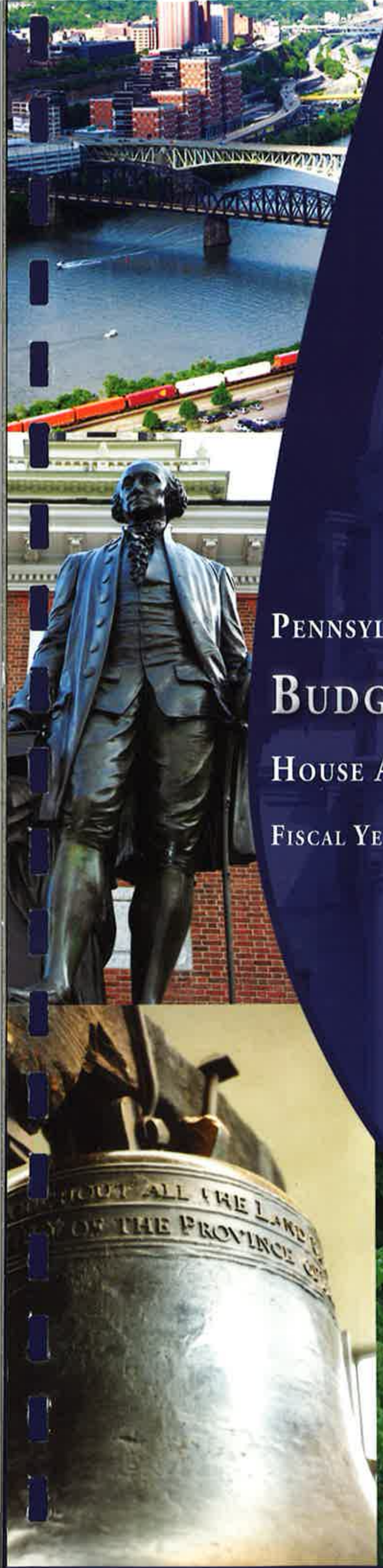
A Component Unit of the Commonwealth of Pennsylvania



Pennsylvania Public School Employees' Retirement System

Budget Report

House Appropriations Committee

Fiscal Year 2017-2018

COMMONWEALTH OF PENNSYLVANIA

PUBLIC SCHOOL EMPLOYEES' RETIREMENT BOARD

MELVA S. VOGLER
Chairman

February 22, 2017

Members of the House Appropriations Committee

Dear Members:

On behalf of the Public School Employees' Retirement System (PSERS), I am pleased to present the accompanying document on the financial, actuarial, and investment operations of PSERS and the budgetary recommendations for the 2017/18 fiscal year. Copies of this document and PSERS' Comprehensive Annual Financial Report for the fiscal year ended June 30, 2016 (FY2016) are available for download from PSERS' website at www.psers.state.pa.us. Hard copies and CDs are also available upon request.

This document includes "PSERS on Point – Budget Report Highlights", which appears at the beginning of the document, and summarizes key points from PSERS detailed budget report, which follows. Copies of this document are available on PSERS' website.

In closing, PSERS looks forward to working with you during the current legislative session. Please contact PSERS Executive Office, if you have any questions or would like additional information.

Respectfully,

Melva S. Vogler

Melva S. Vogler
Chairman of the Board

A Component Unit of the Commonwealth of Pennsylvania

PSERS on Point

Pennsylvania Public School Employees' Retirement System

Budget Report Highlights

Fiscal Year 2017-2018

February 22, 2017

PSERS Board of Trustees Chairman
Melva S. Vogler

PSERS Executive Director
Glen R. Grell

Table of Contents and Summary of Key Points

Overview

PSERS was established on July 18, 1917, to provide retirement benefits to public school employees of the Commonwealth of Pennsylvania. PSERS' preliminary total plan net assets as of December 31, 2016 were approximately $51.5 billion.

PSERS has paid out retirement benefits uninterrupted for nearly 100 years--through two World Wars, the Great Depression, and the Great Recession. Today, PSERS provides a secure retirement to over half a million current and retired public school employees.

PSERS Snapshot

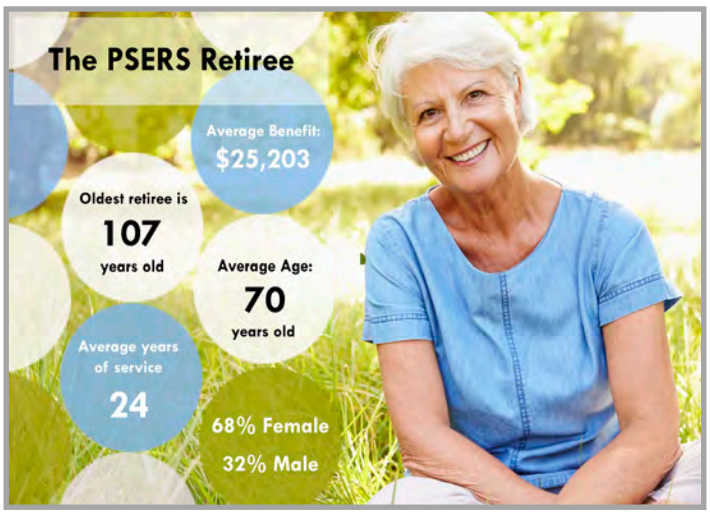
- **20th Largest State-Sponsored Defined Benefit Public Pension Plan**
- **225,000 Retired Members**
- **257,000 Active Members**
- **23,000 Terminated Vested Members**
- **781 School Employers**
- **322 PSERS Staff**

The plan is funded through three sources:

- Employer contributions
- Member contributions*
- Investment earnings

**In 2010, pension reform legislation (Act 120) was passed that put in place "shared investment risk," a unique defined contribution element for new PSERS members. Under Act 120, a new member's contribution rate could increase or decrease by 0.5% every three years based on investment performance.*

Most members contribute between 7.50% and 10.30% of their pay depending on their class of membership to help fund their own retirement benefit.



PSERS also administers two postemployment healthcare programs, the Premium Assistance Program and the Health Options Program (HOP) for its annuitants.

- PSERS sponsors a group health insurance program called HOP for individuals who are annuitants or survivor annuitants or the spouse or dependents of an annuitant or survivor annuitant. The HOP is funded solely by and for eligible participants. As of December 1, 2016, there are 107,689 HOP participants.
- PSERS provides up to $100 per month in Premium Assistance to eligible retirees to help cover the cost of their health insurance. As of December 1, 2016, Premium Assistance is offered to 90,180 members.

PSERS Increases Efficiency of Customer Service Operations

- **Ongoing Pension Administration System Upgrade** --Through 2016, PSERS continued its multi-year effort to upgrade its entire pension administration system. This technology upgrade helps ensure the viability of PSERS' pension administration system into the future, and it will make future enhancements much easier to implement. Enhancements will provide opportunities for members and employers to conduct transactions for themselves that would have previously required staff intervention. These changes will not only directly increase customer service opportunities, but will also generate financial savings while potentially enabling PSERS to redeploy staff to other critical needs as workloads shift.

- **Account Verification Program Expanded** --PSERS expanded its program of reviewing active member accounts at periodic milestones during the member's career to ensure each detail of a member's account is accurately portrayed prior to the member applying for retirement. Nearly 24,000 accounts were reviewed in FY 2015-16.

- **Comprehensive Studies Conducted**--PSERS engaged a third party consultant to conduct comprehensive studies of PSERS' disability benefit process, call center operations, and communications structure and efforts. The multiple studies are expected to result in many positive changes for enhanced customer service and operational efficiencies.

Calendar Year 2016 Customer Service Highlights

Answered **183,000** Member Calls

Responded to **13,800** Member Emails

Served **6,800** Members in Counseling Sessions

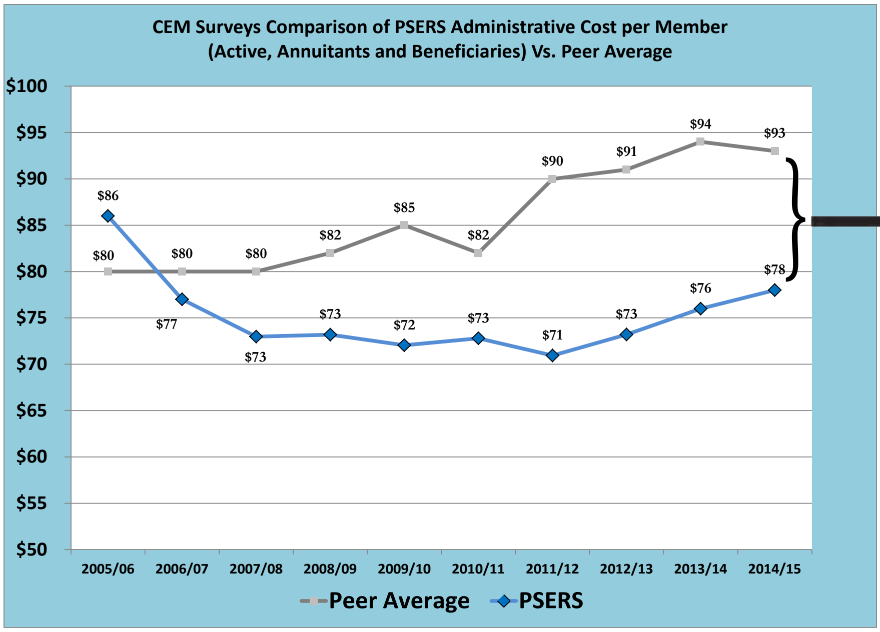
Issued **2.6 Million** Monthly Benefit Payments to Members

Processed **11,300** Retirement Applications

Prepared & Issued **253,000** 1099-R's

PSERS Administrative Costs are Significantly Below Peers

PSERS participates in an independent, international benchmarking survey evaluating its costs and service performance in comparison to other similar public pension funds. PSERS has 29% fewer full-time equivalent staff per member than the peer group average. By running a lean and efficient operation PSERS saves the Commonwealth and school employers approximately $7.3 million annually in administrative expenses compared to its peers.



PSERS Saves $7.3 Million Annually

PSERS had a 16% lower pension administration cost per member than the average cost of its peer group.

PSERS Budget Summary

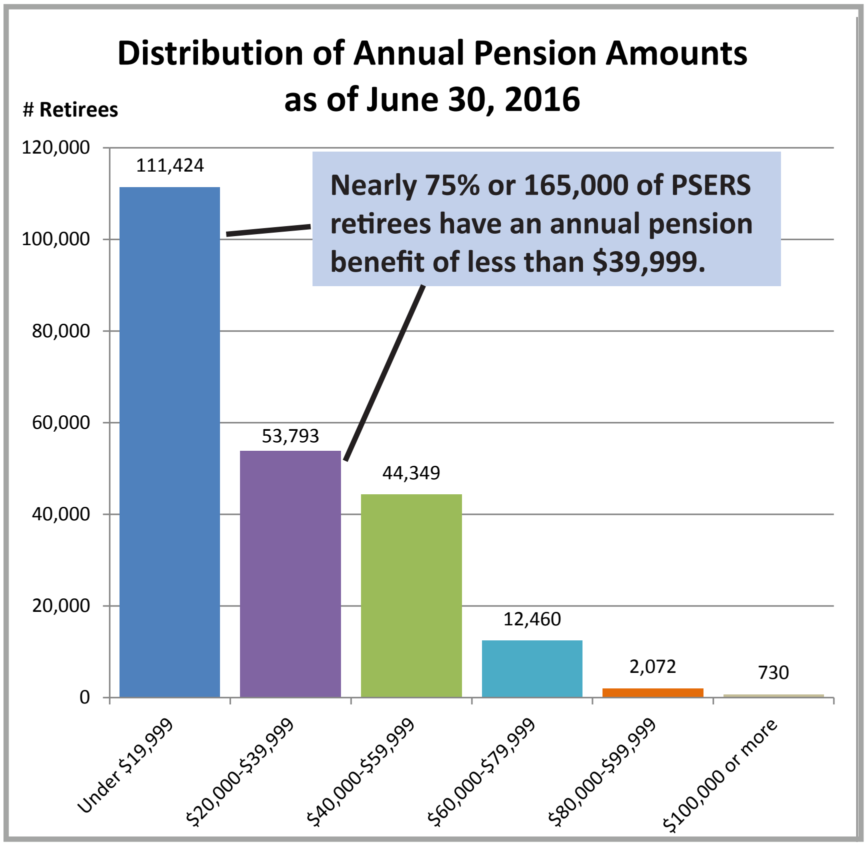
PSERS continues to be prudent in its use of funds and managing its annual budget. The administrative budget is not funded from the Commonwealth's General Fund, rather from the earnings of the Fund itself. PSERS' FY 2017-18 budget submission contains an Administrative budget request of $45,841,000. PSERS also manages non-appropriated funds that cover expenses for Directed Commissions, Health Insurance Account, Health Options Program, and Investment Related Expenses. PSERS' FY2017-18 budgets, including non-appropriated funds, total $71,992,000.

Appropriation	*PSERS' Budget Submission (000s)*
Administrative	$ 45,841
Directed Commissions	2,000
Health Insurance Account	2,411
Health Options Program	781
Investment-Related	20,959
Total	**$ 71,992**

PSERS Provides Significant Resources and Technical Assistance for Pension Policy Proposals

Throughout 2016, PSERS staff worked cooperatively with and was actively engaged in providing actuarial data, legislative analyses and related technical information to members of the General Assembly and Executive Branch Officials on a range of pension policy proposals while remaining policy neutral on plan design elements. PSERS incurred over $320,000 in costs for outside actuarial services from PSERS' actuary solely for numerous legislative pension policy proposals during 2016. PSERS staff also spent hundreds of hours drafting legislation and providing cost data for multiple variations of pension policy proposals. The cost work performed internally by PSERS staff saved over $100,000 in outside actuarial fees in 2016.

PSERS Members Help Fund Their Own Retirement Benefit



The average PSERS retiree receives a modest pension of $25,203 on an annual basis, a benefit earned through a lengthy career of 24 years in public education. During their career, members made mandatory contributions to PSERS to help fund their own retirement benefit. Most members contribute between 7.50% and 10.30% of their pay depending on their class of membership to help fund their own retirement benefit. This is in contrast to many non-public (private) pension plans to which members of over 90% of such plans do not contribute. For these plans, the employers bear 100% of the cost of the benefit.*

PSERS' member contribution rate is one of the highest among U.S. public pension plans that participate in Social Security.**

Six-figure pensions are rare. In FY 2015-16 there were approximately 730 retired members receiving an annual benefit over $100,000 out of a total 225,000 PSERS retirees. These six-figure pension retirees spent an average of 38 years working in their public education careers and contributing to their benefit.

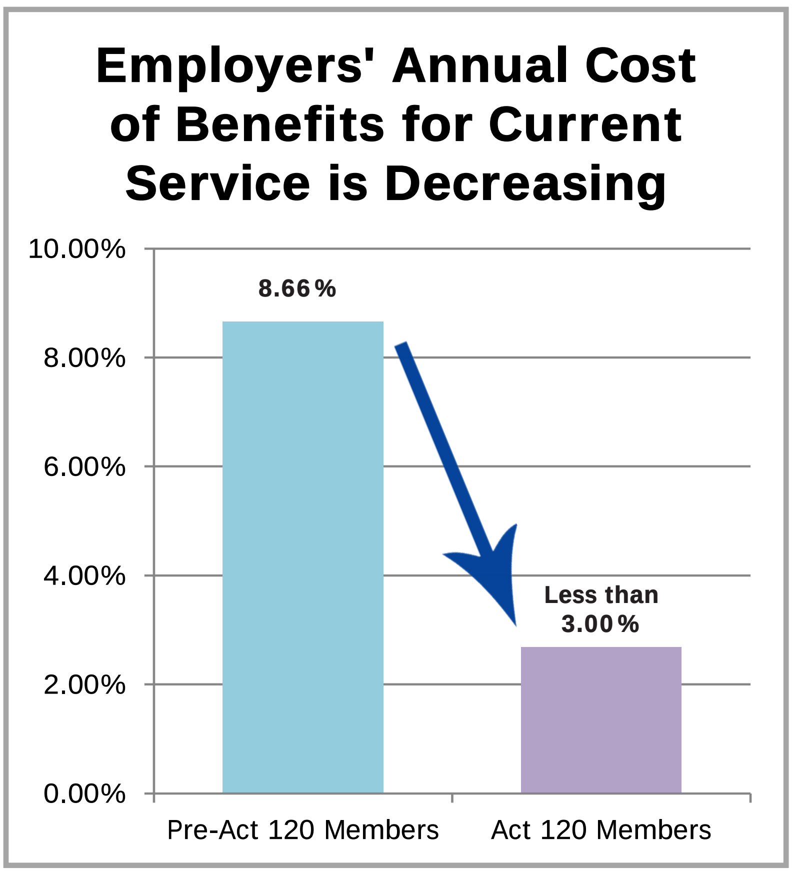
* Based on a query of private plan IRS Form 5500 filings

** According to recent National Association of State Retirement Administrators (NASRA) data, PSERS member contribution rate is the 12th highest member contribution rate among 84 large U.S. public pension plans that participate in Social Security.

Cost of Current Benefits Earned by Members Continues to Decline

The cost structure of PSERS' new members under Act 120 of 2010 is low and the shared risk provisions shift a portion of the investment risk to new members giving PSERS a defined contribution element. Essentially, Act 120 provides the members with a defined benefit plan, which is both adequate and secure, and provides the employers with a low cost employee pension benefit funded in large part by the members who have also assumed some of the investment risk.

The employer normal cost decreases over time as Act 120 members replace retiring pre-Act 120 members. The employer normal cost (cost of current benefits being earned) of Act 120 members is less than 3% of payroll which is over 65% less than the normal cost for pre-Act 120 members. This represents a significant benefit cost reduction for the employers. As of December 31, 2016 there are over 60,000 Act 120 members and growing.



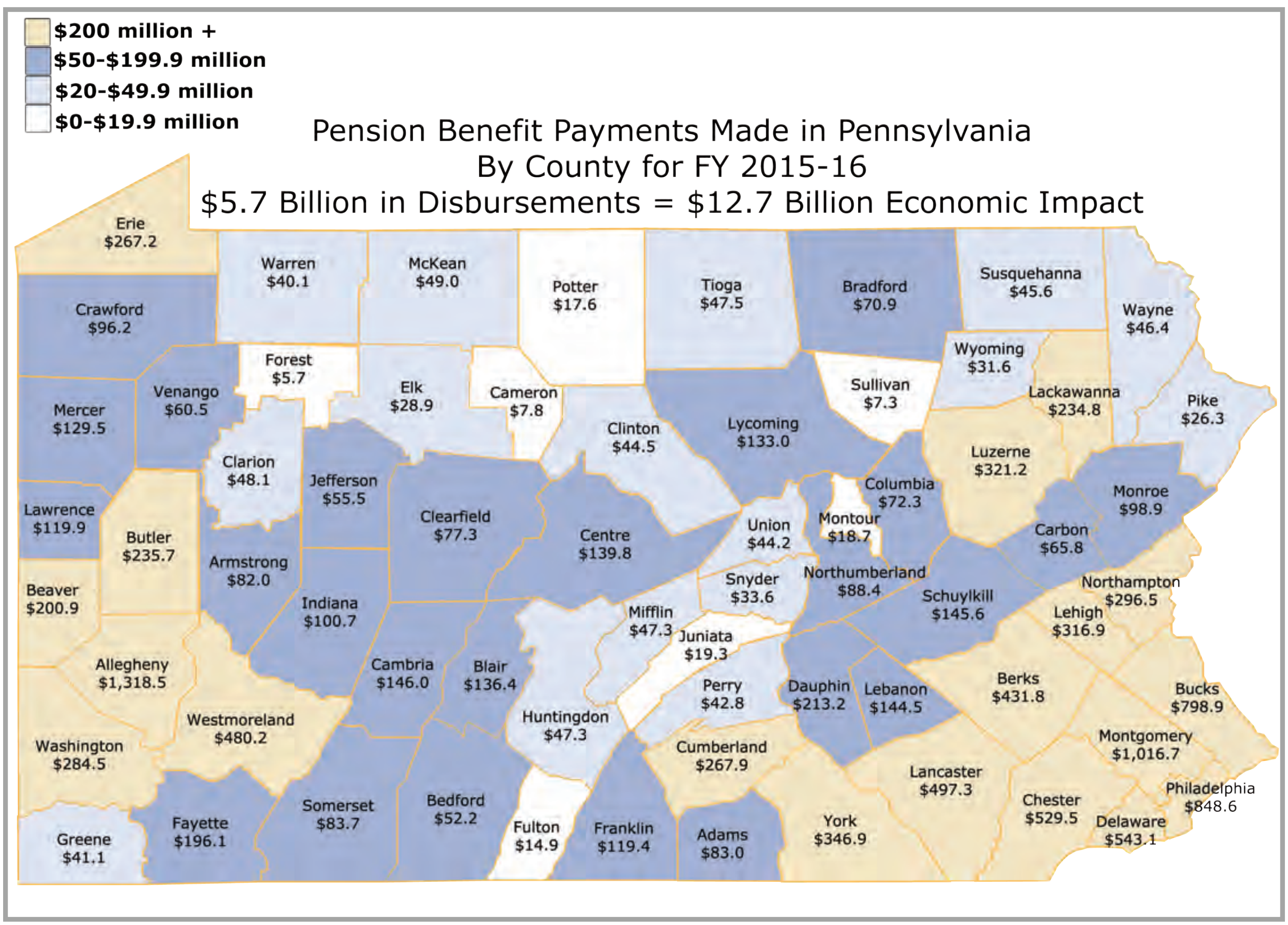
The cost of current benefits being earned by Act 120 members is less than 3% which is less than 65% of the cost of pre-Act 120 members.

Economic Impact to Pennsylvania: $12.7 Billion

In FY 2015-16, PSERS pension disbursements to retirees totaled approximately $6.3 billion. Of this amount, approximately 90%, or $5.7 billion, went directly into Pennsylvania and local economies.

According to a study by the National Institute on Retirement Security (NIRS) this spending expands through the economy as the retiree's spending becomes another's income, multiplying the effect of the $5.7 billion into an economic impact of $12.7 billion throughout the Commonwealth. Estimates show that the impact of money from PSERS in Pennsylvania includes $1.5 billion in federal, state and local tax revenues.

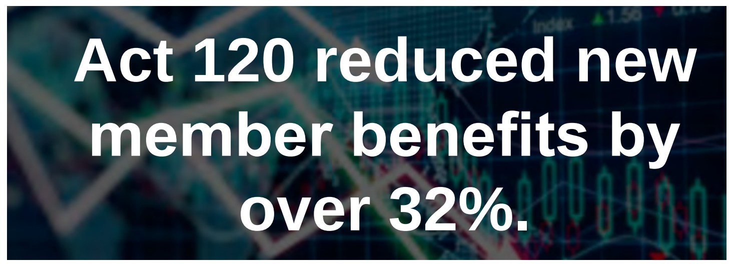
Impact of Benefits



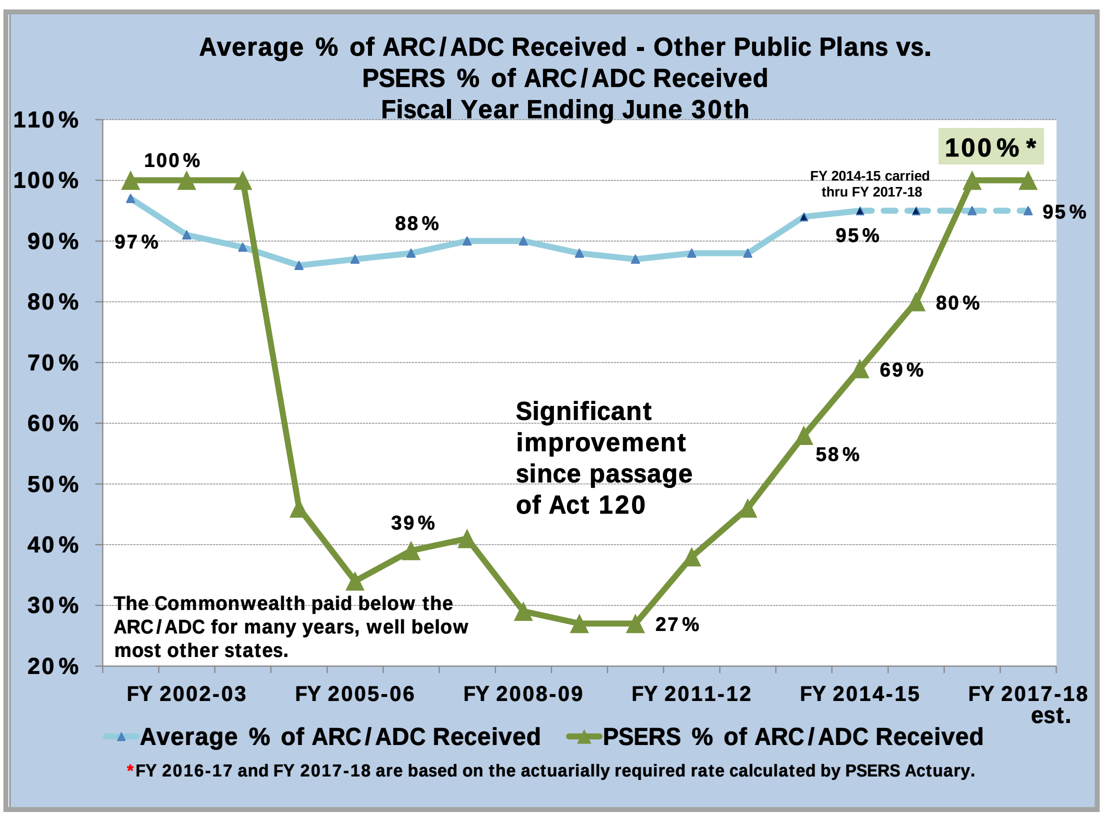
Progress Made Under Act 120

- Dramatic progress has been made toward addressing the annual funding shortfall. Thanks to the General Assembly's enactment of Act 120 pension reform, employer contributions steadily increased in defined increments and for the first time in 15 years, the employer contribution rate (ECR) for the fiscal year that began July 1, 2016, provided 100% of the actuarially required rate based on sound actuarial practices and principles. This progress to bring PSERS slowly back to full funded status has been noted by various bond rating agencies.

"Moody's Investors Service has revised the Commonwealth of Pennsylvania's outlook to stable from negative…Further, the Commonwealth is on a solid (though slow) path toward full funding of its pension plans. Favorably, the most difficult phase of pension contribution ramp-ups is now in the rearview mirror, and the magnitude of annual pension contribution increases will be more manageable in the coming years." ***--Moody's August 2016***



- While employer contributions will remain high for many years to pay down the past pension debt already incurred, as a result of the increased employer funding, in less than two years, PSERS' funded ratio is projected to slowly improve. PSERS is now on a path to full funding.
- In addition to reducing new member benefits by over 32%, Act 120 put in place "Shared Investment Risk", which transfers some investment risk to PSERS members. A post-Act 120 member's contribution rate will increase or decrease within a specified range every three years based on PSERS' investment performance, giving PSERS a defined contribution element.
- As noted on page 5, Act 120 also reduced the employers' cost of current benefits being earned.

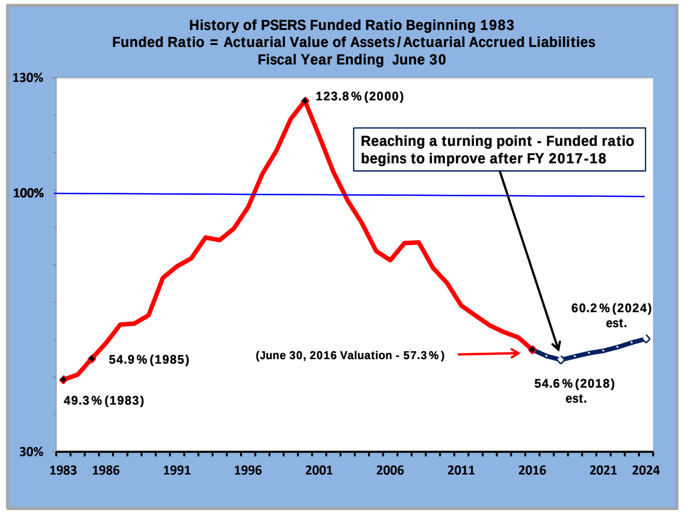


Reaching a Turning Point

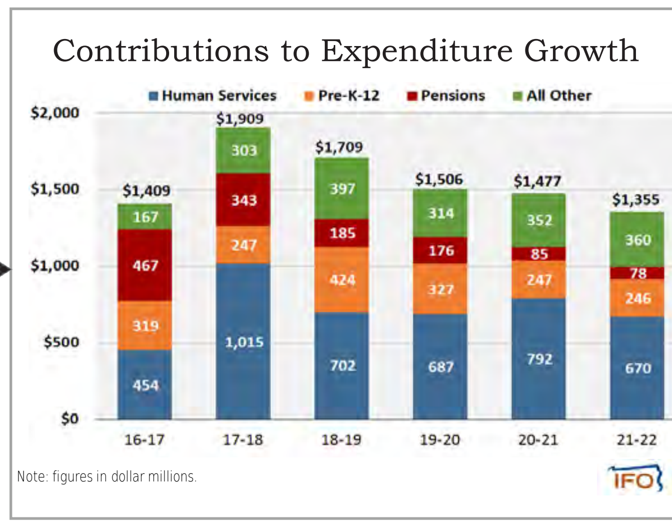
An independent review of PSERS' assets and liabilities is performed annually. As part of this review, the progress toward funding PSERS' pension obligations is measured. This measurement is referred to as the funded ratio or funded status. PSERS is 57.3% funded with an unfunded liability of $42.7 billion as of June 30, 2016.

The decrease in the funded status since 2000 is the result of several factors including: the unfavorable investment markets from FY 2000-01 to FY 2002-03 and FY 2007-08 to FY 2008-09; funding changes enacted in Act 38 of 2002 and Act 40 of 2003 which resulted in employers underfunding PSERS; benefit enhancements from Act 9 and Act 38; the adoption of new demographic and economics assumptions in FY 2015-16; funding collars in Act 120 which continued the employer underfunding of the system; and, actuarial liability losses.

As a result of legislated contribution increases under Act 120, PSERS is reaching a turning point. In FY 2017-18 PSERS' funded ratio is projected to slowly improve after declining for many years.

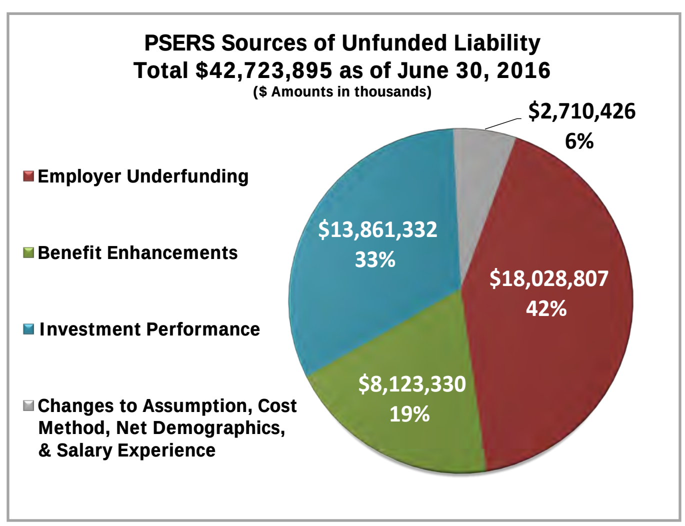


The Pennsylvania Independent Fiscal Office (IFO) has recognized the Commonwealth's progress on its pension funding issues. The IFO noted in its November 15, 2016 presentation that "Pension contribution growth decelerates dramatically after FY 2017-18." Also as shown, after FY 2017-18 pensions are no longer a major cost driver of Commonwealth expenditure growth.



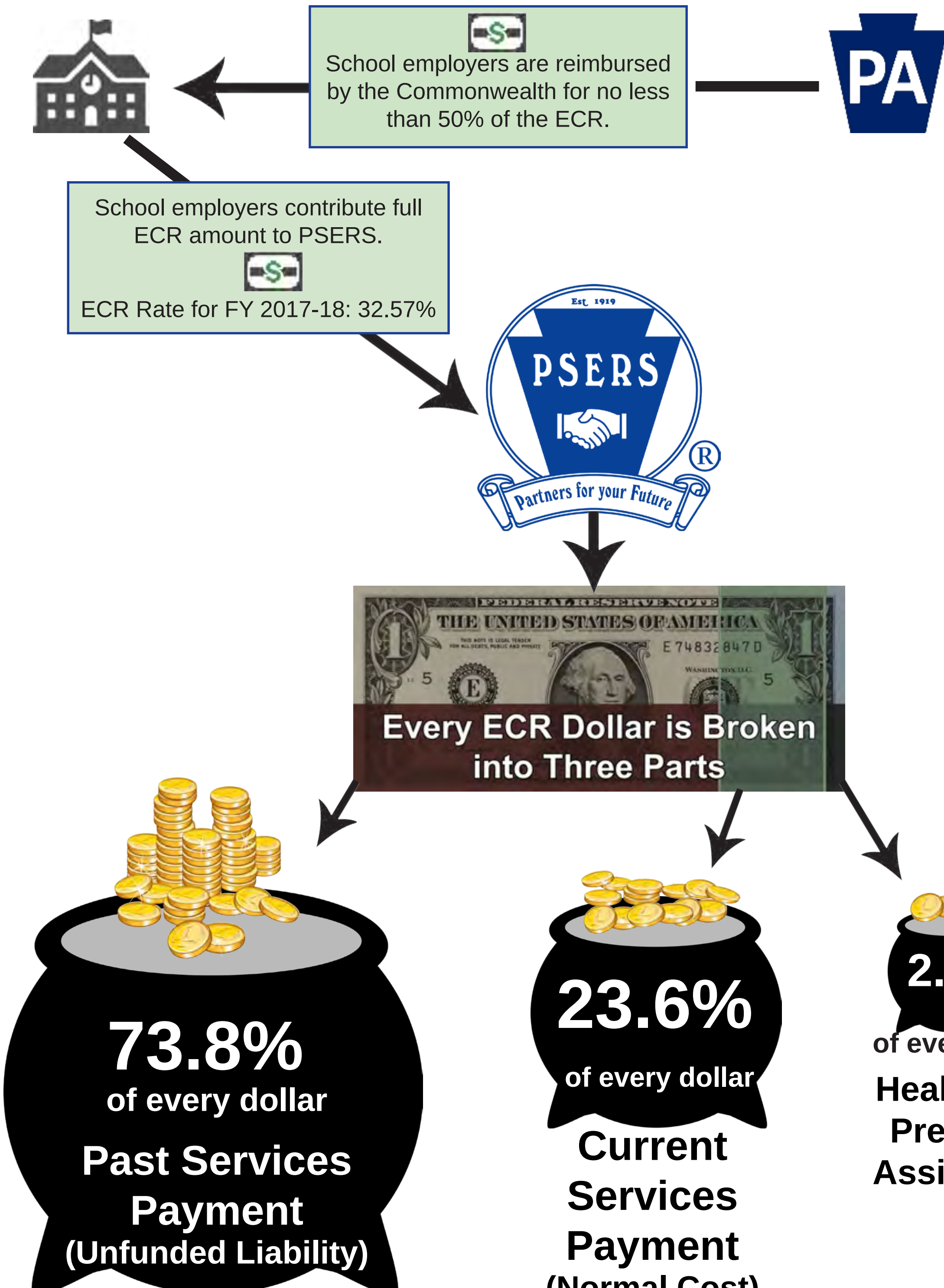
Sources of Unfunded Liability

- Underfunding by the Commonwealth and school employers is the largest source (42%) of the unfunded liability.
- The portion of the liability resulting from investment performance was significantly impacted by the Great Recession of 2008-2009.
- Benefit enhancements includes the impact of Act 9 of 2001, cost of living increases, and early retirement incentives.

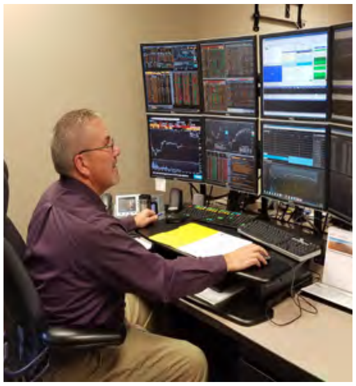


Payment for Debt from Past Service is Nearly 75% of the Employer Contribution Rate (ECR)

The graphic below displays the components of PSERS' projected employer contribution rate in FY 2017-18. The majority of the rate, approximately 75%, is for payment of the debt from past service (unfunded liability), and is not due to the payment of the current cost of benefits (employer normal cost) being earned by active members.



Prudently Managing Investment Fees and Expenses

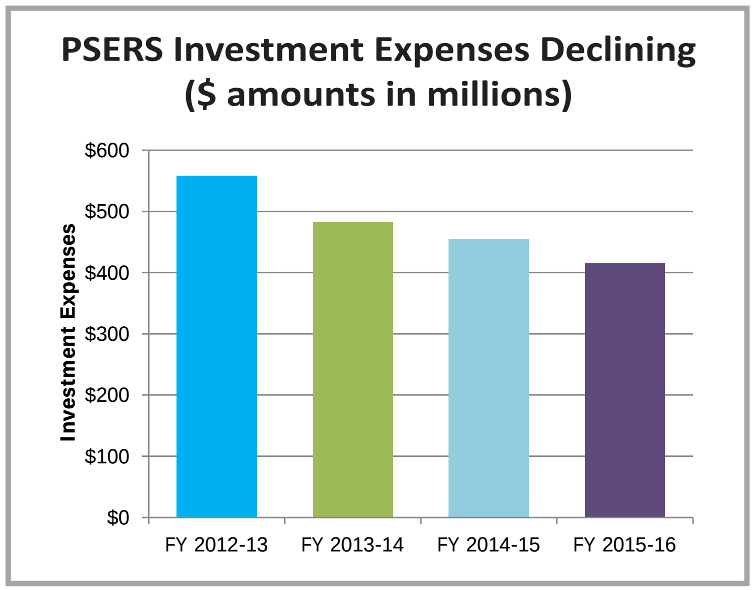


PSERS uses both internal staff and external investment managers to invest its assets. As of June 30, 2016, PSERS employed 34 internal investment staff with a variety of professional credentials including: Chartered Financial Analyst Charterholders, Certified Public Accountants, Masters of Business Administration, Chartered Alternative Investment Analyst, and a Professional Risk Manager.

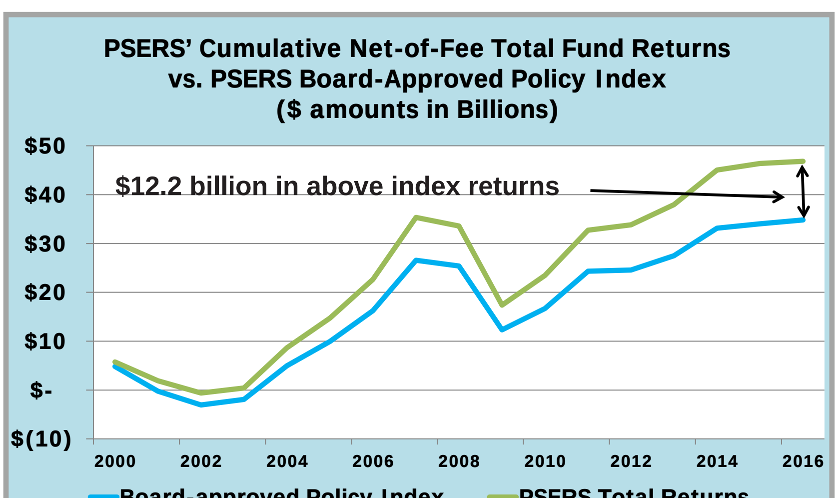
During FY 2016 PSERS increased the amount of asset exposure managed internally from $16.8 billion, or 30% of PSERS' exposures, to $19.3 billion, or 35% of the System's exposures. Asset classes such as U.S. equities and infrastructure are entirely managed in-house by PSERS investment staff. Other asset classes such as non U.S. equities, private markets, commodities, real estate, risk parity and master limited partnerships are partly managed in-house by PSERS investment staff.

By bringing more assets in-house, PSERS generates investment management fee savings. When assets are assigned to PSERS' staff, the total costs (e.g., staff salary and benefits, computers and office supplies) are much lower than the largest "very low fee" index mutual fund companies, giving PSERS a significant advantage.

For the third year in a row, PSERS' investment manager fees have declined. PSERS' investment expenses decreased by over $142 million, from $558 million in FY 2012-13 to $416 million in FY 2015-16, which is a reduction of over 25%.



Active Management Has Been Very Successful



Due to PSERS' use of active management, PSERS earned $12.2 billion in excess investment return above the Board-approved passive policy index.

Long-Term Investment Performance Consistently Outperforms

PSERS is a long-term investor and manages the Fund with long-term objectives (i.e., 25 to 30 years) in mind. The System has built a diversified allocation that positions the Fund to earn its return assumption of 7.25% over the long-term although annual fluctuations will occur. PSERS believes the best way to achieve its long-term objectives is to maintain a very diversified portfolio which includes all asset classes available to it, such as equities, fixed income, real assets, risk parity and absolute return.

In the short-term, PSERS expects to go through periods of time when the Fund may not earn its return assumption. This past fiscal year was a challenging return environment for most investors as evidenced by PSERS' one-year investment return.

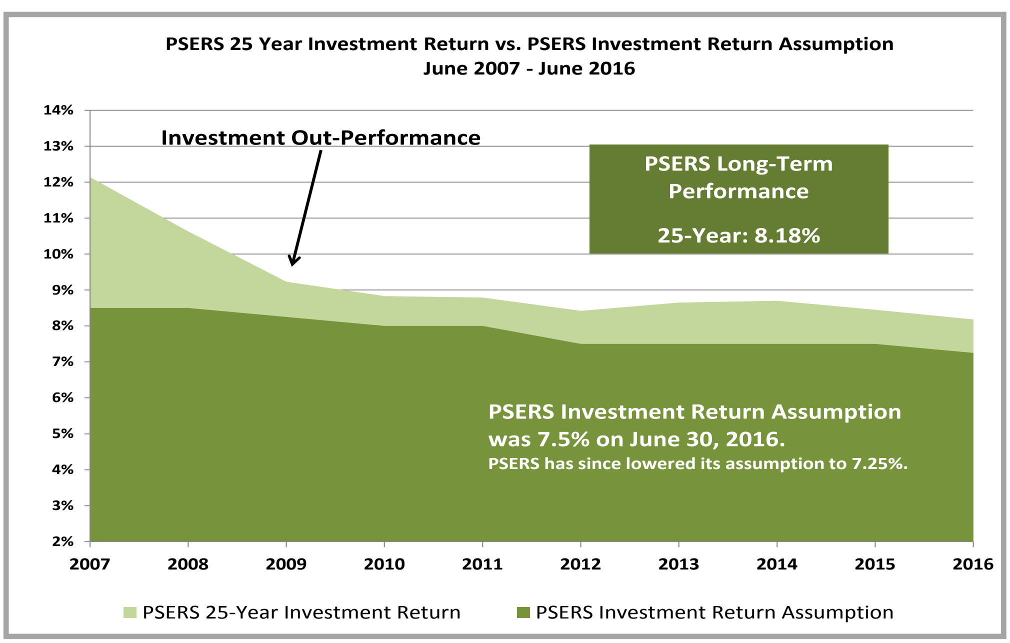
For the period ended June 30, 2016, PSERS posted returns of:

- One-year: 1.29%, added $474 million in net investment income
- Five-year: 6.01%, added $14.1 billion in net investment income
- 10-year: 4.94%, added $24.2 billion in net investment income
- Since Great Recession: 9.16%, added $29.5 billion in net investment income

Note: Since June 2016, investment markets have improved. For the one-year period ended December 31, 2016, PSERS earned a preliminary, net of fee return of 10.75% and added $4.9 billion in net investment income.

In any given year, PSERS expects some assets to perform well, such as U.S. long-term treasuries, real estate, and gold did this past fiscal year, and some to not do as well, such as commodities. Over the long run, however, the System expects each of its asset classes to generate a positive return commensurate with the risks taken.

Long-term returns remain above PSERS' return assumption. PSERS posted positive returns of 8.18% for the 25-year and 8.32% for the 30-year period ended June 30, 2016. PSERS' focus remains on maintaining a well-diversified asset allocation that can withstand the volatility in the markets, provide enough liquidity to meet cash flow obligations (primarily monthly benefit payments), and meet PSERS' earnings assumption over the long-term which the Fund has consistently done.



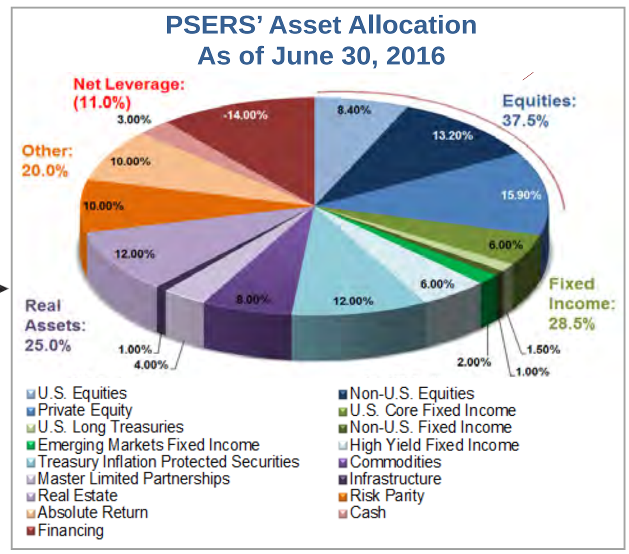
PSERS Maintains a Prudently Diversified Asset Allocation

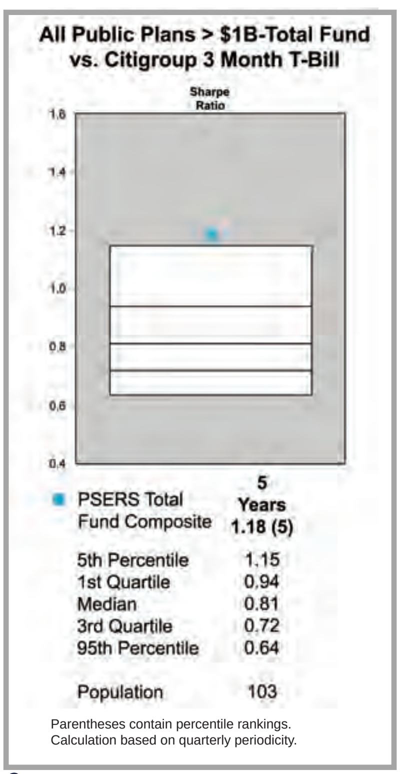
PSERS Board reviews and approves the long-term asset allocation annually taking the following factors into consideration:

• Investment time horizon	• Cash flow
• Demographics	• Funded status
• Actuarial assumptions	• The Board's willingness to take risk
• Employers' financial strength	

PSERS Board is heavily focused on PSERS risk profile, including liquidity risk. While there are other allocations which could achieve our long-term return objective of 7.25%, PSERS is focused on achieving that return with as little risk as possible. Excess risk taking by being overly concentrated in one asset class or similar asset classes can have damaging effects on a fund with large cash outflows such as PSERS. Over the past 15 years, PSERS paid out $42.7 billion more in benefits than it has received in member and employer contributions (negative cash flow). During this period, annual negative cash flow has ranged from $2.1 billion to $3.7 billion, or between 4.2% and 8.2% of net assets. While negative cash flow has improved significantly since the implementation of Act 120, negative cash flows are expected to continue into the foreseeable future. This negative cash flow continues to necessitate a larger liquidity position and a lower risk profile than a pension plan with a better cash flow profile.

PSERS' Asset Allocation is well-diversified into numerous asset classes.





For the 5 year period ended June 30, 2016, PSERS ranked in the top decile (higher risk-adjusted returns) for the Sharpe Ratio* as calculated by PSERS general investment consultant, Aon Hewitt.

**The Sharpe Ratio is a measurement that is used to calculate the risk-adjusted return of an investment. A higher Sharpe Ratio is more positive and means that an investor is earning more return per unit of investment risk they are taking.*

PSERS Maintains a High Level of Financial and Actuarial Governance

Actuarial Governance - Five Year Experience Study Results

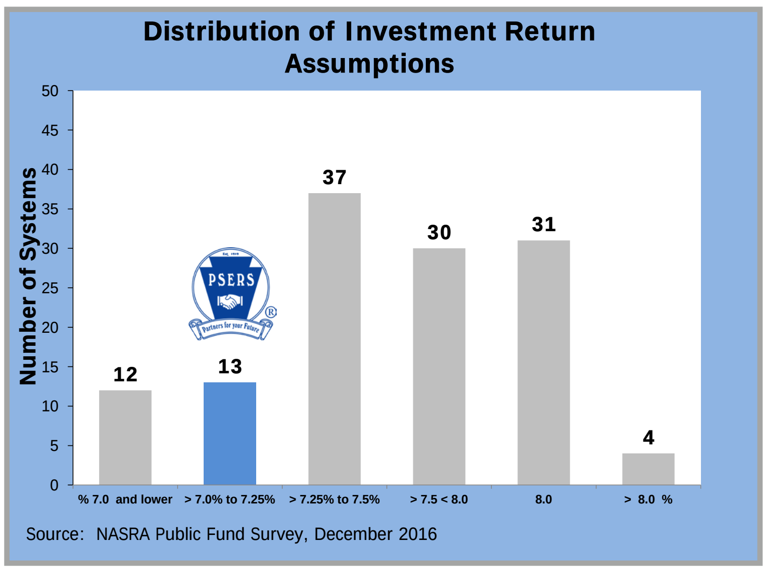
According to the Retirement Code, every five years PSERS Board reviews the results of an experience study prepared by PSERS' actuary. The experience study includes an in-depth look at the mortality, service and compensation experience and compares the results to PSERS' assumptions. The Board reviews the actuary's recommendations and may adopt and change PSERS' demographic and economic assumptions as necessary. Reviewing assumptions is an important task for PSERS' Board. An assumption that is significantly wrong in either direction could have an unfair cost distribution on generations of taxpayers and school employers.

The revised demographic assumptions include new mortality, retirement, and withdrawal assumptions and updated option factors to match the new mortality tables. The Board approved the following assumptions:

- Reducing the salary growth from 5.50% to 5.00%;
- Reducing inflation from 3.00% to 2.75%;
- Reducing the investment rate of return from 7.50% to 7.25% and,
- New mortality, retirement, and withdrawal factors.

PSERS reduced its return assumption to 7.25% in June 2016.

A 7.25% return assumption places PSERS among the most conservative funds in the public pension universe.

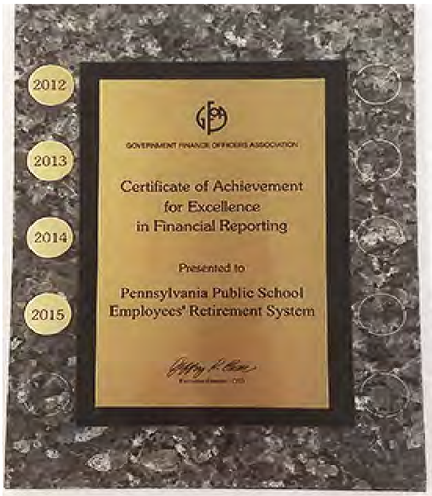


Source: NASRA Public Fund Survey, December 2016

Financial Governance and Disclosure

PSERS is considered a component unit of the Commonwealth of Pennsylvania as defined by the Governmental Accounting Standards Board. An annual audit of the System by an independent certified public accounting firm is required by the Retirement Code. PSERS has received an unmodified opinion as evidenced in the Report of Independent Public Accountants in the Financial Section of the Comprehensive Annual Financial Report which is available on PSERS' website www.psers.state.pa.us. An unmodified opinion means that PSERS' financial statements fairly present, in all material respects, its financial condition. In addition, no significant findings were noted during the audit and therefore, a management letter was not issued. This is the seventh consecutive year that a management letter was not issued and is reflective of the hard work and dedication of PSERS' staff to continue to improve the internal controls, operations, and efficiency of the System.

Awards Received During the Past Fiscal Year



Government Finance Officers Association of the United States and Canada Certificate of Achievement for Excellence in Financial Reporting: The Certificate of Achievement awarded by the GFOA is a prestigious national award recognizing conformance with the highest standards for preparation of state and local government financial reports. PSERS has received a Certificate of Achievement for 33 consecutive years.

Public Pension Coordinating Council Public Pension Standards Award: This award is in recognition of meeting professional standards for plan design and administration as set forth in the Public Pension Standards.

Institutional Investor Asset Management Industry Award: This award is in recognition of the most outstanding and innovative Corporate and Public Plan sponsors and Endowments and Foundations in North America.

PSERS Board of Trustees as of February 2017

Melva S. Vogler, Board Chairman

Deborah J. Beck

James R. Biery

Honorable Stephen Bloom
House of Representatives

Honorable Patrick M. Browne
Senate of Pennsylvania

James M. Davis

Virginia M. Lastner

Susan C. Lemmo

Nathan G. Mains

Honorable Joseph F. Markosek
House of Representatives

Pedro A. Rivera
Secretary of Education

Christopher SantaMaria

Ambassador Martin J. Silverstein

Honorable Joseph M. Torsella
Treasurer of Pennsylvania

Appointment Pending
Senate of Pennsylvania

This document and PSERS Budget Report are available on the "Publications" page on PSERS' website at *www.psers.state.pa.us*.

Contact PSERS

Toll-Free:1.888.773.7748
Local Phone: 717.787.8540
Email Address: ContactPSERS@pa.gov
Website: *www.psers.state.pa.us*

5 North 5th Street | Harrisburg, PA 17101-1905

Pennsylvania
Public School Employees' Retirement System

(A Component Unit of the Commonwealth of Pennsylvania)

5 North 5th Street
Harrisburg, Pennsylvania 17101-1905

Fiscal Year 2017-18 Budget Report
House Appropriations Committee
February 22, 2017

Melva S. Vogler
Chairman
Board of Trustees

Glen R. Grell
Executive Director

Report prepared by the Public School Employees' Retirement System
Office of Financial Management and Investment Office staff

FY 2017-18 Budget Hearing Materials
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SECTION 1 - PSERS OVERVIEW

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Overview

Established on July 18, 1917, with operations commencing in 1919, the Pennsylvania Public School Employees' Retirement System (PSERS, System, or Fund) provides retirement benefits to public school employees of the Commonwealth of Pennsylvania.

As of June 30, 2016, the System had approximately 257,000 active members. The annuitant membership was comprised of approximately 225,000 retirees and beneficiaries who received average monthly pension benefit payments of over $476 million including healthcare premium assistance. The average yearly pension benefit paid to annuitants was $25,203. PSERS had 781 participating employers on June 30, 2016.

As reported in the latest *Pension and Investments* survey, published February 6, 2017, PSERS is the 32nd largest plan among United States corporate and public pension plans, and the 20th largest state-sponsored defined benefit public pension fund in the nation. PSERS' preliminary total plan net assets as of December 31, 2016 were approximately $51.5 billion. PSERS' preliminary investment rate of return for the calendar year ended December 31, 2016 is 10.75%, net of fees.

During fiscal year 2016, PSERS' pension disbursements to retirees totaled $6.3 billion. Of this amount 90%, or $5.7 billion, was distributed to Pennsylvania residents representing PSERS' significant impact on the Commonwealth's economy.

PSERS also administers two postemployment healthcare programs, the Premium Assistance Program and the Health Options Program (HOP) for its annuitants.

Mission Statement

The Board of Trustees and the employees of the Public School Employees' Retirement System serve the members and stakeholders of the System by:

- Providing timely and accurate payment of benefits,
- Maintaining a financially sound System,
- Prudently investing the assets of the System,
- Clearly communicating members' and employers' rights and responsibilities, and
- Effectively managing the resources of the System.

PSERS Board of Trustees

as of February 1, 2017

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Virginia N. Lastner

Susan C. Lemmo

Nathan G. Mains

Honorable Joseph F. Markosek
House of Representatives

Pedro A. Rivera
Secretary of Education

Christopher SantaMaria

Ambassador Martin J. Silverstein

Honorable Joseph M. Torsella
Treasurer of Pennsylvania

Appointment Pending
Senate of Pennsylvania

Organizational Structure of the Public School Employees' Retirement System

Executive Office

This office is responsible for the overall management of the Public School Employees' Retirement System (PSERS) to achieve the primary objectives of the Fund as established by the Board of Trustees (Board). Reporting directly to the Executive Director are the Deputy Executive Director, Assistant Executive Director, Chief Investment Officer, Chief Financial Officer, Internal Auditor, Press Secretary, Board Liaison, Legislative Liaison, and Executive Secretary. The Executive Director serves as chief executive officer responsible for the establishment, installation, and maintenance of modern management techniques to provide an efficient control of funds for and services to the active members and annuitants of the System.

The Executive Office monitors the operation of the investment portfolio and evaluates portfolio performance for consideration by the Board, certifies expenditures of the Fund and measures performance of professional individuals or firms with whom the Board contracts for specialized services. The Executive Office also apprises the Board of any development that will affect the System and its operation.

Investment Office

This office is responsible for all investment activities of the System. In compliance with the investment policies established by the Board, PSERS' investment assets are allocated to numerous outside professional investment advisors and internal investment professionals.

Chief Counsel's Office

This office provides legal services through a team of professional personnel under the Governor's Office of General Counsel. The legal staff is responsible for representing the System in all administrative hearings and other litigation matters and providing counsel in a wide variety of matters including the interpretation of the Retirement Code, form and legality of all System contracts, corporate governance issues and the structure and implementation of the System's varied financial investments.

Internal Auditor's Office

This office performs systematic reviews of the various activities of PSERS, testing for compliance with applicable laws, policies and procedures. The Internal Auditor makes recommendations on the improvement of the System's internal control system.

Office of Financial Management

This office is directed by the Chief Financial Officer and has responsibility for planning, organizing and directing a complete accounting and financial reporting system in conformance with generally accepted accounting principles. Oversight is provided for new systems development and maintenance of existing systems, and ensuring appropriate accounting controls. The office is the liaison for other state and federal agencies, reporting units, financial consultants, actuaries, and investment advisors for all accounting, treasury operations, taxation, actuarial and budgetary matters.

Deputy Executive Director

The Deputy Executive Director directly oversees the benefit programs for all active and retired members of the System, the development and implementation of the member and employer communications programs and the retirement counseling programs, and the maintenance of agency policies, procedures, and benefit related data. Additionally, this position oversees business and information technology strategic planning, policy development, and implementation.

Bureau of Benefits Administration

The Bureau of Benefits Administration maintains account data, determines membership and benefits eligibility, and calculates benefits for Pennsylvania public school employees. This bureau provides these functions for all benefits provided by PSERS, except the PSERS Health Options and Premium Assistance Programs.

Bureau of Communications and Counseling

The Bureau provides services to educate and inform annuitants, members, employers, staff and the public about the benefit related programs and services provided by PSERS, as well as the rights and duties of employers and members in relation to those benefits. Information communicated spans from very detailed and fact-specific explanations and instructions to more general explanations and educational materials.

Information Technology Office

This office oversees the Bureau of Information Technology and the Business Architecture Center. It is responsible for strategic information technology planning and policy development, ensuring that information technology plans, projects and policies are aligned with, in support of, and prioritized according to agency needs and requirements as well as those Commonwealth needs and requirements that are consistent with agency needs, and for communicating such to the agency's information technology staff. Large information technology contracts and projects are managed by this office. This office is also responsible for understanding, analyzing, documenting, and improving PSERS' processes, information systems, and the relationships among these components so that PSERS is able to: conduct its business

Organizational Structure (continued)

consistently and according to established rules; understand each component, its relationship to each of the other components and to PSERS' mission, vision, values and goals; fully, yet quickly analyze and understand the impact of potential change to one or more of these components on the others; more effectively identify inefficient, duplicate, or suspect processes, technologies; account for its processes, information systems and technologies.

Business Architecture Center

This center serves as the repository for PSERS' business knowledge and makes that knowledge available and understandable to agency processing and technology staff. The center receives and responds to data queries from agency staff and investigates system, data, or process problems. This center includes staff who collect, analyze, and document PSERS' processes, information systems and data, and perform detailed impact analysis as and when change is proposed. Additionally, staff in this unit coordinate, lead, and track projects and confirm that changes have been applied correctly. They look for opportunities for improvement, lead the development of business requirements, and serve as liaisons between PSERS' end-users and information technology staff. The Systems Support section provides key analytical services to the center and to other bureaus within the organization including specific services such as research, analysis, recommendations for action, and implementation support related to PSERS' information systems, data, or business or management processes.

Bureau of Information Technology

This bureau is responsible for planning, coordinating, administering, and implementing information technology resources in accordance with the agency's strategic plans, goals, objectives, and priorities as communicated by PSERS' Chief Information Officer, and for providing operational support for those technologies and initiatives.

Assistant Executive Director

This position reports to the Executive Director and may provide assistance to the Executive Director on agency-wide projects. The position administers the Health Options and Premium Assistance Programs in addition to the facilities, human resources, and procurement activities necessary to support, secure and optimize agency operations. Organizational units overseen by the Assistant Executive Director include the Bureau of Administration, the Human Resources Office, and the Health Insurance Office.

Bureau of Administration

This bureau provides facilities, purchasing and contracting, policies and procedures, business continuity, records management, automotive, mail, imaging, and other administrative services necessary to support agency functions.

Human Resources Office

This office is responsible for supporting management and staff to facilitate the accomplishment of the agency's mission. It administers all human resources programs and ensures compliance with labor laws and Commonwealth regulations. Programs include position classification, labor relations, recruitment and placement, employee benefits, employee compensation and pay, training and staff development, time and attendance, performance management, organizational development and support, employee transactions, Equal Employment Opportunities and other miscellaneous programs.

Health Insurance Office

This office is responsible for all aspects of the PSERS' Health Options Program (HOP) and administering the PSERS annuitant health insurance premium assistance benefits. HOP is a voluntary statewide plan that provides group health insurance coverage for school retirees, their spouses, and eligible dependents.

PSERS Regional Offices

There are eight PSERS Regional Offices strategically located throughout the Commonwealth. The offices provide services to both active and retired PSERS members and 781 employers. Among these services are regularly scheduled retirement counseling meetings and other informational presentations on various topics relating to retirement benefits and programs.

Chart 1.1

Organizational Chart of the Public School Employees' Retirement System

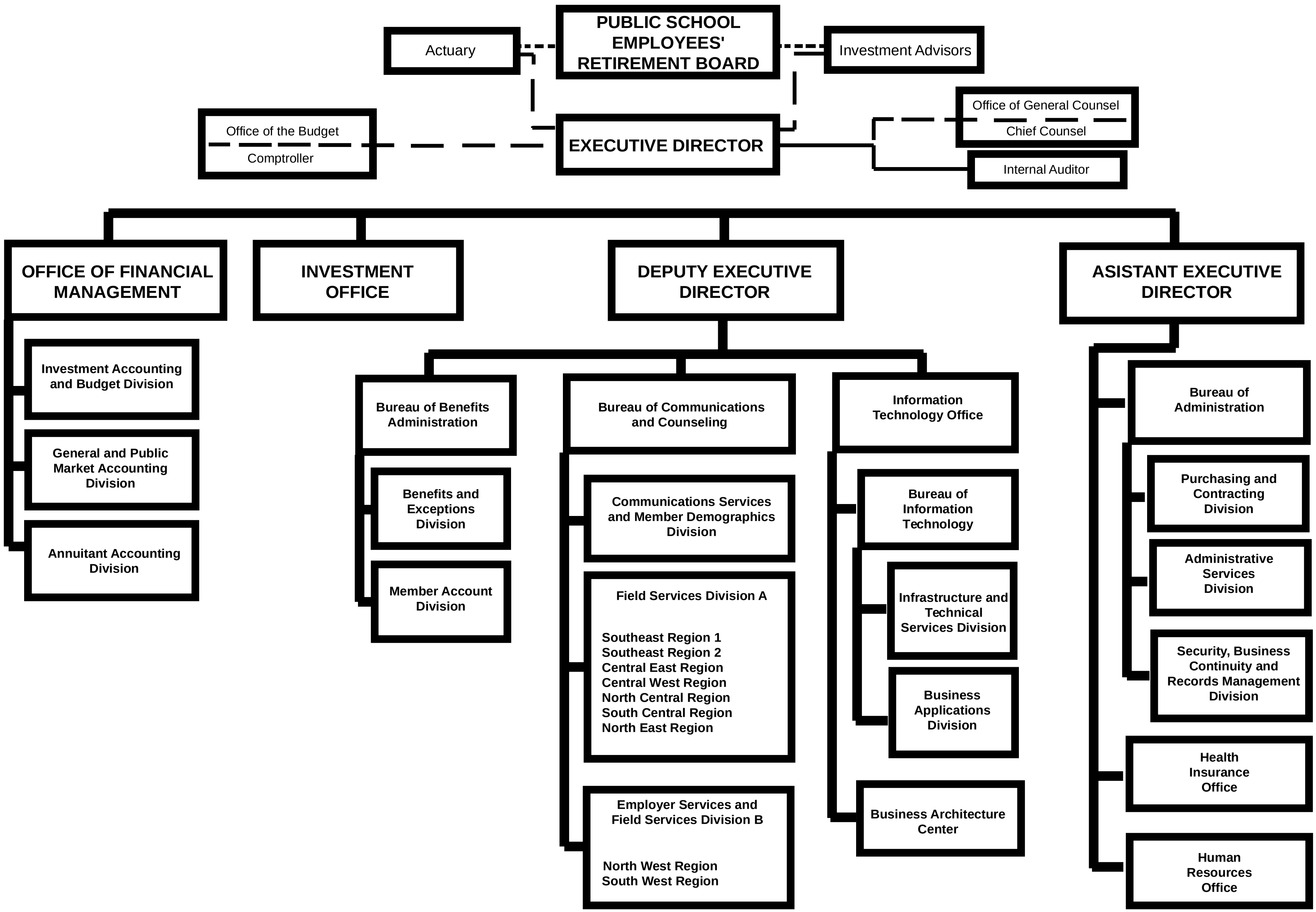


Chart 1.2

PSERS REGIONAL OFFICES

Public School Employees' Retirement System of Pennsylvania

PSERS FIELD SERVICES DIVISION

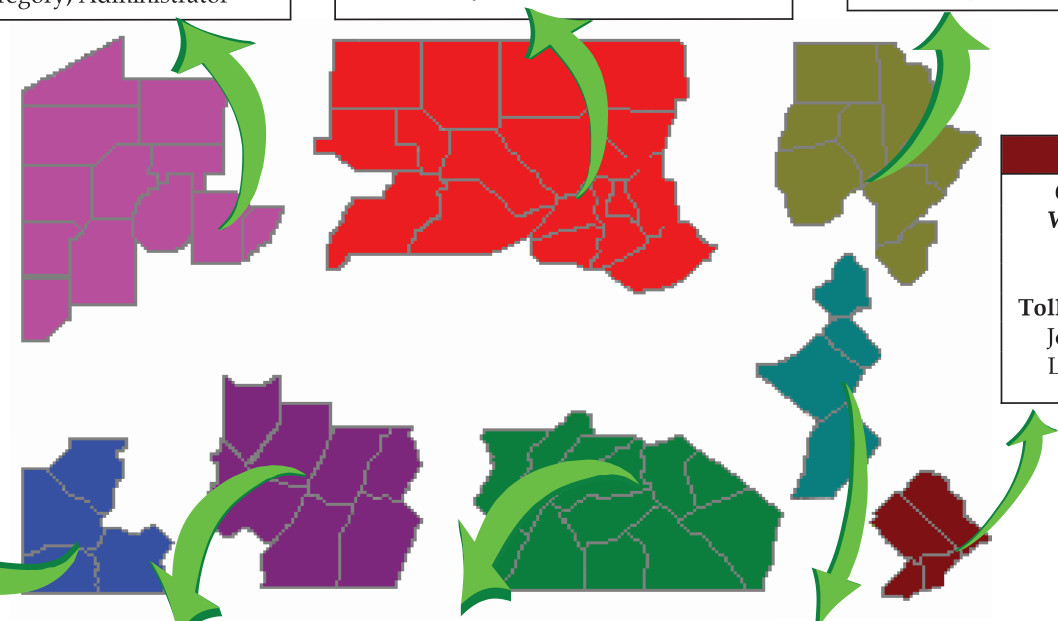
Serving You in the 21st Century

NORTHWEST
Franklin Penn Wood Center, Suite C
464 Allegheny Blvd.
Franklin, PA 16323-6210
Local (814) 437-9845
FAX (814) 437-5826
Toll Free 1-888-773-7748 ext. 5175
Donald Gregory, Administrator

NORTHCENTRAL
Suite 201
300 Bellefonte Avenue
Lock Haven, PA 17745-1903
Local (570) 893-4410
FAX (570) 893-4414
Toll Free 1-888-773-7748 ext. 5275
Jeremy Wible, Administrator

NORTHEAST
417 Lackawanna Avenue
Suite 201
Scranton, PA 18503-2013
Local (570) 614-0269
FAX (570) 614-0278
Toll Free 1-888-773-7748 ext. 5375
Sherry L. Sibio, Administrator

SOUTHWEST
300 Cedar Ridge Drive, Suite 301
Pittsburgh, PA 15205-9778
Local (412) 920-2014
FAX (412) 920-2015
Toll Free 1-888-773-7748 ext. 5775
Russell J. Miller, Administrator



SOUTHEAST
605 Louis Drive, Suite 500
Warminster, PA 18974-2825
Local (215) 443-3495
FAX (215) 443-3487
Toll Free 1-888-773-7748 ext. 5575
Joshua Catalfu, Administrator
Linda Visco, Administrator

CENTRALWEST
219 W. High Street
Ebensburg, PA 15931-1540
Local (814) 419-1180
FAX (814) 419-1189
Toll Free 1-888-773-7748 ext. 5875
Brian Farester, Administrator

SOUTHCENTRAL
5 N 5th Street
Harrisburg, PA 17101-1905
Local (717) 720-6335
FAX (717) 783-9606
Toll Free 1-888-773-7748 ext. 6335
John Tucker, Administrator

CENTRALEAST
Suite 103, 110 West Arch Street
Fleetwood, PA 19522-1321
Local (610) 944-9113
FAX (610) 944-9275
Toll Free 1-888-773-7748 ext. 5475
Lisa A. York, Administrator

Summary of Various Member Service Statistics

PSERS operates very efficiently. There are only 322 staff serving the needs of over 500,000 members of the System and 781 employers. PSERS staff is dedicated to fulfilling PSERS mission to serve our members. Below are highlights of some of the more common services that PSERS provides to its members.

Table 1.1 Benefits Processed (Major)

Calendar Year	2015	2016
Initial Retirements (1-Step)	9,677	8,854
Initial Retirements (2-Step)	1,120	968
Final Retirements (2nd Step of 2-Step)	924	1,523
Purchases of Service and Corrections for Previously Unreported Service and/or Contributions not Withheld	19,817	16,792
Refunds	4,569	3,851
Deaths - Processed and Paid	3,552	3,428
Account Verification - non retirements	13,754	15,014
TOTAL	53,413	50,430
Percent of Retirement Paid as 1 Step	90%	90%

Table 1.2 Other Member Services (Major)

Calendar Year	2015	2016
Retirement Estimates	22,257	20,448
Phone Calls Answered	191,057	183,070
E-mails Received	13,228	15,183
E-mails Sent	13,377	13,756
General Information Sessions	198	191
General Information Attendees	8,334	10,511
Exit Counseling Sessions	902	833
Exit Counseling Attendees	7,748	6,771

Table 1.3 Member Payment Services for Retirees and Beneficiaries

Calendar Year	2015	2016
Monthly Payments to Members	2,583,630	2,648,042
Non-recurring Payments to Members	42,326	48,881
Forms 1099-R Produced	251,822	253,000
W4-P Tax Withholding Forms Processed	4,974	5,211
EFT Forms Processed - Direct Deposit	9,443	12,377
ACH Rejects Researched and Reviewed (Direct Deposit Failures)	3,706	4,857
Member Payment Changes Processed	4,554	4,314

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Economic Impact on Pennsylvania, Member Demographics, and Financial Information

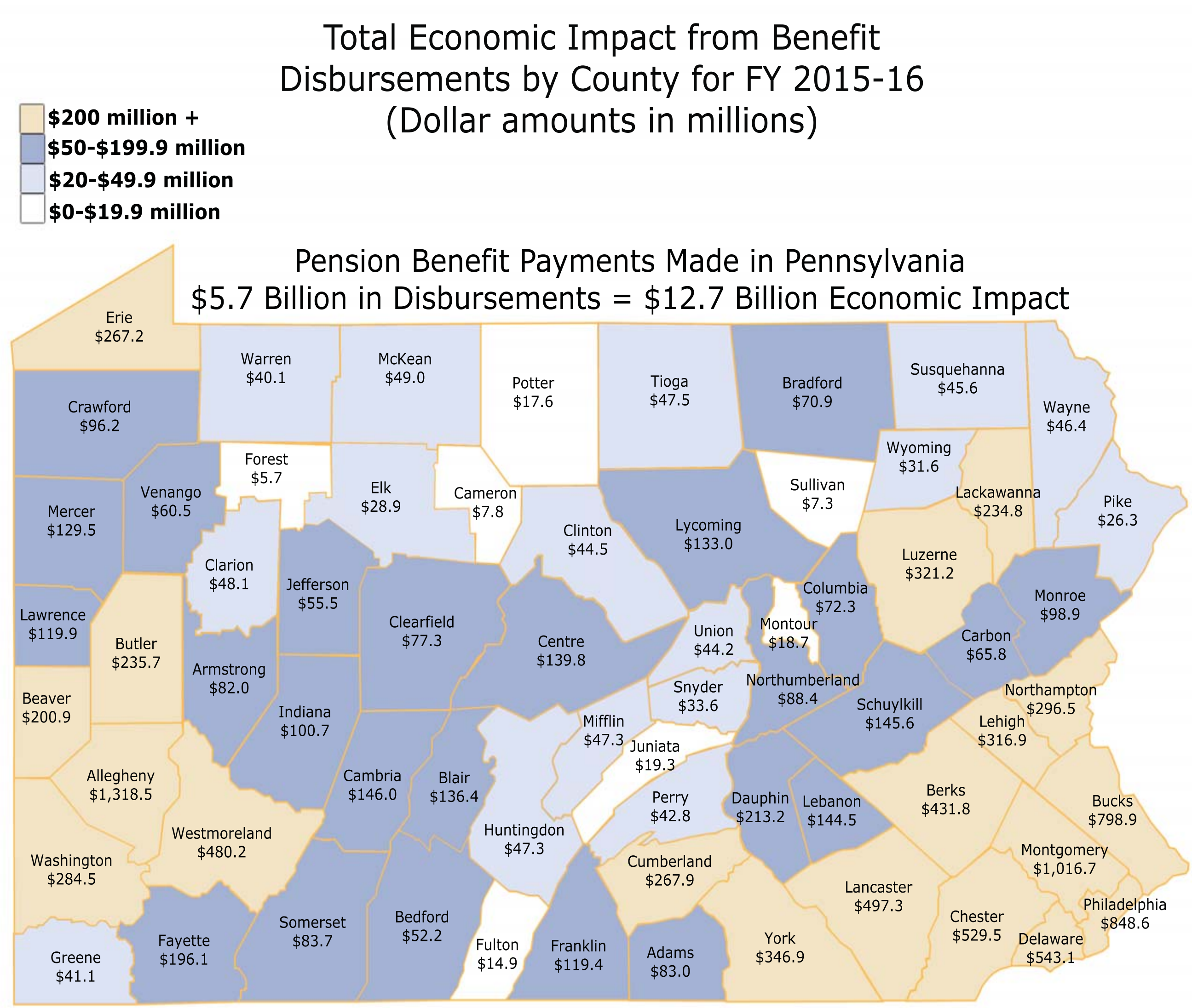
Economic Impact of Pension Benefits on Pennsylvania

In Fiscal Year 2015-16, PSERS' pension disbursements to retirees totaled approximately $6.3 billion. Of this amount, approximately 90%, or $5.7 billion, went directly into state and local economies. According to a study by the National Institute on Retirement Security (NIRS) this spending expands through the economy as the retiree's spending becomes another's income, multiplying the effect of the $5.7 billion into an economic impact of $12.7 billion throughout the Commonwealth. Estimates show that the impact of money from PSERS in Pennsylvania includes[1]:

- Economic impact exceeding $12.7 billion
- Support for over 55,000 jobs that paid $2.8 billion in wages and salaries
- $1.5 billion in federal and local tax revenues

Table 1.4
Top 10 Counties Based on Economic Impact from Benefit Disbursements
(Dollars in Millions)

Allegheny	$1,318.5
Montgomery	$1,016.7
Philadelphia	$848.6
Bucks	$798.9
Delaware	$543.1
Chester	$529.5
Lancaster	$497.3
Westmoreland	$480.2
Berks	$431.8
York	$346.9



[1] *Pensionomics.* The National Institue on Retirement Security, September 2016

Member Demographics and Financial Information (continued)

Table 1.5 Members by Type

Fiscal Year ended June 30	Active Members	Annuitants, Beneficiaries, and Survivor Annuitants	Total Active/Retired Members	Ratio of Active/ Retired	Vestees	Total Membership
2016	257,080	224,828	481,908	1.14 to 1	23,437	505,345
2015	259,868	219,775	479,643	1.18	21,909	501,552
2014	263,312	213,900	477,212	1.23	20,467	497,679
2013	267,428	209,204	476,632	1.28	18,911	495,543
2012	273,504	202,015	475,519	1.35	17,121	492,640
Average ratio of annuitants to active members (Public Funds)				1.44*		

*Based on the December 2016 Public Fund Survey prepared by the National Association of State Retirement Administrators (NASRA).

Table 1.6 Profile of PSERS' Annuitants, Beneficiaries, and Survivor Annuitants

Type of Member	Number of Members 6/30/2015	Number of Members 6/30/2016	Average Annual Benefit 6/30/2015	Average Annual Benefit 6/30/2016
Normal/Early Retirees	200,161	204,843	$26,030	$26,081
Survivor Annuitants	10,509	10,809	13,066	13,543
Disability Retirees	9,105	9,176	19,009	19,350
Total	219,775	224,828	$25,119	$25,203

Age and Service Profile of All Active Members

	June 30, 2015	June 30, 2016
Average Age	44.9	45.1
Average Years of PSERS Service	11.1	11.3
Average Annual Compensation	$48,787	$49,989

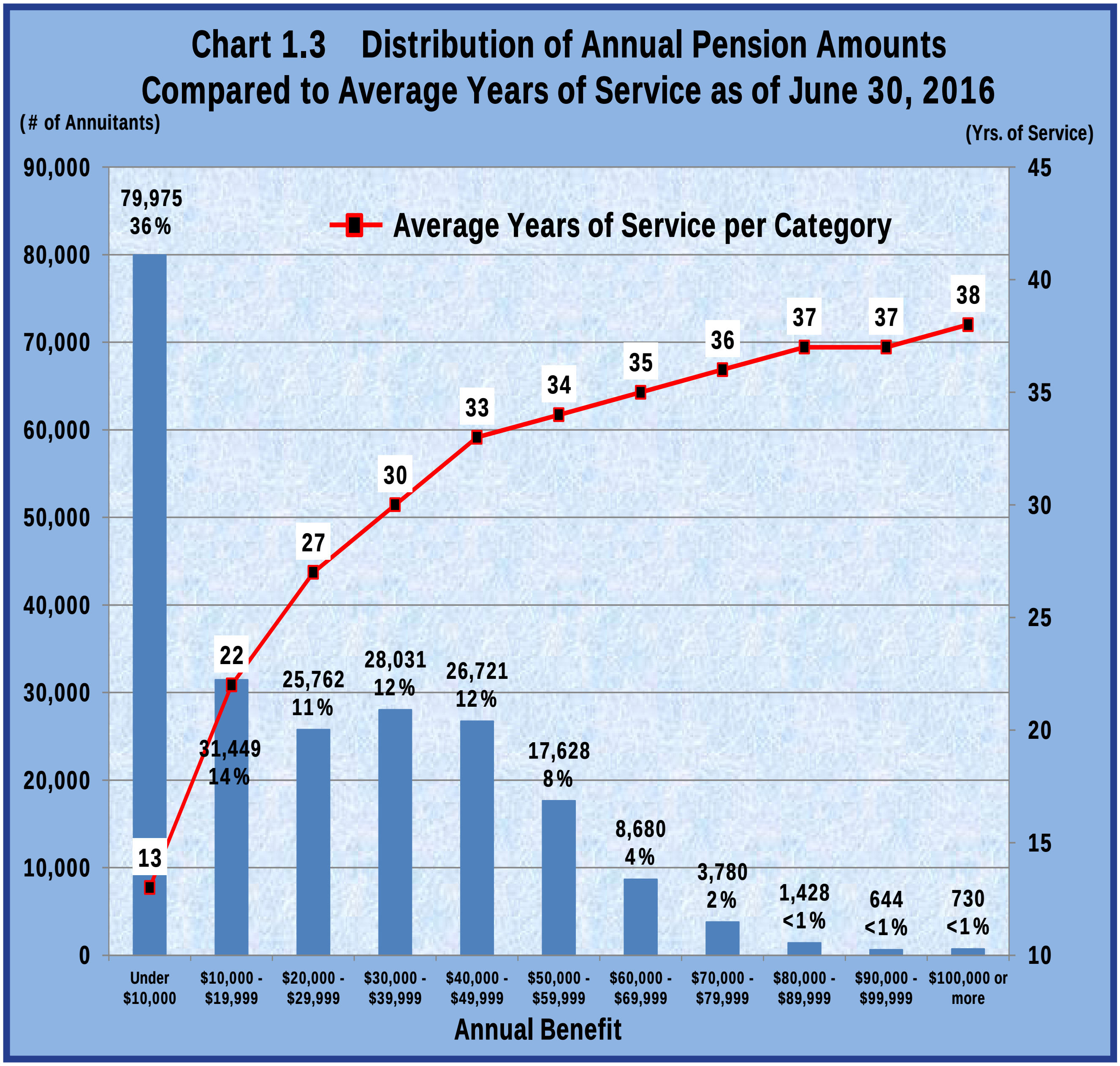
Class T-E Members

	June 30, 2015	June 30, 2016
Number of Members	41,189	48,628
Average Age	37.4	37.9
Average Years of PSERS Service	1.3	1.7
Average Annual Compensation	$25,086	$26,898

Class T-F Members

	June 30, 2015	June 30, 2016
Number of Members	7,280	9,293
Average Age	36.3	37.0
Average Years of PSERS Service	1.7	1.9
Average Annual Compensation	$33,035	$36,822

Member Demographics and Financial Information (continued)



Benefit Summary

The average System retiree receives $25,203 annually, a benefit earned through a career in education.

- Approximately 75% of System retirees receive less than $40,000 per year in benefits
- Six-figure pensions are rare, with fewer than one-half of 1% of PSERS retirees receiving an annual benefit over $100,000. Retirees earning over six figures have spent an average of 38 years working in their careers

Member Demographics and Financial Information (continued)

Table 1.7 **PSERS Pension Plan Changes in Fiduciary Net Position**
10 Year Cumulative Summary-CALENDAR YEAR-PRELIMINARY
(Dollar Amounts in Millions)

		Cumulative 10 Year Total
		January 1, 2007 - December 31, 2016
Balance of Pension Net Position (01/01/07)		**$ 62,514**
Member Contributions	$ 9,612	
Employer Contributions	14,912	
Net Investment Income	19,672	
Total Deductions - Benefits & Expenses	(55,611)	
Net Decrease		**$ (11,415)**
Balance of Pension Net Position (12/31/16)		**$ 51,099**

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Member Demographics and Financial Information (continued)

Table 1.8 PSERS Pension Plan Changes in Fiduciary Net Position
10 Year Cumulative Summary-FISCAL YEAR
(Dollar Amounts in Millions)

	Cumulative 10 Year Total	
	July 1, 2006 - June 30, 2016	
Balance of Net Position (07/01/06)		**$ 57,236**
Member Contributions	$ 9,526	
Employer Contributions	13,352	
Net Investment Income	24,147	
Total Deductions - Benefits & Expenses	(54,429)	
Net Decrease		**$ (7,404)**
Balance of Net Position (6/30/16)		**$ 49,832**

Table 1.9 Cash Flow
Fiscal Years Ended in June 30
(Dollar Amounts in Millions)

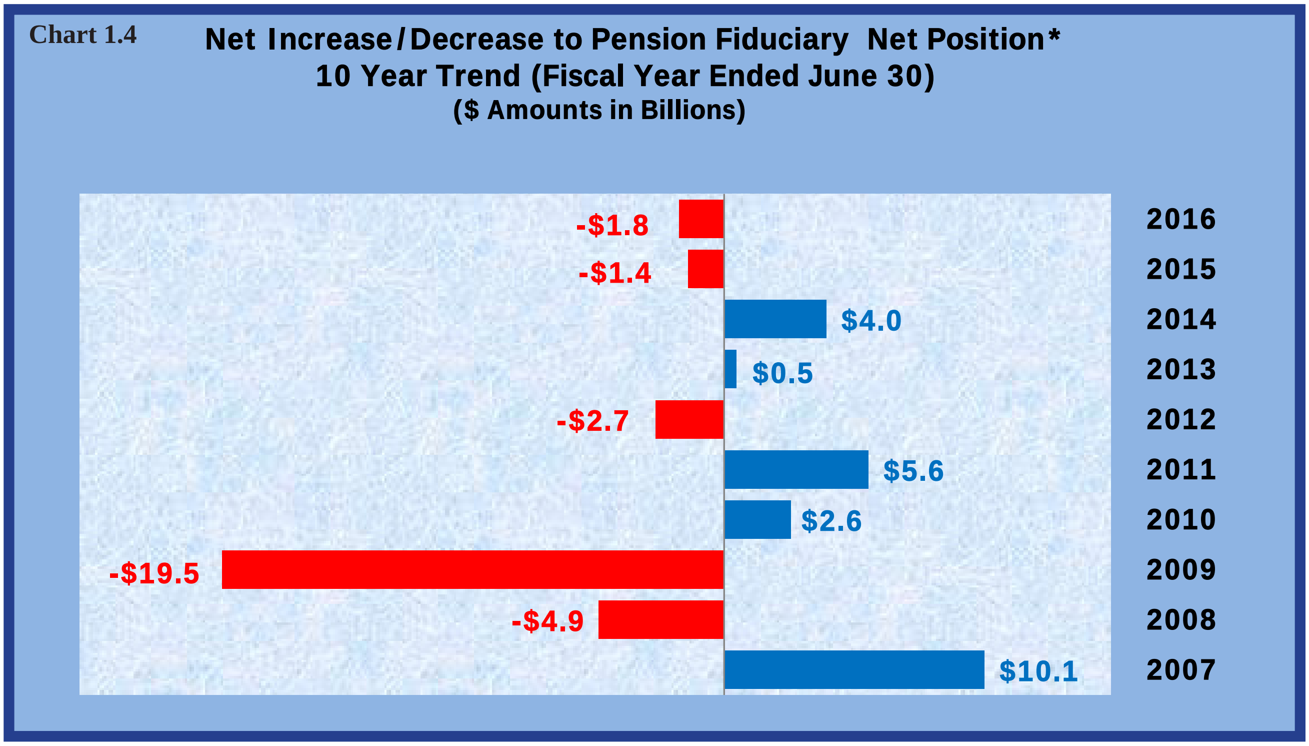
		- - - Projected - - -	
	2016	**2017**	**2018**
Member Contributions	$ 989	$ 996	$ 1,015
Employer Contributions	3,190	3,953	4,356
Total Contributions	**$ 4,179**	**$ 4,949**	**$ 5,371**
Less:			
Pension Benefits	6,340	6,515	6,680
Negative Cash Flow	**$ -2,161**	**$ -1,566**	**$ -1,309**
Beginning of Year Total Assets	**$ 51,586**	**$ 49,832**	**$ 51,746**
Negative Cash Flow (NCF) as a % of Total Assets	**-4.2%**	**-3.1%**	**-2.5%**
Average NCF as a % of Total Assets (Public Funds)	**-2.3%***		

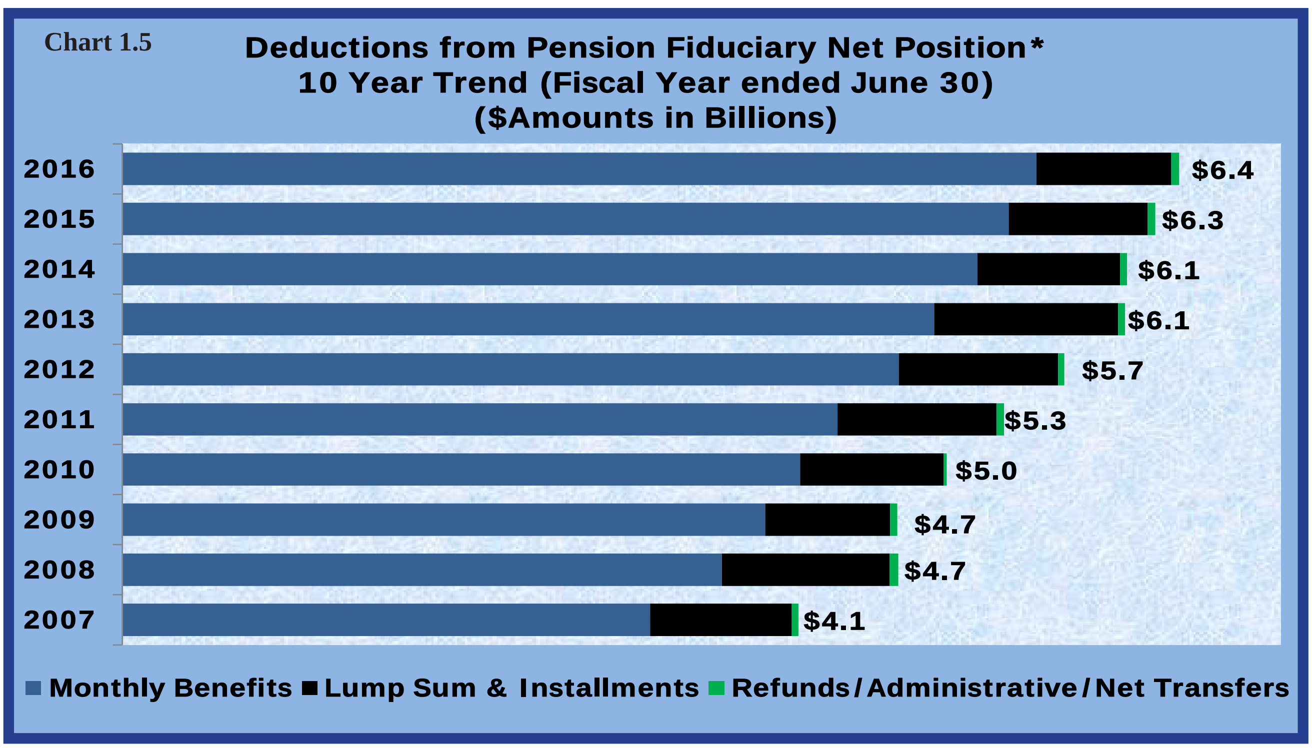
*Based on the December 2016 Public Fund Survey prepared by NASRA.

Negative Cash Flow (NCF)

Using data from Table 1.8 at the top of the page, the last 10 years of contributions and benefit payments resulted in a Negative Cash Flow (NCF) of -$31.6 billion (comprised of total deductions less member and employer contributions) during that time period. In Table 1.9, PSERS' NCF percentage is -4.2% of total assets for FY 2015-16. PSERS' projected NCF percentage of -2.5% for FY 2017-18 is approaching the public fund average due to the System receiving the actuarially required contributions. PSERS total assets are projected to grow.

Member Demographics and Financial Information (continued)





*Does not include PSERS Postemployment Healthcare Plan Net Position.

Statement of Fiduciary Net Position - Preliminary and Unaudited
December 31, 2016
(Dollar Amounts in Thousands)

	Pension	Postemployment Healthcare: Premium Assistance	Postemployment Healthcare: Health Options Program	Totals
Assets:				
Receivables:				
Members	$ 325,407	$ 3,061	$ 57	$ 328,525
Employers	1,027,013	30,217	-	1,057,231
Investment income	183,107	132	48	183,287
Investment proceeds	988,846	-	-	988,846
CMS Part D and prescriptions	-	-	61,161	61,161
Interfund	-	6,420	-	6,420
Miscellaneous	245	51	-	296
Total Receivables	2,524,619	39,881	61,265	2,625,765
Investments, at fair value:				
Short-term	5,693,930	82,700	224,170	6,000,800
Fixed income	4,232,445	-	-	4,232,445
Common and preferred stock	10,242,471	-	-	10,242,471
Collective trust funds	12,817,234	-	-	12,817,234
Real estate	5,071,950	-	-	5,071,950
Alternative investments	11,140,556	-	-	11,140,556
Total Investments	49,198,587	82,700	224,170	49,505,457
Securities lending collateral pool	1,479,953	-	-	1,479,953
Capital assets (net of accumulated depreciation $28,096)	22,972	-	-	22,972
Total Assets	53,226,130	122,581	285,435	53,634,146
Deferred outflows of resources	11,324	-	-	11,324
Liabilities:				
Accounts payable and accrued expenses	180,602	218	1,495	182,315
Benefits payable	191,536	-	22,444	213,981
Participant premium advances	-	-	28,186	28,186
Investment purchases and other liabilities	279,112	-	-	279,112
Obligations under securities lending	1,479,953	-	-	1,479,953
Interfund payable	6,420	-	-	6,420
Total Liabilities	2,137,623	218	52,125	2,189,967
Deferred inflows of resources	1,268	-	-	1,268
Net position restricted for pension and postemployment healthcare benefits	$ 51,098,563	$ 122,363	$ 233,310	$ 51,454,236

Statements of Changes in Fiduciary Net Position - Preliminary and Unaudited
Six Months Ended December 31, 2016
(Dollar Amounts in Thousands)

		Postemployment Healthcare		
	Pension	Premium Assistance	Health Options Program	Totals
Additions:				
Contributions:				
Members	$ 467,373	$ -	$ -	$ 476,373
Employers	1,811,317	53,457	-	1,864,774
Total contributions	2,287,690	53,457	-	2,341,146
Participant premiums	-	-	163,551	163,551
Centers for Medicare & Medicaid Services premiums	-	-	50,906	50,906
Investment income:				
From investing activities:				
Net appreciation (depreciation) in fair value of investments	1,712,835	(209)	-	1,712,625
Short-term	40,296	524	259	41,079
Fixed income	77,142	-	-	77,142
Common and preferred stock	111,641	-	-	111,641
Collective trust funds	1,643	-	-	1,643
Real estate	99,470	-	-	99,470
Alternative investments	290,361	-	-	290,361
Total investment activity income	2,333,389	314	259	2,333,962
Investment expenses	(240,503)	-	-	(240,503)
Net income from investing activities	2,092,886	314	259	2,093,460
From securities lending activities:				
Securities lending income	8,402	-	-	8,402
Securities lending expense	(2,318)	-	-	(2,318)
Net income from securities lending activities	6,083	-	-	6,083
Total net investment income	2,098,970	314	259	2,099,543
Total Additions	4,386,660	53,771	214,717	4,655,147
Deductions:				
Benefits	3,093,178	55,008	157,033	3,305,219
Refunds of contributions	8,040	-	-	8,040
Administrative expenses	18,939	963	18,312	38,214
Total Deductions	3,120,157	55,971	175,346	3,351,473
Net increase (decrease)	1,266,503	(2,200)	39,371	1,303,674
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	$ 51,098,563	$ 122,363	$ 233,310	$ 51,454,236

The Actuarial Process and Pension Plan Funding

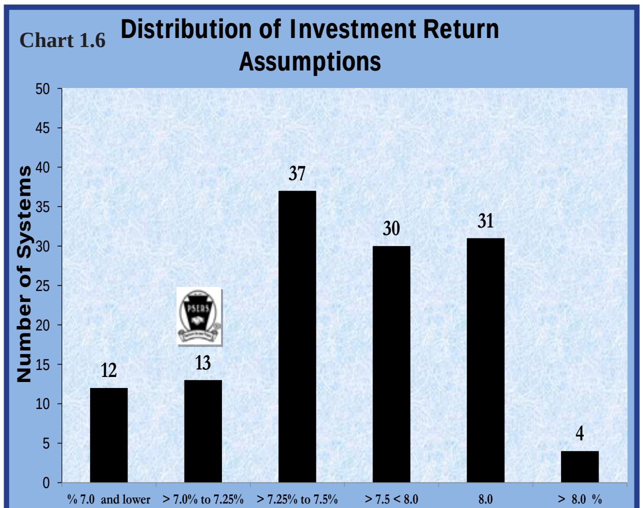
PSERS is a defined benefit plan, meaning benefits are based on members' service and salary history. The following information highlights the actuarial process and funding for PSERS.

Actuarial Process

The actuarial process presumes that there will be a systematic flow of contributions at a specified level to pay for plan benefits and that the flow of contributions, together with investment earnings, will be sufficient to meet all benefit and expense requirements of the plan. Actuarial cost methods for funding PSERS' pension plan are defined in the Public School Employees' Retirement Code. The actuary for the pension plan and PSERS' staff review economic and demographic experience annually and, in more depth, over five-year periods. The actuary's periodic valuations test the validity of the underlying actuarial assumptions versus the actual experience of the plan. That experience is also used as a basis for formulating actuarial assumptions about what will occur in the future with respect to salary growth, investment returns, and demographic factors such as rates of retirement and death.

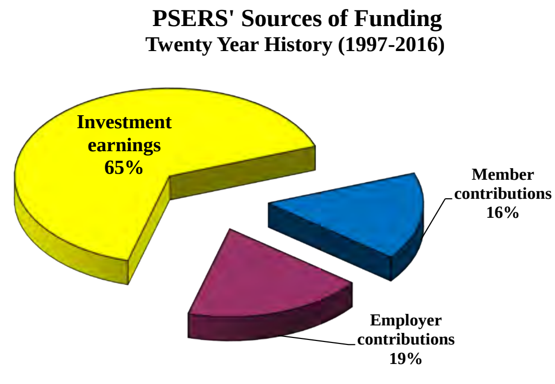
Effective with the June 30, 2016 actuarial valuation, PSERS adopted several new demographic and economic assumptions as a result of the five-year Experience Study completed by PSERS' actuary. PSERS' investment rate of return assumption was changed from 7.50% to 7.25%, the salary growth assumption was changed from 5.50% to 5.00%, the inflation assumption was reduced from 3.00% to 2.75%, the rates of withdrawal, disability and retirement from employment among active members were updated and mortality rates were revised. Chart 1.6 places PSERS' 7.25% return assumption among the most conservative funds in the public pension universe.

Chart 1.6



Source: NASRA Public Fund Survey, December 2016

Chart 1.7



Funding

The plan is funded through three sources: (1) employer contributions; (2) member contributions; and, (3) investment earnings. As depicted in Chart 1.7, for the twenty-year period ended June 30, 2016 investment earnings provided 65% of PSERS' funding followed by 16% from members while employers contributed 19%.

Employer Contributions

The Retirement Code vests PSERS' Board with the authority to establish the employer contribution rate (ECR) based on the parameters in the Retirement Code. The Board, in consultation with the actuary, establishes the employer contribution rate annually, as part of the annual actuarial valuation. The employer contribution rate, which is expressed as a percentage of payroll, is composed of two items: (1) the pension contribution; and, (2) the contribution for health care premium assistance.

The total employer contribution rate for the fiscal year ended June 30, 2016 was 25.84%, including 0.84% for healthcare premium assistance. The total employer contribution rate for the fiscal year ending June 30, 2017 is 30.03%. This rate consists of a 29.20% pension rate (the Act 120 collar no longer limits the rate) plus the healthcare premium assistance contribution of 0.83%. The FY 2017-18 employer contribution rate is 32.57%. This rate consists of a 31.74% pension rate plus the healthcare premium assistance contribution of 0.83%. The Board of Trustees certified this rate, which was calculated in accordance with the provisions of Act 120 of 2010, at their December 2016 meeting. While any contribution increase is a challenge for PSERS' employers, the increase in the FY 2017-18 contribution rate is the smallest since FY 2009-10.

For the fiscal year ended June 30, 2016, PSERS' employer contributions totaled $3.303 billion, which includes $113 million for healthcare premium assistance. For the fiscal year ending June 30, 2017 the estimate for employer contributions is $3.976 billion, reflective of the 30.03% contribution rate. The contribution rate for the fiscal year ending June 30, 2018 is 32.57% resulting in an employer contribution estimate of $4.401 billion.

The Actuarial Process and Pension Plan Funding (continued)

Member Contributions

Most members of the Public School Employees' Retirement System contribute between 7.5% and 10.3% of their pay depending on their class of membership to help fund their own retirement benefit. The average contribution rate payable by the members for the current year (FY2016-17) is 7.52%. This is in contrast to many non-public (private) pension plans to which members of over 90% of such plans do not contribute (Source: based on a query of private plan IRS Form 5500 filings). For these plans, the employers bear 100% of the costs of the benefit.

According to recent National Association of State Retirement Administrators (NASRA) data, PSERS member contribution rate is one of the highest among U.S. public pension plans that participate in Social Security.

Pursuant to Act 120, Class T-E and Class T-F members are subject to a "shared risk" employee contribution rate. The member contribution rate will stay within the specified range alloted for Class T-E or Class T-F, but could increase or decrease every three years starting July 1, 2015 depending on investment performance. Members now share a portion of the investment risk of the Fund giving PSERS a defined contribution element. As a result of the Fund's 8.66% three year return through June 30, 2014 exceeding the investment performance hurdle mandated by Act 120, the member rate did not change. The next investment performance measurement period for Class T-E and T-F members will end on June 30, 2017.

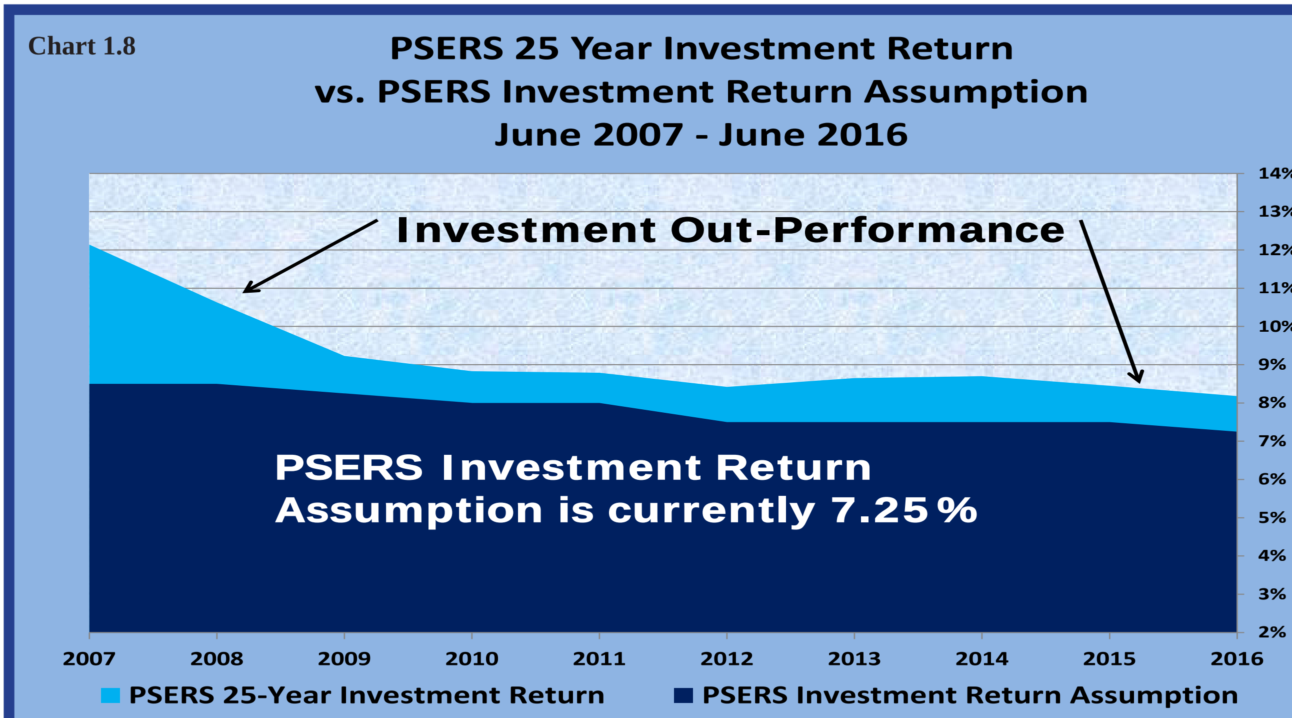
PSERS' members contributed $989 million for pension contributions for FY2016. Total member contributions are estimated to be $996 million for the fiscal year ending June 30, 2017 and $1.019 billion for the fiscal year ending June 30, 2018.

Investment Returns

PSERS' preliminary investment rate of return for the calendar year ended December 31, 2016 is 10.75%, net of fees. The investment rates of return (net of fees) for the fiscal years ended June 30, 2016 and June 30, 2015 were 1.29% and 3.04%, respectively. The annualized rates of investment return for the three, five and ten-year periods ended June 30, 2016 were 6.24%, 6.01%, and 4.94% respectively. Over the past 25 years ended June 30, 2016, the Fund earned an annualized rate of return of 8.18% which exceeded the Fund's long term investment rate of return assumption.

PSERS' 25-year return, as shown in Chart 1.8, has consistently outperformed the actuarial investment rate of return. Throughout much of the 1990s and 2000s PSERS' investment performance exceeded its investment rate of return assumption which resulted in the large cumulative outperformance in 2007. This outstanding long-term investment performance resulted in declining employer contribution rates and/or contribution rates lower than the annual normal cost of benefits for most of those two decades. Even after the Great Recession of 2008-2009, PSERS' long-term returns continued to exceed the return assumption.

Chart 1.8



The Actuarial Process and Pension Plan Funding
(continued)

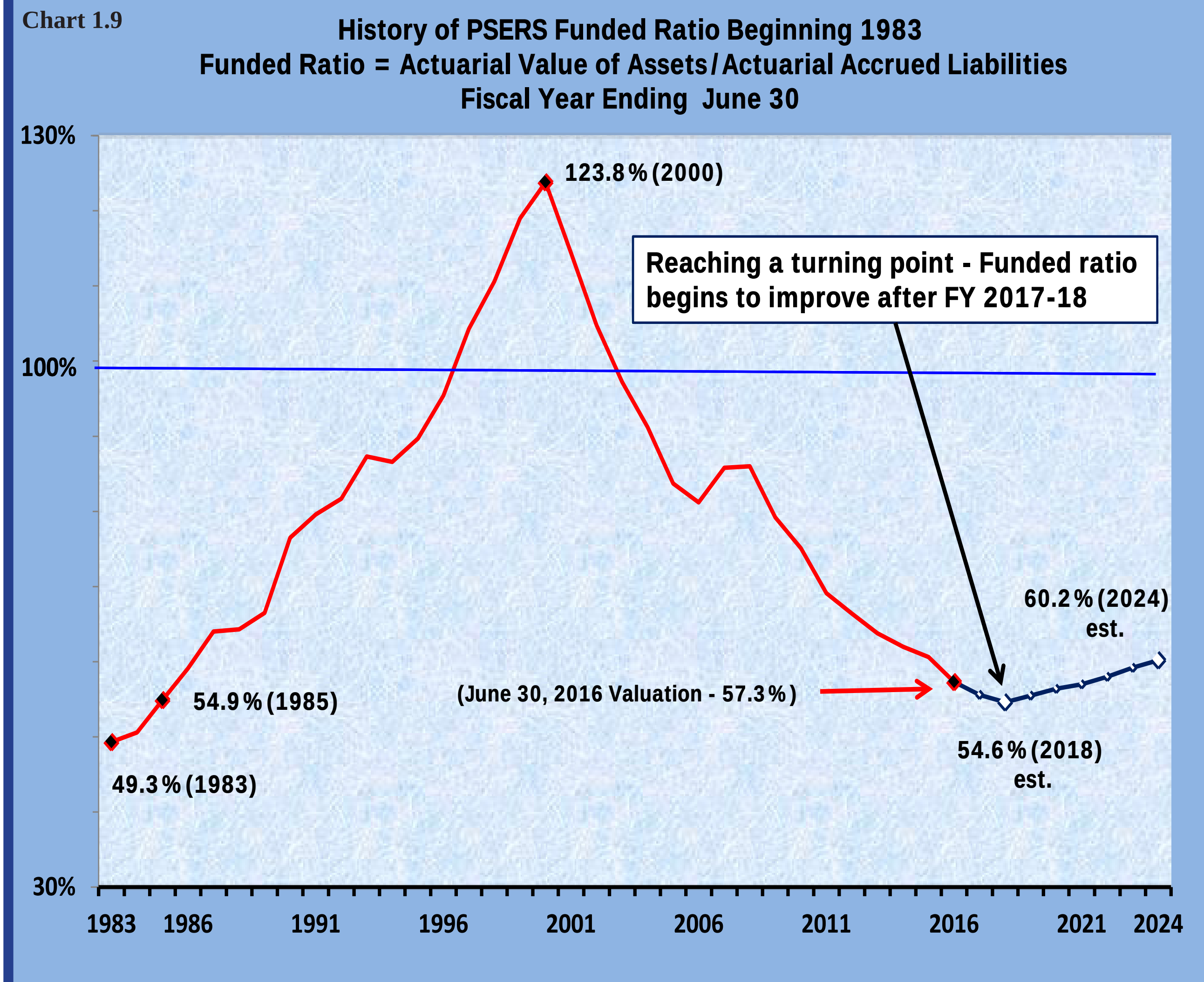
Funded Status
PSERS' funded status is measured by comparing the actuarial value of assets with the accrued liability. The accrued liability is the present value of benefits accumulated to date for both active and retired members.

Key Facts

- As a result of legislated contribution increases under Act 120, PSERS is reaching a turning point. After FY 2017-18 PSERS' funded ratio is projected to slowly improve after declining for many years.
- Funded Status: 57.3% as of June 30, 2016
- Funded Status: 60.6% as of June 30, 2015
- The decrease in FY2016 is primarily due to the actuarial value of assets loss that occurred during the year as a result of the 10 year asset smoothing used for actuarial valuation purposes and the continued underfunding of PSERS by its employers. As a result of the rate collar provisions of Act 120, employers underfunded PSERS by $377 million in FY2016.
- The decrease in the funded status since 2000 is the result of several factors including: the unfavorable investment markets from FY2001 to FY2003 and FY2008 to FY2009; funding changes enacted in Act 38 of 2002 and Act 40 of 2003 which resulted in employers underfunding PSERS; benefit enhancements from Act 9 and Act 38; the adoption of new demographic and economics assumptions in FY2016; funding collars in Act 120 which continued the employer underfunding of the system; and, actuarial liability losses.

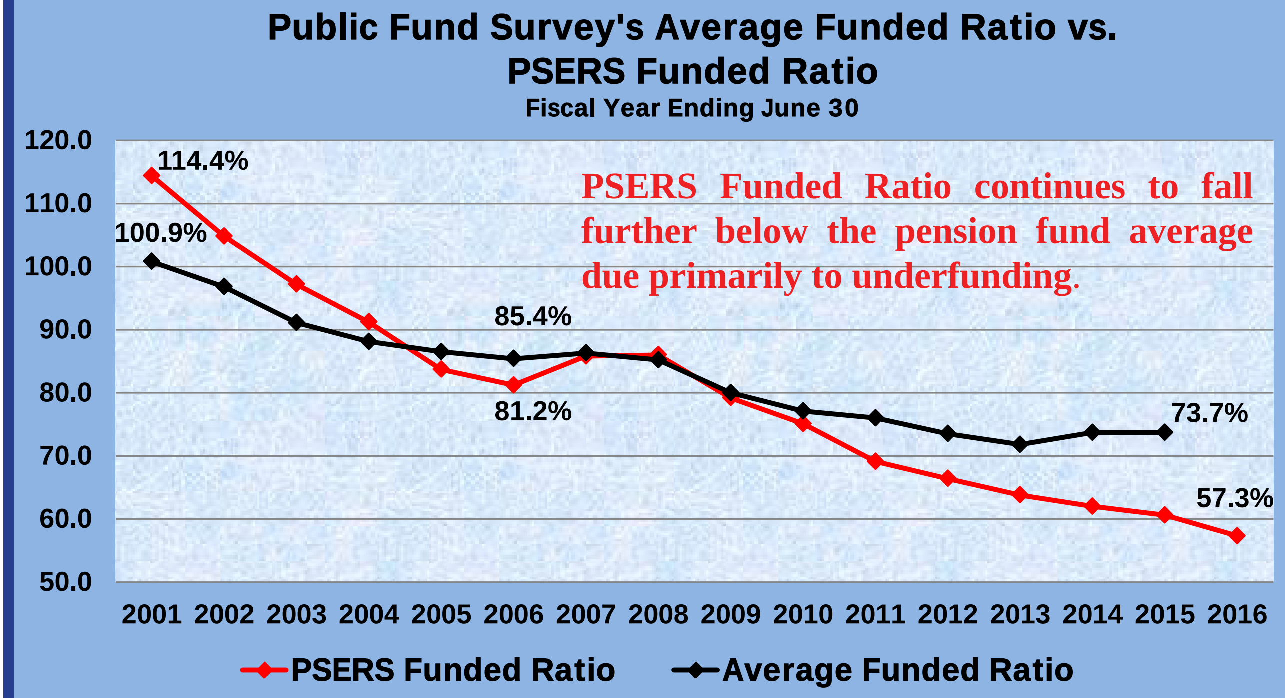
A history of PSERS' funded ratio beginning in 1983 and eight-year projection of PSERS' funded status is shown in Chart 1.9. As a result of legislated contribution increases under Act 120, PSERS is reaching a turning point. In FY 2017-18 PSERS' funded ratio is projected to slowly improve after declining for many years.

Chart 1.9



The Actuarial Process and Pension Plan Funding
(continued)

Chart 1.10



A comparison of PSERS' funded ratio to the public fund projected weighted average funding ratio provided by the National Association of State Retirement Administrators (NASRA) is shown in Chart 1.10 above. A lower than average funded ratio is an important factor because it signifies a smaller than average asset base. A smaller asset base means a greater percentage of the investment returns are being used to pay benefits, and results in a very slow growth of assets.

Besides market performance, other factors that affect a plan's funding level include contributions made relative to those that are required; changes in benefit levels; changes in actuarial assumptions, and rates of employee salary growth (*Public Fund Survey,* 2016).

Beginning July 1, 2016 PSERS' employer contribution rate provides 100% of the actuarially required rate. This is the first major step needed for PSERS' funded ratio to begin to improve. As a result of receiving 100% of the actuarially required rate, PSERS' funded ratio is projected to improve after FY 2017-18.

The Actuarial Process and Pension Plan Funding (continued)

Sources of Unfunded Liability

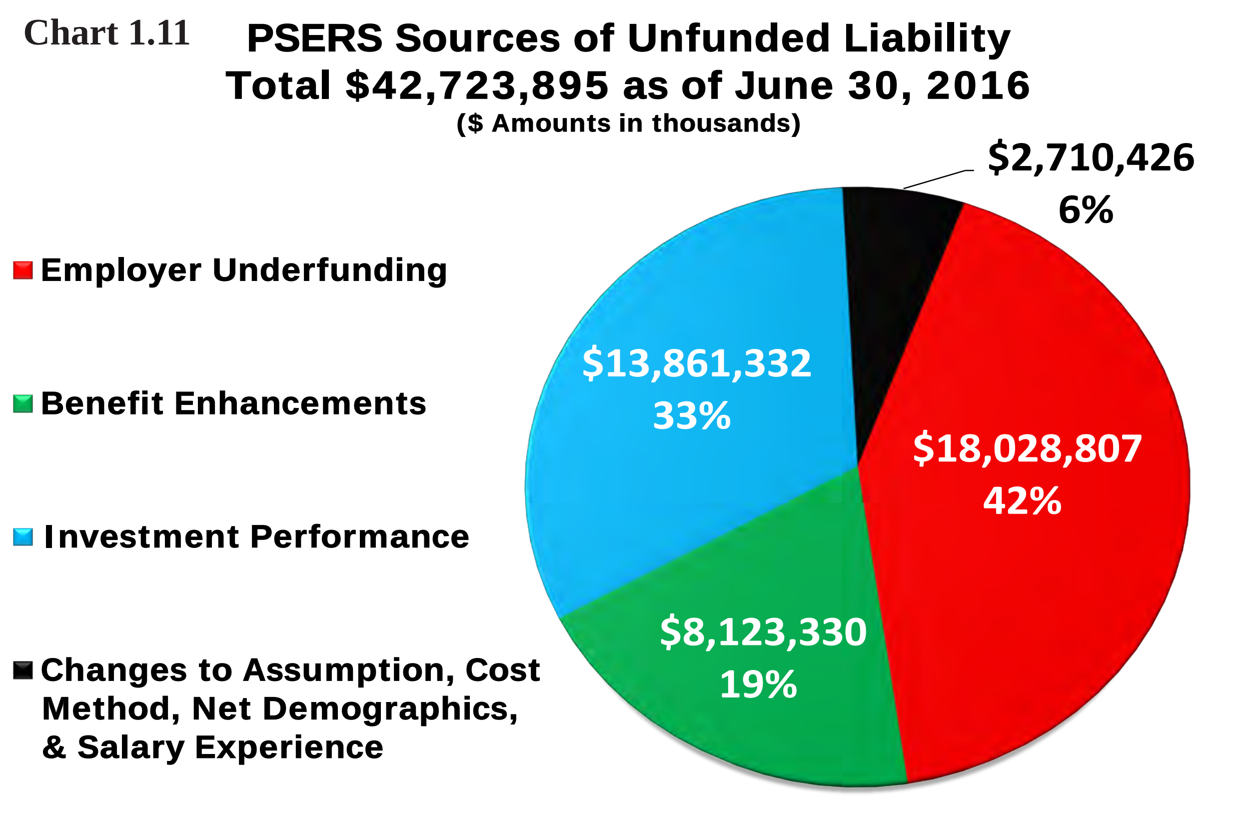
The System's total funded ratio (for Pensions and Health Insurance combined) is 57.3% as of June 30, 2016. This funded ratio is based on an actuarial value of assets of $57.39 billion and a total accrued liability of $100.11 billion which equates to a $42.72 billion unfunded liability. Chart 1.11 depicts the sources of the unfunded liability. The largest sources of unfunded liability in order of magnitude are employer funding deferrals (42%), investment performance (33%), and benefit enhancements (19%), which include Act 9, cost of living increases and early retirement incentives. The new demographic and economic assumptions adopted by the Board in June 2016 have added approximately $2.5 billion to the unfunded liability. The additional unfunded liability will be amortized over 24 years so the impact to the FY 2017-18 employer contribution rate was small.

For many years PSERS' outstanding investment performance compensated for unfunded benefit enhancements and employer funding deferrals. The Great Recession had a negative impact upon the System's long-term investment performance. Without the higher investment out-performance to compensate, the employer funding deferrals and benefit enhancements have significantly increased PSERS' unfunded liability. Approximately sixty-one percent of PSERS' June 30, 2016 unfunded liability is due to employer funding deferrals and benefit enhancements, both of which are not a result of the defined benefit plan design.

GASB 68 Pension Reporting for Employers

In June 2016, PSERS sent information to its employers to assist them in complying with the Governmental Accounting Standards Board (GASB) Statement No. 68, *Accounting and Financial Reporting for Pensions*. The information sent to employers included a memo explaining PSERS' role, descriptions of the material provided, and the employers' responsibilities. In addition to the memo, PSERS provided a variety of schedules audited by PSERS' independent public accountants as well as unaudited schedules. PSERS strives to incorporate all the information necessary for employers to comply with GASB 68 reporting requirements in these audited and unaudited schedules. Additionally, PSERS continues to make itself available to assist employers and their auditors should they have any additional requests in order to comply with GASB 68.

Chart 1.11



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Employer Contribution Rate

PSERS undergoes an annual independent actuarial valuation to calculate the actuarial assets and liabilities of the pension fund. Based on the actuarial valuation process, the actuary develops the recommended Employer Contribution Rate (ECR) that determines the employer contributions to the pension plan and healthcare premium assistance. The valuation process also measures the progress of the pension system towards funding pensions for its active and retired members.

Employer Contribution Rate Statistics

• Highest historical ECR (FY 2016-17)	30.03%
• Lowest historical ECR (FY 2001-02)	1.09%
• Ten yr. avg. ECR (2007-08 to 2016-17)	13.75%
• Twenty yr. avg. ECR (1997-98 to 2016-17)	9.01%
• Thirty yr. avg. ECR (1987-88 to 2016-17)	11.12%
• Adopted ECR (FY 2017-18)	32.57%

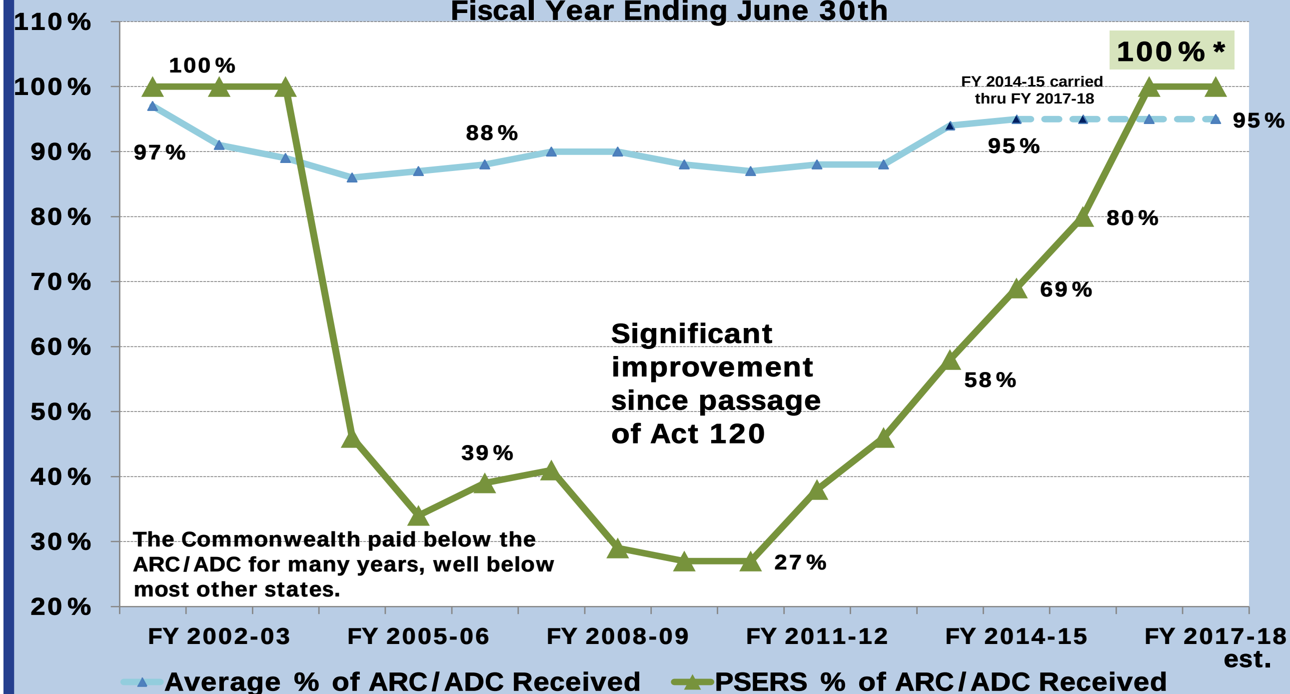
Act 120 of 2010

Progress on Funding Issue

PSERS is now in the 6th year of a multi-year phase in of Act 120 of 2010. Act 120 provided historic pension reform and made dramatic progress toward addressing funding issues at PSERS. The legislation included actuarial and funding changes to PSERS and benefit reductions for individuals who became new members of PSERS on or after July 1, 2011.

As depicted in the Chart 1.12, the gradual rate increases under Act 120 have raised PSERS' employer contributions to the 100% annual required contribution (ARC) goal, now referred to as the actuarially determined contribution (ADC), for the first time in 15 years. An ARC includes both the employer's normal cost and the amount required to amortize the unfunded actuarial accrued liability (UAAL). PSERS' Board certified an employer contribution rate of 32.57% for FY 2017-18 in compliance with Act 120. This is the second consecutive year PSERS' contribution rate provides 100% of the actuarially required rate based on sound actuarial practices and principles and now exceeds the average ARC percentage of 95% for public funds based on the December 2016 Public Fund Survey prepared by NASRA.

Chart 1.12 Average % of ARC/ADC Received - Other Public Plans vs. PSERS % of ARC/ADC Received Fiscal Year Ending June 30th



*FY 2016-17 and FY 2017-18 are based on the actuarially required rate calculated by PSERS Actuary.

Employer Contribution Rate
(continued)

Impact of Benefit Cuts for New Members on or after July 1, 2011

For school employees who became new members of PSERS on or after July 1, 2011, there are two new classes; Class T-E and T-F. As of June 30, 2016, members hired since the passage of Act 120 now total approximately 58,000 and account for 23% of the total active membership.

Class T-E
- Pension multiplier is 2%
- Effective July 1, 2011 employee contribution base rate is 7.5% (base rate) with "shared risk" contribution levels between 7.5% and 9.5%

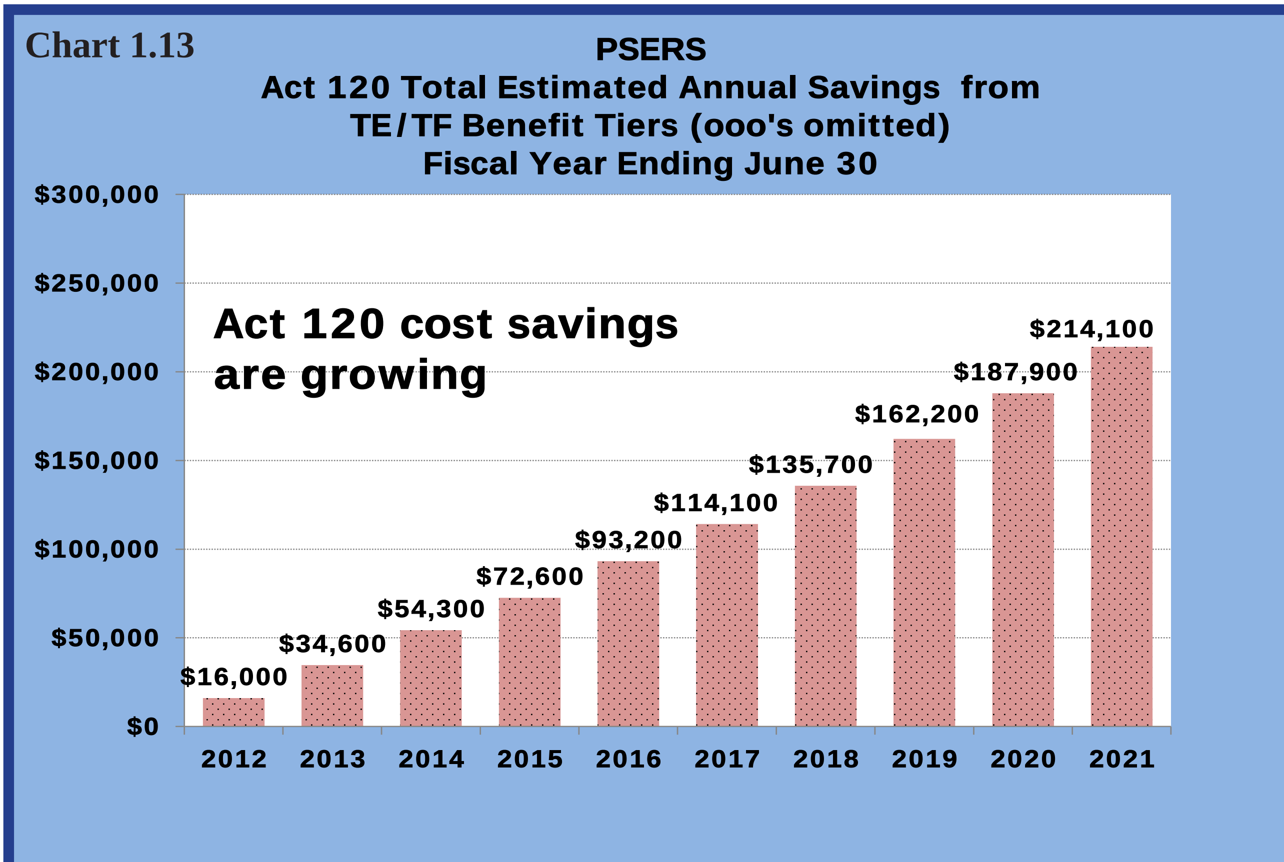
Class T-F
- Pension multiplier is 2.5%
- Effective July 1, 2011 employee contribution base rate is 10.3% (base rate) with "shared risk" contribution levels between 10.3% and 12.3%

Class T-E and T-F members share some of the risk when investments underperform. As a result of the Fund's 8.66% three year return through June 30, 2014 exceeding the investment performance hurdle mandated by Act 120, the member rate has not changed. The next three year investment performance measurement period for T-E/T-F members that could increase the member rate by .5% ends June 30, 2017.

The total estimated savings of the T-E/T-F Benefit Tiers is illustrated in Chart 1.13. As the membership grows, the annual savings from the low T-E/T-F cost structure also increases and allows a greater portion of employer contributions to go towards paying the unfunded liability. Cumulative estimated savings through June 30, 2016 were $270.7 million. The average member benefit for Act 120 members is approximately 32% lower than the benefit for pre-Act 120 members.

As of June 30, 2016, 9,293 or 16% of new members elected Class T-F and 48,628 or 84% of new members remained in Class T-E. As indicated, Class T-F members maintain the higher 2.5% pension multiplier but contribute at a higher member contribution rate than Class T-E members.

Chart 1.13



Employer Contribution Rate (continued)

Funding Changes - Employer Contributions

Act 120 of 2010 also 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.

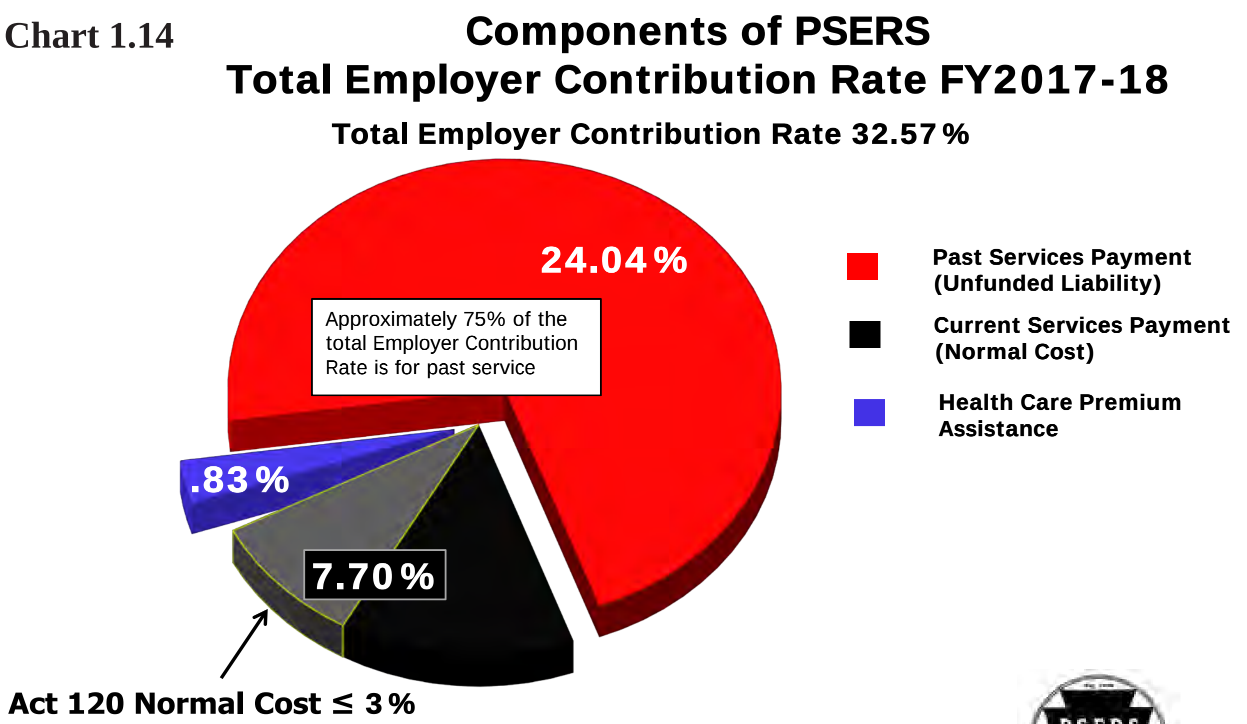
The Act 120 rate caps limited the amount the pension component of the employer contribution rate could increase over the prior year's rates.

PSERS' Board has approved a total employer contribution rate of 32.57% comprised of a pension contribution rate of 31.74% for FY 2017-18 which represents an increase of 2.54% over the FY 2016-17 rate of 29.20% and a healthcare rate of 0.83%.

Employer Contribution Rate

Chart 1.14 displays the components of PSERS' projected employer contribution rate of 32.57% in FY 2017-18. The majority of the rate, approximately 75%, is dedicated toward paying the cost of past service. The employers' cost for current service is a much smaller portion of the contribution rate and is projected to decrease each year as more Act 120 members join the System. The cost structure of PSERS' new members under Act 120 is low and the shared risk provisions shift a portion of the investment risk to active members giving PSERS a defined contribution element. Essentially, Act 120 provides the members with a defined benefit plan, which is both adequate and secure, and provides the employers with a low cost employee pension benefit funded in large part by the members who have also assumed some of the investment risk.

Chart 1.14

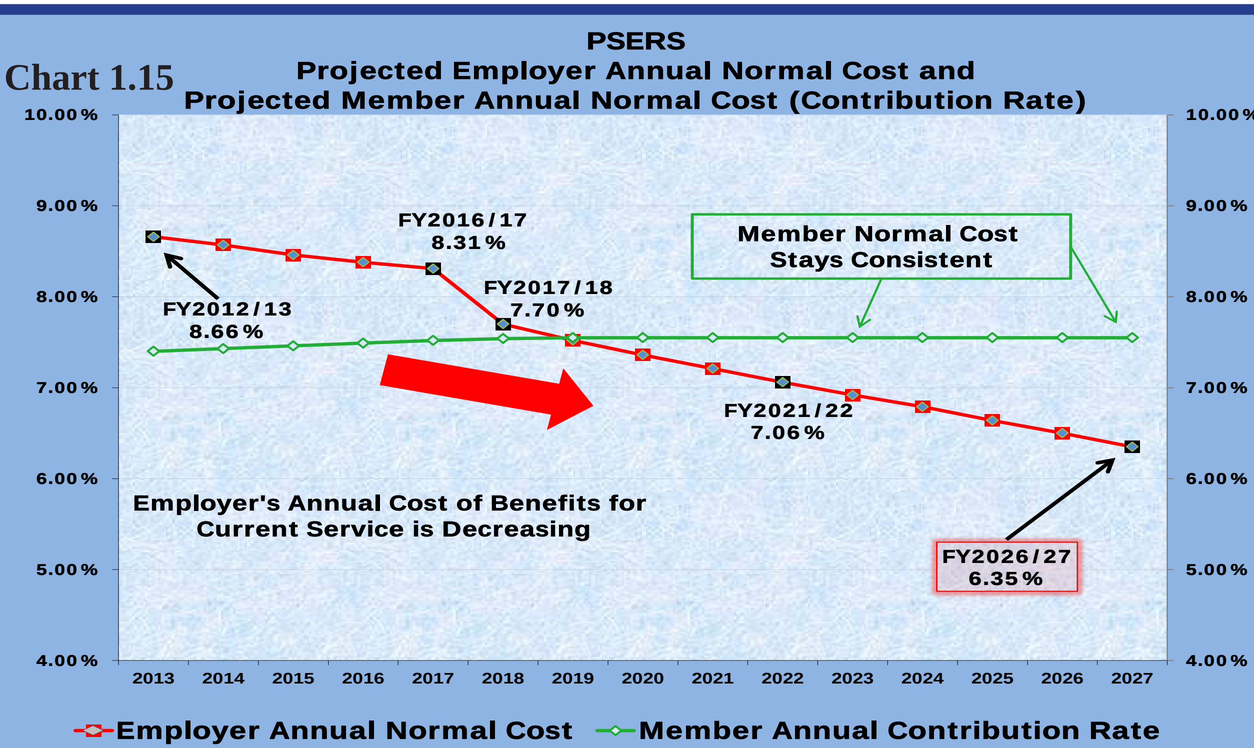


Employer Contribution Rate
(continued)

Act 120 Employer Costs

As Chart 1.15 depicts, the employer normal cost decreases over time as Act 120 members replace retiring pre-Act 120 members. The employer normal cost of current benefits earned by Act 120 members is less than 3% of payroll which is less than 65% of the normal cost for pre-Act 120 members. This represents a significant cost reduction for the employers. Chart 1.15 projects the employer normal cost to be 6.35% in FY 2026-27 when over 50% of active employees will be Act 120 members.

Chart 1.15



The Commonwealth's Department of Education School Employees Retirement Appropriation

The Commonwealth provides for its share of contributions to PSERS within the Department of Education budget. On average, the Commonwealth pays 56% of total employer contributions and employers pay for 44%. Table 1.10 illustrates the projected amounts of the Commonwealth's Appropriation for FY 2017-18 through FY 2021-22. As depicted, the Commonwealth's share of contributions are starting to level out as the year-over-year increases are smaller each year.

Table 1.10 Commonwealth's Department of Education School Employees' Retirement Appropriation

($ amounts in Billions)

	- - - - - - - - - - Projected - - - - - - - - -				
	2017-18	**2018-19**	**2019-20**	**2020-21**	**2021-22**
School Employees' Retirement	$ 2.304	$ 2.514	$ 2.683	$ 2.803	$ 2.911

Employer Contribution Rate (continued)

Legislative Pension Proposal Assistance

Throughout 2016, PSERS staff was actively engaged in providing actuarial data, legislative analyses and related technical information to members of the General Assembly and Executive Branch Officials on a range of pension policy proposals while remaining policy neutral. PSERS incurred over $320,000 in outside actuarial services from PSERS' actuary solely for numerous pension policy proposals during 2016.

PSERS staff also spent hundreds of hours on multiple variations of pension policy proposals. The cost work performed internally by PSERS staff saved over $100,000 in outside actuarial fees in 2016. PSERS legal staff also drafted hundreds of pages of draft legislation for numerous pension policy proposals.

PSERS will continue to cooperate with the General Assembly in its role as a technical expert in providing fact-based information to support efforts in determining effective pension policy. As in the past, PSERS will assist in drafting technically correct provisions and providing input on funding and operational aspects of various proposals, while remaining policy neutral on plan design elements of legislative proposals.

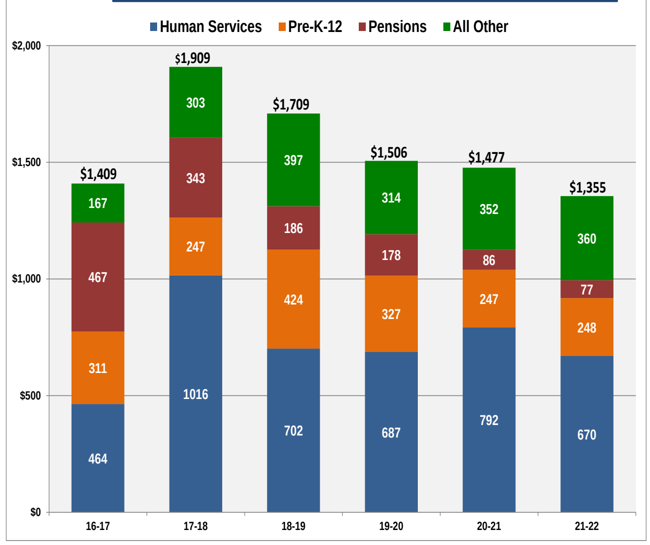
Recap

Act 120 reduced the employer's annual cost of benefits for members hired after June 30, 2011 by over 32% via member benefit reductions. However, a significant unfunded liability for service already rendered by pre-Act 120 members still remains to be paid. To address the underfunding which had taken place since FY 2000-01, Act 120 also included rate collars designed to systematically increase the employer contribution rate over several years to raise the funding to actuarially required levels. Now that this objective has been achieved, the rate collars no longer apply.

At its December 2016 meeting, PSERS Board of Trustees certified an annual contribution rate of 32.57% for FY 2017-18 which continues to put PSERS on the path towards full funding. For the second consecutive year, the Commonwealth's employer contribution rate provides 100% of the actuarially required rate based on sound actuarial practices and principles. After July 1, 2016, no additional pension debt will be added due to underfunding. Future contribution rates begin to level off after FY 2017-18 which will reduce budgetary pressure on the Commonwealth and school districts in FY 2018-19 and beyond. Future employer contribution rates will remain elevated for many years to compensate for 15 years of underfunding and to fully pay down the unfunded liability.

The Pennsylvania Independent Fiscal Office (IFO) has recognized the Commonwealth's progress on its pension funding issues. The IFO noted in its November 15, 2016 presentation that "Pension contribution growth decelerates dramatically after FY 2017-18." Also as shown in Chart 1.16, after FY 2017-18 pensions are no longer a major cost driver of Commonwealth expenditure growth.

Chart 1.16 Contributions to Expenditure Growth



PSERS is reaching a Turning Point under Act 120

After FY 2017-18, PSERS' funded ratio is projected to slowly improve after declining steadily since FY2001. As a result of these funding improvements, bond rating agencies have noted that the pension contribution increases borne by school employers and the Commonwealth will become more manageable. This is very important to note as the bond rating agencies' outlooks impact the Commonwealth's borrowing costs. This turning point represents a major step forward in PSERS' financial recovery and, as noted by Moody's, PSERS is on a path to full pension funding.

> "Moody's Investors Service has revised the Commonwealth of Pennsylvania's outlook to stable from negative…Further, the Commonwealth is on a solid (though slow) path toward full funding of its pension plans. Favorably, the most difficult phase of pension contribution ramp-ups is now in the rearview mirror, and the magnitude of annual pension contribution increases will be more manageable in the coming years."

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Section 2 - PSERS FY2017-18 Budget

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Consultants' Fees
($100,000 and Over)

Tables 6.1 and 6.2 list professional service firms under contract to provide services to PSERS during the fiscal year ended June 30, 2016.

Table 6.1	Investment and Pension Fund Administration Consultants		
Firm	**Services Provided**	**Consultant Fee**	
ViTech Systems Group, Inc.	Pension administration system services	$ 5,500,000	*
Greenhill Cogent, LP	Private market consulting	$ 2,914,331	
Portfolio Advisors, LLC	Private market consulting	$ 2,037,542	
Aksia LLC	Hedge fund investment consulting	$ 700,000	
AonHewitt	General investment consulting	$ 679,292	
Buck Consultants LLC	Pension benefit actuarial services	$ 644,679	*
Financial Control Systems, Inc.	Investment accounting application service provider	$ 643,256	
Courtland Partners, Ltd.	Real estate investment consulting	$ 278,750	
Gartner Group, Inc.	Information technology services	$ 273,190	
Glass, Lewis & Co., LLC	Proxy voting	$ 174,315	
OST, Inc.	Webmaster consulting	$ 146,614	

Table 6.2	Health Options and Premium Assistance Program Consultants		
Firm	**Services Provided**	**Consultant Fee**	
CoreSource, Inc.	Postemployment healthcare benefits administration and claims adjudication	$ 23,460,388	*
Optum Rx, Inc.	Administration of postemployment healthcare benefits and prescription drug plan	$ 6,806,395	*
The Segal Company, Inc.	Consulting services for the Health Options Program and prescription drug plan	$ 2,588,395	*
Independent Pharmaceutical Consultants, Inc.	Pharmacy benefit consulting services	$ 575,878	*
Healthways, Inc.	Administration of Silver Sneakers Fitness Program	$ 669,169	*

** Amounts as reported in PSERS' Comprehensive Annual Financial Report.*

Legislation

PSERS Related Legislation Activities during Calendar Year 2016

Act 13A of 2016

On July 8, 2016, Governor Wolf signed into law House Bill Number 2182, Printer's Number 3557. This legislation makes an appropriation in the amount of $44,739,000 from the Public School Employees' Retirement Fund to provide for the administrative expenses of PSERS for the fiscal year July 1, 2016 to June 30, 2017.

Pension Legislative Proposals

Throughout 2016, the PSERS staff was actively engaged in providing actuarial data, legislative analyses and related technical information to members of the General Assembly and Executive Branch Officials on a range of pension legislative proposals.

Public School Employees' Retirement System
Fiscal Year 2017-18 Administrative Budget

Table 7.1	Budget FY2015-2016	Budget FY2016-2017	PSERS' Budget Request FY2017-2018
Total Personnel Services	$ 25,483,000	$ 25,644,000	**$ 26,591,000**
Operating Expenses and Fixed Assets			
Travel	$ 146,750	$ 147,900	**$ 149,500**
Training & Conference Registration	154,400	133,300	**134,900**
Telecomm - Recurring	383,500	349,700	**362,200**
Telecomm - Non-Recurring	11,300	12,500	**13,000**
Telecomm - Voice Hardware less than $5,000	3,000	-	**5,000**
Electricity	35,000	35,000	**30,000**
Consultant Services - Non EDP	1,091,150	1,729,250	**2,026,900**
Consulting - Managed Services	1,111,600	1,631,000	**1,600,000**
Outsourced IT Consulting for apps & development	-	17,200	**-**
Consulting - Maint & Support - (post implementation)	45,000	79,800	**60,000**
Consulting - General IT Support	357,000	317,500	**193,500**
Consulting - Outsourced Infrastructure Svcs (DPH)	1,111,600	10,000	**10,000**
Legal Services/Fees	-	64,000	**64,000**
Specialized Services	405,100	427,300	**443,800**
Other Specialized Services	199,300	181,300	**194,700**
Advertising	10,000	10,000	**10,000**
Medical, Mental, & Dental Services	4,100	5,000	**4,000**
Software Licensing - Maintenance	1,124,200	1,608,700	**1,721,300**
Hardware Server - Maintenance	12,000	1,500	**1,000**
Hardware Network - Maintenance	21,500	22,000	**23,000**
Hardware Storage - Maintenance	88,000	33,400	**-**
Hardware Periph - Maintenance	8,000	8,000	**8,000**
Hardware Desktop - Maintenance	3,000	1,000	**1,000**
Contracted Maintenance Non EDP	143,840	153,500	**166,100**
Telecomm Data Services	82,000	87,700	**89,800**
Contracted Repairs - Non EDP	61,000	105,000	**15,200**
Real Estate Rental	1,998,200	2,006,000	**2,036,500**
Vehicle Rental	1,600	1,600	**2,600**
Office Equipment Rental	278,200	193,800	**201,000**
Other Rentals	44,360	3,900	**8,300**
Office Supplies	220,000	214,500	**211,500**
Educational Supplies (Books)	11,000	10,000	**9,000**
Medical Supplies	1,000	400	**2,600**

Public School Employees' Retirement System
Fiscal Year 2017-18 Administrative Budget
(continued)

Table 7.1	Budget FY2015-2016	Budget FY2016-2017	PSERS Budget Request FY2017-2018
Software License non-recurring less than $5,000	47,300	53,700	**71,600**
Hardware Desktop less than $5,000	56,000	76,000	**301,100**
Furniture and Fixtures	49,500	58,450	**58,100**
Other Equipment	2,000	2,000	**7,000**
Motorized Equipment Supplies	21,000	21,000	**21,000**
Postage	1,159,800	1,113,600	**1,091,800**
Freight	5,000	5,000	**5,000**
Printing	237,700	213,000	**212,500**
Subscriptions	110,200	306,000	**311,300**
Membership Dues	33,800	34,500	**35,200**
Conference Expense	49,000	49,000	**49,000**
Insurance, Surety, & Fidelity Bonds	23,000	23,000	**23,000**
Other Operational Expenses	1,927,000	1,963,000	**1,927,000**
Hardware-Server	-	-	**300,000**
Automobiles	20,000	40,000	**40,000**
Network Hardware	-	-	**165,000**
Purchase EDP - Computers	-	7,500	**-**
Software License non-recurring greater than $5,000	95,400	-	**-**
Software License recurring greater than $5,000	5,500,000	5,500,000	**4,805,000**
Office Equipment	24,600	27,500	**28,000**
Total Operating Expenses and Fixed Assets	$ 18,528,000	$ 19,095,000	**$ 19,250,000**
Total Administrative Budget	$ 44,011,000	$ 44,739,000	**$ 45,841,000**

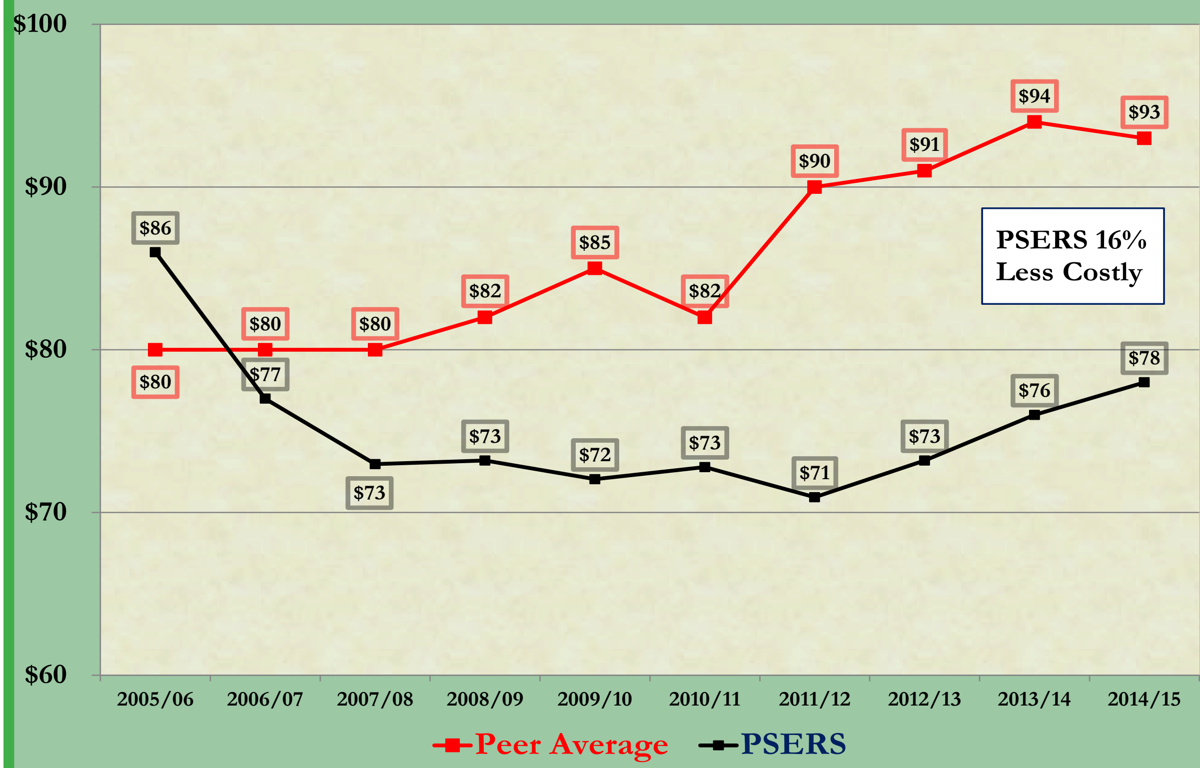
Administrative Budget

Table 7.1 displays PSERS Administrative Budget Request for FY 2017-18. The $45,841,000 administrative budget is not funded from the Commonwealth's General Fund, rather from the earnings of the Fund itself. PSERS has annually underspent its approved budget, keeping more funds available to invest for PSERS' members.

In FY 2016, PSERS entered into a new agreement for its hardware and server maintenance resulting in significant savings. PSERS reduced mailings to members, producing savings in both printing and postage costs. Working with its actuary, PSERS saved over $100,000 in actuarial fees by completing various analyses in-house. Other reductions were made to wages, overtime, travel, and training, all part of PSERS' ongoing efforts to control costs and improve operational efficiency.

Public School Employees' Retirement System
Fiscal Year 2017-18 Administrative Budget
(continued)

Chart 7.1 **CEM Surveys Comparison of PSERS Administrative Cost per Member (Active, Annuitants and Beneficiaries) Vs. Peer Average**



PSERS' Administrative Costs are Significantly Below Peers

PSERS participates in an independent, international benchmarking survey evaluating its costs and service performance in comparison to other similar public pension funds. Based on the results of the most recent survey, PSERS has 29% fewer full-time equivalent staff per member than the peer group average. Chart 7.1 above illustrates that PSERS had a 16% lower pension administration cost per member than the average cost for its peer group. By running a lean and efficient operation, PSERS saves the Commonwealth and school employers approximately $7.3 million annually compared to its peer funds.

PSERS Directed Commissions Recapture Program
(unaudited)

Directed Commissions Recapture is a program whereby a portion of commissions incurred by PSERS through investment trading activity is returned to PSERS. These funds can be used for the administration of the Fund or can be reinvested back into the asset allocation through a transfer to the PSERS Retirement Account. Expenditures paid from the Directed Commissions Recapture Program Budget have the same PSERS' internal approval process as any other expenditure made by the Fund.

Directed Commissions Recapture Program -
Directed Commissions Appropriation #6012700000

	Actual Expenditures FY2015-2016	Available FY2016-2017	PSERS' Budget FY2017-2018
Budgetary Reserve	-	$2,000,000	$2,000,000
Total	-	$2,000,000	$2,000,000

Section 3 - Investment Information

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Investment Policy

The Public School Employees' Retirement Board of Trustees (the Board) is responsible for, among other things, the formulation of an Investment Policy for the Public School Employees' Retirement System (the System). As articulated in the Public School Employees' Retirement Code 24 Pa. C.S. §8521(a), the Board and PSERS' staff delegated with investment authority must act in a manner consistent with the Prudent Investor Standard, which requires "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 Prudent Investor Standard recognizes modern portfolio theory and guides investment and management decisions respecting individual assets so that the trade-offs between risk and return for each asset are considered in the context of an overall investment strategy.

The System's Investment Policy Statement, Objectives, and Guidelines (the Policy), which is available at www.psers.state.pa.us, reflects the many implications of the Prudent Investor Standard. The Board reviews the Policy regularly, and makes changes as necessary. The Policy establishes clear criteria for the management of the assets by or on behalf of the Board. For example:

- The Board, PSERS' staff, investment consultants, and investment managers are assigned appropriate responsibilities and made to understand clearly the objectives and policies of the Board and the System;
- Allocation plans are prepared to guide the investment of the System's assets;
- Guidelines are established for each investment category so that asset quality, diversification, and return can be monitored;
- Investment managers are given guidance and limitations on the investment of the System's assets; and,
- The Board has created a meaningful basis for evaluating the investment performance of individual investment managers, as well as for evaluating overall success in meeting its objectives.

General Return and Risk Objectives

The System seeks to provide benefits to its members through a carefully planned and well-executed investment program, and the Policy identifies the following general return and risk objectives and constraints for its investments:

Return Objectives

- The assets of the System shall be invested to maximize the returns for the level of risk taken; and
- The System shall strive to achieve a return that exceeds the Policy Index.

Risk Objectives

- The assets of the System shall be diversified to minimize the risk of losses within any one asset class, investment type, industry or sector distribution, maturity date, or geographic location; and
- The System's assets shall be invested so that the probability of investment losses (as measured by the Policy Index) in excess of 15% in any one year is no greater than 2.5% (or two standard deviations below the expected return).

Constraints

- The System shall maintain adequate liquidity to meet required benefit payments to the System's beneficiaries;
- The System's assets shall be invested in a manner that is consistent with the System's long-term investment horizon; and,
- As a tax-exempt investor, the System's assets may be invested without distinction between returns generated from income and returns generated from capital gains.

Investment Risk Management

PSERS recognizes that risk management is an essential component of a prudent investment program. The implementation of a well-defined risk management framework improves the likelihood that the System is compensated adequately for the risks taken, and helps to avoid unexpected and unintended risks. Therefore, PSERS pursues a disciplined and advanced risk management approach. Through investment policies and guidelines, PSERS defines the amount of investment risk to be taken by the System, and how it is to be measured and monitored.

PSERS has created a practical framework that enables the System to implement risk-focused investment strategies, and transparently monitor active portfolio risks and returns relative to budgets and/or specific objectives. PSERS has identified over 100 specific investment risks for modeling and analysis, and categorizes those risks into the following broad classes:

- Market
- Fund and Portfolio
- Operational
- Liquidity, Leverage and Finance
- Legal
- Organizational

PSERS' team manages these broad classes of risk consistent with its long-term investment objectives.

Investment risk reflects the possibility that the future value of investments will deviate from targeted return objectives. This deviation often occurs as a result of changes in perception of market conditions, whether those changes are caused by factors specific to individual investments, classes of investments or factors affecting all investments simultaneously.

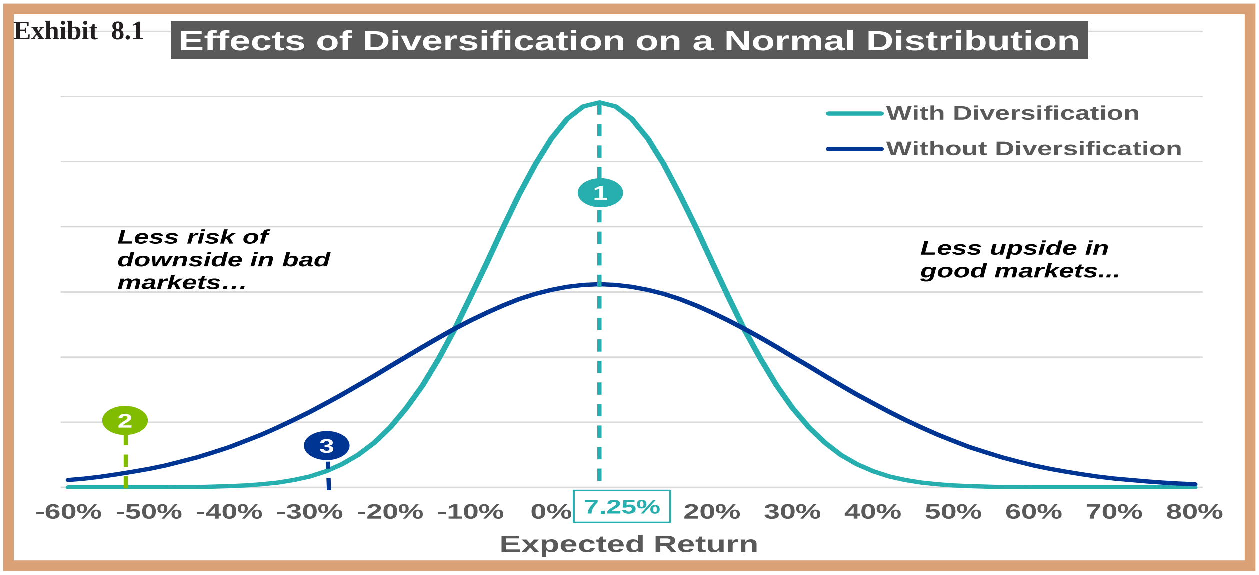
The goal of investment risk management is to find the appropriate balance between expected returns and the risks taken to generate those returns. An entirely risk-free investment portfolio that has a high probability of meeting all investment goals does not exist. Therefore, PSERS does not attempt to eliminate all risk but instead seeks to limit the possibility of permanent loss. Risk itself is neither good nor bad, but it is necessary that the System expose itself to some appropriate level of risk if it is to generate the investment returns required to maintain stable and cost-effective contribution rates. In positioning for future developments, PSERS cannot know with complete certainty how markets or particular investment strategies will perform, but can understand the future as a range of probabilities, some desirable and some not, and can position its current investments to guard against undesirable outcomes and to make desirable outcomes more likely.

Given its long-term investment horizon, PSERS accepts prudent investment risk in exchange for acceptable levels of additional incremental return. PSERS diversifies across investment categories, each having different characteristics across all market environments.

The benefit of a diversified portfolio is that it reduces the probability of outsized outcomes relative to return objectives. Diversification is the only "free lunch" in finance; excess volatility is damaging to PSERS' portfolio, while diversification is beneficial.

Exhibit 8.1 illustrates two distributions with the same expected return. The distribution shown in blue assumes a portfolio risk of 22.1%, which reflects 100% correlations between risk factors, while the green distribution reflects the risk of PSERS' portfolio which benefits from diversification. In the event of a negative two standard deviation move, the undiversified portfolio would experience losses more than double what the diversified portfolio would experience. In a normal distribution, the chance of a two standard deviation decline is approximately 2.3%.

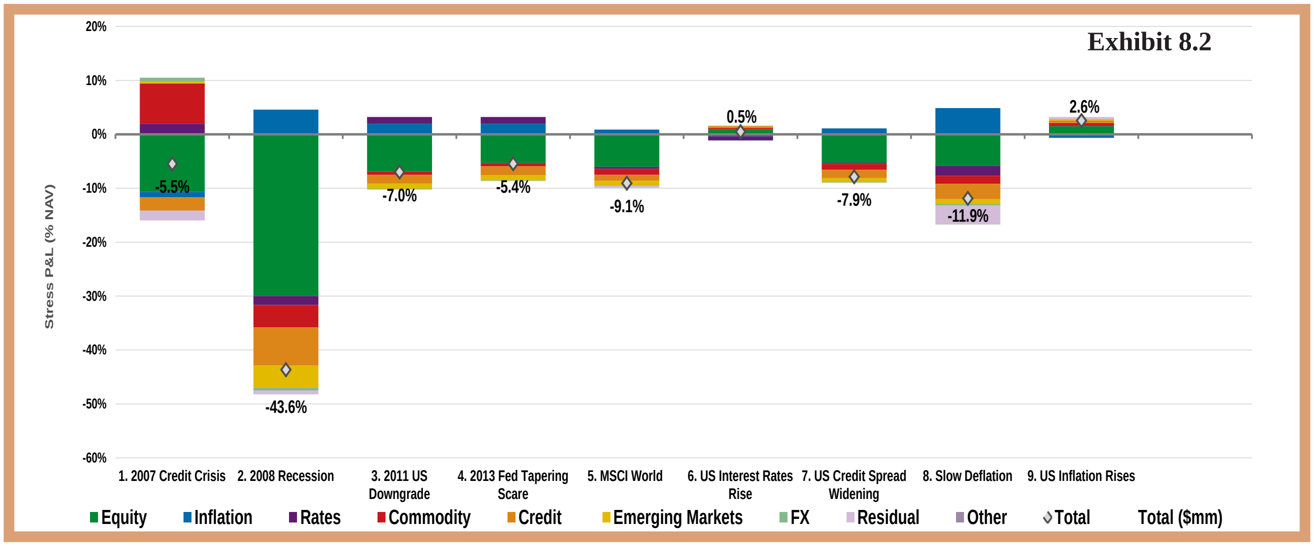
Exhibit 8.1



Investment Risk Management
(continued)

One way that PSERS assesses the amount of diversification in the portfolio is through stress testing. This is a process that quantifies anticipated portfolio losses under various calamitous market events. There are two types of stress tests: historical (meaningful actual past market events) and hypothetical (scenarios designed to reflect potentially calamitous market events).

Exhibit 8.2 below depicts several historical and hypothetical stress scenarios of PSERS' allocation as of June 30, 2016, and the impact of each as related to a series of common economic factors. Strategically, the exposures to each risk factor are driven by PSERS' asset allocation decisions, which could be tactically adjusted to the extent that a market event is likely, using stress scenarios to assist in these tactical decisions.



Capital Market Assumptions

Capital Market Assumptions (CMAs) are estimates of expected returns and risks for a given set of asset classes, and expectations of the relationship (correlations) between these asset classes over long periods of time. They are issued periodically by investment consultants, asset managers, and investment banks. Inflation, real short-term interest rates, and economic data frequently provide the foundation used by CMAs for expected returns across global asset classes. These are the primary building blocks for developing equity and fixed income returns expectations, which in turn are used in setting expectations for alternative asset class returns. PSERS collects and evaluates this information when considering its long-term actuarial rates of return assumptions and in setting its Asset Allocation Policy.

Compared to 2015, 2016 survey results under the 20-year forecast indicate an increase in return assumptions across most asset classes. Even with the increase, CMAs are forecasting slower growth and lower asset returns over the coming decade than has been experienced in past decades. Select asset classes are detailed in Table 8.1.

Fixed Income

Nominal government bond returns are a function of long-term expectations for inflation and government yields:

- Government bond yields rose in 2016 by 0.15-0.30%

Corporate bond returns are a function of expected inflation, government yields and expectations for credit spreads, defaults and downgrades. The majority of increase in corporate bond return assumptions can be explained by the increase in expectations for government bond yields and inflation as defaults, downgrades and spreads have been relatively stable.

Equities

Equity return assumptions are driven by market valuations, earnings growth expectations and assumed dividend payouts:

- Global equity assumptions have increased across all markets between 0.4% and 0.9% and are largely back to their 2013 levels

Equity market returns over the past two years have been driven by rising valuations rather than profits. A growing number of market participants worry that equities look expensive and there is an expectation for these market valuations to decline towards historical levels. With

Table 8.1 summarizes the average expected capital market 20 year geometric return assumptions of 20 to 30 surveyed independent investment advisors in 2013, 2014, 2015 and 2016:

Table 8.1 — **PSERS Capital Market Assumptions (CMAs)**

Average Expected Geometric Returns (2013 - 2016)

Asset Class	2013 Survey	2014 Survey	2015 Survey	2016 Survey
U.S. Equity - Large Cap	7.6%	7.4%	7.1%	7.9%
U.S. Equity - Small Cap	8.1%	7.7%	7.3%	8.2%
Non-U.S. Equity - Developed	8.0%	7.8%	7.5%	8.0%
Non-U.S. Equity - Emerging	9.1%	8.9%	8.7%	9.1%
U.S. Fixed Income - Core	3.4%	4.0%	3.7%	4.6%
U.S. Fixed Income - Long Duration Corp.	4.2%	4.9%	4.0%	4.9%
U.S. Fixed Income - High Yield	5.9%	6.0%	6.0%	6.8%
Non-U.S. Fixed Income - Developed	3.0%	3.5%	2.7%	3.7%
Non-U.S. Fixed Income - Emerging	5.4%	5.9%	6.0%	6.4%
Treasuries (Cash Equivalents)	2.2%	2.7%	2.4%	3.2%
TIPS (Inflation-Protected)	2.6%	3.5%	3.1%	3.9%
Real Estate	6.8%	6.5%	6.3%	6.8%
Hedge Funds	6.4%	6.3%	5.8%	6.2%
Commodities	5.1%	4.9%	4.4%	4.8%
Infrastructure	7.1%	7.8%	7.1%	7.1%
Private Equity	10.1%	9.8%	9.5%	10.3%
Inflation	2.5%	2.4%	2.2%	2.3%

Capital Market Assumptions
(continued)

that said, future return assumptions have been raised slightly, reflecting changes in the basis of government bond expectations.

Real Estate

Like equities, real estate assumptions have increased to their 2013 level due to an increase in the expected return on cash equivalents.

- Expected returns across the global real estate markets have increased by 0.5% over the past year back to 2013 assumptions

Hedge Funds

Recent structural changes within the hedge fund industry include a) improved information availability, b) lower leverage utilized, c) changing objectives, and d) dramatic increases in market players. However, while this has resulted in lower expected alpha opportunities for hedge funds generally, expected returns for 2016 have increased by 0.4% due to the increase in expected returns of cash equivalents.

An alternative approach to asset allocation that is sometimes suggested to pension plans is to establish a stereotypical 60% equity/40% fixed income policy that remains static over time. Tables 8.1 and 8.2 illustrate one reason why such an approach would not be prudent. Because PSERS can select from a broad array of asset allocation alternatives, we can analyze alternative allocation strategies using asset classes with varying expected returns and expected risk in order to formulate an optimal asset allocation policy most likely to achieve the investment return and investment risk goals established by the Board. In recent years, lower risk projections have afforded PSERS valuable flexibility in identifying different combinations of asset allocations that can achieve our current long-term goal of 7.25% at acceptable levels of risk even as return assumptions have fallen. Furthermore, PSERS applies leverage opportunistically in implementing its asset allocation policy, providing an additional mechanism to increase expected volatility in order to target higher expected return when warranted. A stereotypical 60%/40% strategy would have precluded such flexibility and exposed the system to artificial and harmful limits on our ability to manage the Fund.

The CMA surveys also included forecasts for 20 year average expected risk (Table 8.2). The numbers below reflect the expected standard deviation in % around the expected return.

Table 8.2 — **PSERS Capital Market Assumptions (CMAs)**

Average Expected Risk (2013 - 2016)

Asset Class	2013 Survey	2014 Survey	2015 Survey	2016 Survey
U.S. Equity - Large Cap	18.1%	17.5%	17.1%	16.9%
U.S. Equity - Small Cap	22.5%	21.1%	21.0%	21.0%
Non-U.S. Equity - Developed	20.5%	19.8%	19.6%	19.5%
Non-U.S. Equity - Emerging	27.5%	26.4%	26.6%	26.4%
U.S. Fixed Income - Core	5.3%	5.4%	5.6%	6.0%
U.S. Fixed Income - Long Duration Corp.	11.8%	11.3%	10.8%	10.5%
U.S. Fixed Income - High Yield	12.3%	11.5%	11.2%	11.0%
Non-U.S. Fixed Income - Developed	8.2%	7.6%	7.4%	7.6%
Non-U.S. Fixed Income - Emerging	12.4%	10.9%	11.7%	11.6%
Treasuries (Cash Equivalents)	1.8%	2.3%	2.8%	2.8%
TIPS (Inflation-Protected)	5.9%	6.3%	6.3%	6.5%
Real Estate	12.4%	13.1%	13.6%	14.7%
Hedge Funds	9.4%	9.0%	8.3%	8.4%
Commodities	18.5%	18.0%	18.0%	18.5%
Infrastructure	15.2%	13.5%	13.1%	13.8%
Private Equity	26.2%	24.8%	23.6%	23.1%
Inflation	2.0%	2.1%	1.8%	1.8%

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Asset Exposure

(as of June 30, 2016)

While the Board can choose to modify its asset allocation at any time it determines that changes are warranted (for example, due to changing liquidity circumstances or opportunities in the marketplace), the Board maintains a disciplined and thorough process to establish a new asset allocation policy annually. This process begins following the Board's review and acceptance of the actuary's annual report, as described in Tab 5. PSERS' staff and general investment consultant collaborate to analyze potential asset allocations (using actuarial as well as capital market return assumptions) in order to identify those potential asset allocations that meet the long-term return and risk objectives of the Fund. The Board is then presented with alternative asset allocations with detailed analysis of probable long-term return and risk characteristics from which it will select a new Asset Allocation Policy for further implementation by staff.

Table 9.1 represents PSERS' asset exposure and target allocation plan that became effective October 1, 2015, and was in effect on June 30, 2016:

Table 9.1 PSERS' Asset Exposure and Target Asset Allocation Plan

(as of June 30, 2016)

Asset Class	Market Value (in millions)	Percentage of Gross Asset Exposure	Percentage of Net Asset Exposure	Target Allocation %	Target Allocation Range
Global Public Market Equity:					
U.S. Equity	$ 3,790.3	6.8 %	7.8 %	8.4 %	
Non-U.S. Equity	6,370.9	11.4	13.1	13.1	
Total Global Public Market Equity	$ 10,161.2	18.2 %	20.9 %	21.5 %	
Private Markets	7,647.1	13.7	15.7	16.0	
Total Equity	**$ 17,808.3**	**31.9 %**	**36.6 %**	**37.5 %**	± 10%
Fixed Income*	**$ 16,177.1**	**28.9 %**	**33.2 %**	**31.5 %**	± 10%
Master Limited Partnerships	$ 2,299.2	4.1 %	4.7 %	4.0 %	
Commodities*	3,872.6	6.9	7.9	8.0	
Infrastructure*	504.7	0.9	1.0	1.0	
Real Estate*	5,709.7	10.2	11.7	12.0	
Total Real Asset Exposure	**$ 12,386.2**	**22.1 %**	**25.3 %**	**25.0 %**	± 10%
Risk Parity*	**$ 4,941.4**	**8.8 %**	**10.1 %**	**10.0 %**	± 5%
Absolute Return	**$ 4,608.1**	**8.2 %**	**9.5 %**	**10.0 %**	± 4%
Gross Asset Exposure	**$ 55,921.1**	**100.0 %**	**114.8 %**	**114.0 %**	
Financing*	**$ (7,201.3)**		**(14.8) %**	**(14.0) %**	
Net Asset Exposure	**$ 48,719.8**		**100.0 %**	**100.0 %**	

*PSERS uses financing to achieve increased economic exposure to diversifying asset classes to manage the overall portfolio risk while maintaining an allocation designed to achieve the long-term return goals of the System. Increased economic exposure is generally achieved through the use of either derivative positions or higher volatility funds. As of June 30, 2016, PSERS had total increased economic exposure of $7.2 billion related to the following asset classes: Fixed Income ($4.0 billion); Risk Parity ($0.6 billion); Infrastructure ($0.2 billion); Real Estate ($0.2 billion) and Commodities ($2.2 billion).

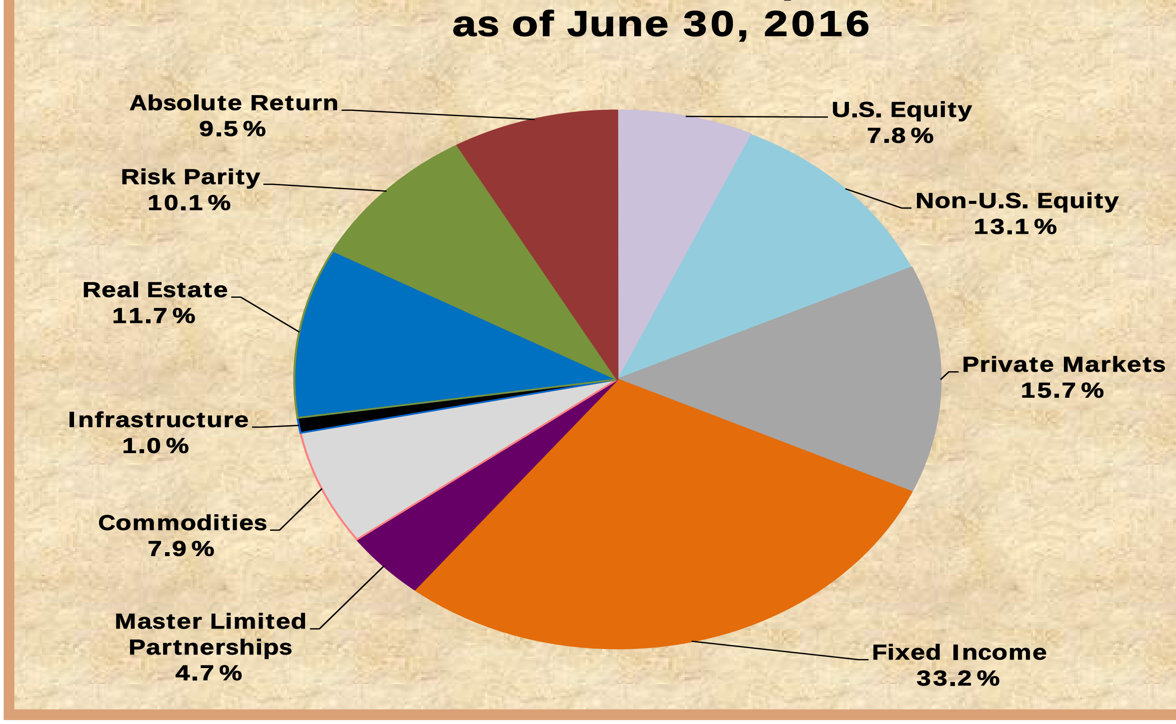
Note: PSERS' asset allocation was updated October 1, 2016, and is available for review at http://www.psers.state.pa.us.

Asset Exposure

(continued)

Chart 9.1 illustrates PSERS' asset allocation exposure as of June 30, 2016:

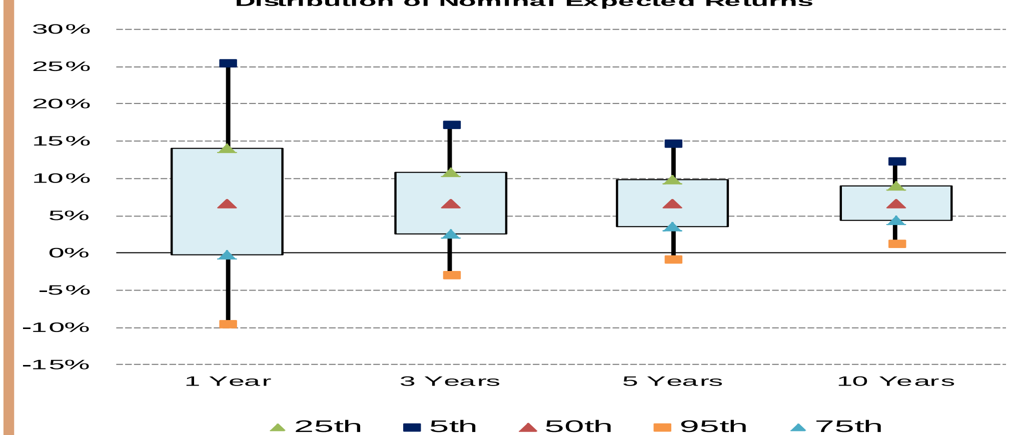
Chart 9.1



Note: Financing represents a negative 14.8% allocation and is not reflected in Chart 9.1.

The purpose of the asset allocation is to meet the long-term financial needs and investment objectives of the System. PSERS considers the expected range of returns for 1, 3, 5, and 10 year periods of various alternative asset allocations (as seen in Exhibit 9.1) to select the optimal asset allocation annually. While the range of returns can be high for any single year, volatility will decrease and converge around a median return over time. This is demonstrated in Exhibit 9.1 below, which depicts expected future returns for PSERS' current asset allocation:

Exhibit 9.1
Distribution of Nominal Expected Returns



Range of Returns

Percentiles	1 Year	3 Years	5 Years	10 Years
5%	25.6%	17.2%	14.7%	12.3%
25%	14.0%	10.9%	9.9%	8.9%
50%	6.6%	6.6%	6.6%	6.6%
75%	-0.3%	2.6%	3.5%	4.4%
95%	-9.4%	-3.0%	-0.9%	1.3%

Source: Aon Hewitt's 30-year capital market assumptions.

Public Market Global Equity Investments

Public Market Global Equity includes both U.S. Equity and Non-U.S. Equity investments. PSERS' investment plan diversifies equity investments and balances equity management styles. Equities are utilized by the Fund primarily because their expected large return premiums versus inflation will, if realized, help preserve and enhance the real value of the Fund over long periods of time. Equities tend to perform well when economic growth is stronger than expected or inflation is lower than expected. The Public Market Global Equity Exposure asset class is managed on a total return basis.

Equity investments consist almost entirely of publicly-traded securities listed on major world-wide stock exchanges or derivatives such as swaps or listed futures that replicate the performance of equity indexes such as the S&P 500 Index. Swaps and futures are employed by PSERS' to equitize cash.

PSERS' Asset Allocation targets an eventual allocation of 21.5% of assets to Global Public Market Equity. PSERS contracts with external investment managers and also uses internal portfolio managers to manage Public Market Equity portfolios.

Private Market Investments

Private Market investments provide the opportunity to negotiate and set a price between the owner of a business and the buyer/investor in a private fashion. There exists a very large private economy of companies with various needs (for example, operating expertise, capital to grow their businesses, and an exit out of family businesses). In public equity markets, thousands of buyers and sellers set prices of securities issued by companies every day, however no such mechanism exists in the private markets. Thus, private markets provide fertile grounds for investing.

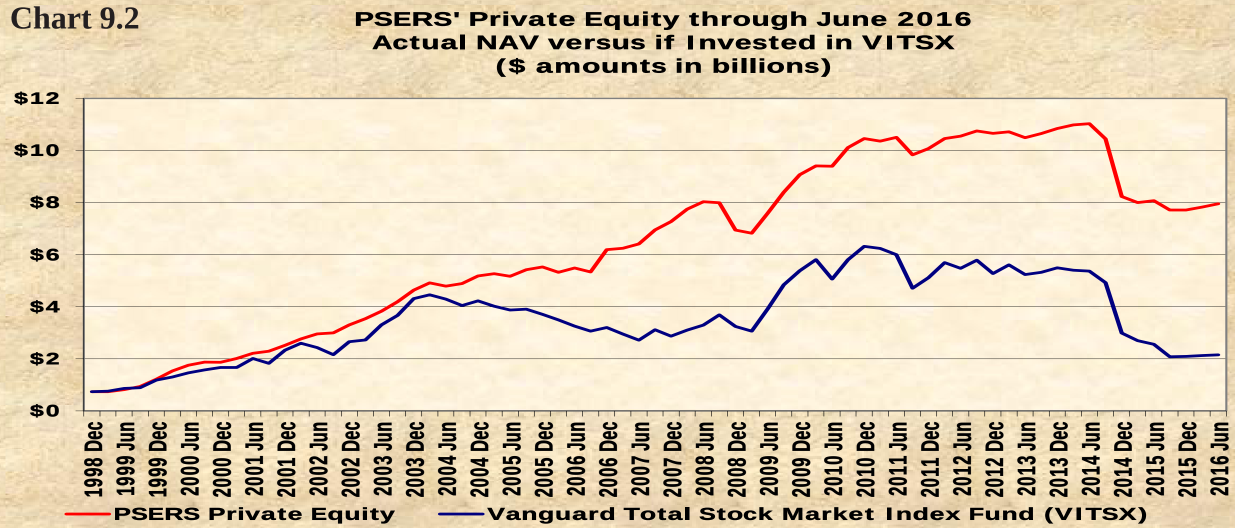
For the Private Markets investment program, PSERS' long-term investment objective is to achieve a risk-adjusted total return, net of fees, that exceeds market returns for similar investments. The primary vehicle used to invest funds in this asset class is the limited partnership. Individual management groups selected by PSERS form these partnerships for the purpose of investing in and managing private equity and unlisted-subordinated debt positions on behalf of PSERS and other limited partners. PSERS' Asset Allocation currently targets an allocation of 16.0% to Private Market investments.

As an example of PSERS' private markets success, PSERS has modeled, in Chart 9.2, what its returns would have been if, instead of investing in Private Equity, the cash flows into/out of Private Equity investments were made into/out of a very low cost mutual fund that seeks to replicate the U.S. equity market. PSERS chose the Vanguard Total Stock Market Index Fund (VITSX) due to its low cost (currently 0.03%) and its success at closely matching the returns of the overall U.S. stock market. Private Market Investment sub-asset classes include:

Private Equity involves investments in private companies which normally do not have technology risk associated with traditional venture capital investments. It has evolved to include the financing of more mature, profitable companies that do not have access to, or qualify for, public equity and debt funding.

Chart 9.2 tracks the performance of PSERS Private Equity program versus the performance of the Vanguard Total Stock Market Index Fund from December 1998 through June 2016. PSERS has been able to generate almost $6 billion in incremental value, net of all fees and costs, versus the passive, low cost index approach to equity investing.

Chart 9.2



Private Market Investments
(continued)

Table 9.2 reflects the more recent total returns for the past 10 years (through June 30, 2016) for PSERS' Private Equity Program, the Vanguard Total Stock Market Index Fund (VITSX), the PSERS' Internally-Managed S&P 500 Index Fund (PSERS 500) and the Vanguard 500 Index Fund Admiral Shares (VFIAX) (VITSX, VFIAX, and PSERS 500 with dividends re-invested):

Table 9.2 10 Year Return Comparison

	10 Year, Net of Fee Return (June 2006 - June 2016)
PSERS' Private Equity Program	**9.63%**
Vanguard Total Stock Market Index (VITSX)	**7.59%**
PSERS' Internally-Managed S&P 500 Index Fund	**7.81%**
Vanguard 500 Index Fund Admiral Shares (VFIAX)	**7.41%**

Venture Capital is considered the financing of young, relatively small, rapidly growing companies. In traditional venture capital investments, companies have a 5-10 year investment horizon and develop technology for a particular market, such as pharmaceuticals, software, medical products, etc.

Private Debt involves investments in the secured and/or unsecured debt obligations of private and/or public companies. This debt is typically acquired through directly negotiated or competitively bid transactions. Owners of these debt instruments typically take either an active or passive role in the management of the firm.

PSERS Private Market Internal Co-Investment Program consists of co-investments made alongside of General Partners with whom PSERS has a strong relationship. These relationships aid in the generation of deal flow for investments and also serve as additional due diligence for the evaluation of General Partners. The investments have the potential for higher returns as they have low or no fees and no profit sharing. This program also provides PSERS with the ability to buy secondary interests in funds from other Limited Partners usually at a discount to net asset value.

Fixed Income Investments

Fixed Income investments include a wide variety of bonds and similar securities which allow PSERS to diversify Fixed Income investments and balance Fixed Income management styles. PSERS contracts with external investment managers and also uses internal portfolio managers to manage Fixed Income portfolios.

Fixed Income securities are used for a variety of purposes as follows:

Nominal bonds are used for their ability to serve as a hedge against disinflation and/or deflation, their general ability to produce current income in the form of periodic interest payments, and their ability to provide sufficient liquidity to meet the Fund's obligations to pay member benefits and support other investment commitments. Nominal bonds tend to do well when growth is weaker than expected or when inflation is lower than expected;

Inflation-linked bonds are used for their ability to serve as a hedge against inflation, their general ability to produce current income in the form of periodic interest payments, and their ability to provide sufficient liquidity to meet the Fund's obligations to pay member benefits and support other investment commitments. Inflation-linked bonds tend to do well when growth is weaker than expected or when inflation is higher than expected; and

High yield securities and emerging market bonds are used for their ability to generate high current income in the form of periodic interest payments as well as offering greater total return opportunities than high grade debt. High yield securities and emerging market bonds tend to do well when growth is stronger than expected.

PSERS' Asset Allocation targets an eventual allocation of 31.5% of assets to Fixed Income, 8.5% of which is designated to Investment Grade, 8.0% of which is designated to Credit-Related, 12.0% of which is designated to TIPS strategies, and 3.0% designated to Cash.

Master Limited Partnerships

Master Limited Partnership (MLP) securities, which are publicly traded on a securities exchange, avoid federal and state income taxes by meeting specific qualifications of the IRS related to the production, processing or transportation of oil, natural gas, and coal. MLP securities are utilized by the System due to their low correlation to stock and bond returns, attractive growth characteristics, and their ability to produce current income in the form of periodic distributions. MLP securities tend to do well when economic growth is stronger than expected and when inflation is higher than expected. PSERS contracts with external investment managers and also uses internal portfolio managers to manage MLP portfolios.

PSERS' Asset Allocation currently targets an allocation of 4.0% of assets to MLP investments and consists of both actively managed and passively managed portfolios.

Commodity Investments

Commodity investments such as gold, oil and wheat, are utilized by the Fund for diversification within the portfolio and to act as a hedge against unanticipated inflation. The prices of commodities are determined primarily by near-term events in global supply and demand conditions and are positively related with both the level of inflation and the changes in the rate of inflation. However, stock and bond valuations are based on longer-term expectations and react negatively to inflation. Therefore, commodity returns have had a historically negative correlation to stock and bond returns since commodities tend to do very well in periods of rising inflation. As such, commodities, when combined with stocks and bonds, lower the risk of a portfolio. PSERS contracts with external investment managers and also uses internal portfolio managers to manage Commodity portfolios.

PSERS' Asset Allocation currently targets an allocation of 8.0% of assets to Commodity investments which includes a 5.0% target allocation to a Diversified Commodity Bucket and a 3.0% asset allocation to Gold. Gold is particularly useful as a contra-currency to provide protection against the debasement of fiat currencies in periods of monetary inflation.

Infrastructure Investments

Infrastucture investments target stable, defensive investments primarily within the energy, power, water, and transportation sectors. The program plays a strategic role within the System by providing steady returns and cash yields, defensive growth, inflation protection, capital preservation and diversification benefits. Historically, Infrastructure investments have performed better in environments of falling growth and falling inflation. PSERS contracts with external investment managers and also uses internal portfolio managers to manage Infrastructure portfolios.

PSERS' Asset Allocation currently targets an allocation of 1.0% of assets in Infrastructure investments.

Real Estate Investments

Real Estate investments provide PSERS exposure to real property directly or indirectly through global publicly-traded real estate securities (PTRES), direct investments, commingled fund investments, limited partnerships, and direct private placements. This is done in a prudent manner to create a diversified real estate portfolio of high quality investments which will enhance PSERS' overall long-term investment performance, diversify the asset base, and reduce the volatility of the total investment portfolio returns. Real Estate investments tend to perform well in periods of stronger than expected growth and lower than expected inflation.

The real estate program is designed to create the highest possible risk-adjusted returns in a controlled, coordinated, and comprehensive manner. Recognizing that real estate market conditions and PSERS' objectives for real estate may change over time, the program is reviewed periodically and updated as needed. The existing target allocation is 12.0% of total assets, of which 11.0% is designated for Private Real Estate and 1.0% for PTRES.

PSERS seeks to diversify its real estate portfolio by investing in a mix of Opportunistic (30%), Value Added (50%) and Core (20%) real estate investments.

Opportunistic real estate investing is the financing, acquisition or investment in real estate assets, real estate companies, portfolios of real estate assets, and private and public Real Estate Investment Trusts (REIT's) that do not have access to traditional public equity or debt financing. Opportunistic real estate consists of investment strategies that seek to exploit market inefficiencies with an emphasis on total return. Opportunistic investments require specialized expertise and the flexibility to respond quickly to market imbalances or changing market conditions. Investments may include non-traditional property types and/or assets that involve development, re-development, or leasing risks.

Real Estate Investments (continued)

Value Added real estate investing typically focuses on both income growth and appreciation potential, where opportunities created by dislocations and inefficiencies between and within segments of the real estate capital markets are capitalized upon to enhance returns. Investments can include high-yield equity and debt investments and undervalued or impaired properties in need of repositioning, re-development, or leasing.

Core real estate investing is the financing, acquisition or investment in real estate assets, real estate companies, portfolios of real estate assets, and private REITs that are broadly diversified by property type and location, focused primarily on completed, well-leased properties with modest levels of leasing risk, using relatively low leverage, and investing mainly in institutional property types and qualities allowing for relative ease of resale.

PSERS Real Estate Internal Co-Investment Program consists of co-investments made alongside of General Partners with whom PSERS has a strong relationship. These relationships aid in the generation of deal flow for investments and also serve as additional due diligence for the evaluation of General Partners. The investments have the potential for higher returns as they have low or no fees and no profit sharing. This program also provides PSERS with the ability to buy secondary interests in funds from other Limited Partners usually at a discount to net asset value.

Risk Parity Investments

Risk Parity investments are designed to generate investment returns through a more diversified allocation by endeavoring to balance market risk factor exposures as opposed to capital exposures. PSERS' Risk Parity investment managers each have proprietary methods to define and measure the risk factors upon which they manage their portfolios. Inclusion of this asset class is expected to reduce the portfolio's overall risk exposure over long-term horizons because it is designed to be more resistant to market downturns than traditional investment strategies, and further enhances the System's diversification due to the risk-balancing portfolio construction. Risk Parity portfolios are designed to perform consistently well in periods of rising or falling growth or inflation. PSERS contracts with external investment managers and also uses internal portfolio managers to manage Risk Parity portfolios.

PSERS' Asset Allocation currently targets an allocation of 10.0% of assets to Risk Parity investments. The Risk Parity investments are targeted to be 100% actively managed.

Absolute Return Investments

Absolute Return investments, sometimes referred to as hedge funds, are used by the Fund primarily to generate returns that are uncorrelated to the equities, fixed income, and commodities asset classes and to diversify the overall Fund. As such, returns are driven more by manager skill than changes in economic growth and inflation which affects other financial assets. PSERS contracts with external investment managers to manage Absolute Return portfolios.

Absolute Return investments are made in a variety of unique, non-directional investment strategies, including global macro, relative value, event driven, capital structure arbitrage, reinsurance, volatility and other opportunistic strategies. The Fund diversifies this program by manager and style.

PSERS' Asset Allocation currently targets an allocation of 10.0% of assets in Absolute Return investments.

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Performance

PSERS' general investment consultant calculates the total investment return of the System as well as the performance of each external investment management firm and each internal investment manager retained by the Board to invest the System's assets. Performance is calculated using a time-weighted return methodology. For the one-year period ended June 30, 2016, the System generated a total net of fee return of 1.29%. This return fell below the Total Fund Policy Index return of 2.00% by 71 basis points. Annualized total net of fee returns for the three-, five-, and ten-year periods ended June 30, 2016 were 6.24%, 6.01%, and 4.94%, respectively. The three-, five- and ten-year returns ended June 30, 2016, exceeded the Total Fund Policy Index returns by 105, 150, and 102 basis points, respectively.

Table 10.1 provides the System's total time-weighted investment returns for each major asset class and the total portfolio, including, where applicable and available, respective benchmark indexes used by asset class and median performance by asset class:

Table 10.1	Annualized Total Returns (%) Net of Fees Ended June 30, 2016			
	1 Year	3 Years	5 Years	10 Years
PSERS Total Portfolio	**1.29**	**6.24**	**6.01**	**4.94**
Total Fund Policy Index	2.00	5.19	4.51	3.92
Median Public Defined Benefit Plan (DBP) Fund Universe (Aon Hewitt Database)	0.26	6.36	6.27	5.49
PSERS U.S. Equity Portfolios	**3.79**	**11.47**	**11.83**	**7.23**
U.S. Equity Policy Index (1)	2.25	11.18	11.61	7.39
PSERS Non-U.S. Equity Portfolios	**-8.25**	**5.76**	**3.59**	**4.68**
Non-U.S. Equity Policy Index (2)	-9.38	5.25	2.50	3.50
PSERS Fixed Income Portfolios (10)	**6.42**	**6.02**	**5.98**	**7.40**
Fixed Income Policy Index (3)	6.32	3.82	3.60	6.34
PSERS Commodity Portfolios (10)	**-1.34**	**-4.01**	**-6.66**	**N/A**
Commodity Policy Index (4)	-4.58	-6.01	-8.13	N/A
PSERS Absolute Return Portfolios	**-3.43**	**2.43**	**2.88**	**5.12**
Absolute Return Policy Index (5)	4.01	5.08	6.04	7.02
PSERS Risk Parity Portfolios (11)	**0.01**	**5.40**	**N/A**	**N/A**
Risk Parity Policy Index (6)	5.13	6.69	N/A	N/A
PSERS Master Limited Partnership (MLP) Portfolios	**-18.75**	**-0.24**	**9.13**	**N/A**
Standard & Poor's MLP Index	-18.93	-5.44	3.36	N/A
PSERS Real Estate (7) (10)	**8.86**	**13.03**	**11.09**	**2.51**
Blended Real Estate Index (8)	5.71	10.41	10.14	6.76
PSERS Alternative Investments (7)	**3.44**	**6.65**	**7.93**	**9.63**
Burgiss Median, Vintage Year Weighted Index (9)	2.11	4.63	4.54	4.06

Footnotes to the Total Portfolio are available on page 75 of PSERS Consolidated Annual Financial Report.

Performance
(continued)

The past fiscal year was a challenging year for the System with a net of fee return of 1.29%. The following asset classes generated solid returns this past fiscal year:

- U.S. Long Treasuries, as represented by the Barclays Capital U.S. Treasury Long Index, were up 19.30%. Returns in long-term treasuries were driven by falling interest rates and increased demand for safe haven assets, especially from foreign investors who were looking for assets with positive yields;

- Gold, as represented by the Bloomberg Gold Index, was up 12.23%. Gold represents a safe haven asset that has benefited from global uncertainty and ultra-low and negative interest rates in many global markets; and

- Real Estate, as represented by a blended benchmark consisting of the National Council of Real Estate Investment Fiduciaries (NCREIF) – Open End Diversified Core Equity (ODCE) Index and Burgiss Private iQ (for Value-Added Real Estate and Opportunistic Real Estate), was up 5.71%, as fundamentals were strong and capitalization rates fell driving real estate prices higher.

Significant detractors from performance this past fiscal year included:

- Master Limited Partnerships (MLPs), as represented by the Standard & Poor's MLP Index, were down 18.93% driven by falling oil prices and reduced expectations for ongoing growth; and

- Commodities, as represented by the Bloomberg Commodity Index, were down 13.34% led by a fall in oil prices. Crude oil futures fell from $59.47 a barrel on June 30, 2015, to $48.33 a barrel on June 30, 2016. Prices fell due to a large supply glut driven by increasing shale production in the U.S and slow global growth.

As noted, the best performing asset class this past fiscal year was U.S. long-term treasury bonds, which were up over 19%. Coming into the fiscal year, the 30-year U.S. Treasury bond yielded 3.12%, meaning that if an investor had purchased that bond on June 30, 2015, and held that bond to maturity, the investor's total annualized return would be 3.12%. Not many investors with return targets of 7.0%+ were holding a lot of long U.S. Treasuries due to their low absolute yields. However, yields fell during the fiscal year as the Fed backed away from expectations of multiple interest rate hikes which caused bond prices to rise and yields to fall. By June 30, 2016, the yield on the 30-year Treasury bond had fallen 0.83% to 2.29%, generating a total return for the year significantly higher than 3.12%. This illustrates the importance of diversification. Many investment professionals discuss diversification using terms such as standard deviation, correlation, and co-variance. However, at its most basic level, diversification is insurance against bad outcomes. The System diversifies simply because it doesn't know how actual events in the future will transpire relative to what is priced into the market. Diversification is a very humble approach to investing. If an investor knew with certainty which asset class would perform best the next month, quarter, or year, the investor would simply invest in that one asset class. However, without such perfect foresight, the downside risk of such a strategy could be devastating. Diversification into asset classes such as non-U.S. equities, commodities and MLPs resulted in a drag on overall performance during this past fiscal year.

In analyzing performance, PSERS' Board, general investment consultant and staff pay particular attention to the Sharpe ratio, which tells an investor what portion of a portfolio's performance is associated with risk taking. The Sharpe ratio measures a portfolio's added value relative to its total risk; the higher a portfolio's Sharpe ratio, the better its risk-adjusted return. PSERS' Sharpe ratio, as calculated by the general investment consultant, was 1.64 for the 5 year period ending September 30, 2016, a top 20th percentile score.

The fiscal year was a tale of two halves. The first seven and a half months (July 1, 2015 to February 11, 2016) were weak, marked by a Fed rate hike in December, expectations of multiple interest rate hikes in 2016, and risk assets falling in price. The MSCI All Country World Index, a global equity index, fell by 16.6% during this period, only to rebound 13.0% from the middle of February to June 30, 2016, for a total return of negative 3.1% for the fiscal year. Commodities fell by 27.9% during the first seven and a half months, but rebounded 20.3% during the remainder of the year for a total return of negative 13.3%. U.S. long-term treasuries were up 14.0% during the first half and continued to rise another 4.6% during the second half for a total return of 19.3%. Prior to February 11, 2016, the market was pricing in multiple Fed interest rate hikes for 2016. What changed on February 11, 2016? Fed Chair Janet Yellen gave her semi-annual testimony to Congress which was interpreted by the market as very dovish remarks, meaning the pace and number of interest rate increases priced into the market were too aggressive. This meant that the discount rate used to value assets was now too high and a falling discount rate generally translates into higher asset values. In addition, given the expectation that interest rates would remain lower for longer periods of time, the prospects for economic growth improved which also needed to be priced into markets. Finally, the United Kingdom (U.K.) held a non-binding referendum on June 23, 2016, to determine if the U.K. would remain in or leave the European Union (EU),

Performance
(continued)

where the U.K. had been a member since being admitted in 1973. The long-term impacts of the “Brexit” vote have yet to be determined, however many global markets reacted strongly immediately after the vote.

While it has been a challenging return environment as evidenced by the System’s one-, three-, five-, and ten-year returns, since the first quarter after the Great Recession, PSERS’ annualized net of fee return has been 9.16%, comfortably above the actuarial assumed rate of return of 7.25%. With cash rates below 1%, the System needs to take prudent risks to achieve its long-term goal of a 7.25% return. An important concept to remember from the last sentence is “long-term”. The System has built a diversified allocation to allow it to collect risk premiums over the long-term. In the short-term, no one knows what will happen and the System can go through periods of time of sub-7.25% annual returns. The System continues to believe the best way to achieve its long-term objectives is to maintain a very diversified portfolio which includes all asset classes available to it, such as equities, fixed income, real assets, risk parity and absolute return. In any given year, the System expects some assets to perform well, such as U.S. long-term treasuries, real estate, and gold did this past fiscal year, and some to not do as well, such as non-U.S. equities, MLPs and commodities did this past fiscal year. However, over the long run, the System expects each of its asset classes to generate a positive return commensurate with the risks taken. The future is uncertain, but PSERS believes it is well positioned to accomplish its objectives.

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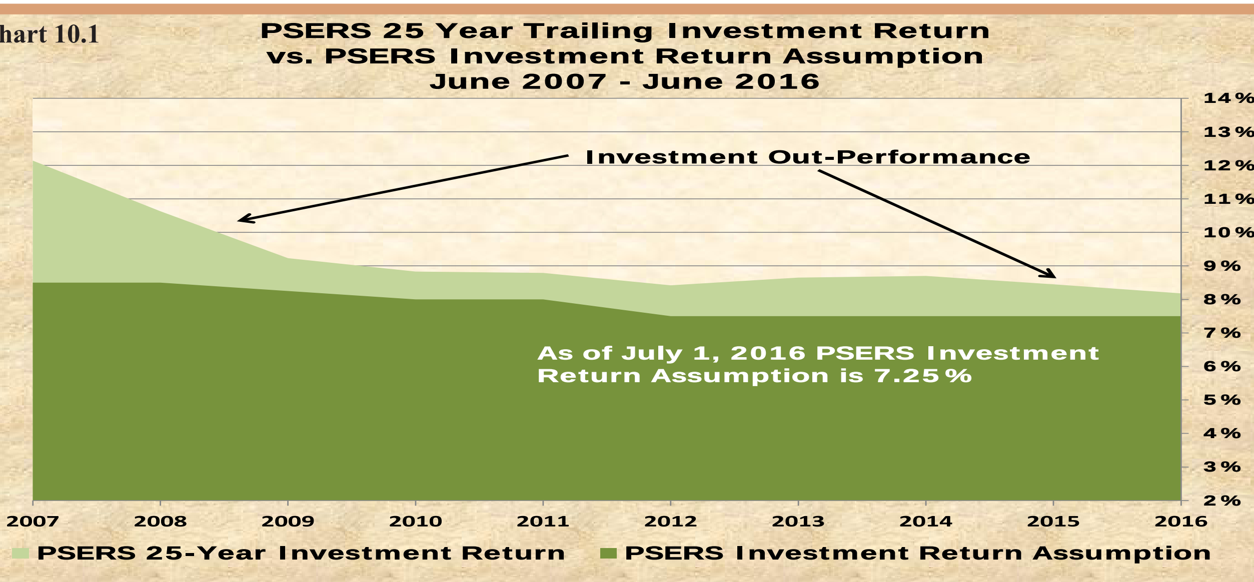
Performance (continued)

Long Term Investment Performance Consistently Outperforms

The assets of the System are invested to maximize the returns for the level of risk taken. Chart 10.1 shows PSERS' 25 Year Trailing Investment Return for each of the past 10 fiscal years and Chart 10.2 depicts PSER'S Fiscal Year Investment Returns, versus PSERS' Investment Return Assumption for the past 10 fiscal years.

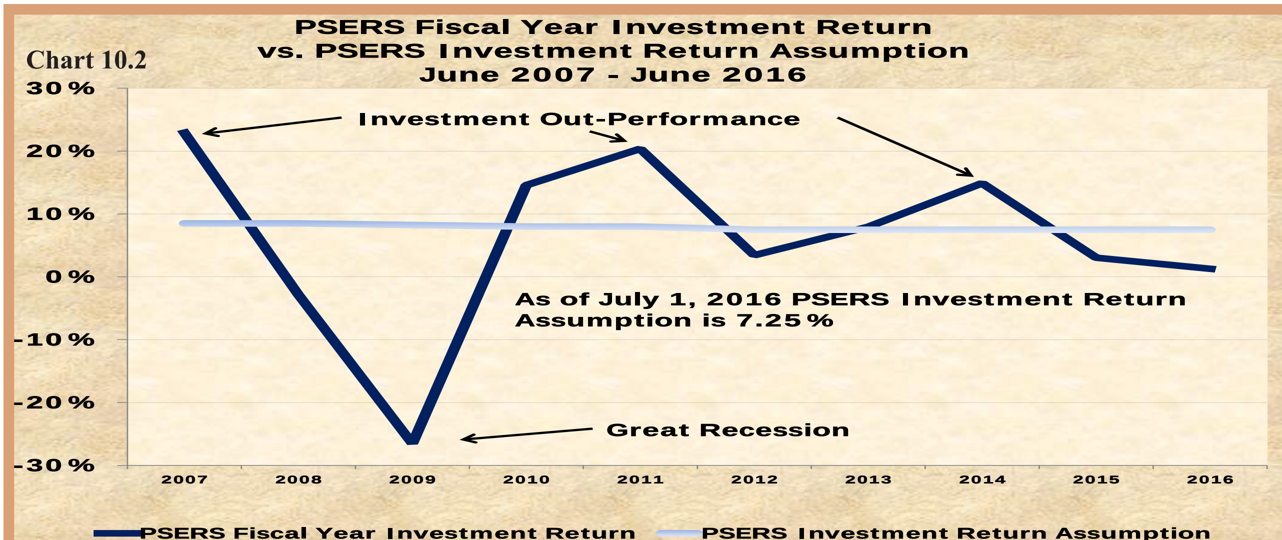
As shown in Chart 10.1, the 25 year trailing investment return has exceeded the investment return assumption over the last ten years including the Great Recession.

Chart 10.1



As depicted in chart 10.2, PSERS' one-year investment return has remained above the investment return assumption for five of the past ten fiscal years. The notable exception is the period of the Great Recession from December 2007 through June 2009 which resulted in the largest decrease in stock market performance since the Great Depression.

Chart 10.2



Performance (continued)

Table 10.2 demonstrates that over the past 17 fiscal years, on average, every dollar PSERS has spent in investment fees and expenses has resulted in investment earnings of $3.05 above the Policy Benchmark's dollar returns.

Table 10.2 PSERS' Investment Earnings over Policy Benchmark
Fiscal Years Ended June 30
(Dollar Amounts in Millions)

Fiscal Year	*Total Investment Expenses**	*PSERS' Net Return over Policy Benchmark (AFTER Payment of all Expenses)*	*PSERS' Investment Earnings over Policy Benchmark Net of Total Investment Expenses**	*$1 of Investment Expenses Translates into $$$ in Excess Earnings*
2016	$ 416	(0.71)%	$ (339)	$ 0.19
2015	455	1.02%	497	2.09
2014	482	2.74%	1,519	4.15
2013	558	2.28%	1,243	3.23
2012	481	1.45%	900	2.87
2011	515	2.81%	1,573	4.05
2010	522	3.72%	1,754	4.36
2009	478	(5.87)%	(3,131)	(5.55)
2008	399	(0.98)%	(618)	(0.55)
2007	314	7.45%	2,360	8.52
2006	211	3.30%	1,635	8.75
2005	193	2.33%	1,090	6.65
2004	191	3.33%	1,388	8.27
2003	179	(0.42)%	(141)	(0.21)
2002	163	0.57%	319	2.96
2001	144	2.27%	1,200	9.33
2000	125	1.85%	934	8.47
Total	**$ 5,826**		**$ 12,183**	**$ 3.05**

*Dollar amounts in millions.

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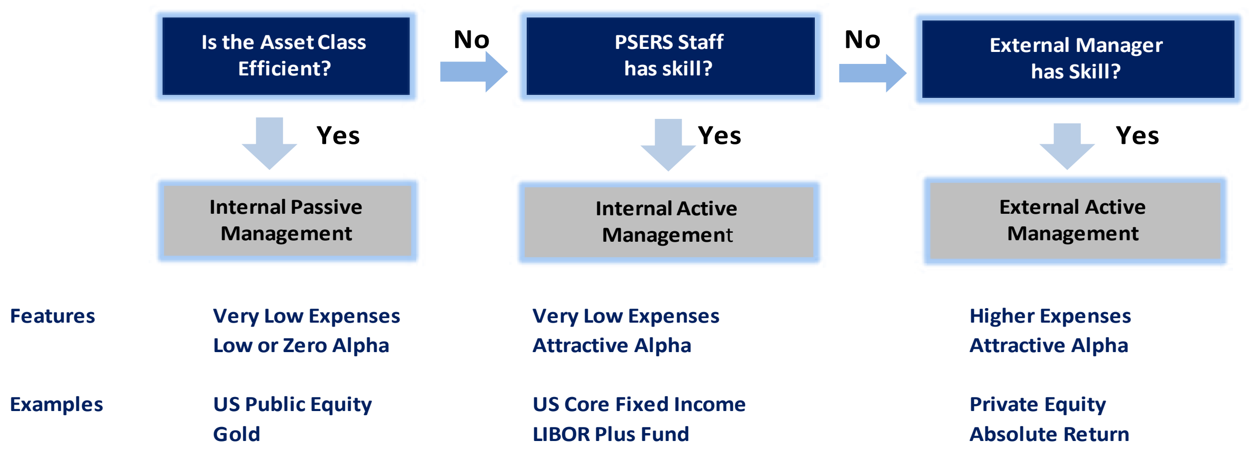
Managing Investment Fees and Expenses

PSERS' Board annually establishes an Asset Allocation Policy (as more fully described in Tab 9) with input from staff and the general investment consultant, and works on an ongoing basis to implement the Policy through identification of attractive investment strategies and well-qualified investment managers. A fundamental part of this implementation process is making key decisions with regard to use of active or passive strategies implemented by internal staff or external investment managers, as depicted in Chart 11.1.

Chart 11.1



Management of investment fees and expenses is integrated into the process of making these key decisions, so analysis of these costs must also occur within this context. If one assumes that, under PSERS' Asset Allocation Policy, all of PSERS' investments could be made in a passive manner resulting in negligible fees and expenses while earning investment returns equal to the Policy Benchmark, then one can also assume that all of PSERS' actual investment fees and expenses are incurred with the goal of earning investment returns that exceed the Policy Benchmark (of course, as the prudent investor realizes, not all investments can be made in passive strategies, not all passive strategies have low fees, and not all passive strategies deliver the market returns targeted). These assumptions allow PSERS to analyze how much excess investment return above the Policy Benchmark the System has been able to generate over time for the level of fees and expenses actually paid.

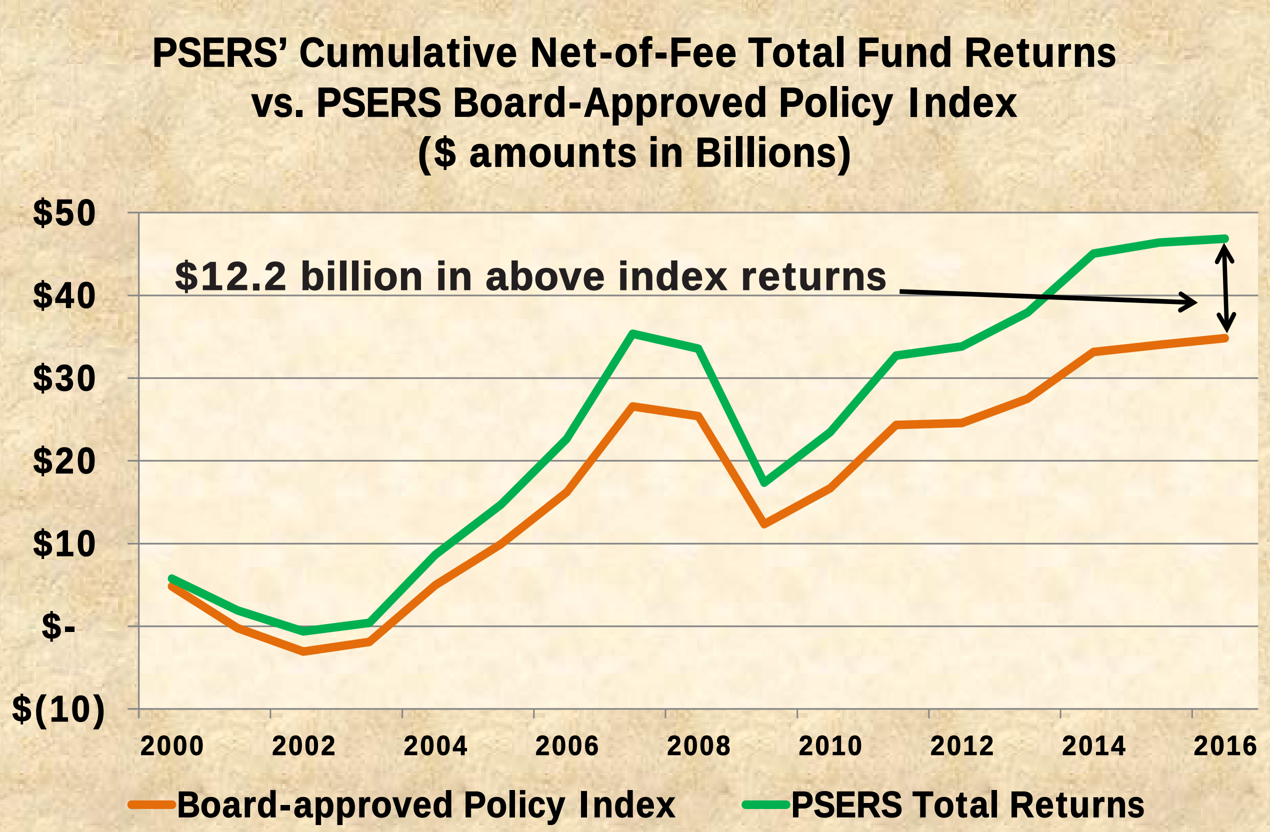
PSERS' ability to select a prudent combination of both internal and external managers, and both active and passive strategies, has generated and continues to generate significant excess risk-adjusted, net of fee returns relative to the Policy Benchmarks.

Managing Investment Fees and Expenses

(continued)

Chart 11.2 below demonstrates that over the past 17 fiscal years, PSERS has earned $12.2 billion in additional investment returns above the Board-approved Policy Index, net of fees.

Chart 11.2



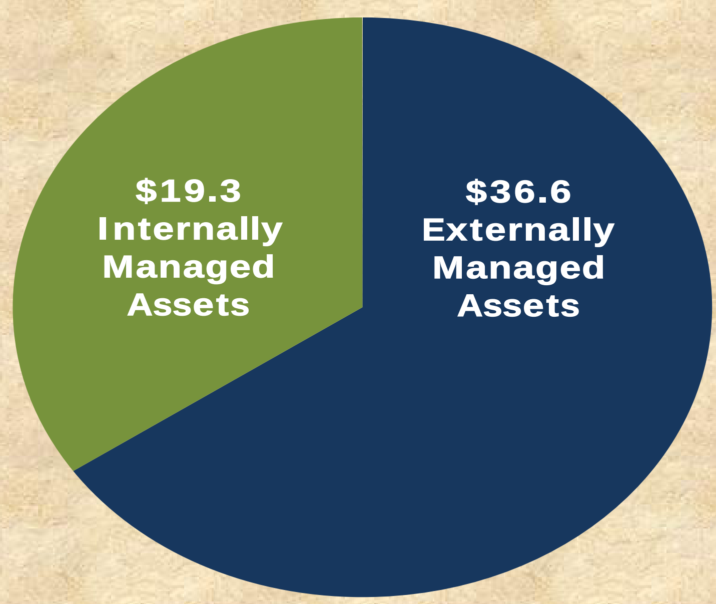
Key Decision: Internal vs. External Investment Management

PSERS generally prefers to assign investment management responsibilities to internal staff rather than to external investment management companies when certain conditions are present (see chart 11.1). For example, it must be clear that staff can achieve risk-adjusted returns that are at least equal to what might be earned by external investment managers in equivalent strategies, and PSERS' staff must simultaneously have the operational capacity to take on the additional work. When assets are assigned to PSERS' staff, the total costs (e.g., staff salary and benefits, computers and office supplies) are much lower than using even the largest "very low fee" index mutual fund companies charge, giving PSERS a significant advantage.

When PSERS does select external investment managers, the decision is based in part on the fees the System has negotiated and in part on the likelihood the manager will meet or exceed the performance expected. Fee negotiations begin with the expectation that the contract with the investment manager will have a "Most Favored Nations" clause guaranteeing that PSERS' fees will be at least as low as other clients with a similar investment amount, and the System then negotiates fees lower from that point wherever possible.

Chart 11.3 displays the distribution of PSERS managed assets as of June 30, 2016.

Chart 11.3 **PSERS' Asset Exposures under Management as of June 30, 2016 ($ Billions)**



Note: Financing represents a negative $7.2 billion allocation exposure and is not reflected in Chart 11.3.

Key Decision: Internal vs. External Investment Management (continued)

PSERS' Investment staff managed 20 portfolios internally, with a total estimated net asset value of over $19 billion on June 30, 2016, resulting in significant fee savings. For the entire fiscal year, PSERS incurred costs of just under $10 million to manage these portfolios internally, as well as oversee all of the external managers, manage the asset allocation, oversee risk, and perform other tasks in managing the overall investment program.

As shown in Table 11.1 below, managing these assets externally would have cost PSERS over $30 million in additional fees:

Table 11.1

Account	*Asset Class*	*Market Value as of 6/30/16* (000s)*	*Estimated Annual Fee %*	*Estimated Cost to Manage Externally (000s)*
PSERS - S&P 500 Index	U.S. Equities	$2,842,316	0.01%	284
PSERS - S&P 400 Index	U.S. Equities	485,271	0.03%	146
PSERS - S&P 600 Index	U.S. Equities	460,738	0.04%	184
Misc. PSERS Equity Accounts	U.S. Equities	2,000	0.00%	-
	U.S. Equities Total	**3,790,325**		**614**
PSERS ACWI ex. U.S. Index	Non U.S. Equities	3,165,531	0.08%	2,532
	Non U.S. Equities Total	**3,165,531**		**2,532**
Private Markets Co-Investments	Private Markets	366,037	1.00%	3,660
PA Investment Fund - Private Equity.	Private Makets	4,602	1.00%	46
	Private Markets Total	**370,639**		**3,706**
Private Debt Internal	Fixed Income	16,437	1.00%	164
PSERS Active Aggregate	Fixed Income	1,224,766	0.21%	2,572
PSERS TIPS Portfolio	Fixed Income	943,607	0.13%	1,227
PSERS Long Treasuries	Fixed Income	1,335,864	0.18%	2,405
	Fixed Income Total	**3,520,674**		**6,368**
PSERS Infrastructure Index	Infrastructure	506,862	0.47%	2,382
	Infrastructure Total	**506,862**		**2,382**
PSERS Commodity Beta	Commodities	1,687,853	0.15%	2,532
PSERS Gold Fund	Commodities	1,450,000	0.15%	2,175
	Commodities Total	**3,137,853**		**4,707**
PSERS S&P MLP Index	MLP	460,538	0.50%	2,303
	MLP Total	**460,538**		**2,303**
PSERS REIT Index	Real Estate	412,985	0.08%	330
Real Estate Co-Investments	Real Estate	121,231	1.00%	1,212
	Real Estate Total	**534,216**		**1,543**
PSERS Risk Parity	Risk Parity	2,008,965	0.30%	6,027
	Risk Parity Total	**2,008,965**		**6,027**
PSERS Cash Management	Cash Management	1,793,382	0.01%	179
	Cash Management Total	**1,793,382**		**179**
	Grand Total	**$19,288,988**		**$30,361**

**Market values include cash and derivatives exposure*

Key Decision: Active vs. Passive Investment Management

Passive investment strategies form the basis that the Fund uses to attain market exposure in many public market asset classes. The advantage of passive strategies, such as indexing, is that they are generally very inexpensive to implement. If solely using passive strategies, however, performance will be limited to general market performance with little or no potential for excess earnings.

PSERS evaluates and selects active managers on a case by case basis with strong emphasis on understanding the manager's sustainable investment edge. If the investment staff and consultants have conviction that the manager's process will generate attractive and potentially uncorrelated risk-adjusted net of fee returns in excess of the most competitive passive benchmarks, the active manager will be considered. Active strategies are also used by PSERS in asset classes where passive strategies are not available, such as Private Equity.

In selecting active managers, PSERS strives to hire managers that meet the following criteria:

- have a unique insight or process;
- have the ability to add long-term excess returns above passive alternatives, net of fees;
- have adequate capacity to execute the strategy;
- add diversification to PSERS' existing investment structure;
- do not exhibit style drift; and
- exhibit a high level of ethical behavior.

The advantage of active strategies is that they endeavor to generate net of fee returns in excess of the passive alternatives, if available, and/or provide diversification benefits which help manage total portfolio risk. The disadvantages of active strategies include being more expensive to implement than passive strategies and the risk that they may underperform passive strategies.

PSERS regularly measures the performance of active strategies relative to alternative passive strategies. In cases where PSERS is not receiving investment earnings from its active strategies in excess of alternative passive strategies, when all investment fees are taken into account, capital is redeployed either to other active strategies or to passive strategies. If PSERS determines that the active managers are not meeting expectations as a group, the Fund would endeavor to exit active strategies altogether and move to a purely passive implementation.

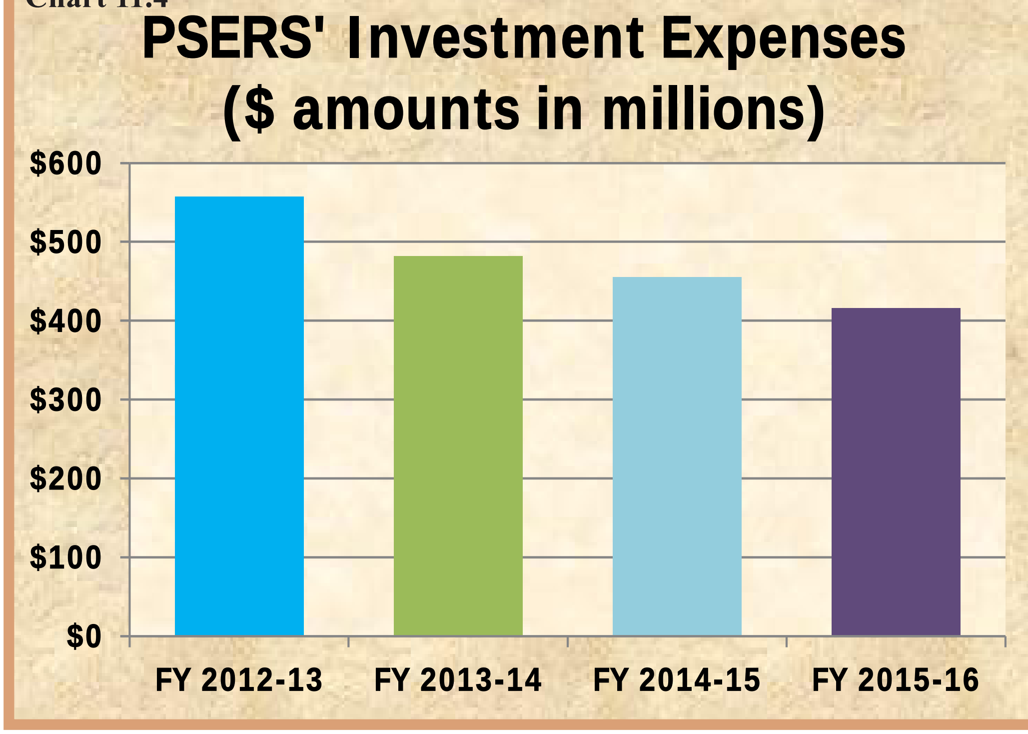
Table 11.2 summarizes total investment expenses for the fiscal year ended June 30, 2016. "Total External Management" includes all fees paid to external investment managers as either a base fee or a share of profits earned (performance fee). "Total Internal Management" includes all staff salaries related to PSERS' Investment Office as well as costs needed to support their work (e.g., vendor services, hardware and software, office supplies). "Total Other Expenses" include fees paid to the custodian bank, consultants, and legal services providers.

Table 11.2 Summary of Investment Advisory Fees
Fiscal Year Ended June 30, 2016
(Dollar Amounts in Thousands)

	Base Fees	Performance Fees	Total Fees	Basis Points
External Management				
U.S. Equity	$ 1,461	$ 1,736	$ 3,197	102
Non - U.S. Equity	18,455	5,831	24,286	28
Fixed Income	77,901	3,895	81,796	75
Real Estate	52,006	-	52,006	94
Alternative Investments	99,492	-	99,492	91
Absolute Return	80,209	24,055	104,264	221
Commodities	4,304	(272)	4,032	53
Master Limited Partnerships	6,956	1,377	8,333	53
Risk Parity	18,428	-	18,428	60
Total External Management	**$ 359,212**	**$ 36,622**	**$ 395,834**	85
Total Internal Management			**9,669**	6
Total Investment Management			**405,503**	63
Custodian Fees			2,331	
Consultant and Legal Fees			7,948	
Total Other Expenses			**10,279**	
Total Investment Expenses			**$ 415,782**	65

Increasing the number and size of portfolios managed internally has been a core initiative in reducing PSERS' Total Investment Expenses in recent years. **As Chart 11.4 illustrates, Total External Management fees have decreased from $538 million in Fiscal Year 2013 to $396 million in Fiscal Year 2016.** It is worth noting that these decreases have occurred while Total Internal Management and Total Other Expenses have remained flat. As discussed elsewhere, PSERS is hopeful that it will be permitted to increase its investment professional complement in order to maintain and even expand these savings.

Chart 11.4



External management fees are treated as a reduction of the investment revenue of the Fund rather than as a budgeted administrative expense.

Table 11.3 **Investment Fees by Manager**

Fiscal Year Ended June 30, 2016

(Dollar Amounts in Thousands)

Manager	**Total Fees**
U.S. Equity	
AH Lisanti Capital Growth, LLC	$ (26)
AllianceBernstein LP	79
Radcliffe Capital Management, L.P.	3,144
Total - U.S. Equity	**3,197**
Non - U.S. Equity	
Acadian Asset Management, LLC	859
Baillie Gifford Overseas Ltd.	2,949
Batterymarch Financial Management, Inc.	557
BlackRock Financial Management, Inc.	6,400
BlackRock Institutional Trust Company, N.A.	2,855
Marathon Asset Management Limited	2,955
Oberweis Asset Management, Inc.	1,401
Pareto Investment Management, Ltd.	954
Pyramis Global Advisors Trust Company	1,061
Wasatch Advisors, Inc.	4,295
Total - Non - U.S. Equity	**24,286**
Fixed Income	
AllianceBernstein L.P.	729
Apollo European Principal Finance Fund II(Dollar A), L.P.	2,567
Avenue Energy Opportunities Fund, L.P.	1,185
Avenue Europe Special Situations Fund III (U.S.), L.P.	375
Bain Capital Credit Managed Account (PSERS), L.P.	1,631
Bain Capital Distressed and Special Situations 2013 (A), L.P.	2,614
Bain Capital Distressed and Special Situations 2016 (A), L.P.	92
Bain Capital Middle Market Credit 2010, L.P.	507
Bain Capital Middle Market Credit 2014, LP	1,143
BlackRock Financial Management, Inc.	6,147
Bridgewater Associates, LP	16,871
Brigade Capital Management, LLC	978
Cargill Financial Services Corporation	6,472
Carlyle Energy Mezzanine Opportunities Fund II, L.P.	1,555
Carlyle Energy Mezzanine Opportunities Fund-Q, L.P.	1,282
Cerberus Levered Loan Opportunities Fund I, L.P.	587

( ) Represents reversal of amount accrued in prior fiscal year.

Table 11.3 **Investment Fees by Manager**

Fiscal Year Ended June 30, 2016

(Dollar Amounts in Thousands)

(continued)

Manager	Total Fees
Fixed Income (continued)	
Cerberus Levered Loan Opportunities Fund II, L.P.	$ 3,481
Cerberus PSERS Levered Loan Opportunities Fund, L.P.	1,390
Galton Onshore Mortgage Recovery Fund III, L.P.	790
Hayfin Credit Opp Fund, L.P.	2,745
ICG Europe Fund V, L.P.	1,886
ICG Europe Fund VI, L.P.	1,851
International Infrastructure Finance Company, L.P.	1,500
LBC Credit Partners II, L.P.	916
LBC Credit Partners III, L.P.	3,207
Mariner Investment Group, LLC	571
Oaktree Loan Fund 2X, LP	51
Pacific Investment Management Company (PIMCO)	4,641
Park Square - PSERS Credit Opportunities Fund, L.P.	861
Piedmont Investment Advisors, LLC	43
Pugh Capital Management, Inc.	183
PSERS TAO Partners Parallel Fund, L.P.	1,608
Radcliffe Capital Management, L.P.	2,016
Sankaty Credit Opportunities IV, L.P.	1,725
SEI Investments Company	640
Stone Harbor Investment Partners, L.P.	672
Templeton Investment Counsel, LLC	1,713
TOP NPL (A), L.P.	79
TPG Opportunities Partners II (A), L.P.	484
TPG Opportunities Partners III (A), L.P.	2,239
Varde Scratch and Dent Fund, L.P., The	1,769
Total - Fixed Income	**81,796**
Real Estate-Direct Ownership	
Charter Oak Advisors, Inc.	1,084
GF Management, Inc.	131
Grosvenor Investment Management U.S., Inc.	12
L & B Realty Advisors, L.L.P.	87
Subtotal - Real Estate-Direct Ownership	**1,314**
Real Estate-Partnerships/Funds	
AG Core Plus Realty Fund III, L.P.	626
AG Core Plus Realty Fund IV, L.P.	179

Table 11.3

Investment Fees by Manager
Fiscal Year Ended June 30, 2016
(Dollar Amounts in Thousands)
(continued)

Manager	Total Fees
Real Estate-Partnerships/Funds (continued)	
Almanac Realty Securities V, L.P.	$ 563
Almanac Realty Securities VI, L.P.	236
Almanac Realty Securities VII, L.P.	1,355
Apollo European Real Estate Fund III, L.P.	345
Apollo European Real Estate Fund IV, L.P.	1,253
Apollo Real Estate Finance Corporation	100
Apollo Value Enhancement Fund VII, L.P.	1,047
Apollo Value Enhancement Fund VIII, L.P.	901
Avenue Real Estate Fund Parallel, L.P.	1,138
Beacon Capital Strategic Partners V, L.P.	201
Bell Institutional Fund IV, LLC	660
Bell Institutional Fund V, LLC	645
BlackRock Asia Property Fund III, L.P.	490
BlackRock Europe Property Fund III, L.P.	485
Blackstone Real Estate Debt Strategies II, L.P.	1,142
Blackstone Real Estate Partners Europe III, L.P.	1,514
Blackstone Real Estate Partners Europe IV, L.P.	1,500
Blackstone Real Estate Partners VI.TE.1, L.P.	1,671
Blackstone Real Estate Partners VII.TE.1, L.P.	2,788
Blackstone Real Estate Partners VIII, L.P.	3,333
Brookfield Strategic Real Estate Partners, L.P.	2,250
Brookfield Strategic Real Estate Partners II, L.P.	172
Cabot Industrial Value Fund IV, L.P.	1,151
Carlyle Realty Partners IV, L.P.	796
Carlyle Realty Partners V, L.P.	849
Carlyle Realty Partners VI, L.P.	509
Carlyle Realty Partners VII, L.P.	905
DRA Growth and Income Fund VI, L.P.	598
DRA Growth and Income Fund VII, L.P.	1,639
DRA Growth and Income Fund VIII, L.P.	1,114
Exeter Core Industrial Club Fund II, L.P.	12
Exeter Industrial Value Fund II, L.P.	493
Exeter Industrial Value Fund III, L.P.	786
Fillmore West Fund, L.P.	2
Fortress Investment Fund IV, L.P.	573
Fortress Investment Fund V (Fund A), L.P.	2,271
JPMCB Strategic Property Fund	265

Table 11.3 **Investment Fees by Manager**

Fiscal Year Ended June 30, 2016

(Dollar Amounts in Thousands)

(continued)

Manager	Total Fees
Real Estate-Partnerships/Funds (continued)	
Latitude Management Real Estate Capital III, Inc.	$ 848
Legg Mason Real Estate Capital II, Inc.	592
LEM RE High Yield Debt & Preferred Equity Fund III, L.P.	562
LEM Real Estate Mezzanine Fund II, L.P.	140
Madison Marquette Retail Enhancement Fund, L.P.	(400)
Paladin Realty Latin America Investors III, L.P.	385
Paramount Group Real Estate Fund VII, L.P.	629
Peabody Global Real Estate Partners, L.P.	12
Pramerica Real Estate Capital VI, L.P.	148
PRISA	745
RCG Longview Debt Fund IV, L.P.	189
RCG Longview Debt Fund V, L.P.	941
RCG Longview Equity Fund, L.P.	298
Senior Housing Partnership Fund IV, L.P.	716
Senior Housing Partnership Fund V, L.P.	1,117
Silverpeak Legacy Pension Partners II, L.P.	306
Silverpeak Legacy Pension Partners III, L.P.	499
Silverpeak/PSERS Real Estate, L.P.	77
Stockbridge Real Estate Fund, L.P.	1,952
Stockbridge Real Estate Fund II, L.P.	627
Stockbridge Real Estate Fund III, L.P.	2,280
Strategic Partners Fund II RE, L.P.	53
Strategic Partners Fund IV RE, L.P.	219
UBS (US) Trumbull Property Fund, L.P.	960
Subtotal - Real Estate-Partnerships/Funds	**50,452**
Real Estate-Farmland	
Prudential Agricultural Group	240
Subtotal - Real Estate-Farmland	**240**
Total Real Estate	**52,006**
Private Equity	
ABS Capital Partners II, L.P.	1
Actis Emerging Markets 3, L.P.	2,282
Actis Global 4 L.P.	1,798
Bain Capital Asia Fund III, L.P.	573

( ) Represents reversal of amount accrued in prior fiscal year.

Table 11.3 **Investment Fees by Manager**

Fiscal Year Ended June 30, 2016

(Dollar Amounts in Thousands)

(continued)

Manager	Total Fees
Private Equity (continued)	
Bain Capital XI, L.P.	$ 750
Baring Asia Private Equity Fund III, L.P.	633
Baring Asia Private Equity Fund IV, L.P.	2,978
Baring Asia Private Equity Fund V, L.P.	3,349
Barings Asia Private Equity Fund VI, L.P.	1,453
Blue Point Capital Partners III (B), L.P.	574
Bridgepoint Europe III-A, L.P.	23
Bridgepoint Europe IV, L.P.	2,237
Bridgepoint Europe V, L.P.	915
Capital International Private Equity Fund V, L.P.	820
Capital International Private Equity Fund VI, L.P.	1,189
Catterton Growth Partners, L.P.	840
Catterton Growth Partners II , L.P.	1,195
Catterton Growth Partners III, L.P.	698
Catterton Partners V, L.P.	379
Catterton Partners VI, L.P.	1,131
Catterton Partners VII, L.P.	1,757
Cinven Fund (Fourth), L.P. (The)	833
Cinven Fund (Fifth), L.P. (The)	764
Coller International Partners VI, L.P.	1,286
Crestview Capital Partners, L.P.	283
Crestview Partners II (PF), L.P.	1,352
CVC Capital Partners Asia III Pacific, L.P.	708
CVC European Equity Partners V (A), L.P.	720
DCPF VI Oil and Gas Co-Investment Fund, L.P.	55
Denham Commodity Partners Fund VI, L.P.	1,264
Energy & Mineral Group Fund III, L.P.	1,235
Equistone Partners Europe Fund V E, L.P.	1,127
Evergreen Pacific Partners II, L.P.	272
First Reserve Fund XI, L.P.	753
First Reserve Fund XII, L.P.	1,445
GoldPoint Partners Co-Investment V, L.P.	500
HgCapital 7, L.P.	1,888
HGGC Fund II, L.P.	439
Incline Equity Partners III, L.P.	589
Irving Place Capital Partners III, L.P.	446
Landmark Equity Partners XIII, L.P.	399

Table 11.3 **Investment Fees by Manager**
Fiscal Year Ended June 30, 2016
(Dollar Amounts in Thousands)
(continued)

Manager		Total Fees
Private Equity (continued)		
Landmark Equity Partners XIV, L.P.	$	1,490
Milestone Partners II, L.P.		154
Milestone Partners III, L.P.		93
Milestone Partners IV, L.P.		820
New Mountain Partners III, L.P.		1,386
New Mountain Partners IV, L.P.		1,210
New York Life Capital Partners III, L.P.		609
New York Life Capital Partners IV, L.P.		467
NGP Natural Resources X, L.P.		1,207
NGP Natural Resources XI, L.P.		759
North Haven PE Asia Fund IV, L.P.		1,495
Odyssey Investment Partners Fund V, L.P.		1,980
Orchid Asia V, L.P.		405
Orchid Asia VI, L.P.		1,500
PAI Europe IV, L.P.		752
PAI Europe V, L.P.		1,059
PAI Europe VI, L.P.		1,585
Palladium Equity Partners IV, L.P.		859
Partners Group Secondary 2008, L.P.		1,383
Partners Group Secondary 2011, L.P.		1,766
Partners Group Secondary 2015 (USD) A, L.P.		744
Permira IV, L.P.		498
PNC Equity Partners II, L.P.		44
StepStone International Investors III, L.P.		636
Strategic Partners II, L.P.		381
Strategic Partners III-B, L.P.		500
Strategic Partners IV, L.P.		346
Strategic Partners V, L.P.		860
Strategic Partners VI, L.P.		1,125
Trilantic Capital Partners IV, L.P.		211
Trilantic Capital Partners V, L.P.		1,193
Subtotal - Private Equity		**69,450**
Private Debt		
Apollo Investment Fund VIII, L.P.		1,749
Avenue Asia Special Situations Fund IV, L.P.		1,047
Avenue Special Situations Fund VI, L.P.		193

Table 11.3 **Investment Fees by Manager**

Fiscal Year Ended June 30, 2016

(Dollar Amounts in Thousands)

(continued)

Manager	Total Fees
Private Debt (continued)	
Cerberus Institutional Partners, L.P. (Series Three)	$ 80
Cerberus Institutional Partners, L.P. (Series Four)	1,058
Cerberus Institutional Partners V, L.P.	2,215
Cerberus Institutional Partners VI, L.P.	2,069
Clearlake Capital Partners IV, L.P.	748
Coller International Partners VII, L.P.	648
Gleacher Mezzanine Fund II, L.P.	38
GSC Recovery III, L.P.	270
NYLIM Mezzanine Partners Parallel Fund II, L.P.	97
OCM Opportunities Fund VII, L.P.	270
OCM Opportunities Fund VII-B, L.P.	456
Searchlight Capital II, L.P.	634
Venor Special Situations Fund II, L.P.	352
Versa Capital Fund, L.P.	718
Versa Capital Fund II, L.P.	434
Versa Capital Fund III, L.P.	951
Windjammer Senior Equity Fund IV, L.P.	1,219
Subtotal - Private Debt	**15,246**
Venture Capital	
Aisling Capital II, L.P.	262
Aisling Capital III, L.P.	399
Aisling Capital IV, L.P.	145
Co-Investment Fund II, L.P. (The)	1,334
KBL Partnership, L.P.	114
LLR Equity Partners II, L.P.	179
LLR Equity Partners III, L.P.	1,969
LLR Equity Partners IV, L.P.	3,500
Psilos Group Partners III, L.P.	252
Quaker BioVentures II, L.P.	989
SCP Private Equity Partners II, L.P.	422
Starvest Partners II, L.P.	397
Strategic Partners III-VC, L.P.	181
Strategic Partners IV VC, L.P.	230
Summit Partners Growth Equity Fund VIII, L.P.	750

Table 11.3 **Investment Fees by Manager**

Fiscal Year Ended June 30, 2016

(Dollar Amounts in Thousands)

(continued)

Manager	Total Fees
Venture Capital (continued)	
Tenaya Capital V-P, LP	$ 787
Tenaya Capital VI, L.P.	1,000
Tenaya Capital VII, L.P.	1,886
Subtotal - Venture Capital	**14,796**
Total Alternative Investments	**99,492**
Absolute Return	
Aeolus Capital Management Ltd.	9,125
BlackRock Financial Management, Inc.	18,176
Brevan Howard Asset Management LLP	3,695
Bridgewater Associates, Inc.	21,053
Brigade Capital Management, LLC	3,458
Capula Global Relative Value Fund	5,836
Capula Tail Risk Fund	7,639
Caspian Select Credit International, Ltd.	8,459
Garda Asset Management LLC	6,739
Independence Reinsurance Partners GP, LLC	889
Nephila Capital Ltd.	3,598
Oceanwood Capital Management L.L.P.	(2,148)
One William Street Capital Management, L.P.	2,113
Pacific Investment Management Company (PIMCO)	8,863
Perry Partners, L.P.	2,131
Sciens Aviation Spec Opp Inv Fund II	2,085
Sciens Aviation Spec Opp Inv Fund III	2,553
Total - Absolute Return	**104,264**
Commodities	
Gresham Investment Management, LLC	609
Wellington Management Company, L.L.P.	3,423
Total - Commodities	**4,032**

( ) Represents reversal of amount accrued in prior fiscal year.

Table 11.3	Investment Fees by Manager Fiscal Year Ended June 30, 2016 (Dollar Amounts in Thousands) (continued)	
Manager		**Total Fees**
Master Limited Partnerships		
Harvest Fund Advisors, LLC		$ 3,273
Salient Capital Advisors, LLC		2,476
Stein Roe Investment Counsel D/B/A Atlantic Trust		2,584
Total - Master Limited Partnerships		**8,333**
Risk Parity		
AQR Capital Management, LLC		1,841
BlackRock Institutional Trust Company, N.A.		2,076
Bridgewater All Weather Fund @15%, Ltd.		4,109
Bridgewater Optimal Portfolios, Ltd.		3,889
D. E. Shaw & Co., L.P.		6,513
Total - Risk Parity		**18,428**
Total External Management		**395,834**
Total Internal Management		**9,669** *
Total Investment Management		**$ 405,503**

*Internal Management expenses include salaries and fringe benefits of $6,719 and operating expenses of $2,950.

Investment Fees and Expenses Initiatives

PSERS continues to pursue several avenues intended to maintain a reasonable cost structure. These initiatives include:

- Identifying opportunities to invest more assets internally. PSERS' current staffing levels are too low to significantly increase internal asset management, but we continue to work with the Administration to look for ways to reduce investment fees by increasing internal investment staff. PSERS continues to believe this is in the best interests of both the Fund and the Commonwealth and, therefore, has included additional positions in the FY2017-18 budget request.

- For external managers making traditional investments, reduce base fees and create better alignment of interests by moving to a lower base fee coupled with a profit share.

- For external managers making traditional and absolute return investments, enter into arrangements for netting of profit shares for managers with multiple PSERS mandates.

- For external managers making non-traditional investments, continue to grow co-investments (which have lower fees and profit shares).

- For external managers making non-traditional investments, move away from paying on committed capital and towards paying on invested capital.

- For external managers, re-underwriting all fee arrangements to ensure that the fee arrangements are fair and equitable.

Commitment to Pennsylvania Financial Services Firms

(as of June 30, 2016)

The members of the Board and Staff are fiduciaries and must act in the interests of the members of the System and for the exclusive benefit of the System's members. In creating the investment program, the Board hires both external investment managers and internal investment managers. The Board has determined that it is in the best interest of the System to manage assets internally when (1) the System's staff has the proven ability and capacity to manage portfolios internally at least as well as the external investment managers, and (2) the cost of investing those assets is no greater than the cost that would have been incurred to have those assets externally managed. The Board will also consider the diversification benefits that may be achieved by allocating assets to external portfolio managers even when conditions (1) and (2) are met.

The Board evaluates external managers based on a variety of factors, including: (1) a unique insight or process; (2) the ability to add long-term excess returns above passive alternatives, net of fees; (3) adequate capacity to execute the strategy; (4) adding diversification to our existing investment structure; (5) not exhibiting style drift, and; (6) exhibiting a high level of ethical behavior. In selecting external managers, PSERS will show preference to Pennsylvania-based potential managers that demonstrate similar strengths to alternative managers without a Pennsylvania nexus.

PSERS has shown a strong commitment to Pennsylvania's financial services industry by having assets managed by firms based in Pennsylvania or by firms with offices in Pennsylvania. In FY 2016, investment management fees paid to external firms managing PSERS' assets from offices located in Pennsylvania amounted to $ 27.6 million, or 7.0% of the total external investment manager fees.

Table 12.1 lists the asset exposures managed internally by PSERS, as of June 30, 2016.

Table 12.1

Pennsylvania-Based Asset Exposures Managed Internally

(as of June 30, 2016)

Asset Class	Market Value (in millions)	Percentage of Total
U.S. Equity	$ 3,790.3	19.7 %
Non-U.S. Equity	3,165.5	16.4
Private Markets	370.6	1.9
Fixed Income	5,314.1	27.6
Master Limited Partnerships	460.5	2.4
Commodities	3,137.9	16.3
Infrastructure	506.9	2.6
Real Estate	534.2	2.7
Risk Parity	2,009.0	10.4
Totals	**$ 19,289.0**	**100.0 %**

Commitment to Pennsylvania Financial Services Firms
(continued)

Chart 12.1 displays the distribution of exposures managed internally as of June 30, 2016.

Chart 12.1

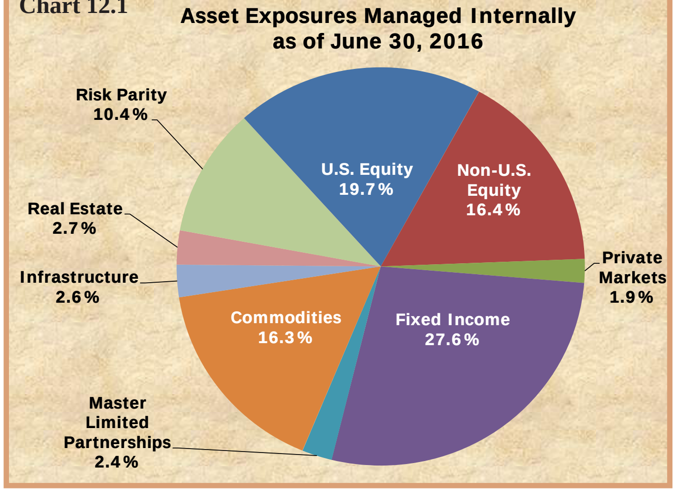


Table 12.2 is a list of assets managed by external managers with headquarters or offices located in Pennsylvania, as of June 30, 2016.

Table 12.2 *Pennsylvania-Based External Managers*

Fixed Income:	Venture Capital:
International Infrastructure Finance Company Fund, L.P.	Adams Capital Management, L.P.
LBC Credit Partners II, LP	Co-Investment 2000 Fund, L.P.
LBC Credit Partners III, LP	Co-Investment Fund II, L.P.
Mariner - International Infrastructure Finance Company Fund L.P.	Cross Atlantic Technology Fund, L.P.
Radcliffe Capital Management	Cross Atlantic Technology Fund II, L.P.
SEI Investments Company	LLR Equity Partners, L.P.
	LLR Equity Partners II, L.P.
Master Limited Partnership:	LLR Equity Partners III, L.P.
Harvest Fund Advisors, LLC	LLR Equity Partners IV, L.P.
	NEPA Venture Fund II
Real Estate:	Novitas Capital, L.P.
BPG Co-Investment Fund	Novitas Capital II, L.P.
Charter Oak Advisors, Inc.	Quaker Bio-Ventures, L.P.
Exeter Core Industrial Club Fund II, L.P.	Quaker Bio-Ventures II, L.P.
Exeter Industrial Value Fund II, L.P.	SCP Private Equity Partners I, L.P.
Exeter Industrial Value Fund III, L.P.	SCP Private Equity Partners II, L.P.
GF Management, Inc.	TDH III, L.P.
LEM Real Estate Mezzanine Fund II, L.P.	
LEM RE High Yield Debt & Preferred Equity Fund III, LP	
Private Equity and Debt:	
Incline Equity Fund III, L.P.	
Milestone Partners II, L.P.	
Milestone Partners III, L.P.	
Milestone Partners IV, L.P.	
PNC Equity Partners, L.P.	
PNC Equity Partners II, L.P.	
Versa Capital Fund I, L.P.	
Versa Capital Fund II, L.P.	
Versa Capital Fund III, L.P.	

Investments in Pennsylvania-Based Companies
(as of June 30, 2016)

Where investment characteristics including yield, risk, and liquidity are equivalent, the Board's policy favors investments that have a positive impact on the economy of Pennsylvania. The Board, in managing the investment portfolio, will also be cognizant of concentration risk to any one region, including Pennsylvania. The Fund will continue to seek investments in Pennsylvania-based companies when the investment characteristics are equivalent to other favorable investments, subject to diversification considerations.

U.S. Equities

PSERS invests in the stock of Pennsylvania-based companies through the various U.S. Equity portfolios managed by external and internal portfolio managers. PSERS has always had investments in large national firms located in Pennsylvania.

Fixed Income Securities

PSERS invests in the debt of Pennsylvania-based companies through the various Fixed Income portfolios managed by external and internal portfolio managers. PSERS has always had investments in large national firms located in Pennsylvania.

Private Real Estate

PSERS has investments in limited partnerships that have invested in Pennsylvania real estate properties. PSERS Real Estate program has committed $16.3 billion to 124 partnerships. From the program inception to June 30, 2016, PSERS has committed capital to 16 partnerships headquartered in Pennsylvania.

Venture Capital

PSERS' Venture Capital program has committed $2.9 billion to 58 partnerships. In addition to the current geographically diverse scope of venture capital investments, a historical objective of this program has been to target partnerships that demonstrate an ability to invest in Pennsylvania-based companies. Selected partnerships offer diversification according to geographic region and financing stage within Pennsylvania. From the program inception to June 30, 2016, PSERS has committed capital to 29 partnerships headquartered in Pennsylvania.

Private Equity

PSERS' Private Equity program has committed $19.4 billion to 146 partnerships. From the program inception to June 30, 2016, PSERS has committed capital to 7 partnerships headquartered in Pennsylvania.

Private Debt

PSERS' Private Debt program has committed $5.1 billion to 34 partnerships. From the program inception to June 30, 2016, PSERS has committed capital to 3 partnerships headquartered in Pennsylvania.

Private Markets and Real Estate Pennsylvania In-House Co-Investment Program

PSERS seeks to make co-investments in assets located in Pennsylvania from funds where PSERS or Portfolio Advisors, PSERS Private Market Consultant, is already a Limited Partner. PSERS has set aside $250 million to be committed to this program. As of June 30, 2016, PSERS has invested $21.6 million in the Private Markets and Real Estate Pennsylvania In-House Co-Investment Program. The number of employees, payroll and market value are included within their respective asset class.

Table 12.3 displays Pennsylvania-based investments and other statistics at June 30, 2016 ($'s in millions):

Table 12.3 **Statistics of Pennsylvania-Based Investments**

Asset Class	*Total PA Market Value (PSERS' Portion)*	*Total PA Market Value (Total Invested)*	*# of People Employed*	*Payroll*
U.S. Equities	$ 248.0	$ 248.0	*	$ *
Fixed Income	55.0	55.0	*	*
Private Real Estate	81.4	2,219.4	391	8.0
Private Markets:				
Venture Capital	113.8	358.5	2,615	77.9
Private Equity	1,127.9	16,364.4	24,033	584.4
Private Debt	255.2	2,294.1	11,726	160.5
Total	**$ 1,881.3**	**$ 21,539.4**	**38,765**	**$ 830.8**

* Statistics for publicly traded companies not included due to the difficulty in obtaining the information.

Section 4 - PSERS Postemployment Healthcare Programs

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Health Options Program

Pursuant to Sec. 8502.2 PSERS sponsors a group health insurance program called the Health Options Program (HOP) for individuals who are annuitants or survivor annuitants or the spouse or dependents of an annuitant or survivor annuitant. The HOP commenced on January 1, 1994. As of December 1, 2016 there are 107,689 participants (91,206 retirees plus their dependents) in the Health Options Program. The HOP is funded solely by and for eligible participants. Employers provide no funding for the HOP. The following is a summary of HOP initiatives during the period January 1, 2016 to January 1, 2017.

The Retirement Board issued an Invitation for Application (IFA) to allow qualified insurance carriers to apply to PSERS to offer a fully insured Medicare Advantage group insurance plan and accompanying Pre-65 group insurance plan to PSERS retirees who participate in the Health Options Program. The effective date of the insurance is January 1, 2017. As a result of the IFA, PSERS is expecting the following carriers to participate in HOP:

Aetna
Capital Blue Cross/Keystone Health Plan Central
Highmark
Independence Blue Cross (IBC)/Keystone Health Plan East
UPMC

- The Retirement Board continues to make changes in the Basic and Enhanced Medicare Rx Options as required by the Centers for Medicare and Medicaid Services (CMS). The following is a summary of the changes in Part D Medicare benefits from 2016 to 2017:

Standard Benefit	2016	2017
Deductible	$ 360	$ 400
Initial Coverage Limit	3,310	3,700
Out-of Pocket Threshold	4,850	4,950
Minimum Cost sharing in Catastrophic Coverage Portion of the Benefit		
Generic	$ 2.95	$ 3.30
Other	7.40	8.25

These plan design limits and thresholds are tied to specific indices, including the average per capita Part D spending and the annual percentage increase in the Consumer Price Index.

Health Options Program
(continued)

The Affordable Care Act (ACA) mandates that Medicare prescription drug plans provide 42% coverage for generic drugs in the Coverage Gap for 2016, and 51% in 2017. While the Act increases this benefit ratably toward an ultimate level of 75%, it provides effectively no additional funding from CMS. Accordingly, the cost of the mandated benefit increase is paid by participants not receiving low-income subsidies. The Affordable Care Act also mandates that Medicare prescription drug plans pay 5% of the cost of brand drugs in the Coverage Gap for 2017, which will increase to 25% over the next several years. The following table shows how much members pay for drugs in the Coverage Gap:

The Member Pays in Coverage Gap:	2016 Medicare Rx Option	2017 Medicare Rx Option
Generic Drugs	58%	51%
Brand Drugs	45% (after 50% manufacturer discount and 5% plan benefit)	40% (after 50% manufacturer discount and 10% plan benefit)
Non-preferred Brand Rx	45% (after 50% manufacturer discount and 5% plan benefit)	40% (after 50% manufacturer discount and 10% plan benefit)

Plans Available Through the Health Options Program

The Health Options Program offers participants a choice among supplements to Medicare, various Medicare prescription drug plans, and Medicare Advantage plans. Participants under age 65 and not eligible for Medicare may elect to enroll in a high deductible health insurance plan with or without prescription drug coverage or a managed care plan. These options were available to new enrollees or Health Option Program participants electing to change coverage during the 2017 option selection period conducted in the fall of 2016. The following is a list of HOP plans as of January 1, 2017:

For Individuals Eligible for Medicare:	For Individuals Not Eligible for Medicare:
HOP Value Medical Plan (Medicare supplement)	
HOP Medical Plan (Medicare supplement)	HOP Pre-65 Medical Plan
Value Medicare Rx Option (Medicare Part D)	
Basic Medicare Rx Option (Medicare Part D) Enhanced Medicare Rx Option (Medicare Part D)	HOP Pre-65 Medical Plan w/ Rx coverage
Medicare Advantage Plans	**Companion Pre-65 Managed Care Plans**
Aetna Medicare PPO	Aetna PPO Plan
Capital Blue Cross SeniorBlue PPO	Capital Blue Cross PPO
Highmark FreedomBlue PPO	Highmark PPO Blue
Independence Blue Cross-Keystone 65 HMO	Independence Blue Cross-Keystone HMO
UPMC for Life HMO	UPMC Health Plan

Health Options Program
(continued)

HOP Program Plan Premiums

Paid By Individuals ELIGIBLE for Medicare
The premiums paid by participants eligible for Medicare generally vary by geographical area. The exceptions are the premiums for the HOP Medicare Rx Options. The following tables show the standard premium rates for 2017 compared to the 2016 rates in Pennsylvania for single coverage. These rates do not reflect the $100 Premium Assistance benefit provided to eligible retirees or discounts available to individuals enrolling at age 65.

Southeastern Region: Bucks, Chester, Delaware, Montgomery, and Philadelphia Counties	2016	2017	Increase/ (Decrease)
Medicare Supplement Plans			
Value Medical Plan	$117	$117	0%
Value Medical Plan w/ Value Medicare Rx Option	136	139	2%
HOP Medical Plan	199	199	0%
HOP Medical Plan w/ Basic Medicare Rx Option	248	257	4%
HOP Medical Plan w/ Enhanced Medicare Rx Option	298	310	4%
Medicare Advantage Plans			
Aetna Medicare 15 Special PPO	379	368	(3)%
Highmark FreedomBlue PPO	363	376	4%
Independence Blue Cross/Keystone 65 Select HMO	335	353	5%
Legacy Medicare Advantage Plans (no new enrollment)			
Aetna Medicare 10 Special Plan HMO	461	449	3%
IBC's Personal Choice 65 PPO	671	714	6%

Southwestern Region: Allegheny, Fayette, Greene, Indiana, Washington, and Westmoreland Counties	2016	2017	Increase/ (Decrease)
Medicare Supplement Plans			
Value Medical Plan	$115	$115	0%
Value Medical Plan w/ Value Medicare Rx Option	134	137	2%
HOP Medical Plan	195	190	(3)%
HOP Medical Plan w/ Basic Medicare Rx Option	244	248	2%
HOP Medical Plan w/ Enhanced Medicare Rx Option	294	301	2%
Medicare Advantage Plans			
Aetna Medicare 15 Special PPO	345	328	(5)%
Highmark SecurityBlue HMO	304	317	4%
UPMC for Life HMO	243	243	0%
Legacy Medicare Advantage Plans (no new enrollment)			
Aetna Medicare 15 Special Plan HMO	454	437	(4)%
Highmark FreedomBlue PPO	338	351	4%

Health Options Program

(continued)

North & Central Region: (All other counties in Pennsylvania)	2016	2017	Increase/ (Decrease)
Medicare Supplement Plans			
Value Medical Plan	$102	$102	0%
Value Medical Plan w/ Value Medicare Rx Option	121	124	2%
HOP Medical Plan	172	172	0%
HOP Medical Plan w/ Basic Medicare Rx Option	221	230	4%
HOP Medical Plan w/ Enhanced Medicare Rx Option	271	283	4%
Medicare Advantage Plans			
Aetna Medicare 15 Special PPO[1]	253	229	(9)%
Capital Blue Cross SeniorBlue PPO[1]	222	222	0%
Highmark FreedomBlue PPO	297	310	4%
UPMC for Life HMO[1]	243	243	0%
Legacy Medicare Advantage Plans (no new enrollment)			
Aetna Medicare 10 Special HMO Plan[1]	290	274	(6)%
Highmark SecurityBlue HMO[1]	304	317	4%
Keystone Central SeniorBlue HMO[1]	200	200	0%

[1]Plans not available in all North & Central Region counties.

Health Options Program participants may select Enhanced, Basic, or Value Medicare Rx Option coverage without enrolling in the HOP Medical Plan or Value Medical Plan. The premium rates for the Medicare Rx Options do not vary by region. Stand-alone prescription drug coverage does not qualify for Premium Assistance.

Medicare Prescription Drug Plans All Regions	2016	2017	Increase
Enhanced Medicare Rx Only	$99	$111	12%
Basic Medicare Rx Only	49	58	18%
Value Medicare Rx Only	19	22	16%

Health Options Program

(continued)

HOP Premiums Paid By Individuals NOT ELIGIBLE for Medicare

The premiums paid by participants not eligible for Medicare generally do not vary by geographical area. The exceptions are the regional managed care plans. The following tables show the premium rates for 2017 compared to the 2016 rates in Pennsylvania for single coverage. These rates do not reflect the $100 Premium Assistance benefit provided to eligible retirees.

All Regions	2016	2017	Increase
HOP Pre-65 Medical Plan			
HOP Pre-65 Medical Plan (Single Coverage)	$ 836	$ 889	6%
Pre-65 Medical Plan w/ Prescription Drugs	964	1,001	4%

Southeastern Region: Bucks, Chester, Delaware, Montgomery, and Philadelphia Counties	2016	2017	Increase
Managed Care Plans			
Aetna PPO	$1,147	$1,147	0%
Highmark PPOBlue	1,150	1,588	38%
Keystone East HMO	1,629	1,864	14%
Legacy Managed Care Plans (no new enrollments)			
Aetna Citizen HMO Plan	1,245	1,245	0%
IBC's Personal Choice PPO	1,653	1,934	17%

Southwestern Region: Allegheny, Fayette, Greene, Indiana, Washington, and Westmoreland Counties	2016	2017	Increase
Managed Care Plans			
Aetna PPO	$1,147	$1,147	0%
Highmark PPOBlue	1,150	1,588	38%
UPMC Health Plan EPO	1,384	1,384	0%
Legacy Managed Care Plans (no new enrollments)			
Aetna Citizen HMO Plan	1,245	1,245	0%
Highmark PPOBlue - High Option	1,438	2,170	41%

Health Options Program
(continued)

North & Central Region: (All other counties in Pennsylvania)	2016	2017	Increase
Managed Care Plans			
Aetna PPO*	$1,147	$1,147	0%
Capital Blue Cross PPO*	1,304	1,343	3%
Highmark PPO	1,150	1,588	38%
UPMC EPO*	1,384	1,384	0%
Legacy Managed Care Plans (no new participants)			
Aetna Citizen Plan HMO	1,245	1,245	0%
Highmark PPOBlue – High Option	1,541	2,170	41%
Capital Blue Cross / Keystone Central HMO	1,239	1,338	8%

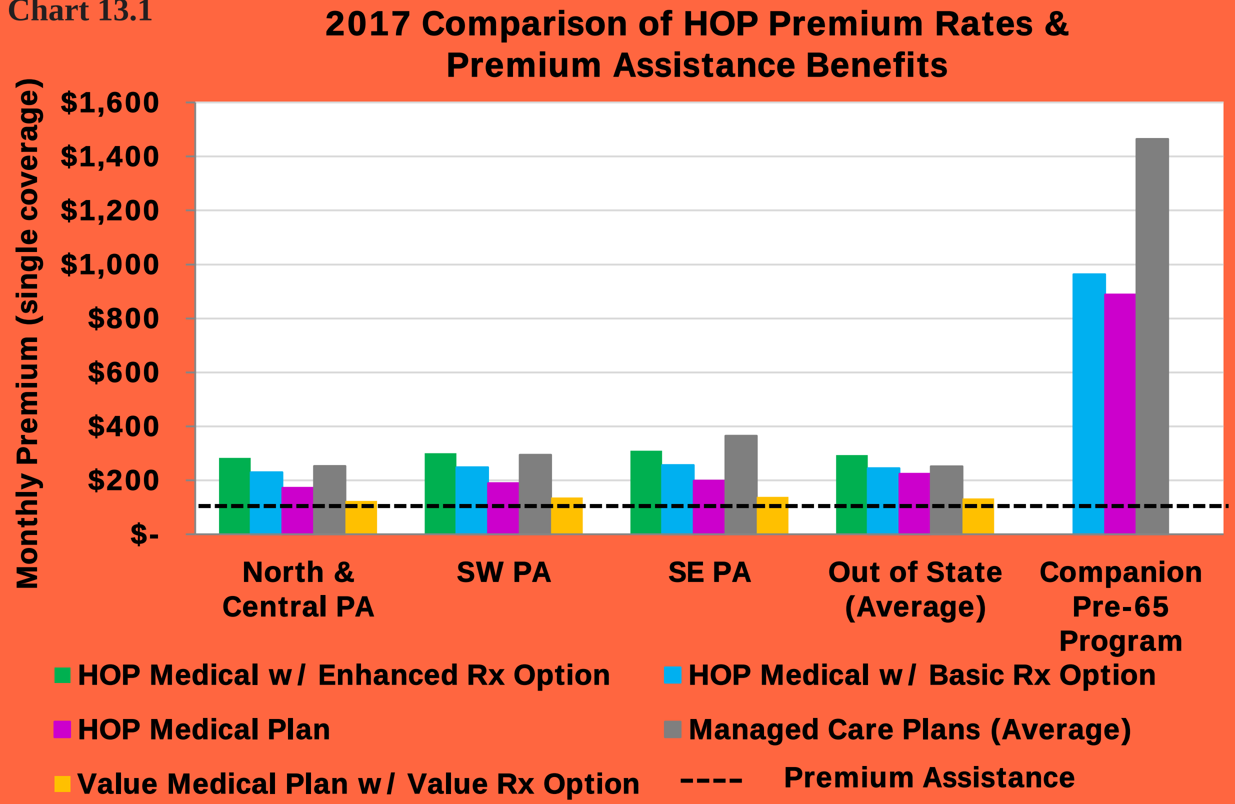
*Not available in all North and Central Region counties.

Health Options Program
(continued)

HOP Premiums Compared to the PSERS Premium Assistance Benefit

Chart 13.1 displays the HOP premiums paid by PSERS' retirees for single coverage compared with the PSERS Premium Assistance benefit. 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 premiums for 2-person and family coverage would be at least twice the cost of single coverage. Premium Assistance is an offset for the PSERS retiree's premium only.

Chart 13.1



	North & Central PA	Southwest PA	Southeast PA	Out of State (Average)	Companion Pre-65 Program
HOP Medical w/ Enhanced Rx Option	$283	$301	$310	$294	
HOP Medical w/ Basic Rx Option	230	248	257	245	$964
HOP Medical Plan	172	190	199	224	889
Value Medical Plan w/ Value Rx Option	124	137	139	133	
Managed Care Plans (Average)	253	295	365	252	1,465
Premium Assistance	100	100	100	100	100

As illustrated in the table above, the percentage of Premium Assistance benefit coverage varies by region and plan.

Health Options Program
(continued)

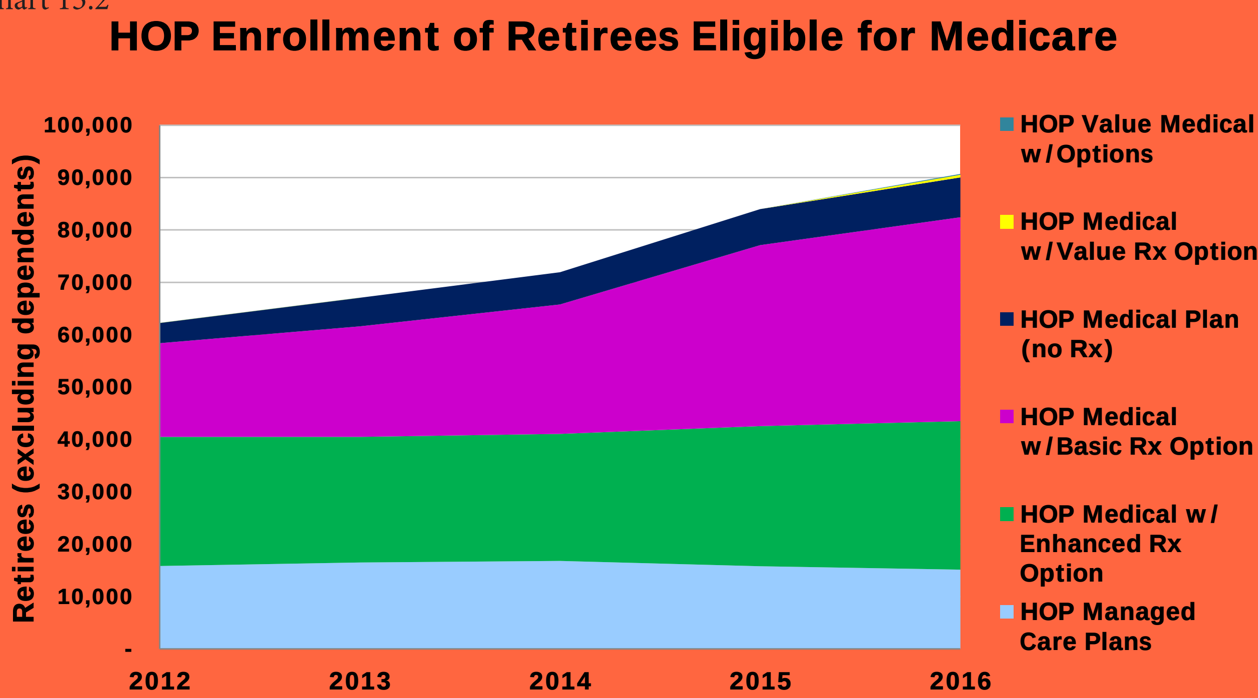
HOP Enrollment
As of December 1, 2016 there are 107,689 participants (91,206 retirees plus their dependents) in the Health Options Program. The total numbers of retirees by Option are:

Individuals Eligible for Medicare	Retirees	Participants
HOP Medical w/ Basic Medicare Rx Option	38,948	45,482
HOP Medical w/ Enhanced Medicare Rx Option	28,355	33,097
HOP Medical w/ Value Medicare Rx Option	496	532
HOP Medical Plan (no Rx)	7,609	8,426
HOP Enhanced Rx Only	92	113
HOP Basic Rx Only	241	309
HOP Value Rx Only	8	8
HOP Value Medical Only	41	46
HOP Value Medical w/ Enhanced Medicare Rx Option	7	11
HOP Value Medical w/ Basic Medicare Rx Option	26	36
HOP Value Medical w/ Value Medicare Rx Option	97	121
Highmark PPO/Legacy HMO	12,014	15,407
Keystone East HMO/IBC Legacy PPO	1,013	1,217
Capital BC PPO/Keystone Central Legacy HMO	779	1,008
UPMC HMO	767	1058
91Aetna PPO/Legacy HMO	554	658
Total Medicare Eligible	91,047	107,529
Individuals Not Eligible for Medicare		
HOP Pre-65 Medical Plan w/ Rx Coverage	93	94
HOP Pre-65 Medical Plan	27	27
Highmark PPO	22	22
Capital BC PPO/Keystone Central Legacy HMO	9	9
Keystone East HMO/IBC Legacy PPO	7	7
Aetna PPO/Legacy HMO	1	1
Total Not Eligible for Medicare	159	160
Total in Health Options Program	91,206	107,689

Health Options Program
(continued)

Enrollment in the PSERS' Health Options Program continues to increase. As illustrated by Chart 13-2, the number of retirees participating in the HOP has increased 48% over the past 5 years.

Chart 13.2



Health Options Program Funding

A majority of the premium income is deducted from the retiree's monthly retirement benefit and transferred to the plan (claims administrator for the self-funded Options). Approximately 5,000 retirees submit monthly premium payments to the HOP Administration Unit, as their monthly retirement benefits, if any, are insufficient to cover the premium cost. In addition, individuals enrolled in a Medicare Rx Option without HOP Medical plan coverage must submit monthly premium payments.

Health Options Program income is projected to be $393 million during the 2017 Plan (calendar) Year. A majority of this income comes from premium payments from participants. Other sources of funding are Medicare prescription drug payments (for participants enrolled in a Medicare prescription drug plan) from the Center for Medicare and Medicaid Services (CMS) and interest income. Table 13.1 displays the breakdown of these sources of income (Dollar amounts in millions):

Table 13.1 Income	Calendar Year 2017
Participant Contributions	$ 332.7
CMS - Medicare Prescription Drug Payments	59.6
Interest Income	0.4
Total	**$ 392.7**

Health Options Program
(continued)

PSERS retirees enrolled in the Health Options Program, who meet the eligibility requirements for Premium Assistance, receive $100 per month as a partial reimbursement for the out-of-pocket premium expense. Approximately 74,000 of the 91,206 HOP retirees receive Premium Assistance. This accounts for nearly $88 million of the $108 million annual benefit expense of the Premium Assistance Program. The following Premium Assistance Program section provides additional information.

Contributions and interest income pay for the benefits provided to Health Options Program participants plus administrative expenses. Table 13.2 displays the breakdown of the benefit expenses (Dollar amounts in millions):

Table 13.2 Benefit Expense	Calendar Year 2017
Self-funded Hospital, Medical & Major Medical Benefits	$165.8
Self-funded Prescription Drug Benefits	137.2
Insured Managed Care and Dental Premiums	79.0
Total	**$382.0**

In addition to the benefit expenses identified above, the Health Options Program will pay $8 million in enrollment and administrative expenses including reimbursing PSERS for its expenses.

As of December 31, 2016, HOP had net assets of $233.3 million held in trust to pay the expenses of Health Options Program for the exclusive benefit of participants.

Premium Assistance Program

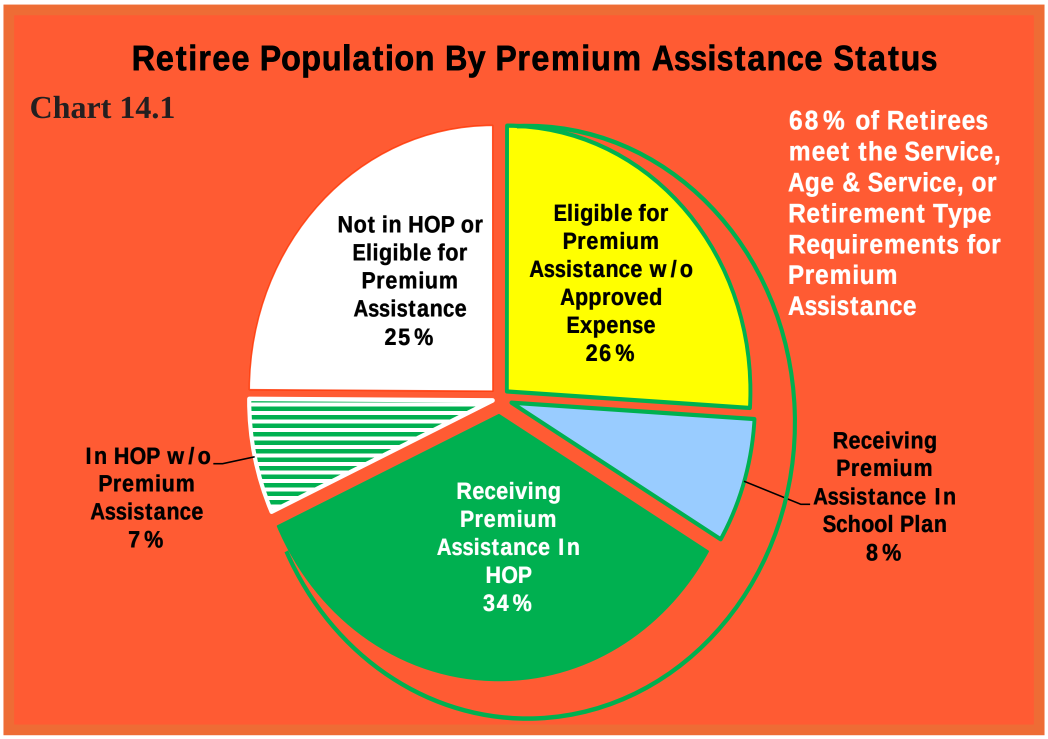
In accordance with Sec. 8509 of the Public School Employees' Retirement Code 24 Pa. C.S. § 8509, PSERS provides up to $100 per month in Premium Assistance to eligible retirees to help cover the cost of their health insurance. The Premium Assistance program began on July 1, 1992. The eligibility requirements for premium assistance are as follows:

- 24.5 years of credited service, or
- 15 years of credited service if termination of employment and retirement occurred after superannuation age , or
- Receiving a disability annuity from PSERS; and
- Have an out-of-pocket premium expense from their former school employer's health plan or the PSERS sponsored Health Options Program (HOP).

Enrollment

As of June 30, 2016, PSERS had 214,019 retirees (excluding survivor annuitants and beneficiaries) receiving a monthly benefit. Of these retirees 146,114 meet the service, service and age at termination of school service, or retirement type (disability) eligibility requirements for the premium assistance program. Of the retirees meeting these requirements, 55,610 are not receiving premium assistance payments because they do not have an out-of-pocket premium expense from an approved plan. Of the 90,180 retirees receiving premium assistance benefits, 73,926 are enrolled in HOP and 16,254 are participating in their former school employer's health plan and have an out-of-pocket premium expense.

A breakdown of retirees by their premium assistance status is displayed in Chart 14.1:



June 30, 2015	Number	Percentage
Eligible for Premium Assistance w/o Approved Expense[1]	55,610	26%
Receiving Premium Assistance In School Plan[1]	16,254	8%
Receiving Premium Assistance In HOP[1]	73,926	34%
In HOP w/o Premium Assistance	14,921	7%
Not In HOP or Eligible for Premium Assistance	53,308	25%
Total Retiree Population[2]	214,019	100%

(1) Meeting the service, service and age at termination of school employment or retirement type requirements.
(2) As of June 30, 2016 Actuarial Valuation (Excludes Survivor Annuitants and Beneficiaries)

Premium Assistance Program
(continued)

Funding

The Premium Assistance Program is funded by employer contributions. The contribution rate is calculated by PSERS' actuary in accordance with the formula set forth in the Retirement Code[1]. The contribution needed during FY2017/18 is 0.83% of payroll.

For the year ended June 30, 2016, employer contributions equaled $113.3 million and net investment income totaled $0.5 million. During this period, PSERS paid Premium Assistance benefits equaling $108.3 million and incurred administrative expenses of $1.6 million.

As of December 31, 2016, the Premium Assistance Program had net assets of $122.4 million.

[1]§8509. Health insurance premium assistance program: (a) Contribution rate.-- For each fiscal year beginning after July 1, 1991, the premium assistance contribution rate shall be established to provide reserves sufficient, when combined with unexpended amounts from the reserves set aside the previous fiscal year for health insurance assistance payments, to provide premium assistance payments in the subsequent fiscal year for all participating eligible annuitants. The Board is authorized to expend an amount not to exceed 2% of the health insurance account each year to pay for the direct expense of administering the health insurance premium assistance program, which expenditure may be included in the Board's consideration when it establishes the premium assistance contribution rate each year.