What's going on in the marketplace?

The rise in global markets during the month of October was driven by an easing of investor concerns that centered primarily on trade and global economics. The upturn in global markets was also due to renewed U.S. and China trade talks and the continued accommodative policies of some central banks. Stocks rose higher on the back of generally positive economic and earnings results. Non-U.S. equity markets outpaced U.S. markets. Further, U.S. credit markets, though positive, underperformed their international counterparts.

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 small caps, which earned approximately 2.6%. Large caps returned roughly 2.2%, and mid-caps trailed, gaining just over 1.1%. Growth outpaced value by 1.3% (R3000G 2.8%, R3000V 1.5%).

During the month, the KRS U.S. Equity portfolio underperformed the Russell 3000 Index by 16 bps (2.0% vs 2.2%). Relative performance was driven by weakness in the internal factor based portfolio which tilts towards value and to the smaller portion of the large cap universe, two headwinds during the month. Allocation had little effect on relative performance as the overweight to both small and mid-caps offset one another as the best and worst performing market cap segments, respectively.

Non-U.S. Equities

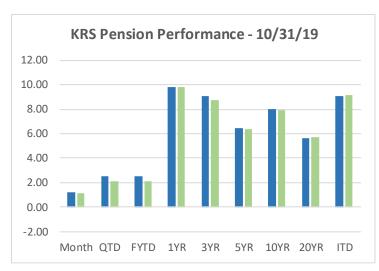
Non-U.S. equities markets performed well during the period gaining 3.6% per the MSCI ACWI-Ex US Index. Both developed and emerging markets performed well; however, emerging markets outperformed their developed counterparts, 4.2% compared to 3.3%.

The KRS Non-U.S. Equity portfolio gained 3.6% during the month, performing in line with the benchmark. Stock selection was mixed with two of the four active mandates outperforming their index. Allocation decisions had little effect on the period's relative performance.

Fixed Income

The fixed income markets were mixed but mostly positive during the month. The intermediate credit, aggregate, and high yield markets returned 0.6%, 0.4%, and 0.3%, respectively. The leverage loan market dropped -0.5%.

The KRS Specialty Credit allocation was relatively flat versus a benchmark that fell -0.1%. Relative strategy was generally positive, with only one trailing its respective benchmark. The KRS Core Fixed income portfolio gained 35 bps versus the Bloomberg Barclays Aggregate return of 0.3%. Relative performance was bolstered by the intermediate credit mandate, which gained 60 bps.



Alternative Assets

The diversifying strategy group gained 0.5% during the month. Three of the four major portfolio segments provided positive returns. The Real Estate allocation led the way, earning nearly 1.8%. The Opportunistic and Absolute Return portfolios followed, returning 0.9% and 0.4%, respectively. The Real Return portion of the portfolio lost -12 bps during the period. The Private Equity portion of the portfolio provided a return of 13 bps on the month.

Cash

The cash portfolio performed inline during the month (0.2% vs 0.2%). The cash allocation finished the period above target (3.3%) 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.

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)

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.

Pension Benchmark Composite 01/01/16 to 08/31/17

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%)

Pension Benchmark Composite 09/01/17 to 05/31/18 -

<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%) Insurance Benchmark Composite 01/01/16 to 08/31/17

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%)

Insurance Benchmark Composite 09/01/17 to 05/31/18 -

<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

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%)

Real Estate: NCREIF ODCE (5.0%)

Absolute Return: HFRI Diversified FOF (10.0%)

Real Return<5yrs: Actual Performance

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 (2.0%)

Insurance Benchmark Composite 06/01/18 to Present

US Equity: Russell 3000 (17.9%)

Non US Equity: MSCI AXCI Ex-US IMI (21.9%)

Global Fixed Income: Barclays Universal Index (13.0%) Credit Fixed Income: Barclays US High Yield (11.0%)

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% (9.2%)

Cash: Cit Grp 3-mos Treasury Bill (2.0%)

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

KENTUCKY RETIREMENT SYSTEMS - PENSION FUND - NET RETURNS - 10/31/19 3 Years 5 Years 10 Years 20 Years ITD KRS Benchmark TOTAL FUND KY Ret. Blended Index 4/1/1984 13.044.053.848.61 100.00 1.21 1.11 1.21 1.11 2.50 2.09 9 80 9.83 9.09 8.73 6.41 6.33 7.99 7.94 5.63 5.67 9 03 9.13 8,250,402,667.02 GROWTH 7/1/2018 63.25 1.70 1.70 2.94 11.13 6.67 US PUBLIC KY Domestic Equity Blend 4/1/1984 2,453,109,804.56 18.81 1.99 2.15 3.28 3.34 13.38 13.49 13.78 14.47 9.68 10.31 13.07 13.67 6.36 11.25 11.31 2,597,060,337.51 1,138,642,935.92 3.56 0.13 2.36 1.79 12.26 11.47 10.92 11.47 8.08 14.13 5.53 13.77 5.33 3.22 11.29 3.40 11.53 FOUITY NON US KY Ret.Int'l Eq. Blended Index 7/1/2000 19.91 3.57 3.57 3.56 9.55 5.22 4.03 PRIVATE QUITY 14.13 Russell 3000 + 3%(Qtr Lag) 7/1/2002 8.73 0.13 0.13 0.13 11.53 11.53 HIGH YIELD / SPECIALTY CREDIT High Yield Custom Benchmark 7/1/2017 2,061,589,589.03 15.80 -0.09 -0.02 -0.09 1.08 7.16 5.50 FIXED INCOME / LIQUIDITY 7/1/2018 2.778.601.952.57 21 30 0.32 0.32 1 57 7 5 7 5.88 Bloomberg Barclays US Aggregate 7/1/2013 2,343,671,506.80 0.35 2.58 CORE FIXED INCOME 17.97 0.30 11.51 3.03 3.43 0.35 1.72 8.68 3.29 3.01 3.24 3.40 Citigroup Treasury Bill-3 Month 1/1/1988 434,930,445.77 0.17 0.16 0.17 0.73 2.35 1.83 1.57 1.31 0.99 0.90 0.53 2.15 3.54 3.10 DIVERSIFYING STRATEGIES 7/1/2018 2.015.470.883.50 15.45 0.50 0.50 2.09 7.67 5.45 REAL ESTATE NCREIF NFI-ODCE Net 1 Qtr in Arrears Index^ 553,270,747.67 1.75 1.75 5.90 0.77 11.25 10.18 10.97 8.87 7.89 7.35 6.29 6.42 7/1/1984 4.24 0.00 11.70 5.46 6.61 8.76 OPPORTUNISTIC / ABSOLUTE RI HFRI Diversified 339,023,670.66 2.60 0.35 0.41 0.35 0.41 -0.08 -0.36 -1.35 3.50 2.52 3.49 1.71 2.13 3.49 2.79 REAL RETURN Pension Real Return Custom Benchmark 7/1/2011 1,123,176,465.17 8.61 -0.12 -0.12 -0.12 -0.12 0.55 0.55 7.96 7.96 4.11 4.11 2.71 2.71 3.78 2.78 KENTUCKY RETIREMENT SYSTEMS - PENSION FUND - PLAN NET RETURNS - 10/31/19 2,304,560,459.28 701,225,945.97 8.23 9.13 8.11 8.94 5.88 6.45 6.08 6.28 7.75 8.01 9.08 9.12 KERS KY Ret. KERS Plan Index 100.00 1.02 0.97 1 94 2 45 2 01 9 10 9.64 7.79 5.52 5 60 8.96 5.66 KERS- H KY Ret. KERS Haz Plan Index 100.00 1.22 1.12 2.07 1.73 2.48 2.12 9.70 9.91 7.92 5.64 9.04 KY Ret. CERS Plan Index 7,291,594,905.42 100.00 1.25 1.12 2.50 2.12 9.91 9.23 8.95 6.27 8.03 7.92 5.65 5.66 9.04 9.12 CERS 2.11 1.73 9.89 6.49 2,456,291,609.77 290,380,926.32 8.95 8.40 6.27 CERS- H KY Ret. CERS Haz Plan Inde: 100.00 1.24 1.12 2.07 1.73 2.46 2.12 9.87 9.91 9.21 6.52 5.77 8.03 7.92 5.65 5.66 9.04 9.12 8.94 KY Ret. SPRS Plan Index 100.00 1.08 0.97 2.06 2.45 9.39 9.64 8.52 7.68 7.78 5.48 5.59 SPRS 1.68 2.01 9.08 15.8 KERS 5.3 2.7 KERS-H 18.8 19.3 15.3 19.0 2.6 5.1 2.4 CERS 19.1 20.2 2.1 5.4 2.7 CERS-H 18.9 20.0 15.3 17.2 2.6 5.1 2.6 SPRS 15.8

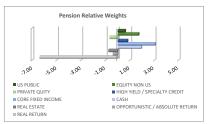
20% 30% 40% 50% 66% 70% US Equity Private Equity High Yield / Specialty Credit Core Fixed Income Cash Real Estate Opportunistic / Absolute Return Real Return



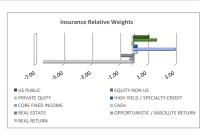
0%



10%







90%

100%

				KENTUCK	Y RETIRE	MENT SYST	EMS - IN	SURANCE F	2.44 2.02 9.75 9.80 9.29 8.97 6.58 6.58 7.94 8.37 5.11 5.38 7.41 7.75 3.26 3.34 13.35 13.49 13.81 14.47 9.91 10.31 13.02 13.53 6.61 6.52 9.67 9.60 2.36 1.79 12.11 10.92 9.43 8.08 5.09 4.03 5.24 5.20 3.20 2.61 3.74 10.39 10.39 14.83 13.58 13.58 15.12 16.14 6.00 4.41 1.61 7.44 5.79 1.93 3.24 5.74 5.79 3.24 5.79 3.24 5.79 3.43 3.08 3.43 3.08 3.43 3.29 2.99 3.24 5.79 1.71 5.62 2.50 2.50 2.50 2.50 2.50 2.50 2.50 2.50 2.50 2.50 2.50 2.50 2.50 2.50 2.50 2.50													
Structure	Benchmark	Inception	Market Value	% of Total	Moi	nth	QTD		Fiscal YTD		1 Year		3 Years		5 Years		10 Years		20 Years		ITD	
					KRS	Benchmark	KRS	Benchmark	KRS	Benchmark	KRS E	Benchmark	KRS	Benchmark	KRS	Benchmark	KRS	Benchmark	KRS	Benchmark	KRS	Benchmark
TOTAL FUND	KY Ret. Blended Index	4/1/1987	5,583,393,665.27	100.00	1.27	1.20	1.27	1.20	2.44	2.02	9.75	9.80	9.29	8.97	6.58	6.58	7.94	8.37	5.11	5.38	7.41	7.75
GROWTH	Growth Custom Benchmark	7/1/2018	3,650,967,869.59	65.39	1.70	2.05	1.70	2.05	2.73	3.07	10.93	11.47									6.37	7.58
US PUBLIC	KY Domestic Equity Blend	7/1/1992	1,108,665,594.10	19.86	1.99	2.15	1.99	2.15	3.26	3.34	13.35	13.49	13.81	14.47	9.91	10.31	13.02	13.53	6.61	6.52	9.67	9.60
EQUITY NON US	KY Ret.Int'l Eq. Blended Index	4/1/2000	1,139,195,515.24	20.40	3.60	3.56	3.60	3.56	2.36	1.79	12.11	10.92	9.43	8.08	5.09	4.03	5.24	5.20			3.20	2.61
PRIVATE QUITY	Russell 3000 + 3%(Qtr Lag)	7/1/2002	550,546,677.04	9.86	0.12	0.12	0.12	0.12	3.74	3.74	10.39	10.39	14.83	14.83	13.58	13.58	15.12	16.14			10.32	10.99
HIGH YIELD / SPECIALTY CREE	OIT Bloomberg Barclays US High Yield	7/1/2017	852,560,083.21	15.27	-0.04	-0.09	-0.04	-0.09	1.92	1.08	6.99	5.50									6.00	4.41
FIXED INCOME / LIQUIDITY		7/1/2018	1,071,538,810.88	19.19	0.34		0.34		1.61		7.44										5.79	
CORE FIXED INCOME	Bloomberg Barclays US Aggregate	7/1/2013	1,001,275,407.89	17.93	0.36	0.30	0.36	0.30	1.69	2.58	8.63	11.51	3.00	3.29	2.99	3.24					3.08	3.43
CASH	Citigroup Treasury Bill-3 Month	7/1/1992	70,263,402.99	1.26	0.16	0.17	0.16	0.17	0.73	0.73	2.36	2.35	1.71	1.57	1.14	0.99	0.71	0.53	1.91	1.72	2.62	2.50
DIVERSIFYING STRATEGIES		7/1/2018	861,173,211.47	15.42	0.69		0.69		2.29		7.89										5.62	
REAL ESTATE	NCREIF NFI-ODCE Net 1 Qtr in Arrears Index^	5/1/2009	229,986,284.33	4.12	1.54	0.00	1.54	0.00	5.85	0.77	11.75	5.46	11.44	6.61	10.29	8.76					9.49	5.91
OPPORTUNISTIC / ABSOLUTE RI HFRI Diversified			152,852,759.78	2.74	0.36	0.41	0.36	0.41	-0.05	-0.36	-1.29	3.50	2.54	3.49	1.74	2.13					3.45	2.79
REAL RETURN	Pension Real Return Custom Benchmark	7/1/2011	478,334,167.36	8.57	0.31	0.31	0.31	0.31	0.92	0.92	8.23	8.23	3.97	3.97	2.66	2.66					3.57	2.88

KENTUCKY RETIREMENT SYSTEMS - INSURANCE FUND - PLAN NET RETURNS - 10/31/19																						
Plan	Benchmark	Inception Market V	alue % of To	tal	Month		3 Months		Fiscal YTD		1 Year		3 Years		5 Years		10 Years		20 Years		ITD	
KERS INS	KY Ins. KERS Plan Index	967,600	892.93 10	0.00	1.31	1.19	1.87	1.74	2.20	2.03	9.14	9.83	8.59	9.06	6.02	6.35	7.60	8.25	4.95	5.32	7.31	7.71
KERS - H INS	KY Ins. KERS Haz Plan Index	533,976	027.07 10	0.00	1.28	1.19	2.06	1.74	2.39	2.03	9.65	9.83	9.22	9.07	6.49	6.42	7.92	8.29	5.10	5.34	7.41	7.72
CERS INS	KY Ins. CERS Plan Index	2,533,108	812.42 10	0.00	1.25	1.19	2.12	1.74	2.46	2.03	9.78	9.83	9.36	9.04	6.66	6.44	7.99	8.30	5.14	5.34	7.43	7.73
CERS - H INS	KY Ins. CERS Haz Plan Index	1,346,250	315.42 10	0.00	1.26	1.19	2.12	1.74	2.46	2.03	9.85	9.83	9.43	9.03	6.73	6.44	8.02	8.30	5.15	5.34	7.44	7.73
SPRS INS	KY Ins. SPRS Plan Index	202,457	620.20 10	0.00	1.24	1.19	2.12	1.74	2.49	2.03	9.80	9.83	9.42	9.03	6.69	6.45	8.01	8.30	5.15	5.35	7.43	7.73

