

**What’s going on in the marketplace?**

Global equity markets continued to rise in 2019 during the month of April. First quarter economic data was better than expected which pushed markets higher and U.S. markets outpaced Non-U.S. markets based on relative strength in that data. Investor sentiment improved with the potential of a trade deal between the U.S. and China. In general, U.S. bonds performed better than their counterparts as global economic concerns subsided.

**U.S. Equities**

U.S. equity markets gained roughly 4.0% during the month per the Russell 3000. All market cap segments performed well with large and mid-caps gaining just over 4.0%, while small caps rose approximately 3.4%. Again, growth outpaced value by nearly 85 bps (R3000G 4.4%, R3000V 3.6%).

The KRS U.S. Equity portfolio performed in line with the Russell 3000 Index during the month (4.0% vs 4.0%). The portfolio’s relative performance was effective by both stock selection and allocation decisions. From a stock selection perspective, most mandates outperformed their respective benchmarks; however, the internal factor based portfolio trailed the S&P 500 by 77 bps, which has more to do with its tilt toward value and smaller in terms of market cap (see above). From an allocation perspective, the previous comment holds with regard to tilts held true for the U.S. equity portfolio in general.

**Non-U.S. Equities**

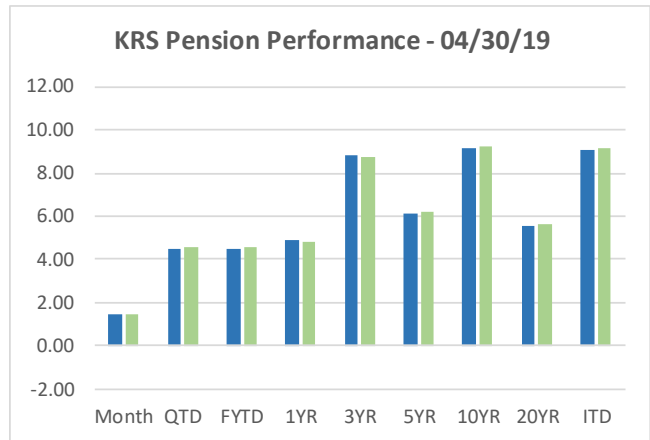
Non-U.S. equities gained roughly 2.6% per the MSCI ACWI Ex-U.S. Developed markets outpaced emerging markets by roughly 70bps, while growth outperformed value for the period.

The KRS Non-U.S. Equity portfolio outpaced the index by 12 basis points during the month (2.7% vs 2.6%). Stock selection was primarily responsible for the relative outperformance as three of the four active large cap managers outperformed their index. The small cap allocation also outperformed its index. Allocation decisions had little impact on relative performance.

**Fixed Income**

The fixed income market provided positive performance during the month. The leveraged loan and high yield segments of the market were the best performers gaining just over 1.6% and 1.4%, respectively. The intermediate credit portion of the market returned 44 bps, while the Aggregate Index was relatively flat at 0.03%.

The KRS specialty credit allocation performed well, returning 0.7%. Results were mixed amongst individual mandates with respect to relative performance. The KRS core portion of the portfolio also performed well, providing an absolute return of 27 bps.



**Alternative Assets**

The diversifying strategy group gained 0.4% during the period. The Real Estate portfolio earned 0.7% during the month, and was the strongest segment of the market. The Opportunistic and Absolute Return portfolios added 56 bps and 51 bps, respectively. The Real Return allocation gained 0.2%. The Private Equity portion of the portfolio was positive, earning 11bps.

## Cash

The cash portfolio performed inline during the month (0.2% vs 0.2%). The cash allocation finished the period above target (4.0%) in part due to the continued transitioning of assets to the newly approved asset allocation.

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### 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) <b>01/01/16 to Present</b> <b>100.00% Russell 3000 Index + 3% (Qtr Lag)</b>	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) <b>01/01/16 to Present</b> <b>100.00% Russell 3000 Index + 3% (Qtr Lag)</b>
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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 - 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 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%) <b><u>Pension Benchmark Composite 06/01/18 to Present</u></b>	<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 - 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 (2.0%) <b><u>Insurance Benchmark Composite 06/01/18 to Present</u></b>
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**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%)**

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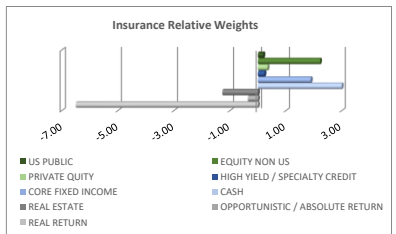
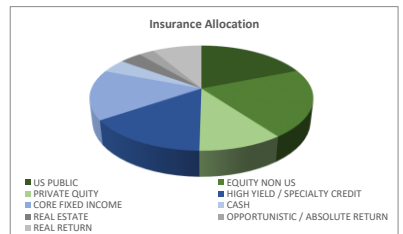
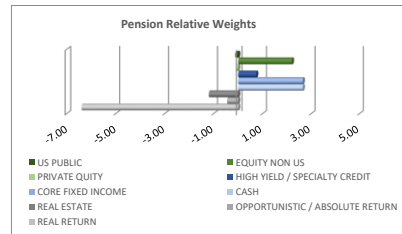
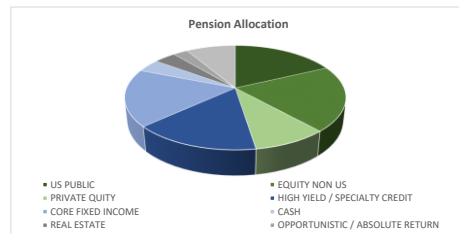
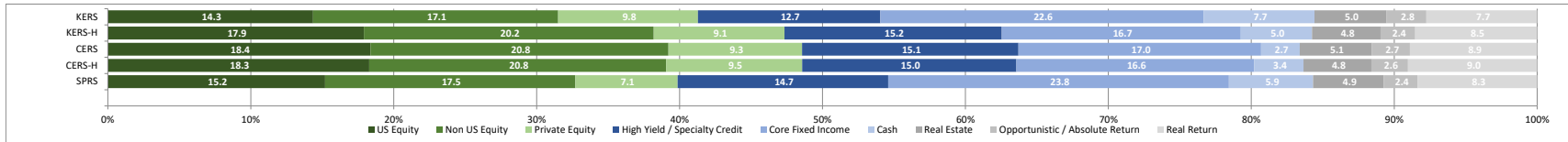
\*\*Fund composite benchmark is a roll-up of individual plans, which may differ from one another.

KENTUCKY RETIREMENT SYSTEMS - PENSION FUND - NET RETURNS - 04/30/19

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	12,607,756,695.01	100.00	1.48	1.47	6.09	6.93	4.44	4.60	4.88	4.78	8.81	8.71	6.12	6.20	9.16	9.27	5.52	5.60	9.05	9.16
GROWTH			7,973,472,031.00	63.24	2.17		7.80		4.71												4.71	
US PUBLIC	KY Domestic Equity Blend	4/1/1984	2,266,622,367.64	17.98	3.97	3.99	14.25	14.04	7.44	8.88	11.34	12.68	13.89	14.74	10.31	11.20	14.54	15.30	6.54	6.72	11.31	11.37
EQUITY NON US	KY Ret.Int'l Eq. Blended Index	7/1/2000	2,559,828,016.40	20.30	2.70	2.58	11.14	10.30	0.52	0.11	-2.34	-3.98	8.89	8.16	3.99	3.20	8.27	8.19			3.15	3.38
PRIVATE EQUITY	Russell 3000 + 3%(Qtr Lag)	7/1/2002	1,162,445,734.84	9.22	0.11	0.11	-1.99	-1.99	7.96	7.96	10.52	10.52	11.92	11.92	10.84	10.84	12.90	17.02			11.10	11.10
HIGH YIELD / SPECIALTY CREDIT	Bloomberg Barclays US High Yield		1,984,575,912.12	15.74	0.72		3.69		5.22		5.09										6.08	
FIXED INCOME / LIQUIDITY			2,748,610,991.83	21.80	0.26		2.43		4.16												4.16	
CORE FIXED INCOME	Bloomberg Barclays US Aggregate		2,237,898,442.46	17.75	0.27	0.03	2.79	3.01	4.64	4.67	5.11	5.29	2.19	1.90	2.79	2.57					2.99	3.78
CASH	Citigroup Treasury Bill-3 Month	1/1/1988	510,712,549.37	4.05	0.21	0.20	0.63	0.60	1.92	1.88	2.23	2.18	1.63	1.23	1.09	0.76	0.84	0.42	2.22	1.78	3.56	3.12
DIVERSIFYING STRATEGIES			1,886,067,114.95	14.96	0.37		4.41		3.79												3.79	
REAL ESTATE	NCREIF NFI-ODCE Net 1 Qtr in Arrears Index	7/1/1984	479,554,828.43	3.80	0.70	0.00	1.83	1.52	7.79	5.29	10.33	7.36	10.28	7.27	9.65	9.41	9.14	6.01	7.04	7.55	6.18	6.45
OPPORTUNISTIC / ABSOLUTE RETURN	HFRF Diversified		321,765,147.25	2.55	0.51	1.04	0.98	4.26	0.45	1.11	0.98	1.58	3.86	4.17	2.20	2.45					3.81	2.92
REAL RETURN	Pension Real Return Custom Benchmark	7/1/2011	1,084,747,139.27	8.60	0.18	0.18	6.78	6.78	3.09	3.09	2.77	2.77	5.18	5.18	2.58	2.58					3.71	2.64

KENTUCKY RETIREMENT SYSTEMS - PENSION FUND - PLAN NET RETURNS - 04/30/19

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		2,136,785,260.02	100.00	1.23	1.33	2.77	3.41	4.34	4.70	4.64	4.92	8.00	8.11	5.63	5.84	8.92	9.11	5.40	5.52	8.98	9.11
KERS-H	KY Ret. KERS Haz Plan Index		675,765,542.67	100.00	1.50	1.52	3.51	3.60	4.35	4.62	4.77	4.80	8.78	8.89	6.16	6.08	9.18	9.25	5.53	5.59	9.06	9.15
CERS	KY Ret. CERS Plan Index		7,124,488,220.42	100.00	1.53	1.52	3.60	3.60	4.40	4.62	4.84	4.80	8.96	8.92	6.20	6.08	9.20	9.25	5.53	5.58	9.06	9.15
CERS-H	KY Ret. CERS Haz Plan Index		2,393,221,801.32	100.00	1.52	1.52	3.61	3.60	4.42	4.62	4.89	4.80	8.94	8.91	6.23	6.08	9.21	9.25	5.54	5.58	9.06	9.15
SPRS	KY Ret. SPRS Plan Index		275,495,861.15	100.00	1.32	1.33	3.22	3.41	4.34	4.58	4.67	4.76	8.18	8.37	5.50	5.80	8.85	9.10	5.37	5.51	8.96	9.11



KENTUCKY RETIREMENT SYSTEMS - INSURANCE FUND - NET RETURNS - 04/30/19

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	5,367,851,377.80	100.00	1.50	1.50	6.20	7.04	4.31	4.52	4.92	4.88	9.05	8.99	6.28	6.52	9.47	10.12	5.03	5.31	7.41	7.76
GROWTH		7/1/2018	3,514,622,636.22	65.48	2.15		7.92		4.52												4.52	
US PUBLIC	KY Domestic Equity Blend	7/1/1992	3,016,691,764.98	18.94	3.98	3.99	14.20	14.04	7.47	8.88	11.32	12.68	13.92	14.74	10.56	11.20	14.54	15.20	6.59	6.50	9.72	9.65
EQUITY NON US	KY Ret.Int'l Eq. Blended Index	4/1/2000	1,125,403,801.82	20.97	2.67	2.58	11.03	10.30	0.39	0.11	-2.58	-3.98	8.74	8.16	3.86	3.09	7.90	7.94			3.13	2.57
PRIVATE EQUITY	Russell 3000 + 3%(Qtr Lag)	7/1/2002	554,814,699.25	10.34	0.04	0.04	-0.73	-0.73	7.40	7.40	12.08	12.08	13.50	13.50	13.63	13.63	14.89	17.01			10.19	10.55
HIGH YIELD / SPECIALTY CREDIT	Bloomberg Barclays US High Yield		817,712,370.17	15.23	0.67		3.29		5.07		4.86										5.70	
FIXED INCOME / LIQUIDITY			1,055,189,624.07	19.66	0.27		2.33		4.10												4.10	
CORE FIXED INCOME	Bloomberg Barclays US Aggregate	7/1/2013	825,994,586.35	15.39	0.28	0.03	2.76	2.94	4.62	4.67	4.99	5.29	2.18	1.90	2.40	2.57					2.64	2.89
CASH	Citigroup Treasury Bill-3 Month	7/1/1992	229,235,027.72	4.27	0.21	0.20	0.61	0.60	1.90	1.88	2.21	2.18	1.39	1.23	0.93	0.76	0.61	0.42	1.96	1.78	2.63	2.50
DIVERSIFYING STRATEGIES			798,305,386.59	14.87	0.38		4.12		3.79												3.79	
REAL ESTATE	NCREIF NFI-ODCE Net 1 Qtr in Arrears Index	5/1/2009	200,122,567.25	3.73	0.68	0.00	1.95	1.52	7.92	5.29	10.45	7.36	10.52	7.27	9.84	9.41					9.25	6.01
OPPORTUNISTIC / ABSOLUTE RETURN	HFRF Diversified		141,769,712.18	2.64	0.50	1.04	0.99	4.26	0.50	1.11	1.02	1.58	3.85	4.17	2.23	2.45					3.76	2.92
REAL RETURN	Pension Real Return Custom Benchmark	7/1/2011	456,413,107.16	8.50	0.20	0.20	6.14	6.14	2.97	2.97	2.66	2.66	4.77	4.77	2.43	2.43					3.44	2.70

KENTUCKY RETIREMENT SYSTEMS - INSURANCE FUND - PLAN NET RETURNS - 04/30/19

Plan	Benchmark	Inception	Market Value	% of Total	Month		3 Months		Fiscal YTD		1 Year		3 Years		5 Years		10 Years		20 Years		ITD	
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KERS INS	KY Ins. KERS Plan Index		907,247,305.01	100.00	1.60	1.52	3.81	3.74	3.83	4.56	4.13	4.76	8.52	9.09	5.81	6.22	9.17	10.00	4.89	5.25	7.32	7.73
KERS-H INS	KY Ins. KERS Haz Plan Index		522,084,805.62	100.00	1.51	1.52	3.63	3.74	4.26	4.56	4.83	4.95	9.00	9.10	6.21	6.29	9.45	10.04	5.02	5.27	7.40	7.74
CERS INS	KY Ins. CERS Plan Index		2,437,008,048.59	100.00	1.47	1.52	3.57	3.74	4.34	4.54	4.99	4.94	9.11	9.06	6.35	6.31	9.51	10.05	5.05	5.28	7.42	7.74
CERS-H INS	KY Ins. CERS Haz Plan Index		1,305,238,926.64	100.00	1.48	1.52	3.58	3.74	4.39	4.54	5.07	4.94	9.16	9.05	6.42	6.31	9.54	10.05	5.06	5.28	7.43	7.74
SPRS INS	KY Ins. SPRS Plan Index		196,272,297.34	100.00	1.49	1.52	3.56	3.74	4.36	4.54	5.02	4.94	9.15	9.05	6.38	6.32	9.53	10.05	5.06	5.28	7.43	7.74

