

FINANCIAL SECTION

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INDEPENDENT AUDITORS' REPORT

The Board of Trustees of
Commonwealth of Pennsylvania Public School Employees' Retirement System
Harrisburg, Pennsylvania

Report on the Financial Statements

We have audited the financial statements of the Commonwealth of Pennsylvania Public Employees' Retirement System (PSERS), which comprise the Statement of Fiduciary Net Position as of June 30, 2018, and the related Statement of Changes in Fiduciary Net Position for the year then ended, and the related Notes to the Financial Statements, as listed in the table of contents.

Management's Responsibility for the Financial Statements

Management is responsible for the preparation and fair presentation of these financial statements in accordance with 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.

Auditors' Responsibility

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

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

Opinion

In our opinion, the financial statements referred to above present fairly, in all material respects, the net position of the PSERS as of June 30, 2018, and the respective changes in its net position for the year then ended in accordance with accounting principles generally accepted in the United States of America.

The Board of Trustees of
Commonwealth of Pennsylvania Public School Employees' Retirement System
Harrisburg, Pennsylvania

Other Matters

Other Auditors

The financial statements of PSERS which comprise the Statement of Fiduciary Net Position as of June 30, 2017, and the related Statement of Changes in Fiduciary Net Position for the year then ended, and the related Notes to the Basic Financial Statements, were audited by other auditors whose report dated September 25, 2017, expressed an unmodified opinion on those statements.

Required Supplementary Information

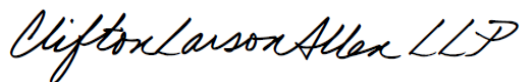
Accounting principles generally accepted in the United States of America require that the Management's Discussion and Analysis and the Schedules of Changes in the Employer Net Pension Liability, Employer Net Pension Liability, Employer Pension Contributions, Changes in the Employer Net OPEB Liability, Employer Net OPEB Liability, Employer Premium Assistance Contributions, Investment Returns – Pension and OPEB, and related Notes, as listed in the table of contents, 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 audits 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 audits were conducted for the purpose of forming an opinion on the basic financial statements. The Schedule of Administrative and Investment Expenses, Summary of Investment Expenses, and the Schedule of Payments to Non-Investment Consultants, as listed in the table of contents, for the year ended June 30, 2018 are presented for purposes of additional analysis and are not a required part of the basic financial statements.

The other supplementary information is the responsibility of management and was 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 audits of the basic financial statements for the year ended June 30, 2018 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 supplementary information is fairly stated, in all material respects, in relation to the basic financial statements as a whole for the year ended June 30, 2018.

The Introductory, Actuarial, Investment and Statistical section, as listed in the table of contents, have not been subjected to the auditing procedures applied in the audits of the basic financial statements, and accordingly, we do not express an opinion or provide any assurance on them.



CliftonLarsonAllen LLP

Baltimore, Maryland
October 1, 2018

Management's Discussion and Analysis

Management's Discussion and Analysis (MD&A) of the Commonwealth of Pennsylvania Public School Employees' Retirement System (PSERS, System, Fund) for the fiscal year ended June 30, 2018 (FY 2018) provides a narrative summary of PSERS' financial position and performance, including highlights and comparative data. The MD&A is presented as required supplementary information to the financial statements and should be read in conjunction with the financial statements, the notes to financial statements, and the supplementary schedules.

Overview of Financial Statements

PSERS is primarily responsible for administering a defined benefit pension plan for public school employees in the Commonwealth of Pennsylvania. PSERS also administers two voluntary postemployment healthcare programs, the Health Insurance Premium Assistance Program (Premium Assistance) and the Health Options Program (HOP), for its annuitants. As part of the HOP, PSERS has an Employer/Union Direct Contract with the Centers for Medicare and Medicaid Services (CMS) to provide a Medicare Part D Prescription Drug Plan to participants. On July 1, 2019 PSERS will begin administration of a Defined Contribution (DC) Plan for new employees. The financial statements reflect start-up funding and expenses for the DC plan. The financial statements present the financial position and activities for the pension plan, the DC Plan and the two postemployment healthcare programs.

The *Statements of Fiduciary Net Position* provide a snapshot of the financial position of PSERS at June 30, 2018. Amounts are shown for the most recent and previous fiscal years for comparison and analysis of changes in individual line items.

The *Statements of Changes in Fiduciary Net Position* summarize PSERS' financial activities that occurred during the fiscal period from July 1, 2017 to June 30, 2018. Amounts are shown for the most recent and previous fiscal years for comparison and analysis of changes in individual line items.

The *Notes to Financial Statements* provide additional information that is essential for a full understanding of the financial statements. The notes are an integral part of the financial statements and include detailed information not readily evident in the basic financial statements such as accounting policies, plan membership and benefits, and summary disclosures of selected financial data.

The *Required Supplementary Information* immediately following the notes to financial statements provide seven schedules illustrating the Changes in the Employer Net Pension Liability, Employer Net Pension Liability, Employer Pension Contributions, Changes in the Employer

Net OPEB Liability, Employer Net OPEB Liability, Employer Premium Assistance Contributions, and Investment Returns - Pension and OPEB.

The remaining supplementary schedules provide additional detailed information concerning the administrative expenses, investment expenses, and payments to non-investment consultants. These schedules emphasize the long-term nature of the pension and premium assistance plans and show the progress of PSERS in accumulating assets sufficient to pay benefits when due. All of this supplementary information is considered useful in understanding and evaluating the financial activities of PSERS.

Financial Highlights

- The time-weighted rate of return on investments was 9.27% for FY 2018, 10.14% for the fiscal year ended June 30, 2017 (FY 2017), and 1.29% for the fiscal year ended June 30, 2016 (FY 2016). The annualized rate of return since the Great Recession was 9.28%, which exceeded the 7.25% actuarial investment rate. Unless otherwise noted, all rates of return are net of fees.
- PSERS' total net position increased by \$3.2 billion from \$53.5 billion at June 30, 2017 to \$56.7 billion at June 30, 2018. The change in total net position from June 30, 2016 to June 30, 2017 was an increase of \$3.3 billion from \$50.2 billion at June 30, 2016 to \$53.5 billion at June 30, 2017. The increase in both years was due mostly to net investment income plus member and employer contributions exceeding deductions for benefit and administrative expenses.
- After increasing for many years, PSERS' unfunded liability on a market value basis declined for the second year in a row due to the Fund receiving actuarially required contributions and earning investment returns above the assumed rate of return in both years.
- Total employer contributions increased from \$3.9 billion in FY 2017 to \$4.4 billion in FY 2018. This increase was primarily attributable to an increase in the total employer contribution rate from 30.03% in FY 2017 to 32.57% in FY 2018 in accordance with Act 120 of 2010. PSERS' employers fully funded the actuarially required contributions in both FY 2018 and FY 2017.
- PSERS' total benefit expense increased from \$6.9 billion in FY 2017 to \$7.1 billion in FY 2018. The average monthly benefit and the number of members receiving benefits increased in FY 2018. New retirements during FY 2018 increased by approximately 2% from FY 2017.

Management’s Discussion and Analysis (continued)

Progress of Act 120 on PSERS’ Funding

On November 23, 2010, the Governor signed HB 2497 into law. The legislation is now known as Act 120 of 2010. Act 120 preserves the benefits of existing members and includes a series of actuarial and funding changes to PSERS and benefit reductions for individuals who become new members of PSERS on or after July 1, 2011. The Act created two new membership classes, T-E and T-F. T-E and T-F members are “shared-risk,” meaning that their employee contributions can increase or decrease due to investment performance.

Act 120 addressed the pending employer contribution rate spike projected for FY 2013 by smoothing the projected rate increases over a five- to nine-year time period. Instead of a large rate spike in one year, under Act 120, the employer contribution rate has increased steadily each year from the 5.64% in effect when Act 120 became law to the 32.57% rate in FY 2018. Prior to Act 120, PSERS’

Annual Required Contribution (ARC) percentage under Governmental Accounting Standards Board (GASB) standards was 27%. As a result of the Act 120 funding increases, on July 1, 2016, PSERS began receiving 100% of actuarially required contributions based on sound actuarial practices and principles for the first time in 15 years. This marks a significant milestone in PSERS’ contribution history and establishes a path to full funding. PSERS received the actuarially required contributions in both FY 2017 & FY 2018 and the large annual employer contribution rate increases that occurred over the past seven years are now complete.

Funded Status and State Accumulation Account

PSERS uses an actuarial reserve type of funding that is financed by member contributions, employer contributions, and earnings from invested assets. Figure 1 illustrates a thirty-year history of PSERS’ funded status. An independent

Analysis of Fiduciary Net Position					
(Dollar Amounts in Thousands)					
Summary of Fiduciary Net Position	FY 2018	Increase (Decrease)	FY 2017	Increase (Decrease)	FY 2016
Assets:					
Receivables	\$ 2,204,001	\$ (332,841)	\$ 2,536,842	\$ (658,316)	\$ 3,195,158
Investments	55,902,330	3,416,519	52,485,811	4,487,827	47,997,984
Securities lending collateral pool	2,980,119	964,056	2,016,063	(76,666)	2,092,729
Capital assets	23,430	(571)	24,001	1,130	22,871
Miscellaneous	17,529	278	17,251	5,061	12,190
Total Assets	61,127,409	4,047,441	57,079,968	3,759,036	53,320,932
Liabilities:					
Payables and other liabilities	1,418,563	(138,396)	1,556,959	479,318	1,077,641
Obligations under securities lending	2,980,119	964,056	2,016,063	(76,666)	2,092,729
Total Liabilities	4,398,682	825,660	3,573,022	402,652	3,170,370
Net Position	\$ 56,728,727	\$ 3,221,781	\$ 53,506,946	\$ 3,356,384	\$ 50,150,562
Summary of Changes in Fiduciary Net Position					
Additions:					
Contributions	\$ 5,387,972	\$ 430,367	\$ 4,957,605	\$ 665,522	\$ 4,292,083
Commonwealth of Pennsylvania	6,801	6,801	-	-	-
Participant premiums and CMS	423,894	13,477	410,417	51,251	359,166
Net investment income	4,717,626	(279,077)	4,996,703	4,522,656	474,047
Total Additions	10,536,293	171,568	10,364,725	5,239,429	5,125,296
Deductions:					
Benefit expense	7,143,341	219,437	6,923,904	144,327	6,779,577
Administrative expenses	91,095	6,658	84,437	4,206	80,231
Total Deductions	7,234,436	226,095	7,008,341	148,533	6,859,808
Effect of change in accounting principle	(80,076)	(80,076)	-	-	-
Changes in Net Position	\$ 3,221,781	\$ (134,603)	\$ 3,356,384	\$ 5,090,896	\$ (1,734,512)

Management’s Discussion and Analysis (continued)

actuarial valuation of PSERS’ actuarial assets and liabilities is performed annually. As part of this valuation, the progress toward funding pension obligations of PSERS is measured by comparing the actuarial value of assets to the actuarial accrued liability. This measurement is referred to as the funded ratio or funded status. The most recent actuarial valuation reports that PSERS is 56.3% funded as of June 30, 2017. The funded ratio decreased from 57.3% as of June 30, 2016 due to the recognition of asset losses from the use of ten-year asset smoothing and an increase in the actuarial accrued liability from additional member service. The actuarial value of assets, which is based on a ten-year smoothing period, remained consistent.

The results of operations for FY 2018 will be reflected in the actuarial valuation for the year ended June 30, 2018. Due to the normal lag time for completion of the actuarial valuation, the resulting funded status will be available at the end of the 2018 calendar year and will be reported in the financial statements for the fiscal year ending June 30, 2019 (FY 2019). Based on the investment performance for the ten-year period ended June 30, 2018, which is below the investment rate of return assumption during that time period, the funded ratio at June 30, 2018 is expected to decrease. The June 30, 2018 valuation will recognize the last year of losses from the Great Recession under the System’s ten-year asset smoothing. As a result, the funded ratio in the June 30, 2019 valuation and thereafter is expected to improve.

Under GASB 67, the market value funded ratio, which is referred to as the plan fiduciary net position as a percentage of total pension liability, increased from 51.84% at June 30, 2017 to 54.00% at June 30, 2018 as the Fund received the full actuarially determined contributions, had investment returns which exceeded the investment return assumption

and experienced a small growth in benefit payments in FY 2018. The Fund has reached a turning point after experiencing declining actuarial and market value funded ratios for many years. All the ingredients are now in place and a path to full funding has been established.

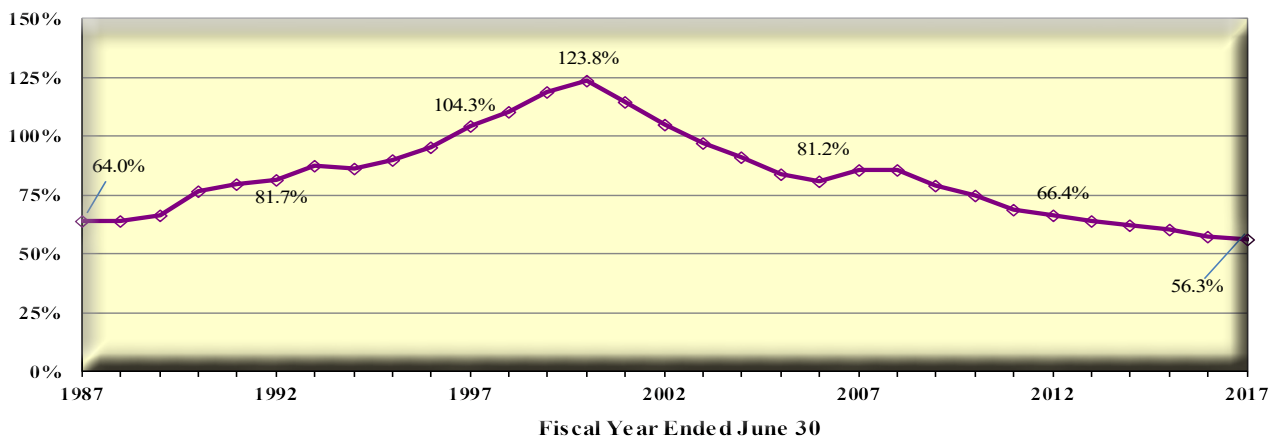
PSERS’ State Accumulation Account improved from \$(19.0) billion at June 30, 2017 to \$(17.2) billion at June 30, 2018 due to favorable investment performance and employer contributions at the actuarially required level. Investment earnings and actuarially required employer contributions will reduce the deficit in this account in the future (See Note 3).

Investments

PSERS is a long-term investor and manages the pension fund with long-term objectives in mind. A primary element of PSERS’ investment philosophy is diversification among various asset classes, which is the best way to achieve its goals. PSERS makes estimates of future long-term market returns and establishes an asset allocation plan taking into account the risk associated with each asset class as well as the financial objectives of the Fund.

The past fiscal year can be characterized as a risk-on period where taking concentrated equity risk, specifically U.S. equity risk, paid off as opposed to holding a diversified portfolio of assets. Improving economic fundamentals, improving global growth, low but rising inflation, U.S. tax reform, and improving corporate profitability were all contributors to strong equity performance. The MSCI USA Investible Market Index (IMI), a U.S. equity index, rose by 14.9% during this period. Threats of trade sanctions imposed by the U.S. on imports and rising political uncertainty in Europe weighed on Non-U.S. equity performance vs. U.S.

Figure 1 - PSERS' Funded Ratio
Funded Ratio = Actuarial Value of Assets / Actuarial Accrued Liability



Management’s Discussion and Analysis (continued)

equity performance. Central banks globally remained generally very accommodative with the European Central Bank (ECB) and the Bank of Japan keeping short-term interest rates in negative territory and the Federal Reserve Bank in the U.S. increasing interest rates at a measured pace.

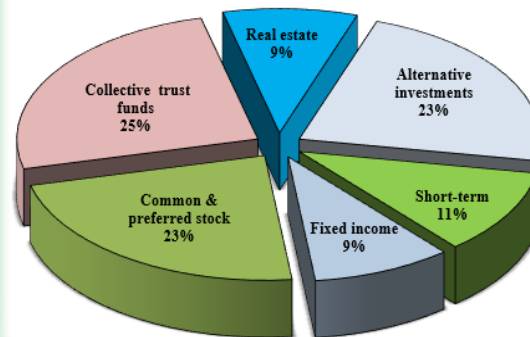
The U.S. economy showed improvement this past year, aided by favorable monetary conditions and optimism from individual and corporate tax cuts signed into law in December 2017. While interest rates rose moderately, they provided a historically low cost of borrowing which resulted in the improvement of broad economic conditions. The U.S. real Gross Domestic Product (GDP) increased year-over-year an average of 2.9% per quarter during the past fiscal year with a range of 2.2% to 4.1%. Concurrently, U.S. consumer confidence, as measured by the Conference Board’s Consumer Confidence Index, increased from 117.3 at June 30, 2017 to 127.1 at June 30, 2018.

The Euro Area economy experienced modest growth this fiscal year. The unemployment rate continues to normalize and improved to 8.3% as of June 2018 from 9.2% a year earlier. The economy is still expanding as evidenced by the Markit Eurozone Manufacturing PMI (Purchasing Managers Index) measurement of 55.1 for the past fiscal year. The ECB has continued its policy of very accommodative overnight interest rates (negative 0.4%) but has slightly restricted economic conditions by reducing monthly purchases of euro-denominated sovereign and corporate debt from \$68 billion last year to \$35 billion as of fiscal year end. In addition, the ECB has only committed to quantitative easing through September 2018 which, if ended, would result in a further tightening of monetary conditions.

Japan’s economy has moderately retreated over the past year. As of the second quarter 2018, Japan’s real GDP increased by a year-over-year rate of 1.0% versus 1.6% as of June 2017. Japanese policy makers have aggressively attempted to stimulate their economy through a combination of low interest rates (the Bank of Japan policy rate is negative 0.1%), the purchase of higher risk assets by the Bank of Japan, coordinated diversification into higher risk assets by large public investors, and fiscal spending policies to encourage liquidity to move into riskier assets. China maintained robust economic growth compared to the other developed regions of the world. China’s real GDP increased by 6.7% over the past year, only slightly slower than the 6.9% pace for the year ended June 2017. The Chinese government is continuing to target economic growth of between 6.5% and 7.0% over the foreseeable future.

For FY 2018, PSERS’ time-weighted rate of return on investments was 9.27% which far exceeded PSERS’ total

**Figure 2 - Asset Distribution
June 30, 2018**



fund Policy Index of 7.95% for the same time period. A time-weighted rate of return considers investment performance of a hypothetical dollar invested from the beginning of an investment period to the period’s end. The Policy Index is a custom benchmark, based on the Board-established asset allocation structure, that seeks to generate a return that meets the actuarial rate of return assumption. Net investment income of \$4.7 billion in FY 2018 declined slightly from a net investment income of \$5.0 billion in FY 2017 as both years’ returns exceeded the actuarial investment rate of return.

The time-weighted annualized rate of return over the past three- and five-year periods ended June 30, 2018 was 6.84% and 7.62%, respectively. The time-weighted returns for the three- and five-year periods exceeded the total fund Policy Index returns for those periods by 39 and 32 basis points, respectively. The annualized time-weighted rate of return for the ten- and twenty-five-year periods ended June 30, 2018 was 5.03% and 7.88%, respectively.

PSERS’ long-term actuarial investment rate of return assumption was 7.25% during FY 2018. PSERS’ Board lowered the return assumption from 7.50% to 7.25% effective with the June 30, 2016 actuarial valuation.

The asset distribution of PSERS’ investment portfolio at June 30, 2018, 2017, and 2016, at fair value, and including defined contribution and postemployment healthcare assets, is presented in Figure 2 and Table 1.

FY 2018

- **Short-term investments** (cash and cash equivalents) remained consistent at \$6.1 billion at June 30, 2017 and \$6.2 billion at June 30, 2018.
- **Fixed income investments** increased by \$0.2 billion from \$5.0 billion at June 30, 2017 to \$5.2 billion at June 30, 2018 mainly due to investment performance.
- **Common and preferred stock investments** increased by \$1.5 billion from \$11.3 billion at June 30, 2017 to

Management's Discussion and Analysis (continued)

\$12.8 billion at June 30, 2018. Due to a reallocation of exposure from other asset classes and favorable investment performance, PSERS increased its common and preferred stock investments during FY 2018.

- **Collective trust funds** increased by \$1.2 billion from \$12.8 billion at June 30, 2017 to \$14.0 billion at June 30, 2018 mostly due to investment performance.
- **Real estate investments** decreased by \$0.3 billion from \$5.3 billion at June 30, 2017 to \$5.0 billion at June 30, 2018 due to significant partnership distributions which exceeded contributions to new and existing partnerships and valuation increases in partnership portfolio holdings.
- **Alternative investments** increased by \$0.7 billion from \$11.9 billion at June 30, 2017 to \$12.6 billion at June 30, 2018 due to contributions to new and existing partnerships combined with valuation increases in partnership portfolio holdings which exceeded significant partnership distributions.

FY 2017

- **Short-term investments** (cash and cash equivalents) increased by \$1.1 billion from \$5.0 billion at June 30, 2016 to \$6.1 billion at June 30, 2017. Due to a reallocation of exposure from other asset classes, PSERS increased its short-term investments during FY 2017.
- **Fixed income investments** increased by \$0.9 billion from \$4.1 billion at June 30, 2016 to \$5.0 billion at June 30, 2017 mainly due to investment performance.
- **Common and preferred stock investments** increased by \$0.8 billion from \$10.5 billion at June 30, 2016 to \$11.3 billion at June 30, 2017. The increase in this asset category was mainly due to higher market value increases compared to the prior fiscal year.
- **Collective trust funds** increased by \$0.7 billion from \$12.1 billion at June 30, 2016 to \$12.8 billion at June 30, 2017 mostly due to investment performance.
- **Real estate investments** increased by \$0.1 billion from \$5.2 billion at June 30, 2016 to \$5.3 billion at June 30, 2017 due to contributions to new and existing

partnerships combined with valuation increases in partnership portfolio holdings which exceeded significant partnership distributions.

- **Alternative investments** increased by \$0.7 billion from \$11.2 billion at June 30, 2016 to \$11.9 billion at June 30, 2017 due to contributions to new and existing partnerships combined with valuation increases in partnership portfolio holdings which exceeded significant partnership distributions.

Securities Lending

The System's net income from securities lending activities increased from \$11.8 million in FY 2017 to \$12.5 million in FY 2018. Lending income rose significantly in FY 2018 due to the increased popularity of master limited partnerships among borrowers and an increase in short-term rates, however, this was offset by increased amounts of earnings on collateral being rebated to the borrowers.

Contributions

Employer contributions increased from \$3.9 billion in FY 2017 to \$4.4 billion in FY 2018 due to the increase in the total employer contribution rate from 30.03% in FY 2017 to 32.57% in FY 2018. Total employer contributions increased from \$3.3 billion in FY 2016 to \$3.9 billion in FY 2017. This increase was primarily attributable to an increase in the total employer contribution rate from 25.84% in FY 2016 to 30.03% in FY 2017.

Total member contributions slightly increased from \$1.01 billion in FY 2017 to \$1.03 billion in FY 2018. The increase was mainly due to an increase in member contributions from active member payroll. Total member contributions increased from \$989.3 million in FY 2016 to \$1.01 billion in FY 2017. The increase was mainly due to an increase in member contributions from active member payroll and purchase of service.

Table 1 - Investment Balances by Asset Class

Asset Class	(Dollar Amounts in Thousands)					
	2018	%	2017	%	2016	%
Short-term	\$ 6,173,655	11.0	\$ 6,107,020	11.6	\$ 4,980,721	10.4
Fixed income	5,235,603	9.4	4,961,284	9.5	4,052,513	8.4
Common and preferred stock	12,832,667	23.0	11,337,865	21.6	10,456,298	21.8
Collective trust funds	14,011,193	25.1	12,816,147	24.4	12,143,184	25.3
Real estate	5,039,237	9.0	5,340,555	10.2	5,166,068	10.8
Alternative investments	12,609,975	22.5	11,922,940	22.7	11,199,200	23.3
Total	\$ 55,902,330	100.0	\$ 52,485,811	100.0	\$ 47,997,984	100.0

Management’s Discussion and Analysis (continued)

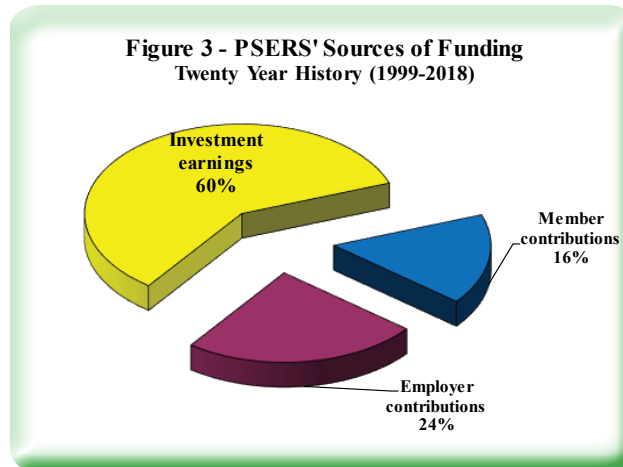
As a result of an increase in the receivables of member contributions from active member payroll, in the last quarter of FY 2017 to the last quarter of FY 2018, member contribution receivables increased from \$349.7 million at June 30, 2017 to \$350.4 million at June 30, 2018. The increase in the employer contribution rate from FY 2017 to FY 2018, resulted in the employer contribution receivables rising from \$1.1 billion at June 30, 2017 to \$1.2 billion at June 30, 2018. See Figure 4 for thirty-year history of PSERS’ contribution rates.

Investment Income

Net investment income slightly decreased from \$5.0 billion in FY 2017 to \$4.7 billion in FY 2018, which is consistent with the decrease in the time-weighted investment rate of return from 10.14% for FY 2017 to 9.27% for FY 2018. The investment returns in both years exceeded the actuarial rate return assumption. Net investment income increased significantly from \$0.5 billion in FY 2016 to \$5.0 billion in FY 2017, which is consistent with the increase in the time-weighted investment rate of return from 1.29% for FY 2016 to 10.14% for FY 2017. As depicted in Figure 3, investment earnings provided 60% of PSERS’ funding over the past 20 years. Net investment income also includes investment expenses as a deduction. The “Total PSERS’ Benefits and Expenses” section that follows includes an analysis of investment expenses.

Total PSERS’ Benefits and Expenses

The primary source of expense during FY 2018 was for the payment of pension and healthcare benefits approximating \$7.1 billion. The breakdown consisted of \$6.6 billion for Pension, \$111.8 million for Premium Assistance, and \$376.3

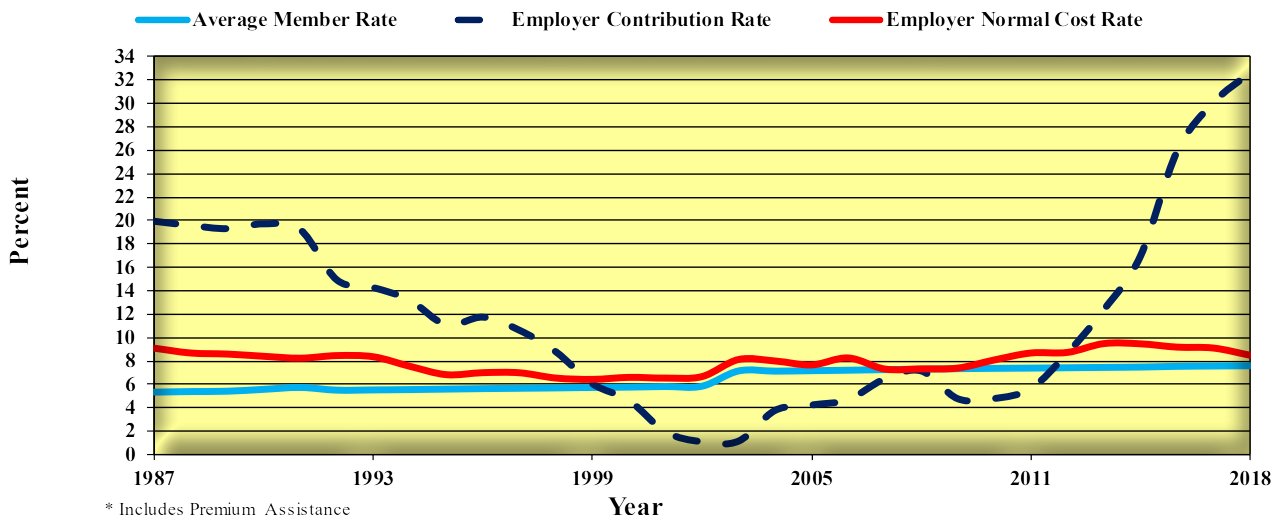


million for HOP benefits. Figure 5 illustrates the significant portion of expenses attributable to benefit payments.

Total PSERS’ benefit expense increased from \$6.9 billion in FY 2017 to \$7.1 billion in FY 2018. The increase is attributable to an ongoing increase to the average monthly benefit and an increase in the number of members receiving benefits. Pension benefits payable increased from \$529.8 million at June 30, 2017 compared to \$582.4 million at June 30, 2018. This increase was mainly attributable to an increase in pension payments payable which was partially offset by a small decrease in death payments payable. New retirements during FY 2018 increased by approximately 2% from FY 2017 and lump sum rollovers increased by 10%. Total PSERS’ benefit expense increased from \$6.8 billion in FY 2016 to \$6.9 billion in FY 2017. The increase is attributable to an ongoing increase to the average monthly benefit and an increase in the number of members receiving benefits. Pension benefits payable increased slightly from \$520.5 million at June 30, 2016 compared to \$529.8 million

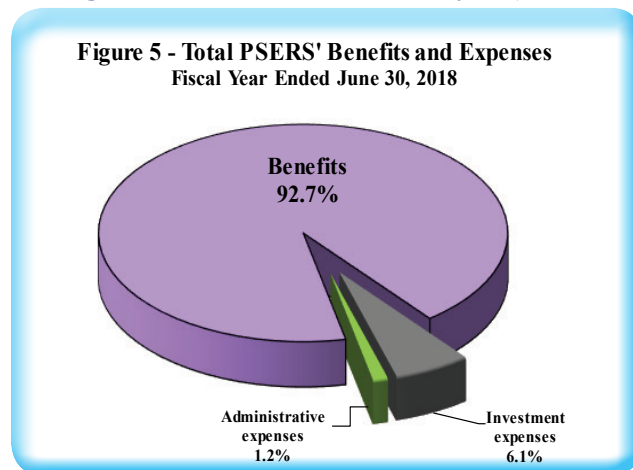
Below is a thirty-year history of PSERS’ contribution rates:

Figure 4 - History of PSERS' Contribution Rates as a Percent of Payroll*



* Includes Premium Assistance

Management's Discussion and Analysis (continued)



at June 30, 2017. This increase was mainly attributable to a small increase in pension payments payable which was partially offset by a small decrease in death payments payable. New retirements during FY 2017 decreased by approximately 6% from FY 2016.

Investment expenses decreased by \$6.8 million from \$474.5 million in FY 2017 to \$467.7 million in FY 2018 mainly due to a decrease in management fees in absolute return and alternative investments of \$18 million. The decrease in absolute return is mainly attributable to a renegotiation of fee terms and lower performance fees earned in FY 2018. The decrease in the alternative investment class is attributable to change in fee structure brought on by partnerships maturing. The decreases are partially offset by increases in management fees in international equity, fixed income, and commodities asset classes of \$11 million.

As a percentage of total benefits and expenses, investment expense decreased from 6.3% in FY 2017 to 6.1% in FY 2018. Investment expenses increased by \$58.7 million from \$415.8 million in FY 2016 to \$474.5 million in FY 2017 mainly due to increases in management fees in fixed income, absolute return, and risk parity. This increase is mainly attributable to an increase in performance fees due to performance and growth in the asset base in the fixed income, absolute return, and risk parity asset classes. The fixed income fee increase was also attributable to a higher allocation in this asset class. As a percentage of total benefits and expenses, investment expense has decreased from a high of 8.2% in FY 2013 to 6.1% in FY 2018 due to a decrease in investment expenses from \$558 million in FY 2013 to \$468 million in FY 2018. During this same period net assets increased \$8 billion from \$48.7 billion at June 30, 2012 to \$56.7 billion at June 30, 2018.

PSERS continues to be one of the most transparent among large public pension funds in the nation for the disclosure of management fees. For example, certain pension funds report no or very little management fees for alternative

investments because they are considered part of the cost of the investment and are netted against performance rather than shown separately. PSERS, however, gathers management fee information from each of its limited partnerships and collective trust fund investments, even if it is not specifically disclosed in the fund's standard reports or specifically identified in capital call requests. Such management fee information includes both base and performance fees obtained from either the fund's administrator statement, capital account statement or financial statements. This information is then utilized to report all relevant management fees in the System's financial statements. While the national debate over what constitutes a "fee" continues, PSERS will endeavor to remain transparent and report fees in accordance with current GASB standards and prevailing public pension industry practice to keep PSERS' financial statements both meaningful and comparative to its peers. In addition, PSERS reports all other investment expenses, including staff compensation and overhead, consultant, legal, and bank expenses incurred.

Administrative expenses increased by \$6.7 million from \$84.4 million during FY 2017 compared to \$91.1 million during FY 2018. This rise was mainly attributable to the increase in administrative costs for HOP due to an increase in the number of participants. As depicted in Figure 5, administrative expenses represent only 1.2% of total benefits and expenses.

New GASB Standards

During the fiscal year ended June 30, 2018 the System adopted GASB Statement No. 75, *Accounting and Financial Reporting for Postemployment Benefits Other Than Pensions (OPEB)*. GASB 75 addresses financial accounting and reporting for governments that provide or finance OPEB. GASB 75 replaces GASB 45, *Accounting and Financial Reporting by Employers for Postemployment Benefits Other Than Pensions*, as amended, and GASB No. 57, *OPEB Measurements by Agent Employers and Agent Multiple-Employer Plans*, for OPEB.

Management’s Discussion and Analysis (continued)

Postemployment Healthcare

PSERS administers two postemployment healthcare programs, the Health Insurance Premium Assistance Program (Premium Assistance) and the Health Options Program (HOP), for its annuitants. The following paragraphs and summary financial data provide supplementary information to the financial statements which contain the financial position and activities for the two postemployment healthcare programs.

**Health Insurance Premium Assistance Program
(Premium Assistance)**

Financial Highlights

- Total net position decreased by \$1.0 million in FY 2018 mainly due to deductions for benefits and administrative expenses slightly exceeding net investment income and employer contributions. The total net position continues to be sufficient to fund one full year of benefits. The change from June 30, 2016 to June 30, 2017 was a decrease of \$0.8 million mainly due to deductions for benefits and administrative expenses slightly exceeding employer contributions and investment income. The contribution rate decreased from 0.84% for FY 2016 to 0.83% for FY 2017.
- Investments increased from \$82.9 million at June 30, 2017 to \$91.7 million at June 30, 2018 mainly due to a decrease in interfund receivables which resulted in a higher amount available to invest at June 30, 2018.

Contributions

Total employer contributions for Premium Assistance increased slightly from \$111 million in FY 2017 to \$112 million in FY 2018 due to an increase in active member payroll and a level contribution rate of 0.83% for both FY 2017 and FY 2018.

Investment Income

Total investment income for Premium Assistance increased from \$0.7 million for FY 2017 to \$1.5 million for FY 2018 due to higher short-term interest rates.

Benefits and Expenses

Overall deductions for Premium Assistance increased from \$112.5 million in FY 2017 to \$114.5 million in FY 2018. This increase is due to the increase in the number of members receiving premium assistance benefits and an increase in administrative expenses.

Health Options Program (HOP)

Financial Highlights

- Total net position increased by \$7.7 million in FY 2018 primarily due to the rise in premiums and investment income that outpaced the rise in both benefit payments and administrative expenses. The change from June 30, 2016 to June 30, 2017 is also primarily due to the rise in premiums and investment income that outpaced the rise in expenses in both benefit payments and administrative expenses.
- Total receivables decreased from \$67.2 million at June 30, 2017 to \$58.6 million at June 30, 2018. The decrease is attributed to a change in CMS reimbursement.
- Investments increased from \$219.8 million at June 30, 2017 to \$237.5 million at June 30, 2018 as HOP additions exceeded deductions, which produced more funds for investment.
- Total liabilities increased 6.8% from \$59.2 million at June 30, 2017 to \$63.3 million at June 30, 2018. The increase is mainly due to increased participation in the program and claim costs causing an increase in claims payable and administrative expense payable.

Participant and CMS Premiums

Total participant CMS premiums for HOP increased from \$410.4 million at June 2017 to \$423.9 million at June 2018 due to an increase in plan participation.

Investment Income

Investment income for HOP increased from \$0.7 million for FY 2017 to \$2.0 million for FY 2018 due to the increase in investments and higher short-term interest rates.

Benefits and Expenses

Overall deductions for HOP increased from \$377.2 million in FY 2017 to \$418.2 million in FY 2018. This increase is primarily due to the increase in the number of members enrolled in the HOP combined with an increase in the cost of claims and an increase in administrative costs.

Management's Discussion and Analysis (continued)**Premium Assistance****Summary of Fiduciary Net Position**

(Dollar Amounts in Thousands)

	FY 2018	Increase (Decrease)	FY 2017	Increase (Decrease)	FY 2016
Assets:					
Receivables	\$ 35,208	\$ (5,718)	\$ 40,926	\$ 4,961	\$ 35,965
Investments	91,705	8,788	82,917	(5,970)	88,887
Miscellaneous	247	(8)	255	(232)	487
Total Assets	127,160	3,062	124,098	(1,241)	125,339
Liabilities:					
Payables and other liabilities	4,426	4,071	355	(421)	776
Total Liabilities	4,426	4,071	355	(421)	776
Net Position	\$ 122,734	\$ (1,009)	\$ 123,743	\$ (820)	\$ 124,563

Summary of Changes in Fiduciary Net Position

	FY 2018	Increase (Decrease)	FY 2017	Increase (Decrease)	FY 2016
Additions:					
Contributions	\$ 111,986	\$ 1001	\$ 110,985	\$ (2,322)	\$ 113,307
Net investment income	1,455	792	663	121	542
Total Additions	113,441	1,793	111,648	(2,201)	113,849
Deductions:					
Benefit expenses	111,847	1,618	110,229	1,956	108,273
Administrative expenses	2,603	364	2,239	583	1,656
Total Deductions	114,450	1,982	112,468	2,539	109,929
Changes in Net Position	\$ (1,009)	\$ (189)	\$ (820)	\$ (4,740)	\$ 3,920

Health Options Program**Summary of Fiduciary Net Position**

(Dollar Amounts in Thousands)

	FY 2018	Increase (Decrease)	FY 2017	Increase (Decrease)	FY 2016
Assets:					
Receivables	\$ 58,577	\$ (8,669)	\$ 67,246	\$ 14,583	\$ 52,663
Investments	237,498	17,747	219,751	26,421	193,330
Miscellaneous	2,717	2,624	93	(3)	96
Total Assets	298,792	11,702	287,090	41,001	246,089
Liabilities:					
Payables and other liabilities	63,272	4,049	59,223	7,073	52,150
Total Liabilities	63,272	4,049	59,223	7,073	52,150
Net Position	\$ 235,520	\$ 7,653	\$ 227,867	\$ 33,928	\$ 193,939

Summary of Changes in Fiduciary Net Position

	FY 2018	Increase (Decrease)	FY 2017	Increase (Decrease)	FY 2016
Additions:					
Participant and CMS premiums	\$ 423,894	\$ 13,477	\$ 410,417	\$ 51,251	\$ 359,166
Net investment income	1,960	1,282	678	379	299
Total Additions	425,854	14,759	411,095	51,630	359,465
Deductions:					
Benefit expenses	376,348	36,252	340,096	29,117	310,979
Administrative expenses	41,853	4,782	37,071	3,614	33,457
Total Deductions	418,201	41,034	377,167	32,731	344,436
Changes in Net Position	\$ 7,653	\$ (26,275)	\$ 33,928	\$ 18,899	\$ 15,029

Statements of Fiduciary Net Position
June 30, 2018 and 2017
(Dollar Amounts in Thousands)

	2018				
	Pension	Defined Contribution (DC)	Postemployment Healthcare		Totals
			Premium Assistance	Health Options Program	
Assets:					
Receivables:					
Members	\$ 347,684	\$ -	\$ 2,703	\$ 40	\$ 350,427
Employers	1,207,900	-	31,789	-	1,239,689
Investment income	192,262	53	124	156	192,595
Investment proceeds	362,317	-	-	-	362,317
CMS Part D and prescriptions	-	-	-	58,381	58,381
Interfund receivable	-	-	592	-	592
Total Receivables	2,110,163	53	35,208	58,577	2,204,001
Investments, at fair value:					
Short-term	5,837,717	6,735	91,705	237,498	6,173,655
Fixed income	5,235,603	-	-	-	5,235,603
Common and preferred stock	12,832,667	-	-	-	12,832,667
Collective trust funds	14,011,193	-	-	-	14,011,193
Real estate	5,039,237	-	-	-	5,039,237
Alternative investments	12,609,975	-	-	-	12,609,975
Total Investments	55,566,392	6,735	91,705	237,498	55,902,330
Securities lending collateral pool	2,980,119	-	-	-	2,980,119
Capital assets (net of accumulated depreciation \$31,840)	23,430	-	-	-	23,430
Miscellaneous	14,565	-	247	2,717	17,529
Total Assets	60,694,669	6,788	127,160	298,792	61,127,409
Liabilities:					
Accounts payable and accrued expenses	82,219	29	313	2,541	85,102
Benefits payable	582,430	-	72	26,721	609,223
HOP Participant premium advances	-	-	-	34,010	34,010
Investment purchases and other payables	537,857	-	4,041	-	541,898
Obligations under securities lending	2,980,119	-	-	-	2,980,119
Interfund payable	592	-	-	-	592
Other liabilities	147,738	-	-	-	147,738
Total Liabilities	4,330,955	29	4,426	63,272	4,398,682
Net position restricted for pension, DC and postemployment healthcare benefits					
	\$ 56,363,714	\$ 6,759	\$ 122,734	\$ 235,520	\$ 56,728,727

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

Statements of Fiduciary Net Position
June 30, 2018 and 2017
(Dollar Amounts in Thousands)

	2017			
	Postemployment Healthcare			Totals
	Pension	Premium Assistance	Health Options Program	
Assets:				
Receivables:				
Members	\$ 346,618	\$ 3,057	\$ 36	\$ 349,711
Employers	1,067,100	30,540	-	1,097,640
Investment income	150,626	112	84	150,822
Investment proceeds	864,326	-	-	864,326
CMS Part D and prescriptions	-	-	67,126	67,126
Interfund receivable	-	7,217	-	7,217
Total Receivables	2,428,670	40,926	67,246	2,536,842
Investments, at fair value:				
Short-term	5,804,352	82,917	219,751	6,107,020
Fixed income	4,961,284	-	-	4,961,284
Common and preferred stock	11,337,865	-	-	11,337,865
Collective trust funds	12,816,147	-	-	12,816,147
Real estate	5,340,555	-	-	5,340,555
Alternative investments	11,922,940	-	-	11,922,940
Total Investments	52,183,143	82,917	219,751	52,485,811
Securities lending collateral pool	2,016,063	-	-	2,016,063
Capital assets (net of accumulated depreciation \$29,973)	24,001	-	-	24,001
Miscellaneous	16,903	255	93	17,251
Total Assets	56,668,780	124,098	287,090	57,079,968
Liabilities:				
Accounts payable and accrued expenses	92,777	272	2,288	95,337
Benefits payable	529,833	83	24,539	554,455
HOP Participant premium advances	-	-	32,396	32,396
Investment purchases and other payables	800,996	-	-	800,996
Obligations under securities lending	2,016,063	-	-	2,016,063
Interfund payable	7,217	-	-	7,217
Other liabilities	66,558	-	-	66,558
Total Liabilities	3,513,444	355	59,223	3,573,022
Net position restricted for pension and postemployment healthcare benefits	\$ 53,155,336	\$ 123,743	\$ 227,867	\$ 53,506,946

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

Statements of Changes in Fiduciary Net Position
Years Ended June 30, 2018 and 2017
(Dollar Amounts in Thousands)

	2018				Totals
	Pension	Defined Contribution (DC)	Postemployment Healthcare		
			Premium Assistance	Health Options Program	
Additions:					
Contributions:					
Members	\$ 1,026,375	\$ -	\$ -	\$ -	\$ 1,026,375
Employers	4,249,611	-	111,986	-	4,361,597
Total contributions	5,275,986	-	111,986	-	5,387,972
HOP Participant premiums	-	-	-	359,896	359,896
Centers for Medicare & Medicaid Services premiums	-	-	-	63,998	63,998
Commonwealth of Pennsylvania	-	6,801	-	-	6,801
Investment income:					
From investing activities:					
Net appreciation in fair value of investments	3,710,566	-	1	-	3,710,567
Short-term	85,074	53	1,485	1,988	88,600
Fixed income	193,759	-	-	-	193,759
Common and preferred stock	321,547	-	-	-	321,547
Collective trust funds	5,166	-	-	-	5,166
Real estate	367,526	-	-	-	367,526
Alternative investments	485,718	-	-	-	485,718
Total investment activity income	5,169,356	53	1,486	1,988	5,172,883
Investment expenses	(467,653)	-	(31)	(28)	(467,712)
Net income from investing activities	4,701,703	53	1,455	1,960	4,705,171
From securities lending activities:					
Securities lending income	38,506	-	-	-	38,506
Securities lending expense	(26,051)	-	-	-	(26,051)
Net income from securities lending activities	12,455	-	-	-	12,455
Total net investment income	4,714,158	53	1,455	1,960	4,717,626
Total Additions	9,990,144	6,854	113,441	425,854	10,536,293
Deductions:					
Benefits	6,635,265	-	111,847	376,348	7,123,460
Refunds of contributions	19,881	-	-	-	19,881
Administrative expenses	46,544	95	2,603	41,853	91,095
Total Deductions	6,701,690	95	114,450	418,201	7,234,436
Net increase (decrease)	3,288,454	6,759	(1,009)	7,653	3,301,857
Net position restricted for pension, DC and postemployment healthcare benefits:					
Balance, beginning of year	53,155,336	-	123,743	227,867	53,506,946
Effect of change in accounting principle	(80,076)	-	-	-	(80,076)
Balance, beginning, as restated	53,075,260	-	123,743	227,867	53,426,870
Balance, end of year	\$ 56,363,714	\$ 6,759	\$ 122,734	\$ 235,520	\$ 56,728,727

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

Statements of Changes in Fiduciary Net Position
Years Ended June 30, 2018 and 2017
(Dollar Amounts in Thousands)

	2017			
	Pension	Postemployment Healthcare		Totals
		Premium Assistance	Health Options Program	
Additions:				
Contributions:				
Members	\$ 1,013,847	\$ -	\$ -	\$ 1,013,847
Employers	3,832,773	110,985	-	3,943,758
Total contributions	4,846,620	110,985	-	4,957,605
HOP Participant premiums	-	-	336,646	336,646
Centers for Medicare & Medicaid Services premiums	-	-	73,771	73,771
Investment income:				
From investing activities:				
Net appreciation (depreciation) in fair value of investments	4,204,585	(337)	-	4,204,248
Short-term	67,694	1,024	704	69,422
Fixed income	156,837	-	-	156,837
Common and preferred stock	295,427	-	-	295,427
Collective trust funds	3,379	-	-	3,379
Real estate	236,650	-	-	236,650
Alternative investments	493,426	-	-	493,426
Total investment activity income	5,457,998	687	704	5,459,389
Investment expenses	(474,441)	(24)	(26)	(474,491)
Net income from investing activities	4,983,557	663	678	4,984,898
From securities lending activities:				
Securities lending income	21,395	-	-	21,395
Securities lending expense	(9,590)	-	-	(9,590)
Net income from securities lending activities	11,805	-	-	11,805
Total net investment income	4,995,362	663	678	4,996,703
Total Additions	9,841,982	111,648	411,095	10,364,725
Deductions:				
Benefits	6,452,651	110,229	340,096	6,902,976
Refunds of contributions	20,928	-	-	20,928
Administrative expenses	45,127	2,239	37,071	84,437
Total Deductions	6,518,706	112,468	377,167	7,008,341
Net increase (decrease)	3,323,276	(820)	33,928	3,356,384
Net position restricted for pension and postemployment healthcare benefits:				
Balance, beginning of year	49,832,060	124,563	193,939	50,150,562
Balance, end of year	\$ 53,155,336	\$ 123,743	\$ 227,867	\$ 53,506,946

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

Notes to Financial Statements

Years Ended June 30, 2018 and 2017

1. Organization and Description of the System

(A) Organization

The System was established on July 18, 1917, under the provisions of Pamphlet Law 1043, No. 343 as a governmental cost-sharing multiple-employer plan that provides retirement allowances and other benefits to its members. Membership in the System is mandatory for nearly all qualifying public school employees in the Commonwealth of Pennsylvania (Commonwealth). At June 30, 2018, there were 775 participating employers, generally school districts. Membership at June 30, 2017, the most recent year for which actual amounts are available, is presented in Table 2.

The Public School Employees’ Retirement Board (Board) is established by state law as an independent administrative board of the Commonwealth. The Board exercises control and management of the System, including the investment of its assets. The Board has fifteen members including the Commonwealth’s Secretary of Education, the Commonwealth’s Secretary of Banking and Securities, the State Treasurer, the Executive Director of the Pennsylvania School Boards Association, one member appointed by the Governor, six elected members (three from among the System’s certified members, one from among the System’s noncertified members, one from among the System’s annuitants, and one from among school board members in Pennsylvania), two members from the Senate, and two members from the House of Representatives. Effective with Act 5 which was enacted on June 12, 2017, one of the Governor’s appointees was replaced with the Commonwealth’s Secretary of Banking and Securities who is also appointed by the Governor.

The State Treasurer is the custodian of the System’s Fund. The retirement plan of the System is a contributory defined benefit plan for which the benefit payments to

members and contribution provisions by employers and employees are specified in the Pennsylvania Public School Employees’ Retirement Code (Code). Changes in benefit and contribution provisions for the retirement plan must be made by legislation. Pursuant to state law, all legislative bills and amendments proposing to change the System’s retirement plan are to be accompanied with an actuarial note prepared by an enrolled pension actuary from the Independent Fiscal Office (IFO) providing an estimate of the cost and actuarial effect of the proposed change.

Based upon criterion of financial accountability as defined by governmental accounting standards, the System is considered a component unit of the Commonwealth of Pennsylvania financial reporting entity and is included in the Comprehensive Annual Financial Report of the Commonwealth of Pennsylvania.

(B) Pension Plan

i. Pension Benefits

Under the provisions of the 1975 revision of the Code by the Pennsylvania General Assembly, members are eligible for monthly retirement benefits upon reaching (a) age 62 with at least 1 year of credited service; (b) age 60 with 30 or more years of credited service; or (c) 35 or more years of service regardless of age. Act 120 of 2010 (Act 120) preserves the benefits of existing members and introduced benefit reductions for individuals who become new members on or after July 1, 2011. Act 120 created two new membership classes, Membership Class T-E (Class T-E) and Membership Class T-F (Class T-F). To qualify for normal retirement, Class T-E and Class T-F members must work until age 65 with a minimum of 3 years of service or attain a total combination of age and service that is equal to or greater than 92 with a minimum of 35 years of service. The Internal Revenue Code (IRC) limitation on the annual benefits for a defined benefit plan was \$220,000 for 2018 and \$215,000 for 2017.

Benefits are generally equal to 2% or 2.5%, depending upon membership class, of the member’s final average salary (as defined in the Code) multiplied by the number of years of credited service. For members whose membership started prior to July 1, 2011, after completion of five years of service, a member’s right to the defined benefits is vested and early retirement benefits may be elected. For Class T-E and Class T-F members, the right to benefits is vested after ten years of service. Active members may purchase credit for various types of school and non-school service on a lump-sum, installment purchase basis, or through an actuarially calculated benefit reduction. Class T-E and Class T-F members must purchase Non-Qualifying Part

Table 2 - Membership as of June 30, 2018

Active members:	
Vested	173,311
Nonvested	83,051
Total active members	256,362
Inactive members:	
Retirees and beneficiaries currently receiving benefits	233,288
Inactive members and vestees entitled to but not receiving benefits	25,117
Total retirees and other members	258,405
Total number of members	514,767

Notes to Financial Statements (continued)

The contribution rates based on qualified member compensation for virtually all members are presented below:

PSERS members whose membership started prior to July 1, 2011:

Membership Class T-C	Active Members hired before July 22, 1983	5.25%
Membership Class T-C	Active Members hired on or after July 22, 1983	6.25%
Membership Class T-D	Active Members hired before July 22, 1983	6.50%
Membership Class T-D	Active Members hired on or after July 22, 1983	7.50%

PSERS members whose membership started on or after July 1, 2011 (Act 120 members):

Membership Class T-E*		7.50%
Membership Class T-F**		10.30%

* Shared risk program could cause future contribution rates to fluctuate between 7.5% and 9.5%

** Shared risk program could cause future contribution rates to fluctuate between 10.3% and 12.3%

Time service and most other types of non-school or non-state service credit at full actuarial cost. Class T-E and Class T-F members must purchase credit for Non-Qualifying Part Time service within 365 days of enrollment in the System.

In addition to regular retirement benefits, the System also provides for disability retirement benefits and death benefits. Participants are eligible for disability retirement benefits after completion of five years of credited service. Such benefits are generally equal to 2% or 2.5%, depending upon membership class, of the member's final average salary (as defined in the Code) multiplied by the number of years of credited service, but not less than one-third of such salary nor greater than the benefit the member would have had at normal retirement age. Members over normal retirement age may apply for disability benefits.

Death benefits are payable upon the death of an active member who has reached age 62 with at least one year of credited service (age 65 with at least three years of credited service for Class T-E and Class T-F members) or who has at least five years of credited service (ten years for Class T-E and Class T-F members). Such benefits are actuarially equivalent to the benefit that would have been effective if the member had retired on the day before death.

Members with credited service in the Commonwealth of Pennsylvania State Employees' Retirement System (SERS) may elect to transfer service to the Public School Employees' Retirement System upon commencement of employment in the public school system. Similarly, a member with credited service in the System may transfer such service to SERS upon becoming a member of that system.

All members are fully vested in their individual balance in the Members' Savings Account which is described in Note 3. All non-vested members may receive a refund of their individual balance of member contributions and interest from the Members' Savings Account upon termination of public school employment. Vested members who enrolled prior to July 1, 2011 may elect to receive a return of their accumulated contributions and interest upon their retirement

which results in a reduced monthly annuity. Effective with Act 5 which was enacted on June 12, 2017, vested Class T-E and Class T-F members can now withdraw their accumulated contributions and interest from the Members' Savings Account upon their retirement.

ii. Contributions

The contribution policy is set by the Code and requires contributions by active members, employers, and the Commonwealth. The System's funding policy provides for periodic employer and Commonwealth contributions at actuarially determined rates, expressed as a percentage of annual covered payroll, such that they, along with employee contributions and an actuarially determined rate of investment return, are adequate to accumulate assets to pay retirement benefits when due. Level percentage of payroll employer contribution rates are determined using the entry age normal actuarial funding method. This method determines the amount of contributions necessary to (1) fully fund all current costs, (also known as normal cost), which represents the estimated amount necessary to pay for the benefits earned by the employees during the current service year; and (2) liquidate the prior service cost for service earned prior to the current service year and subsequent benefit increases, which represents the amount necessary to fund accrued liabilities over the appropriate amortization periods.

Contribution rates for active members are set by law (redefined with the provisions of Act 9 of 2001 and Act 120) and are dependent upon membership class. The Internal Revenue Code (IRC) limitation on the annual compensation for a defined benefit plan was \$275,000 for 2018 and \$270,000 for 2017.

Active members who enrolled between July 1, 2001, the effective date of Act 9, and June 30, 2011 are Membership Class T-D (Class T-D). The contribution rates for all members in Class T-D were effective January 1, 2002. For Act 120 members, all new members automatically become Class T-E members. New members, however, have

Notes to Financial Statements (continued)

a one-time opportunity to elect Class T-F within 45 days of receiving written notification from PSERS. Failure to elect Class T-F at time of original eligibility will make the member ineligible for Class T-F forever. Act 120 introduced a shared risk program that could affect Class T-E and Class T-F members' contribution rates in future fiscal years. With the shared risk program Class T-E and Class T-F members benefit when investments of the fund are doing well and share some of the risk when investments underperform. The member contribution rate will stay within the specified range allotted for Class T-E or Class T-F; but could increase or decrease by 0.5% every three years dependent on investment performance of PSERS. The member contribution rate will never go below the base rate of 7.5% for Class T-E and 10.3% for Class T-F members, or above 9.5% for Class T-E and 12.3% for Class T-F members.

The total contribution rate for the employers and the Commonwealth was 32.57% and 30.03% (31.74% and 29.20% for pension component) of qualified compensation for the years ended June 30, 2018 and 2017, respectively.

Act 120 suppressed the employer contribution rate by using rate caps in future years to keep the rate from rising too high, too fast for budgetary purposes.

The rate caps limit the amount the pension component of the employer contribution rate can increase over the prior year's rate. For FY 2014 and thereafter, the rate can increase no more than 4.5% plus the premium assistance contribution rate.

The rate cap remained at 4.5% until the rate cap no longer applied, i.e., the rise in the employer contribution rate was less than the rate cap in effect at that time. For FY 2017, the actuarially calculated contribution rate exceeded the prior year's rate by less than 4.5%. As a result, the rate caps are no longer in effect. Since the rate caps no longer apply, the employer normal cost is the contribution rate floor.

According to requirements established in Act 29 of 1994, the Commonwealth reimburses school entity employers a portion of the employer contributions paid to the System. All school entity employers are reimbursed by the Commonwealth at least 50% of the total employer contributions based on the total contribution rate. The Commonwealth reimburses certain school entity employers at a rate greater than 50% based upon non-pension criteria which stipulate that the entity must have a Commonwealth Department of Education calculated Market Value / Personal Income Aid Ratio in excess of .5000. School entities remit 100% of total employer contributions directly to the System. The Commonwealth remits 50% of the total employer contributions for employers other than school entities directly to the System. All contributions from

employers and the Commonwealth are shown as employer contributions on the Statements of Changes in Fiduciary Net Position.

(C) Postemployment Healthcare Plans

i. Health Insurance Premium Assistance Program

(a) Premium Assistance Benefits

The System provides a Health Insurance Premium Assistance Program (Premium Assistance) for all eligible annuitants who qualify and elect to participate. Under this program, employer contribution rates for Premium Assistance are established to provide reserves in the Health Insurance Account that are sufficient for the payment of Premium Assistance benefits for each succeeding year. Effective January 1, 2002, under the provisions of Act 9 of 2001, participating eligible annuitants are entitled to receive premium assistance payments equal to the lesser of \$100 per month or their out-of-pocket monthly health insurance premium. To receive premium assistance, eligible annuitants must have an out-of-pocket premium expense from an approved plan. Plans approved for Premium Assistance are health insurance plans maintained by a Commonwealth School Employer or the PSERS sponsored Health Options Program. As of June 30, 2018, there were no assumed future benefit increases to participating eligible annuitants in the Premium Assistance program. Membership at June 30, 2017, the most recent year for which actual amounts are available, is presented in Table 3.

(b) Contributions

A portion of each employer contribution to the System is set aside for the funding of Premium Assistance. The Premium Assistance contribution rate is set at a level necessary to establish reserves sufficient to provide Premium Assistance payments for all participating eligible members for the subsequent fiscal year. The portion of the total contribution rate for employers used to fund Premium Assistance was 0.83% for the years ended June 30, 2018 and 2017. Members do not contribute to Premium Assistance.

Table 3 - Premium Assistance Membership at June 30, 2018

Retirees and beneficiaries currently receiving benefits	93,400
Inactive members and vestees entitled to but not receiving benefits	422
Total retirees and other inactive members	93,822
Total active members	256,362
Total number of members	350,184

Notes to Financial Statements (continued)

ii. Health Options Program

The Health Options Program (HOP) is a PSERS-sponsored voluntary health insurance program for the sole benefit of annuitants of PSERS, spouses of annuitants, survivor annuitants and their dependents who participate in HOP. The HOP is funded exclusively by the premiums paid by its participants for the benefit coverage they elect. The PSERS pension fund assets are not available to fund or satisfy obligations of the HOP.

HOP offers several health plans. Participants may select among two self-funded Medicare supplement plans, three Medicare Rx plans, and multiple Medicare Advantage plans for those eligible for Medicare. Participants not eligible for Medicare have a choice between a self-funded high deductible indemnity plan and multiple managed care plans. Medicare Advantage and managed care plans are available to retirees residing in the plan's service area. The Medicare supplements and pre-65 high deductible plan are self-funded and claims are adjudicated by a third party administrator. The Medicare Rx Options and the prescription drug benefit of the pre-65 high deductible plan are also self-funded and claims are adjudicated by a pharmacy benefits manager. The Medicare Advantage and managed care plans are provided by private insurance companies or managed care organizations and benefits are fully insured. HOP also offers dental benefits through a fully insured carrier.

Effective January 1, 2006, PSERS entered into an Employer/Union Entity contract with the Centers for Medicare and Medicaid Services (CMS) to operate a voluntary Medicare Prescription Drug Plan (PDP). The PDP covers over 88,000 participants. CMS provides partial funding of the PDP in the form of monthly per capita payments and reinsurance. An independent actuarial consulting firm sets the rates for the self-funded benefits. The HOP maintains reserves for claims that are Incurred But Not Reported (IBNR) and for claim fluctuation for the self-funded benefit plans. At June 30, 2018 and 2017 PSERS recorded \$17,880,000 and \$16,239,000, respectively, in IBNR. The IBNR is included in benefits payable.

(D) Defined Contribution Plan

On June 12, 2017, Commonwealth of Pennsylvania Act 5 of 2017 was signed into law. This legislation establishes a new hybrid defined benefit/defined contribution (DC) retirement benefit plan applicable to all school employees who become new members of PSERS on July 1, 2019 and thereafter. The three new plan design options under Act 5 include two hybrid plans consisting of defined benefit and defined contribution components and a stand-alone defined contribution plan. A stand-alone defined benefit plan will no longer be available to new members after June 30,

2019. The financial statements for FY 2018 reflect start-up funding and expenses for the DC plan.

2. Summary of Significant Accounting Policies

(A) Basis of Accounting

The financial statements of the System are prepared on the accrual basis of accounting under which expenses are recorded when the liability is incurred, revenues are recorded in the accounting period in which they are earned and become measurable, and investment purchases and sales are recorded as of their trade date. Member and employer contributions are recognized in the period for which employees' salaries are reported. Benefits and refunds are recognized when due and payable in accordance with the terms of the plan.

The accounting and reporting policies of the System conform to accounting principles generally accepted in the United States of America (GAAP). The preparation of financial statements in conformity with GAAP requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of additions and deductions in fiduciary net position during the reporting period. Actual results could differ from those estimates.

(B) Investments

The System's investments are reported at fair value. Fair value is the amount that the System can reasonably expect to receive for an investment in a current sale between a willing buyer and a willing seller, that is, other than in a forced or liquidation sale. See Note 4(B) for the description of the Fair Value of Investments.

Net appreciation (depreciation) is determined by calculating the change in fair value of investments between the beginning of the year and end of the year, less purchases of investments at cost, plus sales of investments at fair value.

Investment purchases and sales are recorded as of the trade date. Interest income is comprised of dividend, interest, and other investment income. Dividend income is recognized on the ex-dividend date. Interest and other investment income is recognized when earned.

Investment expenses consist of investment manager fees and those administrative expenses directly related to the System's investment operations. Investment proceeds receivable generally includes unsettled investment sales and unsettled investment purchases are included in investment purchases and other liabilities. At June 30, 2017,

Notes to Financial Statements (continued)

investment proceeds receivable also includes \$480,771,000 in receivables due to the sale of limited partnership and real estate interests during FY 2015 and FY 2016.

(C) Capital Assets

Capital assets consist primarily of data processing equipment, software, and internally developed computer software recognized as intangible assets. Capital assets are depreciated using the straight-line method over an estimated useful life of five years. Intangible assets are amortized using the straight-line method over an estimated useful life of twenty years for assets purchased prior to July 1, 2012 and up to 10 years for assets purchased after June 30, 2012.

(D) Benefits Payable

Benefits payable identifies the obligations of the System, on an accrual basis, at the end of the fiscal year. It includes the estimated retirement and death benefits payable, federal taxes withheld but not yet due to IRS, premium assistance benefits payable, and the HOP IBNR claims for its participants.

(E) Pensions for Employees of the System

For purposes of measuring the net pension liability, deferred outflows of resources, deferred inflows of resources, and pension expense, information about the fiduciary net position of the Pennsylvania State Employees' Retirement System (SERS) and additions to/deductions from SERS' fiduciary net position have been determined on the same basis as they are reported by SERS. Please refer to Note 8 for additional information regarding SERS. PSERS' net pension liability for its employees to SERS is reported in Other liabilities. Pension expense is reported in administrative expenses and is detailed on the Schedule of Administrative and Investment Expenses Supplementary Schedule.

(F) Postemployment Healthcare Plan for Employees of the System

For purposes of measuring the net OPEB liability, deferred outflows of resources, deferred inflows of resources and OPEB expense, information about the fiduciary net position of the Commonwealth of Pennsylvania Retired Employees Health Program (REHP) and additions to/deductions from REHP fiduciary net position have been determined on the same basis as they are reported by the REHP. Please refer to Note 9 for additional information regarding the REHP. PSERS' net OPEB liability for its employees to the REHP is reported in Other liabilities. OPEB expense is reported in Administrative and Investment Expenses Supplementary Schedule.

(G) Compensated Absences

The System uses the accrual basis of accounting for measuring vacation leave, sick leave, and other compensated absences liabilities. Employees of the System are paid for accumulated vacation leave upon termination or retirement. Retiring employees of the System that meet service, age, or disability requirements are paid between 30% and 100% of sick days available at retirement, up to 161 maximum days paid. At June 30, 2018 and 2017, \$4,216,000 and \$3,789,000, respectively, were accrued for unused vacation and sick leave for the System's employees and are included in Accounts payable and accrued expenses on the Statements of Fiduciary Net Position.

(H) Participant Premium Advances

Premium advances at June 30, 2018 and 2017 are for HOP premiums related to health care coverage to be provided in July of 2018 and 2017, respectively.

(I) Federal Income Taxes

The Internal Revenue Service (IRS) issued a determination letter dated March 16, 2017 which stated that the plan and its underlying trust qualify under the provisions of Section 501(a) of the IRC and therefore are exempt from federal income taxes.

(J) Risk Management

The System is exposed to various liabilities and risks of loss, including, without limitation, the ordinary risks of investment losses, risks related to theft or destruction of assets, liabilities resulting from injuries to employees, and liabilities resulting from court challenges to fiduciary decisions. As an administrative agency of the Commonwealth of Pennsylvania, the System is accorded sovereign immunity. For claims not shielded by sovereign immunity, the System participates in certain Commonwealth pooled insurance programs and requires asset managers to carry certain insurance coverage for the protection of the System. The System has implemented a self-insurance program for fiduciary and director and officer liability coverage. During the past three fiscal years, insurance settlements did not exceed insurance coverage.

(K) Reclassifications

Certain 2017 amounts have been reclassified in conformity with the 2018 presentation. These reclassifications had no effect on net position restricted for pension benefits or the change in fiduciary net position.

Notes to Financial Statements (continued)

(L) Members Receivables

Members receivables include an amount for members' obligations to the System for the purchase of service credit. Members have a variety of options to remit purchase of service payments:

- Remit a lump sum payment.
- Request an installment plan from one to seven years where the member's employer establishes a payroll deduction process. The member's employer then forwards monthly payments of the withheld amounts to PSERS.
- Accept an actuarial reduction debt through which the amount of the purchase plus accumulated interest will reduce the member's retirement or death benefit.
- Rollover funds from an eligible distribution.

The following is a summary of the members receivables at June 30, 2018 and 2017:

	(Dollar Amounts in Thousands)	
	2018	2017
Pension:		
Member contributions	\$ 85,842	\$ 85,451
Purchase of service	258,807	258,799
Other	3,035	2,368
Total Members Receivables	\$ 347,684	\$ 346,618

(M) Interfund Transactions and Balances

Interfund transfers of assets take place on a regular recurring basis between Pension and Premium Assistance. The transfers occur upon receipt of employer contributions and payment of benefits or expenses. The interfund receivables and payables related to interfund activity are classified under receivables and liabilities on the financial statements.

(N) Change in Accounting Principle

Due to the implementation of GASB Statement No. 75, the beginning net position restricted for pension, DC and postemployment healthcare benefits has been restated by \$(80,076,000). The purpose of the restatement was to record the beginning net OPEB liability of \$(82,591,000) and the beginning deferred outflows of resources for contributions subsequent to the measurement date of \$1,900,000 to the Commonwealth of Pennsylvania REHP.

(O) Adoption of New Accounting Standards

During the fiscal year ended June 30, 2018 the System adopted GASB Statement No. 75, *Accounting and*

Financial Reporting for Postemployment Benefits Other Than Pensions (OPEB). GASB 75 addresses financial accounting and reporting for governments that provide or finance OPEB. GASB 75 replaces GASB 45, *Accounting and Financial Reporting by Employers for Postemployment Benefits Other Than Pensions*, as amended, and GASB No. 57, *OPEB Measurements by Agent Employers and Agent Multiple-Employer Plans*, for OPEB.

GASB Statement No. 81, *Irrevocable Split - Interest Agreements*, was issued March 2016. GASB 81 improves accounting and financial reporting for irrevocable split interest agreements. Upon examination, it was determined to have no current impact on the System.

GASB Statement No. 82, *Pension Issues-An Amendment of GASB Statements No. 67, No. 68, and No. 73*, was issued March 2016. GASB 82 addresses certain issues with the presentation of payroll-related measures in required supplementary information, and the classification of payments made by employers to satisfy employee contribution requirements. Upon examination, it was determined that the System is currently presenting information in accordance with the requirements.

GASB Statement No. 83, *Certain Asset Retirement Obligations*, addresses accounting and financial reporting for certain asset retirement obligations, (AROs) and was issued November 2016. This Statement establishes criteria for determining the timing and pattern of recognition of a liability and a corresponding deferred outflow of resources for AROs. The System is evaluating GASB 83 and its potential impact to the financial statements.

GASB Statement No. 84, *Fiduciary Activities*, is to improve guidance regarding the identification of fiduciary activities for accounting and financial reporting purposes and how those activities should be reported and was issued January 2017. The System is evaluating GASB 84 and its potential impact to the financial statements.

GASB Statement No. 85, *Omnibus 2017*, addresses practice issues that have been identified during implementation and application of certain GASB statements and was issued March 2017. GASB 85 addresses the timing of the measurement of pension or OPEB liabilities and expenditures recognized in financial statements prepared using the current financial resources measurement focus, and recognizing on-behalf payments for pension or OPEB in employer financial statements. Upon examination, it was determined that the System is currently presenting information in accordance with the requirements.

Notes to Financial Statements (continued)

Table 4 - Account Balance

(Dollar Amounts in Thousands)

	2018	2017
Pension:		
State Accumulation Account	\$ (17,236,211)	\$ (19,030,322)
Members' Savings Account	16,120,538	15,500,215
Annuity Reserve Account	57,479,387	56,685,443
	<u>\$ 56,363,714</u>	<u>\$ 53,155,336*</u>
Defined Contribution Plan	\$ 6,759	\$ -
Postemployment Healthcare:		
Health Insurance Account	\$ 122,734	\$ 123,743
Health Insurance Program Account	\$ 235,520	\$ 227,867

*Does not reflect (\$80,076) effect of change in accounting principle

GASB Statement No. 86 *Certain Debt Extinguishment Issues* was issued June 2017 and addresses accounting and financial reporting or in substance defeasance of debt by providing guidance for transactions in which cash and other monetary assets acquired with only existing resources, resources other than the proceeds of refunding debt are placed in an irrevocable trust for the sole purpose of extinguishing debt. Upon examination, it was determined to have no current impact on the System.

GASB Statement No. 87, *Leases*, was issued in June 2017, and requires recognition of certain lease assets and liabilities for leases that previously were classified as operating leases and recognized as inflows of resources or outflows of resources based on provisions of the contract. The System is evaluating GASB 87 and its potential impact to the financial statements.

3. Description of Accounts

The Code requires the System to maintain the following accounts which represent reserves held for future and current benefit payments as follows and as illustrated in Table 4.

(A) State Accumulation Account

The State Accumulation Account is credited with contributions from the Commonwealth and the employers. Additionally, interest earnings of the System (after crediting the Members' Savings Account with 4% interest and the reserve for retirement with 5.50% statutory interest) are credited to this account. Each year, the necessary amounts, as determined by the actuary for the payment of retirement, disabilities, and death benefits, are transferred from the State Accumulation Account to the Annuity Reserve Account increasing the reserve credit to the 7.25% valuation assumption rate determined by the actuary. All administrative expenses necessary for the operation of

the System, except for Premium Assistance, HOP, and Defined Contribution Plan expenses, are paid from the State Accumulation Account.

(B) Members' Savings Account

The Members' Savings Account is credited with all contributions made by active members of the System. Interest is added to the member's individual account at an annual rate of 4%. Upon death or retirement of a member, the accumulated contributions plus interest are transferred to the Annuity Reserve Account for subsequent payment of benefits.

(C) Annuity Reserve Account

The Annuity Reserve Account represents the amounts transferred from the Members' Savings and State Accumulation Accounts, plus additional contributions made by the Commonwealth and employers for the payment of supplemental annuities and cost-of-living increases. All death, disability, and retirement benefits are paid from this account. Annual interest of 5.50% is credited to the Annuity Reserve Account.

(D) School Employees' Defined Contribution Trust (Defined Contribution Plan)

The School Employees' Defined Contribution Trust accumulates DC member and employer contributions, investment earnings and DC plan expenses of the School Employees Defined Contribution Plan. The trust is comprised of individual investment accounts, all assets in those accounts and any assets held that are not allocated to the individual investment accounts. The assets of the plan are held in trust for the exclusive benefit of the participants and their beneficiaries and may be used for payment of fees, costs and expenses related to the administration and investment of the plan and the trust.

(E) Health Insurance Account

The Health Insurance Account is credited with contributions from the employers for Premium Assistance. Effective January 1, 2002, under the provisions of Act 9 of 2001, participating eligible annuitants are entitled to receive premium assistance payments equal to the lesser of \$100 per month or their out-of-pocket monthly health insurance premium. The Health Insurance Account pays all administrative expenses necessary to operate the Premium Assistance.

Notes to Financial Statements (continued)

(F) Health Insurance Program Account

The Health Insurance Program Account is credited with premiums from members of the HOP and from CMS. All benefits related to the HOP (premium payments to the insurance companies and self-funded benefits) are paid from this account. The Health Insurance Program Account pays all administrative expenses necessary to operate the HOP.

4. Investments

(A) Summary of Investments

The Board has the responsibility to invest and reinvest available funds of the System in accordance with the guidelines and limitations set forth in the Code and other applicable state law. The Board accomplishes the daily management of the System's investments through investment advisors who act as agents for the System and through internal investment managers.

The Board invests the funds of the System using the Prudent Investor Standard, as articulated in the Code, which means "the exercise of that degree of judgment, skill and care under the circumstances then prevailing which persons of prudence, discretion, and intelligence who are familiar with such matters exercise in the management of their own affairs not in regard to speculation, but in regard to the permanent disposition of the fund, considering the probable income to be derived therefrom as well as the probable safety of their capital." The Board has adopted its investment policy to formally document investment objectives and responsibilities. This policy, as well as applicable state law, establishes guidelines for permissible investments of the System.

(B) Fair Value of Investments

i. Fair Value Levels

PSERS measures and records its investments using fair value measurement guidelines established by generally accepted accounting principles. These guidelines recognize a three-tiered fair value hierarchy as follows:

- **Level 1 inputs:** Level 1 inputs are quoted prices (unadjusted) for identical assets or liabilities in active markets. A quoted price for an identical asset or liability in an active market (e.g., an equity security traded on a major exchange) provides the most reliable fair value measurement and, if available, should be used to measure fair value in that particular market.

- **Level 2 inputs:** Level 2 inputs are prices that are observable either directly or indirectly. Level 2 inputs may include quoted prices in markets that are not considered active or inputs other than quoted prices that are observable such as interest rates, yield curves, implied volatilities, credit spreads or market-corroborated inputs.
- **Level 3 inputs:** Reporting entities may use unobservable inputs to measure fair value if relevant observable inputs are not available, thereby allowing for situations in which there is little, if any, market activity for the asset or liability at the measurement date. These unobservable inputs are considered Level 3.

Debt, equity, and derivative instrument securities 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 of the fair value hierarchy are valued using a matrix pricing technique. Matrix pricing is used to value securities based on the securities' relationship to benchmark quoted prices and recently published security specific trading levels. Short-term securities are carried at cost, which approximates fair value, unless they have published market prices or quotations from national securities exchanges or securities pricing services, in which case they are valued at the published market price. Fixed income securities and common and preferred stocks are generally valued based on published market prices and quotations from national securities exchanges or securities pricing services. Securities which are not traded on a national securities exchange are valued by the respective fund manager or other third parties based on similar sales.

For alternative investments, which include private equity, special situation (private debt), venture capital and equity real estate investments where no readily ascertainable market value exists, management, in consultation with the general partner and investment advisors, has determined the fair values for the individual investments based upon the partnership's most recent available financial information.

Directly-owned real estate investments are primarily valued based on appraisals performed by independent appraisers and, for properties not appraised, the present value of the projected future net income stream is used. Real estate owned investments are reported net of related debt borrowed against the market value of the property. At June 30, 2018 and 2017, \$132,000,000 in open-ended repurchase agreements were netted against the related property valuation and classified as Level 1. The agreements are payable at an interest rate equivalent to 1 month LIBOR plus 40 basis points and are collateralized by certain fixed income investments of the System.

Financial Section

Notes to Financial Statements (continued)

At June 30, 2018, the System had the following recurring fair value measurements.

Investments and Derivative Instruments Measured at Fair Value

(Dollar Amounts in Thousands)

	2018	Fair Value Measurements Using		
		Level 1	Level 2	Level 3
Pension investments:				
Investments by fair value level				
Short term:				
PSERS Short-Term Investment Fund	\$ 5,584,103	\$ 5,584,103	\$ -	\$ -
Other domestic short-term	229,596	84,915	144,681	-
International short-term	24,018	16,677	7,341	-
	<u>5,837,717</u>	<u>5,685,695</u>	<u>152,022</u>	<u>-</u>
Fixed income:				
Domestic asset-backed and mortgage-backed securities	1,843,721	-	1,839,471	4,250
U.S. government and agency obligations	1,053,358	1,039,502	13,856	-
Domestic corporate and taxable municipal bonds	1,985,513	297,689	1,687,824	-
International fixed income	353,011	-	353,011	-
	<u>5,235,603</u>	<u>1,337,191</u>	<u>3,894,162</u>	<u>4,250</u>
Common and preferred stock:				
Domestic common and preferred stock	7,159,479	7,159,479	-	-
International common and preferred stock	5,673,188	5,673,157	-	31
	<u>12,832,667</u>	<u>12,832,636</u>	<u>-</u>	<u>31</u>
Directly-owned real estate	602,609	(132,000)	-	734,609
Total investments by fair value level	24,508,596	\$ 19,723,522	\$ 4,046,184	\$ 738,890
Investments measured at the net asset value (NAV)				
Collective trust funds	14,011,193			
Equity real estate	4,436,628			
Alternative investments:				
Private equity	5,950,167			
Special situations (Private debt)	5,607,778			
Venture capital	1,052,030			
	<u>12,609,975</u>			
Total investments measured at the NAV	31,057,796			
Total investments measured at fair value	\$ 55,566,392			
Investment derivative instruments				
Futures	\$ 20,952	\$ 20,952	\$ -	\$ -
Total return type swaps	(108,341)	(108,341)	-	-
Foreign exchange contracts	68,333	68,333	-	-
Options	43,904	43,904	-	-
Total investment derivative instruments	\$ 24,848	\$ 24,848	\$ -	\$ -

Notes to Financial Statements (continued)

At June 30, 2017, the System had the following recurring fair value measurements.

Investments and Derivative Instruments Measured at Fair Value

(Dollar Amounts in Thousands)

	2017	Fair Value Measurements Using		
		Level 1	Level 2	Level 3
Pension investments:				
Investments by fair value level				
Short term:				
PSERS Short-Term Investment Fund	\$ 5,565,178	\$ 5,565,178	\$ -	\$ -
Other domestic short-term	105,174	30,832	74,342	-
International short-term	134,000	132,601	1,399	-
	<u>5,804,352</u>	<u>5,728,611</u>	<u>75,741</u>	<u>-</u>
Fixed income:				
Domestic asset-backed and mortgage-backed securities	1,589,887	-	1,585,156	4,731
U.S. government and agency obligations	1,073,883	1,073,883	-	-
Domestic corporate and taxable municipal bonds	1,927,373	554,004	1,373,369	-
International fixed income	370,141	-	370,141	-
	<u>4,961,284</u>	<u>1,627,887</u>	<u>3,328,666</u>	<u>4,731</u>
Common and preferred stock:				
Domestic common and preferred stock	5,649,599	5,609,569	-	40,030
International common and preferred stock	5,688,266	5,688,266	-	-
	<u>11,337,865</u>	<u>11,297,835</u>	<u>-</u>	<u>40,030</u>
Directly-owned real estate	<u>367,078</u>	<u>(132,000)</u>	<u>-</u>	<u>499,078</u>
Total investments by fair value level	<u>22,470,579</u>	<u>\$ 18,522,333</u>	<u>\$ 3,404,407</u>	<u>\$ 543,839</u>
Investments measured at the net asset value (NAV)				
Collective trust funds	<u>12,816,147</u>			
Equity real estate	<u>4,973,477</u>			
Alternative investments:				
Private equity	5,883,902			
Special situations (Private debt)	5,053,043			
Venture capital	985,995			
	<u>11,922,940</u>			
Total investments measured at the NAV	<u>29,712,564</u>			
Total investments measured at fair value	<u>\$ 52,183,143</u>			
Investment derivative instruments				
Futures	\$ (10,152)	\$ (10,152)	\$ -	\$ -
Total return type swaps	(2,413)	(2,413)	-	-
Foreign exchange contracts	(195,195)	(195,195)	-	-
Options	12,009	12,009	-	-
Total investment derivative instruments	<u>\$ (195,751)</u>	<u>\$ (195,751)</u>	<u>\$ -</u>	<u>\$ -</u>

Financial Section

Notes to Financial Statements (continued)

The valuation method for investments measured at the net asset value (NAV) per share (or its equivalent) at June 30, 2018 and 2017 are presented in the following tables.

Investments measured at the NAV				
(Dollar Amounts in Thousands)				
	<u>June 30, 2018</u>	<u>Unfunded Commitments</u>	<u>Redemption Frequency</u>	<u>Redemption Notice Period</u>
Collective trust funds (a)	\$ 14,011,193	\$ -	see note (a)	0 - 90 Days
Equity real estate (b)	4,436,628	2,726,771	see note (b)	
Alternative investments:				
Private equity (c)	5,950,167	3,514,005	see note (c)	
Special situations (Private debt) (d)	5,607,778	3,175,638	see note (d)	
Venture capital (e)	1,052,030	538,517	see note (e)	
	12,609,975			
Total investments measured at the NAV	\$ 31,057,796			

Investments measured at the NAV				
(Dollar Amounts in Thousands)				
	<u>June 30, 2017</u>	<u>Unfunded Commitments</u>	<u>Redemption Frequency</u>	<u>Redemption Notice Period</u>
Collective trust funds (a)	\$ 12,816,147	\$ -	see note (a)	0 - 90 Days
Equity real estate (b)	4,973,477	2,063,824	see note (b)	
Alternative investments:				
Private equity (c)	5,883,902	2,855,180	see note (c)	
Special situations (Private debt) (d)	5,053,043	2,933,173	see note (d)	
Venture capital (e)	985,995	324,830	see note (e)	
	11,922,940			
Total investments measured at the NAV	\$ 29,712,564			

Derivative instruments classified in Level 1 of the fair value hierarchy are valued using observable exchange, dealer, or broker market pricing.

The Premium Assistance investment assets have the following recurring fair value measurements at June 30, 2018 and 2017:

- PSERS Short-Term Investment Fund of \$5,565,000 and \$62,257,000 at June 30, 2018 and 2017, respectively, is valued using pricing quoted in active markets for those securities (Level 1 inputs).
- Other domestic short-term investments of \$86,140,000 and \$20,660,000 at June 30, 2018 and 2017, respectively, are valued using a matrix pricing model (Level 2 inputs).

The HOP investment assets have the following recurring fair value measurements at June 30, 2018 and 2017:

- PSERS Short-Term Investment Fund of \$91,094,000 and \$89,755,000 at June 30, 2018 and 2017, respectively, is valued using pricing quoted in active markets for those securities (Level 1 inputs).
- Other domestic short-term investments of \$146,404,000 and \$129,996,000 at June 30, 2018 and 2017, respectively, are valued using pricing quoted in active markets for those securities (Level 1 inputs).

Notes to Financial Statements (continued)

The Defined Contribution Plan investment assets have the following fair value measurement at June 30, 2018:

- PSERS Short-Term Investment Fund of \$6,735,000 at June 30, 2018 is valued using pricing quoted in active markets for those securities (Level 1 inputs).

ii. Investments at Net Asset Value (NAV)

- (a) Collective trust fund investments (CTF) consist primarily of domestic and international institutional funds. The fair value of CTF is based on the reported share value of the respective fund. CTF are managed by state chartered banks for which various state banking departments have regulatory oversight and investment advisors for which regulatory agencies such as the Securities and Exchange Commission have regulatory oversight. Investments that are not subject to this oversight are subject to annual independent audits. Redemption frequency for these assets range from monthly, to quarterly, to annual.
- (b) Equity real estate includes real estate funds that invest primarily in U.S., Latin American, European and Asian commercial real estate. Fund investments can be made across the capital structure of each property venture. The fair value of the investments in this type have been determined using the NAV per share (or its equivalent) of the System's ownership interest in partners' capital. These investments cannot be easily redeemed. Distributions from each fund may be received as: 1) cash flows from operations or 2) return of capital from dispositions. It is expected that the underlying assets of the funds will be liquidated over the next 7 to 12 years.
- (c) Private equity includes U.S. buyout funds and international buyout funds that invest mostly in private companies across a variety of industries (although they may invest in public companies from time to time). The fair value of the investments in this type have been determined using the NAV per share (or its equivalent) of the System's ownership interest in partners' capital. These investments cannot be easily redeemed. The nature of private equity investments is that distributions are received through the liquidation of the underlying assets of the fund. The expected holding period of a private equity portfolio company is 3 to 7 years.
- (d) Special situations (Private debt) includes private investment funds that invest across the fixed income capital structure primarily in North America and Western Europe. The fair value of the investments in this type have been determined using the NAV per

share (or its equivalent) of the System's ownership interest in partners' capital. These investments cannot be easily redeemed. Instead, the nature of the investments in this type is that distributions are received through the orderly liquidation of the underlying assets of the fund throughout the stated term of the fund. It is expected that the underlying assets of the funds will be liquidated over the next 3 to 7 years.

- (e) Venture capital includes U.S. based private funds, that finance young, relatively small, rapidly growing companies, typically in either the health care or information technology sectors. The fair value of the investments in this type have been determined using the NAV per share (or its equivalent) of the System's ownership interest in partners' capital. These investments cannot be easily redeemed. The nature of venture capital investments is that distributions are received through the liquidation of the underlying assets of the fund. It is expected that the underlying assets of the funds will be liquidated over the next 5 to 10 years.

(C) Deposit and Investment Risk Disclosures

i. Deposits

Custodial credit risk for deposits is the risk that, in the event of a financial institution failure, the System would not be able to recover the value of the deposits. The Commonwealth's Treasury Department is the custodian of the System's funds. Commonwealth Treasury Department deposits must be held in insured depositories approved by the Commonwealth's Board of Finance and Revenue and must be fully collateralized.

The System, through its third party administrator, maintains certain bank deposits for the operation of its voluntary HOP. These deposits are not required to be collateralized by statute or policy. These deposits totaled \$146,404,000 and \$129,996,000 at June 30, 2018 and 2017, respectively, and are under the custody of M&T Bank which has an A- rating by Standard and Poor's (S&P) and an A3 rating by Moody's Investor Services (Moody's).

Notes to Financial Statements (continued)

For derivatives exposed to credit risk, the table below presents aggregate market value by the least favorable credit rating provided by NRSROs at June 30, 2018 and 2017.

Quality Rating	(Dollar Amounts in Thousands)	
	2018 Fair Value	2017 Fair Value
AA	\$ -	\$ (804)
A	(156,006)	(9,451)
BBB	47,665	8,830
BB	-	(988)
Total Swaps-Total Return	\$ (108,341)	\$ (2,413)

ii. Investment Risks

The System’s investments, including derivatives and other similar investments, may be subject to various risks. Among these risks are concentration of credit risk, custodial credit risk, credit risk, interest rate risk, and foreign currency risk. The policies addressing each one of these risks, discussed in more detail below, are contained within the Investment Policy Statement, Objectives, and Guidelines reviewed and approved annually by the Board. Due to the level of risk associated with certain investments, it is possible that changes in the values of investments may occur in the near term and that such changes could materially affect the amounts reported in the Statements of Fiduciary Net Position.

(a) Concentration of Credit Risk

Concentration of credit risk is the risk of loss attributed to the magnitude of the System’s investment in a single issuer. As of June 30, 2018 and 2017, the System had no single issuer that exceeded 5% of total investments. Investments issued or explicitly guaranteed by the U.S. government and investments in mutual funds, external investment pools, and other pooled investments were excluded.

(b) Custodial Credit Risk

Custodial credit risk for investments is the risk that, in the event of the failure of the counterparty to a transaction, the System would not be able to recover the value of investment or collateral securities that are in the possession of an outside party. In accordance with a contractual relationship between the Commonwealth’s Treasury Department and its custodial agent, substantially all investments, where securities are used as evidence of the investment, are held by the custodian in book-entry form in the System’s name. Those investments are defined as insured or registered investments for which the securities are held by the System or its agent and, therefore,

The following table discloses aggregate market value by credit quality rating category. Many securities have ratings from more than one NRSRO and sometimes those ratings differ from one NRSRO to another. The data listed below uses the rating (expressed as S&P equivalent) available from Fitch, Moody’s and/or S&P that indicates the lowest credit quality at June 30, 2018 and 2017.

Quality Rating	(Dollar Amounts in Thousands)	
	2018 Fair Value	2017 Fair Value
AAA	\$ 532,128	\$ 797,203
AA	728,428	210,405
A	333,381	414,985
BBB	1,039,962	739,916
BB and Below	392,570	431,513
NR*	12,237,183	11,419,428
Total Exposed to Credit Risk	15,263,652	14,013,450
US Government Guaranteed**	1,698,960	1,531,272
Total Fixed Income and Short-Term Investments	\$ 16,962,612	\$ 15,544,722

* Not Rated securities include \$5,553,354 and \$4,476,419 in collective trust funds and \$5,687,497 and \$5,718,223 in PSERS Short Term Investment Fund assets at June 30, 2018 and 2017, respectively.

** Comprised of U.S. government and agency obligations explicitly guaranteed by the U.S. government and not considered to have credit risk.

have a very minimal level of custodial credit risk. The remaining investments, which do not have securities that are used as evidence of the investment, are primarily in collective trust funds and limited partnerships, which include real estate and alternative investments.

(c) Credit Risk

Credit risk is the risk that an issuer or other counterparty to an investment will not fulfill its obligations. The credit risk of a debt instrument is measured by nationally recognized statistical rating organizations (NRSRO) such as Fitch Investor Services (Fitch), Moody’s, and S&P. Annually, the Board establishes an asset allocation plan. This plan manages the overall credit risk of the fixed income asset class through a clearly defined long-term asset allocation policy. This policy establishes a long-term target allocation of the fixed income asset class at 38.0% of the investment portfolio. Leverage is utilized for 10.0%. The fixed income target allocation consists of:

- An allocation of 8.0% of the portfolio has been made to the U.S. core plus segment of the fixed income asset class benchmarked to the Barclays Capital U.S. Aggregate Index. The U.S. core plus allocation is composed of primarily investment grade, relatively

Notes to Financial Statements (continued)

At June 30, 2018 and 2017, the System's fixed income portfolio had the following option-adjusted durations by fixed income sector:

Investment Type	(Dollar Amounts in Thousands)			
	2018		2017	
	Option-Adjusted Duration	Fair Value	Option-Adjusted Duration	Fair Value
Domestic asset-backed and mortgage-backed securities	2.2	\$ 1,843,721	1.7	\$ 1,639,886
U.S. government and agency obligations	8.1	1,053,358	9.6	1,073,883
Domestic corporate and taxable municipal bonds	1.3	1,985,513	1.8	1,927,373
International fixed income	1.0	353,011	5.9	370,140
Collective trust funds	6.6	5,553,354	3.2	4,476,419
PSERS Short-Term Investment Fund	0.1	5,687,497	0.1	5,718,223
Other Short Term Assets	0.1	486,158	-	338,798
Total	3.1*	\$ 16,962,612	2.1*	\$ 15,544,722

* Fixed income investment managers enter into futures contracts to adjust the durations of their portfolios as a whole rather than any particular investment type within the portfolio. In total, the futures contracts have adjusted PSERS' total portfolio duration upward by 0.1 at June 30, 2018 and 2017. The total portfolio option-adjusted duration is calculated by weighting each investment type by fair value.

liquid, public domestic bonds with an overall weighted-average NRSRO credit rating of A or better.

- An allocation of 10.0% of the portfolio has been made to the high yield segment of the fixed income asset class benchmarked to the Barclays Capital U.S. High Yield Index. The high yield allocation is composed of less liquid public non-investment grade fixed income securities with an overall weighted-average NRSRO credit rating of B- or better.
- An allocation of 15.0% of the portfolio has been made to the Treasury Inflation-Protected Securities (TIPS) segment of the fixed income asset class benchmarked to the Barclays Capital World Government Inflation-Linked Bond Index (Hedged to USD) and composed of primarily government issued TIPS with an overall weighted-average NRSRO credit rating of AA or better. The portfolio manager is permitted to leverage the portfolio using TIPS total return swaps up to 3:1.
- An allocation of 1.0% of the portfolio has been made to the non-U.S. developed markets fixed income asset class benchmarked to the Barclays Capital Global Aggregate GDP-weighted Developed Market ex-U.S. (Unhedged) Index composed of primarily investment grade, relatively liquid non-U.S. public bonds with an overall weighted-average NRSRO credit rating of A or better.
- An allocation of 1.0% of the portfolio has been made to the emerging markets fixed income asset class

benchmarking to the Barclays Capital EM Local Currency-Government-MV Weighted (Unhedged) -10% Country Cap Index composed of primarily investment grade, relatively liquid non-U.S. public bonds with an overall weighted-average NRSRO credit rating of BB- or better.

- An allocation of 3.0% of the portfolio has been made to cash benchmarked to the Bank of America/Merrill Lynch U.S. Treasury Bill 0-3 Months Index composed of primarily investment grade, relatively liquid U.S. and non-U.S. public bonds with an overall weighted-average NRSRO credit rating of AA or better.

(d) Interest Rate Risk

Interest rate risk is the risk that changes in interest rates will adversely affect the fair value of a fixed income investment. The System manages its interest rate risk by diversifying the fixed income portfolio and maintaining the fixed income portfolio at a Board-approved effective duration range of the benchmark index.

Duration is a measure of the approximate sensitivity of a bond's value to interest rate changes. The higher the duration, the greater the changes in fair value when interest rates change. For example, a duration of 4.0 would mean that, given a 100-basis point change up/down in rates, a bond's price would move down/up approximately 4.0%. PSERS measures interest rate risk using option-adjusted duration, which recognizes the fact that yield changes may change the expected cash flows due to embedded options.

Financial Section

Notes to Financial Statements (continued)

(e) Foreign Currency Risk

Foreign currency risk is the risk that fluctuations in exchange rates will adversely affect the fair value of an investment. As part of the System's program to manage risk and enhance returns, the System invests in non-U.S. markets. Investment managers in non-U.S. equity and global fixed income may hedge their non-U.S. foreign currency exposure back to U.S. dollars.

(D) Securities Lending

The System participates in a securities lending program with a third party agent. Under this program, the lending agent loans securities (equities, fixed income, and money market instruments) to independent brokers and dealers in exchange for U.S. dollar cash collateral in an amount not less than 102% of the fair value of any securities loaned. Collateral is marked-to-market daily. If the fair value of the collateral held falls below the minimum guidelines for securities loaned, additional collateral is obtained. The lending agent invests the cash collateral in accordance with reinvestment guidelines approved by the System.

As of June 30, 2018 and 2017, the System had no credit risk exposure to borrowers because the amounts the System owed the borrowers exceeded the amounts the borrowers owed the System. Under the securities lending program, the lending agent provides indemnification to the System if a borrower fails to return borrowed securities (and the collateral is inadequate to replace the loaned securities) or fails to pay income distributions on them. The lending agent also provides indemnification to the System if investment of cash collateral results in investment loss. There were no losses during the fiscal years ended June 30, 2018 and 2017 resulting from a default of the borrowers or the lending agent.

All securities loans can be terminated on demand by either the System or the borrower, although the average term of

the loan is one day. There were no term loans at June 30, 2018 and 2017.

Cash collateral is invested in a short-term collateral investment pool that is managed by the lending agent, is segregated from all other clients of the lending agent, and is not subject to custodial credit risk. The System's income from securities lending represents its pro-rata share from participating in the program. The weighted-average maturity of the investments in the pool was one day at June 30, 2018 and 2017. During the fiscal years ended June 30, 2018 and 2017, the mismatch between the maturities of the investments made with cash collateral and the maturities of the securities loans may have posed some interest rate risk to the System. In the event of a default, the lending agent may use the collateral to replace the loaned securities.

As of June 30, 2018, the fair value of loaned securities was \$2,917,358,000. The fair value of the associated collateral was \$2,980,119,000, all of which was cash. As of June 30, 2017, the fair value of loaned securities was \$1,972,488,000. The fair value of the associated collateral was \$2,016,063,000, all of which was cash.

At June 30, 2018 and 2017, the System had the following foreign currency exposures for its derivatives (except for foreign exchange contracts which are included in Note 5):

Currency	(Dollar Amounts in Thousands)	
	2018	2017
	Notional Value	Notional Value
Euro	\$ 196,957	\$ 393,290
Japanese yen	157,013	193,886
British pound sterling	73,117	140,837
Canadian dollar	46,428	43,820
Australian dollar	42,585	41,056
Hong Kong dollar	8,604	9,177
Total Futures Contracts and Total Return Swaps	\$ 524,704	\$ 822,066

Notes to Financial Statements (continued)

Non-U.S. currency exposures at June 30, 2018 and 2017:

2018						
(Dollar Amounts in Thousands)						
Currency	Equity	Fixed Income	Alternative Investments & Real Estate	Short-Term*	Currency Hedge	Total Fair Value
Euro	\$ 1,102,053	\$ 80,144	\$ 1,590,146	\$ 6,907	\$ (1,951,095)	\$ 828,155
British pound sterling	885,533	8,291	209,662	1,158	(786,747)	317,897
South Korean won	161,072	-	-	1,143	107	162,322
Taiwan new dollar	147,945	-	-	438	(83)	148,300
South African rand	84,499	9,956	-	204	(383)	94,276
Indian rupee	70,039	-	-	(32)	-	70,007
Brazil real	54,967	2	-	849	(725)	55,093
Danish krone	126,043	275	-	2,537	(69,691)	59,164
Hong Kong dollar	251,845	-	-	338	(198,563)	53,620
Other non-U.S. currencies	2,398,858	135,132	7,358	20,525	(2,459,545)	102,328
Total	\$ 5,282,854	\$ 233,800	\$ 1,807,166	\$ 34,067	\$ (5,466,725)	\$ 1,891,162

2017						
(Dollar Amounts in Thousands)						
Currency	Equity	Fixed Income	Alternative Investments & Real Estate	Short-Term*	Currency Hedge	Total Fair Value
Euro	\$ 1,102,951	\$ 59,764	\$ 1,649,694	\$ 25,326	\$ (2,097,348)	\$ 740,387
British pound sterling	868,409	11,755	158,464	31,441	(889,499)	180,570
South Korean won	159,331	-	-	(202)	91	159,220
Taiwan new dollar	147,406	-	-	87	(50)	147,443
South African rand	71,882	11,236	-	137	(1,517)	81,738
Indian rupee	72,416	-	-	13	-	72,429
Brazil real	63,652	3,170	-	(2,927)	427	64,322
Danish krone	132,302	259	-	1,776	(73,854)	60,483
Mexican peso	25,532	18,353	-	(2,085)	(4,282)	37,518
Other non-U.S. currencies	2,588,546	119,637	-	67,521	(2,996,129)	(220,425)
Total	\$ 5,232,427	\$ 224,174	\$ 1,808,158	\$ 121,087	\$ (6,062,161)	\$ 1,323,685

* Includes investment receivables and payables

Financial Section

Notes to Financial Statements (continued)

The following table summarizes the System's foreign exchange contracts by currency at June 30, 2018 and 2017:

2018				
(Dollar Amounts in Thousands)				
Currency	Buys	Unrealized Gain/(Loss)	Sells	Unrealized Gain/(Loss)
Euro	\$ 72,860	\$ (24)	\$ 2,023,955	\$ 15,064
Japanese yen	9,165	(117)	1,095,908	13,532
Swiss franc	9,006	(69)	285,786	1,005
Australian dollar	3,606	(85)	360,830	8,780
Swedish krona	3,111	(92)	118,132	3,051
Canadian dollar	2,623	1	479,328	11,398
Singapore dollar	2,390	(46)	67,055	1,165
Mexican peso	1,373	65	54	-
British pound sterling	772	(6)	787,519	12,232
New Zealand dollar	-	-	23,392	553
Other non-US currencies	4,237	(35)	333,909	1,961
Total	\$ 109,143	\$ (408)	\$ 5,575,868	\$ 68,741

2017				
(Dollar Amounts in Thousands)				
Currency	Buys	Unrealized Gain/(Loss)	Sells	Unrealized Gain/(Loss)
Euro	\$ 78,103	\$ 2,259	\$ 2,174,510	\$ (130,531)
Japanese yen	21,517	(324)	1,156,315	(137)
Australian dollar	12,038	454	437,390	(1,579)
British pound sterling	8,490	57	894,487	(32,333)
Canadian dollar	7,640	261	540,836	(4,998)
Swiss franc	4,276	138	373,082	(13,447)
Czech koruna	3,921	70	293	(3)
New Zealand dollar	3,272	121	31,661	(855)
Polish zloty	2,832	23	2,676	(123)
Mexican peso	2,540	(11)	6,822	31
Swedish krona	1,250	22	154,593	(7,316)
Turkish lira	897	5	882	(1)
Singapore dollar	611	5	73,296	(2,106)
Other non-US currencies	1,694	4	359,103	(4,881)
Total	\$ 149,081	\$ 3,084	\$ 6,205,946	\$ (198,279)

Notes to Financial Statements (continued)

Table 5 - Notional Amounts of Derivatives

The table presented below summarizes the aggregate notional or contractual amounts for the System's derivative financial instruments at June 30, 2018 and 2017.

	(Dollar Amounts in Thousands)	
	2018	2017
Futures contracts - long:		
Treasury futures	\$ 3,003,525	\$ 2,624,369
U.S. equity futures	591,676	856,999
Non-U.S. equity futures	524,749	755,187
Commodity futures	355,009	314,613
Non-U.S. bond futures	163,823	184,169
Futures contracts - short:		
Treasury futures	39,132	21,878
Non- U.S. bond futures	33,706	4,282
Foreign exchange forward and spot contracts, gross	5,685,011	6,355,027
Options - puts purchased	2,132,285	899,648
Swaps - total return type	7,608,586	8,638,151

5. Derivative and Other Similar Investments

The System enters into a variety of financial contracts, which include options and futures. The System also enters into foreign exchange positions, such as forward and spot contracts to obtain or hedge foreign currency exposure; swap agreements to gain exposure to certain sectors of the equity and fixed income markets; collateralized mortgage obligations (CMOs); other forward contracts; and U.S. Treasury STRIPS. The System is not a dealer, but an end-user of these instruments. The contracts are used primarily to enhance performance and/or reduce the volatility of the portfolio. The System is exposed to credit risk in the event of non-performance by counterparties to financial instruments.

The System generally enters into transactions only with high quality institutions. Legal risk is mitigated through selection of executing brokers and review of all documentation. The System is exposed to market risk, the risk that future changes in market conditions may make an instrument less valuable. Exposure to market risk is managed in accordance with risk limits set by senior management, through buying or selling instruments or entering into offsetting positions.

The notional or contractual amounts of derivatives indicate the extent of the System's involvement in the various types and uses of derivative financial instruments and do not measure the System's exposure to credit or market

The fair values of derivative instruments outstanding at June 30, 2018 and 2017 are classified by type and by the changes in fair value of the derivative instrument in the table below.

Investment Derivative Type	(Dollar Amounts in Thousands)			
	Change in Fair Value Gain/(Loss) FY 2018		Fair Value at June 30, 2018	
	Classification	Amount	Classification	Amount
Futures	Investment income	\$ 20,952	Receivable/(Payable)	\$ 20,952
Total return type swaps	Investment income	(108,341)	Receivable/(Payable)	(108,341)
Foreign exchange contracts	Investment income	68,333	Receivable/(Payable)	68,333
Options	Investment income	(19,224)	Investment	43,904
Total		\$ (38,280)		\$ 24,848
Investment Derivative Type	(Dollar Amounts in Thousands)			
	Change in Fair Value Gain/(Loss) FY 2017		Fair Value at June 30, 2017	
	Classification	Amount	Classification	Amount
Futures	Investment income	\$ (10,152)	Receivable/(Payable)	\$ (10,152)
Total return type swaps	Investment income	(2,413)	Receivable/(Payable)	(2,413)
Foreign exchange contracts	Investment income	(195,195)	Receivable/(Payable)	(195,195)
Options	Investment income	(14,933)	Investment	12,009
Total		\$ (222,693)		\$ (195,751)

Notes to Financial Statements (continued)

risks and do not necessarily represent amounts exchanged by the parties. The amounts exchanged are determined by reference to the notional amounts and the other terms of the derivatives.

Futures contracts are contracts in which the buyer agrees to purchase and the seller agrees to make delivery of a specific financial instrument at a predetermined date and price. Gains and losses on futures contracts are settled daily based on a notional (underlying) principal value and do not involve an actual transfer of the specific instrument. Futures contracts are standardized and are traded on exchanges. The exchange assumes the risk that a counterparty will not pay and generally requires margin payments to minimize such risk. In addition, the System enters into short sales, sales of securities it does not presently own, to neutralize the market risk of certain equity positions. Initial margin requirements on futures contracts and collateral for short sales are provided by investment securities pledged as collateral and by cash held by various brokers. Although the System has the right to access individual pledged securities, it must maintain the amount pledged by substituting other securities for those accessed. The value of securities pledged and the amount of cash held at June 30, 2018 and 2017 represent a restriction on the amount of assets available at year-end for other purposes.

Option contracts provide the option purchaser with the right, but not the obligation, to buy or sell the underlying security at a set price during a period or at a specified date. The option writer is obligated to buy or sell the underlying security if the option purchaser chooses to exercise the option. The System generally uses exchange listed currency, index, stock, and futures options. During FY 2018 and FY2017, the System purchased over-the-counter put options on the S&P 500 Index. The fair value of these option contracts of \$43,904,000 and \$12,009,000 at June 30, 2018 and 2017, respectively, is included in the Statements of Fiduciary Net Position.

Foreign exchange contracts involve an agreement to exchange the currency of one country for the currency of another country at an agreed-upon price and settlement date. To reduce the risk of counterparty non-performance, the investment managers generally enter into these contracts with institutions regarded as meeting high standards of credit worthiness. The contracts reported in Table 5 primarily include forwards. The \$5,685,011,000 of foreign currency contracts outstanding at June 30, 2018 consist of “buy” contracts, which represent the U.S. dollar equivalents of commitments to purchase foreign currencies of \$109,143,000 and “sell” contracts, which represent U.S. dollar equivalents of commitments to sell foreign currencies of \$5,575,868,000. The \$6,355,027,000 of foreign currency contracts outstanding at June 30, 2017 consist of

“buy” contracts of \$149,081,000 and “sell” contracts of \$6,205,946,000. The unrealized gain/(loss) on contracts of \$68,333,000 and \$(195,195,000) at June 30, 2018 and 2017, respectively, is included in the Statements of Fiduciary Net Position and represents the fair value of the contracts.

Swap agreements provide for periodic payments at predetermined future dates between parties based on the change in value of underlying securities, indexes, or interest rates. During the years ended June 30, 2018 and 2017, the System entered into total return type swaps. Under the total return type swap arrangements, the System receives the net return of certain equity securities or indexes in exchange for a short-term rate minus a spread or a predetermined fixed charge. The payable on the total return type swap contracts of \$(108,341,000) and \$(2,413,000) at June 30, 2018 and 2017, respectively, is included in the Statements of Fiduciary Net Position and represents the fair value of the contracts. The contracts have varying maturity dates ranging from July 2, 2018 to June 4, 2019.

The System also invests in mortgage-backed securities (MBS) such as CMOs and MBS forwards to maximize yields. These securities are sensitive to prepayments of mortgages, which may result from a drop in interest rates. The MBS forwards are subject to credit risk in the event of nonperformance by counterparties. The fair value of CMOs at June 30, 2018 and 2017 is \$548,512,000 and \$517,910,000, respectively.

The System invests in U.S. Treasury STRIPS which essentially act as zero coupon bonds and are subject to market volatility from a rise or drop in interest rates.

Through certain collective trust funds, the System also indirectly holds various derivative financial instruments. The collective trust funds invest in futures and options thereon; forward foreign currency contracts; options; interest rate, currency, equity, index, and total return swaps; interest-only STRIPS; and CMOs, to enhance the performance and/or reduce the volatility of their portfolios.

6. Net Pension Liability of Participating Employers

The components of the net pension liability of the participating employers at June 30, 2018 were as follows:

(Dollar amounts in thousands)	
Total pension liability	\$ 104,368,679
Less: Plan fiduciary net position	56,363,714
Employer net pension liability	<u>\$ 48,004,965</u>
Plan fiduciary net position as a percentage of the total pension liability	54.00%

Notes to Financial Statements (continued)

Actuarial Assumptions

The total pension liability at June 30, 2018 was determined by rolling forward the System's total pension liability at June 30, 2017 to June 30, 2018 using the following actuarial assumptions, applied to all periods included in the measurement:

- Actuarial cost method - Entry Age Normal - level % of pay.
- Investment return - 7.25%, includes inflation at 2.75%
- Salary growth - Effective average of 5.00%, comprised of inflation of 2.75% and 2.25% for real wage growth and for merit or seniority increases.
- Mortality rates were based on the RP-2014 Mortality Tables for Males and Females, adjusted to reflect PSERS' experience and projected using a modified version of the MP-2015 Mortality Improvement Scale.

Investments

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

The pension plan's policy in regard to the allocation of invested plan assets is established and may be amended by the Board. Plan assets are managed with a long-term objective of achieving and maintaining a fully funded status for the benefits provided through the pension.

For the year ended June 30, 2018, the annual money-weighted rate of return on pension plan investments, net of pension plan investment expense, was 9.30%. The money-weighted rate of return expresses investment performance, net of investment expense, adjusted for the changing amounts actually invested. Table 6 shows the Board's adopted asset allocation policy and best estimates of geometric real rates of return for each major asset class at June 30, 2018.

Table 6 - Pension Asset Allocation

Pension - Asset Class	Target Allocation	Long-Term Expected Real Rate of Return
Global public equity	20.0%	5.2%
Fixed income	36.0%	2.2%
Commodities	8.0%	3.2%
Absolute return	10.0%	3.5%
Risk parity	10.0%	3.9%
Infrastructure/MLPs	8.0%	5.2%
Real estate	10.0%	4.2%
Alternative investments	15.0%	6.7%
Cash	3.0%	0.4%
Financing (LIBOR)	(20.0%)	0.9%
	100.0%	

Discount Rate

The discount rate used to measure the total pension liability was 7.25%. The projection of cash flows used to determine the discount rate assumed that contributions from plan members will be made at the current contribution rate and that contributions from employers will be made at contractually required rates, actuarially determined. Based on those assumptions, the pension plan's fiduciary net position was projected to be available to make all projected future benefit payments of current plan members. Therefore, the long-term expected rate of return on pension plan investments was applied to all periods of projected benefit payments to determine the total pension liability.

Sensitivity of the Net Pension Liability

Table 7 presents the net pension liability, calculated using the discount rate of 7.25%, as well as what the net pension liability would be if it were calculated using a discount rate that is 1-percentage point lower (6.25%) or 1-percentage point higher (8.25%) than the current rate:

Table 7 - Sensitivity of the Net Pension Liability

(Dollar amounts in thousands)

	1% Decrease	Current Discount Rate	1% Increase
	6.25%	7.25%	8.25%
Net pension liability \$	59,505,689	48,004,965	38,280,768

Notes to Financial Statements (continued)

7. Net Other Postemployment Benefits (OPEB)

Liability of Participating Employers

The components of the net OPEB liability of the participating employers at June 30, 2018 for the Premium Assistance Program were as follows:

(Dollar amounts in thousands)	
Total OPEB liability	\$ 2,207,683
Less: Plan fiduciary net position	122,734
Employer net OPEB liability	\$ 2,084,949
Plan fiduciary net position as a percentage of the total OPEB liability	5.56%

Postemployment Healthcare Plans

PSERS provides a Health Insurance Premium Assistance program funded by employer contributions which makes up the OPEB liability.

HOP is a PSERS sponsored voluntary health insurance program funded exclusively by the premiums paid by its participants for benefit coverage they elect. The HOP is not part of the OPEB liability.

Change in Actuarial Assumptions

The following change in assumption was used in the measurement of the Total OPEB Liability beginning June 30, 2018. The Investment Rate of Return was adjusted from 3.13% to 2.98% which represents the S&P 20 Year Municipal Bond Rate.

Actuarial Assumptions

The total OPEB liability at June 30, 2018 was determined by rolling forward the System’s total OPEB liability at June 30, 2017 to June 30, 2018 using the following actuarial assumptions, applied to all periods included in the measurement:

- Actuarial cost method - Entry Age Normal - level % of pay.
- Investment return - 2.98% - S&P 20 Year Municipal Bond Rate.
- Salary growth - Effective average of 5.00%, comprised of inflation of 2.75% and 2.25% for real wage growth and for merit or seniority increases.
- Premium Assistance reimbursement is capped at \$1,200 per year.
- Assumed Healthcare cost trends were applied to retirees with less than \$1,200 in premium assistance per year.

- Mortality rates were based on the RP-2014 Mortality Tables for Males and Females, adjusted to reflect PSERS’ experience and projected using a modified version of the MP-2015 Mortality Improvement Scale.

Investments

The Board has the responsibility to invest and reinvest available funds of the System in accordance with the guidelines and limitations set forth in the Code and other applicable state law. The Board accomplishes the daily management of the System’s investments through investment advisors who act as agents for the System and through internal investment managers. Investments consist primarily of short term assets designed to protect the principal of plan assets. Table 8 reflects the Fund’s OPEB asset allocation policy and best estimates of geometric real rates of return for each asset class at June 30, 2018.

Under the program, employer contribution rates for Premium Assistance are established to provide reserves in the Health Insurance Account that are sufficient for the payment of Premium Assistance benefits for each succeeding year.

For the year ended June 30, 2018, the annual money-weighted rate of return on OPEB plan investments, net of OPEB plan investment expense, was 1.63%. The money-weighted rate of return expresses investment performance, net of investment expense, adjusted for the changing amounts actually invested.

Table 8 - OPEB Asset Allocation

OPEB - Asset Class	Target Allocation	Long-Term Expected Real Rate of Return
Cash	5.9%	0.3%
US Core Fixed Income	92.8%	1.2%
Non-US Developed Fixed	1.3%	0.4%
	100.0%	

Discount Rate

The discount rate used to measure the total OPEB liability was 2.98%. The Health Insurance Premium Assistance Program is funded by employer contributions. Under the plan’s funding method, the OPEB plan’s fiduciary net position was not projected to be sufficient to meet projected future benefit payments. Therefore, the plan is considered a “pay-as-you-go” plan and a discount rate of 2.98%, which represents the S&P 20 year Municipal Bond Rate at June 30, 2018, was applied to all projected benefit payments to measure the total OPEB liability.

Notes to Financial Statements (continued)

Sensitivity of the Net OPEB Liability

Table 9 presents the net OPEB liability, calculated using the discount rate of 2.98%, as well as what the net OPEB liability would be if it were calculated using a discount rate that is 1-percentage point lower (1.98%) or 1-percentage point higher (3.98%) than the current rate:

Table 9 - Sensitivity of the Net OPEB Liability
(Dollar amounts in thousands)

	1% Decrease	Current Discount Rate	1% Increase
	1.98%	2.98%	3.98%
Net OPEB liability	\$ 2,371,118	\$ 2,084,949	\$ 1,847,409

Healthcare Cost Trend Rates

Healthcare cost trends were applied to retirees with less than \$1,200 in Premium Assistance per year. Premium Assistance is capped at a maximum of \$1,200 per year. At June 30, 2017, there were 93,380 members receiving the maximum amount allowed of \$1,200 in Premium Assistance per year and their Premium Assistance benefits are not subject to future healthcare cost increases. At June 30, 2017, there were 1,077 members receiving less than the maximum amount allowed of \$1,200 per year. The actual number of retirees receiving less than the \$1,200 per year cap is a small percentage of the total population and has a minimal impact from Healthcare Cost Trends, as depicted in Table 10, which discloses the effect of a 1% increase or decrease in the rate.

Table 10 - Sensitivity of the Net OPEB Liability to Change in Healthcare Cost Trend Rates
(Dollar amounts in thousands)

	1% Decrease	Current Trend Rate	1% Increase
Net OPEB liability	\$ 2,084,537	\$ 2,084,949	\$ 2,085,279

8. Pension Plan for Employees of the System

(A) SERS' Plan Description

As an employer, the System contributes to SERS, a cost-sharing multiple-employer defined benefit pension plan established by the Commonwealth to provide pension benefits for employees of state government and certain independent agencies. SERS is a component unit of the Commonwealth and is included in the Commonwealth's financial report as a pension trust fund.

Membership in SERS is mandatory for most state employees. SERS provides retirement, death, and disability benefits. Article II of the Commonwealth's Constitution assigns the authority to establish and amend the benefit provision of the plan to the General Assembly.

(B) SERS' Benefits Provided to Employees of the System

SERS member retirement benefits are generally determined by taking years of credited service times final average salary times 2% or 2.5%, depending on date of hire. The normal retirement age ranges from 50 - 65, depending on the membership class. According to the State Employees' Retirement Code (SERC), all obligations of SERS will be assumed by the Commonwealth should SERS terminate.

(C) Contributions to SERS

The contribution requirements of SERS plan members is mandated by Commonwealth statute. The member contribution rate for the majority of SERS' members is 6.25%. At December 31, 2017 and 2016 the blended employer contribution rates were 30.04% and 26.71%, respectively. Contributions to SERS from PSERS were \$7.3 million for the year ended June 30, 2018.

(D) Proportionate Share of Pension Liabilities, Pension Expense, and Deferred Inflows of Resources and Deferred Outflows of Resources

At June 30, 2018, PSERS reported a liability of \$60.2 million and \$64.1 million at June 30, 2017, for its proportionate share of the net pension liability for the SERS plan in Other liabilities on the Statement of Fiduciary Net Position. The net pension liability was measured at December 31, 2017 and 2016, and the total pension liability used to calculate the net pension liability was determined by an actuarial valuation at December 31, 2017 and 2016. PSERS' proportion of the net pension liability was calculated utilizing a projected-contribution method. At December 31, 2017, PSERS' proportion was 0.34849162 percent and 0.33288975 percent at December 31, 2016.

Notes to Financial Statements (continued)

PSERS recognized total pension expense of \$9.4 million in FY 2018 on the Statement of Changes in Fiduciary Net Position. Of the \$9.4 million of pension expense, \$8.7 million was reflected in administrative expenses and \$0.7 million was reflected in investment expenses. Deferred inflows of resources of \$4.3 million and \$2.4 million at June 30, 2018, and June 30, 2017, respectively, are reported in Other liabilities on the Statement of Fiduciary Net Position. Deferred outflows of resources of \$12.4 million and \$16.7 million at June 30, 2018, and June 30, 2017, respectively, are reported in Miscellaneous assets. Of the \$12.4 million of deferred outflows of resources at June 30, 2018, PSERS recorded \$3.5 million for contributions subsequent to the measurement date which will be recognized as a reduction of the net pension liability in the year ending June 30, 2019. Other amounts reported as deferred outflows of resources and deferred inflows of resources will be recognized in pension expense as follows:

Year Ending June 30:	(Dollar amounts in thousands)
2019	\$ 2,571
2020	2,141
2021	382
2022	(743)
2023	116

(E) SERS’ Pension Plan Fiduciary Net Position

Detailed information about SERS’ fiduciary net position is available in SERS’ Comprehensive Annual Financial Report which can be found on SERS’ website at www.SERS.pa.gov.

9. Postemployment Healthcare Plan for Employees of the System

(A) REHP Plan Description

As an employer, the System participates in the Commonwealth’s REHP. The REHP is a single employer plan and provides certain healthcare benefits to qualifying individuals meeting specified age and/or service requirements. The Commonwealth’s Office of Administration (OA), in its sole discretion, determines available REHP benefits on an ongoing basis. The Pennsylvania Employees Benefit Trust Fund (PEBTF) is a third-party administrator for the REHP under the provisions of an Administration Agreement between OA and PEBTF.

(B) OPEB Benefits Provided to Employees of the System

The Commonwealth sponsors the REHP for eligible retirees and their dependents to receive subsidized health coverage for the retiree’s lifetime. The REHP is provided as part of collective bargaining agreements with most Commonwealth labor unions. All policy decisions, types and levels of benefits for the REHP fall under the purview of the Commonwealth’s Executive Board and the Secretary of Administration.

(C) Contributions to the REHP

Employer costs for retiree healthcare benefits are charged as a component of payroll expenditures, on a ‘pay as you go’ basis. All employing agencies contributed \$362 per biweekly pay period for each current REHP eligible active employee during fiscal year ended June 30, 2017 to the REHP Trust. PSERS’ contributions to the REHP for FY 2018 were \$1.9 million. Plan members who retired after June 30, 2005 contribute to the plan based on a percentage of their final annual gross base salary at the time of retirement. Plan member contribution rates vary based on their REHP enrollment date.

(D) Proportionate Share of OPEB Liabilities, OPEB Expense and Deferred Inflows of Resources and Deferred Outflows of Resources

At June 30, 2018, PSERS reported a liability of \$76.3 million for its proportionate share of net OPEB liability for the REHP plan in Other Liabilities on the Statement of Fiduciary Net Position. The current liability portion of the net OPEB liability is \$2.0 million. The net OPEB liability was measured at June 30, 2017, and the total OPEB liability used to calculate the net OPEB liability was determined by an actuarial valuation at June 30, 2017. Since the REHP has insufficient assets to meet next year’s projected benefit payments, the discount rate used to measure the total OPEB liability is based on the 20-year tax-exempt general obligation municipal bond index rate which was 3.58% on June 30, 2018. PSERS’ proportion of the net OPEB liability was calculated utilizing a contribution method. At June 30, 2017, PSERS’ proportion was 0.387675 percent.

Notes to Financial Statements (continued)

PSERS recognized total OPEB expense of \$3.2 million in FY 2018 on the Statement of Changes in Fiduciary Net Position. Of the \$3.2 million of OPEB expense, \$3.0 million was reflected in administrative expenses and \$0.2 million was reflected in investment expenses. Deferred outflows of resources of \$1.9 million at June 30, 2018 are reported in Miscellaneous assets and represent contributions subsequent to the measurement date which will be recognized as a reduction of the net OPEB liability in the year ending June 30, 2019. Deferred inflows of resources of \$7.0 million at June 30, 2018 are reported in Other liabilities on the Statement of Fiduciary Net Position and will be recognized in OPEB expense as follows:

Year Ending June 30:	(Dollar amounts in thousands)
2019	\$ (1,492)
2020	(1,492)
2021	(1,492)
2022	(1,492)
2023	(1,048)

(E) REHP Plan Fiduciary Net Position

Detailed information about the REHP fiduciary net position is available in the Commonwealth's Comprehensive Annual Financial Report which can be found at www.budget.pa.gov.

10. Litigation and Contingencies

The System is subject to various threatened and pending lawsuits. These lawsuits include issues related to benefit calculations and eligibility. It is the opinion of management that the ultimate liability arising from such threatened and pending litigation will not have a material effect on the financial position of the System. The System is exposed to various other liabilities and risks related to fiduciary responsibilities of directors and officers.

11. Commitments

At June 30, 2018, PSERS had commitments for the future purchase of investments in alternative investments of \$7.2 billion and real estate of \$2.7 billion.

Required Supplementary Information

Schedule 1 Schedule of Changes in the Employer Net Pension Liability (Unaudited – See Accompanying Auditor’s Report) (Dollar Amounts in Thousands)

	2018	2017	2016	2015	2014
Total pension liability					
Service cost	\$ 1,890,906	\$ 1,873,844	\$ 1,932,401	\$ 1,926,539	\$ 2,139,037
Interest	7,334,484	7,110,987	7,028,292	6,857,497	6,523,484
Changes of benefit terms	-	(449)	-	-	-
Differences between expected and actual experience	(745,306)	644,051	(348,429)	(223,437)	-
Changes of assumptions	-	-	2,236,118	-	-
Benefit payments	(6,655,146)	(6,473,579)	(6,360,325)	(6,220,601)	(6,053,505)
Net change in total pension liability	1,824,938	3,154,854	4,488,057	2,339,998	2,609,016
Total pension liability - beginning	102,543,741	99,388,887	94,900,830	92,560,832	89,951,816
Total pension liability - ending (a)	<u>\$ 104,368,679</u>	<u>\$ 102,543,741</u>	<u>\$ 99,388,887</u>	<u>\$ 94,900,830</u>	<u>\$ 92,560,832</u>
Plan fiduciary net position					
Contributions - employer	\$ 4,249,611	\$ 3,832,773	\$ 3,189,510	\$ 2,596,731	\$ 1,992,084
Contributions - member	1,026,375	1,013,847	989,266	984,634	966,926
Net investment income	4,714,158	4,995,362	473,206	1,328,516	7,097,761
Benefit payments	(6,655,146)	(6,473,579)	(6,360,325)	(6,220,601)	(6,053,505)
Administrative expense	(46,544)	(45,127)	(45,118)	(42,331)	(38,712)
Net Change in plan fiduciary net position	3,288,454	3,323,276	(1,753,461)	(1,353,051)	3,964,554
Plan fiduciary net position - beginning	53,155,336	49,832,060	51,585,521	52,980,115	49,015,561
Effect of change in accounting principle	(80,076)	-	-	(41,543)	-
Plan fiduciary net position - beginning restated	53,075,260	-	-	52,938,572	-
Plan fiduciary net position - ending (b)	<u>\$ 56,363,714</u>	<u>\$ 53,155,336</u>	<u>\$ 49,832,060</u>	<u>\$ 51,585,521</u>	<u>\$ 52,980,115</u>
Employer net pension liability - ending (a)-(b)	<u>\$ 48,004,965</u>	<u>\$ 49,388,405</u>	<u>\$ 49,556,827</u>	<u>\$ 43,315,309</u>	<u>\$ 39,580,717</u>

Required Supplementary Schedules are intended to show information for 10 years. Additional years will be displayed as they become available.

See accompanying independent auditor’s report and notes to the required supplementary information.

Required Supplementary Information

Schedule 2 Schedule of Employer Net Pension Liability (Unaudited – See Accompanying Auditor’s Report) (Dollar Amounts in Thousands)

	2018	2017	2016	2015	2014
Total pension liability	\$ 104,368,679	\$ 102,543,741	\$ 99,388,887	\$ 94,900,830	\$ 92,560,832
Less: Plan fiduciary net position	56,363,714	53,155,336	49,832,060	51,585,521	52,980,115
Employer net pension liability	<u>\$ 48,004,965</u>	<u>\$ 49,388,405</u>	<u>\$ 49,556,827</u>	<u>\$ 43,315,309</u>	<u>\$ 39,580,717</u>
Plan fiduciary net position as a percentage of the total pension liability	54.00%	51.84%	50.14%	54.36%	57.24%
Covered payroll	\$ 13,466,526	\$ 13,313,900	\$ 12,951,077	\$ 12,866,473	\$ 12,760,785
Employer net pension liability as a percentage of covered payroll	356.48%	370.95%	382.65%	336.65%	310.17%
Employer net pension liability as a percentage of covered payroll	370.95%	370.95%	382.65%	336.65%	310.17%

Schedule 3 Schedule of Employer Pension Contributions (Unaudited – See Accompanying Auditor’s Report) (Dollar Amounts in Thousands)

	Pension				
	2018	2017	2016	2015	2014
Actuarially determined contribution	\$ 4,243,328	\$ 3,824,908	\$ 3,540,304	\$ 3,289,615	\$ 2,965,715
Contributions in relation to the actuarially determined contribution ⁽¹⁾⁽²⁾	4,243,328	3,824,908	3,181,438	2,582,114	1,992,084
Contribution deficiency	<u>\$ -</u>	<u>\$ -</u>	<u>\$ 358,866</u>	<u>\$ 707,501</u>	<u>\$ 973,631</u>
Covered payroll	\$ 13,466,526	\$ 13,313,900	\$ 12,951,077	\$ 12,866,473	\$ 12,760,785
Contributions as a percentage of covered payroll	31.51%	28.73%	24.57%	20.07%	15.61%

⁽¹⁾ Amounts for 2015-2018 exclude purchase of service contributions.

⁽²⁾ Same as contractually required contributions.

Required Supplementary Schedules are intended to show information for 10 years. Additional years will be displayed as they become available.

See accompanying independent auditor’s report and notes to the required supplementary information.

Required Supplementary Information

Schedule 4 Schedule of Changes in the Employer Net OPEB Liability (Unaudited – See Accompanying Auditor’s Report) (Dollar Amounts in Thousands)

	2018	2017
Total OPEB liability		
Service cost	\$ 37,809	\$ 42,038
Interest	67,091	61,404
Differences between expected and actual experience	15,019	-
Changes of assumptions	38,456	(110,610)
Benefit payments	(111,847)	(110,229)
Net change in total OPEB liability	46,528	(117,397)
Total OPEB liability - beginning	2,161,155	2,278,552
Total OPEB liability - ending (a)	\$ 2,207,683	\$ 2,161,155
Plan fiduciary net position		
Contributions - employer	\$ 111,986	\$ 110,985
Net investment income	1,455	663
Benefit payments	(111,847)	(110,229)
Administrative expense	(2,603)	(2,239)
Net Change in plan fiduciary net position	(1,009)	(820)
Plan fiduciary net position - beginning	123,743	124,563
Plan fiduciary net position - ending (b)	\$ 122,734	\$ 123,743
Employer net OPEB liability - ending (a) - (b)	\$ 2,084,949	\$ 2,037,412

Required Supplementary Schedules are intended to show information for 10 years. Additional years will be displayed as they become available.

See accompanying independent auditor’s report and notes to the required supplementary information.

Required Supplementary Information

Schedule 5 Schedule of Employer Net OPEB Liability (Unaudited – See Accompanying Auditor’s Report) (Dollar Amounts in Thousands)

	2018	2017	2016
Total OPEB liability	\$ 2,207,683	\$ 2,161,155	\$ 2,278,552
Less: Plan fiduciary net position	122,734	123,743	124,563
Employer net OPEB liability	<u>\$ 2,084,949</u>	<u>\$ 2,037,412</u>	<u>\$ 2,153,989</u>
Plan fiduciary net position as a percentage of the total OPEB liability	5.56%	5.73%	5.47%
Covered payroll	\$ 13,466,526	\$ 13,313,900	\$ 12,951,077
Employer net OPEB liability as a percentage of covered payroll	15.48%	15.30%	16.63%

Schedule 6 Schedule of Employer Premium Assistance Contributions (Unaudited – See Accompanying Auditor’s Report) (Dollar Amounts in Thousands)

	OPEB		
	2018	2017	2016
Actuarially determined contribution	\$ 134,607	\$ 125,694	\$ 129,494
Contributions in relation to the actuarially determined contribution ^{(1) (2)}	111,724	110,558	112,557
Contribution deficiency	<u>\$ 22,883</u>	<u>\$ 15,136</u>	<u>\$ 16,937</u>
Covered payroll	\$ 13,466,526	\$ 13,313,900	\$ 12,951,077
Contributions as a percentage of covered payroll	0.83%	0.83%	0.87%

⁽¹⁾ Amounts exclude purchase of service contributions.

⁽²⁾ Same as contractually required contributions.

Required Supplementary Schedules are intended to show information for 10 years. Additional years will be displayed as they become available.

See accompanying independent auditor’s report and notes to the required supplementary information.

Required Supplementary Information

Schedule 7 Schedule of Investment Returns - Pension and OPEB (Unaudited – See Accompanying Auditor’s Report)

	<u>2018</u>	<u>2017</u>	<u>2016</u>	<u>2015</u>	<u>2014</u>
Annual money-weighted rate of return, net of investment expense- Pension	9.30%	10.15%	1.11%	3.08%	14.98%
Annual money-weighted rate of return, net of investment expense- OPEB	1.63%	0.90%	0.65%	0.30%	-

Required Supplementary Schedules are intended to show information for 10 years. Additional years will be displayed as they become available.

See accompanying independent auditor’s report and notes to the required supplementary information.

**Notes to Required Supplementary Information
for the Years Ended June 30, 2014 thru June 30, 2018**

Pension

Changes in benefit terms

With the passage of Act 5 class T-E & T-F members are now permitted to elect a lump sum payment of member contributions upon retirement.

Changes in assumptions used in measurement of the Total Pension Liability beginning June 30, 2017 & beginning June 30, 2018.

None.

Changes in assumptions used in measurement of the Total Pension Liability beginning June 30, 2016

The Investment Rate of Return was adjusted from 7.50% to 7.25%. The inflation assumption was decreased from 3.00% to 2.75%.

Salary growth changed from an effective average of 5.50%, which was comprised of inflation of 3.00%, real wage growth and for merit or seniority increases of 2.50%, to an effective average of 5.00%, comprised of inflation of 2.75% and 2.25% for real wage growth and for merit or seniority increases.

Mortality rates were modified from the RP-2000 Combined Healthy Annuitant Tables (male and female) with age set back 3 years for both males and females to the RP-2014 Mortality Tables for Males and Females, adjusted to reflect PSERS' experience and projected using a modified version of the MP-2015 Mortality Improvement Scale. For disabled annuitants the RP-2000 Combined Disabled Tables (male and female) with age set back 7 years for males and 3 years for females to the RP-2014 Mortality Tables for Males and Females, adjusted to reflect PSERS' experience and projected using a modified version of the MP-2015 Mortality Improvement Scale.

Method and assumptions used in calculations of actuarially determined contributions

The actuarially determined contributions are calculated as of the June 30 preceding the fiscal year in which contributions are made. That is, the contribution calculated as of the June 30, 2017 actuarial valuation will be made during the fiscal year ending June 30, 2019. The following actuarial methods and assumptions were used to determine contribution rates reported in that schedule:

- Investment return - 7.25%, includes inflation at 2.75% and the real rate of return 4.50%.
- Salary growth - Effective average of 5.00%, which reflects an allowance for inflation of 2.75%, real wage growth and merit or seniority of 2.25%.
- Benefit payments - no postretirement benefit increases assumed in the future.
- Mortality rates were based on the RP-2014 Mortality Tables for Males and Females, adjusted to reflect PSERS' experience and projected using a modified version of the MP-2015 Mortality Improvement Scale.

10-year reporting requirements

Required Supplementary Schedules 1-3 and 7, as related to pensions, are intended to show information for 10 years. Additional years will be displayed as they become available.

The Accounting Valuation

The GASB 67 accounting valuation can be found on PSERS' website at www.psers.pa.gov.

**Notes to Required Supplementary Information
for the Years Ended June 30, 2014 thru June 30, 2018**

OPEB

Changes in benefit terms

None.

Changes in assumptions used in measurement of the Total OPEB Liability beginning June 30, 2018

The Discount Rate decreased from 3.13% to 2.98%.

Changes in assumptions used in measurement of the Total OPEB Liability beginning June 30, 2017

The Discount Rate increased from 2.71% to 3.13%.

Changes in assumptions used in measurement of the Total OPEB Liability beginning June 30, 2016

Salary growth changed from an effective average of 5.50%, which was comprised of inflation of 3.00%, real wage growth and for merit or seniority increases of 2.50%, to an effective average of 5.00%, comprised of inflation of 2.75% and 2.25% for real wage growth and for merit or seniority increases.

Mortality rates were modified from the RP-2000 Combined Healthy Annuitant Tables (male and female) with age set back 3 years for both males and females to the RP-2014 Mortality Tables for Males and Females, adjusted to reflect PSERS' experience and projected using a modified version of the MP-2015 Mortality Improvement Scale. For disabled annuitants the RP-2000 Combined Disabled Tables (male and female) with age set back 7 years for males and 3 years for females to the RP-2014 Mortality Tables for Males and Females, adjusted to reflect PSERS' experience and projected using a modified version of the MP-2015 Mortality Improvement Scale.

Method and assumptions used in calculations of actuarially determined contributions

The actuarially determined contributions are calculated as of the June 30 preceding the fiscal year in which contributions are made. That is, the contribution calculated as of the June 30, 2017 actuarial valuation will be made during the fiscal year ending June 30, 2019. The following actuarial methods and assumptions were used to determine contribution rates reported in that schedule:

- Investment return - 2.98% - 20 year S&P Municipal Bond Rate.
- Salary growth - Effective average of 5.00%, which reflects an allowance for inflation of 2.75%, real wage growth and merit or seniority of 2.25%.
- Benefit payments - no postretirement benefit increases assumed in the future.
- Mortality rates were based on the RP-2014 Mortality Tables for Males and Females, adjusted to reflect PSERS' experience and projected using a modified version of the MP-2015 Mortality Improvement Scale.
- Assumed Healthcare cost trends were applied to retirees with less than \$1,200 in premium assistance per year.

10-year reporting requirements

Required Supplementary Schedules 4-7, as related to OPEB, are intended to show information for 10 years. Additional years will be displayed as they become available.

The Accounting Valuation

The GASB 74 accounting valuation can be found on PSERS' website at www.pfers.pa.gov.

Supplementary Schedule 1
Schedule of Administrative and Investment Expenses
Year Ended June 30, 2018
(Dollar Amounts in Thousands)

	Administrative Expenses				Total
	Pension	Defined Contribution	Post-employment Healthcare (1)	Investment Expenses (2)	
Personnel costs:					
Salaries and wages	\$ 15,776	\$ 38	\$ 1,119	\$ 6,803	\$ 23,736
Employee benefits	10,301	22	767	3,619	14,709
Total personnel costs	26,077	60	1,886	10,422	38,445
Operating costs:					
Investment managers' fees	-	-	-	447,028	447,028
Custodian fees	-	-	-	2,268	2,268
Specialized services	517	-	1,842	625	2,984
Third party administrator	-	-	27,857	-	27,857
Fitness program administrator	-	-	8,544	-	8,544
Healthcare project management	-	-	3,358	-	3,358
Rental of real estate, electricity	1,968	-	154	251	2,373
Consultant and legal fees	2,909	34	637	3,942	7,522
Treasury and other Commonwealth services	1,685	-	-	195	1,880
Postage	1,110	-	1	-	1,111
Contracted maintenance and repair services	1,533	-	-	8	1,541
Printing and office supplies	272	-	-	4	276
Rental of equipment and software	4,089	-	-	-	4,089
Travel and training	186	1	3	50	240
Telecommunications	473	-	-	45	518
Equipment (non-capital assets)	131	-	-	40	171
Subscriptions	597	-	4	1,873	2,474
Miscellaneous expenses	730	-	-	76	806
Total operating costs	16,200	35	42,400	456,405	515,040
Other charges:					
Depreciation	1,867	-	-	-	1,867
Total Administrative and Investment Expenses Before Pension & OPEB Expense	44,144	95	44,286	466,827	555,352
Pension expense (3)	1,344	-	96	700	2,140
OPEB expense (4)	1,056	-	74	185	1,315
Total Administrative and Investment Expenses	\$ 46,544	\$ 95	\$ 44,456	\$ 467,712	\$ 558,807

(1) Administrative expenses for Postemployment Healthcare includes \$2,603 related to Premium Assistance and \$41,853 related to Healthcare Health Options Program for the fiscal year ended June 30, 2018.

(2) Includes investment expenses of \$31 related to Postemployment Healthcare Premium Assistance and \$28 related to Health Options Program for the fiscal year ended June 30, 2018 and does not include \$4,547 in capitalized broker commissions for the fiscal year ended June 30, 2018.

(3) Total GASB 68 pension expense is \$9.4 million and is reflected under Employee benefits and Pension expense. Employer contributions of \$7.3 million are included as Employee benefits under Personnel costs and \$2.1 million is reflected as Pension expense.

(4) Total GASB 75 OPEB expense is \$3.2 million and is reflected under Employee benefits and OPEB expense. Employer contributions of \$1.9 million are included as Employee benefits under Personnel costs and \$1.3 million is reflected as OPEB expense.

Supplementary Schedule 2
Summary of Investment Expenses*
Year Ended June 30, 2018
(Dollar Amounts in Thousands)

	<u>Investment Management</u>		<u>Other Expenses</u>	<u>Total</u>
	<u>Base</u>	<u>Performance</u>		
External management:				
Domestic equity	\$ 1,479	\$ 572	\$ -	\$ 2,051
International equity	22,220	6,144	-	28,364
Fixed income	98,076	12,594	-	110,670
Real estate	49,640	-	-	49,640
Alternative investments	98,176	-	-	98,176
Absolute return	83,243	32,086	-	115,329
Commodities	5,534	4,449	-	9,983
Master limited partnership	7,887	987	-	8,874
Infrastructure	1,707	-	-	1,707
Risk parity	20,372	1,862	-	22,234
Total external management	<u>388,334</u>	<u>58,694</u>	<u>-</u>	<u>447,028</u>
Total internal management	<u>-</u>	<u>-</u>	<u>14,474</u>	<u>14,474</u>
Total investment management	<u>388,334</u>	<u>58,694</u>	<u>14,474</u>	<u>461,502</u>
Custodian fees	-	-	2,268	2,268
Consultant and legal fees	-	-	3,942	3,942
Total investment expenses	<u>\$ 388,334</u>	<u>\$ 58,694</u>	<u>\$ 20,684</u>	<u>\$ 467,712</u>

* External investment management fees classified on an asset allocation basis.

Supplementary Schedule 3
Schedule of Payments to Non-Investment Consultants
Year Ended June 30, 2018
(Dollar Amounts Greater than \$100,000)

Consultant	Fees	Services Provided
Coresource, Inc.	\$ 28,933,725	Postemployment healthcare benefits administration and claims adjudication
Optum, RX, Inc.	8,142,534	Administration of postemployment healthcare benefits and prescription drug plan
ViTech Systems Group, Inc.	5,168,750	Pension administration system services
The Segal Company	3,095,874	Actuarial services and consulting for HOP and prescription drug plan
Unisys Corporation	1,436,523	Server maintenance
Healthways, Inc.	807,462	Administration of the Silver Sneakers Fitness Program
OST, Inc.	502,341	Information technology training, testing and consulting services
BluePeak Advisors LLC	451,850	Pharmacy benefit consulting services
Conduent HR Services	284,320	Pension benefit actuarial services
Independent Pharmaceutical Consultants, Inc.	243,028	Pharmacy benefit consulting services



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