



Teachers' Retirement System of the State of Kentucky

Public Pension Oversight Board

Sept. 22, 2020

Gary L. Harbin, CPA
Executive Secretary

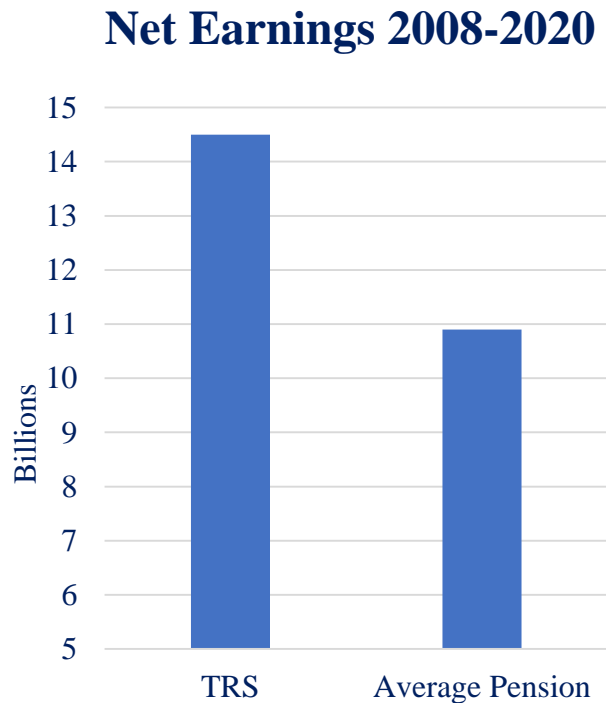
Investment Performance

Retirement Annuity Trust Returns as of June 30, 2020 (preliminary and unaudited)

	Quarter	1-year	3-year	5-year	10-year	20-year
Gross	14.48%	5.8%	7.48%	7.23%	9.59%	6.09%
<i>Benchmark</i>	13.3%	4.23%	6.97%	7.21%	9.25%	N/A
<i>TRS Aon Rank</i>	Top 5%	Top 5%	Top 4%	Top 7%	Top 3%	N/A
Net	14.31%	5.5%	7.18%	6.93%	9.34%	5.93%

30-year compounded gross return
7.98%

Investment Performance



From 2008 to June 2020, TRS investment returns totaled a net \$14.5 billion, compared to the average plan's \$10.9 billion.

This outperformance generated \$3.6 billion to the benefit of Kentucky's teachers.

Cash Flow Update

Retirement Annuity Trust – Preliminary and Unaudited

	FY 2020	FY 2019
Cash Inflows		
Member contributions	\$ 321,100,000	\$ 321,200,000
Employer contributions/appropriations	1,115,400,000	1,123,000,000
Investment income (Net of any asset gains/losses)	<u>381,300,000</u>	<u>433,700,000</u>
Total Cash Inflows	1,817,800,000	1,877,900,000
Cash Outflows		
Benefit payments/refunds	2,195,700,000	2,126,800,000
Administrative expense	<u>13,600,000</u>	<u>12,300,000</u>
Total Outflows	2,209,300,000	2,139,100,000
Net cash flow before asset gain/(losses)*	(391,500,000)	(261,200,000)
Investment gains or losses (realized and unrealized)	723,200,000	651,487,000
Net plan assets		
Beginning of fiscal year	\$ 20,371,900,000	\$ 19,981,600,000
At end of period	\$ 20,702,800,000	\$ 20,371,900,000

*Appreciation/depreciation in fair value does not generate cash inflows or outflows.

Cash Flow Update

Health Insurance Trust – Preliminary and Unaudited

	FY 2020	FY 2020
Cash Inflows		
Member contributions	\$ 191,200,000	\$ 189,400,000
Employer contributions/appropriations	183,700,000	183,100,000
Recovery income	96,600,000	84,300,000
Investment income (net of any asset gains/losses)	<u>13,000,000</u>	<u>10,500,000</u>
Total Cash Inflows	484,500,000	467,300,000
Cash Outflows		
Benefit payments/refunds	302,500,000	307,600,000
Administrative expense	<u>0</u>	<u>0</u>
Total Cash Outflows	302,500,000	307,600,000
Net cash flow before asset gain/(losses)*	182,000,000	159,700,000
Investment gains or losses (realized and unrealized)	19,300,000	63,800,000
Net plan assets		
Beginning of fiscal year	\$ 1,414,000,000	\$ 1,190,300,000
At end of period	\$ 1,615,300,000	\$ 1,414,000,000

*Appreciation/depreciation in Fair Value does not generate cash inflows or outflows.

TRS's Continual Risk Evaluation

Adjustments made in short and long terms

- Independent actuary performs stress test of TRS pension and health care plans on valuation and projection basis.
 - Actuary has added new Actuarial Standards of Practice (ASOP) 51 to its reports, reviewing investment risk on a one-year basis and demonstrating sensitivity analysis on the TRS investment return assumption. For projections, the actuary performs TRS funding forecasts on a deterministic basis, demonstrating contribution risk to the plan.
- Annually the actuary studies and reports on the actual experience compared to what was assumed. Differences each year addressed with layered amortization of liabilities over a 20-year period (aka the Montana approach). Since TRS adopted in 2014, differences have resulted in more actuarial gains than losses.
- TRS has an outside investment consultant periodically conduct asset liability modeling studies which reassess assumptions, risks, asset allocation and the likelihood of meeting assumptions to ensure that benefits will be paid.
- Every five years an experience study compares actuarial experience projected five years ago to the actual experience of those years. Next study will be for five years that ended June 30, 2020. (Study released in 2021 because it necessarily follows the annual actuarial valuation, which is completed in November, for the fifth year.)
- Full replication audit to review the TRS actuary conducted periodically by another actuarial firm, which examines, in part, assumptions and methodologies. Next: Fiscal year ending June 30, 2024.
- Governmental Accounting Standards Board (GASB) requires plans not receiving full employer contributions to use a lower assumed rate of return, with an insolvency date projection.

2019 Sensitivity Analysis

Retirement Annuity Trust

	Investment Return Assumption		
Statistic/Scenario	<u>Decline 1%</u> 6.50%	<u>Current</u> 7.50%	<u>Increase 1%</u> 8.50%
Funding Level:	52.1%	58.1%	64.3%
UAAL:	\$ 18.5 B	\$ 14.5 B	\$ 11.2 B
ADEC Change (\$ dollars and % of pay)	↑ \$314 M 8.6% of Pay	-	↓ \$274 M (7.5)% of Pay

	Payroll (UAAL Payment) Growth Assumption		
	<u>Current</u> 3.50%	<u>Decline 1.5%</u> 2.00%	<u>No Growth</u> 0.00%
Funding Level:	58.1%	58.1%	58.1%
UAAL:	\$ 14.5 B	\$ 14.5 B	\$ 14.5 B
ADEC Change (\$ dollars and % of pay)	-	↑ \$157 M 4.3% of Pay	↑ \$387 M 10.6% of Pay

Market Scenario Analysis

Actuary Projected — Retirement Annuity Trust

	FY2021	FY2022	FY2025	FY2030	FY2040	20-year Total
CURRENT	\$1,167.3 M	\$1,166.2 M	\$1,263.6 M	\$1,535.4 M	\$2,351.3 M	\$32,453.4 M
<i>2019 Valuation Projections</i>	30.89% of Pay	30.45% of Pay	30.68% of Pay	33.17% of Pay	38.90% of Pay	
	57.7% Funded	58.1% Funded	60.5% Funded	62.7% Funded	74.5% Funded	
	\$14.3 B	\$14.5 B	\$14.6 B	\$15.3 B	\$12.4 B	
POSITIVE Scenario	\$1,167.3 M	\$1,166.2 M	\$1,228.0 M	\$1,398.4 M	\$2,151.8 M	\$30,175.3 M
<i>Updated 2019 Valuation with Actual (FY20), 15% (FY21), and 7.5% for FY22 and beyond</i>	30.89% of Pay	30.45% of Pay	29.82% of Pay	30.21% of Pay	35.60% of Pay	
	57.7% Funded	58.1% Funded	61.7% Funded	66.5% Funded	76.7% Funded	
	\$14.3 B	\$14.5 B	\$14.2 B	\$13.8 B	\$11.3 B	
EXPECTED Scenario	\$1,167.3 M	\$1,166.2 M	\$1,283.8 M	\$1,576.9 M	\$2,411.5 M	\$33,185.7 M
<i>Updated 2019 Valuation with Actual (FY20), and 7.5% for FY21 and beyond</i>	30.89% of Pay	30.45% of Pay	31.17% of Pay	34.07% of Pay	39.90% of Pay	
	57.7% Funded	58.1% Funded	59.8% Funded	61.6% Funded	74.0% Funded	
	\$14.3 B	\$14.5 B	\$14.9 B	\$15.8 B	\$12.6 B	
FLAT Scenario	\$1,167.3 M	\$1,166.2 M	\$1,339.6 M	\$1,755.4 M	\$2,671.2 M	\$36,196.1 M
<i>Updated 2019 Valuation w/ Actual (FY20), 0% (FY21), and 7.5% for FY22 and beyond</i>	30.89% of Pay	30.45% of Pay	32.53% of Pay	37.92% of Pay	44.19% of Pay	
	57.7% Funded	58.1% Funded	57.9% Funded	56.7% Funded	71.2% Funded	
	\$14.3 B	\$14.5 B	\$15.6 B	\$17.8 B	\$14.0 B	
NEGATIVE Scenario	\$1,167.3 M	\$1,166.2 M	\$1,395.5 M	\$1,933.9 M	\$2,930.8 M	\$39,206.6 M
<i>Updated 2019 Valuation w/ Actual (FY20), -7.5% (FY21), and 7.5% for FY22 and beyond</i>	30.89% of Pay	30.45% of Pay	33.88% of Pay	41.78% of Pay	48.49% of Pay	
	57.7% Funded	58.1% Funded	55.9% Funded	51.8% Funded	68.4% Funded	
	\$14.3 B	\$14.5 B	\$16.3 B	\$19.8 B	\$15.3 B	

2019 Sensitivity Analysis

Health Insurance Trust

Statistic/Scenario	Investment Return Assumption			Payroll (UAAL Payment) Growth Assumption		
	<u>Decline 1%</u>	<u>Current</u>	<u>Increase 1%</u>	<u>Current</u>	<u>Decline 1.5%</u>	<u>No Growth</u>
	7.00%	8.00%	9.00%	3.50%	2.00%	0.00%
Funding Level:	40.5%	46.0%	51.9%	46.0%	46.0%	46.0%
UAAL:	\$ 2.1 B	\$ 1.7 B	\$ 1.3 B	\$ 1.7 B	\$ 1.7 B	\$ 1.7 B
ADEC Change (\$ dollars and % of pay)	↑ \$38 M 1.0% of Pay	-	↓ \$32 M (0.9)% of Pay	-	↑ \$15 M 0.4% of Pay	↑ \$37 M 1.0% of Pay

Market Scenario Analysis

Actuary Projected — Health Insurance Trust

	FY2021	FY2022	FY2025	FY2030	FY2040	20-Year Total
CURRENT	\$177.3 M	\$173.7 M	\$150.3 M	\$99.3 M	\$162.8 M	\$2,682.2 M
<i>2019 Valuation Projections</i>	4.74% of Pay	4.53% of Pay	3.65% of Pay	2.15% of Pay	2.69% of Pay	
	52.4% Funded	59.1% Funded	79.0% Funded	100.0% Funded	100.0% Funded	
	\$1.6 B	\$1.4 B	\$0.9 B	\$0.0 B	\$0.0 B	
POSITIVE Scenario	\$179.3 M	\$175.7 M	\$149.4 M	\$99.3 M	\$162.8 M	\$2,677.7 M
<i>Updated 2019 Valuation with Actual (FY20), 16% (FY21), and 8.0% for FY22 and beyond</i>	4.79% of Pay	4.59% of Pay	3.63% of Pay	2.15% of Pay	2.69% of Pay	
	51.5% Funded	58.3% Funded	79.2% Funded	100.0% Funded	100.0% Funded	
	\$1.6 B	\$1.5 B	\$0.8 B	\$0.0 B	\$0.0 B	
EXPECTED Scenario	\$179.3 M	\$177.7 M	\$161.6 M	\$99.3 M	\$162.8 M	\$2,758.4 M
<i>Updated 2019 Valuation with Actual (FY20), and 8.0% for FY21 and beyond</i>	4.79% of Pay	4.64% of Pay	3.92% of Pay	2.15% of Pay	2.69% of Pay	
	51.5% Funded	57.5% Funded	75.7% Funded	100.0% Funded	100.0% Funded	
	\$1.6 B	\$1.5 B	\$1.0 B	\$0.0 B	\$0.0 B	
FLAT Scenario	\$179.3 M	\$179.8 M	\$173.8 M	\$99.3 M	\$162.8 M	\$2,850.6 M
<i>Updated 2019 Valuation w/ Actual (FY20), 0% (FY21), and 8.0% for FY22 and beyond</i>	4.79% of Pay	4.69% of Pay	4.22% of Pay	2.15% of Pay	2.69% of Pay	
	51.5% Funded	56.7% Funded	72.1% Funded	100.0% Funded	100.0% Funded	
	\$1.6 B	\$1.5 B	\$1.1 B	\$0.0 B	\$0.0 B	
NEGATIVE Scenario	\$179.3 M	\$181.8 M	\$186.0 M	\$99.3 M	\$162.8 M	\$2,959.2 M
<i>Updated 2019 Valuation w/ Actual (FY20), -8.0% (FY21), and 8.0% for FY22 and beyond</i>	4.79% of Pay	4.75% of Pay	4.52% of Pay	2.15% of Pay	2.69% of Pay	
	51.5% Funded	56.0% Funded	68.5% Funded	100.0% Funded	100.0% Funded	
	\$1.6 B	\$1.5 B	\$1.3 B	\$0.0 B	\$0.0 B	



Our Members Come First!

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**8 a.m. – 5 p.m. ET
Monday – Friday**

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Protecting & Preserving Teachers' Retirement Benefits