Partners IV LP	8,618,225	4,910,661	4,744,800	0	0	4,604,544	2,656,140	2,566,427	0	0	2,490,564
Levine Leichtman Capital Partners V, L.P.	24,000,000	13,675,190	4,970,709	25,220	10,540	4,985,389	7,396,807	2,688,619	13,641	5,701	2,696,559
Levine Leichtman Capital Partners VI LP	37,500,000	15,525,007	21,454,693	451,868	90,024	21,816,537	9,374,983	12,955,704	272,867	54,362	13,174,208
Lubert Adler VII	15,250,000	7,036,350	3,559,093	0	250,861	3,308,232	3,823,174	1,933,820	0	136,305	1,797,515
Lubert-Adler Real Estate Fund VII-B LP	15,750,000	7,232,401	2,087,374	0	0	2,087,374	3,968,999	1,145,510	0	0	1,145,510
Magentar MTP Energy Opportunities Fund II LLC	12,500,000	5,764,587	21,076	0	0	21,076	3,188,762	11,658	0	0	11,658
Maritime Partners LP	75,000,000										
MatlinPatterson Global Opportunities Partners II	5,000,000	2,014,376	30,641	0	10,054	20,587	1,078,282	16,402	0	5,382	11,020
MatlinPatterson Global Opportunities Partners III	5,000,000	2,014,376	497	0	464	33	1,078,282	266	0	248	18
Merit Mezzanine Fund IV, L.P.	3,000,000	1,208,626	17,924	0	0	17,924	646,969	9,595	0	0	9,595
Mesa West Core Lending Fund, LP	29,600,000	13,790,640	20,262,032	412,564	412,564	20,262,032	7,619,040	11,194,348	227,933	227,933	11,194,348
Mesa West Real Estate Income Fund IV LP	14,000,000	6,428,800	2,660,066	0	0	2,660,066	3,527,999	1,459,792	0	0	1,459,792
MiddleGround Partners I LP	25,000,000	3,750,000	6,576,359	398,582	170,953	6,768,757	1,999,999	3,507,390	212,577	91,175	3,610,002
MiddleGround Partners II LP	25,000,000	11,262,207	11,280,643	1,266,683	128,461	12,469,718	5,794,817	5,804,303	651,755	66,098	6,416,125
MiddleGround Partners II-X LP	12,500,000	5,631,103	5,601,570	947,872	51,449	6,510,639	2,897,408	2,882,212	487,715	26,473	3,349,961
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 III, L.P.	7,186,045	2,895,079	145,060	0	0	145,060	1,549,716	77,649	0	0	77,649
New Mountain Partners IV, L.P.	17,200,000	9,800,553	3,362,810	0	0	3,362,810	5,301,045	1,818,918	0	0	1,818,918
New State Capital Partners Fund III LP	7,500,000	3,378,662	670,640	105,472	0	776,112	1,738,445	345,069	54,269	0	399,338
Oak Hill Capital Partners II, L.P.	7,500,000	3,021,564	6,963	0	0	6,963	1,617,422	3,727	0	0	3,727
Oberland Capital Healthcare LP	15,500,000	4,840,652	855,539	0	0	855,539	2,631,898	465,163	0	0	465,163
Patron Capital V LP	14,822,500	6,806,493	3,056,088	31,171	76,434	2,920,550	3,735,269	1,677,121	17,106	41,945	1,602,740
Riverside Capital Appreciation Fund VI, L.P.	18,712,500	10,748,972	3,422,480	0	0	3,422,480	5,705,349	1,816,587	0	0	1,816,587
Rubenstein Properties Fund II	9,200,000	4,244,871	1,599,358	560,488	0	2,159,846	2,306,445	869,009	304,540	0	1,173,549
Secondary Opportunities Fund III, L.P.	75,000,000	34,884,827	7,662,033	0	411,185	7,250,703	18,849,301	4,140,022	0	222,175	3,917,769
Strategic Value Special Situations Fund IV LP	21,700,000	6,776,910	8,339,469	0	5,225	8,334,244	3,684,660	4,534,236	0	2,841	4,531,395
Strategic Value Special Situations Fund V LP	30,000,000	13,514,648	7,841,895	-10,136	0	7,831,759	6,953,780	4,034,941	-5,215	0	4,029,726
Taurus Mining Finance Fund LLC	19,900,000	11,339,013	932,535	0	66,424	866,111	6,133,188	504,401	0	35,928	468,473
Tenaska Power Fund II, L.P.	3,000,000	1,278,755	3,682	0	0	3,682	678,044	1,952	0	0	1,952
Triton Fund IV, L.P.	13,704,460	7,808,796	4,036,311	0	0	3,916,997	4,223,718	2,183,210	0	0	2,118,674
VantagePoint Venture Partners 2006, L.P.	3,000,000	1,208,626	257,628	0	0	257,628	646,969	137,907	0	0	137,907
VantagePoint Venture Partners IV, L.P.	4,000,000	1,611,501	2,851	0	0	2,851	862,625	1,526	0	0	1,526
Vista Equity Partners III, L.P.	5,000,000	2,014,376	87,337	0	0	87,337	1,078,282	46,751	0	0	46,751
Vista Equity Partners IV, L.P.	23,000,000	12,603,996	9,177,019	46,376	0	9,223,395	7,544,005	5,492,819	27,758	0	5,520,577
Vista Equity Partners VI LP	25,000,000	10,349,999	13,902,488	0	2,439,651	11,462,837	6,250,000	8,395,223	0	1,473,219	6,922,004
Walton Street Real Estate Fund VI, LP	4,000,000	1,712,019	753,521	0	0	753,521	917,457	403,806	0	0	403,806
Walton Street Real Estate Fund VII, LP	16,755,000	7,730,005	1,649,039	8,462	129,411	1,528,088	4,199,996	895,983	4,598	70,314	830,267
Warburg, Pincus Private Equity IX, L.P.	10,000,000	4,028,752	4,521	0	0	4,521	2,156,563	2,420	0	0	2,420

**Kentucky Public Pensions Authority
Capital Calls and Distributions
For the period July 1, 2023 thru September 30, 2023**

Insurance Funds Managers	Total Insurance Fund Commitment	County Employees Retirement System					County Employees Hazardous Retirement System				
		Commitment	Beginning Valuation	Period Contributions	Period Distributions	Ending Valuation	Commitment	Beginning Valuation	Period Contributions	Period Distributions	Ending Valuation
Warburg, Pincus Private Equity X, L.P.	7,500,000	3,021,564	55,215	0	0	55,215	1,617,422	29,556	0	0	29,556
Wayzata Opportunities Fund II, L.P.	7,500,000	3,021,564	65	0	0	65	1,617,422	35	0	0	35
Wayzata Opportunities Fund III, L.P.	18,712,500	10,748,972	1,383,426	0	124,608	1,258,819	5,705,349	734,296	0	66,139	668,157
White Oak Yield Spectrum Parallel Fund LP	50,000,000	22,344,255	28,663,637	2,502,456	1,836,660	29,329,433	12,186,342	15,632,872	0	1,001,697	15,995,991

Kentucky Public Pensions Authority

Commissions Report

Quarter Ending: September 30, 2023

Reports can be found:

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

Kentucky Public Pensions Authority

Internal Asset Holdings Report & Internal Asset Transaction Report

Quarter Ending: September 30, 2023

Reports can be found:

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

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

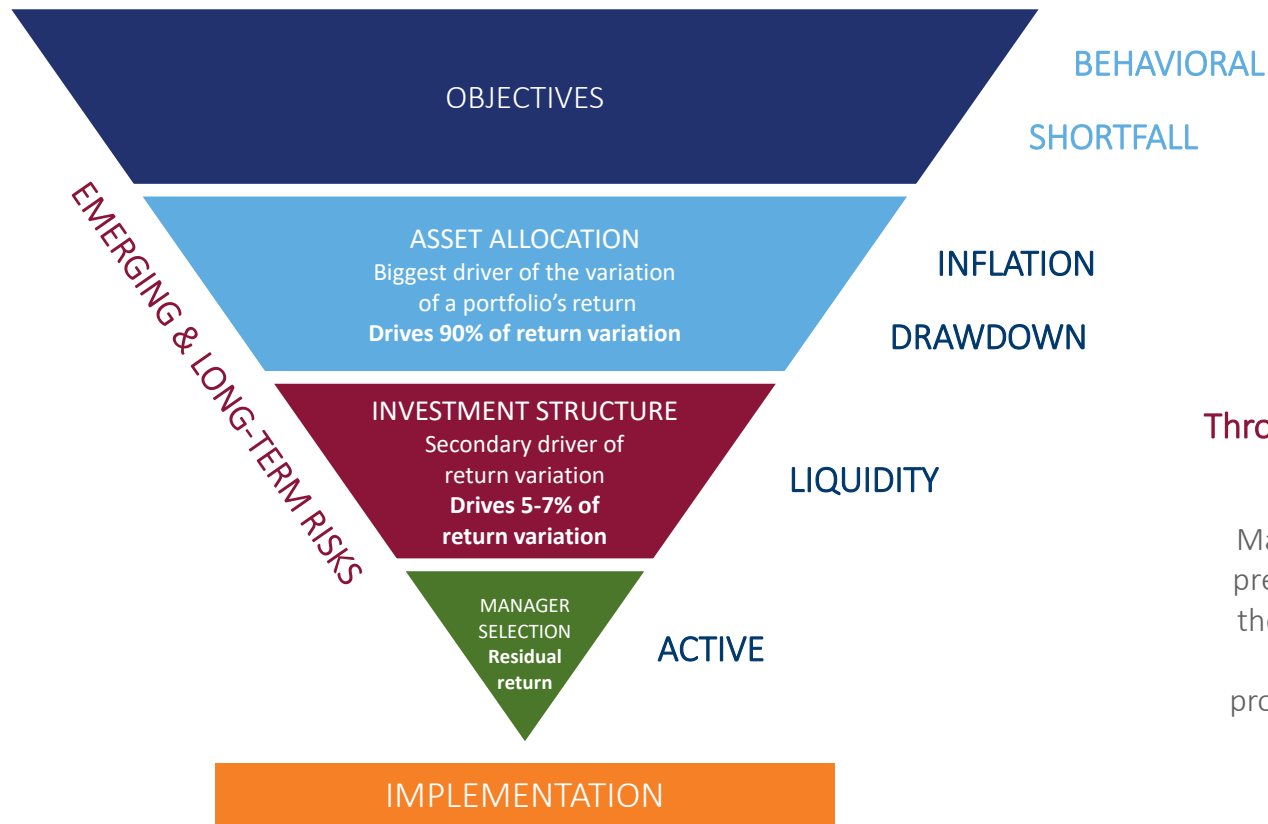
- Public Equity constrained to minimum of 40%
- Slight reduction in Private Equity to 7.5%
- Increased allocation to Specialty Credit (20%*)
- Modest cash allocation of 2%
- Increased Core Fixed Income Allocation to 15.5%
- Slightly reduced expected return when compared to Current Policy (6.86%, or 9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

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

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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

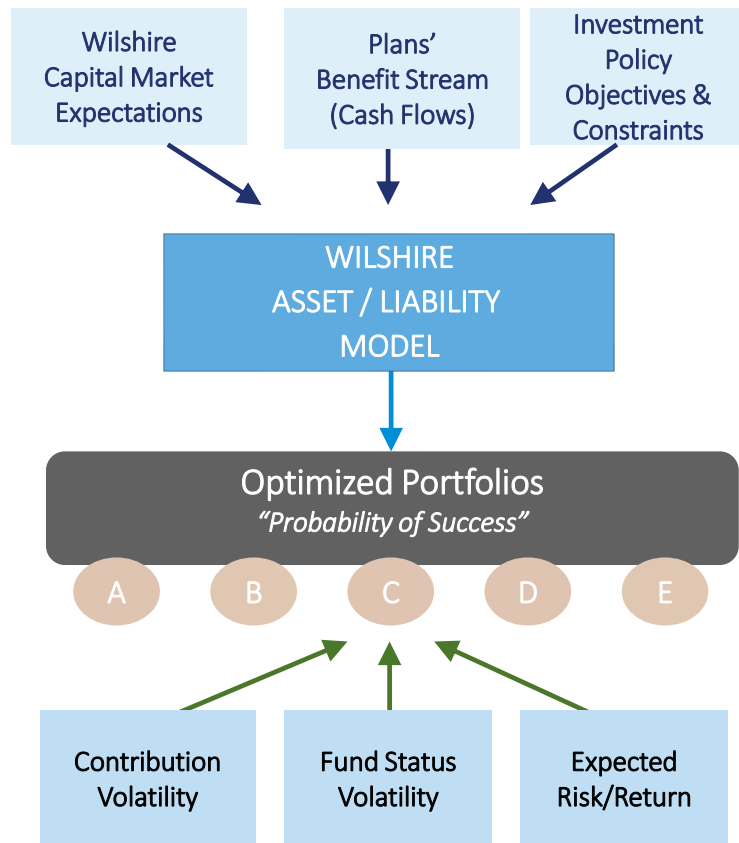
Liquidity: Balance near-term needs, long-term opportunities

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

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Asset Allocation Inputs

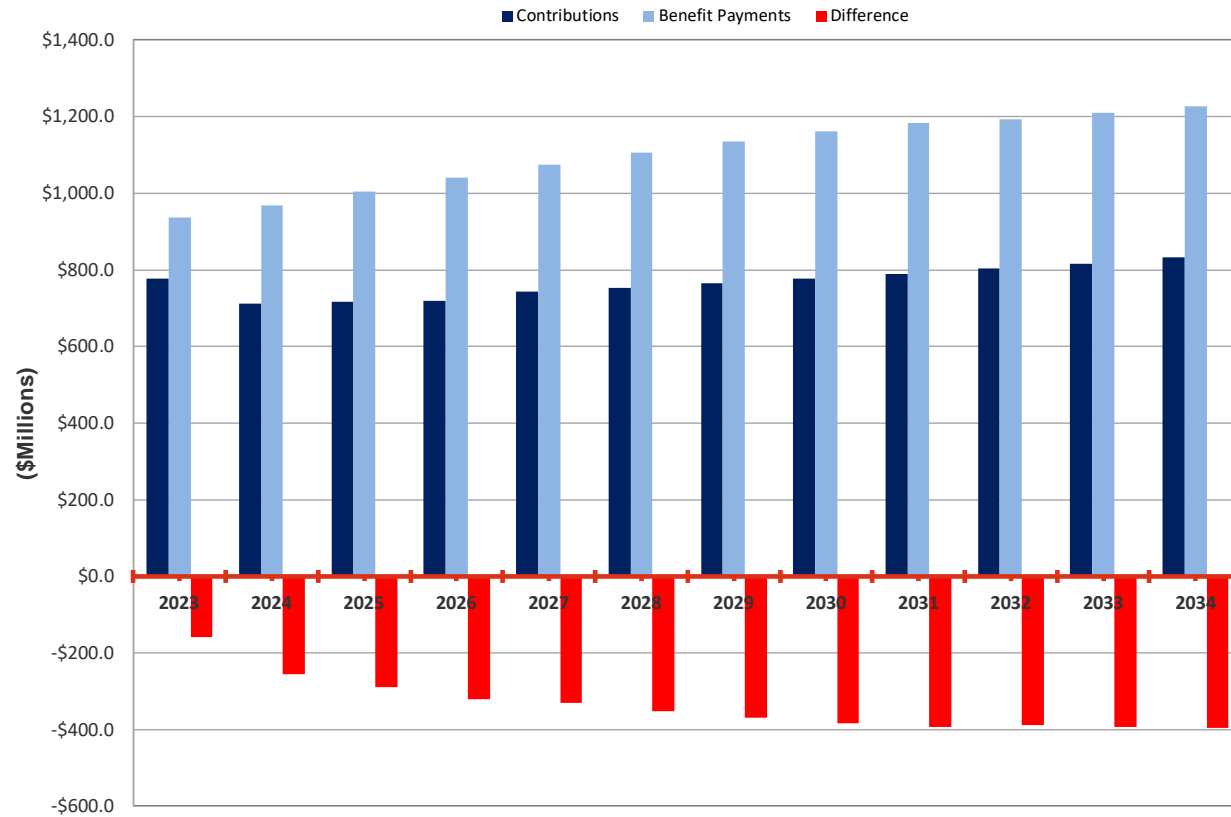
CERS NON-HAZARDOUS RETIREMENT PLAN

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.*

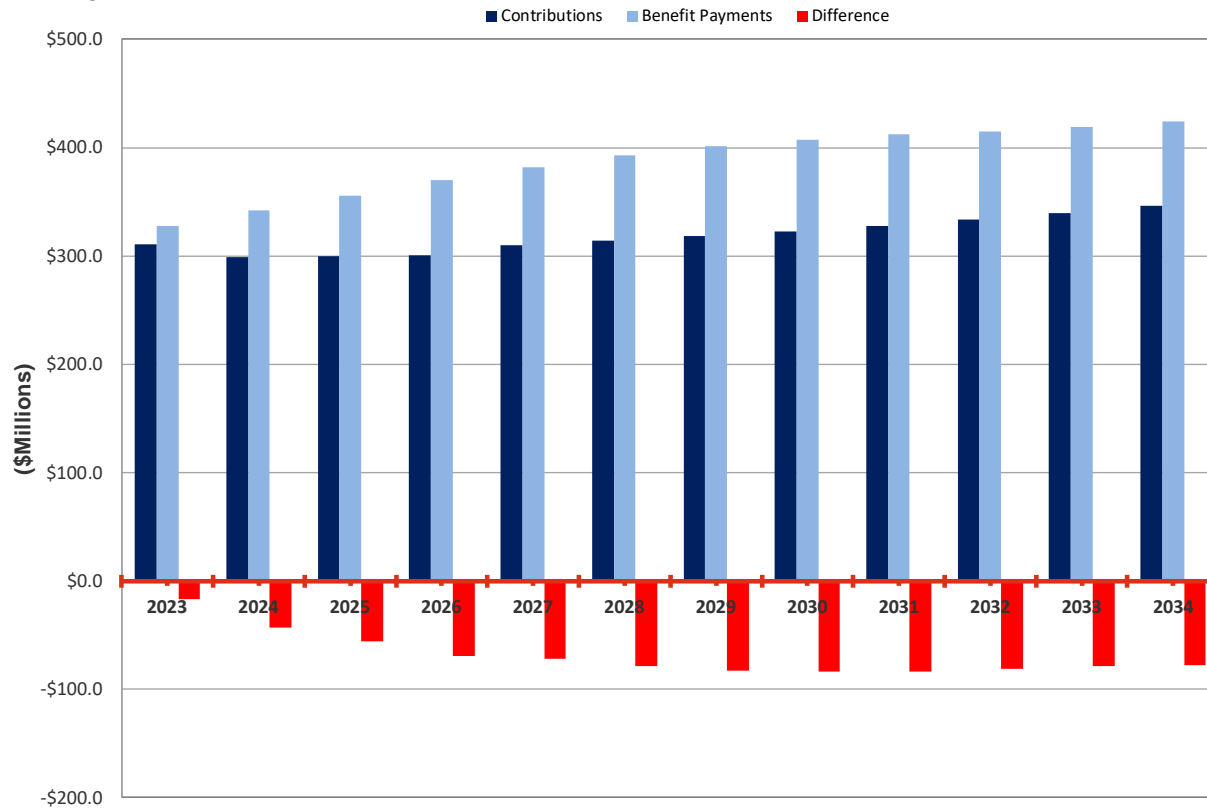
CERS HAZARDOUS RETIREMENT PLAN

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%

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Projected Cashflow



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

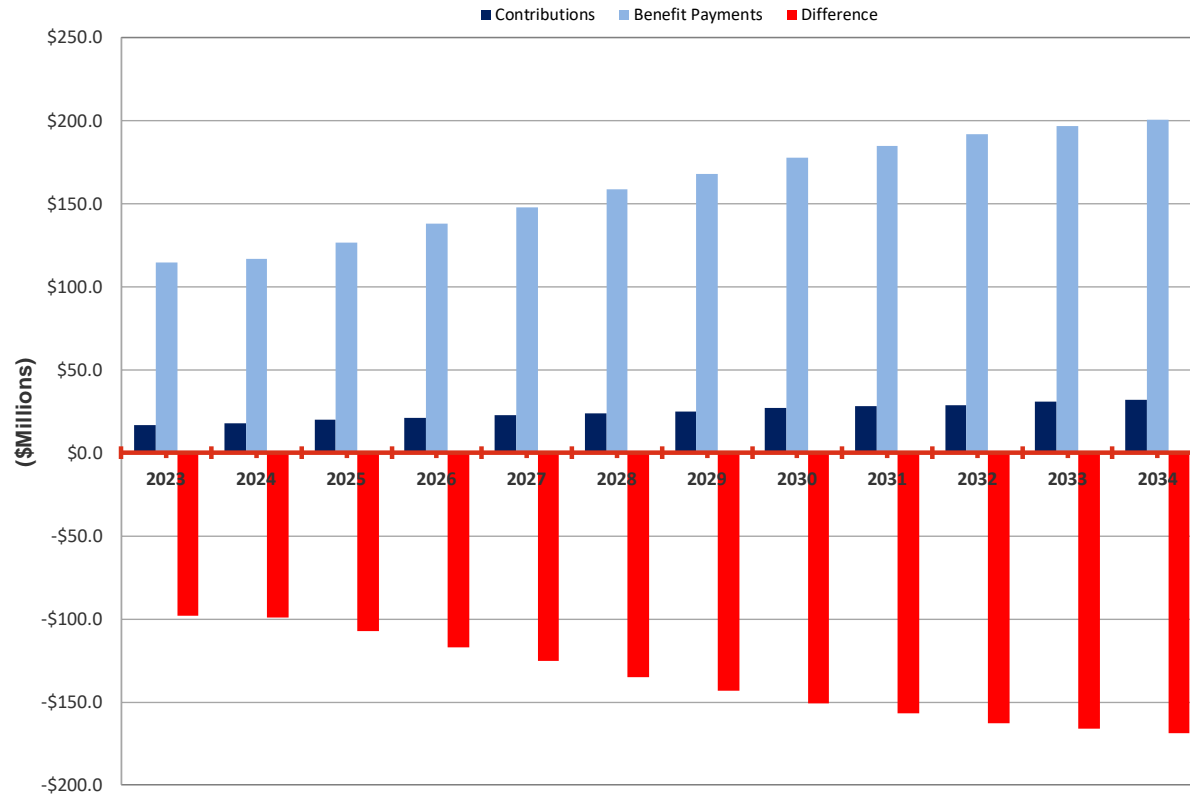
CERS NON-HAZARDOUS INSURANCE PLAN

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%

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Projected Cashflow



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

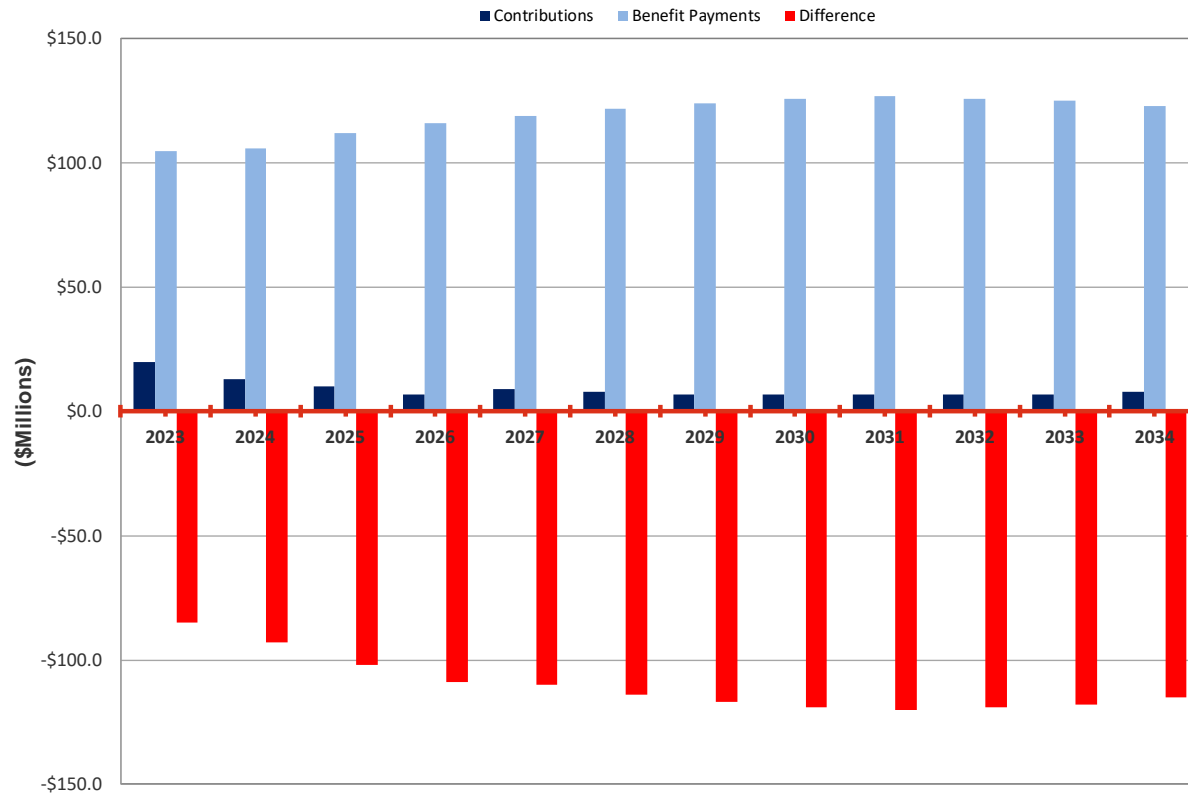
CERS HAZARDOUS INSURANCE PLAN

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%

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- 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%

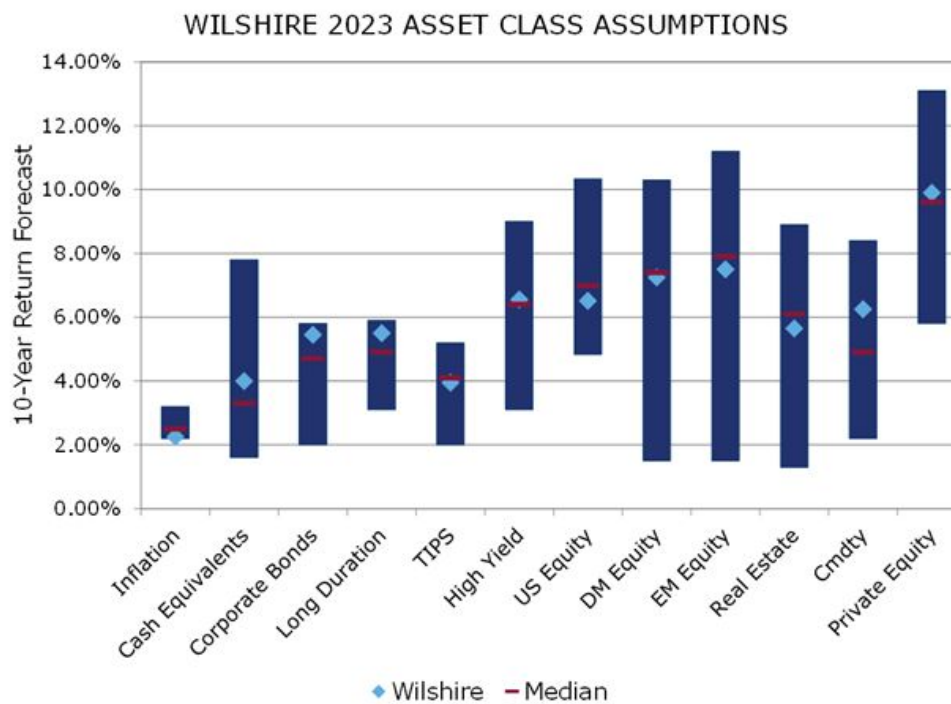
- June 30, 2023, data was projected by Wilshire using data from the report and additional metrics provided by the actuary.

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

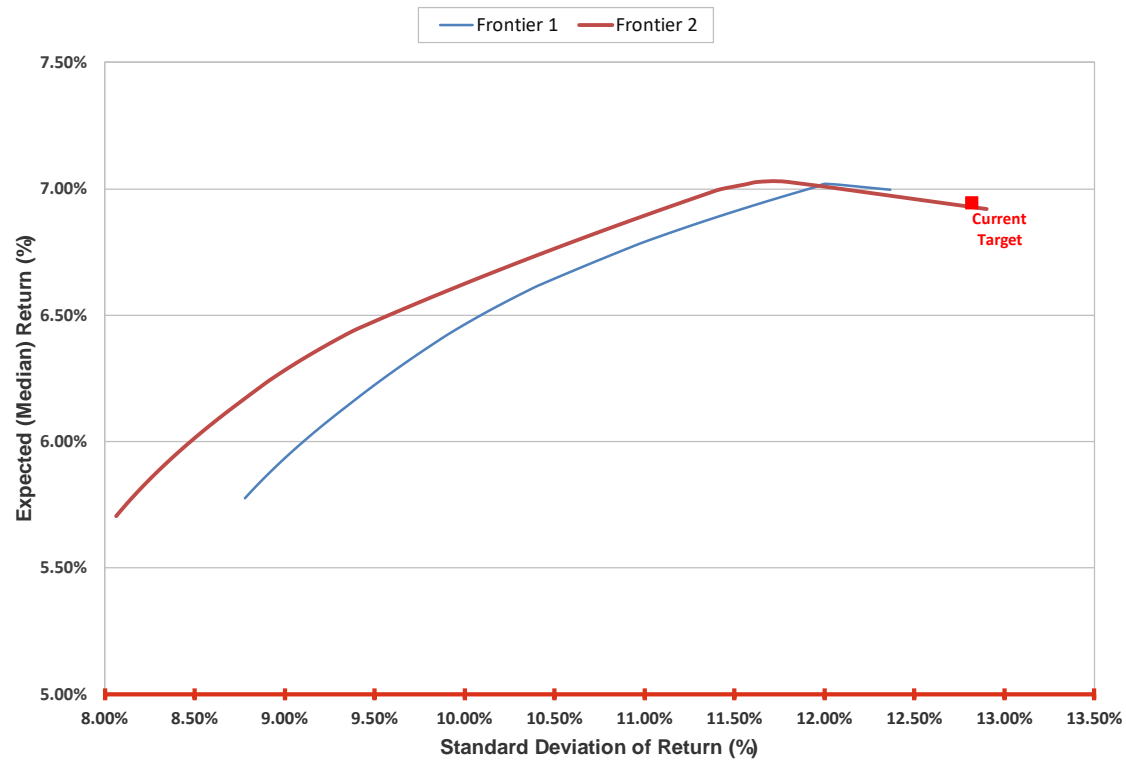
Public market return expectations represent a passive investment in the asset class (beta). They do not reflect value added from active management (alpha).

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.

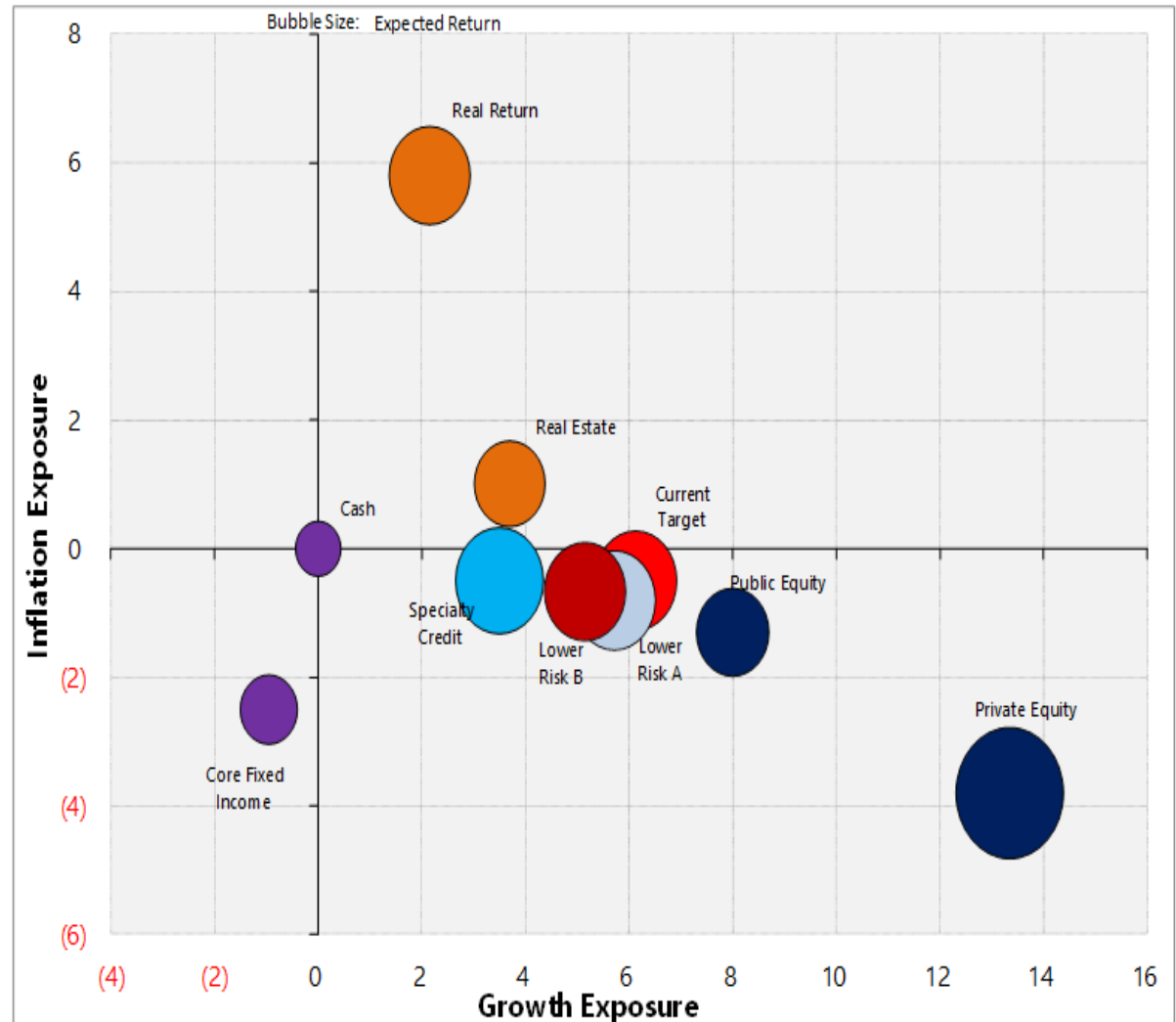
Portfolios Modeled – Wilshire Bucketing

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

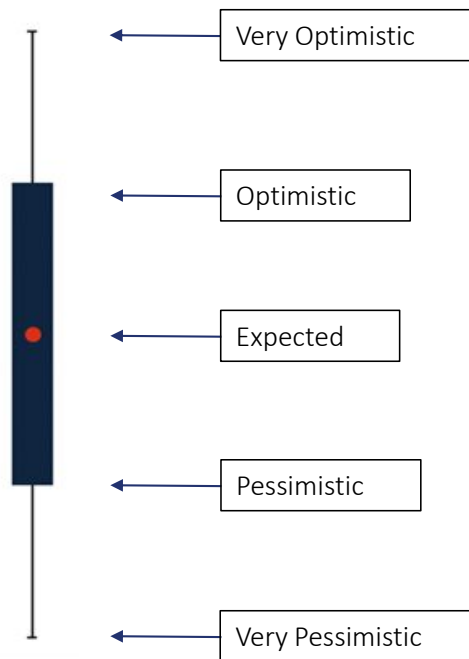
Economic Factor Exposure – Asset Classes

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

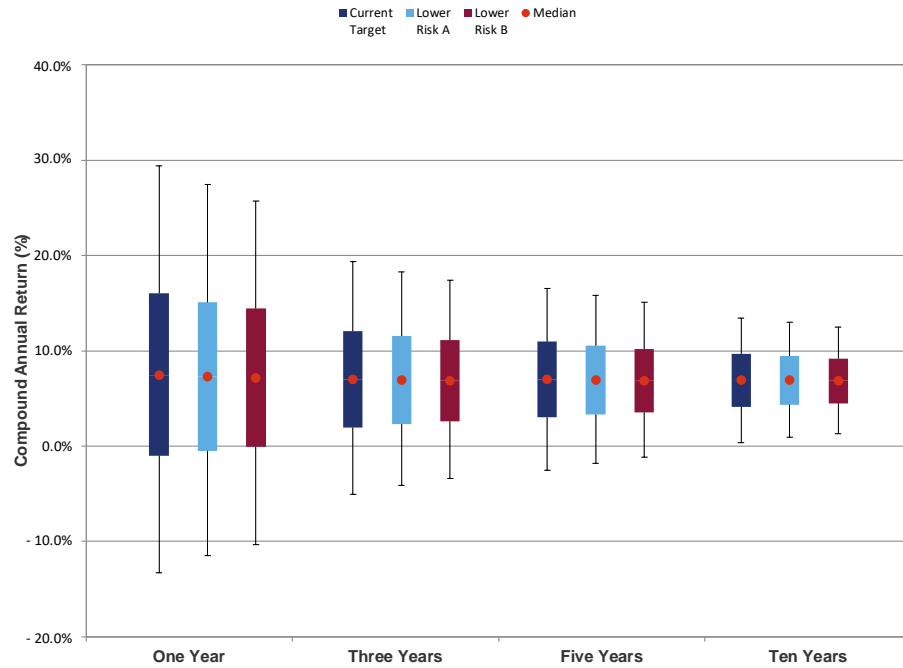
Very optimistic: Only 5% of the scenarios result in higher than this value and 95% result in lower

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

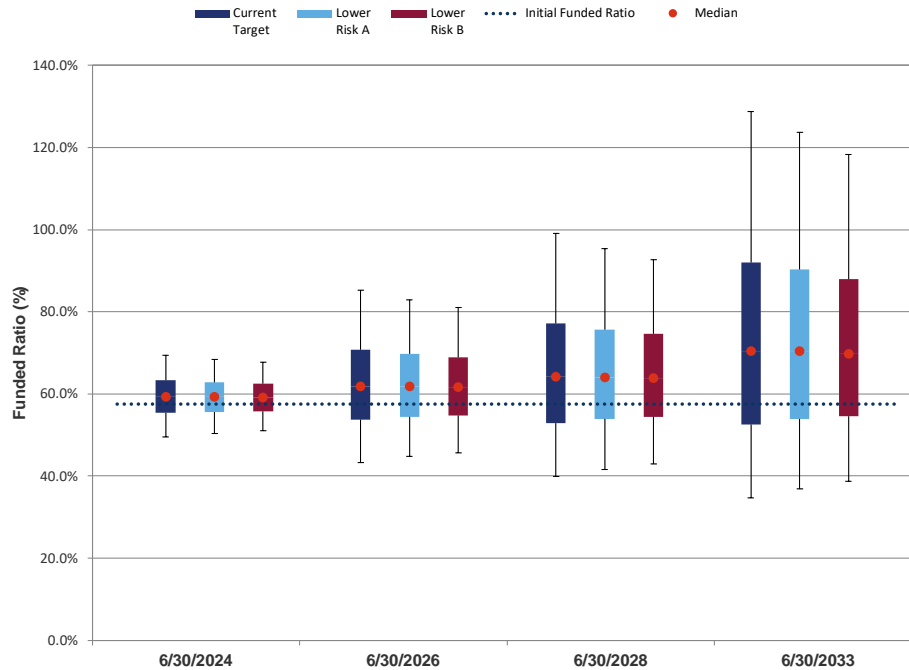
*For periods longer than one year, returns are compound annual.

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.

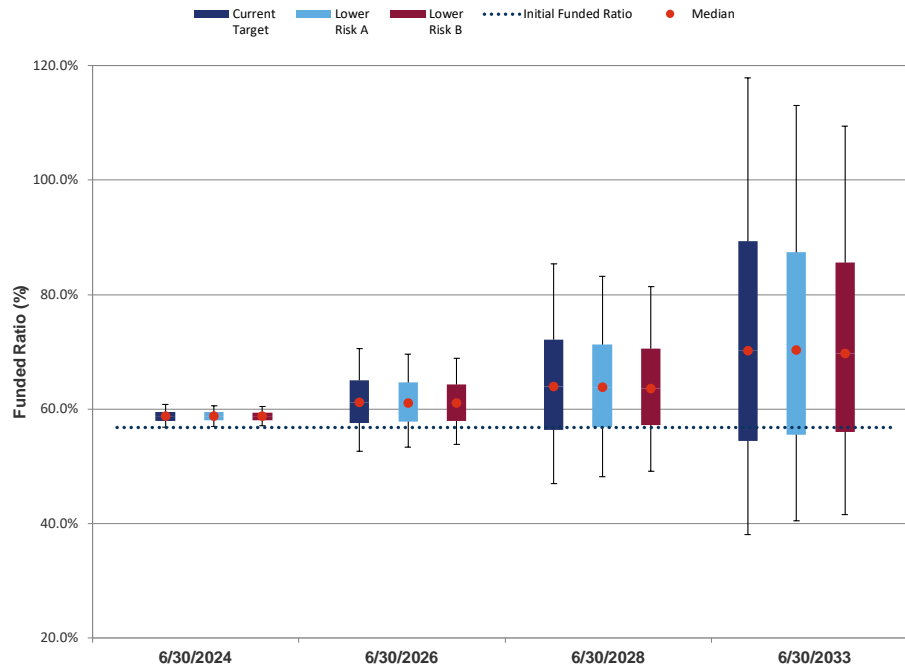
Drawdown Risk:
The potential for the current policy to have a lower “very pessimistic” funded ratio than the alternative policies.

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.

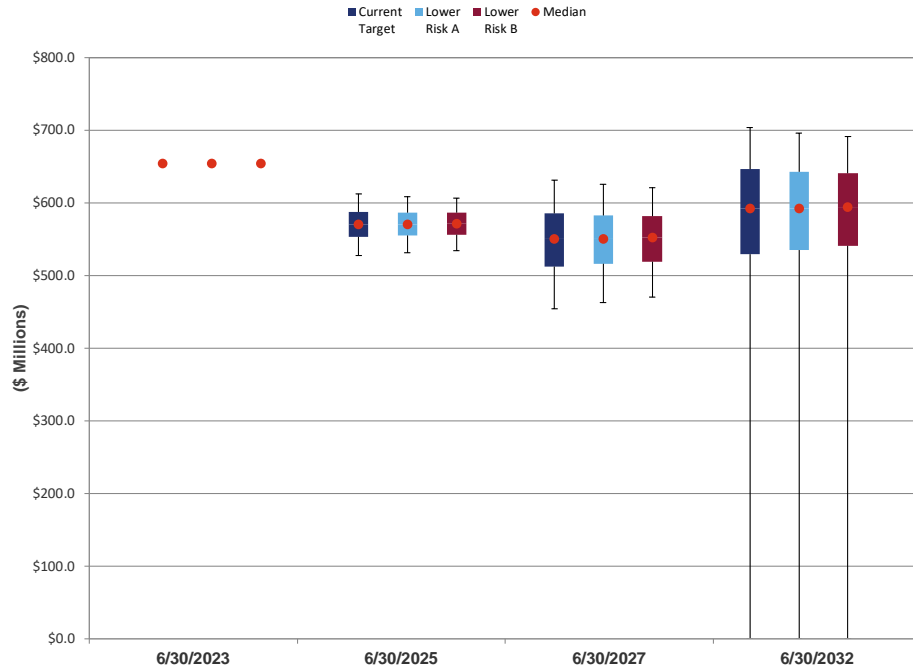
Drawdown Risk:
The potential for the current policy to have a lower “very pessimistic” funded ratio than the alternative policies.

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

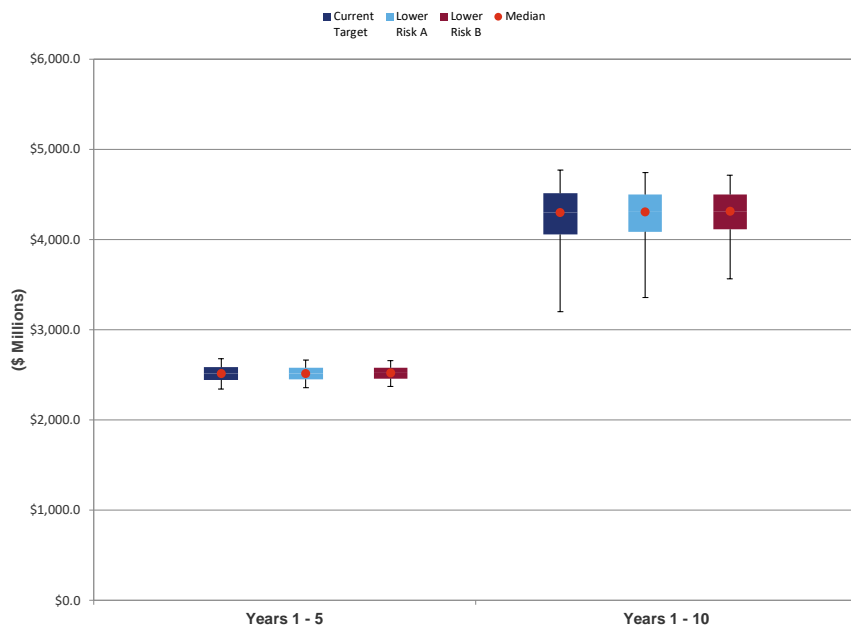


Shortfall Risk:
The potential for the current policy to have higher median contributions than the alternative policies.

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



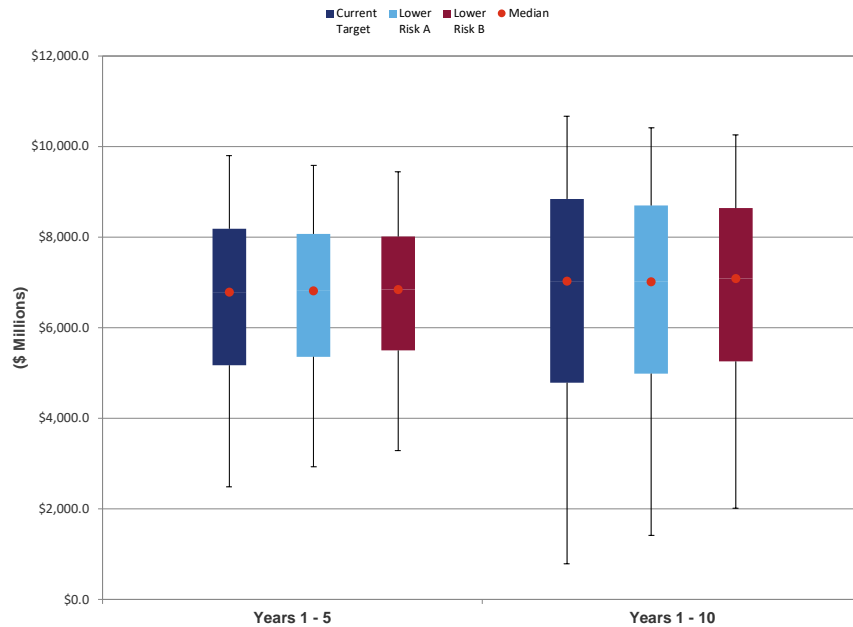
(\$ Millions)	Years 1 - 5			Years 1 - 10		
	Current Target	Lower Risk A	Lower Risk B	Current Target	Lower Risk A	Lower Risk B
Very Pessimistic	2,673.2	2,660.2	2,651.6	4,772.3	4,737.6	4,715.4
Pessimistic	2,581.3	2,576.5	2,574.2	4,515.4	4,500.9	4,495.1
Median (Expected)	2,513.7	2,514.8	2,516.6	4,300.0	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

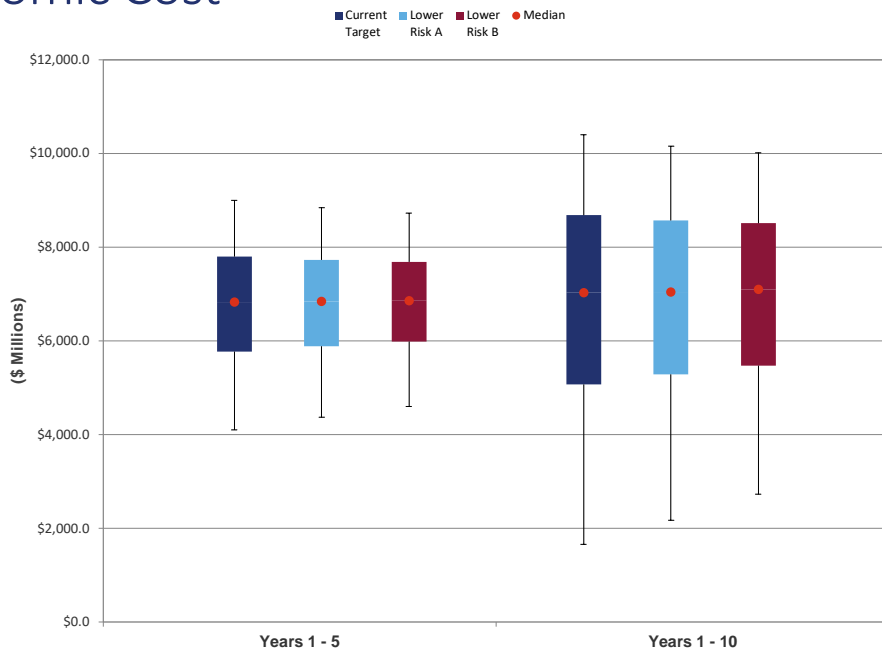
Shortfall Risk:
The potential for the current allocation to have a higher median economic cost than the alternative policies.

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.

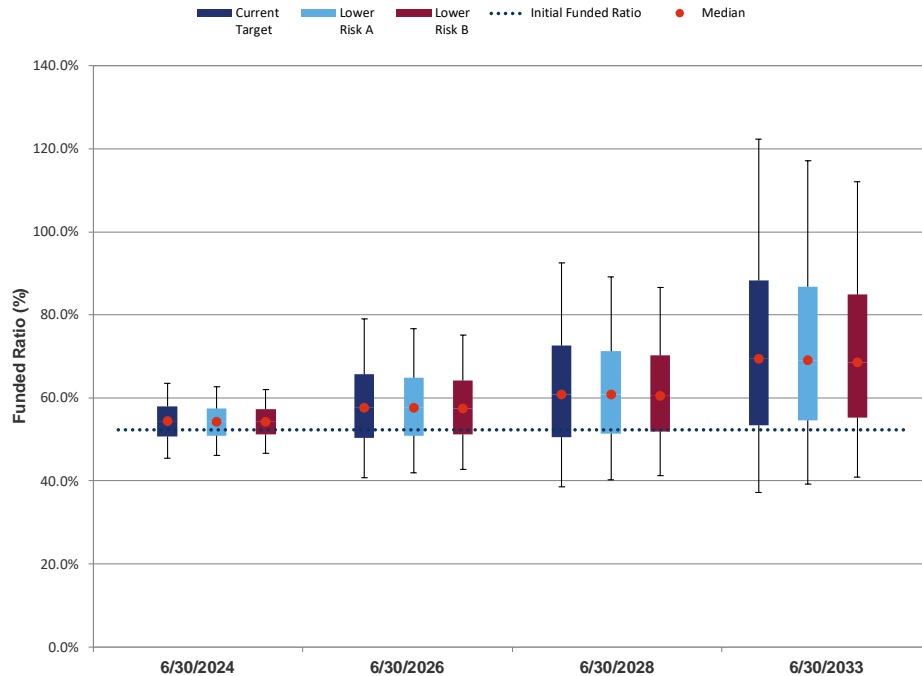
Drawdown Risk:
The potential for the current allocation to have a higher “very pessimistic” economic cost than the alternative policies.

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.

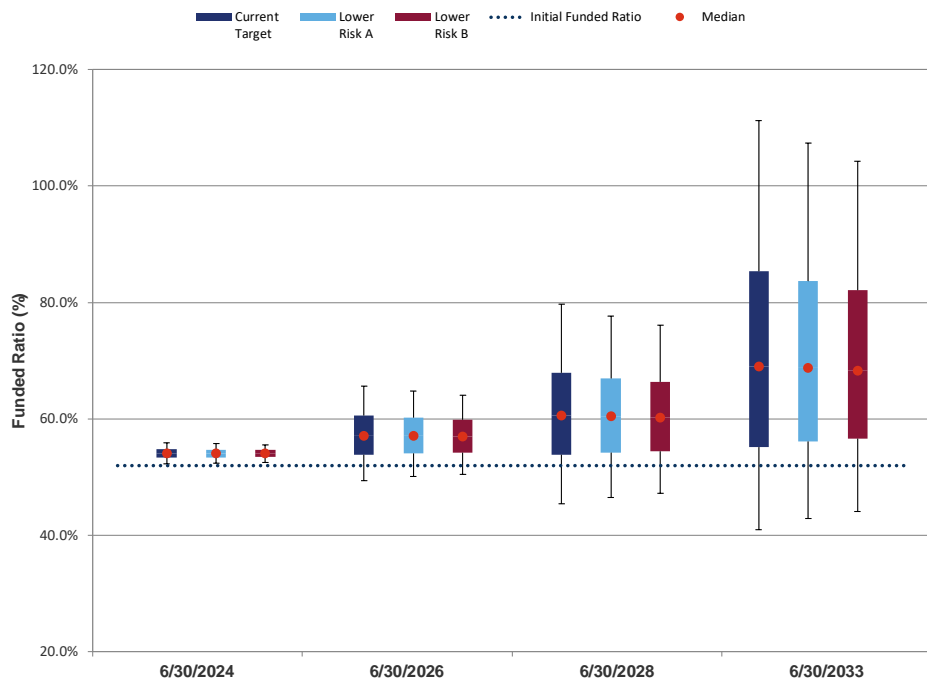
Drawdown Risk:
The potential for the current policy to have a lower “very pessimistic” funded ratio than the alternative policies.

Initial Funded Ratio = 52.3%

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	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

AAL AVA Funded Ratio



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

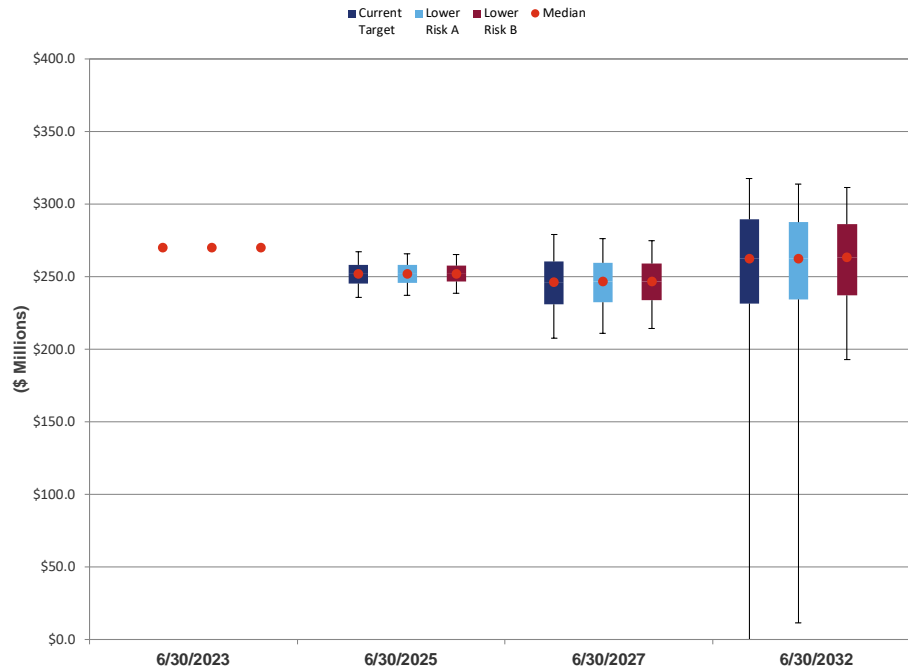
Drawdown Risk:
The potential for the current policy to have a lower “very pessimistic” funded ratio than the alternative policies.

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

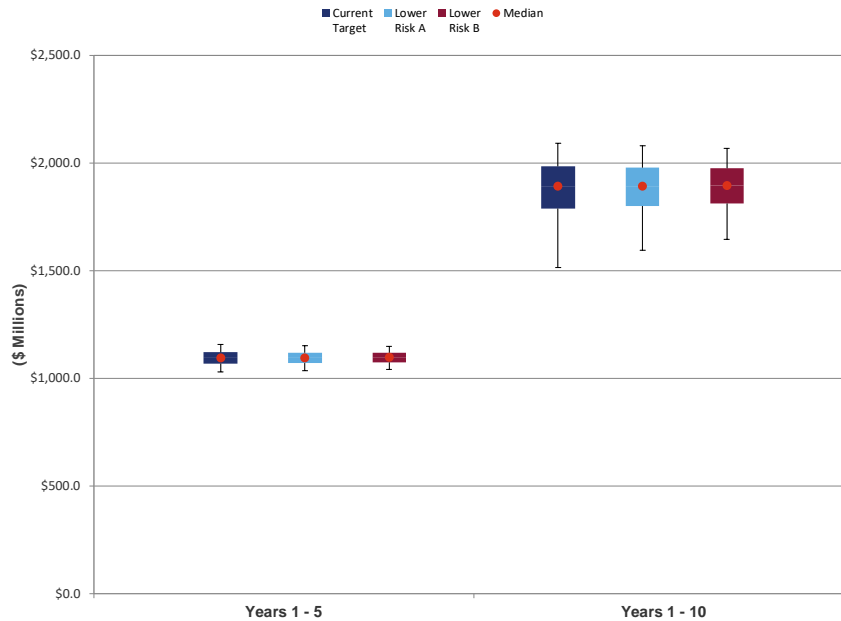


Shortfall Risk:
The potential for the current policy to have higher median contributions than the alternative policies.

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



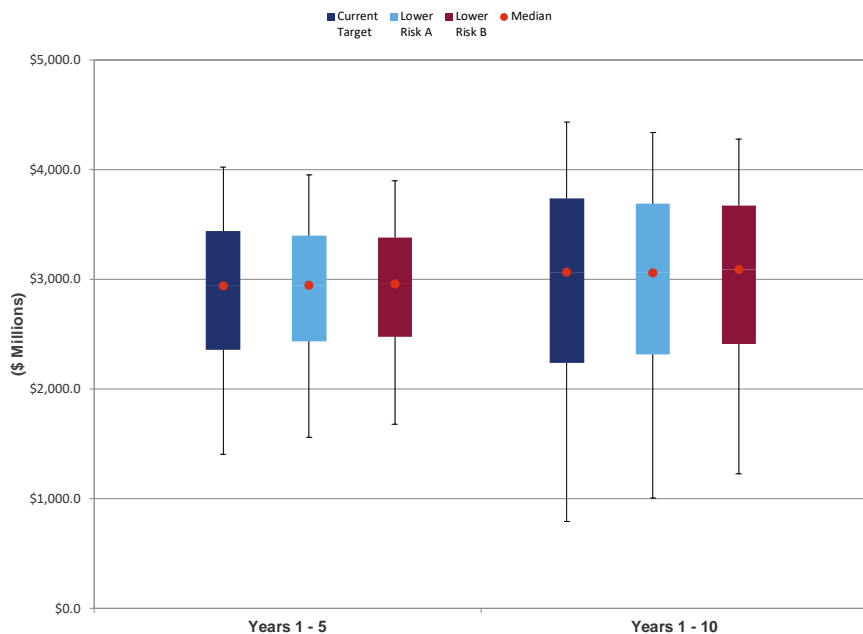
Shortfall Risk:
The potential for the current allocation to have higher median present value of contributions than the alternative policies.

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

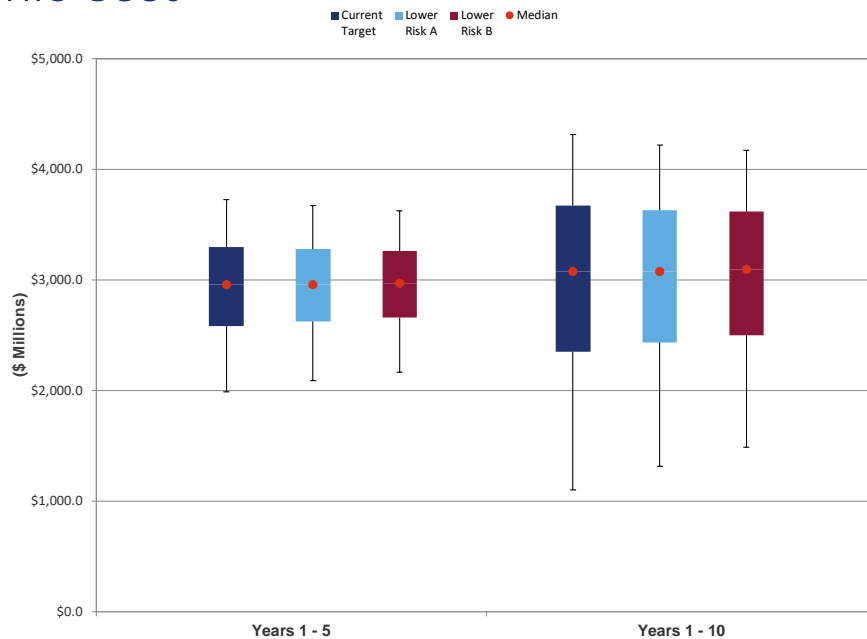
Shortfall Risk:
The potential for the current allocation to have a higher median economic cost than the alternative policies.

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.

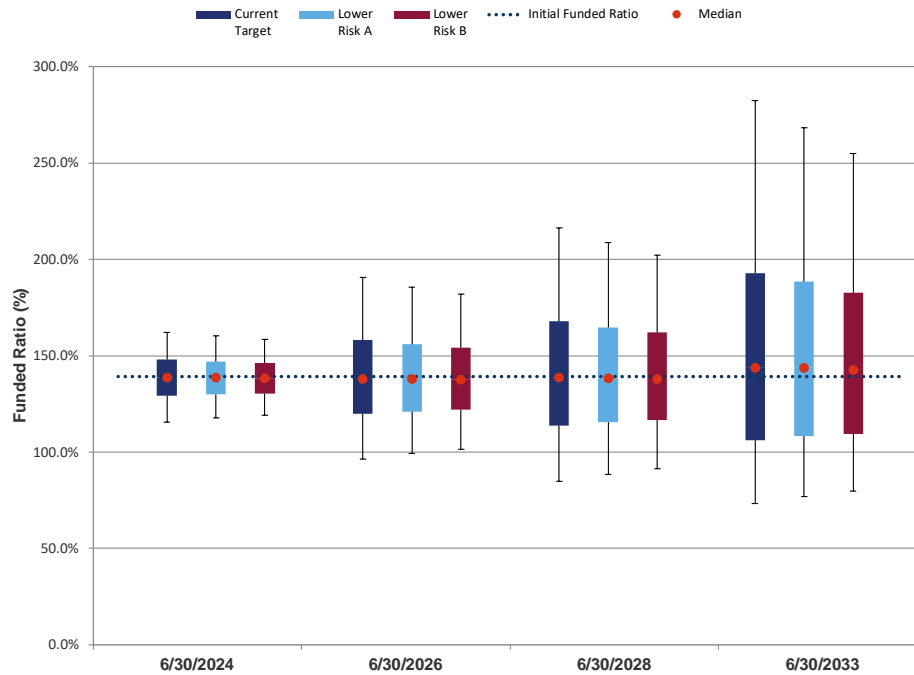
Drawdown Risk:
The potential for the current allocation to have a higher “very pessimistic” economic cost than the alternative policies.

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.

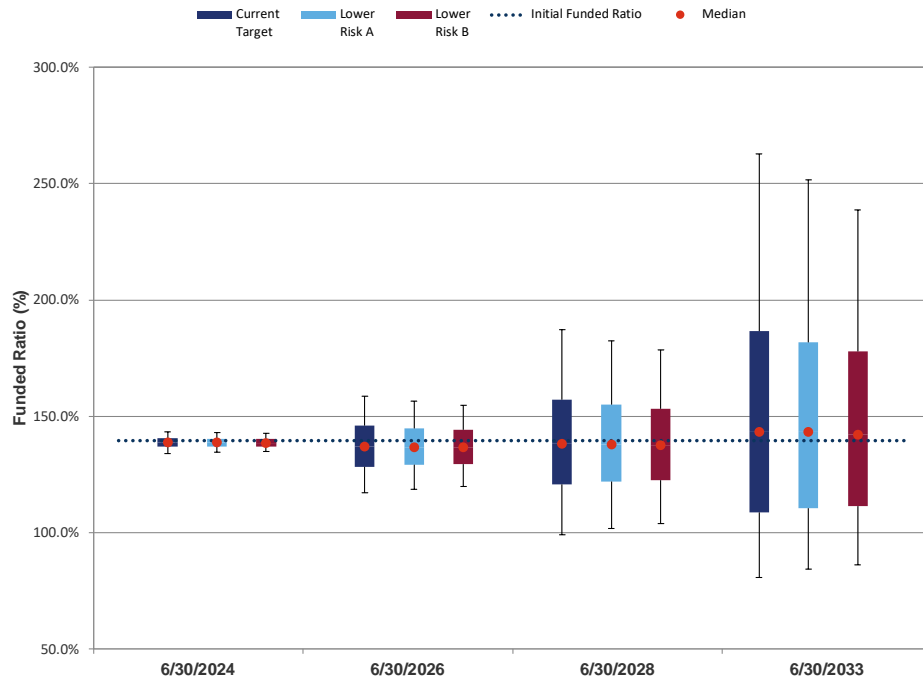
Drawdown Risk:
The potential for the current policy to have a lower “very pessimistic” funded ratio than the alternative policies.

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.

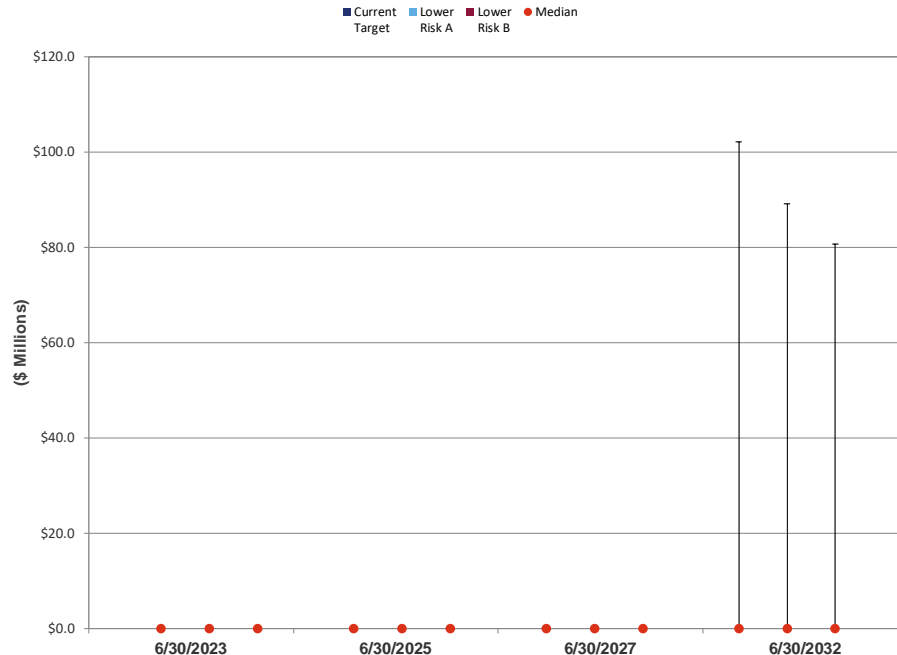
Drawdown Risk:
The potential for the current policy to have a lower “very pessimistic” funded ratio than the alternative policies.

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

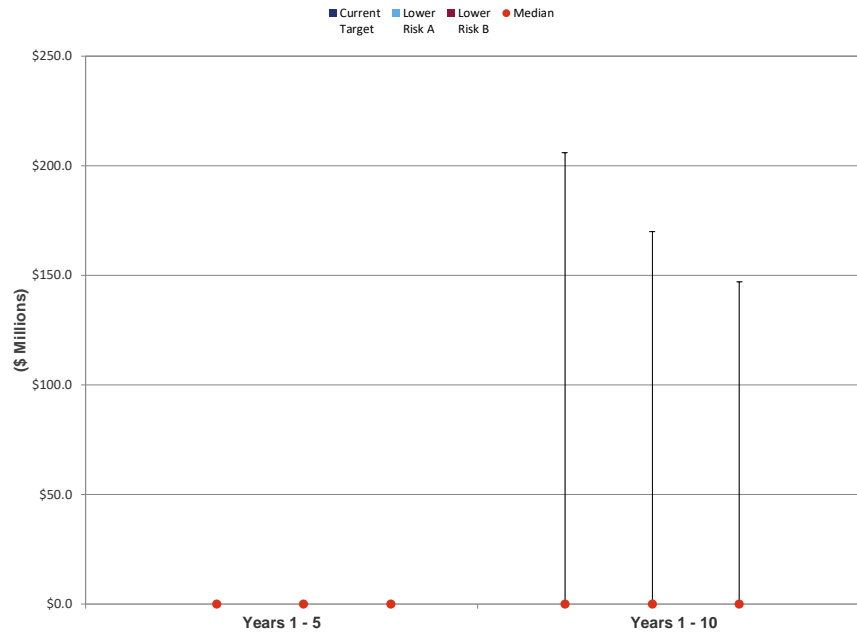


Shortfall Risk:
The potential for the current policy to have higher median contributions than the alternative policies.

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	0.0	0.0	0.0	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	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



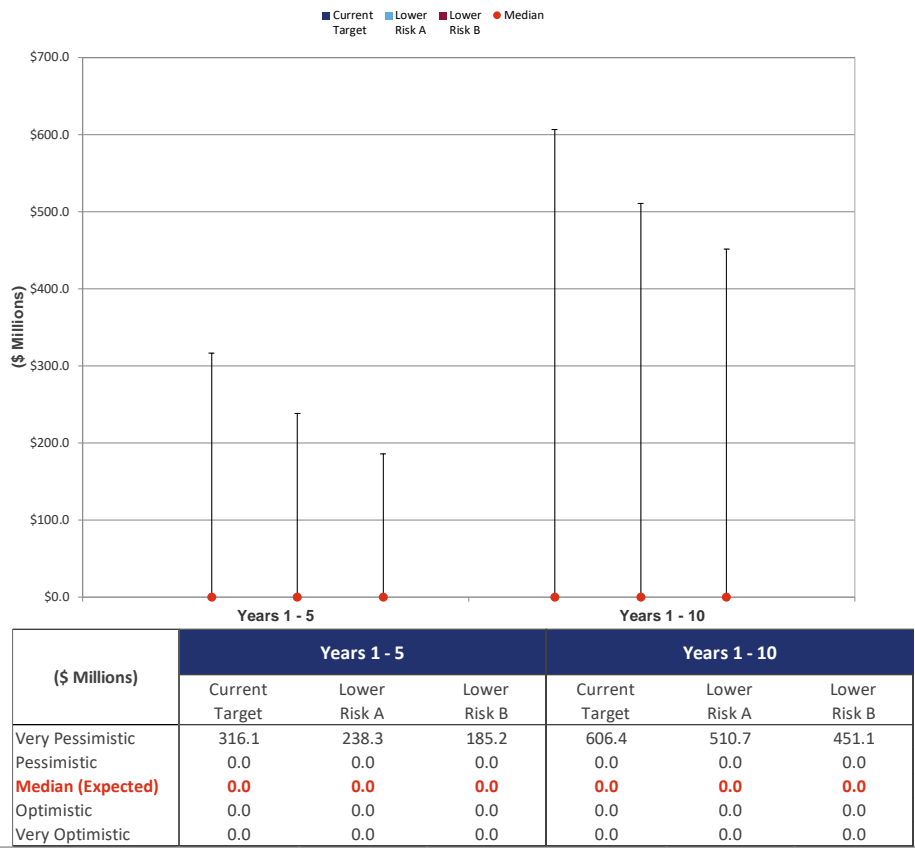
(\$ Millions)	Years 1 - 5			Years 1 - 10		
	Current Target	Lower Risk A	Lower Risk B	Current Target	Lower Risk A	Lower Risk B
Very Pessimistic	0.0	0.0	0.0	206.0	169.9	146.9
Pessimistic	0.0	0.0	0.0	0.0	0.0	0.0
Median (Expected)	0.0	0.0	0.0	0.0	0.0	0.0
Optimistic	0.0	0.0	0.0	0.0	0.0	0.0
Very Optimistic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

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



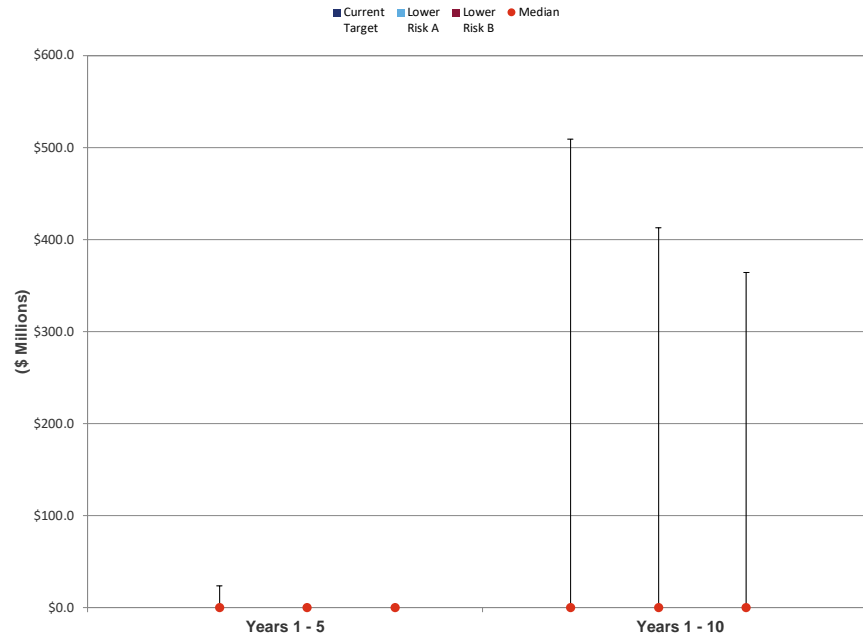
Shortfall Risk:
The potential for the current allocation to have a higher median economic cost than the alternative policies.

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.

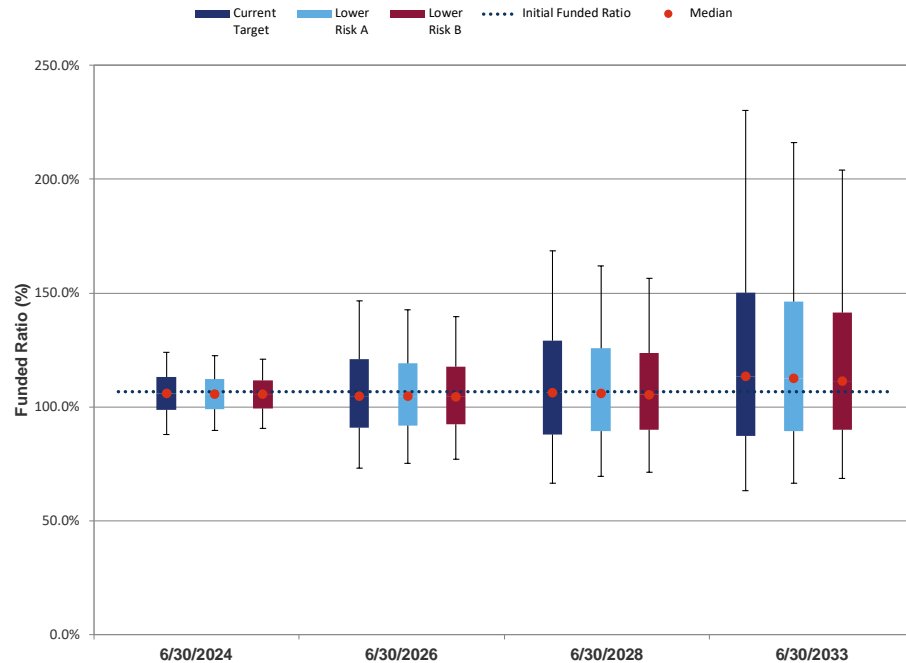
Drawdown Risk:
The potential for the current allocation to have a higher “very pessimistic” economic cost than the alternative policies.

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.

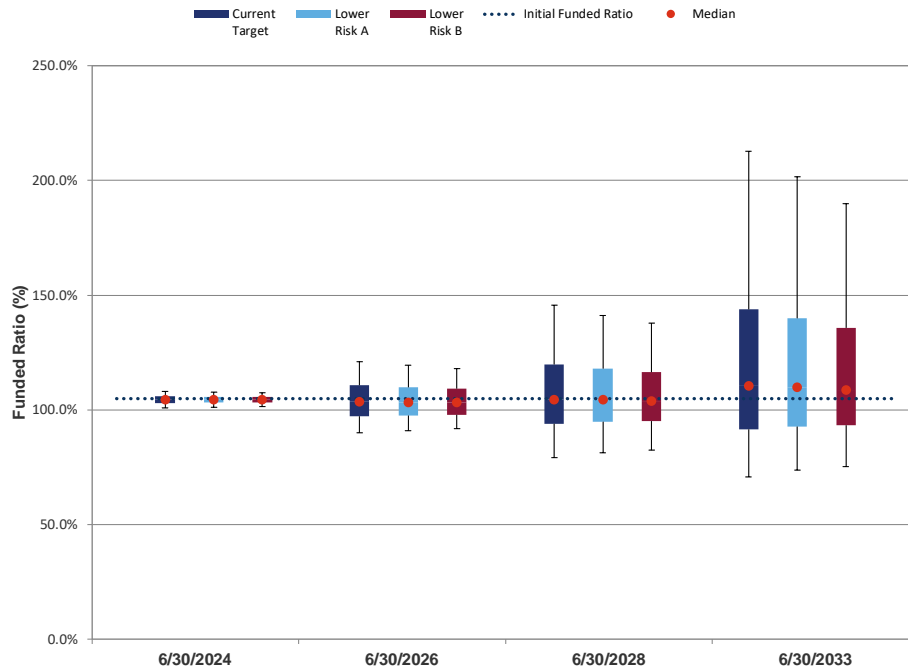
Drawdown Risk:
The potential for the current policy to have a lower “very pessimistic” funded ratio than the alternative policies.

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.

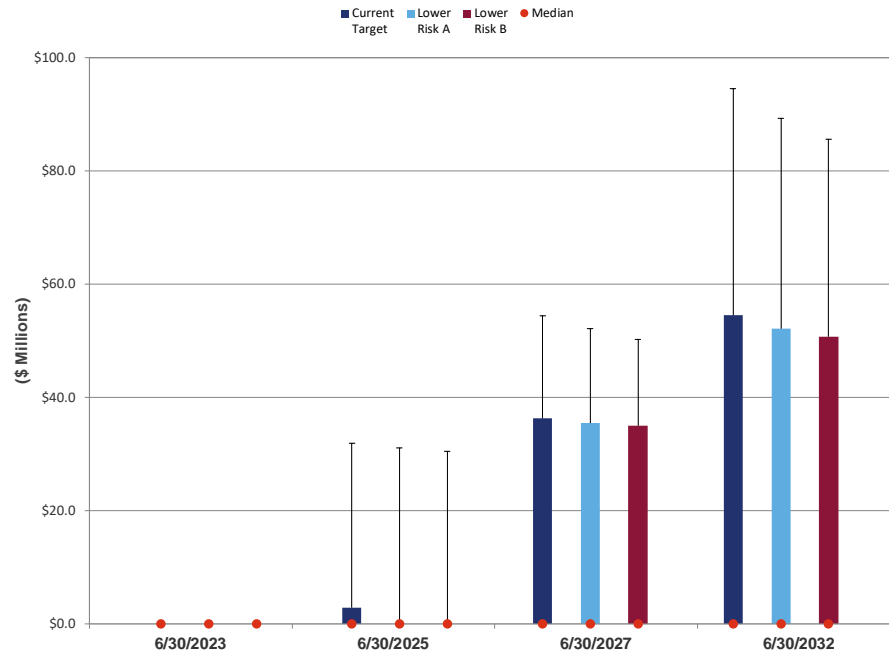
Drawdown Risk:
The potential for the current policy to have a lower “very pessimistic” funded ratio than the alternative policies.

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

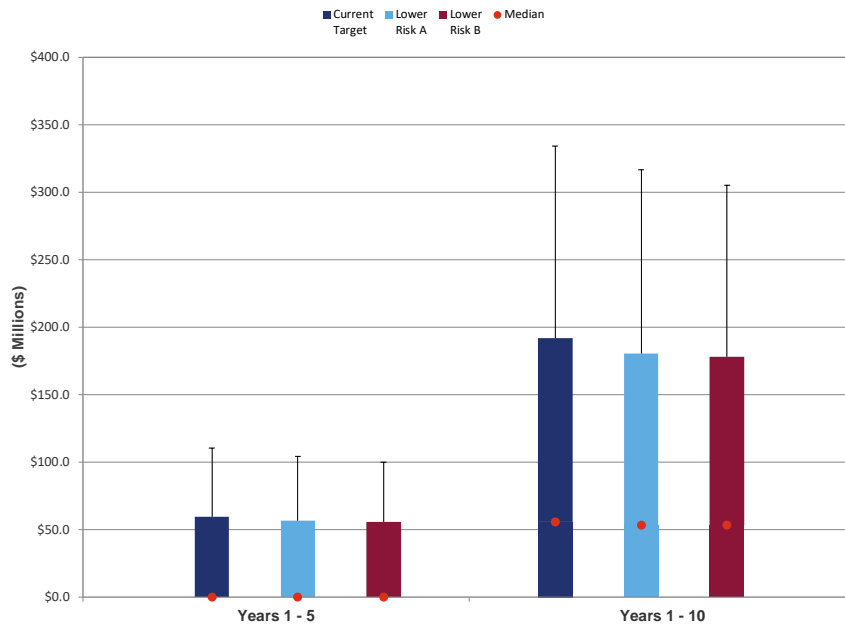


Shortfall Risk:
The potential for the current policy to have higher median contributions than the alternative policies.

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	0.0	0.0	0.0	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	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



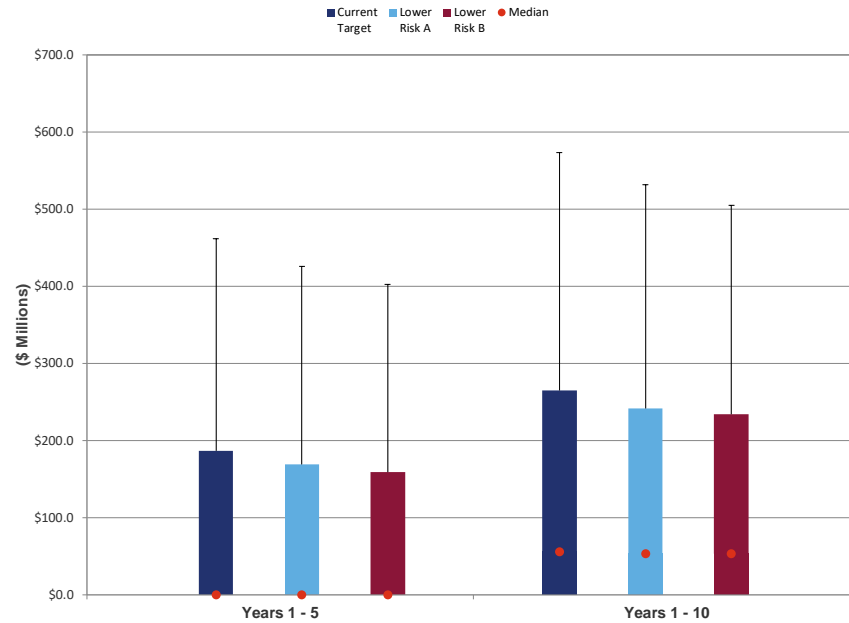
(\$ Millions)	Years 1 - 5			Years 1 - 10		
	Current Target	Lower Risk A	Lower Risk B	Current Target	Lower Risk A	Lower Risk B
Very Pessimistic	110.2	104.0	99.9	334.3	316.6	304.9
Pessimistic	59.2	56.6	55.4	191.8	180.6	177.8
Median (Expected)	0.0	0.0	0.0	55.4	53.0	53.2
Optimistic	0.0	0.0	0.0	0.0	0.0	0.0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

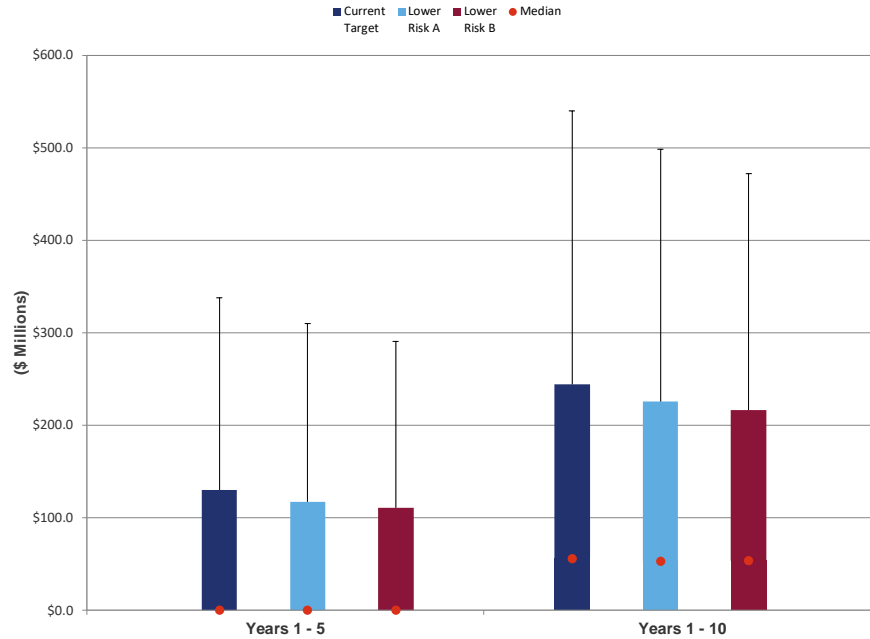
Shortfall Risk:
The potential for the current allocation to have a higher median economic cost than the alternative policies.

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.

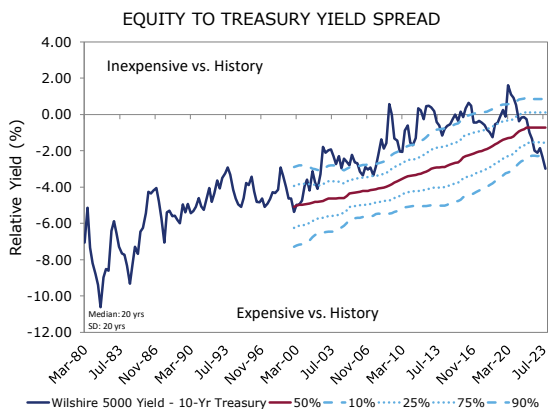
EROA = 6.50%

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.

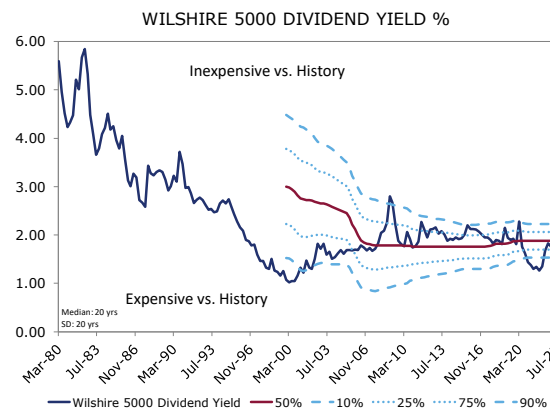
Appendix – Market Valuations

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

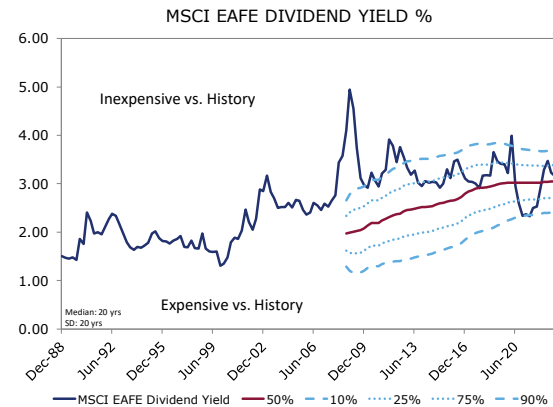
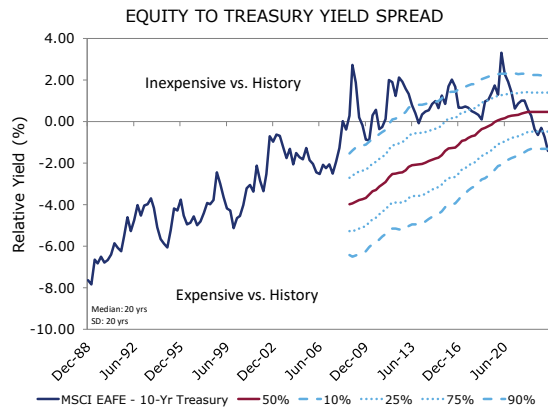


Data Source: Wilshire Atlas

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

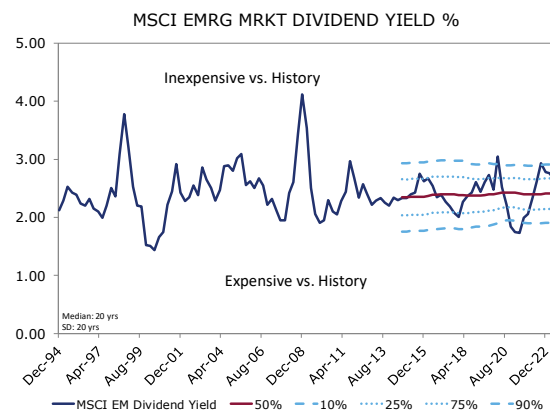
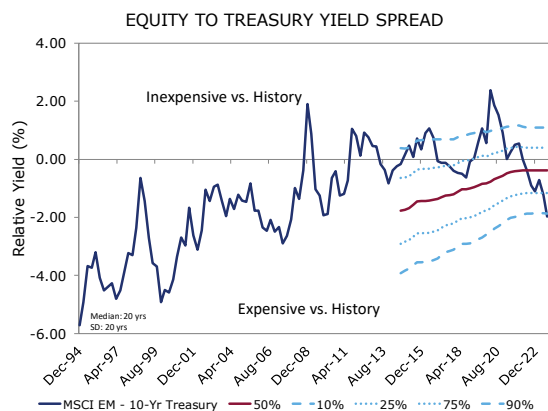


Data Source: Wilshire Atlas

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%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	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%	25.00%	25.00%	25.00%	25.00%	25.00%	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%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	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%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	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%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	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%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	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.

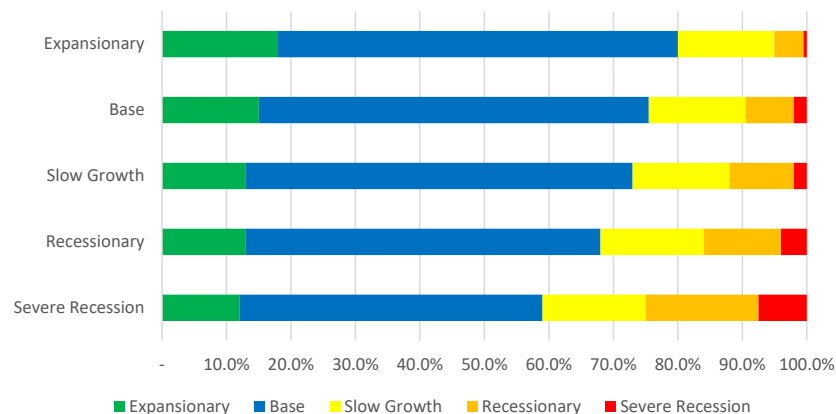
Appendix – Regimes

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.

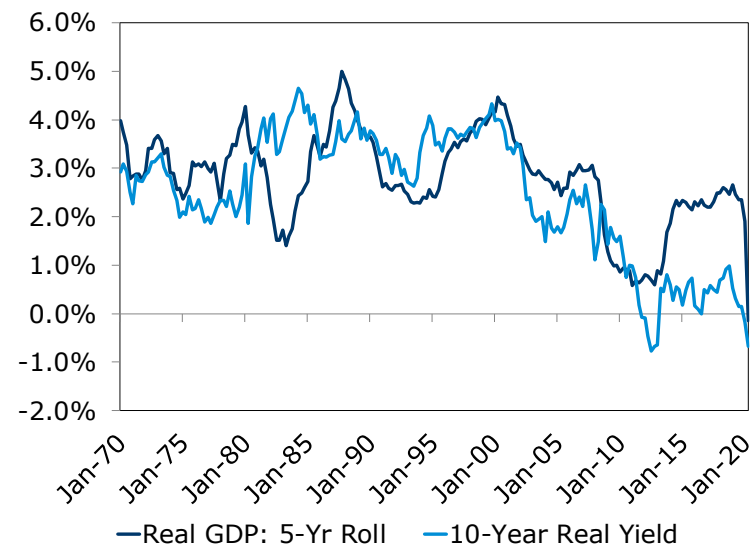
Appendix – Economic Factor Exposures

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

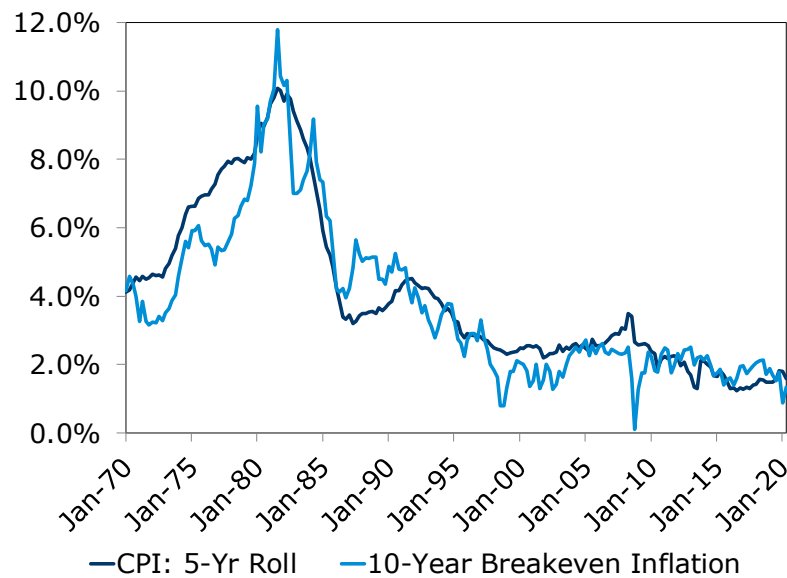
- Interest rates contain information and can reflect economic factors
- Nominal yields aggregate two important and distinct sources of economic information – real yields and expected inflation
- Disaggregating these factors should prove beneficial in developing a set of factors with improved explanatory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



Data Source: Federal Reserve, Bridgewater

Inflation Proxy

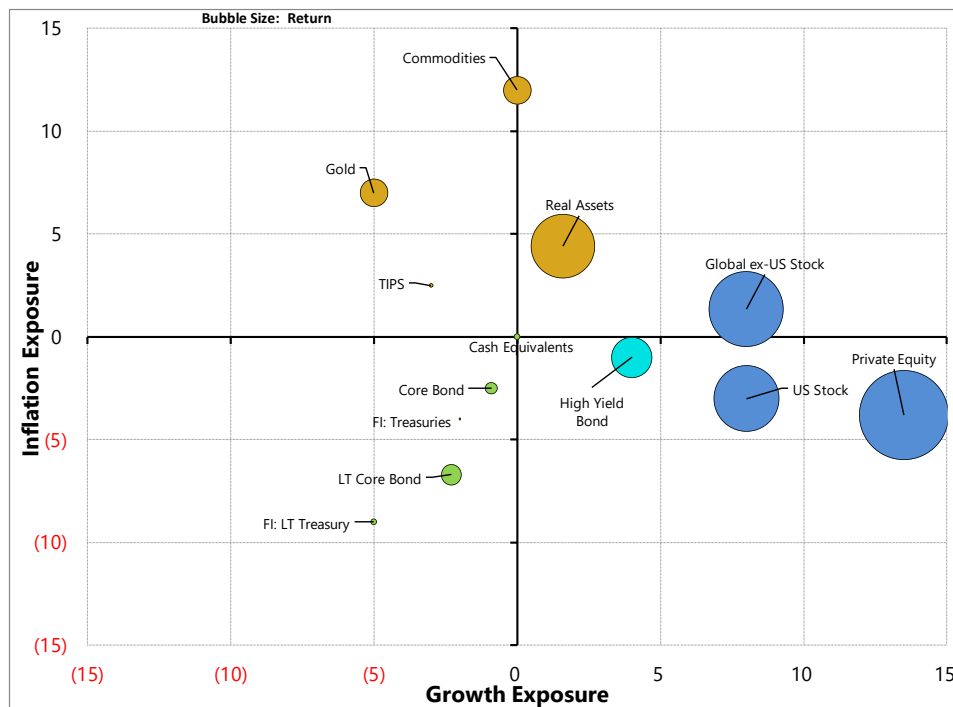
- Breakeven inflation is the market’s expectation for inflation
- Tends to follow closely with actual, recent inflation and can act as a timely signal of trends in consumer prices



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



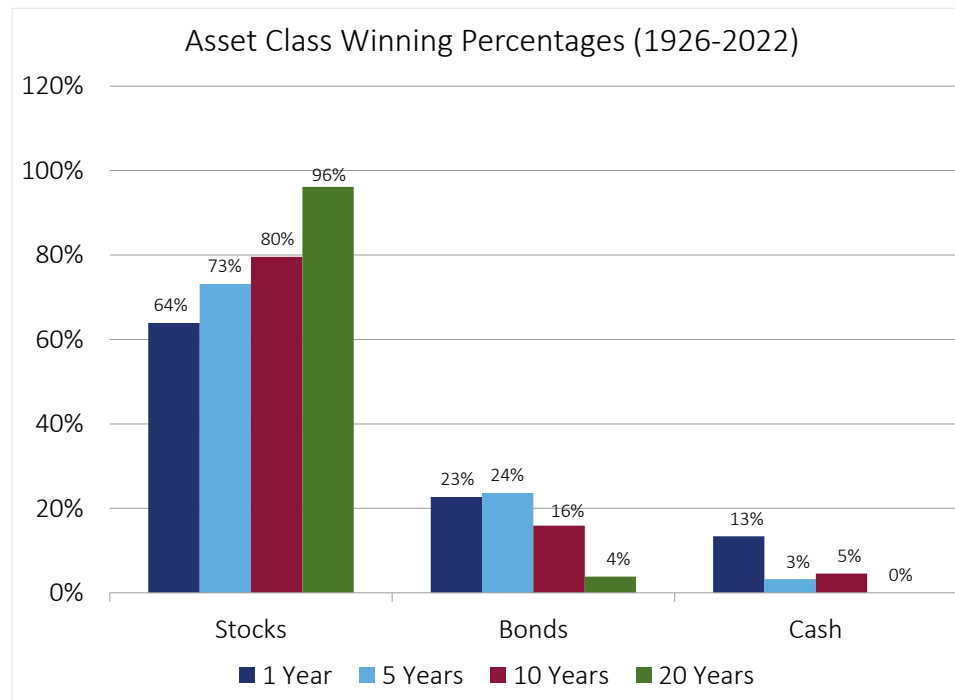
Appendix – Liquidity

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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