

What’s going on in the marketplace?

Global equity markets continued their 2019 rise during the month. Talks centering on a potential trade deal between the U.S. and China buoyed markets in addition to Fed comments about no more rate hikes in the near-term. U.S. markets in general outpaced their international counterparts as data showed that not only does it appear global growth has stabilized, but that the U.S. economy (in terms of GDP growth) performed better in the fourth quarter than what was expected. The U.S. bond market outperformed Non-U.S. credits, although it was fairly flat during the month.

U.S. Equities

U.S. equity markets gained roughly 3.5% during the month per the Russell 3000. Just as in January, small caps led the market (5.1%), followed by midcaps (4.2%), and then large caps (3.2%). During the month, growth outpaced value by roughly 60 bps (R3000G 3.8%, R3000V 3.2%).

The KRS U.S. Equity portfolio bested the Russell 3000 Index by 17 basis points during the month (3.7% vs 3.5%). The portfolio’s relative performance was driven by both stock selection and allocation decisions. From a stock selection perspective, the all cap strategies outperformed their respective indices. Further, the internal factor based portfolio nearly 30 basis points over its index, the S&P 500. From an allocation perspective, the portfolio benefited by being slightly smaller in terms of market cap.

Non-U.S. Equities

Non-U.S. equities also performed well, gaining nearly 2% per the MSCI ACWI Ex-U.S. Developed markets outpaced emerging markets by roughly 2%, while growth outperformed value for the period.

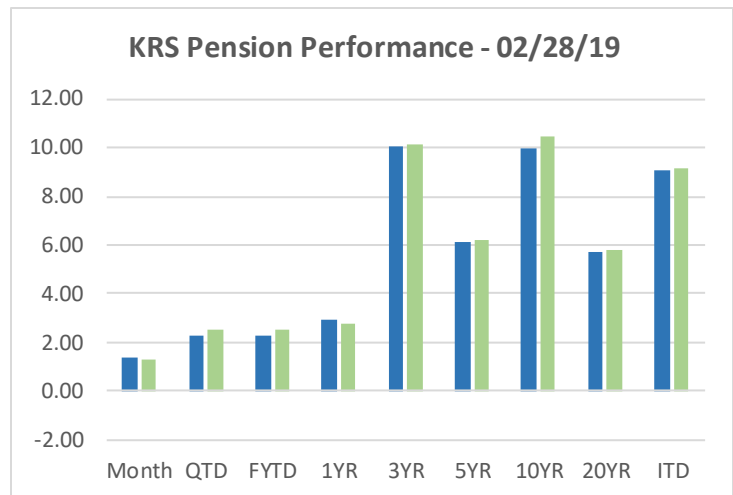
The KRS Non-U.S. Equity portfolio outpaced the index by 26 basis points during the month (2.2% vs 2.0%). Stock selection was primarily responsible for the relative outperformance as three of the four active large cap managers outperformed their index. Allocation decisions had little impact on relative performance.

Fixed Income

The fixed income market was relatively flat during the month. The high yield and leveraged loan segments led the fixed income market, returning 1.7% and 1.6%, respectively. The core fixed income segment of the market dropped a few basis points during the period. The KRS specialty credit allocation performed well, returning 1.12%. Results were mixed amongst individual mandates with respect to relative performance. The KRS core portion of the portfolio performed well gaining 34 bps points versus a slightly negative market.

Alternative Assets

The diversifying strategy group gained 0.33% during the period. The Opportunistic portfolio earned 1.3% during the month, and was the strongest segment of the market. The Absolute Return portfolio added 50 bps on the month, but struggled to keep up with its index. The Real Return portfolio gained 38 bps on the month. The Real Estate allocation was the only



segment that lost ground during the period, though it dropped just 9 bps. The Private Equity portion of the portfolio also was slightly negative, dropping 6 bps.

Cash

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

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 Real Return>5Yrs: CPI+3% (8%)	<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 Real Return>5Yrs: CPI+3% (8%)
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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.

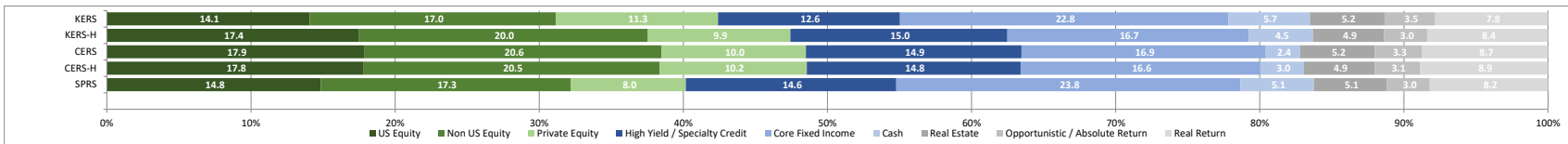
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Cash: Cit Grp 3-mos Treasury Bill (2.0%)

KENTUCKY RETIREMENT SYSTEMS - PENSION FUND - NET RETURNS - 02/28/19

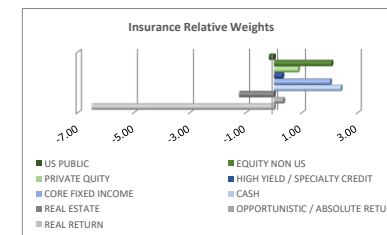
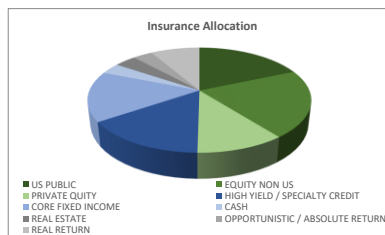
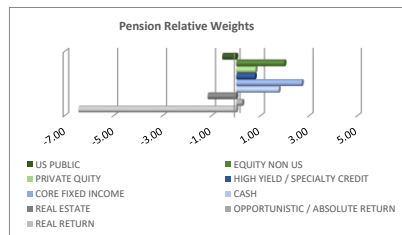
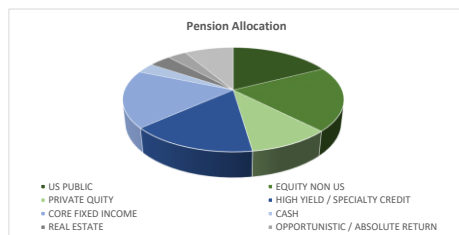
Structure	Benchmark	Inception	Market Value	% of Total	Month		QTD		Fiscal YTD		1 Year		3 Years		5 Years		10 Years		20 Years		ITD	
					KRS	Benchmark	KRS	Benchmark	KRS	Benchmark	KRS	Benchmark	KRS	Benchmark	KRS	Benchmark	KRS	Benchmark	KRS	Benchmark	KRS	Benchmark
TOTAL FUND	KY Ret. Blended Index	4/1/1984	12,383,722,313.83	100.00	1.35	1.32	5.45	6.07	2.30	2.54	2.92	2.73	10.04	10.15	6.09	6.19	9.99	10.43	5.72	5.79	9.03	9.14
GROWTH			7,857,345,171.50	63.45	1.98		7.56		2.25													2.25
US PUBLIC	KY Domestic Equity Blend	4/1/1984	2,171,296,516.87	17.53	3.69	3.52	13.11	12.40	2.30	3.19	5.28	5.05	14.94	15.53	9.32	10.15	16.01	16.85	6.71	6.87	11.21	11.26
EQUITY NON US	KY Ret.Int'l Eq. Blended Index	7/1/2000	2,484,923,525.01	20.07	2.23	1.97	10.39	9.72	-2.78	-2.94	-5.85	-7.05	11.26	10.92	3.57	2.81	9.93	10.03			2.99	3.24
PRIVATE QUITY	Russell 3000 + 3%(Qtr Lag)	7/1/2002	1,249,927,135.19	10.09	-0.06	-0.06	0.93	0.93	11.06	11.06	17.67	17.67	13.47	13.47	13.46	13.46	12.38	19.09			11.40	11.27
HIGH YIELD / SPECIALTY CREDIT	Bloomberg Barclays US High Yield		1,931,197,894.43	15.76	1.12		2.91		3.68		4.00											1.97
FIXED INCOME / LIQUIDITY			2,591,935,891.18	20.93	0.22		1.20		2.63													2.63
CORE FIXED INCOME	Bloomberg Barclays US Aggregate		2,203,560,078.55	17.79	0.22	-0.06	1.35	1.02	2.89	2.67	3.24	3.17	2.04	1.69	2.58	2.32						2.77
CASH	Citigroup Treasury Bill-3 Month	1/1/1988	388,375,812.63	3.14	0.19	0.19	0.41	0.39	1.48	1.46	2.08	2.04	1.55	1.11	1.01	0.68	0.83	0.39	2.24	1.80	3.57	3.64
DIVERSIFYING STRATEGIES			1,934,637,972.54	15.62	0.33		3.01		2.02													2.02
REAL ESTATE	NCREIF NFI-ODCE Net 1 Qtr in Arrears Index	7/1/1984	474,257,342.29	3.83	-0.09	0.00	0.51	0.00	5.66	3.71	11.04	7.71	10.60	7.83	9.89	9.71	8.93	4.62	7.29	7.60	6.15	6.44
OPPORTUNISTIC / ABSOLUTE R	HFRI Diversified		402,191,321.67	3.25	0.50	1.25	0.39	3.78	-0.64	-0.44	-0.10	-0.23	3.03	3.33	2.33	2.33						3.76
REAL RETURN	Pension Real Return Custom Benchmark	7/1/2011	1,058,189,308.58	8.55	0.38	0.38	5.09	5.09	1.28	1.28	1.50	1.50	7.08	7.08	2.56	2.56						3.55

KENTUCKY RETIREMENT SYSTEMS - PENSION FUND - PLAN NET RETURNS - 02/28/19

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		2,085,727,144.52	100.00	1.16	1.20	3.06	3.48	2.71	2.68	3.18	3.04	9.05	9.32	5.83	5.82	9.81	10.27	5.63	5.72	8.98	9.10
KERS-H	KY Ret. KERS Haz Plan Index		662,093,293.72	100.00	1.36	1.35	3.03	3.63	2.18	2.54	2.80	2.69	10.06	10.35	6.12	6.09	10.01	10.41	5.73	5.78	9.03	9.13
CERS	KY Ret. CERS Plan Index		7,013,816,849.67	100.00	1.38	1.35	3.06	3.63	2.16	2.54	2.79	2.69	10.24	10.40	6.12	6.08	10.02	10.40	5.73	5.78	9.04	9.13
CERS-H	KY Ret. CERS Haz Plan Index		2,351,905,098.97	100.00	1.37	1.35	3.06	3.63	2.16	2.54	2.85	2.69	10.23	10.38	6.15	6.08	10.03	10.40	5.74	5.78	9.04	9.13
SPRS	KY Ret. SPRS Plan Index		270,179,933.30	100.00	1.21	1.20	2.93	3.48	2.31	2.56	2.74	2.81	9.31	9.73	5.50	5.82	9.69	10.26	5.57	5.71	8.94	9.09



Note: The above chart displays the average monthly allocation.

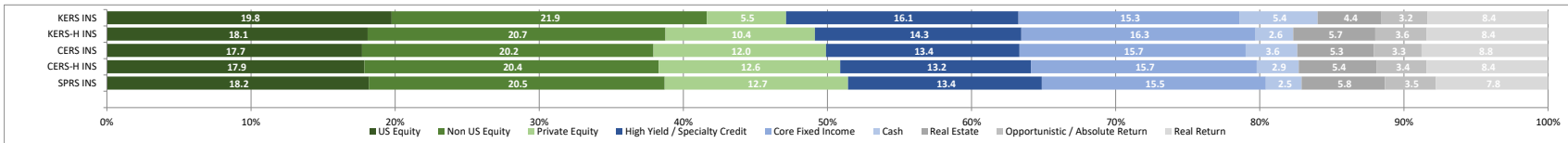


KENTUCKY RETIREMENT SYSTEMS - INSURANCE FUND - NET RETURNS - 02/28/19

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	5,243,824,188.58	100.00	1.38	1.36	5.45	6.07	2.04	2.32	2.89	2.76	10.35	10.47	6.12	6.47	10.83	11.69	5.21	5.50	7.37	7.73
GROWTH		7/1/2018	3,436,499,227.39	65.53	1.97		7.44		1.88													1.88
US PUBLIC	KY Domestic Equity Blend	7/1/1992	973,836,410.64	18.57	3.67	3.52	13.06	12.40	2.32	3.19	5.23	5.05	14.99	15.53	9.50	10.15	15.87	16.68	6.75	6.62	9.58	9.49
EQUITY NON US	KY Ret.Int'l Eq. Blended Index	4/1/2000	1,091,128,410.26	20.81	2.23	1.97	10.32	9.72	-2.85	-2.94	-6.10	-7.05	11.11	10.92	3.45	2.81	9.57	9.73			2.97	2.43
PRIVATE QUITY	Russell 3000 + 3%(Qtr Lag)	7/1/2002	569,343,947.15	10.86	-0.02	-0.02	0.67	0.67	8.88	8.88	18.78	18.78	15.16	15.16	15.73	15.73	14.87	19.16			10.39	10.71
HIGH YIELD / SPECIALTY CREDIT	Bloomberg Barclays US High Yield		802,190,459.34	15.30	1.03		2.51		3.58		3.81											3.58
FIXED INCOME / LIQUIDITY			990,965,624.96	18.90	0.22		1.15		2.63													2.63
CORE FIXED INCOME	Bloomberg Barclays US Aggregate	7/1/2013	813,334,798.83	15.51	0.22	-0.06	1.32	1.02	2.87	2.67	3.09	3.17	2.05	1.69	2.22	2.32						2.41
CASH	Citigroup Treasury Bill-3 Month	7/1/1992	177,630,826.13	3.39	0.19	0.19	0.41	0.39	1.49	1.46	2.09	2.04	1.28	1.11	0.85	0.68	0.57	0.39	1.97	1.80	2.63	2.50
DIVERSIFYING STRATEGIES			816,492,470.77	15.57	0.35		2.76		2.05													2.05
REAL ESTATE	NCREIF NFI-ODCE Net 1 Qtr in Arrears Index	5/1/2009	196,639,299.10	3.75	-0.08	0.00	0.50	0.00	5.67	3.71	10.97	7.71	10.77	7.83	9.69	9.71						9.18
OPPORTUNISTIC / ABSOLUTE R	HFRI Diversified		174,577,249.95	3.33	0.51	1.25	0.40	3.78	-0.58	-0.44	-0.02	-0.23	3.03	3.33	2.35	2.33						3.71
REAL RETURN	Pension Real Return Custom Benchmark	7/1/2011	445,275,921.72	8.49	0.38	0.38	4.59	4.59	1.26	1.26	1.44	1.44	6.52	6.52	2.41	2.41						3.29

KENTUCKY RETIREMENT SYSTEMS - INSURANCE FUND - PLAN NET RETURNS - 02/28/19

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		876,646,862.03	100.00	1.51	1.34	2.74	3.32	1.53	2.25	1.78	2.57	9.84	10.63	5.64	6.16	10.52	11.56	5.06	5.43	7.28	7.69
KERS - H INS	KY Ins. KERS Haz Plan Index		512,972,433.88	100.00	1.38	1.34	2.88	3.54	1.99	2.52	2.75	2.99	10.30	10.69	6.05	6.28	10.81	11.62	5.20	5.46	7.37	7.71
CERS INS	KY Ins. CERS Plan Index		2,382,518,700.33	100.00	1.34	1.36	2.91	3.47	2.09	2.33	3.05	2.79	10.40	10.56	6.18	6.26	10.87	11.62	5.23	5.46	7.39	7.71
CERS - H INS	KY Ins. CERS Haz Plan Index		1,279,401,321.61	100.00	1.34	1.36	2.94	3.47	2.13	2.33	3.14	2.79	10.46	10.55	6.25	6.27	10.90	11.62	5.24	5.46	7.40	7.71
SPRS INS	KY Ins. SPRS Plan Index		192,284,868.14	100.00	1.36	1.36	2.96	3.47	2.15	2.33	3.14	2.79	10.45	10.55	6.23	6.28	10.90	11.62	5.24	5.46	7.39	7.71



Note: The above chart displays the average monthly allocation.