



Executive Summary Third Quarter 2023

Arkansas Public Employees
Retirement System

Brianne Weymouth, CAIA
Senior Vice President

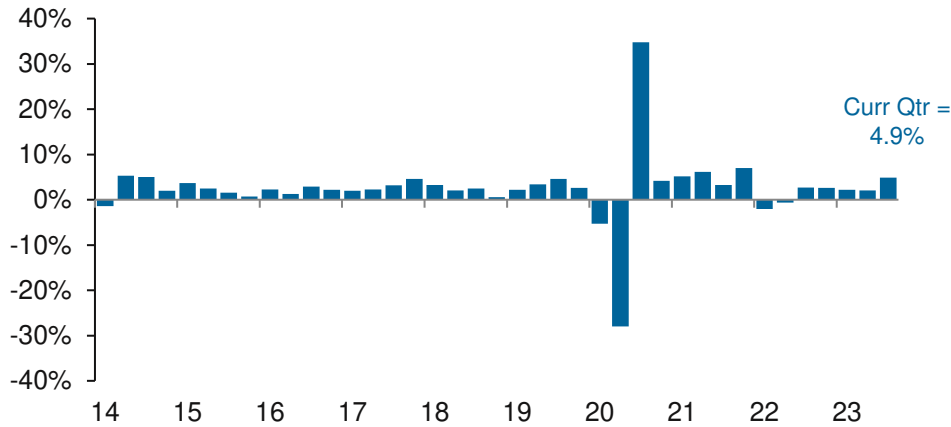
John Jackson, CFA
Senior Vice President

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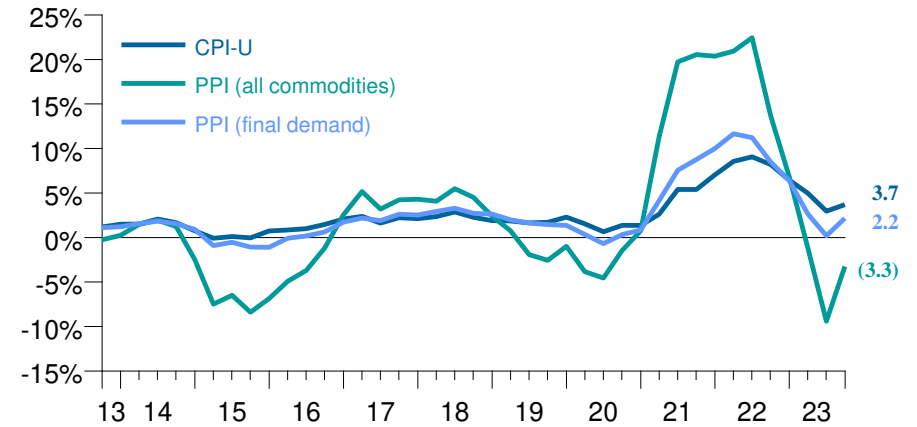
U.S. Economy—Summary

For periods ended 9/30/23

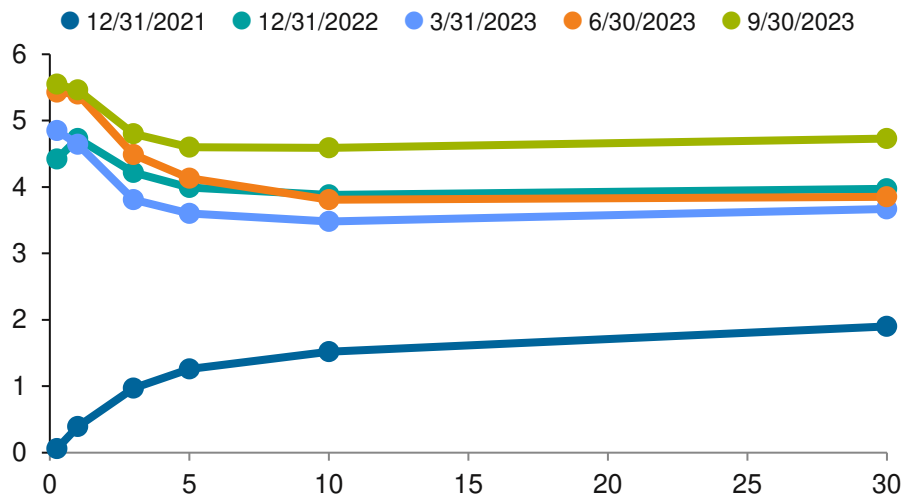
Quarterly Real GDP Growth



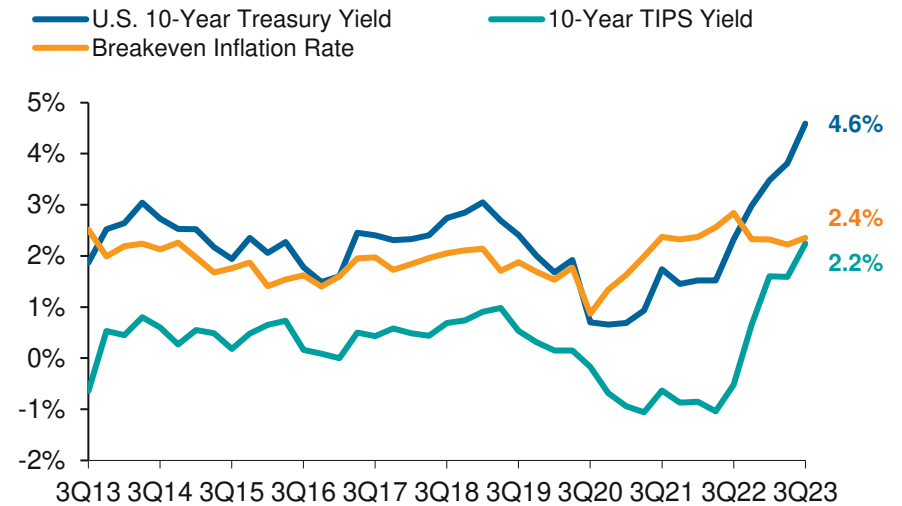
Inflation Year-Over-Year



U.S. Treasury Yield Curves



Historical 10-Year Yields Through 9/30/23



Sources: Bloomberg, Bureau of Labor Statistics, Callan

Equity Markets Down in 3Q, Following Rebound in First Half of 2023

Stocks and bonds still have ground to make up after declines in 2022

S&P 500 down 3.3% in 3Q23.

- Loss through first three quarters of 2022 was 23.9%; rebound in the following three quarters reduced the loss to 2.9% by September, but decline in 3Q shows S&P is still over 7% below 1/2022 high-water mark

Fixed income recovered in first half of 2023 as high inflation began to ease; speculation about interest rate cuts evaporated

- Bloomberg Aggregate: up 3% in 1Q, but declined 0.8% in 2Q and another 3.2% in 3Q as Fed continued to raise rates
- CPI-U: +3.7% year-over year for 3Q, and still up 5.8% since the start of 2022

Economic data defied expectations of recession in 2023; GDP growth came in at 2.1% in 1Q and 2.2% in 2Q, and surged to a stunning 4.9% in 3Q

- Job market remains solid, providing support to Fed efforts to fight inflation

Returns for Periods ended 9/30/23

	Quarter	YTD	Last Year	5 Years	10 Years	25 Years
U.S. Equity						
Russell 3000	-3.25	12.39	20.46	9.14	11.28	8.09
S&P 500	-3.27	13.07	21.62	9.92	11.91	7.92
Russell 2000	-5.13	2.54	8.93	2.40	6.65	8.00
Global ex-U.S. Equity						
MSCI World ex USA	-4.10	6.73	24.00	3.44	3.84	4.98
MSCI Emerging Markets	-2.93	1.82	11.70	0.56	2.07	--
MSCI ACWI ex USA Small Cap	-1.70	5.03	19.01	2.58	4.35	7.41
Fixed Income						
Bloomberg Aggregate	-3.23	-1.21	0.64	0.10	1.13	3.59
90-day T-Bill	1.31	3.60	4.47	1.72	1.11	1.89
Bloomberg Long Gov/Credit	-9.37	-5.40	-2.93	-1.21	1.94	4.67
Bloomberg Global Agg ex-US	-4.00	-3.20	3.39	-3.10	-1.73	2.04
Real Estate						
NCREIF Property	-1.37	-5.07	-8.39	5.26	7.40	8.31
NCREIF:NFI-ODCE Eq Wt Net	-2.12	-8.42	-13.08	5.22	7.55	6.94
Alternatives						
CS Hedge Fund Index	1.81	3.71	4.66	4.77	4.08	5.96
Cambridge Private Equity*	1.59	3.71	0.39	15.37	14.91	13.67
Bloomberg Commodity	4.71	-3.44	-1.30	6.13	-0.75	2.45
Gold Spot Price	-3.28	2.18	11.61	9.30	3.47	7.60
Inflation - CPI-U	0.88	3.70	3.70	4.04	2.77	2.56

*Cambridge PE data as of 2Q23

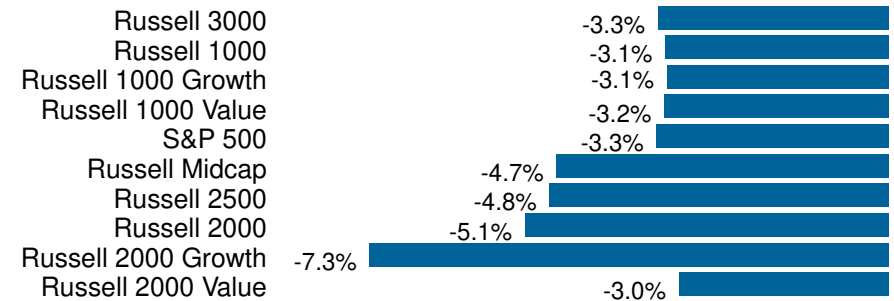
Sources: Bloomberg, Callan, Cambridge, Credit Suisse, FTSE Russell, MSCI, NCREIF, S&P Dow Jones Indices

U.S. Equity Performance: 3Q23

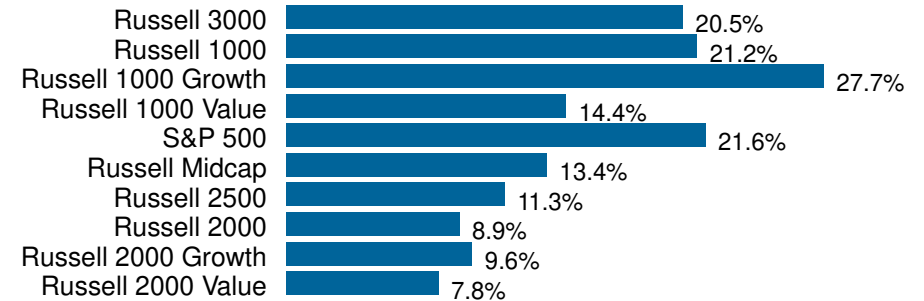
The U.S. equity markets cooled in 3Q after an exuberant start to the year

- ▶ All U.S. equity indices posted losses during 3Q23. August and September were marked by investor fears about the potential of a “higher for longer” interest rate environment, leading to broader market declines.
- ▶ While all indices were negative, the Russell 2000 Value Index led the pack during the quarter, a reversal of the previous two quarters when the Russell 1000 Growth Index led.
- ▶ Only two of the 11 S&P 500 Index sectors generated positive 3Q returns; Energy was up 12% and Communication Services was up 3%. However, on a YTD basis, six sectors generated positive returns, with Information Technology, Communication Services and Consumer Discretionary substantially leading the group.

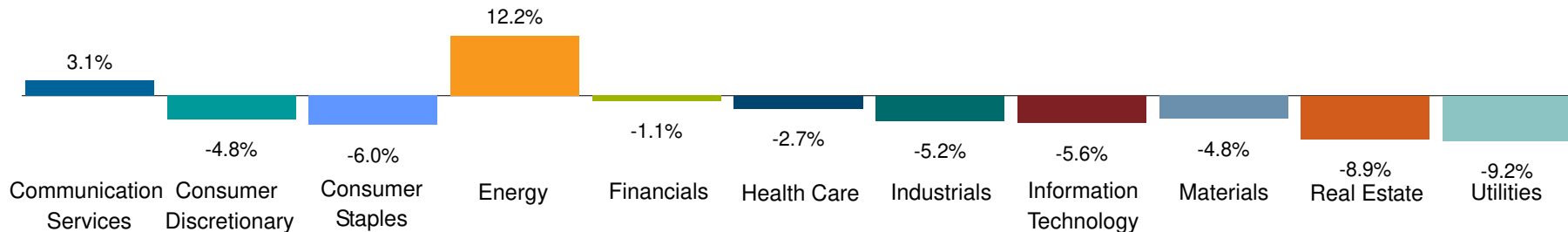
U.S. Equity: Quarter Ended 9/30/23



U.S. Equity: One-Year Returns Ended 9/30/23



Industry Sector Quarterly Performance (S&P 500) as of 9/30/23



Sources: FTSE Russell, S&P Dow Jones Indices

Global/Global ex-U.S. Equity Performance: 3Q23

Global growth concerns

Most global markets were in the red for 3Q23.

Narrow market

- ▶ Global markets retreated in 3Q23 amid fears of a global recession driven by higher interest rates and slowing growth in regions outside the U.S.
- ▶ Emerging markets outperformed developed markets, buoyed by good results from India, whose economy grew nearly 8% on the heels of supportive infrastructure spending.
- ▶ Japan was strong again in local currency as it continues to benefit from post-COVID exuberance, easy monetary policy, and a new economic stimulus plan.

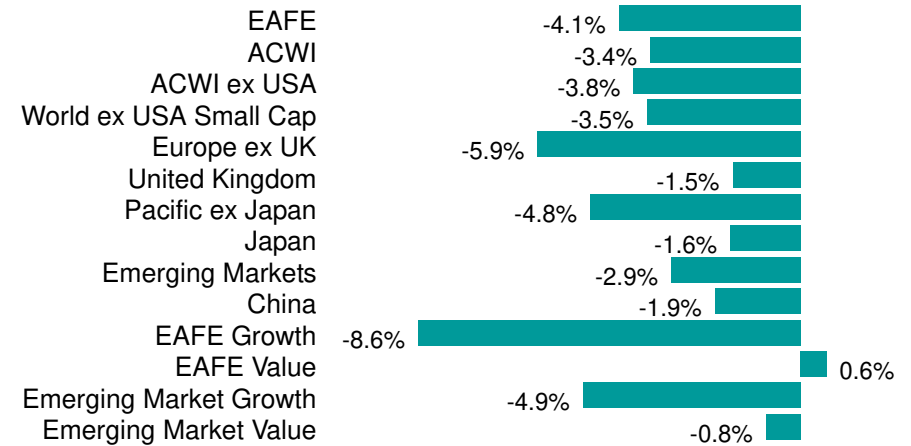
Growth vs. value

- ▶ With energy as a strong outperformer on the heels of oil price increases, value outpaced growth by a wide margin in global ex-U.S. markets.

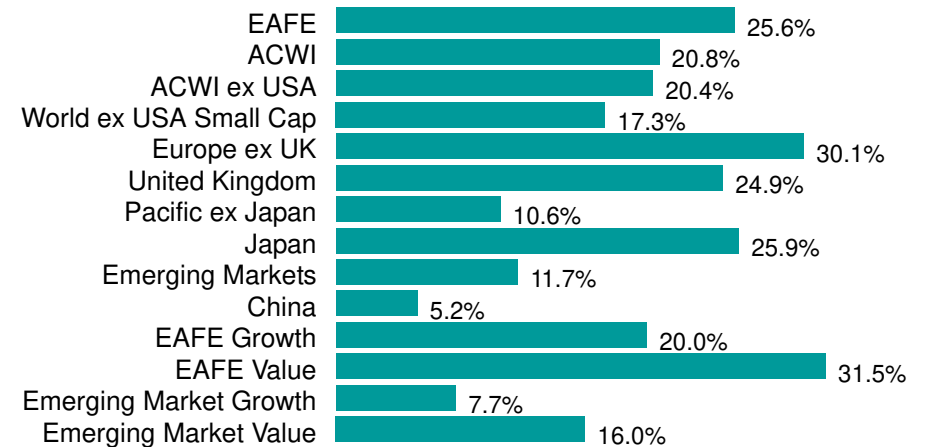
U.S. dollar vs. other currencies

- ▶ The stronger U.S. dollar, which gained 3% over the quarter, was a notable headwind for the period.

Global Equity Returns: Quarter Ended 9/30/23



Global Equity Returns: One Year Ended 9/30/23



Source: MSCI

U.S. Fixed Income Performance: 3Q23

Yields continue to march upward as spreads remain range-bound

U.S. fixed income fell for a second straight quarter

- ▶ The Bloomberg Aggregate Index is on track for a third calendar year of negative returns, with the rise in yields continuing to detract from performance.

U.S. Treasury 10-year yield climbed roughly 80 bps

- ▶ 10-year ended the quarter at 4.59%, its highest level since 2007.
- ▶ The yield curve's inversion narrowed as long-term rates rose more than short-term rates.

TIPS outperformed nominal Treasuries

- ▶ 10-year break-even spreads widened over 10 bps.

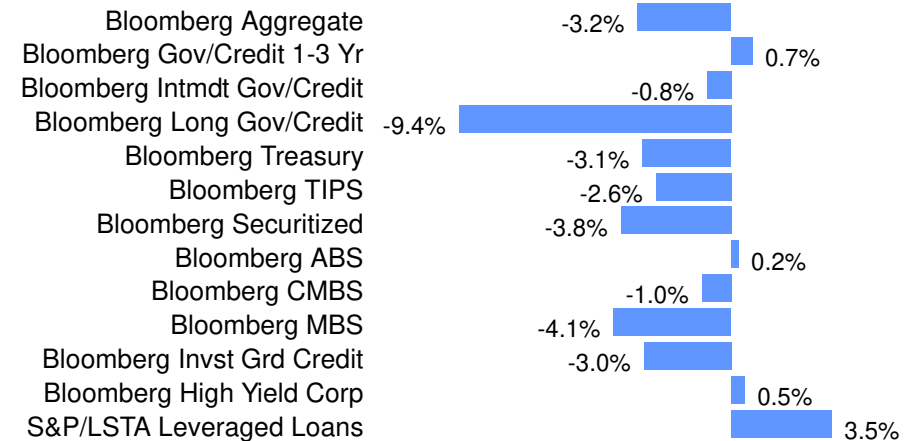
Fed policy rate held to 5.25%-5.50%

- ▶ The updated dot plot suggested an additional rate hike may be in the cards before year-end.

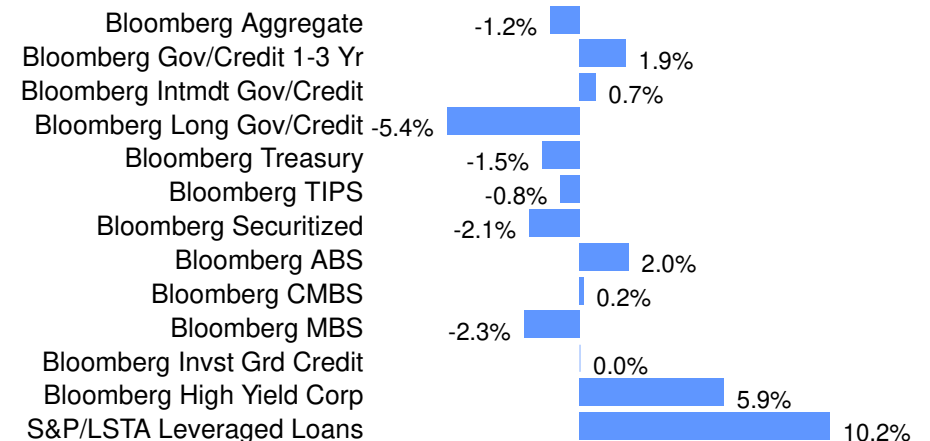
Lower-quality credit continued to outperform

- ▶ High yield spreads were flat, but the sector was buoyed by strong performance in July. Additionally, a combination of higher yields and no duration continued to drive bank loan outperformance.
- ▶ IG corporate spreads tightened slightly and remained close to their 10-year average.
- ▶ Agency RMBS underperformed other securitized sectors as interest rate volatility weighed on the sector.

U.S. Fixed Income Returns: Quarter Ended 9/30/23



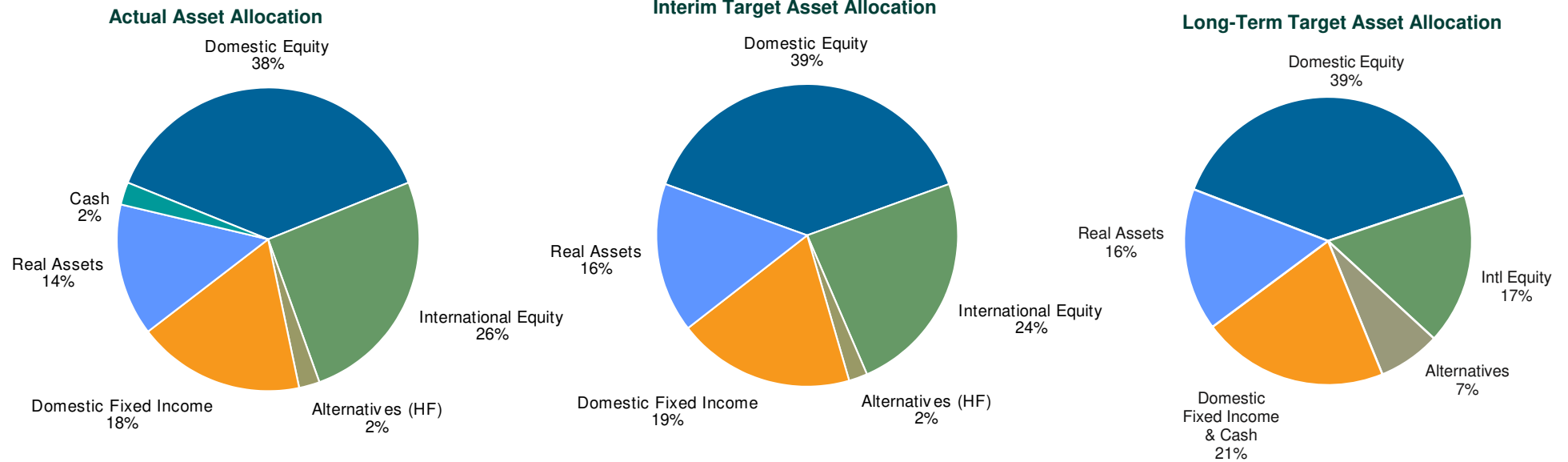
U.S. Fixed Income Returns: YTD Ending 9/30/23



Sources: Bloomberg, S&P Dow Jones Indices

Actual vs. Target Asset Allocation*

September 30, 2023



Asset Class	\$Millions Actual	Weight Actual	Interim Target	Percent Difference	\$Millions Difference
Domestic Equity	3,872	37.8%	39.0%	(1.2%)	(125)
International Equity	2,623	25.6%	24.0%	1.6%	164
Alternatives (HF)	224	2.2%	2.0%	0.2%	19
Domestic Fixed Income	1,837	17.9%	19.0%	(1.1%)	(111)
Real Assets	1,443	14.1%	16.0%	(1.9%)	(197)
Cash	250	2.4%	0.0%	2.4%	250
Total	10,249	100.0%	100.0%		

- The APERS Investment Policy states that rebalancing to the target asset allocation should take place when the actual asset allocation falls outside of a +/- 5% range from the target asset allocation. All asset classes are within their allowable ranges.

*The long-term asset allocation was approved in 2023. The benchmark will be modified to reflect the new long-term targets when the Private Equity allocation has been implemented. Benchmark definitions can be found in the appendix.

Investment Manager Asset Allocation

September 30, 2023

	September 30, 2023				June 30, 2023	
	Market Value	Weight	Net New Inv.	Inv. Return	Market Value	Weight
Domestic Equity	\$3,872,081,260	37.78%	\$(88,312,587)	\$(164,893,366)	\$4,125,287,213	38.59%
Lazard Asset Mgmt.	467,314,126	4.56%	(381,326)	(41,011,865)	508,707,318	4.76%
CastleArk Mgmt. LLC	474,331,629	4.63%	(20,413,243)	(23,253,906)	517,998,778	4.85%
Mellon S&P 500 Index Fd	679,162,779	6.63%	(65,024,172)	(25,362,189)	769,549,140	7.20%
Horrell Capital - Passive	198,501,532	1.94%	(83,727)	(8,232,774)	206,818,033	1.93%
Mellon Large Cap Growth	386,023,943	3.77%	(956)	(12,464,665)	398,489,563	3.73%
Wellington Management	458,491,802	4.47%	(354,085)	(13,742,671)	472,588,558	4.42%
Intech	91	0.00%	(371,442)	(6,365)	377,898	0.00%
LSV Asset Management	355,907,983	3.47%	(509,206)	(1,925,428)	358,342,617	3.35%
Stephens Investment Mgmt.	446,888,117	4.36%	(753,184)	(22,461,999)	470,103,300	4.40%
Froley Revy Investment	405,459,257	3.96%	(421,245)	(16,431,505)	422,312,007	3.95%
International Equity	\$2,623,430,264	25.60%	\$(2,504,237)	\$(129,615,426)	\$2,755,549,927	25.77%
Artisan Partners	673,150,031	6.57%	(914,953)	(17,897,610)	691,962,595	6.47%
Mellon ACWI ex US Fund	584,408,641	5.70%	(91,791)	(22,656,670)	607,157,102	5.68%
Baillie Gifford Overseas	482,527,541	4.71%	(524,815)	(55,035,645)	538,088,001	5.03%
Lazard Asset Mgmt.	550,106,793	5.37%	(440,245)	(25,979,509)	576,526,548	5.39%
Acadian ACW ex US SmallCap	184,580,361	1.80%	(279,512)	(2,513,517)	187,373,390	1.75%
Franklin Templeton Intl SmallCap	148,656,896	1.45%	(252,921)	(5,532,474)	154,442,291	1.44%
Alternatives	\$223,616,430	2.18%	\$(560,637)	\$4,864,632	\$219,312,434	2.05%
AQR Capital	0	0.00%	(3)	0	3	0.00%
Hedge Funds	\$223,616,430	2.18%	\$(560,633)	\$4,864,632	\$219,312,431	2.05%
Blackstone Alt. Asset Mgmt	223,616,430	2.18%	(560,633)	4,864,632	219,312,431	2.05%
Domestic Fixed Income	\$1,836,696,646	17.92%	\$(931,098)	\$(50,344,889)	\$1,887,972,633	17.66%
DoubleLine Capital	582,165,535	5.68%	(282,564)	(17,884,186)	600,332,285	5.62%
MacKay Shields	622,574,079	6.07%	(317,522)	(16,350,753)	639,242,354	5.98%
PGIM	631,957,032	6.17%	(331,012)	(16,109,949)	648,397,994	6.06%
Real Assets	\$1,443,208,786	14.08%	\$(19,991,205)	\$(22,139,951)	\$1,485,339,942	13.89%
REITS	\$10,759,340	0.10%	\$(1,449)	\$(861,991)	\$11,622,780	0.11%
MCM EB DV Non-SL REIT Fd	10,759,340	0.10%	(1,449)	(861,991)	11,622,780	0.11%
Core Real Estate	\$921,340,278	8.99%	\$(2,889,716)	\$(17,572,748)	\$941,802,742	8.81%
Invesco Real Estate	569,483,459	5.56%	(518,746)	(9,017,401)	579,019,606	5.42%
Heitman Real Estate Tr LP	351,856,819	3.43%	(2,370,970)	(8,555,347)	362,783,136	3.39%
Value Add Real Estate	\$324,047,436	3.16%	\$(14,553,089)	\$(8,155,016)	\$346,755,542	3.24%
Clarion Lion Industrial Trust	82,228,230	0.80%	(243,746)	611,458	81,860,518	0.77%
Harrison Street Fund VIII	44,480,708	0.43%	(187,500)	58,261	44,609,947	0.42%
Heitman Value Partners IV	45,477,284	0.44%	(99,479)	1,076,418	44,500,345	0.42%
LaSalle Inc & Growth VI LP	5,006,567	0.05%	0	(541,601)	5,548,168	0.05%
LaSalle Inc & Growth VII LP	21,450,195	0.21%	(87,122)	(6,792,827)	28,330,144	0.26%
Starwood SOF XII	16,821,504	0.16%	(234,056)	502,808	16,552,752	0.15%
TA Realty X	0	0.00%	(5,530)	(2,753)	8,283	0.00%
TA Realty XI	8,774,280	0.09%	(13,878,289)	(720,104)	23,372,673	0.22%
TA Realty XII	99,808,668	0.97%	182,632	(2,346,676)	101,972,712	0.95%
Farmland	\$89,704,145	0.88%	\$(834,079)	\$921	\$90,537,303	0.85%
IFC Core Farmland Fund	52,592,621	0.51%	(729,844)	599,683	52,722,782	0.49%
PGIM Agriculture	37,111,524	0.36%	(104,235)	(598,762)	37,814,521	0.35%
Timber	\$97,357,587	0.95%	\$(1,712,873)	\$4,460,420	\$94,610,040	0.88%
Pinnacle	97,357,587	0.95%	(1,712,873)	4,460,420	94,610,040	0.88%
Cash	\$250,175,559	2.44%	\$30,361,970	\$2,002,419	\$217,811,171	2.04%
Composite Fund	\$10,249,208,945	100.0%	\$(81,937,794)	\$(360,115,045)	\$10,691,261,784	100.0%

Asset Class Performance and Market Values

September 30, 2023

	Market Value \$(Dollars)	Ending Weight	Last Quarter	Last Year	Last 3 Years	Last 5 Years
Domestic Equity	\$3,872,081,260	37.78%	(4.01%)	14.99%	7.73%	7.89%
Russell 3000 Index	-	-	(3.25%)	20.46%	9.38%	9.14%
International Equity	\$2,623,430,264	25.60%	(4.71%)	23.07%	4.38%	4.08%
Benchmark**	-	-	(3.49%)	20.19%	3.42%	1.86%
Alternatives	\$223,616,430	2.18%	2.22%	9.24%	5.06%	5.13%
Hedge Funds	\$223,616,430	2.18%	2.22%	7.24%	7.13%	5.69%
HFRI FOF: Diversified Index***	-	-	0.68%	6.80%	5.15%	5.39%
Domestic Fixed Income	\$1,836,696,646	17.92%	(2.67%)	2.72%	(3.90%)	0.93%
Blmbg Aggregate	-	-	(3.23%)	0.64%	(5.21%)	0.10%
Real Assets	\$1,443,208,786	14.08%	(1.50%)	(9.66%)	11.94%	5.92%
NCREIF Total Index****	-	-	(1.37%)	4.31%	8.59%	7.36%
REITS	\$10,759,340	0.10%	(7.42%)	2.23%	6.10%	1.29%
S&P DJ US Select REIT	-	-	(7.40%)	2.61%	6.12%	1.56%
Core Real Estate	\$921,340,278	8.99%	(1.87%)	(12.29%)	7.75%	5.32%
NFI-ODCE Eq Wt Net	-	-	(2.12%)	(13.08%)	6.69%	5.22%
Value Add Real Estate	\$324,047,436	3.16%	(2.39%)	(12.72%)	16.64%	13.63%
NCREIF Total Index	-	-	(1.37%)	(8.39%)	6.04%	5.26%
Farmland	\$89,704,145	0.88%	0.01%	4.68%	-	-
NCREIF Farmland Index	-	-	(0.26%)	5.81%	7.17%	6.13%
Timber	\$97,357,587	0.95%	4.73%	16.83%	14.02%	6.15%
NCREIF Timberland Index	-	-	1.37%	10.03%	9.15%	5.87%
Cash	\$250,175,559	2.44%	1.20%	4.42%	1.80%	1.74%
Total Fund	\$10,249,208,945	100.00%	(3.41%)	9.91%	5.25%	5.28%
Total Fund ex Cash	\$9,999,033,385	97.56%	(3.47%)	9.90%	5.24%	5.29%
Benchmark*	-	-	(2.93%)	13.85%	5.11%	5.77%

- **Domestic Equity** underperformed the benchmark in the third quarter and over the last 5-year period.
- **International Equity** underperformed the benchmark in the third quarter but has exceeded the benchmark return over longer time periods.
- **Hedge Funds** outperformed the index in the third quarter and leads the benchmark over longer time periods.
- **Domestic Fixed Income** outperformed the benchmark in the third quarter and leads the index over longer trailing time periods.
- **Farmland** and **Timber** outperformed their respective benchmarks for the quarter. The Timber allocation outpaced its benchmark over the last one-, three-, and five-year periods, while Farmland trailed its benchmark over the last year.
- **Value Add Real Estate** lagged the benchmark in the third quarter, but the allocation meaningfully outperformed over the trailing three- and five-year periods.
- **Core Real Estate** edged its benchmark return for the quarter and outperformed over longer periods.
- **REITS** performed in line with the benchmark for the quarter and modestly underperformed over the last five years.

* Current Quarter Target = 39% Russell 3000 Index, 24% MSCI ACWI ex US IMI Index, 19% Blmbg Aggregate Index, 16% CPI All Urban Cons +4%, 3% MSCI World Index and 2% Blmbg Aggregate Index

** MSCI EAFE through 12/31/2020; MSCI ACWI ex US IMI (Net) thereafter.

*** 60% MSCI World and 40% Bloomberg Aggregate through 6/30/2023; HFRI FOF: Diversified Index thereafter

**** CPI All Urban Consumers +4% through 6/30/2023; NCREIF Total Index thereafter

Total Fund Performance

September 30, 2023

	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 10 Years	Last 20 Years
10th Percentile	(1.32)	→ 13.96	7.58	6.86	7.61	7.78
25th Percentile	(1.80)	12.42	6.31	→ 6.25	7.18	7.47
Median	→ (2.30)	11.09	→ 5.25 ←	→ 5.48 ←	→ 6.68 ←	→ 7.19 ←
75th Percentile	→ (2.92)	← 9.75	4.16	← 4.81	6.12	6.79
90th Percentile	(3.33) ←	8.49	3.13	4.28	5.55	6.43
● Total Fund	(3.41) (92)	9.91 (73)	5.25 (50)	5.28 (59)	6.69 (50)	7.22 (45)
● Policy Target	(2.50) (62)	14.35 (7)	5.26 (49)	5.86 (36)	6.76 (47)	7.20 (48)

- The above chart shows the distribution of returns for the Callan Public Fund DB Peer Group across time periods ended September 30, 2023. Returns longer than one year annualized.
- The returns and peer group ranking for the APERS Total Fund and Total Fund Target are shown in the bottom two rows.
 - **The 25th percentile return** represents the value above which 25% of the returns fall. In other words, it's the point where a quarter of the peer group earned a higher return, and three-quarters of the peer group earned a lower return.
 - **The median return** represents the middle value in a distribution of returns. If we arrange all the returns in ascending order, the median is the value that separates the lower half from the higher half.
 - **The 75th percentile return** represents the value above which 75% of the returns fall. In other words, it's the point where three-quarters of the peer group earned a higher return, and a quarter of the peer group earned a lower return.
- Over the last one- and 5-year periods, the Fund underperformed its benchmark and finished below its peer group median.
- Over the last 3- and 10-year periods, the Fund finished in line with the benchmark and peer group median.
- For the trailing 20-year period, the Fund edged its benchmark return and ranked in the top half of its peer group.

Current Quarter Target = 39% Russell 3000 Index, 24% MSCI ACWI ex US IMI Index, 19% Blmbg Aggregate Index, 16% NCREIF Total Index, 2% HFRI FOF: Diversified Index

Investment Manager Returns and Peer Group Rankings

September 30, 2023

	Last Quarter		Last Year		Last 3 Years		Last 5 Years	
Domestic Equity	(4.01%)	89	14.99%	98	7.73%	91	7.89%	74
Russell 3000 Index	(3.25%)	30	20.46%	19	9.38%	65	9.14%	18
Pub Pln- Dom Equity	(3.41%)		19.58%		9.94%		8.53%	
Lazard Asset Mgmt.	(8.07%)	99	12.22%	86	6.26%	78	6.85%	79
Russell 3000 Index	(3.25%)	54	20.46%	46	9.38%	61	9.14%	34
Callan All Cap Broad	(3.02%)		19.20%		10.89%		8.27%	
CastleArk	(4.51%)	81	21.61%	35	8.50%	64	10.24%	24
Russell 3000 Growth Index	(3.34%)	60	26.63%	14	7.54%	75	11.70%	10
Callan All Cap Broad	(3.02%)		19.20%		10.89%		8.27%	
Mellon S&P 500 Index Fd	(3.27%)	85	21.63%	42	10.16%	52	9.61%	56
S&P 500 Index	(3.27%)	85	21.62%	42	10.15%	52	9.92%	46
Callan Large Cap Core	(2.46%)		21.19%		10.30%		9.80%	
Horrell Capital - Passive	(3.98%)	69	12.53%	85	10.10%	57	9.07%	35
Bloomberg Arkansas Index	2.59%	2	18.51%	60	27.09%	3	13.34%	5
S&P 500 Index	(3.27%)	54	21.62%	35	10.15%	57	9.92%	31
Callan All Cap Broad	(3.02%)		19.20%		10.89%		8.27%	
Mellon Large Cap Growth	(3.13%)	36	-		-		-	
Russell 1000 Growth Index	(3.13%)	36	27.72%	43	7.97%	26	12.42%	15
Callan Large Cap Growth	(3.42%)		26.41%		5.97%		10.53%	
Wellington Management	(2.91%)	76	17.06%	45	12.50%	67	7.29%	45
Russell 1000 Value Index	(3.16%)	86	14.44%	66	11.05%	83	6.23%	78
Callan Large Cap Value	(2.07%)		16.45%		13.95%		6.97%	
LSV Asset Management	(0.55%)	22	18.81%	23	21.86%	16	5.69%	34
Russell 2000 Value Index	(2.96%)	63	7.84%	89	13.32%	85	2.59%	94
Callan Small Cap Value	(1.97%)		13.45%		16.80%		5.20%	
Stephens Investment Mgmt.	(4.79%)	11	10.45%	57	3.40%	42	4.14%	63
Russell 2000 Growth Index	(7.32%)	66	9.59%	60	1.09%	64	1.55%	89
Callan Small Cap Growth	(6.49%)		10.67%		2.95%		5.00%	
Froley Revy Investment	(3.90%)	90	2.52%	91	0.88%	83	6.90%	35
ML All Conv	(2.53%)	59	7.49%	47	3.06%	44	8.36%	16
Callan Convert Bonds DB	(2.36%)		7.30%		2.60%		6.28%	

- Total **Domestic Equity** underperformance over the last year has weighed on long-term results, as the composite trails the benchmark and peer group median over the trailing 3- and 5-year periods.
- LSV, Wellington, and Stephens led their respective benchmarks for the quarter, and LSV and Stephens ranked in the top half of their peer universe. All three managers have outperformed their benchmark over the last 5-year period.
- CastleArk, Lazard, and Froley Revy underperformed their respective benchmarks and median peer for the third quarter. CastleArk and Froley Revy trailed the benchmark over the last five years but rank in the top half of peers. Lazard has underperformed the benchmark and its peer group median over longer periods.

Investment Manager Returns and Peer Group Rankings

September 30, 2023

	Last Quarter		Last Year		Last 3 Years		Last 5 Years	
International Equity	(4.71%)	91	23.07%	36	4.38%	45	4.08%	27
Benchmark*	(3.49%)	17	20.19%	73	3.42%	71	1.86%	89
Pub Pln- Intl Equity	(3.70%)		22.07%		4.27%		3.48%	
Artisan Partners	(2.59%)	25	33.54%	7	15.35%	1	8.83%	1
MSCI EAFE	(4.11%)	44	25.65%	38	5.75%	43	3.24%	68
Callan NonUS Eq	(4.58%)		23.96%		4.97%		3.76%	
Mellon ACWI ex US Fund	(3.73%)	37	20.79%	70	4.05%	60	2.90%	75
MSCI ACWI ex US	(3.77%)	37	20.39%	74	3.74%	62	2.58%	81
Callan NonUS Eq	(4.58%)		23.96%		4.97%		3.76%	
Baillie Gifford Overseas	(10.24%)	97	14.63%	96	(6.59%)	97	1.38%	93
MSCI ACWIxUS Gross	(3.68%)	36	21.02%	69	4.24%	57	3.07%	71
Callan NonUS Eq	(4.58%)		23.96%		4.97%		3.76%	
Lazard Asset Mgmt.	(4.51%)	49	23.51%	53	4.83%	51	3.41%	64
MSCI ACWIxUS Gross	(3.68%)	36	21.02%	69	4.24%	57	3.07%	71
Callan NonUS Eq	(4.58%)		23.96%		4.97%		3.76%	
Acadian ACW ex US SmallCap	(1.35%)	10	18.86%	53	-	-	-	-
MSCI ACWI ex US Small Cap	(1.70%)	18	19.01%	53	4.02%	30	2.58%	33
Callan Intl Small Cap	(3.83%)		20.07%		1.65%		1.66%	
Franklin Templeton Intl SmallCap	(3.59%)	45	21.78%	32	-	-	-	-
MSCI ACWI ex US Small Cap	(1.70%)	18	19.01%	53	4.02%	30	2.58%	33
Callan Intl Small Cap	(3.83%)		20.07%		1.65%		1.66%	
Alternatives	2.22%		9.24%		5.06%		5.13%	
Hedge Funds	2.22%		7.24%		7.13%		5.69%	
HFRI FOF: Diversified Index***	0.68%		6.80%		5.15%		5.39%	
Blackstone Alt. Asset Mgmt.	2.22%	13	7.24%	27	7.13%	10	5.69%	16
HFRI FOF: Diversified Index***	0.68%	84	6.80%	30	5.15%	51	5.39%	19
Callan Core Diversif FoF	1.35%		5.86%		5.21%		4.08%	

- Total **International Equity** underperformed the benchmark in the third quarter but has outpaced the benchmark over longer periods. The composite ranks in the 27th percentile of peers over the last five years.
- Artisan and Acadian led their respective benchmarks for the quarter, while Baillie Gifford, Lazard, and Franklin Templeton underperformed. Artisan, Lazard, Acadian, and Franklin Templeton ranked in the top half of their peer groups.
- Over the 5-year period, Artisan and Lazard have outperformed their respective benchmarks. Baillie Gifford underperformed over the last five years.
- **Hedge Funds**, Blackstone, has outpaced its target return and ranks in the top quartile of peers over the trailing 3- and 5-year periods.

** MSCI EAFE through 12/31/2020; MSCI ACWI ex US IMI (Net) thereafter.

*** 60% MSCI World and 40% Bloomberg Aggregate through 6/30/2023; HFRI FOF: Diversified Index thereafter

Investment Manager Returns and Peer Group Rankings

September 30, 2023

	Last Quarter		Last Year		Last 3 Years		Last 5 Years	
Domestic Fixed Income	(2.67%)	57	2.72%	32	(3.90%)	56	0.93%	51
Blmbg Aggregate Index	(3.23%)	78	0.64%	95	(5.21%)	92	0.10%	94
Pub Pln- Dom Fixed	(2.52%)		2.32%		(3.65%)		0.97%	
DoubleLine Capital	(2.98%)	63	1.77%	53	(3.64%)	26	0.34%	94
MacKay Shields	(2.56%)	20	3.25%	8	(3.76%)	31	1.25%	20
PGIM	(2.49%)	16	3.09%	13	(4.28%)	62	1.14%	27
Blmbg Aggregate Index	(3.23%)	82	0.64%	91	(5.21%)	96	0.10%	97
Callan Core Plus FI	(2.88%)		1.84%		(4.13%)		0.91%	
Real Assets	(1.50%)		(9.66%)		11.94%		5.92%	
NCREIF Total Index****	(1.37%)		4.31%		8.59%		7.36%	
REITS	(7.42%)		2.23%		6.10%		1.29%	
S&P DJ US Select REIT	(7.40%)		2.61%		6.12%		1.56%	
MCM EB DV Non-SL REIT Fd	(7.42%)	49	2.23%	57	6.10%	27	1.29%	92
S&P DJ US Select REIT	(7.40%)	44	2.61%	50	6.12%	26	1.56%	88
Callan Real Estate REIT	(7.43%)		2.59%		4.95%		4.32%	
Core Real Estate	(1.87%)		(12.29%)		7.75%		5.32%	
NCREIF NFI-ODCE Eq Wt Net	(2.12%)		(13.08%)		6.69%		5.22%	
Invesco Real Estate	(1.56%)	85	(12.39%)	62	6.89%	45	5.19%	59
Heitman Real Estate Trust LP*****	(2.37%)	88	(12.12%)	60	9.15%	22	5.59%	47
NCREIF NFI-ODCE Eq Wt Net	(2.12%)	87	(13.08%)	66	6.69%	49	5.22%	58
Callan OE Core Cmnlgd RE	(0.61%)		(11.40%)		6.64%		5.38%	
Value Add Real Estate	(2.39%)		(12.72%)		16.64%		13.63%	
NCREIF Total Index	(1.37%)		(8.39%)		6.04%		5.26%	
Clarion Lion Industrial Trust	0.75%		-		-		-	
Harrison Street Fund VIII	0.13%		15.73%		-		-	
Heitman Value Partners IV	2.42%		(6.00%)		17.03%		15.21%	
LaSalle Inc & Growth VI LP	(9.76%)		(33.77%)		(15.29%)		(10.14%)	
LaSalle Inc & Growth VII LP	(24.05%)		(43.08%)		(6.00%)		(1.53%)	
Starwood SOF XI	3.08%		2.07%		-		-	
TA Associates Realty Fund XI	(4.29%)		(40.38%)		10.39%		10.85%	
TA Associates Realty Fund XII	(2.29%)		(10.06%)		24.90%		-	
NCREIF Total Index	(1.37%)		(8.39%)		6.04%		5.26%	
Farmland	0.01%		4.68%		-		-	
IFC Core Farmland Fund	1.15%		8.44%		-		-	
PGIM Agriculture	(1.59%)		(0.79%)		-		-	
NCREIF Farmland Index	(0.26%)		5.81%		7.17%		6.13%	
Timber	4.73%		16.83%		14.02%		6.15%	
Pinnacle	4.73%		16.83%		14.02%		6.15%	
NCREIF Timberland Index	1.37%		10.03%		9.15%		5.87%	
Cash	1.20%		4.42%		1.80%		1.74%	
Total Fund	(3.41%)	92	9.91%	73	5.25%	50	5.28%	59
Callan Public Fund Spr DB	(2.30%)		11.09%		5.25%		5.48%	
Total Fund ex Cash	(3.47%)	92	9.90%	73	5.24%	50	5.29%	59
Benchmark*	(2.93%)	75	13.85%	11	5.11%	54	5.77%	43
Callan Public Fund Spr DB	(2.30%)		11.09%		5.25%		5.48%	

- **Domestic Fixed Income** leads the index over the last 3- and 5-year periods. All three managers delivered excess returns over the benchmark in the third quarter and have outperformed over longer periods.
- The **Real Assets** composite underperformed its target for the third quarter and over the last year. REITS performed in line with the benchmark for the quarter, and Core Real Estate outperformed.
- The **Total Fund** underperformed its benchmark and ranked below its peer group median for the quarter. The Fund ranked at the 50th percentile of peers and exceeded the benchmark over the last 3-year period. Over the last 5 years, the Fund trailed its benchmark and ranked at the 59th percentile of its peer group.

* Current Quarter Target = 39% Russell 3000 Index, 24% MSCI ACWI ex US IMI Index, 19% Blmbg Aggregate Index, 16% CPI All Urban Cons +4%, 3% MSCI World Index and 2% Blmbg Aggregate Index

*** MSCI EAFE through 12/31/2020; MSCI ACWI ex US IMI (Net) thereafter.

**** 60% MSCI World and 40% Bloomberg Aggregate through 6/30/2023; HFRI FOF: Diversified Index thereafter

***** CPI All Urban Consumers +4% through 6/30/2023; NCREIF Total Index thereafter

Organizational Developments

3rd Quarter 2023

Acadian Asset Management – International Small Cap Equity

On October 4, 2023, Acadian announced a 7% staff reduction across the firm 28 people were terminated in total, including 7 individuals across their investment team:

- 3 individuals were from the Analytics & Data and Implementation teams (51 remaining members).
- 3 individuals were mid-level researchers (11 remaining members, although 2 new senior hires are starting in October).
- 1 associate PM on the Core Equity Team – AVP level (30 remaining members, with 1 new hire starting later this year).

The firm continues to hire across its investment platform and has made several significant additions in the past five years with the expansion of its credit capabilities. Callan does not believe this announcement is an actionable event as the staffing reduction should not impact Acadian's investment strategies.

Work Plan Update

Asset Liability Study

- Completed in February 2019. The Board decided to keep the current asset allocation unchanged

Investment Policy Review and Update – Completed in August 2019

Non-US Equity Structure Study

- The Board reviewed the Non-US Equity Structure Study at the November 2019 Board Meeting
- The Board selected a structure which included a new allocation to Non-US Small Cap Equity
- The Non-US Small Cap Equity search was concluded in November 2020 with the selection of Acadian Asset Management and Franklin Templeton Investments

Real Assets Structure Study

- The Board reviewed the Real Assets Structure at the February 2021 meeting. The Board chose to eliminate the Energy equity allocation, in favor of additional Core and Core Plus real estate, and Farmland. Additional Allocations to Value-add real estate were also approved
- At the May 2021 Board Meeting, the Board approved the Real Estate Pacing Study and new commitments to Starwood and Harrison Street Partners
- At the November 2021 Board Meeting, Farmland managers were interviewed and both IFC and PGIM were allocated \$50 million.
- Core Plus Real Estate Manager Interviews occurred at the February Board Meeting, all three managers, Carlyle, Principal, and Clarion, were hired to manage \$85 million.

Domestic Equity Structure Study

- Presented at the August 2022 Board Meeting. The Board decided to maintain the current Domestic Equity Structure.

Private Equity Education and Total Fund Asset Allocation Review

- Private equity education was provided at the Trustee Workshop in October 2022. In the November 2022 meeting the Board received an asset allocation review which included portfolios containing private equity.
- The Board requested that Callan complete a Private Equity pacing analysis using a 5% private equity target allocation for the Fund.

Work Plan Update

Total Fund Asset Allocation Review Update and Private Equity Pacing Study Analysis

- Presented at the February 2023 meeting

Private Equity Education, Pacing Study Review

- Additional Private Equity education provided on May 16th, 2023
- Private Equity Pacing Study results presented at the May 16th, 2023 meeting

Upcoming Projects:

- **Investment Policy Review**
- **Fixed Income Structure Study**

Total Fund Relative Attribution

September 30, 2023

Relative Attribution Effects for Quarter ended September 30, 2023

Asset Class	Effective Actual Weight	Effective Target Weight	Actual Return	Target Return	Manager Effect	Asset Allocation	Total Relative Return
Domestic Equity	39%	39%	(4.01%)	(3.25%)	(0.29%)	0.00%	(0.29%)
Domestic Fixed Income	18%	19%	(2.67%)	(3.23%)	0.10%	0.00%	0.10%
International Equity	26%	24%	(4.71%)	(3.49%)	(0.32%)	(0.01%)	(0.33%)
Alternatives	2%	2%	2.22%	0.68%	0.03%	0.00%	0.03%
Real Assets	14%	16%	(1.50%)	(1.37%)	(0.02%)	(0.04%)	(0.06%)
Cash	2%	0%	1.20%	1.20%	0.00%	0.06%	0.06%
Total			(3.41%)	(2.93%)	(0.49%)	0.01%	(0.48%)

- Active management was the primary detractor for the quarter. Domestic and International Equity outweighed positive contributions from and Fixed Income managers. Variance from policy weights had a muted impact overall.

- Over the last three years, active management had a positive impact on relative performance. Domestic Equity was the only asset class where active management detracted. The Fund benefited from an overweight to domestic Equity and an underweight to Fixed Income, but an underweight to Real Assets and an overweight to International Equity were detractors.

- The Fund trailed its policy benchmark return over the last five years. Active management within International Equity and Fixed Income added value, while Domestic Equity and Real Assets managers were the primary detractors. Underweights to Real Assets and Fixed Income and the overweight to International Equity also detracted. The small allocation to cash also was a headwind to relative performance.

Three Year Annualized Relative Attribution Effects

Asset Class	Effective Actual Weight	Effective Target Weight	Actual Return	Target Return	Manager Effect	Asset Allocation	Total Relative Return
Domestic Equity	39%	37%	7.73%	9.38%	(0.62%)	0.13%	(0.50%)
Domestic Fixed Income	17%	18%	(3.90%)	(5.21%)	0.22%	0.11%	0.33%
International Equity	25%	24%	4.38%	3.42%	0.25%	(0.07%)	0.18%
Alternatives	4%	5%	5.06%	4.22%	0.05%	0.01%	0.06%
Real Assets	13%	16%	11.94%	8.59%	0.26%	(0.17%)	0.09%
Cash	1%	0%	1.80%	1.80%	0.00%	(0.02%)	(0.02%)
Total			5.25%	5.11%	0.15%	(0.01%)	0.14%

Five Year Annualized Relative Attribution Effects

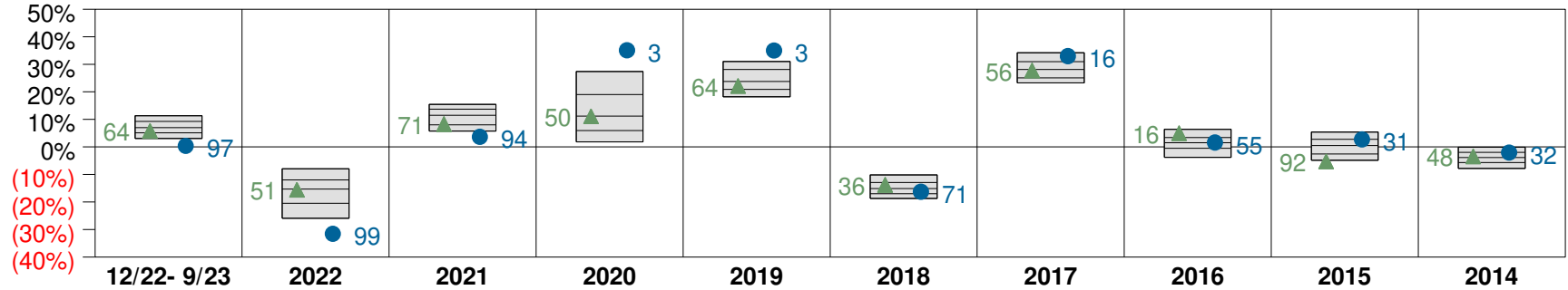
Asset Class	Effective Actual Weight	Effective Target Weight	Actual Return	Target Return	Manager Effect	Asset Allocation	Total Relative Return
Domestic Equity	39%	37%	7.89%	9.14%	(0.48%)	0.03%	(0.45%)
Domestic Fixed Income	17%	18%	0.93%	0.10%	0.11%	(0.08%)	0.04%
International Equity	25%	24%	4.08%	1.86%	0.56%	(0.07%)	0.48%
Alternatives	4%	5%	5.13%	5.70%	(0.03%)	0.00%	(0.02%)
Real Assets	14%	16%	5.92%	7.36%	(0.36%)	(0.15%)	(0.51%)
Cash	1%	0%	1.74%	1.74%	0.00%	(0.02%)	(0.02%)
Total			5.28%	5.77%	(0.20%)	(0.29%)	(0.49%)

Current Quarter Target = 39% Russell 3000 Index, 24% MSCI ACWI ex US IMI Index, 19% Blmbg Aggregate Index, 16% NCREIF Total Index, 2% HFRI FOF: Diversified Index

Manager Spotlight

Baillie Gifford

Performance vs Callan Non-US Equity (Gross)



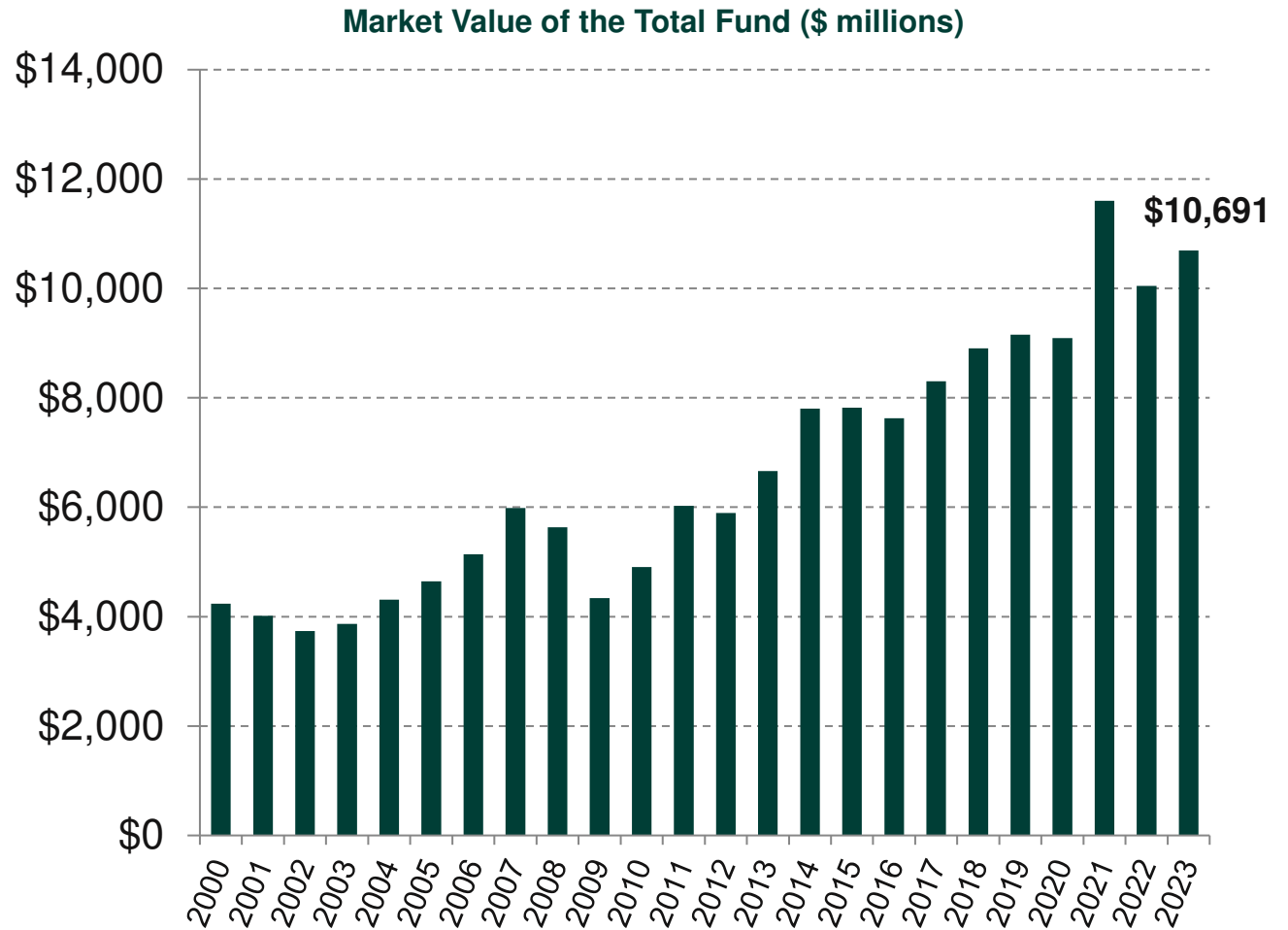
	12/22- 9/23	2022	2021	2020	2019	2018	2017	2016	2015	2014
10th Percentile	11.33	(7.90)	15.44	27.39	31.03	(10.17)	34.21	6.37	5.38	(0.13)
25th Percentile	9.25	(11.97)	13.69	19.00	28.11	(12.90)	30.96	3.40	2.76	(1.97)
Median	7.02	(15.29)	11.50	11.19	23.78	(15.12)	28.16	1.50	0.54	(3.85)
75th Percentile	5.16	(20.51)	7.98	5.93	20.88	(17.01)	25.08	(0.47)	(2.53)	(5.70)
90th Percentile	3.07	(25.95)	5.73	1.81	18.19	(18.73)	23.28	(3.82)	(4.89)	(7.82)
Baillie Gifford Overseas	● (0.06)	(31.98)	3.22	34.64	34.52	(16.76)	32.51	1.13	2.25	(2.50)
MSCI ACWI xUS GD	▲ 5.82	(15.57)	8.29	11.13	22.13	(13.77)	27.77	5.01	(5.25)	(3.44)

- Baillie Gifford outperformed the benchmark and placed in the top third of its peer group in 5 of the last 9 full calendar years.
- Recently, Baillie Gifford has underperformed the benchmark and ranked in the bottom decile of peers in two consecutive calendar years. The strategy trails the benchmark and ranks in the 99th percentile of its peer group year-to-date.

Historical Market Values of the Total Fund

Fiscal Year-End Market Values

Fiscal Year Ending	Market Value
2000	\$4,236,749,732
2001	\$4,012,745,608
2002	\$3,739,381,695
2003	\$3,869,787,673
2004	\$4,307,589,827
2005	\$4,642,924,118
2006	\$5,136,985,259
2007	\$5,985,111,493
2008	\$5,633,155,289
2009	\$4,341,419,711
2010	\$4,907,734,835
2011	\$6,022,965,592
2012	\$5,896,862,618
2013	\$6,662,631,673
2014	\$7,800,291,923
2015	\$7,820,289,128
2016	\$7,624,665,446
2017	\$8,301,352,120
2018	\$8,904,393,859
2019	\$9,153,121,783
2020	\$9,093,497,703
2021	\$11,602,695,185
2022	\$10,042,629,672
2023	\$10,691,261,784



Benchmark Definitions

1. **Total Fund Benchmark (Target):** Blend of asset class benchmarks at policy weights. The Long-Term Target was established in July 2023; however, the benchmark will be modified in accordance with the actual implementation. This process reflects the practical implementation of the strategic long-term asset allocation.

	Long-Term Target	3Q 2023 Target
Russell 3000	39.0%	39.0%
MSCI ACWI xUS IMI	17.0	24.0
Bloomberg Aggregate	21.0	19.0
Real Assets	16.0	16.0
Alternatives	7.0	2.0
- Private Equity	5.0	0.0
- Hedge Funds	2.0	2.0
Total Target	100.0%	100.0%

2. **Domestic Equity Benchmark:** Russell 3000 Index
3. **International Equity Benchmark:** MSCI ACWI xUS IMI Index; Prior to 12/31/2020 MSCI EAFE Index
4. **Fixed Income Benchmark:** Bloomberg Aggregate Index
5. **Real Assets:** NCREIF Property Index; Prior to 7/1/2023 CPI All Urban Consumers + 4%
6. **Private Equity:** Russell 3000 Index +3%
7. **Hedge Funds:** HFRI Diversified Index; Prior to 7/1/2023 60% MSCI World and 40% Bloomberg Aggregate.

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