

A photograph of the Franklin Academy Schoolhouse, an octagonal brick building with a white door and windows, and a small tower on top. The building is surrounded by green trees and grass. The text is overlaid on a white circular background in the upper right.

**Franklin Academy  
Schoolhouse**

Also known as Octagonal School, Franklin Academy schoolhouse was built in 1856, and used by the Watkins family and the employees of their textile mill until the 1870s when it became a residence for mill workers. Located in the Watkins Woolen Mill State Historic Site, the school is now operated by the Missouri Department of Natural Resources.

Local students today attend the Lawson R-XIV School District.

Franklin Academy Schoolhouse  
Lawson, Missouri  
1856

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# Letter from Willis Towers Watson

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October 27, 2017

To the Members of the Board:

Fiscal year 2017 saw strong results in equity markets, with U.S., international developed, and emerging markets all finishing the year in positive territory, with double-digit returns. The year began with uncertainty surrounding the Brexit vote and its ultimate effect on markets, which left a residue of increased volatility through the end of the first quarter of the fiscal year. Domestic equity markets were already experiencing strong performance prior to the U.S. Presidential election in November, which continued through the end of the fiscal year. Emerging markets posted strong results for the fiscal year as the global economy has stabilized and demonstrated continued improvement broadly. Domestic fixed income markets struggled to recover from a negative second quarter fiscal year, as rates increased in anticipation of business friendly policies from the new administration. Longer dated U.S. government bonds finished negative for the year, while credit bonds posted modestly positive returns. As expected, the Fed raised its policy rate by 0.25% in April, and again by the same amount in June. The focus of the coming year will be on the ability of global central banks to tighten monetary policy while maintaining positive and improving global economic growth.

PSRS and PEERS plans are combined to show one performance number for the consolidated Missouri Education Pension Trust (MEPT). The Total Fund return for the fiscal year ended June 30, 2017 was 12.5% for MEPT, which outperformed the policy benchmark return of 11.0%. The MEPT fiscal year return for Public Risk assets was positive with a return of 15.9%, beating the benchmark return of 14.6%, while Safe Assets were negative for the year at -1.7%. MEPT Private Risk assets returned 14.9% and were ahead of the benchmark return of 13.5%.

The Fund continues to evolve through the implementation of the target asset allocation strategy, both at the Total Fund and asset class levels. In doing so, PSRS/PEERS uses to its advantage both internal and external resources in an effort to manage the portfolio on a forward looking basis, and when considering the attractiveness of available investment opportunities.

In the next fiscal year, Willis Towers Watson will continue to work with the PSRS/PEERS internal investment staff, supporting the implementation of the new asset allocation, idea generation and overall governance framework.

We at Willis Towers Watson have enjoyed our relationship with Missouri PSRS/PEERS and are looking forward to the coming year.

Regards,

Towers Watson Investment Services, Inc.



Jim Neill, CFA  
Director, Pennsylvania Investment Leader

## Letter from the Chief Investment Officer



PUBLIC SCHOOL & EDUCATION EMPLOYEE  
RETIREMENT SYSTEMS OF MISSOURI

December 1, 2017

To the Members of the Systems:

Throughout this year's Financial Report, you will see the phrase: "*Serving Missouri's Public Schools Past, Present and Future*". While this statement certainly addresses the PSRS/PEERS commitment to help members manage their retirement security, it also refers to the investment process at the Systems. We continue to build on the *past* success of the PSRS/PEERS' investment program by seeking sound investment returns in the *present* as well as developing a deeper and more robust investment platform that will provide financial security for our members well into the *future*.

With that in mind, I present the following report on the Systems' investments for the fiscal year ended June 30, 2017 on behalf of the PSRS and PEERS' Board of Trustees and the internal investment staff.

An improving global economy coupled with low interest rates and low inflation led to a perfect backdrop to make money in most asset classes in fiscal year 2017. The strength in the investment markets directly resulted in solid gains for PSRS/PEERS as the Systems' assets increased through investment earnings by almost \$4.6 billion from the previous year with a total fund performance of 12.5% for both PSRS and PEERS.

### Key Points within this year's Financial Report

As you review the financial information in this report for the fiscal year ended June 30, 2017, it is important to be aware of the following points:

- PSRS and PEERS significantly outperformed the assumed investment return of 7.75%,
- The Systems generated the investment return while taking less risk than approximately two-thirds of comparable public funds,
- The PSRS/PEERS internal investment staff and external investment managers added value above the policy benchmark of over \$500 million, net of all fees and expenses. This outperformance in 2017 was due to portfolio construction and tactical asset allocation decisions by internal investment staff (overweighting and underweighting asset classes around targets) as well as active management on the part of external managers,
- The PSRS/PEERS investment expenses (including accrued performance based fees and all internal investment staff expenses) for fiscal year 2017 were 1.2%, or \$1.20 for every \$100 managed. The investment returns reported throughout this publication are mostly net of these fees. The investment return net of all fees and expenses was 12.3% for PSRS and PEERS,
- The PSRS and PEERS investment returns for the last five years exceeded 65% of the peer group as defined by the Wilshire TUCS universe of public pension plans with assets in excess of \$1 billion,

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- Investment performance throughout this report is calculated using a time-weighted rate of return based on market values, and
- The total invested assets of both PSRS and PEERS were approximately \$41.5 billion on June 30, 2017, making the combined entity larger than all other public retirement plans in the state combined, and the 43<sup>rd</sup> largest defined benefit plan in the United States.

## Fiscal Year 2017 Year in Review

The internal investment staff, under the direction of the PSRS/PEERS' Board of Trustees, has adopted a disciplined and diversified investment portfolio that includes allocations to multiple asset classes. Over time, every specific asset class within the PSRS/PEERS' investment portfolio performs a valuable function.

In fiscal year 2017, the combined asset allocation provided the Systems with substantial absolute returns, led by above average returns from global stocks. U.S. stocks returned 18.5% for the fiscal year ended June 30, 2017 (as measured by the Russell 3000 Index), non-U.S. developed stocks moved 20.3% higher (as measured by the MSCI EAFE Index), and emerging market stocks increased 23.8% (as measured by the MSCI Emerging Markets Index). In contrast, while interest rates remained near historical lows throughout the year, the yield on the 10-year Treasury Bond did increase from 1.5% at the beginning of the fiscal year to 2.3% on June 30, 2017. This increase in yield contributed to negative absolute returns for the PSRS/PEERS' Safe Asset Portfolio (U.S. Treasury Bonds and U.S. Treasury Inflation Protection Securities).

The PSRS/PEERS non-traditional asset classes also provided strong returns in fiscal year 2017. The Hedged Asset Program represented 12.1% of total fund assets at fiscal year-end and generated a 9.6% return. The objective of the Hedged Assets Program is to provide competitive returns, diversification and lower volatility (risk) than the Systems' stock portfolios. Diversification into private equity, private real estate and private credit proved beneficial for the year as the Private Equity Composite returned 20.1%, the Real Estate Composite increased 8.9%, and the Private Credit Composite increased 23.6%.

As noted above, significant absolute returns in most of the major asset classes contributed to the 12.5% return for PSRS and PEERS. Additionally, the investment returns were supported by solid implementation (security selection) and tactical asset allocation decisions. For example, the PSRS/PEERS' Public Credit Portfolio outperformed its benchmark (Barclays U.S. Intermediate Credit Index) by 1.7% in fiscal year 2017, while the PSRS/PEERS' Real Estate Portfolio outperformed its benchmark (NFI-ODCE Index) by 2.0%. From a portfolio construction and tactical standpoint, the internal investment staff maintained a modest underweight to safe assets (Treasury bonds) throughout the year (due to historically low interest rates) and a significant overweight to stocks (both U.S. and non-U.S.). Additionally, within the global stock allocation, the Systems were overweight to emerging market stocks relative to Europe. The underweight to safe assets and the overweight to stocks for the fiscal year provided meaningful contribution to the overall PSRS/PEERS return.

## Fiscal Year 2018: Assumed rate of return and risk

As I write this annual letter on December 1, 2017, we are five months into fiscal year 2018 and the global economy has continued to improve. Equity markets throughout the world have reached new record highs supported by the synchronized global expansion growing at a steady (but moderate) rate, low interest rates, stable inflation and only gradual declining monetary accommodation.

## Letter from the Chief Investment Officer, continued

The Systems utilized a 7.0% assumed rate of return for the decade of the 1970's. The assumption was increased to 8.0% in 1980 as bond yields increased. This historical assumption was reasonable and supported by market expectations over many years. For example, the 30-year realized return for PSRS/PEERS is 8.4%. However, in the current environment, virtually every asset class (specifically global stock markets) is fully valued and interest rates remain near historical lows. As such, we believe that the expected investment returns going forward could be lower than historical returns. To that end, the Board of Trustees, with input from both internal investment staff and external advisors, have worked to reduce the long-term assumed rate of return for the Systems. The Board moved from the 8.0% assumed rate of return in fiscal year 2016 to 7.75% in fiscal year 2017 and 7.6% for fiscal year 2018. We believe that the directional move to a lower assumed rate of return is prudent and in concert with the Board's objective to provide for the long-term security and financial stability of the Systems.

The strategic asset allocation for PSRS/PEERS is designed to achieve the assumed investment return over long periods of time. To achieve that goal, the Systems will always have a high allocation to stocks (both public and private). Nevertheless, we are very focused on many risk factors in the portfolio including liquidity (ability to meet benefit payments), downside protection (how does the portfolio react in a down market) and tail risk (how does the portfolio perform in a substantial market correction). As you may note within the financial report, the Systems have generated a strong investment return (9.5%) over the last five years while taking less risk than approximately 85% of comparable public funds. This risk level is intentional. The best way to compound wealth over time is to limit losses. The PSRS/PEERS investment portfolio is therefore structured to capture growth in the global economy but also offer protection in the event of an economic downturn.

### Fiscal Year 2018: Portfolio structure

The Board has adopted an Investment Policy that provides the PSRS/PEERS' internal investment staff and external advisors with the flexibility to deviate from the strategic asset allocation within appropriate bands. At times the investment staff has deviated significantly from the target allocation as valuations in specific asset classes were attractive relative to historical pricing.

As mentioned previously in this letter, most asset classes appeared close to full valuation at the end of fiscal year 2017. The same asset classes are even more 'fully' valued as we approach the half way point in fiscal year 2018. Consequently, the Systems currently have allocations that are close to the long-term targets for most of the asset classes in the portfolio.

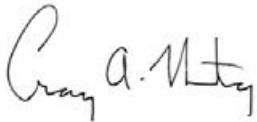
The largest underweight in the portfolio remains the allocation to Public Credit. Bond yields are very low and credit spreads (the amount an investor is compensated for in owning a credit bond) are even lower. Alternatively, we are modestly overweight to Hedged Assets. The Hedged Asset portfolio is designed to offer the diversification benefits traditionally associated with bonds but at higher levels of expected return.

Within the public equity allocation, the investment staff has been re-allocating a portion of the assets from U.S. equity to both non-U.S. equity developed and emerging markets throughout the last year. The valuation levels for the equity markets outside the U.S. and the additional growth potential in emerging markets has supported the rebalancing effort.

The Systems private markets portfolios will continue to be a focus for the investment staff in fiscal year 2018. PSRS/PEERS began building private investment portfolios (including private equity, private credit and private real estate) in 2003 to generate long-term returns superior to the public markets, take advantage of market inefficiencies, and increase diversification. The nature of private investing requires a process of portfolio construction that takes years to develop. This is particularly true for a plan with the substantial assets of PSRS/PEERS. Over the years, the Systems have continued to build on this successful investment platform that serves as an alternative to traditional public markets. At the close of fiscal year 2017, the Systems had almost \$7.0 billion invested in Private Risk Assets.

The PSRS/PEERS investment platform has provided long-term results that have benefited *past* members of the Systems. We believe that through strong Board governance and an adherence to a disciplined and prudent investment process, PSRS/PEERS can continue to maximize *risk-adjusted* returns for *present* and *future* members.

Respectfully,



Craig A. Husting, CFA  
Chief Investment Officer

## Investment Policy Summary

The Board of Trustees of the Public School Retirement System of Missouri and Public Education Employee Retirement System of Missouri (PSRS and PEERS, also referred to as the Systems) is charged with the responsibility for investing the assets of the Systems in a manner consistent with the fiduciary standards set forth in the 'prudent person' rule. To that end, the Board has adopted the following principles to guide all investment-related decisions:

1. Act in the exclusive interest of the members of the Systems,
2. Maximize total return within prudent risk parameters, and
3. Preserve the long-term purchasing power of the Systems.

The investment portfolios of PSRS and PEERS represent all contributions to the plans, from members and their employers, as well as all net earnings on these assets. These funds are held in support of both current and future liabilities. In total, approximately 61% of every dollar used to pay retirees is generated from investment earnings.<sup>1</sup>

The Board of Trustees of PSRS and PEERS approved the commingling of assets for purposes of investment as allowed by state statute in January 2013. In order to implement this change, PSRS and PEERS adopted the Missouri Education Pension Trust Agreement (MEPT), which is managed by the PSRS and PEERS Board of Trustees and Investment Staff. Effective July 1, 2013, the invested assets of the Systems were pooled and invested in MEPT. All assets held by MEPT are for the exclusive benefit of PSRS and PEERS. Each of the Systems has equity in MEPT based on funds contributed and earnings allocated. Earnings of MEPT are allocated based on the average daily balances of each of the respective Systems. Individual investments in MEPT are not specifically identified to the respective Systems. Due to the fact all invested assets are invested in MEPT, the rate of return for each of the Systems is approximately the same. Therefore, the following discussions focus on MEPT in total and not the individual Systems.

## Roles and Responsibilities

### Board of Trustees

It is the responsibility of the Board of Trustees (Board) to establish and maintain policies and objectives for all

aspects of the Systems' investment program including the determination of long-term policies for risk tolerance and asset allocation.

In keeping with its obligation to serve as the governing fiduciary, any changes to the investment policy or investment implementation manuals require the Board's approval.

As one of the largest public pension funds in the United States, the Systems' operational requirements are complex. In order to properly administer the Systems and carry out investment strategies, the Board relies heavily on both internal staff and external service providers. Due to the number of parties involved, their roles as fiduciaries are clearly identified to ensure distinct lines of responsibility and proper controls exist, while providing increased operational efficiency and elimination of duplication of effort.

### Executive Director

The Executive Director (Director) is appointed by, and serves at the pleasure of the Board. The Director is responsible for planning, organizing, and administering all operations of the Systems under the broad policy guidance and direction of the Board. The Director, with the assistance of the investment staff, monitors the performance of the investment portfolio; ensures that funds are invested in accordance with Board policies; and, ensures that proper internal controls are developed to safeguard the assets of the Systems. In fulfilling these responsibilities, the Director relies heavily on the Chief Investment Officer and external asset consultants.

### Chief Investment Officer

The Chief Investment Officer (CIO) serves at the pleasure of the Director yet has a direct, but limited, link to the Board on investment-related issues. The CIO's sole access to the Board is for submission of investment reports, information, or communications required by the investment policy and any other information or opinions specifically requested by the Board with regard to the investment program. The CIO is the individual primarily responsible for providing direction for the investment program. It is the CIO's responsibility to work with the Director, the general consultant, specialty consultants, and other external service providers, with the assistance of the internal staff, in advising the Board on policies related to the investment program. The CIO has responsibilities related to hiring and terminating service providers.

<sup>1</sup> Based on a twenty-year average for fiscal years 1997-2017.



Critical functions of the CIO include recommendations for implementation decisions related to the investment plan and for the strategic allocation of the portfolio within broad ranges approved by the Board.

### External Asset Consultants

The Systems employ Willis Towers Watson (WTW) as a general consultant and Albourne America, LLC (Albourne), Pathway Capital Management (Pathway) and The Townsend Group (Townsend) as specialty consultants. WTW is an independent resource available to collaborate with the Board and staff on the investment process. This typically includes regular meetings with the Board to provide an independent perspective on the Systems' goals, structure, performance and external service providers. Additionally, WTW may be involved with the strategic allocation shifts for the portfolio.

The specialty consultants work on specific programs within the overall investment program. Albourne is utilized for the Private Credit, Private Equity, Hedged Assets and Alpha Overlay programs. Pathway is a consultant for the Private Equity and Private Credit programs and Townsend consults on the Real Estate program.

### External Investment Managers

The Systems employ external investment managers that include external money managers which may be structured as public or private entities in the form of a partnership, limited liability company, trust, separately managed account, commingled account, or some other form of operational structure in which assets may be held by an external custodian selected and monitored by the external manager.

Managers are given explicit written directions detailing their particular assignments or they follow the investment program outlined in their offering documents or Limited Partnership Agreements, and will construct and manage investment portfolios that are consistent with the investment philosophy and disciplines for which they were hired. Discretion is delegated to the managers to carry out investment actions as directed by the Systems.

### Master Custodian

JP Morgan Chase Bank, NA (JP Morgan) serves as the master custodian for the Systems. The master custodian holds most cash and securities for the Systems, except in cases where investment in a partnership, commingled

account, or unique asset class makes it impossible to do so. The Systems thoroughly evaluate the structure of all investments and their custody arrangements. JP Morgan is responsible for providing the official book of record for investment performance reporting and accounting, and serves as an additional layer of risk control in safekeeping the Systems' assets.

### Investment Objective

Based on the long-term investment returns available from a well-diversified, prudently invested portfolio, the Board has adopted an objective to achieve a **total nominal investment return of 7.75% with a real rate of return of at least 5.5% per annum over time.**<sup>2</sup> The Board of Trustees revised the long-term investment return objective to 7.75% effective for fiscal year 2017 investment performance and 7.60% effective for fiscal year 2018 investment performance. The investment objective of 8.0% was effective from 1980 through fiscal year 2016.

In order to achieve the investment objective, the Systems have developed a portfolio that is prudently invested across a broad array of assets that reflects the long-term nature of the Systems' pension obligations. The principles of diversification, risk control, and competitive rates of return provide the framework for selecting an asset allocation that is expected, over longer periods of time and in the aggregate, to give the Systems the most competitive long-term return within a prudent level of risk.

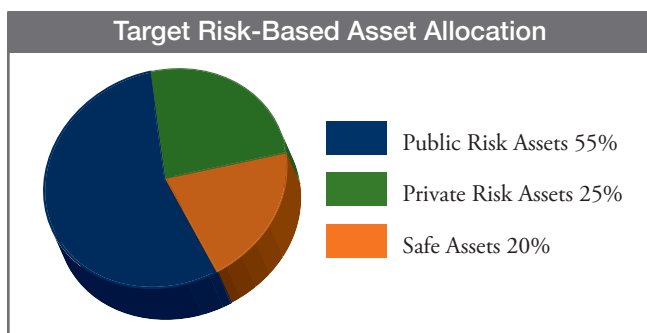
### Understanding Risk

Selection of an appropriate asset allocation is one of the most important decisions made by a retirement plan. Within that asset allocation, it is important to not only consider the expected investment return, but also to understand the risks. The importance of risk consideration for institutional investors is critical to long-term success. To that end, the Systems employ an effective and intuitive risk-based approach to setting and reporting the asset allocation decision. The Systems developed a risk-based asset allocation to clearly define the prudent risks taken within its investment portfolios.

<sup>2</sup> The real rate of return is the rate by which the long-term total return exceeds the long-term inflation rate. The Board of Trustees shall employ an actuarial consultant for purposes of determining the inflation rate to be used in calculating the pension obligations. The assumed inflation rate as of June 30, 2017 was 2.25% per annum.

The Systems consider a variety of risks including, but not limited to, liquidity risk, volatility, tail risk (the possibility that an investment will move much more than expected) and the ability to meet the Systems' assumed rate of return when structuring the portfolio.

This analysis results in an asset allocation to Public Risk Assets, Safe Assets and Private Risk Assets. Within each risk allocation, the Systems' investment portfolio includes long-term commitments to specific asset programs. The target risk-based asset allocation is illustrated in the pie chart below. The Board of Trustees recently increased the Private Risk Assets target by 5% and proportionately decreased the Public Risk Assets target. These changes are discussed further in the following Asset Allocation section.



### Asset Allocation

The asset allocation decision is generally regarded as the most important decision in the investment management process since it is crucial to achieving the long-term objectives established by the Board. In that light, it is the Board's responsibility to determine the appropriate policy asset allocation based upon several criteria with input and guidance from internal staff and WTW. These criteria are as follows:

1. The expected rate of return for each asset classification;
2. The expected risk of each asset classification (expressed as the standard deviation of the rate of return);
3. The correlation of returns between asset types;
4. The investment objectives and risk constraints of the Systems (including, but not limited to, liquidity needs and the expected time horizon);
5. The funded ratio and cash flow requirements for PSRS and PEERS; and
6. The impact of the Systems' return volatility on the contribution rate.

The Board of Trustees amended the long-term target asset allocation at the June 2016 Board of Trustees meeting. The allocation to each investment program considers both the risk tolerance of the Systems and the long-term return objective. The new long-term target asset allocation is expected to maintain similar levels of total portfolio risk while allowing for more efficient investment returns. However, given the nature of investing in Private Risk assets, it is expected to take several years to implement. Implementation will be achieved over a number of years through a disciplined investment approach. The policy benchmarks will change over time as the Systems make meaningful progress to the new long-term targets. The changes to the asset allocation are as follows: Public Risk Assets decreased 5% and Private Risk Assets increased 5%. Within Public Risk Assets, Public Credit decreased from 12% to 7%. Within Private Risk Assets, Private Equity increased from 10.5% to 12%, Real Estate increased from 7.5% to 9% and Private Credit increased from 2% to 4%.

The following chart on page 61 details the long-term target and interim target asset allocations for fiscal year 2017. The interim policy allocations have been established to reflect the continued funding of Private Risk Assets and progress towards the Systems' long-term asset allocation objective. For performance measurement purposes, the interim policy will serve as the basis for establishing the Total Fund policy benchmark until the on-going process of funding Private Risk investments is meaningfully complete.

Long-term Target and Policy Ranges				
Investment Type	Fiscal Year 2017 Interim		As Recently Amended	
	Long-Term Target	Policy Ranges	Long-Term Target	Policy Ranges
<b>Public Risk Asset Programs</b>				
U.S. Public Equity	27.00%	16% - 48%	27.00%	16% - 48%
Public Credit	12.00%	0% - 20%	7.00%	0% - 20%
Hedged Assets	6.00%	0% - 25%	6.00%	0% - 25%
Non-U.S. Public Equity	15.00%	8% - 28%	15.00%	8% - 28%
<b>Total Public Risk Assets</b>	<b>60.00%</b>	<b>35% - 75%</b>	<b>55.00%</b>	<b>35% - 75%</b>
<b>Safe Assets Programs</b>				
U.S. Treasuries	16.00%	0% - 40%	16.00%	0% - 40%
U.S. TIPS	4.00%	0% - 40%	4.00%	0% - 40%
Cash Equivalents	0.00%	0% - 10%	0.00%	0% - 10%
<b>Total Safe Assets</b>	<b>20.00%</b>	<b>10% - 40%</b>	<b>20.00%</b>	<b>10% - 40%</b>
<b>Private Risk Asset Programs</b>				
Private Equity	10.50%	4% - 14%	12.00%	4% - 15%
Private Real Estate	7.50%	4% - 10%	9.00%	4% - 12%
Private Credit	2.00%	0% - 7%	4.00%	0% - 8%
<b>Total Private Risk Assets</b>	<b>20.00%</b>	<b>5% - 25%</b>	<b>25.00%</b>	<b>10% - 30%</b>
<b>Total Fund</b>	<b>100.0%</b>		<b>100.0%</b>	

The Board recognizes the cyclical nature of the investment markets and it has allowed the internal staff to capitalize upon opportunities by changing the allocation of each asset class or sub-asset class within broad strategic bands or policy ranges (as indicated in the previous table). The flexibility given to the internal staff in establishing the strategic mix provides opportunities for the Systems to take advantage of changing market conditions. To ensure appropriate controls, the Director, CIO and WTW must unanimously agree upon all material strategic changes prior to implementation.

## Performance Objectives and Monitoring Process

Generating a total nominal rate of return net of expenses of at least 7.75% and a real rate of return net of expenses of at least 5.5% per annum is an important consideration in the asset allocation decision and the primary performance objective for the Systems over long periods of time. The need for a long-term focus is necessary to preclude the temptation to overreact to events in the financial markets that have no relevance to long-term asset/liability management of the Systems. The resulting dilemma is the conflicting requirement to

evaluate investment policy implementation over shorter time periods while maintaining a long-term focus on meeting the return objectives. In order to determine if the Systems' short-term and long-term objectives are being achieved, the Board evaluates performance relative to policy and strategic benchmarks. The policy benchmarks allow the Systems to be judged by performance relative to a defined set of broad market indices (i.e., the Systems' long-term asset allocation objective). The strategic benchmarks allow the Board to consider the additional value generated from the latitude given to the internal staff to alter the asset class or sub-asset class allocations.

## Policy Decisions

The value added through policy decisions is measured by the difference between the policy benchmark return and the actuarial required rate of return objective (defined as Real Return Objective + Inflation). A policy benchmark return greater than the actuarial required rate of return reflects value added. A policy benchmark return less than the actuarial required rate of return reflects losses or shortfalls in performance in funding the liabilities of the Systems. These policy decisions are measured over long periods of time.

### Strategy Decisions

Strategy decisions are asset class or sub-asset class asset allocation choices made by the internal staff to deviate from the policy benchmark weights, with approval from WTW and the Director that the proposed material deviation is in compliance with the Board's investment policy. The value added through these decisions to overweight and/or underweight these sub-asset classes is measured by the difference between the strategic benchmark return and the policy benchmark return. This difference captures the value added by internal staff through asset class or sub-asset class strategic decisions relative to the Board's broad policy allocation decisions. A strategic benchmark return greater than the policy benchmark return reflects value added through the allocation decisions. A strategic benchmark return less than the policy benchmark return reflects losses to the fund's performance based upon strategy decisions.

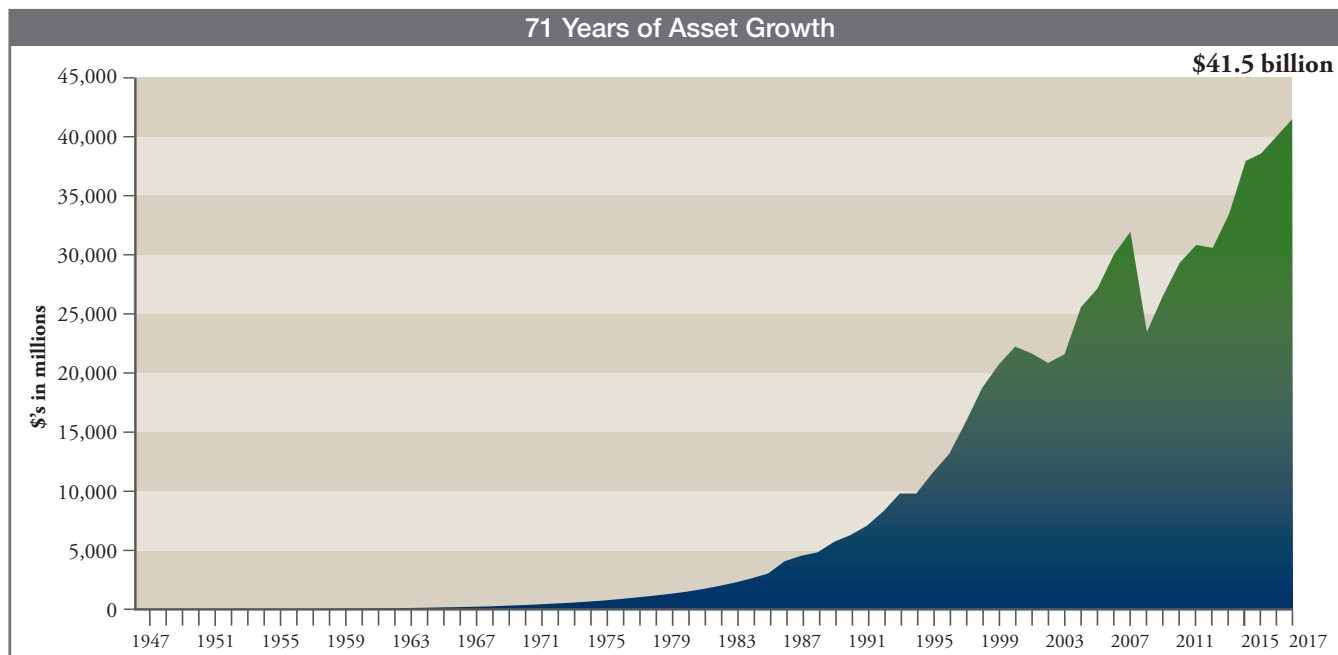
### Implementation Decisions

Implementation decisions are manager selection choices made by the internal staff with the approval of a consultant(s) and the Director. The value added through these manager selection decisions is measured by the difference between the actual portfolio return and the strategic benchmark return. An actual portfolio return greater than the strategic benchmark return reflects value added through these manager selection decisions. An actual portfolio return less than the strategic benchmark return reflects losses to the fund's performance based upon implementation decisions.

### Risk Controls

The Board recognizes that even though the Systems' investments are subject to short-term volatility, it is critical that a long-term investment focus be maintained. Given the importance of the broad asset allocation decision to the Systems' long-term investment success, internal staff is required to conduct an asset allocation/ liability study at least every five years to examine the appropriate long-term investment strategies for the Systems. The most recent asset/liability study was conducted in fiscal year 2016 and the next study is scheduled for 2021. In addition, the CIO must annually evaluate the asset allocation mix and any strategic allocation of the portfolio and provide a report to the Board on the results of that evaluation. This ongoing review of the asset allocation process helps to ensure the asset allocation is being monitored and modified as needed to meet the financial obligations of the Systems.

## Total Fund Review



The Systems' total invested assets were \$41.5 billion as of June 30, 2017. There has been a long-term growth in assets since the inception of PSRS in 1946 and PEERS in 1965, as shown in the graph above.

### Investment Performance<sup>3</sup>

The Systems achieved strong absolute and relative returns in fiscal year 2017. The Systems' well-structured investment portfolio added approximately \$4.6 billion in investment earnings to the growth of assets during the fiscal year 2017. The Systems earned an investment return of 12.5% for fiscal year 2017 (12.3% net of all investment expenses and fees) with an ending market value of invested assets at \$41.5 billion. The total plan return, net of all investment expenses and fees, exceeded both the long-term investment goal (actuarial required rate of return) of 7.75% and the total plan policy benchmark return of 11.0%. PSRS and PEERS are long-term investors with a diversified portfolio that continues to produce strong long-term returns where the annualized investment return is 8.4% (8.3% net of all investment expenses and fees) over the last 30 years.

As illustrated in the table below, within the Systems' investment portfolio, U.S. equities delivered a return of 18.7%, non-U.S. equities returned 20.4%, private equity (investments in private companies) increased 20.1%, real estate produced 8.9% returns, and hedged assets returned 9.6%. Each of these asset classes strongly contributed to the total returns of the Systems while providing diversification from fixed income securities.

Total Fund Performance		
Assets	Total Return	Weighted Contribution*
U.S. Public Equity	18.7%	5.6%
Public Credit	3.1%	0.2%
Hedged Assets	9.6%	1.1%
Non-U.S. Public Equity	20.4%	3.5%
<b>Public Risk Assets</b>	<b>15.9%</b>	<b>10.4%</b>
U.S. Treasuries	-1.9%	-0.3%
U.S. TIPS	-0.3%	0.0%
Cash Equivalents	0.4%	0.0%
<b>Safe Assets</b>	<b>-1.7%</b>	<b>-0.3%</b>
Private Equity	20.1%	1.7%
Private Real Estate	8.9%	0.6%
Private Credit	23.6%	0.1%
<b>Private Risk Assets</b>	<b>14.9%</b>	<b>2.4%</b>
<b>TOTAL RETURN</b>	<b>12.5%</b>	<b>12.5%</b>

\*Percentages have been adjusted to reflect compounding effects and changes in asset weights.

<sup>3</sup> Investment returns were prepared using a time-weighted rate of return based on market values.

## INVESTMENT SECTION

Investment Performance Relative to Benchmarks*				
	Fiscal Year	3-Year	5-Year	10-Year**
<b>Public Risk Assets Programs</b>				
<b>U.S. Public Equity</b>	<b>18.7%</b>	<b>8.6%</b>	<b>14.7%</b>	<b>7.5%</b>
Russell 3000 Index	18.5%	9.1%	14.6%	7.3%
<b>Public Credit</b>	<b>3.1%</b>	<b>2.7%</b>	<b>2.9%</b>	<b>n/a</b>
Barclays U.S. Intermediate Credit Index	1.4%	2.6%	3.0%	n/a
<b>Hedged Assets</b>	<b>9.6%</b>	<b>3.7%</b>	<b>7.0%</b>	<b>n/a</b>
Hedged Assets Benchmark	10.2%	3.9%	7.0%	n/a
<i>Benchmark consists of:</i>				
50.0%	Barclays U.S. Intermediate Credit Index			
25.0%	MSCI ACWI ex-USA Index			
25.0%	Russell 3000 Index			
<b>Non-U.S. Public Equity</b>	<b>20.4%</b>	<b>4.1%</b>	<b>9.8%</b>	<b>2.1%</b>
MSCI ACWI ex-USA Index	20.5%	0.8%	7.0%	1.3%
<b>Total Public Risk Assets</b>	<b>15.9%</b>	<b>6.1%</b>	<b>10.6%</b>	<b>4.4%</b>
Public Risk Assets Benchmark	14.6%	5.3%	9.7%	3.4%
<i>Benchmark consists of:</i>				
47.5%	Russell 3000 Index			
27.5%	MSCI ACWI ex-USA Index			
25.0%	Barclays U.S. Intermediate Credit Index			
<b>Safe Assets Program</b>				
<b>Total Safe Assets</b>	<b>-1.7%</b>	<b>1.4%</b>	<b>0.8%</b>	<b>3.5%</b>
Safe Assets Benchmark	-1.4%	1.7%	1.1%	3.5%
<i>Benchmark consists of:</i>				
80.0%	Barclays U.S. Treasury Index***			
20.0%	Barclays U.S. TIPS 1-10 Years Index			
<b>Private Risk Assets Program</b>				
<b>Private Equity</b>	<b>20.1%</b>	<b>12.6%</b>	<b>15.5%</b>	<b>10.7%</b>
Russell 3000 Index	18.5%	9.1%	14.6%	7.3%
<b>Private Real Estate</b>	<b>8.9%</b>	<b>11.1%</b>	<b>11.9%</b>	<b>4.0%</b>
NFI-ODCE Index	6.9%	10.0%	10.4%	4.6%
<b>Private Credit</b>	<b>23.6%</b>	<b>3.4%</b>	<b>7.5%</b>	<b>n/a</b>
Merrill Lynch High Yield Master II Index	12.8%	4.5%	6.9%	n/a
<b>Total Private Risk Assets</b>	<b>14.9%</b>	<b>11.5%</b>	<b>13.3%</b>	<b>7.3%</b>
Private Risk Assets Benchmark	13.5%	9.2%	12.4%	7.4%
<i>Benchmark consists of:</i>				
52.5%	Russell 3000 Index			
37.5%	NFI-ODCE Index			
10.0%	Merrill Lynch High Yield Master II Index			
<b>TOTAL FUND</b>				
<b>Total Fund</b>	<b>12.5%</b>	<b>6.2%</b>	<b>9.5%</b>	<b>5.5%</b>
Total Fund Benchmark	11.0%	5.4%	8.5%	5.0%
<i>Benchmark consists of:</i>				
39.0%	Russell 3000 Index			
16.5%	MSCI ACWI ex-USA Index			
16.0%	Barclays U.S. Treasury Index***			
4.0%	Barclays U.S. TIPS 1-10 Years Index			
15.0%	Barclays U.S. Intermediate Credit Index			
7.5%	NFI-ODCE Index			
2.0%	Merrill Lynch High Yield Master II Index			
<b>Actuarial Required Rate of Return ****</b>	<b>7.75%</b>	<b>8.0%</b>	<b>8.0%</b>	<b>8.0%</b>
<b>TUCS Universe Median</b>	<b>12.7%</b>	<b>5.7%</b>	<b>9.3%</b>	<b>5.6%</b>

\*Investment returns were prepared using a time-weighted rate of return based on market values.

\*\*Some programs have been established more recently and therefore 10-year returns are not available.

\*\*\*Effective January 1, 2017 the Barclays U.S. Treasury Index replaced the Barclays U.S. Treasury: Intermediate Index and the Barclays U.S. Treasury: Long Index components of the Policy Benchmark.

\*\*\*\*The Board of Trustees revised the long-term investment return objective from 8.0% to 7.75% effective for fiscal year 2017 investment performance. This reduction is included in the blended returns for the extended time periods.

## Investment Performance Relative to Benchmarks

The Board has established a long-term objective (actuarial required rate of return) to achieve a total investment return of at least 7.75% per year and a real rate of return of at least 5.5% per year. As discussed in the Investment Objective section, the long-term objective was revised to 7.75% effective for fiscal year 2017 and 7.60% effective for fiscal year 2018. The fiscal year 2017 total plan return of 12.5% was substantially higher than the long-term objective. Over long periods of time, PSRS and PEERS continue to produce investment returns that exceed the Systems' objective. The annualized investment return for the Systems is 8.4% over the last 30 years. The reductions in the long-term objective is based on capital market expectations and the belief that expected investment returns going forward will be lower than historical returns.

As previously discussed, in order to determine if the Systems' short-term and long-term objectives are being achieved, the Board utilizes three benchmarks by which the Systems' progress may be judged: (1) performance relative to a **policy benchmark** (defined set of broad market indices that reflects the Systems' long-term asset allocation, or market beta), (2) performance relative to a **strategic benchmark** which indicates value added by the internal staff, and, to a lesser extent, (3) performance relative to other public pension systems and their investment managers as a reference point of oversight.

The internal staff presents to the Board a detailed attribution of the total fund performance at the end of each fiscal year. Value is added over and above expected market returns if the strategic benchmark exceeds the policy benchmark (i.e., the internal staff made positive strategic decisions) and/or if the actual total fund return exceeds the strategic benchmark.

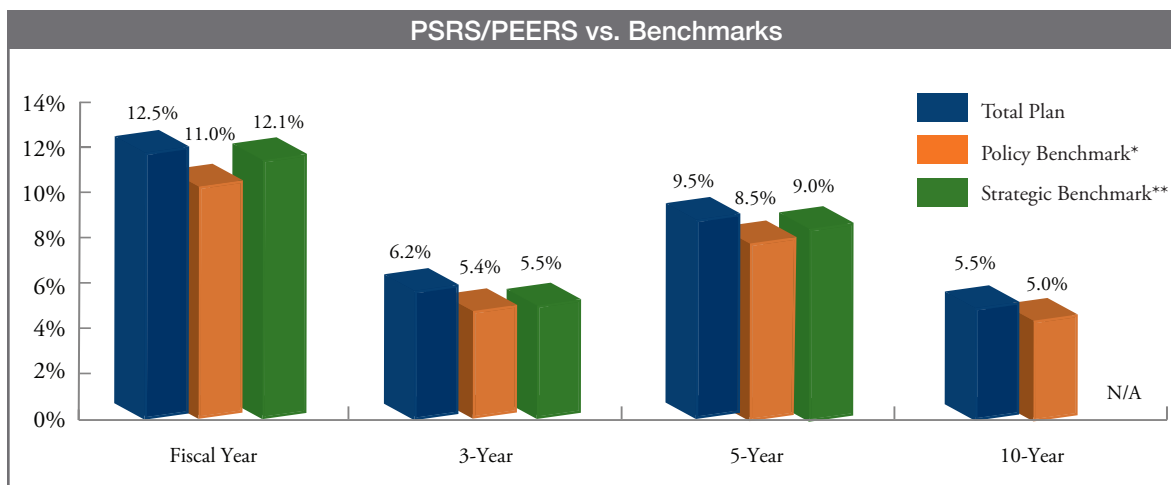
The fiscal year 2017 return was 12.5% which exceeded the policy benchmark by 150 basis points. The fiscal year investment return, net of **all** fees and expenses, was 12.3% which was also significantly above the policy benchmark. The total fund return has exceeded the policy benchmark in seven of the last ten fiscal years, an indication that internal staff and active investment management have added value to the Systems. Over the past five years, the total fund return has exceeded the policy benchmark by 100 basis points, on an annualized basis, resulting in over \$1.6 billion in excess performance (net of all investment expenses and fees) to the Systems.

The Systems' utilize the Trust Universe Comparison Services (TUCS) to compare the total return and risk levels of the Systems relative to other public pension funds with assets in excess of \$1 billion. As the chart on page 64 indicates, the total return for the three-year and five-year time periods exceeded the median return of other large public funds. Total returns for the fiscal year and ten-year time periods were marginally below the public fund median return primarily due to asset allocation and risk tolerance differences. The systems have taken substantially less risk than comparable funds during all time periods yet have consistently provided higher investment returns.

## Statistical Performance

One of the primary investment objectives of the Systems is to achieve returns similar to the market but at lower risk or volatility levels. To that end, internal staff monitors a number of quantitative risk statistics related to the total investment portfolio as well as individual composites. The following table indicates that the Systems have taken less risk than the policy benchmark (as measured by standard deviation) over all time periods while achieving higher returns, thereby indicating strong risk-adjusted performance.

**Beta** measures the volatility, or systematic risk, of a security or portfolio in comparison to the market as a whole. If a portfolio has a beta of 1.0, it indicates that the portfolio moves in unison with the market. The Systems' portfolios have a beta of less than 1.0 relative to the policy benchmark, indicating less market volatility. The Systems' beta relative to the world stock index (MSCI World Index) is approximately 0.50. This signifies that the Systems' portfolio moves up or down approximately half as much as the world stock index.



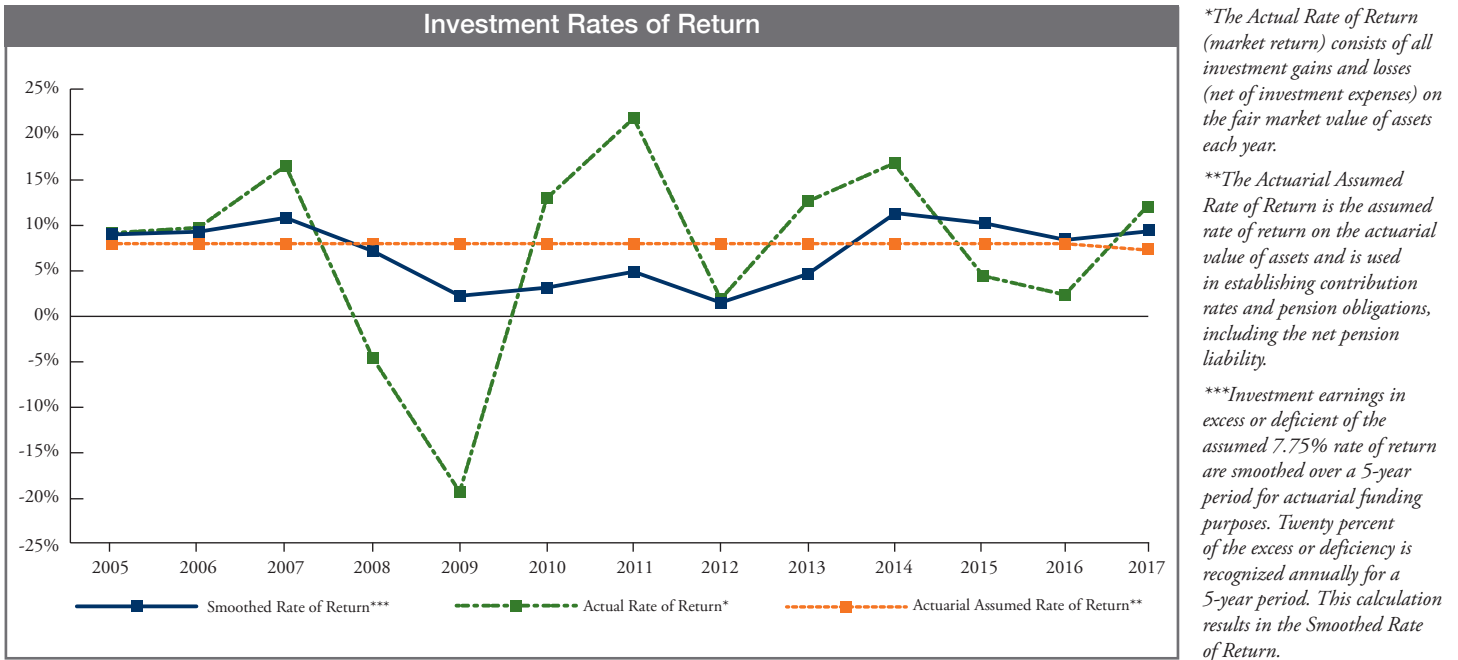
<b>Total Plan Statistical Performance</b>				
Portfolio Characteristics	Fiscal Year	3-Year	5-Year	10-Year
Annualized Total Plan Return	12.5%	6.2%	9.5%	5.5%
Annualized Policy Benchmark Return*	11.0%	5.4%	8.5%	5.0%
Annualized Strategic Benchmark Return**	12.1%	5.5%	9.0%	N/A
Excess return	1.5%	0.8%	1.0%	0.5%
Annualized Standard Deviation of Composite	2.7%	5.0%	4.9%	8.8%
Annualized Standard Deviation of Policy Benchmark*	3.4%	5.9%	5.6%	10.0%
Beta to Policy Benchmark*	0.78	0.83	0.87	0.87
Beta to MSCI World Index	0.47	0.45	0.48	0.53

\*As of June 30, 2017: 39.0% Russell 3000 Index, 16.5% MSCI ACWI ex-USA Index, 16% Barclays US Treasury Index, 15% Barclays U.S. Intermediate Credit Index, 7.5% NFI-ODCE, 4% Barclays U.S. TIPS 1-10 Years Index, and 2% Merrill Lynch High Yield Master II Index.

\*\*As of June 30, 2017: 41.3% Russell 3000 Index, 20.4% MSCI ACWI ex-USA Index, 13.1% Barclays US Treasury Index, 12.9% Barclays U.S. Intermediate Credit Index, 7.6% NFI-ODCE, 2.7% Merrill Lynch 3- Month U.S. Treasury Bill Index, 1.3% Barclays U.S. TIPS 1-10 Years Index, and 0.7% Merrill Lynch High Yield Master II Index. The Total Plan Strategic Benchmark changes monthly based on the actual asset allocation at the end of the previous month. It was established more recently so a 10-year return is not available.



The following chart shows the relationship between market value returns, the actuarially assumed rate of return and the utilization of an actuarial asset valuation method of smoothed assets. To reduce volatility in employer and employee contribution rates, a common actuarial practice of “asset smoothing” is utilized. The application of this practice results in full recognition of returns at the actuarial assumed rate and recognizes any annual excess or deficiency relative to the assumed rate over a period of five years.

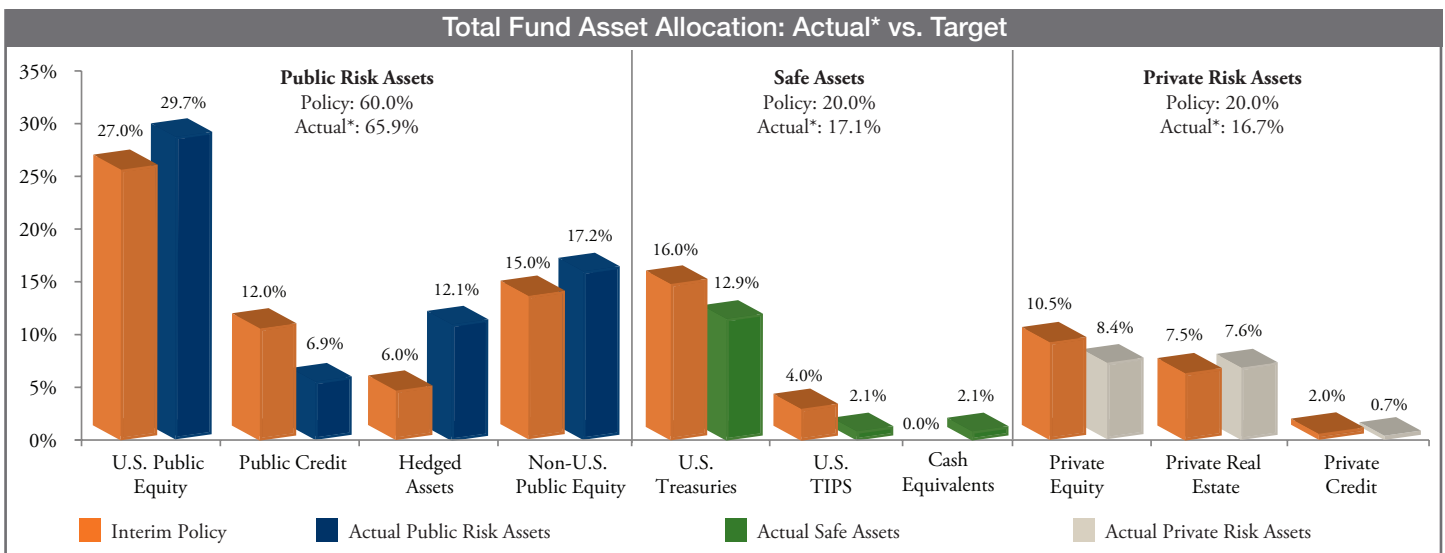


### Asset Allocation: Actual Versus Target

The interim policy allocations have been established to reflect meaningful progress towards the new long-term targets and for policy benchmark weights, as discussed in the Investment Policy Summary: Asset Allocation section. Until meaningful progress is made, the interim target will reflect the prior long-term policy allocations.

For fiscal year 2017 the interim policy allocation was 60% Public Risk Assets, 20% Safe Assets and 20% Private Risk Assets. Within each broad policy target, the Board has established sub-asset class targets. For example, as the chart below indicates, the target allocation to U.S. Public Equity was 27% as of June 30, 2017.

As illustrated in the chart, internal staff utilized the flexibility built into the investment policy to strategically overweight or underweight certain asset classes throughout the year. Strategic decisions within the Public Risk Assets program included an overweight to U.S. equities and Non-U.S. equities which provided meaningful returns to the Systems in fiscal year 2017.



\*Total Plan assets include 0.3% invested in an operating cash account that is not reflected in the chart above.

## Public Risk Assets Summary

As of June 30, 2017, Public Risk assets had a market value of approximately \$27.4 billion, representing 65.9% of total assets.

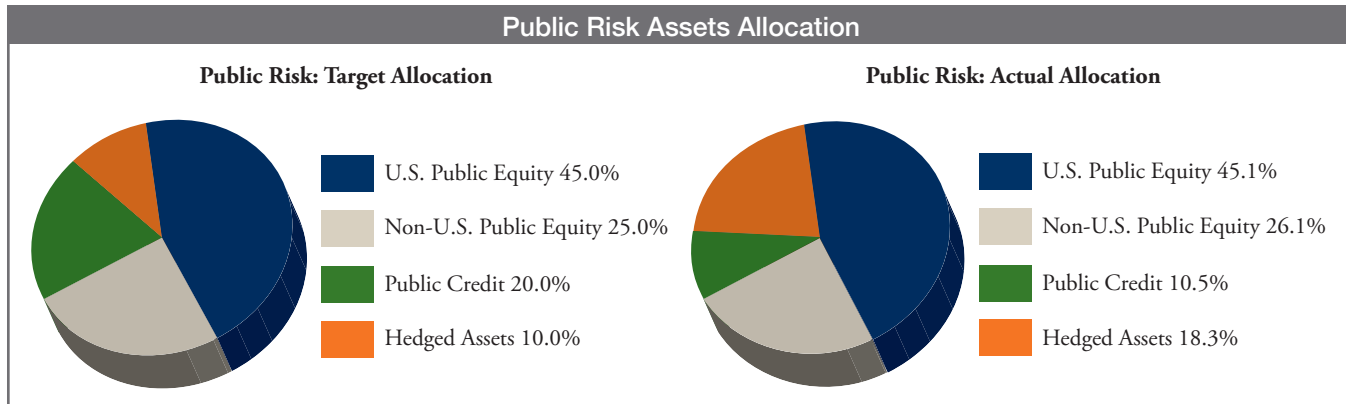
### Investment Program Description

The Board of Trustees has adopted an asset allocation policy that includes a significant allocation to Public Risk Assets. The four programs within the Public Risk Asset composite are U.S. Public Equity, Public Credit, Hedged Assets and Non-U.S. Public Equity. Each program within the Public Risk allocation is a separate multi-manager composite that is treated generally as a single portfolio. Each program serves a specific and distinct role within the overall Public Risk composite and also within the overall total plan allocation. Over time, the Public Risk composite and its sub-components serve as an effective and efficient vehicle to supply the underlying beta exposure to a portfolio of global risk assets required by the Systems' asset allocation policy, while providing the opportunity to achieve excess returns above that of a passive benchmark through the prudent combination of passive investment vehicles and a wide range of active investment strategies.

### Structure

As of June 30, 2017, 45.1% of the Systems' Public Risk assets were invested in the U.S. Public Equity program, 26.1% in the Non-U.S. Public Equity program, 10.5% in the Public Credit program and 18.3% in the Hedged Assets program. Each of these programs is discussed in more detail on the following pages.

The internal staff strategically over weighted the total plan to Public Risk assets during the year. The interim target allocation for Public Risk assets during fiscal year 2017 was 60.0% and the Systems' allocation at the end of the fiscal year was 65.9%. Within the Public Risk Assets composite, internal staff decreased its overweight to U.S. Public Equity and Hedged Assets while increasing an overweight to Non-U.S. Public Equity throughout the fiscal year. The Systems' continued to underweight Public Credit during the year.

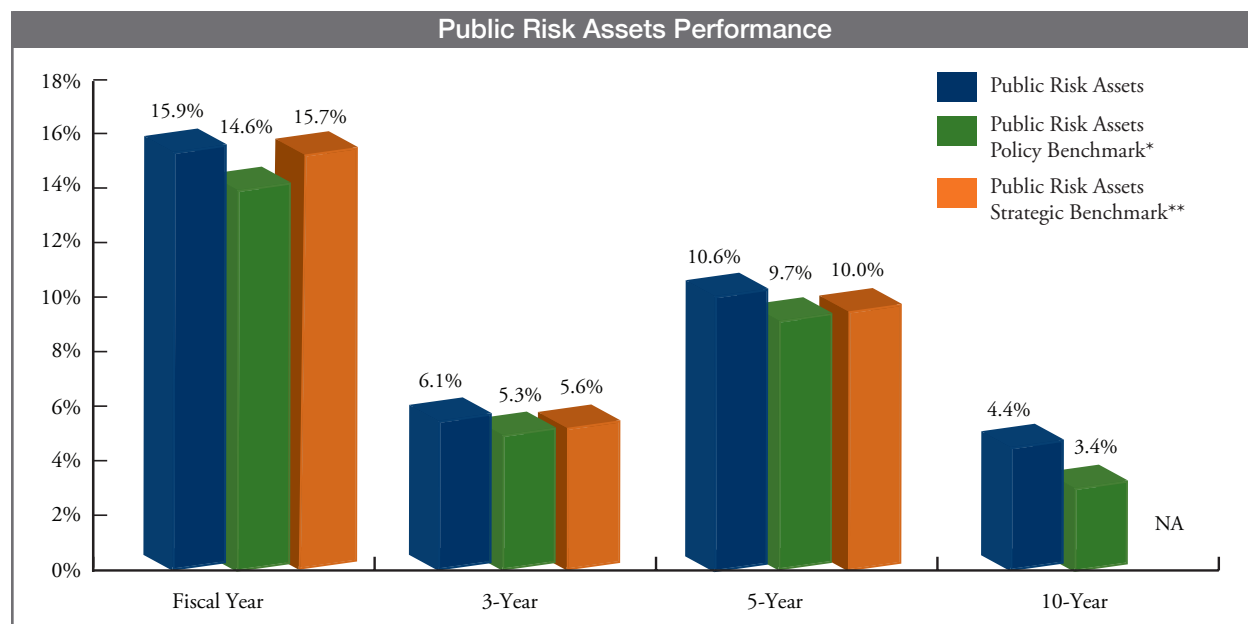


### Market Overview

Global equity markets performed very well in fiscal year 2017, driven in large part by a strengthening global economic outlook and strong corporate earnings. The Russell 3000 Index (broad measure of the U.S. stock market) was up 18.5% for the year and the MSCI ACWI ex-USA Index (broad measure of the international stock markets) increased 20.5%. Bond markets were mixed with Treasuries declining from rising rates while credit markets were positive from decreasing spreads, resulting in a modest gain for the Public Credit benchmark (Barclays U.S. Intermediate Credit Index) of 1.4%.

## Performance

The total return for the Systems' Public Risk portfolio was 15.9%, which outperformed the policy benchmark by 130 basis points. As shown in the table and graph below, the Systems' Public Risk composite returns significantly outperformed the benchmark in all reported time periods. The positive performance of the portfolio relative to the policy benchmark indicates substantial value added by the internal staff through both strategic asset allocation decisions and manager selection decisions.



Portfolio Characteristics	Fiscal Year	3-Year	5-Year	10-Year
Annualized Return	15.9%	6.1%	10.6%	4.4%
Annualized Policy Benchmark Return*	14.6%	5.3%	9.7%	3.4%
Annualized Strategic Benchmark Return**	15.7%	5.6%	10.0%	N/A
Excess Return	1.3%	0.8%	0.9%	1.0%
Annualized Standard Deviation of Composite	3.9%	7.7%	7.3%	13.7%
Annualized Standard Deviation of Policy Benchmark*	4.3%	8.2%	7.6%	14.2%
Beta to Policy Benchmark*	0.90	0.94	0.96	0.96
Beta to MSCI World Index	0.71	0.71	0.73	0.82

\*The Public Risk Assets Policy Benchmark is composed as follows: 47.5% Russell 3000 Index, 27.5% MSCI ACWI ex-USA Index, 25.0% Barclays U.S. Intermediate Credit Index.

\*\* The Public Risk Assets Strategic Benchmark changes monthly based on the actual asset allocation at the end of the previous month. It was established more recently so a ten-year return is not available.

The table indicates that the Systems have taken slightly less risk relative to the policy benchmark (as measured by standard deviation) while achieving higher returns over the longer-term time periods, thereby indicating strong risk-adjusted performance. Additionally, the Systems' portfolios have a beta of less than 1.0 relative to the policy benchmark, indicating less market risk.

## U.S. Public Equity Program Summary

As of June 30, 2017, the U.S. Public Equity assets had a market value of approximately \$12.3 billion, representing 29.7% of total assets.

### Investment Program Description

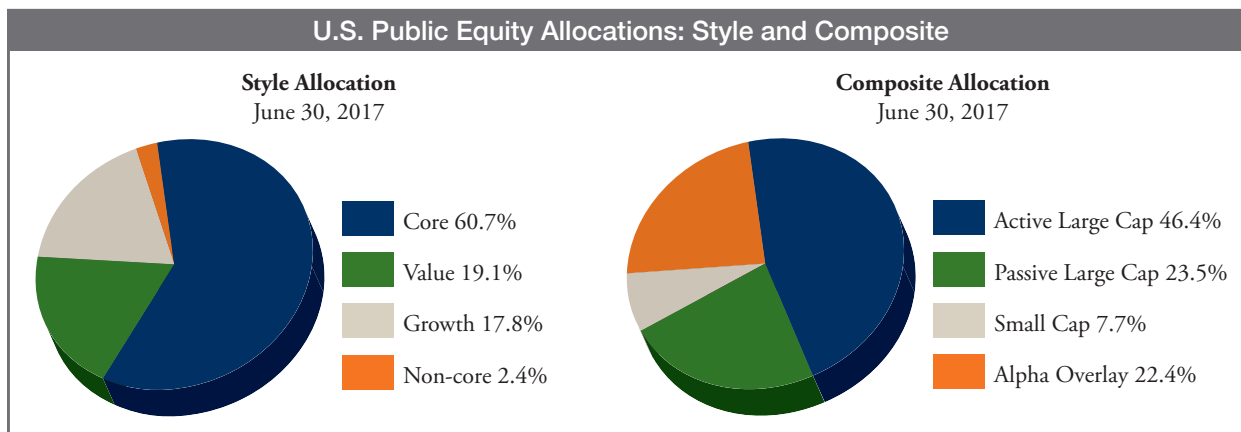
U.S. Public Equity is comprised of the Large-Cap, Small-Cap and Alpha Overlay programs which seek to provide long-term capital appreciation and dividend income in excess of inflation through the investment in domestic equity securities. Returns above a purely passive investment benchmark are targeted through the use of a wide variety of active investment strategies that may employ exposure to both equity securities and other types of investments. The primary *beta* exposure is achieved through investments in passive investment vehicles (including derivatives), traditional long-only active domestic equity management, and active long/short approaches. *Alpha* (or, excess returns above a passive alternative) is expected to be achieved through traditional long-only active domestic equity management, active long/short approaches and alpha overlay strategies (described in greater detail at the end of this section).

### Structure

As of June 30, 2017, 23.5% of the U.S. Public Equity composite was passively managed. The remainder of the portfolio was actively managed and diversified across a broad array of capitalization ranges and investment styles, including the Small-Cap and the Alpha Overlay program. Both programs represent multi-manager pools of assets managed within the overall U.S. Public Equity structure. The Small-Cap program encompasses all small capitalization assets. The Alpha Overlay composite focuses on the separation of returns into alpha and beta, and encompasses alternative equity mandates including hedge fund portfolios.

Exposure to the various segments of the domestic equity market (i.e., growth-oriented, value-oriented, and core) and to the approved investment strategy types are achieved through the identification, selection and on-going management of SEC-registered investment advisors qualified to serve as fiduciaries to the Systems.

The pie charts below depict the U.S. Public Equity portfolio by presenting the current style structure of the portfolio as well as the allocation by composite and market sector.



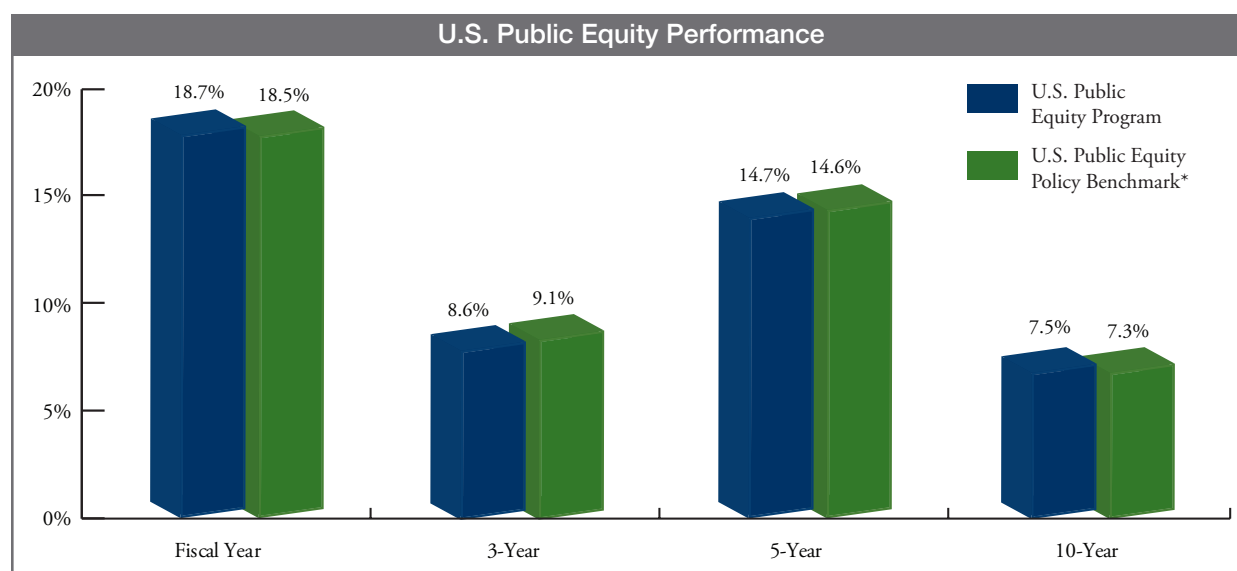
## Market Overview

The U.S. stock markets had a very strong year across both market capitalization and styles. The comprehensive measure of the U.S. stock market (Russell 3000 Index) increased 18.5% while small-cap stocks (Russell 2000 Index) increased 24.6% for the year. Large-cap growth stocks (Russell 1000 Growth Index) outperformed large-cap value stocks (Russell 1000 Value Index) with a return of 20.4% compared to 15.5% while small-cap growth stocks (Russell 2000 Growth Index) slightly underperformed small cap value stocks (Russell 2000 Value Index) with a return of 24.4% compared to 24.9%.

## Performance

The total return for the U.S. Public Equity program was 18.7% compared to the benchmark return of 18.5% for the fiscal year ended June 30, 2017. Within the U.S. Public Equity program, the Large-Cap pool returned 17.7%, Alpha Overlay returned 20.5% and the Small-Cap program returned 22.4% for the year.

As indicated in the table and graph, the U.S. Public Equity portfolio has produced strong returns for all reported time periods. Over longer periods of time, the Systems' U.S. Public Equity portfolio is designed to deliver approximately 50-100 basis points of excess return through a combination of active and passive investment strategies.



Portfolio Characteristics	Fiscal Year	3-Year	5-Year	10-Year
U.S. Public Equity Return	18.7%	8.6%	14.7%	7.5%
Annualized Policy Benchmark Return*	18.5%	9.1%	14.6%	7.3%
Excess Return	0.2%	-0.5%	0.1%	0.2%

\*The U.S. Public Equity Policy Benchmark is the Russell 3000 Index.

## Statistics

The following table displays the statistical characteristics of the Systems' U.S. Public Equity program as of June 30, 2017 with comparisons shown to the portfolio's policy benchmark. In addition, the top ten U.S. stock holdings as of June 30, 2017 are shown in the table below the characteristics.

U.S. Public Equity Characteristics		
Characteristics	June 30, 2017 Combined Systems*	June 30, 2017 Russell 3000 Index
Number of Securities	1,889	3,000
Dividend Yield	1.8%	1.9%
Price-to-Earnings Ratio	19.2	22.2
Avg Market Capitalization	\$ 118.8 bil	\$140.2 bil
Price-to-Book Ratio	3.2	3.0

\* Includes only actively managed separate accounts.

A complete list of portfolio holdings is available upon request.

U.S. Public Equity - Top 10 Holdings		
Top 10 Largest Holdings* June 30, 2017	Fair Value	% of Total U.S. Public Equity
Johnson & Johnson	\$ 112,386,573	0.9%
Alphabet, Inc.	90,797,772	0.7%
Amazon.com, Inc.	79,555,080	0.7%
JPMorgan Chase & Co.	78,271,213	0.6%
Merck & Co.	73,955,630	0.6%
PepsiCo, Inc.	72,053,518	0.6%
Bank of America Corp.	71,687,475	0.6%
Facebook, Inc.	68,051,215	0.6%
Wal-mart Stores, Inc.	65,684,564	0.5%
Apple, Inc.	62,958,199	0.5%
<b>TOTAL</b>	<b>\$ 775,401,239</b>	<b>6.3%</b>

## Investment Advisors

As of June 30, 2017, the Systems had contracts with 13 external investment advisors who managed 20 portfolios that comprised 77.5% of the U.S. Public Equity portfolio. The remaining 22.5% of the portfolio was in the Alpha Overlay program described in the next section. The Systems repositioned the Small-Cap program during the fiscal year by terminating four portfolios and adding a new passive Russell 2000 mandate with Blackrock.

U.S. Public Equity Investment Advisors			
Investment Advisor	Investment Style	Fair Value* As of June 30, 2017	% of Total Fair Value
Analytic Investors	Structured Large Cap Value	\$ 265,938,547	0.6%
Analytic Investors	U.S. Low Volatility Equity	1,303,549,214	3.1%
AQR Capital Management	Large Cap 140/40 Core	744,060,895	1.8%
Aronson + Johnson + Ortiz	Active Large Cap 130/30 Value	426,046,072	1.0%
Aronson + Johnson + Ortiz	Active Large Cap Value	574,533,515	1.4%
Blackrock	Passive Russell 1000 Index	2,784,858,601	6.7%
Blackrock	Passive Russell 1000 Growth Index	110,561,201	0.3%
Columbia Management	Active Large Cap Growth	351,701,879	0.9%
Lazard Asset Management	Active US Equity Concentrated	342,822,444	0.8%
Martingale Asset Management	Active Large Cap 130/30 Growth	441,754,473	1.1%
Westwood Management	Active Large Cap Value	473,283,878	1.1%
Westwood Management	Master Limited Partnerships	228,179,404	0.6%
Zevenbergen Capital	Active All Cap Growth	577,736,053	1.4%
<b>Large-Cap Subtotal</b>		<b>8,625,026,176</b>	<b>20.8%</b>
Allianz	Active Micro Cap Growth	113,873,894	0.3%
Allianz	Active Ultra Micro Cap Growth	37,607,612	0.1%
AQR Capital Management	Active Small Cap Value	162,394,025	0.4%
Blackrock	Passive Russell 2000 Index	305,438,438	0.7%
Chartwell Investment Partners	Active Small Cap Value	89,017,243	0.2%
Columbus Circle	Active Small Cap Growth	74,325,509	0.2%
RBC Global Asset Management	Active Small Cap Core	162,226,631	0.4%
<b>Small-Cap Subtotal</b>		<b>944,883,352</b>	<b>2.3%</b>
<b>Total</b>		<b>\$ 9,569,909,528</b>	<b>23.1%</b>

\*Includes manager cash.

## Alpha Overlay Program Summary

As of June 30, 2017, the Alpha Overlay allocation had a market value of approximately \$2.8 billion, representing 6.6% of total assets.

### Investment Program Description

The Alpha Overlay portfolio resides within the U.S. Large-Cap Equity program. The Alpha Overlay portfolio has been constructed to assist in meeting the long-term goals established for the overall U.S. Large-Cap Equity allocation. Specifically, Alpha Overlay provides broad exposure to large-cap U.S. stocks using S&P 500 total return swaps, while the returns of a select portfolio of hedge fund strategies provides the opportunity to earn excess returns above the passive S&P 500 Index. By combining the market exposure obtained through the S&P 500 total return swaps with the diversified exposures to investment strategies focused on alpha generation, the combined portfolio is constructed and managed to produce a return stream with volatility and beta characteristics similar to the passive S&P 500 Index, while generating excess returns (or alpha) of approximately 200-250 basis points over longer periods of time.

### Structure

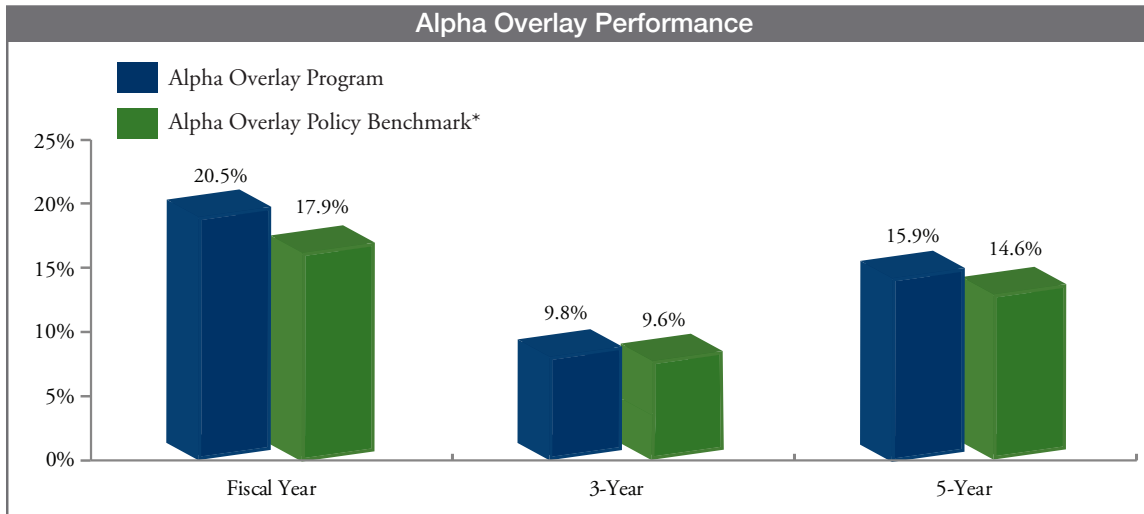
As of June 30, 2017, 27.0% of the Alpha Overlay composite assets were passively managed by NISA Investment Advisors using S&P 500 total return swaps to attain equitization. An additional 68.9% of the portfolio was actively managed across a diversified range of multi-strategy and market neutral hedge fund mandates. The remaining 4.1% of the portfolio was actively managed by Zevenbergen Capital in a long-only mandate. The chart below displays the specific investment advisor exposure within the composite as of June 30, 2017.

Alpha Overlay Investment Advisors				
Investment Advisor	Investment Style	Fair Value*	As of June 30, 2017	% of Total Fair Value
Analytic Investors	Relative Value	\$	31,855,512	0.1%
AQR Absolute Return Fund	Relative Value		165,566,347	0.4%
Bridgewater Pure Alpha II	Asset Allocation/Global Macro		320,474,650	0.8%
Carlson Black Diamond	Relative Value		258,174,852	0.6%
Davidson Kempner Institutional Partners	Event Driven		255,681,731	0.6%
HBK Capital Management	Relative Value		140,088,453	0.3%
NISA Investment Advisors	S&P 500 Exposure		748,242,414	1.8%
Och-Ziff Domestic Partners	Multi-Strategy		117,869,239	0.3%
Pershing Square	Activist Equity		66,430,073	0.1%
Renaissance Institutional Equities Fund	Low Volatility Equity		297,901,064	0.7%
Stark Investments Limited Partners	Equity Long/Short		2,042,244	0.0%
UBS O'Connor Multi-Strategy Alpha	Relative Value		233,502,668	0.6%
York Capital Management	Event Driven		19,342,428	0.0%
Zevenbergen Capital	Active All-Cap Growth		113,699,587	0.3%
<b>Total</b>			<b>\$ 2,770,871,262</b>	<b>6.6%</b>

\* Includes manager cash.

## Performance

The fiscal year 2017 return for the Alpha Overlay program was 20.5% exceeding the benchmark return of 17.9% by 260 basis points. As shown in the table and graph below, the Alpha Overlay composite has produced significant absolute and relative returns over the last five years while maintaining a risk profile (standard deviation and beta) lower than the benchmark.



Alpha Overlay Statistical Performance			
Portfolio Characteristics	Fiscal Year	3-Year	5-Year
Annualized Alpha Overlay Return	20.5%	9.8%	15.9%
Annualized Policy Benchmark Return*	17.9%	9.6%	14.6%
Excess Return	2.6%	0.2%	1.3%
Annualized Standard Deviation of Composite	4.7%	9.0%	8.9%
Annualized Standard Deviation of Policy Benchmark*	6.1%	10.4%	9.6%
Beta to Benchmark*	0.72	0.84	0.90

\*The Alpha Overlay Policy Benchmark is the S&P 500 Index.

The Alpha Overlay Program was established in January 2008, so ten-year returns are not available.



## Non-U.S. Public Equity Program Summary

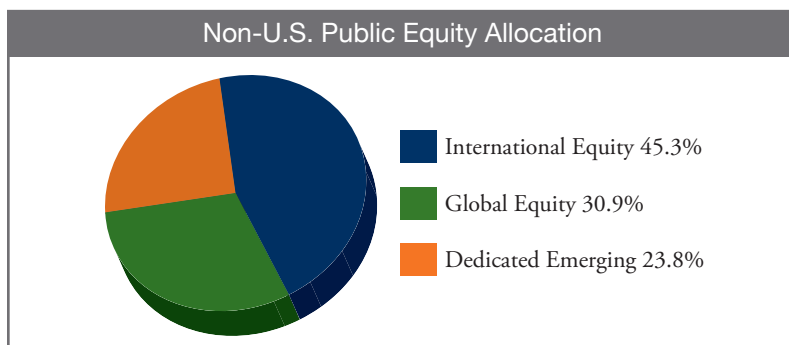
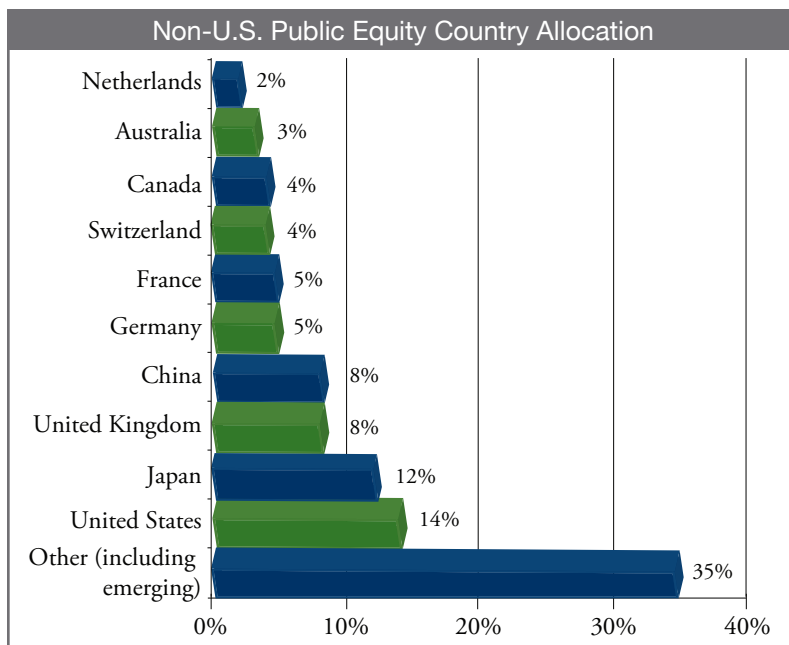
As of June 30, 2017, the Non-U.S. Public Equity assets had a market value of approximately \$7.1 billion, representing 17.2% of total assets.

### Investment Program Description

The Non-U.S. Public Equity program provides long-term capital appreciation and dividend income in excess of inflation through exposure to public equity securities on a global basis. Specific investment strategies approved for the Non-U.S. Public Equity program include passive investment vehicles, traditional long-only active equity management and active long/short approaches. Exposure to the various segments of the global equity market (i.e., U.S., developed non-U.S., emerging, growth-oriented, value-oriented, and core) and to the approved investment strategy types are achieved through the identification, selection and on-going management of SEC-registered investment advisors qualified to serve as fiduciaries to the Systems. The Non-U.S. Public Equity portfolios provide an element of diversification relative to the domestic equity portfolios. Currency is an aspect of international investing that can impact the performance and volatility of the asset class over the short-term. However, over the long-term, the effect from currency is expected to be neutral.

### Structure

As of June 30, 2017, 10.4% of the Non-U.S. Public Equity composite was passively managed. The remainder of the portfolio was actively managed and diversified across capitalization ranges, styles and a number of developed and emerging market countries. The bar graph displays the specific country exposure within the composite while the pie chart indicates broader exposure by investment mandate.

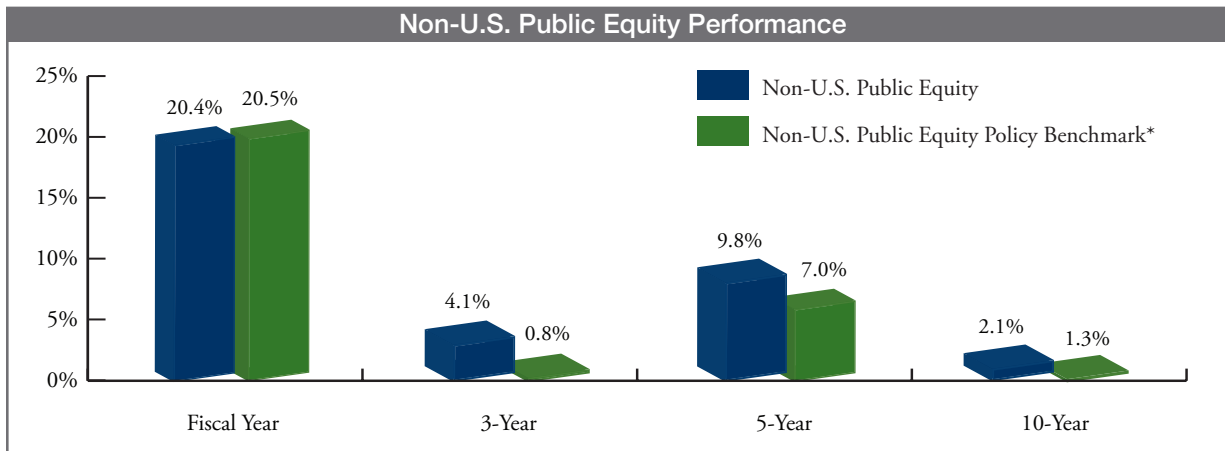


**Market Overview**

Stock markets throughout the world increased substantially in fiscal year 2017 as result of strong economic growth, stable energy prices and accommodative monetary policies across the globe. The broad measure for developed international markets (MSCI EAFE Index) increased 20.3%, emerging markets (MSCI EM Index) increased 23.8% and global stocks (MSCI World) increased 18.2%.

**Performance**

The total return for the Non-U.S. Public Equity program was 20.4% compared to the benchmark return of 20.5% for the fiscal year ended June 30, 2017. As shown in the table and graph below, the Systems’ Non-U.S. Public Equity composite returns substantially outperformed the benchmark over the three- and five-year time periods. Over long periods of time, the Systems’ Non-U.S. Public Equity program is designed to deliver approximately 100-150 basis points of excess returns through a combination of active and passive investment strategies. The ten-year excess returns are indicative of this expectation.



Portfolio Characteristics	Fiscal Year	3-Year	5-Year	10-Year
Annualized Non-U.S. Public Equity Return	20.4%	4.1%	9.8%	2.1%
Annualized Policy Benchmark Return*	20.5%	0.8%	7.0%	1.3%
Excess Return	-0.1%	3.3%	2.8%	0.8%

\*The Non-U.S. Public Equity Benchmark is the MSCI ACWI ex-USA Index.

## Statistics

The following table displays the top ten global stock holdings as of June 30, 2017.

Non-U.S. Public Equity - Top 10 Holdings		
Top 10 Largest Holdings* June 30, 2017	Fair Value	% of Total Non-U.S. Public Equity
Nestle SA	\$ 62,616,648	0.9%
Roche Holding AG	56,132,213	0.8%
ING	44,809,337	0.6%
Bayer AG	42,859,958	0.6%
Hoya Corp.	39,770,926	0.6%
AIA Group Ltd.	39,096,619	0.5%
Samsung Electronics Ltd.	37,414,144	0.5%
Compass Group	35,017,281	0.5%
Canadian National Railway Co.	34,148,441	0.5%
Taiwan Semiconductor Ltd.	33,010,176	0.5%
<b>Total</b>	<b>\$ 424,875,743</b>	<b>6.0%</b>

\* Includes only actively managed separate accounts.

A complete list of portfolio holdings is available upon request.

## Investment Advisors

As of June 30, 2017, the Systems had contracts with 13 external investment advisors who managed 16 portfolios within the Non-U.S. Public Equity portfolio. In fiscal year 2017, a NISA ACWI swaps portfolio was terminated while two new investment portfolios were added: an active international low volatility mandate managed by Aronson + Johnson + Ortiz and an active international low volatility mandate managed by Invesco.

Non-U.S. Public Equity Investment Advisors			
Investment Advisor	Investment Style	Fair Value* As of June 30, 2017	% of Total Fair Value
Acadian Asset Management	Active Emerging Markets	\$ 479,285,753	1.1%
Aronson + Johnson + Ortiz	Active Intl Low Volatility	103,990,493	0.2%
AllianceBernstein Institutional Mgmt.	Active Intl Value	454,480,094	1.1%
Analytic Investors	Active Global	749,542,508	1.8%
AQR Capital Management	Active Intl Core	745,697,004	1.8%
Arrowstreet Capital	Active Emerging Markets	236,724,862	0.6%
Arrowstreet Capital	Active Global	648,844,262	1.6%
Arrowstreet Capital	Global Long/Short	832,677,288	2.0%
Blackrock	Passive Intl Core	742,870,205	1.8%
Coronation Asset Management Limited	Active Emerging Markets	287,572,240	0.7%
Invesco	Active Intl Low Volatility	106,171,981	0.3%
MFS Investment Management	Active Intl Core	866,270,097	2.1%
MFS Investment Management	Active Intl Concentrated Core	217,313,340	0.5%
Neon Capital Management	Active Emerging Markets	120,653,440	0.3%
NISA Investment Advisors	Currency Hedge	(22,449,448)	-0.1%
Rock Creek Group	Active Emerging Markets	574,138,690	1.4%
Transition accounts	Transition accounts	174,584	0.0%
<b>Total</b>		<b>\$ 7,143,957,392</b>	<b>17.2%</b>

\* Includes manager cash.

## Public Credit Program Summary

As of June 30, 2017, the Public Credit assets had a market value of approximately \$2.9 billion, representing 6.9% of total assets.

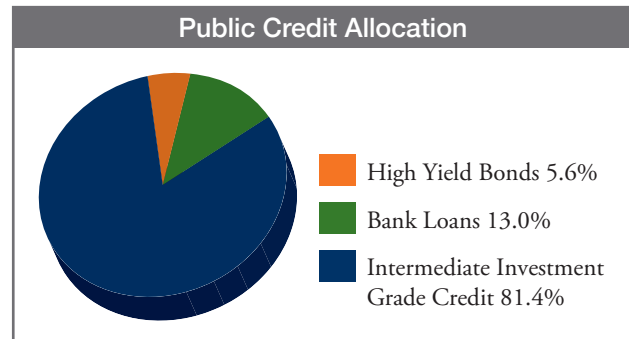
### Investment Program Description

The Public Credit Program is designed to provide a source of income and capital appreciation for the Systems while creating substantial diversification to the total plan with a low correlation to other asset classes. Most securities in this program exhibit high liquidity. Specific investments can include investment grade corporate securities, below investment grade debt instruments, distressed debt securities, convertible bonds, bank loans, agencies, mortgage-backed securities, asset-backed securities, and interest rate sensitive securities (including those issued or guaranteed by the United States government or its agencies). Investments in this program may include debt of both U.S. and non-U.S. issuers.

The performance objective for the Public Credit program is to exceed the returns of the investment grade credit markets through the use of a wide variety of active management approaches while incurring a level of risk that is generally consistent with the policy benchmark.

### Structure

As of June 30, 2017, the Public Credit composite was actively managed and diversified across high quality corporate bonds, bank loans and high yield bonds. The Systems' internal staff has built a diversified Public Credit portfolio with a base of high quality, shorter duration corporate bonds. The following pie chart presents the strategy allocation of the Systems' Public Credit assets as of June 30, 2017.

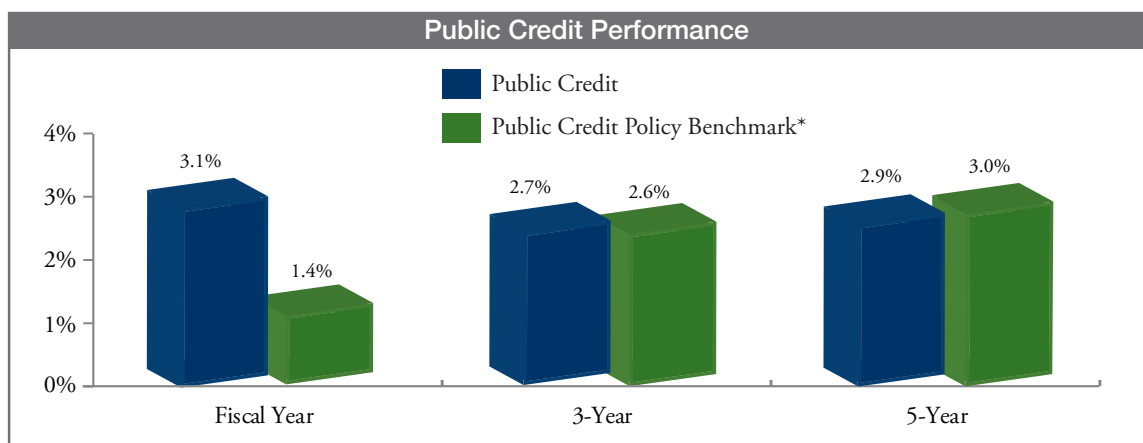


### Market Overview

High yield bonds strongly outperformed treasuries and investment grade credit during the year as the yield on the 10-year Treasury increased to 2.3% on June 30, 2017 from 1.5% on June 30, 2016. Investment grade credit corporate bonds (Barclays U.S. Intermediate Credit Index) increased 1.4% for the year while a broader measure of the U.S. bond market (Barclays U.S. Aggregate Index) decreased 0.3%. High yield, or lower quality bonds (Merrill Lynch High Yield Master II Index), increased 12.8% for the year and global bonds (Barclays Global Agg. Ex-US Index) decreased 3.8%.

### Performance

The Public Credit program produced solid absolute and relative returns for fiscal year 2017. The fiscal year return of 3.1% exceeded the benchmark return of 1.4% by 170 basis points. Over long periods of time, the Systems' Public Credit program is designed to deliver approximately 30-70 basis points of excess return through a combination of active and passive strategies. See charts on the following page.



**Public Credit Statistical Performance**

Portfolio Characteristics	Fiscal Year	3-Year	5-Year
Annualized Public Credit Return	3.1%	2.7%	2.9%
Annualized Policy Benchmark Return*	1.4%	2.6%	3.0%
Excess Return	1.7%	0.1%	-0.1%

\*The Public Credit Policy Benchmark is the Barclays U.S. Intermediate Credit Index.

The Public Credit Program was established in December 2008, so ten-year returns are not available.

## Statistics

The following table displays the top ten Public Credit holdings as of June 30, 2017.

**Public Credit - Top 10 Holdings**

Top 10 Largest Holdings* June 30, 2017	Fair Value	% of Total Public Credit
Goldman Sachs Group, 2.91%, 6/05/2023	\$ 99,641,230	3.5%
J.P. Morgan Chase & Co., 3.22%, 03/01/2025	97,032,000	3.4%
AT&T, Inc., 0.00%, 11/27/2022	61,452,130	2.1%
Great Plains Energy, Inc., 3.9%, 04/01/2027	51,828,861	1.8%
Capital One Financial Corp., 2.5%, 05/12/2020	50,216,500	1.7%
Citigroup, Inc., 3.89%, 01/10/2028	49,750,223	1.7%
Transcontinental Gas Pipe Line Co., 7.85%, 02/01/2026	48,954,514	1.7%
Bank of America Corp., 2.88%, 04/24/2023	47,445,612	1.6%
Shire Acquisitions Investments, 2.88%, 9/23/2023	45,355,939	1.6%
Morgan Stanley, 1.98%, 02/14/2020	45,184,500	1.6%
<b>Total</b>	<b>\$ 596,861,509</b>	<b>20.7%</b>

\*Includes only actively managed separate accounts.

A complete list of portfolio holdings is available upon request.

## Investment Advisors

As of June 30, 2017, the Systems had contracts with three external investment advisors who managed three portfolios in the Public Credit program.

**Public Credit Investment Advisors**

Investment Advisor	Investment Style	Fair Value* As of June 30, 2017	% of Total Fair Value
NISA Investment Advisors	Corporate Credit	\$ 2,342,086,702	5.6%
Oaktree Bank Loans	Senior Bank Loans	374,789,459	0.9%
Pacific Investment Management Co.	High Yield	161,633,902	0.4%
<b>Total</b>		<b>\$ 2,878,510,063</b>	<b>6.9%</b>

\*Includes manager cash.

## Hedged Assets Program Summary

As of June 30, 2017, the Hedged Assets portfolio had a market value of approximately \$5.0 billion, representing 12.1% of total assets.

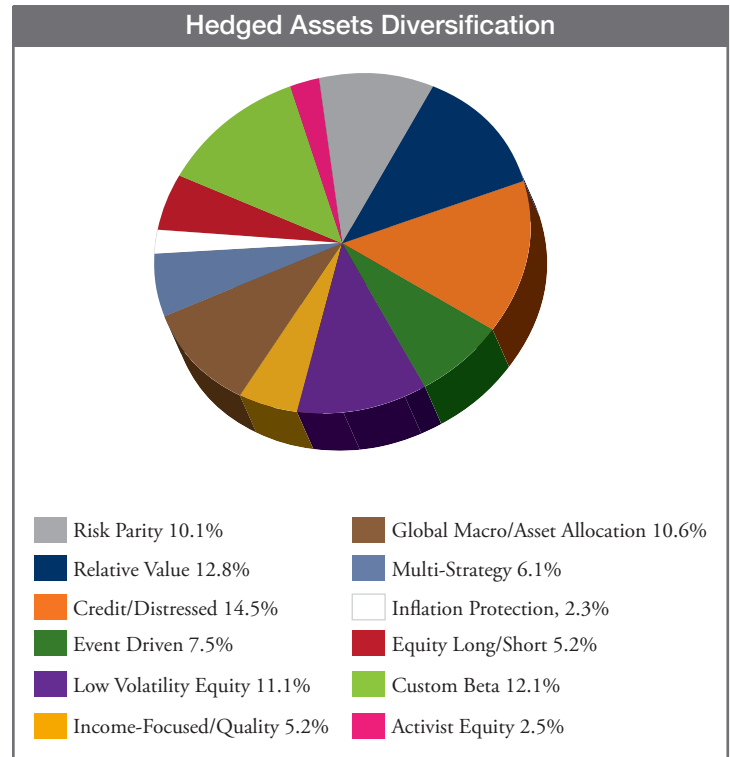
### Investment Program Description

The Hedged Assets program’s objective is to provide diversification to the total portfolio and reduce volatility within the Public Risk composite. The purpose of this program is to enhance the overall risk/return profile of the Public Risk composite through the inclusion of specialized investment strategies that typically generate returns in a different fashion (i.e., absent a high correlation to equities or bonds). These strategies may utilize leverage as allowed within their governing documents. The returns from these strategies have historically had a low-to-moderate correlation with the traditional equity markets, thus providing diversification benefits in addition to portfolio return enhancement. These strategies seek to control risks and maintain a focus on absolute returns. The inherent nature of these vehicles to serve as a “hedge” provides for the expectation that the program will lag the equity market during times when equities are performing above the long-term averages. However, when equities are performing below the long-term averages, the program would be expected to outperform the equity market. In addition, managers within this asset class have historically possessed significantly lower volatility relative to traditional equity managers.

### Structure

The Systems have retained Albourne America, LLC (Albourne) as its hedged asset consultant. Albourne is an independent global advisory firm with a significant focus on hedge funds. The Systems utilize direct investments into hedge funds as opposed to incorporating fund-of-funds. The Systems’ internal staff believes the benefits of direct investments, including lower fees, customized portfolio exposures, direct access to manager knowledge, and higher levels of transparency outweighed the benefit of quicker implementation offered by fund-of-funds.

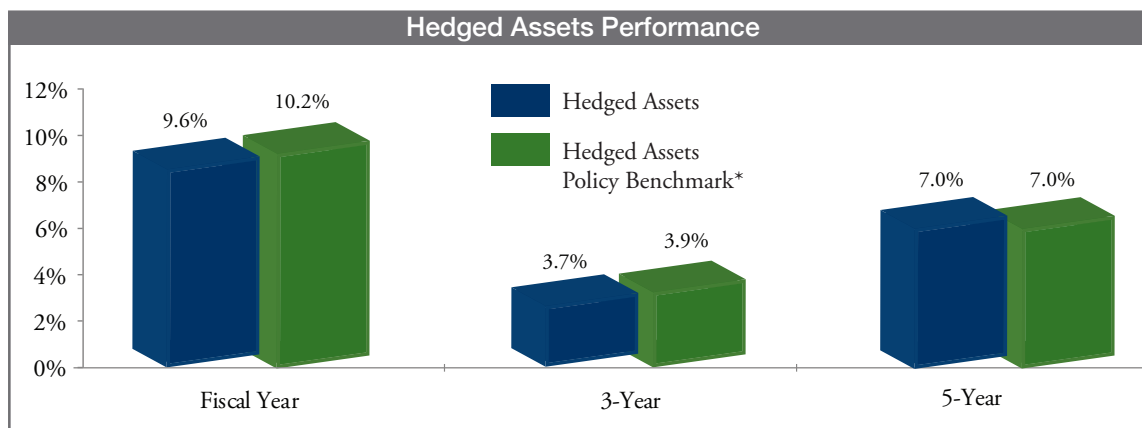
The following chart indicates the strategy diversification of the Hedged Assets program as of June 30, 2017. The Systems manage the Hedged Assets portfolio to a blended benchmark of 25% Russell 3000 Index, 25% MSCI ACWI ex-USA Index, and 50% Barclays U.S. Intermediate Credit Index.



### Performance

The total annualized return on the Systems’ Hedged Assets portfolio was 9.6%, compared to the benchmark return of 10.2% for the fiscal year ended June 30, 2017.

Over the past five years, the Hedged Assets program has performed equal to its policy benchmark of 7.0%. The performance relative to the policy benchmark is particularly significant given the strong performance of equities over the past five years. The Russell 3000 Index was up an annualized 14.6% over the past five years and the MSCI ACWI Index was up an annualized 10.5%. As discussed previously, the hedging characteristics of the Hedged Assets program provide for the expectation that its performance will lag equity markets and/or its policy benchmark during periods of higher-than-normal equity returns. The Hedged Assets program is expected to outperform in more normal and down markets. As the table indicates, the longer-term performance was accomplished by assuming less than one-half of the volatility of the world stock index and achieving a beta of approximately 0.40 to the index, signifying that the Systems’ portfolio moves up or down less than half as much as the world stock index.



### Hedged Assets Statistical Performance

Portfolio Characteristics	Fiscal Year	3-Year	5-Year
Annualized Hedged Assets Return	9.6%	3.7%	7.0%
Annualized Policy Benchmark Return*	10.2%	3.9%	7.0%
Annualized S&P 500 Return	17.9%	9.6%	14.6%
Annualized MSCI ACWI Index	18.8%	4.8%	10.5%
Annualized Standard Deviation of Composite	2.0%	4.0%	4.5%
Annualized Standard Deviation of Policy Benchmark*	3.4%	5.9%	5.5%
Annualized Standard Deviation of S&P 500	6.1%	10.4%	9.6%
Annualized Standard Deviation of MSCI ACWI Index	5.3%	10.8%	10.0%
Beta to Policy Benchmark*	0.23	0.57	0.70
Beta to S&P 500	0.12	0.29	0.35
Beta to MSCI ACWI Index	0.15	0.30	0.37

\*The Hedged Assets Policy Benchmark is composed as follows: 50% Barclays U.S. Intermediate Credit Index, 25% MSCI ACWI ex-USA, 25% Russell 3000 Index.

The Hedged Assets Program was established in January 2008, so ten-year returns are not available.

## Investment Advisors

As of June 30, 2017, the Systems had contracts with 17 external investment advisors who managed 25 portfolios.

Hedged Assets Investment Advisors			
Investment Advisor	Investment Style	Fair Value*	% of Total
		As of June 30, 2017	Fair Value
AQR Absolute Return Fund	Relative Value	\$ 219,471,670	0.5%
AQR Diversified Beta Fund	Risk Parity	334,168,173	0.8%
AQR Real Asset Fund	Inflation Protection	44,284,149	0.1%
Bridgewater All Weather	Risk Parity	171,642,929	0.4%
Bridgewater Inflation Pool	Inflation Protection	69,360,037	0.2%
Bridgewater Pure Alpha II	Asset Allocation/Global Macro	522,879,676	1.3%
Bridgewater Pure Alpha Major Markets	Asset Allocation/Global Macro	6,222,612	0.0%
Carlson Black Diamond	Relative Value	172,116,568	0.4%
Davidson Kempner Institutional Partners	Event Driven	255,681,731	0.6%
Davidson Kempner Distressed Opportunities Fund	Distressed Debt/Credit	244,102,967	0.6%
GoldenTree Partners	Distressed Debt/Credit	482,735,063	1.2%
HBK Capital Management	Relative Value	93,392,302	0.2%
Indus Asia Pacific Fund	Equity Long/Short	109,589,266	0.3%
Maverick Fund USA	Equity Long/Short	149,191,893	0.4%
NISA Investment Advisors	Custom Beta	605,126,065	1.5%
Och-Ziff Domestic Partners	Multi-Strategy	156,245,270	0.4%
Och-Ziff Europe	Multi-Strategy	2,711,641	0.0%
Och-Ziff Asia	Multi-Strategy	147,505,391	0.3%
Owl Creek Overseas Fund	Event Driven	90,531,749	0.2%
Pershing Square	Activist Equity	123,370,135	0.3%
Renaissance Institutional Equities Fund	Low Volatility Equity	553,244,833	1.3%
Stark Investments Limited Partners	Equity Long/Short	3,792,739	0.0%
UBS O'Connor Multi-Strategy Alpha	Relative Value	155,668,445	0.4%
Westwood Management	Income Focused/Quality	259,645,969	0.6%
York Capital Management	Event Driven	29,013,642	0.1%
<b>Total</b>		<b>\$ 5,001,694,915</b>	<b>12.1%</b>

\*Includes manager cash.



## Safe Assets Summary

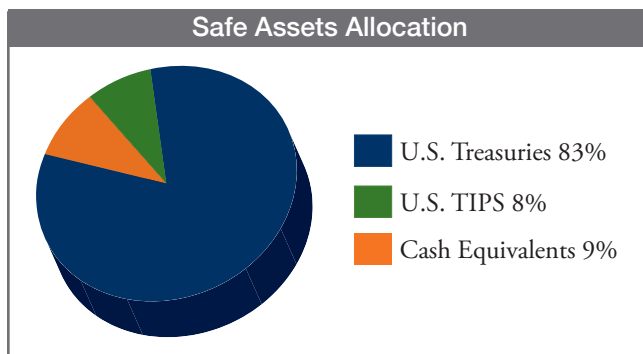
*As of June 30, 2017, the Safe Assets had a market value of approximately \$7.1 billion, representing 17.1% of total assets.*

### Investment Program Description

The Safe Assets program is intended to act as a source of safety and income for the Systems. The program is designed to create substantial diversification to the total portfolio and reduce volatility through low correlation to other asset classes. Specifically, the Safe Assets portfolio should provide asset protection at the total fund level in periods of economic stress.

### Structure

As of June 30, 2017, the Systems' entire Safe Assets program was managed by NISA Investment Advisors. The assets held within the program exhibit high liquidity and safety. The pie chart below depicts the Safe Assets Program by showing the sector and composite allocations as of June 30, 2017.



Internal staff continues to maintain a slight underweight to Safe Assets due in part to historically low yields and due to better expected risk/adjusted returns going forward within the Public Risk and Private Risk programs. The Systems' allocation to Safe Assets was 17.1% as of June, 30, 2017, as compared to the target weight of 20%.

### Market Overview

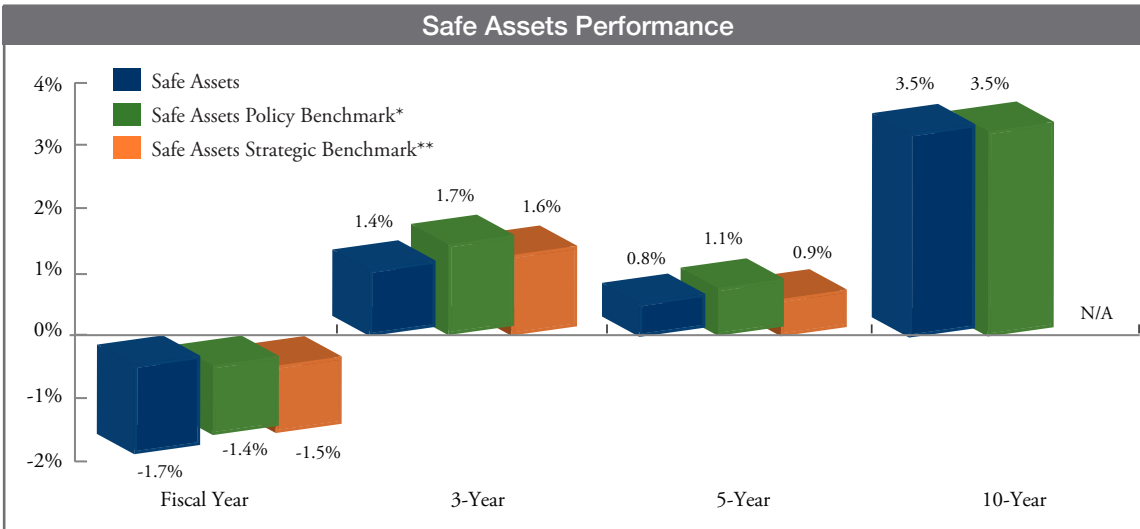
The yield on the 10-year Treasury increased to 2.3% on June 30, 2017 from 1.5% on June 30, 2016. The significant increase in interest rates throughout the year negatively impacted the price of bonds.

### Performance

The total return for Safe Assets portfolio was -1.7% for the fiscal year ended June 30, 2017. The portfolio underperformed the benchmark for the year by 30 basis points. For the three- and five-year time periods, the Systems' slightly underperformed the Safe Assets benchmark while the portfolio return was equal to benchmark for the ten-year time period.

The absolute return of the Safe Assets portfolio is relatively modest over longer time periods. However, the Safe Assets portfolio continues to provide asset protection at the total fund level in periods of economic stress and ultimate liquidity to the Systems. An allocation to Safe Assets allows the Systems to accept market risk in other portions of the total fund portfolio.

The Board of Trustees approved a new U.S. Treasuries benchmark effective January 1, 2017. The benchmark was modified from the Barclays U.S. Treasury Blended Index (a combination of 90% Barclays U.S. Treasury: Intermediate Index and 10% Barclays U.S. Treasury: Long Index) to the Barclays U.S. Treasury Index. The new Barclays Treasury Index is a better representation of the investable universe of U.S. Treasuries. The historical benchmark will reflect the Barclays U.S. Treasury Blended Index prior to 2017 with the Barclays U.S. Treasury Index returns being linked to this series following January 1, 2017.



**Safe Assets Statistical Performance**

Portfolio Characteristics	Fiscal Year	3-Year	5-Year	10-Year
Annualized Safe Assets Return	-1.7%	1.4%	0.8%	3.5%
Annualized Policy Benchmark Return*	-1.4%	1.7%	1.1%	3.5%
Annualized Strategic Benchmark Return**	-1.5%	1.6%	0.9%	N/A
Excess Return	-0.3%	-0.3%	-0.3%	0.0%
Annualized Standard Deviation of Composite	2.6%	2.8%	2.6%	3.3%
Annualized Standard Deviation of Policy Benchmark*	2.6%	2.9%	2.8%	3.4%
Beta to Policy Benchmark*	0.97	0.93	0.92	0.95
Beta to MSCI World Index	0.23	-0.06	-0.03	-0.02

\*The Safe Assets Policy Benchmark is composed as follows: 80.0% Barclays U.S. Treasury Index and 20.0% Barclays U.S. TIPS 1-10 Yrs. Index. Effective January 1, 2017, the Barclays U.S. Treasury Index component replaced the Barclays U.S. Treasury: Intermediate Index and Barclays U.S. Treasury: Long Index components.

\*\*The Safe Assets Strategic Benchmark changes monthly based on the actual asset allocation at the end of the previous month. It was established more recently so a ten-year return is not available.

The Systems have specifically taken less risk compared to the Policy benchmark due to the inclusion of the cash equivalents portfolio. Additionally, the Systems' portfolios have a beta slightly less than 1.0 relative to the Policy benchmark over all time periods, indicating less market volatility. Most importantly, the Safe Asset portfolio exhibits a beta of approximately zero relative to the world stock index (MSCI ACWI Index) over longer time periods, indicating no correlation to risk assets. These statistics support one of the primary objectives of Safe Assets: diversification from other risk assets in the total fund.

## Statistics

The following table displays the statistical characteristics of the Systems' Safe Assets Program as of June 30, 2017 with comparisons shown to the Barclays U.S. Treasury Index. Additionally, the top ten Safe Asset holdings as of June 30, 2017 are shown in the table below the characteristics.

Safe Assets Characteristics		
Characteristics	June 30, 2017 Combined Systems*	June 30, 2017 Barclays U.S. Treasury Index
Number of Securities	89	257
Average Coupon	1.6%	2.1%
Yield to Maturity	1.0%	1.9%
Average Maturity (Years)	6.6	7.6
Duration (Years)	4.9	6.2

Safe Assets - Top 10 Holdings		
Top 10 Largest Holdings* June 30, 2017	Fair Value	% of Total Safe Assets
United States Treasury Note, 1.25%, 04/30/2019	\$ 565,365,770	8.0%
United States Treasury Note, 0.75%, 08/31/2018	311,736,505	4.4%
United States Treasury Note, 2.50%, 05/15/2024	283,750,563	4.0%
United States Treasury Note, 0.875%, 03/31/2018	269,285,343	3.8%
United States Treasury Note, 1.125%, 07/31/2021	256,343,470	3.6%
United States Treasury Note, 3.50%, 05/15/2020	205,685,551	2.9%
United States Treasury Bond, 2.50%, 02/15/2045	194,020,596	2.8%
United States Treasury Note, 2.00%, 02/15/2025	185,772,653	2.6%
United States Treasury Note, 1.50%, 12/31/2018	182,468,733	2.6%
United States Treasury Note, 2.00%, 12/31/2021	179,256,723	2.5%
<b>TOTAL</b>	<b>\$ 2,633,685,907</b>	<b>37.2%</b>

\*Includes only actively managed separate accounts.

A complete list of portfolio holdings is available upon request.

## Investment Advisors

NISA Investment Advisors managed the Safe Assets program as of June 30, 2017. The following table lists the firm's management by investment style.

Safe Assets Investment Advisor			
Investment Advisor	Investment Style	Fair Value* As of June 30, 2017	% of Total Fair Value
NISA Investment Advisors	U.S. Treasuries	\$ 5,351,369,846	12.9%
NISA Investment Advisors	Cash Equivalents	861,503,557	2.1%
NISA Investment Advisors	U.S. TIPS	857,731,901	2.1%
<b>Total</b>		<b>\$ 7,070,605,304</b>	<b>17.1%</b>

\*Includes manager cash.

## Private Risk Assets Summary

*As of June 30, 2017, the Private Risk assets had a market value of approximately \$6.9 billion, representing 16.7% of total assets.*

### Investment Program Description

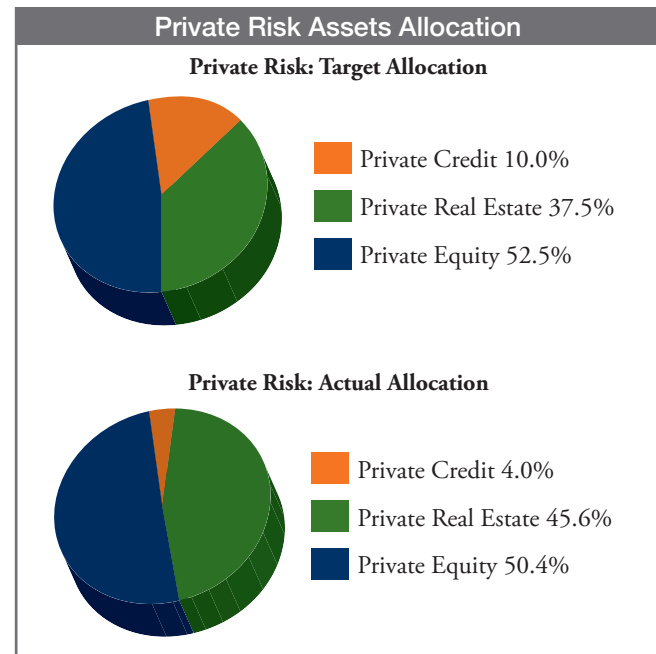
The allocation to Private Risk investments is viewed as a separate asset class for inclusion in the Systems' overall investment portfolios. The process of building the Systems' Private Risk program and fully funding the target allocation is expected to occur over a period of several years. Additional new investments will be necessary beyond the funding period in order to maintain the long-term target allocation. The three programs within the Private Risk Assets composite are Private Equity, Private Real Estate and Private Credit. Each program within the Private Risk allocation is a separate multi-manager composite that is treated generally as a single portfolio. Each program serves a specific and distinct role within the overall Private Risk Composite and also within the overall Total Plan allocation. Over time, the Private Risk Composite serves as a long-term vehicle to supply the underlying beta exposure to a portfolio of private assets.

Investments in Private Risk Assets differ substantially from the Systems' public markets asset classes (Public Risk Assets and Safe Assets) in part because they are typically very long-term in nature, not publicly traded, relatively illiquid, and offer the potential for substantially higher returns (along with a commensurate level of risk). The illiquid nature of Private Risk Assets can result from the form of the asset or security itself, or it can be a function of the investment structure being utilized (e.g., a limited partnership).

Due to the fact that Private Risk Assets are not publicly traded, pricing and performance measurements prior to realization of gains are less reliable than in the traditional publicly traded asset classes. The Systems continually monitor the valuation policies and procedures utilized for such investments.

### Structure

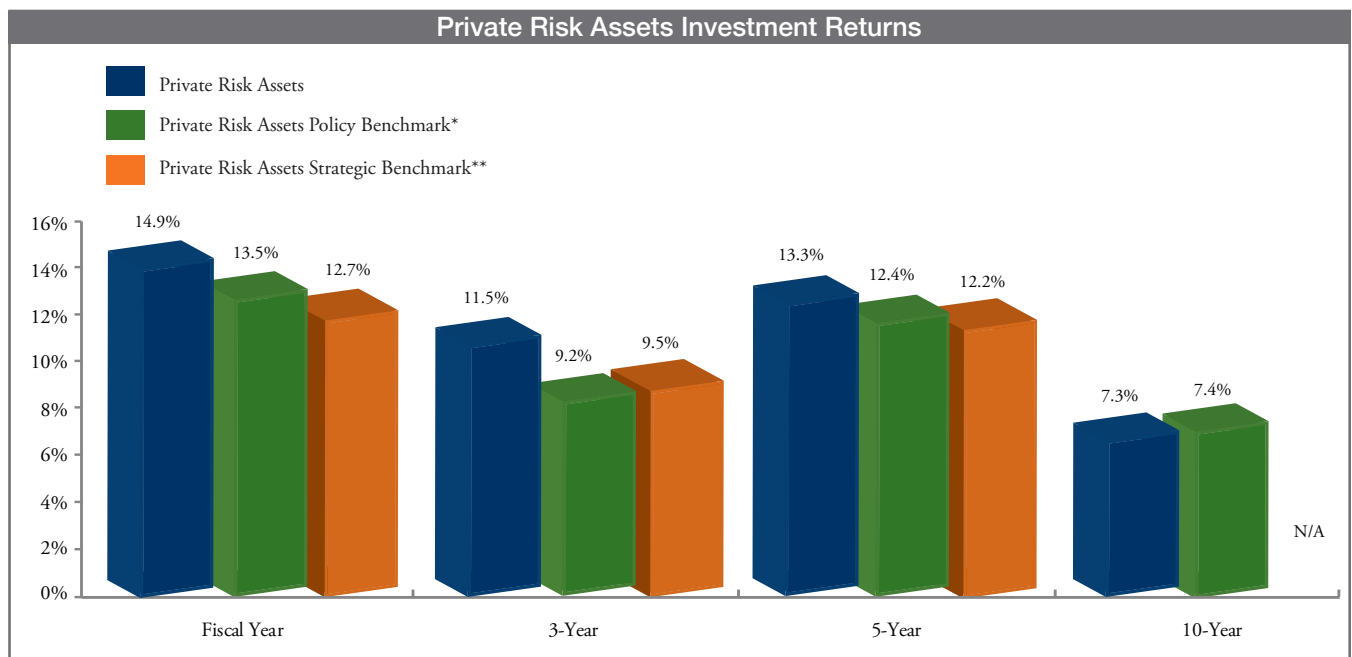
As of June 30, 2017, 50.4% of Private Risk assets were invested in the Private Equity program, 45.6% in the Private Real Estate program, and 4.0% in the Private Credit program. Each of these programs is discussed in more detail on the following pages.



## Performance

The total return for the Private Risk portfolio was 14.9%, compared to the policy benchmark return of 13.5% for the fiscal year ended June 30, 2017. For the three- and five-year time periods, the Systems also significantly outperformed the benchmark. The ten-year return was marginally below the benchmark due to the immaturity of the programs and the impacts of the financial crisis of 2008 and 2009.

The pricing and performance methodology utilized for private assets can provide for significant performance variances over short time periods. For instance, the Systems utilize a liquid benchmark (Russell 3000 Index) to measure an illiquid (private equity) asset class. Thus, there will be significant performance differences over short time periods in volatile markets. Due to the long term nature of Private Risk assets, the performance can be more appropriately judged over a longer timeframe. As the table below indicates, the Private Risk portfolios have produced excellent absolute returns over all time periods.



**Private Risk Assets Statistical Performance**

Portfolio Characteristics	Fiscal Year	3-Year	5-Year	10-Year
Annualized Private Risk Assets Return	14.9%	11.5%	13.3%	7.3%
Annualized Policy Benchmark Return*	13.5%	9.2%	12.4%	7.4%
Excess Return	1.4%	2.3%	0.9%	-0.1%
Annualized Strategic Benchmark Return**	12.7%	9.5%	12.2%	N/A

\* The Private Risk Assets Policy Benchmark is composed as follows: 52.5% Russell 3000 Index, 37.5% NFI-ODCE Index and 10.0% Merrill Lynch High Yield Master II Index.

\*\* The Private Risk Assets Strategic Benchmark changes monthly based on the actual asset allocation at the end of the previous month. It was established more recently so a 10-year return is not available.

## Private Equity Program Summary

*As of June 30, 2017, the Private Equity assets had a market value of approximately \$3.5 billion, representing 8.4% of total assets.*

### Investment Program Description

The Private Equity asset class is comprised of investment opportunities not typically included within the public equity and fixed income markets. Private Equity investments provide financing for start-up companies, private middle market companies, firms in financial distress and public and non-public firms seeking buyout financing. Private Equity investments can be classified into three basic sub-asset class categories:

- Venture Capital,
- Buyouts, and
- Debt-Related.

Investments in the sub-asset classes can be made in the U.S. or foreign countries. In total, the allocation to Non-U.S. Private Equity investments will not exceed 40.0% of the overall Private Equity target allocation. The risks associated with Private Equity will be viewed both in isolation and within the context of the entire fund.

In January 2014, the Board of Trustees approved the development and implementation of a Private Equity Co-Investment Program. The Co-Investment Program is expected to further advance the goals and objectives of the overall Private Equity Program by obtaining additional exposure to underlying portfolio company investments through direct equity investments made on a side-by-side basis with private equity funds where the Systems have an existing relationship. Co-investments serve to increase exposure to the Private Equity asset class with little or no additional fees and/or performance carry paid to the underlying private equity partnerships. The objective of the Co-Investment Program is to leverage existing, high-quality relationships with private equity managers in order to increase commitments to the asset class in a format that does not materially increase overall risk, while simultaneously helping to lower fees and performance carry.

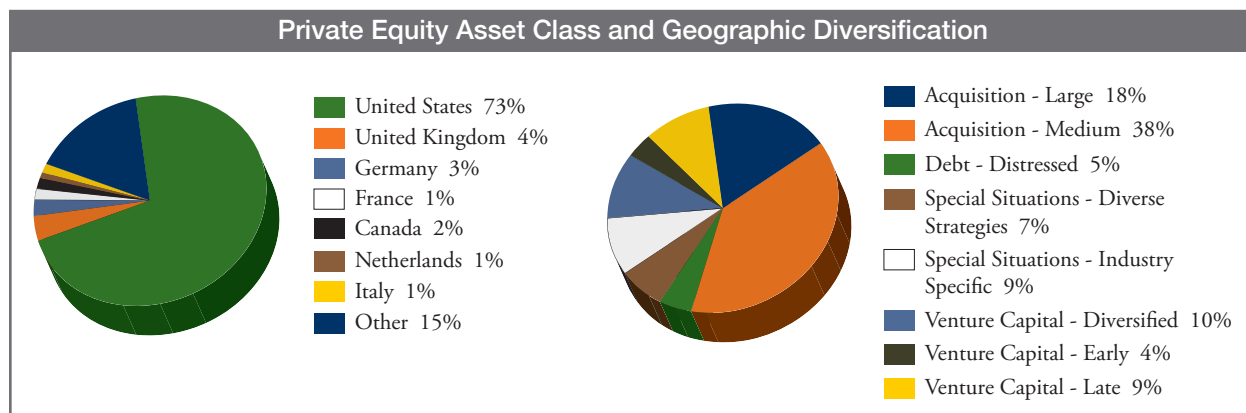
### Structure

As of June 30, 2017, Private Equity assets committed\* for investment were \$8.5 billion. The market value of funds that had been drawn down and actually invested as of June 30, 2017 was approximately \$3.5 billion, representing 8.4% of total assets. The Systems private equity investment commitments that have not yet been funded were approximately \$3.5 billion as of June 30, 2017.

The objective for the Systems' allocation to Private Equity is to achieve returns that are higher than those attainable in the public equity markets with the added benefit of diversification. The long-term target allocation to Private Equity is 12.0%. However, as of June 30, 2017, the actual allocation for the Systems was just 8.4% because the long-term and illiquid nature of the private equity asset class dictates that capital must be invested at a measured pace. In addition, private equity investments have made record distributions in recent years. Pathway Capital Management has been retained by the Systems to provide private equity investment management services through three structures; a discretionary fund-of-funds relationship, an advisory relationship and a co-investment program. Additionally, the Systems have invested in private equity secondary funds and also utilize Albourne America, LLC to provide private equity advisory services.

The pie charts on the following page show the diversification (utilizing the market value of the assets that have been invested) of the Systems' private equity holdings as of June 30, 2017 from both strategy and country perspectives.

*\* Committed capital reflects the total amount of capital that the Systems are legally obligated to supply to the partnerships and funds as the capital is needed to invest in underlying holdings. Market value reflects capital that has actually been drawn and invested by the partnerships and funds.*

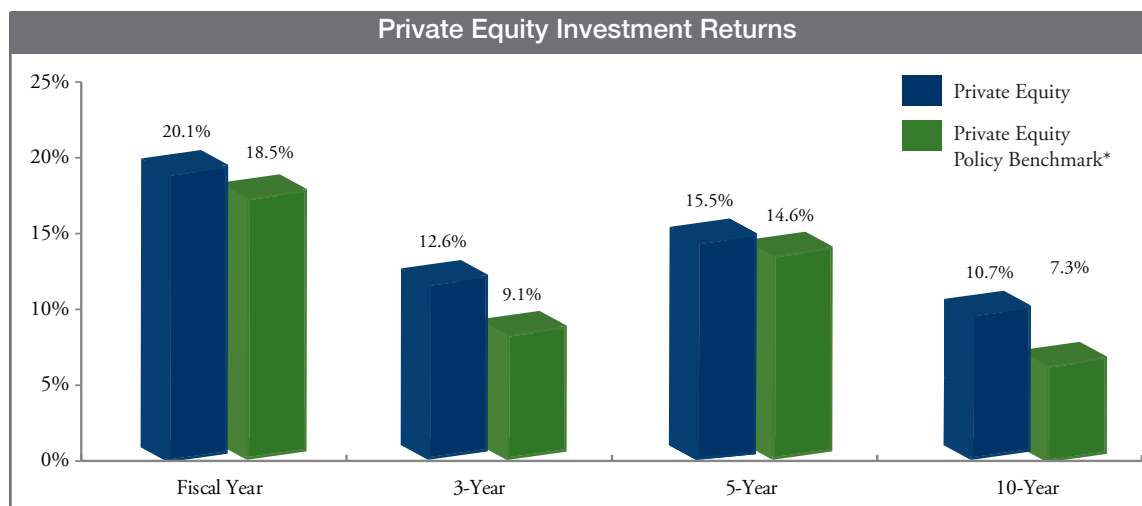


## Market Overview

The Private Equity Program continued to perform well in fiscal year 2017. Global IPO issuances and merger and acquisition activity for private equity companies was strong throughout the year. Private equity firms capitalized on the robust exist markets to sell their portfolio companies and return capital to limited partners.

## Performance

The total return for the Private Equity program was 20.1%, compared to the benchmark return of 18.5% for the fiscal year ended June 30, 2017. While short-term returns are not overly insightful for the Private Equity Program in comparison to its benchmark, the one-year return exceeded the benchmark by 160 basis points. The private equity benchmark utilizes a liquid public equity index (Russell 3000 Index) to measure an illiquid (private equity) asset class. As such, there could be significant performance differences over short time periods in volatile markets. Due to the long term nature of the asset class, the performance of a private equity portfolio can be more appropriately judged over a longer timeframe. As the table below indicates, the Private Equity portfolio has produced excellent absolute and relative returns over all time periods. The ten-year return exceeded the benchmark by 340 basis points. These excess returns are net of fees and expenses.



### Private Equity Statistical Performance

Portfolio Characteristics	Fiscal Year	3-Year	5-Year	10-Year
Annualized Private Equity Return	20.1%	12.6%	15.5%	10.7%
Annualized Policy Benchmark Return*	18.5%	9.1%	14.6%	7.3%
Excess Return	1.6%	3.5%	0.9%	3.4%

\*The Private Equity Policy Benchmark is the Russell 3000 Index.

## Investment Advisors

As of June 30, 2017, the Systems had committed to 112 separate partnerships with 47 firms within the Private Equity asset class. In fiscal year 2017, the Systems committed to 21 new partnerships for \$1.5 billion. Additionally, the Systems received total distributions from the private equity partnerships of approximately \$880 million in fiscal year 2017.

Private Equity Investment Advisors				
Investment Advisor	Investment Style	Fair Value*	As of June 30, 2017	% of Total Fair Value
Advent International GPE VII-B and VIII	Acquisition - Medium	\$	61,181,992	0.1%
Baring Asia VI	Acquisition - Medium		16,632,254	0.0%
BC European IX	Acquisition - Medium		35,900,374	0.1%
Blackstone Capital Partners V and VI	Acquisition - Large		30,440,452	0.1%
Canaan Partners IX and X	Venture Capital		38,843,011	0.1%
Carlyle Europe Partners III	Acquisition - Medium		7,047,301	0.0%
Carlyle Partners IV, V and VI	Acquisition - Large		40,910,837	0.1%
Centerbridge Capital Partners I, II and III	Acquisition & Debt		50,253,443	0.1%
Centerbridge Capital Special Credit Partners II and III	Debt - Distressed		23,875,059	0.1%
Coller International Partners VII	Secondary Fund		11,346,816	0.0%
CVC Capital Partners VI	Acquisition - Large		34,016,285	0.1%
CVC European Equity Partners IV and V	Acquisition - Large		12,819,096	0.0%
CVC European Equity Tandem Fund	Acquisition - Large		301,066	0.0%
Encap VIII Co-Investors, IX, Flatrock III and Energy fund X	Acquisition - Energy		69,346,939	0.2%
Exponent Partners II	Acquisition - Medium		6,167,574	0.0%
First Reserve Fund XI and XII	Acquisition - Energy		11,042,486	0.0%
Genstar Capital Partners V and VIII	Acquisition - Medium		2,981,267	0.0%
Glendon Opportunities Fund	Debt - Distressed		23,393,005	0.1%
GTCR Fund IX, XI and X	Acquisition - Medium		60,401,983	0.1%
Hellman & Friedman Capital Partners VI, VII and VIII	Acquisition - Large		55,024,979	0.1%
Insight Venture Partners IX	Acquisition - Technology		23,278,756	0.1%
Institutional Investment Partners XV	Venture Capital		11,254,482	0.0%
Kelso Investment Associates VIII	Acquisition - Medium		19,901,663	0.1%
KKR 2006 Fund	Acquisition - Large		16,981,744	0.0%
KRG Fund IV	Acquisition - Medium		7,629,646	0.0%
Lexington Capital Partners VI-B, VII and VIII	Secondary Fund		140,640,725	0.3%
Madison Dearborn VI and VII	Acquisition - Large		31,149,547	0.1%
Montagu III and IV	Acquisition - Medium		28,069,437	0.1%
Nordic VII and VIII	Acquisition - Medium		54,788,062	0.1%
New Enterprise Associates 14, 15, 16 and XIII	Venture Capital		145,361,714	0.4%
Oak Investment Partners XIII	Venture Capital		26,467,726	0.1%
OCM Principal Opportunities Fund IV, VII, VIIb and IX	Debt - Distressed		31,030,310	0.0%
Odyssey Investment Partners IV and V	Acquisition - Medium		24,931,201	0.1%
Onex Partners II, III, IV and ONCAP IV	Acquisition - Medium		53,633,766	0.1%
Pantheon Global Secondary Fund III and IV	Secondary Fund		54,249,042	0.1%
Pathway Capital Management	Fund-of-Funds		1,642,735,087	3.9%
Paul Capital Partners IX	Secondary Fund		24,038,562	0.1%
Permira IV, V and VI	Acquisition - Large		40,828,555	0.1%
Providence Equity Partners VI	Acquisition - Medium		17,170,144	0.0%
Quad-C Partners IX and VIII	Acquisition - Medium		46,784,911	0.1%
Quantum Energy Partners V, V-C, VI, VII and VI-C	Acquisition - Energy		64,696,444	0.2%
The Resolute Fund II and III	Acquisition - Medium		32,915,262	0.1%
Silver Lake Partners III	Acquisition - Technology		18,100,235	0.1%
Spectrum Equity Investors VI and VII	Acquisition - Medium		27,034,812	0.1%
TA XI and XII	Acquisition - Large		33,552,607	0.1%
TCV IX, VI, VII and VIII	Venture Capital		85,383,271	0.2%
Thoma Bravo Discover Fund	Acquisition - Medium		5,426,496	0.0%
Thoma Bravo Fund XII	Acquisition - Large		16,217,734	0.0%
Thoma Bravo Special Opps Fund II	Acquisition - Medium		35,539,628	0.1%
Thoma Cressey Fund VIII	Acquisition - Medium		434,862	0.0%
TPG Partners V and VI	Acquisition - Large		24,157,811	0.1%
Vista Equity Partners V, VI and Foundation III	Acquisition - Medium		68,475,500	0.1%
Wayzata Opportunities Fund I, II and III	Debt - Distressed		19,322,148	0.1%
Wind Point Partners VI and VII	Acquisition - Medium		23,852,447	0.1%
Stock distribution account	Public Stocks		1,595,557	0.0%
<b>Total</b>		<b>\$</b>	<b>3,489,556,113</b>	<b>8.4%</b>

\*Market values are reported by the Systems' Private Equity advisors. Market values reflect the most current net asset values. In instances where the most current net asset values were not as of June 30, 2017, the net asset values utilized were cash flow adjusted through June 30, 2017.



## Private Credit Program Summary

As of June 30, 2017, the Private Credit assets had a market value of approximately \$280 million, representing 0.7% of total assets.

### Investment Program Description

Investments in Private Credit are similar to Private Equity investments in that they are typically very long-term in nature, not publicly traded, relatively illiquid, and offer the potential for substantially higher returns (along with a commensurate level of risk). The Private Credit portfolio also differs from the Private Equity portfolio, and is a separate and distinct composite within Private Risk Assets. The Private Credit asset class is comprised primarily of debt-related investments that provide a current yield along with equity participation (usually warrants) referred to as an 'equity kicker.' Primary strategies are distressed debt, bankruptcy restructurings, mezzanine debt, bank loans, and other credit-driven or debt-related investment strategies. Investments can be made in the U.S. or foreign countries. In total, the allocation to Non-U.S. Private Credit investments will not exceed 40% of the overall Private Credit target allocation. The risks associated with Private Credit will be viewed both in isolation and within the context of the entire fund.

### Structure

As of June 30, 2017, Private Credit assets committed\* for investment were \$1.2 billion. The market value of funds that have been drawn down and actually invested as of June 30, 2017 was approximately \$280 million, representing 0.7% of total assets. The Systems' private credit investment commitments that have not yet been funded were approximately \$363 million as of June 30, 2017.

The objective for the Systems' allocation to Private Credit is to achieve returns that are higher than those attainable in the public markets with the added benefit of diversification. The long-term and illiquid nature of the Private Credit asset class dictates that capital must be invested at a measured pace. Pathway Capital Management has been retained

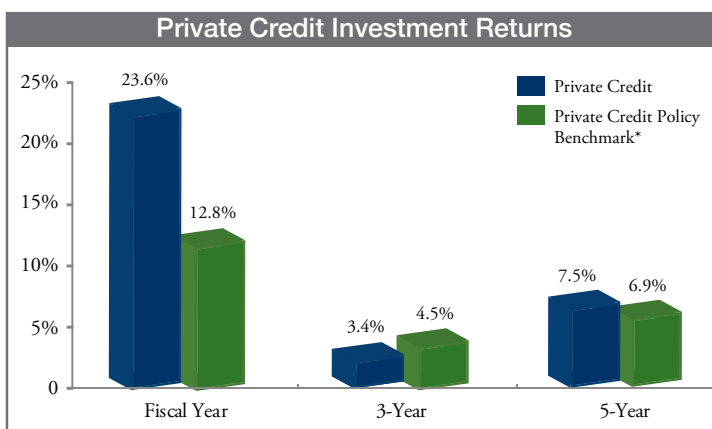
by the Systems to provide private credit investment management services through two structures; a discretionary fund-of-funds relationship and an advisory relationship. Albourne America, LLC has also been retained to provide private credit advisory services.

### Market Overview

Private Credit markets generated strong performance in fiscal year 2017, driven by narrowing credit spreads, a rebound in the energy sector and improving default rates. The recent volatility in financial markets has led to attractive investment opportunities in the private credit space this year.

### Performance

The total return for the Private Credit program was 23.6%, compared to the benchmark return of 12.8% for the fiscal year ended June 30, 2017. Short-term returns can be volatile for the Private Credit Program in comparison to a public benchmark, as discussed previously; private assets are more appropriately evaluated over longer time frames.



**Private Credit Statistical Performance**

Portfolio Characteristics	Fiscal Year	3-Year	5-Year
Annualized Private Credit Return	23.6%	3.4%	7.5%
Annualized Policy Benchmark Return*	12.8%	4.5%	6.9%
Excess Return	10.8%	-1.1%	0.6%

\*The Private Credit Policy Benchmark is the Merrill Lynch High Yield Master II Index. The Private Credit Program was established in December 2007, so ten-year returns are not available.

\* Committed capital reflects the total amount of capital that the Systems are legally obligated to supply to the partnerships and funds as the capital is needed to invest in underlying holdings. Market value reflects capital that has actually been drawn and invested by the partnerships and funds.

## Investment Advisors

As of June 30, 2017, the Systems had committed to 17 separate partnerships with 13 firms within the Private Credit asset class. Three new commitments were made to the Private Credit asset class during fiscal year 2017 for \$235 million. The Systems received total distributions from the private credit partnerships of approximately \$102 million in fiscal year 2017.

<b>Investment Advisor</b>	<b>Investment Style</b>	<b>Fair Value* As of June 30, 2017</b>	<b>% of Total Fair Value</b>
Avenue Capital Group Fund V	Debt - Distressed	\$ 115,033	0.0%
Bayview Opportunity Domestic V	Debt - Distressed	3,146,581	0.0%
Caltius IV	Debt - Mezzanine	2,025,486	0.0%
Centerbridge Special Capital Partners	Debt - Distressed	3,081,833	0.0%
EIG Energy Fund XVI	Debt - Energy	59,909,303	0.1%
Encap Fund VII	Acquisition - Energy	3,014,776	0.0%
Encap Fund VIII	Acquisition - Energy	17,707,883	0.1%
H.I.G Capital Whitehorse	Debt - Distressed	15,152,767	0.0%
H.I.G Capital Bayside IV	Debt - Distressed	8,683,201	0.0%
HPS Specialty Loan Fund 2016	Debt - Mezzanine	5,142,998	0.0%
Indigo Capital V	Debt - Mezzanine	2,028,320	0.0%
Lone Star Real Estate Fund II	Debt - Distressed	7,938,267	0.0%
OCM Opportunities Fund VIII	Debt - Distressed	7,769,239	0.0%
OCM Opportunities Fund VIII b	Debt - Distressed	19,445,585	0.1%
Pathway Capital Management	Funds-of-Funds	88,402,595	0.2%
TA Subordinated Debt Fund III	Debt - Mezzanine	18,519,167	0.1%
TA Subordinated Debt Fund IV	Debt - Mezzanine	17,823,535	0.1%
<b>Total</b>		<b>\$ 279,906,569</b>	<b>0.7%</b>

*\*Market values are reported by the Systems' Private Credit advisors. Market values reflect the most current net asset values. In instances where the most current net asset values were not as of June 30, 2017, the net asset values utilized were cash flow adjusted through June 30, 2017.*

## Private Real Estate Program Summary

As of June 30, 2017, the Private Real Estate assets had a market value of approximately \$3.2 billion, representing 7.6% of total assets.

### Investment Program Description

The Real Estate allocation is intended to provide exposure to a diversified portfolio of institutional quality private real estate investments that will provide meaningful, consistent returns, and act as a hedge against inflation and as a diversifier to the overall investment portfolio. The specific objectives of the real estate allocation will be to optimize yield and return, preserve capital and enhance portfolio value across market cycles. The risks associated with Private Real Estate will be viewed both in isolation and within the context of the entire fund.

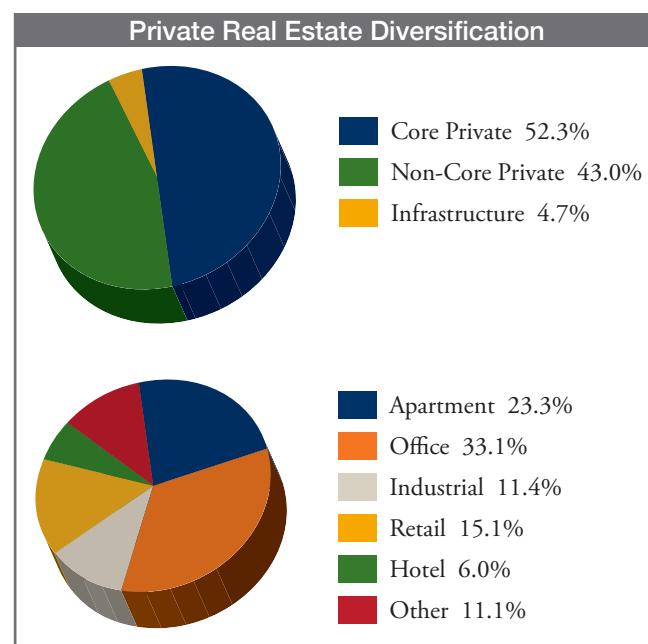
### Structure

As of June 30, 2017, the Systems' private real estate assets committed\* for investment were \$4.2 billion. The market value of funds that had been drawn down and actually invested as of June 30, 2017 was approximately \$3.2 billion, representing 7.6% of total assets. The Systems' private real estate investment commitments that had not yet been funded were approximately \$742 million as of June 30, 2017.

Within the overall Real Estate allocation, the Systems have established a 55% target allocation to non-core real estate and a 45% allocation to core private real estate. Non-Core investments represent those properties and/or investment strategies that require specialized acquisition and management expertise or skill to mitigate the business and leasing risk that may be associated with individual investments. Non-Core investments have greater associated risk compared to Core investments. Core investments include existing, substantially leased income-producing properties located mainly in metropolitan areas that exhibit reasonable economic diversification and growth.

\* Committed capital reflects the total amount of capital that the Systems are legally obligated to supply to the partnerships and funds as the capital is needed to invest in underlying holdings. Market value reflects capital that has actually been drawn and invested by the partnerships and funds.

The following pie charts indicate the current allocation to real estate investment strategies utilizing the market value of the Systems' invested real estate assets and the diversification within the real estate composite by property type.



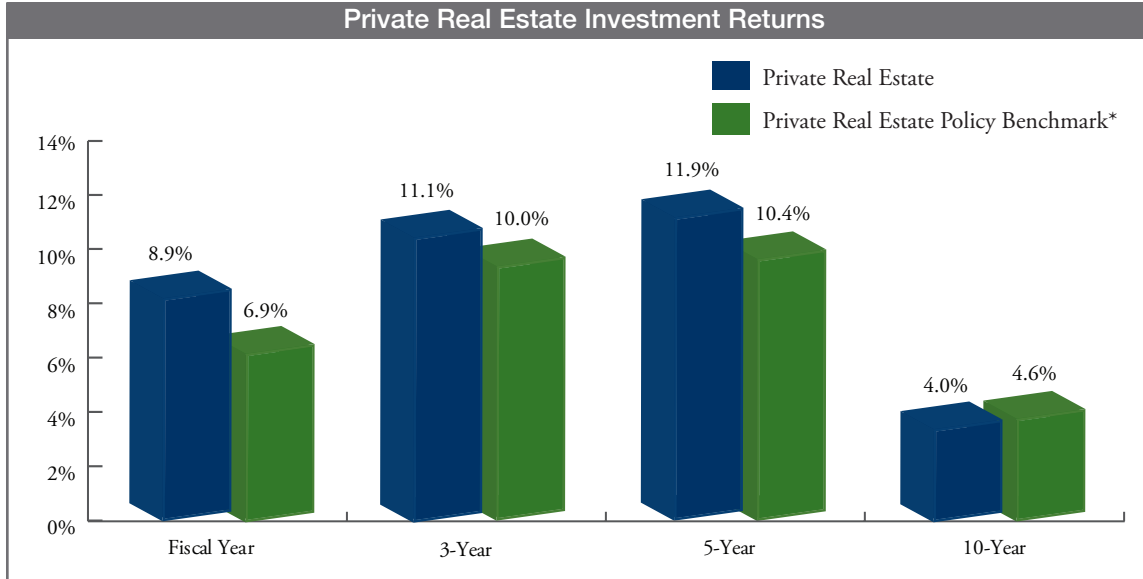
### Market Overview

Real estate fundamentals remained strong for most property types as the U.S. economy continued to expand at a modest pace in fiscal year 2017. Indications of moderating growth are emerging though as commercial real estate sales activity slowed over the last two quarters. Overall, it was a strong year for the real estate markets with the NCREIF Fund Index – Open Diversified Core Equity (NFI-ODCE) returning 6.9% for the fiscal year.

The Systems maintain a sizable allocation to high-quality, stabilized real estate assets (core) due to the secure income return. Additionally, the Systems have an allocation to non-core assets to enhance return to the overall real estate portfolio. The Systems will continue to focus real estate efforts going forward on investments that complement the existing portfolio.

**Performance**

The total return for the Private Real Estate program was 8.9%, compared to the benchmark return of 6.9% for the fiscal year ended June 30, 2017. The Systems' Private Real Estate program has produced excellent absolute and relative returns for all time periods as noted below, with the exception of the 10-year time period. The underperformance for the 10-year time period was primarily due to the significant downward pressure on real estate valuations during the credit crisis of 2008 and 2009.



Portfolio Characteristics	Fiscal Year	3-Year	5-Year	10-Year
Annualized Private Real Estate Return	8.9%	11.1%	11.9%	4.0%
Annualized Policy Benchmark Return*	6.9%	10.0%	10.4%	4.6%
Excess Return	2.0%	1.1%	1.5%	-0.6%

\*Effective January 1, 2016 the Real Estate Policy Benchmark is the NCREIF Open End Diversified Core Equity Index (NFI-ODCE). The NCREIF Property Index is used for prior periods.

## Investment Advisors

As of June 30, 2017, the Systems had committed to 58 separate partnerships with 29 firms within the Private Real Estate asset class. In fiscal year 2017, the Systems committed to four new partnerships totaling \$290 million. Additionally, the Systems received total distributions from the real estate partnerships of approximately \$518 million in fiscal year 2017.

Private Real Estate Investment Advisors				
Investment Advisor	Investment Style	Fair Value*	As of June 30, 2017	% of Total Fair Value
Alinda Infrastructure Fund I	Infrastructure	\$	37,222,131	0.1%
Alterna Core Capital Assets Fund II	Infrastructure		58,307,702	0.1%
Asana Partners Fund I, L.P.	Non-Core - Private		20,798,968	0.1%
AMB Alliance III	Non-Core - Private		73,388,156	0.2%
AEW Core Property Fund	Core - Private		95,313,258	0.2%
Blackstone R.E. Partners V, VI, VII, VIII, and Real Estate Partners Asia	Non-Core - Private		206,042,563	0.5%
Brockton Capital II	Non-Core - Private		27,183,879	0.1%
Carlyle Europe Real Estate Partners III	Non-Core - Private		11,993,845	0.0%
Carlyle Property Investors	Core - Private		138,804,536	0.3%
Carlyle Realty V, VI and VII	Non-Core - Private		124,060,853	0.3%
CBRE Fund IV, US Value 5, US Value 6, US Value 7	Non-Core - Private		55,925,006	0.1%
CIM Fund III and VIII	Non-Core - Private		87,347,829	0.2%
CIM Urban REIT	Non-Core - Private		24,856,205	0.1%
Colony Investors VIII	Non-Core - Private		6,225,100	0.0%
CPI Capital Partners Europe	Non-Core - Private		1,800,956	0.0%
Dune Real Estate Fund I	Non-Core - Private		5,867,948	0.0%
Forum Asian Realty Income II	Non-Core - Private		1,864,964	0.0%
Heitman Value Partners II and III	Non-Core - Private		36,118,601	0.1%
JPMorgan Special Situation Property Fund	Non-Core - Private		154,514,077	0.4%
JPMorgan Strategic Property Fund	Core - Private		337,025,750	0.8%
KKR Real Estate Partners America	Non-Core - Private		38,553,096	0.1%
LaSalle Asia Opportunity Fund II and III	Non-Core - Private		2,896,755	0.0%
LaSalle Income & Growth V	Non-Core - Private		202,588	0.0%
LaSalle Japan Logistics Fund II	Non-Core - Private		142,002	0.0%
LaSalle Property Fund	Core - Private		211,739,621	0.5%
Lone Star V and VI	Non-Core - Private		15,618,503	0.0%
Lone Star Real Estate Fund	Non-Core - Private		2,273,798	0.0%
Lone Star V Co-Investment Fund, L.P.	Non-Core - Private		454,410	0.0%
Macquarie Infrastructure Partners	Infrastructure		48,148,292	0.1%
MSREF V International	Non-Core - Private		1,626,867	0.0%
Morgan Stanley Prime Property Fund	Core - Private		392,653,719	1.0%
Noble Hospitality Fund I and III	Non-Core - Private		34,606,153	0.1%
Principal Enhanced Property Fund	Core - Private		47,483,354	0.1%
Prudential PRISA Fund	Core - Private		178,866,149	0.4%
Prudential PRISA III	Non-Core - Private		86,254,390	0.2%
RREEF America REIT III	Non-Core - Private		479,155	0.0%
Standard Life European Real Estate Fund I, II and III	Non-Core - Private		152,343,493	0.4%
Starwood Hospitality Fund	Non-Core - Private		4,370,117	0.0%
UBS Trumbull Property Fund	Core - Private		341,835,305	0.8%
Westbrook R.E. Fund VII, VIII, IX and X	Non-Core - Private		92,480,203	0.3%
<b>Total</b>			<b>\$3,157,690,297</b>	<b>7.6%</b>

\*Market values are reported by the Systems' Private Real Estate advisors. Market values reflect the most current net asset values. In instances where the most current net asset values were not as of June 30, 2017, the net asset values utilized were cash flow adjusted through June 30, 2017.

**U.S. Public Equity Broker Commissions Report**

<b>Brokerage Firm</b>	<b>Shares Traded</b>	<b>Dollars Traded</b>	<b>Commissions Paid</b>	<b>Cost Per Share</b>
SG Cowen & Co	24,930,215	\$ 990,090,899	\$ 509,061	\$ 0.02
Merrill Lynch	32,209,441	1,249,192,819	444,781	0.01
Barclays Capital, Inc.	11,385,969	508,075,693	295,998	0.03
Weeden & Co	34,690,422	1,587,215,759	234,332	0.01
Instinet, LLC	32,711,562	1,186,109,292	228,432	0.01
Cap Institutional Services	5,113,989	264,669,747	171,246	0.03
Deutsche Bank	22,024,926	819,156,762	145,130	0.01
Investment Technology Group	18,803,834	793,602,462	133,405	0.01
Bank of New York	19,247,145	672,641,872	132,973	0.01
JP Morgan Chase	16,708,664	580,595,818	130,851	0.01
Other (<\$100,000)	130,271,396	4,336,338,243	1,705,517	0.01
<b>Total</b>	<b>348,097,563</b>	<b>\$12,987,689,366</b>	<b>\$ 4,131,726</b>	<b>\$ 0.01</b>

**Non-U.S. Public Equity Broker Commissions Report**

<b>Brokerage Firm</b>	<b>Shares Traded</b>	<b>Dollars Traded</b>	<b>Commissions Paid</b>	<b>Cost (Basis Points)</b>
Instinet, LLC	154,855,535	\$ 875,633,381	\$ 302,927	3.5
Merrill Lynch	132,554,708	480,972,663	225,887	4.7
Goldman Sachs and Company	85,659,285	427,919,767	204,354	4.8
Citigroup Global Markets, Inc.	35,350,511	232,954,216	186,450	8.0
Deutsche Bank	61,194,698	349,968,894	156,457	4.5
JP Morgan Chase	36,323,085	183,166,957	109,659	6.0
Morgan Stanley & Co Incorporated	44,912,793	259,683,557	106,879	4.1
Investment Technology Group	32,254,066	243,882,104	98,717	4.0
Credit Suisse Securities, LLC	491,125,202	105,650,084	90,154	8.5
HSBC Bank	340,059,989	129,177,679	82,241	6.4
Other (<\$75,000)	583,748,993	780,755,452	439,309	5.6
<b>Total</b>	<b>1,998,038,865</b>	<b>\$ 4,069,764,754</b>	<b>\$ 2,003,034</b>	<b>4.9</b>

Investment Summary as of June 30, 2017			
Asset Type	Fair Value	Percent of Total Fair Value	
		FY 2017	FY 2016
<i>Public Risk Assets</i>			
U.S. Public Equity	\$ 12,340,780,790	29.7%	30.7%
Non-U.S. Public Equity	7,143,957,392	17.2%	15.4%
Public Credit	2,878,510,063	6.9%	6.2%
Hedged Assets	5,001,694,915	12.1%	13.4%
<b>Total Public Risk Assets</b>	<b>27,364,943,160</b>	<b>65.9%</b>	<b>65.7%</b>
<i>Safe Assets</i>			
U.S. Treasuries	5,351,369,846	12.9%	14.6%
U.S. TIPS	857,731,901	2.1%	1.4%
Cash Equivalents	861,503,557	2.1%	1.5%
<b>Total Safe Assets</b>	<b>7,070,605,304</b>	<b>17.1%</b>	<b>17.5%</b>
<i>Private Risk Assets</i>			
Private Real Estate	3,157,690,297	7.6%	7.9%
Private Equity	3,489,556,113	8.4%	8.0%
Private Credit	279,906,569	0.7%	0.7%
<b>Total Private Risk Assets</b>	<b>6,927,152,979</b>	<b>16.7%</b>	<b>16.6%</b>
<b>Securities Lending Collateral</b>	<b>19,757</b>	<b>0.0%</b>	<b>0.0%</b>
<b>Cash &amp; Equivalents*</b>	<b>120,921,741</b>	<b>0.3%</b>	<b>0.2%</b>
<b>Total Investments**</b>	<b>\$ 41,483,642,941</b>	<b>100.0%</b>	<b>100.0%</b>
<i>Reconciliation with Financial Statements</i>			
Total from above	\$ 41,483,642,941		
Accrued payable for investments purchased	2,541,434,371		
Accrued income payable	570,135		
Accrued receivable for investments sold	(1,867,718,251)		
Accrued income receivable	(83,223,859)		
Securities lending collateral	(19,757)		
Short-term investments designated for benefits	(117,123,203)		
<b>Statements of Fiduciary Net Position</b>	<b>\$ 41,957,562,377</b>		

\*Managers may hold cash or cash equivalents as part of an active management strategy. Cash or cash equivalents held as part of an active management strategy are not separately listed.

\*\* Total Investments includes accrued income and securities lending collateral as of June 30, 2017.

**Investment Expenses for the Fiscal Year Ended June 30, 2017**
**Investment Managers**
**Investment Management Fees**

NISA Investment Advisors - Core	\$ 3,964,088
NISA Investment Advisors - TIPS	<u>351,415</u>

**Safe Assets Fees**

	4,315,503
NISA Investment Advisors - Corporate	1,269,236
Oaktree Bank Loans	1,830,806
Pacific Investment Management Company	<u>666,562</u>

**Public Credit Fees**

	3,766,604
Analytic Investors, LLC	2,103,611
AQR Capital Management -140/40	2,465,301
Aronson & Johnson & Ortiz	1,523,396
BlackRock Investment Management	180,189
Columbia Management	761,955
Lazard Asset Management	1,387,522
Martingale Asset Management	1,433,050
Westwood Management	2,529,507
Zevenbergen Capital	<u>1,374,019</u>

**U.S. Public Equity Fees**

	13,758,550
Acadian Asset Management	1,169,516
Alliance Bernstein Institutional Management	1,332,201
Analytic Investors, LLC - Global Low Vol	1,312,783
AQR Capital Management	2,047,886
Aronson & Johnson & Ortiz	118,228
Arrowstreet Capital	7,073,156
BlackRock - ACWI EX US	407,686
Coronation Asset Management (Proprietary) Limited	1,953,509
Invesco Advisers, Inc	159,095
MFS Institutional Advisors	3,180,430
Neon Capital Management	2,934,072
NISA Investment Advisors	217,259
The Rock Creek Group	<u>3,039,528</u>

**Non-U.S. Public Equity Fees**

	24,945,349
Allianz	1,449,886
AQR Capital Management	731,326
Blackrock, Inc	37,328
Chartwell Investment Partners	634,440
Columbus Circle	556,349
NISA Investment Advisors	62,517
Next Century Growth Investors	306,648
RBC Global Asset Management	<u>1,052,769</u>

**S-Cap Fees**

	4,831,263
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**Alpha Overlay Fees**

	51,351,920
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**Hedged Assets Fees**

	100,182,999
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**Private Real Estate Fees**

	46,575,280
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**Private Credit Fees**

	14,690,454
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**Private Equity Fees**

	213,300,397
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**Commission Recapture Income**

	(185,869)
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**Investment Management Expense**

	<u>477,532,450</u>
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**Custodial Services**

State Street Bank & Trust Co.	(204,759)
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JP Morgan Chase, NA	<u>634,569</u>
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**Custodial Fees**

	429,810
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**Investment Consultants**

Albourne America, LLC	750,000
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Pathway Consulting	3,537,800
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Institutional Shareholder Services, Inc.	74,500
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Towers Watson	439,533
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Townsend	<u>350,000</u>
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**Investment Consultant Fees**

	5,151,833
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**Legal Expenses**

	1,198,380
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**Staff Investment Expenses**

	<u>3,708,310</u>
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**Total Investment Expenses**

	<u>\$ 488,020,784</u>
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