Investment Section

CHIEF INVESTMENT OFFICER'S REPORT

INVESTMENT OVERVIEW

The Maryland State Retirement and Pension System returned 3.14 percent net of fees in fiscal year 2023, relative to the actuarial return target of 6.80 percent, and 2.20 percent for its policy benchmark. Including the payment of benefits, the market value of assets increased by approximately $573 million, from $64.6 billion on June 30, 2022 to $65.2 billion on June 30, 2023.

While negative performance in bonds persisted in fiscal year 2023 as global central banks continued to raise interest rates in response to high inflation, stocks posted strong returns as enthusiasm around generative artificial intelligence gained momentum, particularly in the second half of the fiscal year. The System's public equity portfolio returned 13.8 percent while the bond portfolio achieved -3.7 percent. The fiscal year performance was not evenly distributed across the other asset classes as the System's energy-related investments achieved strong returns, while real estate generated negative performance. The natural resources and infrastructure portfolio produced a return of 8.7 percent for the fiscal year, while real estate was the weakest asset class at -8.4 percent.

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 distinct 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 3.14 percent for fiscal year 2023 falls short of the Board's long-term expectation for the portfolio, it is 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 Board approved minor adjustments to the asset allocation that included modest increases to U.S. equity, international equity and credit and corresponding decreases in emerging markets equity and treasury inflation protected securities. These changes are expected to enhance the risk and return profile 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 most 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-duration 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 investments. A significant portion of the assets in this category provides a regular 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 in this asset class include event-driven, global macro, relative value and opportunistic funds.

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 that have been 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, meeting or exceeding the actuarial investment return assumption of the System.** The Board adopts the actuarial rate of interest, which was set at 6.80 percent for fiscal year 2023. 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 6.80 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, 2023 are shown below.

ASSET CLASS	LONG-TERM POLICY TARGET	RANGE
Growth/Equity	**50%**	+/-7%
U.S Equity	17%	
International Developed Equity	11%	
Emerging Markets Equity	6%	
Private Equity	16%	
Rate Sensitive	**20%**	+/- 5%
Long-term Government Bonds	10%	
Securitized/Corporate Bonds	6%	
TIPS	4%	
Credit	**9%**	+/- 4%
High Yield Bonds/Bank Loans	8%	
Emerging Market Debt	1%	
Real Assets	**15%**	+/- 4%
Real Estate	10%	
Natural Resources/Infrastructure	5%	
Absolute Return	**6%**	+/- 4%
Total Assets	**100%**	

INVESTMENT PERFORMANCE

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

The investment program realized a return of 3.14 percent, net of all fees, for fiscal year 2023. Annualized returns for the 3-, 5-, 10-, 20- and 25-year periods ending June 30, 2023 were 8.2 percent, 6.9 percent, 7.0 percent, 6.8 percent and 5.6 percent, respectively.

	FY 2023 SRPS Performance	FY 2023 Benchmark Performance	SRPS Exposure June 30, 2023
Public Equity	13.8%		30.2%
Custom Benchmark		13.8%	
U.S. Equity	19.2%		12.3%
Russell 3000		19.0%	
International Equity	16.7%		7.3%
MSCI World ex U.S.		17.4%	
Emerging Markets Equity	3.1%		7.1%
MSCI Emerging Markets		1.8%	
Global Equity	15.1%		3.5%
MSCI AC World Index		16.5%	
Private Equity	0.3%		21.8%
Custom State Street PE		-2.9%	
Rate Sensitive	-3.7%		172%
Custom Benchmark		-3.5%	
BBG U.S. Gov't Long Index		-6.8%	
BBG Securitized		-1.5%	
BBG Corporate		1.6%	
BC U.S. TIPS Index		-1.3%	
Credit/Debt Strategies	6.0%		8.7%
Custom Benchmark		9.0%	
BBG High Yield		9.1%	
S&P LSTA Leveraged Loan		10.7%	
BBG EM Hard Currency Sov		7.7%	
BBG EM USD Corporate		4.2%	
Real Assets	-3.4%		15.4%
Custom Benchmark		-6.7%	
Absolute Return	-1.4%		5.9%
Custom Benchmark		1.4%	
Multi-Asset			
Custom Benchmark	-1.6%		0.4%
		2.20%	
Cash	5.3%		0.4%
Custom Benchmark		3.8%	
TOTAL FUND	**3.1%**	**2.2%**	**100%**

The allocation as of June 30, 2023 reflects the ranges and transitional targets of the System as described in the previous section.

ECONOMIC AND CAPITAL MARKET OVERVIEW

Investment returns between asset classes varied significantly in fiscal year 2023, with growth-oriented assets like public stocks and credit achieving strong returns, while interest rate sensitive investments like real estate and bonds performed poorly. The Federal Reserve continued to aggressively hike the federal funds rate to get inflation under control and on a path toward the 2% target. During fiscal year 2023, the Fed raised interest rates seven times for an aggregate of 3.5%. These increases were in addition to the three hikes in fiscal year 2022 totaling 1.5%. While inflation, as measured by the Consumer Price Index, has receded from its high of 9.1% in June 2022 to 3.0% as of June 30, 2023, it remains above the Fed's 2% target, making additional hikes a possibility.

Contrary to conventional thinking and historical precedence, the U.S. economy has been resilient in the face of higher interest rates, with real gross domestic product over fiscal year 2023 rising over 2%. This economic growth has been fueled by a persistent fiscal stimulus supporting a robust labor market, healthy wage gains and strong consumer spending. The unemployment rate at the end of the fiscal year was 3.6%, below the 3.8% rate when the Fed began raising rates in March 2022. These factors, in addition to enhanced developments and utilization of generative artificial intelligence, fueled strong stock returns in fiscal year 2023.

This environment of high inflation and rising interest rates is not conducive for generating attractive returns in traditional bonds and other interest rate sensitive sectors like real estate. In addition to higher interest rates, the real estate sector, particularly office properties, is challenged by valuation adjustments as companies require less office space due to the continuation of hybrid work models. Higher rates also present refinancing risk, particularly on highly levered properties, as loans financed at low interest rates several years ago must be refinanced at significantly higher levels. Over the course of the fiscal year, the ten-year Treasury yield climbed from roughly 3.0% to 3.85%, a meaningful increase for borrowers with loans that need to be refinanced.

PUBLIC EQUITIES

As of June 30, 2023, approximately $19.7 billion was invested in public equities, representing 30.2 percent of total assets. The public equity program consists of four components: U.S. equities, international developed equities, emerging markets equities and global 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, 2023, 75 percent of the public market Terra Maria program was invested in equities, and 25% was invested in fixed income strategies. 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, 2023, approximately $8.0 billion, or 12.2 percent of total assets, was invested in U.S. public equities. Passively managed U.S. equities totaled $3.7 billion, while Terra Maria program assets were $333 million, representing 5.7 percent, and 0.5 percent of total assets, respectively.

U.S. Equity	$ Millions	% of Total Plan
Passively/Enhanced Managed	**$3,707**	**5.7%**
Actively Managed	**$3,939**	**6.0%**
Terra Maria Program	**$333**	**0.5%**
Total U.S. Equity	**$7,979**	**12.2%**

For fiscal year 2023, U.S. equities returned 19.2 percent, compared to 19.0 percent for its benchmark, the Russell 3000 Index.

B. International Equities

As of June 30, 2023, approximately $4.8 billion, or 7.3% of total assets, was invested in international equities. Passively managed international equities totaled $1.7 billion, while Terra Maria assets were $1.4 billion, representing 2.6%, and 2.2% 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.

International Equity	$ Millions	% of Total Plan
Passively Managed	**$1,715**	**2.6%**
Actively Managed	**$1,621**	**2.5%**
Terra Maria Program	**$1,445**	**2.2%**
Currency Overlay	**-$11.6**	**0.0%**
Total International Equity	**$4,769**	**7.3%**

For fiscal year 2023, international equities, including the impact of the currency overlay program, returned 16.7%, compared to 17.4% for its benchmark, the MSCI World ex-U.S. Index.

C. Emerging Market Equities

As of June 30, 2023, approximately $4.6 billion, or 7.1% of total assets, was invested in emerging market equities. The portfolio is comprised of actively managed assets.

Emerging Equity	$ Millions	% of Total Plan
Total Emerging Markets Equity	**$4,625**	**7.1%**

For the fiscal year, the portfolio returned 3.1% compared to 1.8% for the MSCI Emerging Market Index.

D. Global Equities

As of June 30, 2023, approximately $2.3 billion, or 3.5% of total assets was invested in global equities, which includes both U.S. and foreign stocks. This portfolio is comprised mostly of active mandates.

Global Equity	$ Millions	% of Total Plan
Passive Management	**$125**	**0.2%**
Actively Managed	**$2,190**	**3.4%**
Currency Overlay	**-$2**	**0.0%**
Total Global Equity	**$2,313**	**3.5%**

For the fiscal year, the portfolio returned 15.1% compared to 16.5% for the MSCI AC World Index.

CURRENCY OVERLAY PROGRAM

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 uses low hedge ratios when the dollar is weakening, and high hedge ratios when the dollar is strengthening.

During fiscal year 2023, the currency program generated positive value in the System's foreign equity holdings, as the U.S. dollar strengthened relative to other currencies. The added value of the currency hedging program during the fiscal year was $12.5 million. Since the inception of the currency hedging program, it has served to reduce volatility and improve the risk/return profile of the System's international and global equity portfolios.

PRIVATE EQUITY

As of June 30, 2023, private equity totaled $14.2 billion, or 21.8% of total assets. This asset class includes buyouts, growth equity, venture capital, secondaries and funds-of-funds.

In fiscal year 2023, commitments were made to 26 private equity funds and co-investments, totaling $1.6 billion. Since the inception of the private equity program in fiscal year 2005, $22.2 billion in commitments have been made to 317 different funds and co-investments. Unfunded commitments totaled $5.7 billion as of June 30, 2023. Future commitments will follow a pacing model designed to achieve and maintain the target allocation. In fiscal year 2023, the private equity program generated a time-weighted return of 0.3%, compared to -2.86% for its benchmark, the State Street Private Equity Index. This return is net of all fees, expenses and carried interest.

RATE SENSITIVE

As of June 30, 2023, the rate sensitive portfolio represented $11.2 billion, or 17.1% of total assets. The rate sensitive portfolio returned -3.7% for the year, compared to -3.5% for its blended benchmark: 50% Bloomberg US Government Long Bond Index, 15% Bloomberg US Investment Grade Corporate Index, 15% Bloomberg US Securitized MBS/ABS/CMBS Index, and 20% Bloomberg US Government Inflation Linked Index.

CREDIT/DEBT STRATEGIES

The credit/debt strategies portfolio totaled approximately $5.7 billion, representing 8.7% of total plan assets as of June 30, 2023. Investments in this asset class are held in both liquid and illiquid structures. Typical asset types in the portfolio include: high yield bonds, bank loans, emerging market debt, and private debt. The portfolio has a blended benchmark of 89 percent U.S. (80% Bloomberg U.S. Corporate High Yield Index, 20% S&P LSTA Leveraged Loan Index), and 11 percent Non-U.S. (50% Bloomberg EM Hard Currency Sovereign Index, 50% Bloomberg EM USD Corporate Index). The portfolio returned 6.0% for the fiscal year, versus 9.0% for its benchmark.

REAL ASSETS

The real assets portfolio totaled approximately $10.0 billion, representing 15.4% of total assets as of June 30, 2023. 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, 2023, the largest component of the asset class was real estate, totaling $6.8 billion, or 10.5% of total assets. The remaining assets consisted of investments associated with natural resources and infrastructure totaling $3.1 billion or 4.8% of total assets.

The real assets portfolio returned -3.4% for the fiscal year, compared to -6.7% for its blended benchmark, which consists of approximately 68% real estate with the remainder in natural resources and infrastructure. Real estate achieved a -8.4% return, versus the real estate benchmark return of -10.3%. The natural resources and infrastructure portion of the portfolio achieved a return of 8.7%, outperforming its benchmark by 6.5%, as the System's exposure to energy-related investments exceeded the public market benchmarks.

ABSOLUTE RETURN

The absolute return portfolio totaled approximately $3.8 billion, representing 5.9% of total assets as of June 30, 2023. The portfolio consists of event-driven, global macro, relative value, equity long/short 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 -1.4%, compared to the 1.4% return for its benchmark.

TERRA MARIA PROGRAM

As previously mentioned, the Terra Maria program seeks to identify promising smaller or developing managers. The three 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 Attucks Asset Management, Xponance, Inc., and Leading Edge Investment Advisors.

Terra Maria publicly-traded assets totaled approximately $2.4 billion, or 3.7 percent of total assets at June 30, 2023. The program returned 10.3% for the fiscal year, underperforming its custom benchmark return of 10.9%. The relative performance results have remained positive since the April 2007 inception of the program. The System also invests in emerging managers in other asset classes. In private equity, the System has committed $1.63 billion to developing managers that are minority and women-owned firms.

At the end of fiscal year 2023, $8.5 billion, or 13.1 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 returns. The asset allocation is also the primary determinant in the cost of investing the assets. Thirty-two percent of the policy allocation does not have public market benchmarks and therefore does not have a passive option for implementation. These alternative assets such as closed-end limited partnerships used for private equity, infrastructure and some real estate, in addition to open-end partnerships used for real estate and hedge fund strategies are included in the asset allocation with the objective of earning higher returns over time, reducing risk by providing returns that are differentiated from stock and bond returns, or for both reasons.

These alternative assets are typically structured as limited partnerships with embedded profit sharing provisions to motivate the manager to make profitable investments, and to ensure alignment of interests. Carried interest represents the portion of the investment profits that is earned by managers, and is only paid if performance thresholds are achieved. The percentage of profits that is allocated to the manager is substantially lower than the amount received by the System. Because of this disproportionate sharing of profits, the amounts realized by the System far exceed any incentive earned by investment managers. Large amounts of carried interest should be considered a positive result, as this would imply much greater gains to the System. In calendar year 2022, the System realized an estimated $2,017.4 million in profits from these private alternative investments, while the investment managers, or general partners, earned roughly $370.3 million in carried interest incentives.

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

The investment environment in fiscal year 2023 reflected a third phase of the pandemic. After the initial decline in the level of economic activity and the value of risky assets, fiscal and monetary stimulus created a growth and inflation pulse that caused the Federal Reserve to aggressively ramp up its interest rate tightening campaign to bring down the COVID-era induced inflation rate. While the impact on fixed income instruments and bond proxies like real estate were predictably negative, growth-oriented investments like publicly-traded equities did not follow the traditional playbook. Fueled by strong economic fundamentals and optimism associated with generative AI, stocks achieved double-digit returns in the face of significantly higher rates. Higher interest rates are painful for fixed income assets during their ascent, but the outlook for future bond returns is positive as maturity proceeds and coupon payments are reinvested at higher yields. Short-term investment returns are unpredictable, and the Board expects periods of underperformance relative to long-term assumptions. The most effective way to manage the unknown and achieve long-term objectives is to maintain a diversified and risk-balanced portfolio that exhibits resiliency against large drawdowns associated with concentrated risk exposures. The Board of Trustees has adopted an asset allocation that is designed to achieve the long-term objectives of the fund through various market environments and stressed economic scenarios.

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, 2023 and 2022
(Expressed in Thousands)

		2023		2022	
		Fair Value	**% of Fair Value**	**Fair Value**	**% of Fair Value**
	Rate Sensitive				
	Fixed Income	$ 8,940,923	13.7	$ 8,447,837	13.1%
	Inflation linked bonds	2,300,720	3.5	2,806,918	4.3
(1)	Cash (non-manager)	292,387	0.4	912,044	1.4
(2)	Net cash & cash equivalents (manager)	(89,805)	(0.1)	117,907	0.2
	Total Rate Sensitive	**11,444,225**	**17.5**	**12,284,706**	**19.0**
	Credit				
	High Yield Bond/Bank Loans	4,912,470	7.5	4,478,208	6.9
	Emerging markets debt	623,306	1.0	483,843	0.7
(2)	Net cash & cash equivalents (manager)	156,570	0.2	117,983	0.2
	Total Credit	**5,692,346**	**8.7**	**5,080,034**	**7.8**
	Equity				
	Domestic stocks	7,811,729	12.0	6,633,901	10.3
	Emerging markets stocks	4,564,213	7.0	4,984,522	7.7
	Global stocks	2,182,010	3.3	2,161,314	3.3
	International stocks	4,649,474	7.1	4,032,252	6.2
(2)	Net cash & cash equivalents (manager)	497,236	0.8	613,772	0.9
	Total Public Equity	**19,704,662**	**30.2**	**18,425,762**	**28.4**
	Private Equity	**14,247,446**	**21.9**	**13,881,133**	**21.5**
	Total Equity	**33,952,108**	**52.1**	**32,306,894**	**49.9**
	Absolute Return	**3,803,238**	**5.8**	**4,576,572**	**7.2**
	Commodities	**106,183**	**0.2**	**0**	**0.0**
	Real Estate	**6,816,799**	**10.5**	**7,126,622**	**11.1**
	Multi Asset	**236,252**	**0.4**	**239,978**	**0.4**
	Natural Resources & Infrastructure	**3,092,767**	**4.7**	**2,677,902**	**4.1**
(2)	**Net cash & cash equivalents (manager)**	**60,086**	**0.1**	**341,366**	**0.5**
	Total Portfolio	**$ 65,204,004**	**100.0**	**$ 64,634,074**	**100.0%**

(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, 2023
(Expressed in Thousands)

	Market Value	Investment Advisory Fees
Public Equity		
AQR Capital Management	$ 246,009	$ 1,728
Axiom International Investors	760,812	4,634
Baillie Gifford & Company	1,314,667	5,941
Brown Capital Management	402,665	2,301
D E Shaw & Company	1,529,857	3,123
Dimensional Fund Advisors	834,179	1,794
Durable Capital Partners	666,506	(18,222)*(7)*
Polunin Capital Management	489,056	3,930
Redwheel	320,670	2,238
T. Rowe Price Associates	1,836,214	5,186
Walter Scott & Partners	594,429	2,089
Westwood Global Investment	845,323	5,059
Attucks Asset Management *(1)*	968,546	5,124
Leading Edge Invest. Advisors *(1)*	490,017	2,410
Xponance *(1)*	319,676	2,001
Marshall Wace	566,715	512
Record Currency Management	(13,594)	3,220
Other *(2)*	40,068	4,045
Internally Managed Assets *(6)*	5,572,018	0
Total Public Equity	**$ 17,783,833**	**$ 37,113**

	Market Value	Investment Advisory Fees
Fixed Income Manager		
Credit Suisse Asset Management	$ 495,617	$ 1,299
Dodge & Cox	409,113	626
Double Line US Securitized	532,816	731
MetLife Investment Management	664,963	1,476
Pacific Investment Management Company	1,869,292	2,288
Pine Bridge Investments	839,010	1,180
Western Asset Management	1,645,624	2,435
Attucks Asset Management *(1)*	636,359	1,410
Cash & Cash Equitization	292,386	N/A
Other *(2)*	197	(17)
Internally Managed Assets *(6)*	$ 6,355,383	0
Total Fixed Income	**$13,740,760**	**$ 11,428**
Alternative Investment		
Absolute Return *(1)*	$ 3,821,938	$ 93,884
Commodity	105,824	542
Credit/Debt Related/Rate Sensitive *(1)*	3,395,809	42,926
Multi-Asset *(3)*	236,253	1,121
Private Equity *(1)*	14,247,446	126,806
Public Equity Long/Short *(1)*	1,920,830	36,784
Real Assets		
Harvest Fund Advisors	342,630	2,457
Tortoise Capital Advisors	134,704	855
Natural Resources & Infrastructure *(1)*	972,639	14,625
Private Real Estate *(1)*	6,816,870	60,090
Other *(2)*	1,297	5,258
Internally Managed Assets *(6)*	1,683,171	0
Total Alternative Investments	**$33,679,411**	**$ 385,348**
Total	**$65,204,004** *(4)*	**$ 433,889** *(5)*

(1) Sub-managers separately listed on the following pages
(2) Consulting fees and/or investment managers no longer under contract as of 6/30/23
(3) Assets that represent the overall allocation
(4) Includes assets invested on behalf of the Maryland Transit Administration.
(5) Includes management fees allocated to the Maryland Transit Administration.
(6) Funds separately listed on the following pages
(7) Incentive fee credit

Note: Investment Advisory Fees represents management fees invoiced or reported on capital statements.

MARYLAND STATE RETIREMENT AND PENSION SYSTEM

ALTERNATIVE INVESTMENTS RELATIONSHIP LISTING

as of June 30, 2023

Private Equity

1315 Capital
1315 Capital II
1315 Capital III
Advent International GPE V-D
Advent International GPE VI-A
Advent International GPE VIIIB
Advent International GPE IX
Apax Europe VI-A
Apax Europe VII-A
Apax IX
Apollo Investment Fund VII Eruro Holdings
Apollo Investment Fund VIII (AIF)
Apollo Investment Fund IX
Apollo Investment Fund X
Arcadia II Beteiligungen BTGmbH&Co
Astorg VII
Audax Private Equity Fund III
Audax Private Equity Fund IV
Audax Private Equity Fund V
Audax Private Equity Fund VI
Audax Private Equity Fund VII
Audax Private Equity Origins Fund I
Bain Capital Asia Fund III
Bain Capital Asia Fund IV
Bain Capital Asia Fund V
Bain Capital Europe Fund IV
Bain Capital Europe Fund V
Bain Capital Europe Fund VI
Bain Capital Fund X
Bain Capital Fund XI
Bain Capital Fund XII
Bain Capital Fund XIII
Bain Capital Life Sciences Fund
Bain Capital LifeSciences Fund II
Bain Capital Empire Holdings
Baring Asia Private Equity Fund VI
Baring Asia Private Equity Fund VII
Black River Capital Partners Fund (Agr.A)
Blackstone Capital Partners VI
Blackstone Capital Partners VII
Blue Wolf Capital Fund III
Blue Wolf Capital Fund IV
Bridgepoint Europe Fund V
Bridgepoint Europe Fund VI
Bridgepoint Europe Fund VII
Brinson Partnership 2000 Primary Fund
Brinson Partnership 2001 Primary Fund
Brinson Partnership 2002 Primary Fund
Brinson Partnership 2002 Secondary Fund
Brinson Partnership 2003 Primary Fund
CDH Fund V
ChrysCapital VIII
Clayton Dubilier&Rice Fund VIII
Clayton Dubilier&Rice Fund IX
Clayton Dubilier&Rice Fund X
Clayton Dubilier&Rice Fund XI
Clearlake Capital Partners III
Clearlake Capital Partners IV
Clearlake Capital Partners V
Clearlake Capital Partners VI
Clearlake Capital Partners VII
Coller Capital Partners VI
Coller Capital Partners VII
Coller Capital Partners VIII
Crescent Capital Partners IV
Crescent Capital Partners V
Crowdstrike Holdings . A
CVC Capital Partners VII
CVC Capital Partners VIII
CVC European Equity Partners V-B
Dover Street VII
Equistone Partners Europe Fund IV
Equistone Partners Europe Fund V
Equistone Partners Europe Fund VI
Everstone Capital Partners II
Everstone Capital Partners III
Frazier Healthcare Growth Buyout Fund VIII
Frazier Healthcare Growth Buyout Fund IX
Frazier Healthcare Growth Buyout Fund X
Frazier Healthcare V
Frazier Healthcare VI
Frazier Healthcare VII
Frazier LifeSciences VIII
Frazier LifeSciences IX
Frazier LifeSciences X
Frazier Life Sciences XI
Frontier Fund III
Frontier Fund IV
Frontier Fund V
GGV Capital VII
GGV Capital VII Plus
GGV Capital VIII
GGV Capital VIII Plus
GGV Discovery II
GGV Discovery III
Goldman Sachs Vintage Fund V
Great Hill Equity Partners IV
Great Hill Equity Partners V
Great Hill Equity Partners VI
Great Hill Equity Partners VII
Great Hill Equity Partners VIII
Green Equity Partners IX
Green Equity Investors VII
Green Equity Investors VIII
Harbour Vest Partners VI-Partnership Fund
Hellman&Friedman Capital Partners VI
Hellman&Friedman Capital Partners VII
Hellman&Friedman Capital Partners VIII
Hellman&Friedman Capital Partners IX
Hellman&Friedman Capital Partners X
Hg Co-Investment Fund
Hg Genesis 9
HgCapital 5
HgCapital 6A
HgCapital 7C
HgCapital 8A
Hg Genesis 10 A
HgCapital Mercury A
Hg Saturn 3 A
Institutional Venture Partners XV
Institutional Venture Partners XVI
Institutional Venture Partners XVII
Institutional Venture Partners XVII
  Co-Investments
Jade Equity Investors
Jade Equity Investors II
Landmark Equity Partners Co-Investment
  Fund XVI
Landmark Equity Partners XIV
Landmark Equity Partners XV
Landmark Equity Partners XVI
Lexington Capital PartnersVII
Lexington Co-Investment Partners IV
Lexington Co-Investment Partners V
Lexington Co-Investment Partners V- Overage
Lexington Middle Market Investors III
Lexington Middle Market Investors IV
Lightspeed Opportunity Fund
Lightspeed Opportunity Fund II
Lightspeed Vent Partners Select V
Lightspeed Vent Partners XIV A
Lightspeed Vent Partners XIV B
Littlejohn Fund III
Littlejohn Fund IV
Littlejohn Fund V
Littlejohn Fund VI
LLR Equity Partners IV
LLR Equity Partners V
LLR Equity Partners VI
LLR Equity Partners VII
Longitude Venture Partners II
Longitude Venture Partners III
Longitude Venture Partners IV
Madison Dearborn Capital Partners V
Madison Dearborn Capital Partners VI
Madison Dearborn Capital Partners VII
Madison Dearborn Capital Partners VIII
Maryland Innovation Opportunity Fund I
MBK Partners Fund III
MBK Partners Fund IV
MBK Partners Fund V
MD Asia Investors
MDAsia Investors II
MD Asia Investors III
MD Asia Investors IV
Navis Asia Fund VI
New Mainstream Capital Fund II
New Mainstream Capital Fund III
New Mountain Partners III
New Mountain Partners IV
New Mountain Partners V
New Mountain Partners VI
North Sky CleanTech Fund IV
Orchid Asia V
Orchid Asia VI
Orchid Asia VII
Orchid Asia VIII
Pacific Equity Partners V
Pacific Equity Partners VI
PAG Asia Capital II
PAG Asia Capital III
Partners Group Emerging 2011
Partners Group Secondary 2008
Partners Group Secondary 2011
Partners Group Secondary 2015
Point 406 Ventures 2016 Opportunities Fund
Point 406 Ventures II
Point 406 Ventures III
Point 406 Ventures IV
Point 406 Ventures Opportunities Fund II
Roark Capital Partners IV
Roark Capital Partners V
Silver Lake Partners V
Silver Lake Partners VI
Spark Capital Growth Fund IV
Spark Capital VII
TA Associates XI
TA Associates XII
TA Associates XIII
TA Associates XIV
TDR Capital III
TDR Capital IV
Thoma Bravo Fund XII
Thoma Bravo Fund XIII
Thoma Bravo Fund XIV
Thoma Bravo Fund XV
Tiger Iron Old Line Fund
Tiger Iron Old Line Fund II
Tiger Iron Old Line Fund III
TPG Partners VI
TPG Partners VII
Vista Equity Partners Fund IV
Vista Equity Partners Fund V
Vista Equity Partners Fund VI
Vista Equity Partners Fund VII
Vista Equity Partners Fund VIII
Vista Foundation Fund II
Vista Foundation Fund III
Vista Foundation Fund IV
Vistria Fund I
Vistria Fund II
Vistria Fund III
Vistria Fund IV
Vistria Fund V
Wind Point Partners VII
Wind Point Partners VIII
Wind Point Partners IX
Wind Point Partners X

Co-Investments
AI Co-Invest I-A SCSp
AP IX Connect Co-Invest Holdings
AP IX Pegasus Co-Invest
AP Windsor Co-Invest
FP Group Holdings
BCPE Osprey Investor
Athena Parent Holdings
FH CSF Holdings
GHP SPV-3
PM Coinvest IX
Jade SA Coinvest
LJ Avalon Co-Invest
Indigo
MDCP Co-Investors (Mobius)
Silver Lake Strategic Investors VI
Co-Invest Maximus Aggregator
TDR Capital Arrow Co-Investment
Project Aine Co-Invest Fund
Project CS Co-Invest Fund
VFF IV Co-Invest 4-A
VEPF VII Co-Invest 4-A
VEPF VIII Co-Invest 1-A
CTSI Co-Invest Holdings

MARYLAND STATE RETIREMENT AND PENSION SYSTEM

ALTERNATIVE INVESTMENTS RELATIONSHIP LISTING

as of June 30, 2023

(continued)

Private Real Estate

Abacus Multi-Family Partners V
Abacus Multi-Family Partners VI
AEW Partners Fund IX
AEW PIX MM Co-Invest
AEW Senior Housing Fund II
AEW Senior Housing Fund IV
Ares Industrial Real Estate Fund
Asana Partners Fund III
Brookfield Strategic Real Estate Partners IV
Carmel Partners Investment Fund VII
Carmel Partners Investment Fund VIII
CBRE Strategic Partners US Value 7
CBRE US Core Partners
Clarion Lion Industrial Trust
Clarion Lion Property Fund
Europe Fund III
Federal Capital Partners Fund II
Federal Capital Partners Fund III
FPA Core Plus Fund V
FPA Core Plus Fund VI
Frogmore Real Estate Partners II
GI Partners Fund IV
Heitman America Real Estate Trust
Heitman Value Partners V
HVP V SR Co-Investment
JP Morgan Strategic Property
JP Morgan Sunbelt Residential Development Fund
LaSalle Property Fund
Lone Star Real Estate Fund II
Lone Star Real Estate Fund III
Lone Star Real Estate Fund IV
Lone Star Real Estate Fund V
Lone Star Real Estate Fund VI
Lubert Adler Real Estate Fund VI
Lubert Adler Real Estate Fund VI-A
MetLife Core Property Fund
Morgan Stanley Prime Property Fund
North Haven Real Estate Fund X Global
Rockwood Capital RE Partners Fund IX
Scout Fund II
Starwood Hospitality Fund II
Tristan Capital-European Special Opps 3
Tristan Capital-European Special Opps 4
Tristan Capital-European Special Opps 5
TruAmerica Workforce Housing Fund
UBS Trumbull Property Fund
Waterton Residential Property Venture XIII
Waterton Residential Property Venture XIV

Real Return

Alinda Infrastructure Fund II
Domain Timber Investments
EIF US Power Fund IV
Energy and Minerals Group V
Energy and Minerals Group V-Accordion
First Reserve Fund XII
First Reserve Fund XIII
Global Timber Investors 9
Harvest Fund Advisors
IFM Global Infrastructure Fund
ISQ Global Infra Fund III
MD Global Infrastructure
Natural Gas Partners IX
Natural Gas Partners X
Natural Gas Partners XI
NGP Natural Resources XII
NGP Midstream & Resources
Quantum Energy Partners V
Quantum Energy Partners VI
Quantum Energy Partners VII
Rhumbline DJ Global Infrastructure
Rhumbline Global Natural Resources
RMS Forest Growth III
Stonepeak Opportunities fund
Tortoise Capital Advisors, LLC
White Deer Energy

Absolute Return

Arctos Sports Partners Fund II
Aristeia Partners
Aristeia Select Opportunities II
ASP II Opportunities
Avidity Capital Fund
BFAM Asian Opportunities Fund
Brevan Howard FG Macro Fund
Brevan Howard Alpha Strategies
Bridgewater All Weather
Bridgewater Pure Alpha
Clover Parallel
Contrarian Emma 2
Empyrean Capital Fund
Exodus Point
Fourier Fund
HSCM Bermuda Fund
Hudson Bay Fund
ILS Property Casualty Fund II
John Street Systematic Fund
King Street Capital
King Street Drawdown
King Street Overflow
Kirkoswald Global Macro Fund
Lone Star Fund XI
Nephila Palmetto Fund
Petershill IV
Petershill Private Equity
Pharo Gaia Fund .
PHM IV Co Investment
SGM Co-Investment Fund
Silver Lake Aine II
Standard General II
TORQ Capital
Voloridge
Yiheng Capital Partners

FIXED INCOME RELATIONSHIP LISTING

Credit/Debt Related

AG Potomac Fund
Alchemy Special Opps. Fund II
Alchemy Special Opps. Fund III
Apollo Credit Opps Fund III
Ares Credit Investment Partnership (MD)
Ares Sports, Media, and Entertainment Finance
Berkshire Multifamily Debt III
CarVal Credit Value Fund A III
CarVal Credit Value Fund A IV
CarVal Credit Value Fund A V
CarVal Credit Value Fund A
Carval Credit Value II
Castle Lake III
Castle Lake IV
Castle Lake V
Castlelake Aviation IV Stable Yield
Castlelake Aviation IV Stable Yield Opps.
Castlelake Aviation V Stable Yield
CB HS Aggregrator II
Charlesbank Credit Dislocation Overage Fund
Charlesbank Credit Opportunities Fund III
Crescent Capital Mezzanine Partners VI
CVI Chesapeake Credit Opps A Fund
CVI Chesapeake Credit Opps B Fund
EIG Energy Fund XV
EIG Energy Fund XVI
Falcon Strategic Partners III
Falcon Strategic Partners IV
FP Credit Partners II
GSO Credit Aha Fund II
Hayfin Healthcare Opportunities Fund
Hayfin HOF Co-Invest I
HCRX Holdings
Highbridge Convertible Dislocation Fund
Edelweiss India Special Assets Fund III
KKR Mezzanine Partners I
LCM Partners COPS 4
MD Cumberland Fund
Merit Mezzanine Fund V
Oaktree European Principal Fund III
Oaktree Opportunity Fund VIII
Oaktree Opportunity Fund VIIIB
Oaktree Principal Fund V
OMR Sands I
Orion Minerals Royalty Fund I
Park Square Capital Partners II
Partners Group European Mezzanine 2008
Peninsula Fund V
Perella Weinberg Partners
Prudential Capital Partners III
Prudential Capital Partners IV
Runway Growth Finance
Runway Growth Finance Opportunities Fund
Shamrock Capital Content Fund II
Shamrock Capital Content Fund III
Shamrock CCF II Coinvestment I
Shoreline China Value Fund III
SLA Marcus Co-Invest
TA Subordinated Debt Fund III
Taurus Mining Finance II
Taurus Mining Royalty Fund
Varde Fund X
Waterfall Silver Spring Fund
Wayzata Opportunities Fund III
Whitehorse Liquidity Partners III
Whitehorse Liquidity Partners IV
Whitehorse Liquidity Partners V
Whitehorse Liquidity V Co-Invst
WH Loch Raven Fund

Rate Sensitive

Garda Firvo
Voya MSR Opportunities Fund I

MARYLAND STATE RETIREMENT AND PENSION SYSTEM

TERRA MARIA PROGRAM
as of June 30, 2023

Terra Maria Program

Attucks Asset Management
Arga Investment Management
Birch Run Investments
Cahnning Global Advisors
Garcia Hamilton and Associates
Globeflex Capital
Lisanti Capital Growth
LM Capital Group
Longfellow Investment Management
New Century Advisors
Pacific Ridge Capital Partners
Paradigm Asset Management Company
Phocas Financial Corp
Profit Investment Management
Promethos Capital
Pugh Capital Management
Ramirez Asset Management
Redwood Investments
Semper Capital Management
Sky Harbor Capital Management
Summit Creek Advisors

Xponance
Algert Global
Arga Investment Management
Denali Advisors
EAM Investors
Lizard Partners

Leading Edge Investment Advisors
Ativo Capital Management
Frontier Global Partners
Henry James International Management Inc
Redwood Investments
Strategic Global Advisors

Bold denotes Program Manager for the Terra Maria Program

EQUITY RELATIONSHIP LISTING
as of June 30, 2023

Public Equity

Axiom International Investors Emerging Markets
Baillie Gifford Emerging Markets
Dimensional Fund Advisors Emerging Markets
Durable Capital Onshore
Durable Capital Opportunities

Equity Long/Short
Marshall Wace TOPS China
Marshall Wace TOPS Emerging Markets
Marshall Wace Eureka
Marshall Wace Americas Tops (Long-Only)

Polunin Capital Management
Redwheel Emerging Markets Equity
SSGA Emerging Market Index
T. Rowe Price US Structured Research

INTERNALLY MANAGED ACCOUNTS
as of June 30, 2023

Commodity Structural
Emerging Markets Structural Overlay/ Tactical
Global Equity Tactical
Inflation Sensitive FI Structural
International Equity Structural/ Tactical
MD Global Infrastructure
MD IG Corporate Bonds
MD International ex US Large Cap Equity
MD International ex US Sci-Beta Value Equity
MD Long Government Bonds
MD Securitized Bonds
MD TIPs
MD US Large Cap Equity
MD US Small Cap Equity
Nominal Fixed Income Structural/ Tactical
US Equity Structural/ Tactical

MARYLAND STATE RETIREMENT AND PENSION SYSTEM

EQUITY COMMISSIONS TO BROKERS
for the Fiscal Year Ended June 30, 2023

(Expressed in Thousands)

Brokers (1)	Total Total Shares	Total Total Commission	Average Commission Per Share
CLSA	63,360	$ 546	$ 0.86
Instinet	141,635	324	0.23
JP Morgan	97,910	284	0.29
Citigroup Global Markets	41,673	283	0.68
Citibank	56,407	272	0.48
HSBC Securities	68,363	223	0.33
Gldman Sachs	51,657	209	0.40
Merrill Lynch	75,764	171	0.23
Morgan Stanley	33,310	170	0.51
UBS Securities	47,205	134	0.28
Jeffries &Company	17,958	124	0.69
Macquarie Capital	110,756	114	0.10
Other Broker Fees	246,219	1,634	0.66
Total Broker Commissions	**1,052,217**	**$ 4,488**	**$ 0.43**

(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 Fiduciary Net Position. Other broker fees include 110 brokers each receiving less than $100,000 in total commissions..

For the fiscal year ended June 30, 2023, total broker commissions averaged .43 cents per share.

MARYLAND STATE RETIREMENT AND PENSION SYSTEM

LARGEST STOCK & BOND HOLDINGS AT MARKET

as of June 30, 2023

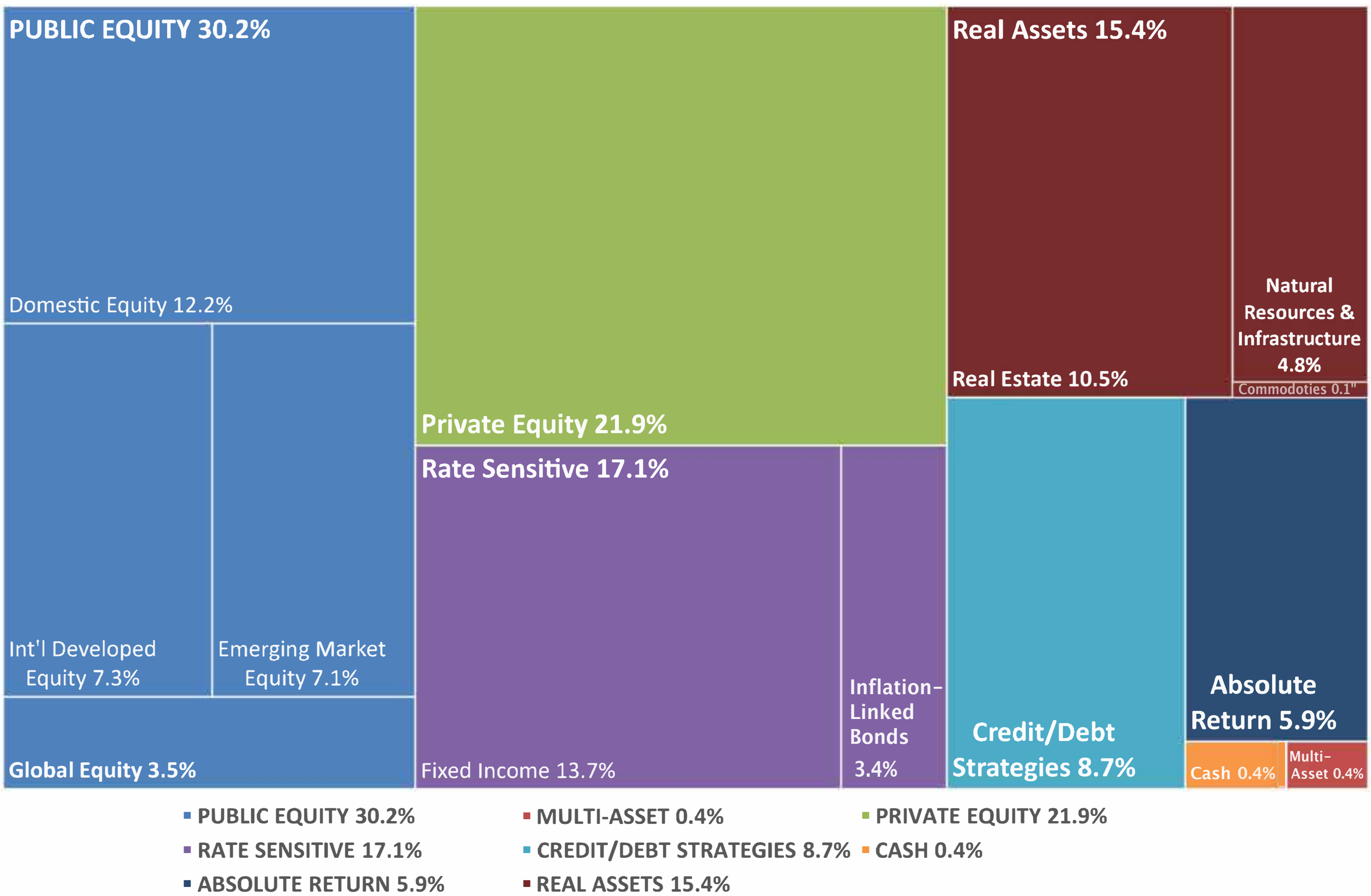
EQUITY INCOME SECURITIES:	Shares	Fair Market Value
Apple Inc.	1,743,820	$338,248,765
Microsoft Corporation	849,102	289,153,195
Nvidia Corp.	375,703	158,929,883
Amazon.com Inc.	1,159,830	151,195,439
Cheniere Energy Inc.	745,092	113,522,217
Tesla Inc.	433,512	113,480,436
Energy Transfer LP	8,750,502	111,131,375
Enbridge Inc.	2,930,678	109,054,664
American Tower Corp.	532,565	103,285,656
Vinci SA	812,961	94,352,754
Enterprise Products Partners	3,344,151	88,118,379
Alphabet Inc. Class A	688,774	82,446,248
Mplx Lp	2,351,764	79,818,870
Asml Holding NV	108,349	78,372,432
National Grid Plc	5,667,029	74,965,752

FIXED INCOME SECURITIES:	Par Value	Fair Market Value
United States Treasury Inflation Linked, 0.25% 15 Jan 2025	$203,613,810	$195,184,198
United States Treasury Bonds, 2.875% 15 May 2043	212,400,000	177,661,980
United States Treasury Inflation Linked, 3.875% 15 Apr 2029	160,518,480	177,313,529
United States Treasury Bonds, 3% 15 Nov 2044	196,000,000	165,857,160
United States Treasury Inflation Linked, 1.75% 15 Jan 2028	166,498,150	164,548,457
United States Treasury Inflation Linked, 3.625% 15 Apr 2028	150,024,800	161,009,616
United States Treasury Inflation Linked, 2.375% 15 Jan 2025	143,210,790	141,709,941
United States Treasury Bonds, 2.5% 15 Feb 2045	176,620,000	136,742,736
United States Treasury Bonds, 1.875% 15 Feb 2041	160,670,000	116,680,161
United States Treasury Bonds, 3% 15 Aug 2052	135,590,000	115,282,686
United States Treasury Inflation Linked, 0.875% 15 Jan 2029	120,122,000	113,684,662
United States Treasury Inflation Linked, 0.125% 15 Apr 2025	117,426,000	111,703,831
United States Treasury Inflation Linked, 3.375% 15 Apr 2032	97,401,600	110,733,931
United States Treasury Bonds, 2.875% 15 May 2052	131,920,000	109,323,423
United States Treasury Inflation Linked, 0.5% 15 Jan 2028	113,127,800	105,802,775

A complete list of portfolio holdings is available upon request.

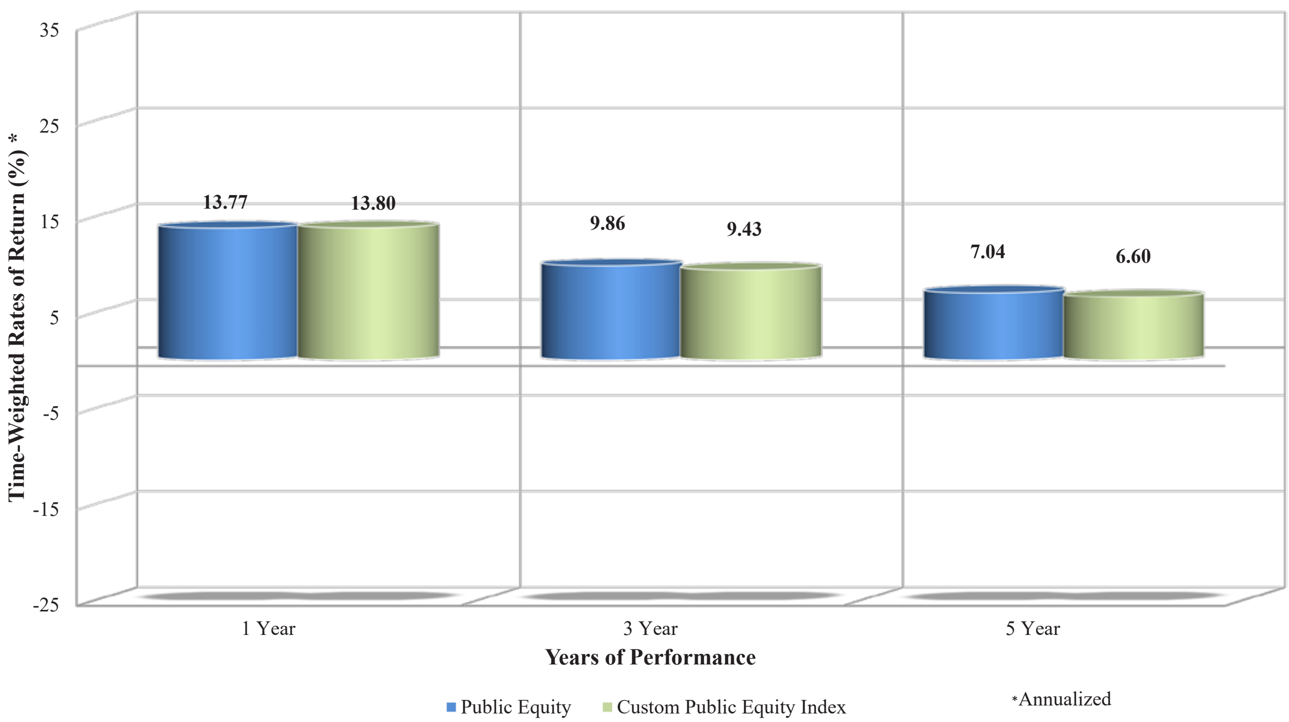
MARYLAND STATE RETIREMENT AND PENSION SYSTEM

INVESTMENT PORTFOLIO ALLOCATION
as of June 30, 2023

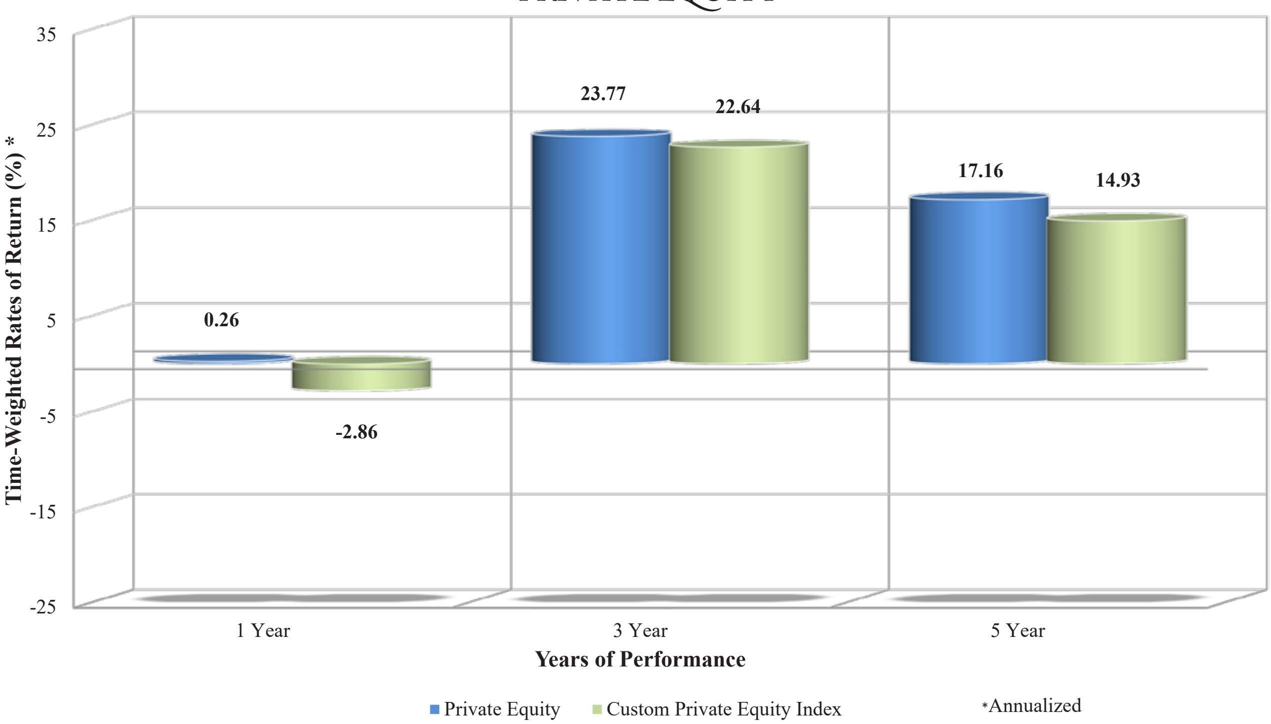


MARYLAND STATE RETIREMENT AND PENSION SYSTEM
COMPARATIVE INVESTMENT RETURNS ENDING JUNE 30, 2023

PUBLIC EQUITY

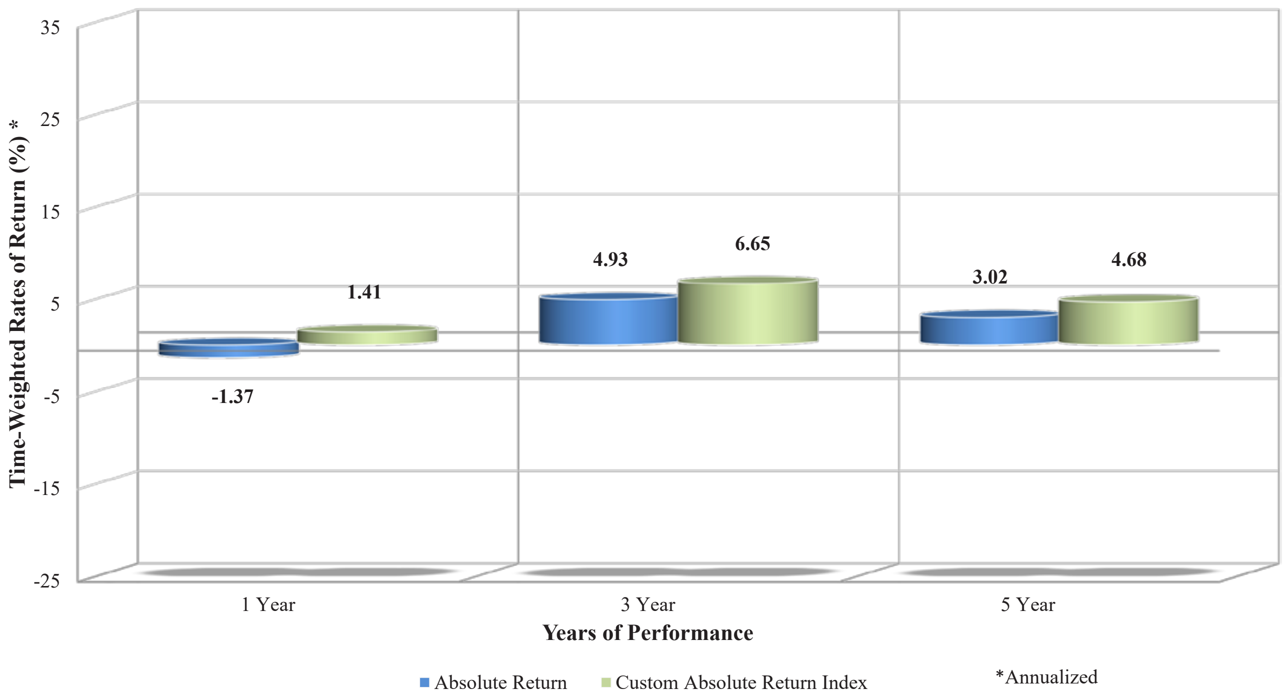


PRIVATE EQUITY

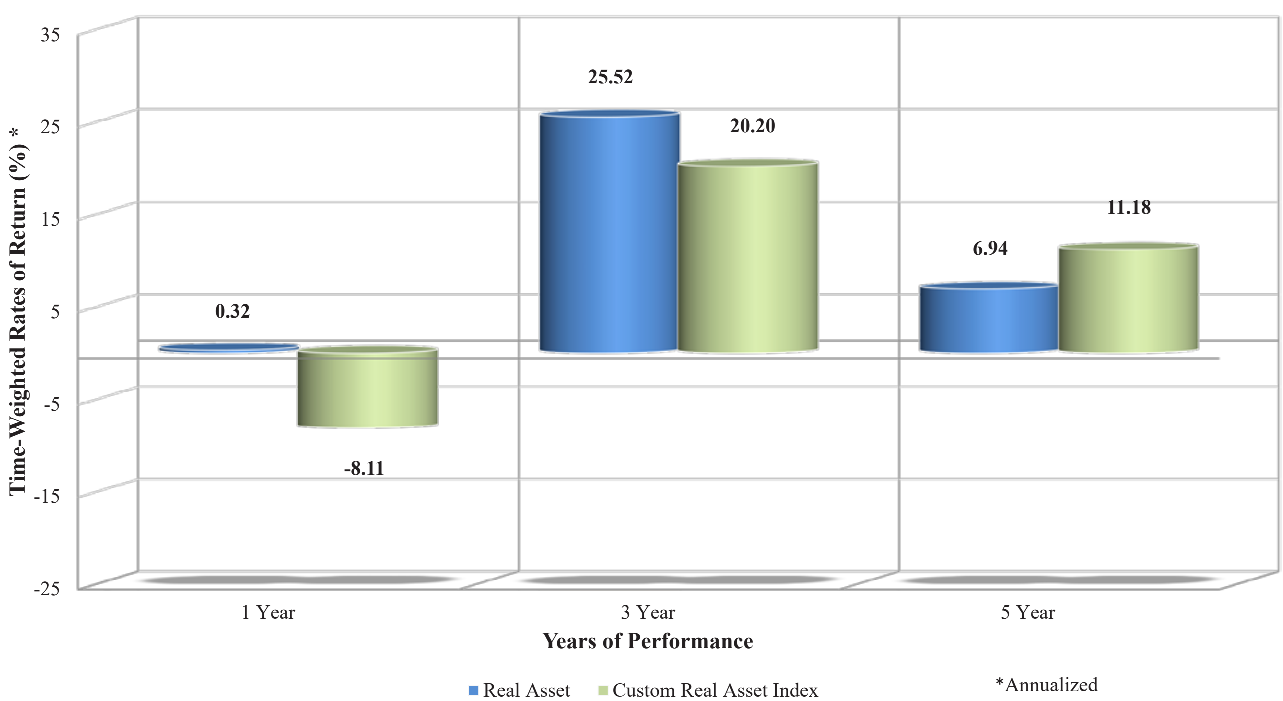


MARYLAND STATE RETIREMENT AND PENSION SYSTEM
COMPARATIVE INVESTMENT RETURNS ENDING JUNE 30, 2023

ABSOLUTE RETURN

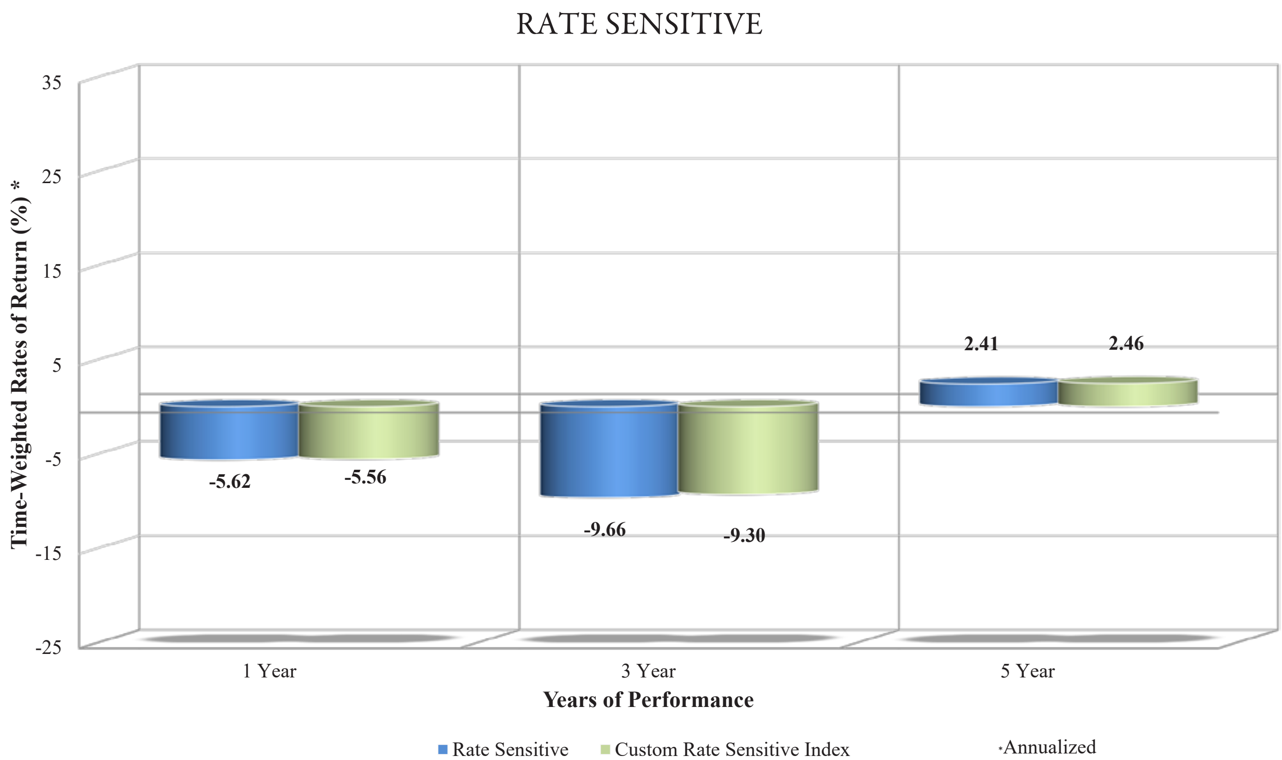


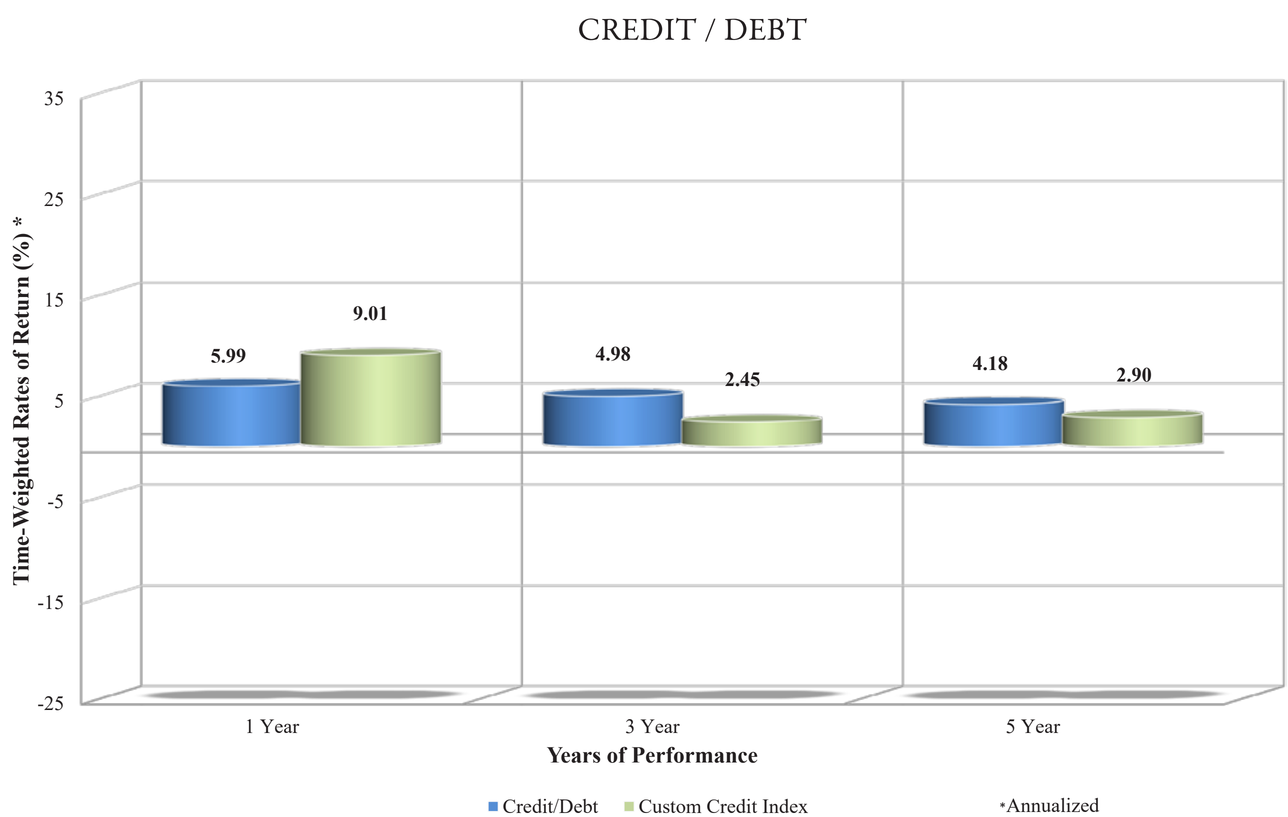
REAL ASSET



MARYLAND STATE RETIREMENT AND PENSION SYSTEM

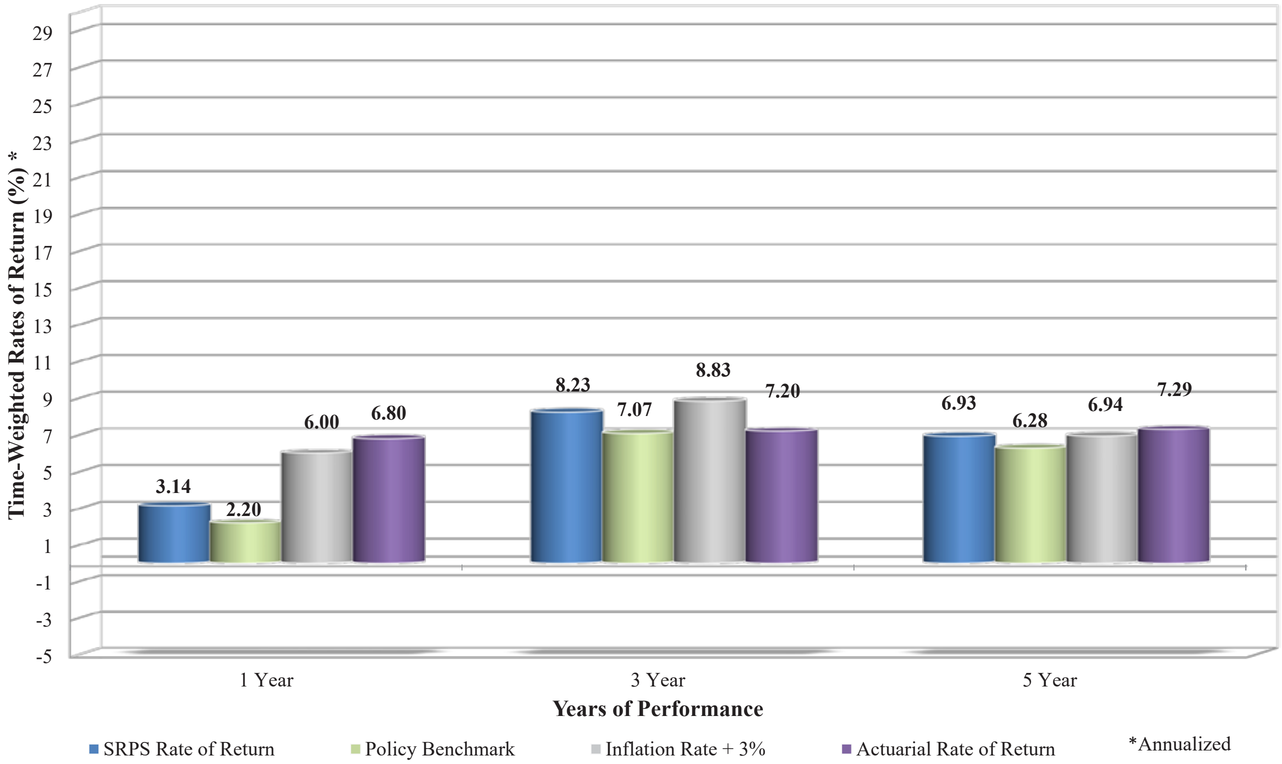
COMPARATIVE INVESTMENT RETURNS ENDING JUNE 30, 2023



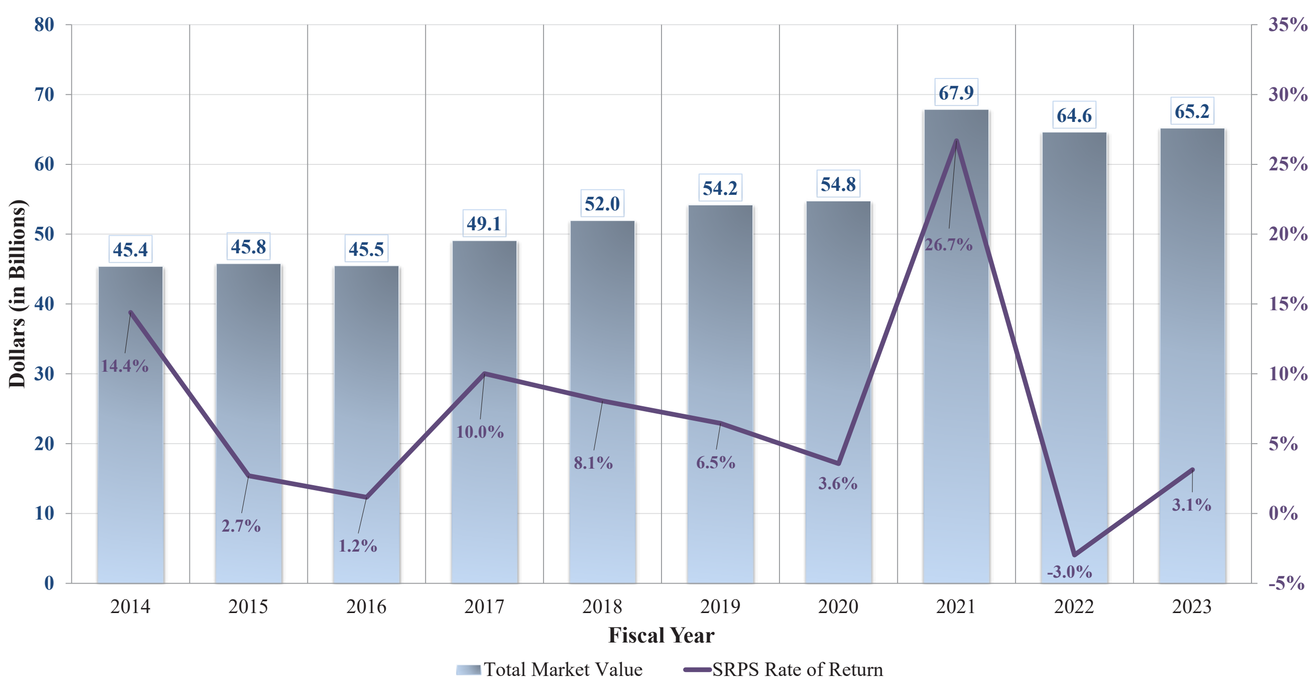


MARYLAND STATE RETIREMENT AND PENSION SYSTEM

TOTAL PLAN



TEN-YEAR HISTORY OF TIME-WEIGHTED ANNUAL RETURNS & GROWTH OF INVESTMENT PORTFOLIO



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