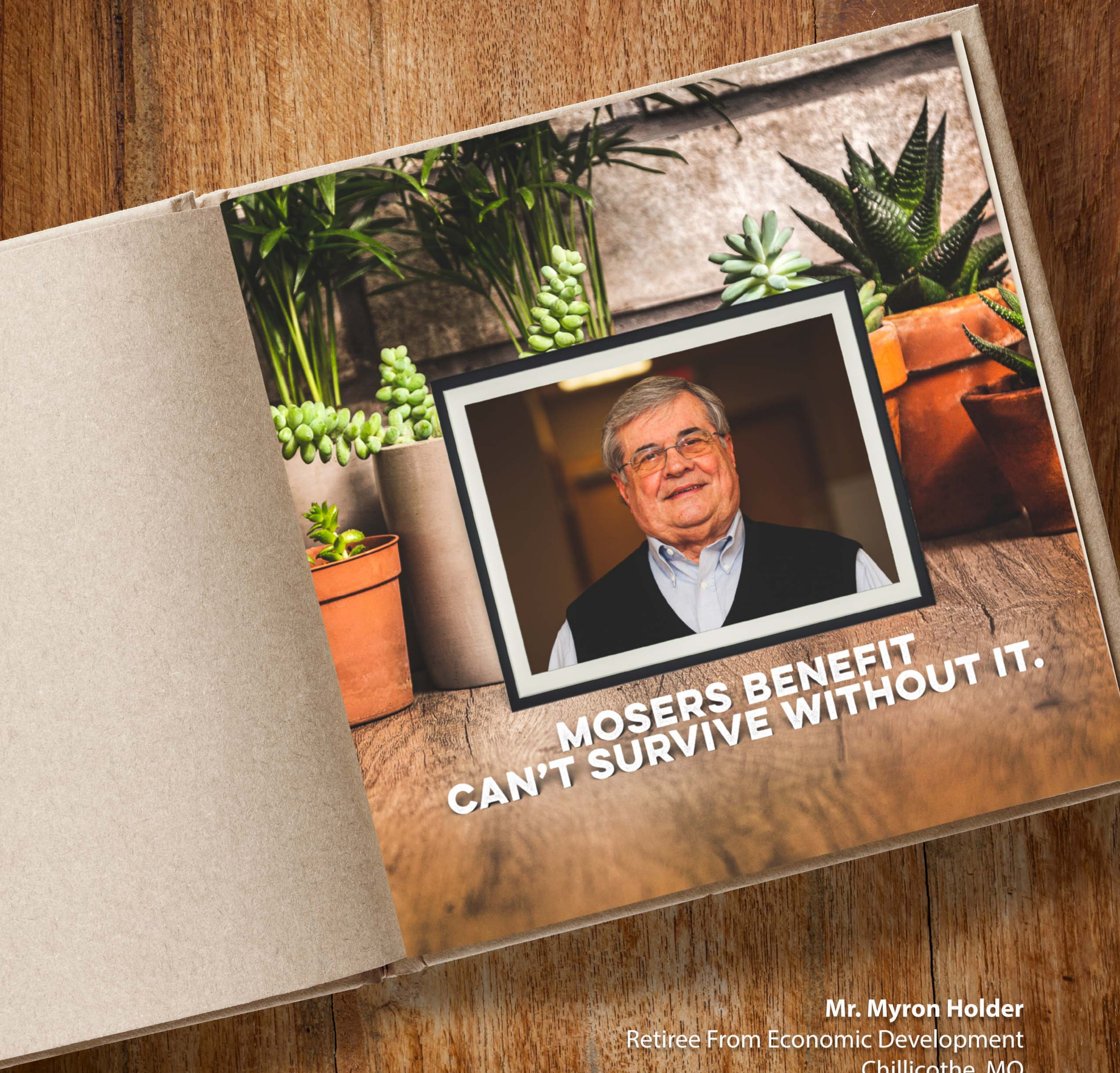
# Financial Section




**Mr. Myron Holder**
Retiree From Economic Development
Chillicothe, MO
Years of Service: 32 Years
Year Retired: 2007

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# Independent Auditor's Report

To the Board of Trustees
Missouri State Employees' Retirement System
Jefferson City, Missouri

## Report on Financial Statements

We have audited the accompanying financial statements of the pension and other trust funds and aggregate remaining fund information of the Missouri State Employees' Retirement System (MOSERS), a pension (and other employee benefit) trust fund of the state of Missouri, which comprise the statements of fiduciary net position as of June 30, 2021, and the related statements of changes in fiduciary net position, for the year then ended, and the related notes to the financial statements.

## Management's Responsibility for the Financial Statements

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

## Auditor's Responsibility

Our responsibility is to express opinions on these financial statements based on our audit. We conducted our audit in accordance with auditing standards generally accepted in the United States of America. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement.

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

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

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## Opinions

In our opinion, the financial statements referred to above present fairly, in all material respects, the respective financial position of the pension and other trust funds and aggregate remaining fund information of MOSERS as of June 30, 2021, and the respective changes in financial position and, where applicable, cash flows thereof for the year then ended in accordance with accounting principles generally accepted in the United States of America.

## Emphasis of Matter - Adoption of New Accounting Standard

As described in Note 2 to the financial statements, MOSERS early adopted the provisions of GASB Statement No. 97, *Certain Component Unit Criteria, and Accounting and Financial Reporting for Internal Revenue Code Section 457 Deferred Compensation Plans, an amendment of GASB Statements No. 14 and No. 84, and a supersession of GASB Statement No. 32.* As discussed in Note 2 to the financial statements, MOSERS has retroactively adjusted the financial statements to remove the administrative funds for the MO Deferred Compensation Plans and has adjusted the financial statements to include the activities of the insurance fund as a custodial fund. Our opinion is not modified with respect to this matter.

## Other Matters

## Required Supplementary Information

Accounting principles generally accepted in the United States of America require that the management's discussion and analysis and required supplementary information on pages 19-22 and 50-57 be presented to supplement the basic financial statements. Such information, although not a part of the basic financial statements, is required by the Governmental Accounting Standards Board, who considers it to be an essential part of financial reporting for placing the basic financial statements in an appropriate operational, economic, or historical context. We have applied certain limited procedures to the required supplementary information in accordance with auditing standards generally accepted in the United States of America, which consisted of inquiries of management about the methods of preparing the information and comparing the information for consistency with management's responses to our inquiries, the basic financial statements, and other knowledge we obtained during our audit of the basic financial statements. We do not express an opinion or provide any assurance on the information because the limited procedures do not provide us with sufficient evidence to express an opinion or provide any assurance.

## Other Information

Our audit was conducted for the purpose of forming an opinion on the financial statements that collectively comprise MOSERS' *Basic Financial Statements* as a whole. The *Introductory*, *Investment*, *Actuarial*, *Statistical Sections* and *Additional Supplemental Schedules* as listed in the table of contents are presented for purposes of additional analysis and are not a required part of the financial statements.

The additional supplementary information accompanying financial information listed as *Additional Supplemental Schedules* in the table of contents are the responsibility of management and were derived from and relate directly to the underlying accounting and other records used to prepare the *Basic Financial Statements*. Such information has been subjected to the auditing procedures applied in the audit of the *Basic Financial Statements* and certain additional procedures, including comparing and reconciling such information directly to the underlying accounting and other records used to prepare the *Basic Financial Statements* or to the *Basic Financial Statements* themselves, and other additional procedures in accordance with auditing standards generally accepted in the United States of America. In our opinion, the accompanying financial information listed as supplemental schedules are fairly stated, in all material respects, in relation to the *Basic Financial Statements* as a whole.

The *Introductory*, *Investment*, *Actuarial*, *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.

Eide Bailly LLP

Boise, Idaho

October 29, 2021

# 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, 2021. It is intended to be used in conjunction with the *Transmittal Letter* beginning on page 6 and *Basic Financial Statements* and *Notes to the Basic Financial Statements*, beginning on page 23 of this report.

## Using This Financial Report

This Annual Comprehensive Financial Report (ACFR) 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 23. These statements are prepared in conformity with generally accepted accounting principles. The *Notes to the Basic 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 Basic Financial Statements* provide historical information and additional details considered useful in evaluating the condition of the plan.

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 ACFR consist of:

- The *Statements of Fiduciary Net Position* report the fiduciary funds' assets, deferred outflows, liabilities, deferred inflows, and resulting net position, where total assets plus deferred outflows less current liabilities and deferred inflows 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 fiduciary funds at that specific point in time.
- The *Statements of Changes in Fiduciary Net Position* summarize the fiduciary funds' financial transactions that have occurred during the fiscal year where additions less deductions equal the 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 *Notes to the Basic Financial Statements* are an integral part of the above financial statements and include additional information not readily evident in the statements themselves.

## Funding Analysis

Funded status is presented using two different valuation methods within this document for two different purposes. One valuation method is for the purpose of determining contribution rates, and the other method is required by Governmental Accounting Standards Board (GASB) Statement 67 to provide information about the net pension liability as of a specific point in time using the market value of investment assets. The valuation method used for determining contribution rates smooths investment activity over a period of five years to minimize the impact investment market volatility can have on contribution rates.

### Funding Methodology for Determining Contribution Rates

The unfunded actuarial accrued liability (UAAL) for the Missouri State Employees' Plan (MSEP) increased by $0.7 billion from $5.5 billion at June 30, 2020, to $6.2 billion at June 30, 2021, with a corresponding decrease in funded percentage from 61.1% to 59.0%.

The UAAL for the Judicial Plan decreased by $12.8 million from $444.1 million at June 30, 2020, to $431.3 million at June 30, 2021, with an increase in funded percentage from 28.9% to 31.1%.

The assumed rate of investment return was 6.95% for both the MSEP and the Judicial Plan.

### Financial Reporting Methodology required by GASB Statement 67

The fund net position as a percentage of total pension liability increased from 55.5% at June 30, 2020, to 63.0% at June 30, 2021, for the MSEP Fund, and increased from 26.8% to 33.7% for the Judicial Plan Fund. See the *Required Supplementary Information* section of this report for more information about net pension liability and related information.

## Financial Reporting Highlights

MOSERS adopted Statement 84 issued by GASB. As part of adopting GASB Statement 84, MOSERS has changed the fund type of its insurance activities from being reported as an internal service fund to being reported as a custodial fund. As part of this change, the insurance activities are now reported in MOSERS' fiduciary statements, instead of being reported as internal service funds.

In addition to the reporting changes related to insurance activities, adopting GASB Statement 84 has also required changes related to how MOSERS reports the deferred compensation plan activities. The administrative activities related to the deferred compensation plan will no longer be included in MOSERS' *Annual Comprehensive Financial Report.* Prior year comparative amounts have been adjusted where applicable. The administrative activities related to the Missouri State Public Employees Deferred Compensation Plan, and the Missouri State Public Employees Deferred Compensation Incentive Plan will continue to be included in the separately issued statements for those respective plans.

The *Summary Comparative Statements of Fiduciary Net Position*, and the *Summary Comparative Statements of Changes in Fiduciary Net Position* presented below are designed to provide the reader of this report with a high level overview of MOSERS' financial activity and net position. Amounts presented for fiscal year 2020 have been adjusted to include insurance activities as a fiduciary fund due to the adoption of GASB Statement 84.

### Summary Comparative Statements of Fiduciary Net Position

| | As of June 30, 2021 | As of June 30, 2020 (as adjusted) | Amount of Change | Percentage Change |
|---|---|---|---|---|
| **Assets** | | | | |
| Administrative operating cash and equivalents | $ 7,386,658 | $ 9,801,690 | $ (2,415,032) | (24.64)% |
| Receivables | 750,600,068 | 396,473,141 | 354,126,927 | 89.32 |
| Investments | 12,850,390,046 | 11,463,190,890 | 1,387,199,156 | 12.10 |
| Capital assets, net of accumulated depreciation | 11,070,763 | 7,530,526 | 3,540,237 | 47.01 |
| Other assets | 0 | 17,717 | (17,717) | (100.00) |
| Total assets | 13,619,447,535 | 11,877,013,964 | 1,742,433,571 | 14.67 |
| **Deferred outflow of resources** | 917,071 | 899,535 | 17,536 | 1.95 |
| **Liabilities** | | | | |
| Administrative and other payables | 6,903,186 | 11,021,679 | (4,118,493) | (37.37) |
| Investment related payables and obligations | 3,869,974,406 | 3,777,012,632 | 92,961,774 | 2.46 |
| MOSERS investment portfolio liability (MIP) | 3,953,169 | 3,481,031 | 472,138 | 13.56 |
| Net OPEB liability | 7,682,560 | 7,695,160 | (12,600) | (0.16) |
| Total liabilities | 3,888,513,321 | 3,799,210,502 | 89,302,819 | 2.35 |
| **Deferred inflow of resources** | 718,655 | 465,011 | 253,644 | 54.55 |
| **Net position restricted for fiduciary activities** | $ 9,731,132,630 | $ 8,078,237,986 | $ 1,652,894,644 | 20.46 |

The largest components of the net position of the pension trust funds are investments, and investment related receivables and liabilities. The majority of MOSERS' receivable balances are comprised of investment related transactions, such as pending trade settlements, and interest and dividends receivable. Investment related liabilities include payables for investments purchased, manager and incentive fees payable, and obligations under repurchase agreements. MOSERS investment portfolio liability (MIP) represents the amount Missouri Deferred Compensation Plan participants have invested in MOSERS' portfolio. Investments, and investment related receivable and liability balances, increased this year because MOSERS experienced a 26.40% return on plan assets, which grew the size of MOSERS' investment portfolio significantly.

Another noteworthy change in MOSERS' *Statement of Fiduciary Net Position* is the increase in capital assets related to the continued development of our new pension administration system. MOSERS capitalized a total of $3.6 million in project costs incurred during the year, which includes staff payroll costs of $0.7 million. When the new pension administration system is implemented, these capitalized software development project costs will be amortized over the estimated useful life the system. The project is expected to be completed in 2023.

## Summary Comparative Statements of Changes in Fiduciary Net Position

| | Year Ended June 30, 2021 | Year Ended June 30, 2020 (as adjusted) | Amount of Change | Percentage Change |
|---|---|---|---|---|
| **Additions** | | | | |
| Contributions | $ 577,738,031 | $ 549,163,044 | $ 28,574,987 | 5.20% |
| Net investment income | 2,077,042,662 | 408,563,551 | 1,668,479,111 | 408.38 |
| Miscellaneous income | 560,195 | 618,027 | (57,832) | (9.36) |
| Total additions | 2,655,340,888 | 958,344,622 | 1,696,996,266 | 177.08 |
| **Deductions** | | | | |
| Benefit payments | 953,049,815 | 904,429,822 | 48,619,993 | 5.38 |
| Premium disbursements | 31,597,820 | 32,549,567 | (951,747) | (2.92) |
| Service transfers and refunds | 8,425,724 | 9,041,675 | (615,951) | (6.81) |
| Administrative expenses | 9,372,885 | 8,952,734 | 420,151 | 4.69 |
| Total deductions | 1,002,446,244 | 954,973,798 | 47,472,446 | 4.97 |
| **Net increase** | 1,652,894,644 | 3,370,824 | 1,649,523,820 | 48,935.33 |
| **Net position beginning of year** | 8,078,237,986 | 8,074,867,162 | 3,370,824 | 0.04 |
| **Net positions restricted for pensions** | $ 9,731,132,630 | $ 8,078,237,986 | $ 1,652,894,644 | 20.46 |

### Investment Results

MOSERS' total fund net position increased by $1.7 billion, to end at $9.7 billion in fiscal year 2021. Net position increased significantly from last year, driven primarily by investment returns. The fund returned a time-weighted return of 26.40% in fiscal year 2021 compared to 5.20% in fiscal year 2020.

The investment markets experienced significant returns during the fiscal year, driven by continued economic recovery, reopening of establishments, and continued government stimulus as a response to the COVID-19 pandemic. As further discussed in the *Investment Section* of this report, while we welcome the high earnings and performance of certain asset classes of the portfolio this year, as long term investors, we continue to recognize the importance of diversifying our investment assets to contribute to our long-term success.

It is also important to note that investment gains and losses are actuarially smoothed over a 5-year period to prevent market volatility from causing significant year-to-year changes in the contribution rate.

The *Investment Section* of this report contains additional information regarding investments activity.

### Contribution Revenue

Contribution revenue increased by 5.20% from the prior year. Contribution revenue is determined by two significant factors: the contribution rate and the covered payroll of active benefit-eligible employees. The contribution rate is set in advance, however unexpected changes in covered payroll can cause contribution revenue to come in above or below expectation.

The employer retirement contribution rates for the MSEP members is the primary driver for total fund contributions revenue. This rate increased from 21.77% in fiscal year 2020 to 22.88% in fiscal year 2021. The employee contribution rates for 2011 tier members remains at 4% of gross pay. The percent of MSEP 2011 tier members who contribute 4% continues to grow every year to make up a larger percentage of our overall membership base, however the number of MSEP 2011 members decreased slightly.

Covered payroll is the other primary factor that ultimately determines our contribution revenue. The growth rate of covered payroll, from which both employee and employer contributions are calculated, slowed from the level experienced last year. At the beginning of fiscal year 2021, we expected payroll growth of 2.25% for the year. Covered payroll generally met or exceeded financial forecasts during the first half of the year, however it started declining during the second half of the year, as did the population of active benefit eligible members, as various state agencies struggled to fill vacant positions.

All things considered, MSEP retirement contributions revenue increased, but not as much as was expected because covered payroll for the year was below expectations.

Judicial Plan contributions and Insurance fund premium contributions each account for less than 10% of total fund contributions revenues. Covered payroll for judges increased 2.6% over last year based on the actuarial valuation report. Judicial Plan membership did not appear to experience the same challenges as the MSEP membership base, and contributions were slightly higher than last year, even though the fiscal year 2021 contribution rate was slightly lower than the fiscal year 2020 rate. Insurance fund premium contributions were lower than the prior year, which was an expected change due to The Standard Insurance Company offering lower rates for basic life insurance and LTD insurance as a result of our recent RFP process.

The *Actuarial Section* of this report contains more information about actuarial experience.

### Benefits Expenses

Increases in benefit payment expenses were larger than the increases in contributions revenue for the year due to shifting member demographics. The population of retirees receiving benefits continued to grow during the fiscal year, while the population of active benefit-eligible state employees has continued to decline. A growing retiree population and shrinking active employee population puts upward pressure on the contribution rate. Schedules of retirees added and removed from the benefit rolls can be viewed on pages 100-101 of the *Actuarial Section* of this report.

Cost-of-living adjustments provided to existing benefit recipients also cause benefit expenses to increase each year. Members employed before August 28, 1997, who retired under the MSEP, receive a COLA of at least 4% each year (maximum 5%) until they reach their COLA cap. For general state employees, COLAs are based on 80% of the percentage increase in the average Consumer Price Index (CPI) from one year to the next. The maximum increase is 5% (minimum 0%). The cost-of-living adjustment for fiscal year 2021 was 0.987%.

### Administrative Expenses

Administrative expenses totaled $9.4 million in fiscal year 2021, compared to $9.0 million in fiscal year 2020. MOSERS experienced an increase in administrative expense due to a variety of factors. There was a general increase in the cost of doing business, such as costs for postage and mailing, facility maintenance, insurance, and professional services. MOSERS completed an actuarial experience study this year, which is a cost that generally occurs once every five years. Administrative payroll costs increased due to recruiting for and filling vacant positions as well as employee wage adjustments.

### Requests 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 *FOIArequest@mosers.org*.

## Statements of Fiduciary Net Position

*As of June 30, 2021*

| | MSEP Fund | Judicial Fund | Insurance Fund | Total |
|---|---|---|---|---|
| **Assets** | | | | |
| Administrative operating cash and cash equivalents | $ 4,559,828 | $ 190 | $ 2,826,640 | $ 7,386,658 |
| ***Receivables*** | | | | |
| Contributions and premiums | 18,248,213 | 1,740,251 | 842,868 | 20,831,332 |
| Investment income | 119,682,578 | 2,641,225 | 0 | 122,323,803 |
| Investment sales | 594,160,906 | 13,112,291 | 0 | 607,273,197 |
| Other receivables | 171,736 | 0 | 0 | 171,736 |
| Total receivables | 732,263,433 | 17,493,767 | 842,868 | 750,600,068 |
| ***Investments and derivatives*** | | | | |
| Investments - cash and cash equivalents | 1,780,496,430 | 39,293,037 | 0 | 1,819,789,467 |
| Investments - treasuries | 4,728,883,304 | 104,359,764 | 0 | 4,833,243,068 |
| Investments - fixed income | 524,907,691 | 11,583,970 | 0 | 536,491,661 |
| Investments - equities | 2,024,391 | 44,675 | 0 | 2,069,066 |
| Investments - real estate investment trusts | 645,319,847 | 14,241,296 | 0 | 659,561,143 |
| Investments - equity and fixed income commingled funds | 1,899,205,289 | 41,912,773 | 0 | 1,941,118,062 |
| Investments - alternatives and limited partnerships | 2,978,559,817 | 65,732,601 | 0 | 3,044,292,418 |
| Investments - derivative instruments | 13,526,647 | 298,514 | 0 | 13,825,161 |
| Total investments and derivatives | 12,572,923,416 | 277,466,630 | 0 | 12,850,390,046 |
| Capital assets, net of accumulated depreciation | 11,070,763 | 0 | 0 | 11,070,763 |
| **Total assets** | 13,320,817,440 | 294,960,587 | 3,669,508 | 13,619,447,535 |
| **Deferred outflow of resources** | 896,172 | 20,899 | 0 | 917,071 |
| **Liabilities** | | | | |
| Administrative and benefit expense payables | 2,493,744 | 43,940 | 3,548,300 | 6,085,984 |
| Employee vacation and overtime liability | 798,598 | 18,604 | 0 | 817,202 |
| Payable for investments purchased | 115,414,738 | 2,547,040 | 0 | 117,961,778 |
| Management and incentive fees payable | 21,200,638 | 467,868 | 0 | 21,668,506 |
| Investment activities payable | 6,878,867 | 151,807 | 0 | 7,030,674 |
| Obligations under repurchase agreements | 3,642,919,372 | 80,394,076 | 0 | 3,723,313,448 |
| MOSERS investment portfolio liability (MIP) | 3,867,812 | 85,357 | 0 | 3,953,169 |
| Net OPEB liability | 7,507,485 | 175,075 | 0 | 7,682,560 |
| **Total liabilities** | 3,801,081,254 | 83,883,767 | 3,548,300 | 3,888,513,321 |
| **Deferred inflow of resources** | 702,278 | 16,377 | 0 | 718,655 |
| **Net position restricted for fiduciary activities** | $ 9,519,930,080 | $ 211,081,342 | $ 121,208 | $ 9,731,132,630 |

See accompanying *Notes to the Basic Financial Statements.*

## Statements of Changes in Fiduciary Net Position

*For the Year Ended June 30, 2021*

| | MSEP Fund | Judicial Fund | Insurance Fund | Total |
|---|---|---|---|---|
| **Additions** | | | | |
| ***Contributions and Premiums*** | | | | |
| Employer contributions and premiums | $ 463,293,368 | $ 39,996,509 | $ 14,658,163 | $ 517,948,040 |
| Employee contributions and premiums | 37,571,263 | 1,448,428 | 16,951,056 | 55,970,747 |
| Member purchases of service credit | 1,520,330 | 0 | 0 | 1,520,330 |
| Service transfer contributions | 2,298,914 | 0 | 0 | 2,298,914 |
| Total contributions and premiums | 504,683,875 | 41,444,937 | 31,609,219 | 577,738,031 |
| ***Investment activity*** | | | | |
| Investing activity income: | | | | |
| Net appreciation in fair value of investments | 2,104,682,949 | 45,537,184 | 0 | 2,150,220,133 |
| Interest | 19,170,915 | 419,539 | 1,869 | 19,592,323 |
| Dividends | 26,333,715 | 570,356 | 0 | 26,904,071 |
| Other | 669,317 | 14,482 | 0 | 683,799 |
| Total investing activity income | 2,150,856,896 | 46,541,561 | 1,869 | 2,197,400,326 |
| Investing activity expenses: | | | | |
| Management and incentives fees | 89,866,889 | 1,952,923 | 0 | 91,819,812 |
| Custody and other fees | 752,291 | 16,278 | 0 | 768,569 |
| Consultant fees | 579,826 | 12,724 | 0 | 592,550 |
| Internal investment activity expenses | 5,654,724 | 51,194 | 0 | 5,705,918 |
| Total investing activity expenses | 96,853,730 | 2,033,119 | 0 | 98,886,849 |
| Reverse repurchase agreement activity: | | | | |
| Loss on assets in reverse repurchase funds | (13,132,424) | (288,967) | 0 | (13,421,391) |
| Interest expense from reverse repurchase agreements | (7,879,656) | (169,768) | 0 | (8,049,424) |
| Total net loss from reverse repurchase agreement activity | (21,012,080) | (458,735) | 0 | (21,470,815) |
| Total net investment income | 2,032,991,086 | 44,049,707 | 1,869 | 2,077,042,662 |
| Miscellaneous income | 80,121 | 0 | 480,074 | 560,195 |
| **Total additions** | 2,537,755,082 | 85,494,644 | 32,091,162 | 2,655,340,888 |
| **Deductions** | | | | |
| Benefit payments | 831,968,945 | 41,625,546 | 0 | 873,594,491 |
| Premium disbursements | 0 | 0 | 31,597,820 | 31,597,820 |
| BackDROP payments | 79,363,265 | 0 | 0 | 79,363,265 |
| Buyout and lump-sum payments | 92,059 | 0 | 0 | 92,059 |
| Service transfer payments | 2,520,166 | 0 | 0 | 2,520,166 |
| Contribution and premium refunds | 5,894,157 | 0 | 11,401 | 5,905,558 |
| Administrative expenses | 8,816,943 | 75,822 | 480,120 | 9,372,885 |
| **Total deductions** | 928,655,535 | 41,701,368 | 32,089,341 | 1,002,446,244 |
| **Net increase in net position** | 1,609,099,547 | 43,793,276 | 1,821 | 1,652,894,644 |
| **Net position restricted for fiduciary activities:** | | | | |
| Beginning of year | 7,910,830,533 | 167,288,066 | 119,387 | 8,078,237,986 |
| End of year | $ 9,519,930,080 | $ 211,081,342 | $ 121,208 | $ 9,731,132,630 |

See accompanying *Notes to the Basic Financial Statements*.

# Notes to the Basic Financial Statements

## Note 1 – Plan Descriptions and Contribution Information

The MSEP and the Judicial Plan are pension plans covering substantially all state of Missouri employees and judges.

### 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. The System is vested with 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 (the Board) 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 pension trust fund of the state of Missouri, 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. For the year ended June 30, 2021, the employer contribution rate was 22.88% 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. Recognizing the difference between the actual and assumed investment returns over a closed, five-year period helps ensure a more stable contribution rate.

At any point in time, the actuarial 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, 2021 the ratio of actuarial value of assets to fair value of assets was 93.59%, for the MSEP.

**Per the June 30, 2021 actuarial valuation, membership in the MSEP consisted of the following:**

| | | |
|---|---|---|
| Retirees and beneficiaries currently receiving benefits | | 52,223 |
| Active | | |
| Vested | 27,557 | |
| Nonvested | 15,272 | 42,829 |
| Inactive | | |
| Vested (not yet receiving benefits)* | 17,763 | |
| Nonvested (with contribution balances) | 25,613 | 43,376 |
| **Total membership** | | **138,428** |

** Includes 191 members on leave of absence and 613 members on long-term disability*

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 of 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, including the MSEP 2011 tier.

Unless otherwise delineated, data for MSEP is inclusive of members in the MSEP 2000 and MSEP 2011, which all provide defined benefit pension, survivor, life insurance, and long-term disability benefits.

Employer contributions for the MSEP are determined through annual actuarial valuations. The required contributions are expressed as a percentage of covered payroll. The state of Missouri and its component employers make required contributions to the plans. Employer contributions for the fiscal year ended June 30, 2021 were 22.88% of covered payroll. Members of MSEP and MSEP 2000 do not make employee contributions. Members of MSEP 2011 tier are required to contribute 4% of covered payroll.

Final average pay (FAP), is the average pay of a member for the 36 full, consecutive months of service before termination of employment when the member's pay was greatest. If the member was on workers compensation leave of absence or medical leave of absence due to an employee illness, or on long-term disability, FAP is the amount of pay the member would have received, but for such leave of absence as reported and verified by the employing department. If the member was employed for less than 36 months, FAP is the average monthly pay of a member during the period for which the member was employed.

For a summary of benefits for general state employees, legislators, and statewide 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.

### MSEP (closed plan)

General state employees are fully vested for benefits upon accruing five 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 employed 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 employed 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, inactive-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, members 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, and meet age requirements. In addition, if members left state employment on or after August 28, 1997, and prior to September 1, 2002, the present value of their benefit must be less than $10,000.

### 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 five 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 the “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%.

***MSEP 2011 Tier***

On July 19, 2010, legislation was signed into law adding a new tier (MSEP 2011) to the MSEP 2000 defined benefit pension plan. This tier includes all members first employed in a benefit-eligible position on or after January 1, 2011.

Legislation signed into law on July 14, 2017, changed the original vesting requirement of 10 years to five years for actively employed members of the MSEP 2011, effective January 1, 2018.

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

- Age 67 with 5 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 five 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%.

## Judicial Plan

The Judicial Plan is a single-employer, defined benefit 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 pension trust fund of the state of Missouri financial reporting entity and is included in the state's financial reports as a pension trust fund.

Judges and commissioners of the supreme court or the court of appeals, judges of any circuit court, probate court, magistrate court, court of common pleas, court of criminal corrections, justices of the peace, commissioners or deputy commissioners of the probate division of the circuit court appointed after February 29, 1972, in a first class county having a charter form of government in a city not within a county, commissioners of the juvenile division of the circuit court appointed pursuant to Section 211.023, RSMo, commissioners of the drug court or commissioners of any family court are eligible for membership in the Judicial Plan. The Judicial Plan provides defined benefit pension and survivor benefits. Members are immediately vested.

**Per the June 30, 2021 actuarial valuation, membership in the Judicial Plan consisted of the following:**

| | | |
|---|---|---|
| Retirees and beneficiaries currently receiving benefits | | 607 |
| Active | | |
| Vested | 418 | |
| Nonvested | 0 | 418 |
| Inactive | | |
| Vested (not yet receiving benefits) | | 27 |
| **Total membership** | | **1,052** |

Funding of the Judicial Plan on an actuarial basis began on July 1, 1998. Employer contributions are determined through annual actuarial valuations. For the year ended June 30, 2021, the employer contribution rate was 63.38% of covered payroll. The state of Missouri makes the employer contribution to the Judicial Plan. Members of Judicial Plan (closed plan) do not make employee contributions. Members of the Judicial Plan 2011 tier are required to contribute 4% of covered payroll.

### 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; or
- 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 first employed 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 first employed 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, inactive-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 August 28, 1997, and prior to September 1, 2002, have less than 10 years of service, not be within five years of retirement eligibility, 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 employed as a judge 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;

Judicial Plan 2011 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.

### Administrative Law Judges and Legal Advisors' Plan
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, administrative law judges and legal advisors (ALJs) 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.

## Missouri State Insured Defined Benefit Insurance Plan
The Missouri State Insured Defined Benefit Insurance Plan is administered through, and underwritten by, The Standard Insurance Company (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, and MSEP 2011 (except employees of the Missouri Department of Conservation and certain state universities), Judicial Plan, Judicial Plan 2011, and certain members of the Public School Retirement System (PSRS).

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 114-115 in 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.

### 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 colleges and 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 participant decides how the money will be invested. Employees may also roll over eligible pre-tax distributions from other qualified retirement plans.

The MO Deferred Comp plan is comprised of a 457 deferred compensation plan for employee contributions and a related 401(a) plan for an employer incentive match contribution. MOSERS uses MissionSquare Retirement, formerly known as ICMA-RC, as an external provider for record keeping for the plans. These plans have separately issued financial statements. The net position of these plans was approximately $2.1 billion and $697.0 million as of June 30, 2021 for the 457 and 401(a) plans, respectively.

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 ACFR are reported in whole and include 0.04%, or approximately $4.0 million, of the units invested in the MIP by Deferred Compensation participants. Effective June 30, 2017, the option to invest in the MIP fund was no longer available to Plan participants. All participants invested in the MIP fund as of that date may continue to defer into it, but no rollovers or new elections are permitted.

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

### Colleges & Universities Retirement Plan (CURP)

The Colleges & Universities Retirement Plan (CURP) is a defined contribution plan administered by MOSERS for education employees (as determined by the university) at nine Missouri state universities. Retirement income from the plan is dependent upon the employee's plan account balance at retirement. The employee's plan account balance is built from mandatory contributions to the plan and the investment returns generated from employee-selected investment options. To be eligible for the CURP, the employee must:

- meet the definition of "education employee" as defined by their employer, and
- be employed in this position for the first time on or after July 1, 2002, and
- not have previous employment in a position covered by another defined benefit pension plan administered by MOSERS, and
- be employed at a participating regional Missouri university.

After six years of participation in CURP, the employee may transfer to a MOSERS defined benefit pension plan and will immediately become a vested member of MSEP 2011. By transferring to MOSERS the employee forfeits all rights to future participation in CURP (i.e., they can't go back to CURP). However, the employee will continue to own and control their CURP account.

## Note 2 – Summary of Significant Accounting Policies

### 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 on an accrual basis.

Contributions are recognized as revenues when due, pursuant to statutory requirements. Benefits, refunds and backDROP payments are recognized when due and payable. Administrative and other expenses are recorded when the corresponding liabilities are incurred.

### Estimates

The preparation of financial statements in conformity with U.S. generally accepted accounting principles 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

Investment assets are reported at fair value, in accordance with Standards issued by the Governmental Accounting Standards Board (see Note 3 for discussion of the valuation methodology for investment assets). The *Schedule of Investments and Derivative Instruments Measured at Fair Value* in Note 3 presents the fair value information of the investments as reported on the *Statements of Fiduciary Net Position.*

### MOSERS Participation in Other Post-Employment Benefit (OPEB) Programs

Other Post-employment Benefit (OPEB) related items, including: Net OPEB liability, deferred outflows of resources, deferred inflows of resources, net OPEB expense, fiduciary net assets, additions to and deductions from fiduciary net assets have been determined on the same basis as they are reported by MCHCP. For this purpose, employer contributions are recognized as revenue when due and payable. Benefits are recognized when due and payable in accordance with the terms of the Plan (see *Note 7 – MCHCP Post-Employment Retiree Health Care OPEB Program*).

### Capital & Intangible Assets

The MOSERS building and other capital assets are stated at cost less accumulated depreciation. Intangible assets include software applications and are stated at cost less accumulated amortization. Intangible assets are reported with capital assets in the *Statements of Changes in Fiduciary Net Position.* Capital and intangible assets are depreciated on a straight-line basis over their estimated useful lives.

### Adoption of Accounting Standards

MOSERS has adopted Governmental Accounting Standards (GASB) Statement No. 84 *Fiduciary Activities,* and Statement No. 97 *Certain Component Unit Criteria, and Accounting and Financial Reporting for Internal Revenue Code Section 457 Deferred Compensation Plans—an amendment of GASB Statements No. 14 and No. 84, and a supersession of GASB Statement No. 32.*

As part of adopting GASB Statement No. 84, MOSERS has changed the fund type of its insurance activities from being reported as an internal service fund to being reported as a custodial fund. As part of this change, the insurance activities are now reported in MOSERS' fiduciary statements, instead of being reported as internal service funds.

Adopting GASB Statement No. 84, and GASB Statement No. 97, has also required changes related to how MOSERS reports the deferred compensation plan activities. The administrative activities related to the deferred compensation plan will no longer be included in MOSERS' *Annual Comprehensive Financial Report* as an internal service fund. Prior year comparative amounts have been adjusted where applicable by removing such amounts from the beginning net position. MOSERS deems these amounts to be immaterial to the financial statements. The administrative activities related to the Missouri State Public Employees Deferred Compensation Plan, and the Missouri State Public Employees Deferred Compensation Incentive Plan will continue to be included in the separately issued statements for those respective plans.

## Note 3 – Cash and Investments

### Cash Deposits with Financial Institutions

MOSERS requires its business bank to collateralize amounts on deposit that exceed 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. Securities pledged as collateral are held in agency by a separate bank. As of June 30, 2021, all deposit balances with MOSERS' business bank were fully collateralized.

Deposits with MOSERS' business bank are invested in short-term repurchase agreements to earn interest. These items are reported with administrative operating cash and cash equivalents in the *Statements of Fiduciary Net Position.*

### Investment Policy

Section 104.440, RSMo allows the Board of Trustees to invest the trust fund assets in accordance with the prudent person rule. In June 2018, the Board voted to transition the portfolio to a new asset allocation, which includes four broad categories: growth, income, inflation hedge, and alternative betas/absolute return. MOSERS completed the transition to this new asset allocation at the end of February 2021.

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 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 11 asset classes contained in the portfolio. The leverage is limited to 1.5 times capital. The limit may also be stated as 150% of capital. The table below illustrates the fair value, market exposure, and policy exposure of the internally managed portfolio by asset class as of June 30, 2021.

#### Schedule of Internally Managed Leverage

| | Fair Value Capital | Percent of Investments at Fair Value | Market Exposure | Percent of Investments at Market Exposure | Policy Exposure |
|---|---|---|---|---|---|
| Growth | $ 4,172,694,467 | 43.0% | $ 4,380,166,669 | 45.1% | 45.1% |
| Income | 1,839,886,154 | 19.0 | 3,094,962,979 | 31.9 | 31.9 |
| Inflation hedge | 1,810,016,709 | 18.6 | 3,866,527,154 | 39.9 | 39.9 |
| Absolute return | 1,878,952,910 | 19.4 | 1,874,459,987 | 19.3 | 19.3 |
| Total new portfolio | $ 9,701,550,240 | 100.0% | $ 13,216,116,789 | 136.2% | 136.2% |

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 rates of return by the target asset allocation percentage and by adjusting for expected inflation, volatility, and correlations. Best estimates of the real rates of return for each major asset class included in MOSERS' target asset allocation as of June 30, 2021, are summarized in the table below.

### Target Asset Allocation

| Asset Class | Policy Allocation | Long-Term Expected Nominal Return* | Long-Term Expected Real Return | Weighted Average Long-Term Expected Nominal Return |
|---|---|---|---|---|
| Global public equities | 30.0% | 7.7% | 5.8% | 2.3% |
| Global private equities | 15.0 | 9.3 | 7.4 | 1.4 |
| Long treasuries | 25.0 | 3.5 | 1.6 | 0.9 |
| Core bonds | 10.0 | 3.1 | 1.2 | 0.3 |
| Commodities | 5.0 | 5.5 | 3.6 | 0.3 |
| TIPS | 25.0 | 2.7 | 0.8 | 0.7 |
| Private real assets | 5.0 | 7.1 | 5.2 | 0.3 |
| Public real assets | 5.0 | 7.7 | 5.8 | 0.4 |
| Hedge funds | 5.0 | 4.8 | 2.9 | 0.2 |
| Alternative beta | 10.0 | 5.3 | 3.4 | 0.5 |
| Private credit | 5.0 | 9.5 | 7.6 | 0.5 |
| Cash and cash equivalents** | (40.0) | 0.0 | 0.0 | 0.0 |
| | 100.0% | | | |
| | | | Correlation/volatility adjustment | (0.6) |
| | | | Long-term expected net nominal return | 7.2 |
| | | | Less: investment inflation assumption | (1.9) |
| | | | Long-term expected geometric net real return | 5.3 % |

* *Long-term expected arithmetic returns of the asset classes at the time of the asset allocation study for the portfolio.*

** *Cash and cash equivalents policy allocation amounts are negative due to use of leverage.*

## Money-Weighted Rate of Return

The annual money-weighted rate of return on pension plan investments, net of pension plan investment expense, was 26.56% for the year ended June 30, 2021. 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 (NAV) 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 tables on pages 34-35 show the fair value leveling of the investments and additional information for investments valued at net asset value.

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 classified in Level 2 have non-proprietary information that was 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.

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 using the last trade price information supplied by various pricing data vendors.

## Investments and Derivative Instruments Measured at Fair Value

| | | Fair Value Measurement Using | | |
|---|---|---|---|---|
| June 30, 2021 | Total | Quoted Prices in Active Markets for Identical Assets (Level 1) | Significant Other Observable Inputs (Level 2) | Significant Unobservable Inputs (Level 3) |
| **Investment by fair value level** | | | | |
| **Treasuries** | | | | |
| U.S. government securities | $ 4,833,243,068 | $ 4,804,124,786 | $ 0 | $ 29,118,282 |
| **Repurchase agreements** | 900,000,000 | 0 | 900,000,000 | 0 |
| **Fixed income securities** | | | | |
| Corporate bonds and asset-backed securities | 405,502,087 | 0 | 403,883,854 | 1,618,233 |
| U.S. government agencies | 109,129,285 | 42,316 | 109,086,969 | 0 |
| Non U.S. sovereign | 21,860,289 | 0 | 21,860,289 | 0 |
| **Total fixed income securities** | 536,491,661 | 42,316 | 534,831,112 | 1,618,233 |
| **Equity** | | | | |
| Real estate investment trusts | 659,561,143 | 659,561,143 | 0 | 0 |
| Equity securities | 2,069,066 | 1,996,848 | 0 | 72,218 |
| **Total equities** | 661,630,209 | 661,557,991 | 0 | 72,218 |
| **Total investment by fair value level** | 6,931,364,938 | 5,465,725,093 | 1,434,831,112 | 30,808,733 |
| **Investments measured at the NAV** | | | | |
| Commingled funds - equity funds | 1,652,557,886 | | | |
| Commingled funds - fixed income funds | 288,560,176 | | | |
| Commingled funds - short-term investment funds | 166,997,000 | | | |
| Hedge funds | 2,216,577,754 | | | |
| Private equity funds | 572,304,369 | | | |
| Private real estate and timber funds | 255,410,295 | | | |
| **Total investments measured at the NAV** | 5,152,407,480 | | | |
| **Total investments measured at fair value** | 12,083,772,418 | 5,465,725,093 | 1,434,831,112 | 30,808,733 |
| **Investment derivative instruments** | | | | |
| Future contracts | (2,956,383) | (2,956,383) | 0 | 0 |
| Swap contracts | 16,781,544 | 0 | 0 | 16,781,544 |
| **Total investment derivative instruments** | 13,825,161 | (2,956,383) | 0 | 16,781,544 |
| **Investments at cost or cost plus accrued interest:** | | | | |
| Cash held in investment accounts | 752,792,467 | | | |
| **Total investments** | 12,850,390,046 | 5,462,768,710 | 1,434,831,112 | 47,590,277 |
| **Obligations under repurchase agreements** | (3,723,313,448) | | | |
| **Total investments, net of obligations under repurchase agreements** | $ 9,127,076,598 | $ 5,462,768,710 | $ 1,434,831,112 | $ 47,590,277 |

## Investments Measured at the Net Asset Value

| | June 30, 2021 | Unfunded Commitments | Redemption Frequency (If Currently Eligible) | Redemption Notice Period (Days) |
|---|---|---|---|---|
| **Commingled fund - equity funds** | $ 1,652,557,886 | | Daily, Monthly | 1-10 |
| **Commingled fund - fixed income fund** | 288,560,176 | | Daily | 2 |
| **Commingled fund - short-term investment funds** | 166,997,000 | | Daily | 0 |
| **Active hedge funds** | | | | |
| Merger arbitrage | 146,114,118 | | Monthly | 45 |
| Equity market neutral | 109,396,165 | | Quarterly | 90 |
| Event driven | 220,894,000 | | Semi-annually | 60 |
| Marco | 63,489,185 | | Quarterly | 30 |
| Quantitative | 70,742,658 | | Monthly | 30 |
| Multi strategy | 549,511,856 | | Monthly, Quarterly | 60-90 |
| Fund-of-funds | 1,044,482,180 | | Monthly | 95 |
| **Pending liquidated hedge funds** | 11,947,592 | | | |
| **Private equity funds** | 572,304,369 | $ 455,023,011 | | |
| **Private real estate and timber funds** | 255,410,295 | 49,352,214 | | |
| **Total investments measured at the net asset value (NAV)** | $ 5,152,407,480 | $ 504,375,225 | | |

- **Commingled fund - equity funds** – Six equity funds are considered to be commingled in nature. Each are valued at the NAV held at the end of the period based upon the fair value of the underlying investments.
- **Commingled fund - fixed income fund** – One fixed income fund is considered to be commingled in nature. It is valued at the NAV held at the end of the period based upon the fair value of the underlying investment.
- **Commingled fund - short term investment funds** – Two short-term investment funds are considered to be commingled in nature. Each are valued at the NAV held at the end of the period based upon the fair value of the underlying investments.
- **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 the NAV, is redeemable monthly, and is not subject to lock-up restrictions.
- **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 the NAV, is redeemable quarterly, and is not subject to lock-up restrictions.
- **Event driven hedge fund** – Consisting of one fund, this strategy seeks to gain an advantage from pricing inefficiencies that may occur in the onset or aftermath of a corporate action or related event. This investment is valued at the NAV, is redeemable semi-annually, and is not subject to lock-up restrictions.
- **Macro hedge fund** – Consisting of one fund, 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 the NAV, is redeemable quarterly, and is not subject to lock-up restrictions.
- **Quantitative hedge funds** – Consisting of two funds, this strategy attempts to achieve uncorrelated returns using advanced statistical methods to select securities across liquid public markets. These investments are valued at the NAV, are redeemable monthly, and are not subject to lock-up restrictions.
- **Multi strategy hedge fund** – Consisting of three funds, these funds aim to pursue varying strategies in order to diversify risks and reduce volatility. These investments are valued at the NAV, are redeemable monthly or quarterly, but are subject to lock-up restrictions.
- **Fund-of-funds** – Consisting of three funds, these funds seek to provide diversification by holding a number of funds within a single fund structure. These investments are valued at the NAV, are redeemable monthly, and are subject to liquidation of the underlying funds.

- **Pending liquidated hedge funds** – Consisting of nine funds which have been fully redeemed as of June 30, 2021, for which MOSERS is awaiting final distribution of the proceeds, which will be received upon sale of the underlying investments or upon completion of the audit of the firm's annual financial statements.
- **Private equity, real estate, and timber funds** – MOSERS' private equity portfolio consists of 38 funds with exposure to buyout funds, distressed funds, infrastructure, energy, secondary, royalty funds, and special situations. The real estate portfolio, comprised of seven funds, invests mainly in U.S. commercial real estate. The timber portfolio consists of one fund in liquidation which invests in global timberland. The fair values of the majority of these funds have 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 as underlying investments when the funds are liquidated, which, on average, can occur over the span of five 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, 2021, MOSERS' fixed income assets that are not U.S. government guaranteed represented 0.3% of fixed income securities. In preparing this report, credit risk associated with all fixed income holdings, including collateral for repurchase agreements has been included. The tables on the following page summarize MOSERS' fixed income security exposure levels and credit qualities.

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 page 41 of the notes.

The commingled funds - investment grade fixed income is invested and reinvested primarily in a portfolio of U.S. dollar denominated investment grade securitized debt obligations, with the objective of approximating the total rate of return of the market for debt securities as defined by the *Bloomberg U.S. Securitized Index*. The average rating for the underlying securities within this fund is AA+.

## Average Credit Quality and Exposure Levels of Nongovernment Guaranteed Securities

| Fixed Income Security Type | Fair Value June 30, 2021 | Percent of all Fixed Income Assets | Weighted Average Credit Quality | Ratings Dispersion Requiring Further Disclosure |
|---|---|---|---|---|
| U.S. government agencies | $ 107,796,677 | 1.4% | AA+ | See below |
| U.S. government mortgages | 803,528 | 0.0 | AA+ | See below |
| Asset-backed securities | 655,023 | 0.0 | AA- | See below |
| Collateralized mortgage obligations | 7,682 | 0.0 | AA+ | See below |
| Corporate bonds | 404,833,087 | 5.4 | BBB+ | See below |
| Municipal bonds | 8,889,359 | 0.1 | AA- | See below |
| Non-U.S. sovereign | 13,506,305 | 0.2 | BBB+ | See below |
| Total nongov't fixed income securities | 536,491,661 | 7.1 | | |
| Nongov't. guaranteed repurchase agreements | 775,000,000 | 10.4 | Not rated | None |
| Bank deposits | 750,000,000 | 10.0 | FDIC Insured | None |
| Commingled funds - investment grade fixed income | 288,560,176 | 3.9 | Not rated | None |
| Pooled instruments | 166,997,000 | 2.2 | AAA | None |
| Total nongov't. guaranteed securities | $ 2,517,048,837 | 33.6% | | |
| U.S. government securities held in portfolio | $ 4,833,243,068 | 64.7% | | |
| Repurchase agreement with U.S. government securities held as collateral | 125,000,000 | 1.7 | | |
| Total fixed income securities | $ 7,475,291,905 | 100.0% | | |

## Ratings Dispersion Detail - Fair Value

| Credit Rating Level | U.S. Government Agencies | U.S. Government Mortgages | Asset-Backed Securities | Collateralized Mortgage Obligations | Corporate Bonds | Municipal Bonds | Non-U.S. Sovereign |
|---|---|---|---|---|---|---|---|
| AAA | $ 0 | $ 0 | $ 0 | $ 0 | $ 3,045,677 | $ 1,139,656 | $ 0 |
| AA | 107,796,677 | 803,528 | 458,434 | 7,676 | 14,090,126 | 4,632,779 | 1,868,364 |
| A | 0 | 0 | 170,938 | 0 | 125,371,373 | 2,966,558 | 2,269,348 |
| BBB | 0 | 0 | 0 | 0 | 258,189,275 | 150,366 | 8,261,866 |
| BB | 0 | 0 | 0 | 0 | 4,136,636 | 0 | 1,106,727 |
| Not rated | 0 | 0 | 25,651 | 6 | 0 | 0 | 0 |
| | $ 107,796,677 | $ 803,528 | $ 655,023 | $ 7,682 | $ 404,833,087 | $ 8,889,359 | $ 13,506,305 |

### 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.

MOSERS invests in mortgage-backed securities, which have embedded within them the option 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. This risk is incorporated within the effective duration calculation used in the interest rate risk analysis.

#### Effective Duration of Fixed Income Assets by Security Type

| Fixed Income Security Type | Fair Value June 30, 2021 | Percent of all Fixed Income Assets | Weighted Average Effective Duration (Years) | Interest Rate Risk Requiring Further Disclosure |
|---|---|---|---|---|
| U.S. treasuries | $ 4,833,243,068 | 64.8% | 9.1 | See below |
| U.S. government agencies | 107,796,677 | 1.4 | 0.5 | None |
| U.S. government mortgages | 803,528 | 0.0 | 3.3 | None |
| Asset-backed securities | 655,023 | 0.0 | 1.7 | None |
| Collateralized mortgage obligations | 7,682 | 0.0 | 0.1 | None |
| Corporate bonds | 404,833,087 | 5.4 | 7.0 | None |
| Municipal bonds | 8,889,359 | 0.1 | 13.2 | None |
| Non-U.S. sovereign | 13,506,305 | 0.2 | 11.5 | None |
| Bank deposits | 750,000,000 | 10.0 | 0.0 | None |
| Repurchase agreements | 900,000,000 | 12.0 | 0.0 | None |
| Commingled funds - investment grade fixed income | 288,560,176 | 3.9 | 4.2 | None |
| Pooled instruments | 166,997,000 | 2.2 | 0.0 | None |
| | $ 7,475,291,905 | 100.0% | 6.5 | |

#### Effective Duration Analysis of U.S. Treasuries

| Maturity | Fair Value June 30, 2021 | Average Effective Duration of the Security Type (Years) | Contribution to Effective Duration (Years) |
|---|---|---|---|
| Less than 1 year to maturity | $ 381,352,543 | 0.0 | 0.0 |
| 1- to 10-year maturities | 2,680,323,319 | 4.7 | 2.6 |
| Long coupon treasuries | 1,771,452,954 | 17.7 | 6.5 |
| Long stripped treasuries | 114,252 | 26.2 | 0.0 |
| | $ 4,833,243,068 | | 9.1 |

## 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 0.02% to 0.25% with maturities of one to five days.

The yield earned by the counterparties on the reverse repo transactions ranged from (0.20)% to 0.22% 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 falls below the loan balance. To minimize this risk, MOSERS requires the financial institution to send collateral with a fair value greater than the value of the loan and revalues the collateral on a daily basis. As of fiscal year end, MOSERS held approximately $48.0 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. Counterparties held approximately $16.0 million of MOSERS' collateral in excess to the reverse repo balance as of the end of the fiscal year.

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

### Tri-Party Repurchase Agreements by Collateral Type

| Collateral Type | Fair Value of Collateral June 30, 2021 | Fair Value Including Accrued Interest of Repurchase Agreements June 30, 2021 | Excess (Deficit) Collateral | Percent Over Collateralized |
|---|---|---|---|---|
| U.S. treasuries | $ 127,500,243 | $ 125,000,000 | $ 2,500,243 | |
| U.S. government agencies | 408,000,075 | 400,000,000 | 8,000,075 | |
| Common stock | 412,502,380 | 375,000,000 | 37,502,380 | |
| Accrued interest | 0 | 2,979 | (2,979) | |
| | $ 948,002,698 | $ 900,002,979 | $ 47,999,719 | 5.3% |

### Reverse Repurchase Agreements by Collateral Type

| Collateral Type | Fair Value of Collateral June 30, 2021 | Fair Value Including Accrued Interest of Repurchase Agreements June 30, 2021 | Excess (Deficit) Collateral | Percent Over Collateralized |
|---|---|---|---|---|
| U.S. treasuries | $ 3,733,666,698 | $ 3,723,313,448 | $ 10,353,250 | |
| Payables | 7,796,446 | 0 | 7,796,446 | |
| Accrued interest | 0 | 2,166,446 | (2,166,446) | |
| | $ 3,741,463,144 | $ 3,725,479,894 | $ 15,983,250 | 0.4 % |

### 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, 2021, is highlighted in the table below.

#### Currency Exposures by Asset Class

| Currency | Cash & Cash Equivalents | Equities | Fixed Income | Alternatives | Total |
|---|---|---|---|---|---|
| Australian Dollar | $ 9,042,557 | $ 0 | $ 0 | $ 0 | $ 9,042,557 |
| Brazilian Real | 0 | 11,825,583 | 0 | 0 | 11,825,583 |
| Canadian Dollar | 6,001,851 | 3,904,304 | 0 | 0 | 9,906,155 |
| Chilean Peso | 0 | 905,507 | 0 | 0 | 905,507 |
| Chinese Yuan Renminbi | 0 | 10,672,365 | 0 | 0 | 10,672,365 |
| Colombian Peso | 7 | 249,705 | 276,022 | 0 | 525,734 |
| Czech Koruna | (785) | 286,763 | 3,157 | 0 | 289,135 |
| Danish Krone | 0 | 2,372,293 | 0 | 0 | 2,372,293 |
| Egyptian Pound | 0 | 178,470 | 0 | 0 | 178,470 |
| Euro | 6,670,760 | 65,768,234 | (82,918) | 43,727 | 72,399,803 |
| Hong Kong Dollar | (7,202,437) | 95,572,797 | 0 | 0 | 88,370,360 |
| Hungarian Forint | 0 | 542,720 | 0 | 0 | 542,720 |
| Indian Rupee | 0 | 23,244,828 | 1,211 | 0 | 23,246,039 |
| Indonesian Rupiah | 0 | 2,507,993 | 0 | 0 | 2,507,993 |
| Israeli Shekel | 0 | 22 | 0 | 0 | 22 |
| Japanese Yen | 1,219,578 | 155,739,531 | 0 | 0 | 156,959,109 |
| Kuwaiti Dinar | 0 | 1,199,304 | 0 | 0 | 1,199,304 |
| Malaysian Ringgit | 0 | 2,781,956 | 0 | 0 | 2,781,956 |
| Mexican Peso | 157 | 4,921,297 | 0 | 0 | 4,921,454 |
| New Taiwan Dollar | 0 | 45,182,681 | 0 | 0 | 45,182,681 |
| Norwegian Krone | 0 | 979,078 | 0 | 0 | 979,078 |
| Pakistani Rupee | 0 | 41,208 | 0 | 0 | 41,208 |
| Philippine Peso | 0 | 1,416,627 | 0 | 0 | 1,416,627 |
| Polish Zloty | 355 | 1,628,542 | 3,131 | 0 | 1,632,028 |
| Qatari Riyal | 0 | 1,502,681 | 0 | 0 | 1,502,681 |
| Russian Ruble | 0 | 4,958,154 | 116,587 | 0 | 5,074,741 |
| Saudi Riyal | 0 | 6,549,512 | 0 | 0 | 6,549,512 |
| Singapore Dollar | 0 | 9,042,826 | 0 | 0 | 9,042,826 |
| South African Rand | (1,087,941) | 15,602,082 | 0 | 0 | 14,514,141 |
| South Korean Won | (313,430) | 40,262,851 | 2,008,984 | 0 | 41,958,405 |
| Swiss Franc | 0 | 41,569,087 | 0 | 0 | 41,569,087 |
| Thai Baht | 0 | 8,534,903 | 0 | 0 | 8,534,903 |
| Turkish Lira | 0 | 4,169,123 | 0 | 0 | 4,169,123 |
| United Arab Emirates Dirham | 0 | 1,439,963 | 0 | 0 | 1,439,963 |
| United Kingdom Pound Sterling | 1,343,560 | 79,819,285 | 0 | 0 | 81,162,845 |
| | $ 15,674,232 | $ 645,372,275 | $ 2,326,174 | $ 43,727 | $ 663,416,408 |

### Derivatives

Derivative instruments are financial contracts whose values depend on the values of one or more underlying assets, reference rates, or financial indexes. They include futures contracts, swap contracts, options contracts, and forward foreign currency exchange. The following tables summarize the various contracts in the portfolio as of June 30, 2021.

#### Futures Contracts

| Futures Contract | | Notional Value | | Exposure |
|---|---|---|---|---|
| Currency futures | $ | 50,427,000 | $ | (1,855,142) |
| Fixed income futures | | (251,685,786) | | (1,065,222) |
| Equity index futures | | 37,982,465 | | 619,748 |
| Commodity futures | | 37,961,379 | | (655,767) |
| Total | $ | (125,314,942) | $ | (2,956,383) |

#### Swap Contracts

| Counterparty Credit Rating | | Notional Value | | Exposure |
|---|---|---|---|---|
| **Total return swaps - equity** | | | | |
| A+ | $ | 1,295,793,199 | $ | 25,666,975 |
| A | | 971,413,543 | | 23,379,421 |
| Total | $ | 2,267,206,742 | $ | 49,046,396 |
| **Total return swaps - fixed income** | | | | |
| A+ | $ | 552,534,767 | $ | 14,473,658 |
| A | | 15,279,026 | | 68,274 |
| Total | $ | 567,813,793 | $ | 14,541,932 |
| **Total return swaps - commodities** | | | | |
| A+ | $ | 226,281,311 | $ | 0 |
| A | | 290,243,828 | | 0 |
| Total | $ | 516,525,139 | $ | 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 fair values of these instruments are recorded in the *Statements of Fiduciary Net Position* and the total changes in fair value for the year are included as net appreciation in fair value of investments in the *Statements of Changes in Fiduciary Net Position*. For the year ended June 30, 2021, the change in fair value in the swap contracts resulted in a gain of $996 million of investment income. The change in fair value in the futures contracts resulted in a gain of $85 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.

### Securities Lending Program

The Board of Trustees' *Investment Policy Statement* 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 fair value for domestic loans and 105% of fair value for international loans. MOSERS does not have the authority to pledge or sell collateral securities, without borrower default.

There was no securities lending activity in fiscal year 2021.

## Note 4 – Capital Assets

Office building, furniture, fixtures, equipment, and software costing $1,000 or more are capitalized. Capital assets are valued at cost and reported net of accumulated depreciation. Improvements, which increase the useful life of the property, are also capitalized. The cost of internally developed software incurred during the application development state, including staff payroll costs, are capitalized in accordance with GASB Statement 51. 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

Schedules of the capital asset account balances for the year ended June 30, 2021 are as follows:

### Capital Assets

| | Land | CIP - Internally Developed Pension Admin. System | Building and Building Improvements | Furniture, Fixtures and Equipment | Software | Total Capital Assets |
|---|---|---|---|---|---|---|
| **Capital assets** | | | | | | |
| Balances June 30, 2020 | $ 267,286 | $ 4,877,733 | $ 3,985,044 | $ 1,443,905 | $ 743,824 | $ 11,317,792 |
| Additions | 0 | 3,557,994 | 166,383 | 200,281 | 0 | 3,924,658 |
| Deletions | 0 | 0 | (31,367) | (37,778) | (15,063) | (84,208) |
| Capital assets June 30, 2021 | 267,286 | 8,435,727 | 4,120,060 | 1,606,408 | 728,761 | 15,158,242 |
| **Accumulated depreciation** | | | | | | |
| Balances June 30, 2020 | 0 | 0 | 2,009,715 | 1,061,454 | 716,097 | 3,787,266 |
| Depreciation expense | 0 | 0 | 134,010 | 163,065 | 11,429 | 308,504 |
| Deletions | 0 | 0 | 0 | (3,023) | (5,268) | (8,291) |
| Accumulated depreciation June 30, 2021 | 0 | 0 | 2,143,725 | 1,221,496 | 722,258 | 4,087,479 |
| Net capital assets June 30, 2021 | $ 267,286 | $ 8,435,727 | $ 1,976,335 | $ 384,912 | $ 6,503 | $ 11,070,763 |

## Note 5 – Employers' Net Pension Liability

The components of net pension liability as of June 30, 2021, are in the *Schedule of Employers' Net Pension Liability* below.

### Schedule of Employers' Net Pension Liability

| | MSEP | Judicial Plan |
|---|---|---|
| Total pension liability | $ 15,110,646,537 | $ 626,284,219 |
| MOSERS' fiduciary net position | 9,519,930,080 | 211,081,342 |
| Employers' net pension liability | $ 5,590,716,457 | $ 415,202,877 |
| Plan net position as a percentage of the total pension liability | 63.00% | 33.70% |
| Covered payroll | $ 2,024,883,601 | $ 63,105,884 |
| Employers' net pension liability as a percentage of covered payroll | 276.10% | 657.95% |

An 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*. The total pension liability, as of June 30, 2021, is $15,110,646,537 for MSEP and $626,284,219 for the Judicial Plan based on an actuarial valuation performed as of June 30, 2021, and a measurement date of June 30, 2021, using generally accepted actuarial procedures.

### Actuarial Assumptions Used to Determine Net Pension Liability

An actuarial experience study covering the five-year period ended June 30, 2020, was performed in 2021. Certain actuarial assumptions and methods were changed as a result of the the experience study, including:

- Subsequent changes in the unfunded actuarial accrued liability due to actuarial gains/losses or assumption changes are now amortized over a closed 25 year period, instead of 30 years.
- Mortality assumptions are now based on generational tables.
- The merit component of the salary increase assumption was adjusted to partially reflect observed experience.

### Summary of Actuarial Assumptions for the MSEP & the Judicial Plan Used to Determine Net Pension Liability

| | |
|---|---|
| Valuation date | June 30, 2021 |
| Actuarial cost method | Entry Age Normal |
| Asset valuation method | Market value |
| Investment rate of return, net of investment expense | 6.95 % |
| Projected salary increases | 2.75 – 10.00% (MSEP)<br>3.00% (Judicial Plan) |
| Rate of payroll growth | 2.25 % |
| COLAs | 4% or 1.80% * |
| Price inflation | 2.25% |

* 4.00% compounded annually, when a minimum COLA of 4.00% is in effect. 1.80% compounded annually, when no minimum COLA is in effect (80% of price inflation).

### Mortality Rates - MSEP

Pre-retirement mortality rates were based on the Pub-2010 General Members Below Median Employee mortality table, set back two years for males and set forward one year for females. Mortality was projected generationally from 2010 to 2020 using Scale MP-2020 and 75% of Scale MP-2020 for years after 2020.

Post-retirement mortality rates for retirees were based on the Pub-2010 General Members Below Median Healthy Retiree mortality table, scaled by 104%, set back two years for males and set forward one year for females. Mortality projected generationally from 2010 to 2020 using Scale MP-2020 and 75% of Scale MP-2020 for years after 2020.

Post-retirement mortality rates for beneficiaries were based on the Pub-2010 General Members Below Median Contingent Survivor mortality table, set back two years for males and set forward one year for females. Mortality was projected generationally from 2010 to 2020 using Scale MP-2020 and 75% of Scale MP-2020 for years after 2020.

### Mortality Rates - Judicial Plan

Pre-retirement mortality rates were based on the Pub-2010 General Members Median Employee mortality table. Mortality was projected generationally from 2010 to 2020 using Scale MP-2020 and 75% of Scale MP-2020 for years after 2020.

Post-retirement mortality rates for retirees were based on the Pub-2010 General Members Median Healthy Retiree mortality table. Mortality was projected generationally from 2010 to 2020 using Scale MP-2020 and 75% of Scale MP-2020 for years after 2020.

Post-retirement mortality rates for beneficiaries were based on the Pub-2010 General Members Median Contingent Survivor mortality table. Mortality was projected generationally from 2010 to 2020 using Scale MP-2020 and 75% of Scale MP-2020 for years after 2020.

### Discount Rate

The discount rate used to measure the total pension liability was 6.95%. 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 6.95% 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, 2021, calculated using the discount rate of 6.95%, as well as what the net pension liability would be if it were calculated using a discount rate that is 1% lower (5.95%) or 1% higher (7.95%) than the current rate.

## Sensitivity of Net Pension Liability to Changes in the Discount Rate

| Employers' Net Pension Liability | 1% Decrease 5.95% | Current Discount Rate 6.95% | 1% Increase 7.95% |
|---|---|---|---|
| MSEP | $ 7,368,837,141 | $ 5,590,716,457 | $ 4,106,209,190 |
| Judicial Plan | $ 477,775,000 | $ 415,202,877 | $ 361,630,687 |

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

## Note 6 – Retiree Life Insurance and Long-Term Disability Insurance Programs

In addition to the defined benefit pension provided through MOSERS, the state of Missouri also funds, either partially or in its entirety, retiree life insurance, and long-term disability insurance programs for eligible members. These insurance programs are underwritten by The Standard. MOSERS collects premiums for participants of these programs and remits them to the The Standard on behalf on the state of Missouri.

### 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, 2021, 28,873 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 The Standard. The cost for the year ended June 30, 2021, was $1,998,030. 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, 2021, 103 retirees were participating in the program. The coverage for this closed group is purchased as a group policy at a current cost of $2.07 per thousand dollars of coverage, per month, per eligible participant ($13,149 for the year ended June 30, 2021). Premiums are paid entirely by the DOLIR as provided by Section 288.225, 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 29,674 members covered under the program as of June 30, 2021. This insured defined benefit coverage is financed on a percentage of covered payroll (0.55% July 2020 through December 2020; .0445% January 2021 and later). Purchased as a group policy, LTD is administered by The Standard. The cost for the year ended June 30, 2021, was $7,830,471. Premiums are contributed by the state and its component employers as provided for by Section 104.515, RSMo.

## Note 7 – MCHCP Post-Employment Retiree Health Care OPEB Program

MOSERS participates as an employer in a cost-sharing, multiple-employer, defined benefit, other post-employment benefits plan, the State Retiree Welfare Benefit Trust (SRWBT), operated by Missouri Consolidated Health Care Plan (MCHCP). Employees may participate at retirement if eligible to receive a monthly retirement benefit from MOSERS. The terms and conditions governing post-employment benefits are vested with the MCHCP Board of Trustees within the authority granted under Chapter 103, Sections 103.003 through 103.178, RSMo. The SRWBT does not issue a separate stand-alone financial report. Financial activity of the SRWBT is included in the *MCHCP Annual Comprehensive Financial Report* as a fiduciary fund and is intended to present only the financial position of the activities attributable to the SRWBT. Additionally, MCHCP is considered a component unit of the state of Missouri reporting entity and is included in the state's financial report.

The Plan's financial statements are available on MCHCP's website at *www.mchcp.org*.

## Benefits

The SRWBT was established and organized on June 27, 2008, pursuant to Sections 103.003 through 103.178, RSMo, to provide health and welfare benefits for the exclusive benefit of current and future retired employees of the state and their dependents who meet eligibility requirements, except for those retired members covered by other OPEB plans of the state. MCHCP's three medical plans offer the same basic coverage such as preventative care, freedom to choose care from a nationwide network of primary care providers, specialists, pharmacies, and hospitals, usually at a lower negotiated group discount and the same covered benefits for both medical and pharmacy. Benefits are the same in all three plans; other aspects differ such as premium, deductible and out-of-pocket costs. Retiree benefits are the same as for active employees, until they are Medicare eligible.

## Contributions

Contributions are established, and may be amended by the MCHCP Board of Trustees, with the authority granted under Chapter 103, Sections 103.003 through 103.178, RSMo. For the fiscal year ended June 30, 2020, employers were required to contribute 4.40% of gross active employee payroll for the periods July 1, 2019, through December 31, 2019; 4.65% for the period January 15, 2020 through April 1, 2020; 4.02% for the period April 15, 2020 through June 1, 2020; and 3.41% for the period June 1, 2020, through June 30, 2020. Employees do not contribute to this plan.

## OPEB Liabilities, OPEB Expense, and Deferred Outflows of Resources and Deferred Inflows of Resources

At June 30, 2021, MOSERS reported a liability of $7,682,560 for its proportionate share of the net OPEB liability. The net OPEB liability was measured as of June 30, 2020, and the total OPEB liability used to calculate the net OPEB liability was determined by an actuarial valuation as of that date. MOSERS' proportion of the net OPEB liability was based on a projection of its long-term share of contributions to the OPEB plan relative to the projected contributions of all participating entities, actuarially determined. At June 30, 2020, MOSERS' proportionate share was 0.4313%. For the year ended June 30, 2021, MOSERS recognized OPEB expense of $507,122. As of June 30, 2021, MOSERS reported deferred outflows of resources and deferred inflows of resources as follows:

### Deferred Outflows/Inflows of Resources Related to Post-Employment Retiree Health Care

| | Deferred Outflows of Resources | Deferred Inflows of Resources |
|---|---|---|
| Difference between expected and actual experience | $ 323,607 | $ 85,458 |
| Changes of assumptions | 0 | 540,713 |
| Net difference between projected and actual earnings on plan investments | 21,744 | 0 |
| Changes in proportion and differences between MOSERS' contributions and proportionate share of contributions | 288,107 | 92,484 |
| MOSERS' contributions subsequent to the measurement date | 283,613 | 0 |
| | $ 917,071 | $ 718,655 |

The $283,613 currently reported as deferred outflows of resources related to OPEB resulting from MOSERS' contributions subsequent to the measurement date will be recognized as a reduction of the net OPEB liability in the year ended June 30, 2022. Other amounts reported as deferred inflows of resources related to OPEB will be recognized in OPEB expense as follows:

### Deferred Outflows/Inflows of Resources Related to Post-Employment Retiree Health Care to be Recognized in Future Years

| Year Ending June 30 | | |
|---|---|---|
| 2022 | $ | 9,399 |
| 2023 | | 9,278 |
| 2024 | | 11,364 |
| 2025 | | 11,980 |
| 2026 | | 14,301 |
| Thereafter | | 28,875 |
| Total | $ | 85,197 |

## Actuarial Assumptions

The collective total OPEB liability for the June 30, 2020, measurement date was determined by an actuarial valuation as of July 1, 2020. This actuarial valuation used the following actuarial assumptions:

### Summary of MCHCP's Actuarial Assumptions for Post-Employment Retiree Health Care

| | |
|---|---|
| Valuation year | July 1, 2019 - June 30, 2020 |
| Actuarial cost method | Entry age normal, level percentage of payroll |
| Asset valuation method | Market value |
| Discount rate (blended) | 4.38% |
| Projected payroll growth rate | 4.0% |
| Inflation rate | 3.0% |
| Health care cost trend rate (medical & prescription drugs combined) | |
| Non-Medicare | 6.0% |
| | (rate decreases by 0.25% per year until an ultimate rate of 5.0% in fiscal year 2023 and later) |
| Medicare | 10.0% |
| | (rate changes to 22.0% in fiscal year 2021, 10.0% in fiscal year 2022 and 2023, 9.5% in fiscal 2024, 9.0% in fiscal 2025, 8.5% in fiscal 2026, then 8.0% in fiscal 2027, decreasing by 1.0% per year to an ultimate rate of 5.0% in fiscal year 2030 and after.) |

Mortality: RP-2016 for Employees/Annuitants without collar adjustments using Scale MP-2016.

The last experience study was conducted in 2020. Termination rates and retirement rates are updated based on an experience study conducted in 2020. Participation and dependent coverage assumptions were updated based upon an experience study conducted in July 2020. Per capita claims costs, administrative expenses and retirees contributions were updated based on analysis of 2021 rates.

## Change in Assumptions and Methods Since Prior Valuation

The discount rate was changed to 4.38% from 5.24%. The expected return on asset assumption was changed from 5.50% to 4.50%.

### Health Care Cost Trend Rate (Medical & Prescription Drugs Combined)

The non-medicare health care cost trend rate was 5.75% for fiscal year 2020. The rate will decrease by 0.25% per year to an ultimate rate of 5.0% in fiscal year 2023 and later. The medicare health care cost trend rate was 10.00% in fiscal year 2020. The medicare health care cost trend rate will be 22.00% in fiscal year 2021, 10.00% in fiscal year 2022 and 2023, 9.5% in fiscal year 2024, 9.00% in fiscal year 2025, 8.5% in fiscal year 2026 then 8.00% in fiscal year 2027 decreasing by 1.0% per year to an ultimate rate of 5.00% in fiscal year 2030 and after.

### Sensitivity to Changes in the Health Care Cost Trend Rates

The following table presents MOSERS' net OPEB liability, calculated using the current trend rate, as well as what the net OPEB liability would be if it were calculated using a trend rate that is one percent lower or one percent higher:

#### Sensitivity of the Net MCHCP OPEB Liability to Changes in Health Care Cost Trend Rates

| | 1% Decrease in Trend Rates | Current Trend Rates | 1% Increase in Trend Rates |
|---|---|---|---|
| Net OPEB liability | $ 6,465,488 | $ 7,682,560 | $ 9,237,124 |

### Discount Rate

A discount rate of 4.38% was used to measure the total OPEB liabilities. The projection of cash flows used to determine the discount rate assumed that contributions from plan members will be made at the current contribution rates and the contributions will be made at statutorily required rates, actuarially determined. This discount rate was determined as a blend of the best estimate of the expected return on plan assets and the 20-year high quality municipal bond rate as of the measurement date. For years where expected benefit payments can be covered by projected trust assets, expected returns are used. For years where payments are not expected to be covered by trust assets, the municipal Bond Buyer 20-Bond General Obligation Index rate is utilized.

### Sensitivity to Changes in the MCHCP Discount Rate

The following table presents MOSERS' net OPEB liability, calculated using a discount rate of 4.38%, as well as what the net OPEB liability would be if it were calculated using a discount rate that is one percent lower or one percent higher:

#### Sensitivity of the Net MCHCP OPEB Liability to Changes in Discount Rate

| | 1% Decrease in Discount Rate (3.38%) | Current Discount Rate (4.38%) | 1% Increase in Discount Rate (5.38%) |
|---|---|---|---|
| Net OPEB liability | $ 9,208,142 | $ 7,682,560 | $ 6,487,312 |

### Long-Term Expected Rate of Return

The target allocation and expected real rate of return for each major asset class are listed below:

#### MCHCP's Long-Term Expected Rate of Return

| Asset Class | Target Allocation | Expected Real Rate of Return |
|---|---|---|
| Large cap stocks | 17.0% | 8.5% |
| Mid cap stocks | 6.0 | 8.8 |
| Small cap stocks | 7.0 | 8.8 |
| International stocks | 4.0 | 8.9 |
| BarCap aggregate bonds | 64.0 | 2.4 |
| Cash equivalents | 2.0 | 2.1 |

## Note 8 – Commitments

As of June 30, 2021, MOSERS has $504.4 million in unfunded commitments in the private asset class.

MOSERS has contracted with various software and consulting firms to provide and implement a pension administration system at a cost of approximately $9.3 million. In addition to the cost of the system, MOSERS has engaged consultants to assist with project governance, change management, and data validation. The contracts for these consulting services have an approximate cost of $2.5 million. As of June 30, 2021, the remaining commitments on these agreements was approximately $5.9 million.

## Note 9 – Contingencies

There were no contingencies which would have a material impact on the financial statements as of June 30, 2021.

## Note 10 – Risk Management

MOSERS is exposed to various risks of loss related to natural disasters, errors 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.

## Schedule of Changes in Employers' Net Pension Liability - MSEP

*For Years Ended June 30, 2014 – 2021**

| | 2021 | 2020 | 2019 | 2018 |
|---|---|---|---|---|
| **Total pension liability** | | | | |
| Service cost | $ 162,668,072 | $ 159,559,528 | $ 158,190,866 | $ 157,351,979 |
| Interest on the total pension liability | 959,662,398 | 960,644,327 | 956,725,536 | 956,201,619 |
| Benefit changes | 0 | 0 | 0 | 0 |
| Difference between expected and actual experience | 133,886,066 | (70,371,777) | 7,426,685 | (118,252,032) |
| Assumption changes | 515,859,705 | 124,766,739 | 74,340,841 | 351,899,973 |
| Benefit payments and member refunds | (919,838,592) | (873,816,238) | (851,821,580) | (886,711,473) |
| **Net change in total pension liability** | 852,237,649 | 300,782,579 | 344,862,348 | 460,490,066 |
| **Total pension liability - beginning** | 14,258,408,888 | 13,957,626,309 | 13,612,763,961 | 13,152,273,895 |
| **Total pension liability - ending (a)** | $15,110,646,537 | $14,258,408,888 | $13,957,626,309 | $13,612,763,961 |
| **Plan fiduciary net position** | | | | |
| Employer contributions | $ 463,293,368 | $ 436,895,653 | $ 394,150,042 | $ 379,557,962 |
| Employee contributions | 37,571,263 | 35,141,960 | 31,286,632 | 28,303,994 |
| Pension plan net investment income (loss) | 2,032,991,086 | 400,354,303 | 313,159,178 | 576,188,826 |
| Benefit payments and member refunds | (919,838,592) | (873,816,238) | (851,821,580) | (886,711,473) |
| Pension plan administrative expense | (8,816,943) | (8,398,164) | (9,200,826) | (9,799,256) |
| Other | 3,899,365 | 4,187,740 | 4,383,409 | 1,610,073 |
| **Net change in plan fiduciary net position** | 1,609,099,547 | (5,634,746) | (118,043,145) | 89,150,126 |
| **Plan fiduciary net position - beginning** | 7,910,830,533 | 7,916,465,279 | 8,034,508,424 | 7,945,358,298 |
| **Plan fiduciary net position - ending (b)** | 9,519,930,080 | 7,910,830,533 | 7,916,465,279 | 8,034,508,424 |
| **Net pension liability - ending (a)-(b)** | $ 5,590,716,457 | $ 6,347,578,355 | $ 6,041,161,030 | $ 5,578,255,537 |
| **Plan fiduciary net position as a percentage of total pension liability** | 63.00% | 55.48% | 56.72% | 59.02% |
| **Covered payroll** | $ 2,024,883,601 | $ 2,006,870,248 | $ 1,950,272,350 | $ 1,951,454,817 |
| **Net pension liability as a percentage of covered payroll** | 276.10% | 316.29% | 309.76% | 285.85% |

* *Schedule is intended to show last 10 fiscal years and will be displayed as it becomes available.*

## Schedule of Changes in Employers' Net Pension Liability - MSEP (continued)

*For Years Ended June 30, 2014 – 2021**

| | 2017 | 2016 | 2015 | 2014 |
|---|---|---|---|---|
| **Total pension liability** | | | | |
| Service cost | $ 152,766,134 | $ 149,021,755 | $ 150,412,577 | $ 158,116,026 |
| Interest on the total pension liability | 945,654,398 | 913,877,923 | 896,451,618 | 869,878,195 |
| Benefit changes | (1,696,059) | 0 | 0 | 0 |
| Difference between expected and actual experience | (104,203,260) | 61,150,083 | (27,983,267) | 12,376,237 |
| Assumption changes | 202,554,786 | 656,805,085 | (57,568,553) | 0 |
| Benefit payments and member refunds | (793,964,857) | (757,310,503) | (728,265,800) | (680,436,107) |
| **Net change in total pension liability** | 401,111,142 | 1,023,544,343 | 233,046,575 | 359,934,351 |
| **Total pension liability - beginning** | 12,751,162,753 | 11,727,618,410 | 11,494,571,835 | 11,134,637,484 |
| **Total pension liability - ending (a)** | $13,152,273,895 | $12,751,162,753 | $11,727,618,410 | $11,494,571,835 |
| **Plan fiduciary net position** | | | | |
| Employer contributions | $ 335,217,422 | $ 329,957,369 | $ 329,752,832 | $ 326,370,336 |
| Employee contributions | 25,439,343 | 21,684,920 | 18,099,455 | 14,025,328 |
| Pension plan net investment income (loss) | 272,595,668 | 1,740,269 | (237,070,529) | 1,193,952,121 |
| Benefit payments and member refunds | (793,964,857) | (757,310,503) | (728,265,800) | (680,436,107) |
| Pension plan administrative expense | (8,759,341) | (8,489,375) | (8,077,692) | (7,336,922) |
| Other | 5,668,849 | 4,923,622 | 5,434,820 | 296,369,500 |
| **Net change in plan fiduciary net position** | (163,802,916) | (407,493,698) | (620,126,914) | 1,142,944,256 |
| **Plan fiduciary net position - beginning** | 8,109,161,214 | 8,516,654,912 | 9,136,781,826 | 7,993,837,570 |
| **Plan fiduciary net position - ending (b)** | 7,945,358,298 | 8,109,161,214 | 8,516,654,912 | 9,136,781,826 |
| **Net pension liability - ending (a)-(b)** | $ 5,206,915,597 | $ 4,642,001,539 | $ 3,210,963,498 | $ 2,357,790,009 |
| **Plan fiduciary net position as a percentage of total pension liability** | 60.41% | 63.60% | 72.62% | 79.49% |
| **Covered payroll** | $ 1,975,353,105 | $ 1,921,528,936 | $ 1,918,527,768 | $ 1,902,719,928 |
| **Net pension liability as a percentage of covered payroll** | 263.59% | 241.58% | 167.37% | 123.92% |

* *Schedule is intended to show last 10 fiscal years and will be displayed as it becomes available.*

## Schedule of Changes in Employers' Net Pension Liability - Judicial Plan

*For Years Ended June 30, 2014 – 2021**

| | 2021 | 2020 | 2019 | 2018 |
|---|---|---|---|---|
| **Total pension liability** | | | | |
| Service cost | $ 12,872,644 | $ 13,119,646 | $ 13,573,453 | $ 12,997,198 |
| Interest on the total pension liability | 42,004,675 | 42,458,800 | 41,710,768 | 41,018,371 |
| Benefit changes | 0 | 0 | 0 | 0 |
| Difference between expected and actual experience | (6,886,109) | (14,933,643) | 978,884 | (1,319,696) |
| Assumption changes | (4,928,456) | 6,341,771 | 5,024,057 | 12,332,042 |
| Benefit payments and member refunds | (41,625,546) | (39,622,268) | (37,593,049) | (35,657,248) |
| **Net change in total pension liability** | 1,437,208 | 7,364,306 | 23,694,113 | 29,370,667 |
| **Total pension liability - beginning** | 624,847,011 | 617,482,705 | 593,788,592 | 564,417,925 |
| **Total pension liability - ending (a)** | $ 626,284,219 | $ 624,847,011 | $ 617,482,705 | $ 593,788,592 |
| **Plan fiduciary net position** | | | | |
| Employer contributions | $ 39,996,509 | $ 39,174,515 | $ 38,604,668 | $ 36,892,203 |
| Employee contributions | 1,448,428 | 1,314,570 | 1,138,101 | 902,319 |
| Pension plan net investment income (loss) | 44,049,707 | 8,162,709 | 6,051,941 | 10,677,666 |
| Benefit payments | (41,625,546) | (39,622,268) | (37,593,049) | (35,657,248) |
| Pension plan administrative expense | (75,822) | (74,450) | (72,141) | (181,595) |
| Other | 0 | 0 | 3,895 | (68,711) |
| **Net change in plan fiduciary net position** | $ 43,793,276 | $ 8,955,076 | $ 8,133,415 | $ 12,564,634 |
| **Plan fiduciary net position - beginning** | 167,288,066 | 158,332,990 | 150,199,575 | 137,634,941 |
| **Plan fiduciary net position - ending (b)** | 211,081,342 | 167,288,066 | 158,332,990 | 150,199,575 |
| **Net pension liability - ending (a)-(b)** | $ 415,202,877 | $ 457,558,945 | $ 459,149,715 | $ 443,589,017 |
| **Plan fiduciary net position as a percentage of total pension liability** | 33.70% | 26.77% | 25.64% | 25.30% |
| **Covered payroll** | $ 63,105,884 | $ 61,402,061 | $ 60,594,362 | $ 59,417,302 |
| **Net pension liability as a percentage of covered payroll** | 657.95% | 745.18% | 757.74% | 746.57% |

* *Schedule is intended to show last 10 fiscal years and will be displayed as it becomes available.*

## Schedule of Changes in Employers' Net Pension Liability - Judicial Plan (continued)

*For Years Ended June 30, 2014 – 2021**

| | 2017 | 2016 | 2015 | 2014 |
|---|---|---|---|---|
| **Total pension liability** | | | | |
| Service cost | $ 12,945,567 | $ 10,932,097 | $ 10,613,686 | $ 8,990,293 |
| Interest on the total pension liability | 40,617,091 | 37,755,240 | 36,161,612 | 34,013,615 |
| Benefit changes | 0 | 0 | 0 | 0 |
| Difference between expected and actual experience | (10,687,091) | (5,036,696) | 5,103,664 | 13,360,614 |
| Assumption changes | 7,905,466 | 53,991,379 | 0 | 0 |
| Benefit payments and member refunds | (33,984,725) | (32,989,714) | (31,245,906) | (29,406,625) |
| **Net change in total pension liability** | 16,796,308 | 64,652,306 | 20,633,056 | 26,957,897 |
| **Total pension liability - beginning** | 547,621,617 | 482,969,311 | 462,336,255 | 435,378,358 |
| **Total pension liability - ending (a)** | $ 564,417,925 | $ 547,621,617 | $ 482,969,311 | $ 462,336,255 |
| **Plan fiduciary net position** | | | | |
| Employer contributions | $ 34,246,826 | $ 33,642,498 | $ 32,696,686 | $ 29,264,877 |
| Employee contributions | 786,745 | 661,206 | 488,193 | 294,810 |
| Pension plan net investment income (loss) | 4,680,131 | 28,081 | (3,610,352) | 17,199,701 |
| Benefit payments | (33,984,725) | (32,989,714) | (31,245,906) | (29,406,625) |
| Pension plan administrative expense | (150,387) | (136,983) | (123,015) | (105,693) |
| Other | 0 | 0 | 0 | 4,195,049 |
| **Net change in plan fiduciary net position** | $ 5,578,590 | $ 1,205,088 | $ (1,794,394) | $ 21,442,119 |
| **Plan fiduciary net position - beginning** | 132,056,351 | 130,851,263 | 132,645,657 | 111,203,538 |
| **Plan fiduciary net position - ending (b)** | 137,634,941 | 132,056,351 | 130,851,263 | 132,645,657 |
| **Net pension liability - ending (a)-(b)** | $ 426,782,984 | $ 415,565,266 | $ 352,118,048 | $ 329,690,598 |
| **Plan fiduciary net position as a percentage of total pension liability** | 24.39% | 24.11% | 27.09% | 28.69% |
| **Covered payroll** | $ 58,591,661 | $ 57,421,016 | $ 55,656,457 | $ 49,587,936 |
| **Net pension liability as a percentage of covered payroll** | 728.40% | 723.72% | 632.66% | 664.86% |

* *Schedule is intended to show last 10 fiscal years and will be displayed as it becomes available.*

*Pension Trust Funds*

## Schedule of Employer Contributions

*Last Ten Fiscal Years*

### MSEP

| Year Ended June 30 | Actuarially Determined Contribution | Contributions in Relation to the Actuarially Determined Contribution* | Contribution Deficiency (Excess) | Covered Payroll** | Contributions as a Percentage of Covered Payroll |
|---|---|---|---|---|---|
| 2021 | $ 463,293,368 | $ 463,293,368 | $ 0 | $ 2,024,883,601 | 22.88% |
| 2020 | 436,895,653 | 436,895,653 | 0 | 2,006,870,248 | 21.77 |
| 2019 | 394,150,042 | 394,150,042 | 0 | 1,950,272,350 | 20.21 |
| 2018 | 379,557,962 | 379,557,962 | 0 | 1,951,454,817 | 19.45 |
| 2017 | 322,772,697 | 335,217,422 | (12,444,725) | 1,975,353,105 | 16.97 |
| 2016 | 310,124,928 | 329,957,369 | (19,832,414) | 1,921,528,936 | 16.97 |
| 2015 | 329,752,832 | 329,752,832 | 0 | 1,918,527,768 | 16.97 |
| 2014 | 326,370,336 | 326,370,336 | 0 | 1,902,719,928 | 16.98 |
| 2013 | 274,655,284 | 274,655,284 | 0 | 1,880,212,950 | 14.45 |
| 2012 | 263,373,924 | 263,373,924 | 0 | 1,864,069,493 | 13.97 |

### Judicial Plan

| Year Ended June 30 | Actuarially Determined Contribution | Contributions in Relation to the Actuarially Determined Contribution* | Contribution Deficiency (Excess) | Covered Payroll** | Contributions as a Percentage of Covered Payroll |
|---|---|---|---|---|---|
| 2021 | $ 39,996,509 | $ 39,996,509 | $ 0 | $ 63,105,884 | 63.38% |
| 2020 | 39,174,515 | 39,174,515 | 0 | 61,402,061 | 63.80 |
| 2019 | 38,604,668 | 38,604,668 | 0 | 60,594,362 | 63.71 |
| 2018 | 36,892,203 | 36,892,203 | 0 | 59,417,302 | 62.09 |
| 2017 | 32,670,710 | 34,246,826 | (1,576,116) | 58,591,661 | 58.45 |
| 2016 | 31,604,527 | 33,642,498 | (2,037,971) | 57,421,016 | 58.45 |
| 2015 | 32,696,686 | 32,696,686 | 0 | 55,656,457 | 58.45 |
| 2014 | 29,264,877 | 29,264,877 | 0 | 49,587,936 | 59.69 |
| 2013 | 28,330,649 | 28,330,649 | 0 | 48,697,726 | 56.92 |
| 2012 | 26,324,526 | 26,324,526 | 0 | 45,835,501 | 57.30 |

* *Since the percent of payroll contributions rate was applied to the pension payroll during the fiscal year, the actuarially determined contribution is equal to the actual contribution. In fiscal years 2016 and 2017, excess contributions were made because the actuarially determined contribution rate fell below the Board-established minimum contribution rate.*

** *For fiscal years 2016 and prior, covered payroll totals from the valuation report were used, which includes actual covered payroll from July through May with estimated amounts for June. For fiscal years 2017 and forward, covered payroll totals used are actual covered payroll from July through June, as reported in the GASB 67 report.*

*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 |
|---|---|
| 2021 | 26.56% |
| 2020 | 5.25 |
| 2019 | 4.10 |
| 2018 | 7.57 |
| 2017 | 3.51 |
| 2016 | 0.08 |
| 2015 | (2.60) |
| 2014 | 19.25 |

** Schedule is intended to show last 10 fiscal years and will be displayed as it becomes available.*

## Notes to the Schedules of Required Supplementary Information - Pension Trust Funds

### Actuarial Methods and Assumptions for Valuations Performed as of June 30, 2021

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 layered, closed 25-year amortization period was used for the June 30, 2021 valuations to determine the fiscal year 2023 contribution rates. The actuarial value is calculated by recognizing the difference between the actual and expected return on the fair value of assets each year over a closed five-year period. In addition, the total unrecognized investment experience as of June 30, 2017, will be recognized evenly over a seven-year period beginning June 30, 2018.

The investment return rate assumption remained constant at 6.95% per year, as of June 30, 2021, compounded annually (net of investment expenses). The price inflation assumption used was 2.25% per year. Projected salary assumptions were 2.75% to 10.00% for the MSEP and 3.00% 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 1.80% (80% of the 2.25% price inflation), on a compounded basis.

### Actuarial Assumptions and Methods Used to Set the Actuarially Determined Contributions - Five-Year Review

#### MSEP & Judicial

| Valuation year | 2021 | 2020 | 2019 | 2018 | 2017 |
|---|---|---|---|---|---|
| Contribution rate for fiscal year | 2023 | 2022 | 2021 | 2020 | 2019 |
| Actuarial cost method | Entry Age Normal | Entry Age Normal | Entry Age Normal | Entry Age Normal | Entry Age Normal |
| Amortization method | Layered bases approach - Level percentage of payroll | Layered bases approach - Level percentage of payroll | Layered bases approach - Level percentage of payroll | Layered bases approach - Level percentage of payroll | Single base approach - Level percentage of payroll |
| Amortization periods | Closed 25-year period | Closed 30-year period | Closed 30-year period | Closed 30-year period | Closed 30-year period |
| Inflation | 2.25% | 2.25% | 2.35% | 2.50% | 2.50% |
| Cost-of-living adjustment | 4% or 1.80% | 4% or 1.80% | 4% or 1.88% | 4% or 2% | 4% or 2% |
| Salary increase | varied | varied | varied | varied | varied |
| Payroll growth | 2.25% | 2.25% | 2.35% | 2.50% | 3.00% |
| Investment rate of return | 6.95% | 6.95% | 7.10% | 7.25% | 7.50% |

## Schedule of Proportionate Share of the Net OPEB Liability

*For Years Ended June 30, 2018 – 2021**

### State Retiree Welfare Benefit Trust

| | 2021 | 2020 | 2019 | 2018 |
|---|---|---|---|---|
| MOSERS' proportion of the net OPEB liability | 0.4313% | 0.4352% | 0.4375% | 0.4121% |
| MOSERS' proportionate share of the net OPEB liability | $ 7,682,560 | $ 7,697,649 | $ 7,666,038 | $ 7,272,038 |
| MOSERS' covered payroll | $ 7,569,252 | $ 7,370,032 | $ 7,056,668 | $ 6,669,717 |
| MOSERS' proportionate share of the net OPEB liability as a percentage of its covered payroll | 101.50% | 104.45% | 108.64% | 109.03% |
| Plan fiduciary net position as a percentage of the total OPEB liability | 8.24% | 7.31% | 6.90% | 6.64% |

* *The amounts presented in this schedule were determined as of the previous fiscal year end. Intended to show information for 10 years, data for additional years will be displayed as it becomes available.*

## Schedule of Employer Contributions for OPEB

*For Years Ended June 30, 2018 – 2021**

| | 2021 | 2020 | 2019 | 2018 |
|---|---|---|---|---|
| Contractually required contribution | $ 283,613 | $ 311,510 | $ 331,275 | $ 301,182 |
| Contributions in relation to the contractually required contribution | $ 283,613 | $ 311,510 | $ 331,275 | $ 301,182 |
| Contribution deficiency (excess) | $ 0 | $ 0 | $ 0 | $ 0 |
| Covered payroll | $ 7,004,895 | $ 7,569,252 | $ 7,370,032 | $ 7,056,668 |
| Contributions as a percentage of covered payroll | 4.05% | 4.12% | 4.49% | 4.27% |

* *Intended to show information for 10 years, data for additional years will be displayed as it becomes available.*

## Schedules of Investment Expenses
*For the Year Ended June 30, 2021*

| Investing activity | MSEP | Judicial Plan | Total |
|---|---|---|---|
| **Investment management and incentive fees** | | | |
| **Equity** | | | |
| Kennedy Capital Management | $ 602,982 | $ 13,104 | $ 616,086 |
| Silchester International Investors | 2,560,100 | 55,634 | 2,615,734 |
| State Street Global Advisors | 17,619 | 383 | 18,002 |
| **Multi-asset** | | | |
| Blackrock | 430,751 | 9,361 | 440,112 |
| NISA Investment Advisors | 5,608,335 | 121,877 | 5,730,212 |
| **Alternatives** | | | |
| Aberdeen Standard Investments | 158,136 | 3,436 | 161,572 |
| Actis Emerging Markets III | 50,894 | 1,106 | 52,000 |
| Actis Emerging Markets IV | 2,839,298 | 61,702 | 2,901,000 |
| AQR DELTA Sapphire Fund, LP | 1,197,712 | 26,028 | 1,223,740 |
| Axiom Asia Private Capital Fund II, LP | 569,143 | 12,368 | 581,511 |
| Axiom Asia Private Capital Fund III, LP | 5,244,986 | 113,980 | 5,358,966 |
| Axiom Asia Fund VI | 158,813 | 3,451 | 162,264 |
| Axxon Brazil Private Equity Fund II B, LP | 172,415 | 3,747 | 176,162 |
| Bayview Opportunity Domestic IIIb, LP | 23,575 | 512 | 24,087 |
| Blackstone Real Estate Partners IV | 412,366 | 8,961 | 421,327 |
| Blackstone Real Estate Partners V | 363,876 | 7,907 | 371,783 |
| Blackstone Real Estate Partners VI | 42,602 | 926 | 43,528 |
| Blackstone Real Estate Partners VII | (50,449) | (1,096) | (51,545) |
| Blackstone Topaz Fund, LP | 3,641,691 | 79,139 | 3,720,830 |
| Blackstone Topaz Private Credit | 2,157,450 | 46,884 | 2,204,334 |
| Brevan Howard Alpha Strategies Fund, LP | 4,325,229 | 93,993 | 4,419,222 |
| Bridgewater Associates - Diamond Ridge Fund, LLC | 1,927,295 | 41,883 | 1,969,178 |
| CarVal Investors CVI Global Value Fund A, LP - private debt | 2,994 | 65 | 3,059 |
| CarVal Investors CVI Global Value Fund A, LP - real estate | 2,994 | 65 | 3,059 |
| Catalyst Fund Limited Partnership III | 156,499 | 3,401 | 159,900 |
| Catalyst Fund Limited Partnership IV | 22,220 | 483 | 22,703 |
| Catalyst Fund Limited Partnership V | 1,675,962 | 36,421 | 1,712,383 |
| CBRE US Core Partners, LP | 312,137 | 6,783 | 318,920 |
| Cornwall Domestic, LP | 72,404 | 1,573 | 73,977 |
| DRI Capital - LSRC | 509,964 | 11,082 | 521,046 |
| EIG Energy Fund XIV, LP | 166,369 | 3,615 | 169,984 |
| EIG Energy Fund XV, LP | 402,797 | 8,753 | 411,550 |
| EIG Energy Fund XVI, LP | 318,815 | 6,928 | 325,743 |
| Eisler Capital Fund, LP | 2,182,309 | 47,424 | 2,229,733 |
| Elliott International, Ltd. | 10,675,570 | 231,994 | 10,907,564 |
| Exodus Point | 7,122,987 | 154,792 | 7,277,779 |
| Farallon Capital Institutional Partners, LP | 140 | 3 | 143 |

*Schedule of Investment Expenses continued on following page.*

## Schedules of Investment Expenses (continued)
*For the Year Ended June 30, 2021*

| Investing activity | MSEP | Judicial Plan | Total |
|---|---|---|---|
| Gateway Energy & Resource Holdings, LLC | $ 16,037 | $ 349 | $ 16,386 |
| Glenview Capital Opportunity Fund, LP | 20,584 | 447 | 21,031 |
| Global Forest Partners GTI7 Institutional Investors Company Ltd. | 4,485 | 97 | 4,582 |
| HBK Merger Strategies Offshore Fund, Ltd. | 2,841,250 | 61,744 | 2,902,994 |
| JLL Partners Fund V, LP | 23,320 | 507 | 23,827 |
| JLL Partners Fund VI, LP | 588,870 | 12,797 | 601,667 |
| King Street Capital, LP | 71,274 | 1,549 | 72,823 |
| King Street Capital, Ltd. | 978 | 21 | 999 |
| LaSalle Property Fund | 161,117 | 3,501 | 164,618 |
| Linden Capital Partners II, LP | 700,040 | 15,213 | 715,253 |
| Merit Energy Partners F-II, LP | 28,975 | 630 | 29,605 |
| MHR Institutional Partners IIA, LP | 9,690,422 | 210,585 | 9,901,007 |
| MHR Institutional Partners III, LP | 162,924 | 3,541 | 166,465 |
| MHR Institutional Partners IV, LP | 3,589,589 | 78,006 | 3,667,595 |
| Millennium Technology Value Partners II | 2,987,615 | 64,925 | 3,052,540 |
| OCM Opportunities Fund VIIb, LP | (1,577) | (34) | (1,611) |
| OCM Opportunities Fund VIIIb, LP | 178,788 | 3,885 | 182,673 |
| OCM Power Opportunities Fund III, LP | 704,147 | 15,302 | 719,449 |
| OCM/GFI Power Opportunities Fund II, LP | 42,639 | 927 | 43,566 |
| Perry Partners, LP | 87 | 2 | 89 |
| Pharo Macro Fund, Ltd. | 3,120,020 | 67,802 | 3,187,822 |
| Portfolio Advisors Secondary Fund IV, LP | 424,319 | 9,221 | 433,540 |
| Silver Creek Special Opportunities Fund I, LP | 27,760 | 603 | 28,363 |
| Silver Creek Special Opportunities Fund II, LP | 33,531 | 729 | 34,260 |
| Silver Lake Partners II, LP | (2,144) | (47) | (2,191) |
| Standard Investment Research Hedged Equity Fund | 6,478,077 | 140,777 | 6,618,854 |
| StepStone Capital Buyout Fund II, LP | 38,453 | 836 | 39,289 |
| TA Realty Core Property Fund, LP | 26,330 | 572 | 26,902 |
| Voleon Institutional Strategies Fund, LP | 1,431,594 | 31,110 | 1,462,704 |
| Voleon Investors Fund, LP | 398,405 | 8,658 | 407,063 |
| Total investment management and incentive fees | 89,866,889 | 1,952,923 | 91,819,812 |
| **Other investment fees** | | | |
| *Investment consultant fees* | | | |
| Meketa Investment Group | 266,697 | 5,853 | 272,550 |
| NEPC | 313,129 | 6,871 | 320,000 |
| Total investment consultant fees | 579,826 | 12,724 | 592,550 |
| *Investment custodial and other fees* | | | |
| BNY Mellon (custodial) | 478,948 | 10,363 | 489,311 |
| BNY Mellon (performance calculation) | 273,343 | 5,915 | 279,258 |
| Total investment custodial and other fees | 752,291 | 16,278 | 768,569 |
| Internal investment activity expenses | 5,654,724 | 51,194 | 5,705,918 |
| Total investing activity expenses | $ 96,853,730 | $ 2,033,119 | $ 98,886,849 |

## Schedules of Internal Investment Activity Expenses

*For the Year Ended June 30, 2021*

| | |
|---|---|
| **Personnel services** | |
| Salaries | $ 2,472,281 |
| Fringe benefits | 942,182 |
| Total personnel services | 3,414,463 |
| **Professional services** | |
| Attorney services | 1,772,804 |
| Total professional services | 1,772,804 |
| **Communications** | |
| Telephone | 4,959 |
| Total communications | 4,959 |
| **Facilities** | |
| Utilities | 8,426 |
| Lease expense | 84,088 |
| Facility maintenance | 10,170 |
| Total facilities | 102,684 |
| **Software and equipment** | |
| Computer supplies and software | 500 |
| Total software and equipment | 500 |
| **Education, meetings and travel** | |
| Professional development including travel | 19 |
| Due diligence travel | 0 |
| Total education, meetings and travel | 19 |
| **General** | |
| Research and information services | 389,494 |
| Membership dues | 9,540 |
| Office supplies | 1,197 |
| Periodicals and publications | 10,258 |
| Total general | 410,489 |
| Total internal investment activity expenses | $ 5,705,918 |

## Schedules of Administrative Expenses

*For the Year Ended June 30, 2021*

| | |
|---|---|
| **Personnel services** | |
| Salaries | $ 4,195,208 |
| Fringe benefits | 2,473,564 |
| Total personnel services | 6,668,772 |
| **Professional services** | |
| Consulting services | 515,934 |
| Attorney services | 103,433 |
| Auditing services | 65,488 |
| Actuarial services | 223,887 |
| Total professional services | 908,742 |
| **Communications** | |
| Postage and mailing | 181,780 |
| Telephone and internet | 66,581 |
| Printing | 27,320 |
| Video production | 1,987 |
| Total communications | 277,668 |
| **Facilities** | |
| Utilities | 93,699 |
| Facility maintenance | 93,201 |
| Vehicle maintenance and operation | 1,072 |
| Total facilities | 187,972 |
| **Software and equipment** | |
| Maintenance agreements and licenses | 390,365 |
| Computer supplies and software | 58,239 |
| Equipment rental | 63,653 |
| Gain on sale of equipment | (7,157) |
| Total software and equipment | 505,100 |
| **Education, meetings and travel** | |
| Professional development including travel | 21,366 |
| Board travel and meetings | 5,431 |
| MOSERS sponsored seminars | 7,043 |
| Tuition reimbursement | 11,646 |
| Total education, meetings and travel | 45,486 |
| **General** | |
| Depreciation and amortization | 308,503 |
| Insurance | 199,197 |
| Business continuity | 99,310 |
| Banking services | 52,858 |
| Research and information services | 42,719 |
| Office supplies and miscellaneous | 36,101 |
| Membership dues | 25,138 |
| Recruiting and outreach | 15,319 |
| Total general | 779,145 |
| Total administrative expenses | $ 9,372,885 |

## Schedules of Professional Service Fees

*For the Year Ended June 30, 2021*

| Professional Services | | |
|---|---|---|
| **Operations administrative expenses** | | |
| ***Actuarial services*** | | |
| Cavanaugh Macdonald Consulting, LLC | $ | 223,887 |
| ***Attorney services*** | | |
| Ice Miller, LLP | | 37,125 |
| Thompson Coburn, LLP | | 64,749 |
| Other attorney services | | 1,559 |
| ***Total attorney services*** | | 103,433 |
| ***Auditing services*** | | |
| Eide Bailly, LLP | | 65,488 |
| ***Consulting services*** | | |
| Avtex – information technology | | 1,468 |
| Black Hills Information Security, LLC – information technology | | 86,760 |
| CBIZ Talent and Compensation Solutions – human resources | | 17,000 |
| Charlesworth & Associates – risk management | | 13,305 |
| Gamble & Schlemeier, Ltd. – governmental affairs | | 27,337 |
| Huber & Associates – information technology | | 19,711 |
| Linea Solutions | | 62,729 |
| McLagan Partners, Inc – human resources | | 7,000 |
| Norlem Technology Consulting – information technology | | 12,280 |
| Verus Advisory, Inc. – investment consulting | | 265,000 |
| Other consulting services | | 3,344 |
| ***Total consulting services*** | | 515,934 |
| Total operations administrative expenses | | 908,742 |
| **Investment administrative expenses** | | |
| ***Attorney services*** | | |
| Cassels Brock & Blackwell, LLC | | 24,446 |
| Quinn Emanuel Urquhart & Sullivan, LLP | | 407,151 |
| Thompson Coburn, LLP | | 1,341,207 |
| ***Total attorney services*** | | 1,772,804 |
| Total investment administrative expenses | | 1,772,804 |
| Total professional services expenses | $ | 2,681,546 |

*Information on investment management and consulting fees can be found in the Schedules of Investment Expenses on pages 58-59.*

| Capitalized professional service fees for the pension administration system | | |
|---|---|---|
| ***Consulting services*** | | |
| ICON Integration and Design, Inc. | $ | 254,129 |
| Tegrit | | 2,609,877 |
| ***Total consulting services*** | $ | 2,864,006 |