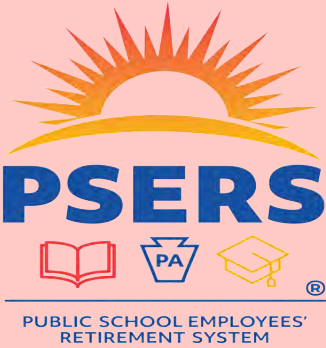


PSERS BUDGET REPORT - FY2023-24

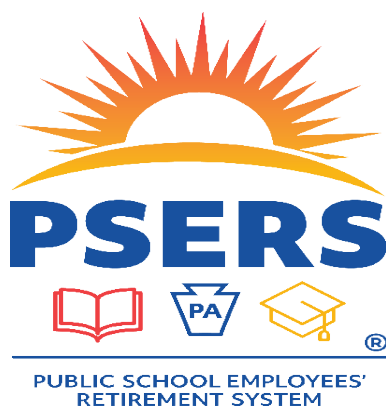


SECTION 3 - INVESTMENT INFORMATION

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Investment Guidelines, Philosophy and Risk Management



Investment Guidelines, Philosophy, and Risk Management

Investment Guidelines

The Board has established investment objectives for the Fund as follows:

To generate returns to support the System's actuarial soundness so it may provide its members with benefits as required by law.

To earn a long-term total return, net of fees and investment expenses, that equals or exceeds the Actuarial Assumed Rate approved by the Board.

To earn a long-term total return, net of fees and investment expenses, that equals or exceeds the Policy Index approved by the Board.

To prudently manage investment risks that are related to the achievement of investment goals.

Investment Philosophy

The PSERS Board of Trustees believes PSERS assets should be managed in accordance with PSERS unique liability stream, funding sources, cash flows, and portfolio size, focusing on the prudent accumulation of wealth over the long term to meet the retirement benefit obligations established by the plan sponsor to its members.

PSERS assets should be managed based on the following beliefs:

1. Uncertainty

The future is difficult to forecast with any accuracy or certainty, particularly changes in the economic and market environment.

2. Asset Allocation

The strategic asset allocation mix, more than implementation or any other factor or decision, largely determines the portfolio's overall risk and return.

3. Diversification

Diversification is the best approach to addressing future uncertainty and therefore meeting PSERS long-term investment objectives.

Diversification should be across multiple dimensions:

- By and within asset classes.
- By geography.
- By strategy (e.g., in Public Equity: growth and value, concentrated and diversified, quantitative and fundamental).
- By vintage year for Private Investments (investment pacing in and out of investments helps mitigate the impact of market volatility).

Over any given period, any number of asset classes, geographies, strategies, and vintages will underperform others; that is to be expected and accepted.

4. Risk

For an underfunded plan or for a plan with negative cash flow (benefits paid exceed contributions received), the path of compounding of investment returns – from month to month, quarter to quarter, and year to year -- matters more than for a plan that is fully funded or has positive cash flow; for the former type of plan, peak-to-trough declines transform unrealized losses into permanent ones.

Drawdown risk should be mitigated, especially as the environment in which drawdowns occur is likely. Also the environment where the Plan Sponsor's willingness and ability to make contributions to the plan may be less than in normal times.

Liquidity should be managed to reasonably ensure that the fund can meet its obligations during periods of market dislocations.

5. Leverage

Leverage at the total fund level can be an effective tool to enhance diversification, since asset classes, over the long-term, have similar risk-adjusted returns, different correlations to each other, and different responses to changes in the economic and market environment.

Leverage can be a vital tool to increase or decrease total fund risk in a diversified manner.

Investment Philosophy (continued)

6. Rebalancing

Disciplined rebalancing enhances long term returns as it is an inherently contrarian process.

Rebalancing restores strategic asset allocation as the primary driver of return and risk.

7. Portfolio Size

Managing a large pool of assets provides investors unique access to investment opportunities not available to smaller institutional investors or individual investors.

PSERS should use its size to its advantage to enhance its net-of-fees return and diversification opportunities.

8. Private Investments

Allocations to Private Equity, Private Credit, Private Real Estate, Private Infrastructure, and other illiquid asset classes may be justified by the illiquidity risk premium available to investors.

Allocations to these asset classes may also be justified by the diversification benefit they provide, through exposure to sectors, businesses, and mode of corporate governance not obtainable through public markets.

9. Active Management

Passive investing, rather than active management, is the default choice to be used for any asset class that is highly efficient or where skilled active managers are less likely to be identified.

Certain asset classes continue to exhibit information inefficiency, where skilled active management and well-resourced investors such as PSERS can potentially persistently outperform peers and the benchmark for that asset class.

There will be short-term periods when a skilled active manager may under perform peers and the benchmark; that is to be expected and accepted; therefore a long-term perspective will be employed.

10. Internal Management

PSERS has developed skilled internal investment managers; as such internal investment management is preferred over external investment management in cases where internal management most likely can match or exceed the long term, net of fees, risk-adjusted returns provided by external managers, provided the internal investment and operational resources are available to do so.

11. Investment Fees

Investment management fees for external management are one of the few aspects of investment management that are certain and over which the investor has control.

Investment management and performance fees should be managed to (i) maximize long term, net of fees, risk-adjusted returns, (ii) split the value added fairly between the investment manager and PSERS, and (iii) align the interests of the investment manager with PSERS.

Risk Management

Risk management is essential to the entire investment process. 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 long-term investment returns required to maintain stable and cost-effective contribution rates.

Risk Management (continued)

The future is difficult to forecast with any accuracy or certainty, particularly changes in the economic and market environment but PSERS 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. In positioning for future developments, PSERS cannot know with complete certainty how markets or particular investment strategies will perform. The strategic asset allocation mix, more than implementation or any other factor or decision, largely determines the portfolio's overall risk and return.

Given its long-term investment horizon, PSERS accepts prudent investment risk in exchange for acceptable levels of additional incremental return. PSERS Board sets long-term asset allocation and risk parameters. The Investment Office implements investment policies within these approved guidelines. The Investment Office works closely with PSERS Board to establish, monitor, and report its various risk metrics and has the required authority to efficiently and effectively implement associated actions.

The Policies of the Board can be found on the Investment page on PSERS website.

Divestiture of Russian and Belarusian Investments

As of December 31, 2022, PSERS has divested all possible related assets and continually looks to decrease exposure whenever possible.

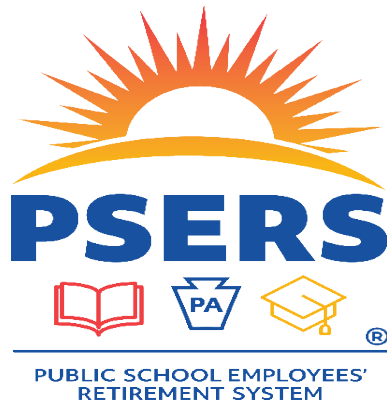
At the start of the Russian invasion of Ukraine in late February 2022, PSERS estimated the Fund held under \$300 million (less than ½ of 1% of PSERS total assets of \$72.5 billion) in Russian and Belarusian investments.

On March 3, 2022, PSERS Board of Trustees passed a Resolution to divest PSERS from investments in Russia and Belarus as expeditiously as possible, consistent with the Board's fiduciary duty of prudence. In addition, future investments involving Russia or Belarus were prohibited until directed otherwise by the Board. Since that time, the amount of PSERS investment holdings in Russia and Belarus has steadily declined.

PSERS estimates as of March 13, 2023, direct Russian holdings had a market value of approximately \$1.5 million according to its custodian bank, BNY Mellon. Liquidation has not yet been achieved due to the Russian market's illiquidity. PSERS had indirect Russian holdings and alternative investments of approximately \$70,000 as of year-end 2022. PSERS does not have any indirect or direct holdings in Belarus.

In addition, on November 3, 2022, Act 132 (House Bill 2447) directed PSERS, as well as the State Treasury, State Employees' Retirement System, and the Pennsylvania Municipal Retirement System to divest from Russian and Belarusian assets.

Capital Market Assumptions



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 return 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 2021, 2022 survey results under the 20-year forecast indicate a slight increase in return assumptions across most asset classes. We elaborate on select asset classes below.

Fixed Income

Nominal government bond returns are a function of long-term expectations for inflation and government yields. Corporate bond returns are a function of expected inflation, government yields, and expectations for credit spreads, defaults, and downgrades. Most of the decrease in bond return assumptions from 2016 – 2021 can be explained by falling yields and tightening credit spreads. In response to the COVID-19 pandemic, the Federal Reserve lowered the target range for the federal funds rate to 0% to 0.25% in 2020 and maintained the target range in 2021. Due to rising inflation in 2022, the Federal Reserve raised the target range for the federal funds rate to 3.75% to 4% as of November 30, 2022. Fixed income return expectations have increased relative to 2021, driven by rising bond yields.

Equities

Equity return assumptions are driven by market valuations, earnings growth expectations and assumed dividend payouts. Equity return expectations have largely remained unchanged relative to 2021. From 2016 – 2021, most of the decrease in equity market return assumptions can be explained by rising valuations.

Real Estate

Global real estate return assumption in 2022 decreased relative to expected returns from 2021. Slowing growth impacted the real return assumption in 2022.

Hedge Funds

Hedge Fund assumptions reflect changes in the underlying equity, fixed income, and cash capital market assumptions. The increase in the hedge fund assumption from 2021 to 2022 reflects the expectations for fixed income and cash.

Diversification Benefit

PSERS can select from a broad array of asset allocation alternatives, analyzing allocation strategies using asset classes with varying expected returns and expected risk to formulate an optimal asset allocation policy more likely to achieve the investment return and investment risk goals established by the Board. In recent years, lower risk projections have afforded PSERS flexibility in identifying different combinations of asset allocations that can achieve our long-term goal of 7.0% at acceptable levels of risk even as return assumptions have fallen. PSERS also applies leverage in implementing its asset allocation policy, providing an additional mechanism to increase expected volatility to target higher expected returns when warranted.

Section 3 Investment Information

Capital Market Assumptions (continued)

The table below summarizes the average expected capital market geometric return assumptions of 20-30 surveyed independent investment advisors in 2018 - 2022.

Table 9.1

Capital Market Assumptions (CMA's) Average Expected Geometric Returns (2018 - 2022)

<u>Asset Class</u>	<u>2018 Survey</u>	<u>2019 Survey</u>	<u>2020 Survey</u>	<u>2021 Survey</u>	<u>2022 Survey</u>
U.S. Equity - Large Cap	7.4%	7.1%	7.1%	6.7%	6.5%
U.S. Equity - Small/Mid Cap	8.2%	7.5%	7.6%	7.0%	7.0%
Non-U.S. Equity - Developed	7.7%	7.7%	7.5%	7.1%	7.1%
Non-U.S. Equity - Emerging	8.8%	8.7%	8.4%	7.8%	7.9%
U.S. Corporate Bonds - Core	4.5%	4.3%	3.6%	3.2%	3.5%
U.S. Corp Bonds - Long Duration	4.4%	4.4%	3.6%	3.4%	3.5%
U.S. Corporate Bonds - High Yield	5.8%	5.8%	5.6%	5.0%	5.0%
Non-U.S. Debt - Developed	3.2%	3.4%	2.3%	2.3%	2.5%
Non-U.S. Debt - Emerging	6.1%	6.1%	5.9%	5.3%	5.3%
U.S. Treasuries (Cash Equivalent)	3.1%	3.0%	2.3%	1.9%	2.0%
TIPS (Inflation-Protected)	4.0%	3.5%	2.7%	2.4%	2.6%
Real Estate	6.7%	6.8%	6.6%	6.2%	6.0%
Hedge Funds	6.2%	6.2%	5.7%	5.3%	5.5%
Commodities	4.9%	4.7%	4.0%	4.0%	4.2%
Infrastructure	7.1%	7.2%	7.3%	6.8%	6.9%
Private Equity	9.5%	10.1%	9.9%	9.7%	9.8%
Private Debt	—	7.8%	7.9%	6.9%	7.1%
Inflation	2.5%	2.3%	2.2%	2.2%	2.4%

Section 3 Investment Information

Capital Market Assumptions (continued)

The CMA surveys also included forecasts for 20 year average expected risk (Table 9.2). The numbers below reflect the expected standard deviation in % around the expected return.

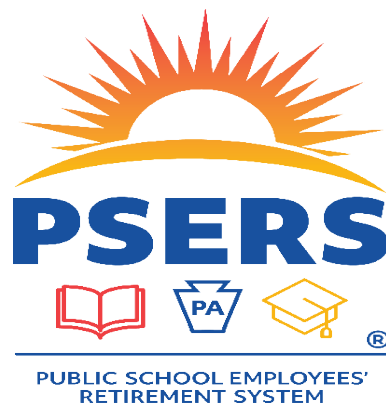
Table 9.2

Capital Market Assumptions (CMA's)

Average Expected Risk (2018 - 2022)

<u>Asset Class</u>	<u>2018 Survey</u>	<u>2019 Survey</u>	<u>2020 Survey</u>	<u>2021 Survey</u>	<u>2022 Survey</u>
US Equity – Large Cap	16.4%	16.2%	16.2%	16.4%	16.3%
US Equity – Small/Mid Cap	20.2%	20.2%	20.2%	20.2%	20.3%
Non-US Equity – Developed	18.7%	18.2%	18.1%	18.3%	18.1%
Non-US Equity – Emerging	24.9%	24.7%	24.2%	24.3%	23.9%
US Corporate Bonds – Core	5.7%	5.5%	5.5%	5.5%	5.4%
US Corporate Bonds – Long Duration	10.8%	10.5%	10.2%	10.4%	10.5%
US Corporate Bonds – High Yield	10.2%	10.1%	9.8%	9.9%	9.9%
Non-US Debt – Developed	6.9%	7.6%	7.0%	7.2%	7.5%
Non-US Debt – Emerging	11.4%	11.3%	11.0%	11.3%	10.9%
US Treasuries (Cash Equivalent)	2.7%	2.3%	1.8%	1.3%	1.1%
TIPS (Inflation-Protected)	6.3%	6.1%	6.1%	5.6%	5.8%
Real Estate	13.9%	15.0%	16.8%	17.6%	17.0%
Hedge Funds	7.9%	8.4%	8.0%	8.1%	8.0%
Commodities	17.6%	17.7%	17.6%	17.3%	17.8%
Infrastructure	14.7%	14.4%	14.6%	17.0%	16.6%
Private Equity	22.2%	22.0%	22.0%	22.3%	22.1%
Private Debt	—	11.6%	12.1%	11.4%	11.5%
Inflation	1.8%	1.7%	1.7%	2.1%	2.1%

Asset Exposure and Investment Program Summary



Asset Exposure (as of June 30, 2022)

The Board maintains a disciplined and thorough process to establish a new asset allocation policy presently every three years while monitoring the implementation of any related adjustments ongoing. This process begins following the Board's review and acceptance of the actuary's annual report, as described in Tab 5. PSERS investment professionals 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 various asset allocations choices

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.

The Board reassesses the long-term asset allocation targets of the System not less than every three years. In establishing the asset allocation plan, the Board will consult with its actuary, consultants, investment staff, and other sources of information it deems appropriate in formulating this allocation. The purpose of the asset allocation is to align strategic investment objectives with the long-term financial needs of the System.

Section 3 - Investment Information

Asset Exposure (continued)

Table 10.1 represents PSERS asset exposure and target allocation plan that became effective April 1, 2022, and was in effect on June 30, 2022.

Table 10.1

PSERS Asset Exposure and Target Asset Allocation Plan (as of June 30, 2022)

<u>Asset Class</u>	<u>Market Value (in millions)</u>	<u>Percentage of Gross Asset Exposure</u>	<u>Percentage of Net Asset Exposure</u>	<u>Target Allocation %</u>	<u>Target Allocation Range</u>
Public Equity	\$ 15,763.9	21.1 %	22.7 %	28.0 %	
Private Equity	12,293.0	16.5 %	17.6 %	12.0 %	
Total Equity	\$ 28,056.9	37.6 %	40.3 %	40.0 %	± 5%
Public Fixed Income*	\$ 16,004.0	21.4 %	23.0 %	27.0 %	
Private Credit	5,323.9	7.1 %	7.6 %	6.0 %	
Total Fixed Income	\$ 21,327.9	28.5 %	30.6 %	33.0 %	± 5%
Public Real Asset*	13,118.1	17.6 %	18.8 %	18.0 %	
Private Real Asset	7,412.8	9.9 %	10.6 %	11.0 %	
Total Real Asset	\$ 20,530.9	27.5 %	29.4 %	29.0 %	± 3%
Tail Risk Mitigation	\$ 370.0	0.5 %	0.5 %	— %	
Absolute Return	\$ 4,438.3	5.9 %	6.4 %	6.0 %	0 to 7%
Gross Asset Exposure	\$ 74,724.0	100.0 %	107.2 %	108.0 %	
Cash	\$ 3,552.1	4.8 %	5.1 %	3.0 %	
Explicit Leverage	(8,561.2)	(11.5)%	(12.3)%	(11.0)%	
Net Leverage	(5,009.1)	(6.7)%	(7.2)%	(8.0)%	10 to -20%
Net Asset Exposure	\$ 69,714.9	100.0%	100.0%	100.0%	

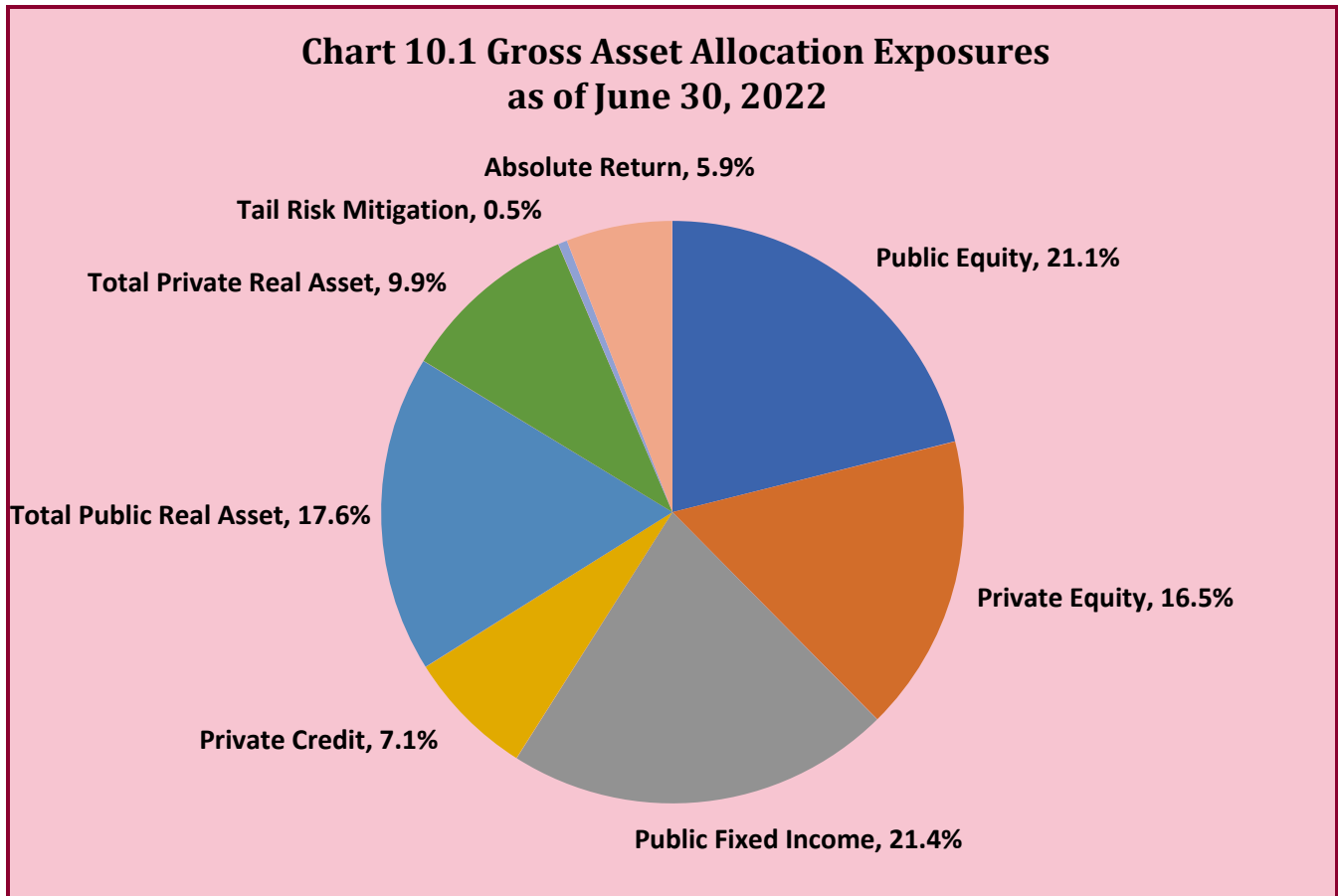
*PSERS uses leverage to achieve increased economic exposure to diversifying asset classes to manage the overall portfolio risk while maintaining an allocation designed to achieve the long-term return goals of the System. Increased economic exposure is generally achieved through the use of either derivative positions or higher volatility funds. As of June 30, 2022, PSERS had total increased economic exposure of \$8.6 billion related to the following asset classes: Fixed Income (\$2.5 billion); Infrastructure (\$1.0 billion); Real Estate (\$0.7 billion) and Commodities (\$4.4 billion). An allocation of 3% to Cash is included in the Target Allocation.

Note: PSERS asset allocation was updated August 5, 2022 and is available for review at <https://www.psers.pa.gov>

Section 3 - Investment Information

Asset Exposure (continued)

Chart 10.1 illustrates PSERS asset allocation exposure as of June 30, 2022:



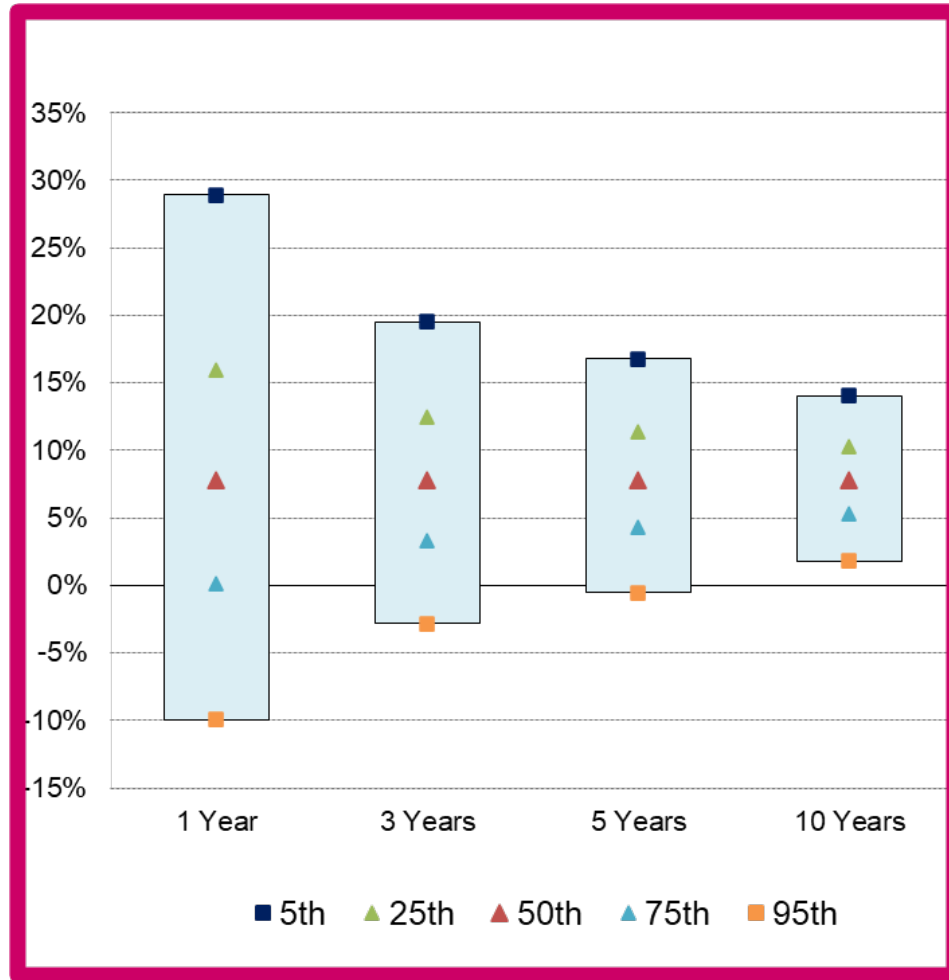
Note: Financing represents a negative 6.7% allocation and is not reflected in Chart 10.1.

Section 3 - Investment Information

Asset Exposure (continued)

The purpose of the asset allocation is to meet the long-term investment objectives of the System. PSERS considers the expected range of returns for 1, 3, 5, and 10 year periods of various asset allocations choices to select the optimal asset allocation. 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 10.1 below, which depicts expected future returns for PSERS current asset allocation:

Exhibit 10.1



Range of Returns				
Percentiles	1 Year	3 Years	5 Years	10 Years
5%	29.0%	19.5%	16.8%	14.1%
25%	16.0%	12.4%	11.4%	10.3%
50%	7.8%	7.8%	7.8%	7.8%
75%	0.1%	3.3%	4.3%	5.3%
95%	(9.9)%	(2.8)%	(0.5)%	1.8%

Source: Aon Hewitt's 30-year capital market assumptions as of June 30, 2022.

Asset Classifications

Public Equity Investments

PSERS seeks to diversify assets by obtaining broad exposure to publicly traded equity markets. Public Equity plays a strategic role within the Fund, by providing a return premium over inflation, thereby preserving and enhancing the real value of the Fund, and by performing well when economic growth is stronger than expected or inflation is lower than expected. To maintain diversification within the asset class, the Fund pursues a global investment strategy across regions, sectors, market capitalization segments, and investment styles.

Public Equity assets may be invested in instruments that provide equity returns. Instruments used may be exchange-traded or non-exchange-traded and may be physical securities or derivatives.

Private Equity Investments

PSERS seeks to diversify its assets by providing exposure to private investments as part of the overall investable universe. Additionally, when compared to other investable opportunities, private investments are intended to provide exposure to higher potential returns and better alignment of interests. Private Equity also provides access to investment opportunities not available in Public Equity markets. The Private Equity asset class targets returns in excess of the benchmark, net of fees, over a full market cycle. The Private Equity portfolio will achieve diversification by investing in funds and co-investments that are complementary in nature regarding fund size, sector, strategic, geographic and industry focus, and vintage year.

Private Equity assets may include but are not limited to, funds, co-investments, secondaries, separate accounts, joint ventures, partnerships, limited liability companies, and operating companies (collectively "Private Equity Investments") investing in Private Equity strategies. Private Equity Investments may result in exposure to any type of private security throughout the capital structure. PSERS will only consider investment structures that provide limited liability to PSERS which limits PSERS losses to the amount invested.

Public Fixed Income Investments

PSERS seeks to diversify assets by obtaining broad exposure to publicly traded fixed income markets. Public Fixed Income plays a strategic role within the Fund in a variety of ways. Nominal bonds serve as a hedge against lower inflation and weak economic growth, produce current income in the form of periodic interest payments, and provide liquidity to meet the Fund's obligations. Inflation protected bonds serve as a hedge against higher inflation and weaker economic growth and provide liquidity. Higher quality bond returns have also served as a diversifier relative to equity returns. Credit-related securities such as emerging market debt and public high yield bonds generate higher current income relative to investment grade debt and tend to do well when economic growth is stronger than expected. To maintain diversification within the asset class, the Fund pursues a global investment strategy across regions, sectors, maturity segments, credit quality, and investment styles.

Public Fixed Income assets may be invested in instruments that provide fixed income returns. Instruments used may be exchange-traded or non-exchange-traded and may be physical securities or derivatives.

Private Credit Investments

PSERS seeks to diversify its assets by providing exposure to private investments as part of the overall investable universe. Additionally, when compared to other investable opportunities, private investments are intended to provide exposure to higher potential returns and better alignment of interests. Private Credit typically provides enhanced yields over publicly-traded fixed income markets and serves as a diversifier to the overall portfolio by providing exposure to a variety of underlying collateral types not easily accessed through traditional asset classes. The Private Credit asset class targets returns in excess of the benchmark, net of fees, over a full market cycle. The Private Credit asset class will achieve diversification by investing in both closed-end and evergreen funds, as well as co-investments that are complementary with respect to fund size, sector, strategic focus, geographic and industry focus and vintage year.

Asset Classifications (continued)

Private Credit assets may include, but are not limited to, funds, co-investments, secondaries and separate accounts (collectively “Private Credit Investments”) investing in Private Credit strategies. Private Credit Investments may result in exposure to diverse securities throughout the capital structure. Private Credit also allows for investment structures which may not conform precisely to the previous list but whose intent is to capture Private Credit exposure and returns. PSERS will only consider investment structures that provide limited liability to PSERS which limits PSERS losses to the amount committed.

Public Commodities Investments

PSERS seeks to diversify assets by obtaining broad exposure to publicly traded commodities markets. Commodity investments consist of energy, precious metals, industrial metals, and agricultural. 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 changes in the rate of inflation. Public Commodities play a strategic role within the Fund, by providing a hedge against unanticipated inflation and diversification benefits. To maintain diversification within the asset class, the Fund pursues an investment strategy across all key commodities and across investment styles.

Public Commodities assets may be invested in instruments that provide publicly traded commodities returns. Instruments used may be exchange-traded or non exchange-traded and may be physical securities or derivatives, and leverage may be employed.

Public Infrastructure Investments

PSERS seeks to diversify assets by obtaining broad exposure to publicly traded infrastructure markets. Public Infrastructure investments target stable, defensive investments with steady cash flows primarily within the energy, power, water, and transportation sectors. Public Infrastructure plays a strategic role within the Fund, by providing steady returns and cash yields, defensive growth, inflation protection, capital preservation, liquidity and diversification benefits. To maintain diversification within the asset class, the Fund pursues a global investment strategy across geographic regions, sectors, market capitalization segments, and investment styles.

Public Infrastructure assets may be invested in instruments that provide publicly-traded infrastructure returns. Instruments used may be exchange-traded or non exchange-traded and may be physical securities or derivatives, and leverage may be employed.

Public Real Estate Investments

PSERS seeks to diversify assets by obtaining broad exposure to publicly-traded real estate markets. Public Real Estate provides a strategic role within the Fund, by providing steady returns and cash yields, inflation protection, defensive growth, capital preservation, liquidity and diversification benefits. To maintain diversification within the asset class, the Fund pursues a global investment strategy across geographic regions, property sectors, market capitalization segments, and investment styles.

Public Real Estate assets may be invested in instruments that provide publicly-traded real estate returns. These include, but are not limited to, US and Non-US publicly-traded real estate investment trusts (REITs). Instruments used may be exchange-traded or non-exchange-traded and may be physical securities or derivatives.

Asset Classifications (continued)

Private Infrastructure Investments

PSERS seeks to diversify its assets by providing exposure to private investments as part of the overall investable universe. Additionally, when compared to other investable opportunities, private investments are intended to provide exposure to higher potential returns and better alignment of interests. While providing a current income return and a potential hedge against inflation, Private Infrastructure also provides access to investment opportunities not available in Public Infrastructure markets. The Private Infrastructure asset class targets returns in excess of the benchmark, net of fees, over a full market cycle. The Private Infrastructure asset class will achieve diversification by investing in funds, both closed-end and evergreen and co-investments that are complementary in nature regarding fund size, sector, strategic focus, regional footprint and vintage year.

Private Infrastructure assets can include but are not limited to, funds, co-investments, separate accounts, joint ventures, partnerships, limited liability companies, and operating companies (collectively "Private Infrastructure Investments") investing in private infrastructure strategies. Private Infrastructure Investments may result in exposure to any type of security throughout the capital structure. Notwithstanding investments in Separate Accounts, PSERS will only consider investment structures that provide limited liability to PSERS which limits PSERS losses to the amount committed.

Private Real Estate Investments

PSERS seeks to diversify its assets by providing exposure to private investments as part of the overall investable universe. Additionally, when compared to other investable opportunities, private investments are intended to provide exposure to higher potential returns and better alignment of interests. Private Real Estate typically provides current income, appreciation, and a potential hedge against inflation, and serves as a diversifier to the overall portfolio. Private Real Estate also provides access to investment opportunities not available in the publicly traded real estate markets. The Private Real Estate asset class targets returns in excess of the benchmark, net of fees, over a full market cycle. The Private Real Estate asset class will achieve diversification by investing in funds, both closed-end and evergreen, and co-investments that are complementary in nature regarding fund size, property type, strategic focus, regional footprint and vintage year.

Private Real Estate investments can be committed to, but not limited to, funds, co-investments, separate accounts, joint ventures, partnerships, limited liability companies, private REITS and real estate operating companies (collectively "Private Real Estate Investments") investing in private real estate strategies. Private Real Estate Investments may be considered throughout the entire capital structure. Notwithstanding investments in Separate Accounts, PSERS will only consider investment structures that provide limited liability to PSERS which limits PSERS losses to the amount committed.

Asset Classifications (continued)

Absolute Return Investments

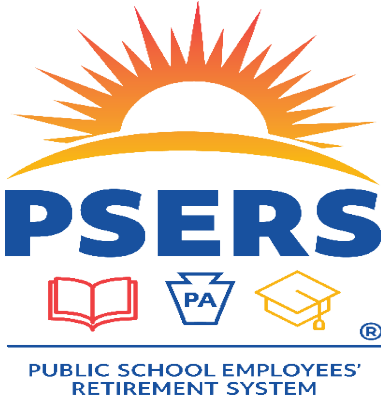
Through investment in Absolute Return strategies, PSERS seeks to reduce the risk and/or enhance the returns of PSERS overall investment program through investment in a diversified basket of portfolios. The Absolute Return asset class targets managers which provide idiosyncratic returns and portfolios that exhibit low correlation to equities, fixed income, commodities, and other sources of low-cost beta over a full market cycle. The Absolute Return asset class targets risk-adjusted returns in excess of the benchmark, net of fees, over a full market cycle. The Absolute Return asset class will achieve diversification by investing in funds, both closed-end and evergreen, and co-investments that are complementary in nature regarding fund size, sector, and strategic focus.

All strategies are eligible for inclusion in the Absolute Return asset class including event driven, relative value, tactical trading, and long/short equity. Investments are diversified by strategy in order to reduce the impact from any one strategy. Absolute Return assets can be committed to, but not limited to, funds, co-investments, separate accounts, joint ventures, partnerships, and limited liability companies (collectively "Absolute Return Investments") investing in Absolute Return strategies. Absolute Return Investments may result in exposure to diverse securities throughout the capital structure. This Policy also allows for structures which may not conform precisely to the previous list but whose intent is to capture absolute return exposure and returns. PSERS will only consider investment structures that provide limited liability to PSERS which limits PSERS losses to the amount committed.

The Board of Trustees voted to end the Absolute Return program in December 2021, and it is anticipated the program will be fully liquidated over the next few years.

PSERS Asset Class Policies can be found on our website at <https://www.psers.pa.gov/About/Investment/Pages/Guide.aspx>

Performance



Section 3 - Investment Information

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, 2022, the System generated a total net of fee return of 2.23%. This

return was above the Total Fund Policy Index return of -0.18% by 241 basis points. Annualized total net of fee returns for the three-, five-, and ten-year periods ended June 30, 2022 were 8.80%, 8.46%, and 7.91%, respectively. The three-, five-, and ten-year returns ended June 30, 2022 exceeded the Total Fund Policy Index returns by 137, 80, and 55 basis points, respectively.

Table 11.1 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 11.1	Annualized Total Returns (%) Net of Fees Ended June 30, 2022					
	1 Year	3 Year	5 Year	10 Year	15 Year	20 Year
PSERS Total Fund	2.23	8.80	8.46	7.91	5.33	7.55
Total Fund Policy Index	(0.18)	7.43	7.66	7.36	5.26	6.89
Median Public Defined Benefit Plan (DBP) Fund Universe (Aon Hewitt Database)	(7.21)	6.26	6.47	7.54	5.55	6.89
60% Global Equity / 40% Barclays U.S. Aggregate Bond Index	(13.41)	3.93	4.99	6.11	4.65	6.20
PSERS U.S. Equity Portfolios	(11.61)	10.21	10.48	12.74	8.25	9.08
U.S. Equity Policy Index	(11.87)	9.83	10.65	12.60	8.34	9.24
PSERS Non-U.S. Equity Portfolios	(21.33)	3.98	5.01	7.94	4.30	8.10
Non-U.S. Equity Policy Index	(18.87)	2.34	3.50	6.79	3.14	7.05
PSERS Fixed Income Portfolios	(5.58)	2.39	4.28	4.82	6.39	6.38
Fixed Income Policy Index	(9.10)	0.74	2.51	2.67	4.89	4.89
PSERS Commodity Portfolios	8.66	8.20	5.98	0.54	(0.38)	N/A
Commodity Policy Index	8.27	6.50	4.84	(0.99)	(1.88)	N/A
PSERS Absolute Return Portfolios	8.79	6.86	5.55	4.82	5.18	N/A
Absolute Return Policy Index	1.10	6.11	5.97	5.71	6.43	6.82
PSERS Infrastructure Portfolios	10.92	0.60	1.73	N/A	N/A	N/A
Infrastructure Policy Index	10.63	1.69	2.60	7.63	N/A	N/A
PSERS Real Estate (hedged)	26.92	14.31	12.79	11.98	4.55	9.12
Blended Real Estate Index	16.69	8.93	9.09	9.87	7.37	8.92
PSERS Alternative Investments	22.64	22.68	19.01	13.85	11.38	13.41
Burgiss Median, Vintage Year Weighted Index	23.07	21.96	18.71	14.97	11.33	10.14

Footnotes to the Total Portfolio are available on page 105 of PSERS Annual Comprehensive Financial Report.

Performance (continued)

The past fiscal year was positive for the System with a net of fee return of 2.23%, exceeding the Total Fund Policy Index by 2.41%. The following asset classes were significant contributors to asset class returns this past fiscal year:

- Private Real Estate, as represented by the National Council of Real Estate Investment Fiduciaries (NCREIF) Open End Diversified Core Equity (ODCE) Net of Fees (1 Quarter Lag), was up 27.3%.
- Public Commodities, as represented by the Bloomberg Commodity Index Total Return, were up 24.3%. Positive absolute returns were largely driven by the energy sector and rising crude oil prices.
- Private Equity, as represented by Burgiss Private Equity (1 Quarter Lag), was up 23.1%.

Significant detractors from performance this past fiscal year included:

- Emerging Market Equities, as represented by the MSCI Emerging Market Investable Market Index, were down 24.8%.
- U.S. Long Treasuries, as represented by the Bloomberg U.S. Long Treasury Index, were down 18.5%. Returns in long-term treasuries were driven by rising interest rates.

As noted, two of the best performing asset classes this past fiscal year were Private Real Estate and Commodities, which were both up over 24%, while two of the worst performers were Emerging Market Equities and U.S. Long Treasuries, returning -24.8% and -18.5%, respectively, for FY 2022. 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 does not know how actual events in the future will transpire relative to what is priced into the market. Diversification is a prudent 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. PSERS employs diversification across a wide variety of public and private markets. Exposure to private real estate, commodities, and private equity aided the System's overall performance during the past fiscal year. Diversification into asset classes such as emerging market equities and U.S. long treasuries resulted in a drag on overall performance.

In analyzing performance, PSERS Board, general investment consultant and staff pay 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 0.91 for the 5-year period ending June 30, 2022, a top 2nd percentile score among public pension plans with assets above \$1 billion.

Over the past fiscal year, the equity markets performed poorly due to inflation levels not seen in decades, sharply rising interest rates, and uncertainty stemming from lingering supply-chain issues and the Russia-Ukraine war. Within the global equity market, growth stocks significantly underperformed value stocks as technology and consumer discretionary stocks struggled amidst elevated inflation and rising interest rates. From a regional perspective, non-U.S. stocks lagged their U.S. counterparts during the fiscal year.

Section 3 - Investment Information

Performance (continued)

Within the non-U.S. markets, continental Europe performed poorly due to its proximity and exposure to the fallout of the Russia-Ukraine war. Emerging markets was the worst performing region for the fiscal year largely driven by China. China's GDP growth slowed over the fiscal year, and China re-imposed lockdown measures in major cities as the country faced a significant surge in COVID-19 cases.

In response to elevated inflation, major central banks increased benchmark interest rates. In the U.S., the Federal Reserve raised the federal funds rate by 150 basis points, to a target range of 1.50% to 1.75%, in the first six months of the 2022 calendar year. Headline inflation, as measured by the Consumer Price Index, rose by 9.1% over the fiscal year. The U.S. nominal yield curve shifted upward as yields rose across all maturities during the fiscal year. The 10-year U.S.

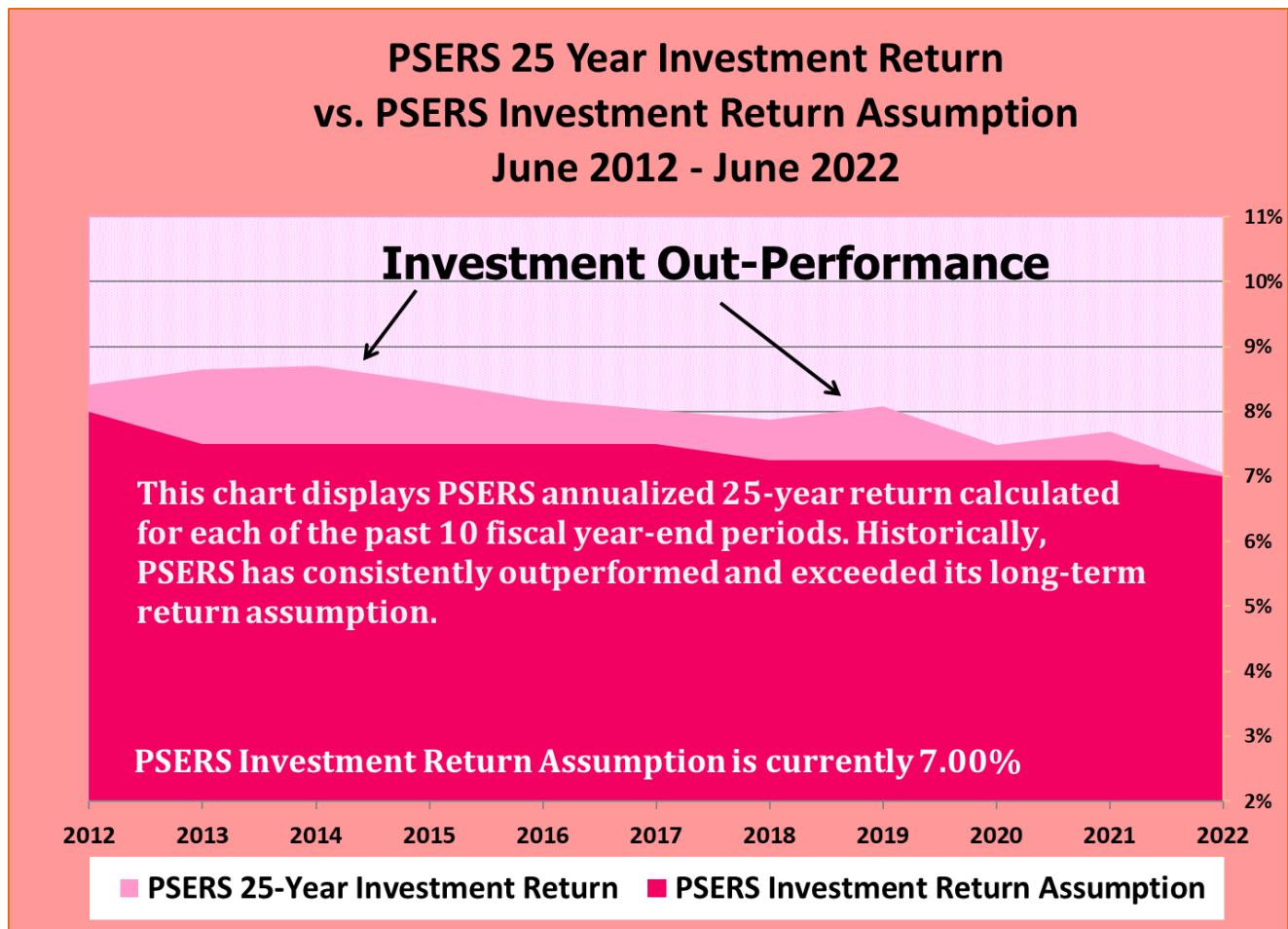
Treasury yield ended the fiscal year at 2.98%, 153 basis points higher than the beginning of the fiscal year. The sharp increase in interest rates resulted in a negative return for long government bonds.

Commodities produced strong positive returns over the 12 months ended June 30, 2022, largely driven by the energy sector and rising crude oil prices. Oil prices advanced sharply due to supply shortages resulting from the Russia-Ukraine war. The price of WTI crude oil increased by ~45% over the past 12 months to US \$106/bbl.

The assets of the System are invested to maximize the returns for the level of risk taken. Chart 11.1 shows PSERS 25-Year Trailing Investment Return for each of the past 10 fiscal years and Chart 11.2 depicts PSERS Fiscal Year Investment Return versus PSERS Investment Return Assumption for the past 10 fiscal years.

As shown in Chart 11.1, the 25-year trailing investment return has exceeded the investment return assumption over the last ten years including the Great Recession.

Chart 11.1



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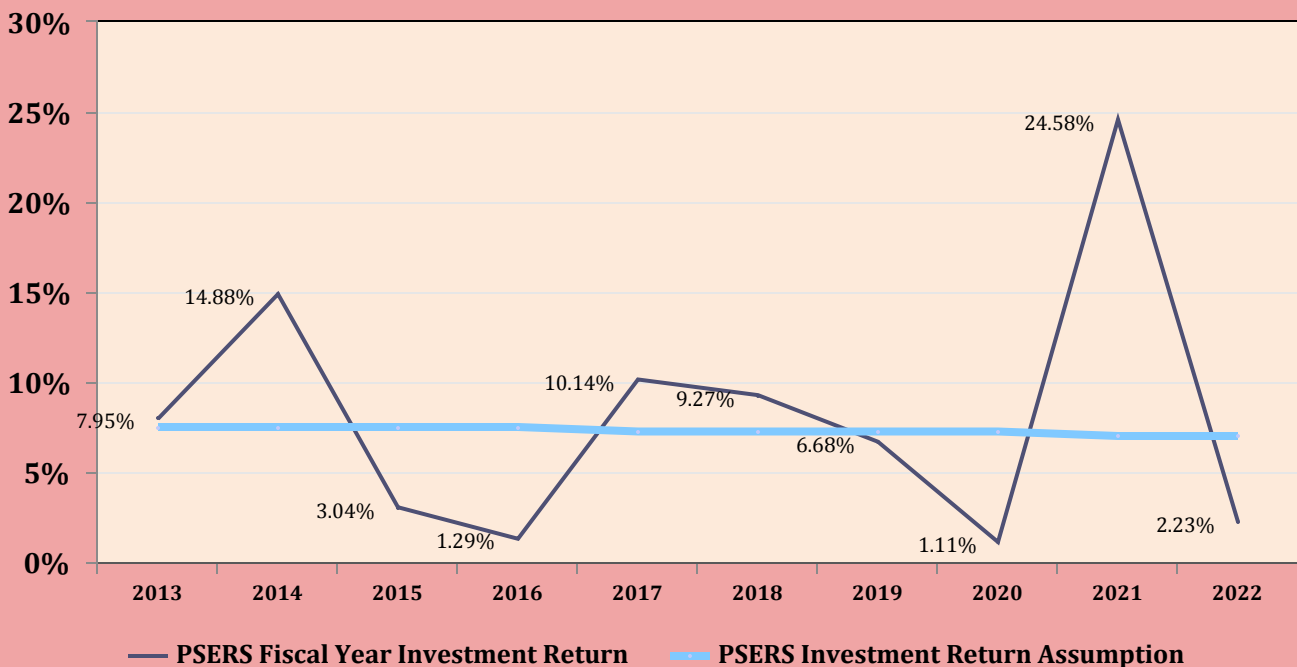
Performance (continued)

PSERS annualized net of fee return for the ten-year period ended June 30, 2022 was 7.91%, exceeding the actuarial assumed rate of return of 7.0%. The System needs to take prudent risks to achieve its long-term goal of a 7.0% 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 premia over the long term. In the short term, no one knows what will happen, and the System can experience periods of time in which annual returns are above and below 7.0%. 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, and real assets. In any given year, the System expects some assets to perform well, such as Private Real Estate and Commodities did this past fiscal year, and some assets to not perform as well, such as Emerging Market Equities and U.S. Long Treasuries did this past fiscal year. However, over the long term, 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.

As depicted in chart 11.2, PSERS one-year investment return was below the investment return assumption for the fiscal year 2022. Five of the ten fiscal years, it performed above the assumption.

**Chart 11.2 PSERS Fiscal Year Investment Return vs. PSERS Investment Return Assumption
June 2013 - June 2022**



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Performance (continued)

Table 11.2 demonstrates that over the past 23 fiscal years, on average, every dollar PSERS has spent in investment fees and expenses has resulted in investment earnings of \$2.15 above the Policy Benchmark's dollar returns.

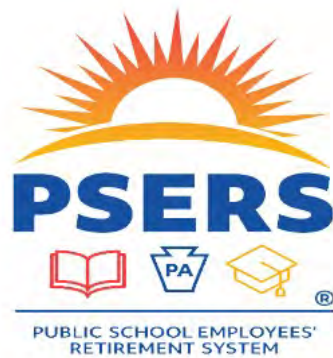
Table 11.2

PSERS Investment Earnings over Policy Benchmark Fiscal Years Ended June 30

<u>Fiscal Year</u>	<u>Total Investment Expenses *</u>	<u>PSERS Net Return over Policy Benchmark (AFTER Payment of all Expenses)</u>	<u>PSERS Investment Earnings over Policy Benchmark Net of Total Investment Expenses *</u>	<u>\$'s of Gross Alpha for every \$1 of Investment Expenses</u>
2022	\$525	2.41%	\$1,721	\$4.28
2021	618	3.50%	1,902	4.08
2020	515	(1.46)%	(807)	(0.57)
2019	450	(1.20)%	(640)	(0.42)
2018	468	1.11%	554	2.18
2017	474	1.80%	821	2.73
2016	416	(1.95)%	(1,006)	(1.42)
2015	455	0.04%	10	1.02
2014	482	0.50%	222	1.46
2013	558	1.25%	579	2.04
2012	481	1.10%	518	2.08
2011	515	1.01%	413	1.80
2010	522	2.19%	890	2.70
2009	478	(5.22)%	(3,131)	(5.55)
2008	399	(0.98)%	(618)	(0.55)
2007	314	4.36%	2,360	8.52
2006	211	3.26%	1,635	8.75
2005	193	2.36%	1,090	6.65
2004	191	3.51%	1,388	8.27
2003	179	(0.42)%	(140)	(0.22)
2002	163	0.56%	316	2.94
2001	144	2.13%	1,200	9.33
2000	125	1.85%	934	8.47
Total	\$8,876		\$10,211	\$2.15

*Dollar amounts in millions.

Managing Investment Fees, Expenses, and Carried Interest



Managing Investment Fees, Expenses, and Carried Interest

PSERS investment professionals formulate an Asset Allocation Policy every three years (as more fully described in Tab 9) with input from the general investment consultant, and work on an ongoing basis to implement the Policy through identification of attractive investment strategies and well-qualified investment managers. The Board reviews and reconfirms the long-term asset allocation targets of the System annually unless there has been a materially change in the underlying assumptions supporting those targets . A fundamental part of this implementation process is making key decisions with regard to use of active or passive strategies implemented by internal professionals or external investment managers.

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, can help generate excess risk- adjusted, net of fee returns relative to the Policy Benchmarks.

Section 3 - Investment Information

Managing Investment Fees, Expenses, and Carried Interest (continued)

Chart 12.2 below demonstrates that over the past 23 fiscal years, PSERS has earned \$10.3 billion in additional investment returns above the Board-approved Policy Index, net of fees.

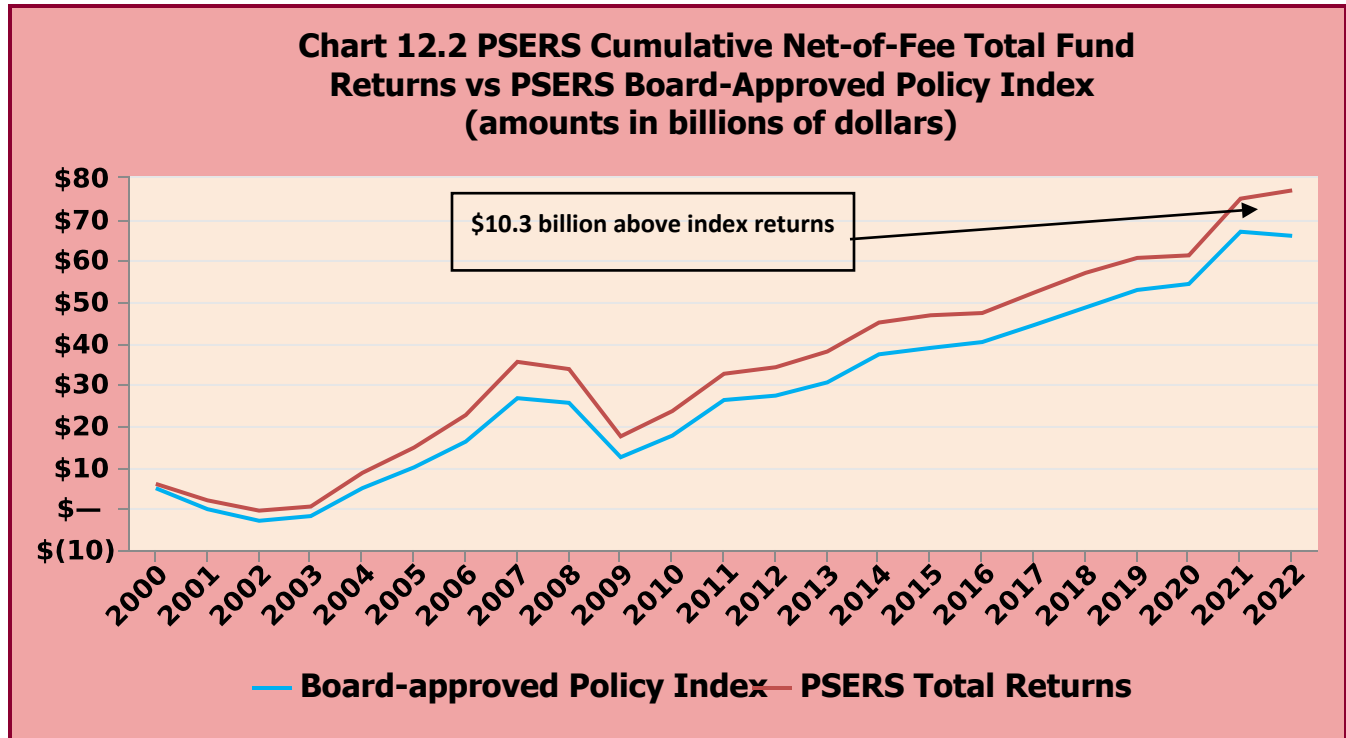
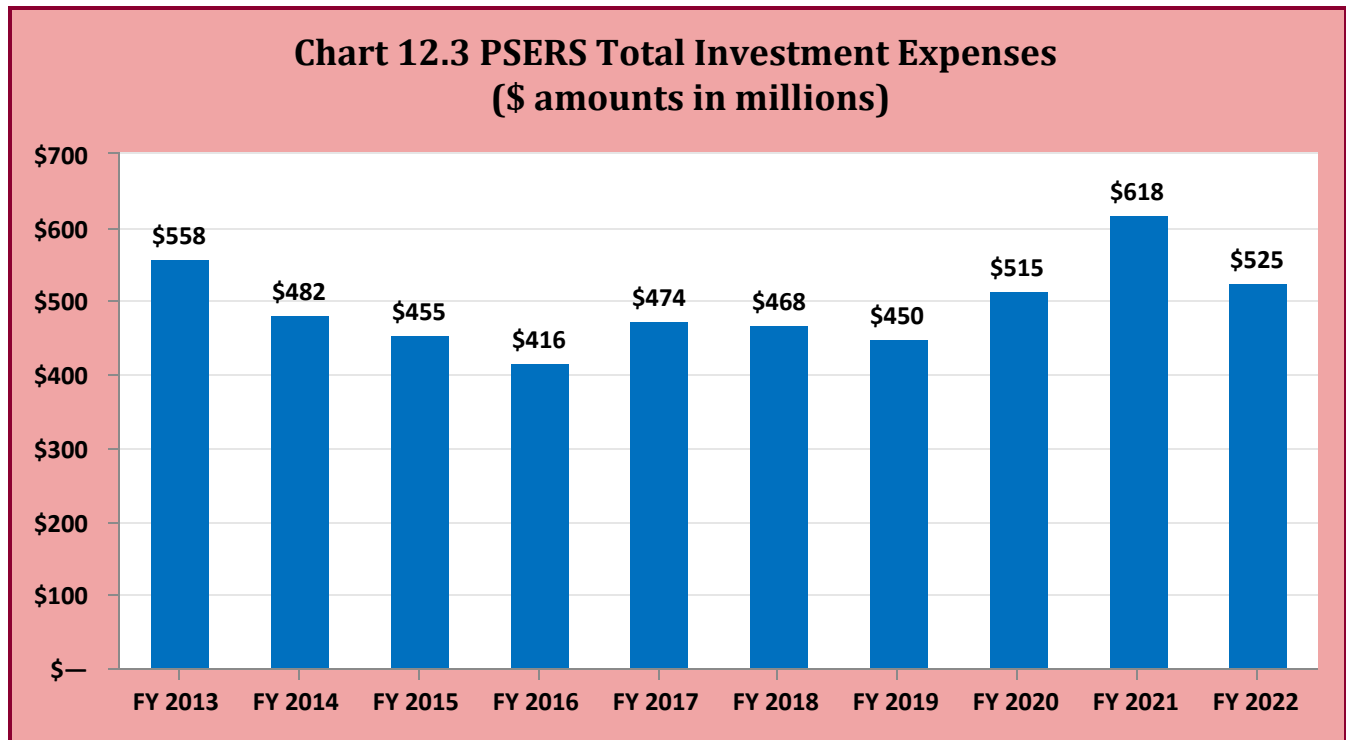


Chart 12.3 shows PSERS Total Investment Expenses over the past ten fiscal years.



Section 3 - Investment Information

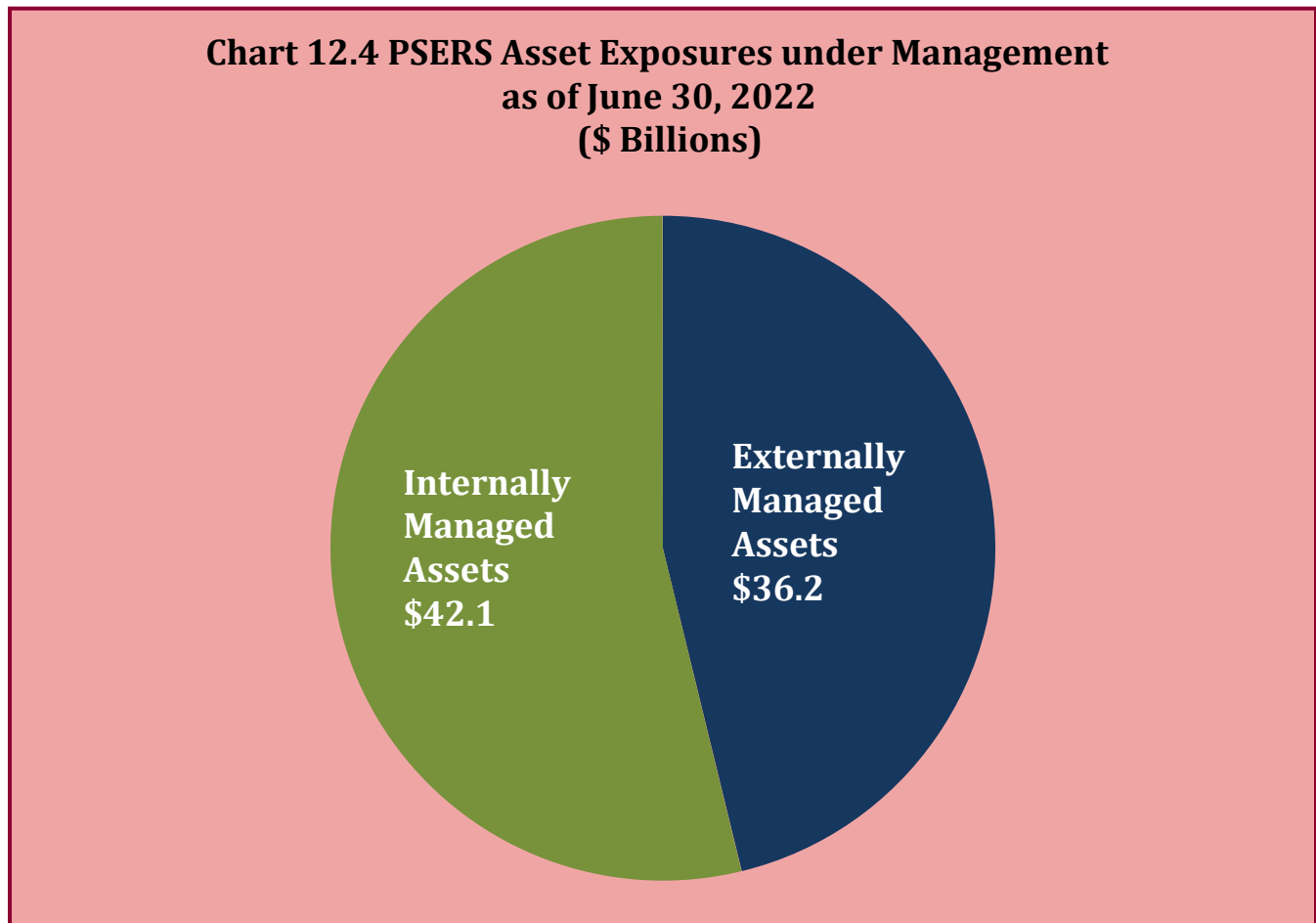
Key Decision: Internal vs. External Investment Management

PSERS generally prefers to assign investment management responsibilities to internal professionals rather than to external investment management companies when certain conditions are present (see Chart 12.1). For example, it must be clear that internal professionals can achieve risk-adjusted returns that are at least equal to what might be earned by external investment managers in equivalent strategies net of all cost and fees, and PSERS investment professionals must simultaneously have the operational capacity to take on the additional work. When assets are assigned to PSERS professionals, the total costs (e.g., salary and benefits, computers and office supplies, incremental operational support) must be

lower than those of even the largest “very low fee” investment fund managers delivering a similar strategy.

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 12.4 displays the distribution of PSERS managed assets as of June 30, 2022.



Note: Financing represents a negative \$8.6 billion allocation exposure and is not reflected in Chart 12.4.

PSERS investment staff managed 27 portfolios internally, with a total estimated net asset value of over \$42 billion on June 30, 2022. We estimate that this has resulted in net savings for the entire

fiscal year of approximately \$33 million. PSERS investment staff also oversee external managers, manage the asset allocation, oversee risk, and perform other tasks in managing the overall investment program.

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

As shown in Table 12.1 below, managing these assets externally would have cost PSERS over \$55 million in fees (\$ amounts in thousands).

Table 12.1

Internally Managed Accounts as of June 30, 2022

Account	Asset Class	Market Value as of 6/30/22*	Estimated Annual Fee %**	Estimated Cost to Manage Externally
S&P 600 Index	Public Equities	\$ 818,993	0.04%	\$ 328
S&P 500 Index	Public Equities	4,890,100	0.05%	2,445
S&P 400 Index	Public Equities	814,368	0.03%	244
Emerging Market Equity Index	Public Equities	485,280	0.03%	146
EMG Mkts IMI	Public Equities	761,405	0.09%	685
MSCI ACWI ex. U.S.	Public Equities	3,357,000	0.17%	5,707
Public Equity Total		\$ 11,127,146		\$ 9,555
Private Equity Co-Investments	Private Equities	1,386,613	1.00%	13,866
Private Equity Total		\$ 1,386,613		\$ 13,866
Active High Yield	Public Fixed Income	184,226	0.44%	811
Emerging Market Bond	Public Fixed Income	21,260	0.39%	83
Funded Passive U.S. TIPS	Public Fixed Income	3,728,923	0.03%	1,119
U.S. Core Fixed Income	Public Fixed Income	589,061	0.21%	1,237
U.S. Long Treasuries	Public Fixed Income	5,149,950	0.03%	1,545
U.S. TIPS	Public Fixed Income	1,062,253	0.13%	1,381
U.S. TIPS Swap	Public Fixed Income	2,539,360	0.03%	762
Public Fixed Income Total		\$ 13,275,033		\$ 6,938
Private Credit Co-Investments	Private Fixed Income	196,255	1.00%	1,963
Private Fixed Income Total		\$ 196,255		\$ 1,963
Bloomberg Commodity Index	Public Real Assets	1,248,880	0.03%	375
Gold Index	Public Real Assets	4,466,130	0.03%	1,340
Infrastructure Index	Public Real Assets	2,067,060	0.03%	620
Public Infrastructure	Public Real Assets	2,666,118	0.35%	9,331
REIT Index	Public Real Assets	1,321,160	0.03%	396
Public Real Assets Total		\$ 11,769,348		\$ 12,062
Direct Real Estate	Private Real Assets	535,200	0.50%	2,676
Real Estate Co-Investments	Private Real Assets	87,252	0.49%	428
Pvt Infrastructure Co-Investments	Private Real Assets	229,017	1.00%	2,290
Pvt Commodities Co-Investments	Private Real Assets	83,900	1.00%	839
Private Real Assets Total		\$ 935,369		\$ 6,233
Absolute Return Co-Investments	Absolute Return	26,300	1.00%	263
Absolute Return Total		\$ 26,300		\$ 263
Tail Risk Mitigation	Tail Risk Mitigation	94,260	1.50%	1,414
Tail Risk Mitigation Total		\$ 94,260		\$ 1,414
Cash Management	Cash Management	3,310,600	0.10%	3,311
Cash Management Total		\$ 3,310,600		\$ 3,311
Total		\$ 42,120,925		\$ 55,603
Internal Management Costs				\$ (22,935)
Net Savings				\$ 32,668

*Market values include cash and derivatives exposure

**Represents consultants peer cost comparisons

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 PSERS investment professionals 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.

Section 3 - Investment Information

Investment Advisory Fees

As depicted in Table 12.2 “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 12.2 summarizes total investment expenses for the fiscal year ended June 30, 2022.

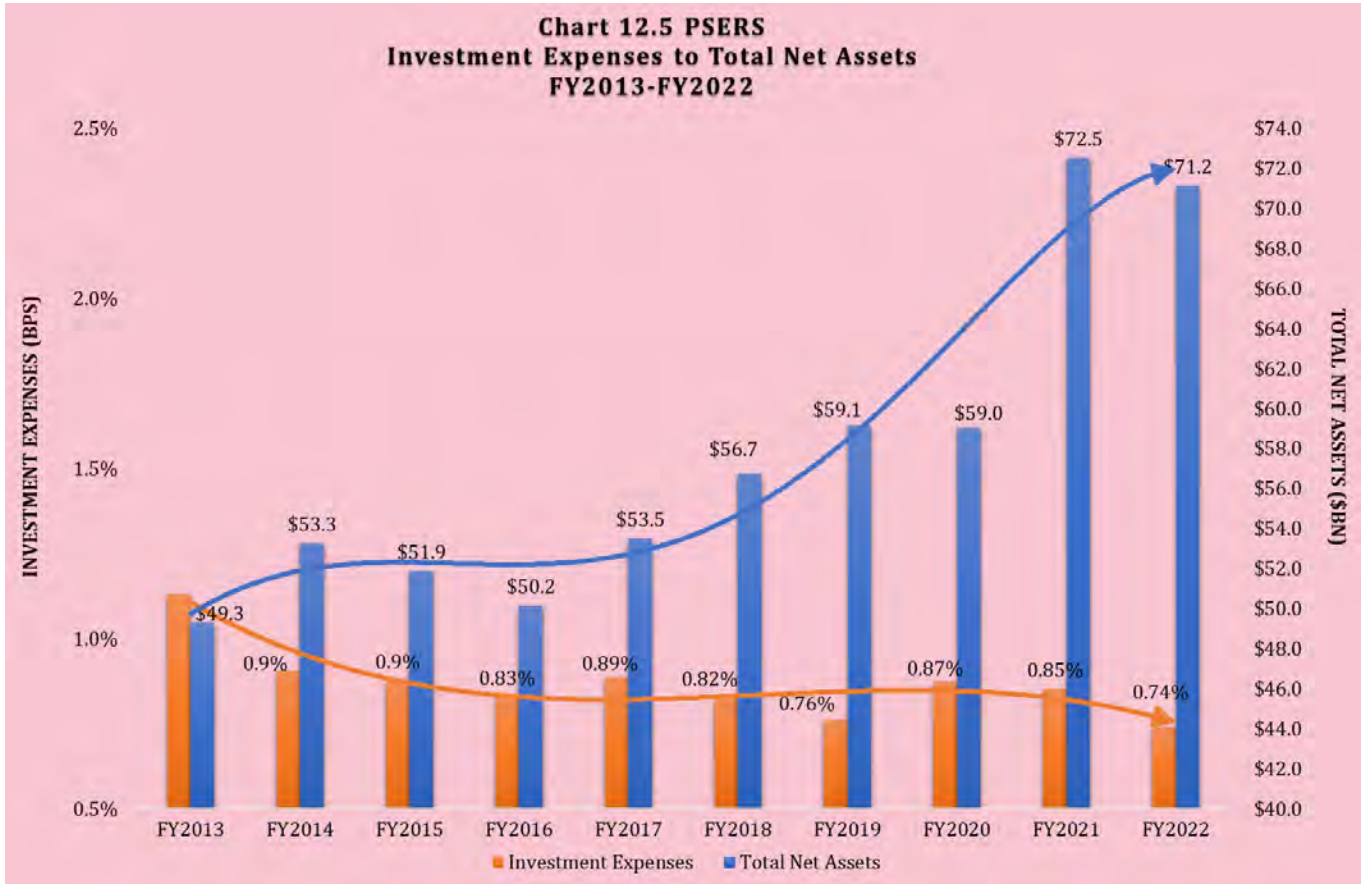
Table 12.2					
Summary of Investment Advisory Fees					
Fiscal Year Ended June 30, 2022					
(Dollar Amounts in Thousands)					
	<u>Base Fees</u>	<u>Performance Fees</u>	<u>Total Fees</u>	<u>Basis Points</u>	
External Management					
International Equity	\$ 25,547	\$ 73,509	\$ 99,056	203	
Fixed Income	32,164	7,922	40,086	124	
Real Estate	45,579	—	45,579	81	
Alternative Investments	106,573	—	106,573	100	
Absolute Return	81,504	45,115	126,619	247	
Commodities	7,710	—	7,710	60	
Master Limited Partnerships	365	1,248	1,613	68	
Infrastructure	9,035	—	9,035	99	
Private Credit	58,079	655	58,734	113	
Tail Risk	642	—	642	44	
Defined Contribution	155	—	155	17	
Total External Management	\$ 367,353	\$ 128,449	\$ 495,802	113	
Total Internal Management			\$ 22,935	6	
Total Investment Management			\$ 518,737	64	
Custodian Fees			\$ 2,522		
Consultant & Legal Fees			4,131		
Total Other Expenses			\$ 6,653		
Total Investment Expenses			\$ 525,390	65	

Section 3 - Investment Information

Investment Advisory Fees (continued)

Increasing the number and size of portfolios managed internally has resulted in reducing PSERS Total Investment Expenses in recent years. As Chart 12.5 illustrates, Total Investment

Expenses have declined from Fiscal Year 2013 to Fiscal Year 2022, while Total Net Assets have increased significantly from \$49.3 billion to \$71.2 billion.



Section 3 - Investment Information

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

Table 12.3

Investment Fees by Manager Fiscal Year ended June 30, 2022 (Dollar amounts in Thousands)

<u>Manager</u>	<u>Base Fees</u>	<u>Performance Fees</u>	<u>Total</u>
Non - U.S. Equity			
Acadian Asset Management, LLC	\$ 1,472	\$ —	\$ 1,472
Baillie Gifford Overseas Ltd.	2,236	—	2,236
BlackRock Financial Management, Inc.	2,079	18	2,097
Cederberg Greater China EQ FD	—	(10,519)	(10,519) *
ECM Feeder Fund 2 LP	—	48,444	48,444
Insight Investment International Limited	996	—	996
Marathon Asset Management Limited	2,721	—	2,721
Oberweis Asset Management, Inc.	2,560	—	2,560
QS Batterymarch Financial Management, Inc.	227	—	227
Steadview Capital Partners LP	2,581	9,812	12,393
The Children's Investment Fund LP	7,214	5,690	12,904
Wasatch Advisors, Inc.	3,461	20,064	23,525
Total - Non - U.S. Equity	\$ 25,547	\$ 73,509	\$ 99,056
<i>*Represents reversal of amount accrued in prior year</i>			
Fixed Income			
BlackRock Financial Management, Inc.	\$ 4,375	\$ 7,922	\$ 12,297
Bridgewater Associates, LP	25,269	—	25,269
Radcliffe Capital Management, L.P.	517	—	517
Templeton Investment Counsel, LLC	2,003	—	2,003
Total - Fixed Income	\$ 32,164	\$ 7,922	\$ 40,086
Real Estate-Partnership/Direct Owner			
AG Core Plus Realty Fund III, L.P.	\$ 110	\$ —	\$ 110
AG Core Plus Realty Fund IV, L.P.	1,055	—	1,055
AG Europe Realty Fund II, L.P.	1,200	—	1,200
AG Europe Realty Fund III, L.P.	1,147	—	1,147
AG Realty Value Fund X, L.P.	1,436	—	1,436
Almanac Realty Securities VI, L.P.	149	—	149
Almanac Realty Securities VII, L.P.	635	—	635
Almanac Realty Securities VIII, L.P.	944	—	944
Ares European Real Estate Fund IV, L.P.	477	—	477
Ares U.S. Real Estate Fund IX, L.P.	936	—	936
Ares U.S. Real Estate Fund VIII, L.P.	298	—	298
ARS VII (SIDE CAR V), L.P.	78	—	78
ARS VIII (SC V), L.P.	99	—	99
Avenue Real Estate Fund (Parallel) L.P.	500	—	500
Bell Institutional Fund V, L.P.	139	—	139

Section 3 - Investment Information

Table 12.3

Investment Fees by Manager Fiscal Year ended June 30, 2022 (Dollar amounts in Thousands)

<u>Manager</u>	<u>Base Fees</u>	<u>Performance Fees</u>	<u>Total</u>
<u>Real Estate-Partnerships/Direct Owner (continued)</u>			
Bell Institutional Fund VI, L.P.	\$ 1,060	\$ —	\$ 1,060
Bell Institutional Fund VII, L.P.	844	—	844
Bell Partners, Inc.	738	—	738
Blackstone Real Estate Debt Strategies II, L.P.	3	—	3
Blackstone Real Estate Debt Strategies III, L.P.	662	—	662
Blackstone Real Estate Partners Europe IV, L.P.	317	—	317
Blackstone Real Estate Partners VII, L.P.	1,233	—	1,233
Blackstone Real Estate Partners VIII, L.P.	2,378	—	2,378
Brookfield Strategic Real Estate Partners II, L.P.	1,719	—	1,719
Brookfield Strategic Real Estate Partners III-B, L.P.	2,543	—	2,543
Brookfield Strategic Real Estate Partners, L.P.	638	—	638
BSREP IV Obsidian Co-Invest B, L.P.	9	—	9
Cabot Industrial Core Fund II, L.P.	888	—	888
Cabot Industrial Value Fund V, L.P.	528	—	528
Cabot Industrial Value Fund VI, L.P.	1,500	—	1,500
Carlyle Realty Partners V, L.P.	76	—	76
Carlyle Realty Partners VI, L.P.	72	—	72
Carlyle Realty Partners VII, L.P.	319	—	319
Carlyle Realty Partners VIII, L.P.	1,564	—	1,564
DRA Fund IX Industrial Co-Investment LLC	99	—	99
DRA Growth and Income Fund IX, LLC	1,470	—	1,470
DRA Growth and Income Fund VII, L.P.	138	—	138
DRA Growth and Income Fund VIII Co-Investment I, LLC	115	—	115
DRA Growth and Income Fund VIII, LLC	902	—	902
DRA Growth and Income Fund X, LLC	1,114	—	1,114
Exeter Core Industrial Club Fund II, L.P.	769	—	769
Exeter Industrial Core Fund III, L.P.	761	—	761
Exeter Industrial Value Fund III, L.P.	56	—	56
Exeter Industrial Value Fund IV, L.P.	555	—	555
Exeter Industrial Value Fund V, L.P.	1,200	—	1,200
GF Management, LLC	131	—	131
L&B Realty Advisors, LLP	87	—	87
Latitude Management Real Estate Capital III, Inc.	118	—	118
LEM Multifamily Fund V, L.P.	1,000	—	1,000
LEM Multifamily Senior Equity Fund IV, L.P.	270	—	270
O'Connor Real Estate Advisors, LLC	900	—	900
Pramerica Real Estate Capital VI, L.P.	549	—	549
Property Management, Inc.	31	—	31
RCG Longview Debt Fund VI, L.P.	564	—	564

Section 3 - Investment Information

Table 12.3

Investment Fees by Manager Fiscal Year ended June 30, 2022 (Dollar amounts in Thousands)

<u>Manager</u>	<u>Base Fees</u>	<u>Performance Fees</u>	<u>Total</u>
<u>Real Estate-Partnerships/Direct Owner (continued)</u>			
RCG Longview Equity Fund, L.P.	\$ 21	\$ —	\$ 21
Security Capital Preferred Growth	2,133	—	2,133
Senior Housing Partnership Fund V, L.P.	755	—	755
Stockbridge I Secondary	107	—	107
Stockbridge Real Estate Fund II, LP	54	—	54
Stockbridge Real Estate Fund III, LP	298	—	298
Stockbridge Real Estate Fund, L.P.	3,887	—	3,887
UBS (US) Trumbull Property Fund, L.P.	230	—	230
Total - Real Estate-Partnership/Direct Owner	\$ 44,608	\$ —	\$ 44,608
<u>Real Estate-Farmland</u>			
Prudential Agricultural Group	\$ 971	\$ —	\$ 971
Subtotal - Real Estate-Farmland	\$ 971	\$ —	\$ 971
Total Real Estate	\$ 45,579	\$ —	\$ 45,579
<u>Alternative Investments</u>			
Actis Global 4, L.P.	\$ 1,251	\$ —	\$ 1,251
Aisling Capital IV, L.P.	463	—	463
Apax Digital, L.P.	1,053	—	1,053
Apax X USD, L.P.	1,943	—	1,943
Apollo Investment Fund IX, L.P.	2,312	—	2,312
Apollo Investment Fund VIII, L.P.	485	—	485
Bain Capital Asia Fund II, L.P.	534	—	534
Bain Capital Asia Fund III-A, L.P.	1,129	—	1,129
Bain Capital Asia Fund IV-B, L.P.	1,500	—	1,500
Bain Capital Fund XI-A, L.P.	350	—	350
Bain Capital Fund XII-A, L.P.	1,048	—	1,048
Baring Asia Private Equity Fund V, L.P.	754	—	754
Baring Asia Private Equity Fund VI, L.P.	348	—	348
Blue Point Capital Partners III (B), L.P.	114	—	114
Blue Point Capital Partners IV, L.P.	750	—	750
Bridgepoint Development Capital III, L.P.	1,031	—	1,031
Bridgepoint Development Capital IV, L.P.	679	—	679
Bridgepoint Europe IV, L.P.	452	—	452
Bridgepoint Europe V, L.P.	1,351	—	1,351
Bridgepoint Europe VI, L.P.	1,570	—	1,570
Capital International Private Equity Fund VI, L.P.	432	—	432
Catterton Growth Partners II, L.P.	934	—	934
Catterton Growth Partners III, L.P., L	1,200	—	1,200

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Table 12.3

Investment Fees by Manager Fiscal Year ended June 30, 2022 (Dollar amounts in Thousands)

<u>Manager</u>	<u>Base Fees</u>	<u>Performance Fees</u>	<u>Total</u>
Alternative Investments (continued)			
Catterton Growth Partners, L.P.	\$ 166	\$ —	\$ 166
Catterton Partners VI, L.P.	33	—	33
Catterton Partners VII, L.P.	943	—	943
Catterton VIII, L.P., L	1,146	—	1,146
Cerberus Institutional Partners V, L.P.	146	—	146
Cerberus Institutional Partners VI, L.P.	2,165	—	2,165
Clearlake Capital Partners IV, L.P.	320	—	320
Clearlake Capital Partners VII, L.P.	240	—	240
Coller International Partners VI, L.P.	631	—	631
Coller International Partners VII, L.P. - Series A	936	—	936
Crestview Partners II, L.P.	872	—	872
Crestview Partners III, L.P.	1,360	—	1,360
Crestview Partners, L.P.	250	—	250
Crown CG Private Equity Fund 2019, L.P.	1,410	—	1,410
DCPF VI Oil and Gas Co-Investment Fund, L.P.	14	—	14
Denham Commodity Partners Fund VI, L.P.	477	—	477
Energy & Minerals Group Fund III, L.P., The	805	—	805
Equistone Partners Europe Fund V E, L.P.	802	—	802
Equistone Partners Europe Fund VI E, SCSp	1,459	—	1,459
GoldPoint Partners Co-Investment V, L.P.	199	—	199
Greenoaks Capital Opportunities Fund III	2,000	—	2,000
Hahn & Company III L.P.	2,250	—	2,250
Hahn & Company III-S L.P.	337	—	337
Hg Genesis 9 L.P.	1,938	—	1,938
Hg Saturn 2 A L.P.	881	—	881
HgCapital 7 A, L.P.	87	—	87
HgCapital 8 D, L.P.	1,599	—	1,599
HGGC Fund II, L.P.	349	—	349
HGGC Fund III, L.P.	1,113	—	1,113
Incline Elevate Fund, L.P.	1,500	—	1,500
Incline Equity Partners IV, L.P.	543	—	543
Insight Opportunities Fund I, L.P.	626	—	626
Insight Partners XI, L.P.	2,189	—	2,189
Insight Partners XII Buyout Annex Fund, L.P.	181	—	181
Insight Partners XII, L.P.	885	—	885
Insight Venture Partners X, L.P.	1,487	—	1,487
Interactions Corporation	50	—	50
K4 Private Investors, L.P.	1,853	—	1,853

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Table 12.3

Investment Fees by Manager Fiscal Year ended June 30, 2022 (Dollar amounts in Thousands)

<u>Manager</u>	<u>Base Fees</u>	<u>Performance Fees</u>	<u>Total</u>
Alternative Investments (continued)			
Landmark Equity Partners XIV, L.P.	\$ 240	\$ —	\$ 240
Lindsay Goldberg V, L.P.	2,558	—	2,558
LLR Equity Partners IV, L.P.	1,353	—	1,353
LLR Equity Partners V, L.P.	2,845	—	2,845
LLR Equity Partners VI, L.P.	3,470	—	3,470
Milestone Partners III, L.P.	85	—	85
Milestone Partners IV, L.P.	263	—	263
New Mountain Partners IV, L.P.	282	—	282
New Mountain Partners V, L.P.	1,424	—	1,424
New Mountain Partners VI, L.P.	2,343	—	2,343
NGP Natural Resources X, L.P.	299	—	299
NGP Natural Resources XI, L.P.	960	—	960
North Haven Private Equity Asia IV, L.P.	979	—	979
Oak HC/FT Partners IV, L.P.	835	—	835
Odyssey Investment Partners Fund V, L.P.	985	—	985
Orchid Asia V, L.P.	106	—	106
Orchid Asia VI, L.P.	619	—	619
Orchid Asia VII, L.P.	1,089	—	1,089
PAI Europe VI, L.P.	1,226	—	1,226
PAI Europe VII, L.P.	1,669	—	1,669
Palladium Equity Partners IV, L.P.	353	—	353
Partners Group Secondary 2011 (USD), L.P. Inc.	779	—	779
Partners Group Secondary 2015 (USD) A, L.P.	1,097	—	1,097
Platinum Equity Capital Partners V, L.P.	2,117	—	2,117
Platinum Equity Small Cap Fund, L.P.	1,456	—	1,456
Portfolio Advisors Secondary Fund III, L.P.	1,812	—	1,812
Portfolio Advisors Secondary Fund IV, L.P.	882	—	882
Portfolio Advisors Secondary Fund, L.P., PA	504	—	504
Sante Health Ventures III	2,382	—	2,382
Sante Health Ventures IV	138	—	138
Searchlight Capital II, L.P.	542	—	542
Searchlight Capital III, L.P.	2,749	—	2,749
StarVest Partners II (Parallel), L.P.	238	—	238
Strategic Partners Fund IV, L.P.	17	—	17
Strategic Partners Fund V, L.P.	89	—	89
Strategic Partners Fund VI, L.P.	467	—	467
Strategic Partners Fund VII, L.P.	1,250	—	1,250
Summit Partners Growth Equity Fund IX-A, L.P.	1,292	—	1,292
Summit Partners Growth Equity Fund VIII-A, L.P.	944	—	944
Summit Partners Growth Equity Fund X-A, L.P.	128	—	128
Summit Partners Growth Equity Fund XI-A, L.P.	118	—	118

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Table 12.3

Investment Fees by Manager Fiscal Year ended June 30, 2022 (Dollar amounts in Thousands)

<u>Manager</u>	<u>Base Fees</u>	<u>Performance Fees</u>	<u>Total</u>
Alternative Investments (continued)			
Summit Partners Venture Capital Fund IV-A, L.P.	\$ 683	\$ —	\$ 683
Tenaya Capital VI, L.P.	451	—	451
Tenaya Capital VII, L.P.	1,394	—	1,394
Tenaya Capital V-P, L.P.	61	—	61
Trilantic Capital Partners V (North America), L.P.	494	—	494
Trilantic Capital Partners VI (North America), L.P.	2,241	—	2,241
Venor Special Situations Fund II, L.P.	397	—	397
Versa Capital Fund II, L.P.	845	—	845
Versa Capital Fund III, L.P.	874	—	874
Webster Capital IV, L.P.	224	—	224
Total Alternative Investments	\$ 106,573	\$ —	\$ 106,573
Absolute Return			
Aeolus Capital Management Ltd.	\$ 3,533	\$ 984	\$ 4,517
AKAZ Offshore Fund LTD	2,166	—	2,166
Bridgewater Associates, Inc.	23,535	—	23,535
Brigade Capital Management	771	902	1,673
Capula Investment Management, LLP	10,017	6,417	16,434
Caspian Capital, LP	3,127	1,430	4,557
Falko Regional Aircraft Opportunities Fund II L.P.	571	—	571
Garda Capital Partners, LP	9,654	9,620	19,274
HS Group Sponsor Fund II Ltd.	933	—	933
Independence Reinsurance Partners GP, LLC	2,115	144	2,259
Nephila Capital Ltd.	416	—	416
Nimbus Weather Fund	2,588	—	2,588
Oceanwood Opportunities Fund	—	(224)	(224) *
OWS Credit Opportunity Offshore Fund III, Ltd.	6,540	7,193	13,733
Pacific Investment Management Company (PIMCO)	10,457	22,033	32,490
Perry Partners, L.P.	(16)	—	(16) *
Sciens Aviation Special Opportunities Investment Fund III, L.P.	410	—	410
Sciens Aviation Special Opportunities Investment Fund IV, L.P.	1,404	—	1,404
Sciens Aviation Special Opportunities Investment Fund V, L.P.	2,180	—	2,180
Venor Capital Offshore	1,103	(3,384)	(2,281) *
Total - Absolute Return	\$ 81,504	\$ 45,115	\$ 126,619
<i>*Represents reversal of amount accrued in prior year</i>			
Commodities			
Denham Mining Fund, L.P.	\$ 1,809	\$ —	\$ 1,809
Gresham Investment Management, LLC	1,359	—	1,359
NGP Natural Resources XII, L.P.	3,068	—	3,068
Wellington Management Company, LLP	1,474	—	1,474
Total - Commodities	\$ 7,710	\$ —	\$ 7,710

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Table 12.3

Investment Fees by Manager Fiscal Year ended June 30, 2022 (Dollar amounts in Thousands)

<u>Manager</u>	<u>Base Fees</u>	<u>Performance Fees</u>	<u>Total</u>
<u>Infrastructure</u>			
Blackstone Infrastructure Partners L.P.	\$ 4,911	\$ —	\$ 4,911
CIM Infrastructure Fund III, L.P.	18	—	18
GCM Grosvenor Customized Infrastructure Strategies II, LP	306	—	306
International Infrastructure Finance Company II, LP	678	—	678
ISQ Global Infrastructure Fund III, L.P.	1,930	—	1,930
ISQ KIO Co-Invest Fund, L.P.	6	—	6
Strategic Partners Real Assets II, L.P.	1,186	—	1,186
Total - Infrastructure	\$ 9,035	\$ —	\$ 9,035
<u>Master Limited Partnerships</u>			
Salient Capital Advisors, LLC	193	—	193
Stein Roe Investment Counsel D/B/A Atlantic Trust	172	1,248	1,420
Total - Master Limited Partnerships	\$ 365	\$ 1,248	\$ 1,613
<u>Private Credit</u>			
Apollo European Principal Finance Fund II (Dollar A), L.P.	\$ 128	\$ —	\$ 128
Apollo European Principal Finance Fund III, (Dollar A), L.P.	1,716	—	1,716
Avenue Energy Opportunities Fund II, L.P.	750	—	750
Avenue Energy Opportunities Fund, L.P.	1,094	—	1,094
Avenue Europe Special Situations Fund III (U.S.), L.P.	821	—	821
Bain Capital Credit Managed Account (PSERS), L.P.	1,170	—	1,170
Bain Capital Distressed and Special Situations 2013 (A), L.P.	802	—	802
Bain Capital Distressed and Special Situations 2016 (A), L.P.	2,227	—	2,227
Bain Capital Distressed and Special Situations 2019 (A), L.P.	2,041	—	2,041
Bain Capital Middle Market Credit 2014, LP	493	—	493
Bain Capital Special Situations Asia II, LP	7	—	7
Brigade Capital Management	1,620	655	2,275
Carlyle Energy Mezzanine Opportunities Fund II, L.P.	1,230	—	1,230
Carlyle Energy Mezzanine Opportunities Fund-Q, L.P.	14	—	14
Cerberus PSERS Levered Loan Opportunities Fund, L.P.	9,100	—	9,100
Clearlake Opportunities Partners (P) II, L.P.	648	—	648
Galton Onshore Mortgage Recovery Fund IV, L.P.	382	—	382
Hayfin SOF II USD Co-Invest, L.P.	86	—	86
Hayfin SOF II USD, L.P.	2,165	—	2,165
HayFin Special Opportunities Credit Fund (Parallel), L.P.	182	—	182
ICG Europe Fund V, L.P.	343	—	343
ICG Europe Fund VI, L.P.	769	—	769
ICG Europe Fund VII Feeder SCSp	1,489	—	1,489

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Table 12.3

Investment Fees by Manager Fiscal Year ended June 30, 2022 (Dollar amounts in Thousands)

<u>Manager</u>	<u>Base Fees</u>	<u>Performance Fees</u>	<u>Total</u>
<u>Private Credit (continued)</u>			
International Infrastructure Finance Company Fund, L.P.	\$ 407	\$ —	\$ 407
Keystone Partners, L.P. Series A	196	—	196
Latitude Management Real Estate Capital IV, Inc.	895	—	895
LBC Credit Partners III, L.P.	442	—	442
LBC-P Credit Fund, L.P.	7,022	—	7,022
Park Square - PSERS Credit Opportunities Fund, L.P.	4,148	—	4,148
PIMCO BRAVO Fund III Onshore Feeder, LP	1,765	—	1,765
PSERS TAO Partners Parallel Fund, L.P. - (TAO 2.0)	1,918	—	1,918
PSERS TAO Partners Parallel Fund, L.P. - (TAO 3.0)	1,867	—	1,867
PSERS TAO Partners Parallel Fund, L.P. - (TAO Contingent)	1,022	—	1,022
Sixth Street Fundamental Strategies Partners (A), L.P.	434	—	434
Sixth Street Opportunities Partners V (A), L.P.	150	—	150
Sixth Street Specialty Lending Europe II, L.P.	631	—	631
SSG Capital Partners V Sidecar, L.P.	750	—	750
SSG Capital Partners V, L.P.	2,097	—	2,097
Sixth Street Opportunities Partners III (A), L.P.	468	—	468
Sixth Street Opportunities Partners IV (A), L.P.	2,062	—	2,062
Varde Scratch and Dent Feeder I-A, L.P., The	363	—	363
Varde Scratch and Dent Feeder, L.P., The	65	—	65
Whitehorse Liquidity Partners (Onshore) IV, L.P.	1,400	—	1,400
Whitehorse Liquidity Partners V, L.P.	700	—	700
Total - Private Credit	\$ 58,079	\$ 655	\$ 58,734
<u>Tail Risk Mitigation</u>			
Capstone Commonwealth Fund LP	\$ 642	\$ —	\$ 642
Total - Tail Risk Mitigation	\$ 642	\$ —	\$ 642
<u>Defined Contribution</u>			
T. Rowe Price Target Date Funds	\$ 155	\$ —	\$ 155
Total - Defined Contribution	\$ 155	\$ —	\$ 155
Total External Management	\$ 367,353	\$ 128,449	\$ 495,802
Total Internal Management			\$ 22,935
Total Investment Management			\$ 518,737

***Internal Management expenses include salaries and fringe benefits of \$16,104 and operating expenses of \$6,831.**

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Investment Fees and Expenses Initiatives

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

- 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 nontraditional investments, move away from paying on committed capital and towards paying on invested capital whenever possible.
- For external managers, re-underwriting all fee arrangements to ensure that the fee arrangements are fair and equitable.

Carried Interest Reported by Manager

PSERS, as part of its historic commitment to transparency, has evolved its reporting on private markets fees and costs. PSERS disclosed profit share (carried interest), net management fees, and other fund expenses by fund in one report for the calendar year ended 2021. PSERS uses a best effort approach to gather the necessary data by canvassing our active funds for carried interest, management fee offsets and other fund expenses detailed out by fund. This information was presented to PSERS Board in December 2022 and the full report is available on our website at www.psers.pa.gov.

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Table 12.4

Carried Interest Reported by Manager Calendar Year ended December 31, 2021 (Dollar amounts in Thousands)

<u>Manager</u>	<u>Net Mgmt Fees</u>	<u>Net Carried Interest</u>	<u>Partnership Expenses</u>	<u>Total</u>
Private Equity				
Actis Emerging Markets 3, L.P.	\$ —	\$ —	\$ —	\$ —
Actis Global 4, L.P.	1,368	2,251	18	3,637
Adams Capital Management, L.P.	—	—	6	6
Aisling Capital II L.P.	—	—	26	26
Aisling Capital III, L.P.	—	76	20	96
Aisling Capital IV, L.P.	—	(21,797)	264	(21,533) *
Apax Digital, L.P.	1,240	5,969	1,145	8,354
Apax Europe VII, L.P.	—	476	12	488
Apax X USD, L.P.	2,011	2,443	1,795	6,249
Apollo Investment Fund IX, L.P.	2,036	13,799	740	16,575
Apollo Investment Fund VIII, L.P.	564	20,354	361	21,279
Avenue Special Situations Fund VI, L.P.	—	—	19	19
Bain Capital Asia Fund II, L.P.	572	1,354	52	1,978
Bain Capital Asia Fund III-A, L.P.	1,206	935	94	2,235
Bain Capital Asia Fund IV-B, L.P.	1,464	4,553	478	6,495
Bain Capital Fund XI-A, L.P.	335	6,848	44	7,227
Bain Capital Fund XII-A, L.P.	1,192	8,373	269	9,834
Baring Asia Private Equity Fund IV, L.P.	—	(167)	151	(16) *
Baring Asia Private Equity Fund V, L.P.	2,200	(8,110)	870	(5,040) *
Baring Asia Private Equity Fund VI, L.P.	843	(14,914)	200	(13,871)
Blue Point Capital Partners II (B), L.P.	—	—	33	33
Blue Point Capital Partners III (B), L.P.	373	11,814	123	12,310
Blue Point Capital Partners IV, L.P.	732	7,477	194	8,403
Bridgepoint Development Capital III, L.P.	391	7,136	603	8,130
Bridgepoint Development Capital IV, L.P.	2,948	—	521	3,469
Bridgepoint Europe III A, L.P.	—	—	54	54
Bridgepoint Europe IV, L.P.	503	4,556	31	5,090
Bridgepoint Europe V, L.P.	1,335	20,625	135	22,095
Bridgepoint Europe VI, L.P.	1,290	4,861	376	6,527
Capital International Private Equity Fund V L.P.	—	—	29	29
Capital International Private Equity Fund VI, L.P.	433	—	46	479
Catterton Growth Partners II, L.P.	956	(11,712)	148	(10,608) *
Catterton Growth Partners III, L.P., L	1,191	21,411	186	22,788
Catterton Growth Partners, L.P.	243	(6,630)	88	(6,299) *
Catterton Partners VI, L.P.	322	2,540	46	2,908
Catterton Partners VII, L.P.	1,103	3,822	88	5,013

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Table 12.4

Carried Interest Reported by Manager Calendar Year ended December 31, 2021 (Dollar amounts in Thousands)

<u>Manager</u>	<u>Net Mgmt Fees</u>	<u>Net Carried Interest</u>	<u>Partnership Expenses</u>	<u>Total</u>
Private Equity (continued)				
Catterton VIII, L.P., L	\$ 1,122	\$ 588	\$ 184	\$ 1,894
Cerberus Institutional Partners V, L.P.	183	16,098	533	16,814
Cerberus Institutional Partners VI, L.P.	2,289	12,219	599	15,107
Cerberus Institutional Partners, L.P. (Series 4)	—	3,621	194	3,815
Cinven Fund (Fourth), L.P.	—	—	3	3
Clearlake Capital Partners IV, L.P.	114	32,192	79	32,385
Clearlake Capital Partners V, L.P.	(118)	39,893	331	40,106
Clearlake Capital Partners VI, L.P.	(398)	18,335	652	18,589
Clearlake Flagship Plus Partners, L.P.	—	2,151	330	2,481
Co-Investment 2000 Fund, L.P.	—	—	13	13
Co-Investment Fund II, L.P.	—	—	125	125
Coller International Partners VI, L.P.	664	2,765	20	3,449
Coller International Partners VII, L.P. - Series A	985	3,054	162	4,201
Crestview Partners II, L.P.	884	12,697	243	13,824
Crestview Partners III, L.P.	1,202	6,097	332	7,631
Crestview Partners, L.P.	250	3,892	211	4,353
Cross Atlantic Technology Fund II	—	—	13	13
Cross Atlantic Technology Fund, L.P.	—	—	13	13
Crown CG Private Equity Fund 2019, L.P.	1,474	—	155	1,629
Crown CG Private Equity Fund 2019S, L.P.	—	134	57	191
CVC Capital Partners Asia Pacific III, L.P.	—	1,372	49	1,421
CVC European Equity Partners V (A), L.P.	—	2,780	43	2,823
DCPF VI Oil and Gas Co-Investment Fund, L.P.	20	523	7	550
Denham Commodity Partners Fund VI, L.P.	479	372	90	941
Energy & Minerals Group Fund III, L.P., The	812	—	39	851
Equistone Partners Europe Fund V E, L.P.	909	—	20	929
Equistone Partners Europe Fund VI E, SCSp	1,487	—	279	1,766
Evergreen Pacific Partners II, L.P.	—	138	420	558
Evergreen Pacific Partners, L.P.	—	—	306	306
First Reserve Fund XII, L.P.	—	—	113	113
Gleacher Mezzanine Fund II, L.P.	—	123	12	135
Gold Hill Venture Lending 03-A, L.P.	—	54	18	72
GoldPoint Partners Co-Investment V, L.P.	245	3,206	36	3,487
Greenoaks Capital Opportunities Fund III	3,626	17,862	572	22,060
Hahn & Company III L.P.	2,250	3,172	375	5,797
Hahn & Company III-S L.P.	316	1,911	66	2,293

Section 3 - Investment Information

Table 12.4

**Carried Interest Reported by Manager
Calendar Year ended December 31, 2021
(Dollar amounts in Thousands)**

<u>Manager</u>	<u>Net Mgmt Fees</u>	<u>Net Carried Interest</u>	<u>Partnership Expenses</u>	<u>Total</u>
Private Equity (continued)				
Hg Genesis 9 L.P.	\$ 1,975	\$ —	\$ 370	\$ 2,345
Hg Saturn 2 A L.P.	996	—	370	1,366
HgCapital 7 A, L.P.	175	8,528	25	8,728
HgCapital 8 D, L.P.	1,317	—	287	1,604
HGGC Fund II, L.P.	762	11,912	96	12,770
HGGC Fund III, L.P.	1,190	17,582	116	18,888
Incline Elevate Fund, L.P.	315	26,680	87	27,082
Incline Equity Partners III (PSERS), L.P.	—	4,602	20	4,622
Incline Equity Partners IV, L.P.	270	6,975	59	7,304
Incline Equity Partners V, L.P.	1,847	—	173	2,020
Insight Opportunities Fund I, L.P.	684	1,084	155	1,923
Insight Partners XI, L.P.	2,155	(1,367)	296	1,084
Insight Partners XII, L.P.	772	—	64	836
Insight Venture Partners X, L.P.	1,435	70,631	48	72,114
Irving Place Capital Partners III SPV, L.P.	—	24,019	82	24,101
K4 Private Investors, L.P.	1,827	11,003	139	12,969
Landmark Equity Partners XIII, L.P.	—	—	1	1
Landmark Equity Partners XIV, L.P.	266	1,886	2	2,154
Lindsay Goldberg V, L.P.	2,467	3,419	746	6,632
LLR Equity Partners II, L.P.	—	88	39	127
LLR Equity Partners III, L.P.	—	32,438	98	32,536
LLR Equity Partners IV, L.P.	1,010	36,305	145	37,460
LLR Equity Partners V, L.P.	2,670	14,959	202	17,831
LLR Equity Partners VI, L.P.	3,469	—	419	3,888
Milestone Partners FS 2, L.P.	121	13,890	59	14,070
Milestone Partners III, L.P.	(86)	—	32	(54) *
Milestone Partners IV, L.P.	340	585	70	995
NEPA Venture Fund II	—	(15,993)	36	(15,957) *
New Mountain Partners III L.P.	—	17,767	34	17,801
New Mountain Partners IV, L.P.	363	1,358	26	1,747
New Mountain Partners V, L.P.	424	24,097	83	24,604
New Mountain Partners VI, L.P.	3,225	594	541	4,360
New Mountain Partners, L.P., Allegheny	—	(157)	20	(137) *
New York Life Capital Partners IV-A. L.P.	—	39	93	132
NGP Natural Resources X, L.P.	403	—	74	477
NGP Natural Resources XI, L.P.	989	—	45	1,034

Section 3 - Investment Information

Table 12.4

**Carried Interest Reported by Manager
Calendar Year ended December 31, 2021
(Dollar amounts in Thousands)**

<u>Manager</u>	<u>Net Mgmt Fees</u>	<u>Net Carried Interest</u>	<u>Partnership Expenses</u>	<u>Total</u>
Private Equity (continued)				
North Haven Private Equity Asia IV, L.P.	\$ 1,035	\$ (6,452)	\$ 203	\$ (5,214) *
Oak HC/FT Partners IV, L.P.	770	794	293	1,857
OCM Opportunities Fund VII L.P.	—	—	9	9
OCM Opportunities Fund VII-b L.P.	—	46	9	55
Odyssey Investment Partners Fund V, L.P.	1,189	—	53	1,242
Orchid Asia V, L.P.	107	192	9	308
Orchid Asia VI, L.P.	785	(4,225)	123	(3,317) *
Orchid Asia VII, L.P.	1,274	(1,703)	406	(23) *
PAI Europe IV-B2, L.P.	—	1,167	164	1,331
PAI Europe V, L.P.	—	(67)	14	(53) *
PAI Europe VI, L.P.	1,094	7,791	52	8,937
PAI Europe VII, L.P.	1,178	6,251	650	8,079
Palladium Equity Partners IV, L.P.	393	5,798	212	6,403
Partners Group Secondary 2008, L.P.	—	156	84	240
Partners Group Secondary 2011 (USD), L.P. Inc.	820	933	22	1,775
Partners Group Secondary 2015 (USD) A, L.P.	1,156	4,243	108	5,507
Platinum Equity Capital Partners IV, L.P.	—	68,607	194	68,801
Platinum Equity Capital Partners V, L.P.	2,710	25,397	662	28,769
Platinum Equity Capital Partners-A II, L.P.	—	3,219	—	3,219
Platinum Equity Capital Partners-A III, L.P.	—	4,690	—	4,690
Platinum Equity Capital Partners-A, L.P.	—	1,941	1,555	3,496
Platinum Equity Small Cap Fund, L.P.	1,456	6,625	568	8,649
Portfolio Advisors Secondary Fund III, L.P.	1,734	5,378	182	7,294
Portfolio Advisors Secondary Fund IV, L.P.	442	3,111	87	3,640
Portfolio Advisors Secondary Fund, L.P., PA	373	—	141	514
Sante Health Ventures III	2,382	—	102	2,484
Sante Health Ventures IV	—	—	176	176
SCP Private Equity Partners II, L.P.	—	—	108	108
Searchlight Capital II, L.P.	566	13,559	110	14,235
Searchlight Capital III, L.P.	2,594	10,369	651	13,614
StarVest Partners , L.P.	—	—	12	12
StarVest Partners II (Parallel), L.P.	247	—	110	357
StepStone International Investors III L.P.	—	—	48	48
Sterling Capital Partners, L.P.	—	(93)	185	92
Sterling Venture Partners, L.P.	—	—	15	15
Strategic Partners Fund III VC, L.P.	—	—	6	6

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Table 12.4

Carried Interest Reported by Manager Calendar Year ended December 31, 2021 (Dollar amounts in Thousands)

<u>Manager</u>	<u>Net Mgmt Fees</u>	<u>Net Carried Interest</u>	<u>Partnership Expenses</u>	<u>Total</u>
Private Equity (continued)				
Strategic Partners Fund III-B, L.P.	\$ —	\$ —	\$ 94	\$ 94
Strategic Partners Fund IV VC, L.P.	8	289	26	323
Strategic Partners Fund IV, L.P.	17	671	23	711
Strategic Partners Fund V, L.P.	179	2,059	35	2,273
Strategic Partners Fund VI, L.P.	432	1,203	51	1,686
Strategic Partners Fund VII, L.P.	1,250	6,759	147	8,156
Summit Partners Growth Equity Fund IX-A, L.P.	1,262	35,727	39	37,028
Summit Partners Growth Equity Fund VIII-A, L.P.	990	14,572	32	15,594
Summit Partners Growth Equity Fund X-A, L.P.	—	6,185	585	6,770
Summit Partners Growth Equity Fund XI-A, L.P.	—	—	124	124
Summit Partners Venture Capital Fund III-A, L.P.	172	2	9	183
Summit Partners Venture Capital Fund IV-A, L.P.	713	23,262	37	24,012
Tenaya Capital IV-P, L.P.	—	—	13	13
Tenaya Capital VI, L.P.	508	1,589	34	2,131
Tenaya Capital VII, L.P.	1,420	42,655	72	44,147
Tenaya Capital V-P, L.P.	194	1,380	76	1,650
Trilantic Capital Partners IV L.P.	—	147	76	223
Trilantic Capital Partners V (North America), L.P.	521	4,907	100	5,528
Trilantic Capital Partners VI (North America), L.P.	2,241	8,265	1,348	11,854
Valar Velocity Fund 2 LP	—	—	525	525
Venor Special Situations Fund II, L.P.	443	1,111	248	1,802
Versa Capital Fund I, L.P.	—	—	130	130
Versa Capital Fund II, L.P.	1,072	—	428	1,500
Versa Capital Fund III, L.P.	1,156	—	852	2,008
Webster Capital IV, L.P.	553	12,569	65	13,187
Total - Private Equity	\$ 112,465	\$ 907,595	\$ 33,604	\$1,053,663
Private Credit				
Apollo European Principal Finance Fund II (Dollar A), L.P.	\$ 170	\$ 1,325	\$ 149	\$ 1,644
Apollo European Principal Finance Fund III, (Dollar A), L.P.	2,189	5,133	738	8,060
SSG Capital Partners V Sidecar, L.P.	793	1,640	284	2,717
SSG Capital Partners V, L.P.	2,335	3,161	268	5,764
Avenue Energy Opportunities Fund II, L.P.	850	5,654	569	7,073
Avenue Energy Opportunities Fund, L.P.	1,267	—	454	1,721
Avenue Europe Special Situations Fund III (U.S.), L.P.	1,155	—	798	1,953
Bain Capital Credit Managed Account (PSERS), L.P.	1,498	—	240	1,738
Bain Capital Distressed and Special Situations 2013 (A), L.P.	990	3,456	206	4,652

Section 3 - Investment Information

Table 12.4

Carried Interest Reported by Manager Calendar Year ended December 31, 2021 (Dollar amounts in Thousands)

<u>Manager</u>	<u>Net Mgmt Fees</u>	<u>Net Carried Interest</u>	<u>Partnership Expenses</u>	<u>Total</u>
Private Credit (continued)				
Bain Capital Distressed and Special Situations 2016 (A), L.P.	\$ 2,451	\$ (10,743)	\$ 1,041	\$ (7,251) *
Bain Capital Distressed and Special Situations 2019 (A), L.P.	1,542	3,930	1,303	6,775
Bain Capital Middle Market Credit 2010, L.P.	—	440	75	515
Bain Capital Middle Market Credit 2014, LP	600	(320)	113	393
Sankaty Credit Opportunities IV, L.P.	—	585	14	599
Brigade Distressed Value Offshore Fund	1,677	5,863	533	8,073
Brigade Structured Credit Offshore Fund	2,538	(60)	420	2,898
Carlyle Energy Mezzanine Opportunities Fund II, L.P.	1,223	—	219	1,442
Carlyle Energy Mezzanine Opportunities Fund-Q, L.P.	127	—	449	576
Cerberus Levered Loan Opportunities Fund II, L.P.	—	(3,806)	159	(3,647) *
Cerberus PSERS Levered Loan Opportunities Fund, L.P.	8,924	9,548	19,059	37,531
Clearlake Opportunities Partners (P) II, L.P.	593	2,905	706	4,204
Galton Onshore Mortgage Recovery Fund III, L.P.	—	—	258	258
Galton Onshore Mortgage Recovery Fund IV, L.P.	381	—	422	803
Hayfin SOF II USD Co-Invest, L.P.	98	—	119	217
Hayfin SOF II USD, L.P.	2,449	—	55	2,504
HayFin Special Opportunities Credit Fund (Parallel), L.P.	235	1,527	60	1,822
ICG Europe Fund V, L.P.	517	1,844	241	2,602
ICG Europe Fund VI, L.P.	980	10,801	1,005	12,786
ICG Europe Fund VII Feeder SCSp	1,586	16,070	631	18,287
Latitude Management Real Estate Capital IV, Inc.	1,038	—	72	1,110
LBC Credit Partners III, L.P.	655	894	181	1,730
LBC-P Credit Fund, L.P.	6,277	5,110	884	12,271
International Infrastructure Finance Company Fund, L.P.	457	(272)	166	351
PIMCO BRAVO Fund III Onshore Feeder, LP	1,623	23,555	307	25,485
PIMCO Commercial Real Estate Debt Fund, L.P.	—	2,812	238	3,050
Park Square - PSERS Credit Opportunities Fund, L.P.	4,293	3,676	5,413	13,382
Opps NPL (A), L.P.	—	20	123	143
PSERS TAO Partners Parallel Fund, L.P. - (TAO 2.0)	1,934	5,249	557	7,740
PSERS TAO Partners Parallel Fund, L.P. - (TAO 3.0)	1,913	5,308	499	7,720
PSERS TAO Partners Parallel Fund, L.P. - (TAO Contingent)	780	2,063	434	3,277
Sixth Street Fundamental Strategies Partners (A), L.P.	278	1,191	258	1,727
Sixth Street Opportunities Partners II (A), L.P.	—	252	54	306
Sixth Street Opportunities Partners III (A), L.P.	554	4,504	202	5,260
Sixth Street Opportunities Partners IV (A), L.P.	2,251	1,789	572	4,612
Sixth Street Specialty Lending Europe II, L.P.	463	474	346	1,283

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Table 12.4

Carried Interest Reported by Manager Calendar Year ended December 31, 2021 (Dollar amounts in Thousands)

<u>Manager</u>	<u>Net Mgmt Fees</u>	<u>Net Carried Interest</u>	<u>Partnership Expenses</u>	<u>Total</u>
Private Credit (continued)				
Summit Partners Credit Fund II, L.P.	\$ —	\$ —	\$ 201	\$ 201
TCI Real Estate Partners Fund III, L.P.	—	986	81	1,067
Varde Scratch and Dent Feeder I-A, L.P., The	411	102	284	797
Varde Scratch and Dent Feeder, L.P., The	275	(232)	262	305
Whitehorse Liquidity Partners (Onshore) IV, L.P.	1,400	2,724	122	4,246
Total - Private Credit	\$ 61,770	\$ 119,158	\$ 41,844	\$ 222,772
Private Commodities				
Denham Mining Fund, L.P.	\$ 1,973	\$ 8,466	\$ 181	\$ 10,620
NGP Natural Resources XII, L.P.	3,071	—	175	3,246
Total - Private Commodities	\$ 5,044	\$ 8,466	\$ 356	\$ 13,866
Private Infrastructure				
Blackstone Infrastructure Partners L.P.	\$ 3,760	\$ 9,459	\$ 1,915	\$ 15,134
Brookfield Global Transition Fund, L.P.	205	—	248	453
GCM Grosvenor Customized Infrastructure Strategies II, LP	351	925	125	1,401
ISQ Global Infrastructure Fund III, L.P.	4,820	—	708	5,528
International Infrastructure Finance Company II, L.P.	748	1,393	205	2,346
Strategic Partners Real Assets II, L.P.	910	2,596	—	3,506
Total - Private Infrastructure	\$ 10,794	\$ 14,373	\$ 3,201	\$ 28,368
Private Real Estate				
AG Core Plus Realty Fund III, L.P.	\$ 125	\$ 696	\$ 36	\$ 857
AG Core Plus Realty Fund IV, L.P.	1,255	5,205	255	6,715
AG Europe Realty Fund II, L.P.	1,257	4,939	344	6,540
AG Europe Realty Fund III, L.P.	1,128	835	241	2,204
AG Realty Value Fund X, L.P.	1,432	6,058	471	7,961
Almanac Realty Securities V, L.P.	—	(7)	34	27
Almanac Realty Securities VI, L.P.	149	9	13	171
Almanac Realty Securities VII, L.P.	594	1,394	34	2,022
Almanac Realty Securities VIII, L.P.	1,539	2,709	34	4,282
Ares European Real Estate Fund III, L.P.	—	—	30	30
Ares European Real Estate Fund IV, L.P.	491	1,182	467	2,140
Ares U.S. Real Estate Fund IX, L.P.	1,069	8,175	190	9,434
Ares U.S. Real Estate Fund VII, L.P.	—	1	25	26

Section 3 - Investment Information

Table 12.4

**Carried Interest Reported by Manager
Calendar Year ended December 31, 2021
(Dollar amounts in Thousands)**

<u>Manager</u>	<u>Net Mgmt Fees</u>	<u>Net Carried Interest</u>	<u>Partnership Expenses</u>	<u>Total</u>
Private Real Estate (continued)				
Ares U.S. Real Estate Fund VIII, L.P.	\$ 393	\$ 5,065	\$ 71	\$ 5,529
Atlanta Marriott	131	—	—	131
Avenue Real Estate Fund (Parallel) L.P.	612	—	291	903
Bell Institutional Fund IV, LLC	—	—	1	1
Bell Institutional Fund V, L.P.	424	7,965	462	8,851
Bell Institutional Fund VI, L.P.	879	8,349	600	9,828
Bell Institutional Fund VII, L.P.	702	3,480	575	4,757
BlackRock Europe Property Fund III, L.P.	—	—	244	244
Blackstone Real Estate Debt Strategies II, L.P.	(3)	9	78	84
Blackstone Real Estate Debt Strategies III, L.P.	837	1,033	169	2,039
Blackstone Real Estate Partners Europe III, L.P.	—	(580)	265	(315) *
Blackstone Real Estate Partners Europe IV, L.P.	351	(97)	—	254
Blackstone Real Estate Partners V, L.P.	—	1,251	—	1,251
Blackstone Real Estate Partners VI, L.P.	—	213	—	213
Blackstone Real Estate Partners VII, L.P.	1,251	11,208	—	12,459
Blackstone Real Estate Partners VIII, L.P.	2,542	24,477	—	27,019
Brookfield Strategic Real Estate Partners II, L.P.	1,778	16,636	71	18,485
Brookfield Strategic Real Estate Partners III-B, L.P.	2,607	8,838	171	11,616
Brookfield Strategic Real Estate Partners IV, L.P.	1,777	—	—	1,777
Brookfield Strategic Real Estate Partners, L.P.	685	2,375	546	3,606
Cabot Industrial Core Fund II, L.P.	699	3,145	88	3,932
Cabot Industrial Core Fund, L.P.	—	4	35	39
Cabot Industrial Value Fund V, L.P.	1,278	28,761	221	30,260
Cabot Industrial Value Fund VI, L.P.	1,500	3,351	138	4,989
Cabot UK Core Plus Industrial Fund SCSp	—	1,172	740	1,912
Carlyle Realty Partners III, L.P.	—	—	82	82
Carlyle Realty Partners IV, L.P.	—	—	131	131
Carlyle Realty Partners IX, L.P.	451	—	261	712
Carlyle Realty Partners V, L.P.	134	12,797	80	13,011
Carlyle Realty Partners VI, L.P.	84	293	132	509
Carlyle Realty Partners VII, L.P.	357	1,857	79	2,293
Carlyle Realty Partners VIII, L.P.	1,753	14,049	325	16,127
Centerline High Yield CMBS III - Loan/Stock	99	—	—	99
DRA Growth and Income Fund IX, LLC	1,573	5,797	85	7,455
DRA Growth and Income Fund VI, L.P.	—	(50)	10	(40) *
DRA Growth and Income Fund VII, L.P.	162	702	63	927
DRA Growth and Income Fund VIII, LLC	1,043	710	79	1,832
DRA Growth and Income Fund X, LLC	792	—	161	953

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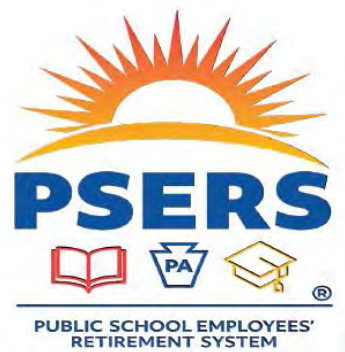
Table 12.4

Carried Interest Reported by Manager Calendar Year ended December 31, 2021 (Dollar amounts in Thousands)

<u>Manager</u>	<u>Net Mgmt Fees</u>	<u>Net Carried Interest</u>	<u>Partnership Expenses</u>	<u>Total</u>
Private Real Estate (continued)				
Exeter Core Industrial Club Fund II, L.P.	\$ 778	\$ 18,599	\$ 90	\$ 19,467
Exeter Industrial Core Fund III, L.P.	469	4,872	71	5,412
Exeter Industrial Value Fund II, L.P.	—	70	7	77
Exeter Industrial Value Fund III, L.P.	136	3,169	39	3,344
Exeter Industrial Value Fund IV, L.P.	1,057	18,290	117	19,464
Exeter Industrial Value Fund V, L.P.	1,200	10,025	108	11,333
Five North 5th Street	54	—	—	54
Fortress Investment Fund IV LP	—	—	59	59
Fortress Investment Fund LLC	—	—	84	84
Fortress Investment Fund V (Fund A) L.P.	—	—	257	257
Galleria at Ft Lauderdale, The	900	—	—	900
Keystone Milano LLC	173	1,397	279	1,849
Keystone Miramar LLC	97	1,436	131	1,664
Keystone Orlando LLC	189	953	212	1,354
Keystone Parkland LLC	279	4,689	474	5,442
LAI Strategic Realty Investors, L.P.	—	—	67	67
Latitude Management Real Estate Capital III, Inc.	350	(150)	157	357
LEM Multifamily Fund V, L.P.	500	10,328	492	11,320
LEM Multifamily Senior Equity Fund IV, L.P.	276	4,394	142	4,812
Paramount Group Real Estate Fund VII, L.P.	—	—	23	23
PGIM Agricultural Separate Account	998	—	—	998
PGIM Real Estate Capital VII, SCSp	268	99	1,054	1,421
Pramerica Real Estate Capital VI, L.P.	664	627	1,345	2,636
PSERS YES Holdings, L.P.	—	—	111	111
RCG Longview Debt Fund VI, L.P.	560	231	974	1,765
RCG Longview Equity Fund, L.P.	35	—	35	70
Rivercenter Mall	59	—	—	59
Senior Housing Partnership Fund IV, L.P.	—	20	(8)	12
Senior Housing Partnership Fund V, L.P.	754	—	152	906
Stockbridge Real Estate Fund II, LP	72	—	44	116
Stockbridge Real Estate Fund III, LP	298	—	134	432
Stockbridge Real Estate Fund, L.P.	3,114	35,362	330	38,806
Strategic Partners Fund IV RE, L.P.	5	—	36	41
UBS (US) Trumbull Property Fund, L.P.	243	—	13	256
Total - Private Real Estate	\$ 47,458	\$ 308,417	\$ 15,457	\$ 371,332
Grand Total	\$ 237,531	\$ 1,358,009	\$ 94,462	\$1,690,001

**Negative balances represent a reduction of previously earned amounts.*

Commitment to Pennsylvania Based Investments



Section 3 - Investment Information

Commitment to Pennsylvania Financial Services Firms

(as of June 30, 2022)

The members of the Board and Professional 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 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 investment professionals have 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 FY2021-22, investment management fees paid to external firms managing PSERS assets from offices located in Pennsylvania amounted to \$25.8 million, or 5.2% of the total external investment manager fees.

Table 13.1 lists the asset exposures managed internally by PSERS, as of June 30, 2022.

Table 13.1

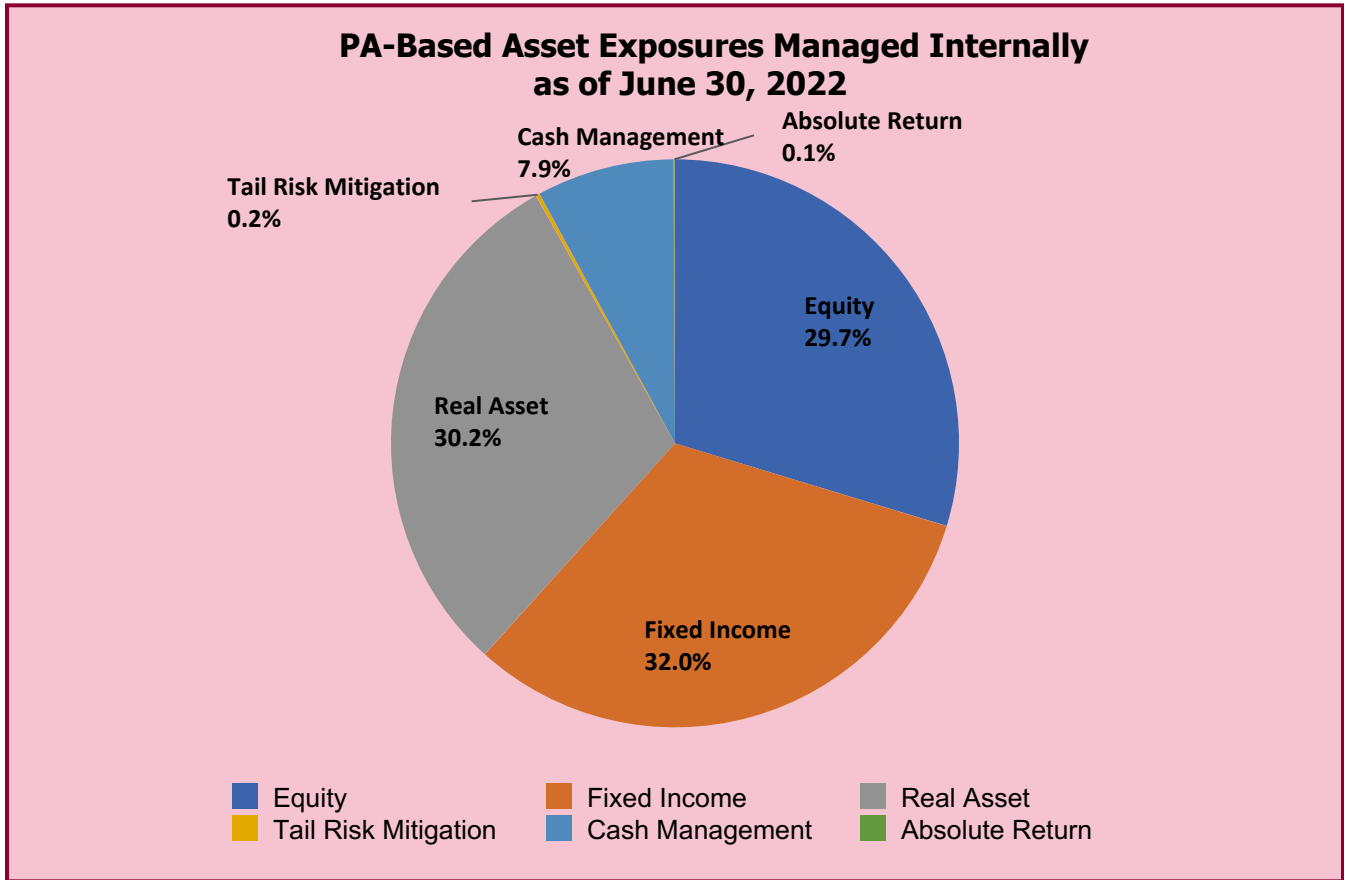
Pennsylvania-Based Asset Exposures Managed Internally

<u>Asset Class</u>	<u>Market Value (in millions)</u>	<u>% of Total</u>
Public Equity	11,127.1	26.4%
Private Equity	1,386.6	3.3%
Public Fixed Income	13,275.0	31.5%
Private Credit	196.3	0.5%
Public Real Asset	11,769.3	27.9%
Private Real Asset	935.4	2.2%
Tail Risk Mitigation	94.3	0.2%
Absolute Return	26.3	0.1%
Cash Management	3,310.6	7.9%
Totals	\$ 42,120.9	100.0%

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Commitment to Pennsylvania Financial Services Firms (continued)

Chart 13.1 displays the distribution of exposures managed internally as of June 30, 2022.



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Table 13.2 is a list of assets managed by external managers with headquarters or offices located in Pennsylvania, as of June 30, 2022.

Table 13.2 Pennsylvania-Based External Managers	
Public Equity:	Private Equity:
Radcliffe Capital Management, L.P.	Adams Capital Management, L.P.
	Co-Investment 2000 Fund, L.P.
Private Credit:	Co-Investment Fund II, L.P.
International Infrastructure Finance Co Fund, L.P.	Cross Atlantic Technology Fund II
Keystone Partners, L.P. Series A	Cross Atlantic Technology Fund, L.P.
Keystone Partners, L.P. Series B	Incline Elevate Fund II, L.P.
LBC Credit Partners III, LP	Incline Elevate Fund, L.P.
LBC Credit Partners-P Credit Fund, LP	Incline Equity Partners III (PSERS), L.P.
	Incline Equity Partners IV, L.P.
Private Real Estate:	Incline Equity Partners V, L.P.
EQT Exeter Industrial Core-Plus Fund IV, L.P.	LLR Equity Partners III, L.P.
Exeter Core Industrial Club Fund II, L.P.	LLR Equity Partners IV, L.P.
Exeter Industrial Core Fund III, L.P.	LLR Equity Partners V, L.P.
Exeter Industrial Value Fund II, L.P.	LLR Equity Partners VI, L.P.
Exeter Industrial Value Fund III, L.P.	Milestone Partners FS 2, L.P.
Exeter Industrial Value Fund IV, L.P.	Milestone Partners III, L.P.
Exeter Industrial Value Fund V, L.P.	Milestone Partners IV, L.P.
GF Management	NEPA Venture Fund II
LEM Multifamily Fund V, L.P.	SCP Private Equity Partners II, L.P.
LEM Multifamily Fund VI, L.P.	Versa Capital Fund I, L.P.
LEM Multifamily Senior Equity Fund IV, L.P.	Versa Capital Fund II, L.P.
Property Management, Inc.	Versa Capital Fund III, L.P.
Private Infrastructure:	
International Infrastructure Finance Co Fund II, L.P.	

Investments in Pennsylvania-Based Companies

Pennsylvania Private Equity and Private Equity Co-Investments are sourced from funds where PSERS or its consultant is an investor. 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 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 Infrastructure

PSERS Private Infrastructure Program has committed \$1.9 billion to 8 partnerships. From the program inception to June 30, 2022, PSERS has committed capital to 1 partnership headquartered 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 \$17.4 billion to 145 partnerships. From the program inception to June 30, 2022, PSERS has committed capital to 21 partnerships headquartered in Pennsylvania.

Private Equity

PSERS Private Equity program has committed \$33.3 billion to 302 partnerships. From the program inception to June 30, 2022, PSERS has committed capital to 46 partnerships headquartered in Pennsylvania.

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

In April 2015, PSERS Board approved a \$250 million commitment for PSERS to co-investment in portfolio companies based in Pennsylvania. The portfolio companies are sourced from funds where PSERS or its consultant is an investor. As of June 30, 2022, PSERS has invested \$58.2 million and has a total value of \$122.5 million, resulting from \$101.9 million in distributions and \$20.6 million of net assets. The number of employees, payroll, and market value are included within their respective asset class in Table 13.3.

Private Credit

PSERS Private Credit Program has committed \$13.0 billion to 63 partnerships. From the program inception to June 30, 2022, PSERS has committed capital to 5 partnerships headquartered in Pennsylvania.

Section 3 - Investment Information

Table 13.3 displays Pennsylvania-based investments and other statistics at June 30, 2022 (\$'s in millions):

Table 13.3

Statistics of Pennsylvania-Based Investments

<u>Asset Class</u>	<u>Total PA Market Value (PSERS Portion)</u>	<u>Total PA Market Value (Total Invested)</u>	<u># of People Employed</u>	<u>Payroll</u>
U.S. Equities	\$ 251.4	\$ 251.4	*	\$ *
Fixed Income	57.2	57.2	*	*
Private Real Estate	147.8	1,809.5	45	3.9
Private Equity	3,066.1	63,456.4	88,068	803.5
Total	\$ 3,522.5	\$ 65,574.5	88,113	\$ 807.4

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