Independent Auditors' Report

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The Board of Trustees
Missouri State Employees' Retirement System

We have audited the accompanying financial statements of the pension trust and internal service funds of the Missouri State Employees' Retirement System (MOSERS), a component unit of the State of Missouri, as of and for the year ended June 30, 2017, and the related notes to the financial statements, which collectively comprise the MOSERS' basic financial statements as listed in the table of contents.

Management's Responsibility for the Financial Statements

Management is responsible for the preparation and fair presentation of these financial statements in accordance with U.S. generally accepted accounting principles; 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.

Auditors' Responsibility

Our responsibility is to express opinions on these financial statements based on our audit. We conducted our audit in accordance with U.S. generally accepted auditing standards. 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 auditors' 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.

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

Opinions

In our opinion, the financial statements referred to above present fairly, in all material respects, the respective financial position of the pension trust and internal service funds of MOSERS as of June 30, 2017, and the respective changes in financial position and, where applicable, cash flows thereof for the year then ended in conformity with U.S. generally accepted accounting principles.

Other Matters

Required Supplementary Information

U.S. generally accepted accounting principles require that the *Management's Discussion and Analysis* on pages 19-23 and the *Schedule of Changes in Employers' Net Pension Liability*, *Schedule of Employer Contributions, Schedule of Annual Money-Weighted Rate of Return on Investments,* and the *Notes to the Schedules of Required Supplementary Information* on pages 51-58 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 U.S. generally accepted auditing standards, 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.

Other Information

Our audit was conducted for the purpose of forming opinions on the financial statements that collectively comprise MOSERS' basic financial statements. The *Introductory*, *Investment*, *Actuarial,* and *Statistical Sections* and the additional information on pages 59-64 are presented for purposes of additional analysis and are not a required part of the financial statements.

The additional information presented on pages 59-64 is the responsibility of management and was derived from and relates directly to the underlying accounting and other records used to prepare the 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 U.S. generally accepted auditing standards. In our opinion, the additional information presented on pages 59-64 is fairly stated in all material respects in relation to the basic financial statements as a whole.

The *Introductory*, *Investment*, *Actuarial,* and *Statistical Sections* have not been subjected to the auditing procedures applied in the audit of the basic financial statements and, accordingly, we do not express an opinion or provide any assurance on them.

Williams-Keepers LLC

October 16, 2017

Management's Discussion and Analysis

This discussion and analysis of the Missouri State Employees' Retirement System (MOSERS) provides an overview of the retirement system's financial activities for the fiscal year ended June 30, 2017. It is intended to be used in conjunction with the *Transmittal Letter* beginning on page 6 and *Financial Statements* and *Notes to the Financial Statements*, on pages 24-50 of this report.

Using This Financial Report

This Comprehensive Annual Financial Report (CAFR) reflects the activities of MOSERS as reported in the *Statements of Fiduciary Net Position* and the *Statements of Changes in Fiduciary Net Position*, which begin on page 24. These statements are prepared in conformity with generally accepted accounting principles. The *Notes to the Financial Statements* are an integral part of the financial statements and include additional information not readily evident in the statements themselves. The *Required Supplementary Information* (RSI) and *Additional Financial Information* following the *Notes to the Financial Statements* provide historical information and additional details considered useful in evaluating the condition of the plan. Investment data in the *Financial Section* is presented at fair value. See the *Actuarial Section* of this report for a detailed discussion of the actuarial value of assets and liabilities and the funded status of the plans.

The basic financial statements contained in this section of the CAFR consist of:

- The *Statements of Fiduciary Net Position* which report the pension trust funds' assets, liabilities, and resulting net position where total assets less current liabilities equal net position held in trust for future pension benefits available at the end of the fiscal year. It is a snapshot of the financial position of the pension trust funds at that specific point in time.
- The *Statements of Changes in Fiduciary Net Position* which summarize the pension trust funds' financial transactions that have occurred during the fiscal year where additions less deductions equal net change in net position. It supports the change that has occurred to the prior year's net position on the *Statements of Fiduciary Net Position*.
- The *Statements of Net Position* of the internal service funds is similar to the *Statements of Fiduciary Net Position* in that it is also a snapshot of the financial position of the internal service funds where net position plus liabilities equals assets.
- The *Statements of Revenues, Expenses, and Changes in Net Position* of the internal service funds is similar to the *Statements of Changes in Fiduciary Net Position* in that it also reports a summary of the financial activity that occurred over the period of the fiscal year where revenues less expenses equals net revenue and supports the change to the prior year's net position.
- The *Statements of Cash Flows* of the internal service funds report the financial transactions of the fiscal year of the internal service funds on a cash basis. It is similar to the *Statements of Revenues, Expenses and Changes in Net Position*; however, the focus of this statement is on the change to cash balances with accrued income and expense items eliminated.
- The *Notes to the Financial Statements* are an integral part of the above financial statements and include additional information not readily evident in the statements themselves.
- *Management's Discussion and Analysis*, the *Required Supplementary Information*, and *Additional Financial Information* following the *Notes to the Financial Statements* provide detailed historical information considered useful in evaluating the condition of the plans administered by MOSERS.

Funding Analysis

The unfunded actuarial accrued liability (UAAL) for MSEP increased by $0.41 billion from $3.87 billion at June 30, 2016 to $4.28 billion at June 30, 2017 with a corresponding decrease in funded percentage from 69.6% to 67.5%. The UAAL for the Judicial Plan increased by $8.44 million from $404.15 million at June 30, 2016 to $412.59 million at June 30, 2017 with a corresponding increase in funded percentage from 26.2% to 26.9%. The primary reason for the increase in the UAAL in both plans was a reduction in the assumed rate of investment return from 7.65% to 7.50%. Other actuarial assumptions remained consistent with the June 30, 2016 valuation.

To determine the UAAL of the plans, MOSERS uses a smoothed value of assets which recognizes market gains and losses on the actuarial value of assets over a five-year open period. For GASB 67 financial statement reporting purposes, the market value of assets is used to determine plan net position. The plan net position as a percentage of total pension liability decreased from 63.6% at June 30, 2016 to 60.41% at June 30, 2017 for MSEP and increased from 24.11% to 24.39% for the Judicial Plan.

Financial Reporting Highlights

- MOSERS' net position restricted for pensions decreased by $158.2 million during FY17. On June 30,2017, total plan assets (including net capital assets of $3.3 million) were $11.5 billion, exceeding total liabilities of $3.4 billion, resulting in a net position held in trust for pension benefits of $8.1 billion.
- Covered payroll, from which both employee and employer contributions are calculated, increased $20.4 million for the Missouri State Employees' Plan (MSEP) and $0.7 million for the Judicial Plan, or 1.1% and 1.3% respectively, over the last fiscal year.
- Total contributions for FY17 were $401.4 million, up from $390.1 million in FY16. Based upon the June 30, 2015 actuarial valuation, the FY17 actuarial required employer contribution rates were determined to be 16.34% for the MSEP and 55.76% for the Judicial Plan. However, the actual rates were set per the board's policy minimum contribution rates at 16.97% for the MSEP and 58.45% for the Judicial Plan. Although not prohibited to increase, future contribution rates shall not be reduced below the rate set by the June 30, 2013 valuation until the actuarial funding ratio of the plans are at least 80%. Investment and securities lending income, net of related fees was $276.7 million. Investments of the pension trust funds generated a time-weighted rate of return of 3.5%, net of fees, for the year, up from the prior year's return of 0.3%. The money-weighted rate of return, net of investment expenses as defined by GASB 67 was 3.51% for FY17.
- Investment activity expenses were $140.3 million in FY17, up from $79.1 million in FY16. Although management fees were reduced by $6.2 million from FY16 and fund pass-through expenses were reduced by approximately $2 million, this overall increase is due to paying $70 million more in incentive fees to external investment managers as a result of the performance of the funds they manage in FY17 as compared to FY16.
- Member benefit payments were $821.3 million in FY17, up $37.9 million from $783.4 million in FY16. Service transfers and refunds totaled $6.7 million in FY17, down $0.2 million from $6.9 million in FY16.
- Administrative expenses totaled $8.9 million in FY17, compared to $8.6 million in FY16.
- The internal service fund's net position increased by $0.3 million. The increase is due to reimbursement from the State of Missouri Deferred Compensation Plan's third-party record keeper to cover administrative expenses occurring in FY17 and future years.

The following schedules present *Summary Comparative Financial Statements* of the pension trust funds and internal service funds for FY17 and FY16. For each schedule, there is a brief summary of the significant changes noted in those schedules.

Pension Trust Funds

Summary Comparative Statements of Fiduciary Net Position

The largest components of the net position of the pension trust funds are the investments, cash and short-term investments, and obligations under repurchase agreements.

MOSERS experienced a slight decrease in the net fair value of investments (total investments less obligations under repo agreements) of $103 million, from $5.7 billion in FY16 to $5.6 billion in FY17, primarily attributable to benefit payment obligations exceeding contribution revenue and lower than expected investment returns as evidenced by MOSERS' total investment return, net of fees, of 3.5% this year. Detailed information regarding MOSERS' investment portfolio is included in the *Investment Section* of this report.

Obligations under repurchase agreements decreased from $3.6 billion in FY16 to $3.4 billion in FY17 due to decreased exposure financed with reverse repurchase agreements.

Cash and short-term investments decreased slightly due to multiple factors including benefit payment obligations exceeding contribution revenue, the timing of investment funding and obligations under derivative investments and reverse repurchase agreements.

Investment sales receivable decreased as a result of the timing of investment purchases.

The decrease in securities lending collateral is due to the investment portfolio not having any securities on loan or collateral held at fiscal year-end.

Pension Trust Funds

Summary Comparative Statements of Fiduciary Net Position

	As of June 30, 2017	As of June 30, 2016	Amount of Change	Percentage Change
Cash and short-term investments	$ 2,417,955,050	$ 2,454,419,406	$ (36,464,356)	(1.49)%
Receivables	43,498,874	89,911,461	(46,412,587)	(51.62)
Investments	9,018,590,792	9,349,306,746	(330,715,954)	(3.54)
Invested securities lending collateral	0	14,258,587	(14,258,587)	(100.00)
Net capital assets	3,316,060	3,541,901	(225,841)	(6.38)
Other assets	105,911	68,128	37,783	55.46
Total assets	11,483,466,687	11,911,506,229	(428,039,542)	(3.59)
Administrative expense payables	2,434,501	2,419,569	14,932	0.62
Investment purchase payables	10,165,707	36,690,153	(26,524,446)	(72.29)
Securities lending collateral	0	14,940,141	(14,940,141)	(100.00)
Other liabilities	9,470,802	10,083,285	(612,483)	(6.07)
Obligations under repurchase agreements	3,373,773,555	3,601,461,597	(227,688,042)	(6.32)
MOSERS investment portfolio liability (MIP)	4,628,883	4,693,919	(65,036)	(1.39)
Total liabilities	3,400,473,448	3,670,288,664	(269,815,216)	(7.35)
Net positions restricted for pensions	$ 8,082,993,239	$ 8,241,217,565	$(158,224,326)	(1.92)

Summary Comparative Statements of Changes in Fiduciary Net Position

The increase in contributions received is primarily attributable to an increase in covered payroll from FY16 to FY17.

The increase in investment income from FY16 to FY17 is attributable to an improvement in market conditions experienced by the investments of the fund. The increase in securities lending income is primarily due to higher lending margins in the lending portfolio during the fiscal year. The *Investment Section* of this report contains additional information regarding investments and securities lending activity.

The total benefit payments increased as a result of an increase in the number of benefit recipients plus cost-of-living adjustments provided to existing benefit recipients. Detailed schedules of these changes can be viewed on pages 100-107 of the *Actuarial Section* of this report.

Service transfer payments decreased $1.2 million in FY17 and are dependent on the number of members electing to transfer their service out of MOSERS. Refunds of employee contributions are the result of the number of members of the MSEP 2011 tier who have terminated employment and are eligible to request a refund, as well as members employed prior to September 1, 1972 who have contributions remaining in the system. Refunds increased in FY17 by $1 million due to a larger number of terminated-nonvested MSEP 2011 members choosing to receive a refund.

Pension Trust Funds

Summary Comparative Statements of Changes in Fiduciary Net Position

	Year Ended June 30, 2017	Year Ended June 30, 2016	Amount of Change	Percentage Change
Contributions	$ 401,359,185	$ 390,869,615	$ 10,489,570	2.68%
Investment income – investing activities	276,722,915	1,213,744	275,509,171	22,699.12
Investment income (loss) – securities lending activities	21,896	(49)	21,945	44,785.71
Miscellaneous income	530,988	554,655	(23,667)	(4.27)
Total additions	678,634,984	392,637,965	285,997,019	72.84
Benefits	821,280,165	783,420,118	37,860,047	4.83
Service transfers and refunds	6,669,417	6,880,099	(210,682)	(3.06)
Administrative expenses	8,909,728	8,626,358	283,370	3.28
Total deductions	836,859,310	798,926,575	37,932,735	4.75
Net (decrease)	(158,224,326)	(406,288,610)	248,064,284	61.06
Net positions beginning of year	8,241,217,565	8,647,506,175	(406,288,610)	(4.70)
Net positions restricted for pensions	$8,082,993,239	$8,241,217,565	$(158,224,326)	(1.92)

Internal Service Funds

Summary Comparative Statements of Net Position Analysis

The increase in premiums receivable is attributable to normal fluctuations in the month-end balance of life and long-term disability insurance premiums receivable during the year, which are dependent on the number of members participating and amount of their coverage.

The increase in investments is attributable to reimbursement from the State of Missouri Deferred Compensation Plan's third-party record keeper to cover administrative expenses in FY17 and future years.

The decrease in premiums payable and increase in other liabilities is attributable to a reclassification of year-end balances of deferred revenue in the long-term disability program.

Summary Comparative Statements of Revenues, Expenses, and Changes in Net Position Analysis

Premium receipts and premium disbursements decreased due to a change in method for recording deferred revenue in the long-term disability program. Prior to FY17, amounts paid by the state in excess of amounts needed to pay The Standard were recorded as an expense and payable when received. These amounts were reclassified as deferred revenue in FY17.

Deferred compensation receipts and disbursements were $0.7 million for FY17. This is attributable to a $0.7 million reimbursement paid in FY17 to cover current and future administrative expenses to the internal service fund at MOSERS from the State of Missouri Deferred Compensation Plan's third-party record keeper, which collects deferred compensation contributions directly from employers. As of June 30, 2017, there were 63,795 participants (both active and terminated/retired), which is a decrease of 1,109 from FY16. The state of Missouri has not contributed an employer match since March 2010.

Administrative expenses decreased primarily as a result of The Standard assuming the cost of a full-time employee to work onsite at MOSERS for the life insurance and long-term disability programs.

Summary Comparative Statements of Cash Flows Analysis

The increase in cash flows from operating activities is primarily attributable to the increase in deferred compensation receipts of $0.7 million to cover current and future administrative expenses.

The decrease in cash flows from noncapital financing activities is primarily attributable to an increase in the amount of life and long-term disability insurance premium refund checks that remained outstanding at year-end.

The decrease in cash flows from investing activities is attributable to several factors including the increase in outflows for net purchase and maturities of overnight repurchase agreements of $0.9 million.

Request for Information

This financial report is designed to provide a general overview of the system's finances for all those interested in the system. Questions concerning any of the information provided in this report or requests for additional information should be addressed to MOSERS at P.O. Box 209, Jefferson City, MO 65102 or by email at *mosers@mosers.org*.

Internal Service Funds

Summary Comparative Statements of Net Position

	As of June 30, 2017	As of June 30, 2016	Amount of Change	Percentage Change
Premiums receivable	$ 967,091	$ 962,006	$ 5,085	0.53%
Investments	4,291,721	3,935,042	356,679	9.06
Fixed assets net of accumulated depreciation	11,598	3,946	7,652	193.92
Leasehold improvements	970	1,940	(970)	(50.00)
Total assets	$5,271,380	$4,902,934	$ 368,446	7.51
Premiums payable	$2,518,379	$4,550,931	$(2,032,552)	(44.66)
Other liabilities	2,257,880	123,378	2,134,502	1,730.05
Total liabilities	4,776,259	4,674,309	101,950	2.18
Unrestricted net position	495,121	228,625	266,496	116.56
Total liabilities and net position	$5,271,380	$4,902,934	$ 368,446	7.51

Internal Service Funds

Summary Comparative Statements of Revenues, Expenses, and Changes in Net Position

	Year Ended June 30, 2017	Year Ended June 30, 2016	Amount of Change	Percentage Change
Premium receipts	$28,779,398	$30,360,162	$(1,580,764)	(5.21)%
Deferred compensation receipts	700,000	0	700,000	100.00
Miscellaneous income	480,120	480,120	0	0.00
Total operating revenue	29,959,518	30,840,282	(880,764)	(2.86)
Premium disbursements	28,769,588	30,328,802	(1,559,214)	(5.14)
Premium refunds	9,810	31,360	(21,550)	(68.72)
Administrative expenses	950,121	1,015,578	(65,457)	(6.45)
Total operating expenses	29,729,519	31,375,740	(1,646,221)	(5.25)
Net operating income (loss)	229,999	(535,458)	765,457	142.95
Investment income	36,497	18,777	17,720	94.37
Net revenues over (under) expenses	266,496	(516,681)	783,177	151.58
Net position beginning of year	228,625	745,306	(516,681)	(69.32)
Net position end of year	$ 495,121	$ 228,625	$ 266,496	116.56

Internal Service Funds

Summary Comparative Statements of Cash Flows

	Year Ended June 30, 2017	Year Ended June 30, 2016	Amount of Change	Percentage Change
Cash flows from operating activities	$ 330,265	$(566,218)	$ 896,483	158.33%
Cash flows from noncapital financing activities	(1,080)	1,596	(2,676)	(167.67)
Cash flows from investing activities	(329,185)	564,622	(893,807)	(158.30)
Net change in cash	0	0	0	
Cash balances beginning of year	0	0	0	
Cash balances end of year	$ 0	$ 0	$ 0	

Pension Trust Funds

Statements of Fiduciary Net Position | As of June 30, 2017

	MSEP	Judicial Plan	Total
Assets			
Cash and short-term investments	$ 2,377,142,446	$ 40,812,604	$ 2,417,955,050
Receivables			
Employer contributions	13,707,849	1,458,285	15,166,134
Investment sales	10,259,116	176,136	10,435,252
Investment income receivable	17,331,102	297,554	17,628,656
Other	264,294	4,538	268,832
Total receivables	41,562,361	1,936,513	43,498,874
Investments at fair value			
U.S. treasury securities	3,865,094,642	66,358,909	3,931,453,551
Government bonds & gov't. mortgage-backed securities	47,133,502	809,224	47,942,726
Corporate bonds	144,857	2,487	147,344
Convertible bonds	599,917	10,300	610,217
U.S. dollar-denominated international corporate bonds	1,181,054	20,277	1,201,331
Limited partnerships	3,747,256,147	64,335,767	3,811,591,914
Common stock	240,136,204	4,122,842	244,259,046
International equities	964,727,815	16,563,187	981,291,002
Foreign currency	83,838	1,439	85,277
Real estate investment trust	8,242	142	8,384
Total investments	8,866,366,218	152,224,574	9,018,590,792
Capital assets			
Land	262,774	4,512	267,286
Building and building improvements	4,171,561	71,621	4,243,182
Furniture, fixtures and equipment	1,273,082	21,857	1,294,939
Software	723,888	12,428	736,316
Total capital assets	6,431,305	110,418	6,541,723
Accumulated depreciation	(3,171,217)	(54,446)	(3,225,663)
Net capital assets	3,260,088	55,972	3,316,060
Prepaid expenses and other	104,123	1,788	105,911
Total assets	11,288,435,236	195,031,451	11,483,466,687
Liabilities			
Administrative expenses payable	2,393,409	41,092	2,434,501
Investment purchases payable	9,994,120	171,587	10,165,707
Investment incentive fees payable	8,714,519	149,618	8,864,137
Employee vacation and overtime liability	596,425	10,240	606,665
Obligations under repurchase agreements	3,316,827,713	56,945,842	3,373,773,555
MOSERS investment portfolio liability (MIP)	4,550,752	78,131	4,628,883
Total liabilities	3,343,076,938	57,396,510	3,400,473,448
Net position restricted for pensions	$ 7,945,358,298	$ 137,634,941	$ 8,082,993,239

See accompanying *Notes to the Financial Statements*.

BASIC FINANCIAL STATEMENTS

Pension Trust Funds

Statements of Changes in Fiduciary Net Position | For Year Ended June 30, 2017

	MSEP	Judicial Plan	Total
Additions			
Contributions			
Employer contributions	$ 335,217,422	$ 34,246,826	$ 369,464,248
Employee contributions	25,439,343	786,745	26,226,088
Member purchases of service credit	1,691,046	0	1,691,046
Service transfer contributions	3,977,803	0	3,977,803
Total contributions	366,325,614	35,033,571	401,359,185
Investment income			
From investing activities			
Net appreciation in fair value of investments	329,824,090	5,662,673	335,486,763
Interest	36,893,888	633,423	37,527,311
Dividends	678,467	11,648	690,115
Other	42,557,190	730,654	43,287,844
Total investing activity income	409,953,635	7,038,398	416,992,033
Investing activity expenses:			
Management fees and incentives	(132,590,711)	(2,276,419)	(134,867,130)
Custody fees	(267,051)	(4,585)	(271,636)
Consultant fees	(786,292)	(13,500)	(799,792)
Performance measurement fees	(454,109)	(7,797)	(461,906)
Internal investment activity expenses	(3,803,355)	(65,299)	(3,868,654)
Total investing activity expenses	(137,901,518)	(2,367,600)	(140,269,118)
Net income from investing activities	272,052,117	4,670,798	276,722,915
From securities lending activities			
Securities lending income	54,981	944	55,925
Securities lending expenses:			
Borrower rebates	32,622	560	33,182
Management fees	(66,077)	(1,134)	(67,211)
Total securities lending activities expenses	(33,455)	(574)	(34,029)
Net income from securities lending activities	21,526	370	21,896
Total net investment income	272,073,643	4,671,168	276,744,811
Miscellaneous income	522,025	8,963	530,988
Total additions	638,921,282	39,713,702	678,634,984
Deductions			
Benefits	700,281,256	33,979,837	734,261,093
BackDROP & lump sum benefits	87,019,072	0	87,019,072
Service transfer payments	1,843,792	0	1,843,792
Contribution refunds	4,820,737	4,888	4,825,625
Administrative expenses	8,759,341	150,387	8,909,728
Total deductions	802,724,198	34,135,112	836,859,310
Net (decrease) increase in net position	(163,802,916)	5,578,590	(158,224,326)
Net position restricted for pensions:			
Beginning of year	8,109,161,214	132,056,351	8,241,217,565
End of year	$7,945,358,298	$137,634,941	$8,082,993,239

See accompanying *Notes to the Financial Statements*.

Internal Service Funds

Statements of Net Position | As of June 30, 2017

	Life & LTD	Deferred Compensation	Total
Assets			
Premiums receivable	$ 967,091	$ 0	$ 967,091
Investments at fair value	3,720,649	571,072	4,291,721
Capital assets	0	21,468	21,468
Accumulated depreciation — fixed assets	0	(9,870)	(9,870)
Leasehold improvements	0	3,880	3,880
Accumulated depreciation — leasehold	0	(2,910)	(2,910)
Total assets	$4,687,740	$583,640	$5,271,380
Liabilities and net position			
Liabilities			
Premiums payable	$2,518,379	$ 0	$2,518,379
Checks outstanding net of deposits	2,114	(1,069)	1,045
Deferred revenue	2,103,956		2,103,956
Other	147,295	5,584	152,879
Total liabilities	4,771,744	4,515	4,776,259
Unrestricted net (deficit) position	(84,004)	579,125	495,121
Total liabilities and net position	$4,687,740	$583,640	$5,271,380

See accompanying *Notes to the Financial Statements*.

Internal Service Funds

Statements of Revenues, Expenses, and Changes in Net Position | For Year Ended June 30, 2017

	Life & LTD	Deferred Compensation	Total
Operating revenues			
Premium receipts	$28,779,398	$ 0	$28,779,398
Deferred compensation receipts	0	700,000	700,000
Miscellaneous income	480,120	0	480,120
Total operating revenues	29,259,518	700,000	29,959,518
Operating expenses			
Premium disbursements	28,769,588	0	28,769,588
Premium refunds	9,810	0	9,810
Administrative expenses	532,169	417,952	950,121
Total operating expenses	29,311,567	417,952	29,729,519
Operating revenues (under) over operating expenses	(52,049)	282,048	229,999
Nonoperating revenues			
Investment income	33,984	2,513	36,497
Net revenues (under) over expenses	(18,065)	284,561	266,496
Net (deficit) position July 1, 2016	(65,939)	294,564	228,625
Net (deficit) position June 30, 2017	$ (84,004)	$ 579,125	$ 495,121

See accompanying *Notes to the Financial Statements*.

BASIC FINANCIAL STATEMENTS

Internal Service Funds
Statements of Cash Flows | Year Ended June 30, 2017

	Life & LTD	Deferred Compensation	Total
Cash flows from operating activities			
Cash received from employer and members	$ 29,253,874	$ 700,000	$ 29,953,874
Payments to outside carriers	(28,698,184)	0	(28,698,184)
Refunds of premiums to members	(9,810)	0	(9,810)
Cash payments to employees for services	(272,091)	(244,286)	(516,377)
Cash payments to other suppliers of goods and services	(226,641)	(172,597)	(399,238)
Net cash provided by operating activities	47,148	283,117	330,265
Cash flows from noncapital financing activities			
Implicit funding of checks outstanding net of deposits	2,114	(1,069)	1,045
Implicit repayment of prior years checks outstanding net of deposits	(2,125)	0	(2,125)
Net cash (used) by noncapital financing activities	(11)	(1,069)	(1,080)
Cash flows from investing activities			
Purchase of investment securities	(1,140,457,675)	(571,072)	(1,141,028,747)
Proceeds from sale and maturities of investment securities	1,140,376,554	295,513	1,140,672,067
Cash received from investment income	33,984	2,513	36,497
Purchase of capital assets	0	(9,002)	(9,002)
Net cash (used) by investing activities	(47,137)	(282,048)	(329,185)
Net increase in cash	0	0	0
Cash balances June 30, 2016	0	0	0
Cash balances June 30, 2017	$ 0	$ 0	$ 0
Reconciliation of operating revenues over operating expenses to net cash provided by operating activities			
Operating revenues (under) over operating expenses	$ (52,049)	$ 282,048	$ 229,999
Adjustments to reconcile operating revenues over operating expenses to net cash provided by operating activities			
Depreciation expense	0	2,320	2,320
Change in assets and liabilities:			
Increase (decrease) in operational accounts receivable	(5,085)	0	(5,085)
Increase (decrease) in operational liabilities	104,282	(1,251)	103,031
Total adjustments	99,197	1,069	100,266
Net cash provided by operating activities	$ 47,148	$ 283,117	$ 330,265

See accompanying *Notes to the Financial Statements*.

Notes to the Financial Statements | Year Ended June 30, 2017

(1) Plan Descriptions and Contribution Information

Missouri State Employees' Plan (MSEP)

The MSEP is a cost-sharing multiple-employer, defined-benefit public employee retirement plan with two benefit structures known as the MSEP (closed plan) and MSEP 2000 (which includes the MSEP 2011 tier), which are administered by the Missouri State Employees' Retirement System (MOSERS) in accordance with Sections 104.010 and 104.312 to 104.1215 of the Revised Statutes of Missouri (RSMo). As established under Section 104.320, RSMo, MOSERS is a body corporate and an instrumentality of the state. In the system are vested the powers and duties specified in Sections 104.010 and 104.312 to 104.1215, RSMo and such other powers as may be necessary or proper to enable it, its officers, employees, and agents to carry out fully and effectively all the purposes of Sections 104.010 and 104.312 to 104.1215, RSMo.

Responsibility for the operation and administration of the system is vested in the 11-member MOSERS Board of Trustees as defined by state law. Due to the nature of MOSERS' reliance on funding from the state of Missouri and the overall control of the plan document by the legislative and executive branches of state government, the MSEP is considered a component unit of the state of Missouri financial reporting entity and is included in the state's financial reports as a pension trust fund.

The board intends to follow a financing pattern which computes and requires contribution amounts which, expressed as a percent of active member payroll, will remain approximately level from year-to-year and from one generation of citizens to the next generation. For the year ended June 30, 2017, the employer contribution rate was 16.97% of covered payroll.

Complete recognition of the year-to-year swings in the fair value of system assets would produce contribution rate changes that would run counter to the "approximately level" goal. A common actuarial practice, referred to as asset smoothing, is used to address that issue. As a result of smoothing, investment gains or losses, relative to what would have been earned at the assumed rate on the actuarial value of assets, were added to any previously unrecognized gains or losses and one-fifth of that total amount was recognized in the June 30, 2017 valuation, with four-fifths deferred for future recognition. In no event may the actuarial value of assets as of the valuation date be more than 125% or less than 80% of the fair value of assets on that date.

The 2017 actuarial valuation used the nominal investment return assumption of 7.50% and wage inflation and price inflation of 3% and 2.5%, respectively, to value plan liabilities. See the *Actuarial Section* for all actuarial assumptions used.

At any point in time, the ratio of actuarial to fair value of assets will be more or less than the fair value but, if the smoothing method is prudent and properly constructed, those values will converge over time. As of June 30, 2017 and 2016, the ratio of actuarial to fair value of assets was 112% and 109%, respectively, for the MSEP.

Generally, all full-time state employees, employed before July 2000 who became vested and were not covered under another state-sponsored retirement plan, are eligible for membership in the MSEP (closed plan). Full-time state employees who were employed after July 1, 2000 but before January 1, 2011, are members in the MSEP 2000. Those first-employed in a benefit-eligible position on or after January 1, 2011 are members of the MSEP 2011 tier of the MSEP 2000. MOSERS participates as an employer in the MSEP and MSEP 2000. The MSEP provides defined-benefit pension, survivor, life insurance, and long-term disability benefits.

As of the June 30, 2017 valuation, membership* in the MSEP consisted of the following:

Retirees and beneficiaries currently receiving benefits		46,560
Terminated employees entitled to, but not yet receiving benefits		19,578
Active		
Vested	28,840	
Nonvested	20,070	48,910
Total membership		115,048

* *Excludes 178 members on leave of absence and 849 members on long-term disability.*

Contributions for MSEP (closed plan), MSEP 2000, and the MSEP 2011 tier are determined through annual actuarial valuations. Employer contributions for FY17 were 16.97% of covered payroll, which is the rate set as a minimum policy employer contribution determined by the June 30, 2013, actuarial valuation until the actuarial funding ratio of the MOSERS plan is at least 80%. Administration of the MSEP is financed through contributions to this plan from the state of Missouri and its component employers and investment earnings.

Prior to September 1, 1972, contributions by members were required. Accumulated employee contributions made prior to that time, plus interest through August 28, 1997, are refundable to the member or designated beneficiaries upon request.

MSEP (closed plan)
General state employees are fully vested for benefits upon accruing 5 years of credited service. Under the MSEP, general employees may retire with full benefits upon the earliest of attaining:

- Age 65 with 5 years of service;
- Age 60 with 15 years of service; or
- Age 48 with age and service equaling 80 or more –"Rule of 80."

General employees may retire early at age 55 with at least 10 years of service with reduced benefits. The base benefit in the general employee plan is equal to 1.6% multiplied by the final average pay multiplied by years of credited service.

Members hired prior to August 28, 1997 receive cost-of-living adjustments (COLAs) annually based on 80% of the percentage increase in the average consumer price index (CPI) from one year to the next, with a minimum rate of 4% and maximum rate of 5% until the cumulative amount of COLAs equals 65% of the original benefit. Thereafter, the 4% minimum rate is eliminated. Members hired on or after August 28, 1997, and members who have met their COLA cap, receive COLAs annually based on 80% of the percentage increase in the average CPI from one year to the next, up to a maximum rate of 5%.

Qualified, terminated-vested members may make a one-time election to receive the present value of their future benefit in a lump-sum payment rather than a monthly benefit at retirement age. To qualify, they must have left state employment on or after October 1, 1984 and prior to September 1, 2002, have less than 10 years of service, not be within five years of retirement eligibility, meet age requirements, and have a benefit present value of less than $10,000.

There are no employee (member) contributions to the MSEP.

MSEP 2000
General state employees are fully vested for benefits upon accruing 5 years of credited service. Under the MSEP 2000, general employees may retire with full benefits upon the earliest of attaining:

- Age 62 with 5 years of service; or
- Age 48 with age and service equaling 80 or more –"Rule of 80."

General employees may retire early at age 57 with at least 5 years of service with reduced benefits. The base benefit in the general employee plan is equal to 1.7% multiplied by final average pay multiplied by years of credited service.

Those retiring under "Rule of 80" receive an additional temporary benefit equivalent to 0.8% multiplied by final average pay multiplied by years of credited service which is payable until age 62.

COLAs are provided annually based on 80% of the percentage increase in the average CPI from one year to the next, up to a maximum rate of 5%.

There are no employee (member) contributions to the MSEP 2000.

MSEP 2011 Tier
On July 19, 2010, an additional tier of the MSEP 2000 defined-benefit pension plan was signed into law for members of MOSERS. This tier (MSEP 2011) includes all members first employed in a benefit-eligible position on or after January 1, 2011.

Currently, general state employees in the MSEP 2011 Tier are fully vested for benefits upon accruing 10 years of credited service. The vesting requirement will change to 5 years for members employed on or after January 1, 2018.

Under the MSEP 2011, general employees may retire with full benefits upon the earliest of attaining:

- Age 67 with 10 years of service; or
- Age 55 with age and service equaling 90 or more –"Rule of 90."

General employees may retire early at age 62 with at least 10 years of service with reduced benefits. The base benefit in the general employee plan is equal to 1.7% multiplied by final average pay multiplied by years of credited service.

Those retiring under "Rule of 90" receive an additional temporary benefit equivalent to 0.8% multiplied by final average pay multiplied by years of credited service, which is payable until age 62.

COLAs are provided annually based on 80% of the percentage increase in the average CPI from one year to the next, up to a maximum rate of 5%.

Employees (members) are required to contribute 4% of pay to the MSEP 2011.

For a summary of benefits for general employees, legislators, and elected officials under the MSEP, MSEP 2000, and MSEP 2011 tier, refer to the *Summary of Plan Provisions* in the *Actuarial Section* of this report.

Judicial Plan

The Judicial Plan is a single-employer, public employee retirement plan administered in accordance with Sections 476.445 to 476.690, RSMo. Responsibility for the operation and administration of the Judicial Plan is vested in the MOSERS Board of Trustees. Due to the nature of MOSERS' reliance on funding from the state of Missouri and the overall control of the plan document by the legislative and executive branches of state government, the Judicial Plan is considered a component unit of the state of Missouri financial reporting entity and is included in the state's financial reports as a pension trust fund.

The 2017 actuarial valuation of the Judicial Plan use the nominal investment return assumption of 7.50% and wage inflation and price inflation of 3% and 2.5%, respectively. See the *Actuarial Sectio*n for all actuarial assumptions used.

Judges and commissioners of the supreme court or the court of appeals, judges of the circuit court, probate court, magistrate court, court of common pleas, court of criminal corrections, justices of the peace, commissioners or deputy commissioners of the circuit court appointed after February 29, 1972, commissioners of the juvenile division of the circuit court appointed pursuant to Section 211.023, RSMo, commissioners of the drug court pursuant to Section 478.466, RSMo, or commissioners of the family court are eligible for membership in the Judicial Plan. The Judicial Plan provides defined-benefit pension, survivor, life insurance, and disability benefits. Members are immediately vested.

Funding of the Judicial Plan on an actuarial basis began on July 1, 1998. Contributions are determined through annual actuarial valuations. Employer contributions for FY17 were 58.45% of covered payroll, which is the rate set as a minimum policy employer contribution determined by the June 30, 2013, actuarial valuation until the actuarial funding ratio of the Judicial Plan is at least 80%. The state of Missouri makes the employer contribution to the Judicial Plan. Administration of the Judicial Plan is financed through contributions to this plan from the state of Missouri and investment earnings.

As of the June 30, 2017 valuation, membership* in the Judicial Plan consisted of the following:		
Retirees and beneficiaries currently receiving benefits		559
Terminated employees entitled to, but not yet receiving benefits		25
Active		
Vested	410	
Nonvested	0	410
Total membership		994

* *Excludes 1 member on long-term disability.*

Judicial Plan (closed plan)

Members of the Judicial Plan may retire with full benefits upon the earliest of attaining:

- Age 62 with 12 years of service;
- Age 60 with 15 years of service; or
- Age 55 with 20 years of service.

Employees may retire early at age 62 with less than 12 years of service or age 60 with less than 15 years of service with a reduced benefit that is based upon years of service relative to 12 or 15 years.

In the Judicial Plan, the base benefit for members with 12 or more years of service is equivalent to 50% of compensation on the highest court served.

Members hired prior to August 28, 1997 receive COLAs annually based on 80% of the percentage increase in the average CPI from one year to the next, with a minimum rate of 4% and a maximum rate of 5% until the cumulative amount of COLAs equals 65% of the original benefit. Thereafter, the 4% minimum rate is eliminated. Members hired on or after August 28, 1997, and members who have met their COLA cap, receive COLAs annually based on 80% of the percentage increase in the average CPI from one year to the next, up to a maximum rate of 5%.

Qualified, terminated-vested members may make a one-time election to receive the present value of their future benefit in a lump-sum payment rather than a monthly benefit at retirement age. To qualify, they must have left state employment on or after October 1, 1984 and prior to September 1, 2002, have less than 10 years of service, not be within five years of retirement eligibility, meet age requirements, and have a benefit present value of less than $10,000.

Judicial Plan 2011 Tier

On July 19, 2010, an additional tier of the defined-benefit Judicial Plan was signed into law. This tier (Judicial Plan 2011) includes all new judicial members first serving in a benefit-eligible position on or after January 1, 2011.

Under the Judicial Plan 2011, members may retire with full benefits upon the earliest of attaining:

- Age 67 with 12 years of service; or
- Age 62 with 20 years of service; or

Judicial members may retire early at age 67 with less than 12 years of service with reduced benefits, or age 62 with less than 20 years of service with a reduced benefit based on years of service.

For a more detailed summary of benefits for members of the Judicial Plan, refer to the *Summary of Plan Provisions* in the *Actuarial Section* of this report.

Missouri State Insured Defined-Benefit Insurance Plan

The Missouri State Insured Defined-Benefit Insurance Plan is accounted for as an internal service fund of the state of Missouri and is administered through The Standard, which is a third-party administrator with oversight by MOSERS. It provides basic life insurance in an amount equal to one times annual salary while actively employed (with a $15,000 minimum) to eligible members of the MSEP, MSEP 2000 (except employees of the Missouri Department of Conservation and certain state colleges and universities), MSEP 2011, Judicial Plan, Judicial Plan 2011, and certain members of the Public School Retirement System.

The plan also provides duty-related death benefits, optional life insurance for active employees and retirees who are eligible for basic coverage, and a long-term disability insurance plan for eligible members. For a more detailed description of insurance benefits, refer to page 119-120 0n the *Actuarial Section* of this report.

Due to the nature of MOSERS' reliance on funding from the state of Missouri and its component employers, and the overall control of the plan document by the legislative and executive branches of state government, the Missouri State Insured Defined-Benefit Insurance Plan is considered a component unit of the state of Missouri financial reporting entity and is included in the state's financial reports as an internal service fund. Administration of the Missouri State Insured Defined-Benefit Insurance Plan is financed through contributions from the state of Missouri and its component employers.

State of Missouri Deferred Compensation Plan (MO Deferred Comp)

MO Deferred Comp is a retirement savings plan for state of Missouri employees, including faculty and staff at 10 state universities. Money invested in the plan provides income in retirement to supplement the member's defined-benefit pension and Social Security benefits. Funds are automatically deducted from the employee's pay and placed in their account. The saver decides how the money will be invested. Employees may also roll over eligible pre-tax distributions from other qualified retirement plans.

The State of Missouri Deferred Compensation Plan is accounted for as an internal service fund. MOSERS uses ICMA-RC as an external provider for record keeping. Total plan assets as of June 30, 2017 were $2,034,459,365.

Record keeping of individual accounts and management of investment options are paid from charges to the participants and investment option asset-based fee reimbursement arrangements. Participants in the plan manage individual accounts by choosing investment options from the available fund lineup. MOSERS' role is to oversee the plan, choose external providers and investment options, and develop communications to plan participants. In FY17, a total of $2,811,397 was collected from a combination of $1,828,269 in investment option asset-based fee reimbursements and $983,128 in participant fees.

Effective July 1, 2012, new permanent full-time and part-time employees are automatically enrolled at 1% of pay into the State of Missouri Deferred Compensation Plan. As of June 30, 2017, 14,629 currently active employees have been automatically enrolled in the plan since inception. There are 13,194 employees who continue to contribute to the plan, making the opt-out rate 9.8%.

Audited financial statements for the State of Missouri Deferred Compensation Plan can be viewed online at *www.modeferredcomp.org.*

(2) Summary of Significant Accounting Policies and Plan Asset Matters

Basis of Accounting

The financial statements of the MSEP, the Judicial Plan, the Missouri State Insured Defined-Benefit Insurance Plan, and the State of Missouri Deferred Compensation Plan were prepared using the accrual basis of accounting. The accompanying financial statements are prepared in accordance with accounting principles generally accepted in the U.S. that apply to governmental accounting.

Contributions are recognized as revenues when due, pursuant to statutory requirements. Benefits and refunds are recognized when due and payable and expenses are recorded when the corresponding liabilities are incurred regardless of when contributions are received or payment is made. The direct method of reporting cash flows is used.

Estimates

The preparation of financial statements in conformity with accounting principles generally accepted in the U.S. requires management to make estimates and assumptions that affect the accompanying financial statements and disclosures. Actual results could differ from those estimates.

Method Used to Value Investments

Section 104.440, RSMo allows the board of trustees to invest the trust fund assets in accordance with the prudent person rule. Investments of the pension trust funds and the internal service funds are reported on the basis of fair value. MOSERS unitizes investments for the purpose of allowing participants in the State of Missouri Deferred Compensation Plan the option to invest in the MOSERS investment portfolio (MIP). For financial reporting purposes, investments throughout this CAFR are reported in whole and include 0.06%, or $4,628,883, of the units invested in the MIP by Deferred Compensation participants. The schedule on page 46 provides a summary of the fair value of the investments as reported on the *Statements of Fiduciary Net Position* of the pension trust funds and *Statements of Net Position* of the internal service funds.

Disclosures regarding fair value measurements, the level of fair value hierarchy, and valuation techniques can be found in note (3) *Cash and Investments* on pages 36-37.

Fair values for the equity real estate investments are based on appraisals. Fair values of the limited partnership investments are based on valuations of the underlying companies of the limited partnerships as reported by the general partner. Certain limited partnerships reflect values and related performance on a quarter lag basis due to the nature of those investments and the time it takes to value them. Fair value of the commingled funds is determined based on the underlying asset values. The remaining assets are primarily valued by the system's master custodian, BNY Mellon, using the last trade price information supplied by various pricing data vendors.

Capital Assets

The MOSERS building and other capital assets are stated at cost less accumulated depreciation.

(3) Cash and Investments

Cash

Custodial credit risk for cash deposits and investments is the risk that, in the event of a bank failure, the system and plan deposits may not be returned. The board adopted the following policy on June 18, 2009:

The executive director shall require that banks managing demand deposit accounts for any retirement plan associated with MOSERS (MOSERS' defined-benefit plan and the deferred compensation plan/state incentive compensation plan) to hold, at minimum, collateral security in either MOSERS' name or the State of Missouri Deferred Compensation Plan and in an amount equal to, or more than, the amount on deposit that exceeds the Federal Deposit Insurance Corporation (FDIC) insured amount. The types of collateral security shall be included on a list maintained by the State Treasurer's office in accordance with Section 30.270 RSMo, but in no case may a bank pledge collateral that does not specifically allow MOSERS to release the collateral or pledge collateral that represents securities of the pledging banks.

Cash balances represent both demand deposit accounts held at the bank and investment cash on deposit with the investment custodian. To maximize investment income, the float caused by outstanding checks is invested in an internally managed short-term investment account, thus causing a possible negative book balance. Negative book balances are reflected in the liabilities' section of the *Statements of Net Position* of the internal service funds and included in the cash and short-term investments on the *Statements of Fiduciary Net Position* of the pension trust funds.

The table below is a schedule of the aggregate book and bank balances of all cash accounts.

Aggregate Book and Bank Balances

	Cash Balances	
	Book	Bank/Investment Custodian
Pension trust funds – investment custodian	$ (722,484)	$(722,484)
Pension trust funds – demand deposits	(10,666,646)	250,107
Internal service fund – insurance and deferred compensation plan demand deposits	(1,045)	161

Under the repurchase agreement, the bank does not have the right to substitute other appropriate securities. Central Trust Bank pledged the following securities to MOSERS on June 30, 2017, as collateral for overnight repurchase agreements:

Collateral for Overnight Repurchase Agreements

	Maturity	Pledged	Fair Value
Federal Farm Credit Bank	03/29/2018	$3,000,000	$2,994,240
Small Business Association Pool	12/25/2036	1,500,000	1,633,710
Small Business Association Pool	10/25/2027	3,000,000	3,265,430
Small Business Association Pool	08/25/2037	5,000,000	5,439,063
Small Business Association Pool	04/25/2035	2,300,000	2,472,590

Investments

Investment Policy

In 2015, MOSERS completed a transition to a portfolio that shifted from a return-driven process to a risk-driven process using an allocation approach that focuses on fundamental economic factors such as growth and inflation as well as other factors with expected return values such as credit, carry, and illiquidity. In July 2016, the board voted to adjust the policy portfolio slightly but still maintain the risk-driven approach to asset allocation.

MOSERS' policy, with respect to the allocation of invested assets, is established and may be amended by the board of trustees majority vote. The board's guiding principles with respect to the investment of MOSERS' assets are to preserve the long-term corpus of the fund, maximize total return within prudent risk parameters, and act in the exclusive interest of the members of the system. The board has developed a risk-weighted policy allocation that is designed to achieve the long-term required return objectives of the system, given certain risk constraints. The current asset allocation reflects a diversified portfolio, which will perform well in a variety of economic conditions and will help reduce the portfolio's overall volatility.

The board has authorized staff to create and maintain an internally managed beta-balanced portfolio that utilizes a modest amount of leverage in order to balance the risk allocations equally across the five asset classes contained in that portfolio. The leverage is limited to 0.83 times of beta-balanced capital. The limit may also be stated as 183% of beta-balanced capital. The table below illustrates the fair value, market exposure, and policy exposure of the internally managed beta-balanced portfolio by asset class as of June 30, 2017.

Schedule of Internally Managed Leverage

Internal Beta-Balanced Portfolio	Fair Value of Internally Managed Beta-Balanced Capital	Percent of Investments at Fair Value	Market Exposure	Percent of Investments at Market Exposure	Policy Exposure Beta-Balanced
Opportunistic global equities	$2,717,429,664	38.2%	$ 2,601,563,280	36.6%	38%
Nominal bonds	747,798,836	10.5	2,840,437,911	39.9	44
Commodities	313,169,917	4.4	1,144,649,079	16.1	20
Inflation-linked bonds	912,475,569	12.8	2,673,386,121	37.6	39
Alternative beta	2,170,513,175	30.5	2,060,111,457	28.9	31
Excess cash	255,616,205	3.6	0	0.0	0
Total internal beta-balanced portfolio	$7,117,003,366	100.0%	$11,320,147,848	159.1%	172%

The long-term expected rate of return on pension plan investments was determined using a building-block method in which best-estimate rates 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. Best estimates of geometric real rates of return for each major asset class included in MOSERS' target asset allocation as of June 30, 2017, are summarized in the table below.

Target Asset Allocation

	Policy Allocation	Long-Term Expected Real Rate of Return*	Weighted Average Long-Term Expected Real Rate of Return
Opportunistic global equities	38.0%	5.5%	2.1%
Nominal bonds	44.0	1.0	0.5
Commodities	20.0	4.5	0.9
Inflation-linked bonds	39.0	0.8	0.3
Alternative beta	31.0	4.5	1.4
	172.0%		5.2%

* *Represents best estimates of geometric rates of return for each major asset class included.*

Concentration of Credit Risk
Concentration of credit risk is the risk of loss attributed to the magnitude of an investment in a single-issuer. Issuer concentration limits are established in individual portfolio guidelines that generally do not allow a single issuer to be greater than 5% of the portfolio's fair value. As of fiscal year end, there is no single issuer exposure, exclusive of investments issued or explicitly guaranteed by the U.S. government, within MOSERS' portfolio that comprises 5% or more of the overall portfolio or MOSERS' fiduciary net position. Therefore, there is no concentration of credit risk to report.

Money-Weighted Rate of Return
The annual money-weighted rate of return on pension plan investments, net of pension plan investment expense, was 3.51% for the year ended June 30, 2017. The money-weighted rate of return expresses investment performance, net of investment expense, adjusted for changing amounts actually invested.

Fair Value Measurement
MOSERS categorizes its fair value measurements within the fair value hierarchy established by generally accepted accounting principles. The hierarchy is based on the valuation inputs used to measure the fair value of the asset and give the highest priority to unadjusted quoted prices in active markets for identical assets or liabilities (level 1 measurements) and the lowest priority to unobservable inputs (level 3 measurements).

- **Level 1** – Unadjusted quoted prices for identical instruments in active markets.
- **Level 2** – Quoted prices for similar instruments in active markets; quoted prices for identical or similar instruments in markets that are not active; and model-derived valuations in which all significant inputs are observable.
- **Level 3** – Valuations derived from valuation techniques in which significant inputs are unobservable.

Investments that are measured at fair value using the net asset value per share (or its equivalent) as a practical expedient are not classified in the fair value hierarchy.

The categorization of investments within the hierarchy is based upon the pricing transparency of the instrument and should not be perceived as the particular investment's risk.

In instances where inputs used to measure fair value fall into different levels in the fair value hierarchy, fair value measurements in their entirety are categorized based on the lowest level input that is significant to the valuation. MOSERS' assessment of the significance of particular inputs to these fair value measurements requires judgment and considers factors specific to each asset or liability. The table on pages 36 shows the fair value leveling of the investments.

Debt, equities, and investment derivatives classified in level 1 of the fair value hierarchy are valued using prices quoted in active markets for those securities.

Debt securities and liabilities classified in level 2 have nonproprietary information readily available to market participants from multiple independent sources, which are known to be actively involved in the market. Pricing inputs may include market quotations, yields, maturities, call features and ratings. Derivative securities classified in level 2 are securities whose values are derived daily from associated traded securities.

Private equity securities classified in level 2 are valued at the price observed in subsequent market activity.

Investments and Derivative Instruments Measured at Fair Value

June 30, 2017	Total	Fair Value Measurement Using: Quoted Prices in Active Markets for Identifical Assets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
Investments by fair value level				
Assets				
Equity securities				
U.S. common and preferred stock	$ 70,003,639	$ 69,997,589	$ 0	$6,050
Foreign stocks	1,344,572	1,344,572	0	0
Total equity securities	71,348,211	71,342,161	0	6,050
Debt securities				
U.S. short-term funds	717,520,000	717,520,000	0	0
Repurchase agreements	1,100,000,000	0	1,100,000,000	0
U.S. agency obligations	325,672,097	0	325,672,097	0
Foreign debt securities	49,144,056	0	49,144,056	0
U.S. corporate bonds	147,344	0	147,344	0
U.S. government	4,206,522,308	4,206,522,308	0	0
Total debt securities	6,399,005,805	4,924,042,308	1,474,963,497	0
Total investment assets	6,470,354,016	4,995,384,469	1,474,963,497	6,050
Liabilities				
Reverse repurchase agreements	(3,373,773,555)	0	(3,373,773,555)	0
Total net investment assets by fair value level	3,096,580,461	4,995,384,469	(1,898,810,058)	6,050
Investment derivative instruments				
Futures contracts	21,913,499	21,913,499	0	0
Foreign exchange forward contracts	80,225	80,225	0	0
Swap market value	(3,925,002)	0	(3,925,002)	0
Total investment derivative instruments	18,068,722	21,993,724	(3,925,002)	0
Investments measured at the net asset value (NAV)				
Commingled international equity funds	1,206,804,849			
Hedge funds	2,664,508,353			
Private equity funds	760,772,033			
Private real estate funds	118,183,607			
Private timber funds	216,143,510			
Total investments measured at NAV	4,966,412,352			
Other Investments				
Cash and receivables/payables	(10,593,016)			
Total fund value	$ 8,070,468,519			
Reconciliation to *Statement of Fiduciary Net Position*				
Total portfolio value	$ 8,070,468,519			
Reverse repurchase agreements	3,373,773,555			
STIF	(2,418,765,451)			
Uninvested cash	722,484			
Interest and dividends receivable	(5,469,068)			
Variation margin	(12,184,564)			
Accounts receivable securities sold	(10,435,252)			
Accounts payable securities purchased	10,165,707			
Fees payable	10,314,862			
Investments per *Statement of Fiduciary Net Position*	$ 9,018,590,792			

Investments Measured at the Net Asset Value

	June 30, 2017	Unfunded Commitments		Redemption Frequency (If Currently Eligible)	Redemption Notice Period (Days)
Commingled international equity funds[1]	$1,206,804,849			Daily, Monthly	1-30
Active hedge funds					
Long/short equity [2]	224,623,297			Quarterly, Semi-Annually, Annually	30-60
Merger arbitrage [3]	115,091,118			Monthly	45
Multi-strategy [4]	62,747,524			Quarterly	65
Equity market neutral [5]	99,796,938			Quarterly	90
Event driven [6]	218,867,279			Quarterly	60-65
Macro [7]	223,258,439			Monthly, Quarterly	30
Risk premia [8]	408,424,347			Bi-Weekly, Monthly	15-30
Risk parity [9]	867,275,340			Monthly	5-15
Fund-of-funds [10]	240,743,966			Monthly	95
Pending liquidated hedge funds [11]	203,680,105				
Private equity funds [12]	760,772,033	$307,845,477	€868,751		
Private real estate funds [12]	118,183,607	19,099,354	0		
Private timber funds [12]	216,143,510	0	0		
Total investments measured at NAV	$4,966,412,352	$326,944,831	€868,751		

1 **Commingled international equity funds** – Three international equity funds are considered to be commingled in nature. Each are valued at the net asset value held at the end of the period based upon the fair value of the underlying investments.

2 **Long/short equity hedge funds** – Consisting of three funds, this strategy invests both long and short in U.S. and global equity securities, with a goal of adding growth and minimizing market exposure. These investments are valued at NAV. Due to contractual lock-up restrictions, these investments remain restricted from 4 to 18 months.

3 **Merger arbitrage hedge fund** – Consisting of one fund, this strategy invests in the common stock of companies that are involved in publicly announced mergers and seeks to generate attractive returns while dampening volatility. This investment is valued at NAV, is redeemable monthly, and is not subject to lock-up restrictions.

4 **Multi-strategy hedge fund** – Consisting of one fund, this fund aims to pursue varying strategies in order to diversify risks and reduce volatility. This investment is valued at NAV, is redeemable quarterly, and is not subject to lock-up restrictions.

5 **Equity market neutral hedge fund** – Consisting of one fund, this strategy invests both long and short in U.S. and global equity securities, with the goal of having little to no net market exposure. This investment is valued at NAV, is redeemable quarterly, and is not subject to lock-up restrictions.

6 **Event driven hedge funds** – Consisting of two funds, this strategy seeks to gain an advantage from pricing inefficiencies that may occur at the onset or in the aftermath of a corporate action or related event. These investments are valued at NAV. Due to contractual lock-up restrictions, approximately 29% of the value of these investments is eligible for redemption quarterly. The remaining 71% of the value of these investments remains restricted for 4 to 20 months.

7 **Macro hedge funds** – Consisting of two funds, this strategy seeks to take advantage of macroeconomic dislocations between countries by trading a number of different markets and financial instruments. This investment is valued at NAV, is redeemable monthly and quarterly, and is not subject to lock-up restrictions.

8 **Risk premia hedge funds** – Consisting of two funds, these strategies seek to capture hedge fund betas through the use of systematic, bottom-up security selection across major hedge fund strategies. Style premia such as value, momentum, and carry help build the long/short portfolios. This investment is valued at NAV, is redeemable at least monthly, and is not subject to lock-up restrictions.

9 **Risk parity funds** – Consisting of two funds, these strategies attempt to build a more efficient portfolio through an equal risk methodology. They take long only positions across equity indices, developed nominal bonds, TIPS, commodities and credit. Diversification benefits decrease both the expected return and volatility thus requiring leverage to maintain a similar return to a more conventional portfolio. This investment is valued at NAV, is redeemable monthly, and is not subject to lock-up restrictions.

10 **Fund-of-funds** – Consisting of one fund, this fund seeks to provide diversification by holding a number of funds within a single fund structure. This investment is valued at NAV, is redeemable monthly, and is not subject to lock-up restrictions.

11 **Pending liquidated hedge funds** – This item consists of 12 funds which have been fully redeemed as of June 30, 2017, for which MOSERS is awaiting final distribution of the proceeds. Approximately 83% of the value was received within 90 days of June 30, 2017. The remaining 17% will be received upon sale of the underlying investments or upon completion of the audit of the firm's annual financial statements.

12 **Private equity, real estate and timber funds** – MOSERS' private equity portfolio consists of 48 funds with exposure to buyout funds, distressed funds, infrastructure, energy, royalty funds, and special situations. The real estate portfolio, comprised of five funds, invests mainly in U.S. commercial real estate. The timber portfolio consists of four funds which invests in global timberland. The fair values of the majority of these funds has been determined using net assets valued one quarter in arrears plus current quarter cash flows. These funds are not eligible for redemption. Distributions are received when underlying investments within the funds are liquidated, which, on average, can occur over the span of 5 to 10 years.

Credit Risk

Credit risk is the risk that an issuer or other counterparty to an investment will not fulfill its obligations to MOSERS. As of June 30, 2017, MOSERS' fixed income assets that are not U.S. government guaranteed represented 36% of fixed income securities. Credit risk associated with all fixed income holdings, including collateral for repurchase agreements, has been included in this report. The tables below summarize MOSERS' fixed income security exposure levels and credit qualities.

Average Credit Quality and Exposure Levels of Nongovernment Guaranteed Securities

Fixed Income Security Type	Fair Value June 30, 2017	Percent of all Fixed Income Assets	Weighted Average Credit Quality	Ratings Dispersion Requiring Further Disclosure
Collateralized mortgage obligations	$ 26,162,520	0.4%	AA	See below
U.S. government agencies	299,535,000	4.9	AA	See below
Non-U.S. sovereign	48,598,153	0.8	BBB	See below
Corporate bonds	1,670,687	0.0	BB	See below
Bank deposits	550,478,970	9.0	FDIC insured	None
Repurchase agreements	1,100,035,267	17.9	Not rated	None
Pooled investments	167,536,670	2.7	AAA	None
Total nongov't. guaranteed securities	$2,194,017,267	35.7%		
Total fixed income securities	$6,149,921,101			

Ratings Dispersion Detail - Fair Value

Credit Rating Level	Collateralized Mortgage Obligations	Non-U.S. Sovereign	Corporate Bonds	U.S. Government Agencies
AA	$26,162,520	$ 119,637		$299,535,000
A		9,067,829	$ 150,397	
BBB		24,720,205	1,412,433	
BB		14,690,482		
Not Rated			107,857	
	$26,162,520	$48,598,153	$1,670,687	$299,535,000

As a matter of practice, there are no overarching limitations for credit risk exposures within the overall fixed income portfolio. Each individual portfolio within fixed income is managed in accordance with operational guidelines that are specific as to permissible credit quality ranges, exposure levels within individual quality tiers, and average credit quality.

Credit risk for derivative instruments held by the system results from counterparty risk assumed by MOSERS. This is essentially the risk that the counterparty to a MOSERS transaction will be unable to meet its obligation. Information regarding MOSERS' credit risk related to derivatives is found under the derivatives disclosures on pages 42 of these notes.

Policies related to credit risk pertaining to MOSERS' securities lending program are found under the securities lending disclosures found on page 43 of these notes.

Interest Rate Risk

Interest rate risk is the risk that changes in interest rates will adversely affect the fair value of an investment. This risk is managed by using the effective duration or option adjusted methodology. It is widely used in the management of fixed income assets by quantifying 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 change in rates and the slope of the yield curve. Within the investment policy, operational guidelines specify the degree of interest rate risk taken within the system's fixed income portfolios, with the exception of some portfolios in which credit risk is the predominant factor and is also controlled by specific guidelines. MOSERS believes that the reporting of effective duration found in the tables below quantifies to the fullest extent possible the interest rate risk of the system's fixed income securities.

Effective Duration of Fixed Income Assets by Security Type

Fixed Income Security Type	Fair Value June 30, 2017	Percent of all Fixed Income Assets	Weighted Average Effective Duration (Years)	Interest Rate Risk Requiring Further Disclosure
U.S. treasuries	$3,955,903,834	64.3%	8.3	See below
U.S. government agencies	299,535,000	4.9	0.2	None
Collateralized mortgage obligations	26,162,520	0.4	0.1	None
Non-U.S. sovereign	48,598,153	0.8	5.3	None
Corporate bonds	1,670,687	0.0	5.3	None
Bank deposits	550,478,970	9.0	0.0	None
Repurchase agreements	1,100,035,267	17.9	0.0	None
Pooled investments	167,536,670	2.7	0.0	None
	$6,149,921,101	100.0%	5.4	

Effective Duration Analysis of U.S. Treasuries

Maturity	Fair Value June 30, 2017	Average Effective Duration of the Security Type (Years)	Contribution to Effective Duration (Years)
Less than 1 year to maturity	$ 275,455,406	0.2	0.0
1- to 10- year maturities	2,641,400,055	5.5	3.7
Long coupon treasuries	1,039,048,373	17.4	4.6
	$3,955,903,834		8.3

MOSERS invests in mortgage-backed securities, which are reported at fair value in the *Statements of Fiduciary Net Position* of the pension trust funds. Such securities have embedded within them the risk of being called, whereby the issuer has the option to keep the debt outstanding in rising interest rate environments or repay the debt in declining interest rate environments, a factor that advantages the issuer. MOSERS invests in these securities to diversify the portfolio with high quality and liquid investments which capture a significant yield premium that is intended to compensate for the call risk. This risk is incorporated within the effective duration calculation used in the interest rate risk analysis.

Repurchase Agreements

Tri-party repurchase agreements (repos) are a secured loan by a financial institution with the collateral held at a custodian bank. In a tri-party repo transaction, MOSERS transfers cash to a financial institution and the financial institution transfers securities to the custodian bank. Simultaneously, the financial institution promises to repay the loan in the future plus interest in exchange for the return of the securities.

Reverse repurchase agreements (reverse repos) are used to convert securities into cash. In a reverse repo transaction, MOSERS transfers securities that are owned in the portfolio to a financial institution and the financial institution transfers cash to MOSERS. Simultaneously, MOSERS promises to repay the loan in the future plus interest in exchange for the return of the securities.

Typical collateral for repos and reverse repos include treasury securities, agency securities, mortgage-backed securities, investment grade corporate bonds, commercial paper, and common stock. Repos and reverse repos are typically done for an overnight term; however, they can be done for a longer term. MOSERS enters into repo transactions to earn interest on short-term funds and enters into reverse repos to finance the purchase of additional securities.

The yield earned by MOSERS on the repo transactions ranged from 0.25% to 1.31% and had maturities of one to five days. The yield earned by the counterparties on the reverse repo transactions ranged from 0.55% to 1.32% and had maturities of one month to one year. The maturities of the investments made with reverse repo proceeds generally have maturities of one to 30 years.

In repo transactions, MOSERS may have credit risk if the counterparty fails to repay the loan and the value of the securities held as collateral fall below the loan balance. To minimize this risk, MOSERS requires the financial institution to send collateral with a market value greater than the value of the loan and revalues the collateral on a daily basis. As of fiscal year end, MOSERS held approximately $39.5 million of counterparty collateral in excess to the repo balance.

In a reverse repo transaction, MOSERS may be subject to credit risk if the counterparty fails to return the securities and the value of the securities held as collateral rise above the loan balance. To minimize this risk, MOSERS sends the minimum amount of collateral required by the financial institution and requires the financial institution to revalue the collateral and return excess collateral on a daily basis. As of fiscal year end, counterparties held approximately $30.9 million of MOSERS' collateral in excess to the reverse repo balance.

The tables below summarize MOSERS' exposure for repo and reverse repo transactions.

Repurchase Agreements by Collateral Type

Collateral Type	Fair Value of Collateral June 30, 2017	Fair Value Including Accrued Interest of Repos June 30, 2017	Excess (Deficit) Collateral	Percent Over Collateralized
U.S treasuries/U.S. agencies	$ 841,500,022	$ 825,000,000	$16,500,022	
Common stock	298,027,065	275,000,000	23,027,065	
Accrued interest	0	35,267	(35,267)	
	$1,139,527,087	$1,100,035,267	$39,491,820	3.6%

Reverse Repurchase Agreements by Collateral Type

Collateral Type	Fair Value of Collateral June 30, 2017	Fair Value Including Accrued Interest of Reverse Repos June 30, 2017	Excess (Deficit) Collateral	Percent Over Collateralized
U.S. treasuries	$3,412,898,141	$3,362,281,438	$ 50,616,703	
Receivables	(8,232,672)	0	(8,232,672)	
Accrued interest	0	11,492,117	(11,492,117)	
	$3,404,665,469	$3,373,773,555	$ 30,891,914	0.9%

Foreign Currency Risk
Foreign currency risk is the risk that changes in exchange rates will adversely impact the fair value of an investment. MOSERS' currency risk exposures, or exchange rate risk, primarily reside within MOSERS' international equity investment holdings. MOSERS' implementation policy allows external managers to decide what action to take regarding their respective portfolio's foreign currency exposures using currency forward contracts. MOSERS' exposure to foreign currency risk in U.S. dollars, as of June 30, 2017, is highlighted in the table below.

Currency Exposures by Asset Class

Currency	Cash & Cash Equivalents	Equities	Fixed Income	Alternatives	Total
Argentine Peso	$ 14				$ 14
Australian Dollar	1,599,168	$ (82,420)	$ (276,290)		1,240,458
Brazilian Real	10,041	10,904,231	5,289,265		16,203,537
Canadian Dollar	(704,907)	4,025,936	(374,220)		2,946,809
Chilean Peso	31,464	1,443,236	160,100		1,634,800
Colombian Peso	7,571	490,843	4,375,831		4,874,245
Czech Koruna	12,663	287,392			300,055
Danish Krone		7,915,672			7,915,672
Egyptian Pound	222	188,864			189,086
Euro	(16,148,991)	154,650,813	5,256,681	$23,990,878	167,749,381
Hong Kong Dollar	266,573	106,050,759			106,317,332
Hungarian Forint	7,847	526,344			534,191
Indian Rupee	114,989	14,430,341			14,545,330
Indonesian Rupiah	68,379	4,038,438	5,540,079		9,646,896
Israeli Shekel		16			16
Japanese Yen	2,064,891	270,199,689			272,264,580
Malaysian Ringgit	77,680	3,919,716	2,777,419		6,774,815
Mexican Peso	23,875	8,140,260	8,683,926		16,848,061
Norwegian Krone		2,852,118			2,852,118
Pakistani Rupee		117,144			117,144
Peruvian Nuevo Sol	2		849,040		849,042
Philippine Peso	12,355	1,934,786			1,947,141
Polish Zloty	924	2,153,764	5,624,492		7,779,180
Qatari Riyal	10,187	1,093,256			1,103,443
Russian Ruble	(1,389)	1,571,962	4,754,949		6,325,522
Singapore Dollar		36,481,683			36,481,683
South African Rand	(637,549)	10,851,140	5,353,603		15,567,194
South Korean Won	(698,833)	40,899,836	1,313,324		41,514,327
Swedish Krona		12,276,390			12,276,390
Swiss Franc		109,896,095			109,896,095
Taiwan New Dollar	160,358	52,296,316			52,456,674
Thai Baht	17,022	30,524,380	1,910,471		32,451,873
Turkish Lira	1,192	11,342,429	3,573,882		14,917,503
United Arab Emirates Dirham	742	1,089,834			1,090,576
United Kingdom Pound Sterling	(323,037)	157,342,198	(296,070)		156,723,091
Uruguayan Peso			455,548		455,548
	$(14,026,547)	$1,059,853,461	$54,972,030	$23,990,878	$1,124,789,822

Derivatives

Derivative instruments are financial contracts whose values depend on the values of one or more underlying assets, reference rates, or financial indices. They include futures contracts, forward foreign currency exchange contracts, and swap contracts. The following tables summarize the various contracts in the portfolio, as of June 30, 2017.

Futures Contracts

Futures Contract	Notional Value	Exposure
Currency futures	$ 19,226,121	$ (944,974)
Fixed income futures	1,281,948,801	23,694,113
Equity index futures	147,312,359	1,091,969
Commodity futures	144,977,942	256,330
Total	$1,593,465,223	$24,097,438

Foreign Currency Forward Contracts at June 30, 2017

Currency	Net Notional Long (Short)	Exposure
Brazilian Real	$ 2,024,588	$ 4,358
Chiliean Peso	1,087,625	4,853
Colombian Peso	(131,880)	14,758
Czech Koruna	3,577,017	68,668
Euro	491,653	9,394
Indonesian Rupiah	(205,185)	(235)
Indian Rupee	1,042,572	(3,791)
Mexican Peso	(3,430,145)	(39,477)
Peruvian Nuevo Sol	(291,136)	(2,622)
Polish Zloty	556,345	12,887
Romanian Leu	2,861,817	80,478
Russian Ruble	(2,507,001)	4,052
Thai Baht	521,734	(41,191)
Turkish Lira	882,520	4,349
Uruguayan Peso	415,787	14,787
South African Rand	(1,731,409)	29,181
U.S. Dollar	(5,004,453)	0
Foreign currency forward contract asset (liability)	$ 160,449	$160,449

Swap Contracts

Counterparty Credit Rating	Notional Value	Exposure
Total return swaps - equity		
A+	$ 69,925,100	$(4,560,844)
Total	$ 69,925,100	$(4,560,844)
Total return swaps - fixed income		
A+	$524,643,852	$ 8,414,108
Total	$524,643,852	$ 8,414,108
Total return swaps - commodities		
A+	$657,937,233	$ 0
A	238,956,839	0
Total	$896,894,072	$ 0

While the board has no formal policy specific to derivatives, the MOSERS investment implementation program, through its external managers, holds investments in futures contracts, swap contracts, and forward foreign currency exchange. MOSERS enters into these certain derivative instruments as investments primarily to enhance the performance and reduce the volatility of its portfolio. It enters swaps and futures contracts to gain or hedge exposure to certain markets and to manage interest rate risk and enters into forward foreign currency exchange contracts primarily to hedge foreign currency exposure.

The notional values associated with these derivative instruments are generally not recorded in the financial statements; however, the amounts for the exposure on these instruments are recorded in the *Statements of Fiduciary Net Position* and the total changes in fair value for the year are included as investment income in the *Statements of Changes in Fiduciary Net Position*. For the year ended June 30, 2017, the change in fair value in the swap contracts resulted in a loss of $106.1 million of investment income. The change in fair value in the futures contracts resulted in a loss of $72.6 million of investment income. The change in fair value in the foreign exchange contracts resulted in a loss of $3.2 million of investment income. MOSERS does not anticipate additional significant market risk from the derivative arrangements.

MOSERS could be exposed to risk if the counterparties to the contracts are unable to meet the terms of the contracts. MOSERS' investment managers seek to control this risk through counterparty credit evaluations and approvals, counterparty credit limits, and exposure monitoring procedures. MOSERS anticipates that the counterparties will be able to satisfy their obligations under the contracts. Investments in limited partnerships and commingled funds may include derivatives that are not shown in the derivative totals.

Limited Partnerships

Many of MOSERS' alternative investments are organized in the form of limited partnerships. In these partnerships, the manager is a general partner and the limited partners are the investors. Investments in limited partnerships are accounted for using the equity method of accounting and their earnings or losses for the period are included in investment income using the equity method.

As of June 30, 2017, MOSERS had contracts with more than 83 limited partnerships across various types of alternative investments which collectively represent 47% of the total fund. A *Schedule of Limited Partnerships* follows on pages 44-45.

Securities Lending Program

The board of trustees' investment policy permits the pension trust funds to participate in a securities lending program. Fixed income, international equity and domestic equity securities of the pension trust funds are loaned to participating brokers who provide collateral in the form of cash, U.S. Treasury or government agency securities, or letters of credit issued by approved banks. Collateral must be provided in the amount of 102% of market value for domestic loans and 105% of market value for international loans. MOSERS does not have the authority to pledge or sell collateral securities, without borrower default.

As of June 30, 2017, Deutsche Bank AG, New York Branch, served as the agent for the fixed income, domestic equity and international equity securities lending programs. In this capacity, MOSERS reduces credit risk by allowing Deutsche Bank to lend these securities to a diverse group of dealers on behalf of MOSERS. Indemnification against dealer default is provided by Deutsche Bank AG, a "BBB rated" bank. With each of MOSERS' securities lending programs, a majority of loans are open loans and can be terminated on demand by either MOSERS or the borrower. Net income from the three lending programs is split on a 90/10 basis between MOSERS and Deutsche Bank, respectively.

Daily monitoring of securities that are on loan ensures proper collateralization levels and mitigates counterparty risk. Cash collateral from all three programs is commingled and invested in a separately managed short-term investment account for MOSERS. This cash collateral account is managed by Deutsche Bank. On June 30, 2017, there were no securities on loan or cash collateral held in the account. For all of the securities lending operational services, the custodian is paid an annual fee, which is netted out against MOSERS' earnings in the securities lending programs managed by Deutsche Bank. The custodian fee is not being charged while there are no loans outstanding.

Schedule of Limited Partnerships

Partnership Name	Style	Investments at Fair Value as of June 30, 2017
Actis Emerging Markets III	Opportunistic global equities − emerging markets	$ 11,393,891
Actis Emerging Markets IV	Opportunistic global equities − emerging markets	27,006,111
African Development Partners I, LLC	Opportunistic global equities − emerging markets	23,311,855
African Development Partners II, LLC	Opportunistic global equities − emerging markets	19,758,189
Alinda Infrastructure Fund I, LP	Opportunistic global equities − infrastructure	21,005,641
AQR DELTA Sapphire Fund, LP	Alternative beta − multi-strategy	348,556,900
AQR Global Risk Premium Fund IV, LP	External beta-balanced − risk parity	405,631,864
AQR Style Premia Fund, LP	Alternative beta − multi-strategy	59,867,447
Axiom Asia Private Capital Fund II, LP	Opportunistic global equities − emerging markets	37,773,482
Axiom Asia Private Capital Fund III, LP	Opportunistic global equities − emerging markets	48,051,826
Axxon Brazil Private Equity Fund II B, LP	Opportunistic global equities − emerging markets	25,657,177
Bayview Opportunity Domestic III b, LP	Opportunistic global equities − opportunistic mortgages	18,105,558
Bayview Opportunity Domestic, LP	Opportunistic global equities − opportunistic mortgages	4,197,423
Blackstone Real Estate Partners IV	Opportunistic global equities − active real estate	11,284,656
Blackstone Real Estate Partners V	Opportunistic global equities − active real estate	31,686,366
Blackstone Real Estate Partners VI	Opportunistic global equities − active real estate	13,915,179
Blackstone Real Estate Partners VII	Opportunistic global equities − active real estate	60,296,117
Blackstone Topaz Fund, LP	Alternative beta multi-strategy − fund-of-funds	240,743,966
Blakeney Onyx, LP	Opportunistic global equities − emerging markets	51,978,370
Bridgewater Associates – All Weather, LLC	External beta-balanced − risk parity	461,643,476
Bridgewater Associates – Diamond Ridge Fund, LLC	Alternative beta − global macro	100,543,340
Campbell Timber Fund II A, LP	Opportunistic global equities − timberland	1,005,329
CarVal Investors CVI Global Value Fund A, LP – private debt	Opportunistic global equities − distressed real estate debt	7,200,000
CarVal Investors CVI Global Value Fund A, LP – real estate	Opportunistic global equities − distressed real estate debt	7,200,000
Catalyst Fund III, LP	Opportunistic global equities − Canadian distressed debt	56,200,437
Catalyst Fund IV, LP	Opportunistic global equities − Canadian distressed debt	23,795,378
Catalyst Fund V, LP	Opportunistic global equities − Canadian distressed debt	19,327,670
Catterton Partners V, LP	Opportunistic global equities − corporate buyout	2,731,889
Cornwall Domestic, LP	Alternative beta − multi-strategy	62,747,524
Davidson Kempner Institutional Partners, LP	Alternative beta − event driven	28,676,279
DRI Capital – LSRC	Opportunistic global equities − intellectual property	14,818,718
EIG Energy Co-investment I	Opportunistic global equities − energy − mezzanine	5,167,130
EIG Energy Fund XIV, LP	Opportunistic global equities − energy − mezzanine	6,953,126
EIG Energy Fund XV, LP	Opportunistic global equities − energy − mezzanine	31,140,378
EIG Energy Fund XVI, LP	Opportunistic global equities − energy − mezzanine	23,559,874
Elliott International, Ltd.	Alternative beta − multi-strategy	190,191,000
Eton Park Fund, LP	Alternative beta − multi-strategy	350,900
Farallon Capital Institutional Partners, LP	Alternative beta − multi-strategy	2,500,000
Gaoling Fund, LP	Opportunistic global equities − long/short − equity	125,614,684
Garnet Sky Investors Company Ltd.	Opportunistic global equities − timberland	123,828,613
Gateway Energy & Resource Holdings, LLC	Opportunistic global equities − energy − diversified	15,758,412
GCM Sidecar, LP	Opportunistic global equities − long/short − equity	59,227,608
Glenview Capital Opportunity Fund, LP	Opportunistic global equities − long/short − equity	39,781,005
Global Forest Partners GTI7 Institutional Investors Company, Ltd.	Opportunistic global equities − timberland	17,889,381
HBK Merger Strategies Offshore Fund, Ltd.	Alternative beta − merger arbitrage	115,091,118

Schedule of Limited Partnerships continued on page 45

Schedule of Limited Partnerships continued from page 44

Partnership Name	Style	Investments at Fair Value as of June 30, 2017
JLL Partners Fund V, LP	Opportunistic global equities − corporate buyout	12,297,620
JLL Partners Fund VI, LP	Opportunistic global equities − corporate buyout	53,135,434
King Street Capital, LP	Alternative beta − credit driven	4,299,013
King Street Capital, Ltd.	Alternative beta − credit driven	345,655
Linden Capital Partners Co-investment, LP	Opportunistic global equities − corporate buyout	10,588,235
Linden Capital Partners II, LP	Opportunistic global equities − corporate buyout	38,689,144
Mast Credit Opportunities I, LP	Alternative beta − credit driven	21,196,607
Merit Energy Partners F-II, LP	Alternative beta − energy − oil and gas	5,154,997
MHR Institutional Partners II A, LP	Alternative beta − distressed debt	26,720,074
MHR Institutional Partners III, LP	Alternative beta − distressed debt	32,873,342
MHR Institutional Partners IV, LP	Alternative beta − distressed debt	10,047,407
Millennium Technology Value Partners Co-investment	Opportunistic global equities − direct secondaries	4,136,056
Millennium Technology Value Partners II, LP	Opportunistic global equities − direct secondaries	15,965,832
Moon Capital Global Equity Offshore Fund, Ltd.	Opportunistic global equities − long/short − equity	825,930
Newport Pioneer, LLC	Alternative beta multi-strategy − fund-of-funds	20,000
Oaktree European Credit Opportunities Fund, LP	Opportunistic global equities − European loans	679,023
OCM/GFI Power Opportunities Fund II, LP	Opportunistic global equities − corporate buyout	115,743
OCM Opportunities Fund IV b, LP	Alternative beta − distressed debt	78,224
OCM Opportunities Fund VII b, LP	Alternative beta − distressed debt	7,228,543
OCM Opportunities Fund VIII b, LP	Alternative beta − distressed debt	15,585,875
OCM Power Opportunities Fund III, LP	Opportunistic global equities − corporate buyout	13,357,793
OCM Real Estate Opportunities Fund III, LP	Opportunistic global equities − active real estate	1,001,289
Perry Partners, LP	Alternative beta − multi-strategy	40,458
Pharo Macro Fund, Ltd.	Alternative beta − global macro	122,709,138
Resource Management Service – Wildwood Timberlands, LLC	Opportunistic global equities − timberland	73,420,187
Silver Creek Special Opportunities Fund I, LP	Opportunistic global equities − fund-of-funds (special situations)	9,612,857
Silver Creek Special Opportunities Fund II, LP	Opportunistic global equities − fund-of-funds (special situations)	12,632,356
Silver Lake Partners II, LP	Opportunistic global equities − corporate buyout	4,348,208
Siris II Co-investment I	Opportunistic global equities − corporate buyout	3,983,438
Siris II Co-investment II	Opportunistic global equities − corporate buyout	7,500,000
Standard Investment Research Hedged Equity Fund, LP	Alternative beta − equity market neutral	99,796,938
StepStone Capital Buyout Fund I, LP	Opportunistic global equities − corporate buyout − fund-of-funds	6,880,171
StepStone Capital Buyout Fund II, LP	Opportunistic global equities − corporate buyout − fund-of-funds	18,096,782
StepStone Opportunities Fund II, LP	Opportunistic global equities − corporate buyout − fund-of-funds	950,711
TPG-Axon Partners (Offshore) Ltd	Opportunistic global equities − long/short − equity	1,320,083
Viking Global Equities III, Ltd.	Opportunistic global equities − long/short − equity	168,906,465
Visium Balanced Fund, LP	Opportunistic global equities − long/short − equity	3,460,388
Wellington Management – Spindrift Investors (Bermuda)	Opportunistic global equities − long/short − equity	414,115
Other Miscellaneous	Miscellaneous	12,496
		$3,811,591,914

Summary of Fair Value of Investments as of June 30, 2017

	Pension Trust Funds		Internal Service Funds	
	Investments at Cost Value	**Investments at Fair Value**	**Investments at Cost Value**	**Investments at Fair Value**
U.S. treasury securities	$4,084,879,757	$ 3,931,453,551		
Government bonds & gov't. mortgage-backed securities	53,283,215	47,942,726		
Corporate bonds	225,519	147,344		
Convertible bonds	649,291	610,217		
U.S. dollar-denominated international corporate bonds	1,263,652	1,201,331		
Limited partnerships	2,464,132,351	3,811,591,914		
Common stock	220,586,960	244,259,046		
International equities	172,972,066	981,291,002		
Foreign currency	17,749	85,277		
Real estate investment trust	3,617	8,384		
Repurchase agreements	10,553,752	10,553,752	$4,291,721	$4,291,721
Short-term investment funds	2,418,765,451	2,418,765,451		
Total investments	$9,427,333,380	$11,447,909,995	$4,291,721	$4,291,721
Reconciliation to investments on *Statement of Fiduciary Net Position*				
Total from above		$11,447,909,995		
Less short-term investments:				
Repurchase agreements		(10,553,752)		
Short-term investment funds		(2,418,765,451)		
Investments on *Statement of Fiduciary Net Position*		$ 9,018,590,792		

Due to space limitations and printing costs, a detailed listing of the investment holdings and transactions is not provided in this annual report; however, the detailed reports are available for review as an appendix to this report at the MOSERS office.

(4) Capital Assets

Office building, furniture, fixtures, and equipment costing $1,000 or more when acquired are recorded at cost at the time of acquisition and are reported net of accumulated depreciation. Improvements, which increase the useful life of the property, are also capitalized. Maintenance and repairs are charged to expense as incurred. Depreciation is computed using the straight-line method over the estimated useful life of the related assets according to the following guidelines:

- 5 years for furniture, fixtures, and equipment
- 40 years for building
- 5 years for software and licensing

Below are schedules of the capital asset account balances for the pension trust funds and the internal service funds – State of Missouri Deferred Compensation Plan for the year ended June 30, 2017.

Pension Trust Funds

Capital Asset Account

	Land	Building and Building Improvements	Furniture Fixtures and Equipment	Software and Licensing	Total Capital Assets
Capital assets					
Balances June 30, 2016	$267,286	$4,284,337	$1,285,636	$724,563	$6,561,822
Additions	0	4,225	32,856	11,753	48,834
Deletions	0	(45,380)	(23,553)	0	(68,933)
Balances June 30, 2017	267,286	4,243,182	1,294,939	736,316	6,541,723
Accumulated depreciation					
Balances June 30, 2016	0	1,720,870	1,021,529	277,522	3,019,921
Depreciation expense	0	148,438	64,292	38,126	250,856
Deletions	0	(21,560)	(23,554)	0	(45,114)
Balances June 30, 2017	0	1,847,748	1,062,267	315,648	3,225,663
Net capital assets June 30, 2017	$267,286	$2,395,434	$ 232,672	$420,668	$3,316,060

Internal Service Funds

Capital Asset Account

	Leasehold Improvements	Furniture Fixtures and Equipment	Software and Licensing	Total Capital Assets
Capital assets				
Balances June 30, 2016	$3,880	$ 7,516	$4,950	$16,346
Additions	0	9,002	0	9,002
Deletions	0	0	0	0
Balances June 30, 2017	3,880	16,518	4,950	25,348
Accumulated depreciation				
Balances June 30, 2016	1,940	5,142	3,378	10,460
Depreciation expense	970	698	652	2,320
Deletions	0	0	0	0
Balances June 30, 2017	2,910	5,840	4,030	12,780
Net capital assets June 30, 2017	$ 970	$10,678	$ 920	$12,568

(5) Employers' Net Pension Liability

The components of the net pension liability as of June 30, 2017, are shown in the *Schedule of Employers' Net Pension Liability* below.

Schedule of Employers' Net Pension Liability

	MSEP	Judicial Plan
Total pension liability	$13,152,273,895	$564,417,925
MOSERS fiduciary net position	7,945,358,298	137,634,941
Employers' net pension liability	$ 5,206,915,597	$426,782,984
Plan net position as a percentage of the total pension liability	60.41%	24.39%
Covered employee payroll	$ 1,941,969,786	$ 58,150,935
Employers' net pension liability as a percentage of employee covered payroll	268.13%	733.92%

Actuarial valuation of an ongoing plan involves estimates of the reported amounts and assumptions about the probability of occurrence of events far into the future. Examples include assumptions about future employment mortality and future salary increases. Amounts determined regarding the net pension liability are subject to continual revision as actual results are compared with past expectations and new estimates are made about the future. The *Schedule of Changes in Employers' Net Pension Liability* presents multi-year trend information about whether the plan fiduciary net positions are increasing or decreasing over time relative to the total pension liability. These schedules are presented in the *Required Supplementary Information* on page 51-52. The total pension liability, as of June 30, 2017, is $13,152,273,895 for MSEP and $564,417,925 for the Judicial Plan based on an actuarial valuation performed as of June 30, 2017, and a measurement date of June 30, 2017, using generally accepted actuarial procedures.

Changes to Amortization Period

In June 2013, the board approved a change to the period over which unfunded actuarial accrued liabilities are amortized to reduce the amortization period from an open 30 years to a closed 30 years beginning July 1, 2014. This will continue to reduce by one year for each subsequent annual valuation until the period reaches one year. The board intends to reexamine the amortization period in connection with the 2030 actuarial valuation to determine whether or not it should be reduced below 15 years.

The *Summary of Actuarial Assumptions* below applies to all periods included in the measurement of the total pension liability.

Summary of Actuarial Assumptions for MSEP & Judicial Plan

Valuation date	June 30, 2017
Actuarial cost method	Entry age normal
Amortization method	Level percentage, closed
Remaining amortization period	27 years for FY19 contribution rate
Asset valuation method	Open 5-year smoothed +25/-20% market corridor
Investment rate of return	7.65% effective June 30, 2016 7.50% effective June 30, 2017
Projected salary increases	3.25 – 8.75% (MSEP) 3.0 – 5.2% (Judicial Plan)
Rate of payroll growth	3.00%
COLAs	4.00%/2.00%*
Price inflation	2.50%

Mortality rates are based on the RP-2014 Healthy Annuitant mortality table, projected from 2006 to 2026 with Scale MP-2015 and scaled by 120% for the MSEP and 98% for the Judicial Plan. The preretirement mortality table used was the RP-2014 Employee mortality table, projected from 2006 to 2026 with Scale MP-2015 and scaled by 95% for males and 90% for females for the MSEP.

An experience study covering the five-year period ending June 30, 2015 was performed in 2016.

* *On a compound basis, 4.00% for the first 12 years, 3.06% for the 13th year, and 2.00% per year thereafter. When no minimum COLA is in effect, the annual COLA is assumed to be 2.00% (80% of the 2.50% price inflation), on a compounded basis.*

The discount rate used to measure the total pension liability was 7.50%. The projection of cash flows used to determine the discount rate assumed that contributions from participating employers will be made using the actuarially determined rates. Based on those assumptions, MOSERS' fiduciary net position was projected to be available to make all the projected future benefit payments of the current plan members. As a result, the long-term expected rate of return on pension plan investments of 7.50% was applied to all periods of projected benefit payments to determine the total pension liability.

The table below presents the net pension liability of the plans, as of June 30, 2017, calculated using the discount rate of 7.50%, as well as what the net pension liability would be if it were calculated using a discount rate that is 1% lower (6.50%) or 1% higher (8.50%) than the current rate.

Sensitivity of Net Pension Liability to Changes in the Discount Rate

Employers' Net Pension Liability	1% Decrease (6.50%)	Current Discount Rate (7.50%)	1% Increase (8.50%)
MSEP	$6,704,024,789	$5,206,915,597	$3,947,666,258
Judicial Plan	484,552,509	426,782,984	377,354,336

The funding status of the plans and *Employer Schedule of Funding Progress* can be found in the *Actuarial Section* on page 96.

(6) Contributions and Reserves

The MSEP and the Judicial Plan are pension plans covering substantially all state of Missouri employees and judges. The state of Missouri and its component employers make required contributions to the plans. The required contributions are expressed as a level percentage of covered payroll and are actuarially determined using an individual entry-age normal actuarial cost method. Contributions began July 2014 at the contribution rate determined by the June 30, 2013 actuarial valuation (16.97% and 58.45% for MSEP and Judicial Plan, respectively) and will continue at or above that rate until the actuarial funding of the plans is at least 80%. MSEP 2011 and Judicial Plan 2011 members are required to contribute 4% of their pay. Costs of administering the plans are financed from the contributions to the pension trust funds and investment earnings.

(7) Other Post-Employment Benefits (OPEB)

In addition to the defined-benefit pension provided through MOSERS, the state of Missouri also funds, either partially or in its entirety, OPEB for eligible retirees as follows:

Retiree Life Insurance

Members who retire on or after October 1, 1985, are eligible for $5,000 of state-sponsored basic life insurance coverage if they retire directly from active employment. As of June 30, 2017, 25,819 retirees were participating in the program. This insured defined-benefit coverage is financed on a percentage of payroll (.115%) and is purchased as a group policy through competitive bids and is currently administered through The Standard insurance company. The cost for the year ended June 30, 2017 was $1,901,630. Premiums are contributed entirely by the state and its component employers as provided by Section 104.515, RSMo.

Retirees of the Department of Labor and Industrial Relations (DOLIR), who retired prior to January 1, 1996, are eligible for state-sponsored insured defined-benefit insurance coverage in the same amount of coverage they were receiving through the DOLIR. As of June 30, 2017, 189 retirees were participating in the program. The coverage for this closed group is purchased as a group policy through competitive bids at a current cost of $2.07 per thousand dollars of coverage, per month, per eligible participant ($23,586 for the year ended June 30, 2017). Premiums are paid entirely by the DOLIR as provided by Section 228.225, RSMo. Retirees of the DOLIR who retired on or after January 1, 1996, are eligible for $5,000 of state-sponsored life insurance coverage if they retire directly from active employment. They are included in the group described in the preceding paragraph.

Long-Term Disability Insurance (LTD)

MOSERS provides LTD coverage for eligible members and generally includes those active members of MOSERS' retirement plans who do not have other disability coverage and are not yet eligible to receive normal (unreduced) retirement benefits. There were 33,277 members covered under the program, as of June 30, 2017. This insured defined-benefit coverage is billed on a percentage of covered payroll (0.55%). Purchased as group policy through competitive bids, LTD is administered by The Standard insurance company. The cost for the year ended June 30, 2017 was $8,137,551. Premiums are contributed by the state and its component employers as provided for by Section 104.515, RSMo.

Post-Employment Retiree Health Care

MOSERS participates in a cost-sharing multiple-employer defined-benefit post-employment health care plan administered by the Missouri Consolidated Health Care Plan (MCHCP). The plan provides medical benefits to retirees of participating governmental entities. Retirees who had medical insurance coverage for six months immediately prior to termination or state-sponsored medical coverage since the effective date of the last enrollment period (or since first eligible), before they are eligible to retire, may continue coverage into retirement.

MCHCP issues a publicly available financial report that includes *Financial Statements* and *Required Supplementary Information* for the post-employment health care plan. The report may be obtained online at *www.mchcp.org* or by calling (800) 487-0771 or writing to MCHCP, 832 Weathered Rock Court, P.O. Box 104355, Jefferson City, MO 65110-4355.

Plan funding requests are actuarially determined, approved by the MCHCP Board of Trustees and subject to appropriation by the Missouri General Assembly. MOSERS contributed $267,315 in FY15, $260,223 in FY16, and $275,895 in FY17 in accordance with the state's funding policy toward the annual required contributions for post-employment retiree health care, which equaled MOSERS' required contribution each year.

(8) Plan Termination

MOSERS and its related plans are administered in accordance with Missouri statutes. Plans can only be terminated by an amendment to these statutes by the Missouri legislature.

On April 26, 2005, Senate Bill 202 was enacted, which terminated the Administrative Law Judges and Legal Advisors' Plan (ALJLAP) for new hires only. Under this legislation, individuals who assume a position after April 26, 2005, who would have otherwise been covered by the ALJLAP, will instead participate in the MSEP or the MSEP 2000, depending on when they initially became state employees. For fiscal years 2005 and after, all liabilities and assets of the ALJLAP were transferred and combined with the MSEP. Membership totals for the ALJLAP are included in the MSEP in all relevant sections of this report.

(9) Commitments

As of June 30, 2017, MOSERS has $326,944,831 and €868,751 unfunded commitments in the private asset class.

(10) Contingencies

MOSERS is a defendant in a lawsuit involving the GM Bankruptcy. The trustee for the bankruptcy paid MOSERS $500,047 based on the assumption that it was a secured debt owed to MOSERS. It appears that the loan administrator released the security interest prior to the payment being made by the trustee. MOSERS and the other investors who received similar payments have been sued in the bankruptcy case on the theory that we were unsecured creditors who improperly received payments. MOSERS is being represented by a firm that is also representing a number of similarly situated defendants. Our group has filed a cross claim against JP Morgan and is currently engaged in that litigation.

(11) Risk Management

MOSERS is exposed to various risks of loss related to natural disasters, error, and omissions, loss of assets, torts, etc. MOSERS has chosen to cover such losses through the purchase of commercial insurance to help mitigate some of the exposure to those risks. There have been no material insurance claims filed or paid during the past three years.

REQUIRED SUPPLEMENTARY INFORMATION

Pension Trust Funds

Schedule of Changes in Employers' Net Pension Liability | For Years Ended June 30, 2014–2017*

MSEP

	2014	2015	2016	2017
Total pension liability				
Service cost	$ 158,116,026	$ 150,412,577	$ 149,021,755	$ 152,766,134
Interest on the total pension liability	869,878,195	896,451,618	913,877,923	945,654,398
Benefit changes	0	0	0	(1,696,059)
Difference between expected and actual experience	12,376,237	(27,983,267)	61,150,083	(104,203,260)
Assumption changes	0	(57,568,553)	656,805,085	202,554,786
Benefit payments and member refunds	(680,436,107)	(728,265,800)	(757,310,503)	(793,964,857)
Net change in total pension liability	359,934,351	233,046,575	1,023,544,343	401,111,142
Total pension liability - beginning	11,134,637,484	11,494,571,835	11,727,618,410	12,751,162,753
Total pension liability - ending (a)	$11,494,571,835	$11,727,618,410	$12,751,162,753	$13,152,273,895
Plan fiduciary net position				
Employer contributions	$ 326,370,336	$ 329,752,832	$ 329,957,369	$ 335,217,422
Employee contributions	14,025,328	18,099,455	21,684,920	25,439,343
Pension plan net investment income (loss)	1,193,952,121	(237,070,529)	1,740,269	272,595,668
Benefit payments and member refunds	(680,436,107)	(728,265,800)	(757,310,503)	(793,964,857)
Pension plan administrative expense	(7,336,922)	(8,077,692)	(8,489,375)	(8,759,341)
Other	296,369,500	5,434,820	4,923,622	5,668,849
Net change in plan fiduciary net position	1,142,944,256	(620,126,914)	(407,493,698)	(163,802,916)
Plan fiduciary net position - beginning	7,993,837,570	9,136,781,826	8,516,654,912	8,109,161,214
Plan fiduciary net position - ending (b)	9,136,781,826	8,516,654,912	8,109,161,214	7,945,358,298
Net pension liability - ending (a)-(b)	$ 2,357,790,009	$ 3,210,963,498	$ 4,642,001,539	$ 5,206,915,597
Plan fiduciary net position as a percentage of total pension liability	79.49%	72.62%	63.60%	60.41%
Covered employee payroll	$ 1,902,719,928	$1,918,527,768	$ 1,921,528,936	$ 1,941,969,786
Net pension liability as a percentage of covered employee payroll	123.92%	167.37%	241.58%	268.13%

** Schedule is intended to show information for 10 years. Data for additional years will be displayed as it becomes available.*

REQUIRED SUPPLEMENTARY INFORMATION

Pension Trust Funds

Schedule of Changes in Employers' Net Pension Liability | For Years Ended June 30, 2014–2017*

Judicial Plan

	2014	2015	2016	2017
Total pension liability				
Service cost	$ 8,990,293	$ 10,613,686	$ 10,932,097	$ 12,945,567
Interest on the total pension liability	34,013,615	36,161,612	37,755,240	40,617,091
Benefit changes	0	0	0	0
Difference between expected and actual experience	13,360,614	5,103,664	(5,036,696)	(10,687,091)
Assumption changes	0	0	53,991,379	7,905,466
Benefit payments including member refunds	(29,406,625)	(31,245,906)	(32,989,714)	(33,984,725)
Net change in total pension liability	26,957,897	20,633,056	64,652,306	16,796,308
Total pension liability - beginning	435,378,358	462,336,255	482,969,311	547,621,617
Total pension liability - ending (a)	$462,336,255	$482,969,311	$547,621,617	$564,417,925
Plan fiduciary net position				
Employer contributions	$ 29,264,877	$ 32,696,686	$ 33,642,498	$ 34,246,826
Employee contributions	294,810	488,193	661,206	786,745
Pension plan net investment income (loss)	17,199,701	(3,610,352)	28,081	4,680,131
Benefit payments including member refunds	(29,406,625)	(31,245,906)	(32,979,706)	(33,984,725)
Pension plan administrative expense	(105,693)	(123,015)	(136,983)	(150,387)
Other	4,195,049	0	0	0
Net change in plan fiduciary net position	21,442,119	(1,794,394)	1,205,088	5,578,590
Plan fiduciary net position - beginning	111,203,538	132,645,657	130,851,263	132,056,351
Plan fiduciary net position - ending (b)	132,645,657	130,851,263	132,056,351	137,634,941
Net pension liability - ending (a)-(b)	$329,690,598	$352,118,048	$415,565,266	$426,782,984
Plan fiduciary net position as a percentage of total pension liability	28.69%	27.09%	24.11%	24.39%
Covered employee payroll	$ 49,587,936	$ 55,656,457	$ 57,421,016	$ 58,150,935
Net pension liability as a percentage of covered employee payroll	664.86%	632.66%	723.72%	733.92%

** Schedule is intended to show information for 10 years. Data for additional years will be displayed as it becomes available.*

REQUIRED SUPPLEMENTARY INFORMATION

Pension Trust Funds

Schedule of Employer Contributions | Last Ten Years

MSEP

Year Ended June 30	Actuarially Determined Contribution	Contributions in Relation to the Actuarially Determined Contribution**	Contribution Deficiency (Excess)	Covered Employee Payroll	Contributions as a Percentage of Covered Payroll*
2008	$249,770,156	$249,770,156	$ 0	$1,916,527,398	13.0%
2009	252,105,008	252,105,008	0	2,002,402,087	12.6
2010	251,226,187	251,226,187	0	1,945,095,321	12.9
2011	263,418,048	263,418,048	0	1,875,569,816	14.0
2012	263,373,924	263,373,924	0	1,864,069,493	14.1
2013	274,655,284	274,655,284	0	1,880,212,950	14.6
2014	326,370,336	326,370,336	0	1,902,719,928	17.2
2015	329,752,832	329,752,832	0	1,918,527,768	17.2
2016	329,957,369	329,957,369	0	1,921,528,936	17.2
2017	322,772,697	335,217,422	(12,444,725)	1,941,969,786	17.3

Judicial Plan

Year Ended June 30	Actuarially Determined Contribution	Contributions in Relation to the Actuarially Determined Contribution**	Contribution Deficiency (Excess)	Covered Employee Payroll	Contributions as a Percentage of Covered Payroll*
2008	$26,215,309	$26,215,309	0	$44,542,530	58.9%
2009	27,725,882	27,725,882	0	45,505,512	60.9
2010	27,029,198	27,029,198	0	46,112,730	58.6
2011	27,702,682	27,702,682	0	45,888,020	60.4
2012	26,324,526	26,324,526	0	45,835,501	57.4
2013	28,330,649	28,330,649	0	48,697,726	58.2
2014	29,264,877	29,264,877	0	49,587,936	59.0
2015	32,696,686	32,696,686	0	55,656,457	58.7
2016	33,642,498	33,642,498	0	57,421,016	58.6
2017	32,670,710	34,246,826	(1,576,116)	58,150,935	58.9

* *Actuarial contribution rate shown is the actual employer contribution made divided by payroll in force on May 31 reported for valuation. This rate as computed may vary from the board's certified employer contribution rate due to the fluctuations in membership and pay during the year.*

** *Since the percent of payroll contribution rate was applied to pension payroll during the fiscal year, the actuarially determined contribution is equal to the actual contribution.*

REQUIRED SUPPLEMENTARY INFORMATION

Pension Trust Funds

Schedule of Annual Money-Weighted Rate of Return on Investments*

Year Ended June 30	Annual Money-Weighted Rate of Return — Net of Investment Expense
2014	19.25%
2015	(2.60)
2016	0.08
2017	3.51

* *Schedule is intended to show information for 10 years. Data for additional years will be displayed as it becomes available.*

REQUIRED SUPPLEMENTARY INFORMATION

Pension Trust Funds

Notes to the Schedules of Required Supplementary Information | Last Ten Years

Actuarial Methods and Assumptions for Valuations Performed as of June 30, 2017

The entry-age actuarial cost method of valuation is used in determining liabilities and normal cost. Regular actuarial valuations provide valuable information about the composite change in the unfunded actuarial accrued liabilities (whether or not the liabilities are increasing or decreasing, and by how much). Since the future cannot be predicted with precision, actual experience is expected to differ from assumed experience. Differences occurring in the past between assumed experience and actual experience (actuarial gains and losses) become part of actuarial accrued liabilities. Unfunded actuarial accrued liabilities are amortized to produce payments (principal and interest), which are expressed as a percent of payroll. A closed 27-year amortization period was used for the June 30, 2017 valuations to determine the FY19 contribution rates. The actuarial value of assets is based on a method that fully recognizes expected investment returns and averages unanticipated market returns over a 5-year period. The corridor limit is currently 80% to 125%.

The investment return rate assumption was reduced from 7.65% as of June 30, 2016, to 7.50% per year as of June 30, 2017, compounded annually (net of investment expenses). The price inflation assumption used was 2.5% per year. Projected salary assumptions were 3.25% to 8.75% for MSEP and 3.0% to 5.2% for the Judicial Plan. The assumption used for annual post-retirement benefit increases (COLAs) is 4.0% (on a compound basis) when a minimum COLA is in effect. When no minimum COLA is in effect, the annual COLA is assumed to be 2.00% (80% of the 2.50% price inflation), on a compounded basis.

2008 | The actuarial valuations, as of June 30, 2008, reflected the following changes to the computed contribution rates for fiscal year ended June 30, 2010.

	Amount	Percent of Payroll
MSEP		
Change in benefit assumptions or methods	$4,791,318	0.25%
Experience and nonrecurring items	(574,958)	(0.03)
Judicial Plan		
Change in benefit assumptions or methods	(547,873)	(1.23)
Experience and nonrecurring items	(160,353)	(0.36)

2009 | The actuarial valuations, as of June 30, 2009, reflected the following changes to the computed contribution rates for fiscal year ended June 30, 2011.

	Amount	Percent of Payroll
MSEP		
State of Missouri general pay freeze	$ (4,405,285)	(0.22)%
Experience and nonrecurring items	55,466,538	2.77
Change in valuation asset corridor from +/- 20% to +/- 30%	(29,835,791)	(1.49)
Judicial Plan		
State of Missouri general pay freeze	350,392	0.77
Experience and nonrecurring items	496,010	1.09
Change in valuation asset corridor from +/- 20% to +/- 30%	(141,067)	(0.31)

2010

The actuarial valuations, as of June 30, 2010, reflected the following changes to the computed contribution rates for fiscal year ended June 30, 2012.

	Amount	Percent of Payroll
MSEP		
State of Missouri general pay freeze	$ (2,528,624)	(0.13)%
Addition of new tier of benefits effective January 1, 2011	(17,311,348)	(0.89)
Experience and nonrecurring items	25,480,749	1.31
Change in timing of contributions	(2,528,624)	(0.13)
Judicial Plan		
State of Missouri general pay freeze	(308,955)	(0.67)
Addition of new tier of benefits effective January 1, 2011	(493,406)	(1.07)
Experience and nonrecurring items	438,071	0.95
Change in timing of contributions	(894,587)	(1.94)

2011

The actuarial valuations, as of June 30, 2011, reflected the following changes to the computed contribution rates for fiscal year ended June 30, 2013.

	Amount	Percent of Payroll
MSEP		
State of Missouri general pay freeze	$(6,376,937)	(0.34)%
Experience and nonrecurring items	17,630,356	0.94
Change in normal cost due to increasing population in MSEP 2011	(2,250,684)	(0.12)
Judicial Plan		
State of Missouri general pay freeze	(293,683)	(0.64)
Experience and nonrecurring items	289,095	0.63
Change in normal cost due to increasing population in Judicial Plan 2011	(169,786)	(0.37)

2012

The actuarial valuations, as of June 30, 2012, reflected the following changes to the computed contribution rates for fiscal year ended June 30, 2014.

	Amount	Percent of Payroll
MSEP		
Change in assumptions or methods	$21,623,206	1.16%
Experience and nonrecurring items	25,537,752	1.37
Judicial Plan		
Change in assumptions or methods	948,795	2.07
Experience and nonrecurring items	320,849	0.70

REQUIRED SUPPLEMENTARY INFORMATION

2013

The actuarial valuations, as of June 30, 2013, reflected the following changes to the computed contribution rates for fiscal year ended June 30, 2015.

	Amount	Percent of Payroll
MSEP		
Change in benefit assumptions or methods	$18,990,151	1.01%
Experience and nonrecurring items	(376,043)	(0.02)
Judicial Plan		
Change in benefit assumptions or methods	(603,852)	(1.24)

2014

The actuarial valuations, as of June 30, 2014, reflected the following changes to the computed contribution rates for fiscal year ended June 30, 2016.

	Amount	Percent of Payroll
MSEP		
Recognition of asset gains	$16,173,119	0.85%
Experience and nonrecurring items	(1,141,632)	(0.06)
Change in normal cost due to increasing population in MSEP 2011 and experience	4,376,256	0.23
Judicial Plan		
Change in normal cost due to increasing population in Judicial Plan 2011 and experience	(510,756)	(1.03)
Anticipated change in salary levels	(1,180,193)	(2.38)

2015

The actuarial valuations, as of June 30, 2015, reflected the following changes to the computed actuarially determined contribution (ADC) rates for fiscal year ended June 30, 2017. Actual contribution rate differs from computed ADC due to minimum funding policy adopted by the board in September 2014, requiring contributions to be no less than 16.97% of covered payroll for MSEP and 58.45% for Judicial Plan until the funding ratio is at least 80% for each plan.

	Amount	Percent of Payroll
MSEP		
Recognition of asset losses	$ 7,674,111	0.40%
Experience and nonrecurring items	4,412,614	0.23
Change in normal cost due to increasing population in MSEP 2011 and experience	(4,604,467)	(0.24)
Liability (gain) loss	(1,918,528)	(0.10)
Change in benefit assumptions or methods	3,069,644	0.16
Minimum funding policy contribution	(1,151,117)	(0.06)
Judicial Plan		
Recognition of asset losses	116,879	0.21
Experience and nonrecurring items	417,423	0.75
Change in normal cost due to increasing population in Judicial Plan 2011 and experience	(372,898)	(0.67)
Liability (gain) loss	361,767	0.65
Minimum funding policy contribution	(122,444)	(0.22)

2016

The actuarial valuations, as of June 30, 2016, reflected the following changes to the computed actuarially determined contribution (ADC) rates for fiscal year ended June 30, 2018.

	Amount	Percent of Payroll
MSEP		
Recognition of asset losses	$ 21,136,818	1.10%
Change in normal cost due to increasing population in MSEP 2011 and experience	(3,843,058)	(0.20)
Liability (gain) loss	3,843,058	0.20
Projected payroll higher than expected	(192,153)	(0.01)
Change in benefit assumptions or methods	39,583,496	2.06
Minimum funding policy contribution	(768,612)	(0.04)
Judicial Plan		
Recognition of asset losses	9,415,492	0.49
Experience and nonrecurring items	(13,258,550)	(0.69)
Change in benefit assumptions or methods	130,856,121	6.81
Change in normal cost due to increasing population in Judicial 2011 and experience	(1,345,070)	(0.07)
Minimum funding policy contribution	(4,035,211)	(0.21)

2017

The actuarial valuations, as of June 30, 2017, reflected the following changes to the computed actuarially determined contribution (ADC) rates for fiscal year ended June 30, 2019.

	Amount	Percent of Payroll
MSEP		
Recognition of asset losses	$ 14,758,970	0.76%
Recognition of liability gains	(1,359,379)	(0.07)
Change in benefit assumptions or methods	13,982,182	0.72
Projected payroll lower than expected	970,985	0.05
Minimum funding policy contribution	(776,788)	(0.04)
Normal cost	(2,524,561)	(0.13)
Change in effective employee contribution rate	1,359,379	0.07
Transition/actuarial software	(12,622,804)	(0.65)
Experience and nonrecurring items	970,985	0.04
Judicial Plan		
Recognition of asset losses	226,789	0.39
Recognition of liability gains	(122,117)	(0.21)
Change in benefit assumptions or methods	453,577	0.78
Projected payroll lower than expected	343,091	0.59
Minimum funding policy contribution	(104,672)	(0.18)
Normal cost	(360,536)	(0.62)
Change in effective employee contribution rate	58,151	0.10
Transition/actuarial software	186,083	0.32
Other experience	261,679	0.45

ADDITIONAL FINANCIAL INFORMATION

Pension Trust Funds

Schedules of Investment Expenses

Investing Activity	MSEP	Judicial Plan	Total
Investment management and administrative fees			
Actis Emerging Markets III & IV – private equity	$ 1,314,433	$ 22,567	$ 1,337,000
African Development Partners I & II, LLC – private equity	6,882,599	118,166	7,000,765
Alinda Infrastructure Fund I, LP – private equity	248,137	4,260	252,397
American Industrial Partners V & VI – private equity	1,098,253	18,856	1,117,109
AQR DELTA Sapphire Fund, LP – hedge funds	3,788,947	65,052	3,853,999
AQR Global Risk Premium Fund IV, LP – beta-balanced	2,491,944	42,784	2,534,728
AQR Style Premia Fund, LP – hedge funds	(256,555)	(4,405)	(260,960)
Astenbeck Capital – beta-balanced	14,440,025	247,917	14,687,942
Axiom Asia Private Capital Fund II & III, LP – private equity	1,403,226	24,092	1,427,318
Axxon Brazil Private Equity Fund II B – private equity	211,187	3,626	214,813
Bayview Opportunity Domestic, LP – high yield	409,936	7,038	416,974
Bayview Opportunity Domestic III b, LP – real estate	1,978,399	33,967	2,012,366
BlackRock Financial Management Bank Loans – high yield	837	14	851
Blackstone Real Estate Partners IV, V, VI, & VII – real estate	5,161,290	88,613	5,249,903
Blackstone Topaz Fund, LP – hedge funds	3,024,740	51,931	3,076,671
Blakeney Onyx, LP – emerging markets	1,223,100	20,999	1,244,099
Bridgewater Associates Diamond Ridge Fund, LLC – hedge funds	3,518,197	60,403	3,578,600
Bridgewater All Weather, LLC – beta-balanced	2,088,540	35,858	2,124,398
CarVal Investors CVI Global Value Fund A, LP – real estate	110,293	1,894	112,187
CarVal Investors CVI Global Value Fund A, LP – private debt	110,293	1,894	112,187
Castlelake Aviation II – private equity	392,299	6,735	399,034
Catalyst Fund III, IV & V, LP – private debt	6,392,392	109,749	6,502,141
Catterton Partners V, VI, & VII, LP – private equity	939,157	16,124	955,281
Cornwall Domestic, LP – hedge funds	1,039,537	17,848	1,057,385
Davidson Kempner Institutional Partners, LP – hedge funds	673,926	11,570	685,496
DRI Capital LSRC – private equity	719,803	12,358	732,161
EIG Energy Fund XIV, XV, & XVI, LP – private equity	2,310,943	39,676	2,350,619
Elliott International, Ltd. – hedge funds	7,645,014	131,255	7,776,269
Farallon Capital Institutional Partners, LP – hedge funds	56,597	972	57,569
Gaoling Fund, LP – hedge funds	7,126,563	122,354	7,248,917
Garnet Sky Investors Company, Ltd. – timber	2,578,521	44,270	2,622,791
Gateway Energy & Resource Holdings, LLC – real estate	375,998	6,455	382,453
GCM Equity Partners & Glenview Capital Opportunity Fund, LP – hedge funds	544,687	9,352	554,039
Global Forest Partners GTI7 Institutional Investors Company Ltd. – timber	579,316	9,946	589,262
Harvest Fund Advisors – real estate	703,651	12,081	715,732
HBK Merger Strategies Offshore Fund, Ltd. – hedge funds	3,207,556	55,070	3,262,626
JLL Partners V & VI, LP – private equity	3,777,109	64,848	3,841,957
King Street Capital, LP – hedge funds	81,538	1,400	82,938
Linden Capital Partners II & Linden – Co-investment I – private equity	3,654,416	62,742	3,717,158
Mast Credit Opportunities I, LP – hedge funds	816,934	14,026	830,960
Merit Energy Partners F–II, LP – real estate	183,189	3,145	186,334
MHR Institutional Partners IIA, III & IV LP – private debt	5,044,016	86,600	5,130,616
Millennium Technology Value Partners II, LP – private equity	725,355	12,453	737,808
New Mountain Partners III, LP – private equity	4,132,505	70,950	4,203,455
NISA Investment Advisors, LLC – beta-balanced	4,687,062	80,471	4,767,533

Schedule of Investment Expenses continued on page 60

ADDITIONAL FINANCIAL INFORMATION

Schedule of Investment Expenses continued from page 59

Investing Activity	MSEP	Judicial Plan	Total
OCM Real Estate Opportunities Fund III, LP – real estate	(75,706)	(1,300)	(77,006)
OCM Opportunities Fund IV b, VII b & VIII b, LP – private debt	271,278	4,658	275,936
OCM/GFI Power Opportunities Fund II & III, LP – private equity	1,244,038	21,359	1,265,397
Perry Partners – hedge funds	505	9	514
Pharo Macro Fund, Ltd. – hedge funds	6,691,588	114,886	6,806,474
Resource Management Service Wildwood Timberlands, LLC – timber	958,531	16,457	974,988
Silchester International Investors – int'l developed equity	4,542,856	77,995	4,620,851
Silver Creek Special Opportunities Fund I & II – private equity	63,600	1,092	64,692
Silver Lake Partners II, LP – private equity	(201,751)	(3,464)	(205,215)
SIR Hedged Equity Fund, Ltd. – hedge funds	2,991,158	51,354	3,042,512
Siris Partners II & III, LP – private equity	523,608	8,990	532,598
State Street Global Advisors – emerging markets	155,009	2,661	157,670
StepStone Capital Buyout Fund I & II, LP – private equity	267,412	4,591	272,003
StepStone Opportunities Fund II, LP – private equity	33,902	582	34,484
Stone Harbor Investment Partners, LP – emerging markets	182,190	3,128	185,318
Veritas Capital Fund III & IV, LP – private equity	2,862,296	49,142	2,911,438
Viking Global Equities III, Ltd. – hedge funds	4,444,292	76,303	4,520,595
Total investment management fees	132,590,711	2,276,419	134,867,130
Other investment fees			
Investment consultant fees			
Albert A. Slawsky	43,012	738	43,750
Summit Strategies, Inc.	716,244	12,298	728,542
TimberLink Consulting	27,036	464	27,500
Investment custodial fees			
BNY Mellon	267,051	4,585	271,636
Performance and risk measurement fees			
BNY Mellon	196,040	3,366	199,406
MSCI, Inc.	258,069	4,431	262,500
Internal investment activity expenses	3,803,355	65,299	3,868,654
Total investing activity expenses	137,901,518	2,367,600	140,269,118
Securities lending activity			
Securities lending borrower rebates	(32,622)	(560)	(33,182)
Securities lending management fees			
BNY Mellon	61,445	1,055	62,500
Deutche Bank	4,632	79	4,711
Total securities lending activity expenses	33,455	574	34,029
Total investment expenses	$137,934,973	$2,368,174	$140,303,147

ADDITIONAL FINANCIAL INFORMATION

Pension Trust Funds

Schedules of Internal Investment Activity Expenses | Year Ended June 30, 2017

	MSEP	Judicial Plan	Total
Personnel services			
Salaries	$2,348,574	$40,322	$2,388,896
Fringe benefits	808,979	13,889	822,868
Total personnel services	3,157,553	54,211	3,211,764
Professional services			
Attorney services	148,466	2,549	151,015
Total professional services	148,466	2,549	151,015
Communications			
Telephone	15,807	271	16,078
Total communications	15,807	271	16,078
Facilities			
Utilities	2,997	51	3,048
Lease expense	50,323	864	51,187
Depreciation	34,895	599	35,494
Facility maintenance	7,932	136	8,068
Vehicle maintenance and operation	204	4	208
Total facilities	96,351	1,654	98,005
Software and equipment			
Computer supplies and software	7,751	133	7,884
Depreciation	2,616	45	2,661
Loss on sale of equipment	3,236	56	3,292
Total software and equipment	13,603	234	13,837
Education, meetings and travel			
Tuition reimbursement	8,274	142	8,416
Professional development including travel	26,726	459	27,185
Due diligence travel	17,091	293	17,384
Total travel and meetings	52,091	894	52,985
General			
Research and information services	292,039	5,014	297,053
Membership dues	13,513	232	13,745
Office supplies	1,175	20	1,195
Periodicals and publications	9,444	162	9,606
Miscellaneous expense	3,313	58	3,371
Total general	319,484	5,486	324,970
Total internal investment activity expenses	$3,803,355	$65,299	$3,868,654

Pension Trust Funds

Schedules of Administrative Expenses | Year Ended June 30, 2017

	MSEP	Judicial Plan	Total
Personnel services			
Salaries	$4,339,071	$ 74,496	$4,413,567
Fringe benefits	1,787,989	30,698	1,818,687
Total personnel services	6,127,060	105,194	6,232,254
Professional services			
Actuarial services	357,455	6,137	363,592
Attorney services	182,165	3,128	185,293
Auditing services	80,545	1,383	81,928
Banking services	36,415	625	37,040
Consulting services	246,024	4,224	250,248
Total professional services	902,604	15,497	918,101
Communications			
Video production	2,007	34	2,041
Telephone	64,450	1,107	65,557
Printing	32,134	552	32,686
Postage and mailing	109,159	1,874	111,033
Total communications	207,750	3,567	211,317
Facilities			
Depreciation	111,038	1,906	112,944
Utilities	48,719	836	49,555
Facility maintenance	84,133	1,444	85,577
Vehicle maintenance and operation	4,901	84	4,985
Total facilities	248,791	4,270	253,061
Software and equipment			
Computer supplies and software	71,411	1,226	72,637
Depreciation	98,073	1,684	99,757
Maintenance agreements	273,189	4,690	277,879
Equipment rental	151,475	2,601	154,076
Loss on sale of equipment	18,706	321	19,027
Total software and equipment	612,854	10,522	623,376
Education, meetings and travel			
Board travel and meetings	22,235	382	22,617
Professional development including travel	88,745	1,524	90,269
MOSERS sponsored seminars	90,117	1,547	91,664
Due diligence travel	7,136	123	7,259
Tuition reimbursement	860	15	875
Total education, meetings and travel	209,093	3,591	212,684
General			
Advertising	24,349	417	24,766
Research and information services	76,454	1,313	77,767
Insurance	174,234	2,991	177,225
Membership dues	25,432	437	25,869
Business continuity	61,378	1,054	62,432
Office supplies	7,578	130	7,708
Periodicals and publications	81,765	1,404	83,169
Miscellaneous	(1)	0	(1)
Total general	451,189	7,746	458,935
Total administrative expenses	$8,759,341	$150,387	$8,909,728

ADDITIONAL FINANCIAL INFORMATION

Internal Service Funds

Schedules of Administrative Expenses | Year Ended June 30, 2017

	Life and LTD	Deferred Compensation	Total
Personnel services			
Salaries	$287,764	$228,614	$516,378
Employee fringe benefits	117,162	92,457	209,619
Total personnel services	404,926	321,071	725,997
Professional services			
Attorney services	560	149	709
Auditing services	5,645	38,460	44,105
Banking services	498	0	498
Total professional services	6,703	38,609	45,312
Communications			
Postage and mailing	5,473	129	5,602
Telephone	4,517	2,420	6,937
Printing	2,252	147	2,399
Video production expense	141	0	141
Total communications	12,383	2,696	15,079
Facilities			
Building use charge	17,915	6,924	24,839
Utilities	3,414	0	3,414
Maintenance	6,200	0	6,200
Total facilities	27,529	6,924	34,453
Software and equipment			
Computer supplies and equipment	5,005	5,936	10,941
Depreciation	0	2,320	2,320
Equipment maintenance	18,954	458	19,412
Equipment rental	10,616	0	10,616
Total software and equipment	34,575	8,714	43,289
Education, meetings and travel			
Board travel and meetings	1,558	0	1,558
Professional development including travel	6,100	11,792	17,892
MOSERS sponsored seminars	6,316	442	6,758
Due diligence travel	500	2,412	2,912
Total education, meetings and travel	14,474	14,646	29,120
General			
Advertising	1,707	8,604	10,311
Research and information services	5,358	14,780	20,138
Insurance	12,311	0	12,311
Membership dues	1,782	1,425	3,207
Business continuity	5,730	0	5,730
Office supplies	4,160	483	4,63
Periodicals and publications	531	0	531
Total general	31,579	25,292	56,871
Total administrative expenses	$532,169	$417,952	$950,121

Schedules of Professional Service Fees | Year Ended June 30, 2017

		Pension Trust Funds			Internal Service Funds		
Professional Services	Nature of Service	MSEP	Judicial Plan	Total	Life and LTD	Deferred Compensation	Total
Operation administrative expenses							
Albert A. Slawsky	Asset consulting	$ 8,667	$ 149	8,816	$ 0	$ 0	$ 0
Avtex Solutions, Inc.	Information technology consulting	3,356	58	3,414	0	0	0
Cavanaugh Macdonald	Actuarial	116,518	2,001	118,519	0	0	0
Central Bank	Banking	36,415	625	37,040	387	0	387
Charlesworth & Associates	Risk management consulting	8,980	154	9,134	0	0	0
Collector Solutions, Inc.	Banking	0	0	0	111	0	111
Corporate Renaissance Group	Information technology consulting	82	1	83	0	0	0
DeKalb County Probate Court	Legal counsel	10	0	10	0	0	0
Dell	Information technology consulting	9,961	171	10,132	0	0	0
Gabriel, Roeder, Smith & Co.	Actuarial	240,935	4,137	245,072	0	0	0
Gamble & Schlemeier, Ltd.	Governmental consulting	24,929	428	25,357	0	0	0
Huber & Associates	Information technology consulting	8,371	144	8,515	0	0	0
ICON Integration and Design, Inc.	Pension administration system consulting	89,746	1,541	91,287	0	0	0
Linea Solutions	Pension administration system consulting	91,933	1,578	93,511	0	0	0
Thompson Coburn, LLP	Legal counsel	182,156	3,127	185,283	560	149	709
Williams Keepers, LLC	Financial audit	80,545	1,383	81,928	5,645	38,460	44,105
Operations administrative expenses subtotal		902,604	15,497	918,101	6,703	38,609	45,312
Internal investment administrative expenses							
Purrington Moody Weil, LLP	Legal counsel	24,228	416	24,644	0	0	0
Thompson Coburn, LLP	Legal counsel	124,238	2,133	126,371	0	0	0
Internal investment administrative expenses subtotal		148,466	2,549	151,015	0	0	0
Total professional fees		$1,051,070	$18,046	$1,069,116	$6,703	$38,609	$45,312

Information on investment management and consulting fees can be found in the *Schedule of Investment Expenses* on pages 59-60.