



SRPS
Investment Section

CHIEF INVESTMENT OFFICER'S REPORT

INVESTMENT OVERVIEW

The Maryland State Retirement and Pension System returned 8.06 percent (time-weighted) net of fees in fiscal year 2018. After the payment of benefits, the market value of assets increased by approximately \$2.9 billion, from \$49.1 billion on June 30, 2017 to \$52.0 billion on June 30, 2018. The fund exceeded its actuarial return target of 7.5 percent, and also outperformed its policy benchmark of 7.60 percent.

While all major asset classes achieved positive returns, the performance was not evenly distributed. Private equity and public equity provided the best returns for the year, producing 19.6 percent and 10.7 percent, respectively. At the other end of the spectrum, nominal bonds and emerging markets debt struggled, generating returns of 0.1 percent and -2.0 percent, respectively.

The Board's asset allocation policy is designed to achieve the actuarial rate of return over long periods of time by assembling a diversified portfolio of asset classes, each of which may have a large or small, positive or negative return in any given year. By assembling assets that exhibit unique risk and return characteristics in different market environments, the Board expects more stable investment returns over time than a less diversified portfolio. This lower risk portfolio should result in a larger asset pool for the System's beneficiaries than a more volatile portfolio with the same average return. Understanding the Board's principals of asset allocation is important in evaluating the performance in any one-year period. While the realized return of 8.06 percent for fiscal year 2018 is above the Board's long-term expectation for the portfolio, it is well within its expected ranges for annual variations.

The System's asset allocation is organized into five broad categories: Growth/Equity, Rate Sensitive, Credit, Real Assets, and Absolute Return. During the fiscal year, the asset allocation remained largely unchanged from the prior year, with only minor adjustments being made to improve the efficiency of the portfolio.

The Growth/Equity portfolio is comprised of public equity and private equity. Within public equity, there are dedicated allocations to U.S., international developed, and emerging markets. The objective of this asset class is to generate high returns associated with the economic growth underlying global economies.

The Rate Sensitive category consists of exposure to core, or investment-grade, bonds. This asset class is designed to provide protection against downturns in the equity market

by offering a reliable income stream through the yield component. This yield also provides some protection against a deflationary environment, characterized by falling interest rates. This asset class includes long-term U.S. Treasury bonds, Treasury inflation protected securities, corporate bonds and securitized debt.

The purpose of the Credit asset class is to take advantage of the potential higher returns offered by below investment-grade bonds. The return objective is similar to public equity, with a lower risk profile. This category includes high yield bonds, bank loans, emerging markets debt, distressed debt, mezzanine debt, and other credit-focused investments.

Real Assets includes real estate, natural resources and infrastructure. A significant portion of the assets in this category provides an income stream. Due to the tangible, or real, element of this asset class, it is expected to provide some level of protection against an inflationary environment, as well as additional diversification to the total portfolio.

The objective of the Absolute Return asset class is to achieve a return that falls between the expectations for public equity and bonds, with low correlation to other asset classes. The risk profile of this asset class is expected to be significantly lower than public equity, which should provide protection during periods of stock market decline. Strategies included in this asset class are hedge funds, multi-asset mandates, insurance-related products, and other strategies with similar expected risk and return profiles.

INVESTMENT POLICY AND OBJECTIVES

The Board of Trustees is charged with the responsibility of managing the assets of the System. In doing so, the Board is required to exercise its fiduciary duties solely in the interest of the participants with the care, skill, and diligence that a prudent person would exercise under similar circumstances. This standard of care encourages diversifying investments across various asset classes.

Investment objectives are designed to support the fulfillment of the Board's mission to optimize risk-adjusted returns to ensure that sufficient assets are available to pay benefits to members and beneficiaries when due. As a long-term investor, the Board understands that short-term market returns will fluctuate.

These investment objectives are implemented in accordance with investment policies developed by the Board.

The “prudent person standard”, as outlined in both the Maryland Annotated Code and the Board’s investment policies, allows the Board to set investment policies and delegate authority to investment professionals employing active and passive strategies. Firms retained generally have a demonstrated performance record and a clearly defined and consistently applied investment process.

The Board manages the assets for the System with the goal of achieving an annualized investment return that over a long-term time frame: (1) meets or exceeds the investment policy benchmark for the System; (2) in nominal terms, equals or exceeds the actuarial investment return assumption adopted by the Board; and (3) in real terms, exceeds the U.S. inflation rate by at least 3 percent. A more detailed discussion of each of these goals follows below.

1. **Meeting or exceeding the Investment Policy Benchmark for the System.** The Investment Policy Benchmark is calculated by using a weighted average of the Board-established benchmarks for each asset class. This benchmark enables the comparison of the actual performance of the System to a proxy portfolio, and provides a measure of the contribution of policy implementation and active management to overall fund returns.
2. **In nominal terms, equaling or exceeding the actuarial investment return assumption of the System.** The Board adopts the actuarial rate of interest, which was set at 7.5 percent for fiscal year 2018. The actuarial investment return assumption functions as an estimate of the long-term rate of growth of the assets for the System. In adopting an actuarial return assumption, the Board anticipates that the investment portfolio will achieve higher or lower returns each year but will trend toward 7.5 percent over time.
3. **In real terms, exceeding the U.S. inflation rate by at least 3 percent.** The inflation related objective compares the investment performance against a rate of inflation measured by the Consumer Price Index (CPI) plus 3 percent. The inflation measure provides a link to the liabilities of the System, which have an embedded sensitivity to changes in the inflation rate.

The Board is also responsible for establishing the asset allocation policy for the System. It does this by weighing three liability-oriented objectives when making asset allocation determinations. These objectives include:

1. achieving and maintaining a fully funded pension plan;
2. minimizing contribution volatility year to year; and
3. realizing surplus assets.

Asset allocation policy targets are determined by recognizing that liabilities (future benefit payments to the participants and beneficiaries of the System) must be paid in full and on time. The mix of asset classes is chosen to provide sufficient growth to meet the long-term return objective of the System, while providing sufficient diversification to moderate the volatility of that return. For example, a portfolio of equities will likely provide the required return over a long time horizon, but will subject the market value of the portfolio to unacceptable levels of volatility such that the goals of minimizing contribution volatility and realizing surplus assets would be difficult to achieve. Combining other asset classes with equities will provide differentiated return sources, reduce the volatility of returns and help realize those liability-oriented objectives.

The Board’s long-term asset class targets and ranges as of June 30, 2018 are shown below.

ASSET CLASS	LONG-TERM	
	POLICY TARGET	RANGE
Growth Equity	50%	+/- 7%
U.S Equity	16%	
International Developed Equity	10%	
Emerging Markets Equity	11%	
Private Equity	13%	
Rate Sensitive	19%	+/- 5%
Long-term Government Bonds	10%	
MBS/Corporate Bonds	5%	
TIPS	4%	
Credit	9%	+/- 4%
High Yield Bonds/Bank Loans	7%	
Emerging Market Debt	2%	
Real Assets	14%	+/- 4%
Real Estate	10%	
Natural Resources/Infrastructure	4%	
Absolute Return	8%	+/- 4%
Total Assets	100%	

For private market investments in the real assets and private equity asset classes, additional risk reduction may be

achieved through temporal diversification, making investments over time to take advantage of varying opportunities. To reflect the desirability of investing over time in accordance with a prudent pacing schedule, transitional allocations are implemented. Assets not yet deployed to private equity are assigned to the public equity transitional target. Assets not yet deployed to real estate are assigned to the rate sensitive transitional target.

INVESTMENT PERFORMANCE

Investment performance is calculated using time-weighted rates of total return. Total return includes interest and dividends, as well as capital appreciation.

The investment program realized a return of 8.1 percent for fiscal year 2018. Annualized returns for the 3-, 5-, 10-, 20- and 25-year periods ending June 30, 2018 were 6.3 percent, 7.2 percent, 5.6 percent, 5.3 percent and 6.7 percent, respectively.

	FY 2018 SRPS Performance	FY 2018 Benchmark Performance	SRPS Exposure June 30, 2018
Public Equity	10.7%		37.5%
Custom Benchmark		10.6%	
U.S. Equity	15.1%		12.3%
Russell 3000		14.8%	
International Equity	7.8%		7.8%
MSCI World ex U.S.		7.0%	
Emerging Markets Equity	7.2%		9.4%
MSCI Emerging Markets		8.2%	
Global Equity	12.5%		8.0%
MSCI AC World Index		10.7%	
Private Equity	19.6%		12.5%
Custom State Street PE		15.9%	
Rate Sensitive	0.6%		19.9%
Custom Benchmark		0.4%	
BC U.S. Gov't Long Index		-0.1%	
BC U.S. TIPS Index		2.3%	
Credit/Debt Strategies	2.3%		8.0%
Custom Benchmark		2.3%	
BC High Yield		2.6%	
S&P LSTA Leveraged Loan		4.4%	
JP Morgan GBI EM GD		-2.3%	
JP Morgan EMBI GD		-1.6%	
JP Morgan CEMBI Broad		0.10%	
Real Assets	8.2%		11.9%
Custom Benchmark		9.4%	
NCREIF ODCE		8.1%	
FTSE EPRA NAREIT		5.6%	
Natural Resources and Infrastructure Custom Benchmark		16.3%	
Absolute Return	3.3%		8.4%
Custom Benchmark		5.2%	
Cash and Cash Equitization	8.8%		1.8%
Custom Benchmark		1.3%	
TOTAL FUND	8.1%	7.6%	100%

The allocation as of June 30, 2018 reflects the ranges and transitional targets of the System as described in the previous section.

ECONOMIC AND CAPITAL MARKET OVERVIEW

For fiscal year 2018, the System produced its ninth consecutive year of positive performance, as the length of the bull market in U.S. stocks approached record status. The economic backdrop continued to be supportive of riskier assets tied to economic expansion. Strong corporate earnings in the U.S. were fueled by low interest rates and tax cuts that were enacted in December of 2017. These favorable conditions led to robust GDP growth in the U.S. of 2.9% for the fiscal year. Consistent with a strong economy, the U.S. unemployment rate continued to decline from 4.4% at the end of the prior fiscal year to 3.9% as of June 30, 2018. Somewhat surprisingly, the strong growth and employment picture in the U.S. has not translated into commensurate wage or price inflation. For the fiscal year, wage growth grew by a modest 2.8%, while the Consumer Price Index excluding food and energy expanded by 2.3%, well within the Federal Reserve's targeted range. Against this attractive backdrop, U.S. stocks, as represented by the S&P 500, achieved an attractive investment return of 14.4% in fiscal year 2018.

Foreign stocks also produced solid returns for the fiscal year, albeit much lower than in the U.S. Trade tensions, geopolitical concerns, and currency weakness weighed on non-U.S. equities, particularly in the second half of the year. Emerging markets performed the worst during this period, as rising concerns about the prospect of a global trade war came to the fore. In addition, a stronger U.S. dollar, driven in part by higher U.S. interest rates, prompted investors to sell emerging market securities in favor of safer U.S. assets with a more competitive return profile. Even with these challenges, foreign stocks still produced good returns for the fiscal year, with developed and emerging market stock indices generating 7.0% and 8.2%, respectively.

While equities performed well in fiscal year 2018, the same cannot be said about fixed income securities with sensitivity to interest rates. During the year, the Federal Reserve continued the process of interest rate normalization it began in December 2015 by increasing the Federal Funds rate an additional three times in fiscal year 2018. In addition, the Federal Reserve has begun to gradually reduce the size of its balance sheet. These two monetary tightening mechanisms exerted downward pressure on U.S. bond prices during the fiscal year and resulted in returns that were below long-term expectations. For the fiscal year, the System's Rate Sensitive portfolio returned 0.6%, with nominal bonds producing 0.1% and the TIPS program generating 2.1%.

Most of the volatility in fiscal year 2018 can be attributed to interest rate spikes due to actions by the Federal Reserve and inflation concerns. While these factors were benign in the first half of the year, they became more prominent in the second half. Assets with the most exposure to these risk factors experienced the greatest declines. Long duration Treasury Bonds and emerging market assets, hurt by a stronger U.S. dollar, experienced the most significant losses in the second half of the year.

PUBLIC EQUITIES

As of June 30, 2018, approximately \$19.5 billion was invested in public equities, representing 37.5 percent of total assets. The public equity program consists of three components: U.S. equities, international developed equities and emerging markets equities.

The Terra Maria program, which seeks to identify promising smaller or developing management firms, is an integral part of the public equities asset class. As of June 30, 2018, 78 percent of the public market Terra Maria program was invested in equities, with 55 percent in international stocks. Each of the managers in the Terra Maria program has an active management mandate. A more detailed discussion of the Terra Maria program follows below.

A. U.S. Equities

As of June 30, 2018, approximately \$6.4 billion, or 12.3 percent of total assets, was invested in U.S. public equities. Passively and enhanced-passively managed equities totaled \$5.9 billion, while Terra Maria program assets were \$509 million, representing 11.4 percent, and 0.9 percent of total assets, respectively.

U.S. Equity	\$ Millions	% of Total Plan
Passively Managed	\$5,900	11.4%
Terra Maria Program	\$509	0.9%
Total U.S. Equity	\$6,409	12.3%

For fiscal year 2018, U.S. equities returned 15.1 percent, compared to 14.8 percent for its benchmark, the Russell 3000 Index.

B. International Equities

As of June 30, 2018, approximately \$4.0 billion, or 7.8% of total assets, was invested in international equities. Passively and enhanced-passively managed assets totaled approximately \$1.7 billion, while actively managed assets outside of the Terra Maria program totaled approximately \$1.1 billion and Terra Maria assets were \$1.2 billion, representing 3.4%, 2.1% and 2.3% of total assets, respectively. As more fully described below, in 2009 the System instituted a currency overlay program which is designed to protect the value of some foreign equities in a rising dollar environment.

For fiscal year 2018, international equities, including the impact of the currency overlay program, returned 7.8%, compared to 7.0% for its benchmark, the MSCI World ex-U.S. Index.

International Equity	\$ Millions	% of Total Plan
Passively Managed	\$1,780	3.4%
Actively Managed (excluding T.M.)	\$1,105	2.1%
Terra Maria Program	\$1,184	2.3%
Currency Overlay	\$9.7	0.0%
Total International Equity	\$4,083	7.8%

C. Emerging Market Equities

As of June 30, 2018, approximately \$4.9 billion, or 9.4% of total assets, was invested in emerging market equities. Actively managed long-only assets outside of the Terra Maria program totaled \$4.3 billion, Terra Maria assets were \$360 million, and passively-managed assets were \$199 million, representing 8.3%, 0.70%, and 0.4% of total assets, respectively.

For the fiscal year, the portfolio returned 7.2% compared to 8.2% for the MSCI Emerging Market Index.

D. Global Equities

Emerging Equity	\$ Millions	% of Total Plan
Passively Managed	\$199	0.4%
Actively Managed (excluding T.M.)	\$4,318	8.3%
Terra Maria Program	\$360	0.7%
Total Emerging Markets Equity	\$4,877	9.4%

As of June 30, 2018, approximately \$4.2 billion, or 8.0% of total assets was invested in emerging market equities. This portfolio is comprised of 100% active mandates.

For the fiscal year, the portfolio returned 12.5% compared to 10.7% for the MSCI AC World Index.

CURRENCY OVERLAY PROGRAM

Global Equity	\$ Millions	% of Total Plan
Actively Managed	\$4,159	8.0%
Total Emerging Markets Equity	\$4,159	8.0%

The currency overlay program was implemented in May of 2009. An objective of the program is to provide insurance against a strengthening dollar, which could negatively impact returns from foreign currency denominated equities. The manager in this program uses a systematic currency overlay strategy and generally, does not make fundamental currency valuation assessments. The strategy is also dynamic in that the degree to which currency hedging is applied changes depending on currency market conditions. The manager in this program tends to use low hedge ratios when the dollar is weak, and high hedge ratios when the dollar is strong.

During fiscal year 2018, the currency program acted as a slight drag to returns in the System's foreign equity holdings, as the U.S. dollar weakened relative to other currencies. The cost of the currency hedging program during the fiscal year was \$8.7 million. While the program produced moderate losses during fiscal year 2018, it has served to reduce volatility and improve the risk/return profile of non-U.S. stocks since its inception.

PRIVATE EQUITY

As of June 30, 2018, private equity totaled \$6.5 billion, or 12.5% of total assets. This asset class includes buyouts, growth equity, venture capital, secondaries and funds-of-funds.

In fiscal year 2018, commitments were made to 14 private equity funds, totaling \$1.3 billion. Since the inception of the private equity program in fiscal year 2005, \$13.9 billion in commitments have been made to 203 different funds. In fiscal year 2018, the private equity program returned 19.6%, compared to 15.9% for its benchmark, the State Street Private Equity Index.

In fiscal year 2019, the Board expects that exposure to private equity will continue to increase toward its long-term targeted levels, as unfunded commitments of \$5.6 billion are drawn down by the fund managers. Future commitments will follow a pacing model designed to approach the 13% allocation target for invested assets. This allocation is expected to be maintained with distributions from mature partnerships, providing the funds to invest in new partnerships.

RATE SENSITIVE

As of June 30, 2018, the rate sensitive portfolio represented \$10.3 billion, or 19.9% of total assets. The rate sensitive portfolio returned 0.6% for the year, compared to 0.4% for its blended benchmark: 53% Barclays US Government Long Bond Index, 13% Barclays US Investment Grade Corporate Index, 13% Barclays US Securitized Index, and 21% Barclays US TIPS Index.

CREDIT/DEBT STRATEGIES

The credit/debt strategies portfolio totaled approximately \$4.2 billion, representing 8.0% of total plan assets as of June 30, 2018. Investments in this asset class are held in both liquid and illiquid structures. Typical asset types in the portfolio include: mezzanine and distressed debt, high yield bonds, bank loans, and emerging market debt. The portfolio has a blended benchmark of 78 percent U.S. (80% BC U.S. Corporate High Yield Index, 20% S&P LSTA Leveraged Loan Index), and 22% Non-U.S. (50% BBG Barclays EM Local Government Index, 25% BBG Barclays EM Hard Currency Sovereign Index, 25% BBG Barclays EM USD Corporate Index). The portfolio returned 2.31% for the fiscal year, versus 2.34% for its benchmark.

REAL ASSETS

The real assets portfolio totaled approximately \$6.2 billion, representing 11.9% of total assets as of June 30, 2018. The objectives of this asset class are to provide a level of protection against inflation, and to enhance diversification for the total fund. As of June 30, 2018, the largest component of the asset class was real estate, totaling \$4.6 billion, or 8.9% of total assets. The remaining assets consisted of investments associated with natural resources and infrastructure totaling \$1.6 billion or 3.0% of total assets.

The real assets portfolio returned 8.2% for the fiscal year, compared to 9.4% for its blended benchmark, which is approximately 70% real estate with the remainder in natural resources and infrastructure. Real estate achieved strong performance with a 9.0% return, versus the real estate benchmark return of 7.8%. The natural resources and infrastructure portion of the portfolio underperformed its benchmark, as the public equities component in the benchmark performed better than the mostly private natural resources portfolio. Over time, the private energy investments should follow the public securities in the natural resources and infrastructure benchmark more closely.

ABSOLUTE RETURN

The absolute return portfolio totaled approximately \$4.4 billion, representing 8.4% of total assets as of June 30, 2018. The portfolio consists of event-driven, global macro, multi-asset, relative value multi-strategy, and opportunistic funds. Its goal is to provide diversification for the total plan through its low correlation to the broad financial markets. The absolute return portfolio returned 3.3%, compared to the 5.2% return for its benchmark: Hedge Funds Research, Inc. (HFRI) Fund of Funds Index: Conservative +1%.

TERRA MARIA PROGRAM

As previously mentioned, the Terra Maria program seeks to identify promising smaller or developing managers. The five public market program managers serve as an extension of staff to source investment managers, perform manager due diligence, monitor managers and prepare manager "hire/fire" and funding recommendations. The managers include Acuitas Investment Management, Attucks Asset Management, Capital Prospects LLC, FIS Group, and Leading Edge Investment Advisors.

Terra Maria publicly-traded assets totaled approximately

\$2.6 billion, or 5.1 percent of total assets at June 30, 2018. The program returned 7.0% for the fiscal year, equaling its custom benchmark return. The relative performance results have remained positive since the April 2007 inception of the program.

During fiscal year 2011, the Terra Maria program was expanded to include investments in private equity partnerships. Since January 2011, \$9.2 billion has been committed globally to 105 private equity funds. Of this, \$5.8 billion has been committed to 63 domestic funds, which includes \$1.0 billion to 20 Terra Maria emerging managers.

Additionally, at the end of fiscal year 2018, \$10.7 billion, or 20.6 percent of the System's total assets, were managed by minority and women-owned firms.

INVESTMENT MANAGEMENT FEES

The asset allocation of the System is the primary determinant of return. The asset allocation is also the primary determinant in the cost of investing the assets. Of secondary importance is the proportion of assets invested passively. Alternative assets such as closed-end limited partnerships used for private equity, infrastructure and some real estate do not offer passive avenues for investment. In addition, open-end partnerships used for real estate and hedge fund strategies cannot be invested passively. Alternative assets are included in the asset allocation with the objective of earning higher returns over time, reducing risk by earning returns that are differentiated from stock and bond returns, or for both reasons. The Board is mindful of the negative effects fees have on net investment performance and is committed to aggressively negotiating fair and reasonable terms to mitigate the drag on performance, while maintaining exposure to investments that exhibit positive risk and return characteristics in a total portfolio context.

CONCLUSION

Fiscal year 2018 was a solid year for the assets of the System, producing a net return of 8.06%, exceeding the actuarial assumed rate of return of 7.5%. While the Board of Trustees is proud of this one-year performance, the focus continues to be on long-term returns. The System has constructed a diversified portfolio that allows it to collect different cash flow streams that are associated with distinct risk exposures. Short-term investment returns are unpredictable and the System should expect that individual years of strong investment returns will be mixed with years that produce

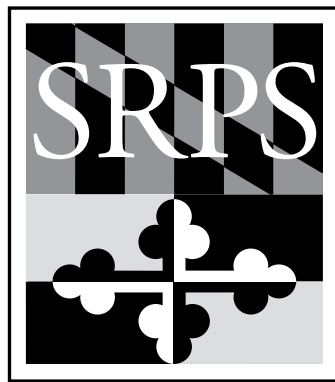
performance that does not meet expectations. The best way to account for the unknown and achieve long-term objectives is to maintain a balanced and diversified portfolio that is not overly dependent on single economic outcomes.

It is an honor to serve the members and beneficiaries of the System as your Chief Investment Officer. I would like to thank the Board of Trustees and Staff for their support and dedication as we endeavor to manage the assets of the plan as prudently and efficiently as possible.

Respectfully submitted,



Andrew C. Palmer CFA
Chief Investment Officer



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MARYLAND STATE RETIREMENT AND PENSION SYSTEM

INVESTMENT PORTFOLIO SUMMARY as of June 30, 2018 and 2017 (Expressed in Thousands)

	2018		2017	
	Fair Value	% of Fair Value	Fair Value	% of Fair Value
Rate Sensitive				
Fixed Income	\$ 8,155,151	15.7 %	\$ 8,957,071	18.2 %
Inflation linked bonds	2,000,831	3.9	2,245,091	4.6
(1) Cash (non-manager)	947,306	1.8	584,887	1.2
(2) Net cash & cash equivalents (manager)	163,872	0.3	(-898,295)	-1.8
Total Rate Sensitive	<u>11,267,160</u>	<u>21.7</u>	<u>10,888,754</u>	<u>22.2</u>
Credit				
Hight Yield Bond/Bank Loans	2,775,004	5.4	3,184,539	6.4
Emerging markets debt	1,323,123	2.5	1,458,431	3.0
(2) Net cash & cash equivalents (manager)	60,951	0.1	39,625	0.1
Total Credit	<u>4,159,078</u>	<u>8.0</u>	<u>4,682,595</u>	<u>9.5</u>
Equity				
Domestic stocks	6,384,482	12.3	5,182,241	10.6
Emerging markets stocks	4,846,222	9.4	3,732,543	7.6
Global stocks	4,106,295	7.9	5,420,822	11.0
International stocks	3,916,511	7.5	4,443,071	9.0
(2) Net cash & cash equivalents (manager)	230,648	0.4	243,531	0.5
Total Public Equity	<u>19,484,158</u>	<u>37.5</u>	<u>19,022,208</u>	<u>38.7</u>
Private Equity	<u>6,484,363</u>	<u>12.5</u>	<u>5,045,050</u>	<u>10.3</u>
Total Equity	<u>25,968,521</u>	<u>50.0</u>	<u>24,067,258</u>	<u>49.0</u>
Absolute Return	4,363,245	8.4	3,523,187	7.2
Real Estate (includes private)	4,624,011	8.9	3,920,731	8.0
Commodities	-	-	1,034,673	2.1
Natural Resources & Infrastructure	1,524,763	2.9	907,619	1.9
(2) Net cash & cash equivalents (manager)	49,812	0.1	73,029	0.1
Total Portfolio	<u>\$ 51,956,590</u>	<u>100.0 %</u>	<u>\$ 49,097,846</u>	<u>100.0 %</u>

(1) Securities lending collateral payable has been netted against the actual collateral. The amounts net to zero.

(2) Includes investment receivables and payables.

Note: This schedule includes assets invested on behalf of the Maryland Transit Administration.

MARYLAND STATE RETIREMENT AND PENSION SYSTEM

INVESTMENT PORTFOLIOS BY MANAGER

as of June 30, 2018

(Expressed in Thousands)

	Fair Value	Investment Advisory Fees		Fair Value	Investment Advisory Fees
Public Equity			Fixed Income Manager		
RhumbLine Advisors	\$ 4,826,171	\$ 1,474	State Street Global Advisors	\$ 4,593,214	\$ 575
D E Shaw & Co., LP	1,778,272	5,765	Western Asset Management	2,783,929	4,227
AQR Capital Management, LLC	1,505,661	5,558	Pacific Investment Management Company	1,319,288	2,274
Dimensional Fund Advisors, Inc.	1,423,486	6,088	Capital Prospects, LLC (1)	595,033	1,469
Baillie Gifford & Company	1,374,666	6,831	Double Line US Securitized	399,259	446
Equity Long Short (1)	965,800	30,781	Dodge & Cox	376,619	772
T. Rowe Price Associates, Inc.	839,204	1,842	Garda Firvo	227,200	6,638
Axiom International Investors	792,982	3,133	Nominal FI Income Structural/Tactical	24,769	0
Longview Partners Ltd.	654,439	3,402	Cash & Cash Equitization	947,305	N/A
Artisan Partners Limited Partnership	552,539	2,808	Other (2)	1	3,135
Brown Capital Management	552,464	2,822		<u>\$11,266,617</u> (3)	<u>\$ 19,536</u> (4)
Fisher Investments	510,880	3,969			
Attucks Asset Management, LLC (1)	441,445	2,794			
Leading Edge Invest. Advisors, LLC (1)	424,293	2,495	Private Equity Funds (1)	\$ 6,484,363	\$ 104,331
Polunin Capital Management	410,570	3,811	Credit/Debt Related (1)	1,309,120	22,443
Capital Prospects, LLC (1)	399,200	2,130	Logan Circle Partners	735,342	1,611
Westwood Global Investment	378,133	2,801	Neuberger Berman Investment Advisors LLC	559,905	2,304
FIS Group, Inc.(1)	674,141	3,109	Kohlberg Kravis Roberts (KKR)	495,600	2,440
Genesis Asset Management	262,924	2,168	Mackay Shields LLC	471,332	1,196
Acadian Asset Management	248,161	1,503	State Street Global Advisors	587,778	449
State Street Global Advisors	247,858	272	Absolute Return (1)	4,366,387	49,415
Acuitas Asset Management (1)	109,681	763	Real Assets		
Metis Global Partners	70,638	26	Natural Resources & Infrastructure (1)	1,558,123	14,422
Record Currency Management	13,132	5,053	Private Real Estate (1)	3,896,947	30,620
Other (2)	27,418	6,533	Morgan Stanley Investment Management	512,483	2,248
	<u>\$19,484,159</u> (3)	<u>\$ 107,931</u> (4)	State Street Global Advisors	226,585	166
			Record Currency Management	0	253
			Other (2)	1,848	14,850
				<u>\$21,205,814</u> (3)	<u>\$ 246,749</u> (4)

(1) Sub-managers separately listed on the following pages

(2) Consulting fees and/or investment managers no longer under contract as of 6/30/18

(3) Includes assets invested on behalf of the Maryland Transit Administration.

(4) Includes management fees allocated to the Maryland Transit Administration.

MARYLAND STATE RETIREMENT AND PENSION SYSTEM

ALTERNATIVE INVESTMENTS RELATIONSHIP LISTING

as of June 30, 2018

Private Equity

1315 Capital, LP	Dover Street VII, LP	MBK Partners Fund III, LP
Abbott Capital Private Equity Fund III, LP	ECI 9, LP	MBK Partners Fund IV, LP
Adams Street Partners, LLC	Equistone Partners Europe Fund IV, LP	MD Asia Investors, LP
Advent Central & Eastern Europe IV, LP	Equistone Partners Europe Fund V, LP	MD Asia Investors II, LP
Advent International GPE V D, LP	Everstone Capital Partners II, LLC	MD Asia Investors III, LP
Advent International GPE VI A, LP	Everstone Capital Partners III, LLC	Navis Asia Fund VI, LP
Advent International GPE VIII B, LP	Fort Point Capital (FPC Small Cap) I, LP	New Mainstream Capital Fund II, LP
AIF Capital Asia IV, LP	Frazier Healthcare V, LP	New Mountain Partners III, LP
Alchemy Partners, LP	Frazier Healthcare VI, LP	New Mountain Partners IV, LP
Apax Europe VI A, LP	Frazier Healthcare VII, LP	New Mountain Partners V, LP
Apax Europe VII A, LP	Frazier Healthcare Growth Buyout Fund III, LP	North Sky Clean Tech Fund IV, LP
Apax France VIII	Frazier Life Sciences VIII, LP	Northstar Equity Partners IV
Apax France IX	Frazier Life Sciences IX, LP	Orchid Asia V, LP
Apollo Investment Fund VII (AIF), LP	Frontier Fund III, LP	Orchid Asia VI, LP
Apollo Investment Fund VIII (AIF), LP	Frontier Fund IV, LP	Pacific Equity Partners V, LP
Arcadia II Beteiligungen BT GmbH & Co	Frontier Fund V, LP	PAG Asia Capital II, LP
Astorg VI	Goldman Sachs Vintage Fund V, LP	Partners Group Secondary 2008, LP
Audax Private Equity Fund II, LP	Graphite Capital Partners VII	Partners Group Secondary 2011, LP
Audax Private Equity Fund III, LP	Graphite Capital Partners VII, Top Up	Partners Group Emerging 2011, LP
Audax Private Equity Fund IV, LP	Graphite Capital Partners VIII	Partners Group Secondary 2015, L.P
Audax Private Equity Fund V, LP	Great Hill Equity Partners III, LP	Pemira IV, LP
Azure Capital Partners II, LP	Great Hill Equity Partners IV, LP	Point 406 Ventures II, LP
Azure Capital Partners III, LP	Great Hill Equity Partners V, LP	Point 406 Ventures III, LP
Bain Capital Asia Fund III	Great Hill Equity Partners VI, LP	Point 406 Ventures 2016 Opportunities Fund
Bain Capital Europe Fund IV, LP	Green Equity Investors VII	Private Equity Partners Fund IV
Bain Capital Fund IX, LP	Hancock Park Capital III, LP	Quaker BioVentures II, LP
Bain Capital IX Co-investment Fund, LP	HarbourVest Partners VI - Buyout Fund, LP	Riverside Asia Pacific Fund II, LP
Bain Capital Fund X, LP	HarbourVest Partners VI - Partnership Fund, LP	Riverside Capital Appreciation Fund V, LP
Bain Capital X Co-investment Fund, LP	Hellman & Friedman Capital Partners VI, LLC	Riverside Capital Appreciation Fund VI, LP
Bain Capital Fund XI, LP	Hellman & Friedman Capital Partners VII, LLC	Riverside Europe Fund IV, LP
Bain Capital Fund XII, LP	Hellman & Friedman Capital Partners VIII, LLC	RLH Investors II, LP
Bain Capital Life Sciences Fund, LP	Hg Capital 5, LP	RLH Investors III, LP
Baring Asia Private Equity Fund VI, LP	Hg Capital 6 A, LP	Roark Capital Partners IV, LP
BC European Capital VIII, LP	Hg Capital 7 C, LP	Silver Lake Partners V, LP
BC European Capital IX, LP	Hg Capital Mercury A, LP	Siris Partners II, LP
Black River Capital Partners Fund (Agr. A)LP	ICV Partners III, LP	SSG Capital Partners III, LP
Blackstone Capital Partners VI, LP	Institutional Venture Partners XV	Summer Street Capital Fund II, LP
Blackstone Capital Partners VII, LP	Institutional Venture Partners XVI	Summer Street Capital Fund III, LP
Blue Wolf Capital Fund III, LP	KKR European Fund III, LP	Symmetric Partners, LP
Blue Wolf Capital Fund IV, LP	Landmark Equity Partners XIV, LP	TA X, LP
Brazos Equity Fund III, LP	Landmark Equity Partners XV, LP	TA XI, LP
Bridgepoint Europe Fund V, LP	Landmark Equity Partners XVI, LP	TA XII, LP
Bunker Hill Capital II, LP	Landmark Equity Partners Co-Investment	TDR Capital III, LP
Calvert Street Capital Partners III, LP	Fund XVI, LP	Thoma Bravo Fund XII, LP
Camden Partners Strategic Fund IV, LP	Lexington Capital Partners, VII	Tiger Iron Old line Fund, LP
Carlyle Partners V, LP	Lexington Co-Investment VII	TPG Partners VI, LP
Carlyle Partners VI, LP	Lexington Middle Market Investors III, LP	TPG Partners VII, LP
CDH Fund V, LP	Lion Capital Fund II, LP	Triton Fund III, LP
Charterhouse Capital Partners IX, LP	Lion Capital Fund III, LP	Triton Fund IV, LP
Clayton, Dubilier & Rice Fund VIII, LP	Littlejohn Fund III, LP	Valhalla Partners II, LP
Clayton, Dubilier & Rice Fund IX, LP	Littlejohn Fund IV, LP	Vector Capital IV, LP
Clayton, Dubilier & Rice Fund X, LP	Littlejohn Fund V, LP	Vestar Capital Partners V, LP
Clearlake Capital Group	LLR Equity Partners IV, LP	Vista Equity Partners Fund IV, LP
Clearlake Capital Group IV	LLR Equity Partners V, LP	Vista Equity Partners Fund V, LP
Clearlake Capital Group V	Lombard Asia IV, LP	Vista Equity Partners Fund VI, LP
Coller Capital Partners VI, LP	Longitude Venture Partners, LP	Vista Foundation Fund II, LP
Coller Capital Partners VII, LP	Longitude Venture Partners II LP	Vista Foundation Fund III, LP
Commonwealth Capital Ventures IV, LP	Longitude Venture Partners III LP	Vistria Fund II, LP
Court Square Capital Partners III, LP	Madison Dearborn Capital Partners V, LP	Vistria Group
Crescent Capital Partners IV, LP	Madison Dearborn Capital Partners VI, LP	Wind Point Partners VII, LP
Crescent Capital Partners V, LP	Madison Dearborn Capital Partners VII, LP	Wind Point Partners VIII, LP
CVC European Equity Partners V-B, LP	Maryland Innovation Opportunity Fund I	Yucaipa American Alliance Fund II LP

MARYLAND STATE RETIREMENT AND PENSION SYSTEM

ALTERNATIVE INVESTMENTS RELATIONSHIP LISTING

as of June 30, 2018

(continued)

Private Real Estate

AEW Senior Housing Fund II, LP	Heitman America Real Estate Trust	Realty Associates Fund X
Blackrock Asia Property Fund III, LP	JP Morgan Investment Management Inc	Rockwood Capital R E Partners Fund VIII, LP
CBRE US Core Partners	LaSalle Property Fund	Rockwood Capital R E Partners Fund IX, LP
CBRE Strategic Partners US Value 5, LP	Lion Industrial Trust	Scout Fund II, LP
CBRE Strategic Partners US Value 6, LP	Lone Star Real Estate Fund II, LP	Secured Capital Japan R E Partners Asia, LP
CBRE Strategic Partners US Value 7, LP	Lone Star Real Estate Fund III, LP	Secured Capital Japan R E Partners IV, LP
Covenant Apartment Fund VII	Lone Star Real Estate Fund IV, LP	Starwood Hospitality Fund II, LP
Federal Capital Partners Fund II	Lone Star Real Estate Fund V, LP	Tristan Capital- European Special Opps 3
Federal Capital Partners Fund III	Lubert Adler Real Estate Fund VI	Tristan Capital- European Special Opps 4
Frogmore Real Estate Partners II, LP	Lubert Adler Real Estate Fund VI-A	UBS Trumbull Property Fund
GI Partners Fund III, LP	Morgan Stanley Prime Property Fund, LLC	Waterton Residential Property Venture XIII
GI Partners Fund IV, LP	Realty Associates Fund IX	

Natural Resources and Infrastructure

Alinda Infrastructure Fund II, LP	Harvest Fund Advisors, LLC	Quantum Energy Partners V, LP
Domain Timber Investments	Natural Gas Partners IX, LP	Quantum Energy Partners VI, LP
EIF US Power Fund IV, LP	Natural Gas Partners X, LP	Quantum Energy Partners VII, LP
First Reserve Fund XII, LP	Natural Gas Partners XI, LP	RMS Forest Growth III,LP
First Reserve Fund XIII, LP	NGP Natural Resources XII	Tortoise Capital Advisors, LLC
Global Timber Investors 9	NGP Midstream & Resources, LP	White Deer Energy, LP
Hancock Timberland X, LP	Quantum Energy Partners IV, LP	

Absolute Return

1977 Merger Arbitrage Fund	Carlson Double Black Diamond	Nephia Palmetto Fund
Aristeia Capital	Empyrean Capital Fund	Nimbus Weather Fund Ltd
Aristeia Co-invest	Fort Global Contrarian	Petershill Private Equity
BlackRock Absolute Return Structural	Graham Tactical Trend	Shoals Financial Opportunity Fund, LP
Bridgewater All Weather	Hudson Bay Fund	Tenacis Systematic Global Macro Fund
Bridgewater Pure Alpha	King Street Capital, LP	

FIXED INCOME RELATIONSHIP LISTING

as of June 30, 2018

Credit/Debt Related

Alchemy Special Opps Fund II, LP	EIG Energy Fund XV, LP	Oaktree Principal Fund V, LP
Alchemy Special Opps Fund III, LP	EIG Energy Fund XVI, LP	Park Square Capital Partners II, LP
Anchorage Capital Partners, LP	Falcon Strategic Partners III, LP	Partners Group European Mezzanine 2008, LP
Apollo Credit Opps Fund III, LP	Falcon Strategic Partners IV, LP	Peninsula Fund V, LP
CarVal Credit Value Fund A, LP	Garda Firvo	Perella Weinberg Partners
CarVal Credit Value Fund II, LP	GSO Credit Alpha Fund II	Prudential Capital Partners III, LP
CarVal Credit Value Fund III, LP	KKR Mezzanine Partners I, LP	Prudential Capital Partners IV, LP
CarVal Credit Value Fund IV, LP	LBC Credit Partners II, LP	Shoreline China Val Fund III, LP
Castle Lake III, LP	Merit Mezzanine Fund V, LP	TA Subordinated Debt Fund III, LP
Castle Lake IV, LP	Oaktree European Principal Fund III, LP	Varde Fund X, LP
Castle Lake V, LP	Oaktree Opportunity Fund VIII, LP	Wayzata Opportunities Fund III, LP
Crescent Capital Mezzanine Partners VI, LP	Oaktree Opportunity Fund VIII B, LP	

MARYLAND STATE RETIREMENT AND PENSION SYSTEM

TERRA MARIA PROGRAM

as of June 30, 2018

Terra Maria Program

Acuitas

Altravue Capital
Matarin Capital Management
Signia Capital Management

Attucks Asset Management

Arga Investment Management, LP
Globeflex Capital LP
Metis Global Partners
Paradigm Asset Management Company, LLC
Redwood Investments, LLC

Capital Prospects LLC

Garcia Hamilton and Associates
Inview Investment Management, LLC
Lebenthal Lisanti Capital Growth LLC
Longfellow Investment Management
LM Capital Group
Matarin Capital Management
Pacific Ridge Capital Partners

Pacific View Asset management
Piedmont Investment Advisors, LLC
Profit Investment Management
Pugh Capital Management
Ramirez Asset Management
New Century Advisors

FIS Group

Algert Global, LLC
Ativo Capital Management, LLC
Global Alpha Capital Management
Metis Global Partners

Leading Edge Investment Advisors

Ativo Capital Management
Black Crane Capital LLC
Black Creek Investment Management, Inc.
Redwood Investments, LLC
Strategic Global Advisors

Bold denotes Program Manager for the Terra Maria Program

EQUITY RELATIONSHIP LISTING

as of June 30, 2018

Equity Long/Short

Criterion Capital Partners Fund
Hoplite OnShore

Indus-Pacific Opportunities Fund
Marshall Wace Eureka Fund

MARYLAND STATE RETIREMENT AND PENSION SYSTEM

EQUITY COMMISSIONS TO BROKERS

for the Fiscal Year Ended June 30, 2018

(Expressed in Thousands)

Brokers (1)	Total Shares	Total Commission
J P Morgan Securities	60,004	\$ 479
Instinet	109,301	460
Cowen Execution Services	116,370	459
Merrill Lynch	98,395	362
Goldman Sachs	109,935	354
Credit Suisse	165,014	304
Morgan Stanley	64,062	238
BNP Paribas	24,196	193
Jefferies & Company	23,451	182
UBS	43,569	180
Loop Capital Markets	13,320	173
Deutsche Bank	71,935	156
Citigroup Global Markets	47,835	149
HSBC Bank	61,961	143
Weeden & Co.	26,042	132
Penserra Securities	6,617	107
Other Broker Fees	227,309	2,326
Total Broker Commissions	<u>1,269,316</u>	<u>\$ 6,397</u>

(1) Proceeds from the sale and disbursements for the purchase of securities are reported net of brokers' commissions. As such, brokers' commissions are not included as investment expenses on the Statement of Changes in Plan Net Assets. Other broker fees include 188 brokers each receiving less than \$100,000 in total commissions.

For the fiscal year ended June 30, 2018, total broker commissions averaged .50 cents per share.

MARYLAND STATE RETIREMENT AND PENSION SYSTEM

LARGEST STOCK & BOND HOLDINGS AT MARKET as of June 30, 2018

EQUITY INCOME SECURITIES:	Shares	Fair Value
Amazon.Com Inc.	132,530	\$ 225,274,494
Apple Inc.	1,196,024	221,396,003
Microsoft Corporation	1,635,636	161,290,066
Facebook Inc. A	765,569	148,765,368
Alphabet Inc. Cl C	90,759	101,255,278
Tencent Holdings Ltd	1,936,600	97,207,054
Nvidia Corporation	347,635	82,354,732
J P Morgan Chase & Co.	740,744	77,185,525
Alibaba Group Holdings SP ADR	409,885	76,045,964
Alphabet Inc. CL A	67,243	75,930,123
Wells Fargo & Company	1,348,640	74,768,602
Unitedhealth Group Inc.	294,906	72,352,238
Exxon Mobil Corporation	835,959	69,158,888
Netflix Inc.	169,607	66,389,268
Pfizer Inc.	1,733,293	62,883,870

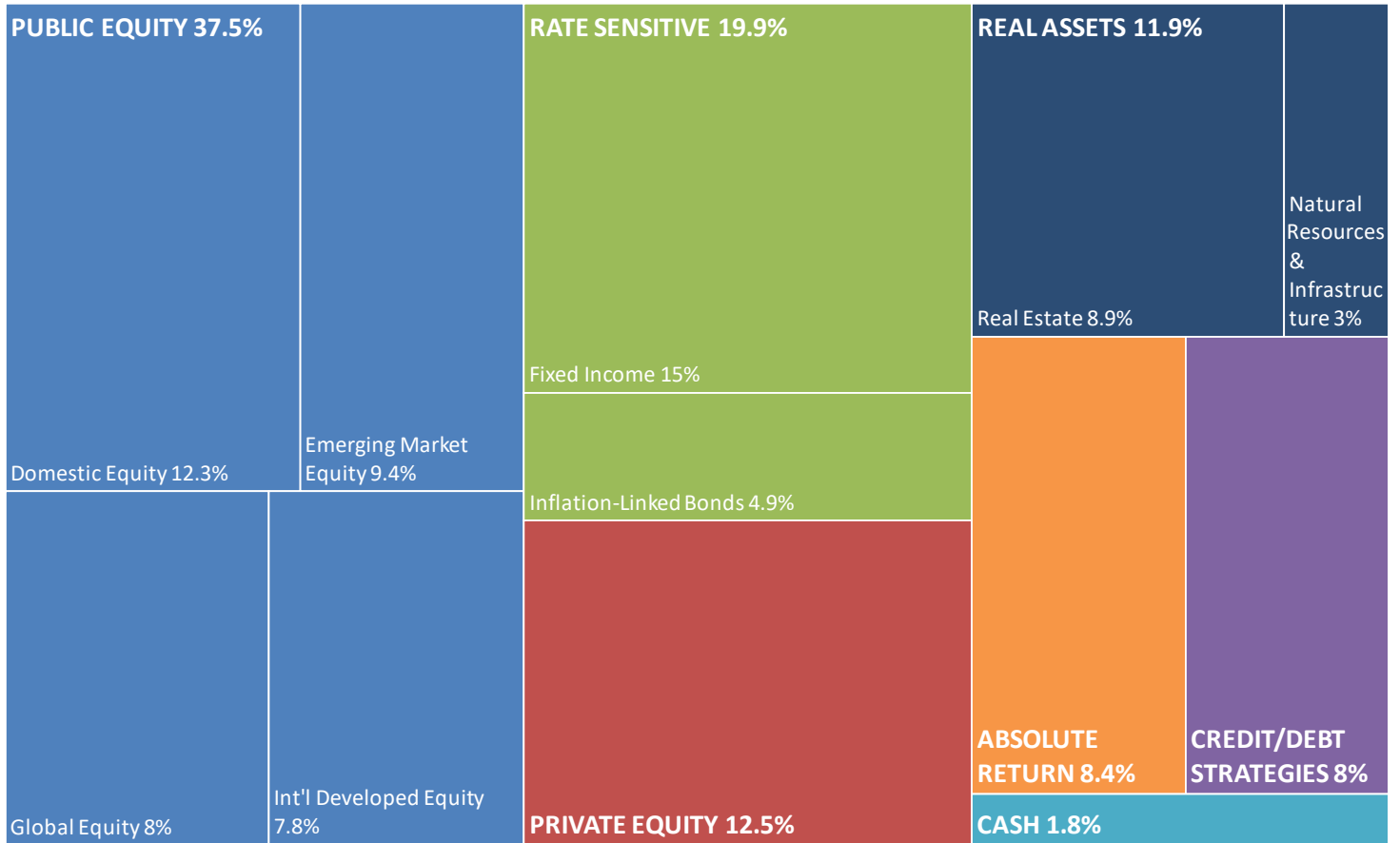
FIXED INCOME SECURITIES:	Par Value	Fair Value
United States Treasury Bonds, 3.125%, due Aug 15, 2044	\$ 292,060,000	\$ 299,898,890
United States Treasury Bonds, 3%, due Feb 15, 2047	275,774,000	276,764,029
United States Treasury Bonds, 3%, due Nov 15, 2044	267,390,000	268,475,603
United States Treasury Bonds, 2.875%, due May 15, 2043	242,200,000	237,980,876
United States Treasury Bonds, 4.375%, due Nov 15, 2039	178,800,000	219,602,160
United States Treasury Bonds, 3.75%, due Nov 15, 2043	161,785,000	183,923,659
United States Treasury Bonds, 3%, due May 15, 2045	162,185,000	162,812,656
United States Treasury Notes, 2.25%, due Aug 15, 2027	168,615,000	160,481,012
United States Treasury Bonds, 3%, due May 15, 2047	157,404,000	157,865,194
United States Treasury Bonds, 4.25%, due May 15, 2039	121,940,000	147,095,003
United States Treasury Bonds, 2.75%, due Aug 15, 2047	124,870,000	119,158,446
United States Treasury Bonds, 3.625%, due Aug 15, 2043	105,620,000	117,733,558
United States Treasury Bonds, 3%, due Feb 15, 2048	116,015,000	116,404,810
United States Treasury Bonds, 3.625%, due Feb 15, 2044	102,800,000	114,682,652
United States Treasury Notes, 1.875%, due Mar 31, 2022	106,200,000	103,150,998

A complete list of portfolio holdings is available upon request.

MARYLAND STATE RETIREMENT AND PENSION SYSTEM

INVESTMENT PORTFOLIO ALLOCATION

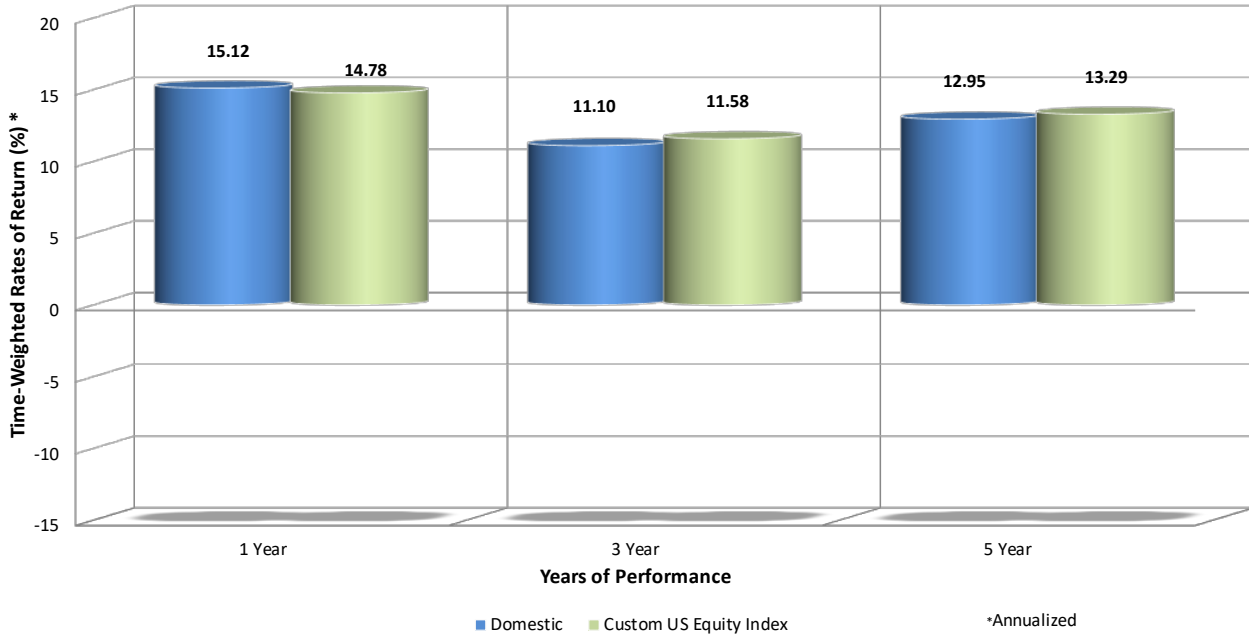
as of June 30, 2018



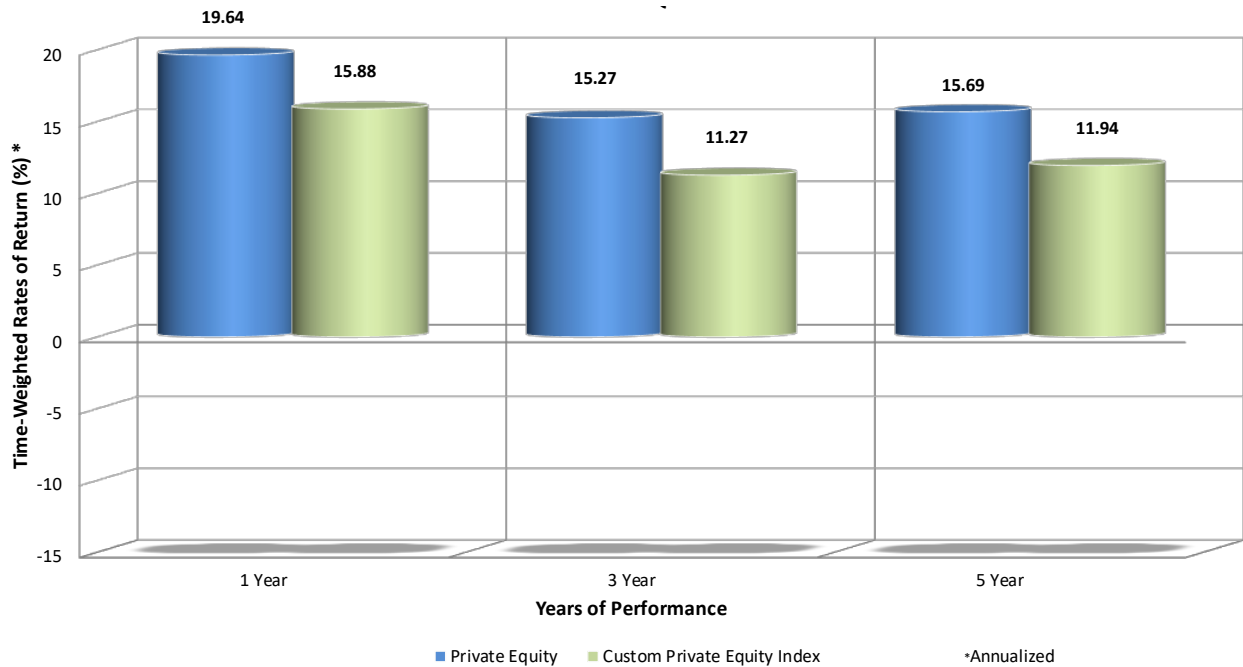
- PUBLIC EQUITY 37.5%
- PRIVATE EQUITY 12.5%
- RATE SENSITIVE 19.9%
- CREDIT/DEBT STRATEGIES 8%
- CASH 1.8%
- ABSOLUTE RETURN 8.4%
- REAL ASSETS 11.9%

MARYLAND STATE RETIREMENT AND PENSION SYSTEM
COMPARATIVE INVESTMENT RETURNS ENDING JUNE 30, 2018

DOMESTIC EQUITY

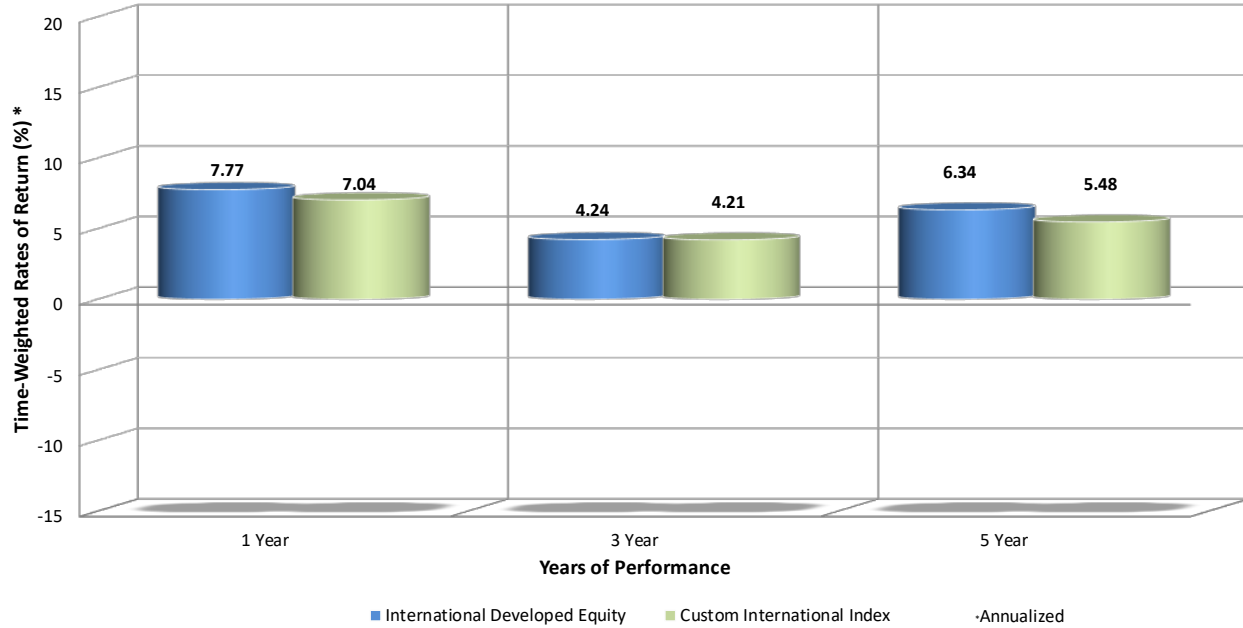


PRIVATE EQUITY

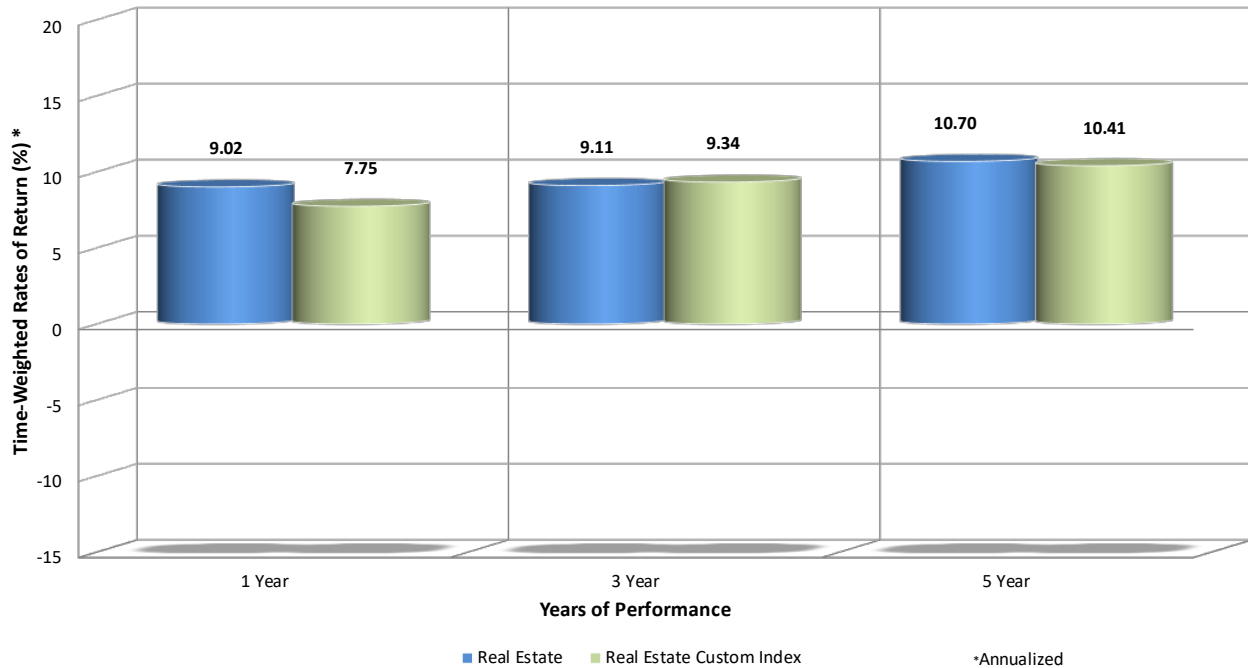


MARYLAND STATE RETIREMENT AND PENSION SYSTEM
 COMPARATIVE INVESTMENT RETURNS ENDING JUNE 30, 2018

INTERNATIONAL DEVELOPED EQUITY

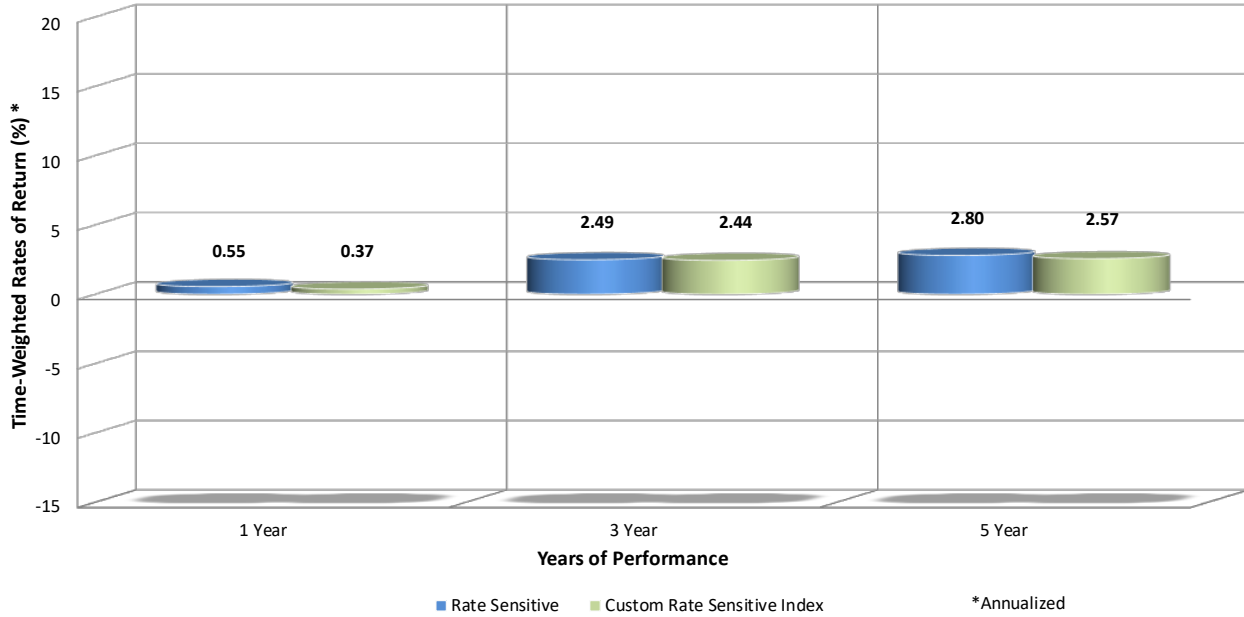


REAL ESTATE

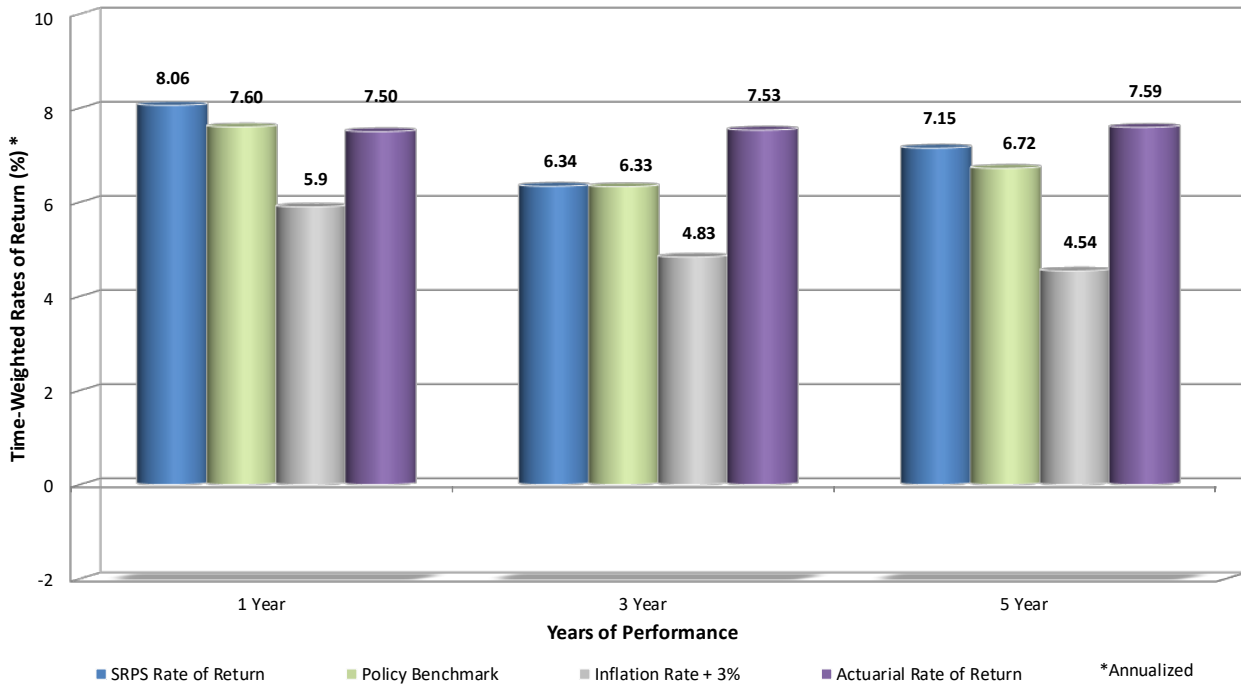


MARYLAND STATE RETIREMENT AND PENSION SYSTEM
 COMPARATIVE INVESTMENT RETURNS ENDING JUNE 30, 2018

RATE SENSITIVE

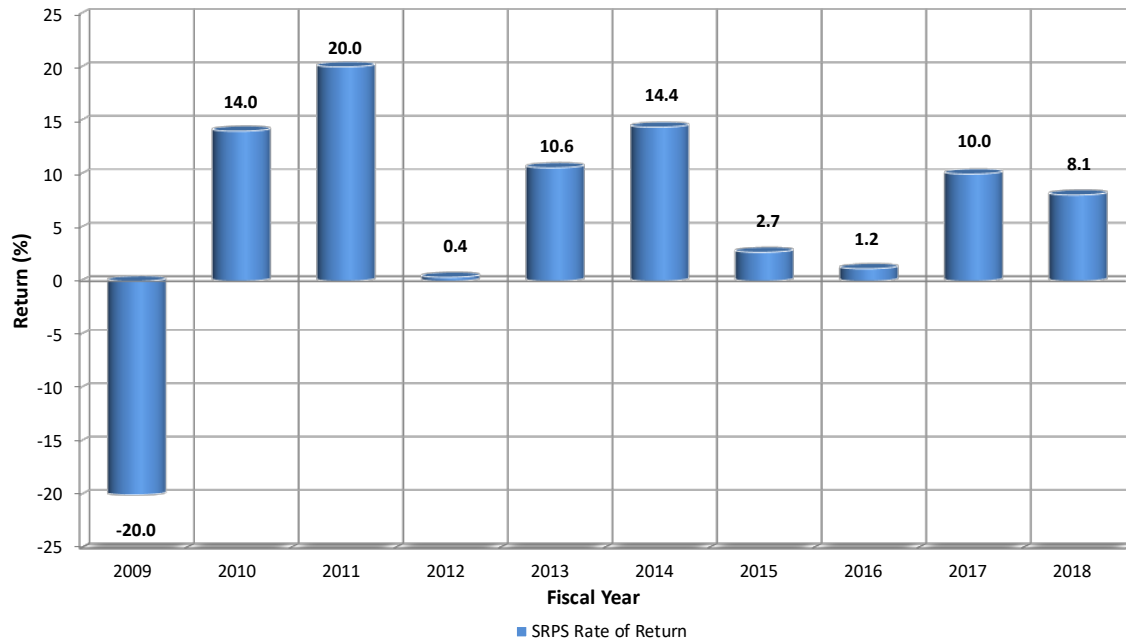


TOTAL PLAN

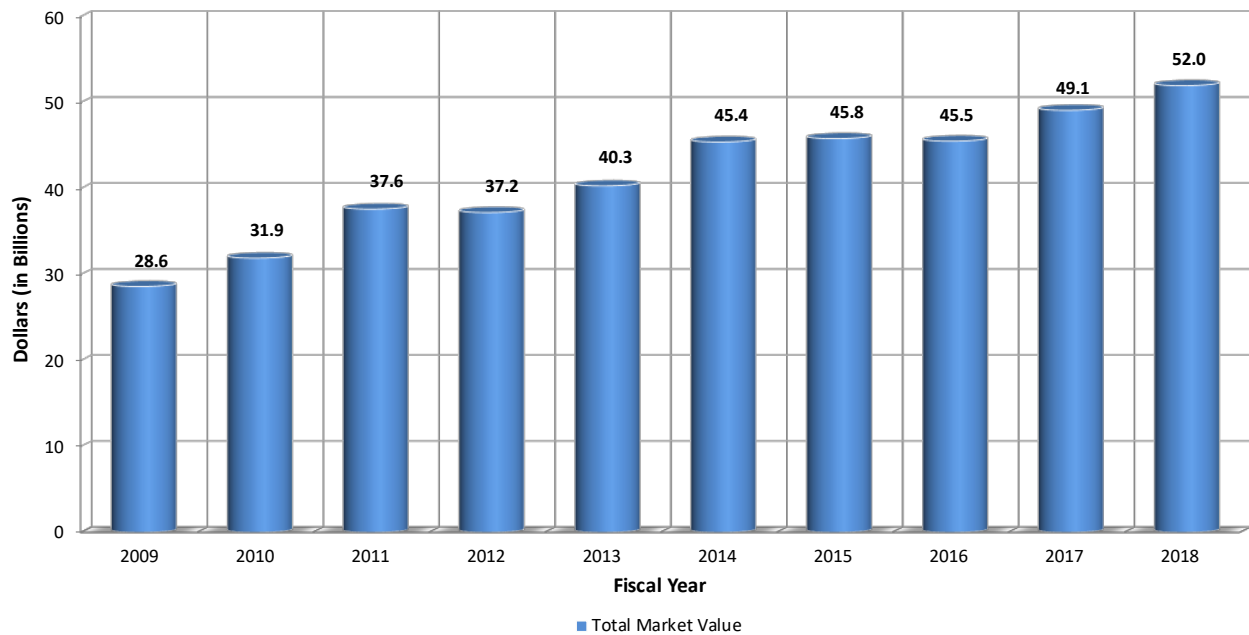


MARYLAND STATE RETIREMENT AND PENSION SYSTEM

TEN-YEAR HISTORY OF TIME-WEIGHTED ANNUAL RETURNS



TEN-YEAR GROWTH OF INVESTMENT PORTFOLIO





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