



Investment Performance Analysis

Ohio Retirement Study Council

Period Ended: June 30, 2024



INDEX GLOSSARY

S&P 500: The **S&P 500 Index (Cap Wtd)** is a commonly recognized, market-capitalization weighted index of 500 widely held equity securities designed to measure broad US equity performance.

R 3000: The **Russell 3000 Index** is a market-capitalization weighted index of 3,000 widely held equity securities designed to measure performance of the entire U.S. stock market.

Wilshire 5000: The **Wilshire 5000 Index** is a market-capitalization weighted index of more than 6,700 widely held equity securities designed to measure performance of the entire U.S. stock market.

MSCI ACW Ex US: The **MSCI ACW (All Country World) Ex US Index** is designed to measure equity market performance in global developed and emerging markets, excluding the US. The 22 underlying developed countries are: *Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Hong Kong, Ireland, Israel, Italy, Japan, Netherlands, New Zealand, Norway, Portugal, Singapore, Spain, Sweden, Switzerland, and the United Kingdom*. The 23 emerging market countries are: *Brazil, Chile, China, Colombia, Czech Republic, Egypt, Greece, Hungary, India, Indonesia, Korea, Malaysia, Mexico, Peru, Philippines, Poland, Russia, Qatar, South Africa, Taiwan, Thailand, Turkey, and United Arab Emirates*.

MSCI ACW Ex US Investable Mkt: The **MSCI ACW Ex US Investable Mkt Index** is designed to measure equity performance across 22 of 23 Developed Markets (DM) countries (excluding the United States) and 24 Emerging Markets (EM) countries. With 6,174 constituents, the index covers approximately 99% of the global equity opportunity set outside the US.

MSCI EAFE: The **MSCI EAFE (Europe, Australasia, Far East) Index** is designed to measure equity market performance of 21 developed countries, excluding the US & Canada: *Australia, Austria, Belgium, Denmark, Finland, France, Germany, Hong Kong, Ireland, Israel, Italy, Japan, Netherlands, New Zealand, Norway, Portugal, Singapore, Spain, Sweden, Switzerland, and the United Kingdom*.

MSCI World Ex US: The **MSCI World Index Ex US Index** is designed to measure the equity market performance of developed markets. The MSCI World Index consists of the following 22 developed market country indexes: *Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Hong Kong, Ireland, Israel, Italy, Japan, Netherlands, New Zealand, Norway, Portugal, Singapore, Spain, Sweden, Switzerland, and the United Kingdom*.

MSCI Emerging Markets: The **MSCI Emerging Markets Index** is designed to measure equity market performance of emerging markets. The MSCI Emerging Markets Index consists of the following 24 emerging market country indexes: *Brazil, Chile, China, Colombia, Czech Republic, Egypt, Greece, Hungary, India, Indonesia, Korea, Malaysia, Mexico, Pakistan, Peru, Philippines, Poland, Qatar, Russia, South Africa, Taiwan, Thailand, Turkey* and United Arab Emirates*.

Bloomberg US Agg Bond: The **Bloomberg US Aggregate Bond Index** covers the US dollar-denominated, investment-grade, fixed-rate, taxable bond market of SEC-registered securities: US Treasury and agency bonds, domestic corporate debt, and mortgage-backed securities.

Bloomberg US Universal: The **Bloomberg US Universal Index** covers US dollar-denominated, taxable bonds that are rated either investment grade or high-yield.

Bloomberg US Trsy: The **Bloomberg US Treasury Index** measures US dollar-denominated, fixed-rate, nominal debt issued by the US Treasury.

Bloomberg US Trsy: US TIPS: The **Bloomberg US Treasury: US TIPS Index** is an unmanaged index that consists of inflation-protected securities issued by the U.S. Treasury.

Bloomberg Mortgage: The **Bloomberg US Mortgage Backed Securities (MBS) Index** tracks agency mortgage backed pass-through securities (both fixed-rate and hybrid ARM) guaranteed by Ginnie Mae (GNMA), Fannie Mae (FNMA), and Freddie Mac (FHLMC).

Bloomberg CMBS: The **U.S. Bloomberg CMBS Investment Grade Index** measures the market of conduit and fusion CMBS deals with a minimum current deal size of \$300mn.

Bloomberg US High Yield: The **Bloomberg US Corporate High Yield Bond Index** measures the USD-denominated, high yield, fixed-rate corporate bond market. Securities are classified as high yield if the middle rating of Moody's, Fitch and S&P is Ba1/BB+/BB+ or below.

Bloomberg Global High Yield: The **Bloomberg Global High-Yield Index** provides a broad-based measure of the global high-yield fixed income markets.

CS High Yield Dev Countries Only: The **Credit Suisse High Yield Dev Countries Only Index** tracks the performance of noninvestment-grade corporate bonds from developed countries.

CS Leveraged Loan: The **Credit Suisse Leveraged Loan Index** is an index designed to mirror the investable universe of the \$US-denominated leveraged loan market.

JPMorgan GBI-EM Gbl Dvf'd: The **JPMorgan GBI-EM Global Diversified Total Return Index (Unhedged)** is a global emerging markets index that consists of regularly traded, liquid fixed-rate, domestic currency government bonds.

JPMorgan Emerging Markets Bond Global: The **JPMorgan Emerging Markets Bond Global Index** is a global emerging markets index that consists of regularly traded, liquid fixed-rate, US dollar-denominated government bonds.

NCREIF ODCE: The **NCREIF ODCE (Open End Diversified Core) Index** is an index of investment returns reporting on both a historical and current basis the results of 16 open-end commingled funds pursuing a core investment strategy, some of which have performance histories dating back to the 1970s. The NCREIF ODCE Index is capitalization-weighted and performance is time-weighted.

NCREIF Property: The **NCREIF Property Index** prepared by the National Council of Real Estate Investment Fiduciaries is a quarterly time series composite return measure for over 6,000 individual commercial real estate properties acquired in the private market for investment purposes. Total performance represents returns from appreciation and income, and includes multi-family, office, retail, and industrial properties.

NCREIF Timberland: The **NCREIF Timberland Index** is a quarterly time series composite return measure of investment performance of a large pool of individual U.S. timber properties acquired in the private market for investment purposes only.

NCREIF Farmland: The **NCREIF Farmland Index** is a quarterly time series composite return measure of investment performance of a large pool of individual farmland properties acquired in the private market for investment purposes only.

HFRI FOF Composite: The **HFRI FOF (Fund of Funds) Composite Index** is an equal-weighted index that contains over 400 constituent hedge fund of funds, both domestic and offshore.

Burgiss All Private Equity: The **Burgiss All Private Equity Benchmark** is a composite of nearly 1400 private equity funds derived from the holdings of over 200 institutional investors.

Alerian MLP: The **Alerian MLP Index** is a market-capitalization weighted index of the 50 most prominent energy Master Limited Partnerships.

S&P Goldman Sachs Commodity: The **S&P Goldman Sachs Commodity Index** is a composite index of commodity sector returns representing an unleveraged, long-only investment in commodity futures that is broadly diversified across the spectrum of commodities. Components are weighted by their respective world production quantities.

3 Month LIBOR Rate: The **3 Month LIBOR Rate Index** is the rate of interest at which banks offer to lend money to one another in the wholesale money markets in London.

S&P Risk Parity Index – 8% Target Volatility: The **S&P Risk Parity Index – 8% Target Volatility Index** seeks to measure the performance of a multi-asset risk parity strategy that allocates risk equally among U.S. dollar-denominated equity, fixed income, and commodities futures contracts, while targeting a volatility level of 8%.

S&P GSCI Gold: The **S&P GSCI Gold Index** provides investors with a reliable and publicly available benchmark tracking the COMEX gold future.

FTSE Dev Core 50/50 Infrastructure: The **FTSE Dev Core 50/50 Infrastructure Index** is a market-capitalization-weighted index of worldwide infrastructure and infrastructure-related securities.

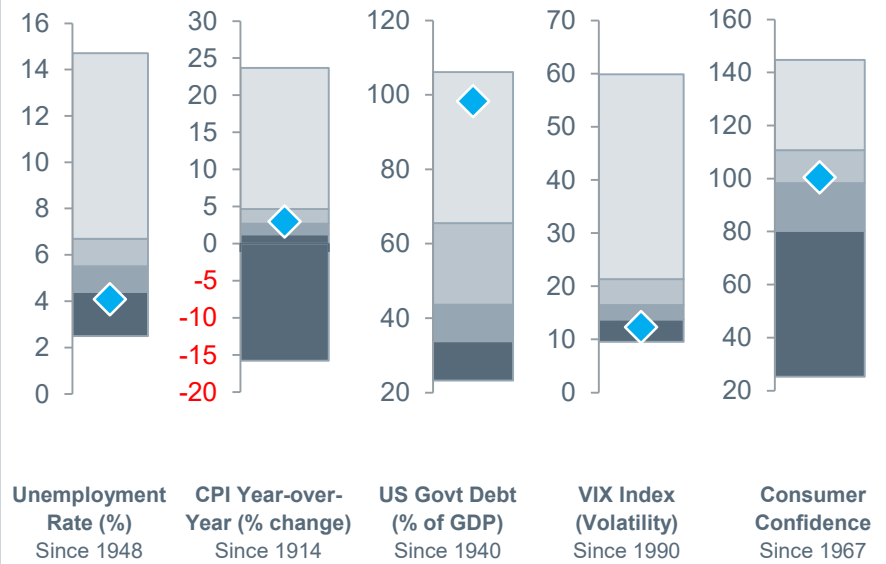
Capital Markets Review



Second Quarter Economic Environment

During Q2, broad global equity markets experienced subdued volatility and continued appreciation, while aggregate fixed income was flat. Within equity markets, results were once again driven by mega cap growth stocks, including NVIDIA and others expected to benefit from further adoption of AI. Within fixed income, the lack of movement in monetary policy and persistently tight spreads among corporate debt led to marginally positive returns for broad fixed income indexes, but longer duration asset prices declined modestly as long-term Treasury yields rose in Q2. Inflationary conditions improved as highlighted by the personal consumption expenditures deflator reading of 2.6% in May (the preferred inflation measure of the US Federal Reserve). The headline Consumer Price Index also came in below expectations at 3.0% in the June reading. The Federal Open Markets Committee (FOMC) indicated that “greater confidence” was necessary with regard to the downward path of inflation prior to considering major policy changes. The “dot plot” released by the FOMC indicated dispersion in rate forecasts among the group with the median member indicating that the Federal Funds Rate would decline by 25 basis points by the end of 2024. The June outlook released by the World Bank forecasted global GDP growth of 2.6% in 2024 and 2.7% in 2025. Global inflation levels were forecasted to be 3.5% this year with expectations that reductions will be more gradual than in prior projections.

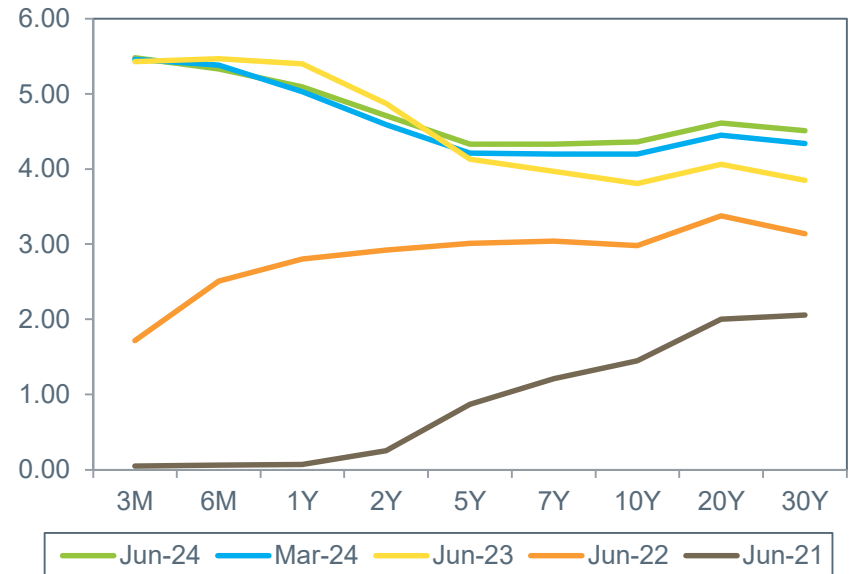
Key Economic Indicators

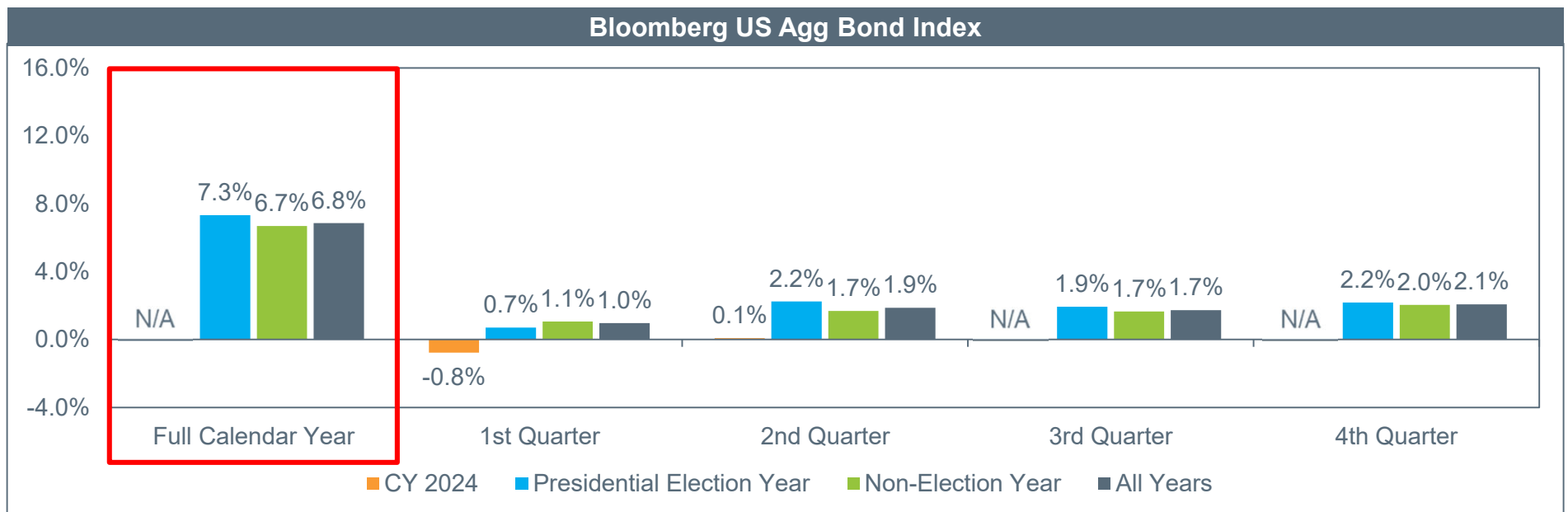
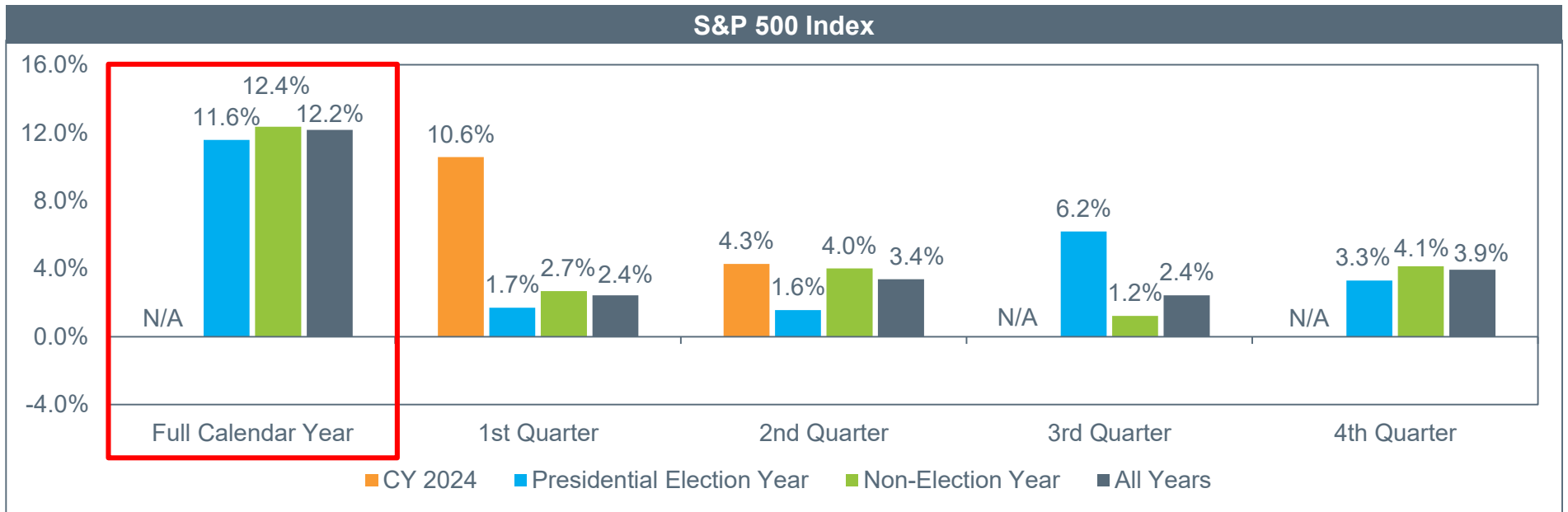


Economic Indicators	Jun-24	Mar-24	Jun-23	Jun-21	20 Yr
Federal Funds Rate (%)	5.33 —	5.33	5.08	0.08	1.60
Breakeven Infl. - 5 Yr (%)	2.24 ▼	2.44	2.17	2.50	1.94
Breakeven Infl. - 10 Yr (%)	2.27 ▼	2.32	2.21	2.34	2.09
CPI YoY (Headline) (%)	3.0 ▼	3.5	3.0	5.4	2.6
Unemployment Rate (%)	4.1 ▲	3.8	3.6	5.9	5.8
Real GDP YoY (%)	3.1 ▲	2.9	2.4	11.9	2.0
PMI - Manufacturing	48.5 ▼	50.3	46.0	60.9	53.1
USD Total Wtd Idx	124.52 ▲	121.41	119.71	112.61	104.24
WTI Crude Oil per Barrel (\$)	81.5 ▼	83.2	70.6	73.5	71.2
Gold Spot per Oz (\$)	2,337 ▲	2,230	1,906	1,770	1,282

Market Performance (%)	QTD	CYTD	1 Yr	5 Yr	10 Yr
S&P 500 (Cap Wtd)	4.28	15.29	24.56	15.05	12.86
Russell 2000	-3.28	1.73	10.06	6.94	7.00
MSCI EAFE (Net)	-0.42	5.34	11.54	6.46	4.33
MSCI EAFE SC (Net)	-1.84	0.51	7.78	4.19	4.29
MSCI Emg Mkts (Net)	5.00	7.49	12.55	3.10	2.79
Bloomberg US Agg Bond	0.07	-0.71	2.63	-0.23	1.35
ICE BofAML 3 Mo US T-Bill	1.32	2.63	5.40	2.16	1.51
NCREIF ODCE (Gross)	-0.45	-2.81	-9.26	3.16	6.41
FTSE NAREIT Eq REIT (TR)	0.06	-0.13	7.79	3.90	5.90
HFRI FOF Comp	0.44	4.63	8.50	4.78	3.48
Bloomberg Cmdbt (TR)	2.89	5.14	5.00	7.25	-1.29

Treasury Yield Curve (%)





Average quarterly and calendar year returns are measured from: January 1926 to June 2024 for the S&P 500 Index (Cap Wtd); and January 1976 to June 2024 for the Bloomberg US Aggregate Bond Index.

Second Quarter Review

Broad Market

During Q2, US equities posted mixed results across the style spectrum, with broader market cap-weighted indexes delivering modest gains, as demonstrated by the Russell 3000 return of 3.2%. In contrast, returns from equal-weighted broad market indexes were negative highlighting the lack of market breadth in Q2. There was continued dispersion between the “Magnificent Seven” and the broader US market.

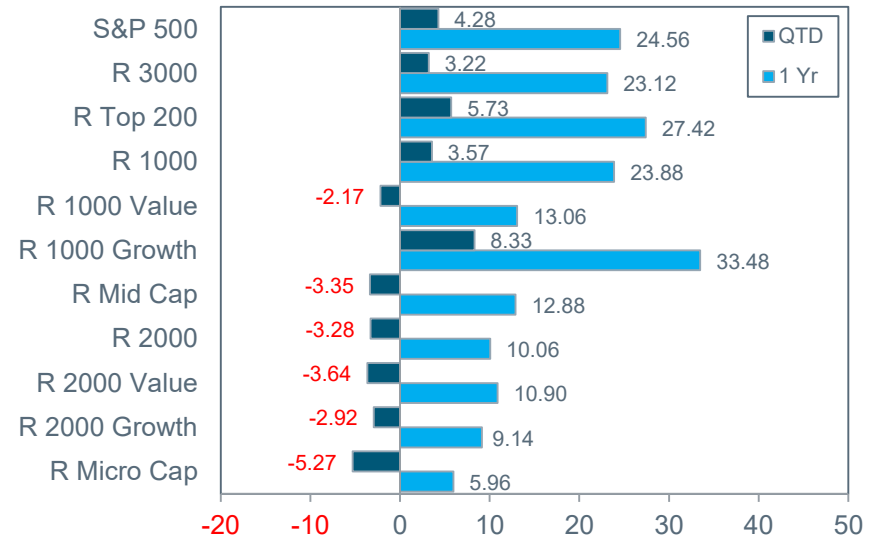
Market Cap

During Q2, large-cap equities significantly outperformed small-cap equities, and value underperformed growth, particularly in the large-cap space, with the Russell 1000 Value and Russell 1000 Growth delivering -2.2% and 8.3%, respectively.

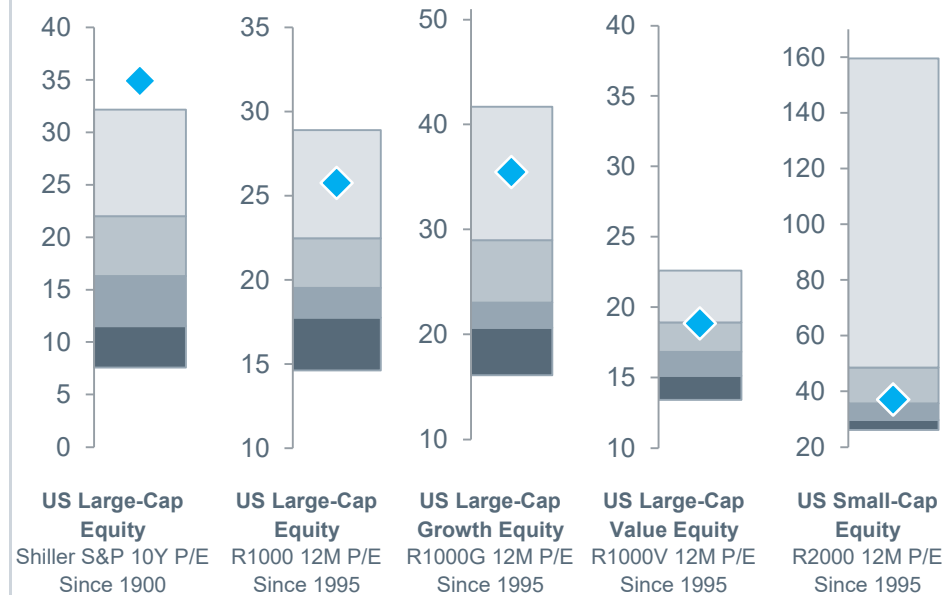
Style and Sector

Median manager excess returns were mostly negative in Q2, except for the small-cap space. The largest dispersion in manager median excess returns occurred in large-cap, with growth managers, in particular, struggling to keep pace with strong benchmark returns compared to value managers, who delivered modest excess returns, on average. This trend of underperformance by median growth managers was consistent in the mid-cap space, but not in the small-cap space, where managers fared better relative to the benchmark.

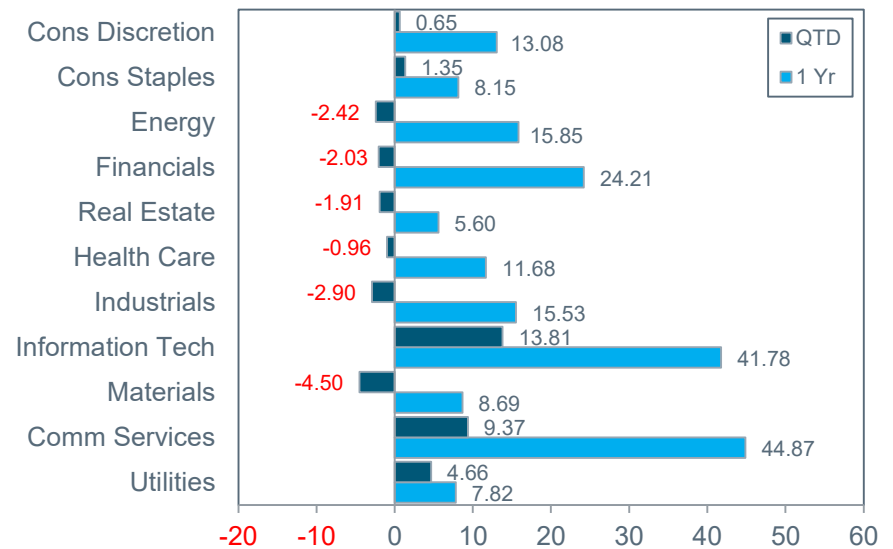
Style and Capitalization Market Performance (%)



Valuations



S&P 500 Index Sector Performance (%)



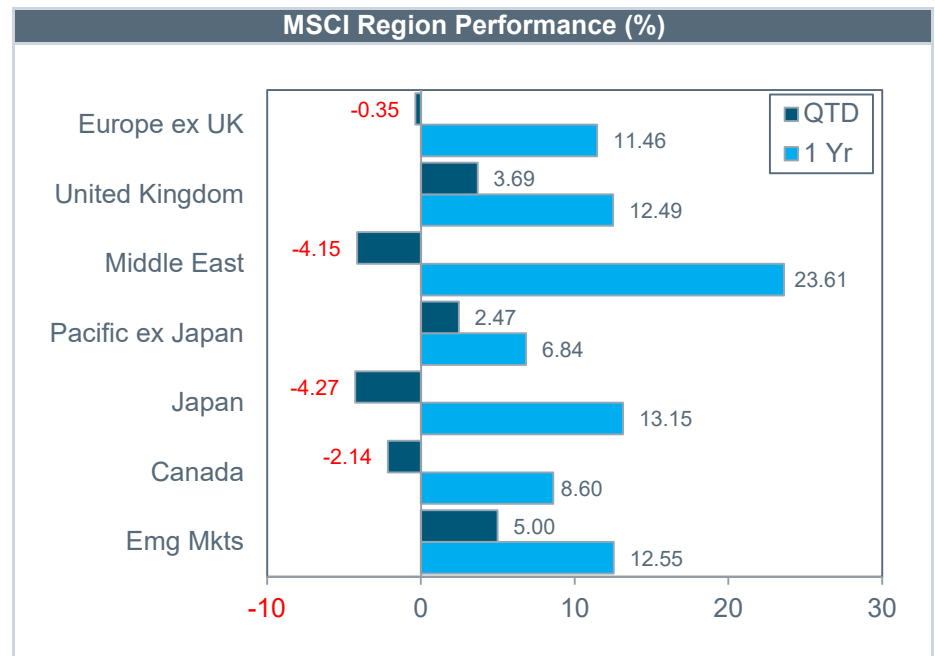
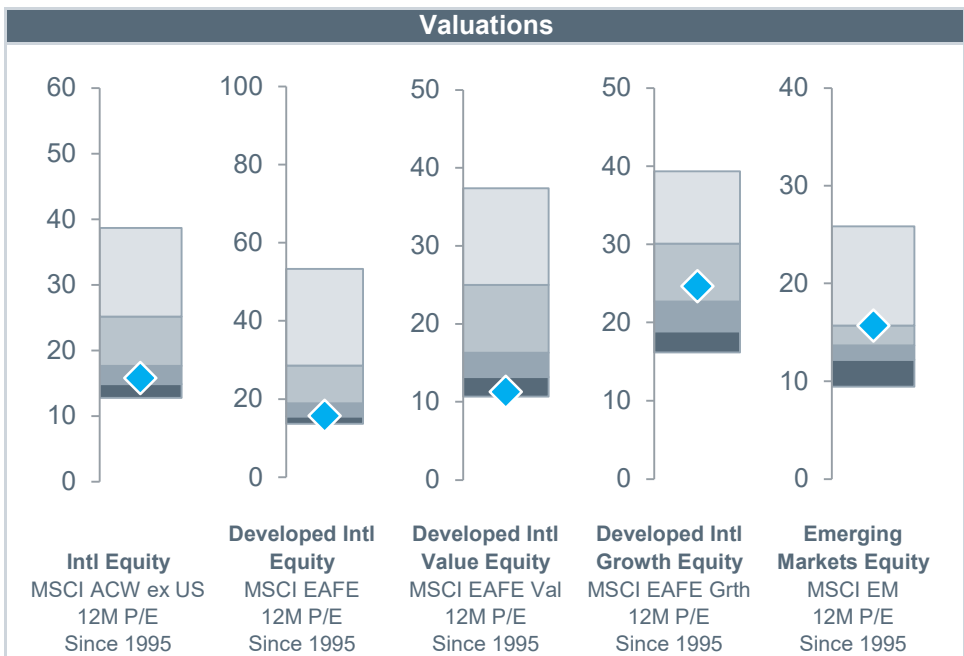
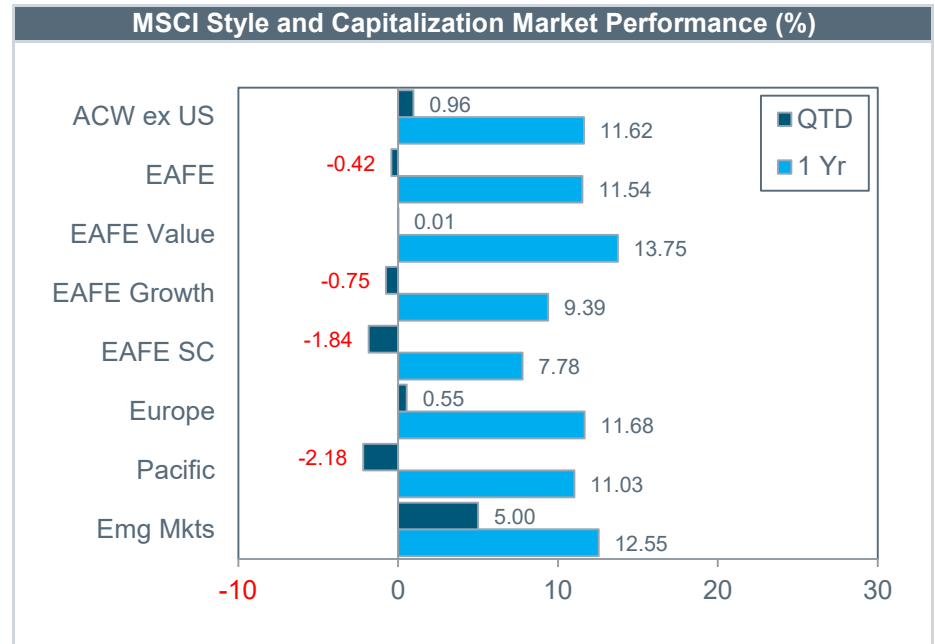
Valuation data courtesy of Bloomberg Professional Service and Robert J. Shiller, Irrational Exuberance, Second Edition. P/E metrics shown represent the 5th through 95th percentiles to minimize the effect of outliers.

Second Quarter Review

Developed Markets
 Developed international markets continued to trail their US counterparts in Q2 with the MSCI EAFE Index returning -0.4%. Developed markets were particularly influenced by election results in the European Parliament and the European Central Bank's first interest rate cut since 2019 following the easing of year-over-year inflation.

Emerging Markets
 Emerging market equities significantly outperformed developed markets in Q2 reversing a recent trend with the MSCI Emerging Markets Index finishing the quarter up 5.0%. Emerging market value stocks narrowly outperformed growth while small-cap outperformed large-cap.

Market Cap & Style
 As with the US Market, large-cap stocks again outpaced small-cap stocks however, in a reversal from the prior quarter, value stocks outperformed their growth counterparts with the MSCI EAFE Value Index outperforming the MSCI EAFE Growth Index. Most developed active managers struggled to beat their index in Q2 with the exception being the small-cap value space.



Valuation data courtesy of Bloomberg Professional Service.
 P/E metrics shown represent the 5th through 95th percentiles to minimize the effect of outliers.
 All returns are shown net of foreign taxes on dividends.



Second Quarter Review

Broad Market

In Q2, the fixed income market experienced volatility due to uncertainty around rate cuts and inflation data. The latest Summary of Economic Projections released by the FOMC indicated only one expected rate cut in 2024 compared to a median forecast of three in the March release. FOMC members continued to stress the need for more confidence in economic data before adjusting policy. US Treasury yields experienced a steady increase across the curve, with the 10-year yield rising by 16 basis points to end at 4.4%. The yield spread between 2- and 10-year Treasury remained negative, marking a record duration of 24 months since the start of the inversion. Against this backdrop, the Bloomberg US Aggregate Bond Index posted a return of 0.1% in Q2.

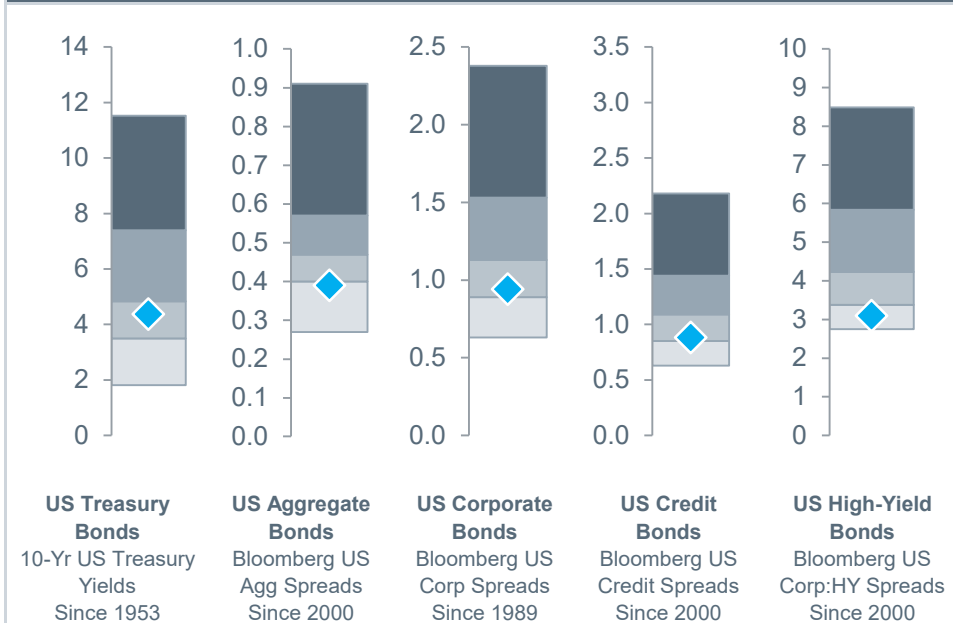
Credit Market

Risk assets weathered rising rates, with lower-rated bonds outperforming the broad market. The Bloomberg US Corporate Investment Grade Index returned -0.1%, while the Bloomberg US Corporate High Yield Index returned 1.1%.

Emerging Market Debt

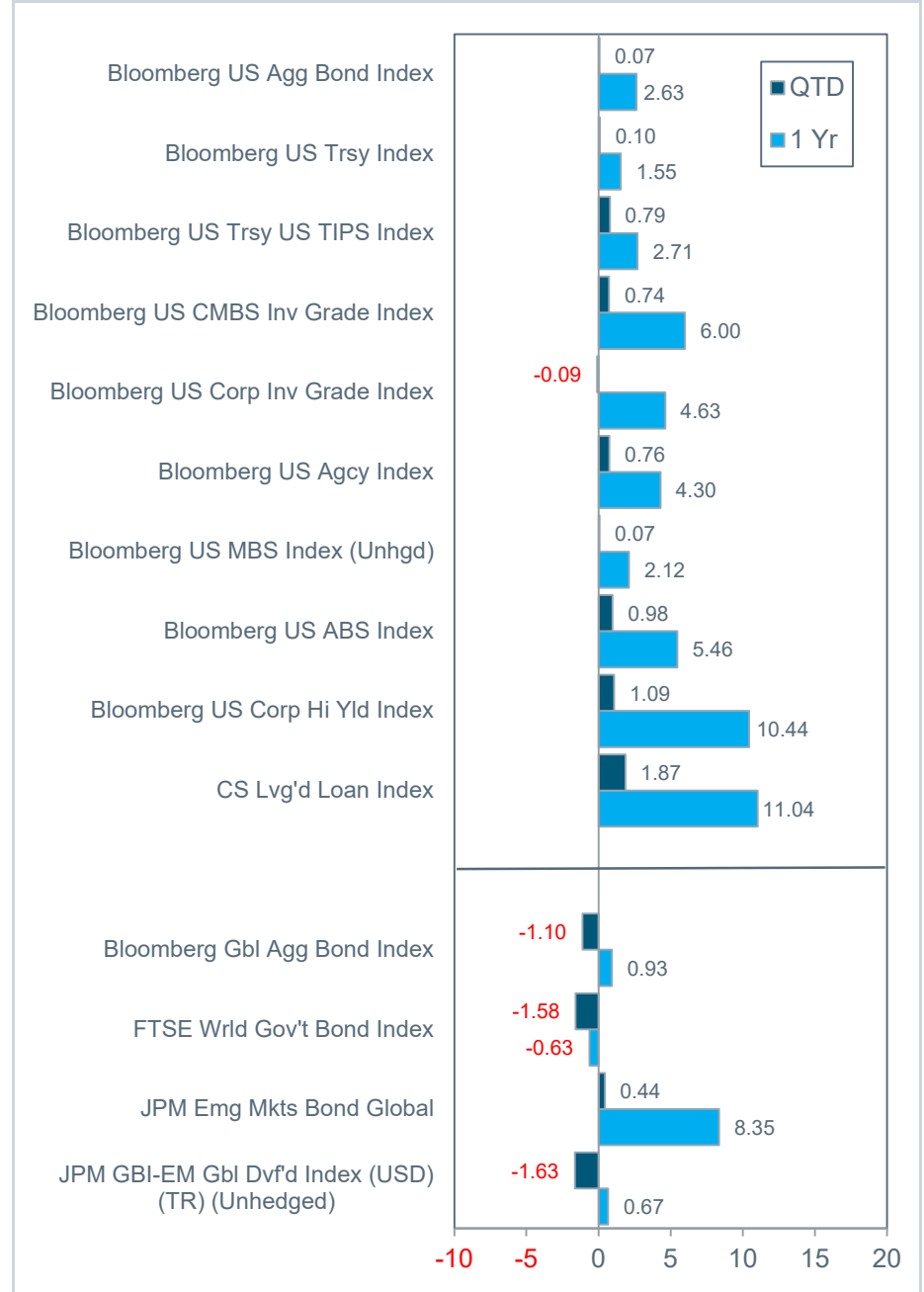
Emerging market debt delivered mixed results. The JPMorgan EMBI Global Diversified Index, tracking hard currency bond markets, posted a 0.3% return in Q2. However, the strength of the US dollar led to the underperformance of the JPMorgan GBI-EM Global Diversified Index, tracking local currency bond markets, which declined -1.6% in Q2.

Valuations



Valuation data courtesy of Bloomberg Professional Service. Valuations shown represent the 5th through 95th percentiles to minimize the effect of outliers.

Fixed Income Performance (%)



Second Quarter Review - Absolute Return

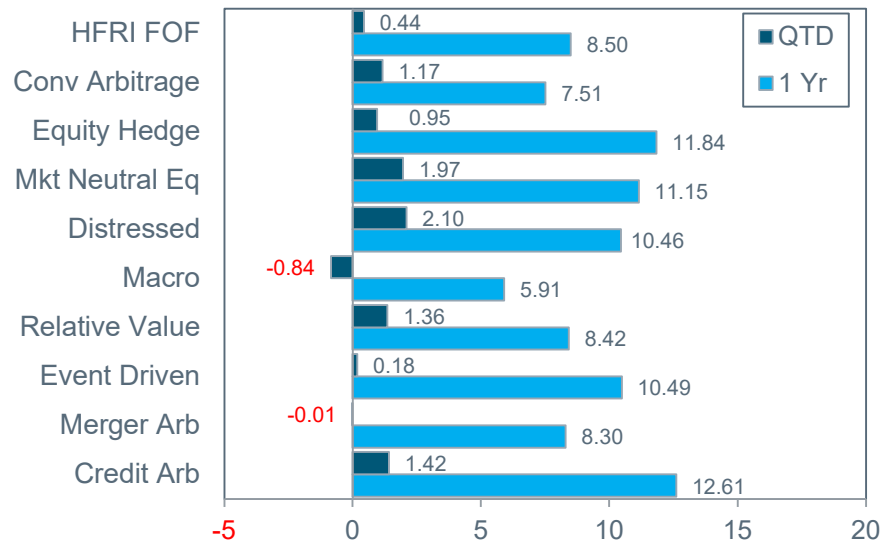
General Market - Hedge Funds

In Q2, the HFRI Asset Weighted Composite Index finished the quarter up 0.1% resulting in a year-to-date return of 5.1%. Risk market volatility remained subdued amid uncertainty surrounding the anticipated interest rate policy pivot and the upcoming US presidential election. The long technology trade continues to perform well as NVIDIA and other “Magnificent Seven” stocks continue to push higher even as concentration among hedge fund managers reaches record levels. Long biased tech-oriented hedge funds were top performers during the quarter, with the HFRI EH: Technology Sector Index up 3.2%, and the HFRI EH: Fundamental Growth Index up 2.2%.

General Market - Global Tactical Asset Allocation (GTAA)

Global Tactical Asset Allocation (GTAA) strategies that RVK follows closely posted modest positive returns with limited dispersion. Generally, active managers providing significant diversification underperformed a US-centric blend of 60% equity and 40% fixed income (60/40 blend) as US stocks continued to trend higher. Relatedly, long-biased GTAA strategies featuring higher allocation to US stocks tied to information technology and communication services sectors outpaced peers.

HFRI Hedge Fund Performance (%)



Second Quarter Review - Real Assets

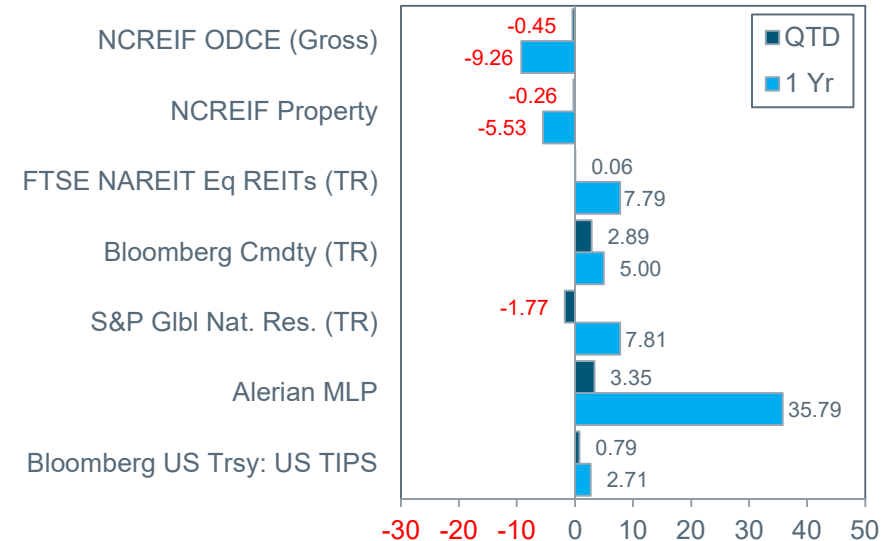
General Market - Diversified Inflation Strategies (DIS)

Diversified Inflation Strategy managers tracked closely by RVK underperformed a US-centric 60/40 blend over the quarter. While results were relatively muted, managers with higher allocations to treasury inflation protected securities (TIPS) and exposures to commodities outperformed peers. Notably, managers with higher allocations to real estate investment trusts (REITs) tended to lag peers.

General Market - Real Estate

Core private real estate generated a negative total return of -0.5% in Q2 as reported by the NFI-ODCE Index, with the total return comprising 1.0% from income and -1.5% from price appreciation. Investors of publicly traded real estate underperformed their private market counterparts, though both were negative. Publicly traded real estate delivered a second quarter total return of -0.9%, as measured by FTSE/NAREIT All REITs Index. Negative price appreciation in institutional real estate, driven by rate expansion, continues to show a slowing pace. Coupled with stabilizing transaction markets and expectations of an interest rate cut in the near-term there is some anticipation from real estate investors that an eventual market inflection point could be realized.

Real Asset Performance (%)



Annual Asset Class Performance

As of June 30, 2024

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	YTD
Best	27.94	22.49	20.00	38.82	30.14	15.02	21.31	37.28	8.35	31.49	19.96	43.24	16.09	26.29	15.29
	26.85	15.99	18.23	32.39	19.31	9.59	17.13	33.01	1.87	26.00	18.40	28.71	7.47	18.24	7.49
	22.04	13.56	18.06	29.30	13.69	3.20	11.96	25.03	0.01	25.53	18.31	27.11	1.46	16.93	5.34
	18.88	8.29	17.32	22.78	12.50	1.38	11.77	21.83	-1.26	24.96	16.12	22.17	-5.31	13.73	5.14
	16.83	7.84	16.35	13.94	5.97	0.55	11.19	14.65	-2.08	22.01	12.34	14.82	-11.19	13.45	4.83
	16.36	4.98	16.00	8.96	4.89	0.05	8.77	10.71	-4.02	19.59	10.99	11.26	-11.85	13.16	2.63
	15.12	2.11	15.81	7.44	3.64	-0.27	8.52	7.77	-4.38	18.42	10.88	10.10	-13.01	9.83	2.58
	15.06	0.10	10.94	2.47	3.37	-0.81	6.67	7.62	-4.62	14.32	7.82	6.17	-14.45	7.13	1.73
	10.16	-4.18	8.78	0.07	2.45	-1.44	4.68	7.50	-4.68	8.72	7.51	5.96	-18.11	6.07	0.70
	7.75	-5.72	6.98	-2.02	0.04	-3.30	2.65	5.23	-11.01	8.43	7.11	5.28	-20.09	5.53	0.51
	6.54	-12.14	4.79	-2.60	-2.19	-4.41	2.18	3.54	-11.25	8.39	1.19	0.05	-20.44	5.02	-0.13
	6.31	-13.32	4.21	-8.61	-4.90	-4.47	1.00	3.01	-13.79	7.69	0.67	-1.55	-21.39	3.90	-0.71
	5.70	-15.94	0.11	-8.83	-4.95	-14.92	0.51	1.70	-14.57	5.34	-3.12	-2.52	-24.37	-7.91	-2.80
Worst	0.13	-18.42	-1.06	-9.52	-17.01	-24.66	0.33	0.86	-17.89	2.28	-8.00	-2.54	-27.09	-12.02	-4.10
	S&P 500 - US Large Cap	R 2000 - US Small Cap	MSCI EAFE (Net) - Int'l Dev.	MSCI EAFE SC (Net) - Int'l SC	MSCI EM (Net) - Int'l Emg Mkts	Bloombrg US Agg Bond - FI	Bloombrg US Corp Hi Yield - FI	Bloombrg US Trsy US TIPS - FI	Bloombrg US Gov Credit Lng - FI	NCREIF ODCE (Gross) - Real Estate	FTSE NAREIT Eq REITs Index (TR)	HFRI FOF Comp Index - ARS	Bloombrg Cmdty (TR) - Commod.	ICE BofAML 3 Mo T-Bill - Cash Equiv	

NCREIF ODCE (Gross) performance is reported quarterly; performance is shown N/A in interim-quarter months.



Performance Report - All Systems



Asset Allocation & Performance - Gross of Fees											
	Market Value (\$000)	Trailing Performance (%)						Calendar Year Performance (%)			
		2 Quarters	1 Year	3 Years	5 Years	7 Years	10 Years	2023	2022	2021	2020
PERS (DB)	102,435,241	5.40	10.30	3.14	7.25	7.47	6.92	11.42	-11.95	15.43	12.11
PERS (DB) Total Fund Benchmark		4.27	8.59	2.42	6.74	6.94	6.39	10.46	-11.44	15.28	11.65
Difference		1.13	1.71	0.72	0.51	0.53	0.53	0.96	-0.51	0.15	0.46
Rank		41	42	55	60	51	47	53	67	52	47
PERS (HC 115)	13,118,031	5.88	11.96	2.09	6.58	6.62	5.74	13.97	-15.51	14.34	10.96
PERS (HC 115) Total Fund Benchmark		5.42	11.54	1.72	6.05	6.17	5.41	13.65	-15.56	13.76	10.13
Difference		0.46	0.42	0.37	0.53	0.45	0.33	0.32	0.05	0.58	0.83
Rank		24	15	85	82	82	89	11	96	64	64
STRS	95,277,745	6.20	10.66	4.73	8.90	8.74	8.14	11.64	-9.52	19.36	12.26
STRS Total Fund Benchmark		5.97	10.75	4.00	8.21	8.19	7.61	12.39	-10.90	17.36	11.92
Difference		0.23	-0.09	0.73	0.69	0.55	0.53	-0.75	1.38	2.00	0.34
Rank		14	28	18	10	7	5	48	41	12	44
OP&F	18,156,365	5.65	10.09	4.61	7.74	7.83	7.30	9.52	-8.73	19.24	9.09
OP&F Total Fund Benchmark		4.54	8.95	3.16	6.77	6.78	6.19	10.30	-10.57	16.29	9.86
Difference		1.11	1.14	1.45	0.97	1.05	1.11	-0.78	1.84	2.95	-0.77
Rank		30	47	19	42	37	27	81	32	13	84
SERS	18,989,567	5.87	10.46	6.17	9.58	9.29	8.51	10.66	-4.89	17.88	12.99
SERS Total Fund Benchmark		5.32	8.78	3.94	7.56	7.50	6.88	10.00	-7.91	14.66	11.55
Difference		0.55	1.68	2.23	2.02	1.79	1.63	0.66	3.02	3.22	1.44
Rank		24	36	4	3	3	1	68	8	22	34
HPRS	1,122,712	6.05	12.46	4.99	10.08	9.22	7.94	15.03	-8.92	16.92	16.86
HPRS Total Fund Benchmark		6.84	13.11	5.32	9.20	8.64	7.60	14.41	-9.21	16.63	13.16
Difference		-0.79	-0.65	-0.33	0.88	0.58	0.34	0.62	0.29	0.29	3.70
Rank		16	8	16	1	4	9	3	35	36	3
<i>All Public Plans > \$1B-Total Fund Median</i>		<i>5.13</i>	<i>10.03</i>	<i>3.26</i>	<i>7.52</i>	<i>7.47</i>	<i>6.88</i>	<i>11.53</i>	<i>-10.50</i>	<i>15.53</i>	<i>11.86</i>

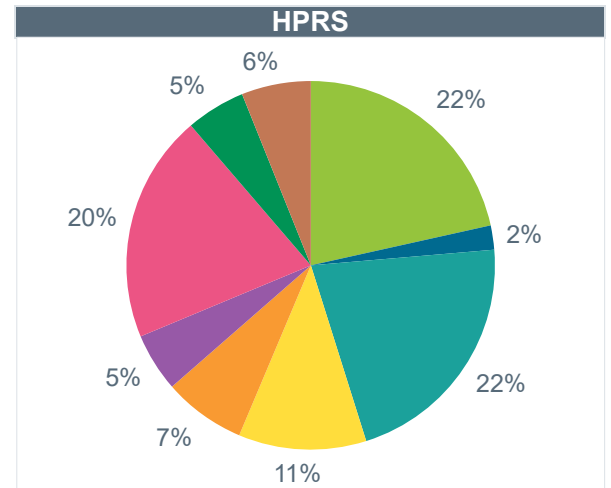
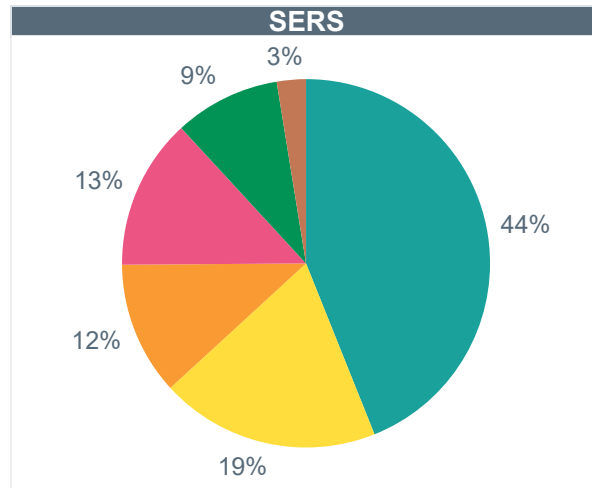
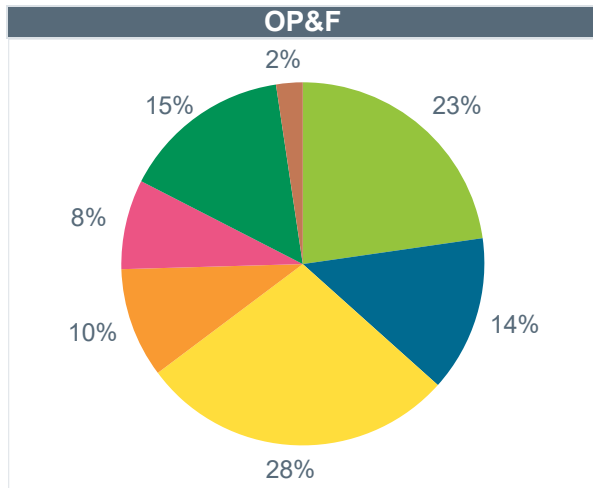
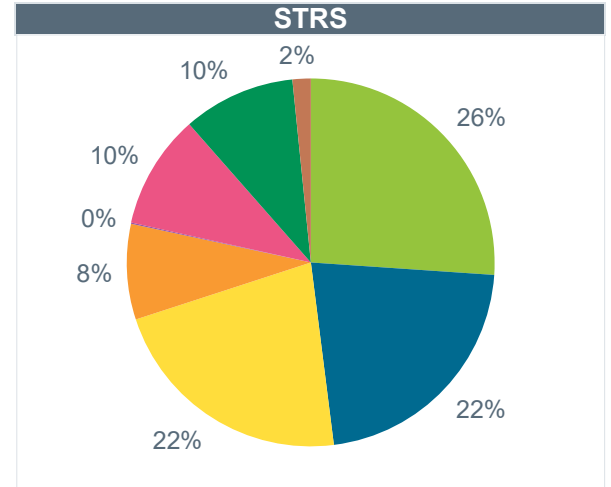
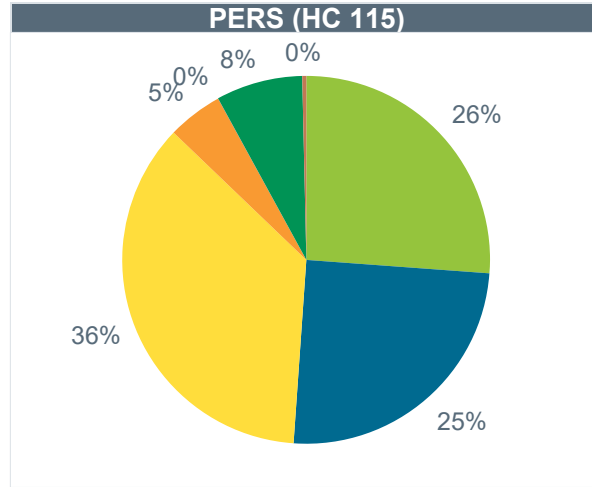
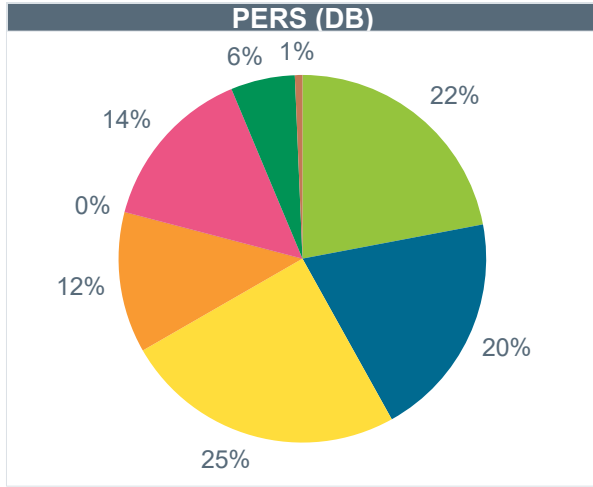
OPERS health care plan is not a pension plan and therefore has significantly different characteristics including a shorter focus asset allocation with more liquidity than the pension plans. For purposes of this study, the OPERS health care plan has been included in the results. The results for OPERS health care plan is reflected in the PERS 115 trust subsequent to October 2014 and in the PERS HC results prior to October 2014.

Performance shown is gross of fees but is net of embedded fees on externally managed real estate and alternative investments. Ranks are shown against All Public Plans >\$1B-Total Fund. PERS (DB): 3 Year performance reduced 0.37%, 5 Year performance reduced 0.23%, 7 Year performance reduced 0.16%, and 10 Year performance reduced 0.11% due to change in distribution methodology in private equity and real estate portfolios.

Asset Allocation & Performance - Net of Fees											
	Market Value (\$000)	Trailing Performance (%)						Calendar Year Performance (%)			
		2 Quarters	1 Year	3 Years	5 Years	7 Years	10 Years	2023	2022	2021	2020
PERS (DB)	102,435,241	5.34	10.14	3.03	7.15	7.37	6.78	11.26	-12.03	15.34	12.02
PERS (DB) Total Fund Benchmark		4.27	8.59	2.42	6.74	6.94	6.39	10.46	-11.44	15.28	11.65
Difference		1.07	1.55	0.61	0.41	0.43	0.39	0.80	-0.59	0.06	0.37
PERS (HC 115)	13,118,031	5.88	11.96	2.09	6.58	6.62	5.71	13.97	-15.51	14.34	10.96
PERS (HC 115) Total Fund Benchmark		5.42	11.54	1.72	6.05	6.17	5.41	13.65	-15.56	13.76	10.13
Difference		0.46	0.42	0.37	0.53	0.45	0.30	0.32	0.05	0.58	0.83
STRS	95,277,745	6.14	10.53	4.60	8.78	8.61	8.01	11.51	-9.64	19.24	12.14
STRS Total Fund Benchmark		5.97	10.75	4.00	8.21	8.19	7.61	12.39	-10.90	17.36	11.92
Difference		0.17	-0.22	0.60	0.57	0.42	0.40	-0.88	1.26	1.88	0.22
OP&F	18,156,365	5.40	9.58	3.99	7.11	7.19	6.68	9.03	-9.38	18.39	8.51
OP&F Total Fund Benchmark		4.54	8.95	3.16	6.77	6.78	6.19	10.30	-10.57	16.29	9.86
Difference		0.86	0.63	0.83	0.34	0.41	0.49	-1.27	1.19	2.10	-1.35
SERS	18,989,567	5.53	9.69	5.44	8.88	8.59	7.82	9.89	-5.60	17.13	12.40
SERS Total Fund Benchmark		5.32	8.78	3.94	7.56	7.50	6.88	10.00	-7.91	14.66	11.55
Difference		0.21	0.91	1.50	1.32	1.09	0.94	-0.11	2.31	2.47	0.85
HPRS	1,122,712	5.82	11.94	4.44	9.56	8.71	7.42	14.39	-9.38	16.31	16.38
HPRS Total Fund Benchmark		6.84	13.11	5.32	9.20	8.64	7.60	14.41	-9.21	16.63	13.16
Difference		-1.02	-1.17	-0.88	0.36	0.07	-0.18	-0.02	-0.17	-0.32	3.22

Performance shown is net of all investment management costs. PERS (DB): 3 Year performance reduced 0.37%, 5 Year performance reduced 0.23%, 7 Year performance reduced 0.16%, and 10 Year performance reduced 0.11% due to change in distribution methodology in private equity and real estate portfolios.

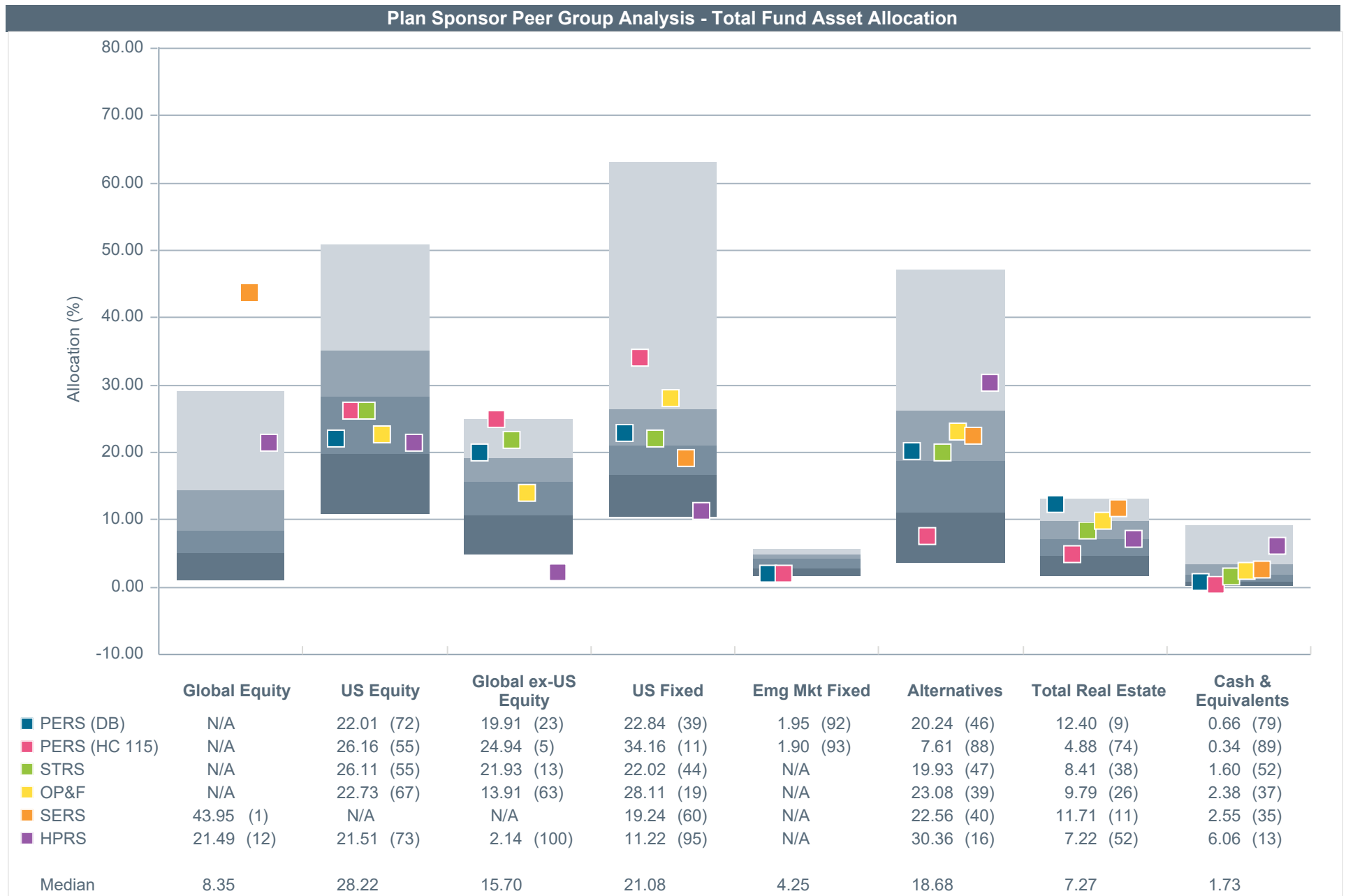
Ohio Retirement Study Council
Current Asset Allocation by Asset Class



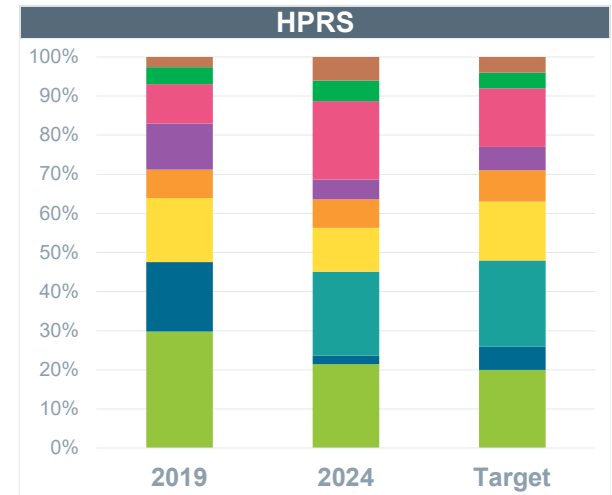
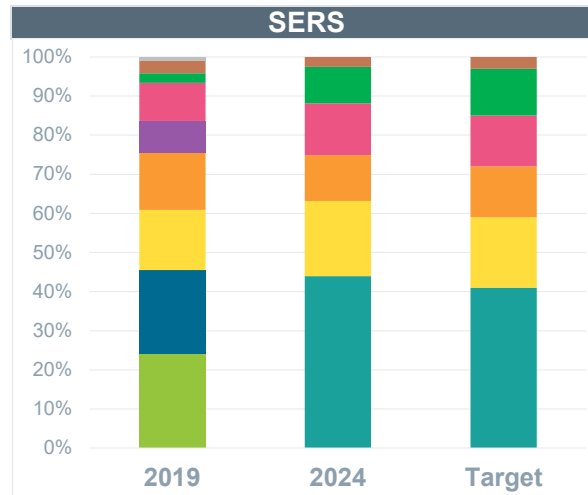
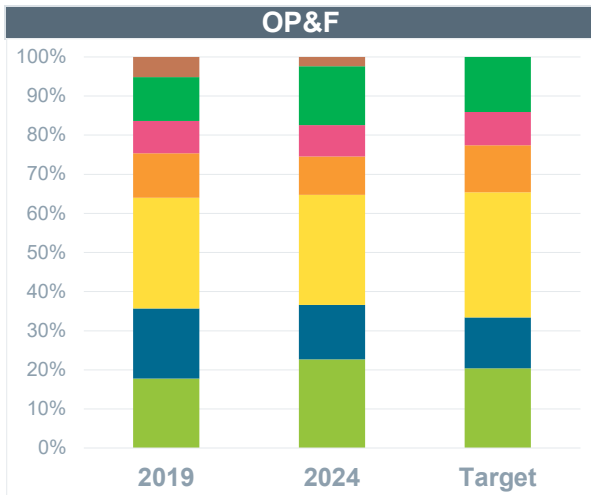
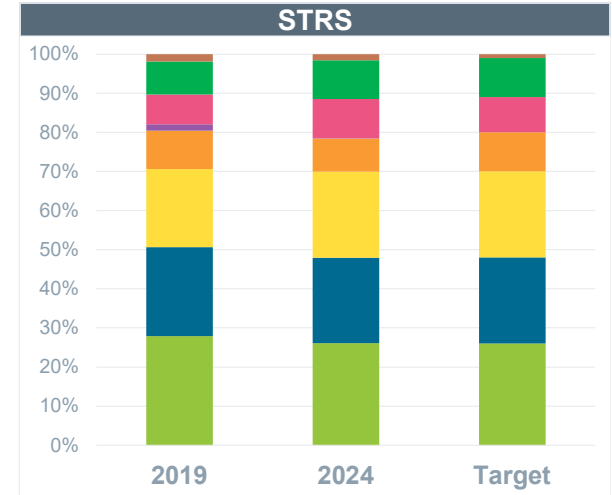
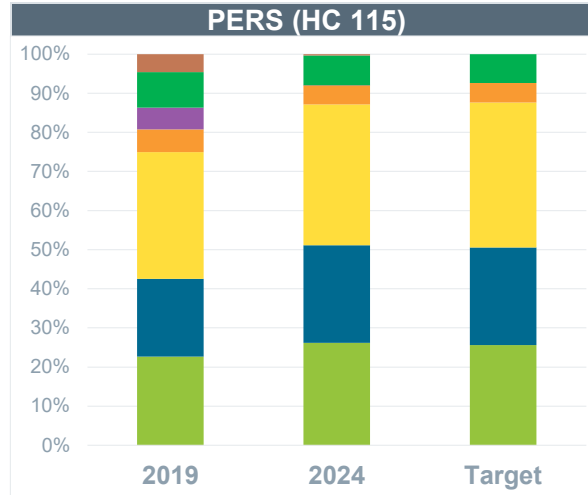
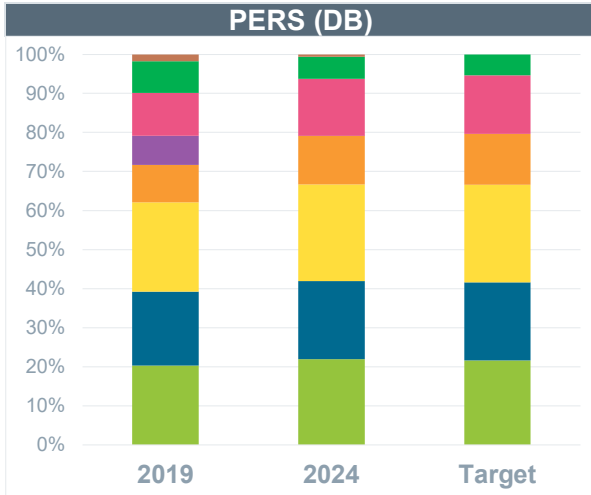
- US Equity
- International Equity
- Global Equity
- Fixed Income
- Real Estate
- Hedge Funds
- Private Equity
- Other Alternatives
- Cash Equivalents

Allocations shown may not sum up to 100% exactly due to rounding. Cash Equivalents for PERS (DB) and PERS (HC 115) consists of cash, rebalancing, and additional annuity.





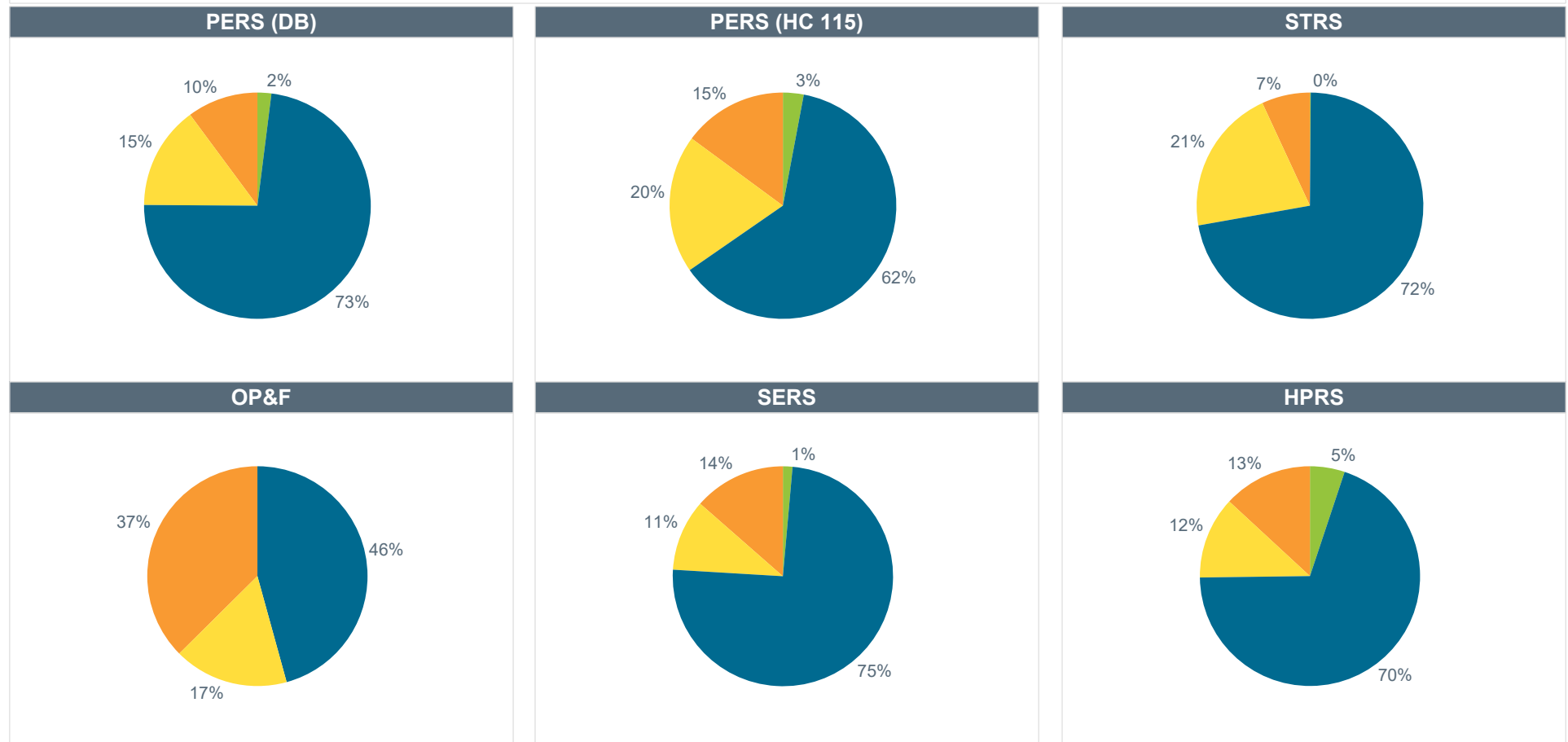
Allocations shown may not add up to 100% due to rounding. US Fixed Income may include allocations to Intl. Fixed Income not explicitly broken out by the plans. Parentheses contain percentile ranks. Cash Equivalents for PERS (DB) consists of cash, rebalancing, and additional annuity. Cash Equivalents for PERS (HC 115) consists of cash and rebalancing.



- US Equity
- International Equity
- Global Equity
- Fixed Income
- Real Estate
- Hedge Funds
- Private Equity
- Other Alternatives
- Cash Equivalents

Summary

- **Alpha:** Aims to continually provide a return in excess of the portfolio benchmark return for a given level of risk and are intended to provide diversification (primarily with the Capital Appreciation and Capital Preservation components).
(Includes: Hedge Funds, Global Tactical Asset Allocation (GTAA), and Risk Parity)
- **Capital Appreciation:** Seeks high level of capital gains through increased risk-return trade-off.
(Includes: Public & Private Equities, High Yield, Emerging Markets Debt, MLPs, Timber, Non-Core Real Estate, Opportunistic Investments, and Securitized Debt)
- **Capital Preservation:** Conservative strategy designed to avoid risk of loss of principal.
(Includes: Core Fixed Income and Cash Equivalents)
- **Inflation:** Provide returns that will keep pace with normal inflationary movements in the long-term market. Designed not to lose value in an inflationary environment.
(Includes: TIPS, Commodities, Real Return, Floating Rate Debt, REITs, and Core Real Estate)



Asset Allocation by Thematic Category percentages are provided by the Plans. Allocations are based on dedicated composite allocations and not underlying investment manager exposures; as such, thematic allocations are approximations. OP&F does not have any dedicated exposure to Alpha strategies, but does have alpha exposure embedded within other asset class buckets. Allocations shown may not sum up to exactly 100% due to rounding. Please see the Glossary for additional information regarding thematic descriptions.

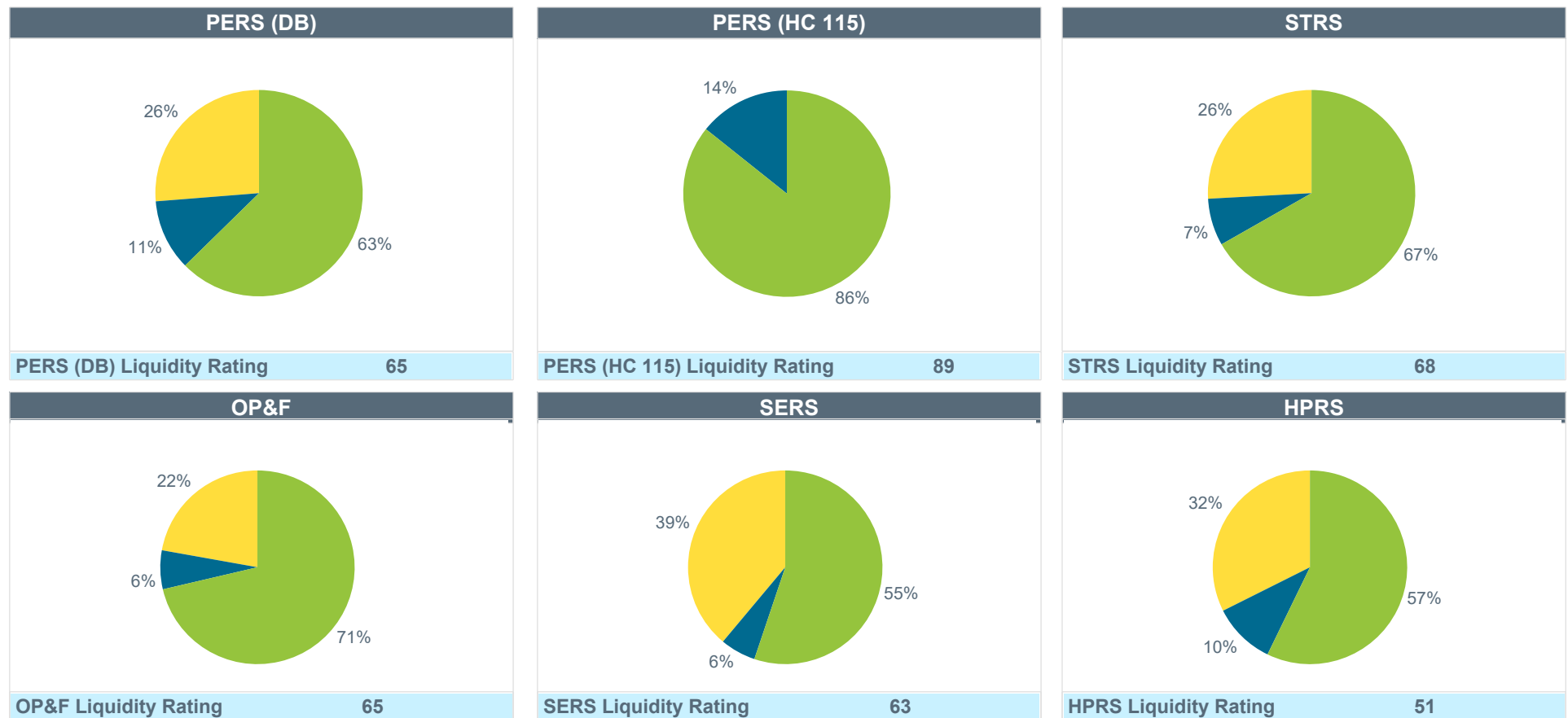
Summary

RVK Liquidity Rating - A qualitative method developed and calculated by RVK for determining the relative amount of liquidity in a portfolio.

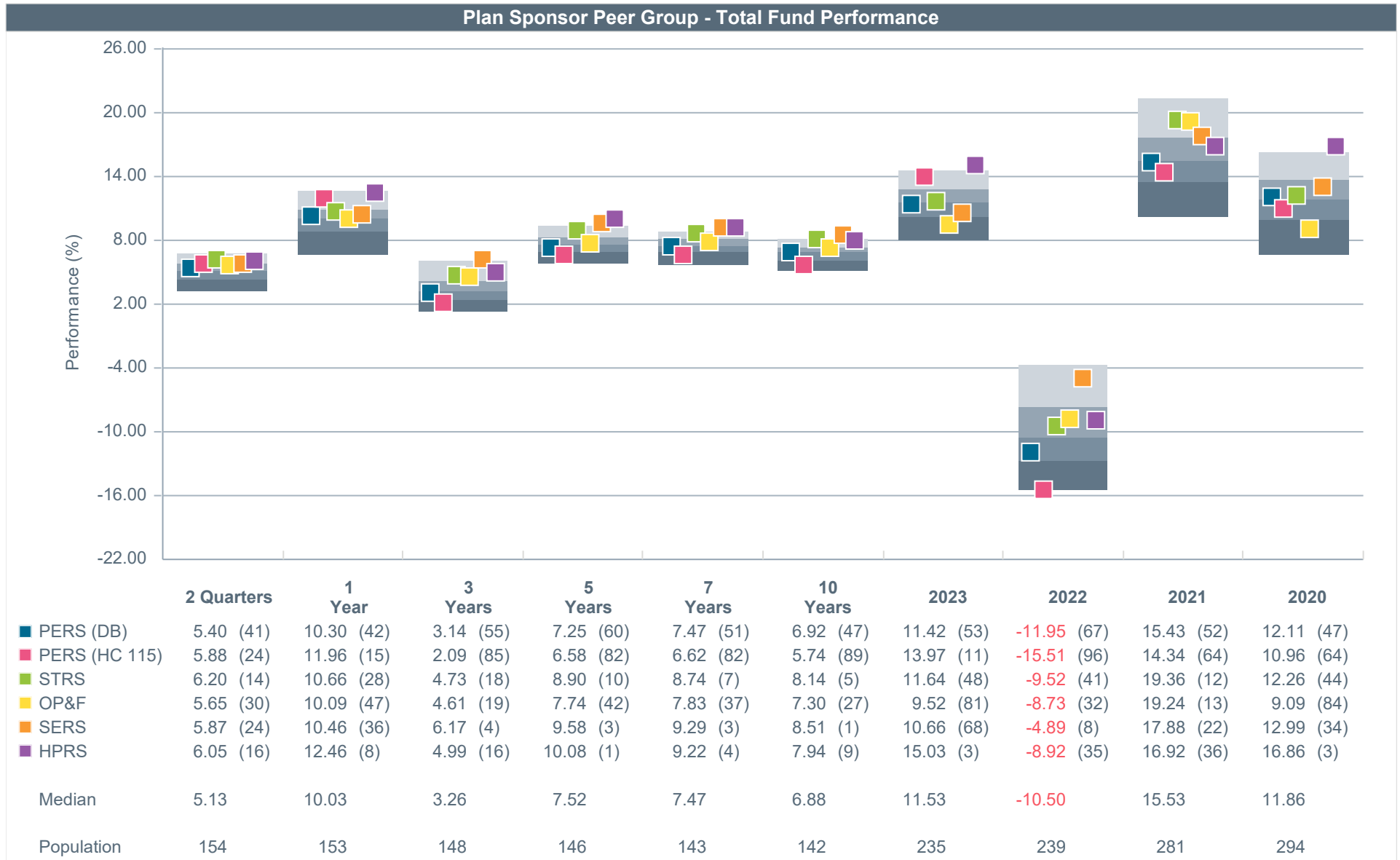
Liquid Investments: Publicly traded assets, largely exchanged traded with significant trading volume for the overall asset classes. Takes a relatively small discount or time required to raise cash, but generally expected to clear at quoted bid prices within several trading days.

Less Liquid Investments: Smaller trading volume, non-exchange traded, or vehicle-based liquidity constraints. Moderate to significant discount to raise cash, expected to see fewer purchase-oriented bids, or time required to receive cash is significantly greater than several trading days.

Not Liquid Investments: Private appraisal-based transactions, vehicle-based liquidity constraints, or privately held assets. Extreme discount to raise cash or 6-12+ months required to receive cash.

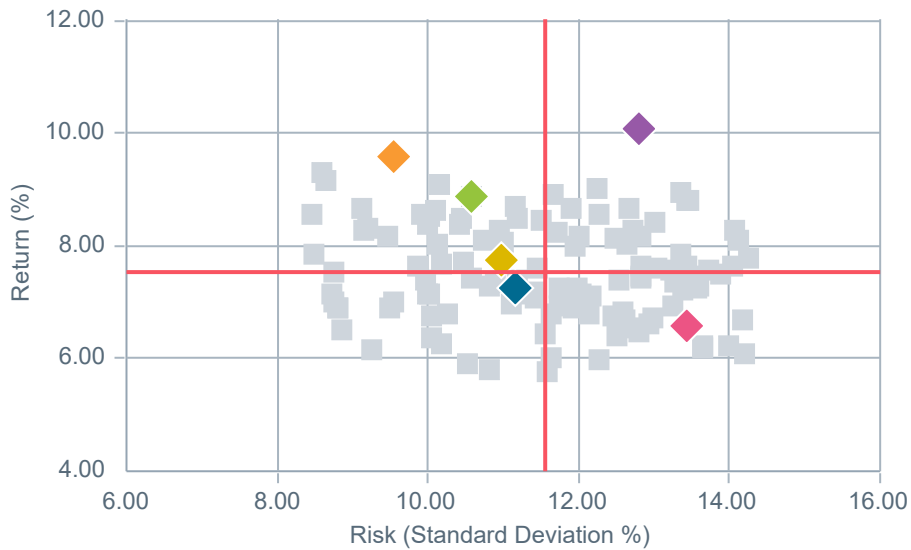


Asset Allocation by Liquidity percentages are provided by the Plans. Allocations are based on dedicated composite allocations and not underlying investment manager exposures; as such, liquidity allocations are approximations. Allocations shown may not sum up to exactly 100% due to rounding. The RVK Liquidity Rating is calculated by RVK using beginning of quarter investment weights applied to each corresponding asset class liquidity rating. Please see the glossary for additional information regarding liquidity and custom index descriptions.



Performance shown is gross of fees. Parentheses contain percentile ranks. PERS (DB): 3 Year performance reduced 0.37%, 5 Year performance reduced 0.23%, 7 Year performance reduced 0.16%, and 10 Year performance reduced 0.11% due to change in distribution methodology in private equity and real estate portfolios.

Plan Sponsor Peer Group Scattergram - 5 Years

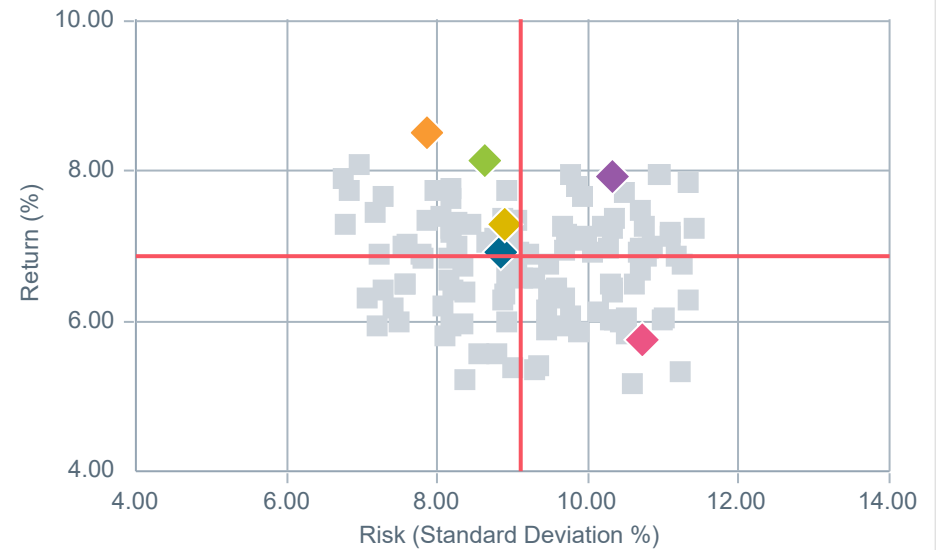


	Return	Standard Deviation
◆ PERS (DB)	7.25	11.15
◆ PERS (HC 115)	6.58	13.44
◆ STRS	8.90	10.57
◆ OP&F	7.74	10.98
◆ SERS	9.58	9.54
◆ HPRS	10.08	12.80
— Median	7.52	11.57

Sharpe Ratio - 5 Year

PERS (DB)	0.49
PERS (HC 115)	0.39
STRS	0.66
OP&F	0.54
SERS	0.78
HPRS	0.65
<i>All Public Plans > \$1B-Total Fund Median</i>	0.48

Plan Sponsor Peer Group Scattergram - 10 Years



	Return	Standard Deviation
◆ PERS (DB)	6.92	8.85
◆ PERS (HC 115)	5.74	10.71
◆ STRS	8.14	8.64
◆ OP&F	7.30	8.90
◆ SERS	8.51	7.86
◆ HPRS	7.94	10.33
— Median	6.88	9.11

Sharpe Ratio - 10 Year

PERS (DB)	0.64
PERS (HC 115)	0.44
STRS	0.78
OP&F	0.67
SERS	0.89
HPRS	0.65
<i>All Public Plans > \$1B-Total Fund Median</i>	0.59

Performance shown is gross of fees.

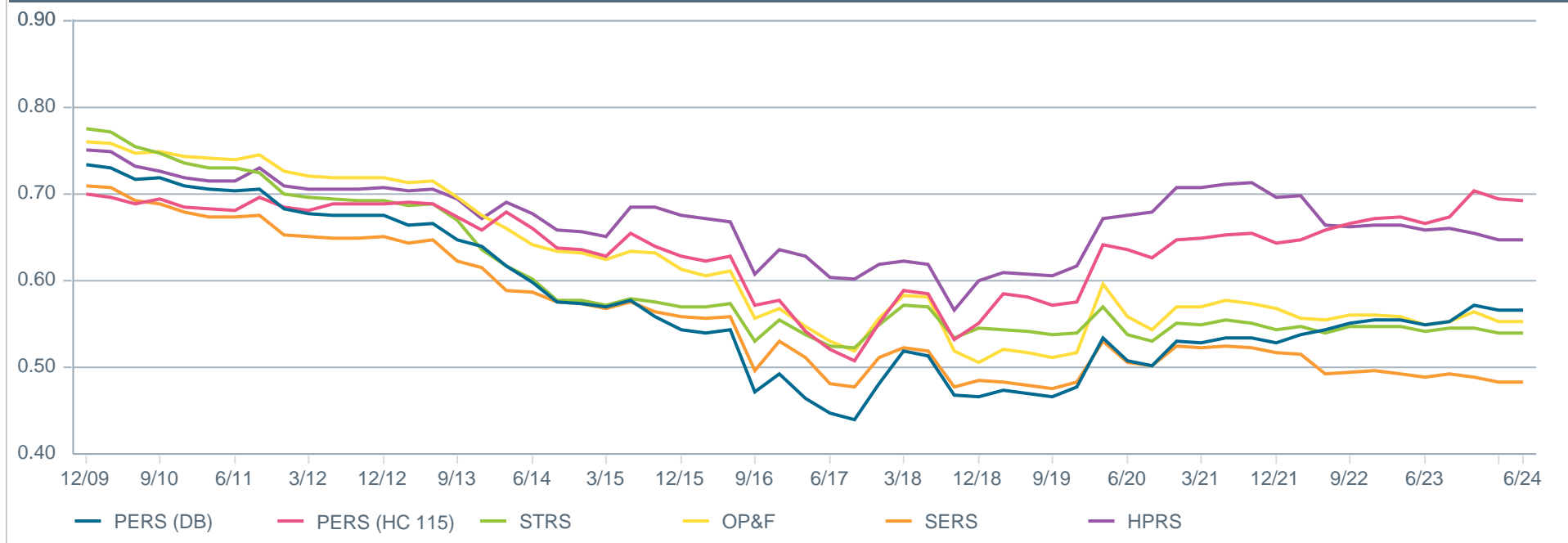
Summary

Beta is a measure of the sensitivity of a portfolio to the movements of the U.S. equity market as represented by the S&P 500 Index (Cap Wtd). Beta measures a portfolio's non-diversifiable or systematic risk. As an example, a Beta of 0.70 indicates that a portfolio captures roughly 70% of the S&P 500 Index return. If the S&P 500 Index returns 10%, the portfolio would be expected to return 7%.

Equity Beta

	3 Years	5 Years	7 Years	10 Years
PERS (DB)	0.55	0.57	0.54	0.54
PERS (HC 115)	0.68	0.69	0.67	0.66
STRS	0.49	0.54	0.54	0.54
OP&F	0.46	0.55	0.54	0.54
SERS	0.39	0.48	0.48	0.48
HPRS	0.50	0.65	0.64	0.64
S&P 500 Index (Cap Wtd)	1.00	1.00	1.00	1.00

5 Year Rolling Equity Beta



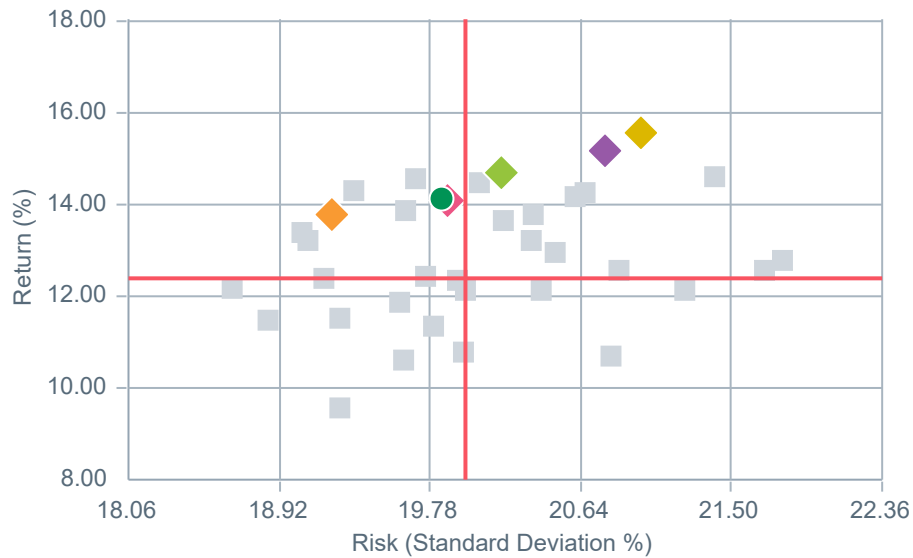
Performance shown is gross of fees and is calculated using quarterly periodicity.



Performance										
	Trailing Performance (%)						Calendar Year Performance (%)			
	2 Quarters	1 Year	3 Years	5 Years	7 Years	10 Years	2023	2022	2021	2020
US Equity										
PERS (DB)	13.61	23.20	8.29	14.07	13.48	12.04	25.95	-18.97	26.30	19.69
Russell 3000 Index	13.56	23.12	8.05	14.14	13.48	12.15	25.96	-19.21	25.66	20.89
Difference	0.05	0.08	0.24	-0.07	0.00	-0.11	-0.01	0.24	0.64	-1.20
Rank	16	16	18	21	18	18	21	61	34	43
PERS (HC 115)	13.61	23.20	8.29	14.07	13.48	12.04	25.95	-18.97	26.30	19.69
Russell 3000 Index	13.56	23.12	8.05	14.14	13.48	12.15	25.96	-19.21	25.66	20.89
Difference	0.05	0.08	0.24	-0.07	0.00	-0.11	-0.01	0.24	0.64	-1.20
Rank	16	16	18	21	18	18	21	61	34	43
STRS	14.59	24.35	7.97	14.71	14.05	12.45	25.25	-19.50	26.53	23.00
Russell 3000 Index	13.56	23.12	8.05	14.14	13.48	12.15	25.96	-19.21	25.66	20.89
Difference	1.03	1.23	-0.08	0.57	0.57	0.30	-0.71	-0.29	0.87	2.11
Rank	8	12	19	7	8	6	23	75	32	16
OP&F	16.52	24.24	10.01	15.58	14.93	13.34	23.13	-17.23	27.18	22.79
Wilshire 5000 Index	13.58	23.15	8.37	14.41	13.67	12.35	26.14	-19.04	26.70	20.82
Difference	2.94	1.09	1.64	1.17	1.26	0.99	-3.01	1.81	0.48	1.97
Rank	2	12	4	2	1	2	49	38	27	17
SERS	13.53	22.60	7.68	13.80	13.10	11.72	23.13	-18.51	24.90	21.87
Russell 3000 Index	13.56	23.12	8.05	14.14	13.48	12.15	25.96	-19.21	25.66	20.89
Difference	-0.03	-0.52	-0.37	-0.34	-0.38	-0.43	-2.83	0.70	-0.76	0.98
Rank	17	25	25	24	27	24	49	59	43	22
HPRS	12.81	22.32	8.97	15.17	13.73	12.39	25.38	-17.27	27.38	23.28
Russell 3000 Index	13.56	23.12	8.05	14.14	13.48	12.15	25.96	-19.21	25.66	20.89
Difference	-0.75	-0.80	0.92	1.03	0.25	0.24	-0.58	1.94	1.72	2.39
Rank	25	26	14	4	10	9	22	38	26	11
<i>All Public Plans > \$1B-US Equity Segment Median</i>	<i>11.29</i>	<i>19.27</i>	<i>6.44</i>	<i>12.37</i>	<i>11.96</i>	<i>10.88</i>	<i>23.03</i>	<i>-17.92</i>	<i>24.35</i>	<i>18.92</i>

Performance shown is gross of fees. Ranks are shown against All Public Plans >\$1B-US Equity Segment.

Plan Sponsor Peer Group Scattergram - 5 Years

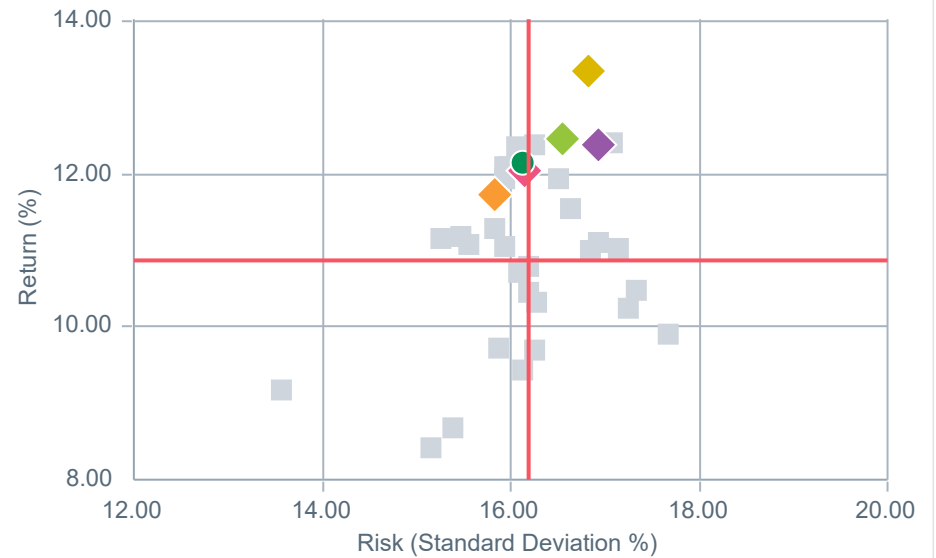


	Return	Standard Deviation
◆ PERS (DB)	14.07	19.88
◆ PERS (HC 115)	14.07	19.88
◆ STRS	14.71	20.19
◆ OP&F	15.58	20.98
◆ SERS	13.80	19.22
◆ HPRS	15.17	20.77
● Russell 3000 Index	14.14	19.84
— Median	12.37	19.98

Sharpe Ratio - 5 Years

PERS (DB)	0.67
PERS (HC 115)	0.67
STRS	0.69
OP&F	0.71
SERS	0.67
HPRS	0.69
Russell 3000 Index	0.67
All Public Plans > \$1B-US Equity Segment Median	0.59

Plan Sponsor Peer Group Scattergram - 10 Years



	Return	Standard Deviation
◆ PERS (DB)	12.04	16.14
◆ PERS (HC 115)	12.04	16.14
◆ STRS	12.45	16.56
◆ OP&F	13.34	16.83
◆ SERS	11.72	15.82
◆ HPRS	12.39	16.93
● Russell 3000 Index	12.15	16.13
— Median	10.88	16.19

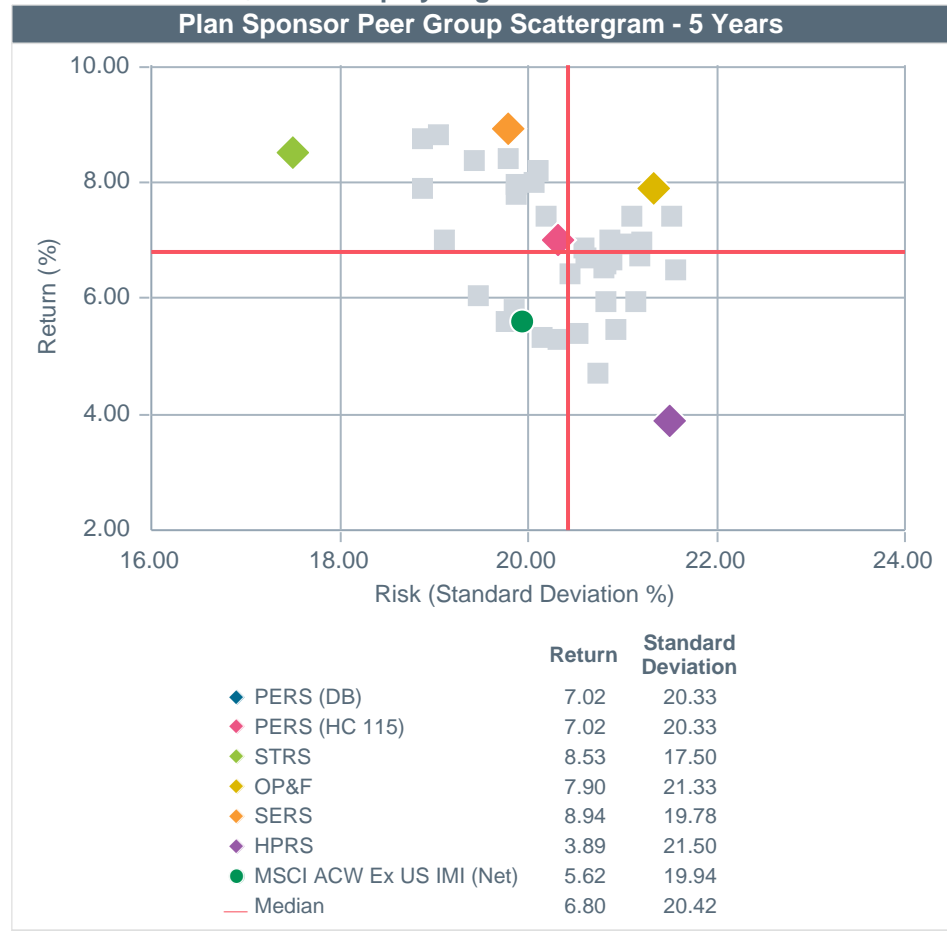
Sharpe Ratio - 10 Years

PERS (DB)	0.71
PERS (HC 115)	0.71
STRS	0.71
OP&F	0.75
SERS	0.70
HPRS	0.70
Russell 3000 Index	0.71
All Public Plans > \$1B-US Equity Segment Median	0.63

Performance shown is gross of fees.

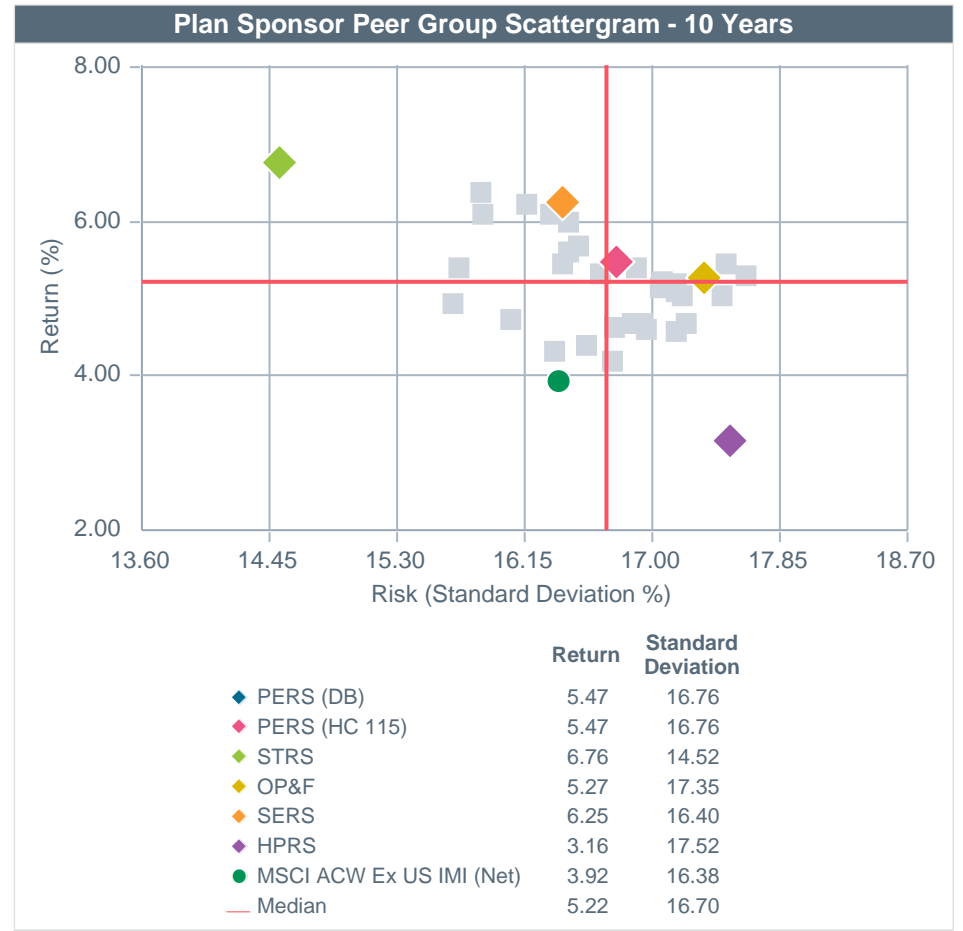
Performance										
	Trailing Performance (%)						Calendar Year Performance (%)			
	2 Quarters	1 Year	3 Years	5 Years	7 Years	10 Years	2023	2022	2021	2020
International Equity										
PERS (DB)	7.40	14.20	1.11	7.02	6.50	5.47	17.50	-17.51	9.00	14.81
PERS (DB) International Equity Custom Benchmark	5.46	11.69	-0.21	5.50	5.08	3.92	15.12	-16.85	7.89	11.90
Difference	1.94	2.51	1.32	1.52	1.42	1.55	2.38	-0.66	1.11	2.91
Rank	21	18	44	40	48	27	38	53	62	39
PERS (HC 115)	7.40	14.20	1.11	7.02	6.50	5.47	17.50	-17.51	9.00	14.81
PERS (HC 115) International Equity Custom Benchmark	5.46	11.69	-0.21	5.50	5.08	3.92	15.12	-16.85	7.89	11.90
Difference	1.94	2.51	1.32	1.52	1.42	1.55	2.38	-0.66	1.11	2.91
Rank	21	18	44	40	48	27	38	53	62	39
STRS	9.47	14.87	5.71	8.53	7.50	6.76	16.83	-9.11	13.20	6.78
STRS International Equity Custom Benchmark	8.20	14.28	4.26	7.79	7.06	5.94	16.93	-11.64	12.36	7.88
Difference	1.27	0.59	1.45	0.74	0.44	0.82	-0.10	2.53	0.84	-1.10
Rank	8	15	4	11	11	1	54	1	19	97
OP&F	6.19	12.98	2.47	7.90	6.29	5.27	19.82	-15.75	11.79	12.43
MSCI ACW Ex US IM Index (USD) (Net)	5.28	11.57	0.19	5.62	5.13	3.92	15.62	-16.58	8.53	11.12
Difference	0.91	1.41	2.28	2.28	1.16	1.35	4.20	0.83	3.26	1.31
Rank	41	29	26	25	55	48	10	35	31	54
SERS	11.01	18.12	3.32	8.94	7.76	6.25	18.60	-16.03	10.76	15.29
SERS International Equity Custom Benchmark	7.96	14.69	1.86	6.42	5.79	4.27	18.17	-15.87	7.46	10.65
Difference	3.05	3.43	1.46	2.52	1.97	1.98	0.43	-0.16	3.30	4.64
Rank	1	5	18	6	9	10	22	37	45	34
HPRS International Equity	4.50	8.09	-5.55	3.89	4.16	3.16	13.08	-22.31	1.89	19.02
HPRS International Equity Custom Benchmark	5.25	11.12	-4.33	2.43	2.86	2.31	11.02	-20.33	1.59	11.12
Difference	-0.75	-3.03	-1.22	1.46	1.30	0.85	2.06	-1.98	0.30	7.90
Rank	84	97	100	100	95	100	95	96	100	12
HPRS Global Equity	7.65	16.44	1.19	N/A	N/A	N/A	24.61	-22.67	N/A	N/A
HPRS Global Equity Custom Benchmark	11.30	19.38	5.43	N/A	N/A	N/A	22.20	-18.36	N/A	N/A
Difference	-3.65	-2.94	-4.24	N/A	N/A	N/A	2.41	-4.31	N/A	N/A
<i>All Public Plans > \$1B-Intl. Equity Segment Median</i>	<i>5.72</i>	<i>11.43</i>	<i>0.35</i>	<i>6.80</i>	<i>6.41</i>	<i>5.22</i>	<i>17.02</i>	<i>-17.26</i>	<i>9.61</i>	<i>12.76</i>

Performance shown is gross of fees. Ranks are shown against All Public Plans >\$1B-Intl. Equity Segment. HPRS International Equity Portfolio consists of international small cap holdings. HPRS Global Equity consists of domestic equity and broad international equity holdings.



Sharpe Ratio - 5 Years

PERS (DB)	0.34
PERS (HC 115)	0.34
STRS	0.44
OP&F	0.37
SERS	0.43
HPRS	0.19
MSCI ACW Ex US IMI (Net)	0.27
<i>All Public Plans > \$1B-Intl. Equity Segment Median</i>	0.32



Sharpe Ratio - 10 Years

PERS (DB)	0.32
PERS (HC 115)	0.32
STRS	0.43
OP&F	0.30
SERS	0.37
HPRS	0.18
MSCI ACW Ex US IMI (Net)	0.23
<i>All Public Plans > \$1B-Intl. Equity Segment Median</i>	0.30

Performance shown is gross of fees.

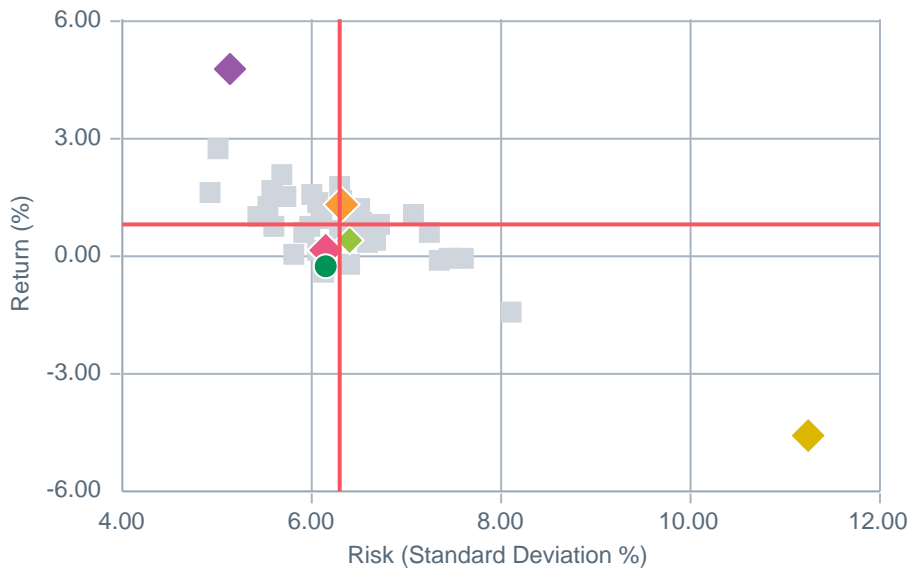
Performance										
	Trailing Performance (%)						Calendar Year Performance (%)			
	2 Quarters	1 Year	3 Years	5 Years	7 Years	10 Years	2023	2022	2021	2020
Fixed Income										
PERS (DB) Core Fixed Income	-0.64	2.46	-2.99	0.16	1.14	1.61	5.29	-12.93	-0.98	9.09
PERS (DB) Core Fixed Income Custom Benchmark	-0.71	2.63	-3.02	-0.23	0.86	1.35	5.53	-13.01	-1.54	7.51
Difference	0.07	-0.17	0.03	0.39	0.28	0.26	-0.24	0.08	0.56	1.58
Rank	78	71	70	73	79	79	68	66	85	41
PERS (HC 115) Core Fixed Income	-0.64	2.46	-2.99	0.16	1.14	1.61	5.29	-12.93	-0.98	9.09
PERS (HC 115) Core Fixed Income Custom Benchmark	-0.71	2.63	-3.02	-0.23	0.86	1.34	5.53	-13.01	-1.54	7.51
Difference	0.07	-0.17	0.03	0.39	0.28	0.27	-0.24	0.08	0.56	1.58
Rank	78	71	70	73	79	79	68	66	85	41
STRS Core Fixed Income	-0.28	3.58	-2.43	0.43	1.40	1.89	6.32	-12.51	-0.76	8.12
Bloomberg US Universal index	-0.28	3.47	-2.68	0.11	1.15	1.63	6.17	-12.99	-1.10	7.58
Difference	0.00	0.11	0.25	0.32	0.25	0.26	0.15	0.48	0.34	0.54
Rank	61	47	63	68	66	61	36	57	82	64
OP&F Core Fixed Income	-3.16	-0.04	-3.37	-4.56	-2.15	-0.60	4.72	-26.89	-2.97	7.35
Bloomberg US Agg Bond Index + Leverage Factor	-4.15	-0.66	-9.62	-4.58	-2.30	-0.89	5.25	-26.84	-3.30	8.16
Difference	0.99	0.62	0.25	0.02	0.15	0.29	-0.53	-0.05	0.33	-0.81
Rank	100	89	99	99	99	98	77	100	97	80
SERS	0.22	4.45	-1.87	1.33	2.12	2.34	7.39	-12.21	-0.56	10.59
Bloomberg US Agg Bond Index	-0.71	2.63	-3.02	-0.23	0.86	1.35	5.53	-13.01	-1.55	7.51
Difference	0.93	1.82	1.15	1.56	1.26	0.99	1.86	0.80	0.99	3.08
Rank	43	33	44	31	32	37	17	50	75	18
HPRS	2.35	7.92	3.44	4.78	4.93	4.55	10.96	-3.97	3.59	8.30
HPRS Fixed Income Custom Benchmark	2.37	7.67	1.27	2.63	2.91	2.82	10.05	-8.46	1.51	5.95
Difference	-0.02	0.25	2.17	2.15	2.02	1.73	0.91	4.49	2.08	2.35
Rank	7	4	1	1	1	1	3	2	2	61
<i>All Public Plans > \$1B-US Fixed Income Segment Median</i>	<i>0.12</i>	<i>3.52</i>	<i>-2.18</i>	<i>0.80</i>	<i>1.71</i>	<i>2.04</i>	<i>5.79</i>	<i>-12.28</i>	<i>0.15</i>	<i>8.60</i>

Performance shown is gross of fees. Ranks are shown against All Public Plans >\$1B-US Fixed Income Segment. PERS (DB), PERS (HC), and OP&F performance for Total Fixed Income is unavailable, so Core Fixed Income is shown for illustrative purposes.

Risk & Return - Fixed Income

All Public Plans > \$1B-US Fixed Income Segment

Plan Sponsor Peer Group Scattergram - 5 Years

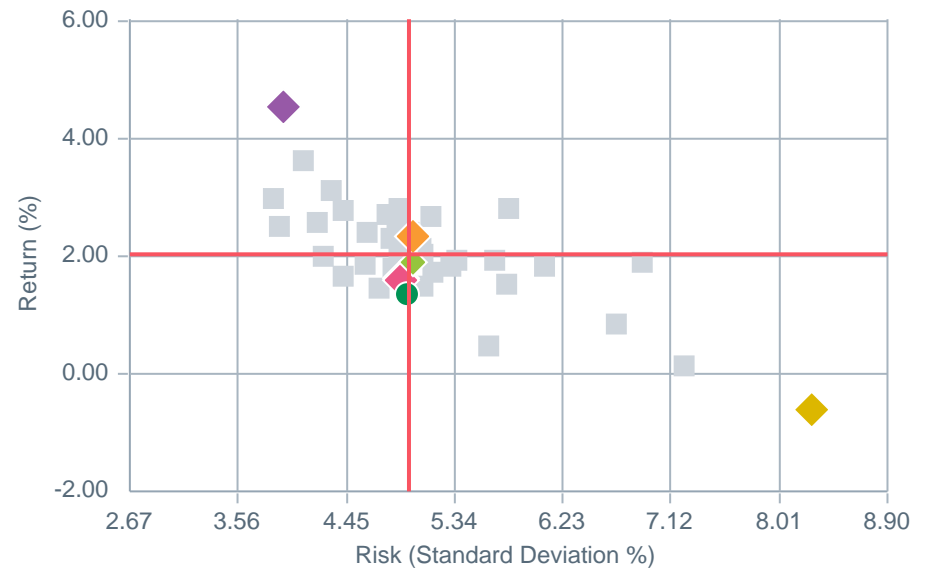


	Return	Standard Deviation
◆ PERS (DB) Core Fixed Income	0.16	6.14
◆ PERS (HC 115) Core Fixed Income	0.16	6.14
◆ STRS Core Fixed Income	0.43	6.39
◆ OP&F Core Fixed Income	-4.56	11.25
◆ SERS	1.33	6.32
◆ HPRS	4.78	5.14
● Bloomberg US Agg Bond Index	-0.23	6.15
— Median	0.80	6.29

Sharpe Ratio - 5 Years

PERS (DB) Core Fixed Income	-0.30
PERS (HC 115) Core Fixed Income	-0.30
STRS Core Fixed Income	-0.24
OP&F Core Fixed Income	-0.55
SERS	-0.10
HPRS	0.53
Bloomberg US Agg Bond Index	-0.37
All Public Plans > \$1B-US Fixed Income Segment Median	-0.18

Plan Sponsor Peer Group Scattergram - 10 Years



	Return	Standard Deviation
◆ PERS (DB) Core Fixed Income	1.61	4.90
◆ PERS (HC 115) Core Fixed Income	1.61	4.90
◆ STRS Core Fixed Income	1.89	5.00
◆ OP&F Core Fixed Income	-0.60	8.28
◆ SERS	2.34	5.01
◆ HPRS	4.55	3.93
● Bloomberg US Agg Bond Index	1.35	4.94
— Median	2.04	4.96

Sharpe Ratio - 10 Years

PERS (DB) Core Fixed Income	0.04
PERS (HC 115) Core Fixed Income	0.04
STRS Core Fixed Income	0.10
OP&F Core Fixed Income	-0.21
SERS	0.19
HPRS	0.79
Bloomberg US Agg Bond Index	-0.01
All Public Plans > \$1B-US Fixed Income Segment Median	0.13

Performance shown is gross of fees.

Performance										
	Trailing Performance (%)						Calendar Year Performance (%)			
	2 Quarters	1 Year	3 Years	5 Years	7 Years	10 Years	2023	2022	2021	2020
Additional Fixed Income										
PERS (DB) US Treasury	-0.88	1.58	-3.34	-0.67	0.42	N/A	3.84	-12.47	-2.27	8.08
Bloomberg US Trsy Index	-0.86	1.55	-3.26	-0.65	0.44	N/A	4.05	-12.46	-2.32	8.00
Difference	-0.02	0.03	-0.08	-0.02	-0.02	N/A	-0.21	-0.01	0.05	0.08
PERS (DB) EMD	0.68	9.12	-0.70	1.08	1.96	1.69	17.02	-13.50	-4.65	5.36
PERS (DB) EMD Custom Benchmark	-0.97	4.46	-2.72	-0.48	0.72	0.78	11.60	-14.07	-5.18	4.32
Difference	1.65	4.66	2.02	1.56	1.24	0.91	5.42	0.57	0.53	1.04
PERS (DB) High Yield	2.57	9.91	1.77	4.02	4.33	4.31	12.68	-10.41	5.16	7.42
Bloomberg U.S. High Yield Index	2.58	10.44	1.64	3.92	4.23	4.31	13.45	-11.19	5.28	7.11
Difference	-0.01	-0.53	0.13	0.10	0.10	0.00	-0.77	0.78	-0.12	0.31
PERS (DB) Securitized Debt	7.46	12.84	0.25	3.18	4.19	4.23	7.38	-13.23	5.20	7.40
Bloomberg CMBS Index + 2%	9.57	13.29	-2.06	0.44	2.26	2.96	-0.43	-13.17	4.50	1.18
Difference	-2.11	-0.45	2.31	2.74	1.93	1.27	7.81	-0.06	0.70	6.22
PERS (DB) TIPS	0.69	2.71	-1.32	2.06	2.46	1.90	3.91	-11.82	5.96	10.89
Bloomberg U.S. TIPS Index	0.70	2.71	-1.33	2.07	2.47	1.91	3.90	-11.85	5.96	10.99
Difference	-0.01	0.00	0.01	-0.01	-0.01	-0.01	0.01	0.03	0.00	-0.10
PERS (DB) Investment Grade Credit	-0.58	4.10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Bloomberg US Corporate Investment Grade Credit Index	-0.49	4.63	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Difference	-0.09	-0.53	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PERS (HC 115) EMD	0.68	9.12	-0.70	1.08	1.96	1.70	17.02	-13.50	-4.65	5.36
PERS (HC 115) EMD Custom Benchmark	-0.97	4.46	-2.72	-0.48	0.72	0.78	11.60	-14.07	-5.18	4.32
Difference	1.65	4.66	2.02	1.56	1.24	0.92	5.42	0.57	0.53	1.04

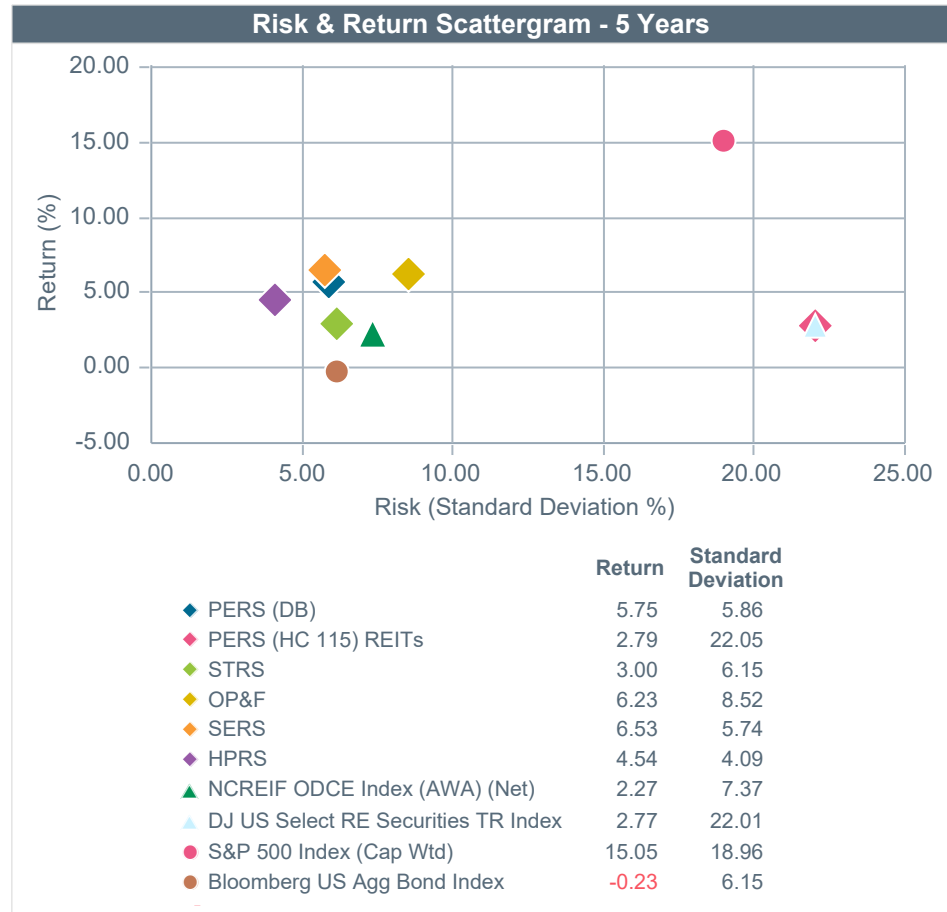
Performance shown is gross of fees.

	Trailing Performance (%)						Calendar Year Performance (%)			
	2 Quarters	1 Year	3 Years	5 Years	7 Years	10 Years	2023	2022	2021	2020
Additional Fixed Income										
PERS (HC 115) High Yield	2.57	9.91	1.77	4.02	4.33	4.31	12.68	-10.41	5.16	7.42
Bloomberg Barclays U.S. High Yield Index	2.58	10.44	1.64	3.92	4.23	4.31	13.45	-11.19	5.28	7.11
Difference	-0.01	-0.53	0.13	0.10	0.10	0.00	-0.77	0.78	-0.12	0.31
PERS (HC 115) Securitized Debt	7.46	12.84	0.25	3.18	4.19	4.23	7.38	-13.23	5.20	7.40
Bloomberg CMBS Index + 2%	9.57	13.29	-2.06	0.44	2.26	2.96	-0.43	-13.17	4.50	1.18
Difference	-2.11	-0.45	2.31	2.74	1.93	1.27	7.81	-0.06	0.70	6.22
PERS (HC 115) TIPS	0.69	2.71	-1.32	2.06	2.46	1.90	3.91	-11.82	5.96	10.89
Bloomberg U.S. Tips Index	0.70	2.71	-1.33	2.07	2.47	1.91	3.90	-11.85	5.96	10.99
Difference	-0.01	0.00	0.01	-0.01	-0.01	-0.01	0.01	0.03	0.00	-0.10
PERS (HC 115) Investment Grade Credit	-0.58	4.10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Bloomberg US Corporate Investment Grade Credit Index	-0.49	4.63	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Difference	-0.09	-0.53	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
STRS Liquid Treasury Portfolio	0.24	3.41	-1.36	0.34	1.01	N/A	4.32	-7.71	-1.67	5.90
Bloomberg US Intermediate Treasury Index	0.21	3.37	-1.41	0.28	0.95	N/A	4.28	-7.77	-1.72	5.78
Difference	0.03	0.04	0.05	0.06	0.06	N/A	0.04	0.06	0.05	0.12
OP&F High Yield	2.94	10.47	1.88	4.15	4.52	4.53	12.09	-9.60	5.35	6.71
CS Developed Countries High Yield	2.62	10.46	1.63	3.70	4.08	4.16	13.47	-11.25	5.34	6.08
Difference	0.32	0.01	0.25	0.45	0.44	0.37	-1.38	1.65	0.01	0.63
OP&F Private Credit Fixed Income	7.24	17.77	11.18	9.19	9.28	N/A	17.38	4.87	15.80	-1.54
S&P LTSA Levered Loan Index + 2%	6.44	14.72	8.12	7.61	N/A	N/A	15.31	-0.63	10.58	3.09
Difference	0.80	3.05	3.06	1.58	N/A	N/A	2.07	5.50	5.22	-4.63
OP&F US TIPS	2.16	1.79	-3.71	3.23	4.20	5.06	-0.05	-21.16	15.47	20.11
Bridgewater Custom US TIPS Index	-0.72	-0.24	-6.74	1.20	2.01	3.17	1.24	-25.71	11.81	23.25
Difference	2.88	2.03	3.03	2.03	2.19	1.89	-1.29	4.55	3.66	-3.14
SERS Private Credit	6.78	13.40	10.52	N/A	N/A	N/A	12.25	6.80	16.30	N/A
3 Month LIBOR Rate + 4.5%	4.96	10.02	7.64	N/A	N/A	N/A	9.60	6.00	4.67	N/A
Difference	1.82	3.38	2.88	N/A	N/A	N/A	2.65	0.80	11.63	N/A

Performance shown is gross of fees.

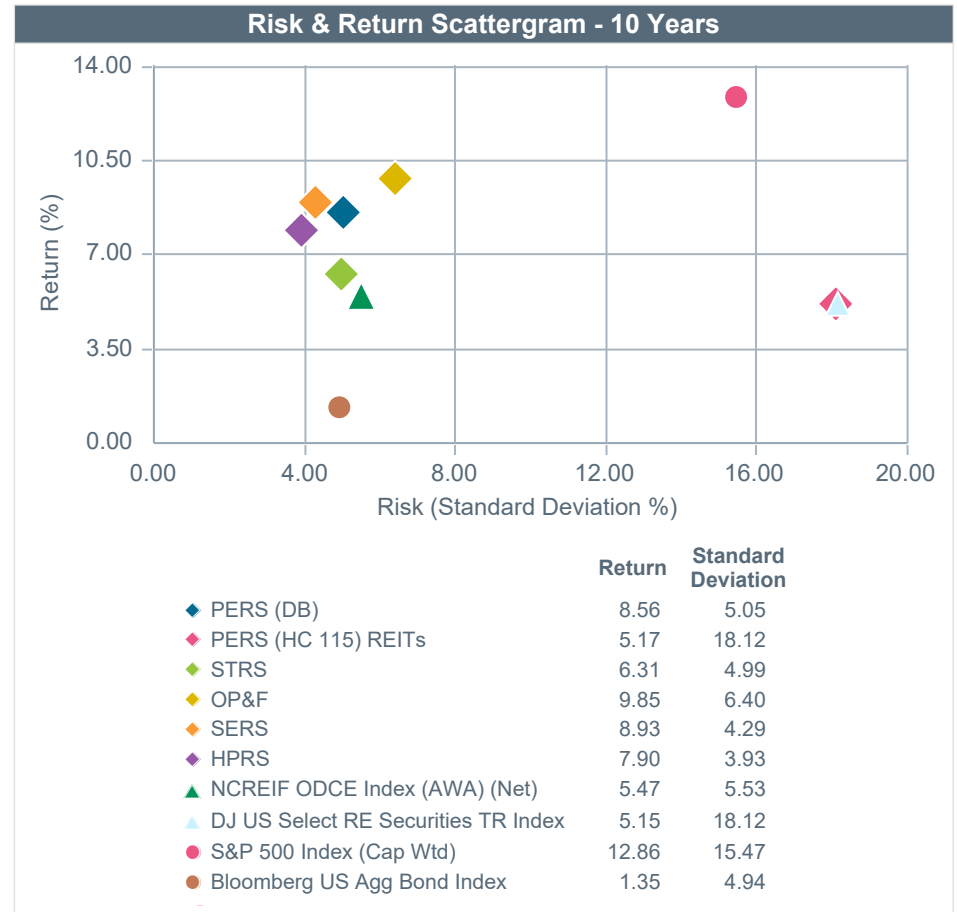
Performance										
	Trailing Performance (%)						Calendar Year Performance (%)			
	2 Quarters	1 Year	3 Years	5 Years	7 Years	10 Years	2023	2022	2021	2020
Real Estate										
PERS (DB)	-2.85	-4.96	6.20	5.75	6.48	8.56	-5.78	15.07	17.08	2.55
PERS (DB) Real Estate Custom Benchmark	-6.96	-11.15	3.33	3.42	4.62	6.67	-12.03	21.81	14.49	1.37
Difference	4.11	6.19	2.87	2.33	1.86	1.89	6.25	-6.74	2.59	1.18
PERS (DB) REITs	-0.60	7.12	N/A	N/A	N/A	N/A	14.04	N/A	N/A	N/A
PERS (DB) REITs Benchmark	-0.60	7.12	N/A	N/A	N/A	N/A	14.03	N/A	N/A	N/A
Difference	0.00	0.00	N/A	N/A	N/A	N/A	0.01	N/A	N/A	N/A
PERS (HC 115) REITs	-0.60	7.12	-0.09	2.79	4.00	5.17	14.04	-25.86	46.02	-11.40
DJ US Select Real Estate Securities TR Index	-0.60	7.12	-0.17	2.77	3.95	5.15	14.03	-26.03	45.91	-11.20
Difference	0.00	0.00	0.08	0.02	0.05	0.02	0.01	0.17	0.11	-0.20
STRS	-4.92	-8.44	1.62	3.00	4.50	6.31	-7.32	5.56	20.64	-1.27
STRS Real Estate Custom Benchmark	-1.07	-3.41	2.30	3.82	4.73	6.28	-4.72	0.85	21.38	0.89
Difference	-3.85	-6.03	-0.68	-0.82	-0.23	0.03	-2.60	4.71	-0.74	-2.16
OP&F	-5.64	-9.44	6.51	6.23	7.81	9.85	-10.80	23.99	24.21	0.11
NCREIF ODCE Index (AWA) (Net) (1 Qtr Lag)	-7.45	-12.00	2.47	2.56	3.76	5.82	-12.88	20.96	13.64	0.52
Difference	1.81	2.56	4.04	3.67	4.05	4.03	2.08	3.03	10.57	-0.41
SERS	-5.17	-6.40	6.32	6.53	7.71	8.93	-4.14	17.90	18.47	3.30
NCREIF Property Index (1 Qtr Lag)	-3.98	-7.16	3.63	3.76	4.67	6.41	-8.39	16.08	12.15	2.00
Difference	-1.19	0.76	2.69	2.77	3.04	2.52	4.25	1.82	6.32	1.30
HPRS	-2.03	-4.93	2.89	4.54	7.07	7.90	-4.47	7.64	14.28	3.32
HPRS Real Estate Custom Benchmark (Net)	-2.48	-5.91	1.49	3.27	5.47	6.98	-5.67	5.90	12.91	2.11
Difference	0.45	0.98	1.40	1.27	1.60	0.92	1.20	1.74	1.37	1.21
NCREIF ODCE Index (AWA) (Net)	-3.22	-9.99	1.02	2.27	3.45	5.47	-12.73	6.55	21.02	0.34

Performance shown may be net or gross of fees depending on underlying investments. Prior to 2008, HPRS's real estate portfolio consisted of two buildings. Since then, HPRS has shifted its focus to externally managed funds. PERS (DB): 3 Year performance reduced 1.20%, 5 Year performance reduced 0.72%, 7 Year performance reduced 0.51%, and 10 Year performance reduced 0.37% due to change in distribution methodology in real estate portfolios.



Sharpe Ratio - 5 Years

PERS (DB)	0.56
PERS (HC 115) REITs	0.15
STRS	0.14
OP&F	0.46
SERS	0.80
HPRS	0.48
NCREIF ODCE Index (AWA) (Net)	0.05
S&P 500 Index (Cap Wtd)	0.74
Bloomberg US Agg Bond Index	-0.37



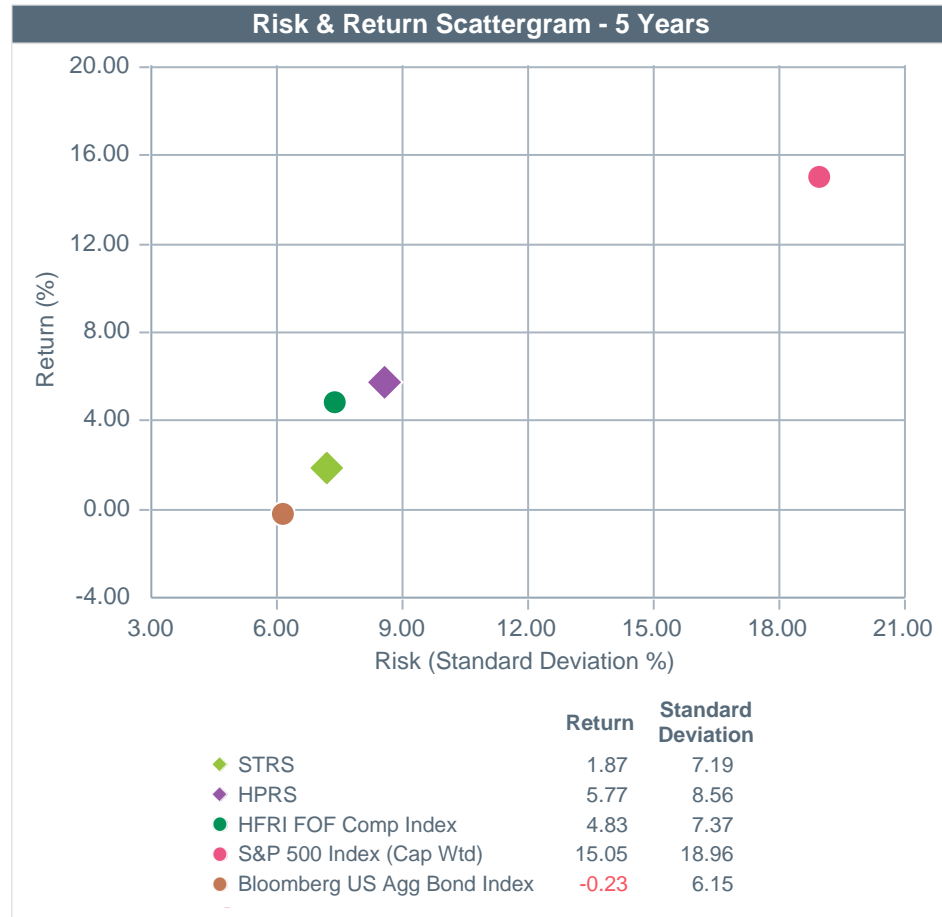
Sharpe Ratio - 10 Years

PERS (DB)	1.23
PERS (HC 115) REITs	0.29
STRS	0.85
OP&F	1.16
SERS	1.62
HPRS	1.38
NCREIF ODCE Index (AWA) (Net)	0.64
S&P 500 Index (Cap Wtd)	0.78
Bloomberg US Agg Bond Index	-0.01

Performance shown may be net or gross of fees depending on underlying investments.

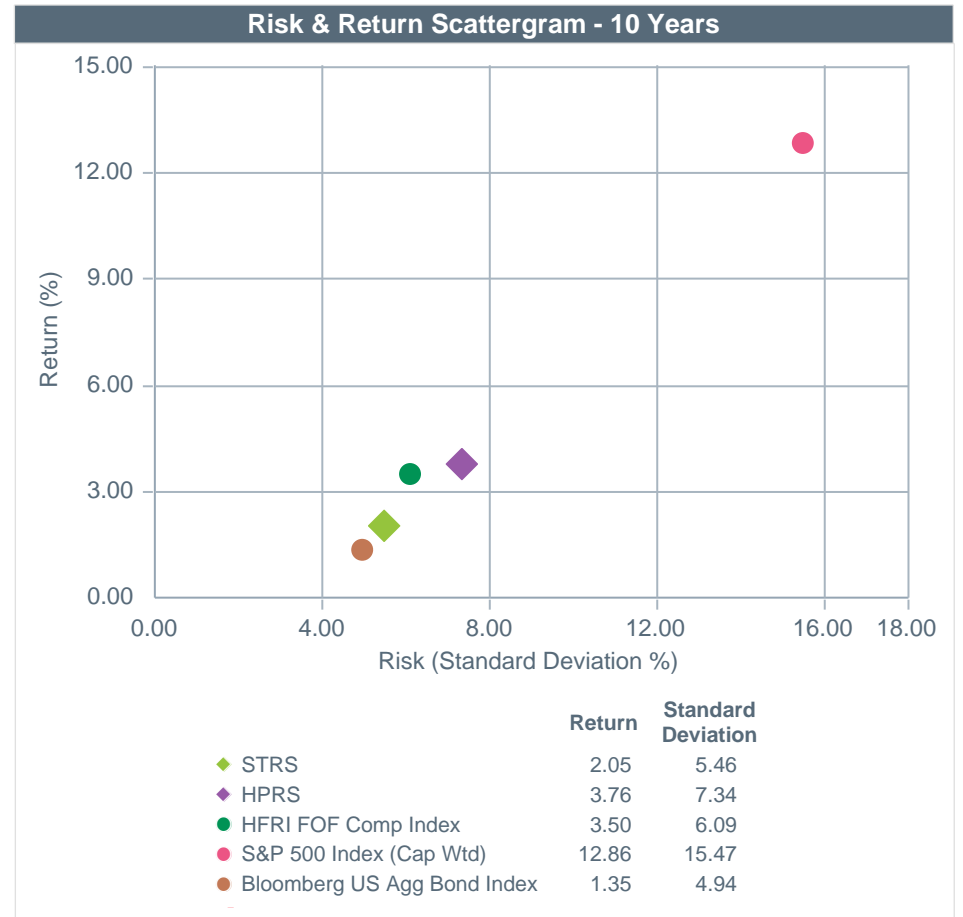
Performance										
	Trailing Performance (%)						Calendar Year Performance (%)			
	2 Quarters	1 Year	3 Years	5 Years	7 Years	10 Years	2023	2022	2021	2020
Hedge Funds										
STRS	4.19	3.60	4.80	1.87	2.21	2.05	-1.78	6.05	2.14	-2.47
HFRI FOF Comp Index	4.85	8.74	2.13	4.83	4.35	3.50	6.07	-5.31	6.17	10.88
Difference	-0.66	-5.14	2.67	-2.96	-2.14	-1.45	-7.85	11.36	-4.03	-13.35
HPRS	5.17	10.79	1.86	5.77	5.07	3.76	7.78	-6.68	8.09	12.02
HFRI FOF Comp Index	4.85	8.74	2.13	4.83	4.35	3.50	6.07	-5.31	6.17	10.88
Difference	0.32	2.05	-0.27	0.94	0.72	0.26	1.71	-1.37	1.92	1.14

Performance shown is net of fees. PERS (DB) has no Hedge Fund target allocation and remaining assets are liquidating.



Sharpe Ratio - 5 Years

STRS	0.00
HPRS	0.45
HFRI FOF Comp Index	0.38
S&P 500 Index (Cap Wtd)	0.74
Bloomberg US Agg Bond Index	-0.37



Sharpe Ratio - 10 Years

STRS	0.12
HPRS	0.34
HFRI FOF Comp Index	0.35
S&P 500 Index (Cap Wtd)	0.78
Bloomberg US Agg Bond Index	-0.01

Performance shown is net of fees. PERS (DB) has no Hedge Fund target allocation and remaining assets are liquidating.

Performance										
	2 Quarters	1 Year	3 Years	5 Years	7 Years	10 Years	2023	2022	2021	2020
Private Equity										
PERS (DB)	5.37	9.19	9.24	14.30	14.27	12.86	6.93	-4.79	44.84	16.38
PERS (DB) Private Equity Custom Benchmark	4.36	6.30	8.59	13.97	13.79	12.12	5.27	-1.25	49.22	13.78
Difference	1.01	2.89	0.65	0.33	0.48	0.74	1.66	-3.54	-4.38	2.60
STRS	3.03	3.44	5.24	15.29	15.78	14.21	0.77	-8.49	53.50	25.49
STRS Private Equity Benchmark	3.80	4.83	6.25	N/A	N/A	N/A	3.67	-5.40	N/A	N/A
Difference	-0.77	-1.39	-1.01	N/A	N/A	N/A	-2.90	-1.09	N/A	N/A
OP&F	2.49	5.79	6.90	15.21	15.89	14.57	7.68	-9.91	54.51	22.30
OP&F Private Equity Custom Benchmark	2.49	5.79	6.90	15.21	15.89	14.57	7.68	-9.91	54.51	22.30
Difference	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SERS	7.07	10.93	15.18	17.97	17.83	17.18	8.12	7.57	48.06	15.77
Burgiss All Private Equity Benchmark	6.73	5.28	7.30	13.13	13.17	11.90	3.77	-0.81	44.38	12.16
Difference	0.34	5.65	7.88	4.84	4.66	5.28	4.35	8.38	3.68	3.61
HPRS	2.41	8.05	9.04	14.97	13.50	11.18	8.97	5.76	36.53	20.12
HPRS Private Equity Custom Benchmark	2.41	8.05	9.04	14.97	13.50	13.13	8.97	5.76	36.53	20.12
Difference	0.00	0.00	0.00	0.00	0.00	-1.95	0.00	0.00	0.00	0.00

Performance shown is net of fees. Therefore longer period trailing returns relative to the benchmark may not be relevant. The STRS Private Equity Benchmark is the quarterly Cambridge Associates Private Equity and Venture Capital Index, one quarter lagged to be consistent with external fund reporting, effective July 1, 2021. PERS (DB): 3 Year performance reduced 2.20%, 5 Year performance reduced 1.37%, 7 Year performance reduced 0.98%, and 10 Year performance reduced 0.68% due to change in distribution methodology in private equity portfolios.

Performance										
	Trailing Performance (%)						Calendar Year Performance (%)			
	2 Quarters	1 Year	3 Years	5 Years	7 Years	10 Years	2023	2022	2021	2020
Other Alternatives										
PERS (DB) Commodities	5.21	5.36	5.87	4.61	5.40	-4.51	-7.54	15.88	36.99	-21.96
S&P Goldman Sachs Commodity Index (TR)	5.14	5.00	5.65	3.81	4.79	-5.15	-7.91	16.09	35.46	-23.72
Difference	0.07	0.36	0.22	0.80	0.61	0.64	0.37	-0.21	1.53	1.76
PERS (DB) Risk Parity	4.29	8.64	-5.98	-0.04	2.99	2.46	8.53	-29.78	11.94	5.96
PERS (DB) Risk Parity Custom Benchmark	4.02	9.44	-6.26	-0.33	2.01	3.24	9.27	-30.25	11.56	5.25
Difference	0.27	-0.80	0.28	0.29	0.98	-0.78	-0.74	0.47	0.38	0.71
PERS (DB) Opportunistic	11.23	17.64	4.49	N/A	N/A	N/A	15.21	-14.38	11.59	N/A
PERS (DB) Opportunistic Benchmark	6.86	15.86	3.63	N/A	N/A	N/A	16.76	-15.14	12.63	N/A
Difference	4.37	1.78	0.86	N/A	N/A	N/A	-1.55	0.76	-1.04	N/A
PERS (HC 115) Commodities	5.21	5.36	5.87	4.61	5.40	-4.44	-7.54	15.88	36.99	-21.96
S&P Goldman Sachs Commodity Index (TR)	5.14	5.00	5.65	3.81	4.79	-5.15	-7.91	16.09	35.46	-23.72
Difference	0.07	0.36	0.22	0.80	0.61	0.71	0.37	-0.21	1.53	1.76
PERS (HC 115) Risk Parity	4.29	8.64	-5.98	-0.04	2.99	2.46	8.53	-29.78	11.94	5.96
PERS (HC 115) Risk Parity Custom Benchmark	4.02	9.44	-6.26	-0.33	2.01	3.24	9.27	-30.25	11.56	5.25
Difference	0.27	-0.80	0.28	0.29	0.98	-0.78	-0.74	0.47	0.38	0.71
PERS (HC 115) Opportunistic	11.23	17.64	4.49	N/A	N/A	N/A	15.21	-14.38	11.59	N/A
PERS (HC 115) Opportunistic Benchmark	6.86	15.86	3.63	N/A	N/A	N/A	16.76	-15.14	12.63	N/A
Difference	4.37	1.78	0.86	N/A	N/A	N/A	-1.55	0.76	-1.04	N/A

Performance shown may be net or gross of fees depending on underlying investments.

	Trailing Performance (%)						Calendar Year Performance (%)			
	2 Quarters	1 Year	3 Years	5 Years	7 Years	10 Years	2023	2022	2021	2020
Other Alternatives										
STRS Opportunistic/Diversified Investments	5.34	10.58	10.15	8.94	7.91	6.51	10.89	4.55	23.68	-1.80
STRS Opportunistic/Diversified Blended Benchmark	4.73	7.96	6.85	N/A	N/A	N/A	9.13	0.40	N/A	N/A
Difference	0.61	2.62	3.30	N/A	N/A	N/A	1.76	4.15	N/A	N/A
OP&F Real Assets	3.11	5.47	7.83	5.49	5.81	5.01	5.03	10.03	7.85	-0.28
OP&F Real Assets Custom Benchmark	9.17	5.87	7.03	5.69	5.97	6.28	5.12	3.34	9.84	-2.27
Difference	-6.06	-0.40	0.80	-0.20	-0.16	-1.27	-0.09	6.69	-1.99	1.99
OP&F MLPs	21.42	35.25	23.87	13.35	9.57	3.96	19.03	30.50	41.02	-26.09
Alerian MLP Index	16.12	26.68	16.55	11.33	7.72	1.64	14.02	21.53	38.43	-23.37
Difference	5.30	8.57	7.32	2.02	1.85	2.32	5.01	8.97	2.59	-2.72
OP&F Gold	9.94	14.70	5.78	N/A	N/A	N/A	7.34	-2.45	-3.82	N/A
S&P GSCI Gold Index Minus the Cost of Financing	9.84	14.49	5.53	N/A	N/A	N/A	7.25	-2.97	-4.41	N/A
Difference	0.10	0.21	0.25	N/A	N/A	N/A	0.09	0.52	0.79	N/A
SERS Opportunistic & Tactical Portfolio	3.48	7.47	5.61	6.47	7.03	6.50	7.82	-1.12	22.04	0.96
SERS Opportunistic Custom Benchmark	0.49	4.63	-1.02	0.45	2.38	3.29	7.53	-11.01	0.46	0.36
Difference	2.99	2.84	6.63	6.02	4.65	3.21	0.29	9.89	21.58	0.60
SERS Global Infrastructure	2.76	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Consumer Price Index+1.2%	4.13	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Difference	-1.37	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
HPRS Real Assets	11.29	23.50	22.74	17.03	12.39	N/A	19.76	24.62	29.85	-1.80
HPRS Real Assets Custom Benchmark (Net)	11.29	23.36	22.29	16.66	12.85	N/A	19.06	24.23	29.17	-1.80
Difference	0.00	0.14	0.45	0.37	-0.46	N/A	0.70	0.39	0.68	0.00

Performance shown may be net or gross of fees depending on underlying investments. The OP&F Gold composite was inceptioned during the second half of 2020. Beginning with the Dec. 2021 report, STRS will report Opportunistic/Diversified Investments (which includes Hedge Funds). Effective July 1, 2021, the STRS Opportunistic/diversified blended benchmark consists of the actual Opportunistic Investments Portfolio weight multiplied by the Cambridge Associates Private Credit Index one quarter lagged to be consistent with external fund reporting plus the actual weight of the Diversified Investments Portfolio multiplied by the HFRI Fund of Funds Composite Index, which is a monthly index where subsequent revisions will be reflected in the following period.

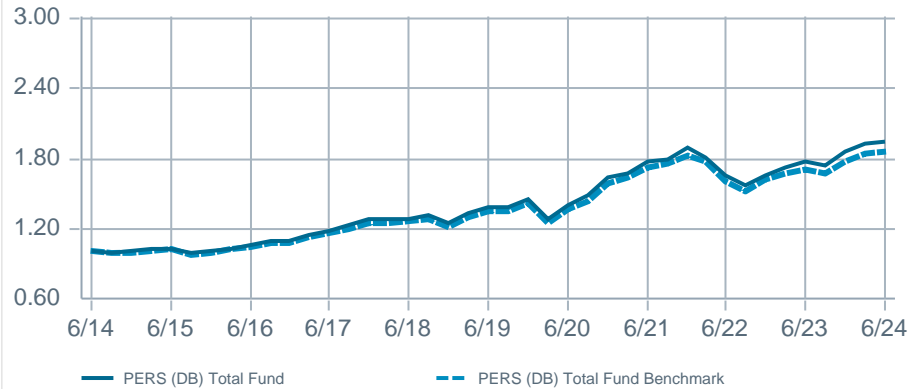
Plan Specific Pages



Summary

- PERS (DB) has generated an annualized 0.51% of alpha over the trailing 5-year period and 0.53% over the trailing 10-year period.
- Relative to a 60 Equity/40 Bond portfolio, the plan has exhibited similar up-market capture and smaller down-market capture characteristics over the past 10 years.

Growth of \$1 - 10 Years



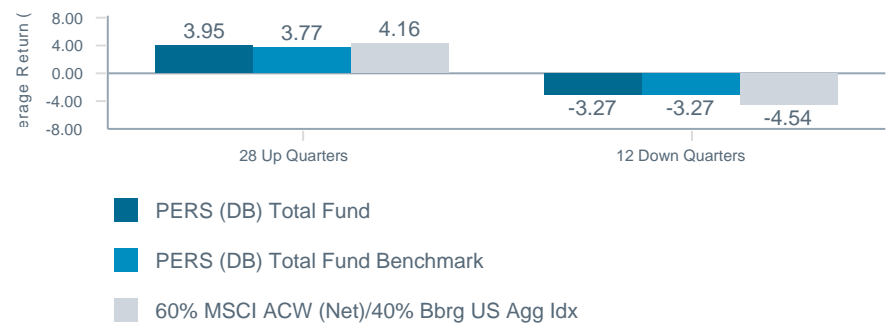
MPT Stats

	5 Years	10 Years
Maximum Return	10.35	10.35
Minimum Return	-11.66	-11.66
Standard Deviation	11.15	8.85
vs. PERS (DB) Total Fund Benchmark		
Info Ratio	0.48	0.60
Tracking Error	1.05	0.85
Alpha	0.41	0.46
vs. S&P 500 Index (Cap Wtd)		
Beta	0.57	0.54
vs. ICE BofAML 3 Mo US T-Bill Index		
Sharpe Ratio	0.49	0.64

Asset Allocation vs. Targets

	Market Value (\$)	Allocation (%)	Target (%)
US Equity	22,541,322,331	22.01	21.60
International Equity	20,390,920,745	19.91	20.00
Core Fixed Income	8,817,099,992	8.61	10.00
U.S. Treasury	2,780,141,511	2.71	3.00
High Yield	4,136,821,988	4.04	4.00
Global High Yield	3,521	0.00	0.00
EMD	1,997,520,181	1.95	1.00
Securitized Debt	1,642,336,323	1.60	1.00
TIPS	3,173,932,208	3.10	3.00
Investment Grade Credit	2,846,211,551	2.78	3.00
Real Estate	11,949,812,081	11.67	12.00
REITs	752,361,863	0.73	1.00
Hedge Funds	1,512,130	0.00	0.00
Opportunistic	1,555,649,485	1.52	1.40
Commodities	2,192,849,341	2.14	2.00
Private Equity	14,959,447,974	14.60	15.00
Risk Parity	2,018,892,969	1.97	2.00
Cash Equivalents	663,753,432	0.65	0.00
Additional Annuity	14,650,550	0.01	0.00
Other Pension Assets	343	0.00	0.00
TAA	1	0.00	0.00
Total Fund	102,435,240,522	100.00	100.00

Up/Down Markets - 10 Years

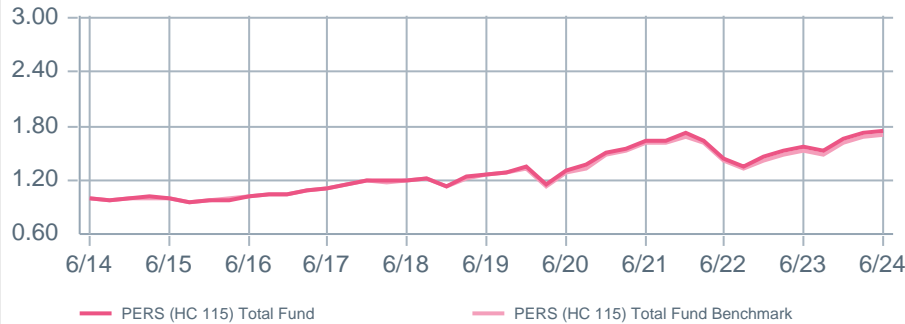


Performance shown is gross of fees. Calculations are based on quarterly periodicity. Allocations shown may not sum up to 100% exactly due to rounding.

Summary

- PERS HC was formed in 2005, segregating HC from the DB assets. PERS HC 115 was formed October 2014 to hold all HC assets of PERS, and has a performance inception date of January 2015.
- OPERS health care plan is not a pension plan and therefore has significantly different characteristics including a shorter focus asset allocation with more liquidity than the pension plans. For purposes of this study, the OPERS health care plan has been included in the results. The results for OPERS HC plan were reflected in the PERS HC since 2005 through October 2014, and then transferred to and renamed PERS HC 115 at that time.

Growth of \$1 - 10 Years



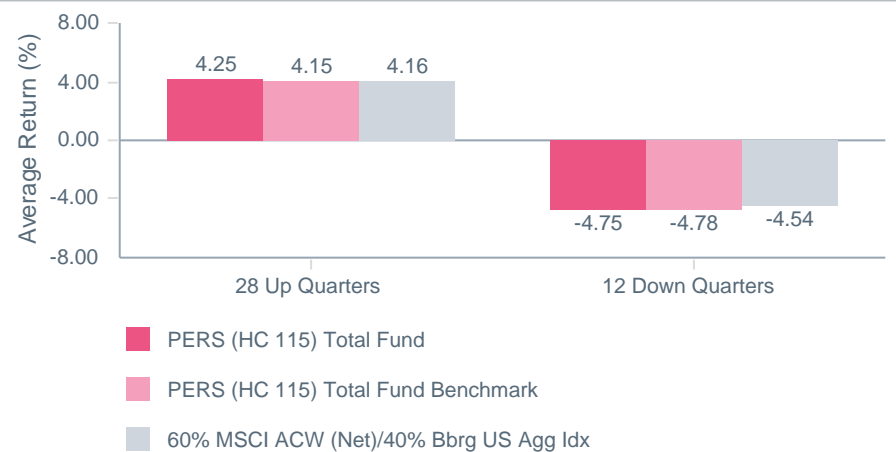
MPT Stats

	10 Years
Maximum Return	12.24
Standard Deviation	10.71
Minimum Return	-14.63
vs. PERS (HC 115) Total Fund Benchmark	
Info Ratio	0.81
Tracking Error	0.38
Alpha	0.34
vs. S&P 500 Index (Cap Wtd)	
Beta	0.69
vs. ICE BofAML 3 Mo US T-Bill Index	
Sharpe Ratio	0.44

Asset Allocation vs. Targets

	Market Value (\$)	Allocation (%)	Target (%)
US Equity	3,432,242,832	26.16	25.60
International Equity	3,271,975,822	24.94	25.00
Core Fixed Income	1,911,967,224	14.58	16.00
EMD	249,639,721	1.90	1.00
High Yield	643,108,645	4.90	5.00
Securitized Debt	395,450,477	3.01	3.00
TIPS	894,660,410	6.82	7.00
Global High Yield	17,665	0.00	0.00
REITs	639,943,305	4.88	5.00
Hedge Funds	915,964	0.01	0.00
Opportunistic	193,990,649	1.48	1.40
Commodities	417,158,055	3.18	3.00
Risk Parity	386,370,881	2.95	3.00
Cash Equivalents	45,148,883	0.34	0.00
U.S. Treasury	247,286,129	1.89	2.00
Investment Grade Credit	388,153,958	2.96	3.00
TAA	-	0.00	0.00
Total Fund	13,118,030,620	100.00	100.00

Up/Down Markets - 10 Years

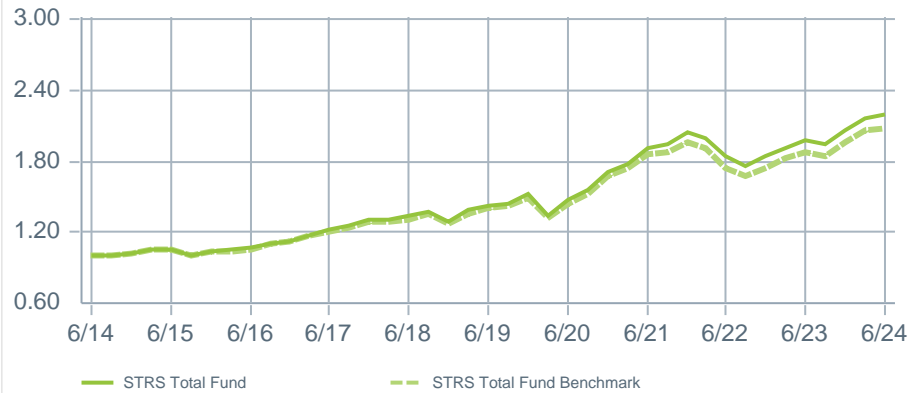


Performance shown is gross of fees. Calculations are based on quarterly periodicity. Allocations shown may not sum up to 100% exactly due to rounding.

Summary

- STRS has generated 0.69% of alpha over the trailing 5-year period and 0.53% of alpha over the trailing 10-year period.
- Relative to a 60 Equity/40 Bond portfolio, the plan has exhibited larger up-market capture and smaller down-market capture characteristics over the past 10 years.

Growth of \$1 - 10 Years



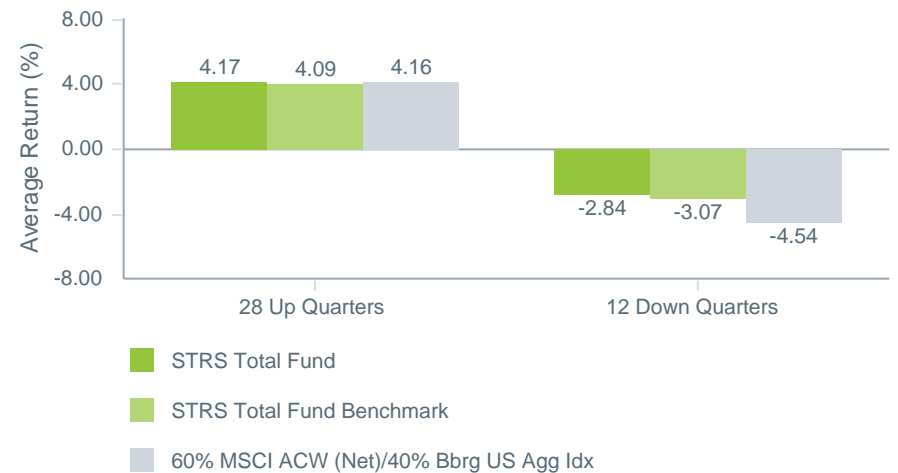
MPT Stats

	5 Years	10 Years
Maximum Return	10.00	10.00
Minimum Return	-11.51	-11.51
Standard Deviation	10.57	8.64
vs. STRS Total Fund Benchmark		
Info Ratio	1.04	0.99
Tracking Error	0.61	0.50
Alpha	0.73	0.53
vs. S&P 500 Index (Cap Wtd)		
Beta	0.54	0.54
vs. ICE BofAML 3 Mo US T-Bill Index		
Sharpe Ratio	0.66	0.78

Asset Allocation vs. Targets

	Market Value (\$)	Allocation (%)	Target (%)
US Equity	24,879,665,623	26.11	26.00
International Equity	20,892,595,738	21.93	22.00
Fixed Income	20,981,519,416	22.02	22.00
Real Estate	8,011,803,807	8.41	10.00
Opportunistic (Incl. Hedge Funds)	9,407,727,572	9.87	10.00
Private Equity	9,577,051,179	10.05	9.00
Cash Equivalents	1,527,381,323	1.60	1.00
Total Fund	95,277,744,658	100.00	100.00

Up/Down Markets - 10 Years

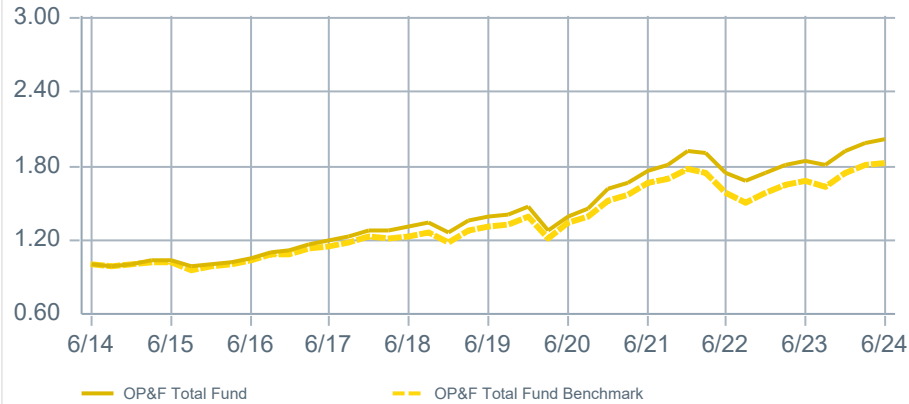


Performance shown is gross of fees. Calculations are based on quarterly periodicity. Allocations shown may not sum up to 100% exactly due to rounding.

Summary

- OP&F has generated 0.97% of alpha over the trailing 5-year period and 1.11% of alpha over the trailing 10-year period.
- Relative to a 60 Equity/40 Bond portfolio, the plan has exhibited similar up-market and smaller down-market capture characteristics over the past 10 years.

Growth of \$1 - 10 Years



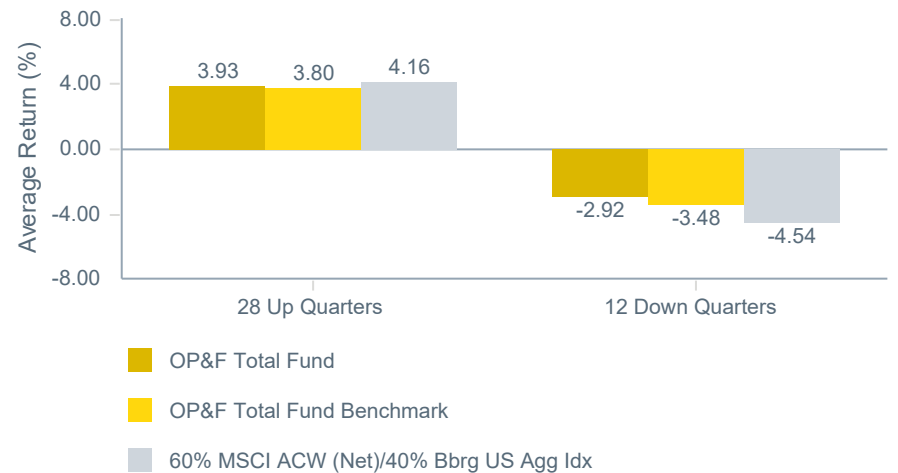
MPT Stats

	5 Years	10 Years
Maximum Return	10.66	10.66
Minimum Return	-13.55	-13.55
Standard Deviation	10.98	8.90
vs. OP&F Total Fund Benchmark		
Info Ratio	0.54	0.75
Tracking Error	1.71	1.41
Alpha	1.02	1.15
vs. S&P 500 Index (Cap Wtd)		
Beta	0.55	0.54
vs. ICE BofAML 3 Mo US T-Bill Index		
Sharpe Ratio	0.54	0.67

Asset Allocation vs. Targets

	Market Value (\$)	Allocation (%)	Target (%)
US Equity	4,127,718,865	22.73	20.40
International Equity	2,525,534,175	13.91	13.00
High Yield Fixed Income	1,442,135,786	7.94	8.00
US TIPS	1,429,268,015	7.87	7.50
Core Fixed Income	1,659,284,958	9.14	12.50
Private Credit	572,552,881	3.15	4.00
Real Estate	1,778,030,309	9.79	12.00
Private Markets	1,451,333,287	7.99	8.50
MLPs	1,199,814,914	6.61	5.00
Real Assets	1,105,560,154	6.09	6.60
Gold	178,708,905	0.98	0.50
Cash Equivalents	432,126,131	2.38	0.00
Commodities	254,296,287	1.40	2.00
Total Fund	18,156,364,668	100.00	100.00

Up/Down Markets - 10 Years

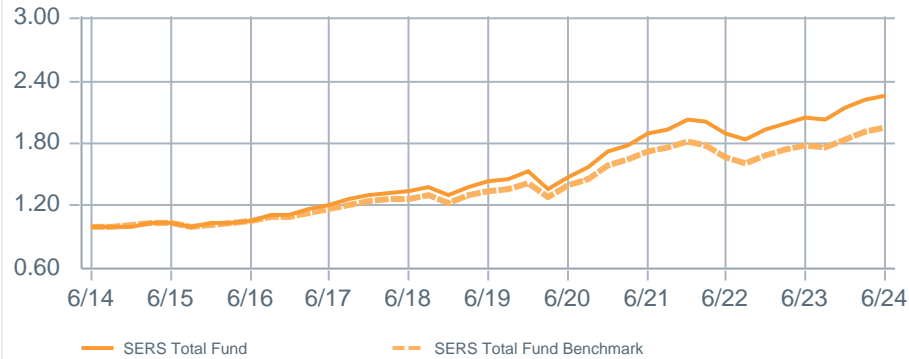


Performance shown is gross of fees. Calculations are based on quarterly periodicity. Allocations shown may not sum up to 100% exactly due to rounding. OP&F's target allocations are based on market value and does not reflect the notional exposures as a result of the embedded leverage in the asset allocation policy.

Summary

- SERS has generated 2.02% of alpha over the trailing 5-year period and 1.63% of alpha over the trailing 10-year period.
- Relative to a 60 Equity/40 Bond portfolio, SERS has exhibited similar up-market capture and smaller down-market capture characteristics over the past 10 years.

Growth of \$1 - 10 Years



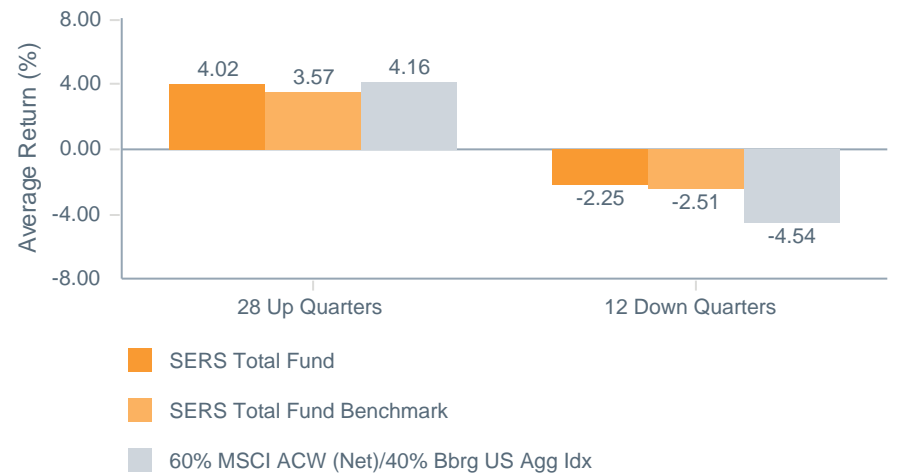
MPT Stats

	5 Years	10 Years
Maximum Return	9.94	9.94
Minimum Return	-11.00	-11.00
Standard Deviation	9.54	7.86
vs. SERS Total Fund Benchmark		
Info Ratio	1.51	1.48
Tracking Error	1.28	1.06
Alpha	1.72	1.26
vs. S&P 500 Index (Cap Wtd)		
Beta	0.48	0.48
vs. ICE BofAML 3 Mo US T-Bill Index		
Sharpe Ratio	0.78	0.89

Asset Allocation vs. Targets

	Market Value (\$)	Allocation (%)	Target (%)
Global Equity	8,345,504,817	43.95	41.00
Fixed Income	2,442,394,194	12.86	18.00
Private Credit	1,210,420,461	6.37	5.00
Real Estate	2,223,110,492	11.71	13.00
Infrastructure	1,234,690,123	6.50	7.00
Opportunistic Investments	530,168,539	2.79	0.00
Private Equity	2,519,201,833	13.27	13.00
Cash Equivalents	484,076,963	2.55	3.00
Total Fund	18,989,567,422	100.00	100.00

Up/Down Markets - 10 Years

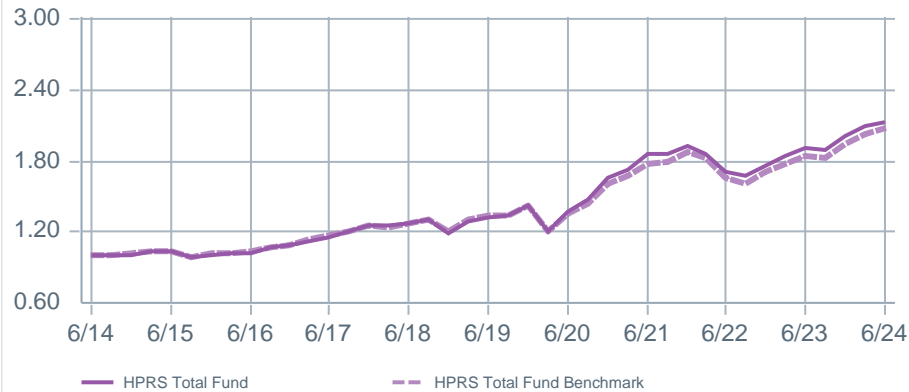


Performance shown is gross of fees. Calculations are based on quarterly periodicity. Allocations shown may not sum up to 100% exactly due to rounding.

Summary

- HPRS has generated 0.88% of alpha over the trailing 5-year period and 0.34% of alpha over the trailing 10-year period.
- Relative to a 60 Equity/40 Bond portfolio, the total portfolio has exhibited larger up-market and smaller down-market capture characteristics over the past 10 years.

Growth of \$1 - 10 Years



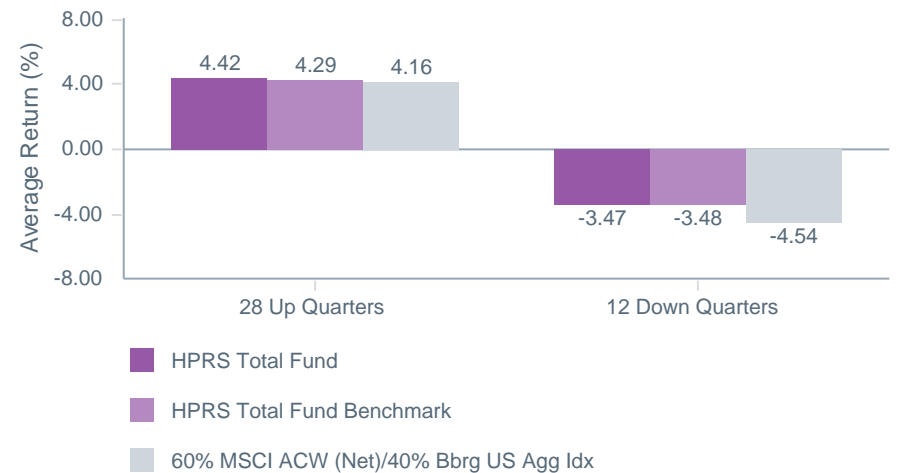
MPT Stats

	5 Years	10 Years
Maximum Return	13.60	13.60
Minimum Return	-14.84	-14.84
Standard Deviation	12.77	10.31
vs. HPRS Total Fund Benchmark		
Info Ratio	0.68	0.31
Tracking Error	1.23	1.11
Alpha	0.54	0.03
vs. S&P 500 Index (Cap Wtd)		
Beta	0.65	0.64
vs. ICE BofAML 3 Mo US T-Bill Index		
Sharpe Ratio	0.65	0.65

Asset Allocation vs. Targets

	Market Value (\$)	Allocation (%)	Target (%)
US Equity	241,489,966	21.51	20.00
International Equity	24,005,450	2.14	6.00
Global Equity	241,265,024	21.49	22.00
Fixed Income	125,954,865	11.22	15.00
Real Estate	81,083,391	7.22	8.00
Hedge Funds	57,431,918	5.12	6.00
Private Equity	224,883,261	20.03	15.00
Real Assets	58,516,879	5.21	4.00
Cash Equivalents	68,080,854	6.06	4.00
Total Fund	1,122,711,608	100.00	100.00

Up/Down Markets - 10 Years



Performance shown is gross of fees. Calculations are based on quarterly periodicity. Allocations shown may not sum up to 100% exactly due to rounding.

Ohio Retirement Study Council
HPRS Total Fund Performance vs. Peers

As of June 30, 2024

	Market Value (\$) (\$000)	Trailing Performance (%)						Calendar Year Performance (%)			
		2 Quarters	1 Year	3 Years	5 Years	7 Years	10 Years	2023	2022	2021	2020
HPRS	1,122,712	6.05	11.87	4.81	9.96	9.14	7.88	14.43	-8.92	16.92	16.86
HPRS Total Fund Benchmark		6.84	12.68	5.19	9.12	8.58	7.56	13.99	-9.21	16.63	13.16
Difference		-0.79	-0.81	-0.38	0.84	0.56	0.32	0.44	0.29	0.29	3.70
<i>All Public Plans > \$1B-TF Median</i>		5.13	10.03	3.26	7.52	7.47	6.88	11.53	-10.50	15.53	11.86
Rank		16	16	17	2	4	10	7	35	36	3
Population		154	153	148	146	143	142	235	239	281	294
<i>All Public Plans \$250M to \$1B-TF Median</i>		5.56	10.58	2.78	7.31	7.28	6.76	12.62	-12.81	14.29	12.97
Rank		35	29	5	1	2	6	23	9	17	9
Population		87	87	86	84	83	80	134	141	167	178

Performance shown is gross of fees but is net of embedded fees on externally managed real estate and alternative investments.



Appendix

Performance Related Comments

- Performance shown is gross of fees unless otherwise noted and is annualized for periods greater than one year.
- Peer group ranks are measured in percentiles.
- Total Fund performance shown is net of embedded fees on externally managed real estate and alternative investments.
- All quarterly market value and performance data, including custom benchmark performance, is provided by the individual Plans.
- In 2005, the 401(h) Health Care Trust portfolio assets were segregated from the pension portfolio and invested with a more conservative asset-allocation. In 2014, the 115 Health Care Trust portfolio was created as another funding vehicle for post-employment health care for members in the Traditional Pension Plan and Combined Plan. Assets were segregated into the 115 Health Care Trust beginning September 2014, with the initial health care disbursements from the trust commencing late 2015 for January 2016 premium reimbursements. Favorable rulings from the Internal Revenue Service received March 2016 allowed OPERS to consolidate health care assets from the VEBA Trust and the 401(h) Health Care Trust into the 115 Health Care Trust.

Asset Class Fee Comparison – as of 6/30/2024

	(annualized fees shown in basis points)							
	Domestic Equity	Global Equity	International Equity	Fixed Income	Real Estate	Private Equity	Hedge Funds	Other Alternatives
■ PERS (DB)	2	-	29	5	71	51	-	57
■ PERS (HC 115)	2	-	29	5	-	-	-	57
■ STRS	12	-	24	5	48	80	78	74
■ OP&F	44	-	43	48	55	69	-	77
■ SERS	20	-	53	27	81	98	-	108
■ HPRS	7	50	86	61	132	134	95	126

- Fees for Private Equity are based on committed capital, with the exception of SERS and OP&F, which is based on AUM.
- PERS (DB) and PERS (HC 115) Other Alternatives include Risk Parity, Opportunistic, and Commodities.
- PERS (DB) and PERS (HC 115) expenses for Real Estate, Other Alternatives, and Private Equity include net management fees and partnership expenses. Fees are estimated and are for externally managed accounts or portfolios.
- PERS (DB) and PERS (HC 115) are in the process of liquidating all Hedge Funds
- STRS Other Alternatives fees include Opportunistic/Diversified Investments excluding Hedge Fund exposure.
- OP&F Fixed income fee is the weighted average of Core Fixed Income, High Yield, Private Credit Fixed Income, and US TIPS. Core Fixed income and US TIPS fees are on the notional value of the portfolio.
- OP&F Other Alternatives fees include Real Assets, MLPs, Gold and Commodities.
- SERS Other Alternatives fees include Opportunistic and Tactical Portfolio.
- HPRS Other Alternatives fees include Real Assets.

Appendix

Percentage of Assets Managed by External Managers – as of 6/30/2024

Percentage of Assets Managed by External Managers - As of 6/30/2024								
	Total Fund	Domestic Equity	International Equity	Fixed Income	Real Estate	Private Equity	Hedge Funds	Other Alternatives
■ PERS (DB)	49%	3%	81%	19%	94%	100%	100%	26%
■ PERS (HC 115)	28%	3%	81%	15%	-	-	100%	23%
■ STRS	34%	6%	48%	9%	23%	90%	100%	81%
■ OP&F	100%	100%	100%	100%	100%	100%	-	100%
■ SERS	97%	100%	100%	97%	100%	100%	100%	100%
■ HPRS	100%	100%	100%	100%	100%	100%	100%	100%

- PERS (DB) and PERS (HC 115) Other Alternatives include Risk Parity, Opportunistic, and Commodities.
- STRS Other Alternatives include Opportunistic/Diversified Investments (includes Hedge Fund exposure).
- OP&F Other Alternatives include Real Assets, MLPs, and Gold.
- OP&F's Cash is 100% externally managed.
- SERS Other Alternatives include Opportunistic Investments and Tactical Portfolio.
- SERS has one internally-managed Cash mandate.
- HPRS Other Alternatives include Real Assets.

Percentage of Actively Managed Assets – as of 6/30/2024

Percentage of Assets Actively Managed - As of 6/30/2024								
	Total Fund	Domestic Equity	International Equity	Fixed Income	Real Estate	Private Equity	Hedge Funds	Other Alternatives
■ PERS (DB)	77%	18%	90%	88%	100%	100%	100%	100%
■ PERS (HC 115)	69%	18%	90%	81%	100%	-	100%	100%
■ STRS	90%	62%	100%	100%	100%	100%	100%	100%
■ OP&F	85%	80%	100%	80%	100%	100%	-	100%
■ SERS	82%	26%	93%	100%	99%	100%	100%	100%
■ HPRS	82%	18%	100%	100%	100%	100%	100%	100%

- PERS (DB) and PERS (HC 115) Other Alternatives include Risk Parity, Opportunistic, and Commodities.
- STRS Other Alternatives include Opportunistic/Diversified Investments (includes Hedge Fund exposure).
- OP&F Other Alternatives include Real Assets, MLPs, and Gold.
- SERS Other Alternatives include Opportunistic Investments and Tactical Portfolio.
- SERS has one internally-managed Cash mandate.
- HPRS Other Alternatives include Real Assets.

Custom Benchmark Glossary

PERS (DB) Total Fund Custom Benchmark:

- 21.6% Russell 3000 Index
- 20.0% PERS (DB) International Equity Custom Benchmark
- 10.0% PERS (DB) Core Fixed Income Custom Benchmark
- 3.0% Bloomberg U.S. Treasury Index
- 4.0% Bloomberg U.S. High Yield Index
- 1.0% PERS (DB) EMD Custom Benchmark
- 1.0% PERS (DB) Securitized Debt Custom Benchmark
- 3.0% Bloomberg U.S. TIPS Index
- 3.0% Bloomberg U.S. Corporate Bond Index
- 12.0% PERS (DB) Real Estate Custom Benchmark
- 1.0% Dow Jones U.S. Select Real Estate Securities TR Index
- 15.0% PERS (DB) Private Equity Custom Benchmark
- 1.4% PERS (DB) Opportunistic Custom Benchmark
- 2.0% Commodities Custom Benchmark
- 2.0% PERS (DB) Risk Parity Custom Benchmark

PERS (HC 115) Total Fund Custom Benchmark:

- 25.6% Russell 3000 Index
- 25.0% PERS (HC 115) International Equity Custom Benchmark
- 16.0% PERS (HC 115) Core Fixed Income Custom Benchmark
- 1.0% PERS (HC 115) EMD Custom Benchmark
- 5.0% Bloomberg U.S. High Yield Index
- 3.0% PERS (HC 115) Securitized Debt Custom Benchmark
- 7.0% Bloomberg U.S. TIPS Index
- 5.0% Dow Jones U.S. Select Real Estate Securities TR Index
- 1.4% PERS (HC 115) Opportunistic Custom Benchmark
- 3.0% Commodities Custom Benchmark
- 3.0% PERS (HC 115) Risk Parity Custom Benchmark
- 2.0% Bloomberg U.S. Treasury Index
- 3.0% Bloomberg U.S. Corporate Bond Index

STRS Total Fund Custom Benchmark:

- 26.0% Russell 3000 Index
- 22.0% MSCI World Ex US Index (50% Hedged)/ MSCI Emg Mkts Index
- 22.0% STRS Fixed Income Blended Benchmark
- 10.0% STRS Real Estate Custom Benchmark
- 19.0% Alternative Investment Blended Benchmark
- 1.0% ICE BofA US 3-Month Treasury Bill Index

OP&F Total Fund Custom Benchmark:

- 16.32% Wilshire 5000 Index
- 10.4% MSCI ACW Ex US IMI Index (Net)
- 20.0% Bloomberg US Aggregate Bond Index + Leverage Factor
- 6.4% CS High Yield Dev. Countries Only Index
- 12.0% Bridgewater Custom US TIPS Index
- 3.2% S&P LTSA Levered Loan Index + 2%
- 9.6% NCREIF ODCE (Net) (1 Quarter Lag)
- 5.28% OP&F Real Assets Custom Index
- 4.0% Alerian MLP Index
- 6.8% OP&F Private Equity Custom Benchmark
- 1.6% Bloomberg Commodity TR Index
- 4.4% S&P GSCI Gold Index Minus the Cost of Financing

*OP&F's target allocations are based on notional value, and have been scaled to 100% for this report.

SERS Total Fund Custom Benchmark:

- 41.0% MSCI All Country World Net Total Return Index (USD)
- 18.0% Bloomberg Barclays US Aggregate Bond Index
- 13.0% NCREIF Property Index (1 Quarter Lag)
- 7.0% Quarterly Smoothed CPI +1.20% per Quarter
- 5.0% 90 Day T-Bill + 4.5%
- 13.0% Burgiss All Private Equity (1 Quarter Lag)
- 3.0% FTSE 30 Day T-Bill Index

HPRS Total Fund Custom Benchmark:

- 20.0% Russell 3000 Index
- 6.0% HPRS International Equity Custom Benchmark
- 22.0% MSCI ACWI Index
- 15.0% HPRS Fixed Income Custom Benchmark
- 8.0% HPRS Total Real Estate Composite (Net)
- 6.0% HFRI FOF Composite Index
- 15.0% HPRS Total Private Equity Composite
- 4.0% HPRS Real Assets Composite (Net)
- 4.0% BofA Merrill Lynch 91-Day T-Bill

Custom Benchmark Glossary

PERS (DB) International Equity Custom Benchmark:

- 55% MSCI World Ex US Standard Index
- 10% MSCI World Ex US Small Cap Index
- 31% MSCI Emerging Markets Standard Index
- 4% MSCI Emerging Markets Small Cap Index

PERS (DB) Core Fixed Income Custom Benchmark:

- Bloomberg US Aggregate Bond Index
- From 2012-2014: Barclays Capital 75% U.S. Aggregate ex Govt/25% U.S. Govt Index

PERS (DB) EMD Custom Benchmark:

- 50% JP Morgan Emerging Markets Bond Index Global
- 50% JP Morgan Government Bond Index-Emerging Markets Global Diversified

PERS (DB) Securitized Debt Custom Benchmark:

- 50% Bloomberg Non-Agency Investment Grade CMBS: BBB Total Return Index (Unhedged) (USD)
- 50% Bloomberg Non-Agency CMBS Agg Eligible Total Return Index Value (Unhedged) (USD)
- Prior to 2018: Non-Agency CMBS component of the U.S. Aggregate Index plus 160 annualized basis points

PERS (DB) Real Estate Custom Benchmark:

- NFI-ODCE Index (Net) + 0.85% (1 Quarter Lag)
- Prior to 2013: NCREIF Property Index (1 Quarter Lag)

PERS (DB) Private Equity Custom Benchmark:

- State Street Private Equity Index (1 Quarter Lag)
- Prior to 2015: 60% Russell 3000 Index, 40% MSCI ACWI Ex US IMI plus 300 basis points (1 Quarter Lag)
- Prior to 2013: Russell 3000 Index + 300 bps (1 Quarter Lag)

PERS (DB) Hedge Funds Custom Benchmark:

- 65% HFRI Event Driven (Total) Index
- 35% HFRI Relative (Total) Index

PERS (DB) Opportunistic Custom Benchmark:

- Russell 2000 Index
- Bloomberg Gold Subindex Total Return
- Prior to Q4 2023:S&P Risk Parity 10% Target Volatility Index
- Russell 2000 Index
- Bloomberg Gold Subindex Total Return

PERS (DB) Risk Parity Custom Benchmark:

- External: HFR Risk Parity Institutional Custom Index
- Internal: S&P Risk Parity 10% Target Volatility Index
- Prior to Q4 2023: HFR Risk Parity Institutional Custom Index

PERS (DB) Commodity Custom Benchmark:

- Bloomberg Commodity Index
- Prior to Q3 2021: Goldman Sachs Commodity Index

PERS (HC 115) International Equity Custom Benchmark:

- 55% MSCI World Ex US Standard Index
- 10% MSCI World Ex US Small Cap Index
- 31% MSCI Emerging Markets Standard Index
- 4% MSCI Emerging Markets Small Cap Index

PERS (HC 115) Core Fixed Income Custom Benchmark:

- Bloomberg US Aggregate Bond Index
- From 2012-2014: Barclays Capital 75% U.S. Aggregate ex Govt/25% U.S. Govt Index

PERS (HC 115) EMD Custom Benchmark:

- 50% JP Morgan Emerging Markets Bond Global Index
- 50% JP Morgan Government Bond Index-Emerging Markets Global Diversified

PERS (HC 115) Securitized Debt Custom Benchmark:

- 50% Bloomberg Non-Agency Investment Grade CMBS: BBB Total Return Index (Unhedged) (USD)
- 50% Bloomberg Non-Agency CMBS Agg Eligible Total Return Index Value (Unhedged) (USD)
- Prior to 2018: Non-Agency CMBS component of the U.S. Aggregate Index plus 160 annualized basis points

PERS (HC 115) Hedge Funds Custom Benchmark:

- 65% HFRI Event Driven (Total) Index
- 35% HFRI Relative (Total) Index

PERS (HC 115) Opportunistic Custom Benchmark:

- Russell 2000 Index
- Bloomberg Gold Subindex Total Return
- Prior to Q4 2023:S&P Risk Parity 10% Target Volatility Index
- Russell 2000 Index
- Bloomberg Gold Subindex Total Return

Custom Benchmark Glossary

PERS (HC 115) Risk Parity Custom Benchmark:

- External: HFR Risk Parity Institutional Custom Index
- Internal: S&P Risk Parity 10% Target Volatility Index
- Prior to Q4 2023: HFR Risk Parity Institutional Custom Index

PERS (HC 115) Commodity Custom Benchmark:

- Goldman Sachs Commodity Index

STRS International Equity Custom Benchmark:

- 80% MSCI EAFE Index
- 20% MSCI Emerging Markets Index

STRS Real Estate Custom Benchmark:

- 85% NCREIF Property Index
- 15% FTSE NAREIT Equity REITs Index

STRS Private Equity Benchmark:

- The Private Equity Benchmark is the quarterly Cambridge Associates Private Equity and Venture Capital Index, one quarter lagged to be consistent with external fund reporting, effective July 1, 2021.

STRS Opportunistic/Diversified Blended Benchmark:

- Effective July 1, 2021, the Opportunistic/diversified blended benchmark consists of the actual Opportunistic Investments Portfolio weight multiplied by the Cambridge Associates Private Credit Index one quarter lagged to be consistent with external fund reporting plus the actual weight of the Diversified Investments Portfolio multiplied by the HFRI Fund of Funds Composite Index, which is a monthly index where subsequent revisions will be reflected in the following period.

OP&F Real Assets Custom Benchmark:

- 45% FTSE Dev Core 50/50 Infrastructure Index
- 35% NCREIF Timberland Index
- 20% NCREIF Farmland Index (1 Quarter Lag)

OP&F Private Equity Custom Benchmark:

- Actual net of fee return of the Private Equity Composite

SERS International Equity Custom Benchmark:

- MSCI ACW Ex US Index (USD) (Net)
- Prior to 2014Q1: MSCI ACWI ex-US (Net) Index (dev. markets 50% hedged)
- Prior to 2013Q3: MSCI ACWI ex-US (Gross) Index (dev. markets 50% hedged)

SERS Opportunistic Custom Benchmark:

- Bloomberg US Aggregate Bond Index + 2%
- Prior to 2020Q1: SERS Total Fund Custom Benchmark

HPRS International Equity Custom Benchmark:

- 67% MSCI Emerging Markets
- 33% MSCI EAFE Small Cap

HPRS Fixed Income Custom Benchmark:

- 40% Bloomberg Aggregate Bond Index
- 60% Credit Suisse Leveraged Loans

HPRS Total Private Equity Custom Benchmark:

- Private Equity Composite Performance
- Prior to 2017Q1: Wilshire 5000 + 3% (1 Quarter Lag)
- Prior to 2010Q3: CPI + 5%

Glossary

Alpha - A measure of the difference between a portfolio's actual returns and its expected performance, given its level of risk as measured by beta. It is a measure of the portfolio's historical performance not explained by movements of the market.

Benchmark - A standard against which the performance of a fund or investment manager can be measured.

Beta - A measure of the sensitivity of a portfolio to the movements in the market. A beta of 1.0 indicates the same level of stock market risk as the S&P 500 Index (Cap Wtd), unless otherwise noted. Lower betas indicate lower stock market risk. Beta is a measure of a portfolio's non-diversifiable or systematic risk.

Capital Markets Review -

Breakeven Inflation - Measures the expected inflation rate at each stated maturity by taking the difference between the real yield of the inflation-linked maturity curve and the yield of the closest nominal Treasury maturity.

Consumer Confidence - Measures domestic consumer confidence as defined by the degree of optimism on the state of the economy that consumers express through saving and spending.

Consumer Price Index (CPI) - Measures the change in the price level of consumer goods and services.

Option-Adjusted Spread - Measures the flat spread of an index or bond to the Treasury yield curve after removing the effect of any embedded options.

Purchasing Managers Index (PMI) - Measures economic activity by surveying purchasing managers on a monthly basis as to whether business conditions have improved, worsened, or stayed the same.

US Dollar Total Weighted Index - Measures the value of the US Dollar relative to a basket of other world currencies. It is calculated as the weighted geometric mean of the dollar's value versus the EUR, GBP, CAD, SEK, CHF, and JPY.

VIX - Measures the implied volatility of S&P 500 Index options by looking at the market's expectation of the S&P 500 Index volatility over the next 30 day period. Commonly referred to as the "fear index" or the "fear gauge."

Downside Risk - A measure similar to standard deviation, but focuses only on the negative returns of the fund or investment. The higher the factor, the riskier the fund or investment.

Correlation - A statistical measure of the relationship between asset class returns. A value of 1.00 is a perfect correlation; that is, the asset classes always move in the same direction. A value of -1.00 indicates a perfect negative correlation, in which the asset classes always move in opposite directions of each other. A value of 0 indicates there is no relationship between the direction of returns of the two asset classes. Correlation calculations only consider the direction of changes relative to two variables and not the magnitude of those changes.

Down Market Capture - Down market by definition is negative benchmark return and down market capture represents the ratio in % terms of the average portfolios return over the benchmark during the down market period. The lower the value of the down market capture the better the product's performance.

Excess Return - Arithmetic difference between the fund or investment return and the risk-free return (or other specified market index) over a specified time period, shown on an annualized basis.

Indices - All indices and related information are considered intellectual property and are licensed by each index provider. The indices may not be copied, used or distributed without the index provider's prior written approval. Index providers make no warranties and bear no liability with respect to the indices, any related data, their quality, accuracy, suitability and/or completeness.

Information Ratio - Measured by dividing the active rate of return by the tracking error. The higher the information ratio, the more value-added contribution relative to the market benchmark.

Maximum Return - The maximum quarterly return earned over the specified time period.

Minimum Return - The minimum quarterly return earned over the specified time period.

Glossary

Thematic Classification - Represents dedicated manager allocations; as such, thematic allocations are approximations. RVK categorizes the following asset classes as Alpha, Capital Appreciation, Capital Preservation, and Inflation:

Alpha

Absolute Return Strategies
Currency Overlay
GTAA (Global Tactical Asset Allocation)

Capital Appreciation

Public Equity
Private Equity
Preferred Securities
High Yield
Convertible Fixed Income
TALF Funds
Distressed Debt
Emerging Market Fixed Income
MLPs
Value Added Real Estate
Opportunistic Real Estate

Capital Preservation

Core Fixed Income
CMBS Fixed Income
Asset Backed Fixed Income
Domestic Core Plus Fixed Income
Mortgage Backed Fixed Income
International Developed Fixed Income
Cash Equivalents
Stable Value

Inflation

TIPS
Bank Loans
Core Real Estate
Real Return
Inflation Hedges
REITs
Commodities

Tracking Error - A measure of the standard deviation of a portfolio's performance relative to the performance of an appropriate market benchmark.

Unit Value - The dollar value of a portfolio, assuming an initial nominal investment of \$1.00, growing at the compounded rate of %Return for a given period.

Up Market Capture - Up market by definition is positive benchmark return and up market capture represents the ratio in % terms of the average portfolios return over the benchmark during the up market period. The higher the value of the up market capture the better the product's performance.

PORTLAND

BOISE

CHICAGO

NEW YORK

Disclaimer of Warranties and Limitation of Liability - This document was prepared by RVK, Inc. (RVK) and may include information and data from some or all of the following sources: client staff; custodian banks; investment managers; specialty investment consultants; actuaries; plan administrators/record-keepers; index providers; as well as other third-party sources as directed by the client or as we believe necessary or appropriate. RVK has taken reasonable care to ensure the accuracy of the information or data, but makes no warranties and disclaims responsibility for the accuracy or completeness of information or data provided or methodologies employed by any external source. This document is provided for the client's internal use only and does not constitute a recommendation by RVK or an offer of, or a solicitation for, any particular security and it is not intended to convey any guarantees as to the future performance of the investment products, asset classes, or capital markets.

