

What’s going on in the marketplace?

Global equity markets tumbled during the month; domestic equity markets were down more than -9% and international equity markets were down approximately -4.5%. It is difficult to point to any one reason for these steep declines but are likely a combination of several concerns. Global growth, though still positive, has slowed in conjunction with concerns about China’s slowing economy – the world’s second largest. The Fed’s recent interest rate hikes have some concerned that they may have been a little aggressive in its tightening which could put further pressure on slowing the economy. Uncertainty regarding trade tariffs continued to weigh on the market as well as the threat of a looming government shutdown (which ultimately occurred). Also, an official plan to deal with the Brexit phenomenon had yet to be determined. All of these issues likely played a role in increasing market volatility to the downside. In response, investors moved towards more defensive sectors opposed to those more cyclical.

U.S. Equities

U.S. equity markets fell off a cliff during the last month of the calendar year, dropping -9.3% per the Russell 3000 Index. This substantial slide brought markets into negative territory for the year with domestic equity markets returning -5.2%. No market cap segment was immune, with small and mid-caps falling -11.9% and -11.3%, respectively. However, large caps fared better returning -9.0%. Growth provided 80 bps of downside protection versus value (R3000G -8.8%, R3000V -9.8%).

The KRS U.S. Equity portfolio trailed the Russell 3000 by 43 basis points during the month (-9.7% vs -9.3%). The portfolio’s relative performance was driven by both stock selection and allocation. From a stock selection perspective, there were two strategies that struggled versus their respective benchmarks. From an allocation perspective, the portfolio being slightly smaller in terms of market cap and tilting slightly towards value served as a tailwind during the period.

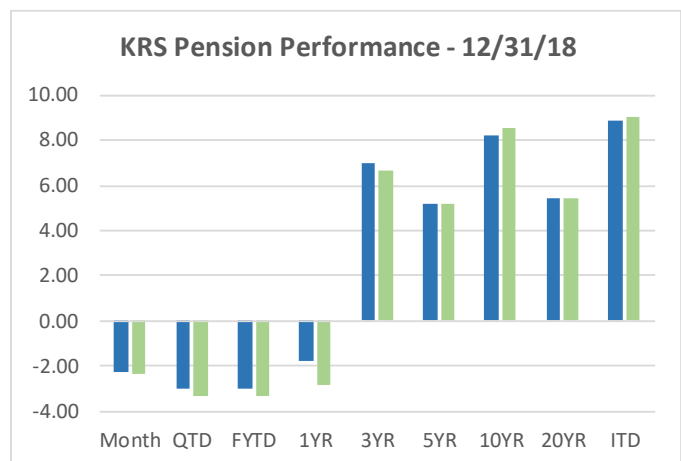
Non-U.S. Equities

While negative, Non-U.S. equities held up much better than the U.S. markets and fell -4.7% during the month, bringing the annual return to -11.5%. Emerging markets outperformed their developed market counterparts. Though there was not much style bias in the Non-U.S. markets during the period, while value seemed to hold up a little better.

The KRS Non-U.S. Equity portfolio trailed the index by 17 basis points during the month (-4.8% vs -4.7%). Stock selection was difficult as three of the four active large cap and the small cap managers underperformed their associated indices, leaving the remaining large cap as the lone outperformer. Allocation decisions had little impact on relative performance as there was little discrepancy in performance in terms of market cap or style.

Fixed Income

Fixed income market segments were mixed. What seemed to be a repeat of November, those spaces seen as “safer” tended to do well, while those higher yielding segments struggled. The U.S. Aggregate and intermediate credit space gained 1.8% and 1.1%, respectively. The corporate high yield and leveraged loan areas fell by -2.1% and -2.5%, respectively. For the 2018 year, core fixed income was flat and the high yield market was down just over -2.1%.



The core portion of the KRS portfolio gained 1.1% during the period, while the specialty credit piece fell -0.8%. Relative performance within the core portfolio was in line with the market, while additive in the specialty credit portfolio, especially within the leveraged loan mandates.

Alternative Assets

The diversifying strategy group dropped -60 bps during the period. The Real Estate and Opportunistic portions of the portfolio returned 1.9% and 0.2%, respectively. The Real Return and Absolute Return portions of the portfolio declined -1.8% and -0.6%, respectively. The Private Equity portion of the portfolio was strong during the month gaining 4.5%.

Cash

The cash portfolio performed inline during the month (0.2% vs 0.2%). For the calendar year, the 3-month T-Bill returned 1.1%. The cash allocation finished the period 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>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>
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Transition Period w/Sliding Targets

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%)

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.

Transition Period w/Sliding Targets

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%)

Insurance Benchmark Composite 06/01/18 to Present

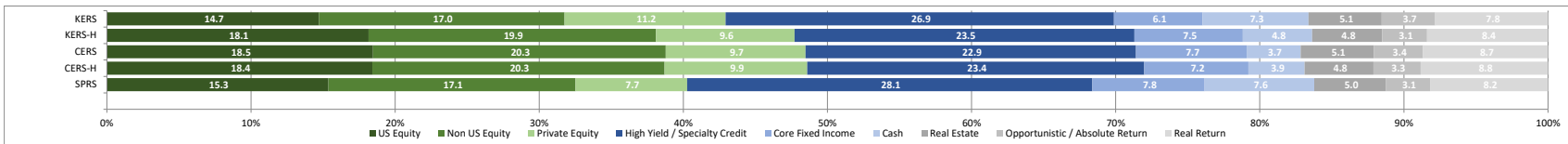
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KENTUCKY RETIREMENT SYSTEMS - PENSION FUND - NET RETURNS - 12/31/18

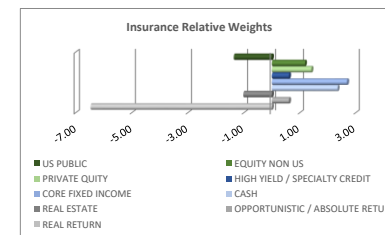
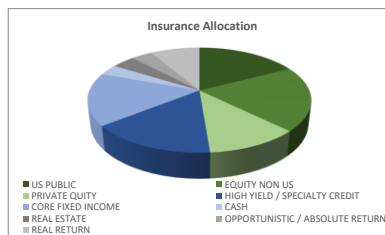
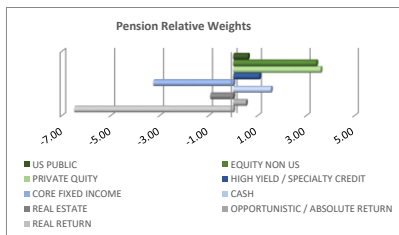
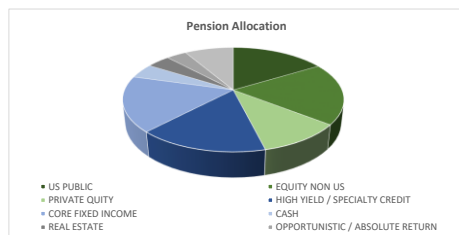
Structure	Benchmark	Inception	Market Value	% of Total	Month		QTD		Fiscal YTD		1 Year		3 Years		5 Years		10 Years		20 Years		ITD	
					KRS	Benchmark	KRS	Benchmark	KRS	Benchmark	KRS	Benchmark	KRS	Benchmark	KRS	Benchmark	KRS	Benchmark	KRS	Benchmark	KRS	Benchmark
TOTAL FUND	KY Ret. Blended Index	4/1/1984	11,775,534,732.62	100.00	-2.25	-2.33	-5.75	-6.75	-2.99	-3.33	-1.82	-2.81	7.00	6.64	5.19	5.16	8.18	8.51	5.42	5.45	8.91	9.00
GROWTH																						
US PUBLIC	KY Domestic Equity Blend	4/1/1984	1,925,754,800.83	16.35	-9.74	-9.31	-14.84	-14.30	-9.55	-8.20	-6.40	-5.24	8.39	8.97	6.92	7.91	12.35	13.12	6.06	6.23	10.87	10.94
EQUITY NON US	KY Ret.Int'l Eq. Blended Index	7/1/2000	2,256,324,692.86	19.16	-4.82	-4.65	-12.64	-11.88	-11.93	-11.53	-13.36	-14.76	5.20	4.69	1.53	0.98	6.85	6.90			2.47	2.76
PRIVATE EQUITY	Russell 3000 + 3%(Qtr Lag)	7/1/2002	1,246,960,042.40	10.59	4.49	4.49	-0.06	-0.06	10.03	10.03	16.68	16.68	13.06	13.06	13.29	13.29	11.47	18.50			11.46	11.77
HIGH YIELD / SPECIALTY CREDIT	Bloomberg Barclays US High Yield		1,890,886,507.20	16.06	-0.78	-0.78	-1.40	-1.40			2.57										4.42	4.42
FIXED INCOME / LIQUIDITY			2,562,665,595.16	21.76	0.94	0.94	0.73	0.73			1.42										1.42	1.42
CORE FIXED INCOME	Bloomberg Barclays US Aggregate		2,028,643,697.43	17.23	1.14	1.84	0.78	0.78	1.52	1.66	0.66	0.01	2.42	2.06	2.69	2.52					2.61	3.60
CASH	Citigroup Treasury Bill-3 Month	1/1/1988	534,021,897.73	4.54	0.20	0.20	0.57	0.57	1.07	1.07	2.06	1.86	1.44	0.99	0.93	0.60	0.80	0.35	2.27	1.81	3.57	3.13
DIVERSIFYING STRATEGIES			1,893,561,392.81	16.08	-0.60	-0.60	-2.35	-2.35	-0.96												-0.96	
REAL ESTATE	NCREIF NFI-ODCE Net 1 Qtr in Arrears Index	7/1/1984	478,628,847.87	4.06	1.91	1.87	0.42	0.42	5.12	3.71	10.51	7.71	10.45	7.83	9.81	9.71	8.87	4.62	7.20	7.60	6.17	6.47
OPPORTUNISTIC / ABSOLUTE RETURN	HFRI Diversified		414,073,874.00	3.52	-0.64	-1.54	-0.65	-0.65	-1.03	-4.12	1.09	-3.37	2.04	1.13	2.52	1.77					3.79	2.41
REAL RETURN	Pension Real Return Custom Benchmark	7/1/2011	1,000,858,670.94	8.50	-1.76	-1.76	-4.46	-4.46	-3.63	-3.63	-3.91	-3.91	4.65	4.65	2.15	2.15					2.95	1.84

KENTUCKY RETIREMENT SYSTEMS - PENSION FUND - PLAN NET RETURNS - 12/31/18

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		1,971,028,247.28	100.00	-1.62	-2.00	-4.17	-4.94	-1.95	-2.77	-1.01	-2.23	6.31	6.31	5.08	4.93	8.07	8.40	5.37	5.40	8.88	8.97
KERS-H	KY Ret. KERS Haz Plan Index		627,804,077.27	100.00	-2.35	-2.40	-5.33	-5.69	-3.15	-3.43	-2.00	-2.90	7.07	6.75	5.19	5.04	8.19	8.47	5.43	5.43	8.91	8.99
CERS	KY Ret. CERS Plan Index		6,681,069,336.25	100.00	-2.40	-2.40	-5.42	-5.69	-3.26	-3.43	-2.08	-2.90	7.13	6.78	5.18	5.03	8.19	8.47	5.42	5.43	8.91	8.99
CERS-H	KY Ret. CERS Haz Plan Index		2,237,927,891.62	100.00	-2.39	-2.40	-5.41	-5.69	-3.24	-3.43	-2.03	-2.90	7.14	6.77	5.21	5.03	8.20	8.47	5.43	5.43	8.91	8.99
SPRS	KY Ret. SPRS Plan Index		257,705,192.38	100.00	-1.91	-2.00	-4.51	-4.94	-2.50	-2.88	-1.62	-2.39	6.35	6.52	4.69	4.88	7.93	8.39	5.30	5.40	8.84	8.97



Note: The above chart displays the average monthly allocation.

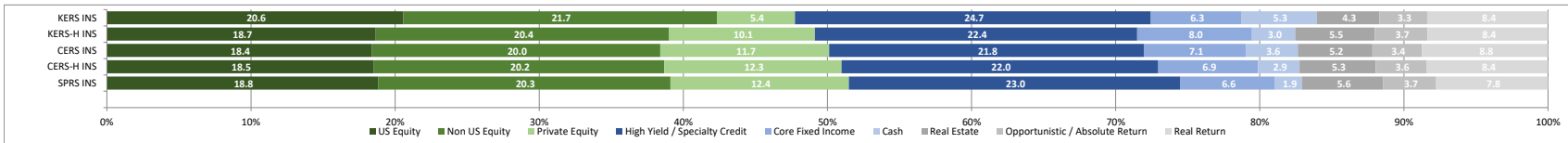


KENTUCKY RETIREMENT SYSTEMS - INSURANCE FUND - NET RETURNS - 12/31/18

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	4,968,619,033.55	100.00	-2.42	-2.45	-5.88	-6.78	-3.23	-3.54	-1.84	-2.74	7.28	6.90	5.20	5.43	8.49	9.24	4.86	5.08	7.23	7.57
GROWTH																						
US PUBLIC	KY Domestic Equity Blend	7/1/2018	3,196,847,080.33	64.34	-3.88	-3.88	-8.69	-8.69	-5.18												-5.18	
EQUITY NON US	KY Ret.Int'l Eq. Blended Index	4/1/2000	990,213,279.67	19.93	-9.72	-9.31	-14.79	-14.30	-9.50	-8.2	-6.40	-5.24	8.59	8.97	7.10	7.91	12.37	13.03	6.02	5.86	9.14	9.07
PRIVATE EQUITY	Russell 3000 + 3%(Qtr Lag)	7/1/2002	566,696,034.45	11.41	3.48	3.48	0.21	0.21	8.16	8.16	18.12	18.12	14.85	14.85	15.59	15.59	13.87	18.02			10.46	11.21
HIGH YIELD / SPECIALTY CREDIT	Bloomberg Barclays US High Yield		775,830,817.86	15.61	-0.56	-0.56	-1.17	-1.17	1.05		2.74										4.26	4.26
FIXED INCOME / LIQUIDITY			970,935,122.78	19.54	0.97	0.97	0.74	0.74	1.46		2.74										1.46	1.46
CORE FIXED INCOME	Bloomberg Barclays US Aggregate	7/1/2013	804,291,090.58	16.19	1.14	1.84	0.77	0.77	1.53	1.66	0.63	0.01	2.47	2.06	2.32	2.52					2.24	2.62
CASH	Citigroup Treasury Bill-3 Month	7/1/1992	166,644,032.20	3.35	0.20	0.2	0.57	0.57	1.07	1.07	1.90	1.86	1.16	0.99	0.77	0.60	0.53	0.35	1.99	1.81	2.63	2.50
DIVERSIFYING STRATEGIES			801,257,466.66	16.13	-0.44	-0.44	-2.01	-2.01	-0.70												-0.70	
REAL ESTATE	NCREIF NFI-ODCE Net 1 Qtr in Arrears Index	5/1/2009	197,814,172.45	3.98	1.88	1.87	0.45	0.45	5.14	3.71	10.46	7.71	10.58	7.83	9.63	9.71					9.29	6.06
OPPORTUNISTIC / ABSOLUTE RETURN	HFRI Diversified		179,398,199.38	3.61	-0.62	-1.54	-0.66	-0.66	-0.97	-4.12	1.13	-3.37	2.04	1.13	2.54	1.77					3.73	2.41
REAL RETURN	Pension Real Return Custom Benchmark	7/1/2011	424,045,094.83	8.53	-1.45	-1.45	-3.84	-3.84	-3.18	-3.18	-3.42	-3.42	4.38	4.38	2.07	2.07					2.75	1.98

KENTUCKY RETIREMENT SYSTEMS - INSURANCE FUND - PLAN NET RETURNS - 12/31/18

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		820,416,215.99	100.00	-2.93	-2.37	-6.07	-5.50	-4.06	-3.38	-3.30	-2.69	6.57	7.02	4.63	5.18	8.16	9.13	4.69	5.03	7.13	7.54
KERS-H INS	KY Ins. KERS Haz Plan Index		488,921,118.69	100.00	-2.42	-2.37	-5.32	-5.32	-3.26	-3.17	-1.97	-2.34	7.20	7.11	5.13	5.29	8.48	9.19	4.85	5.06	7.23	7.56
CERS INS	KY Ins. CERS Plan Index		2,259,879,487.74	100.00	-2.32	-2.45	-5.21	-5.68	-3.10	-3.53	-1.60	-2.71	7.38	6.96	5.29	5.24	8.55	9.16	4.88	5.04	7.25	7.55
CERS-H INS	KY Ins. CERS Haz Plan Index		1,216,791,311.05	100.00	-2.30	-2.45	-5.20	-5.68	-3.06	-3.53	-1.51	-2.71	7.46	6.96	5.35	5.24	8.58	9.17	4.90	5.04	7.26	7.55
SPRS INS	KY Ins. SPRS Plan Index		182,610,895.31	100.00	-2.30	-2.45	-5.23	-5.68	-3.07	-3.53	-1.52	-2.71	7.44	6.96	5.33	5.25	8.57	9.17	4.89	5.05	7.26	7.55



Note: The above chart displays the average monthly allocation.