

What’s going on in the marketplace?

September was a reversal of August. Global equity markets rose as investors stopped to take a deep breath and reconsider the same concerns that have pushed and pulled markets for some time. Perhaps the slowdown in global growth will not be as severe as once thought. Trade tensions between the U.S. and China, and Brexit concerns seemed to abate somewhat. These matters, plus a more dovish Fed gave some comfort to equity investors. As such, bond markets came off somewhat as interest rates moved off the prior month’s lows.

U.S. Equities

U.S. markets gained approximately 2.0% during the month per the Russell 3000. All market cap segments produced positive returns led by mid-caps, which earned just over 3.0%. Both small and large caps returned roughly 2.0%. In a shift, value significantly outpaced growth by 3.7% (R3000V 3.7%, R3000G 0.0%).

During the month, the KRS U.S. equity portfolio outperformed the Russell 3000 Index by 23 bps (2.0% vs 1.8%). The portfolio benefited both from solid stock selection and allocation effects. Outside of one, all strategies either performed in line or outperformed their respective indices. The portfolio being smaller in terms of market cap was also additive as mid and small caps outperformed there large cap counterparts (MC 3.1%, SC 2.1%, LC 1.9%).

Non-U.S. Equities

Non-U.S. equities markets performed well during the period gaining 2.6% per the MSCI ACWI-Ex US Index. Both developed and emerging markets performed well; however, developed markets outperformed their emerging counterparts, 2.8% compared to 1.9%.

The KRS Non-U.S. equity portfolio gained 2.4% during the month, which trailed the index by 11 bps (2.6%). Relative underperformance was due to weaker stock selection from three of the active strategies, which were significantly offset by strong selection from the remaining mandate. Allocation decisions had little effect on the period’s relative performance.

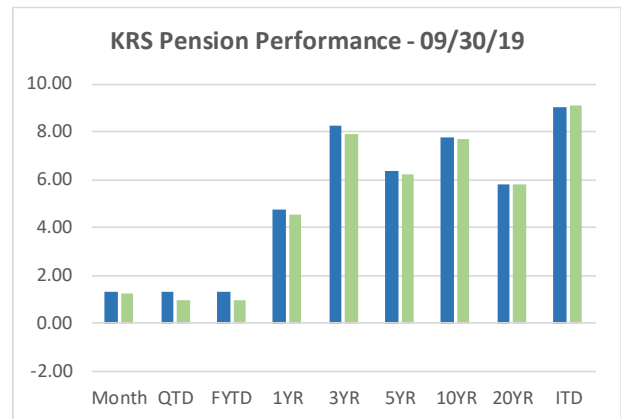
Fixed Income

The fixed income markets were mixed during the month. The leverage loan segment rose 0.5% and the corporate high yield market gained 0.4%. The intermediate and aggregate market segments fell -23 bps and -53 bps, respectively.

The KRS specialty credit allocation earned 0.3% versus a benchmark return 0.4%. In general, relative strategy performance was mixed, led by solid performance in the leveraged loan space. The KRS core fixed income portfolio fell -17 bps versus the Bloomberg Barclays Aggregate return of -0.5%. Relative performance was bolstered by the intermediate credit mandates, which held up better, failing just 23 bps.

Alternative Assets

The diversifying strategy group gained 2.1% during the month. Three of the four major portfolio segments provided positive returns. The Real Estate allocation led the way, earning nearly 4.2%. The Real Return and Opportunistic portfolios followed,



returning 1.7% and 0.9%, respectively. The Absolute Return portion of the portfolio lost -48 bps during the period, however; it did outperform its index return of -0.6%. The Private Equity portion of the portfolio provided a return of 1.6%.

Cash

The cash portfolio performed inline during the month (0.2% vs 0.2%). The cash allocation finished the period above target (3.8%) in part due to the continued transitioning of assets to the newly approved asset allocations. The overweight had a slightly adverse effect on the fund's relative performance as most asset classes outperformed cash during the period.

NOTES:

- 1) Returns displayed are "net". For the purposes of this report, total fund return information is net of fees and expenses, with audited data beginning in July 2011. At the manager level returns are net of fees beginning with July 2011, and gross of fees for prior data.
- 2) Individual plan allocation and performance (pg.4).
- 3) Prior to January 1, 2014, the inception date for the Private Equity asset class was stated as 10/1/1990 for Pension Fund and 6/1/2001 for Insurance Fund. Prior to 07/01/02, the characteristics of the allocation, and the benchmark itself, were more closely aligned with Real Estate. As such, it is not appropriate to report this portion of the return stream within the Private Equity allocation, whose true inception date has been determined to be 07/01/02 based on funding the Systems' first private equity mandate. The portion of the original return streams that are no longer reported within the Private Equity allocation (Pension from 10/1/90 to 06/30/02; Insurance 06/01/01 to 06/30/02) are reported within the Fund Level performance figures.
- 4)

Private Equity Composite (Pension) Inception (07/01/02) to 06/30/11 60.00% S&P 1500 Composite Index 40.00% Barclays US Corporate High Yield Index 07/01/11 to 12/31/15 100.00% Russell 3000 Index + 4% (Qtr Lag) 01/01/16 to Present 100.00% Russell 3000 Index + 3% (Qtr Lag)	Private Equity Composite (Insurance) Inception (07/01/02) to 06/30/11 80.00% S&P 1500 Composite Index 20.00% Barclays US Corporate High Yield Index 07/01/11 to 12/31/15 100.00% Russell 3000 Index + 4% (Qtr Lag) 01/01/16 to Present 100.00% Russell 3000 Index + 3% (Qtr Lag)
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- 5) The Private Equity & Real Return Benchmarks, from one month returns up until five year returns, is equal to the performance of the associated KRS allocations. Given there is not appropriate benchmark to use for short term performance evaluation, this will allow greater focus on longer term returns, which is more appropriate given the long term nature of these investments.

<u>Pension Benchmark Composite 01/01/16 to 08/31/17</u> US Equity: Russell 3000 (25.6%) Non US Equity: MSCI AXCI Ex-US IMI (25.2%) Global Fixed Income: Barclays Universal Index (6.8%) Credit Fixed Income: Barclays US High Yield (7.2%) Real Estate: NCREIF ODCE (5.0%) Absolute Return: HFRI Diversified FOF (10.0%) Real Return: Allocation Specific (8.0%) Private Equity<5Yrs: Actual Performance Private Equity>5Yrs: Russell 3000 Index+3% (10.0%) Cash: Cit Grp 3-mos Treasury Bill (2.2%) <u>Pension Benchmark Composite 09/01/17 to 05/31/18 -</u> <u>Transition Period w/Sliding Targets</u> US Equity: Russell 3000 (23.6%) Non US Equity: MSCI AXCI Ex-US IMI (23.2%) Global Fixed Income: Barclays Universal Index (9.0%) Credit Fixed Income: Barclays US High Yield (9.0%) Real Estate: NCREIF ODCE (5.0%) Absolute Return: HFRI Diversified FOF (10.0%) Real Return<5yrs: Actual Performance	<u>Insurance Benchmark Composite 01/01/16 to 08/31/17</u> US Equity: Russell 3000 (26.5%) Non US Equity: MSCI AXCI Ex-US IMI (26.5%) Global Fixed Income: Barclays Universal Index (6.0%) Credit Fixed Income: Barclays US High Yield (6.0%) Real Estate: NCREIF ODCE (5.0%) Absolute Return: HFRI Diversified FOF (10.0%) Real Return: Allocation Specific (8.0%) Private Equity<5Yrs: Actual Performance Private Equity>5Yrs: Russell 3000 Index+3% (10.0%) Cash: Cit Grp 3-mos Treasury Bill (2.0%) <u>Insurance Benchmark Composite 09/01/17 to 05/31/18 -</u> <u>Transition Period w/Sliding Targets</u> US Equity: Russell 3000 (24.5%) Non US Equity: MSCI AXCI Ex-US IMI (24.5%) Global Fixed Income: Barclays Universal Index (8.0%) Credit Fixed Income: Barclays US High Yield (8.0%) Real Estate: NCREIF ODCE (5.0%) Absolute Return: HFRI Diversified FOF (10.0%) Real Return<5yrs: Actual Performance
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Real Return>5yrs: CPI+3% (8%)
Private Equity<5Yrs: Actual Performance
Private Equity>5Yrs: Russell 3000 Index+3% (10.0%)
Cash: Cit Grp 3-mos Treasury Bill (2.2%)
Pension Benchmark Composite 06/01/18 to Present
US Equity: Russell 3000 (17.0%)
Non US Equity: MSCI AXCI Ex-US IMI (21.0%)
Global Fixed Income: Barclays Universal Index (13.0%)
Credit Fixed Income: Barclays US High Yield (12.4%)
Real Estate: NCREIF ODCE (5.0%)
Absolute Return: HFRI Diversified FOF (10.0%)
Real Return<5yrs: Actual Performance
Real Return>5yrs: CPI+3% (10.0%)
Private Equity<5Yrs: Actual Performance
Private Equity>5Yrs: Russell 3000 Index+3% (9.4%)
Cash: Cit Grp 3-mos Treasury Bill (2.2%)

**Fund composite benchmark is a roll-up of individual plans, which may differ from one another.

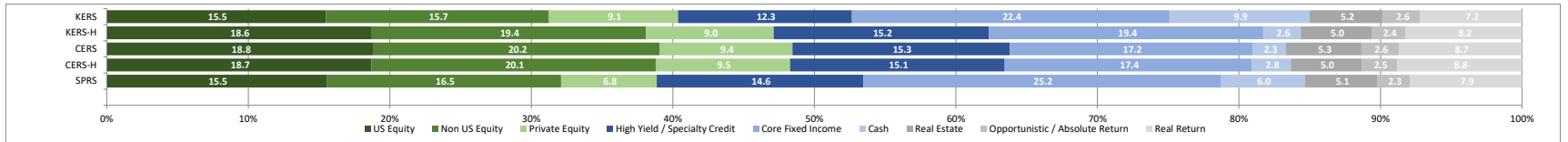
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KENTUCKY RETIREMENT SYSTEMS - PENSION FUND - NET RETURNS - 09/30/19

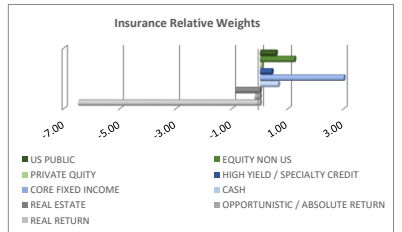
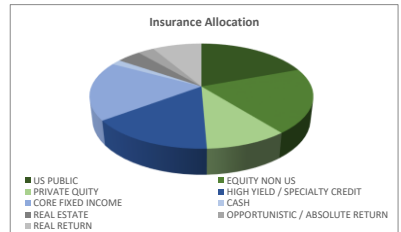
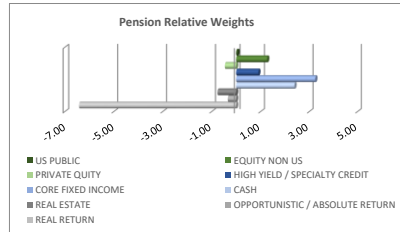
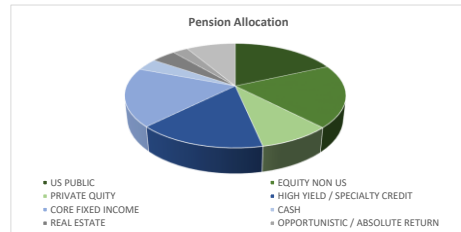
Structure	Benchmark	Inception	Market Value	% of Total	Month		QTD		Fiscal YTD		1 Year		3 Years		5 Years		10 Years		20 Years		ITD	
					KRS	Benchmark	KRS	Benchmark	KRS	Benchmark	KRS	Benchmark	KRS	Benchmark	KRS	Benchmark	KRS	Benchmark	KRS	Benchmark	KRS	Benchmark
TOTAL FUND	KY Ret. Blended Index	4/1/1984	12,902,082,447.45	100.00	1.32	1.21	1.28	0.97	1.28	0.97	4.77	4.55	8.28	7.94	6.33	6.24	7.78	7.72	5.77	5.80	9.02	9.12
GROWTH	KY Ret. Blended Index	7/1/2018	8,074,178,575.88	62.58	1.64	1.23	1.23	1.23	1.23	1.23	3.82	4.55	8.28	7.94	6.33	6.24	7.78	7.72	5.77	5.80	9.02	9.12
US PUBLIC	KY Domestic Equity Blend	4/1/1984	2,355,442,991.25	18.26	1.99	1.76	1.27	1.16	1.27	1.16	2.79	2.92	12.25	12.83	9.85	10.44	12.49	13.11	6.55	6.95	11.21	11.27
EQUITY NON US	KY Ret.Int'l Eq. Blended Index	7/1/2000	2,511,768,193.56	19.47	2.44	2.55	-1.16	-1.72	-1.16	-1.72	-0.73	-1.84	7.56	6.26	4.36	3.10	5.01	4.82	3.04	3.23	3.04	3.23
PRIVATE QUITY	Russell 3000 + 3%(Qtr Lag)	7/1/2002	1,153,844,067.59	8.94	1.56	1.56	5.09	5.09	5.09	5.09	11.14	11.14	14.05	14.05	11.50	11.50	13.83	15.74			11.34	11.48
HIGH YIELD / SPECIALTY CREDIT	High Yield Custom Benchmark	7/1/2017	2,039,123,323.48	15.91	0.33	0.42	2.00	1.16	2.00	1.16	6.76	4.73									6.56	4.62
FIXED INCOME / LIQUIDITY	Bloomberg Barclays US Aggregate	7/1/2018	2,830,675,544.62	21.94	-0.11	1.22	1.25	1.25	1.25	1.25	6.97										6.02	
CORE FIXED INCOME	Bloomberg Barclays US Aggregate	7/1/2013	2,341,871,106.26	18.15	-0.17	-0.53	1.37	2.27	1.37	2.27	7.92	10.30	2.64	2.92	3.44	3.38					3.39	3.43
CASH	Citigroup Treasury Bill-3 Month	1/1/1988	488,804,438.36	3.79	0.18	0.17	0.57	0.56	0.57	0.56	2.45	2.36	1.90	1.52	1.28	0.96	0.89	0.52	2.16	1.73	3.55	3.11
DIVERSIFYING STRATEGIES	1,997,544,567.81	7/1/2018	15.48	2.09		1.58		1.58		5.81											5.39	
REAL ESTATE	NCREIF NFI-ODCE Net 1 Qtr in Arrears Index	7/1/1984	547,646,427.20	4.24	4.17	0.77	4.08	0.77	4.08	0.77	10.17	5.46	10.64	6.61	9.82	8.76	10.78	8.87	7.77	7.35	6.26	6.43
OPPORTUNISTIC / ABSOLUTE RETURN	HFRF Diversified		343,298,153.44	2.66	-0.48	-0.59	-0.43	-0.63	-0.43	-0.63	-1.09	0.55	2.47	3.28	1.57	2.07					3.49	2.79
REAL RETURN	Pension Real Return Custom Benchmark	7/1/2011	1,106,599,987.17	8.58	1.71	1.71	0.67	0.67	0.67	0.67	5.05	5.05	3.94	3.94	2.72	2.72					3.83	2.82

KENTUCKY RETIREMENT SYSTEMS - PENSION FUND - PLAN NET RETURNS - 09/30/19

Plan	Benchmark	Inception	Market Value	% of Total	Month		3 Months		Fiscal YTD		1 Year		3 Years		5 Years		10 Years		20 Years		ITD	
					KRS	Benchmark	KRS	Benchmark	KRS	Benchmark	KRS	Benchmark	KRS	Benchmark	KRS	Benchmark	KRS	Benchmark	KRS	Benchmark	KRS	Benchmark
KERS	KY Ret. KERS Plan Index		2,277,762,392.91	100.00	1.09	1.03	1.41	1.03	1.41	1.03	4.80	4.88	7.60	7.46	5.83	5.97	7.56	7.59	5.66	5.73	8.95	9.08
KERS-H	KY Ret. KERS Haz Plan Index		692,431,655.61	100.00	1.33	1.24	1.25	0.99	1.25	0.99	4.60	4.53	8.30	8.13	6.35	6.16	7.79	7.70	5.77	5.79	9.02	9.11
CERS	KY Ret. CERS Plan Index		7,215,246,566.99	100.00	1.38	1.24	1.23	0.99	1.23	0.99	4.69	4.53	8.38	8.14	6.41	6.16	7.81	7.70	5.78	5.79	9.03	9.11
CERS-H	KY Ret. CERS Haz Plan Index		2,430,493,410.34	100.00	1.36	1.24	1.20	0.99	1.20	0.99	4.68	4.53	8.36	8.13	6.43	6.16	7.82	7.70	5.78	5.79	9.03	9.11
SPRS	KY Ret. SPRS Plan Index		286,148,414.32	100.00	1.16	1.03	1.36	1.03	1.36	1.03	4.93	4.88	7.80	7.68	5.74	5.91	7.48	7.57	5.62	5.73	8.93	9.07



Note: The above chart displays the average monthly allocation.

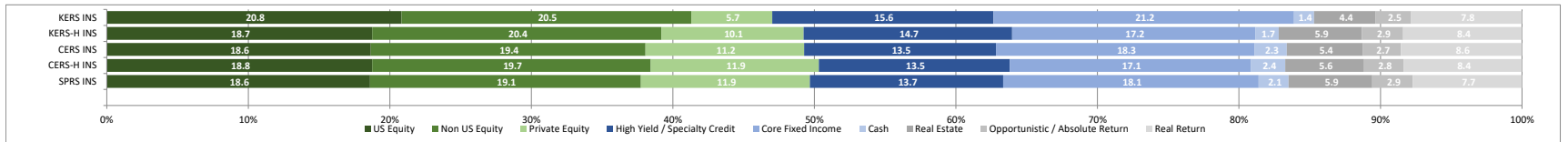


KENTUCKY RETIREMENT SYSTEMS - INSURANCE FUND - NET RETURNS - 09/30/19

Structure	Benchmark	Inception	Market Value	% of Total	Month		QTD		Fiscal YTD		1 Year		3 Years		5 Years		10 Years		20 Years		ITD	
					KRS	Benchmark	KRS	Benchmark	KRS	Benchmark	KRS	Benchmark	KRS	Benchmark	KRS	Benchmark	KRS	Benchmark	KRS	Benchmark	KRS	Benchmark
TOTAL FUND	KY Ret. Blended Index	4/1/1987	5,510,309,004.08	100.00	1.31	1.18	1.15	0.81	1.15	0.81	4.55	4.38	8.43	8.13	6.48	6.47	7.65	8.09	5.21	5.48	7.39	7.73
GROWTH	Growth Custom Benchmark	7/1/2018	3,569,233,010.30	64.77	1.61	2.52	1.01	0.99	1.01	0.99	3.59	4.26	8.43	8.13	6.48	6.47	7.65	8.09	5.21	5.48	7.39	7.73
US PUBLIC	KY Domestic Equity Blend	7/1/1992	3,064,379,511.88	19.32	1.98	1.76	1.25	1.16	1.25	1.16	2.79	2.92	12.26	12.83	10.10	10.44	12.52	13.03	6.75	6.64	9.63	9.54
EQUITY NON US	KY Ret.Int'l Eq. Blended Index	4/1/2000	1,101,050,679.85	19.98	2.40	2.55	-1.19	-1.72	-1.19	-1.72	-0.90	-1.84	7.45	6.26	4.23	3.10	4.72	4.68	3.02	2.43	3.02	2.43
PRIVATE QUITY	Russell 3000 + 3%(Qtr Lag)	7/1/2002	554,094,930.88	10.06	1.28	1.28	3.62	3.62	3.62	3.62	10.08	10.08	14.76	14.76	13.55	13.55	15.06	15.78			10.36	10.94
HIGH YIELD / SPECIALTY CREDIT	Bloomberg Barclays US High Yield	7/1/2017	849,707,887.69	15.42	0.34	0.42	1.97	1.16	1.97	1.16	6.69	4.73									6.25	4.62
FIXED INCOME / LIQUIDITY	Bloomberg Barclays US Aggregate	7/1/2018	1,090,529,515.04	19.79	-0.11	1.27	1.27	1.27	1.27	1.27	6.81										5.91	3.43
CORE FIXED INCOME	Bloomberg Barclays US Aggregate	7/1/2013	999,540,816.29	18.14	-0.15	-0.53	1.33	2.27	1.33	2.27	7.85	10.30	2.61	2.92	3.08	3.38					3.06	3.43
CASH	Citigroup Treasury Bill-3 Month	7/1/1992	90,988,698.75	1.65	0.17	0.17	0.57	0.56	0.57	0.56	2.39	2.36	1.66	1.52	1.11	0.96	0.69	0.52	1.92	1.73	2.63	2.50
DIVERSIFYING STRATEGIES	850,761,148.74	7/1/2018	15.44	1.95		1.60		1.60		5.92											5.43	
REAL ESTATE	NCREIF NFI-ODCE Net 1 Qtr in Arrears Index	5/1/2009	227,114,222.36	4.12	4.34	0.77	4.24	0.77	4.24	0.77	10.48	5.46	10.86	6.61	10.04	8.76					9.40	5.96
OPPORTUNISTIC / ABSOLUTE RETURN	HFRF Diversified		154,495,835.65	2.81	-0.45	-0.59	-0.41	-0.63	-0.41	-0.63	-1.04	0.55	2.49	3.28	1.60	2.07					3.44	2.79
REAL RETURN	Pension Real Return Custom Benchmark	7/1/2011	469,151,090.73	8.51	1.42	1.42	0.61	0.61	0.61	0.61	5.07	5.07	3.66	3.66	2.60	2.60					3.57	2.87

KENTUCKY RETIREMENT SYSTEMS - INSURANCE FUND - PLAN NET RETURNS - 09/30/19

Plan	Benchmark	Inception	Market Value	% of Total	Month		3 Months		Fiscal YTD		1 Year		3 Years		5 Years		10 Years		20 Years		ITD	
					KRS	Benchmark	KRS	Benchmark	KRS	Benchmark	KRS	Benchmark	KRS	Benchmark	KRS	Benchmark	KRS	Benchmark	KRS	Benchmark	KRS	Benchmark
KERS INS	KY Ins. KERS Plan Index		950,161,451.29	100.00	1.18	1.17	0.88	0.84	0.88	0.84	3.65	4.42	7.70	8.18	5.91	6.25	7.31	7.98	5.04	5.42	7.28	7.69
KERS-H INS	KY Ins. KERS Haz Plan Index		528,254,362.58	100.00	1.32	1.17	1.09	0.84	1.09	0.84	4.49	4.42	8.35	8.22	6.39	6.31	7.63	8.01	5.20	5.44	7.38	7.71
CERS INS	KY Ins. CERS Plan Index		2,500,799,484.43	100.00	1.32	1.17	1.19	0.84	1.19	0.84	4.65	4.42	8.51	8.20	6.56	6.33	7.70	8.02	5.24	5.45	7.41	7.71
CERS-H INS	KY Ins. CERS Haz Plan Index		1,331,073,613.08	100.00	1.34	1.17	1.19	0.84	1.19	0.84	4.70	4.42	8.58	8.20	6.62	6.33	7.73	8.02	5.25	5.45	7.42	7.71
SPRS INS	KY Ins. SPRS Plan Index		200,020,097.45	100.00	1.33	1.17	1.23	0.84	1.23	0.84	4.66	4.42	8.58	8.19	6.59	6.34	7.72	8.03	5.25	5.45	7.41	7.71



Note: The above chart displays the average monthly allocation.