Interim Joint Committee on Appropriations and Revenue

August 25, 2016

Investment Overview

August 25, 2016

David Peden
Chief Investment Officer

KRS Investment Performance

- Investment performance is a product of asset allocation and manager selection
- The Board's policies establish asset allocation targets based on asset-liability modeling studies that are conducted by independent experts at least once every five years
- The objective of the asset allocation policies is to produce returns that meet certain benchmarks, or goals, both on a short-term and long-term basis
- In order to meet its objectives, the investment program employs diversification and rebalancing strategies among and within the asset classes

Asset Class Characteristics

Data as of 6/30/2016

Monthly Correlations (since 1990)						
	NCREIF Property	Barclays Aggr. Bonds	HFRI Fund of Funds	Barclays High Yield	MSCI ACWI ex-US	S&P 500
NCREIF Property	1	-0.05	-0.05	-0.25	-0.02	0.00
Barclays Aggr. Bonds		1	0.04	0.23	0.07	0.08
HFRI Fund of Funds			1	0.44	0.57	0.51
Barclays High Yield				1	0.60	0.60
MSCI ACWI ex-US					1	0.78
S&P 500						1

Annualized Data (since 1990)		
	Return	Risk
NCREIF Property 1Q in Arrers	6.3%	10.6%
Barclays U.S.Aggregate Bond Index	6.4%	4.2%
HFRI Fund of Funds Diversified Index	6.1%	7.6%
Barclays U.S. Corporate High Yield	8.5%	8.4%
MSCI All Country World Ex US Index	5.2%	16.7%
S&P 500	9.3%	15.4%

Monthly Correlations (past 10 years)						
	NCREIF Property	Barclays Aggr. Bonds	HFRI Fund of Funds	Barclays High Yield	MSCI ACWI ex-US	S&P 500
NCREIF Property	1	-0.04	-0.04	-0.28	-0.07	-0.01
Barclays Aggr. Bonds		1	-0.04	0.23	0.14	0.03
HFRI Fund of Funds			1	0.64	0.76	0.68
Barclays High Yield				1	0.79	0.73
MSCI ACWI ex-US					1	0.89
S&P 500						1

Annualized Data (past 10 years)		
	Return	Risk
NCREIF Property 1Q in Arrers	5.4%	14.2%
Barclays U.S.Aggregate Bond Index	5.1%	2.8%
HFRI Fund of Funds Diversified Index	1.7%	7.8%
Barclays U.S. Corporate High Yield	7.6%	8.7%
MSCI All Country World Ex US Index	2.3%	19.4%
S&P 500	7.4%	16.7%

Monthly Correlations (past 5 years)						
	NCREIF Property	Barclays Aggr. Bonds	HFRI Fund of Funds	Barclays High Yield	MSCI ACWI ex-US	S&P 500
NCREIF Property	1	0.06	-0.35	-0.29	-0.23	-0.23
Barclays Aggr. Bonds		1	-0.14	0.18	-0.06	-0.19
HFRI Fund of Funds			1	0.61	0.72	0.75
Barclays High Yield				1	0.84	0.76
MSCI ACWI ex-US					1	0.87
S&P 500						1

Annualized Data (past 5 years)		
	Return	Risk
NCREIF Property 1Q in Arrers	12.2%	1.3%
Barclays U.S.Aggregate Bond Index	3.8%	2.9%
HFRI Fund of Funds Diversified Index	1.8%	5.3%
Barclays U.S. Corporate High Yield	5.8%	4.6%
MSCI All Country World Ex US Index	0.6%	14.2%
S&P 500	12.1%	14.2%

Asset Allocation Targets – PENSION FUND 01/01/2016 - Present

KRS Pension Fund - Asset Allocation							
Asset Class	Benchmark	Target					Allowable Range (+/- Target)
		KERS	KERS Hazardous	CERS	CERS Hazardous	SPRS	
US Equity	Russell 3000	22.0%	26.5%	26.5%	26.5%	23.0%	5.0%
Non US Equity	MSCI ACWI Ex-US IMI	20.0%	26.5%	26.5%	26.5%	23.0%	5.0%
Global Fixed Income	Barclays Universal Index	10.0%	6.0%	6.0%	6.0%	9.0%	2.0%
Credit Fixed Income	Barclays US High Yield	12.0%	6.0%	6.0%	6.0%	9.0%	2.0%
Real Estate	NCREIF ODCE	5.0%	5.0%	5.0%	5.0%	5.0%	2.0%
Absolute Return	HFRI Diversified FOF	10.0%	10.0%	10.0%	10.0%	10.0%	2.0%
Real Return	Custom- Allocation Specific	8.0%	8.0%	8.0%	8.0%	8.0%	2.0%
Private Equity ST<5 Yrs	Actual Performance	10.0%	10.0%	10.0%	10.0%	10.0%	3.0%
Private Equity LT 5+ Yrs	Russell 3000 + 300 bps (lagged)	10.0%	10.0%	10.0%	10.0%	10.0%	3.0%
Cash	Cit Grp 3-mos Treasury Bill	3.0%	2.0%	2.0%	2.0%	3.0%	2.0%

Asset Allocation Targets – PENSION FUND Pre 01/01/2016

KRS Pension Fund - Asset Allocation							
Asset Class	Benchmark	Target					Allowable Range (+/- Target)
		KERS	KERS Hazardous	CERS	CERS Hazardous	SPRS	
US Equity	Russell 3000	22.0%	20.0%	20.0%	20.0%	20.0%	5.0%
Non US Equity	MSCI ACWI Ex-US Standard	20.0%	20.0%	20.0%	20.0%	20.0%	5.0%
Emerging Market	MSCI Emerging Markets	0.0%	4.0%	4.0%	4.0%	4.0%	2.0%
Core Fixed Income	Barclays US Aggregate	10.0%	9.0%	9.0%	9.0%	8.0%	3.0%
High Yield Bonds	Barclays US High Yield	5.0%	5.0%	5.0%	5.0%	5.0%	2.0%
Global Bonds	Barclays Global Agg	5.0%	5.0%	5.0%	5.0%	5.0%	2.0%
Real Estate	NCREIF ODCE	3.0%	5.0%	5.0%	5.0%	5.0%	3.0%
Absolute Return	HFRI Diversified FOF	10.0%	10.0%	10.0%	10.0%	10.0%	3.0%
Real Return	Custom- Allocation Specific	10.0%	10.0%	10.0%	10.0%	10.0%	3.0%
Private Equity ST<5 Yrs	Actual Performance	10.0%	10.0%	10.0%	10.0%	10.0%	5.0%
Private Equity LT 5+ Yrs	Russell 3000 + 400 bps (lagged)	10.0%	10.0%	10.0%	10.0%	10.0%	5.0%
Cash	Cit Grp 3-mos Treasury Bill	5.0%	2.0%	2.0%	2.0%	3.0%	2.0%

Asset Allocation Targets – INSURANCE FUND 01/01/2016 - Present

KRS Insurance Fund - Asset Allocation							
Asset Class	Benchmark	Target					Allowable Range (+/- Target)
		KERS	KERS Hazardous	CERS	CERS Hazardous	SPRS	
US Equity	Russell 3000	26.5%	26.5%	26.5%	26.5%	26.5%	5.0%
Non US Equity	MSCI ACWI Ex-US IMI	26.5%	26.5%	26.5%	26.5%	26.5%	5.0%
Global Fixed Income	Barclays Universal Index	6.0%	6.0%	6.0%	6.0%	6.0%	2.0%
Credit Fixed Income	Barclays US High Yield	6.0%	6.0%	6.0%	6.0%	6.0%	2.0%
Real Estate	NCREIF ODCE	5.0%	5.0%	5.0%	5.0%	5.0%	2.0%
Absolute Return	HFRI Diversified FOF	10.0%	10.0%	10.0%	10.0%	10.0%	2.0%
Real Return	Custom- Allocation Specific	8.0%	8.0%	8.0%	8.0%	8.0%	2.0%
Private Equity ST<5 Yrs	Actual Performance	10.0%	10.0%	10.0%	10.0%	10.0%	3.0%
Private Equity LT 5+ Yrs	Russell 3000 + 300 bps (lagged)	10.0%	10.0%	10.0%	10.0%	10.0%	3.0%
Cash	Cit Grp 3-mos Treasury Bill	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%

Asset Allocation Targets – INSURANCE FUND Pre 01/01/2016

KRS Insurance Fund - Asset Allocation							
Asset Class	Benchmark	Target					Allowable Range (+/- Target)
		KERS	KERS Hazardous	CERS	CERS Hazardous	SPRS	
US Equity	Russell 3000	20.0%	20.0%	20.0%	20.0%	20.0%	5.0%
Non US Equity	MSCI ACWI Ex-US Standard	20.0%	20.0%	20.0%	20.0%	20.0%	5.0%
Emerging Market	MSCI Emerging Markets	4.0%	4.0%	4.0%	4.0%	4.0%	2.0%
Core Fixed Income	Barclays US Aggregate	10.0%	10.0%	10.0%	10.0%	10.0%	3.0%
High Yield Bonds	Barclays US High Yield	5.0%	5.0%	5.0%	5.0%	5.0%	2.0%
Global Bonds	Barclays Global Agg	5.0%	5.0%	5.0%	5.0%	5.0%	2.0%
Real Estate	NCREIF ODCE	5.0%	5.0%	5.0%	5.0%	5.0%	3.0%
Absolute Return	HFRI Diversified FOF	10.0%	10.0%	10.0%	10.0%	10.0%	3.0%
Real Return	Custom- Allocation Specific	10.0%	10.0%	10.0%	10.0%	10.0%	3.0%
Private Equity ST >5 Yrs	Actual Performance	10.0%	10.0%	10.0%	10.0%	10.0%	3.0%
Private Equity LT 5+ Yrs	Russell 3000 + 400 bps (lagged)	10.0%	10.0%	10.0%	10.0%	10.0%	5.0%
Cash	Cit Grp 3-mos Treasury Bill	1.0%	1.0%	1.0%	1.0%	1.0%	2.0%

Calendar/Fiscal Year Returns

KRS Pension Fund	
Fiscal Year	Return
1990	11.67
1991	8.24
1992	11.67
1993	12.16
1994	1.02
1995	18.99
1996	17.63
1997	24.16
1998	20.76
1999	14.27
2000	6.42
2001	-5.42
2002	-4.31
2003	4.28
2004	13.59
2005	9.25
2006	9.68
2007	15.27
2008	-4.22
2009	-17.23
2010	15.76
2011	18.75
2012	0.01
2013	10.82
2014	15.55
2015	2.01
2016	-0.52

KRS Pension Fund	
Calendar Year	Return
1990	1.39
1991	21.79
1992	8.77
1993	7.40
1994	1.24
1995	26.91
1996	16.54
1997	23.27
1998	18.08
1999	14.08
2000	-2.70
2001	-3.31
2002	-6.82
2003	20.02
2004	10.93
2005	6.40
2006	13.98
2007	6.58
2008	-23.92
2009	19.66
2010	12.70
2011	-0.48
2012	12.68
2013	12.70
2014	5.14
2015	-0.02

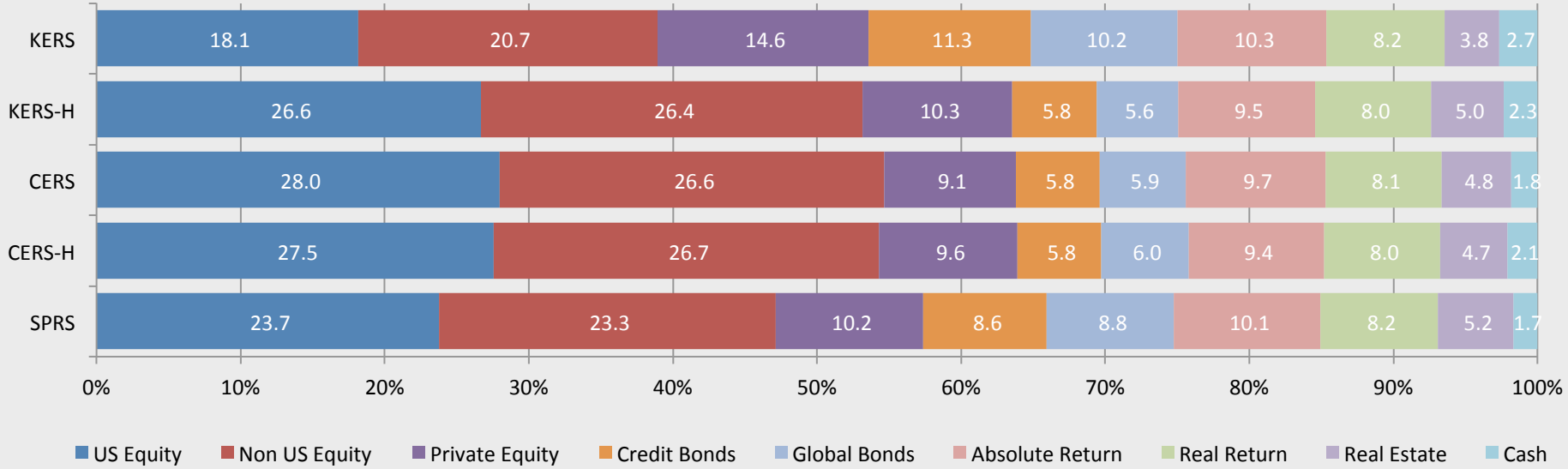
KRS Insurance Fund	
Fiscal Year	Return
1990	8.34
1991	13.27
1992	15.72
1993	11.29
1994	-0.02
1995	15.61
1996	10.28
1997	21.75
1998	21.00
1999	12.12
2000	6.41
2001	-3.81
2002	-9.31
2003	1.67
2004	13.84
2005	9.49
2006	12.37
2007	19.32
2008	-7.86
2009	-23.19
2010	15.44
2011	23.49
2012	-1.84
2013	10.11
2014	14.89
2015	1.86
2016	-0.09

KRS Insurance Fund	
Calendar Year	Return
1990	9.86
1991	20.92
1992	7.18
1993	9.17
1994	-1.09
1995	22.67
1996	9.47
1997	23.18
1998	16.39
1999	12.55
2000	-1.26
2001	-5.37
2002	-12.50
2003	20.59
2004	13.17
2005	8.10
2006	15.79
2007	8.39
2008	-32.96
2009	25.66
2010	13.25
2011	-1.98
2012	11.99
2013	12.30
2014	4.46
2015	-0.12

*1984 performance began April 1

Pension Plan

Allocations as of 6/30/16

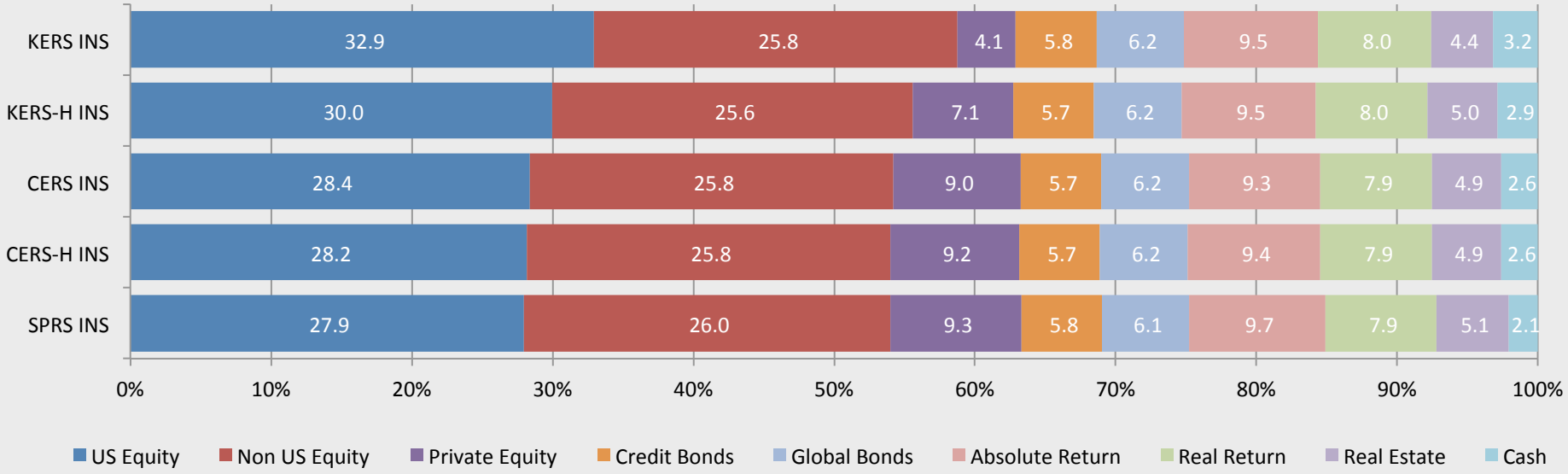


Performance as of 6/30/16

Plan	Month	FYTD	1 YR	3 YR	5 YR	10 YR	ITD
KERS	0.05	-0.68	-0.68	5.51	5.41	5.04	9.03
KERS Plan Index	0.44	0.71	0.71	5.75	5.82	5.45	9.18
KERS-H	-0.14	-0.24	-0.24	5.53	5.43	5.05	9.03
KHAZ Plan Index	0.20	-0.61	-0.61	5.35	5.58	5.33	9.14
CERS	-0.12	-0.53	-0.53	5.42	5.36	5.01	9.02
CERS Plan Index	0.19	-0.66	-0.66	5.32	5.56	5.32	9.14
CERS-H	-0.13	-0.38	-0.38	5.47	5.39	5.03	9.03
CHAZ Plan Index	0.19	-0.66	-0.66	5.33	5.57	5.32	9.14
SPRS	0.00	-1.49	-1.49	5.09	5.16	4.91	8.99
SPRS Plan Index	0.33	-0.31	-0.31	5.43	5.63	5.35	9.15

Insurance Plan

Allocations as of 6/30/16



Performance as of 6/30/16

Plan	Month	FYTD	1 YR	3 YR	5 YR	10 YR	ITD
KERS INS	-0.21	-0.59	-0.59	4.86	4.50	4.14	7.16
INS KERS Plan Index	0.20	-0.56	-0.56	5.40	5.51	4.69	7.56
KERS-H INS	-0.10	-0.27	-0.27	5.35	4.79	4.28	7.21
INS KHAZ Plan Index	0.24	-0.38	-0.38	5.51	5.58	4.72	7.57
CERS INS	-0.07	-0.07	-0.07	5.43	4.84	4.31	7.21
INS CERS Plan Index	0.26	-0.25	-0.25	5.59	5.62	4.75	7.58
CERS-H INS	-0.07	0.06	0.06	5.47	4.86	4.32	7.22
INS CHAZ Plan Index	0.26	-0.24	-0.24	5.59	5.63	4.75	7.58
SPRS INS	-0.08	-0.02	-0.02	5.43	4.84	4.31	7.21
INS SPRS Plan Index	0.26	-0.22	-0.22	5.61	5.64	4.75	7.58

Kentucky Retirement Systems Monthly Investment Update: 6/30/16

Pension	Month	Fiscal YTD	1 Year	3 Years	5 Years	10 Years	20 Years	Since inception	Inception Date
TOTAL FUND	-0.09	-0.52	-0.52	5.45	5.38	5.02	6.94	9.03	4/1/84
Performance Benchmark	0.24	-0.19	-0.19	5.61	5.74	5.41	7.11	9.17	4/1/84
US PUBLIC	0.05	1.44	1.44	10.34	10.73	7.13	8.22	11.07	4/1/84
Performance Benchmark	0.21	2.14	2.14	11.13	11.60	7.42	8.21	11.07	4/1/84
EQUITY NON US	-2.51	-8.47	-8.47	2.09	0.45	1.99		1.83	7/1/00
Performance Benchmark	-1.67	-9.72	-9.72	1.65	0.58	1.92		2.28	7/1/00
PUBLIC EQUITY	-1.22	-4.28	-4.28	5.67	5.14	4.36	7.00	10.29	4/1/84
Performance Benchmark	-0.73	-5.03	-5.03	5.53	5.18	4.15	6.71	10.11	4/1/84
FIXED INCOME	1.10	4.76	4.76	4.39	4.74	5.49	5.95	7.72	4/1/84
Performance Benchmark	1.34	7.53	7.53	4.76	4.35	5.50	5.96	7.54	4/1/84
REAL RETURN	3.17	1.13	1.13	1.91	3.31			3.31	7/1/11
Performance Benchmark	2.67	2.10	2.10	1.42	2.65			2.65	7/1/11
ABSOLUTE RETURN	-0.20	-6.26	-6.26	2.36	3.93			3.73	4/1/10
Performance Benchmark	0.50	-5.52	-5.52	1.73	1.66			2.38	4/1/10
REAL ESTATE	1.82	9.20	9.20	8.37	8.91	6.35	5.79	5.83	7/1/84
Performance Benchmark	1.95	12.62	12.62	12.59	12.20	5.38	8.41	6.41	7/1/84
PRIVATE EQUITY	0.63	5.46	5.46	12.36	12.20	7.59		10.83	7/1/02
Performance Benchmark	0.63	5.46	5.46	12.36	14.80	10.23		10.26	7/1/02
CASH ACCOUNT	0.05	0.47	0.47	0.41	0.36	1.54	2.76	3.75	1/1/88
Performance Benchmark	0.02	0.14	0.14	0.07	0.06	0.96	2.31	3.30	1/1/88

Kentucky Retirement Systems Monthly Investment Update: 6/30/16

Insurance	Month	Fiscal YTD	1 Year	3 Years	5 Years	10 Years	20 Years	Since inception	Inception Date
TOTAL FUND	-0.09	-0.09	-0.09	5.35	4.79	4.28	6.18	7.21	4/1/87
Performance Benchmark	0.27	0.03	0.03	5.88	5.80	4.83	6.74	7.61	4/1/87
US PUBLIC	0.01	2.31	2.31	10.61	10.85	7.09	7.85	9.22	7/1/92
Performance Benchmark	0.21	2.14	2.14	11.13	11.60	7.38	7.65	9.05	7/1/92
EQUITY NON US	-2.66	-8.63	-8.63	1.95	0.27	1.95		1.84	4/1/00
Performance Benchmark	-1.67	-9.72	-9.72	1.65	0.58	1.57		1.35	4/1/00
PUBLIC EQUITY	-1.24	-3.77	-3.77	5.89	5.18	4.25	6.65	8.21	7/1/92
Performance Benchmark	-0.73	-4.92	-4.92	5.62	5.16	4.02	6.39	7.98	7/1/92
FIXED INCOME	1.40	5.11	5.11	3.90	4.41	5.60	6.50	6.55	7/1/92
Performance Benchmark	1.34	7.53	7.53	4.76	4.35	5.58	6.38	6.50	7/1/92
REAL RETURN	3.04	1.52	1.52	1.93	3.11			3.11	7/1/11
Performance Benchmark	2.68	2.57	2.57	1.62	2.78			2.78	7/1/11
ABSOLUTE RETURN	1.90	9.75	9.75	8.20	8.51			8.79	5/1/09
Performance Benchmark	1.95	12.62	12.62	12.59	12.20			5.63	5/1/09
REAL ESTATE	-0.22	-6.17	-6.17	2.38	3.91			3.66	4/1/10
Performance Benchmark	0.50	-5.52	-5.52	1.73	1.66			2.38	4/1/10
PRIVATE EQUITY	1.36	10.59	10.59	15.65	13.78	9.32		9.53	7/1/02
Performance Benchmark	1.36	10.59	10.59	15.65	14.80	9.58		9.61	7/1/02
CASH ACCOUNT	0.04	0.31	0.31	0.25	0.28	1.28	2.48	2.77	7/1/92
Performance Benchmark	0.02	0.14	0.14	0.07	0.06	0.96	2.31	2.64	7/1/92

FY 2016 Performance Drivers

- The more real estate, private equity, core and long duration fixed income, and U.S. large cap equity exposure a portfolio had the better it did.
- The more non-U.S. equity, U.S. small and mid cap equity, and absolute return/hedge fund exposure a portfolio had the worse it did.

FY 2016 Performance Drivers

- Passive management in U.S. equities did better than active management.
- Value stocks did better than growth stocks, but the out performance was all in the second half of fiscal year.
- High yield credit, commodities, and emerging market debt and equity all had a difficult first half of fiscal year, but were some of the best performing asset classes in the second six months.

Asset Class Heat Map

Annual Asset Class Performance

As of June 30, 2016

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	YTD
Best	25.91	61.34	33.16	34.00	35.97	39.38	8.44	78.51	28.60	22.49	20.00	38.82	31.78	15.02	14.33
	16.56	55.81	31.45	26.19	32.18	16.23	5.24	58.21	26.86	15.99	18.23	32.39	19.31	9.59	13.23
	14.81	47.25	25.55	21.39	26.34	15.97	2.06	46.78	22.04	13.56	17.59	29.30	13.69	4.23	11.09
	10.25	38.59	20.25	21.36	19.31	11.63	-2.35	31.78	18.88	9.24	17.32	22.78	12.50	1.38	9.06
	5.54	36.18	18.33	13.82	18.37	11.17	-10.01	28.60	16.83	7.84	16.34	13.94	5.97	0.55	6.41
	3.58	28.97	13.06	13.54	16.32	9.91	-20.47	27.18	16.36	4.98	16.00	9.10	4.89	0.05	6.24
	3.12	28.68	11.13	6.75	15.79	6.97	-26.16	26.46	15.12	2.11	15.81	7.44	3.64	-0.81	5.31
	1.78	23.93	10.88	5.33	11.85	6.60	-33.79	18.91	15.06	0.10	10.94	1.86	3.03	-1.24	4.36
	-1.41	11.93	9.15	4.91	9.85	5.49	-35.65	11.41	10.16	-4.18	8.82	0.07	2.45	-1.44	3.84
	-6.17	9.28	8.56	4.55	4.85	5.00	-37.00	9.72	7.75	-5.55	6.98	-2.02	0.04	-3.30	2.22
	-7.83	8.39	8.46	3.07	4.33	1.87	-39.20	5.93	6.54	-12.14	4.80	-2.60	-2.19	-4.41	0.15
	-15.94	5.87	6.79	2.84	2.71	1.45	-43.38	1.92	6.31	-13.32	4.21	-8.61	-4.90	-4.47	-2.87
	-20.48	4.10	4.34	2.74	2.07	-1.57	-47.01	0.21	4.77	-15.94	0.11	-8.83	-4.95	-14.92	-3.18
Worst	-22.10	1.15	1.33	2.43	0.41	-17.55	-53.33	-29.76	0.13	-18.42	-1.06	-9.52	-17.01	-24.66	-4.42
	S&P 500 - US Large Cap	R 2000 - US Small Cap	MSCI EAFE (Net) - Int'l Dev.	MSCI EAFE SC (Net) - Int'l SC	MSCI EM (Net) - Int'l Emg Mkts	Barclays US Agg Bond - FI	Barclays US Corp: Hi Yield - FI	Barclays US Trsy: US TIPS - FI	Barclays US Gov/Credit: Lng - FI	NCREIF ODCE (Gross) - Real Estate	Wilshire US REIT - REITs	HFN FOF Multi-Strat (Net) - ARS	Bloombrg Cmdty (TR) - Commod.	BofA ML 3 Mo T-Bill - Cash Equiv	

RVK

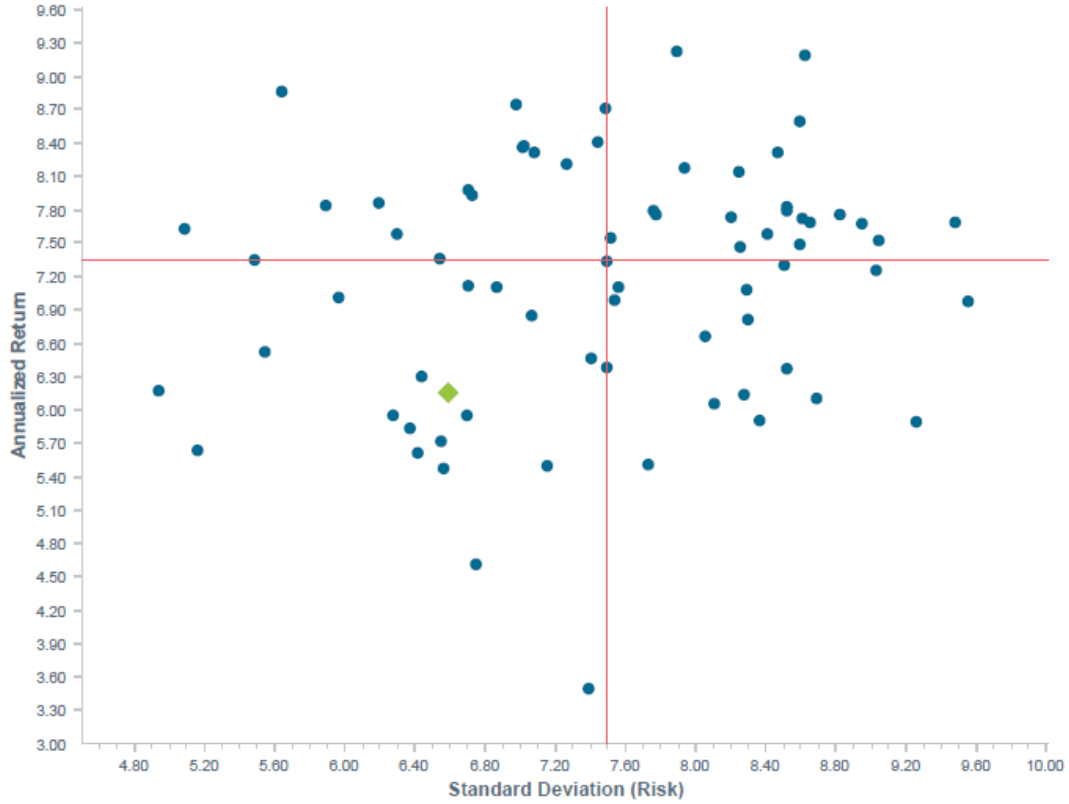
5 Year Risk/Return

Fund Number: 1
Risk/Return Analysis
5 Year Annualized Total Fund Returns vs. Standard Deviation

As of December 31, 2015

73 of 75 funds provided Total Fund returns for this time period (%)

Fund Sharpe Ratio: 0.93



Universe Median Risk: 7.50 Median Return: 7.34 Median Sharpe Ratio: 0.94

Funds with less history than the specified time period will not appear in the chart.

RVK

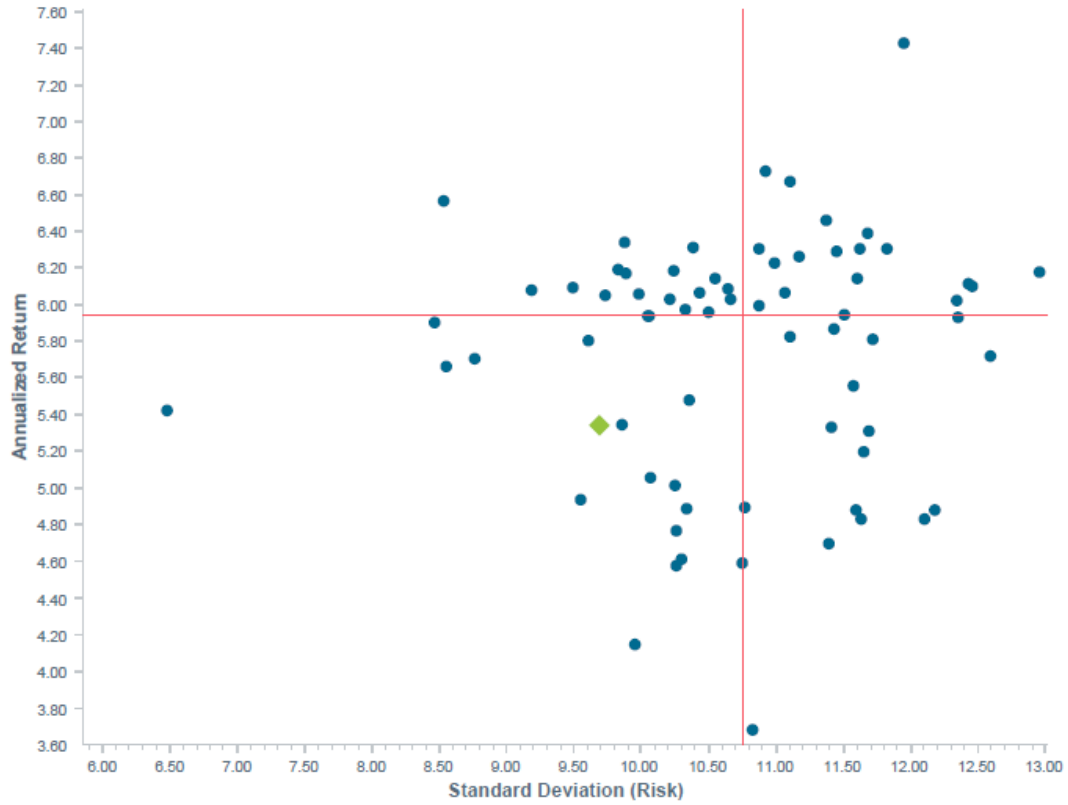
10 Year Risk/Return

Fund Number: 1
Risk/Return Analysis
10 Year Annualized Total Fund Returns vs. Standard Deviation

As of December 31, 2015

71 of 75 funds provided Total Fund returns for this time period (%)

Fund Sharpe Ratio: 0.46



Universe Median Risk: 10.76 Median Return: 5.94 Median Sharpe Ratio: 0.48

Funds with less history than the specified time period will not appear in the chart.

RVK

Cash Flow Overview

August 25, 2016

Karen Roggenkamp
Chief Operating Officer

KERS Non Hazardous Pension Plan
Cash Flow Review

Cash Flow Stress beginning in 1998

- Employer Contributions (ARC) Underfunding Impact = $2.44 Billion (Pension); $2.1 Billion (Insurance)
- Incentive Windows to Reduce Payroll = Retirement Spike and Extended Payment Outflows
- "Air" Time Purchases (excluded New Hires in 2002)
- Unfunded Cost of Living Adjustments for Retirees – last COLA granted in 2011
- Increased Reliance on Investment Performance; Market Volatility and Asset Sales

KERS Non Hazardous vs. CERS Non Hazardous Comparisons

Cash Flow Stress Mitigation

- Additional Employee 1% Contribution (2009)
- Reductions in Future Benefit Outflow; (Tier 2 and Tier 3)
- Full payment of ARC (2015 – 2018)
- Additional Funding 2017 and 2018; partially offset by Tier 1 Retirement Bubble

*cash flow = $ inflows less $ outflows

KERSNHZ Historical Contribution Rates
Pension & Insurance

HISTORICAL REDUCTIONS TO THE EMPLOYER CONTRIBUTION RATES

PENSION

Kentucky Employees Retirement System (KERS): Non-Hazardous Employees

Fiscal Year	Covered Payroll	Recommended Employer Rate	Recommended Dollar Contribution	Budgeted Employer Rate	Budgeted Dollar Contribution	Difference (%)	Difference ($)
FY 1993	$1,079,322,020	6.69%	$72,206,643	5.68%	$61,305,491	1.01%	$10,901,152
FY 1994	$1,121,481,440	5.54%	$62,130,072	4.53%	$50,803,109	1.01%	$11,326,963
FY 1996	$1,232,974,460	5.60%	$69,046,570	5.41%	$66,703,918	0.19%	$2,342,651
FY 2003	$1,658,604,696	0.34%	$5,639,256	0.34%	$5,639,256	0.00%	$0
FY 2004	$1,645,412,496	2.86%	$47,058,797	1.22%	$20,074,032	1.64%	$26,984,765
FY 2005	$1,655,907,288	5.11%	$84,616,862	2.92%	$48,352,493	2.19%	$36,264,370
FY 2006	$1,702,230,777	7.85%	$133,625,116	3.39%	$57,705,623	4.46%	$75,919,493
FY 2007	$1,780,223,493	10.68%	$190,127,869	4.83%	$85,984,795	5.85%	$104,143,074
FY 2008	$1,837,873,488	15.55%	$888,979,406	5.47%	$100,531,680	10.08%	$185,257,648
FY 2009	$1,754,412,912	16.54%	$501,762,093	5.79%	$101,580,508	10.75%	$188,599,388
FY 2010	$1,815,146,388	18.96%	$567,959,305	6.65%	$120,707,235	12.31%	$223,444,520
FY 2011	$1,731,632,748	21.77%	$376,976,449	9.58%	$165,890,417	12.19%	$211,086,032
FY 2012	$1,644,896,681	24.30%	$399,709,893	11.59%	$190,643,525	12.71%	$209,066,368
FY 2013	$1,644,408,698	28.03%	$460,927,758	14.86%	$244,359,133	13.17%	$216,568,626
FY 2014	$1,577,496,447	32.57%	$513,790,593	17.29%	$272,749,136	15.28%	$241,041,457
							$1,742,946,507

HISTORICAL REDUCTIONS TO THE EMPLOYER CONTRIBUTION RATES

INSURANCE

Kentucky Employees Retirement System (KERS): Non-Hazardous Employees

Fiscal Year	Covered Payroll	Recommended Employer Rate	Recommended Dollar Contribution	Budgeted Employer Rate	Budgeted Dollar Contribution	Difference (%)	Difference ($)
FY 1993	$1,079,322,020	1.97%	$21,262,644	1.97%	$21,262,644	0.00%	$0
FY 1994	$1,121,481,440	3.12%	$34,990,221	3.12%	$34,990,221	0.00%	$0
FY 1996	$1,232,974,460	3.15%	$38,838,695	3.15%	$38,838,695	0.00%	$0
FY 2003	$1,658,604,696	5.55%	$92,052,561	3.42%	$56,724,281	2.13%	$35,328,280
FY 2004	$1,645,412,496	4.67%	$76,840,764	4.67%	$76,840,764	0.00%	$0
FY 2005	$1,655,907,288	5.18%	$85,775,998	2.97%	$49,180,446	2.21%	$36,595,551
FY 2006	$1,702,230,777	5.77%	$98,218,716	2.50%	$42,555,769	3.27%	$55,662,946
FY 2007	$1,780,223,493	6.45%	$114,824,415	2.92%	$51,982,526	3.53%	$62,841,889
FY 2008	$1,837,873,488	32.82%	$888,979,406	3.03%	$55,687,567	29.79%	$547,502,512
FY 2009	$1,754,412,912	12.06%	$501,762,093	4.22%	$74,036,225	7.84%	$137,545,972
FY 2010	$1,815,146,388	12.33%	$567,959,305	4.96%	$90,031,261	7.37%	$133,776,289
FY 2011	$1,731,632,748	16.81%	$291,087,465	7.40%	$128,140,823	9.41%	$162,946,642
FY 2012	$1,644,896,681	16.41%	$269,927,545	8.23%	$135,374,997	8.18%	$134,552,549
FY 2013	$1,644,408,698	16.52%	$271,656,317	8.75%	$143,885,761	7.77%	$127,770,556
FY 2014	$1,577,496,447	12.71%	$200,499,798	9.50%	$149,862,162	3.21%	$50,637,636
							$1,485,160,822

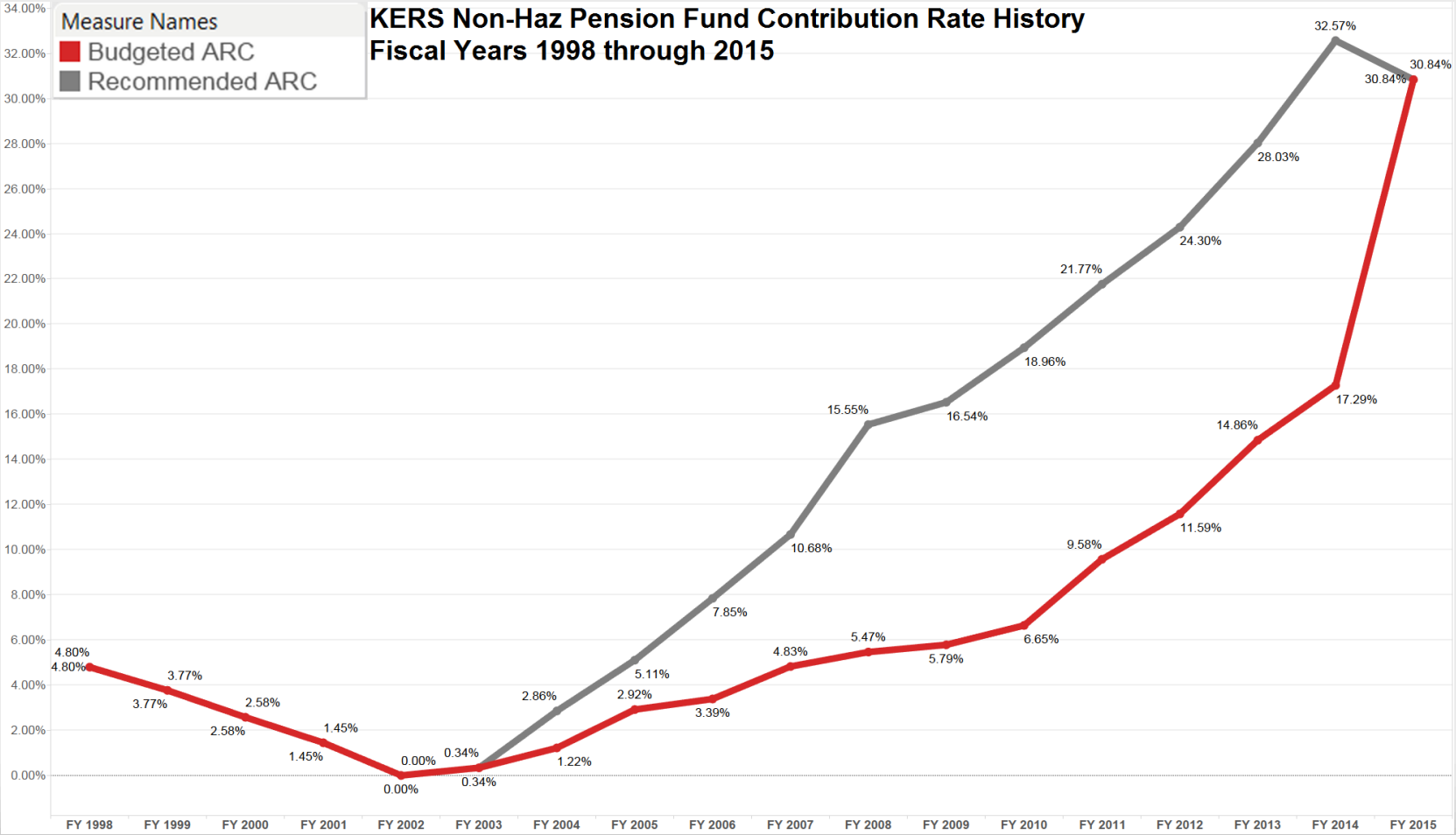
	Pension	Insurance	Total
Underfunding of ARC	*$ 1,742,946,507*	*$ 1,485,160,822*	*$ 3,228,107,329*
Estimated Lost Investment Income	*$ 697,200,056*	*$ 612,680,480*	*$ 1,309,880,537*
Total Loss from Underfunding	***$ 2,440,146,563***	***$ 2,097,841,302***	***$ 4,537,987,865***

Pension Funding History
KERSNZ & CERSNZ

Kentucky Employees Retirement System (KERS): Non-Hazardous Employees							
Fiscal Year	Covered Payroll	Recommended Employer Rate	Recommended Dollar Contribution	Budgeted Employer Rate	Budgeted Dollar Contribution	Difference (%)	Difference ($)
FY 1993	$1,079,322,020	6.69%	$72,206,643	5.68%	$61,305,491	1.01%	$10,901,152
FY 1994	$1,121,481,440	5.54%	$62,130,072	4.53%	$50,803,109	1.01%	$11,326,963
FY 1996	$1,232,974,460	5.60%	$69,046,570	5.41%	$66,703,918	0.19%	$2,342,651
FY 2003	$1,658,604,696	0.34%	$5,639,256	0.34%	$5,639,256	0.00%	$0
FY 2004	$1,645,412,496	2.86%	$47,058,797	1.22%	$20,074,032	1.64%	$26,984,765
FY 2005	$1,655,907,288	5.11%	$84,616,862	2.92%	$48,352,493	2.19%	$36,264,370
FY 2006	$1,702,230,777	7.85%	$133,625,116	3.39%	$57,705,623	4.46%	$75,919,493
FY 2007	$1,780,223,493	10.68%	$190,127,869	4.83%	$85,984,795	5.85%	$104,143,074
FY 2008	$1,837,873,488	15.55%	$888,979,406	5.47%	$100,531,680	10.08%	$185,257,648
FY 2009	$1,754,412,912	16.54%	$501,762,093	5.79%	$101,580,508	10.75%	$188,599,388
FY 2010	$1,815,146,388	18.96%	$567,959,305	6.65%	$120,707,235	12.31%	$223,444,520
FY 2011	$1,731,632,748	21.77%	$376,976,449	9.58%	$165,890,417	12.19%	$211,086,032
FY 2012	$1,644,896,681	24.30%	$399,709,893	11.59%	$190,643,525	12.71%	$209,066,368
FY 2013	$1,644,408,698	28.03%	$460,927,758	14.86%	$244,359,133	13.17%	$216,568,626
FY 2014	$1,577,496,447	32.57%	$513,790,593	17.29%	$272,749,136	15.28%	$241,041,457
						Total Underfunding	*$1,742,946,507*
						Lost Investment Opportunity	*$ 697,200,056*

County Employees Retirement System (CERS)			
Fiscal Year	Recommended Employer Rate	Budgeted Employer Rate	Difference (%)
FY 1993	8.82%	8.82%	0.00%
FY 1994	8.82%	8.82%	0.00%
FY 1996	8.94%	8.94%	0.00%
FY 2003	6.34%	6.34%	0.00%
FY 2004	7.34%	7.34%	0.00%
FY 2005	8.48%	8.48%	0.00%
FY 2006	10.98%	10.98%	0.00%
FY 2007	13.19%	13.19%	0.00%
FY 2008	16.17%	16.17%	0.00%
FY 2009	13.50%	13.50%	0.00%
FY 2010	16.16%	16.16%	0.00%
FY 2011	16.93%	16.93%	0.00%
FY 2012	18.96%	18.96%	0.00%
FY 2013	19.55%	19.55%	0.00%
FY 2014	18.89%	18.89%	0.00%
FY 2015	17.67%	17.67%	0.00%

KERS Non Hazardous Contribution Rates

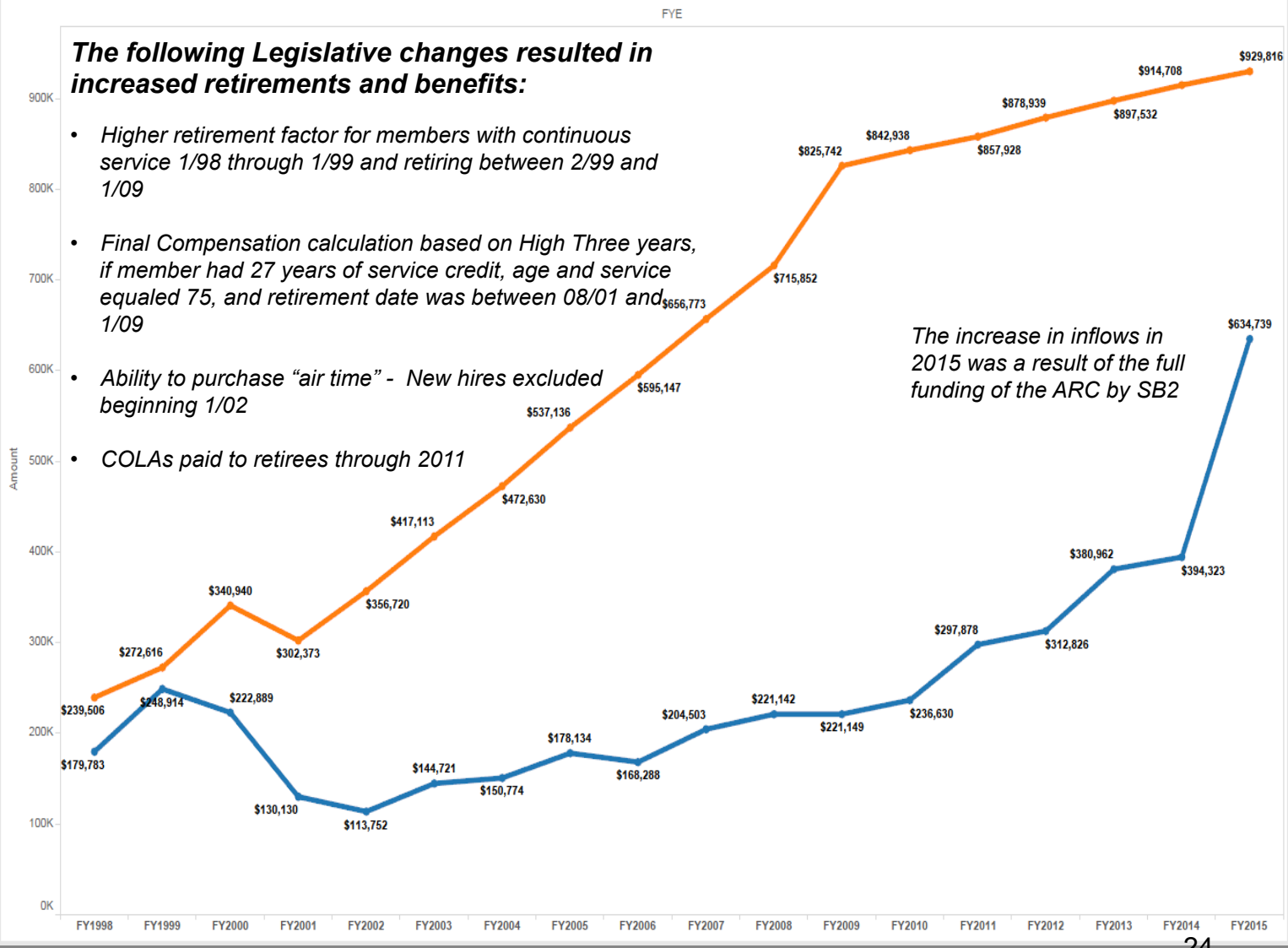


KERS Non Hazardous Cash Flow Excluding Investment Activity ($000's)

In/Out
- Inflow
- Outflow

Description
- (All)
- [x] Administrative Expenses
- [x] Bank of America Settlement
- [x] Benefit Payments
- [x] Capital Project Expenses
- [x] Commissions
- [x] Employer Contributions
- [x] Health Insurance Contributions (HB1)
- Investment Expense
- Investment Income
- [x] Member Contributions
- [x] Other Deductions
- [x] Pension Spiking Contributions
- Realized Gain/loss
- Reduction to Employer Contributions
- [x] Refunds
- Securities Lending Borrower Rebates
- Securities Lending Income
- Security Lending Agent Fee
- SL Custodial Fee

Retirements by Fiscal Year	
Total KERS	
Fiscal Year	Total
1998	1,363
1999	1,843
2000	2,559
2001	2,210
2002	2,390
2003	2,565
2004	2,997
2005	3,060
2006	2,878
2007	2,880
2008	2,849
2009	3,891
2010	1,385
2011	1,878
2012	2,041
2013	2,288
2014	2,235
Total	**41,312**



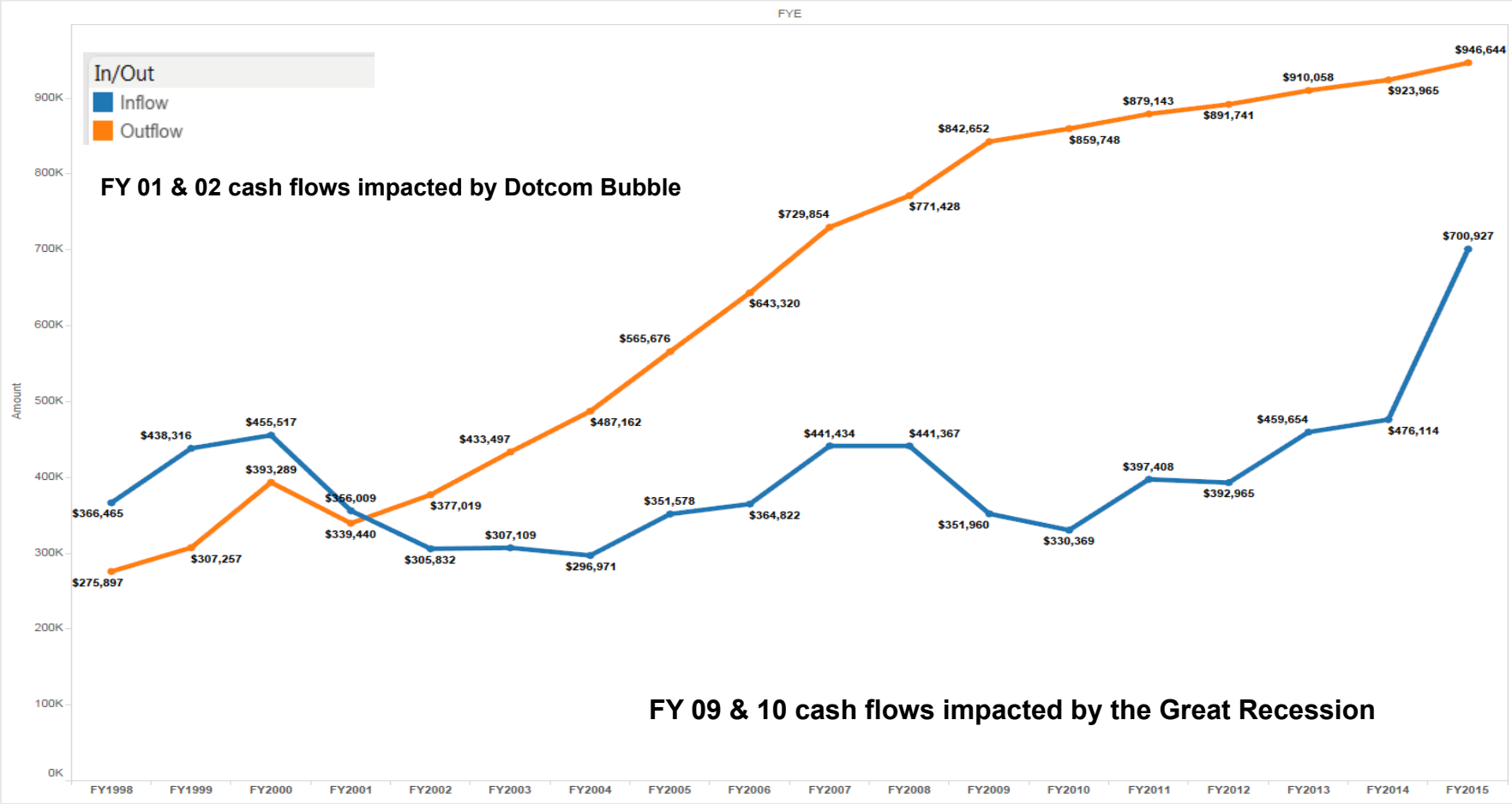
The following Legislative changes resulted in increased retirements and benefits:

- *Higher retirement factor for members with continuous service 1/98 through 1/99 and retiring between 2/99 and 1/09*
- *Final Compensation calculation based on High Three years, if member had 27 years of service credit, age and service equaled 75, and retirement date was between 08/01 and 1/09*
- *Ability to purchase "air time" - New hires excluded beginning 1/02*
- *COLAs paid to retirees through 2011*

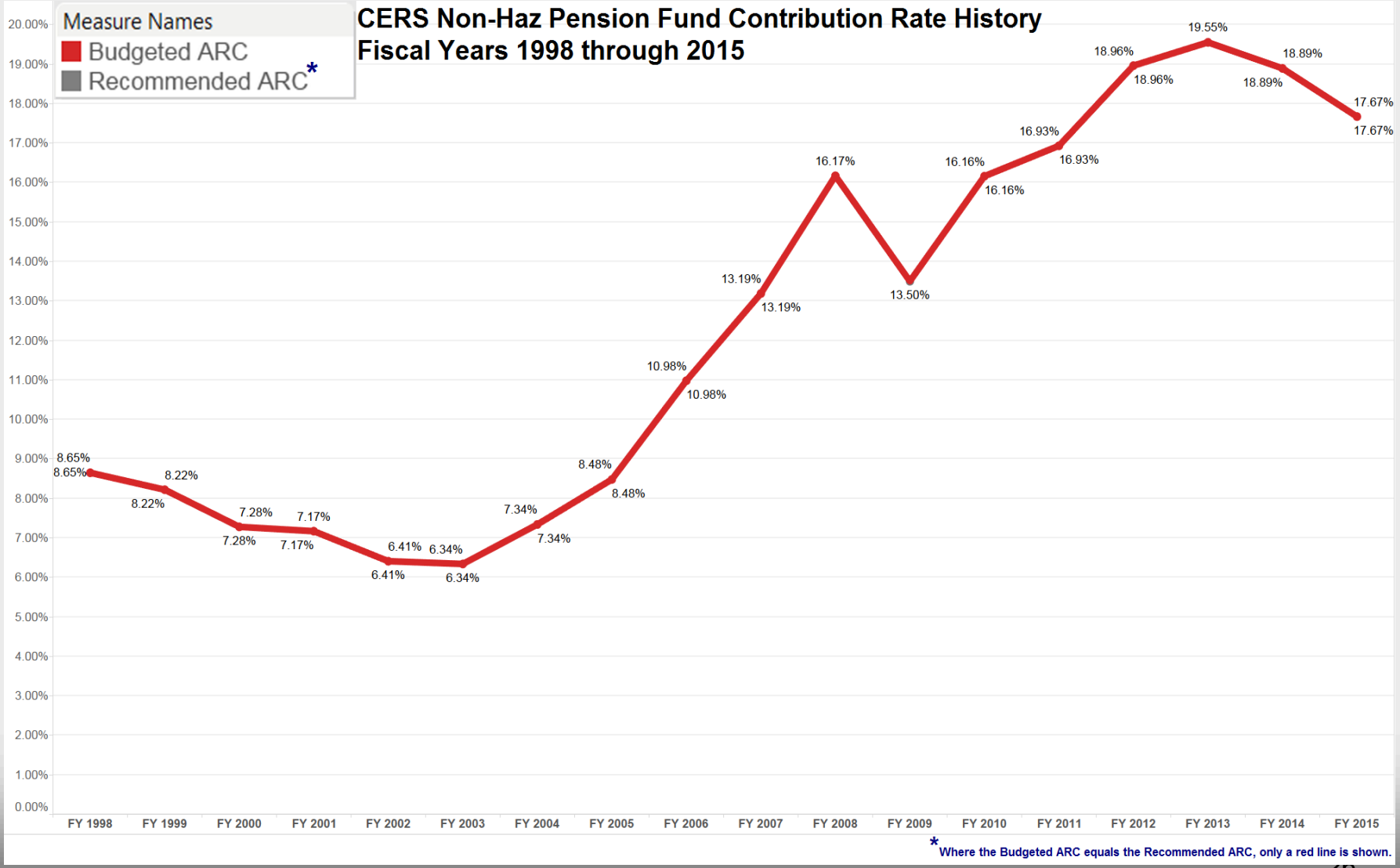
The increase in inflows in 2015 was a result of the full funding of the ARC by SB2

KERS Non Hazardous Cash Flow with Investment Income and Expense

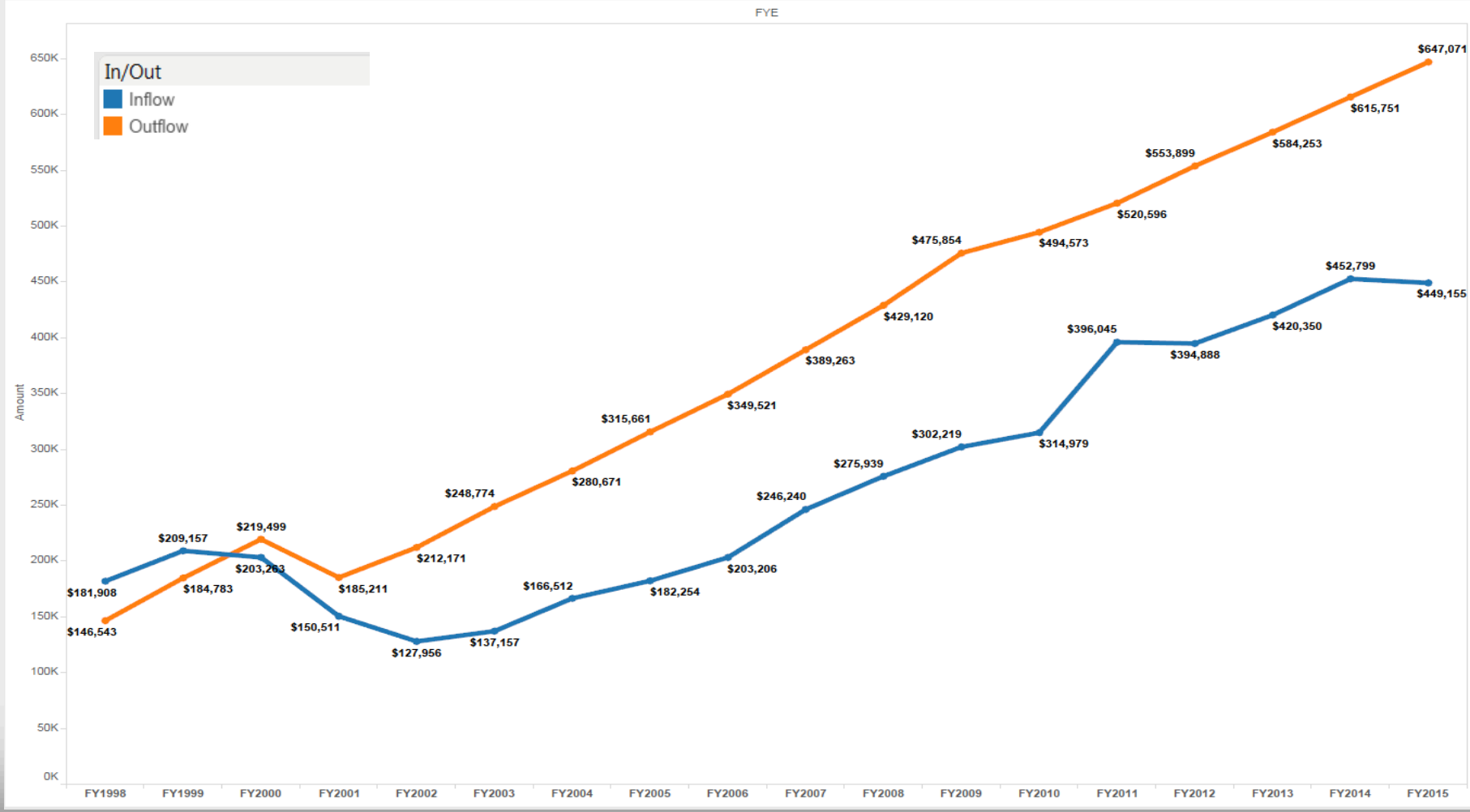
Without Unrealized Investment Gains/Losses



CERS Non Hazardous Contribution Rates

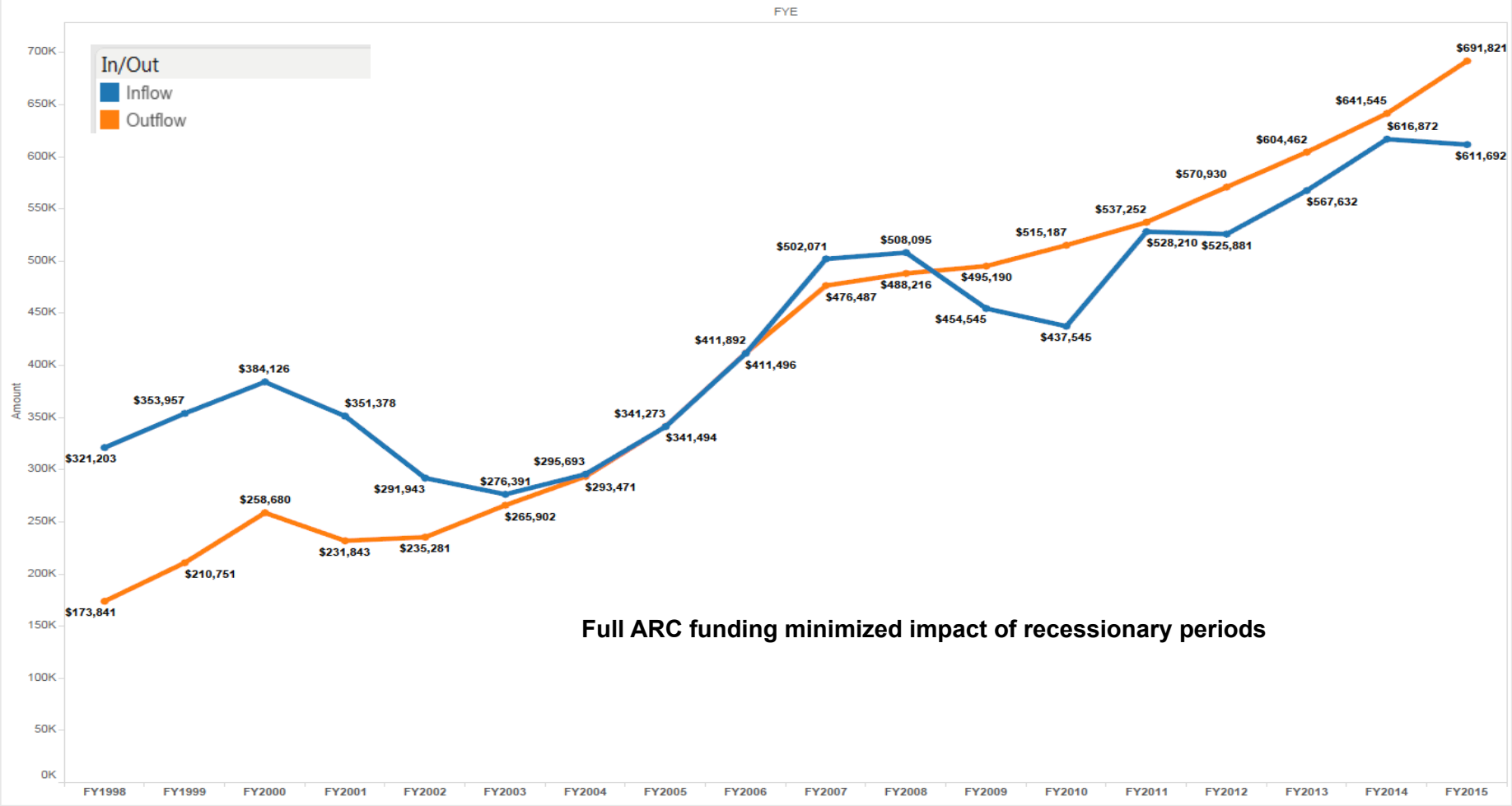


CERS Non Hazardous Cash Flow without Investment Activity



CERS Non Hazardous Cash Flow with Investment Income and Expense

Without Unrealized Investment Gains/Losses



KERS Non Hazardous Pension Cash Flow FY 2016 – FY 2018

$000's	FY 2016 Preliminary	FY 2017 Estimated	FY 2018 Estimated
Inflows			
Employer Contributions	513,084	656,361	669,736
Employee Contributions	106,494	86,319	86,319
Investment Income	41,013	TBD	TBD
Total Inflows	**660,591**	**742,680**	**756,055**
HB 303 Funding		58,193	67,574
Total	**660,591**	**800,873**	**823,629**
Outflows			
Benefits	923,288	950,987	979,517
Refunds/Adjustments	12,311	12,130	12,130
Administrative Expenses	10,808	10,808	10,808
Investment Expenses	16,476	TBD	TBD
Total Outflows	**962,883**	**973,925**	**1,002,455**
Cash Flows	**(302,292)**	**(173,052)**	**(178,826)**
Total Cash Flow	**($302,292)**	**($173,052)**	**($178,826)**
Investment Gains/Losses	(45,200)	TBD	TBD
Net Position with Gains/Losses	($347,492)	($173,052)	($178,826)

NOTE: Estimates for FY 2017 and FY 2018 do not include Investment Income or Investment Expenses

Appendix
Investments

The KRS Investment Function

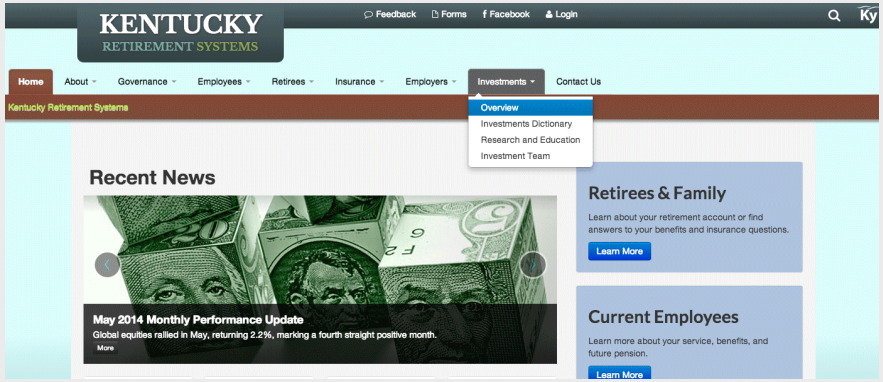
- Under Kentucky Revised Statute 61.650, **the KRS Board of Trustees (the Board) has the "… exclusive power to invest and reinvest… (the Systems' funds)… in accordance with federal law."**

- **The Board is required by statute to establish an Investment Committee**
  - Two (2) members must be the two trustees with investment experience appointed by the Governor.
  - Three (3) members are appointed by the Board chair.

- The Investment Committee has the authority to implement the investment policies adopted by the Board and to "… act on behalf of the Board on all investment-related matters and to acquire, sell, safeguard, monitor, and manage the assets and securities of the several funds."

- The KRS Chief Investment Officer supervises the KRS Investment Division and reports to the Investment Committee and the Executive Director (for administrative purposes).

Investment Website



https://kyret.ky.gov

- Latest Investment News
- Monthly Performance Updates
- Consultant Reports
- Investment Committee Summary
- Quarterly Performance Updates
- Quarterly Holdings
- Quarterly Commissions

Investment Consultants

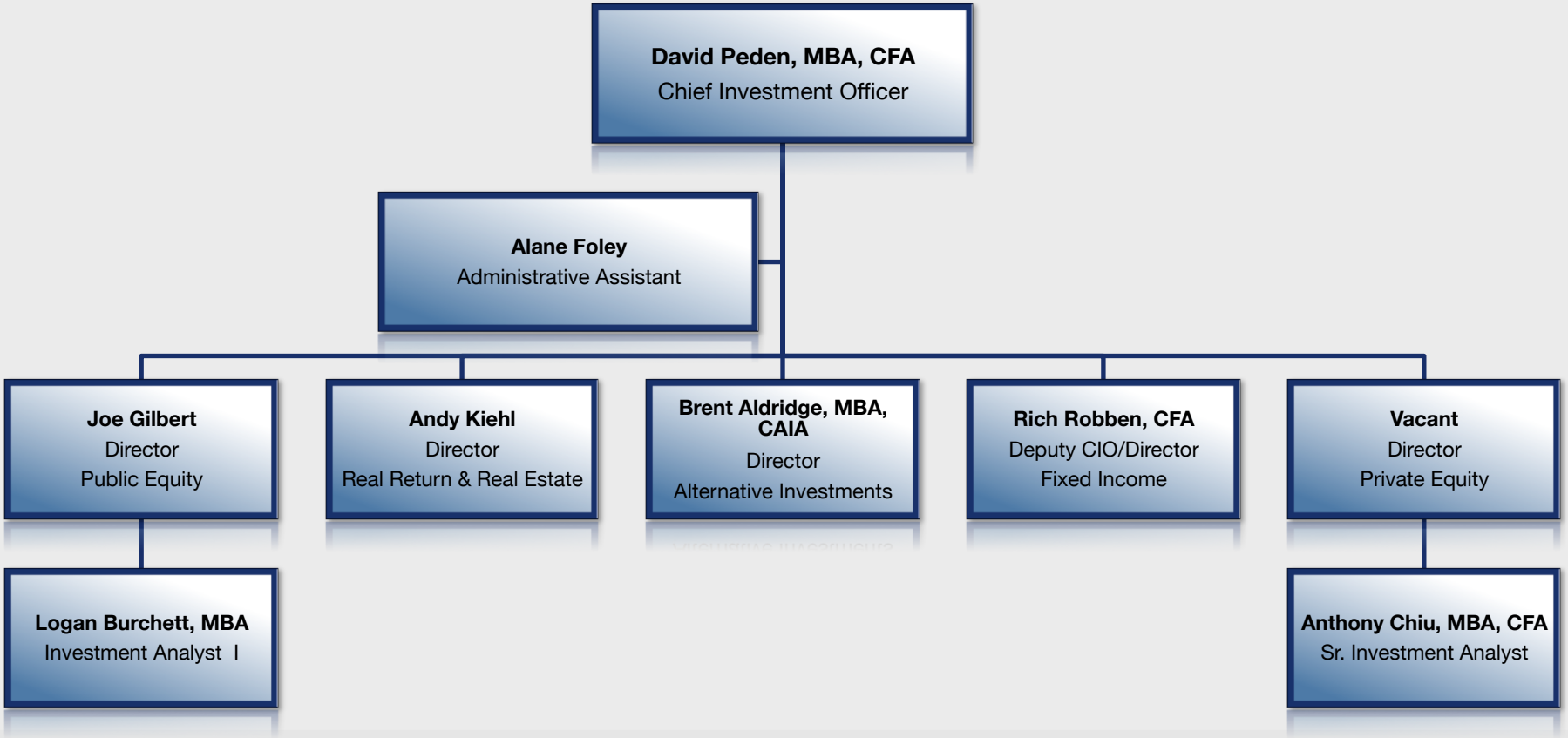
RVK
General Consultant

Albourne
Absolute and Real Return

ORG Portfolio Management
Real Estate

Pension Consulting Alliance
Private Equity

Investments Staff



Staff Educational Qualifications

7 Professional Staff and 1 Administrative Assistant

Traditional Education – Advanced Degrees

- 4 Master of Business Administration

Industry Certifications

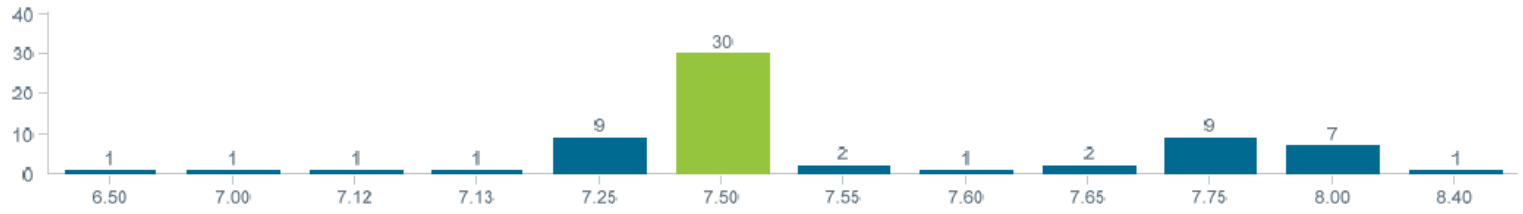
- 3 Chartered Financial Analyst (CFA) Charterholders
  - 1 CFA Candidate (7 covered by CFA Code of Ethics)
- 2 Chartered Alternative Investment Analysts (CAIA)
  - 1 CAIA Candidate

Fund Number: 1
Actuarial Assumption Rates

As of December 31, 2015

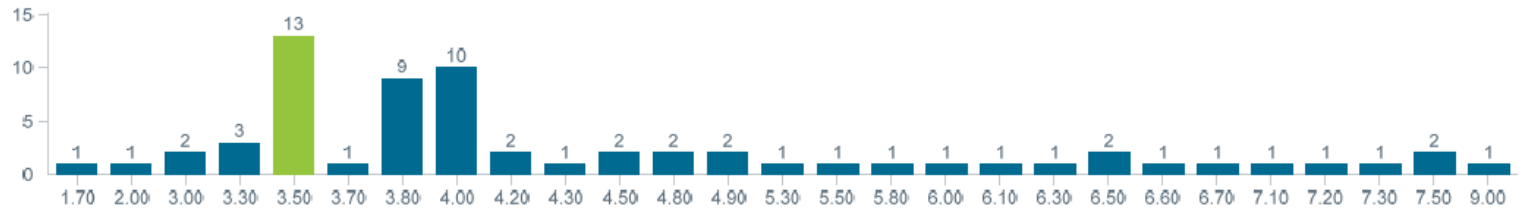
Actuarial Rate Assumptions - 7.50% Median

65 of 76 funds provided Actuarial Rate data



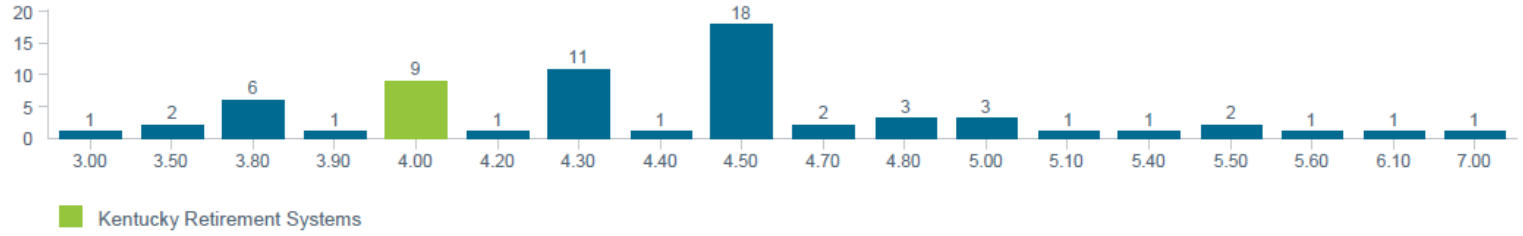
Salary Growth Rate Assumptions (Inflation plus Merit) - 4.00% Median

65 of 76 funds provided Salary Growth Rate data



Real Rate of Assumed Investment Return (Interest Rate minus Inflation) - 4.50% Median

65 of 76 funds provided Real Rate of Assumed Investment Return data



Funds that did not provide data will not appear in the chart.

RVK

KRS Fees by Asset Class

Total Investment Expenses						
	FY 2016			FY 2015		
	2016 FYTD Fees	% of MV	Market Value	2015 FYTD Fees	% of MV	Market Value
Absolute Return	**$ 9,915,064**	**0.66%**	**$ 1,500,636,863**	**$ 7,526,173**	**0.45%**	**1,679,122,598**
Investment Advisory Fees	*9,133,492*			*3,732,702*		
Performance Fees	*481,870*			*3,793,471*		
Other Fees and Expenses	*299,701*					
Fixed Income	**10,788,109**	**0.55%**	**$ 1,979,132,082**	**11,059,928**	**0.37%**	**2,969,839,696**
Investment Advisory Fees	*8,080,382*			*10,184,022*		
Performance Fees	*2,699,970*			*827,111*		
Other Fees and Expenses	*7,756*			*48,795*		
Private Equity	**59,143,546**	**4.11%**	**$ 1,437,999,859**	**54,844,836**	**3.97%**	**1,381,127,382**
Investment Advisory Fees	*13,962,069*			*18,107,999*		
Performance Fees	*38,285,949*			*31,320,546*		
Other Fees and Expenses	*6,895,527*			*5,416,291*		
Public Equity	**13,510,430**	**0.17%**	**$ 7,784,670,410**	**15,144,399**	**0.22%**	**7,031,215,863**
Investment Advisory Fees	*13,483,980*			*13,898,905*		
Other Fees and Expenses	*26,449*			*1,245,494*		
Real Estate	**14,914,409**	**2.08%**	**$ 717,873,053**	**9,690,124**	**1.15%**	**840,964,188**
Investment Advisory Fees	*7,374,794*			*4,982,134*		
Performance Fees	*4,775,574*			*815,411*		
Other Fees and Expenses	*2,764,040*			*3,892,579*		
Real Return	**10,427,388**	**0.83%**	**$ 1,257,972,548**	**6,384,231**	**0.42%**	**1,503,938,472**
Investment Advisory Fees	*7,391,718*			*4,209,078*		
Performance Fees	*1,510,604*			*1,258,015*		
Other Fees and Expenses	*1,525,066*			*917,138*		
Cash	**275,088**	**0.10%**	**$ 265,860,491**	**190,818**	**0.06%**	**294,913,380**
Other Fees and Expenses	*275,088*			*190,818*		
Total Investment Mgmt Fees -	**$ 118,974,032**	**0.80%**	**14,944,145,305**	**$ 104,840,510**	**0.67%**	**15,701,121,578**
Other Investment Fees	**$ 4,192,090**					
Consulting	*$ 1,568,451*			*1,706,261*		
Trustee	*$ 1,544,847*			*1,324,023*		
Securities Lending Fees	*$ 902,148*			*671,046*		
Securities lending Rebate	*$ 176,644*			*(558,023)*		
Manual Accruals				*1,609,997*		
Total Investment Expenses	**$ 123,166,122**	**0.82%**	**14,944,145,305**	**$ 104,840,510**	**0.67%**	**15,701,121,578**

APPENDIX

Cash Flow

	KENTUCKY RETIREMENT SYSTEMS																	
	Cash Flow (ACTUAL)																	
	Pension Fund																	
	KERS Non Hazardous (KERSNHZ)																	
	$000's																	
As of June 30	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
Contributions																		
Member	67,595	141,399	107,834	106,648	111,992	137,124	129,077	127,801	107,607	116,254	116,487	108,362	90,780	109,879	96,418	96,744	92,941	100,424
Employer	112,188	107,515	115,055	23,482	1,760	7,597	21,697	50,333	60,681	88,249	104,655	112,383	144,051	185,558	211,071	280,874	296,836	520,949
Pension Spiking																		743
Bank of America																		8,442
Health Insurance												404	1,799	2,441	5,337	3,344	4,546	4,181
Contribution Inflow	**179,783**	**248,914**	**222,889**	**130,130**	**113,752**	**144,721**	**150,774**	**178,134**	**168,288**	**204,503**	**221,142**	**221,149**	**236,630**	**297,878**	**312,826**	**380,962**	**394,323**	**634,739**
Benefit Payments	(189,406)	(204,302)	(252,775)	(291,704)	(345,666)	(404,896)	(459,367)	(522,396)	(577,947)	(640,201)	(699,052)	(808,513)	(825,627)	(838,372)	(858,151)	(873,906)	(889,936)	(905,790)
Refunds	(8,155)	(8,275)	(7,901)	(6,968)	(6,657)	(7,258)	(8,001)	(8,824)	(9,632)	(9,489)	(9,076)	(9,127)	(8,887)	(10,931)	(12,004)	(12,907)	(13,627)	(13,552)
Administrative	(2,440)	(3,139)	(3,346)	(3,826)	(4,399)	(4,959)	(5,262)	(5,916)	(7,568)	(7,070)	(7,724)	(8,102)	(8,424)	(8,558)	(8,776)	(10,719)	(11,145)	(10,474)
Other Deductions	(39,505)	(56,900)	(76,918)	125	2	0	0	0	0		0			(67)	(8)	0		
Capital Project										(13)	0							
Contribution	**(239,506)**	**(272,616)**	**(340,940)**	**(302,373)**	**(356,720)**	**(417,113)**	**(472,630)**	**(537,136)**	**(595,147)**	**(656,773)**	**(715,852)**	**(825,742)**	**(842,938)**	**(857,928)**	**(878,939)**	**(897,532)**	**(914,708)**	**(929,816)**
Net Contributions	**(59,723)**	**(23,702)**	**(118,051)**	**(172,243)**	**(242,968)**	**(272,392)**	**(321,856)**	**(359,002)**	**(426,859)**	**(452,270)**	**(494,710)**	**(604,593)**	**(606,308)**	**(560,050)**	**(566,113)**	**(516,570)**	**(520,385)**	**(295,077)**
Investment Activity																		
Investment Inflow	**944,313**	**847,177**	**346,029**	**(323,582)**	**(216,105)**	**212,490**	**666,064**	**491,208**	**552,534**	**857,733**	**(166,002)**	**(850,765)**	**543,019**	**621,005**	**22,591**	**315,537**	**347,179**	**61,397**
Investment Outflow	**(36,391)**	**(34,641)**	**(52,349)**	**(37,067)**	**(20,299)**	**(16,384)**	**(14,532)**	**(28,540)**	**(48,173)**	**(73,081)**	**(55,576)**	**(16,910)**	**(16,810)**	**(21,215)**	**(12,802)**	**(12,526)**	**(9,257)**	**(16,828)**
Net Investment	**907,922**	**812,536**	**293,680**	**(360,649)**	**(236,404)**	**196,106**	**651,532**	**462,668**	**504,361**	**784,652**	**(221,578)**	**(867,675)**	**526,209**	**599,790**	**9,789**	**303,011**	**337,922**	**44,569**
Total Net Position	**$ 848,199**	**$ 788,834**	**$ 175,629**	**$ (532,892)**	**$ (479,372)**	**$ (76,286)**	**$ 329,676**	**$ 103,636**	**$ 77,502**	**$ 332,382**	**$ (716,288)**	**$ (1,472,268)**	**$ (80,099)**	**$ 39,740**	**$ (556,324)**	**$ (213,559)**	**$ (182,463)**	**$ (250,508)**

	KENTUCKY RETIREMENT SYSTEMS																	
	Cash Flow without Investment Gains/Losses																	
	Pension Fund																	
	KERS Non Hazardous (KERSNHZ)																	
	$000's																	
As of June 30	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
Contributions																		
Member Contributions	67,595	141,399	107,834	106,648	111,992	137,124	129,077	127,801	107,607	116,254	116,487	108,362	90,780	109,879	96,418	96,744	92,941	100,424
Employer Contributions	112,188	107,515	115,055	23,482	1,760	7,597	21,697	50,333	60,681	88,249	104,655	112,383	144,051	185,558	211,071	280,874	296,836	520,949
Pension Spiking Contributions																		743
Bank of America Settlement																		8,442
Investment Income	152,085	156,211	181,053	188,065	171,525	148,767	135,227	149,411	153,648	169,521	165,355	116,332	90,808	97,186	79,998	76,966	80,939	65,596
Securities Lending Income	34,597	33,191	51,575	37,814	20,555	13,621	10,970	24,033	42,886	67,410	54,870	14,479	2,931	2,344	141	1,726	852	592
Health Insurance Contributions (HB1)												404	1,799	2,441	5,337	3,344	4,546	4,181
Total Inflows with Investment Income	**366,465**	**438,316**	**455,517**	**356,009**	**305,832**	**307,109**	**296,971**	**351,578**	**364,822**	**441,434**	**441,367**	**351,960**	**330,369**	**397,408**	**392,965**	**459,654**	**476,114**	**700,927**
Benefit Payments	(189,406)	(204,302)	(252,775)	(291,704)	(345,666)	(404,896)	(459,367)	(522,396)	(577,947)	(640,201)	(699,052)	(808,513)	(825,627)	(838,372)	(858,151)	(873,906)	(889,936)	(905,790)
Refunds	(8,155)	(8,275)	(7,901)	(6,968)	(6,657)	(7,258)	(8,001)	(8,824)	(9,632)	(9,489)	(9,076)	(9,127)	(8,887)	(10,931)	(12,004)	(12,907)	(13,627)	(13,552)
Administrative Expenses	(2,440)	(3,139)	(3,346)	(3,826)	(4,399)	(4,959)	(5,262)	(5,916)	(7,568)	(7,070)	(7,724)	(8,102)	(8,424)	(8,558)	(8,776)	(10,719)	(11,145)	(10,474)
Other Deductions	(39,505)	(56,900)	(76,918)	125	2	0	0	0	0		0			(67)	(8)	0		
Capital Project Expenses										(13)	0							
Investment Expense	(2,597)	(2,191)	(2,418)	(2,141)	(3,305)	(3,313)	(3,610)	(4,374)	(4,466)	(4,843)	(5,200)	(5,332)	(12,902)	(17,622)	(11,550)	(12,325)	(9,153)	(16,711)
Commissions						(1,401)	(2,316)	(2,703)	(3,427)	(3,154)	(3,130)	(3,156)	(2,843)	(2,551)	(1,260)			
SL Custodial Fee			(156)	(7)	(7)	0	0	0	0	0	0	0	0					
Securities Lending Borrower Rebates	(33,259)	(31,956)	(48,575)	(34,027)	(15,980)	(11,080)	(7,915)	(20,708)	(39,500)	(64,323)	(45,312)	(7,084)	(584)	(690)	71	9	30	(41)
Security Lending Agent Fee	(535)	(494)	(1,200)	(892)	(1,007)	(590)	(691)	(755)	(780)	(761)	(1,934)	(1,338)	(481)	(352)	(63)	(210)	(134)	(76)
Contribution Outflow with Investment Expenses	**(275,897)**	**(307,257)**	**(393,289)**	**(339,440)**	**(377,019)**	**(433,497)**	**(487,162)**	**(565,676)**	**(643,320)**	**(729,854)**	**(771,428)**	**(842,652)**	**(859,748)**	**(879,143)**	**(891,741)**	**(910,058)**	**(923,965)**	**(946,644)**
Net Position excluding Gains/Losses	**90,568**	**131,059**	**62,228**	**16,569**	**(71,187)**	**(126,388)**	**(190,191)**	**(214,098)**	**(278,498)**	**(288,420)**	**(330,061)**	**(490,692)**	**(529,379)**	**(481,735)**	**(498,776)**	**(450,404)**	**(447,851)**	**(245,717)**
Investment Activity																		
Investment Gains/Losses (Excluded in Chart)	757,631	657,775	113,401	(549,461)	(408,185)	50,102	519,867	317,764	356,000	620,802	(386,227)	(981,576)	449,280	521,475	(57,548)	236,845	265,388	(4,791)
Total Net Position	$ 848,199	$ 788,834	$ 175,629	$ (532,892)	$ (479,372)	$ (76,286)	$ 329,676	$ 103,666	$ 77,502	$ 332,382	$ (716,288)	$ (1,472,268)	$ (80,099)	$ 39,740	$ (556,324)	$ (213,559)	$ (182,463)	$ (250,508)

KENTUCKY RETIREMENT SYSTEMS

Cash Flow (Actual)

Pension Fund

CERS Non Hazarous (CERSNHZ)

	$000's																		
As of June 30	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016
Contributions																			
Member Contributions	74,382	98,566	96,676	101,597	122,428	125,301	122,484	127,637	112,372	121,979	125,014	122,518	106,558	144,861	119,123	120,777	122,459	133,637	133,987
Employer Contributions	107,526	110,591	106,587	48,914	5,528	11,856	44,028	54,617	90,834	124,261	150,925	179,286	207,076	247,968	270,664	294,914	324,231	297,714	282,767
Pension Spiking Contributions																		850	1,339
Bank of America Settlement																		10,280	
Health Insurance Contributions (HB1)												415	1,345	3,216	5,101	4,659	6,109	6,674	7,687
Contribution Inflow	181,908	209,157	203,263	150,511	127,956	137,157	166,512	182,254	203,206	246,240	275,939	302,219	314,979	396,045	394,888	420,350	452,799	449,155	425,780
Benefit Payments	(104,353)	(121,932)	(148,015)	(170,256)	(196,659)	(230,317)	(260,643)	(294,590)	(325,135)	(365,648)	(403,958)	(451,304)	(470,249)	(494,344)	(524,385)	(553,204)	(582,850)	(615,335)	(651,247)
Refunds	(9,234)	(9,941)	(10,769)	(8,994)	(8,325)	(10,213)	(11,334)	(11,042)	(11,589)	(11,396)	(11,924)	(10,719)	(10,001)	(11,816)	(12,765)	(13,306)	(14,286)	(13,524)	(13,754)
Administrative Expenses	(3,680)	(4,843)	(5,501)	(6,174)	(7,187)	(8,244)	(8,694)	(10,029)	(12,797)	(12,197)	(13,238)	(13,831)	(14,323)	(14,324)	(16,740)	(17,743)	(18,615)	(18,212)	(19,078)
Capital Project Expenses										(22)	0	0	0						(307)
Other Deductions	(29,276)	(48,067)	(55,214)	213	0	0								(112)	(9)	0			
Contribution Outflow	(146,543)	(184,783)	(219,499)	(185,211)	(212,171)	(248,774)	(280,671)	(315,661)	(349,521)	(389,263)	(429,120)	(475,854)	(494,573)	(520,596)	(553,899)	(584,253)	(615,751)	(647,071)	(684,386)
Net Contributions	35,365	24,374	(16,236)	(34,700)	(84,215)	(111,617)	(114,159)	(133,407)	(146,315)	(143,023)	(153,181)	(173,635)	(179,594)	(124,551)	(159,011)	(163,903)	(162,952)	(197,916)	(258,606)
Investment Activity																			
Investment Inflow	699,230	638,503	255,163	(194,476)	(163,266)	177,238	564,469	439,505	506,463	850,720	(168,924)	(907,754)	689,686	904,170	13,682	599,370	921,325	155,319	8,709
Investment Outflow	(27,298)	(25,968)	(39,181)	(46,632)	(23,110)	(17,128)	(12,800)	(25,833)	(62,371)	(87,224)	(59,096)	(19,336)	(20,614)	(16,656)	(17,031)	(20,209)	(25,794)	(44,750)	(49,508)
Net Investment Activity	671,932	612,535	215,982	(241,108)	(186,376)	160,110	551,669	413,672	444,092	763,496	(228,020)	(927,090)	669,072	887,514	(3,349)	579,161	895,531	110,569	(40,799)
Total Net Position	$707,297	$636,909	$199,746	($275,808)	($270,591)	$48,493	$437,510	$280,265	$297,777	$620,473	($381,201)	($1,100,725)	$489,478	$762,963	($162,360)	$415,258	$732,579	($87,347)	($299,405)

KENTUCKY RETIREMENT SYSTEMS																			
Cash Flow excluding Gains/Losses																			
Pension Fund																			
CERS Non Hazarous (CERSNHZ)																			
	$000's																		
As of June 30	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016
Contributions																			
Member Contributions	74,382	98,566	96,676	101,597	122,428	125,301	122,484	127,637	112,372	121,979	125,014	122,518	106,558	144,861	119,123	120,777	122,459	133,637	133,987
Employer Contributions	107,526	110,591	106,587	48,914	5,528	11,856	44,028	54,617	90,834	124,261	150,925	179,286	207,076	247,968	270,664	294,914	324,231	297,714	282,767
Pension Spiking Contributions																		850	1,339
Bank of America Settlement																		10,280	
Health Insurance Contributions (HB1)												415	1,345	3,216	5,101	4,659	6,109	6,674	7,687
Interest/Dividends	113,334	119,954	142,302	152,160	139,463	123,939	119,560	136,888	150,321	173,310	173,562	134,548	118,487	128,434	130,934	144,667	161,830	160,824	117,432
Securities Lending Income	25,961	24,846	38,561	48,707	24,524	15,295	9,621	22,131	57,969	82,521	58,594	17,778	4,079	3,731	59	2,615	2,243	1,713	2,620
Contribution Inflow	**321,203**	**353,957**	**384,126**	**351,378**	**291,943**	**276,391**	**295,693**	**341,273**	**411,496**	**502,071**	**508,095**	**454,545**	**437,545**	**528,210**	**525,881**	**567,632**	**616,872**	**611,692**	**545,832**
Benefit Payments	(104,353)	(121,932)	(148,015)	(170,256)	(196,659)	(230,317)	(260,643)	(294,590)	(325,135)	(365,648)	(403,958)	(451,304)	(470,249)	(494,344)	(524,385)	(553,204)	(582,850)	(615,335)	(651,247)
Refunds	(9,234)	(9,941)	(10,769)	(8,994)	(8,325)	(10,213)	(11,334)	(11,042)	(11,589)	(11,396)	(11,924)	(10,719)	(10,001)	(11,816)	(12,765)	(13,306)	(14,286)	(13,524)	(13,754)
Administrative Expenses	(3,680)	(4,843)	(5,501)	(6,174)	(7,187)	(8,244)	(8,694)	(10,029)	(12,797)	(12,197)	(13,238)	(13,831)	(14,323)	(14,324)	(16,740)	(17,743)	(18,615)	(18,212)	(19,078)
Capital Project Expenses										(22)	0	0	0						(307)
Other Deductions	(29,276)	(48,067)	(55,214)	213	0	0								(112)	(9)	0			
Investment Expense	(1,940)	(1,676)	(1,849)	(1,646)	(2,835)	(2,851)	(3,219)	(3,977)	(4,252)	(4,731)	(5,136)	(5,616)	(16,017)	(11,451)	(14,986)	(19,876)	(25,695)	(44,636)	(49,107)
Commissions						(1,187)	(2,038)	(2,311)	(3,299)	(2,927)	(3,308)	(3,572)	(3,135)	(3,562)	(2,062)	0			
SL Custodial Fees			(117)	(9)	(8)	0	0	0	0	0	0	0	0						
Securities Lending Borrower Rebates	(24,957)	(23,922)	(36,318)	(43,829)	(19,065)	(12,428)	(6,938)	(18,857)	(53,758)	(78,613)	(48,578)	(8,535)	(802)	(1,088)	132	124	277	143	(392)
Security Lending Agent Fee	(401)	(370)	(897)	(1,148)	(1,202)	(662)	(605)	(688)	(1,062)	(953)	(2,074)	(1,613)	(660)	(555)	(115)	(457)	(376)	(257)	(9)
Contribution Outflow	**(173,841)**	**(210,751)**	**(258,680)**	**(231,843)**	**(235,281)**	**(265,902)**	**(293,471)**	**(341,494)**	**(411,892)**	**(476,487)**	**(488,216)**	**(495,190)**	**(515,187)**	**(537,252)**	**(570,930)**	**(604,462)**	**(641,545)**	**(691,821)**	**(733,894)**
Net Contributions	**147,362**	**143,206**	**125,446**	**119,535**	**56,662**	**10,489**	**2,222**	**(221)**	**(396)**	**25,584**	**19,879**	**(40,645)**	**(77,642)**	**(9,042)**	**(45,049)**	**(36,830)**	**(24,673)**	**(80,129)**	**(188,062)**
Investment Activity																			
Net Appreciation of Investment in Fair Value	559,935	493,703	74,300	(395,343)	(327,253)	38,004	435,288	280,486	298,173	594,889	(401,080)	(1,060,080)	567,120	772,005	(117,311)	452,088	757,252	(7,218)	(111,343)
Total Net Position	$707,297	$636,909	$199,746	($275,808)	($270,591)	$48,493	$437,510	$280,265	$297,777	$620,473	($381,201)	($1,100,725)	$489,478	$762,963	($162,360)	$415,258	$732,579	($87,347)	($299,405)

Investment Opportunity Lost due to Underfunding of ARC			
Kentucky Employees Retirement System (KERS): Non-Hazardous Employees			
Fiscal Year	**Underpayment**	**Actual Rate Of Return**	**$ Impact**
FY 1993	$10,901,152	0.00%	$0
FY 1994	$11,326,963	1.02%	$111,192
FY 1995	$0	18.99%	$3,487,166
FY 1996	$2,342,651	17.63%	$2,654,961
FY 1997	$0	24.16%	$6,704,239
FY 1998	$0	20.76%	$7,880,948
FY 1999	$0	14.27%	$5,503,604
FY 2000	$0	6.42%	$3,263,515
FY 2001	$0	-5.42%	($2,064,121)
FY 2002	$0	-4.31%	($4,851,652)
FY 2003	$0	4.28%	$789,252
FY 2004	$26,984,765	13.59%	$6,650,102
FY 2005	$36,264,370	9.25%	$7,751,882
FY 2006	$75,919,493	9.68%	$15,549,212
FY 2007	$104,143,074	15.27%	$41,957,185
FY 2008	$185,257,648	-4.22%	($28,553,018)
FY 2009	$188,599,388	-17.23%	($120,582,106)
FY 2010	$223,444,520	15.76%	$90,785,944
FY 2011	$211,086,032	18.75%	$211,932,025
FY 2012	$209,066,368	1.00%	($24,384,423)
FY 2013	$216,568,626	10.82%	$152,653,148
FY 2014	$241,041,457	15.55%	$279,804,557
FY 2015	$0	2.01%	$40,156,445
Total	**$1,742,946,507**		**$697,200,056**

History of COLA Benefit Increases to Retirees
JULY 1, 1990 – July 1, 2016

DATE	INCREASE DESCRIPTION
• 8/1/1990	Monthly benefits of retirees who began drawing prior to 1982 increased by $2.50 for each year benefits had been drawn
	Monthly benefits of all retirees including above group increased by 4.5%
• 7/1/1991	Monthly benefits of retirees increased 4.5%
• 7/1/1992	Monthly benefits increased by 1% for KERS and SPRS retirees
• 7/1/1993	Monthly benefits increased by 1% for KERS and SPRS retirees
• 7/1/1994	Monthly benefits increased by 2.11% for KERS and SPRS retirees (1.11% given
•	7/1/94 and 1% given retroactive to 7/1/94 on November 1994 check)
•	Monthly benefits increased by 2.11% for CERS retirees
• 7/1/1995	Monthly benefits increased 2.11% for all recipients
• 8/1/1996	2.8% increase based on CPI for calendar year 1995
• 7/1/1997	3.0% increase based on CPI for calendar year 1996
• 7/1/1998	2.3% increase based on CPI for calendar year 1997
• 7/1/1999	1.6% increase based on CPI for calendar year 1998
• 7/1/2000	2.2% increase based on CPI for calendar year 1999

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History of COLA Benefit Increases to Retirees JULY 1, 1990 – July 1, 2016 (continued)

DATE	INCREASE DESCRIPTION
• 7/1/2001	3.4% increase based on CPI for calendar year 2000
• 7/1/2002	2.85% increase based on CPI for calendar year 2001
• 7/1/2003	1.6% increase based on CPI for calendar year 2002
• 7/1/2004	2.3% increase based on CPI for calendar year 2003
• 7/1/2005	2.7% increase based on CPI for calendar year 2004
• 7/1/2006	3.4% increase based on CPI for calendar year 2005
• 7/1/2007	3.2% increase based on CPI for calendar year 2006
• 7/1/2008	2.8% increase based on CPI for calendar year 2007
• 7/1/2009	1.5% increase based on House Bill 1 (KRS 61.691(2))
• 7/1/2010	1.5% increase based on House Bill 1 (KRS 61.691(2))
• 7/1/2011	1.5% increase based on House Bill 1 (KRS 61.691(2))
• 7/1/2012 – 7/1/2016	0

*For period of 1998-2011 only, KERNZ COLA cost estimated at $146 million and CERSNZ cost $85 million (excluding any Investment opportunity).

SPRS Hazardous Pension Cash Flow
FY 2016 – FY 2018

	SPRS		
	FY 2016	FY 2017	FY 2018
$000's	Preliminary	Estimated	Estimated
Inflows			
Employer Contributions	25,935	46,928	48,349
Employee Contributions	5,149	5,462	5,462
Investment Income	4,366	TBD	TBD
Total Inflows	**35,450**	**52,390**	**53,811**
HB 303 Funding		25,000	10,000
Total	**35,450**	**77,390**	**63,811**
Outflows			
Benefits	56,268	57,956	59,695
Refunds/Adjustments	11	11,237	11,237
Administrative Expenses	177	177	177
Investment Expenses	1,722	TBD	TBD
Total Outflows	**58,178**	**69,370**	**71,109**
Cash Flows	**(22,728)**	**8,020**	**(7,298)**
Total Cash Flow	**($22,728)**	**$8,020**	**($7,298)**
Investment Gains/Losses	(6,487)	TBD	TBD
Net Position with Gains/Losses	($29,215)	$8,020	($7,298)

NOTE: Estimates for FY 2017 and FY 2018 do not include Investment Income or Investment Expenses