

**REPORT OF THE AUDIT OF THE
TEACHERS' RETIREMENT SYSTEM OF
THE STATE OF KENTUCKY**

**For The Years Ended
June 30, 2019 and 2018**



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MIKE HARMON
AUDITOR OF PUBLIC ACCOUNTS

Board of Trustees
Teachers' Retirement System of the State of Kentucky
Frankfort, Kentucky

Independent Auditor's Report

Report on the Financial Statements

We have audited the accompanying financial statements of Teachers' Retirement System of the State of Kentucky (TRS), a component unit of the Commonwealth of Kentucky, as of and for the year ended June 30, 2019, and the related notes to the financial statements, which collectively comprise TRS's basic financial statements as listed in the table of contents.

Management's Responsibility for the Financial Statements

TRS's management is responsible for the preparation and fair presentation of these financial statements in accordance with accounting principles generally accepted in the United States of America; this includes the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of financial statements that are free from material misstatement, whether due to fraud or error.

Auditor's Responsibility

Our responsibility is to express an opinion on these financial statements based on our audit. We conducted our audit in accordance with auditing standards generally accepted in the United States of America and the standards applicable to financial audits contained in *Government Auditing Standards*, issued by the Comptroller General of the United States. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the entity's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. Accordingly, we express no such opinion. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluating the overall presentation of the financial statements.

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Board of Trustees
Teachers' Retirement System of the State of Kentucky

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Opinion

In our opinion, the financial statements referred to above present fairly, in all material respects, the fiduciary net position of TRS, a component unit of the Commonwealth of Kentucky, as of June 30, 2019, and the changes in fiduciary net position for the year then ended in conformity with accounting principles generally accepted in the United States of America.

Emphasis of Matter

Reporting Entity

As discussed in Note 1, the financial statements present only TRS, and are not intended to present fairly the financial position of the Commonwealth of Kentucky, or the results of its operations in conformity with accounting principles generally accepted in the United States of America.

Comparative Financial Statements

The financial statements of TRS for the year ended June 30, 2018 were audited by other auditors whose report dated November 15, 2018 expressed an unmodified opinion on those statements.

Other Matters

Required Supplementary Information

Accounting principles generally accepted in the United States of America require that the Management's Discussion and Analysis (pages 7 through 11), Schedule of Changes in Net Pension Liability - Retirement Annuity Trust (and related notes) (pages 83 through 85), Schedule of Changes in the Net OPEB Liability - Health Insurance Trust (and related notes) (pages 86 through 88), and Schedule of Changes in the Net OPEB Liability - Life Insurance Trust (and related notes) (pages 89 through 91) be presented to supplement the basic financial statements. Such information, although not a part of the basic financial statements, is required by the Governmental Accounting Standards Board who considers it to be an essential part of financial reporting for placing the basic financial statements in an appropriate operational, economic, or historical context. We have applied certain limited procedures to the required supplementary information in accordance with auditing standards generally accepted in the United States of America, which consisted of inquiries of management about the methods of preparing the information and comparing the information for consistency with management's responses to our inquiries, the basic financial statements, and other knowledge we obtained during our audit of the basic financial statements. We do not express an opinion or provide any assurance on the information because the limited procedures do not provide us with sufficient evidence to express an opinion or provide any assurance.

Board of Trustees
Teachers' Retirement System of the State of Kentucky

Supplementary Information

Our audit was conducted for the purpose of forming an opinion on the financial statements that collectively comprise TRS's basic financial statements. The FY 2019 information on the additional supporting schedules (pages 95 through 97) is presented for the purposes of additional analysis and is not a required part of the basic financial statements. The Schedule of Administrative Expenses, Schedule of Professional Services and Contracts, and Schedule of Contracted Investment Management Expenses are the responsibility of management and were derived from and relate directly to the underlying accounting and other records used to prepare the basic financial statements. Such information has been subjected to the auditing procedures applied in the audit of the basic financial statements and certain additional procedures, including comparing and reconciling such information directly to the underlying accounting and other records used to prepare the basic financial statements or to the basic financial statements themselves, and other additional procedures in accordance with auditing standards generally accepted in the United States of America. In our opinion, the Schedule of Administrative Expenses, Schedule of Professional Services and Contracts, and Schedule of Contracted Investment Management Expenses are fairly stated, in all material respects, in relation to the basic financial statements as a whole. The FY 2018 information on the additional supporting schedules (pages 95 through 97) was subjected to the auditing procedures applied in the FY 2018 audit of the basic financial statements by other auditors, whose report on such information stated that it was fairly stated in all material respects in relation to the FY 2018 basic financial statements as a whole.

Other Reporting Required by Government Auditing Standards

In accordance with *Government Auditing Standards*, we have also issued our report dated November 15, 2019 on our consideration of TRS's internal control over financial reporting and on our tests of its compliance with certain provisions of laws, regulations, contracts, and grant agreements and other matters. The purpose of that report is solely to describe the scope of our testing of internal control over financial reporting and compliance and the results of that testing, and not to provide an opinion on the effectiveness of internal control over financial reporting or on compliance. That report is an integral part of an audit performed in accordance with *Government Auditing Standards* in considering TRS's internal control over financial reporting and compliance.

Respectfully submitted,



Mike Harmon
Auditor of Public Accounts

November 15, 2019

MANAGEMENT'S DISCUSSION AND ANALYSIS

TEACHERS' RETIREMENT SYSTEM OF THE STATE OF KENTUCKY MANAGEMENT'S DISCUSSION AND ANALYSIS

This discussion and analysis of the financial performance of the Teachers' Retirement System of the State of Kentucky (TRS or system) provides an overview of the Retirement Annuity Trust, the Health Insurance Trust and the Life Insurance Trust for the fiscal years ended June 30, 2019, and 2018. It should be read in conjunction with the respective financial statements, which begin on page 15. TRS is the fiduciary of funds held in trust for its members.

USING THIS FINANCIAL REPORT

Because of the long-term nature of the retirement annuity, health insurance and life insurance trusts, financial statements alone do not provide the complete scope of TRS. The notes, required supplemental information, and supporting schedules complete that scope.

Information about the activities of the retirement annuity, health insurance and life insurance trusts and the 403(b) Tax-Sheltered Trust as a whole is provided in the Statement of Fiduciary Net Position and Statement of Changes in Fiduciary Net Position (on pages 15-18). The Notes to the Financial Statements are an essential part of the basic financial statements. They provide important background and detailed information about TRS, the plan and the basic financial statements themselves.

The Required Supplementary Information includes historical trend information about the funded status of the retirement annuity, health insurance and life insurance trusts presented as required by accounting standards. The Schedules of Employer Contributions present historical trend information about the required contributions of employers and the contributions made by employers in relation to the requirement. These schedules provide information that contributes to understanding the changes over time in the funded status of the plans. Separate reports prepared by the actuary using a board-adopted funding policy provide a long-term, ongoing plan perspective and the progress made in accumulating sufficient assets to pay benefits and insurance premiums when due.

TEACHERS' RETIREMENT SYSTEM AS A WHOLE

In the fiscal year ended June 30, 2019, the system's combined fiduciary net position increased by \$615.4 million - from \$21.3 billion in 2018 to \$21.9 billion in 2019. In 2017, the combined net position totaled \$19.8 billion. The following summaries focus on the fiduciary net position and changes in fiduciary net position of TRS's retirement annuity, health insurance, and life insurance trusts.

Summary of Fiduciary Net Position (In Millions)

	Retirement Annuity Trust			Health Insurance Trust			Life Insurance Trust		
	2019	2018	2017	2019	2018	2017	2019	2018	2017
Assets									
Cash and Investments	\$ 20,295.0	\$ 19,885.8	\$ 18,649.0	\$ 1,371.2	\$ 1,140.7	\$ 922.6	\$ 85.4	\$ 83.7	\$ 86.6
Receivables	104.3	110.8	135.0	54.7	59.0	44.6	0.5	0.8	1.2
Capital Assets	14.1	16.3	18.1						
Total Assets	20,413.4	20,012.9	18,802.1	1,425.9	1,199.7	967.2	85.9	84.5	87.8
Total Liabilities	(41.6)	(31.3)	(94.4)	(11.9)	(9.4)	(8.8)			
Net Position	\$ 20,371.8	\$ 19,981.6	\$ 18,707.7	\$ 1,414.0	\$ 1,190.3	\$ 958.4	\$ 85.9	\$ 84.5	\$ 87.8

**TEACHERS' RETIREMENT SYSTEM OF THE STATE OF KENTUCKY
MANAGEMENT'S DISCUSSION AND ANALYSIS
(Continued)**

	Trust Totals* ** (In Millions)		
	2019	2018	2017
Assets			
Cash & Investments	\$ 21,751.6	\$ 21,110.2	\$ 19,658.2
Receivables	159.5	170.6	180.8
Capital Assets	14.1	16.3	18.1
Total Assets	<u>21,925.2</u>	<u>21,297.1</u>	<u>19,857.1</u>
Total Liabilities	<u>(53.5)</u>	<u>(40.7)</u>	<u>(103.2)</u>
Net Position	<u>\$ 21,871.7</u>	<u>\$ 21,256.4</u>	<u>\$ 19,753.9</u>

*Trust Totals excludes Other Funds, which consists of the 403(b) Tax-Sheltered Trust, the Supplemental Benefit Fund and the Losey Scholarship Fund. Other Funds had a combined fiduciary net position of \$1.2 million for 2019, \$1.1 million for 2018 and \$1 million for 2017.

**Amounts above may not agree to the financial statements due to rounding.

The fiduciary net position of the Retirement Annuity Trust increased by 2% (\$20.4 billion compared to \$20 billion in 2018). The fiduciary net position in 2017 was \$18.7 billion. The increases primarily are due to additional employer contributions from the state and improvements in market conditions. Net investment income was approximately \$1.1 billion in 2019 and \$2 billion in 2018. This compares to \$2.5 billion in 2017.

The fiduciary net position of the Health Insurance Trust increased by 18.8% (\$1.4 billion compared to \$1.2 billion in 2018) primarily due to investment income and contributions from members and employers due to Shared Responsibility legislation passed in 2010. This compares to 2017 when fiduciary net position was \$958.4 million.

The Summary of Changes in Fiduciary Net Position is presented below followed by discussion of the activities within the different trusts.

**Summary of Changes in Fiduciary Net Position
(In Millions)**

	Retirement Annuity Trust			Health Insurance Trust			Life Insurance Trust		
	2019	2018	2017	2019	2018	2017	2019	2018	2017
Additions									
Member Contributions	\$ 321.2	\$ 319.1	\$ 313.6	\$131.7	\$130.8	\$128.8	\$	\$	\$
Employer Contributions	1,123.0	1,048.7	1,060.7	183.1	187.1	180.3	1.4	1.1	1.0
Net Investment Increase (Decrease)	<u>1,085.2</u>	<u>1,953.2</u>	<u>2,475.8</u>	<u>74.4</u>	<u>76.8</u>	<u>95.5</u>	<u>5.1</u>	<u>1.1</u>	<u>1.0</u>
Total Additions	<u>2,529.4</u>	<u>3,321.0</u>	<u>3,850.1</u>	<u>389.2</u>	<u>394.7</u>	<u>404.6</u>	<u>6.5</u>	<u>2.2</u>	<u>2.0</u>
Deductions									
Benefit Payments	2,094.3	2,004.6	1,918.6				5.2	5.5	5.2
Refunds	32.4	31.1	26.3						
Administrative Expense	12.4	11.4	10.3	1.8	1.7	1.5			
Insurance Expenses				163.7	161.1	178.5			
Total Deductions	<u>2,139.1</u>	<u>2,047.1</u>	<u>1,955.2</u>	<u>165.5</u>	<u>162.8</u>	<u>180.0</u>	<u>5.2</u>	<u>5.5</u>	<u>5.2</u>
Net Increase (Decrease)	<u>\$ 390.3</u>	<u>\$ 1,273.9</u>	<u>\$ 1,894.9</u>	<u>\$223.7</u>	<u>\$231.9</u>	<u>\$224.6</u>	<u>\$1.3</u>	<u>\$(3.3)</u>	<u>\$(3.2)</u>

**TEACHERS' RETIREMENT SYSTEM OF THE STATE OF KENTUCKY
MANAGEMENT'S DISCUSSION AND ANALYSIS
(Continued)**

	Trust Totals* ** (In Millions)		
	2019	2018	2017
Additions			
Member Contributions	\$ 452.9	\$ 449.9	\$ 442.4
Employer Contributions	1,307.5	1,236.9	1,242.0
Net Investment Increase (Decrease)	1,164.7	2,031.1	2,572.3
Total Additions	<u>2,925.1</u>	<u>3,717.9</u>	<u>4,256.7</u>
Deductions			
Benefit Payments	2,099.5	2,010.1	1,923.8
Refunds	32.4	31.1	26.3
Administrative Expense	14.2	13.1	11.8
Insurance Expenses	163.7	161.1	178.5
Total Deductions	<u>2,309.8</u>	<u>2,215.4</u>	<u>2,140.4</u>
Net Increase (Decrease)	<u>\$ 615.3</u>	<u>\$ 1,502.5</u>	<u>\$ 2,116.3</u>

**Trust Totals excludes Other Funds, which consists of the 403(b) Tax-Sheltered Trust, the Supplemental Benefit Fund and the Losey Scholarship Fund.*

***Amounts above may not agree to the financial statements due to rounding.*

RETIREMENT ANNUITY TRUST ACTIVITIES

Retirement contributions are calculated by applying a percentage factor to salary with member and employer contributions withheld from each pay check. Members also may pay contributions to repurchase previously refunded service credit or to purchase various types of elective service credit.

In 2019, employer contributions totaled \$1.12 billion, a net increase of \$74 million from the prior fiscal year. The increase was due to employer contributions paid by the state being more than the prior year. In 2018, employer contributions decreased \$12 million compared 2017 primarily due to amounts received from the state.

In 2019, the Retirement Annuity Trust experienced net investment income of \$1.09 billion compared to the previous year of \$1.95 billion. For 2017, net investment income totaled \$2.5 billion. The increases in net investment income are due to favorable market conditions. Increases in deductions of \$92 million in 2019 and \$91.8 million in 2018 can be attributed to increases in the number of benefit recipients. Members and beneficiaries on the retiree payroll as of June 30, 2019, increased by 1,236 compared to a prior year increase of 1,411.

**TEACHERS' RETIREMENT SYSTEM OF THE STATE OF KENTUCKY
MANAGEMENT'S DISCUSSION AND ANALYSIS
(Continued)**

OTHER POSTEMPLOYMENT BENEFIT (OPEB) ACTIVITIES

During 2019, the Health Insurance Trust member contributions increased \$1 million from 2018 and \$2 million from 2017. Also during 2019, employer contributions decreased \$4 million from 2018 and \$6.8 million from 2017. The member, employer and state contributions increased primarily due to the Shared Responsibility law.

In 2019, the Health Insurance Trust experienced net investment income of \$74.4 million compared to the previous year of \$76.8 million. For 2017, net investment income totaled \$95.5 million. The increases in net investment income are due to favorable market conditions.

The Life Insurance Trust experienced net investment income of \$5.1 million in 2019, \$1.1 million in 2018 and \$1 million in 2017. Life insurance benefits paid for 2019, 2018 and 2017 were \$5.2 million, \$5.5 million and \$5.2 million respectively.

FUNDING

For the 2018-2020 biennium, the state budgeted \$1.09 billion of additional employer contributions for the unfunded liability of the Retirement Annuity Trust. The plan fiduciary net position as a percentage of total pension liability measured in accordance with Governmental Accounting Standards Board (GASB) Statement 67 was 58.8% as of June 30, 2019, compared to 2018's 59.3%. The separately issued actuary's valuation shows progress of the trust's funded status over the amortization period set by the board funding policy. The additional funding provided in the budget resulted in 100% of the actuarially determined employer contribution (ADEC) being made for 2019 and 97% for 2018. Assuming that contributions to the retirement trust are made by the state from year to year in the future as recommended by the actuary, TRS should have sufficient assets to provide all benefits due as defined by law to members.

The funding of the health insurance and life insurance trusts is presented in notes 8 and 9 of these financial statements and the Required Supplementary Information in accordance with GASB Statement 74. Although the Health Insurance Trust continues to have a large net OPEB liability, current obligations are being met by current funding. Shared Responsibility continues to prefund retiree health benefits. The Schedule of Employer Contributions presented in the Required Supplementary Information provides the ADEC of the health and life insurance trusts.

HISTORICAL TRENDS

Accounting standards require that the Statement of Fiduciary Net Position present assets at fair value; include only benefits and refunds due to plan members and beneficiaries; and report accrued investment and administrative expenses as of the reporting date. Detailed information regarding the funded status - including the key actuarial assumptions, target allocations and the sensitivity of the discount rate - can be found for the Retirement Annuity Trust in Note 4 of the financial statements, for the Health Insurance Trust in Note 8 and for the Life Insurance Trust in Note 9. The schedules of employer contributions are provided in the Required Supplementary Information.

**TEACHERS' RETIREMENT SYSTEM OF THE STATE OF KENTUCKY
MANAGEMENT'S DISCUSSION AND ANALYSIS
(Continued)**

TRS's independent consulting actuaries are members of the American Academy of Actuaries and experienced in performing valuations for public retirement systems. As mandated by state law, the valuations of the retirement annuity and health insurance trusts are prepared in accordance with principles of practice prescribed by the Actuarial Standards Board consistent with accepted actuarial procedures. Actuarial assumptions used in the valuations are internally consistent and reasonable based on the actual experience of the trusts. An actuarial audit was completed in 2015, which confirmed the accuracy of actuarial procedures and the reasonableness of assumptions. A five-year experience study was completed in 2016, which also confirmed the reasonableness of assumptions based upon the actual experience of the trusts. The actuarial assumptions may be reasonably relied upon as reflected in the results.

This financial report is designed to provide citizens, participating employers, plan members and other users with an overview of TRS's fiscal practices. Direct questions or requests for additional information to the TRS Chief Financial Officer, Mark Whelan.

FINANCIAL STATEMENTS

TEACHERS' RETIREMENT SYSTEM OF THE STATE OF KENTUCKY
STATEMENT OF FIDUCIARY NET POSITION
As of June 30, 2019

	Retirement Annuity Trust	Health Insurance Trust	Life Insurance Trust	Other Funds	Total
ASSETS					
Cash	\$ 85,986,592	\$ 35,499,235	\$ 261,416	\$ 239,187	\$ 121,986,430
Prepaid expenses	67,059				67,059
Receivables					
Contributions	38,277,522	22,738,889	19,353		61,035,764
Due From Other Trust Funds	1,835,025				1,835,025
State of Kentucky		826,203	120,308		946,511
Investment Income	51,446,307	2,420,395	325,174	3,345	54,195,221
Investment Sales Receivable	12,620,835	1,081,560			13,702,395
Other Receivables	163,007	27,671,716			27,834,723
Total Receivables	<u>104,342,696</u>	<u>54,738,763</u>	<u>464,835</u>	<u>3,345</u>	<u>159,549,639</u>
Investments, at Fair Value (See Note 5)					
Short-term Investments	678,260,542	74,104,999	13,451,102	355,729	766,172,372
Fixed Income	3,227,674,773	112,630,744	19,859,044	268,672	3,360,433,233
Equities	12,288,549,261	768,005,547	48,261,798	334,537	13,105,151,143
Alternative Investments	1,359,374,419	102,153,229	48,510		1,461,576,158
Real Estate	1,223,062,000	75,296,027	2,107,202		1,300,465,229
Additional Categories	1,432,019,602	203,521,400	1,354,418		1,636,895,420
Total Investments	<u>20,208,940,597</u>	<u>1,335,711,946</u>	<u>85,082,074</u>	<u>958,938</u>	<u>21,630,693,555</u>
Capital Assets	26,527,263				26,527,263
Accumulated Depreciation	(12,439,961)				(12,439,961)
Net Capital Assets	<u>14,087,302</u>				<u>14,087,302</u>
Total Assets	<u>20,413,424,246</u>	<u>1,425,949,944</u>	<u>85,808,325</u>	<u>1,201,470</u>	<u>21,926,383,985</u>
LIABILITIES					
Accrued Expenses and Other Liabilities	6,474,507	5,920,066	19,654		12,414,227
Due to Other Trust Funds		1,803,191	30,392	1,442	1,835,025
Investment Purchases Payable	35,039,834	4,206,631			39,246,465
Total Liabilities	<u>41,514,341</u>	<u>11,929,888</u>	<u>50,046</u>	<u>1,442</u>	<u>53,495,717</u>
Net Position Restricted for Pension and Other Postemployment Benefits					
	<u>\$ 20,371,909,905</u>	<u>\$ 1,414,020,056</u>	<u>\$ 85,758,279</u>	<u>\$ 1,200,028</u>	<u>\$ 21,872,888,268</u>

The Combining Statement of Fiduciary Net Position-Other Funds is presented on page 19.

The accompanying notes are an integral part of the financial statements.

TEACHERS' RETIREMENT SYSTEM OF THE STATE OF KENTUCKY
STATEMENT OF FIDUCIARY NET POSITION
As of June 30, 2018

	Retirement Annuity Trust	Health Insurance Trust	Life Insurance Trust	Other Funds	Total
ASSETS					
Cash	\$ 104,214,766	\$ 58,452,151	\$ 432,786	\$ 186,882	\$ 163,286,585
Prepaid expenses	105,795	19,600			125,395
Receivables					
Contributions	30,237,329	18,012,814	13,374		48,263,517
Due From Other Trust Funds	1,779,623				1,779,623
State of Kentucky	16,199,596	10,277,791	35,965		26,513,352
Investment Income	44,151,888	2,061,568	732,657	3,043	46,949,156
Investment Sales Receivable	18,104,128	424,710			18,528,838
Other Receivables	361,346	28,260,451			28,621,797
Total Receivables	110,833,910	59,037,334	781,996	3,043	170,656,283
Investments, at Fair Value (See Note 5)					
Short-term Investments	403,309,780	56,993,634	3,724,036	373,549	464,400,999
Fixed Income	2,983,975,575	89,681,931	47,825,436	247,914	3,121,730,856
Equities	12,544,141,125	605,705,867	29,895,479	312,013	13,180,054,484
Alternative Investments	1,282,830,325	81,232,638			1,364,062,963
Real Estate	1,150,694,282	62,962,565	541,107		1,214,197,954
Additional Categories	1,416,514,873	185,613,170	1,300,000		1,603,428,043
Total Investments	19,781,465,960	1,082,189,805	83,286,058	933,476	20,947,875,299
Capital Assets	26,513,139				26,513,139
Accumulated Depreciation	(10,188,492)				(10,188,492)
Net Capital Assets	16,324,647				16,324,647
Total Assets	20,012,945,078	1,199,698,890	84,500,840	1,123,401	21,298,268,209
LIABILITIES					
Accrued Expenses and Other Liabilities	2,280,864	5,177,013	7,605		7,465,482
Due to Other Trust Funds		1,747,561	30,979	1,083	1,779,623
Investment Purchases Payable	29,031,118	2,493,508			31,524,626
Total Liabilities	31,311,982	9,418,082	38,584	1,083	40,769,731
Net Position Restricted for Pension and Other Postemployment Benefits					
	\$ 19,981,633,096	\$ 1,190,280,808	\$ 84,462,256	\$ 1,122,318	\$ 21,257,498,478

The Combining Statement of Fiduciary Net Position-Other Funds is presented on page 19.

The accompanying notes are an integral part of the financial statements.

TEACHERS' RETIREMENT SYSTEM OF THE STATE OF KENTUCKY
STATEMENT OF CHANGES IN FIDUCIARY NET POSITION
For The Fiscal Year Ended June 30, 2019

	Retirement Annuity Trust	Health Insurance Trust	Life Insurance Trust	Other Funds	Total
ADDITIONS					
Contributions					
State of Kentucky	\$ 1,051,451,775	\$ 76,381,841	\$ 1,209,055	\$	\$ 1,129,042,671
Others Employers	71,583,048	106,764,314	212,172	267,554	178,827,088
Members	321,172,166	131,676,820			452,848,986
Total Contributions	1,444,206,989	314,822,975	1,421,227	267,554	1,760,718,745
Investment Income (Loss)					
Net Appreciation (Depreciation) in					
Fair Value of Investments	651,487,372	63,835,895	3,706,870	43,283	719,073,420
Interest	159,741,150	9,120,053	764,520	21,645	169,647,368
Dividends	304,120,073	6,724,667	727,547	6,365	311,578,652
Rental Income, Net	28,402,562				28,402,562
Securities Lending, Gross Earnings	15,694,255		353,336	5,277	16,052,868
Gross Investment Income (Loss)	1,159,445,412	79,680,615	5,552,273	76,570	1,244,754,870
Less: Investment Expense	(61,166,252)	(5,295,133)	(172,703)	(15,830)	(66,649,918)
Less: Securities Lending Expense	(13,089,811)		(321,382)	(4,718)	(13,415,911)
Net Investment Income (Loss)	1,085,189,349	74,385,482	5,058,188	56,022	1,164,689,041
Total Additions	2,529,396,338	389,208,457	6,479,415	323,576	2,925,407,786
DEDUCTIONS					
Benefits	2,094,364,072		5,153,000	244,424	2,099,761,496
Refunds of Contributions	32,403,149				32,403,149
Insurance Expenses		163,666,017			163,666,017
Administrative Expense	12,352,308	1,803,192	30,392	1,442	14,187,334
Total Deductions	2,139,119,529	165,469,209	5,183,392	245,866	2,310,017,996
Net Increase (Decrease)	390,276,809	223,739,248	1,296,023	77,710	615,389,790
Net Position Restricted for Pension and Other Postemployment Benefits					
Beginning of Year	19,981,633,096	1,190,280,808	84,462,256	1,122,318	21,257,498,478
End of Year	\$ 20,371,909,905	\$ 1,414,020,056	\$ 85,758,279	\$ 1,200,028	\$ 21,872,888,268

The Combining Statement of Changes in Fiduciary Net Position-Other Funds is presented on page 20.

The accompanying notes are an integral part of the financial statements.

TEACHERS' RETIREMENT SYSTEM OF THE STATE OF KENTUCKY
STATEMENT OF CHANGES IN FIDUCIARY NET POSITION
For The Fiscal Year Ended June 30, 2018

	Retirement Annuity Trust	Health Insurance Trust	Life Insurance Trust	Other Funds	Total
ADDITIONS					
Contributions					
State of Kentucky	\$ 969,698,496	\$ 80,959,003	\$ 896,974	\$	\$ 1,051,554,473
Others Employers	78,972,705	106,143,410	161,355	325,950	185,603,420
Members	319,127,087	130,777,471			449,904,558
Total Contributions	1,367,798,288	317,879,884	1,058,329	325,950	1,687,062,451
Investment Income (Loss)					
Net Appreciation (Depreciation) in					
Fair Value of Investments	1,574,056,951	68,954,490	(1,270,937)	20,861	1,641,761,365
Interest	138,027,758	6,195,753	2,446,305	14,895	146,684,711
Dividends	262,669,598	5,633,011	40,895	5,898	268,349,402
Rental Income, Net	29,957,783				29,957,783
Securities Lending, Gross Earnings	16,275,779		42,020	1,246	16,319,045
Gross Investment Income (Loss)	2,020,987,869	80,783,254	1,258,283	42,900	2,103,072,306
Less: Investment Expense	(55,500,376)	(3,942,742)	(113,453)	(16,346)	(59,572,917)
Less: Securities Lending Expense	(12,273,462)		(34,409)	(973)	(12,308,844)
Net Investment Income (Loss)	1,953,214,031	76,840,512	1,110,421	25,581	2,031,190,545
Total Additions	3,321,012,319	394,720,396	2,168,750	351,531	3,718,252,996
DEDUCTIONS					
Benefits	2,004,617,334		5,452,920	190,626	2,010,260,880
Refunds of Contributions	31,072,421				31,072,421
Insurance Expenses		161,081,700			161,081,700
Administrative Expense	11,388,493	1,747,561	30,979	1,083	13,168,116
Total Deductions	2,047,078,248	162,829,261	5,483,899	191,709	2,215,583,117
Net Increase (Decrease)	1,273,934,071	231,891,135	(3,315,149)	159,822	1,502,669,879
Net Position Restricted for Pension and Other Postemployment Benefits					
Beginning of Year	18,707,699,025	958,389,673	87,777,405	962,496	19,754,828,599
End of Year	\$ 19,981,633,096	\$ 1,190,280,808	\$ 84,462,256	\$ 1,122,318	\$ 21,257,498,478

The Combining Statement of Changes in Fiduciary Net Position-Other Funds is presented on page 21.

The accompanying notes are an integral part of the financial statements.

TEACHERS' RETIREMENT SYSTEM OF THE STATE OF KENTUCKY
COMBINING STATEMENT OF FIDUCIARY NET POSITION
As Of Fiscal Year Ended June 30, 2019
Other Funds

	403(b) Tax- Sheltered Trust	Supplemental Benefit Fund	Losey Scholarship Fund	Total
Assets				
Cash	\$	\$ 239,187	\$	\$ 239,187
Receivables				
Investment Income	580		2,765	3,345
Investments at Fair Value				
Short-term Investments	310,008		45,721	355,729
Fixed Income			268,672	268,672
Equities			334,537	334,537
Total Investments	<u>310,008</u>		<u>648,930</u>	<u>958,938</u>
Total Assets	<u>310,588</u>	<u>239,187</u>	<u>651,695</u>	<u>1,201,470</u>
Liabilities				
Due to Other Trusts	43	1,291	108	1,442
Total Liabilities	<u>43</u>	<u>1,291</u>	<u>108</u>	<u>1,442</u>
Net Position Restricted for Pension and Other Postemployment Benefits				
	<u>\$ 310,543</u>	<u>\$ 237,894</u>	<u>\$ 651,591</u>	<u>\$ 1,200,028</u>

TEACHERS' RETIREMENT SYSTEM OF THE STATE OF KENTUCKY
COMBINING STATEMENT OF FIDUCIARY NET POSITION
As Of Fiscal Year Ended June 30, 2018
Other Funds

	403(b) Tax- Sheltered Trust	Supplemental Benefit Fund	Losey Scholarship Fund	Total
Assets				
Cash	\$	\$ 186,882	\$	\$ 186,882
Receivables				
Investment Income	481		2,562	3,043
Investments at Fair Value				
Short-term Investments	324,303		49,246	373,549
Fixed Income			247,914	247,914
Equities			312,013	312,013
Total Investments	<u>324,303</u>		<u>609,173</u>	<u>933,476</u>
Total Assets	<u>324,784</u>	<u>186,882</u>	<u>611,735</u>	<u>1,123,401</u>
Liabilities				
Due to Other Trusts	54	927	102	1,083
Total Liabilities	<u>54</u>	<u>927</u>	<u>102</u>	<u>1,083</u>
Net Position Restricted for Pension and Other Postemployment Benefits				
	<u>\$ 324,730</u>	<u>\$ 185,955</u>	<u>\$ 611,633</u>	<u>\$ 1,122,318</u>

The accompanying notes are an integral part of the financial statements.

TEACHERS' RETIREMENT SYSTEM OF THE STATE OF KENTUCKY
COMBINING STATEMENT OF CHANGES IN FIDUCIARY NET POSITION
For The Fiscal Year Ended June 30, 2019
Other Funds

	403(b) Tax- <u>Sheltered Trust</u>	Supplemental <u>Benefit Fund</u>	Losey <u>Scholarship Fund</u>	<u>Total</u>
ADDITIONS				
Contributions				
Other Employers	\$	\$ 267,554	\$	\$ 267,554
Investment Income (Loss)				
Net Appreciation (Depreciation) in Fair Value of Investments			43,283	43,283
Interest	6,820	4,730	10,095	21,645
Dividends			6,365	6,365
Securities Lending, Gross			5,277	5,277
Gross Investment Income (Loss)	<u>6,820</u>	<u>4,730</u>	<u>65,020</u>	<u>76,570</u>
Less: Investment Expense	(13,592)		(2,238)	(15,830)
Less: Securities Lending Expense			(4,718)	(4,718)
Net Investment Income (Loss)	<u>(6,772)</u>	<u>4,730</u>	<u>58,064</u>	<u>56,022</u>
Total Additions	<u>(6,772)</u>	<u>272,284</u>	<u>58,064</u>	<u>323,576</u>
DEDUCTIONS				
Benefits	7,371	219,053	18,000	244,424
Administrative Expense	44	1,292	106	1,442
Total Deductions	<u>7,415</u>	<u>220,345</u>	<u>18,106</u>	<u>245,866</u>
Net Increase (Decrease)	(14,187)	51,939	39,958	77,710
Net Position Restricted for Pension and Other Postemployment Benefits				
Beginning of Year	<u>324,730</u>	<u>185,955</u>	<u>611,633</u>	<u>1,122,318</u>
End of Year	<u>\$ 310,543</u>	<u>\$ 237,894</u>	<u>\$ 651,591</u>	<u>\$ 1,200,028</u>

The accompanying notes are an integral part of the financial statements.

TEACHERS' RETIREMENT SYSTEM OF THE STATE OF KENTUCKY
COMBINING STATEMENT OF CHANGES IN FIDUCIARY NET POSITION
For The Fiscal Year Ended June 30, 2018
Other Funds

	403(b) Tax- Sheltered Trust	Supplemental Benefit Fund	Losey Scholarship Fund	Total
ADDITIONS				
Contributions				
Other Employers	\$	\$ 325,950	\$	\$ 325,950
Investment Income (Loss)				
Net Appreciation (Depreciation) in Fair Value of Investments			20,861	20,861
Interest	4,101	1,109	9,685	14,895
Dividends			5,898	5,898
Securities Lending, Gross			1,246	1,246
Gross Investment Income (Loss)	4,101	1,109	37,690	42,900
Less: Investment Expense	(13,592)		(2,754)	(16,346)
Less: Securities Lending Expense			(973)	(973)
Net Investment Income (Loss)	(9,491)	1,109	33,963	25,581
Total Additions	(9,491)	327,059	33,963	351,531
DEDUCTIONS				
Benefits	9,651	162,975	18,000	190,626
Administrative Expense	55	926	102	1,083
Total Deductions	9,706	163,901	18,102	191,709
Net Increase (Decrease)	(19,197)	163,158	15,861	159,822
Net Position Restricted for Pension and Other Postemployment Benefits				
Beginning of Year	343,927	22,797	595,772	962,496
End of Year	\$ 324,730	\$ 185,955	\$ 611,633	\$ 1,122,318

The accompanying notes are an integral part of the financial statements.

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NOTES TO FINANCIAL STATEMENTS

TEACHERS' RETIREMENT SYSTEM OF THE STATE OF KENTUCKY
NOTES TO FINANCIAL STATEMENTS
June 30, 2019

NOTE 1: DESCRIPTION OF RETIREMENT ANNUITY TRUST

A. REPORTING ENTITY

The Teachers' Retirement System of the State of Kentucky (TRS or system) was created by the 1938 General Assembly, began operations July 1, 1940, and is governed by Kentucky Revised Statutes (KRS) chapter 161 sections 220 through 990. TRS is a blended component unit of the Commonwealth of Kentucky (Commonwealth or state) and, therefore, is included in the Commonwealth's financial statements. TRS is a cost-sharing multiple-employer defined benefit plan with a special funding situation established to provide retirement, health and life insurance benefits for specified employees of local school districts and other public educational agencies in the Commonwealth.

KRS 161.250 provides that the general administration and management of TRS, and the responsibility for its proper operation, is vested in a board of trustees. The Board of Trustees consists of the chief state school officer, the state treasurer, two trustees appointed by the governor and seven elected trustees. Four of the elected trustees are active teachers, two are not members of the teaching profession, and one is an annuitant of the system.

B. PARTICIPANTS

As of June 30, 2019, a total of 207 employers participated in the plan. Employers are comprised of local school districts, Department of Education agencies, universities, the Kentucky Community and Technical College System and other educational organizations. The Commonwealth under the Governmental Accounting Standards Board (GASB) Statement 67 and 74 is recognized as a non-employer contributing entity providing the employer matching contributions for members employed by the local school districts and regional educational cooperatives.

According to KRS 161.220, any regular or special teacher, or professional occupying a position requiring certification or graduation from a four-year college or university is eligible to participate in the system. The following table illustrates the classifications of members.

	<u>2019</u>	<u>2018</u>
Active contributing members:		
Vested	48,562	47,375
Non-vested	24,085	24,830
Inactive members, vested	8,992	8,814
Retirees and beneficiaries currently receiving benefits	<u>55,613</u>	<u>54,377</u>
Total members, retirees and beneficiaries	<u><u>137,252</u></u>	<u><u>135,756</u></u>

TEACHERS' RETIREMENT SYSTEM OF THE STATE OF KENTUCKY
NOTES TO FINANCIAL STATEMENTS
June 30, 2019
(Continued)

NOTE 1: DESCRIPTION OF RETIREMENT ANNUITY TRUST (Continued)

C. BENEFIT PROVISIONS

For Members Before July 1, 2008:

Members become vested when they complete five years of credited service. To qualify for monthly retirement benefits, payable for life, members must either:

1. Attain age 55 and complete five years of Kentucky service, or
2. Complete 27 years of Kentucky service.

Non-university members receive monthly payments equal to 2% (service prior to July 1, 1983) and 2.5% (service after July 1, 1983) of their final average salaries for each year of credited service. Non-university members who became members on or after July 1, 2002, will receive monthly benefits equal to 2% of their final average salary for each year of service if, upon retirement, their total service is less than 10 years. New members after July 1, 2002, who retire with 10 or more years of total service will receive monthly benefits equal to 2.5% of their final average salary for each year of service, including the first 10 years. In addition, non-university members who retire July 1, 2004, and later with more than 30 years of service will have a multiplier for all years over 30 of 3%.

University employees receive monthly benefits equal to 2% of their final average salary for each year of credited service.

The final average salary is the member's five highest annual salaries except members at least age 55 with 27 or more years of service may use their three highest annual salaries. For all members, the annual allowance is reduced by 5% per year from the earlier of age 60 or the date the member would have completed 27 years of service. The minimum annual service allowance for all members is \$440 multiplied by credited service.

For Members On or After July 1, 2008:

Members become vested when they complete five years of credited service. To qualify for monthly retirement benefits, payable for life, members must either:

1. Attain age 60 and complete five years of Kentucky service, or
2. Complete 27 years of Kentucky service, or
3. Attain age 55 and complete 10 years of Kentucky service.

The annual retirement allowance for non-university members is equal to: (a) 1.7% of final average salary for each year of credited service if their service is 10 years or less; (b) 2% of final average salary for each year of credited service if their service is greater than 10 years but no more than 20 years; (c) 2.3% of final average salary for each year of credited service if their service is greater than 20 years but no more than 26 years; (d) 2.5% of final average salary for each year of credited service if their service is greater than 26 years but no more than 30 years; (e) 3% of final average salary for years of credited service greater than 30 years.

TEACHERS' RETIREMENT SYSTEM OF THE STATE OF KENTUCKY
NOTES TO FINANCIAL STATEMENTS
June 30, 2019
(Continued)

NOTE 1: DESCRIPTION OF RETIREMENT ANNUITY TRUST (Continued)

The annual retirement allowance for university members is equal to: (a) 1.5% of final average salary for each year of credited service if their service is 10 years or less; (b) 1.7% of final average salary for each year of credited service if their service is greater than 10 years but no more than 20 years; (c) 1.85% of final average salary for each year of credited service if their service is greater than 20 years but less than 27 years; (d) 2% of final average salary for each year of credited service if their service is greater than or equal to 27 years.

The final average salary is the member's five highest annual salaries except members at least age 55 with 27 or more years of service may use their three highest annual salaries. For all members, the annual allowance is reduced by 6% per year from the earlier of age 60 or the date the member would have completed 27 years of service.

Other Benefits

TRS provides postemployment medical insurance benefits to retirees as fully described in Note 8. TRS also provides disability benefits for vested members at the rate of 60% of the final average salary. A life insurance benefit payable upon the death of a member, also described in Note 9, is \$2,000 for active contributing members and \$5,000 for retired or disabled members.

Cost of living increases are 1.5% annually. Additional ad hoc increases and any other benefit amendments must be authorized by the General Assembly.

NOTE 2: SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

A. BASIS OF ACCOUNTING

The financial statements are prepared on the accrual basis of accounting. Member contributions and employer matching contributions are recognized in the fiscal year due. Benefits and refunds are recognized when due and payable in accordance with the terms of the plan.

B. CASH

TRS has seven cash accounts. At June 30, 2019, the retirement annuity cash account totaled \$11.7 million, the control cash account totaled \$74 million and the capital project cash account totaled \$274,003 for a total of \$86 million as carrying value of cash in the retirement trust. The medical insurance's Internal Revenue Code sec. 115 trust cash account totaled \$23.6 million, the medical insurance 401(h) cash account totaled \$11.8 million and the medical claims cash account totaled \$115,598 for a total of \$35.5 million as carrying value of cash in the Health Insurance Trust. The Life Insurance Trust cash account totaled \$261,417. The Supplemental Benefit Fund cash account contained \$239,187. Therefore, the carrying value of cash was \$122 million, and the bank balance was \$134.1 million. The variance is primarily due to outstanding checks and items not processed by the bank as of June 30, 2019.

TEACHERS' RETIREMENT SYSTEM OF THE STATE OF KENTUCKY
NOTES TO FINANCIAL STATEMENTS
June 30, 2019
(Continued)

NOTE 2: SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES (Continued)

At June 30, 2018, the retirement annuity cash account totaled \$54.9 million, the control cash account totaled \$49.4 million for a total of \$104.3 million as carrying value of cash in the retirement trust. The medical insurance 115 trust cash account totaled \$41.7 million, the medical insurance 401(h) cash account totaled \$16.6 million and the medical claims cash account totaled \$113,892 for a total of \$58.4 million as carrying value of cash in the Health Insurance Trust. The Life Insurance Trust cash account totaled \$432,786. The Supplemental Benefit Fund cash account contained \$186,882. Therefore, the carrying value of cash was \$163.3 million, and the bank balance was \$161.4 million. The variance is primarily due to outstanding checks and items not processed by the bank as of June 30, 2018.

C. CAPITAL ASSETS

Property and equipment are carried at cost, less accumulated depreciation. All costs of property and equipment \$5,000 or greater are capitalized. Expenditures for maintenance and repairs are charged to operations as incurred. Depreciation is calculated using the straight-line method, with estimated lives ranging from five to 40 years in the following major classes: office furniture and equipment, five years; other equipment, five years; computer software, 10 years; and TRS office buildings, 40 years. Pathway replaced TRS's legacy computer system and is TRS's primary business information technology system. Pathway was capitalized and is being amortized or depreciated over 10 years.

D. INVESTMENTS

Plan investments are reported at fair value. Fair value is the amount that a plan can reasonably expect to receive for an investment in a current sale between a willing buyer and a willing seller. Short-term securities are carried at cost, which approximates fair value. Fixed income and common and preferred stocks are generally valued based on published market prices and quotations from national security exchanges and securities pricing services. Real estate is primarily valued based on appraisals performed by independent appraisers. Other investments, such as private equity, timberland, real estate funds and other additional categories, are valued using the most recent general partner statement at net asset value. Examples of other additional categories are opportunistic credit, high yield bonds and direct lending.

Purchase and sales of debt securities, equity securities and short-term investments are recorded on the trade date. Real estate equity transactions are recorded on the settlement date. Upon sale of investments, the difference between sales proceeds and cost is reflected in the statement of changes in fiduciary net position. Investment expenses consist of investment manager and consultant fees along with fees for custodial services.

E. COMPENSATED ABSENCES

Expenses for accumulated vacation days and compensatory time earned by TRS's employees are recorded when earned. Upon termination or retirement, employees of TRS are paid for accumulated vacation time limited to 60 days and accumulated compensatory time limited to 240 hours. As of June 30, 2019 and 2018, accrued compensated absences were included in accrued expenses and other liabilities on the statements of fiduciary net position amounting to \$1.2 million and \$1.2 million, respectively.

TEACHERS' RETIREMENT SYSTEM OF THE STATE OF KENTUCKY
NOTES TO FINANCIAL STATEMENTS
June 30, 2019
(Continued)

NOTE 2: SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES (Continued)

F. RISK MANAGEMENT

Destruction of assets, theft, employee injuries and court challenges to administrative policy are among the various risks to which TRS is exposed. In order to cover such risks, TRS carries appropriate insurance policies, such as fire and tornado, employee bonds, fiduciary liability, worker's compensation and equipment insurance.

G. OTHER RECEIVABLES

In the Retirement Annuity Trust, other receivables consists primarily of installment contract receivables. TRS allows qualified purchases of service credit to be made by installment payments not to exceed a five-year period. Revenue is recognized in the initial year of the installment contract agreement. The June 30, 2019 other receivables in the retirement trust were \$163,007 and were \$361,346 in 2018. In the Health Insurance Trust, other receivables consists primarily of Medicare subsidies and formulary rebates accrued, but not received. The June 30, 2019 other receivables in the health trust were \$27.7 million and \$28.3 million in 2018.

H. ACCRUED EXPENSES AND OTHER PAYABLES

TRS's accrued expenses and other payables results primarily from the actual amount needed from the state for health insurance premiums for the current biennium being less than what was estimated when the 2018-2020 state budget was enacted. This amount will be netted against the state's share of retiree health costs requested in the 2020-2022 state budget submitted by TRS.

I. USE OF ESTIMATES

The preparation of financial statements in accordance with accounting principles generally accepted in the United States of America requires management to make estimates and assumptions that affect certain reported amounts and disclosures. Accordingly, actual results could differ from those estimates. The most significant estimates impacting the financial statements relate to the actuarial assumptions.

J. INCOME TAXES

The Retirement Annuity Trust is organized as a tax-exempt retirement plan under the Internal Revenue Code. The 403(b) Tax-Sheltered Trust no longer accepts contributions and will be fully terminated when all lifetime annuities have expired. TRS's management believes that it has operated the plans within the constraints imposed by federal tax law.

K. RECENT PRONOUNCEMENTS

TRS implemented the provisions of GASB Statement 85 for the year ended June 30, 2018. GASB 85 addresses several issues identified during the implementation and application of certain GASB pronouncements. OPEB related issues applicable to TRS's medical and life insurance trusts addressed in this new standard include the presentation of payroll-related measures in the schedules of Required Supplementary Information by OPEB plans.

TEACHERS' RETIREMENT SYSTEM OF THE STATE OF KENTUCKY
NOTES TO FINANCIAL STATEMENTS
June 30, 2019
(Continued)

NOTE 2: SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES (Continued)

In January 2017, GASB issued Statement 84 that establishes criteria for identifying fiduciary activities and guidance on reporting those activities. This Statement provides guidance on four fiduciary funds that should be reported if applicable: pension (and other employee benefit) trust funds, investment trust funds, private purpose trust funds, and custodial funds. GASB 84 will be effective for periods beginning after December 15, 2018. TRS has not adopted GASB 84 and has not yet determined the impact of this standard on its financial statements and disclosures.

L. RECLASSIFICATIONS

In accordance with GASB Statement 28, additions and deductions related to securities lending transactions should be reported at their gross amounts. Previously, amounts related to gross borrower rebate expenses were reported net of securities lending gross earnings and have been reclassified to be reported as securities lending expense on the Statement of Changes in Fiduciary Net Position. The reclassification had no effect on total net position and change in net position.

NOTE 3: CONTRIBUTIONS AND FUNDS OF THE PLAN

A. CONTRIBUTIONS

Contribution rates are established by Kentucky Revised Statutes. Non-university members are required to contribute 12.855% of their salaries to the system effective July 1, 2015; university members are required to contribute 10.4% of their salaries effective July 1, 2015. KRS 161.565 allows each university to reduce the contribution of its members by 2.215%; therefore, university members contribute 8.185% of their salary to TRS. For members employed by local school districts, the state, as a non-employer contributing entity, contributes 13.105% of salary for those who joined before July 1, 2008, and 14.105% for those who joined thereafter.

Other participating employers are required to contribute the percentage contributed by members plus an additional 3.25% of members' gross salaries.

The member and employer contributions consist of retirement annuity contributions and OPEB contributions to the medical and life insurance trusts. The member postemployment medical contribution is 3.75% of salary. The employer postemployment medical contribution is 0.75% of member salaries. Also, employers (other than the state) contribute 3% of members' salaries and the state contributes the net cost of health insurance premiums for new retirees after June 30, 2010, in the non-Medicare eligible group. If a member leaves covered employment before accumulating five years of credited service, accumulated member contributions to the retirement trust are refunded with interest upon the member's request.

TEACHERS' RETIREMENT SYSTEM OF THE STATE OF KENTUCKY
NOTES TO FINANCIAL STATEMENTS
June 30, 2019
(Continued)

NOTE 3: CONTRIBUTIONS AND FUNDS OF THE PLAN (Continued)

B. FUNDS OF THE PLAN

Teacher Savings Fund:

KRS 161.420(2) establishes the Teacher Savings Fund consisting of contributions paid by university and non-university members. The fund also includes interest authorized by the Board of Trustees from the Guarantee Fund (described below). The accumulated contributions of members that are returned upon withdrawal or paid to the estate or designated beneficiary in the event of death are paid from this fund. Upon retirement, the member's contributions and the matching state contributions are transferred from this fund to the Allowance Reserve Fund, the fund (also described below) from which retirement benefits are paid.

State Accumulation Fund:

KRS 161.420(3) establishes the State Accumulation Fund, which receives state appropriations to the system. The state matches an amount equal to members' contributions. State appropriations during the year are based on estimates of members' salaries. At year-end when actual salaries are known, the required state matching also is realized by producing either a receivable from or a payable to the state.

Allowance Reserve Fund:

KRS 161.420(4) establishes the Allowance Reserve Fund, which is the source for retirement, disability and survivor benefits paid to TRS members. These benefits are paid from the retired members' contributions until they are exhausted, at which time state matching contributions are used to pay the benefits. After an individual member's contributions and the state matching contributions have been exhausted, retirement benefits are paid from monies transferred from the Guarantee Fund (described below).

Guarantee Fund:

KRS 161.420(6) establishes the Guarantee Fund to collect income from investments, state matching contributions of members withdrawn from the system, and state matching contributions for cost of living adjustments (COLAs). In addition, it receives money for which disposition is not otherwise provided. This fund provides interest to the other funds, benefits in excess of both members' and state matching contributions, monies for administrative expenses of TRS, and deficiencies not covered by the other funds.

Expense Fund:

KRS 161.420(1) establishes the Expense Fund for administrative expenses. Investment income transferred to this fund from the Guarantee Fund is used to pay the administrative expenses of TRS. Administrative expenses are allocated among the funds based on benefits paid.

TEACHERS' RETIREMENT SYSTEM OF THE STATE OF KENTUCKY
NOTES TO FINANCIAL STATEMENTS
June 30, 2019
(Continued)

NOTE 4: NET PENSION LIABILITY OF EMPLOYERS

A. NET PENSION LIABILITY OF EMPLOYERS

The net pension liability (i.e., the system's liability determined in accordance with GASB Statement 67 less the fiduciary net position) as of June 30, 2019 and 2018 is shown below.

Schedule of Net Pension Liability of Employers
(In Thousands)

Fiscal Year	Total Pension Liability	Plan Fiduciary Net Position	Employers Net Pension Liability	Plan Fiduciary Net Position as a % of Total Pension Liability	Covered Payroll	Net Pension Liability as a % of Covered Payroll
June 30	A	B	(A-B)	(B/A)	C	[(A-B)/C]
2019	\$34,666,795	\$20,371,910	\$14,294,885	58.8%	\$3,497,216	408.75%
2018	33,708,555	19,981,633	13,726,922	59.3%	3,455,660	397.23%

B. SUMMARY OF ACTUARIAL ASSUMPTIONS

A summary of the actuarial assumptions as of the latest actuarial valuation follows.

Valuation Date	June 30, 2018
Actuarial Cost Method	Entry Age
Investment Rate of Return	7.5%, net of pension plan investment expense, including inflation.
Projected Salary Increases	3.5 - 7.3%, including inflation
Inflation Rate	3%
Municipal Bond Index Rate	3.5%
Single Equivalent Interest Rate	7.5%

Mortality rates were based on the RP-2000 Combined Mortality Table for Males or Females, as appropriate, with adjustments for mortality improvements based on a projection of Scale BB to 2025, set forward two years for males and one year for females. The actuarial assumptions used in the June 30, 2018 valuation were based on the results of an actuarial experience study for the period July 1, 2010, to June 30, 2015, adopted by the board on September 19, 2016. The Municipal Bond Index Rate used for this purpose is the June average of the Bond Buyer General Obligation 20-year Municipal Bond Index published weekly by the Board of Governors of the Federal Reserve System.

C. TARGET ALLOCATIONS

The long-term expected rate of return on pension plan investments was determined using a log-normal distribution analysis in which best-estimate ranges of expected future real rates of return (expected returns, net of pension plan investment expense and inflation) are developed for each major asset class.

TEACHERS' RETIREMENT SYSTEM OF THE STATE OF KENTUCKY
NOTES TO FINANCIAL STATEMENTS
June 30, 2019
(Continued)

NOTE 4: NET PENSION LIABILITY OF EMPLOYERS (Continued)

These ranges are combined to produce the long-term expected rate of return by weighting the expected future real rates of return by the target asset allocation percentage and by adding expected inflation.

The target allocation and best estimates of arithmetic real rates of return for each major asset class, as provided by TRS's investment consultant, are summarized below.

<u>Asset Class</u>	<u>Target Allocation</u>	<u>Long-Term Expected Real Rate of Return</u>
U.S. Equity	40.0%	4.2%
Non U.S. Equity	22.0%	5.2%
Fixed Income	15.0%	1.2%
Additional Categories	7.0%	3.2%
Real Estate	7.0%	3.8%
Private Equity	7.0%	6.3%
Cash	2.0%	0.9%
Total	<u>100.0%</u>	

D. DISCOUNT RATE

For 2019, the discount rate used to measure the total pension liability was 7.5%. The projection of cash flows used to determine the discount rate assumed that plan member contributions will be made in full at the current contribution rates and the employer contributions will be made at actuarially determined contribution (ADC) rates for all future fiscal years. Based on those assumptions, the pension plan's fiduciary net position was projected to be available to make all projected future benefit payments of current plan members. Therefore, the long-term expected rate of return on pension plan investments was applied to all periods of projected benefit payments to determine the total pension liability.

The following table presents TRS's net pension liability for 2019. TRS's 2019 net pension liability is calculated using the discount rate of 7.5%, as well as what the system's net pension liability would be if it were calculated using a discount rate that is 1 percentage point lower (6.5%) or 1 percentage point higher (8.5%) than the current rate.

	2019 (In Thousands)		
	<u>1% Decrease (6.50%)</u>	<u>Current Discount Rate (7.50%)</u>	<u>1% Increase (8.50%)</u>
System's Net Pension Liability	\$ 18,252,330	\$ 14,294,885	\$ 10,964,314

TEACHERS' RETIREMENT SYSTEM OF THE STATE OF KENTUCKY
NOTES TO FINANCIAL STATEMENTS
June 30, 2019
(Continued)

NOTE 4: NET PENSION LIABILITY OF EMPLOYERS (Continued)

For 2018, the discount rate used to measure the total pension liability was 7.5%. The projection of cash flows used to determine the discount rate assumed that plan member contributions will be made in full at the current contribution rates and the employer contributions will be made at ADC rates, adjusted by 95%, for all future fiscal years. Based on those assumptions, the pension plan's fiduciary net position was projected to be available to make all projected future benefit payments of current plan members. Therefore, the long-term expected rate of return on pension plan investments was applied to all periods of projected benefit payments to determine the total pension liability.

The following table presents TRS's net pension liability for 2018. TRS's 2018 net pension liability is calculated using the discount rate of 7.5%, as well as what the system's net pension liability would be if it were calculated using a discount rate that is one percentage point lower (6.5%) or one percentage point higher (8.5%) than the current rate.

	2018 (In Thousands)		
	1% Decrease (6.50%)	Current Discount Rate (7.50%)	1% Increase (8.50%)
System's Net Pension Liability	\$ 17,595,452	\$ 13,726,922	\$ 10,472,071

June 30, 2018, is the actuarial valuation date upon which the total pension liability (TPL) is based for 2019. An expected TPL is determined as of June 30, 2019, using standard roll forward techniques for the TPL using a discount rate of 7.5%. An expected TPL was also determined using the prior year TPL rolled forward to June 30, 2019. The roll-forward calculation adds the annual normal cost (also called the service cost), subtracts the actual benefit payments, refunds for the plan year and applies the assumed interest rate (SEIR) for the year. The difference between the two roll-forward amounts as of June 30, 2019, is the experience gain or loss.

	TPL Roll-Forward 2019 (In Thousands)	
	Expected	Actual
(a) Interest Rate	7.50%	7.50%
(b) Total Pension Liability as of June 30, 2018	\$ 33,708,555	\$ 33,795,671
(c) Entry Age Normal Cost for the Year July 1, 2018 - June 30, 2019	542,970	542,970
(d) Actual Benefit Payments (including refunds) for the Year July 1, 2018 - June 30, 2019	2,126,767	2,126,767
(e) Total Pension Liability as of June 30, 2019 (b) x (1 + (a)) + (c) - (d) x (1 + 0.5 x (a))	34,573,146	34,666,796
(f) Difference Between Expected and Actual Experience (Gain) / Loss		93,650

TEACHERS' RETIREMENT SYSTEM OF THE STATE OF KENTUCKY
NOTES TO FINANCIAL STATEMENTS
June 30, 2019
(Continued)

NOTE 4: NET PENSION LIABILITY OF EMPLOYERS (Continued)

June 30, 2017, is the actuarial valuation date upon which the TPL is based for 2018. An expected TPL is determined as of June 30, 2018, using standard roll-forward techniques for the TPL using a discount rate of 7.5%. An expected TPL was also determined using the prior year discount rate of 4.49%, which was based on a municipal bond index rate as of that date equal to 3.56%. The roll forward calculation adds the annual normal cost (also called the service cost), subtracts the actual benefit payments and refunds for the plan year and then applies the assumed interest rate (SEIR) for the year. The difference between the two roll-forward amounts as of June 30, 2018, is the gain or loss due to changes in assumptions and other inputs.

In addition, we have determined an expected TPL as of June 30, 2018, based on the TPL roll forward in the 2017 GASB Statement 67 report. The difference between this amount and the roll-forward of the actual TPL using last year's assumptions is reflected as an experience gain or loss for the year. These procedures are shown in the following table.

	TPL Roll-Forward 2018 (In Thousands)		
	<u>Expected</u>	<u>Actual Before Assumption Change</u>	<u>Actual After Assumption Change</u>
(a) Interest Rate	4.49%	4.49%	7.50%
(b) Total Pension Liability as of June 30, 2017	\$ 46,966,822	\$ 46,753,909	\$ 32,819,887
(c) Entry Age Normal Cost for the Year July 1, 2017 - June 30, 2018	1,104,102	1,104,102	539,205
(d) Actual Benefit Payments (including refunds) for the Year July 1, 2017 - June 30, 2018	2,035,690	2,035,690	2,035,690
(e) Total Pension Liability as of June 30, 2018 (b) x (1 + (a)) + (c) - (d) x (1 + 0.5 x (a))	48,098,343	47,875,870	33,708,555
(f) Difference Between Expected and Actual Experience (Gain) / Loss		(222,473)	
(g) Difference Due to Change in Assumptions and Other Inputs (Gain) / Loss			(14,167,315)

TEACHERS' RETIREMENT SYSTEM OF THE STATE OF KENTUCKY
NOTES TO FINANCIAL STATEMENTS
June 30, 2019
(Continued)

NOTE 5: DEPOSITS WITH FINANCIAL INSTITUTIONS AND INVESTMENTS (INCLUDING REPURCHASE AGREEMENTS)

A. LEGAL PROVISIONS FOR INVESTMENTS

The following disclosures are meant to help the users of the financial statements for the Teachers' Retirement System of the State of Kentucky (TRS or system) assess the risks TRS takes in investing member funds. The Board of Trustees and the Investment Committee are guided by asset allocation parameters that the board approves through its powers as defined in KRS 161.430.

TRS administers a Retirement Annuity Trust, Health Insurance Trust and Life Insurance Trust in accordance with state and federal law. TRS provides benefits for service and disability retirements; death and survivors; retiree health insurance; and life insurance for Kentucky public education employees and their beneficiaries.

The asset allocation parameters for the retirement annuity and life insurance trusts are set forth in 102 Kentucky Administrative Regulations (KAR) 1:175, sections 2 and 3 as follows:

- There shall be no limit on the amount of investments owned if the investments are guaranteed by the U.S. government.
- Not more than 35% of the assets at fair value shall be invested in corporate debt obligations.
- Not more than 10% of the assets at fair value shall be invested in foreign debt.
- Not more than 65% of the assets at fair value shall be invested in common stocks or preferred stocks.
- Not more than 25% of the assets at fair value shall be invested in a stock portfolio designed to replicate a general stock index.
- Not more than 30% of the assets at fair value shall be invested in the stocks of companies domiciled outside of the United States; any amounts so invested shall be included in the 65% limitation for total stocks.
- Not more than 10% of the assets at fair value shall be invested in real estate. This would include real estate equity, real estate lease agreements and shares in real estate investment trusts.
- Not more than 10% of the assets at fair value shall be invested in alternative investments. This category may include private equity, venture capital, timberland and infrastructure investments.
- Not more than 15% of the assets at fair value shall be invested in any additional category or categories of investments. The board shall approve by resolution such additional category or categories of investments.

The asset allocation parameters for the Health Insurance Trust fund are set forth in 102 KAR 1:178, section 2 as follows:

- In order to preserve the assets and produce the required rate of return while minimizing risk, assets shall be prudently diversified among various classes of investments.
- In determining asset allocation policy, the investment committee and the board shall be mindful of the trust's liquidity and its capability of meeting both short and long-term obligations.

TEACHERS' RETIREMENT SYSTEM OF THE STATE OF KENTUCKY
NOTES TO FINANCIAL STATEMENTS
June 30, 2019
(Continued)

NOTE 5: DEPOSITS WITH FINANCIAL INSTITUTIONS AND INVESTMENTS (INCLUDING REPURCHASE AGREEMENTS) (Continued)

B. CASH AND CASH EQUIVALENTS

For cash deposits and cash equivalents, custodial credit risk is the risk that, in the event of a bank failure, TRS's deposits may not be returned to the system. TRS's total cash balance held at J.P. Morgan Chase bank on June 30, 2019, was \$134.1 million. TRS's total cash balance held at J.P. Morgan Chase on June 30, 2018, was \$161.4 million.

Deposits are exposed to custodial credit risk if they are not covered by depository insurance and the deposits are:

- a. uncollateralized,
- b. collateralized with securities held by the pledging financial institution or
- c. collateralized with securities held by the pledging financial institution's trust department or agent but not in the depositor-government's name.

As of June 30, 2019, TRS's cash balance of \$134.1 million was not exposed to custodial credit risk because this amount was collateralized fully with a letter of credit in the amount of \$200 million.

As of June 30, 2018, TRS's cash balance of \$161.4 million was not exposed to custodial credit risk because this amount was collateralized fully with a letter of credit in the amount of \$200 million as well as securities held by the Federal Reserve Bank of New York in the name of the Commonwealth of Kentucky - Teachers' Retirement valued at \$52.3 million.

C. INVESTMENTS

All of TRS's assets are invested in short-term and long-term debt (bonds and mortgages) securities, equity (stock) securities, real estate, alternative investments and additional categories as permitted by regulation. These assets are reported at fair value.

Investments are governed by the board's policies. The board and the Investment Committee execute their fiduciary responsibilities in accordance with the prudent person rule, as identified in KRS 161.430 (2)(b). The prudent person rule establishes a standard for all fiduciaries to act as a prudent person would be expected to act, with the "care, skill, prudence, and diligence under the circumstances then prevailing that a prudent person acting in a like capacity and familiar with these matters would use in the conduct of an enterprise of a like character and with like aims."

The following charts represent the fair values of TRS's investments for June 30, 2019, and 2018.

TEACHERS' RETIREMENT SYSTEM OF THE STATE OF KENTUCKY
NOTES TO FINANCIAL STATEMENTS
June 30, 2019
(Continued)

NOTE 5: DEPOSITS WITH FINANCIAL INSTITUTIONS AND INVESTMENTS (INCLUDING REPURCHASE AGREEMENTS) (Continued)

Schedule of Investments Retirement Annuity Trust		
	<u>Fair Value June 30, 2019</u>	<u>Fair Value June 30, 2018</u>
Short-term Investments		
Cash and Cash Equivalents	\$ 678,616,271	\$ 403,683,329
Subtotal	<u>678,616,271</u>	<u>403,683,329</u>
Fixed Income		
U.S. Government	1,297,994,618	1,145,850,222
Agency Bonds	77,746,291	47,262,531
Mortgage-backed Securities	101,618,762	90,483,215
Asset-backed Securities	48,533,798	34,611,394
Commercial Mortgage-backed Securities	28,030,171	40,736,773
Collateralized Mortgage Obligations	22,172,884	17,929,295
Municipal Bonds	284,472,393	335,376,929
Corporate Bonds	1,367,374,528	1,271,973,130
Subtotal	<u>3,227,943,445</u>	<u>2,984,223,489</u>
Equities		
International Equities	4,813,405,181	4,891,933,955
U.S. Equities	7,475,478,617	7,652,519,183
Subtotal	<u>12,288,883,798</u>	<u>12,544,453,138</u>
Real Estate Equity	1,223,062,000	1,150,694,282
Alternative Investments		
Private Equity	1,176,784,326	1,095,289,506
Timberland	182,590,093	187,540,819
Subtotal	<u>1,359,374,419</u>	<u>1,282,830,325</u>
Additional Categories		
Opportunistic Credit	584,110,105	553,448,443
Corporate Securities	170,314,441	156,745,262
Corporate Bonds	360,634,916	329,872,567
Corporate Loans	316,960,140	376,448,601
Subtotal	<u>1,432,019,602</u>	<u>1,416,514,873</u>
Total*	<u>\$ 20,209,899,535</u>	<u>\$ 19,782,399,436</u>

**This schedule includes the 403(b) Tax Shelter fund and Losey Scholarship fund.*

TEACHERS' RETIREMENT SYSTEM OF THE STATE OF KENTUCKY
NOTES TO FINANCIAL STATEMENTS
June 30, 2019
(Continued)

NOTE 5: DEPOSITS WITH FINANCIAL INSTITUTIONS AND INVESTMENTS (INCLUDING REPURCHASE AGREEMENTS) (Continued)

Schedule of Investments
Health Insurance Trust

	<u>Fair Value</u> <u>June 30, 2019</u>	<u>Fair Value</u> <u>June 30, 2018</u>
Short-term Investments		
Cash and Cash Equivalents	\$ 74,104,999	\$ 56,993,634
Subtotal	74,104,999	56,993,634
Fixed Income		
U.S. Government	30,905,025	28,274,922
Agency Bonds	1,014,190	
Municipal Bonds	3,200,070	3,013,547
Corporate Bonds	77,511,459	58,393,462
Subtotal	112,630,744	89,681,931
Equities		
Global Equities	732,597,127	571,646,533
U.S. Equities	35,408,420	34,059,334
Subtotal	768,005,547	605,705,867
Real Estate Equity	75,296,027	62,962,565
Private Equity	102,153,229	81,232,638
Additional Categories		
Opportunistic Credit	65,752,634	58,388,152
Corporate Securities	45,424,820	41,956,341
Corporate Bonds	53,552,150	47,429,471
Corporate Loans	38,791,796	37,839,206
Subtotal	203,521,400	185,613,170
Total	<u>\$ 1,335,711,946</u>	<u>\$ 1,082,189,805</u>

TEACHERS' RETIREMENT SYSTEM OF THE STATE OF KENTUCKY
NOTES TO FINANCIAL STATEMENTS
June 30, 2019
(Continued)

NOTE 5: DEPOSITS WITH FINANCIAL INSTITUTIONS AND INVESTMENTS (INCLUDING REPURCHASE AGREEMENTS) (Continued)

Schedule of Investments
Life Insurance Trust

	<u>Fair Value</u> <u>June 30, 2019</u>	<u>Fair Value</u> <u>June 30, 2018</u>
Short-term Investments		
Cash and Cash Equivalents	\$ 13,451,102	\$ 3,724,036
Subtotal	13,451,102	3,724,036
Fixed Income		
U.S. Government	11,529,380	17,296,920
Mortgage-backed Securities	577,168	752,789
Municipal Bonds	2,601,460	8,720,060
Corporate Bonds	5,151,036	21,055,667
Subtotal	19,859,044	47,825,436
Equities		
International Equities	18,036,908	7,884,256
U.S. Equities	30,224,890	22,011,223
Subtotal	48,261,798	29,895,479
Real Estate Equity	2,107,202	541,107
Private Equity	48,510	
Opportunistic Credit	1,354,418	1,300,000
Total	<u>\$ 85,082,074</u>	<u>\$ 83,286,058</u>

TEACHERS' RETIREMENT SYSTEM OF THE STATE OF KENTUCKY
NOTES TO FINANCIAL STATEMENTS
June 30, 2019
(Continued)

NOTE 5: DEPOSITS WITH FINANCIAL INSTITUTIONS AND INVESTMENTS (INCLUDING REPURCHASE AGREEMENTS) (Continued)

D. CUSTODIAL CREDIT RISK

Custodial credit risk for an investment is the risk that, in the event of the failure of a counterparty, TRS will not be able to recover the value of its investment or collateral securities that are in the possession of an outside party. Investment securities are exposed to custodial credit risk if the securities are uninsured, are not registered in the name of the system and are held by either:

- a. the counterparty or
- b. the counterparty's trust department or agent, but not in the system's name.

The cash reserve of TRS is maintained primarily in high quality short-term investments through the Dreyfus Institutional Cash Advantage Fund. This fund invests in a diversified portfolio of high quality, short-term debt securities, and the fund is rated AAA by S&P, Moody's and Fitch. The fund's portfolio is structured within the confines of Rule 2a-7 under the Investment Company Act of 1940. Commercial paper; U.S. Treasury and agency obligations; certificates of deposit; bankers' acceptances; repurchase agreements; time deposits; etc. all are permissible investments within this fund.

Whenever repurchase agreements are ordered by TRS under the terms of master repurchase agreements with various brokers, the terms are dictated by TRS. The repurchase agreements and their supporting collateral are held by the custodial agent's correspondent bank in an account identified by the custodian's name and TRS's nominee name. This account is unique to TRS. The master repurchase agreements require that the supporting collateral have a fair value of at least 102% of the value of the repurchase agreements.

As of June 30, 2019, cash collateral reinvestment securities acquired through securities lending for the Retirement Annuity Trust by TRS's custodian amounted to \$1.17 billion in relation to the \$1.15 billion securities lent consistent with the lending agreement with the custodian. Cash collateral reinvestment securities lending for the Life Insurance Trust by TRS's custodian amounted to \$3.6 million in relation to the \$3.5 million securities lent consistent with the lending agreement with the custodian. The custodian also is the lending agent and counterparty.

E. INTEREST RATE RISK

Interest rate risk on investments is the possibility that changes in interest rates will reduce the fair value of TRS's investments. In general, the longer the period until an investment matures, the greater the risk of a negative impact on fair value resulting from changes in interest rates.

As of June 30, 2019, and 2018, the Retirement Annuity Trust, Health Insurance Trust and Life Insurance Trust had the following investment fair values and weighted average maturities.

TEACHERS' RETIREMENT SYSTEM OF THE STATE OF KENTUCKY
NOTES TO FINANCIAL STATEMENTS
June 30, 2019
(Continued)

NOTE 5: DEPOSITS WITH FINANCIAL INSTITUTIONS AND INVESTMENTS (INCLUDING REPURCHASE AGREEMENTS) (Continued)

Retirement Annuity Trust

Investment Type	2019			2018		
	Fixed Income	Additional Categories	Average Maturity (Yrs)	Fixed Income	Additional Categories	Average Maturity (Yrs)
U.S. Government	\$ 1,297,994,618	\$	9.77	\$ 1,145,850,222	\$	8.79
Agency	77,746,291		7.33	47,262,531		6.89
Mortgage-backed securities	101,618,762		19.33	90,483,214		16.95
Collateralized mortgage obligations	22,172,884		15.36	17,929,295		9.26
Asset-backed securities	48,533,798		12.01	34,611,394		15.20
Commercial mortgage-backed securities	28,030,171		22.26	40,736,773		21.54
Municipal	284,472,393		12.50	335,376,929		12.21
Corporate bonds and securities	1,367,374,528	530,949,357	8.42	1,271,973,131	486,617,830	7.85
Corporate loans*		316,960,140	4.54		369,365,652	4.60
Total	<u>\$ 3,227,943,445</u>	<u>\$ 847,909,497</u>	9.26	<u>\$ 2,984,223,489</u>	<u>\$ 855,983,482</u>	8.60

*Does not include \$7,082,948 in 2018 cash held directly in the Barings European Loan Fund.

Health Insurance Trust

Investment Type	2019			2018		
	Fixed Income	Additional Categories	Average Maturity (Yrs)	Fixed Income	Additional Categories	Average Maturity (Yrs)
U.S. Government	\$ 30,905,025	\$	8.39	\$ 28,274,923	\$	9.32
Municipal	3,200,070		7.38	3,013,547		8.35
Agency	1,014,190		4.19			
Corporate bonds and securities	77,511,459	98,976,970	6.30	58,393,462	89,385,812	6.30
Corporate loans		38,791,797	4.82		37,839,206	5.27
Total	<u>\$ 112,630,744</u>	<u>\$ 137,768,767</u>	6.34	<u>\$ 89,681,932</u>	<u>\$ 127,225,018</u>	6.54

Life Insurance Trust

Investment Type	2019			2018		
	Fixed Income	Additional Categories	Average Maturity (Yrs)	Fixed Income	Additional Categories	Average Maturity (Yrs)
U.S. Government	\$ 11,529,380	\$	8.42	\$ 17,296,920	\$	8.86
Municipal	2,601,460		10.85	8,720,060		14.64
Mortgage-backed securities	577,168		13.9	752,789		13.5
Corporate bonds	5,151,036		8.67	21,055,667		5.29
Total	<u>\$ 19,859,044</u>	<u>\$</u>	8.96	<u>\$ 47,825,436</u>	<u>\$</u>	8.42

TEACHERS' RETIREMENT SYSTEM OF THE STATE OF KENTUCKY
NOTES TO FINANCIAL STATEMENTS
June 30, 2019
(Continued)

NOTE 5: DEPOSITS WITH FINANCIAL INSTITUTIONS AND INVESTMENTS (INCLUDING REPURCHASE AGREEMENTS) (Continued)

In addition to the above securities, TRS held short-term cash investments in the Dreyfus Institutional Cash Advantage Fund, at the Bank of New York Mellon (BNYM), with a total fair value of \$766.2 million and a weighted average maturity of 15 days. Average maturity is used as a measure of a security's exposure to interest rate risk due to fluctuations in market interest rates. Mortgage-backed securities and collateralized mortgage obligations typically are amortizing investments with an average life and interest rate risk significantly less than suggested by the legal maturity. Mortgage-backed securities, which generally are prepayable, and other callable bonds are subject to adverse changes in average life in response to market interest rate changes. The schedule above reflects only the legal maturity of all such bonds.

Interest rate risk is the risk that changes in interest rates will affect adversely the fair value of an investment. This risk is managed by using the effective duration or option adjusted methodology to quantify the risk of interest rate changes. This methodology takes into account optionality on bonds and scales the risk of price changes on bonds depending upon the degree of changes in rates and the slope of the yield curve. The control of interest rate risk is not set forth in a particular policy; however, the system manages interest rate risk in practice by establishing appropriate benchmarks for its various portfolios.

Mortgage-backed securities are securities representing pass-through interests in the cash flows from pools of mortgage loans on single-family or multi-family residential properties. All of the mortgage-backed securities owned by TRS were securitized and are guaranteed by Fannie Mae, Freddie Mac or Government National Mortgage Association (GNMA). The average life of a mortgage-backed security depends upon the level of prepayments experienced in the underlying pool of loans. Market interest rates are a primary determinant of prepayment levels. Lower-than-anticipated market rates generally lead to higher-than-anticipated prepayments and a shorter average life; higher-than-anticipated market rates generally lead to lower-than-anticipated prepayments and a longer average life. The Retirement Annuity Trust held \$101.6 million in mortgage-backed securities as of June 30, 2019, compared to \$90.5 million as of June 30, 2018.

Collateralized mortgage obligations are bonds that are collateralized by whole loan mortgages, mortgage pass-through securities or stripped mortgage-backed securities. Income is derived from payments and prepayments of principal and interest generated from collateral mortgages. Cash flows are distributed to different investment classes in accordance with collateralized mortgage obligations' established payment order. The Retirement Annuity Trust held \$22.2 million in collateralized mortgage obligations as of June 30, 2019, compared to \$17.9 million as of June 30, 2018.

TEACHERS' RETIREMENT SYSTEM OF THE STATE OF KENTUCKY
NOTES TO FINANCIAL STATEMENTS
June 30, 2019
(Continued)

NOTE 5: DEPOSITS WITH FINANCIAL INSTITUTIONS AND INVESTMENTS (INCLUDING REPURCHASE AGREEMENTS) (Continued)

Asset-backed securities are bonds or notes backed by loan paper or accounts receivables originated by banks, credit card companies or other credit providers and are considered to be moderately sensitive to changes in interest rates. The originator of the loan or accounts receivable paper sells it to a specially created trust, which repackages it as securities. Asset-backed securities have been structured as passthroughs and as structures with multiple bond classes. The Retirement Annuity Trust held \$48.5 million as of June 30, 2019, compared to \$34.6 million as of June 30, 2018.

Commercial mortgage-backed securities represent interests in the cash flows from pools of mortgage loans on commercial properties. The interests in a securitized pool of loans are divided generally into various tranches based upon planned payment order and level of seniority. TRS's commercial mortgage-backed securities consist of highly rated, relatively senior tranches. The average maturity of TRS's commercial mortgage-backed securities in the schedule above reflects the legal maturity of these holdings. Most of the tranches held are earlier in the planned payment order than the legal maturity suggests. The Retirement Annuity Trust held \$28 million in commercial mortgage-backed securities investments as of June 30, 2019, compared to \$40.7 million as of June 30, 2018.

F. CREDIT RISK

Credit risk is the risk that an issuer or counterparty to an investment will not fulfill its obligations. The following schedules list TRS's fixed income investment fair values (net of cash equivalents) according to credit ratings as of June 30, 2019, and 2018.

2019 Retirement Annuity Trust

<u>Rating</u>	<u>Fixed Income</u>	<u>Additional Categories</u>	<u>Total</u>	<u>Percent</u>
U.S. Government	\$ 1,297,994,618	\$	\$ 1,297,994,618	31.84%
AAA	157,995,569		157,995,569	3.88%
AA	494,778,867		494,778,867	12.14%
A	624,081,123		624,081,123	15.31%
BBB	576,137,083	40,857,674	616,994,757	15.14%
BB	10,673,125	335,427,734	346,100,859	8.49%
B		411,265,618	411,265,618	10.09%
CCC		32,622,499	32,622,499	0.80%
D		799,464	799,464	0.02%
Not Rated	66,283,060	26,936,508	93,219,568	2.29%
Total	<u>\$ 3,227,943,445</u>	<u>\$ 847,909,497</u>	<u>\$ 4,075,852,942</u>	<u>100%</u>

TEACHERS' RETIREMENT SYSTEM OF THE STATE OF KENTUCKY
NOTES TO FINANCIAL STATEMENTS
June 30, 2019
(Continued)

NOTE 5: DEPOSITS WITH FINANCIAL INSTITUTIONS AND INVESTMENTS (INCLUDING REPURCHASE AGREEMENTS) (Continued)

2018 Retirement Annuity Trust

<u>Rating</u>	<u>Fixed Income</u>	<u>Additional Categories</u>	<u>Total</u>	<u>Percent</u>
U.S. Government	\$ 1,145,850,222	\$	\$ 1,145,850,222	29.84%
AAA	253,972,006	(91,711)	253,880,295	6.60%
AA	474,173,415		474,173,415	12.35%
A	569,839,193		569,839,193	14.84%
BBB	522,885,079	38,886,604	561,771,683	14.63%
BB	6,899,630	302,177,281	309,076,911	8.05%
B		381,391,910	381,391,910	9.93%
CCC		25,168,121	25,168,121	0.66%
CC		2,032,593	2,032,593	0.05%
D		63,853	63,853	
Not Rated	10,603,944	106,354,831	116,958,775	3.05%
Total	<u>\$ 2,984,223,489</u>	<u>\$ 855,983,482</u>	<u>\$ 3,840,206,971</u>	<u>100%</u>

2019 Health Insurance Trust

<u>Rating</u>	<u>Fixed Income</u>	<u>Additional Categories</u>	<u>Total</u>	<u>Percent</u>
U.S. Government	\$ 30,905,025	\$	\$ 30,905,025	12.34%
AAA	3,567,130		3,567,130	1.43%
AA	22,718,510		22,718,510	9.07%
A	31,647,143		31,647,143	12.64%
BBB	23,321,126	7,073,250	30,394,376	12.14%
BB	471,810	61,043,391	61,515,201	24.57%
B		63,774,983	63,774,983	25.47%
CCC		4,591,525	4,591,525	1.83%
Not Rated		1,285,618	1,285,618	0.51%
Total	<u>\$ 112,630,744</u>	<u>\$ 137,768,767</u>	<u>\$ 250,399,511</u>	<u>100%</u>

TEACHERS' RETIREMENT SYSTEM OF THE STATE OF KENTUCKY
NOTES TO FINANCIAL STATEMENTS
June 30, 2019
(Continued)

NOTE 5: DEPOSITS WITH FINANCIAL INSTITUTIONS AND INVESTMENTS (INCLUDING REPURCHASE AGREEMENTS) (Continued)

2018 Health Insurance Trust

<u>Rating</u>	<u>Fixed Income</u>	<u>Additional Categories</u>	<u>Total</u>	<u>Percent</u>
U.S. Government	\$ 28,274,923	\$	\$ 28,274,923	13.04%
AAA	5,287,825	(25,195)	5,262,630	2.43%
AA	18,339,237		18,339,237	8.45%
A	25,897,007		25,897,007	11.94%
BBB	11,434,235	6,338,732	17,772,967	8.19%
BB	448,705	56,379,687	56,828,392	26.20%
B		59,084,935	59,084,935	27.24%
CCC		3,725,529	3,725,529	1.72%
CC		93,982	93,982	0.04%
D		4,115	4,115	
Not Rated		1,623,233	1,623,233	0.75%
Total	<u>\$ 89,681,932</u>	<u>\$ 127,225,018</u>	<u>\$ 216,906,950</u>	<u>100%</u>

2019 Life Insurance Trust

<u>Rating</u>	<u>Fixed Income</u>	<u>Additional Categories</u>	<u>Total</u>	<u>Percent</u>
U.S. Government	\$ 11,529,380	\$	\$ 11,529,380	58.06%
AAA	499,110		499,110	2.51%
AA	3,634,524		3,634,524	18.30%
A	400,756		400,756	2.02%
BBB	2,379,844		2,379,844	11.98%
BB	1,415,430		1,415,430	7.13%
Total	<u>\$ 19,859,044</u>	<u>\$</u>	<u>\$ 19,859,044</u>	<u>100%</u>

2018 Life Insurance Trust

<u>Rating</u>	<u>Fixed Income</u>	<u>Additional Categories</u>	<u>Total</u>	<u>Percent</u>
U.S. Government	\$ 17,296,920	\$	\$ 17,296,920	36.17%
AAA	6,594,675		6,594,675	13.79%
AA	12,120,689		12,120,689	25.34%
A	3,932,440		3,932,440	8.22%
BBB	5,548,537		5,548,537	11.60%
BB	1,346,115		1,346,115	2.82%
Not Rated	986,060		986,060	2.06%
Total	<u>\$ 47,825,436</u>	<u>\$</u>	<u>\$ 47,825,436</u>	<u>100%</u>

TEACHERS' RETIREMENT SYSTEM OF THE STATE OF KENTUCKY
NOTES TO FINANCIAL STATEMENTS
June 30, 2019
(Continued)

NOTE 5: DEPOSITS WITH FINANCIAL INSTITUTIONS AND INVESTMENTS (INCLUDING REPURCHASE AGREEMENTS) (Continued)

Total fair value of the Retirement Annuity Trust's fixed income portfolio was \$4.08 billion on June 30, 2019. The Health Insurance Trust's fixed income portfolio was valued at \$250.4 million on June 30, 2019. Total fair value of the Life Insurance Trust's fixed income portfolio was \$19.9 million on June 30, 2019. Standard & Poor's (S&P) rating system is used in the above charts. For securities where an S&P rating is not provided, another nationally recognized system is used and translated to the S&P rating system.

In addition to the above categories, the Retirement Annuity Trust held \$678.6 million in short-term investments through the Dreyfus Institutional Cash Advantage Fund. The Health Insurance Trust held \$74 million in the Dreyfus Institutional Cash Advantage Fund. The Life Insurance Trust held \$13.5 million in the Dreyfus Institutional Cash Advantage Fund. The credit risk associated with this fund is minimal as the securities held are required to maintain the highest possible short-term credit ratings by Moody's and S&P. In addition, investments in U.S. government and agency securities also are highly rated securities since they are backed by the U.S. government. Notation is made that the ratings of securities are subject to change.

The Retirement Annuity Trust's policy on credit rating is set forth in 102 KAR 1:175.

G. CONCENTRATION OF CREDIT RISK

Concentration of credit risk is the risk of loss attributed to the magnitude of a government's investment in a single issuer. Losses from credit risk are heightened if a significant portion of resources are invested with a single issuer. In compliance with 102 KAR 1:175, the Retirement Annuity Trust has not invested more than 5% of assets at fair value in any single issuer.

H. FOREIGN CURRENCY RISK

Foreign currency risk is the risk that changes in exchange rates will affect adversely the fair value of an investment or a deposit. As of June 30, 2019, TRS's exposure to foreign currency risk consisted of \$5.03 billion in the Retirement Annuity Trust, \$384.8 million in the Health Insurance Trust and \$18.1 million in the Life Insurance Trust.

The majority of foreign investments are held in commingled funds managed by UBS Global Asset Management, Baillie Gifford, Baring Asset Management and BlackRock. In addition to the commingled funds investing in foreign securities, the Retirement Annuity Trust held \$760.5 million associated with foreign interests in American depositary receipt investments. These American depositary receipts are securities that are issued by a U.S. bank in place of the foreign stock shares held in trust by that bank, thereby facilitating the trading of foreign shares in U.S. markets. The cross-listed equities, in the amount of \$565.8 million, represent securities domiciled in foreign countries, but are listed and traded on U.S. exchanges. Other foreign securities and investments consist of debt securities and alternative investment opportunities. Foreign holdings not readily identifiable to a specific country are listed in the various category, which includes investment receivables, payables and new issues.

TEACHERS' RETIREMENT SYSTEM OF THE STATE OF KENTUCKY
NOTES TO FINANCIAL STATEMENTS
June 30, 2019
(Continued)

NOTE 5: DEPOSITS WITH FINANCIAL INSTITUTIONS AND INVESTMENTS (INCLUDING REPURCHASE AGREEMENTS) (Continued)

The Retirement Annuity Trust's policy regarding foreign equities is that not more than 30% of the assets at fair value shall be invested in the stocks of companies domiciled outside of the United States. Any amounts so invested shall be included in the 65% limitation for total stocks under 102 KAR 1:175 Section 2(e).

The following tables represent the fair values of investments that are subject to foreign currency as a result of cash contributions to each portfolio manager as of June 30, 2019, and 2018.

Retirement Annuity Trust

	2019	2018
Commingled Funds	\$ 3,199,692,153	\$ 3,267,245,812
Alternative Funds	136,944,558	123,779,954
American Depository Receipts (Equities)	760,463,253	783,159,050
Cross-Listed Equities	565,794,759	539,646,891
Bonds (Fixed Income)	130,318,527	143,961,909
Additional Categories (Fixed Income)	103,230,600	83,826,303
Additional Categories (Opportunistic)	130,321,049	127,886,400
Total	<u>\$ 5,026,764,899</u>	<u>\$ 5,069,506,319</u>

Health Insurance Trust

	2019	2018
Commingled Funds	\$ 320,682,241	\$ 275,988,587
Alternative Funds	22,398,280	15,578,376
Bonds (Fixed Income)	3,517,240	5,363,945
American Depository Receipts (Equities)	3,391,560	3,562,059
Additional Categories (Fixed Income)	18,293,421	15,875,004
Additional Categories (Opportunistic)	16,542,883	14,391,605
Total	<u>\$ 384,825,625</u>	<u>\$ 330,759,576</u>

Life Insurance Trust

	2019	2018
Commingled Funds	\$ 17,681,466	\$ 7,812,225
Bonds (Fixed Income)	399,380	2,939,250
American Depository Receipts (Equities)	47,871	
Total	<u>\$ 18,128,717</u>	<u>\$ 10,751,475</u>

TEACHERS' RETIREMENT SYSTEM OF THE STATE OF KENTUCKY
NOTES TO FINANCIAL STATEMENTS
June 30, 2019
(Continued)

NOTE 5: DEPOSITS WITH FINANCIAL INSTITUTIONS AND INVESTMENTS (INCLUDING REPURCHASE AGREEMENTS) (Continued)

The categorized investments in the tables above include foreign currencies, the fair value of which are shown in the following tables.

Retirement Annuity Trust

Currency	2019	2018	Currency	2019	2018
Australian Dollar	\$ 60,131,536	\$ 80,056,199	Mexican Peso	\$ 52,163,849	\$ 78,431,730
Bermudian Dollar	59,714,165	82,563,565	Netherlands Antillean Guilder	15,682,676	26,993,189
Brazilian Real	44,889,952	30,670,609	New Zealand Dollar	2,122,452	1,706,541
British Pound Sterling	570,383,073	542,534,671	Norwegian Krone	34,960,926	40,615,351
Canadian Dollar	254,345,892	235,825,292	Pakastani Rupee	160,131	294,114
Cayman Islands Dollar	59,780,832	43,991,379	Panamanian Balboa	30,452,885	27,813,694
Chilean Peso	13,938,990	17,492,964	Papua New Guinean Kina		288,958
Chinese Yuan	102,706,746	139,954,752	Philippine Peso	3,501,301	3,301,664
Columbian Peso	15,538,891	16,129,857	Polish Zloty	3,499,312	3,614,767
Czech Koruna	270,959	326,311	Qatari Rial	1,655,090	1,473,771
Danish Krone	62,647,510	70,488,935	Russian Ruble	41,201,117	34,420,677
Egyptian Pound	348,495	447,034	Saudi Riyal	2,399,426	
Euro	1,800,364,413	1,840,824,814	Singapore Dollar	30,545,118	29,249,156
Guernsey Pound	7,233,485	13,630,804	Sol		101,565
Hong Kong Dollar	323,234,458	264,619,956	South African Rand	44,302,136	48,035,919
Hungarian Forint	476,256	524,979	Swedish Krona	118,933,415	137,087,835
Indian Rupee	72,172,031	79,415,592	Swiss Franc	200,349,094	201,063,978
Indonesian Rupiah	15,757,628	9,063,489	Taiwan New Dollar	53,353,133	49,926,329
Israeli New Shekel	5,999,416	7,585,527	Thai Baht	7,143,727	9,857,556
Japanese Yen	725,825,349	713,224,851	Trinidadian Dollar	311,309	580,613
Jersey Pound	68,919,072	73,558,462	Turkish Lira	992,210	10,651,999
Korean Won	94,134,336	72,938,027	UAE Dirham	1,129,455	1,152,862
Liberian Dollar	2,018,147	1,968,400	Uruguayan Peso		1,627,660
Macanese Pataca		662,798	Various	9,358,612	7,049,047
Malaysian Ringgit	11,715,893	15,668,077	Total	\$ 5,026,764,899	\$ 5,069,506,319

TEACHERS' RETIREMENT SYSTEM OF THE STATE OF KENTUCKY
NOTES TO FINANCIAL STATEMENTS
June 30, 2019
(Continued)

NOTE 5: DEPOSITS WITH FINANCIAL INSTITUTIONS AND INVESTMENTS (INCLUDING REPURCHASE AGREEMENTS) (Continued)

Health Insurance Trust

<u>Currency</u>	<u>2019</u>	<u>2018</u>	<u>Currency</u>	<u>2019</u>	<u>2018</u>
Argentine Peso	\$	\$	Malaysian Ringgit	\$	\$
Australian Dollar	17,518,159	14,952,558	Mexican Peso	1,898,836	1,577,332
Bermudian Dollar	213,781	2,086,554	Netherlands Antillean Guilder	2,192,778	1,929,849
Brazilian Real	6,506,631	3,688,755	New Zealand Dollar	349,235	589,060
British Pound Sterling	40,816,859	33,230,738	Norwegian Krone	871,670	579,374
Canadian Dollar	29,218,274	24,439,457	Pakastani Rupee	1,914,237	1,598,858
Cayman Islands Dollar	3,803,707	994,258	Panamanian Balboa	78,857	94,341
Chilean Peso	806,468	745,806	Papua New Guinean Kina		597,706
Chinese Yuan	1,934,720	18,830,555	Philippine Peso	946,993	97,332
Columbian Peso	905,394	296,733	Polish Zloty	948,678	617,753
Czech Koruna	121,370	106,784	Qatari Rial	817,579	696,247
Danish Krone	3,810,772	3,168,754	Russian Ruble	2,240,456	508,713
Egyptian Pound	166,457	146,934	Saudi Riyal	1,185,212	2,079,235
Euro	114,816,688	104,404,800	Singapore Dollar	3,211,863	2,549,367
Guernsey Pound		62,516	Sol		33,943
Hong Kong Dollar	24,795,755	8,146,300	South African Rand	4,874,710	4,046,539
Hungarian Forint	237,747	168,560	Swedish Krona	6,843,091	5,504,184
Indian Rupee	8,190,359	6,048,862	Swiss Franc	20,243,461	16,421,811
Indonesian Rupiah	1,806,437	1,266,203	Taiwan New Dollar	9,907,041	8,036,220
Israeli New Shekel	1,089,373	1,364,123	Thai Baht	2,717,338	1,514,111
Japanese Yen	54,808,895	45,957,033	Trinidadian Dollar	63,413	119,100
Jersey Pound	83,475	253,049	Turkish Lira	479,708	533,627
Korean Won	10,845,060	9,730,528	UAE Dirham	544,088	393,174
Liberian Dollar		192,830	Total	<u>\$ 384,825,625</u>	<u>\$ 330,759,576</u>
Macanese Pataca		223,455			

TEACHERS' RETIREMENT SYSTEM OF THE STATE OF KENTUCKY
NOTES TO FINANCIAL STATEMENTS
June 30, 2019
(Continued)

NOTE 5: DEPOSITS WITH FINANCIAL INSTITUTIONS AND INVESTMENTS (INCLUDING REPURCHASE AGREEMENTS) (Continued)

Life Insurance Trust

<u>Currency</u>	<u>2019</u>	<u>2018</u>	<u>Currency</u>	<u>2019</u>	<u>2018</u>
Argentine Peso	\$ 13,630	\$	Malaysian Ringgit	\$ 98,206	\$ 46,475
Australian Dollar	812,170	2,328,511	Mexican Peso	113,425	57,007
Bermudian Dollar	23,587	11,322	Netherlands Antillean Guilder	4,928	
Brazilian Real	334,292	109,096	New Zealand Dollar	40,682	16,936
British Pound Sterling	2,121,683	1,808,287	Norwegian Krone	100,646	44,961
Canadian Dollar	1,153,330	524,742	Pakastani Rupee	4,014	2,919
Cayman Islands Dollar	15,032	1,159	Panamanian Balboa	90	96
Chilean Peso	43,545	21,887	Papua New Guinean Kina	4,740	2,868
Chinese Yuan	1,138,624	514,591	Philippine Peso	48,519	17,896
Columbian Peso	25,520	8,629	Polish Zloty	47,698	20,423
Czech Koruna	7,027	3,238	Qatari Rial	40,579	14,626
Danish Krone	231,412	91,546	Russian Ruble	159,886	61,397
Egyptian Pound	8,814	4,437	Saudi Riyal	60,142	
Euro	4,111,786	1,811,311	Singapore Dollar	162,565	72,064
Guernsey Pound	4,797	1,862	Sol	2,522	1,008
Hong Kong Dollar	666,709	239,681	South African Rand	253,881	119,374
Hungarian Forint	11,937	5,210	Swedish Krona	392,526	158,408
Indian Rupee	427,653	178,964	Swiss Franc	1,033,663	414,458
Indonesian Rupiah	94,245	37,499	Taiwan New Dollar	506,921	237,004
Israeli New Shekel	83,831	38,914	Thai Baht	140,767	44,335
Japanese Yen	2,954,539	1,353,133	Turkish Lira	24,870	15,313
Jersey Pound	5,290	4,038	UAE Dirham	30,206	11,441
Korean Won	554,273	287,376	Uruguayan Peso	606	
Macanese Pataca	11,866	6,578	Various	1,043	455
			Total	<u>\$ 18,128,717</u>	<u>\$ 10,751,475</u>

TEACHERS' RETIREMENT SYSTEM OF THE STATE OF KENTUCKY
NOTES TO FINANCIAL STATEMENTS
June 30, 2019
(Continued)

NOTE 5: DEPOSITS WITH FINANCIAL INSTITUTIONS AND INVESTMENTS (INCLUDING REPURCHASE AGREEMENTS) (Continued)

I. FAIR VALUE MEASUREMENT

A retiree pension defined benefit plan holds significant amounts of investments that are measured at fair value on a recurring basis. TRS categorizes its fair value measurements within the fair value hierarchy established by generally accepted accounting principles (GAAP) in the United States of America. The hierarchy is based on the valuation inputs used to measure the fair value of the asset and is not necessarily indicative of risk.

Level 1 inputs are quoted prices (unadjusted) for identical assets or liabilities in active markets that a government can access at the measurement date. Level 2 inputs are inputs other than quoted prices included within Level 1 that are observable for an asset or liability. Level 2 inputs may include quoted prices for similar assets or liabilities in active markets; quoted prices for identical or similar assets of liabilities in non-active markets; and inputs other than quoted prices that are observable for the assets or liabilities, either directly or indirectly. Level 3 inputs are unobservable inputs for an asset or liability such as property appraisals, third-party valuations and public market comparables of similar assets where applicable. Investments measured at fair value using the net asset value (NAV) per share (or its equivalent) as a practical expedient are not classified in the fair value hierarchy. The fair value hierarchy gives the highest priority to Level 1 inputs and the lowest priority to Level 3 inputs.

J. SCHEDULES OF FAIR VALUES

These category descriptions that immediately follow refer to the investments shown in the fair value level hierarchy schedules shown after these descriptions.

Cash and Cash Equivalents: Cash equivalents are short-term, highly liquid investments that readily are convertible to known amounts of cash and so near to their maturity that they present insignificant risk of changes in value because of changes in interest rates. This category is comprised of short-term investments via the Dreyfus Institutional Cash Advantage Fund and cash. Cash equivalents can be valued with inputs from quoted prices (unadjusted) for identical assets or liabilities in active markets that a government can access at the measurement date and, therefore, are classified as Level 1 assets.

Equity and Fixed Income Securities: Debt and equity securities classified in Level 1 of the fair value hierarchy are valued using prices quoted in active markets issued by pricing vendors for these securities. Debt and equity securities classified in Level 2 of the fair value hierarchy may use inputs such as market quotations, yields, maturities, call features and ratings or may be valued using a matrix pricing technique that values securities based on their relationship to benchmark quoted prices. Debt securities classified in Level 3 are securities whose stated market price is unobservable by the market place and, instead, are priced by the issuers or industry groups for these securities.

Real Estate: Real estate falls into the Level 3 classification of the fair value hierarchy. Much of TRS's real estate consists of owned properties leased to various commercial enterprises. The fair value measurement for real estate is determined by professional appraisals every five years.

TEACHERS' RETIREMENT SYSTEM OF THE STATE OF KENTUCKY
NOTES TO FINANCIAL STATEMENTS
June 30, 2019
(Continued)

NOTE 5: DEPOSITS WITH FINANCIAL INSTITUTIONS AND INVESTMENTS (INCLUDING REPURCHASE AGREEMENTS) (Continued)

Timberland: Timberland investments are managed investments regarding the acquiring, growing and disposing of timber on timberlands owned by TRS. Fair value determinations for Level 3 measurements of investments are the responsibility of the adviser, Molpus Woodlands Group. The adviser contracts with outside appraisers to generate annual fair value estimates. The outside appraisers utilized the cost, sales comparison and income capitalization approaches to estimate the fair value of the timber and timberlands. The adviser challenges the reasonableness of the assumptions used and reviews the methodology to ensure the estimated fair value complies with GAAP. These funds are not available for redemption; instead, they make distributions to TRS as the underlying assets are sold.

Additional Categories: Investments in this category do not fit the regular parameters for the Retirement Annuity Trust in 102 KAR 1:175. They fall into the allowable 15% of assets invested in any additional categories approved by the board. Corporate bonds falling within the Level 1 classification are valued using prices quoted in active markets issued by pricing vendors for these securities. Corporate bonds listed in Level 2 may use inputs such as market quotations, yields, maturities, call features and ratings or may be valued using a matrix pricing technique that values securities based on their relationship to benchmark quoted prices. Corporate loans at Level 3 are valued by third-party pricing vendors such as Markit or Reuters.

Commingled Funds: These funds hold European loans, international equities and domestic equities. Commingled funds are valued at the net asset value held at the end of the period based upon the fair value of the underlying investments.

Private Equity: Private equity funds invest in equity and debt securities issued by private and publicly held companies in connection with leveraged buyouts, recapitalizations and expansion opportunities. Three of these funds are redeemable, but the majority do not allow redemptions. Alternatively, TRS receives distributions as the underlying assets of the funds liquidate, usually over a five- to 10-year liquidation period. Exchange quotations are not available readily for these investments. The fair value for most of these funds is determined using the net asset value one quarter in arrears, plus current quarter cash flows.

Private Real Estate: Three private real estate investments are open-ended. The remaining investments are not redeemable; rather, TRS receives distributions as the underlying assets liquidate, usually over a five- to 10-year liquidation period. Exchange quotations for these investments are not available readily. Most private real estate fair values are determined using the net assets valued one quarter in arrears, plus current quarter cash flows.

Private Timber: TRS has one private timberland fund that is valued using the NAV as a practical expedient. Like most private funds, the fair value for this fund is determined using the net assets valued one quarter in arrears, plus current quarter cash flows.

TEACHERS' RETIREMENT SYSTEM OF THE STATE OF KENTUCKY
NOTES TO FINANCIAL STATEMENTS
June 30, 2019
(Continued)

NOTE 5: DEPOSITS WITH FINANCIAL INSTITUTIONS AND INVESTMENTS (INCLUDING REPURCHASE AGREEMENTS) (Continued)

Private Opportunistic Credit: One private opportunistic credit fund is redeemable. The remainder are closed funds that issue distributions as the underlying assets of the fund liquidate, usually over a five- to 10-year liquidation period. The fair value for most of these funds is determined using the net assets valued one month in arrears, plus current period cash flows.

Retirement Annuity Trust
Schedule of Investments at Fair Value 2019

	<u>Level 1 Inputs</u>	<u>Level 2 Inputs</u>	<u>Level 3 Inputs</u>	<u>Fair Value</u>
Cash and Cash Equivalents	\$ 678,616,271	\$	\$	\$ 678,616,271
Fixed Income				
Asset-backed Securities		48,533,798		48,533,798
Agency Bonds		77,746,291		77,746,291
Commercial Mortgage-backed Securities		28,030,171		28,030,171
Collateralized Mortgage Obligations		22,172,884		22,172,884
Corporate Bonds		1,367,374,528		1,367,374,528
Mortgage-backed Securities		100,749,057	869,705	101,618,762
Municipal Bonds		284,472,393		284,472,393
U.S. Government	1,290,892,773	7,101,845		1,297,994,618
Subtotal	<u>1,290,892,773</u>	<u>1,936,180,967</u>	<u>869,705</u>	<u>3,227,943,445</u>
Equities				
International Equity	1,304,147,775	1,846,353,781		3,150,501,556
U.S. Equity	7,193,195,834			7,193,195,834
Subtotal	<u>8,497,343,609</u>	<u>1,846,353,781</u>		<u>10,343,697,390</u>
Real Estate			424,559,554	424,559,554
Timberland			153,586,426	153,586,426
Additional Categories				
Corporate Bonds and Securities	35,392	530,913,965		530,949,357
Corporate Loans			216,920,140	216,920,140
Subtotal	<u>35,392</u>	<u>530,913,965</u>	<u>216,920,140</u>	<u>747,869,497</u>
Total Investments by Fair Value Level	<u>\$ 10,466,888,045</u>	<u>\$ 4,313,448,713</u>	<u>\$ 795,935,825</u>	<u>\$ 15,576,272,583</u>
Investments Measured at the NAV				
Commingled European Loan Fund				\$ 100,040,000
Commingled International Equity Funds				1,662,903,625
Commingled Domestic Equity Funds				282,282,783
Private Equity Funds				1,176,784,326
Private Real Estate Funds				798,502,446
Private Timber Funds				29,003,667
Private Opportunistic Credit Funds				584,110,105
Total Investments Measured at the NAV				<u>4,633,626,952</u>
Total Investments Measured at Fair Value				<u>\$ 20,209,899,535</u>

TEACHERS' RETIREMENT SYSTEM OF THE STATE OF KENTUCKY
NOTES TO FINANCIAL STATEMENTS
June 30, 2019
(Continued)

NOTE 5: DEPOSITS WITH FINANCIAL INSTITUTIONS AND INVESTMENTS (INCLUDING REPURCHASE AGREEMENTS) (Continued)

Retirement Annuity Trust
Schedule of Investments Measured at the Net Asset Value (NAV) 2019

	June 30, 2019	Unfunded Commitments	Redemption Frequency	Redemption Notice
Commingled European Loan Fund	\$ 100,040,000	\$	Daily	30 days
Commingled International Equity Fund	1,662,903,625		Daily	1-30 days
Commingled Domestic Equity Fund	282,282,783		Daily	1-30 days
Private Equity Funds				
Open-ended Funds *	249,596,594	84,016,297	Quarterly, annually	90 days
Closed-ended Funds	927,187,732	767,795,807	N/A	N/A
Private Real Estate Funds				
Open-ended Funds	474,326,009		Quarterly	45-90 days
Closed-ended Funds	324,176,437	382,276,117	N/A	N/A
Private Timber Funds	29,003,667		Biennially	90 days
Private Opportunistic Credit Funds				
Open-ended Funds	367,578,268		Semiannually	75 days
Closed-ended Funds	216,531,837	139,978,408	N/A	N/A
Total Investments Measured at the NAV	<u>\$ 4,633,626,952</u>			

* Regarding the open-ended private equity, a few restrictions remain that would prevent redemption at this time. One fund currently valued at \$49,674,834 in the Retirement Annuity Trust has a three-year lock-up period that expires June 30, 2021.

TEACHERS' RETIREMENT SYSTEM OF THE STATE OF KENTUCKY
NOTES TO FINANCIAL STATEMENTS
June 30, 2019
(Continued)

NOTE 5: DEPOSITS WITH FINANCIAL INSTITUTIONS AND INVESTMENTS (INCLUDING REPURCHASE AGREEMENTS) (Continued)

Retirement Annuity Trust
Schedule of Investments at Fair Value 2018

	Level 1 Inputs	Level 2 Inputs	Level 3 Inputs	Fair Value
Cash and Cash Equivalents	\$ 403,683,329	\$	\$	\$ 403,683,329
Fixed Income				
Asset-backed Securities		34,611,394		34,611,394
Agency Bonds		47,262,531		47,262,531
Commercial Mortgage-backed Securities		40,736,773		40,736,773
Collateralized Mortgage Obligations		17,929,295		17,929,295
Corporate Bonds	2,404,473	1,269,568,657		1,271,973,130
Mortgage-backed Securities		89,105,435	1,377,780	90,483,215
Municipal Bonds		335,376,929		335,376,929
U.S. Government	1,139,006,569	6,843,653		1,145,850,222
Subtotal	<u>1,141,411,042</u>	<u>1,841,434,667</u>	<u>1,377,780</u>	<u>2,984,223,489</u>
Equities				
International Equity	1,306,678,614	1,999,811,083		3,306,489,697
U.S. Equity	7,387,805,408	33,688		7,387,839,096
Subtotal	<u>8,694,484,022</u>	<u>1,999,844,771</u>		<u>10,694,328,793</u>
Real Estate			420,940,001	420,940,001
Timberland			153,111,010	153,111,010
Additional Categories				
Corporate Bonds and Securities	(91,711)	486,709,541		486,617,830
Corporate Loans			186,153,181	186,153,181
Subtotal	<u>(91,711)</u>	<u>486,709,541</u>	<u>186,153,181</u>	<u>672,771,011</u>
Total Investments by Fair Value Level	<u>\$ 10,239,486,682</u>	<u>\$ 4,327,988,979</u>	<u>\$ 761,581,972</u>	<u>\$ 15,329,057,633</u>
Investments Measured at the NAV				
Commingled European Loan Fund				\$ 102,070,000
Commingled International Equity Funds				1,585,444,258
Commingled Domestic Equity Funds				264,680,086
Private Equity Funds				1,095,289,506
Private Loan Fund				88,225,420
Private Real Estate Funds				729,754,281
Private Timber Funds				34,429,809
Private Opportunistic Credit Funds				553,448,443
Total Investments Measured at the NAV				<u>4,453,341,803</u>
Total Investments at Fair Value				<u>\$ 19,782,399,436</u>

TEACHERS' RETIREMENT SYSTEM OF THE STATE OF KENTUCKY
NOTES TO FINANCIAL STATEMENTS
June 30, 2019
(Continued)

NOTE 5: DEPOSITS WITH FINANCIAL INSTITUTIONS AND INVESTMENTS (INCLUDING REPURCHASE AGREEMENTS) (Continued)

Retirement Annuity Trust
Schedule of Investments Measured at the Net Asset Value (NAV) 2018

	June 30, 2018	Unfunded Commitments	Redemption Frequency	Redemption Notice
Commingled European Loan Fund	\$ 102,070,000	\$	Daily	30 days
Commingled International Equity Fund	1,585,444,258		Daily	1-30 days
Commingled Domestic Equity Fund	264,680,086		Daily	1-30 days
Private Equity Funds				
Open-ended Funds	209,885,810	71,168,561	Quarterly, annually	90 days
Closed-ended Funds	885,403,696	553,049,047	N/A	N/A
Private Loan Fund	88,225,420		Quarterly	30 days
Private Real Estate Funds				
Open-ended Funds*	417,556,034	22,944,664	Quarterly	45-90 days
Closed-ended Funds	312,198,247	239,906,810	N/A	N/A
Private Timber Funds	34,429,809		Biennially	90 days
Private Opportunistic Credit Funds				
Open-ended Funds	336,849,775		Semiannually	75 days
Closed-ended Funds	216,598,668	203,145,926	N/A	N/A
Total Investments Measured at the NAV	<u>\$ 4,453,341,803</u>			

* Regarding the Open Ended Private Real Estate Funds, there are a few restrictions remaining that would prevent redemption at this time. One fund currently valued at \$53,988,311 in the Retirement Annuity Trust and \$10,797,661 in the Health Insurance Trust has a 2-year lock-up period that expires January 2019. Another fund currently valued at \$27,055,336 in the Retirement Annuity Trust, \$5,411,067 in the Health Insurance Trust, and \$541,107 in the Life Insurance Fund has a 180 day lock-up period that expires October of 2018.

TEACHERS' RETIREMENT SYSTEM OF THE STATE OF KENTUCKY
NOTES TO FINANCIAL STATEMENTS
June 30, 2019
(Continued)

NOTE 5: DEPOSITS WITH FINANCIAL INSTITUTIONS AND INVESTMENTS (INCLUDING REPURCHASE AGREEMENTS) (Continued)

Health Insurance Trust
Schedule of Investments at Fair Value 2019

	<u>Level 1 Inputs</u>	<u>Level 2 Inputs</u>	<u>Level 3 Inputs</u>	<u>Fair Value</u>
Cash and Cash Equivalents	\$ 74,104,999	\$	\$	\$ 74,104,999
Fixed Income				
Agency Bonds		1,014,190		1,014,190
Corporate Bonds		77,511,459		77,511,459
Municipal Bonds		3,200,070		3,200,070
U.S. Government	29,905,005	1,000,020		30,905,025
Subtotal	<u>29,905,005</u>	<u>82,725,739</u>		<u>112,630,744</u>
Equities				
Global Equity		732,597,127		732,597,127
U.S. Equity	35,408,420			35,408,420
Subtotal	<u>35,408,420</u>	<u>732,597,127</u>		<u>768,005,547</u>
Additional Categories				
Corporate Bonds and Securities		98,976,969		98,976,969
Corporate Loans			38,791,797	38,791,797
Subtotal		<u>98,976,969</u>	<u>38,791,797</u>	<u>137,768,766</u>
Total Investments by Fair Value Level	<u>\$ 139,418,424</u>	<u>\$ 914,299,835</u>	<u>\$ 38,791,797</u>	<u>\$ 1,092,510,056</u>
Investments Measured at the NAV				
Private Equity Funds				\$ 102,153,229
Private Real Estate Funds				75,296,027
Private Opportunistic Credit Funds				65,752,634
Total Investments Measured at the NAV				<u>243,201,890</u>
Total Investments at Fair Value				<u>\$ 1,335,711,946</u>

TEACHERS' RETIREMENT SYSTEM OF THE STATE OF KENTUCKY
NOTES TO FINANCIAL STATEMENTS
June 30, 2019
(Continued)

NOTE 5: DEPOSITS WITH FINANCIAL INSTITUTIONS AND INVESTMENTS (INCLUDING REPURCHASE AGREEMENTS) (Continued)

Health Insurance Trust
Schedule of Investments Measured at the Net Asset Value (NAV) 2019

	<u>June 30, 2019</u>	<u>Unfunded Commitments</u>	<u>Redemption Frequency</u>	<u>Redemption Notice</u>
Private Real Estate Funds				
Open-ended Funds	\$ 35,426,494	\$	Quarterly	45-90 days
Closed-ended Funds	39,869,533	61,800,630	N/A	N/A
Private Equity Funds				
Closed-ended Funds	102,153,229	108,147,568	N/A	N/A
Private Opportunistic Credit Funds				
Open-ended Funds	46,789,856		Semiannually	75 days
Closed-ended Funds	18,962,778	18,474,255	N/A	N/A
Total Investments Measured at the NAV	<u>\$ 243,201,890</u>			

TEACHERS' RETIREMENT SYSTEM OF THE STATE OF KENTUCKY
NOTES TO FINANCIAL STATEMENTS
June 30, 2019
(Continued)

NOTE 5: DEPOSITS WITH FINANCIAL INSTITUTIONS AND INVESTMENTS (INCLUDING REPURCHASE AGREEMENTS) (Continued)

Health Insurance Trust
Schedule of Investments at Fair Value 2018

	<u>Level 1 Inputs</u>	<u>Level 2 Inputs</u>	<u>Level 3 Inputs</u>	<u>Fair Value</u>
Cash and Cash Equivalents	\$ 56,993,634	\$	\$	\$ 56,993,634
Fixed Income				
Corporate Bonds		58,393,462		58,393,462
Municipal Bonds		3,013,547		3,013,547
U.S. Government	27,301,552	973,370		28,274,922
Subtotal	<u>27,301,552</u>	<u>62,380,379</u>		<u>89,681,931</u>
Equities				
Global Equity		571,646,533		571,646,533
U.S. Equity	34,059,334			34,059,334
Subtotal	<u>34,059,334</u>	<u>571,646,533</u>		<u>605,705,867</u>
Additional Categories				
Corporate Bonds and Securities	(25,195)	89,411,007		89,385,812
Corporate Loans		252,711	37,586,495	37,839,206
Subtotal	<u>(25,195)</u>	<u>89,663,718</u>	<u>37,586,495</u>	<u>127,225,018</u>
Total Investments by Fair Value Level	<u>\$ 118,329,325</u>	<u>\$ 723,690,630</u>	<u>\$ 37,586,495</u>	<u>\$ 879,606,450</u>
Investments Measured at the NAV				
Private Equity Funds				\$ 81,232,638
Private Real Estate Funds				62,962,565
Private Opportunistic Credit Funds				58,388,152
Total Investments Measured at the NAV				<u>202,583,355</u>
Total Investments at Fair Value				<u>\$ 1,082,189,805</u>

TEACHERS' RETIREMENT SYSTEM OF THE STATE OF KENTUCKY
NOTES TO FINANCIAL STATEMENTS
June 30, 2019
(Continued)

NOTE 5: DEPOSITS WITH FINANCIAL INSTITUTIONS AND INVESTMENTS (INCLUDING REPURCHASE AGREEMENTS) (Continued)

Health Insurance Trust
Schedule of Investments Measured at the Net Asset Value (NAV) 2018

	<u>June 30, 2018</u>	<u>Unfunded Commitments</u>	<u>Redemption Frequency</u>	<u>Redemption Notice</u>
Private Real Estate Funds				
Open-ended Funds	\$ 28,142,915	\$ 4,588,933	Quarterly	45-90 days
Closed-ended Funds	34,819,650	30,271,003	N/A	N/A
Private Equity Funds				
Closed-ended Funds	81,232,638	76,482,322	N/A	N/A
Private Opportunistic Credit Funds				
Open-ended Funds	41,599,592		Semiannually	75 days
Closed-ended Funds	16,788,560	11,778,187	N/A	N/A
Total Investments Measured at the NAV	<u>\$ 202,583,355</u>			

TEACHERS' RETIREMENT SYSTEM OF THE STATE OF KENTUCKY
NOTES TO FINANCIAL STATEMENTS
June 30, 2019
(Continued)

NOTE 5: DEPOSITS WITH FINANCIAL INSTITUTIONS AND INVESTMENTS (INCLUDING REPURCHASE AGREEMENTS) (Continued)

Life Insurance Trust
Schedule of Investments at Fair Value 2019

	<u>Level 1 Inputs</u>	<u>Level 2 Inputs</u>	<u>Level 3 Inputs</u>	<u>Fair Value</u>
Cash and Cash Equivalents	\$ 13,451,102	\$	\$	\$ 13,451,102
Fixed Income				
Corporate Bonds		5,151,036		5,151,036
Mortgage-backed Securities		577,168		577,168
Municipal Bonds		2,601,460		2,601,460
U.S. Government	11,529,380			11,529,380
Subtotal	<u>11,529,380</u>	<u>8,329,664</u>		<u>19,859,044</u>
Equities				
International Equity		18,036,908		18,036,908
U.S. Equity	30,224,890			30,224,890
Subtotal	<u>30,224,890</u>	<u>18,036,908</u>		<u>48,261,798</u>
Total Investments by Fair Value Level	\$ 55,205,372	\$ 26,366,572	\$	\$ 81,571,944
Investments Measured at the NAV				
Private Equity Funds				\$ 48,510
Private Opportunistic Credit Funds				1,354,418
Private Real Estate Funds				2,107,202
Total Investments Measured at the NAV				<u>3,510,130</u>
Total Investments at Fair Value				<u>\$ 85,082,074</u>

TEACHERS' RETIREMENT SYSTEM OF THE STATE OF KENTUCKY
NOTES TO FINANCIAL STATEMENTS
June 30, 2019
(Continued)

NOTE 5: DEPOSITS WITH FINANCIAL INSTITUTIONS AND INVESTMENTS (INCLUDING REPURCHASE AGREEMENTS) (Continued)

Life Insurance Trust
Schedule of Investments Measured at the Net Asset Value (NAV) 2019

	<u>June 30, 2019</u>	<u>Unfunded Commitments</u>	<u>Redemption Frequency</u>	<u>Redemption Notice</u>
Private Equity Funds				
Closed-ended Funds	\$ 48,510	\$ 1,450,000	N/A	N/A
Private Real Estate Funds				
Closed-ended Funds		1,500,000	N/A	N/A
Open-ended Funds	2,107,202		Quarterly	45 days
Private Opportunistic Credit Funds				
Open-ended Funds	<u>1,354,418</u>		Semiannually	75 days
Total Investments Measured at the NAV	<u><u>\$ 3,510,130</u></u>			

Life Insurance Trust
Schedule of Investments at Fair Value 2018

	<u>Level 1 Inputs</u>	<u>Level 2 Inputs</u>	<u>Level 3 Inputs</u>	<u>Fair Value</u>
Cash and Cash Equivalents	\$ 3,724,036	\$	\$	\$ 3,724,036
Fixed Income				
Corporate Bonds		21,055,667		21,055,667
Mortgage-backed Securities		752,789		752,789
Municipal Bonds		8,720,060		8,720,060
U.S. Government	<u>17,296,920</u>			<u>17,296,920</u>
Subtotal	<u>17,296,920</u>	<u>30,528,516</u>		<u>47,825,436</u>
Equities				
International Equity		7,884,256		7,884,256
U.S. Equity	<u>22,011,223</u>			<u>22,011,223</u>
Subtotal	<u>22,011,223</u>	<u>7,884,256</u>		<u>29,895,479</u>
Total Investments by Fair Value Level	\$ 43,032,179	\$ 38,412,772	\$	\$ 81,444,951
Investments Measured at the NAV				
Private Real Estate				\$ 541,107
Private Opportunistic Credit				<u>1,300,000</u>
Total Investments Measured at the NAV				<u>1,841,107</u>
Total Investments at Fair Value				<u><u>\$ 83,286,058</u></u>

TEACHERS' RETIREMENT SYSTEM OF THE STATE OF KENTUCKY
NOTES TO FINANCIAL STATEMENTS
June 30, 2019
(Continued)

NOTE 5: DEPOSITS WITH FINANCIAL INSTITUTIONS AND INVESTMENTS (INCLUDING REPURCHASE AGREEMENTS) (Continued)

Life Insurance Trust
Schedule of Investments Measured at the Net Asset Value (NAV) 2018

	<u>June 30, 2018</u>	<u>Unfunded Commitments</u>	<u>Redemption Frequency</u>	<u>Redemption Notice</u>
Private Real Estate Funds				
Open-ended Funds	\$ 541,107	\$ 458,893	Quarterly	45 days
Private Opportunistic Credit Funds				
Open-ended Funds	<u>1,300,000</u>		Semiannually	75 days
Total Investments Measured at the NAV	<u><u>\$ 1,841,107</u></u>			

K. Securities Lending

KRS 161.430 empowers the board with fiduciary responsibility for TRS funds. The system operates a securities lending program in which it temporarily lends securities to qualified agents in exchange for a net fee and high-quality collateral. The types of securities lent are U.S. government and agency securities; selected domestic bonds; and domestic and international stocks. TRS's custodian, BNYM, acts as lending agent in exchanging securities for collateral. The collateral has a value of not less than 102% of the fair value of the lent securities, plus any accrued, unpaid distributions. The collateral may consist of both cash and non-cash collateral. The non-cash collateral may include, but not be limited to, debt obligations and securities, equity securities, corporate bonds and convertible securities.

Securities lending transactions are accounted for in accordance with GASB Statement No. 28. During the fiscal year ended June 30, 2019, only the Retirement Annuity Trust fund had securities lending transactions. The following schedules detail the net income earned in the Retirement Annuity Trust fund from securities lending for the fiscal years ended June 30, 2019, and 2018.

Securities Lending Net Earnings

<u>Item</u>	<u>Retirement Annuity Trust*</u>		<u>Life Insurance Trust</u>	
	<u>2019</u>	<u>2018</u>	<u>2019</u>	<u>2018</u>
Gross Earnings (Interest and Fees)	\$ 15,699,532	\$ 16,277,025	\$ 353,336	\$ 42,020
Gross Borrower Rebates	(11,978,600)	(10,559,667)	(307,690)	(31,148)
Bank Fees	<u>(1,115,929)</u>	<u>(1,714,768)</u>	<u>(13,692)</u>	<u>(3,261)</u>
Net Earnings	<u><u>\$ 2,605,003</u></u>	<u><u>\$ 4,002,590</u></u>	<u><u>\$ 31,954</u></u>	<u><u>\$ 7,611</u></u>

**This schedule includes the Losey Scholarship fund.*

TEACHERS' RETIREMENT SYSTEM OF THE STATE OF KENTUCKY
NOTES TO FINANCIAL STATEMENTS
June 30, 2019
(Continued)

NOTE 5: DEPOSITS WITH FINANCIAL INSTITUTIONS AND INVESTMENTS (INCLUDING REPURCHASE AGREEMENTS) (Continued)

Cash collateral is invested in guaranteed, short-term obligations of the U.S. government, select government agencies and repurchase agreements with qualified agents. TRS cannot pledge or sell collateral securities received unless the borrower defaults. BNYM as the lending agent also indemnifies TRS from any financial loss associated with a borrower's default and collateral inadequacy. The Statement of Fiduciary Net Position does not report securities lending transactions collateralized by letters of credit or by securities that the governmental entity does not have the ability to pledge or sell, unless the borrower defaults.

As of June 30, 2019, the average days to maturity for loans in the Retirement Annuity Trust Fund was one day, and the weighted average investment maturity of cash collateral investments was two days. The trust had no credit risk exposure to borrowers because the amounts owed to borrowers exceeded the amounts the borrowers owed the trust, and no losses resulted during the period.

Security lending programs can entail interest rate risk and credit risk. TRS minimizes interest rate risk by limiting the term of cash collateral investments to several days.

The credit risk is controlled by investing cash collateral in securities with qualities similar to the credit worthiness of lent securities.

The following table presents the fair values of the underlying securities and the value of the collateral pledged at June 30, 2019, and 2018.

Retirement Annuity Trust 2019				
Type of Securities Lent	Fair Value	Cash Collateral Received	Non-Cash Collateral Value Received	Total Collateral Received
Fixed Income	\$ 191,232,211	\$ 3,860,561	\$ 192,188,154	\$ 196,048,715
Equities	959,736,176	400,199,282	570,029,895	970,229,177
Total	<u>\$ 1,150,968,387</u>	<u>\$ 404,059,843</u>	<u>\$ 762,218,049</u>	<u>\$ 1,166,277,892</u>
2018				
Type of Securities Lent	Fair Value	Cash Collateral Received	Non-Cash Collateral Value Received	Total Collateral Received
Fixed income	\$ 121,361,471	\$ 35,699,643	\$ 88,466,188	\$ 124,165,831
Equities	1,144,548,206	844,061,981	327,494,273	1,171,556,254
Total	<u>\$ 1,265,909,677</u>	<u>\$ 879,761,624</u>	<u>\$ 415,960,461</u>	<u>\$ 1,295,722,085</u>

TEACHERS' RETIREMENT SYSTEM OF THE STATE OF KENTUCKY
NOTES TO FINANCIAL STATEMENTS
June 30, 2019
(Continued)

NOTE 5: DEPOSITS WITH FINANCIAL INSTITUTIONS AND INVESTMENTS (INCLUDING REPURCHASE AGREEMENTS) (Continued)

Life Insurance Trust 2019				
Type of Securities Lent	Fair Value	Cash Collateral Received	Non-Cash Collateral Value Received	Total Collateral Received
Fixed Income	\$ 2,996,246	\$ 1,016,250	\$ 2,093,253	\$ 3,109,503
Equities	469,915		473,027	473,027
Total	<u>\$ 3,466,161</u>	<u>\$ 1,016,250</u>	<u>\$ 2,566,280</u>	<u>\$ 3,582,530</u>

2018				
Type of Securities Lent	Fair Value	Cash Collateral Received	Non-Cash Collateral Value Received	Total Collateral Received
Fixed income	\$	\$	\$	\$
Equities	2,179,744	2,107,139	114,609	2,221,748
Total	<u>\$ 2,179,744</u>	<u>\$ 2,107,139</u>	<u>\$ 114,609</u>	<u>\$ 2,221,748</u>

L. ANNUAL MONEY-WEIGHTED RATE OF RETURN

A money-weighted rate of return is an expression of investment performance that is net of TRS's investment fees and expenses, adjusted for the changing amounts actually invested. The following table reflects the money-weighted rates of return.

Annual Rate of Return Net of Investment Fees and Expenses

	<u>2019</u>	<u>2018</u>
Retirement Annuity Trust	5.56%	10.50%
Health Insurance Trust	6.11%	8.44%
Life Insurance Trust	6.49%	N/A

TEACHERS' RETIREMENT SYSTEM OF THE STATE OF KENTUCKY
NOTES TO FINANCIAL STATEMENTS
June 30, 2019
(Continued)

NOTE 6: RETIREMENT PLANS FOR TRS EMPLOYEES

Full-time employees of TRS participate in either TRS or Kentucky Employees Retirement System (KERS). Both plans are multiple-employer cost-sharing defined benefit retirement annuity and other postemployment benefits plans. All TRS employees in positions requiring a four-year degree are covered under TRS. The contribution rates and required employer matching are the same as state agency employers in TRS. These rates, the plan description and funding policy are disclosed fully in the notes to the financial statements.

The annual required contributions for TRS employee members in TRS for the fiscal years 2019, 2018 and 2017 were \$943,837, \$961,413 and \$893,635, respectively. TRS contributed 100% of the required contribution each year.

All other TRS employees are covered under the KERS non-hazardous employees' plan. The plan provides for retirement, disability and death benefits to plan members. Retirement benefits may be extended to beneficiaries of plan members under certain circumstances. Per KRS 61.565(3), contribution rates shall be determined by the KRS board on the basis of an annual actuarial valuation. Rates may be amended by the KRS board as needed.

Members of KERS who joined prior to July 1, 2008, are required to contribute 5% of their annual creditable compensation, and members who joined on or after July 1, 2008, contribute 6%. As the employer, TRS is required to contribute the annual actuarially determined rate of the creditable compensation (or the rate approved by legislators). The approved rate for the fiscal years 2019, 2018 and 2017 were 83.43%, 49.47% and 48.59%, and TRS's annual required contributions to KERS were \$1.1 million, \$673,457 and \$675,300, respectively. TRS contributed 100% of the required contributions for each year.

NOTE 7: DESCRIPTION OF OTHER FUNDS

A. 403(B) TAX-SHELTERED ANNUITY PLAN

Plan Description

TRS has, in prior years, administered a salary deferral program as permitted by section 403(b) of the Internal Revenue Code. Under this program members were able to voluntarily defer a portion of their compensation within the limits established by the applicable laws and regulations. However, TRS's Board of Trustees determined that the cost of providing the necessary services to assure continuing compliance with these laws and regulations was not economically feasible due to the limited participation in the program by TRS's members. The board decided, therefore, to discontinue offering the program as of April 30, 1997. Members who were not receiving annuities from their account as of April 30, 1997, were able to transfer their respective accounts directly into other tax-sheltered plans on a tax-free basis. As of June 30, 2019, the six members who are receiving annuities will continue to receive distributions according to the terms of their respective elections.

TEACHERS' RETIREMENT SYSTEM OF THE STATE OF KENTUCKY
NOTES TO FINANCIAL STATEMENTS
June 30, 2019
(Continued)

NOTE 7: DESCRIPTION OF OTHER FUNDS (Continued)

Basis of Accounting

The Tax-Sheltered Annuity Plan financial statements are prepared using an accrual basis of accounting. Contributions are no longer being accepted into the plan; therefore, no receivables are recognized.

Method Used to Value Investments

The short-term investments are reported at cost, which approximates fair value.

B. SUPPLEMENTAL BENEFIT FUND

The Supplemental Benefit Fund is a qualified governmental excess benefit arrangement as described in Section 415 of the Internal Revenue Code. In accordance with KRS 161.611 and KRS 161.420(8), TRS is authorized to provide a supplemental retirement benefit fund for the sole purpose of enabling the employer to apply the same formula for determining benefits payable to all members of TRS employed by the employer, whose benefits under the system are limited by Section 415 of the Internal Revenue Code of 1986 as amended. Funding of benefits payable under this fund are provided by the employer and are segregated from funds that are maintained by TRS for payment of regular benefits.

C. JUNITA LOSEY SCHOLARSHIP FUND

Junita Losey, a retired teacher, designated TRS as a residuary beneficiary of her estate and expressed a desire that TRS establish a scholarship program for Kentucky students studying to be teachers. Ms. Losey died in 1997, and her estate provided a scholarship bequest to TRS. The scholarship bequest has at all times been segregated from funds that are maintained by TRS for payment of regular benefits. The board's Scholarship Committee meets each December to consider scholarship standards and administration of the bequest.

NOTE 8: OTHER POSTEMPLOYMENT BENEFITS (OPEB) - HEALTH INSURANCE TRUST

A. PLAN DESCRIPTION

In addition to the retirement annuity plan described in Note 1, KRS 161.675 requires TRS to provide access to postemployment healthcare benefits for eligible members and dependents. The TRS Health Insurance Trust is funded by employer and member contributions. Changes made to the medical plans provided through the trust may be made by the TRS Board of Trustees, the Kentucky Department of Employee Insurance and the General Assembly.

Medical coverage through TRS is funded by a combination of contributions from employees, the state and other employers. Coverage is provided through an account established pursuant to 26 U.S.C. sec. 401(h) and a 115 trust fund that went into effect on July 1, 2010. The insurance trust fund includes employer and retired member contributions required under KRS 161.550 and KRS 161.675(4)(b).

TEACHERS' RETIREMENT SYSTEM OF THE STATE OF KENTUCKY
NOTES TO FINANCIAL STATEMENTS
June 30, 2019
(Continued)

NOTE 8: OTHER POSTEMPLOYMENT BENEFITS (OPEB) – HEALTH INSURANCE TRUST
(Continued)

To be eligible for medical benefits, the member must have retired either for service or disability and a required amount of service credit. The TRS medical plan offers members who are not eligible for Medicare and under age 65 coverage through the Kentucky Employees Health Plan (KEHP) administered by the Kentucky Department of Employee Insurance. Once retired members and eligible spouses attain age 65 and or are eligible for Medicare, coverage is obtained through the Medicare Eligible Health Plan (MEHP) administered by TRS.

Contributions are made on behalf of TRS retired members toward payment of health insurance premiums. The amount of the member's contribution is based on a table approved by the TRS board. Retired members pay premiums in excess of the monthly contribution. The amount of insurance premiums paid by retirees for fiscal years 2019 and 2018 were \$57.8 million and \$57.7 million, respectively. The Commonwealth of Kentucky bears risk for excess claims expenses that exceed the premium equivalents charged for the KEHP.

At June 30, 2019, TRS insurance covered 40,711 retirees and 7,569 dependents, and at June 30, 2018, TRS insurance covered 40,230 retirees and 7,595 dependents. The medical plan has 207 participating employers with 72,647 and 72,205 active members contributing at June 30, 2019, and 2018, respectively.

Retiree health care premiums and other income received reduces the amount of expenditures reported in the deductions section in the Statement of Changes in Fiduciary Net Position for the Health Insurance Trust. These expenditures are summarized in the following table.

	<u>2019</u>	<u>2018</u>
65 and Over Group Expenditures	\$ 191,245,906	\$ 186,856,718
Under 65 Group Expenditures	114,509,069	120,519,991
Subtotal	<u>305,754,975</u>	<u>307,376,709</u>
Less: Amounts Paid by Retirees	(57,731,317)	(57,683,452)
Less: Medicare Subsidies and Formulary Rebates	<u>(84,357,641)</u>	<u>(88,611,557)</u>
Total Insurance Expenditures	<u>\$ 163,666,017</u>	<u>\$ 161,081,700</u>

TEACHERS' RETIREMENT SYSTEM OF THE STATE OF KENTUCKY
NOTES TO FINANCIAL STATEMENTS
June 30, 2019
(Continued)

NOTE 8: OTHER POSTEMPLOYMENT BENEFITS (OPEB) – HEALTH INSURANCE TRUST
(Continued)

B. NET OPEB LIABILITY OF EMPLOYERS

The net OPEB liability [i.e., the system's liability determined in accordance with GASB Statement No. 74 less the fiduciary net position (FNP)] for the Health Insurance Trust as of June 30, 2019, and 2018 is shown in the following table.

Schedule of Net OPEB Liability of Employers
(In Thousands)

Fiscal Year Ending June 30	Total OPEB Liability (TOL)* A	Plan Fiduciary Net Position B	Employers Net OPEB Liability (NOL) (A-B)	Plan Fiduciary Net Position as a % of Total OPEB Liability (B/A)	Covered Payroll C	Net OPEB Liability as a % of Covered Payroll [(A-B)/C]
2019	\$ 4,340,807	\$ 1,414,020	\$ 2,926,787	32.6%	\$ 3,497,216	83.69%
2018	4,659,996	1,190,281	3,469,715	25.5%	3,455,660	100.41%

* The TOL includes the additional consideration for the current treatment of KEHP implicit subsidies that may be needed in the future. This is an additional liability from Health Insurance Trust accrued liabilities.

C. ACTUARIAL ASSUMPTIONS

A summary of the actuarial assumptions as of the latest actuarial valuation is shown below.

Valuation date	June 30, 2018
Investment rate of return	8%, net of OPEB plan investment expense, including inflation
Projected salary increases	3.5 - 7.20%, including wage inflation
Inflation rate	3%
Real wage growth	0.5%
Wage inflation	3.5%
Municipal bond index rate	3.5%
Discount rate	8%
Single equivalent interest rate	8%, net of OPEB plan investment expense, including price inflation
Health care cost trends	
KEHP	7.5% for FYE 2019 decreasing to an ultimate rate of 5% by FYE 2024
MEHP	5.5% for FYE 2019 decreasing to an ultimate rate of 5% by FYE 2021
Medicare Part B premiums	2.63% for FYE 2019 with an ultimate rate of 5% by 2031

TEACHERS' RETIREMENT SYSTEM OF THE STATE OF KENTUCKY
NOTES TO FINANCIAL STATEMENTS
June 30, 2019
(Continued)

NOTE 8: OTHER POSTEMPLOYMENT BENEFITS (OPEB) – HEALTH INSURANCE TRUST
(Continued)

Mortality rates were based on the RP-2000 Combined Mortality Table projected to 2025 with projection scale BB, and set forward two years for males and one year for females is used for the period after service retirement and for dependent beneficiaries. The RP-2000 Disabled Mortality Table set forward two years for males and seven years for females is used for the period after disability retirement. The demographic actuarial assumptions for retirement, disability incidence, withdrawal, rates of plan participation, and rates of plan election used in the June 30, 2018, valuation were based on the results of the most recent actuarial experience studies for the system, which covered the five-year period ending June 30, 2015. The Municipal Bond Index Rate used for this purpose is the June average of the Bond Buyer General Obligation 20-year Municipal Bond Index published weekly by the Board of Governors of the Federal Reserve System. The remaining actuarial assumptions used in the June 30, 2018, valuation of the health trust were based on a review of recent plan experience done concurrently with the June 30, 2018, valuation. The health care cost trend rate assumption was updated for the June 30, 2018, valuation and was shown as an assumption change in the total OPEB liability (TOL) roll forward while the change in initial per capita claims costs were included with experience in the TOL roll forward.

D. TARGET ALLOCATIONS

The long-term expected rate of return on OPEB investments was determined using a log-normal distribution analysis in which best-estimate ranges of expected future real rates of return (expected returns, net of pension plan investment expense and inflation) are developed for each major asset class. These ranges are combined to produce the long-term expected rate of return by weighting the expected future real rates of return by the target asset allocation percentage and by adding expected inflation.

The target allocation and best estimates of arithmetic real rates of return for each major asset class, as provided by TRS's investment consultant, are summarized in the following table.

<u>Asset Class</u>	<u>Target Allocation Percentage</u>	<u>30-Year Expected Geometric Real Rate Percentage of Return</u>
Global Equity	58.0%	5.1%
Fixed Income	9.0%	1.2%
Real Estate	6.5%	3.8%
Private Equity	8.5%	6.3%
Additional Categories	17.0%	3.2%
Cash	1.0%	0.9%
Total	100.0%	

TEACHERS' RETIREMENT SYSTEM OF THE STATE OF KENTUCKY
NOTES TO FINANCIAL STATEMENTS
June 30, 2019
(Continued)

NOTE 8: OTHER POSTEMPLOYMENT BENEFITS (OPEB) – HEALTH INSURANCE TRUST
(Continued)

E. DISCOUNT RATE

The discount rate used to measure the TOL as of the measurement date was 8%. The projection of cash flows used to determine the discount rate was performed in accordance with GASB Statement No. 74. The projection's basis was an actuarial valuation performed as of June 30, 2018. In addition to the actuarial methods and assumptions of the June 30, 2018, actuarial valuation, the following actuarial methods and assumptions were used in the projection of cash flows:

- Total payroll for the initial projection year consists of the payroll of the active membership present on the valuation date. In subsequent projection years, total payroll was assumed to increase annually at a rate of 3.5%.
- The KEHP group retiree health care costs for members retired on or after July 1, 2010, were assumed to be paid by either the state or the retirees themselves.
- As administrative expenses, other than the administrative fee of \$7.44 per member per month (PMPM) paid to KEHP by TRS, were assumed to be paid in all years by the employer as they come due, they were not considered.
- Cash flows occur midyear.
- Future contributions to the Health Insurance Trust were based upon the contribution rates defined in statute and the projected payroll of active employees. Per KRS 161.540(1)(c).3 and 161.550(5), when the health trust achieves a sufficient funded status, as determined by TRS's actuary, the following health trust statutory contributions are to be decreased, suspended or eliminated:
 - Employee contributions
 - Employer contributions
 - State contributions for KEHP premium subsidies payable to retirees who retire after June 30, 2010

To reflect these adjustments, open group projections were used and assumed an equal, pro rata reduction to the current statutory amounts in the years if the health trust is projected to achieve a funded ratio of 100% or more. Here, the current statutory amounts are adjusted to achieve total contributions equal to the actuarially determined contribution, as determined by the prior year's valuation and in accordance with the health trust's funding policy (Schedule E). As the specific methodology to be used for the adjustments has yet to be determined, there may be differences between the projected results and future experience. This also may include any changes to retiree contributions for KEHP coverage pursuant to KRS 161.675(4)(b).

TEACHERS' RETIREMENT SYSTEM OF THE STATE OF KENTUCKY
NOTES TO FINANCIAL STATEMENTS
June 30, 2019
(Continued)

NOTE 8: OTHER POSTEMPLOYMENT BENEFITS (OPEB) – HEALTH INSURANCE TRUST
(Continued)

- In developing the adjustments to the statutory contributions in future years, the following was assumed:
 - Liabilities and cash flows are net of expected retiree contributions and any implicit subsidies attributable to coverage while participating in KEHP.
 - A 0% active member growth rate was assumed for the purposes of developing estimates for new entrants (membership dates beyond June 30, 2018).

Based on these assumptions, the Health Insurance Trust's FNP was not projected to be depleted.

The FNP projections are based upon the health trust's financial status on the valuation date, the indicated set of methods and assumptions, and the requirements of GASB Statement No. 74. As such, the FNP projections are not reflective of the cash flows and asset accumulations that would occur on an ongoing basis, reflecting the impact of future members. Therefore, the results of these tests do not necessarily indicate whether or not the health trust will actually run out of money, the financial condition of the trust, or the trust's ability to make benefit payments in future years.

These paragraphs require disclosure of the sensitivity of the NOL to changes in the health care cost trend rates for the Health Insurance Trust (HIT) and the discount rate for the HIT. The following exhibits present the NOL of the HIT, calculated using the health care cost trend rates, as well as what the HIT's NOL would be if it were calculated using a health care cost trend rate that is 1% lower or 1% higher than the current rate. Similarly, the exhibits present the NOL of the HIT, calculated using the single equivalent interest rate (SEIR), as well as what the HIT's NOL would be if it were calculated using a discount rate that is 1% lower or 1% higher than the current SEIR.

Schedule of Net OPEB Liability 2019
(In Thousands)

	1% Decrease (7%)	Current Discount Rate (8%)	1% Increase (9%)
System's Net OPEB Liability- Health Insurance Trust	\$ 3,467,106	\$ 2,926,787	\$ 2,474,190

Schedule of Health Care Cost Trend Rates 2019
(In Thousands)

	1% Decrease	Current Health Care Cost Rate	1% Increase
System's Net OPEB Liability- Health Insurance Trust	\$ 2,382,551	\$ 2,926,787	\$ 3,596,018

TEACHERS' RETIREMENT SYSTEM OF THE STATE OF KENTUCKY
NOTES TO FINANCIAL STATEMENTS
June 30, 2019
(Continued)

NOTE 8: OTHER POSTEMPLOYMENT BENEFITS (OPEB) – HEALTH INSURANCE TRUST
(Continued)

Schedule of Net OPEB Liability 2018
(In Thousands)

	1% Decrease (7%)	Current Discount Rate (8%)	1% Increase (9%)
System's Net OPEB Liability- Health Insurance Trust	\$ 4,068,745	\$ 3,469,715	\$ 2,970,711

Schedule of Health Care Cost Trend Rates 2018
(In Thousands)

	1% Decrease	Current Health Care Cost Rate	1% Increase
System's Net OPEB Liability- Health Insurance Trust	\$ 2,877,113	\$ 3,469,715	\$ 4,200,835

The TOL of the Health Insurance Trust for 2019 is based upon an actuarial valuation performed as of the valuation date, June 30, 2018. An expected TOL is determined as of June 30, 2019, using standard roll-forward techniques. The roll-forward calculation begins with the TOL, as of June 30, 2018, subtracts the actual benefit payments (net of retiree contributions, if applicable) for the year, applies interest at the discount rate for the year and then adds the annual normal cost (also called the service cost). If applicable, actuarial gains and losses arising from the difference between estimates and actual experience (excluding amounts related to benefit changes and changes in assumptions or other inputs) are reconciled to the TOL as of the measurement date. Last, any changes of assumptions or other inputs are reflected. The procedure used to determine the TOL of the health trust, as of June 30, 2019, is shown in the following table.

TEACHERS' RETIREMENT SYSTEM OF THE STATE OF KENTUCKY
NOTES TO FINANCIAL STATEMENTS
June 30, 2019
(Continued)

NOTE 8: OTHER POSTEMPLOYMENT BENEFITS (OPEB) – HEALTH INSURANCE TRUST
(Continued)

TOL Roll-Forward 2019 (In Thousands)		
	Expected	Actual
(a) TOL as of June 30, 2018*	\$ 4,659,996	\$ 4,047,748
(b) Actual benefit payments and refunds for July 1, 2018-June 30, 2019	(163,666)	(163,666)
(c) Interest on TOL = [(a) x (0.08)] + [(b) x (0.04)]	366,254	317,274
(d) Service cost for July 1, 2018-June 30, 2019	93,792	93,792
(e) Changes of benefit terms		
(f) Changes of assumptions (updated health care trend)	45,659	45,659
(g) TOL rolled forward to June 30, 2019 = (a) + (b) + (c) + (d) + (e) + (f)	5,002,035	4,340,807
(h) Difference between expected and actual experience (gain) loss		<u>\$ (661,228)</u>

* The TOL used in the roll-forward as of June 30, 2018 is calculated using the discount rate as of the prior measurement date.

The TOL of the Health Insurance Trust for 2018 is based upon an actuarial valuation performed as of the June 30, 2017, valuation date. An expected, TOL is determined as of June 30, 2018, using standard roll-forward techniques. The roll-forward calculation begins with the TOL, as of June 30, 2017, subtracts the actual benefit payments (net of retiree contributions, if applicable) for the year, applies interest at the discount rate for the year, and then adds the annual normal cost (also called the service cost). If applicable, actuarial gains and losses arising from the difference between estimates and actual experience (excluding amounts related to benefit changes and changes in assumptions or other inputs) are reconciled to the TOL as of the measurement date. Last, any changes of assumptions or other inputs are reflected. The procedure used to determine the TOL of the health trust, as of June 30, 2018, is shown in the following table.

TEACHERS' RETIREMENT SYSTEM OF THE STATE OF KENTUCKY
NOTES TO FINANCIAL STATEMENTS
June 30, 2019
(Continued)

NOTE 8: OTHER POSTEMPLOYMENT BENEFITS (OPEB) – HEALTH INSURANCE TRUST
(Continued)

TOL Roll-Forward 2018
(In Thousands)

	Expected	Actual
(a) TOL as of June 30, 2017*	\$ 4,524,172	\$ 4,329,311
(b) Actual benefit payments and refunds for July 1, 2017-June 30, 2018	(161,082)	(161,082)
(c) Interest on TOL = [(a) x (0.08)] + [(b) x (0.04)]	355,491	339,902
(d) Service cost for July 1, 2017-June 30, 2018	95,382	95,382
(e) Changes of benefit terms		
(f) Changes of assumptions (updated health care trend)	56,483	56,483
(g) TOL rolled forward to June 30, 2018	4,870,446	4,659,996
= (a) + (b) + (c) + (d) + (e) + (f)		
(h) Difference between expected and actual experience (gain) loss		<u>\$ (210,450)</u>

* The TOL used in the roll-forward as of June 30, 2017 is calculated using the discount rate as of the prior measurement date.

NOTE 9: OTHER POSTEMPLOYMENT BENEFITS (OPEB) – LIFE INSURANCE TRUST

A. PLAN DESCRIPTION

TRS administers the Life Insurance Trust as provided by KRS 161.655 to provide life insurance benefits to retired and active members. This benefit is financed by actuarially determined contributions from the 207 participating employers. The benefit is \$5,000 for members who are retired for service or disability, and \$2,000 for active contributing members.

B. NET OPEB LIABILITY OF EMPLOYERS

The net OPEB liability (NOL) (i.e., the system's liability determined in accordance with GASB Statement No. 74 less the fiduciary net position) for the life insurance fund as of June 30, 2019, and 2018 is shown below.

Schedule of Net OPEB Liability of Employers
(In Thousands)

Fiscal Year Ending June 30	Total OPEB Liability (TOL) A	Plan Fiduciary Net Position B	Employers Net OPEB Liability (NOL) (A-B)	Plan Fiduciary Net Position as a % of Total OPEB Liability (B/A)	Covered Payroll C	Net OPEB Liability as a % of Covered Payroll [(A-B)/C]
2019	\$ 116,830	\$ 85,758	\$ 31,072	73.4%	\$3,497,216	0.89%
2018	112,660	84,462	28,198	75.0%	3,455,660	0.82%

TEACHERS' RETIREMENT SYSTEM OF THE STATE OF KENTUCKY
NOTES TO FINANCIAL STATEMENTS
June 30, 2019
(Continued)

NOTE 9: OTHER POSTEMPLOYMENT BENEFITS (OPEB) – LIFE INSURANCE TRUST
(Continued)

C. ACTUARIAL ASSUMPTIONS

A summary of the actuarial assumptions as of the latest actuarial valuation is shown below.

Valuation Date	June 30, 2018
Investment Rate of Return	7.5%, net of OPEB plan investment expense, including inflation
Projected Salary Increases	3.5 - 7.45%, including wage inflation
Inflation Rate	3%
Real Wage Growth	0.5%
Wage Inflation	3.5%
Municipal Bond Index Rate	3.5%
Discount Rate	7.5%
Single Equivalent Interest Rate	7.5%, net of OPEB plan investment expense, including price inflation

Mortality rates were based on the RP-2000 Combined Mortality Table projected to 2025 with projection scale BB, and set forward two years for males and one year for females is used for the period after service retirement and for dependent beneficiaries. The RP-2000 Disabled Mortality Table set forward two years for males and seven years for females is used for the period after disability retirement. The demographic actuarial assumptions for retirement, disability incidence, withdrawal, rates of plan participation and rates of plan election used in the June 30, 2018, valuation were based on the results of the most recent actuarial experience studies for the system, which covered the five-year period ending June 30, 2015. The Municipal Bond Index Rate used for this purpose is the June average of the Bond Buyer General Obligation 20-year Municipal Bond Index published weekly by the Board of Governors of the Federal Reserve System.

D. TARGET ALLOCATIONS

The long-term expected rate of return on OPEB investments was determined using a log-normal distribution analysis in which best-estimate ranges of expected future real rates of return (expected returns, net of pension plan investment expense and inflation) are developed for each major asset class. These ranges are combined to produce the long-term expected rate of return by weighting the expected future real rates of return by the target asset allocation percentage and by adding expected inflation.

The target allocation and best estimates of arithmetic real rates of return for each major asset class, as provided by TRS's investment consultant, are summarized in the following table.

TEACHERS' RETIREMENT SYSTEM OF THE STATE OF KENTUCKY
NOTES TO FINANCIAL STATEMENTS
June 30, 2019
(Continued)

NOTE 9: OTHER POSTEMPLOYMENT BENEFITS (OPEB) – LIFE INSURANCE TRUST
(Continued)

<u>Asset Class</u>	<u>Target Allocation Percentage</u>	<u>Expected Geometric Real Rate Percentage of Return</u>
U.S. Equity	40.0%	4.3%
International Equity	23.0%	5.2%
Fixed Income	18.0%	1.2%
Real Estate	6.0%	3.8%
Private Equity	5.0%	6.3%
Additional Categories	6.0%	3.2%
Cash	2.0%	0.9%
Total	100.0%	

E. DISCOUNT RATE

The discount rate used to measure the total OPEB liability (TOL) as of the measurement date was 7.5%. The projection of cash flows used to determine the discount rate was performed in accordance with GASB Statement No. 74. The projection's basis was an actuarial valuation performed as of June 30, 2018. In addition to the actuarial methods and assumptions of the June 30, 2018, actuarial valuation, the following actuarial methods and assumptions were used in the projection of the life insurance cash flows:

- Total payroll for the initial projection year consists of the payroll of the active membership present on the valuation date. In subsequent projection years, total payroll was assumed to increase annually at a rate of 3.5%.
- The employer will contribute the actuarially determined contribution (ADC) in accordance with the Life Insurance Trust's funding policy (Schedule E) determined by a valuation performed on a date two years prior to the beginning of the fiscal year in which the ADC applies.
- As administrative expenses were assumed to be paid in all years by the employer as they come due, they were not considered.
- Active employees do not contribute to the plan.
- Cash flows occur midyear.

Based on these assumptions, the Life Insurance Trust's fiduciary net position (FNP) was not projected to be depleted.

TEACHERS' RETIREMENT SYSTEM OF THE STATE OF KENTUCKY
NOTES TO FINANCIAL STATEMENTS
June 30, 2019
(Continued)

NOTE 9: OTHER POSTEMPLOYMENT BENEFITS (OPEB) – LIFE INSURANCE TRUST
(Continued)

The FNP projections are based upon the Life Insurance Trust's financial status on the valuation date, the indicated set of methods and assumptions, and the requirements of GASB Statement No. 74. As such, the FNP projections are not reflective of the cash flows and asset accumulations that would occur on an ongoing basis, reflecting the impact of future members. Therefore, the results of these tests do not necessarily indicate whether the Life Insurance Trust actually will run out of money, the financial condition of the trust, or the trust's ability to make benefit payments in future years.

These paragraphs require disclosure of the sensitivity of the NOL to changes the discount rate for the Life Insurance Trust. The schedules below present the NOL of the trust calculated using the single equivalent interest rate (SEIR), as well as what the trust's NOL would be if it were calculated using a discount rate that is 1% lower or 1% higher than the current SEIR.

Schedule of Net OPEB Liability 2019
(In Thousands)

	1% Decrease (6.5%)	Current Discount Rate (7.5%)	1% Increase (8.5%)
Systems' Net OPEB Liability- Life Insurance Trust	\$ 45,921	\$ 31,072	\$ 18,868

Schedule of Net OPEB Liability 2018
(In Thousands)

	1% Decrease (6.5%)	Current Discount Rate (7.5%)	1% Increase (8.5%)
Systems' Net OPEB Liability- Life Insurance Trust	\$ 42,929	\$ 28,198	\$ 16,114

The TOL of the Life Insurance Trust for 2019 is based upon an actuarial valuation performed as of the valuation date, June 30, 2018. An expected TOL is determined as of June 30, 2019, using standard roll-forward techniques. The roll-forward calculation begins with the TOL, as of June 30, 2018, subtracts the actual benefit payments (net of retiree contributions, if applicable) for the year, applies interest at the discount rate for the year, and then adds the annual normal cost (also called the service cost). If applicable, actuarial gains and losses arising from the difference between estimates and actual experience (excluding amounts related to benefit changes and changes in assumptions or other inputs) are reconciled to the TOL as of the measurement date. Last, any changes of assumptions or other inputs are reflected. The procedure used to determine the TOL of the Life Insurance Trust, as of June 30, 2019, is shown in the following table.

TEACHERS' RETIREMENT SYSTEM OF THE STATE OF KENTUCKY
NOTES TO FINANCIAL STATEMENTS
June 30, 2019
(Continued)

NOTE 9: OTHER POSTEMPLOYMENT BENEFITS (OPEB) – LIFE INSURANCE TRUST
(Continued)

TOL Roll-Forward 2019
(In Thousands)

	Expected	Actual
(a) TOL as of June 30, 2018*	\$ 112,660	\$ 112,471
(b) Actual benefit payments and refunds for July 1, 2018-June 30, 2019	(5,153)	(5,153)
(c) Interest on TOL = [(a) x (0.075)] + [(b) x (0.0375)]	8,256	8,241
(d) Service cost for July 1, 2018-June 30, 2019	1,271	1,271
(e) Changes of benefit terms		
(f) Changes of assumptions		
(g) TOL rolled forward to June 30, 2019 = (a) + (b) + (c) + (d) + (e) + (f)	117,034	116,830
(h) Difference between expected and actual experience (gain) loss		\$ (204)

**The TOL used in the roll-forward as of June 30, 2018 is calculated using the discount rate as of the prior measurement date.*

The TOL of the Life Insurance Trust for 2018 is based upon an actuarial valuation performed as of the June 30, 2017, valuation date. An expected TOL is determined as of June 30, 2018, using standard roll-forward techniques. The roll-forward calculation begins with the TOL, as of June 30, 2017, subtracts the actual benefit payments (net of retiree contributions, if applicable) for the year, applies interest at the discount rate for the year and then adds the annual normal cost (also called the service cost). If applicable, actuarial gains and losses arising from the difference between estimates and actual experience (excluding amounts related to benefit changes and changes in assumptions or other inputs) are reconciled to the TOL as of the measurement date. Last, any changes of assumptions or other inputs are reflected. The procedure used to determine the TOL of the trust, as of June 30, 2018, is shown in the following table.

TOL Roll-Forward 2018
(In Thousands)

	Expected	Actual
(a) TOL as of June 30, 2017*	\$ 109,736	\$ 109,069
(b) Actual benefit payments and refunds for July 1, 2017-June 30, 2018	(5,453)	(5,453)
(c) Interest on TOL = [(a) x (0.075)] + [(b) x (0.0375)]	8,026	7,976
(d) Service cost for July 1, 2017-June 30, 2018	1,068	1,068
(e) Changes of benefit terms		
(f) Changes of assumptions		
(g) TOL rolled forward to June 30, 2018 = (a) + (b) + (c) + (d) + (e) + (f)	113,377	112,660
(h) Difference between expected and actual experience (gain) loss		\$ (717)

** The TOL used in the roll-forward as of June 30, 2017 is calculated using the discount rate as of the prior measurement date.*

REQUIRED SUPPLEMENTARY INFORMATION

TEACHERS' RETIREMENT SYSTEM OF THE STATE OF KENTUCKY
REQUIRED SUPPLEMENTARY INFORMATION
June 30, 2019

Schedule of Changes in the Net Pension Liability
Retirement Annuity Trust
(In Thousands)

	2019	2018	2017	2016	2015	2014
Total Pension Liability						
Service Cost	\$ 542,970	\$ 1,104,102	\$ 1,332,587	\$ 1,120,893	\$ 1,015,080	\$ 1,002,338
Interest	2,448,387	2,063,109	1,964,107	2,027,457	2,029,372	1,956,610
Difference Between Expected and Actual Experience	93,650	(222,473)	199,471	(58,035)		
Changes of Assumptions		(14,167,315)	(2,321,327)	4,030,834	1,511,960	(353,043)
Benefit Payments	(2,094,364)	(2,004,617)	(1,918,612)	(1,833,199)	(1,741,456)	(1,654,376)
Refunds of Contributions	(32,403)	(31,073)	(26,305)	(27,748)	(23,033)	(25,462)
Net Change in Total Pension Liability	958,240	(13,258,267)	(770,079)	5,260,202	2,791,923	926,067
Total Pension Liability - Beginning	33,708,555	46,966,822	47,736,901	42,476,699	39,684,776	38,758,709
Total Pension Liability - Ending (a)	34,666,795	33,708,555	46,966,822	47,736,901	42,476,699	39,684,776
Plan Net Position						
Contributions - State	1,051,452	969,698	981,417	484,987	480,073	483,330
Contributions - Other Employers	71,583	78,973	79,303	80,468	79,506	79,996
Contributions - Members	321,172	319,127	313,625	313,044	308,160	304,982
Net Investment Income	1,085,189	1,953,214	2,475,753	(245,215)	862,179	2,803,249
Benefit Payments	(2,094,364)	(2,004,617)	(1,918,612)	(1,833,199)	(1,741,456)	(1,654,376)
Administrative Expense	(12,352)	(11,388)	(10,314)	(8,636)	(8,869)	(7,956)
Refunds of Contributions	(32,403)	(31,073)	(26,305)	(27,748)	(23,033)	(25,462)
Net Change in Plan Net Position	390,277	1,273,934	1,894,867	(1,236,299)	(43,440)	1,983,763
Plan Net Position - Beginning	19,981,633	18,707,699	16,812,832	18,049,131	18,092,571	16,108,808
Plan Net Position - Ending (b)	20,371,910	19,981,633	18,707,699	16,812,832	18,049,131	18,092,571
Net Pension Liability - Ending (a)-(b)	<u>\$ 14,294,885</u>	<u>\$ 13,726,922</u>	<u>\$ 28,259,123</u>	<u>\$ 30,924,069</u>	<u>\$ 24,427,568</u>	<u>\$ 21,592,205</u>

Schedule is intended to show information for 10 years. Future years will be displayed as they become available.

NOTE 1: NET PENSION LIABILITY

The total pension liability contained in the following schedule was provided by TRS's actuary, Cavanaugh Macdonald Consulting. The net pension liability is measured as the total pension liability less the amount of the fiduciary net position of the system.

Changes of Benefit Terms. None.

Changes of Assumptions. In the 2016 valuation, rates of withdrawal, retirement, disability, mortality and rates of salary increase were adjusted to more closely reflect actual experience. In the 2016 valuation and later, the expectation of retired life mortality was changed to the RP-2000 Mortality Tables projected to 2025 with projection scale BB, set forward two year for males and one year for females rather than the RP-2000 Mortality Tables projected to 2020 with projection scale AA, which was used prior to 2016.

**TEACHERS' RETIREMENT SYSTEM OF THE STATE OF KENTUCKY
REQUIRED SUPPLEMENTARY INFORMATION**

June 30, 2019

(Continued)

In the 2011 valuation, rates of withdrawal, retirement, disability and mortality were adjusted to more closely reflect actual experience. In the 2011 valuation and later, the expectation of retired life mortality was changed to the RP-2000 Mortality Tables projected to 2020 with projection scale AA, set back one year for females rather than the 1994 Group Annuity Mortality Tables which was used prior to 2016. For the 2011 valuation through the 2013 valuation, an interest smoothing methodology was used to calculate liabilities for purposes of determining the actuarially determined contributions.

**Schedule of Net Pension Liability
Retirement Annuity Trust
(In Thousands)**

	2019	2018	2017	2016	2015	2014
Total Pension Liability	\$34,666,795	\$33,708,555	\$46,966,822	\$47,736,901	\$42,476,699	\$39,684,776
Plan Net Position	20,371,910	19,981,633	18,707,699	16,812,832	18,049,131	18,092,571
Net Pension Liability	14,294,885	13,726,922	28,259,123	30,924,069	24,427,568	21,592,205
Ratio of Plan Net Position to						
Total Pension Liability	58.76%	59.28%	39.83%	35.22%	42.49%	45.59%
Covered Payroll	\$ 3,497,216	\$ 3,455,660	\$ 3,415,432	\$ 3,390,539	\$ 3,455,008	\$ 3,317,422
Net Pension Liability as						
a Percentage of Covered Payroll	408.75%	397.23%	827.40%	912.07%	707.02%	650.87%

Schedule is intended to show information for 10 years. Future years will be displayed as they become available.

NOTE 2: SCHEDULE OF EMPLOYER CONTRIBUTIONS

**Schedule of Employer Contributions
Retirement Annuity Trust
(In Thousands)**

Fiscal Year		Actuarially	Annual	Actual
Ended	Covered	Determined	Contribution	Contributions as a
June 30	Payroll	Employer	Excess	% of Covered
		Contributions	(Deficiency)	Payroll
2019	\$ 3,497,216	\$ 1,123,035	\$	32.11%
2018	3,455,660	1,048,671	(34,795)	30.35%
2017	3,415,432	1,060,720	(15,897)	31.06%
2016	3,390,539	565,455	(433,815)	16.68%
2015	3,455,008	559,579	(354,075)	16.20%
2014	3,317,422	563,326	(260,120)	16.98%
2013	3,310,710	568,233	(234,752)	17.16%
2012	3,310,176	557,340	(200,482)	16.84%
2011	3,283,749	1,037,936	359,195	31.61%
2010	3,321,614	479,805	(154,133)	14.44%

TEACHERS' RETIREMENT SYSTEM OF THE STATE OF KENTUCKY
REQUIRED SUPPLEMENTARY INFORMATION
June 30, 2019
(Continued)

NOTE 3: ACTUARIAL METHODS AND ASSUMPTIONS

The actuarially determined contribution rates in the Schedule of Employer Contributions are calculated as of June 30 on the three years prior to the end of the fiscal year in which contributions are reported. The following actuarial methods and assumptions were used to determine contribution rates reported in the most recent year of the schedule.

Actuarial Cost Method	Entry age
Amortization Period	Level percentage of payroll, closed
Remaining Amortization Period	28.1 years
Asset Valuation Method	5-year smoothed
Inflation	3%
Salary Increase	3.5 to 7.3%, including inflation
Investment Rate of Return	7.5%, net of pension plan investment expense, including inflation

Percentage shown is annual money-weighted rate of return, net of investment expenses, adjusted for the changing amounts actually invested.

Schedule of Investment Returns
Retirement Annuity Trust

<u>2019</u>	<u>2018</u>	<u>2017</u>	<u>2016</u>	<u>2015</u>	<u>2014</u>
5.56%	10.50%	15.00%	(1.32)%	4.96%	17.95%

Schedule is intended to show information for 10 years. Future years will be displayed as they become available.

TEACHERS' RETIREMENT SYSTEM OF THE STATE OF KENTUCKY
REQUIRED SUPPLEMENTARY INFORMATION
June 30, 2019
(Continued)

Schedule of Changes in the Net OPEB Liability
Health Insurance Trust
(In Thousands)

	<u>2019</u>	<u>2018</u>	<u>2017</u>
Total OPEB Liability			
Service Cost	\$ 93,792	\$ 95,382	\$ 95,625
Interest	366,254	355,491	333,990
Change in Benefit Terms			8,926
Difference Between Expected and Actual Experience	(661,228)	(210,450)	
Changes of Assumptions	45,659	56,483	
Benefit Payments	<u>(163,666)</u>	<u>(161,082)</u>	<u>(178,500)</u>
Net Change in Total OPEB Liability	(319,189)	135,824	260,041
Total OPEB Liability - Beginning	<u>4,659,996</u>	<u>4,524,172</u>	<u>4,264,131</u>
Total OPEB Liability - Ending (a)	4,340,807	4,659,996	4,524,172
 Plan Net Position			
Contributions - State	76,382	80,959	75,497
Contributions - Other Employers	106,764	106,143	104,879
Contributions - Active Members	131,677	130,778	128,819
Net Investment Income	74,385	76,841	95,453
Benefit Payments	(163,666)	(161,082)	(178,500)
Administrative Expense	<u>(1,803)</u>	<u>(1,748)</u>	<u>(1,539)</u>
Net Change in Plan Net Position	223,739	231,891	224,609
Plan Net Position - Beginning	<u>1,190,281</u>	<u>958,390</u>	<u>733,781</u>
Plan Net Position - Ending (b)	1,414,020	1,190,281	958,390
 Net OPEB Liability - Ending (a)-(b)	<u>\$ 2,926,787</u>	<u>\$ 3,469,715</u>	<u>\$ 3,565,782</u>

Schedule is intended to show information for 10 years. Future years will be displayed as they become available.

NOTE 1: NET OPEB LIABILITY – HEALTH TRUST

The net OPEB liability contained in the following schedule was provided by TRS's actuary, Cavanaugh Macdonald Consulting. The net OPEB liability is measured as the total OPEB liability less the amount of the fiduciary net position of the system.

Changes of Benefit Terms. None

Changes of Assumptions. None

TEACHERS' RETIREMENT SYSTEM OF THE STATE OF KENTUCKY
REQUIRED SUPPLEMENTARY INFORMATION
June 30, 2019
(Continued)

Schedule of Net OPEB Liability
Health Insurance Trust
(In Thousands)

	<u>2019</u>	<u>2018</u>	<u>2017</u>
Total OPEB Liability	\$ 4,340,807	\$ 4,659,996	\$ 4,524,172
Plan Net Position	<u>1,414,020</u>	<u>1,190,281</u>	<u>958,390</u>
Net OPEB Liability	2,926,787	3,469,715	3,565,782
Ratio of Plan Net Position to			
Total OPEB Liability	32.58%	25.54%	21.18%
Covered Payroll	\$ 3,497,216	\$ 3,455,660	\$ 3,415,432
Net OPEB Liability as			
a Percentage of Covered Payroll	83.69%	100.41%	104.40%

Schedule is intended to show information for 10 years. Future years will be displayed as they become available.

NOTE 2: SCHEDULE OF EMPLOYER CONTRIBUTIONS

Schedule of Employer Contributions
Health Insurance Trust
(In Thousands)

Fiscal Year Ended June 30	Actuarially Determined Employer Contributions	Contributions			Actual Contributions as a % of Covered Payroll
		in Relation to the Actuarially Determined Contributions	Annual Contribution Deficiency/ (Excess)	Covered Payroll	
2019	\$ 76,597	\$ 183,146	\$ (106,549)	\$ 3,497,216	5.24%
2018	118,837	187,102	(68,265)	3,455,660	5.41%
2017	102,854	180,376	(77,522)	3,415,432	5.28%
2016	97,983	221,967	(123,984)	3,390,539	6.55%
2015	106,606	168,084	(61,478)	3,455,008	4.86%
2014	159,583	162,568	(2,985)	3,317,422	4.90%
2013	186,726	166,611	20,115	3,310,710	5.03%
2012	470,217	177,748	292,469	3,310,176	5.37%
2011	477,723	188,735	288,988	3,283,749	5.75%
2010	457,054	173,380	283,674	3,321,614	5.22%

TEACHERS' RETIREMENT SYSTEM OF THE STATE OF KENTUCKY
REQUIRED SUPPLEMENTARY INFORMATION
June 30, 2019
(Continued)

NOTE 3: ACTUARIAL METHODS AND ASSUMPTIONS

The actuarially determined contribution rates in the Schedule of Employer Contributions are calculated as of June 30, 2018. The following actuarial methods and assumptions were used to determine contribution rates reported in the most recent year of the schedule.

Actuarial Cost Method	Entry age normal
Amortization Period	Level percentage of payroll
Remaining Amortization Period	22 years
Asset Valuation Method	5-year smoothed value
Inflation	3%
Real Wage Growth	0.5%
Wage Inflation	3.5%
Salary Increase	3.5 to 7.2%, including wage inflation
Discount Rate	8%
Health Care Cost Trends	
KEHP Group	7.5% at June 30, 2018, decreasing to an ultimate rate of 5% by June 30, 2024
MEHP Group	5.5% at June 30, 2018, decreasing to an ultimate rate of 5% by June 30, 2021
Medicare Part B Premiums	0% at June 30, 2018 with an ultimate rate of 5% by June 30, 2030
KEHP Group Claims	The current KEHP premium is used as the base cost and is projected forward using only the health care trend assumption (no implicit rate subsidy is recognized).

Percentage shown is annual money-weighted rate of return, net of investment expenses, adjusted for the changing amounts actually invested.

Schedule of Investment Returns
Health Insurance Trust

<u>2019</u>	<u>2018</u>	<u>2017</u>	<u>2016</u>	<u>2015</u>	<u>2014</u>
6.11%	8.44%	14.40%	(2.20)%	1.38%	15.38%

Schedule is intended to show information for 10 years. Future years will be displayed as they become available.

TEACHERS' RETIREMENT SYSTEM OF THE STATE OF KENTUCKY
REQUIRED SUPPLEMENTARY INFORMATION
June 30, 2019
(Continued)

Schedule of Changes in the Net OPEB Liability
Life Insurance Trust
(In Thousands)

	<u>2019</u>	<u>2018</u>	<u>2017</u>
Total OPEB Liability			
Service Cost	\$ 1,271	\$ 1,068	\$ 1,067
Interest	8,256	8,026	7,761
Change in Benefit Terms			
Difference Between Expected and Actual Experience	(204)	(717)	
Changes of Assumptions			
Benefit Payments	<u>(5,153)</u>	<u>(5,453)</u>	<u>(5,151)</u>
Net Change in Total OPEB Liability	4,170	2,924	3,677
Total OPEB Liability - Beginning	<u>112,660</u>	<u>109,736</u>	<u>106,059</u>
Total OPEB Liability - Ending (a)	116,830	112,660	109,736
Plan Net Position			
Contributions - State	1,209	897	882
Contributions - Other Employers	212	161	168
Contributions - Active Members			
Net Investment Income	5,058	1,111	915
Benefit Payments	(5,153)	(5,453)	(5,151)
Administrative Expense	<u>(30)</u>	<u>(31)</u>	<u>(28)</u>
Net Change in Plan Net Position	1,296	(3,315)	(3,214)
Plan Net Position - Beginning	<u>84,462</u>	<u>87,777</u>	<u>90,991</u>
Plan Net Position - Ending (b)	85,758	84,462	87,777
Net OPEB Liability - Ending (a)-(b)	<u><u>\$ 31,072</u></u>	<u><u>\$ 28,198</u></u>	<u><u>\$ 21,959</u></u>

Schedule is intended to show information for 10 years. Future years will be displayed as they become available.

NOTE 1: NET OPEB LIABILITY – LIFE INSURANCE

The net OPEB liability contained in the following schedule was provided by TRS's actuary, Cavanaugh Macdonald Consulting. The net OPEB liability is measured as the total OPEB liability less the amount of the fiduciary net position of the System.

Changes of Benefit Terms. None

Changes of Assumptions. None

**TEACHERS' RETIREMENT SYSTEM OF THE STATE OF KENTUCKY
REQUIRED SUPPLEMENTARY INFORMATION**

June 30, 2019

(Continued)

Schedule of Net OPEB Liability
Life Insurance Trust
(In Thousands)

	2019	2018	2017
Total OPEB Liability	\$ 116,830	\$ 112,660	\$ 109,736
Plan Net Position	85,758	84,462	87,777
Net OPEB Liability	31,072	28,198	21,959
Ratio of Plan Net Position to			
Total OPEB Liability	73.40%	74.97%	79.99%
Covered Payroll	\$ 3,497,216	\$ 3,455,660	\$ 3,415,432
Net OPEB Liability as			
a Percentage of Covered Payroll	0.89%	0.82%	0.64%

Schedule is intended to show information for 10 years. Future years will be displayed as they become available.

NOTE 2: SCHEDULE OF EMPLOYER CONTRIBUTIONS

Schedule of Employer Contributions
Life Insurance Trust
(In Thousands)

Fiscal Year Ended June 30	Actuarially Determined Employer Contributions	Contributions in Relation to the Actuarially Determined Contributions	Annual Contribution Deficiency/ (Excess)	Covered Payroll	Actual Contributions as a % of Covered Payroll
2019	\$ 1,082	\$ 1,421	\$ (339)	\$ 3,497,216	0.04%
2018	1,075	1,058	17	3,455,660	0.03%
2017	1,065	1,050	15	3,415,432	0.03%
2016	1,058	1,038	20	3,390,539	0.03%
2015	1,050	1,020	30	3,455,008	0.03%
2014	1,045	1,006	39	3,317,422	0.03%
2013	1,740	1,680	60	3,310,710	0.05%
2012	1,733	1,685	48	3,310,176	0.05%
2011	1,726	1,669	57	3,283,749	0.05%
2010	1,993	1,967	26	3,321,614	0.06%

TEACHERS' RETIREMENT SYSTEM OF THE STATE OF KENTUCKY
REQUIRED SUPPLEMENTARY INFORMATION
June 30, 2019
(Continued)

NOTE 3: ACTUARIAL METHODS AND ASSUMPTIONS

The actuarially determined contribution rates in the schedule of employer contributions are calculated as of June 30, three years prior to the end of the fiscal year in which contributions are reported. The following actuarial methods and assumptions were used to determine contribution rates reported in the most recent year of the schedule.

Actuarial Cost Method	Entry age normal
Amortization Period	Level percentage of payroll
Remaining Amortization Period	30 years
Asset Valuation Method	5-year smoothed value
Inflation	3.0%
Real Wage Growth	0.5%
Wage Inflation	3.5%
Salary Increase	3.5 to 7.45%, including wage inflation
Discount Rate	7.5%

Percentage shown is annual money-weighted rate of return, net of investment expenses, adjusted for the changing amounts actually invested.

Schedule of Investment Returns
 Life Insurance Trust

2019

 6.49%

TRS began separate reporting of its Life Insurance Trust effective February 1, 2018. Previously, it was reported as part of the pension fund's gross and net performance. This schedule will show more history of the trust as it becomes available.

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ADDITIONAL SUPPORTING SCHEDULES

TEACHERS' RETIREMENT SYSTEM OF THE STATE OF KENTUCKY
ADDITIONAL SUPPORTING SCHEDULES
June 30, 2019

Schedule of Administrative Expenses
For the Years Ended June 30, 2019 and 2018

	<u>2019</u>	<u>2018</u>
Salaries	\$ 7,364,326	\$ 7,362,335
Other Personnel Costs	715,252	669,764
Professional Services and Contracts	668,483	796,286
Utilities	103,202	106,115
Rentals	23,114	25,175
Maintenance	102,570	66,229
Postage and Related Services	330,510	321,972
Printing	96,892	211,541
Insurance	194,601	190,420
Miscellaneous Services	149,267	162,597
Telecommunications	20,255	21,002
Computer Services	92,823	171,465
Supplies	45,050	40,962
Depreciation	2,251,469	2,168,364
Travel	49,890	45,427
Dues and Subscriptions	56,860	82,987
Miscellaneous Commodities	13,950	11,914
Office Systems and Equipment	1,870,795	796,885
Compensated Absences	38,025	(83,324)
Total	<u>\$ 14,187,334</u>	<u>\$ 13,168,116</u>

TEACHERS' RETIREMENT SYSTEM OF THE STATE OF KENTUCKY
ADDITIONAL SUPPORTING SCHEDULES
June 30, 2019
(Continued)

Schedule of Professional Services and Contracts
For the Years Ended June 30, 2019 and 2018

	<u>Nature of Service</u>	<u>2019</u>	<u>2018</u>
Cavanaugh Macdonald Consulting	Actuarial	\$ 238,199	\$ 292,886
Mountjoy Chilton Medley	Auditing	36,454	69,704
Blue & Co.	Auditing	88,200	
Auditor of Public Accounts	Auditing	54,284	
Ice Miller	Attorney	31,388	111,020
Stoll Keenon and Ogden	Attorney	2,353	9,063
Attorney General	Attorney	8,344	313
Williams & Jensen	Attorney	12,000	
Aon Hewitt	Consulting	90,761	193,300
MulloyBorland	Communications	76,500	
Peritus	Communications	30,000	120,000
Total		<u>\$ 668,483</u>	<u>\$ 796,286</u>

TEACHERS' RETIREMENT SYSTEM OF THE STATE OF KENTUCKY
ADDITIONAL SUPPORTING SCHEDULES
June 30, 2019
(Continued)

Schedule of Contracted Investment Management Expenses
Fiscal Year Ended June 30, 2019

	Retirement Annuity Trust*	Health Insurance Trust	Life Insurance Trust	Total
Equity Managers	\$ 16,437,286	\$ 367,283	\$ 10,532	\$16,815,101
Fixed Income Managers	467,031			467,031
Real Estate	10,239,260	1,155,465	9,731	11,404,456
Additional Categories	9,040,647	1,103,845	12,567	10,157,059
Alternative Investments	20,899,483	2,310,360	427	23,210,270
Custodian	539,741	81,648	28,623	650,012
Consultant	499,317			499,317
Legal and Research	88,923			88,923
Other (Administrative and Operational)	2,954,564	276,532	110,823	3,341,919
Total	<u>\$ 61,166,252</u>	<u>\$ 5,295,133</u>	<u>\$ 172,703</u>	<u>\$ 66,634,088</u>

**Does not include expenses for the 403(b) Tax-Sheltered Trust and Losey Scholarship Fund.*

Schedule of Contracted Investment Management Expenses
Fiscal Year Ended June 30, 2018

	Retirement Annuity Trust*	Health Insurance Trust	Life Insurance Trust	Total
Equity Managers	\$ 14,693,395	\$ 314,876		\$ 15,008,271
Fixed Income Managers	443,036			443,036
Real Estate	10,106,962	997,685	1,027	11,105,674
Additional Categories	9,256,358	977,406	2,167	10,235,931
Alternative Investments	17,051,168	1,313,059		18,364,227
Custodian	517,884	84,018	4,412	606,314
Consultant	506,093			506,093
Legal and Research	59,131			59,131
Other (Administrative and Operational)	2,882,695	255,698	105,847	3,244,240
Total	<u>\$ 55,516,722</u>	<u>\$ 3,942,742</u>	<u>\$ 113,453</u>	<u>\$ 59,572,917</u>

**Includes expenses for the 403(b) Tax-Sheltered Trust and Losey Scholarship Fund.*

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**REPORT ON INTERNAL CONTROL OVER FINANCIAL REPORTING AND ON
COMPLIANCE AND OTHER MATTERS BASED ON AN AUDIT OF FINANCIAL
STATEMENTS PERFORMED IN ACCORDANCE WITH
*GOVERNMENT AUDITING STANDARDS***



MIKE HARMON
AUDITOR OF PUBLIC ACCOUNTS

Report On Internal Control Over Financial Reporting And
On Compliance And Other Matters Based On An Audit Of Financial
Statements Performed In Accordance With Government Auditing Standards

Independent Auditor's Report

Board of Trustees
Teachers' Retirement System of the State of Kentucky
Frankfort, Kentucky

We have audited, in accordance with auditing standards generally accepted in the United States of America and the standards applicable to financial audits contained in *Government Auditing Standards* issued by the Comptroller General of the United States, the financial statements of the Teachers' Retirement System of the State of Kentucky (TRS) as of and for the year ended June 30, 2019, and the related notes to the financial statements, which collectively comprise TRS's basic financial statements, and have issued our report thereon dated November 15, 2019.

Internal Control Over Financial Reporting

In planning and performing our audit of the financial statements, we considered the TRS's internal control over financial reporting (internal control) to determine the audit procedures that are appropriate in the circumstances for the purpose of expressing our opinions on the financial statements, but not for the purpose of expressing an opinion on the effectiveness of the TRS's internal control. Accordingly, we do not express an opinion on the effectiveness of the TRS's internal control.

A *deficiency in internal control* exists when the design or operation of a control does not allow management or employees, in the normal course of performing their assigned functions, to prevent, or detect and correct misstatements on a timely basis. A *material weakness* is a deficiency, or combination of deficiencies, in internal control, such that there is a reasonable possibility that a material misstatement of the entity's financial statements will not be prevented, or detected and corrected on a timely basis. A *significant deficiency* is a deficiency, or a combination of deficiencies, in internal control that is less severe than a material weakness, yet important enough to merit attention by those charged with governance.

Our consideration of internal control over financial reporting was for the limited purpose described in the first paragraph of this section and was not designed to identify all deficiencies in internal control over financial reporting that might be material weaknesses or significant deficiencies. Given these limitations, during our audit we did not identify any deficiencies in internal control that we consider to be material weaknesses. However, material weaknesses may exist that have not been identified.



Report On Internal Control Over Financial Reporting And
On Compliance And Other Matters Based On An Audit Of Financial
Statements Performed In Accordance With *Government Auditing Standards*
(Continued)

Compliance and Other Matters

As part of obtaining reasonable assurance about whether the TRS's financial statements are free from material misstatement, we performed tests of its compliance with certain provisions of laws, regulations, contracts, and grant agreements, noncompliance with which could have a direct and material effect on the determination of financial statement amounts. However, providing an opinion on compliance with those provisions was not an objective of our audit, and accordingly, we do not express such an opinion. The results of our tests disclosed no instances of noncompliance or other matters that are required to be reported under *Government Auditing Standards*.

Purpose of this Report

The purpose of this report is solely to describe the scope of our testing of internal control and compliance and the results of that testing, and not to provide an opinion on the effectiveness of the entity's internal control or on compliance. This report is an integral part of an audit performed in accordance with *Government Auditing Standards* in considering the entity's internal control and compliance. Accordingly, this communication is not suitable for any other purpose.

Respectfully Submitted,

A handwritten signature in black ink, appearing to read "Mike Harmon", with a long horizontal line extending to the right.

Mike Harmon
Auditor of Public Accounts

November 15, 2019