2024
ANNUAL INVESTMENT PLAN

FOR THE YEAR ENDED JUNE 30, 2024

School Employees Retirement System of Ohio
Serving the People Who Serve Our Schools®

SCHOOL EMPLOYEES RETIREMENT SYSTEM OF OHIO
ANNUAL INVESTMENT PLAN
For the year ended June 30, 2024

Prepared by SERS Investment Staff
Farouki Majeed, Chief Investment Officer
300 East Broad Street, Suite 100
Columbus, Ohio 43215-3746
www.ohsers.org
Serving the People Who Serve Our Schools®

TABLE OF CONTENTS

Executive Summary

EXECUTIVE SUMMARY

The Board's Statement of Investment Policy (SIP) requires the Chief Investment Officer prepare and present to the Board for its approval an Annual Investment Plan (Plan). The following document outlines the recommended Plan for Fiscal Year (FY) 2024.

As in prior years, the Plan reviews the economic environment based upon consensus reports from leading sources, SERS' asset allocation target and long-term performance objective for each portfolio, last year's objectives and accomplishments, a review of the market conditions over the last year and objectives for FY2024. Implementation Guidelines for each asset class portfolio are included to provide further details on how each portfolio will be managed in the coming year relative to portfolio construction parameters and risk limits. **This Plan is meant to be a living document subject to adjustment during the year.** If circumstances change or opportunities arise during the year, items will be discussed with the Board which may lead to intra-year changes to the Plan or Strategy Statements.

REVIEW OF FY2023 OBJECTIVES AND IMPLEMENTATION

The general objectives of the Investment Department for FY2023 were as follows:

- *Our major strategic goals remain unchanged. The focus will continue to be value added performance, risk management, cost effectiveness and maintenance of an investment program that meets or exceeds investment objectives over the long-term.*

Total Fund returns exceeded the policy benchmark for all periods over ten years. For FYTD, Total Fund return of 4.41% as of March 2023 exceeded the benchmark by 0.01% which is below expectation but longer term excess returns have added significant value to the Total Fund. For three years the annualized return of 12.88% exceeded the benchmark by 2.03%, and for five years the annualized return was 7.81% with 0.96% excess return. Over ten years the Total Fund generated a return of 8.22% exceeding the benchmark by 0.76% on an annualized basis. The excess returns have been generated with modest active risk well within the limits approved by the Board.

- *Continue to implement the asset allocation framework and targets approved by the Board and implement the leverage program as conditions and return expectations improve.*

Staff has been focused on filling the 5% allocation to Private Credit which has been reached and the increase in Private Equity from 10% to 12% has also been achieved. Staff took the opportunity to implement tactical allocation decisions in 2022 by underweighting equities and fixed income throughout this period following peak valuations at the end of 2021. These decisions helped the Fund to outperform the benchmark significantly and minimize the drawdown that occurred in 2022 due to both equities and fixed income having negative double digit returns.

- *Research new strategies in renewable energy, infrastructure, and commodities and implement on a selective basis.*

New investments in infrastructure and Global macro strategy were approved in FY2023.

FY2024 OBJECTIVES

- Our major strategic goals remain unchanged. The focus will continue to be value added performance, risk management, cost effectiveness and maintenance of an investment program that meets or exceeds investment objectives over the long-term.

- Implement the asset allocation framework and targets approved by the Board in April 2023.

- Continue to develop and engage the Investment team, including adding a new Associate Risk Officer due to a promotion and adding a new Investment Analyst to the team if approved by the Board in the FY24 budget.

CONCLUSION

As of March 31, 2023, SERS' Total Fund had net returns of 7.81% over five years and 8.22% over ten years exceeding the actuarial rate of 7.00% by a good margin thus improving the funded ratio of the plan. Staff will remain focused on adding value relative to policy benchmarks and managing risks and costs.

Staff appreciates the support and guidance received from the Board in FY2023 and looks forward to working with the Board in FY2024 for another successful year.

EXECUTIVE SUMMARY

ACKNOWLEDGEMENTS

SERS is very fortunate to have an experienced and deep Investment Staff. The following individuals contributed to this report.

- Economic Outlook – Farouki Majeed and Hai Yen Le
- Total Fund Asset Allocation – Farouki Majeed
- Global Equities – Judi Masri and Hai Yen Le
- Global Private Equity – Steve Price and Phil Sisson
- Global Fixed Income – Jason Naber
- Global Private Credit – Adam Messerschmitt, Phil Sisson, and Michael Browning
- Global Real Assets – Paul Cheng and Michael Browning
- Cash Equivalents & Securities Lending – Jason Naber
- Opportunistic and Tactical – Farouki Majeed, Phil Sisson, Michael Browning, and Adam Messerschmitt
- Overlay Program – Farouki Majeed, Jason Naber, and Judi Masri
- Investment Risk Management and Analytics – Hai Yen Le and Michael Browning
- Investment Operations – Terri Martin and Katie Swank

We would appreciate the opportunity to review the Annual Investment Plan with you at the June 2023 Board meeting. If you have any questions or comments before then, please let me know.

Respectfully submitted,

Farouki A. Majeed
Chief Investment Officer

Global Economic Outlook

GLOBAL ECONOMIC OUTLOOK

After a strong recovery in 2021, both the US and global economy growth slowed in 2022 and further decline in growth is expected for 2023 as shown in tables below. High inflation and aggressive tightening of monetary policy by the Fed to counter high inflation and labor shortages were major challenges to the US economy in 2022. Geopolitical risk intensified with the Russian-Ukraine war causing inflationary pressures in food and energy prices.

Global inflation increased significantly from 4.7% in 2021 to 8.8% in 2022 and is expected to fall to 6.5% in 2023 according to the International Monetary Fund (IMF). US headline inflation reached its peak of 9.1% in June 2022, then declined to 5.0% in March 2023. Global supply chain improvement and tighter monetary policy as well as slowing economic growth are the main factors helping ease inflation.

The US labor market remained strong although tight, adding 4.8 million jobs in 2022 and 1.1 million jobs in Q1 2023. The unemployment rate remained low at 3.5% in March 2023. To curb inflation, the Fed conducted seven interest rate hikes in 2022, and three hikes in the first five months of 2023 raising the federal funds rate from 0-0.25% in January 2022 to 5.00-5.25% in May. Further action by the Fed will depend on inflation, labor market, and banking system's health. The 10-year rate increased from 1.63% in December 2021 to 3.88% in December 2022 and declined to 3.44% by April 30, 2023. The yield curve has been inverted with 3-month rate being higher than the 10-year rate since October 2022, indicating the economy entered a highly uncertain phase.

In 2022, US equity markets were down 19.2%. Non-US developed markets were also down 14.3% while emerging markets lost 20.1%. US consumer sentiment stayed below the historical average throughout 2022 and Q1 2023, due to persistently high inflation and slower economic growth concerns.

Economic forecasts from the Blue Chip Consensus (US) and the IMF are presented below:

US ECONOMY

The Blue Chip consensus expects the US economy growth rate to slow down to 1.0% in 2023 and 1.1% in 2024 amid concerns of negative impacts of tightening financial conditions to the overall economy (Table 1).

According to the Blue Chip Economic forecasts, the unemployment rate is expected to increase from a historically low level of 3.6% in 2022 to 3.9% in 2023 and 4.5% in 2024. Inflation is expected to trend down further from the 2022 peak to 3.9% in 2023, then 2.5% in 2024. The yield on 10-year US Treasuries is expected to be 3.7% in 2023 and 3.4% in 2024, being lower than 3-Month T-Bill yield as the yield curve is expected to stay inverted through 2023 and 2024. US corporate profits are expected to weaken to negative $0.7 trillion in 2023 and improve to positive $2.3 trillion in 2024. Estimated S&P500 earnings growth is negative 6.8% for Q1 2023. The Analysts' Consensus expected the earnings growth to be negative 6.6% in Q2, then positive 1.4% in Q3, 9.7% in Q4 2023, and 12% for 2024.

Table 1

Period	Real GDP Growth Rate (%)	Unemployment Rate (%)	Inflation Rate CPI (%)	T-Bill 3-Mo. (%)	T-Note 10-Yr. (%)	Corporate Profits (Cur. $)
2019	2.3	3.7	1.8	2.1	2.1	3.9
2020	(2.8)	8.1	1.2	0.4	0.9	(5.9)
2021	5.9	5.4	4.7	0.0	1.4	22.6
2022	2.1	3.6	8.0	2.1	3.0	N/A
2023 Consensus	1.0	3.9	3.9	4.9	3.7	(0.7)
2024 Consensus	1.1	4.5	2.5	3.9	3.4	2.3

Source: Blue Chip Economic Indicators, April 2023

GLOBAL ECONOMY

The IMF forecasted global GDP growth to slow to 2.8% in 2023 and then improve to 3.0% in 2024 (Table 2). For 2023, emerging and developing economies are expected to grow faster than advanced economies as the former's expected growth rate is 3.9% while the latter's is 1.3%. For 2024, emerging and developing economies are projected to marginally increase to 4.2%, maintaining their growth advantage versus the advanced economies which are expected to grow 1.4%.

GLOBAL ECONOMIC OUTLOOK

Table 2

Annual GDP Growth (in percent)	2022	2023 (projected)	2024 (projected)
World	3.4	2.8	3.0
US	2.1	1.6	1.1
Advanced Economies (including US)	2.7	1.3	1.4
Emerging and Developing Economies	4.0	3.9	4.2

Source: International Monetary Fund World Economic Outlook, April 2023

Portfolio Strategy

PORTFOLIO STRATEGY – Total Fund Asset Allocation

Actual asset allocation relative to policy target is shown in the table below:

	FY23 Target	Range	Actual			FY24 Target
			3/31/2023	7/1/2022	7/1/2021	
Global Equities	45%	35 – 45%	41.7%	41.0%	48.6%	40%
Global Private Equity	12%	11 – 17%	12.6%	12.9%	10.4%	14%
Global Fixed Income	19%	13 – 23%	13.3%	12.6%	15.1%	18%
Global Real Assets	17%	17 – 22%	20.9%	20.9%	14.8%	20%
Global Private Credit	5%	3 – 7%	5.8%	4.6%	2.4%	5%
Opportunistic	0%	0 – 5%	3.4%	4.8%	4.3%	0%
Cash	2%	1 – 5%	2.0%	3.0%	4.4%	3%
Total Fund	**100%**		**100%**	**100%**	**100%**	**100%**
Leverage	N/A	0% – 10%	0%	N/A	N/A	N/A
Total Notional Exposure (Including Leverage)	100%	100% – 110%	100%	100%	100%	100%

Staff has maintained an underweight in Global Equities and Global Fixed Income, relative to the FY23 policy targets and overweight in Global Real Assets, overweight in Opportunistic investments and overweight in Cash during FY2023. Total Fund FYTD returned 4.41%, matching the benchmark with a 1bps excess return mostly due to the positive selection effects in Private Equity, Real Assets and Fixed Income as these asset classes exceeded their respective benchmarks.

Both Global Equity and Global Fixed Income, which together account for nearly 60% of the Total Fund, had negative returns in CY2022 as inflation spiked and interest rates tightened causing valuations to compress. Interest rates are likely nearing a peak in the U.S and the Fed fund rate may stay for longer before heading down. The slowing economy is impacting corporate profits negatively. In addition, the liquidity crisis in the banking industry, which started in March 2023 will lead to tighter credit conditions for companies and consumers, could increase the probability of a recession. The current environment is characterized by high volatility in the equity and fixed income markets. Staff believes it would be appropriate to maintain underweight positions in both equity and fixed income relative to targets in this environment, but be prepared to increase the allocation to fixed income when the interest rates have peaked and the yield curve ceases being inverted.

The Board approved a new Asset Allocation Policy effective July 1, 2023. Global Equity was reduced by 5% while Private Equity and Real Assets increased by 2% and 3%, respectively. Fixed Income was reduced by 1% and Cash increased by 1%. The changes increased the Total Fund expected return by 2 basis points and reduced expected risk by 7 basis points while maintaining the cash yield advantage to fund the deficit between pension benefit payments and employee/employer contributions.

PORTFOLIO STRATEGY - Global Equities

INVESTMENT STRATEGY

SERS invests in equity securities to earn a premium over government treasury bonds, which is compensation for assuming the higher risk inherent in public equity securities. A sizeable allocation to Global Equities is necessary to meet the long-term return goal.

SERS' Statement of Investment Policy sets the Global Equities target allocation as follows:

	FY23 Total Fund Target	FY24 Total Fund Target	Permissible Range
Global Equities	45%	40%	35% - 45%

The performance objective of the Global Equity portfolio is to exceed the return of the MSCI All Country World Net Total Return Index (USD) by 30 basis points net of management fees.

REVIEW OF FY2023 OBJECTIVES AND IMPLEMENTATION

FY2023 Annual Investment Plan objectives and related activities are as follows:

- *Monitor the portfolio for possible performance enhancement.*

After outperforming FYTD through February 2023 by 53bps net of fees, Global Equities (GE) underperformed 103bps in the month of March due to the portfolio's marginal value tilt negatively impacting the portfolio after Silicon Valley Bank's bankruptcy and UBS assuming control of Credit Suisse. Overweighting US small cap added value, but overweighting Non-US small cap detracted from the FYTD return. The GE portfolio underperformed the benchmark by 56 bps for FYTD through March 2023 but outperformed for longer periods by 0.44% for 1-Year, 0.43% for 3-Years and 0.35% for 5-Years.

- *Complete the US Equity Small Cap Growth and Core manager searches.*

A Small Cap Growth mandate was hired and funded $50 million on June 1, 2022, and has a since inception excess return of 5.50% through March 2023. A Small Cap Core mandate was hired and funded $50 million in two tranches during October 2022 and February 2023 with a since inception excess return of 1.87% through March 2023.

- *Transition the Global Equity portfolio's structure from regionally specific mandates and benchmarks to global mandates and a global benchmark, the MSCI ACWI. The transition includes allocating to global mandates and converting the regional market allocations to MSCI ACWI geographic allocation ranges.*

The new global equity portfolio with two composites (Global and Regional) was effectively and fully transitioned as of July 1, 2022. As of March 2023, the allocation was 16.4% in the Global Composite and 83.6% in the Regional Composite. Staff has continued to monitor regional weightings in the Regional Composite versus the MSCI ACWI benchmark with an overweight to US and underweights to developed markets (DM) and emerging markets (EM), which has been performance additive.

- *Manage the Global Equity portfolio structure relative to benchmark exposures to achieve appropriate risk and return characteristics.*

Both the US and DM portfolios have slight value tilts and are overweight small cap FYTD. The value tilt was additive FYTD through February 2023, but value was a headwind in March with Silicon Valley Bank's default and UBS saving Credit Suisse. The US small cap overweight was helpful to performance through February, but detracted FYTD in DM.

- *Engage with Wilshire on a portfolio structure review. Global Equity will be reviewed for appropriate US and Non-US allocations, correct benchmarks, active-passive allocation, and detailed manager alignment. Make portfolio adjustments, as necessary.*

Staff engaged with Wilshire on a portfolio review during the first quarter of the FY. Two primary outcomes came from this review:

1. Moving DE Shaw to a portable alpha program in US equities effective October 1, 2022. The mandate has a 1.36% excess return through March 2023.

2. Conducting an EM search with Connor, Clark & Lunn (CC&L) funded $50 million on March 1, 2023.

- *Review IMAs and Investment Guidelines on the review schedule and make necessary adjustments as needed.*

The Arrowstreet Capital IMA was renegotiated in June 2022 for the new global mandate effective July 1, 2022.

CURRENT MARKET CONDITIONS AND OUTLOOK

Cumulative Periods through March 31, 2023		Annualized Returns (in percent)			
	FYTD	1 Year	3 Year	5 Year	10 Year
Russell – 3000 Index	9.75	(8.58)	18.48	10.45	11.73
Russell – 3000 Growth Index	12.56	(10.88)	18.23	13.02	14.16
Russell – 3000 Value Index	6.92	(6.35)	18.12	7.30	8.99
Russell – 1000 Index	9.93	(8.39)	18.55	10.87	12.02
Russell – 2000 Index	6.75	(11.60)	17.51	4.71	8.04
MSCI – AC World Index ($Net)	9.75	(7.44)	15.36	6.93	8.06
MSCI – AC World Ex-USA Index ($Net)	10.03	(5.07)	11.80	2.47	4.17
MSCI – World Ex USA Index ($Net)	13.96	(2.74)	13.49	3.80	4.91
MSCI – Emerging Markets Index ($Net)	0.84	(10.70)	7.82	(0.91)	2.00

Source: Wilshire Compass — Fiscal years begin July 1 and end on June 30

After a strong year in 2021, global equity markets (MSCI ACWI) experienced a large draw down of 25.6% for the first three quarters of 2022 due to persistently high inflation, rising interest rates, and the break-out of the Russia-Ukraine war. The markets bounced back with a 9.8% return in Q4 as Europe avoided an expected recession; China started relaxing its zero COVID tolerance policy; and US growth rebounded. Overall, CY 2022 was a down year for equities as MSCI ACWI was down 18.4%; US equity (Russell 3000) was down 19.2%; Non-US developed markets (MSCI World ex USA) were down 14.3% and Emerging markets (MSCI EM) were down 20.1%. Q1, 2023 was volatile with US regional bank troubles, but all major indices finished positive. With two positive quarters, global equity markets had a gain of 9.8% for FYTD through March 2023.

The US equity market was broadly down in 2022 without exceptions by style or capitalization size. Nevertheless, value stocks (Russell 3000 Value) performed better than growth stocks (Russell 3000 Growth) as rising interest rates were particularly challenging for growth stocks in 2022. Russell 3000 Value was down 8% while Russell 3000 Growth was down 29% in CY2022. The size did not have a great performance impact as large cap stocks (Russell 1000) were down 19.1% and small cap stocks (Russell 2000) were down 20.4% in 2022. However, due to market expectations for an end to the rate hiking cycle and the US regional bank turmoil in March, Value underperformed Growth and Small underperformed Large in Q1 2023. For FYTD as of March 31, the US equity market gained 9.8%.

Non-US Equity Developed Markets (MSCI World ex US Index) posted a (2.7%) return for 2022, outperforming US markets as Europe withstood the energy crisis caused by Russian supply disruption better than expected, and the US dollar depreciated. MSCI World ex US also outperformed the US market for FYTD through March with a 14.0% return; however, the index lagged the US market for the longer periods.

Non-US Equity Emerging Markets (MSCI EM) declined 10.7%, performing worse than developed markets in 2022. China's delayed business reopening from COVID-restrictions and the Russia–Ukraine war had negative impacts on emerging markets' performance in 2022. Emerging Markets rebounded at the end of 2022 and early in 2023, but only delivered 0.8% for FYTD as of March 2023.

Equity market volatility is expected to be elevated due to high interest rates, high inflation, and slower growth or even recession concerns. Thus, global equity returns are expected to be lower near-term. Market valuations are close to the historical average. Emerging and developed ex-US companies are trading at about 15 times earnings while the US equity market is more expensive, trading at 23 times earnings.

PORTFOLIO STRUCTURE

At the end of March, Global Equity was underweight the 45% target allocation by 3.2%. The Staff controlled regional composite has the following exposures:

PORTFOLIO STRATEGY - Global Equities

- The US portfolio was 2.25% overweight relative to its 60.56% MSCI ACWI target allocation,

- The Non-US Developed Market portfolio was underweight by 0.45% relative to its 28.50% MSCI ACWI benchmark target allocation, and

- The Non-US Emerging portfolio was underweight by 1.80% relative to its 10.94% MSCI ACWI benchmark target allocation.

The Global Equities allocation will be reduced to the FY 2024 policy target of 40% and may remain underweight in the near-term, depending on the equity risk adjusted return attractiveness relative to other asset classes in the Total Fund.

Both the US and Non-US portfolios maintain a small capitalization bias and a marginal value style tilt. The value tilt will gradually be reduced as interest rates are nearing their peak. The portfolio will remain overweight to small capitalization stocks, as small caps are undervalued relative to large cap. The US portfolio is currently 71.1% passively managed, which may slightly decline as active low beta managers are expected to outperform passive during a declining market. The Non-US portfolio is 71.6% active in Developed markets and 100% active in Emerging markets as active management is expected to be more successful in more inefficient Non-US Equity markets.

FY2024 OBJECTIVES

Staff will focus on the following objectives during FY2024:

- Monitor the portfolio for possible performance enhancement, completing searches, as necessary.

- Manage the Global Equity portfolio structure relative to benchmark exposures to achieve appropriate risk and return characteristics.

- Review IMAs and Investment Guidelines to make any necessary adjustments.

PORTFOLIO STRATEGY – Global Private Equity

INVESTMENT STRATEGY
SERS invests in private equity to provide risk adjusted returns in excess of those provided by publicly traded equities.

SERS' Statement of Investment Policy sets the Private Equity target allocation as follows:

	FY23 Target	FY24 Target	Permissible Range
Global Private Equity	12%	14%	11% - 17%

The performance objective for Private Equity is to provide returns in excess of the Burgiss All Private Equity Benchmark, one quarter in arrears.

REVIEW OF FY2023 OBJECTIVES AND IMPLEMENTATION
The FY2023 Annual Investment Plan objectives and related activities are as follows:

• *Manage the Private Equity portfolio and fiscal year commitments to reflect the increased investment allocation of 12%, subject to identifying opportunities that meet SERS' investment criteria.*

The Private Equity allocation is 12.6% as of March 31, 2023. This is slightly above the allocation target of 12% but well within the upper range of 16%. To date, $216 million has been committed to three funds, and three co-investments.

• *Review the Private Equity portfolio strategy and structure and develop a plan to improve risk and return characteristics of the portfolio, achieve fee reductions and optimize manager counts as appropriate.*

To date, three commitments have been made to private equity funds with an average management fee of 1.7%. Additionally, three commitments were made to co-investments that have no management fees or carried interest. Together the average management fee on all approved commitments is 1.1%. These private equity commitments are diversified by investment strategy, sector focus and geography.

• *Actively seek co-investment opportunities where appropriate with current SERS' private equity general partners who meet co-investment criteria, as outlined in the Private Equity co-investment guidelines.*

Staff reviewed several co-investment opportunities throughout the fiscal year. Three opportunities met SERS criteria and were approved in fiscal year 2023. The Private Equity portfolio has a total of 13 approved co-investments totaling $139.8 million. The co-investments are in various stages of their life cycle and are generating an IRR of 21% and a 1.8x multiple of invested capital as of December 31, 2022.

• *Research and identify new and innovative investment opportunities with managers who offer compelling return expectations. These new opportunities may be used for a combination of purposes to replace current managers who no longer meet SERS' investment criteria or to target strategies that are not currently a directly invested component of the Private Equity portfolio.*

Staff reviewed over 100 investment offerings during the fiscal year 2023. One opportunity with a new manager met the investment criteria and SERS committed a total of $50 million to this fund in fiscal year 2023.

PORTFOLIO COMPOSITION

	Allocations as of March 31, 2023	Target Ranges
Buyout	80%	55% - 95%
Venture Capital	5%	0% - 10%
Special Situations	10%	5% - 25%
Co-Investments	5%	0% - 25%
Domestic	80%	55% - 95%
International	20%	5% - 45%

PORTFOLIO STRATEGY – Global Private Equity

CURRENT MARKET CONDITIONS AND OUTLOOK

Despite a number of headwinds that included the war in Ukraine, inflation, and growing tension between the US and China, private equity continued to expand its record-breaking run of deal activity during the first six months of the year. However, the Federal Reserve's decision to raise interest rates by 75 basis points and then to continue raising them signaled the end of cheap debt in the buyout markets. The combination of concerns about inflation and rate increases drove speculation about a recession which in turn caused banks to be more cautious about providing debt to private equity backed companies. As a result, year-end totals for private equity deals, exits and fund raising were all down considerably. In taking a closer look at the data. transactions fell to $657 billion in 2022. Although still a large number this was well below the record of $1.1 trillion set in 2021. The volume of deals completed in 2022 fell to 2,318. Fund-raising also declined last year by approximately 16% with a total of $347 billion in capital raised resulting in a total of approximately $3.7 trillion of dry powder available across all fund types and all geographies at the end of 2021. The intense competition for assets that has led to growth in purchase price multiples and made it very difficult for private equity firms to find and purchase companies continued in 2022. Purchase price multiples have risen from approximately 9.0 times earnings in 2011 to an average of 11.9 times earnings in 2022, slightly down from 12.3 in 2021 but still ahead of prior periods. The change in conditions also impacted exits in 2022. Exits declined from over 1,500 exits in 2021 to approximately 600 exits totaling $565 billion in 2022. Economic uncertainty combined with elevated purchase valuations and a steady flow of dry powder once again underscores the importance of identifying and backing high quality private equity managers that remain disciplined in their process, due diligence and selection criteria throughout investment cycles.

Nonetheless, as illustrated in the below table, Private Equity continues to generate solid performance over all periods.

Annualized Returns (in percent) for Periods Ended March 31, 2023				
Fund Type	**1-Year**	**3-Years**	**5-Years**	**10-Years**
SERS Private Equity	1.70	21.64	18.66	18.28
Burgiss Benchmark	(5.76)	17.69	15.52	15.30

Source: Burgiss All Private Equity Index

The long-term outlook for private equity remains positive. In the near term, the industry could be influenced by a wide range of factors that may include the economic effects of higher interest rates, inflation, slower economic growth and global trade implications. It is too early to tell what impact these issues may have on the private equity market, however, in the near-term it is expected that fundraising and exit activity will continue at or near the year end 2022 levels. Valuations remain elevated and investor appetite for private equity is expected to continue to rise. As mentioned earlier, the increased price expectations for sellers has resulted in the average private equity firm paying a higher price to acquire new portfolio companies. However, private equity firms with finely tuned strategies and repeatable value-creation models will prosper. Top quartile private equity managers find ways to overcome problems, generate returns for their limited partners and earn the capability to raise additional funds.

With this in mind, the outlook for the SERS Private Equity portfolio is favorable. Current market conditions reflect positively on the style of investing employed by the general partners that make up the core of the SERS Private Equity portfolio. Quality investments can be identified in the current market; however, finding these companies requires patience, discipline and the ability to fully understand the operations of the target company. The full impact of the pandemic, global trade implications, rising inflation and lower economic growth on private equity remains to be seen. Navigating through these issues to date has required firms to pay close attention to portfolio operations and in some cases reassess their approach to value creation. Top private equity firms understand and displayed their ability to create and maintain value in portfolio companies under difficult conditions in 2020, 2021 and again in 2022, generating an opportunity for investors to separate the top private equity firms more easily from the rest of the pack. SERS' Private Equity portfolio is comprised primarily of general partners who have demonstrated their ability to identify, create value and exit companies in all market environments. In an effort to ensure the portfolio is properly positioned for future uncertainty, our goals for the fiscal year include: continuing to identify and invest with operationally focused managers who primarily target the middle market and avoid the competition in the large and mega space; increasing exposure to attractive investments that meet our criteria and offer lower costs through co-investments; and ensuring that we stay on top of market trends and opportunities by continuing to research and seek out managers offering investment strategies that deliver private equity like returns with differentiated and unique strategies. Additionally, as the Total Fund moves into what many believe will be a low return environment, we will seek to maintain the allocation level of Private Equity to slightly above its target of 14% to obtain the benefit of this higher returning asset class to the Total Fund level. This will take time as Private Equity is a long-term asset class where manager selection is critical and additional capital takes more time to deploy.

FY2024 OBJECTIVES

Staff will focus on the following objectives during FY2024:

- Manage the Private Equity portfolio and fiscal year commitments to reflect the investment allocation of 14%, subject to identifying opportunities that meet SERS' investment criteria.

- Review the Private Equity portfolio strategy and structure and develop a plan to improve risk and return characteristics of the portfolio, achieve fee reductions and optimize manager counts as appropriate.

- Actively seek co-investment opportunities where appropriate with current SERS' private equity general partners who meet co-investment criteria, as outlined in the Private Equity co-investment guidelines.

- Research and identify new and innovative investment opportunities with managers who offer compelling return expectations. These new opportunities may be used for a combination of purposes to replace current managers who no longer meet SERS' investment criteria or to target strategies that are not currently a directly invested component of the Private Equity portfolio.

PORTFOLIO STRATEGY - Global Fixed Income

INVESTMENT STRATEGY

SERS invests in fixed income assets for the primary purpose of risk diversification and decreasing the overall risk of the investment plan. Fixed income assets may include sovereign debt securities, global corporates, securitized securities, private placements, convertibles, derivatives, and currency.

SERS' Statement of Investment Policy sets the Fixed Income target allocation as follows:

	FY23 Target	FY24 Target	Permissible Range
Global Fixed Income	19%	18%	13% - 23%

The performance objective for the Fixed Income portfolio is to exceed the Bloomberg US Aggregate Bond Index, net of manager fees, by 60 basis points over rolling three-year periods.

REVIEW OF FY2023 OBJECTIVES AND IMPLEMENTATION

The FY2023 Annual Investment Plan objectives and related activities are as follows:

- *Manage the portfolio structure and risk relative to the benchmark as the central banks around the globe embark on a rate hiking cycle and quantitative tightening over the next several years.*

The portfolio returned 1.13% through March 2023, outperforming the benchmark by 123 basis points. Rising interest rates have been a headwind to fixed income performance over the last 12 months. The portfolio continued to be underweight interest rate duration during the last year, and this has been the leading contributor to the outperformance. The portfolio has gradually reduced the duration underweight as the Federal Reserve gets closer to the end of its interest rate hiking cycle.

- *Tactically manage the allocations to core, core plus and tactical and diversifying sectors to enhance the risk and return tradeoff. Continue to research other potential new and innovative investment opportunities to mitigate the impact of rising interest rates and diversify sources of return.*

During the fiscal year, $70 million was contributed to core strategies, $50 million to core plus strategies and $60 million to tactical and diversifying strategies. The contributions moved the portfolio to a more defensive position by lowering portfolio duration, allocating to outperforming strategies and reducing the active risk of the portfolio during a period of rising interest rates and higher market uncertainty.

- *Review IMAs and Investment Guidelines to make any necessary adjustments.*

One core manager's contract is currently being fully renegotiated and is expected to be finalized before the end of the fiscal year. A second core manager's investment guidelines were modified in Q2 2023 to position the portfolio more defensively going forward.

CURRENT MARKET CONDITIONS AND OUTLOOK

The Bloomberg US Aggregate Bond Index returned (0.09%) for FY2023 through March 2023. The major sectors of the index had mixed performance during this period. US Treasuries were down 0.76% and mortgages down by 0.88% as rising interest rates and the Fed's ongoing balance sheet reduction program negatively impacted the sectors. Investment grade corporates returned 1.84% with the positive impact of an average yield of 5.24% and credit spread compression offset by a negative impact from higher interest rate exposure in a rising rate environment. The asset-backed sector returned 1.30% with consumer balance sheets remaining healthy, but higher interest rates are starting to have an impact on spending. The best performing core plus sector was high yield debt at 7.19%, which has benefited from an average yield of 8.6%, a below average default rate and credit spread compression during the fiscal year. A 50/50 blend of local currency and US dollar-denominated emerging market debt returned 6.90% fiscal year to date with an attractive 8% average yield. Local currency bonds outperformed US dollar bonds by 3.58% due to the weaker US dollar in FY2023 and ongoing high volatility in emerging markets.

The Federal Reserve conducted the third interest rate hike of 0.25% in 2023, after seven hikes in 2022, in an attempt to curb inflation. Labor markets have been resilient and slowing wage gains may be difficult, so the central bank will remain focused on economic data releases. Markets are anticipating the US to enter a recession at some point in the next 12 months. A neutral to long duration stance will have a positive performance impact if the central bank cuts interest rates to address slowing growth. A cautious stance and a focus on high quality fixed income sectors like US government, agency mortgage back securities and investment grade corporates are warranted given the uncertain outlook.

PORTFOLIO STRUCTURE

The Fixed Income portfolio is currently weighted 47% core, 41% core plus and 12% to tactical and diversifying strategies. The portfolio currently has a yield of 5.39% relative to the benchmark yield of 4.39% with an average investment grade credit rating of A+, which is two grades lower than the benchmark rating of AA. The Federal Reserve may have reached the end of its rate hiking cycle and expects to keep rates at this level until the end of 2023. During the fiscal year, the portfolio duration moved closer to the benchmark duration by 0.4 years and stood at 0.3 years shorter than the benchmark duration at the end of March 2023. Going forward, we expect to continue to increase portfolio duration in FY2024 in anticipation of future interest rate cuts.

The portfolio is underweight US government assets and overweight credit sectors to earn additional yield and price appreciation over the benchmark. The allocation to US Treasury and Agency securities increased by 3% over the year as the portfolio reduced risk. Allocations to emerging market debt and high yield debt were reduced by 3% during the year as the portfolio's core plus exposure was reduced. The portfolio allocation to mortgages increased by 4% during the year but continued to be underweight as the Federal Reserve continues to reduce the mortgage allocation on its balance sheet. The asset-backed exposure was stable during the year while the commercial mortgage-backed exposure remains underweight due to the unfavorable outlook for the sector.

FY2024 OBJECTIVES

Staff will focus on the following objectives in FY2024:

- Manage the portfolio structure and risk relative to the benchmark as central banks globally reach peak interest rates and the potential for a US recession grows.

- Explore ways to increase the fixed income allocation to reduce the current underweight using cash securities or derivatives as the outlook for fixed income assets is attractive going forward.

- Tactically manage the allocations to core, core plus and tactical and diversifying strategies to enhance the risk and return tradeoff. Continue to research new and innovative investment opportunities to position the portfolio for a potential recession, falling interest rates and to diversify sources of return.

- Engage with Wilshire on a Fixed Income portfolio structure review focusing on strategy allocations, manager and sector weights and consider new strategies. Make portfolio changes as appropriate.

- Review IMAs and Investment Guidelines to make any necessary adjustments.

PORTFOLIO STRATEGY – Global Private Credit

INVESTMENT STRATEGY
SERS invests in private credit to provide risk adjusted returns in excess of those offered by publicly traded fixed income securities and to generate a consistent cash yield.

SERS' Statement of Investment Policy sets the Global Private Credit target allocation as follows:

	FY23 Target	FY24 Target	Permissible Range
Global Private Credit	5%	5%	3% - 7%

The performance objective for Global Private Credit is to produce net of fee returns in excess of the 90-day Treasury bill rate + 4.5%, one quarter in arrears.

REVIEW OF FY2023 OBJECTIVES AND IMPLEMENTATION
The FY2023 Annual Investment Plan objectives and related activities are as follows:

• *Increase the Private Credit allocation to 5% of the Total Fund by making new investments that fit the SERS' investment policy, while managing the portfolio in conjunction with the pace of capital drawdowns for existing commitments.*

At the end of 2022, the Global Private Credit allocation increased to 5.8% of Total Fund and exceeded the policy target of 5%. To date, Staff executed nearly $1.5 billion in new capital commitments and total unfunded capital commitments decreased to $800 million from the prior year as new fund investments progress through the investment period. Of the new capital commitments executed, $230 million was completed during fiscal year 2023. Deployment has slowed since the portfolio is over target, which has been amplified by the volatility in the public markets.

• *Build the Private Credit allocation in line with the implementation guidelines and ensure appropriate risk and return characteristics are present within the new target allocation.*

Staff executed $1.3 billion in capital commitments to investments that fall within the direct lending sub-asset class and $175 million within the stressed/distressed sub-asset class. The portfolio weight exceeded the target allocation of 5% by 80 basis points at the end of 2022, but all sub-asset classes fell within the ranges stated in the implementation guidelines. In addition, Staff executed investments that are diversified across industries, geographies, and types of private credit instruments. Most of the new investments have been made within the direct lending sub-asset class, which is primarily comprised of investments that are senior in the capital structure of a company, contain a contractual income component, are structured with robust covenants to protect investors, and have priority over a company's cash flows or other assets in the event of a default.

• *Evaluate new investments with a cautious approach given the economic outlook and the rising interest rate environment, while focusing on increasing the cash yield of the portfolio and income distribution to the Total Fund.*

All the investments that have been executed or considered for the Private Credit portfolio include an income component, which is expected to comprise the largest part of the investment return. Most of the underlying investments within private credit funds include a contractual cash payment that is distributed to investors in the form of income on a quarterly basis. As base rates increase, the income generated from the underlying loans also increases. During the fiscal year, Staff remained focused on investing with managers with robust due diligence processes and closely monitored the ability of portfolio companies to withstand a rising interest rate environment and the potential for a slowing economy.

• *Consider differentiated strategies that can add further diversification to the portfolio while also contributing to the portfolio's return and cash yield.*

During the fiscal year, Staff reviewed numerous differentiated strategies that could provide additional diversification benefits to the portfolio and will continue to consider new strategies that could be a fit for the portfolio. Overall capital deployment has slowed given the target allocation for Private Credit has been exceeded, but as capital becomes available, Staff will continue to consider adding differentiated strategies to the portfolio.

• Continue to look for co-investment opportunities with existing managers that could be a fit for the portfolio and that increase the portfolio's cash yield.

There were no co-investments made during the fiscal year. Staff reviews co-investment opportunities if they arise, but the volume tends to be less than other private asset classes and the speed of execution tends to be much quicker.

PORTFOLIO STRATEGY – Global Private Credit

CURRENT MARKET CONDITIONS AND OUTLOOK

The private credit market continued to grow in 2022 and reached an estimated $1.4 trillion in assets under management at the end of the year, which was higher than earlier forecasts. The private credit market is forecast to reach over $2 trillion in the next several years. During 2022, fundraising activity slowed given the economic uncertainty and rapidly increasing interest rates as the Federal Reserve shifted its monetary policy. Many investors paused on new investments within the private credit space given the uncertainty of corporate earnings growth, rising inflation, and the ability of companies to service debt obligations. Nonetheless, over $200 billion was raised within private credit funds during 2022. The direct lending strategy raised approximately $90 billion during the year, which was a decrease from 2021. The leveraged loan market faced a sharp decline in new issuances throughout most of the year as traditional banks pulled back from lending to the middle-market, but activity began to pick up towards the end of 2022. As seen in prior years, larger companies turned to the private credit market for financing needs given the lack of readily available capital. Loan defaults also began to increase across the credit markets and the level of U.S. distressed loan increased drastically to an estimated $100 billion towards the end of 2022. It is estimated that loan default rates will continue to trend upwards in the coming years as companies need to recapitalize balance sheets to deal with rising costs and interest rates. However, deal activity continued to remain strong within the private credit market since many companies had no alternative source of financing, which led to a lender-friendly market with tighter covenants and better pricing terms for investors.

The private credit market began to experience valuation markdowns during 2022, primarily due to mark-to-market movements impacting broader public markets. However, cash yields continued to increase with rising interest rates, providing an attractive return for investors. In particular, the income focused direct lending strategy delivered an estimated 9.5% yield to investors, which was an attractive premium over the U.S. non-investment grade, U.S. investment grade, and 10-year U.S. Treasury yields of 8.6%, 5.3%, and 3.7%, respectively.

The outlook for the private credit market is positive with considerable growth still expected even with the uncertain economic stability in coming years. The regional banking crisis in the first quarter of 2023 gives rise to the possibility for increased regulatory scrutiny, declining net interest rate margins, and a reassessment of their lending business model. As regional banks reassess and regroup, they may restrain their lending, which could result in additional deal flow for private lenders.

The general expectation is that the Federal Reserve will slow its interest rate increases, but that interest rates will remain elevated for longer than originally expected. While rising rates may negatively impact other assets classes, it can add to returns within the private credit asset class since many loans are structured with a floating interest rate. But the likelihood of higher default rates also increases given the uncertainty around whether the borrowers will be able to withstand interest rates at these higher levels for an extended period. Therefore, it is important for private lenders to conduct a rigorous underwriting process on portfolio companies to ensure borrowers can withstand the impacts of further interest rate increases. Since the pipeline of opportunities is expected to be robust, private lenders can be even more disciplined when selecting borrowers. Thus, resulting in the ability to originate loans with better protections in place for the lender, while providing downside protection and an attractive cash yield for investors.

FY2024 OBJECTIVES

Staff will focus on the following objectives in FY2024:

- Manage the Private Credit allocation within the target allocation range while considering the pace of drawdowns for new investments and re-evaluate existing manager performance as new capital is raised.
- Build the Private Credit allocation in line with the implementation guidelines and ensure appropriate risk and return characteristics are present within the target allocation.
- Evaluate new investments with a cautious approach given the economic outlook and the rising interest rate environment, while focusing on increasing the cash yield of the portfolio and income distribution to the Total Fund.
- Consider adding differentiated strategies to the portfolio if capacity permits that could add further diversification to the portfolio, while also contributing to the portfolio's return and cash yield.
- Review the appropriateness of the benchmark and recommend changes if necessary.

PORTFOLIO STRATEGY - Global Real Assets

INVESTMENT STRATEGY

The role of SERS' Global Real Assets portfolio is to provide a stable income return from tangible assets, to be a partial inflation hedge over the long term and to provide low correlation to equities.

SERS' Statement of Investment Policy sets the Global Real Assets target allocation as follows:

	FY23 Target	FY24 Target	Permissible Range
Global Real Assets	17%	20%	17% - 22%

The performance objective for Global Real Assets is to produce net of fee returns in excess of the NCREIF Property Index ("NPI"), one quarter in arrears, over a market cycle, with the income component of the return comprising a significant portion of the total return.

REVIEW OF FY2023 OBJECTIVES AND IMPLEMENTATION

The FY2023 Annual Investment Plan objectives and related activities are as follows:

- *Formulate and implement a portfolio allocation strategy that factors in macroeconomic risks.*

FY2023 was impacted by inflation and economic uncertainty. Staff submitted redemptions from private and public real estate managers that are more correlated to economic growth. Staff also made a new commitment to a core infrastructure fund that has inflation-linked contracted revenues and higher cash yield.

- *Formulate and implement a one-year plan to achieve and maintain a 17% allocation to Real Assets.*

As of March 2023 the Real Assets portfolio allocation is 20.9% of the Total Fund. The Real Assets team was highly selective in deploying new capital to manage its allocation. During 2022, approximately $337 million of capital was called, and Staff made new commitments totaling $100 million. Staff submitted $200 million of redemptions from private real estate funds and $65 million from the public REITs fund. As of May 2023, SERS has received $23 million of the $200 million in private real estate redemptions submitted during FY23. SERS has received all the redemptions from public REITs.

- *Tactically manage the existing real estate and infrastructure allocations to improve portfolio structure and achieve favorable risk-adjusted returns.*

The Real Asset portfolio had about $337 million of capital called during 2022. Most of the capital called ($195 million) during 2022 was invested in core real estate and infrastructure fund strategies. Of the $100 million in new commitments during 2022, the majority ($90 million) was to core strategies. Redemptions were made during the year from REITS to reduce the volatility within the portfolio. The emphasis remains on operating assets, with the current exposure at 93%, vs non-operating assets at 7%.

- *Evaluate new investment strategies for the Real Assets portfolio such as niche real estate property types, non-US real estate, energy transition, listed infrastructure funds, and secondaries.*

Staff evaluated many new mandates for the portfolio and made commitments to three new investments during the year. Among the investments Staff committed to was a US core farmland fund, the first real estate co-investment during 2022. The new commitments will add exposure to new asset types in the Real Asset Portfolio.

- *Actively pursue co-investment opportunities with existing Real Assets managers.*

Staff reviewed several co-investment opportunities with existing general partners during 2022. Staff successfully executed two co-investments, one in a European mobile cell towers platform and the other in a self-storage portfolio.

CURRENT MARKET CONDITIONS AND OUTLOOK

Across most property types, real estate returns were strong in 2022, rebounding from their pandemic lows. SERS' Real Assets portfolio returned 16.91% net of fees in 2022 versus a benchmark NPI return of 16.08% gross of fees, producing an excess return of 0.83%. The income return gross of fees during 2022 was 5.40%.

The real estate portfolio performance in 2022 can be viewed as a tale of two halves. Between January and June, real estate values continued to see strength, led by strong rent growth and low vacancies in both the Industrial and Multifamily sectors. However, between July and December, real estate values were broadly flat in Q3, and then saw across the board declines of 4-9% in our portfolio funds. The Q4 write-downs were largely attributed to two factors – capital market volatility reflected in higher discount and cap rates and ongoing weakness in the Office sector.

Office as a property type is facing multiple challenges like lower workspace needs as tenants shrink their footprint in a hybrid / work-from-home world, glut in outdated class B and C buildings that are either functionally obsolete or have weak demand, and high capital expenditures needs due to tenants' preferences for newer "ESG" friendly buildings.

Retail performed well during 2022 as foot traffic increased and consumers returned to shopping in physical locations. Neighborhood and community shopping centers with a grocery anchor have performed better than malls. Retail vacancy rates declined to 6.9% (vs 8.0% in 2021).

Industrial properties had the best performance in 2022, driven by strong fundamentals. Industrial had a vacancy rate of 3.0% (vs 3.2% in 2021) and strong rent growth of 13.8% (YoY) in 2022. The pandemic has forced companies to create more resilient supply chains and hold excess inventory which requires more warehouse space.

Multifamily can provide inflation protection because rental rates can be reset each year. Higher interest rates and a lack of supply of single-family homes created greater demand for multifamily rentals. Vacancy rates for multifamily increased to 4.6% (vs 2.9% in 2021) as supply increased.

Real estate return forecasts from multiple industry groups and managers indicate that 2023 could see negative returns. While some managers have been more proactive in writing down asset values in Q4 2022, many appear to be taking a more gradual approach, suggesting that 3-5% write-downs per quarter could persist through Q3 and even Q4 of 2023.

While capital markets uncertainty will likely continue to impact real estate valuations, fundamentals in most sectors – with the exception of office – remain healthy. Higher quality Industrial assets in top-20 regions are still seeing strong occupancy and mid to high single digit rent growth or higher. Likewise, the residential sector – apartments, single family rentals, manufactured housing – still benefit from strong fundamentals as the U.S. housing industry has not sufficiently met demand created by population growth and the need to replace obsolete stock. Even Retail, whose weaknesses were exacerbated during the pandemic, have bottomed. As well, numerous managers have indicated that new investments in 2023-24 could be particularly good "vintages" as there could be many attractively priced opportunities created by the current marketplace dislocation.

The infrastructure portfolio proved to be a safe harbor in a volatile year. The core, essential, and monopolistic characteristics of many infrastructure assets demonstrated their resilience. With a few exceptions, our infrastructure funds performed very well in 2022, providing downside protection and cash yield. Most of the funds that had been impacted by the COVID pandemic have recovered from the pandemic lows and funds with more recent vintages are maturing, with their assets becoming operational and generating their target returns after overcoming the J-curve impact. The more recent digital infrastructure fund and U.S. mobile cell tower co-investment have performed well since our commitment, reflecting strong industry fundamentals and manager skill. A new commitment to a "super-core" infrastructure fund is anticipated to provide stabilized returns while offering co-investments that would reduce the fee load.

Going forward, the infrastructure program will continue to focus on attractive assets that provide inflation protection, diversification, and cash yield. Two sectors that will remain priorities are energy transition / renewables because of strong global policy support and investment demand, and digital infrastructure, which continues to benefit from the global mega-trend of digitalization.

FY2024 OBJECTIVES

Staff will focus on the following objectives in FY2024:

- Formulate and implement a one-year plan to remain within the 17-22% allocation range to Real Assets.
- Reallocate capital to lower the allocation to the target 20%.
- Tactically manage the existing real estate and infrastructure allocations to improve portfolio structure and achieve favorable risk-adjusted returns by incrementally reallocating capital from real estate to infrastructure until the latter reaches the target of 7%.
- Evaluate new investment strategies for the Real Assets portfolio such as real estate secondaries, real estate debt, sector specific real estate, niche real estate property types, ex-US real estate, energy transition, digital infrastructure, and listed infrastructure funds.
- Actively pursue co-investment opportunities with existing Real Assets managers.

PORTFOLIO STRATEGY - Cash Equivalents & Securities Lending

INVESTMENT STRATEGY

SERS invests in cash equivalents for the purpose of earning market returns on cash held for benefits and expenses and to provide short-term cash needed to fund other asset classes. Cash Equivalents are fixed income assets with maturities of less than 270 days and may include US government, asset-backed, corporate and high-quality money market-type securities.

SERS' Statement of Investment Policy sets the Cash Equivalent target allocation as follows:

	FY23 Target	FY24 Target	Permissible Range
Cash Equivalents	2%	3%	1% – 5%

The performance objective for Cash Equivalents is to exceed the return on 30-day US Treasury Bills.

The Securities Lending program is designed to be a low risk, intrinsic value focused strategy that generates additional income for the plan by temporarily lending equity and fixed income securities. All loans are collateralized with cash at 102-105% of security market value and reinvested in government money markets and repurchase agreements. Loans to approved borrowers are limited to 25% of the average monthly market value of the loan from the prior year. Fixed income security loans require a ten basis point minimum spread at loan initiation. The program is implemented through a third-party lending agent and collateral reinvestment manager.

REVIEW OF FY2023 OBJECTIVES AND IMPLEMENTATION

The FY2023 Annual Investment Plan objectives and related activities are as follows:

- *Research and monitor money market funds for opportunities to earn additional yield over the portfolio benchmark.*

The daily short-term cash continued to be invested in the Federated Hermes Prime Obligation (FHPO) and Fidelity Government Portfolio money market funds. The proportion of cash invested in the prime money market fund significantly increased during the year to earn a higher yield than offered by the government money market fund.

- *Evaluate opportunities to improve the Cash Management process and maintain liquidity needs for the portfolio.*

A quarterly cash forecast model was created to monitor the ending cash balance at each of the next four quarter-ends based on expected activity in the public and private asset classes, and transfers for the pension benefit payments.

- *Monitor the Securities Lending program for opportunities to generate incremental income and ensure it is operating within the program implementation guidelines.*

Securities lending income increased over the last year through a combination of higher reinvestment rates and more attractive on-loan rates. Much of the additional income was earned by lending US equity and fixed income securities.

CURRENT MARKET CONDITIONS AND OUTLOOK

As interest rates have risen quickly over the last 12 months, so have money market yields. The prime money market fund daily yield has risen from 0.35% to 4.84% during this period. With rising interest rates, money market funds have kept low average weighted maturities to reduce price risk in portfolio securities. The Federal Reserve hiked interest rates by 0.25% in May and expects to keep interest rates at the current level until the end of 2023. Uncertainty around the direction of inflation, recessionary pressures and market volatility could lead to heightened volatility around money market cash flows. The target allocation to the portfolio was increased from 2% to 3% for FY24 to take advantage of attractive current income yields and to increase the liquidity of the Total Fund.

FY2024 OBJECTIVES

Staff will focus on the following objectives in FY2024:

- Research and monitor money market funds for opportunities to earn additional yield over the portfolio benchmark.
- Evaluate opportunities to improve the Cash Management process to include a forecast of expected private market income payments and maintain liquidity needs for the portfolio.
- Forecast and analyze expected asset class cash flows and pension payments quarterly to ensure cash flow needs can be anticipated and planned for in advance.
- Monitor the Securities Lending program for opportunities to generate incremental income and ensure it is operating within the program implementation guidelines.

PORTFOLIO STRATEGY – Opportunistic & Tactical

INVESTMENT STRATEGY

SERS invests in opportunistic investments for the purpose of earning returns greater than the Bloomberg US Aggregate Bond Index + 2% for investments that do not fit within the existing asset classes. The investments are defined as tactical or non-traditional investment opportunities. Such investments may involve capitalizing on short-term market dislocations or other unique situations or innovative strategies including tactical allocation.

SERS' Statement of Investment Policy sets the Opportunistic investments target allocation as follows:

	FY23 Target	FY24 Target	Permissible Range
Opportunistic Investments	0%	0%	0% – 5%

The performance objective for Opportunistic investments is to exceed the return of the Bloomberg US Aggregate Bond Index + 2%.

REVIEW OF FY2023 OBJECTIVES AND IMPLEMENTATION

The FY2023 Annual Investment Plan objectives and related activities are as follows:

- *Search for possible Opportunistic investments for the Fund that are expected to exceed the portfolio benchmark. This will be accomplished through the evaluation of markets, strategies and specific funds that offer compelling risk adjusted returns. Specific investments under consideration include strategies that provide diversification, downside protection, and inflation protection. Investments that pass initial screening will undergo detailed due diligence prior to staff recommendation.*

Two new investments totaling $100 million have been added to the portfolio this fiscal year. The first investment is to a private debt fund that will invest in dislocated credit opportunities, primarily in the United States and Europe. The second investment is in a systematic trend following strategy that provides a low correlation to public equities and bonds.

- *Actively manage the Opportunistic allocation to improve portfolio structure and returns without increasing risk.*

Staff continues to closely monitor and manage the liquid portion of the portfolio, which has grown in recent years. The portfolio is comprised of seven funds that offer liquidity on a regular basis. These funds represent approximately 45% of the Opportunistic allocation.

CURRENT MARKET CONDITIONS AND OUTLOOK

The Opportunistic portfolio consists of funds that seek to take advantage of market dislocations, or which do not fit within the risk and return objectives of other asset classes. The return objective of the portfolio is to outperform the Bloomberg US Aggregate Bond Index + 2%. The portfolio is positioned to take advantage of ongoing Fed tightening, high inflation, and a slowing economy. Current strategies include investments that provide inflation protection as well as investments that are uncorrelated to public equities and fixed income, such as distressed assets, structured credit, long/short multi strategy funds, commodities and risk parity strategies. The maximum allocation has decreased from 7% to 5% to fund inflows to the fixed income portfolio.

FY2024 OBJECTIVES

Staff will focus on the following objectives in FY2024:

- Search for possible Opportunistic investments for the Fund that are expected to exceed the portfolio benchmark. This will be accomplished through the evaluation of markets, strategies and specific funds that offer compelling risk adjusted returns. Specific investments under consideration include strategies that provide diversification, downside protection, and inflation protection. Investments that pass initial screening will undergo detailed due diligence prior to Staff recommendation.
- Actively manage the Opportunistic allocation to improve portfolio structure and returns without increasing risk.

PORTFOLIO STRATEGY – Overlay Program

INVESTMENT STRATEGY

SERS invests in overlay strategies that trade derivatives of the Total Fund's underlying assets and currency exchange rates to enhance the Total Fund portfolio efficiency. The overlay program includes tactical asset allocation and active currency strategies.

The tactical asset allocation strategy aims to add value to the Total Fund performance through active allocations (long/short) across stocks and bonds thereby exploiting short-term macro market dislocations. The active currency strategies aim to add value and risk diversification to the Total Fund, as well as help manage currency risk by utilizing short-term inefficiency in the foreign exchange markets and low correlation of the strategies to the major asset classes such as US equity and fixed income.

The program is fully tactical; exposures to any overlay strategies in this program are not required by the Statement of Investment Policy.

The overlay program is targeted to add 10 to 20 bps excess return to the Total Fund's performance on a three-to five-year horizon. Tracking errors of the tactical rebalancing strategy and the currency program are expected in the ranges of 5 to 15 basis points and 5 to 8%, respectively.

REVIEW OF FY2023 OBJECTIVES AND IMPLEMENTATION

The FY2023 Annual Investment Plan objectives and related activities are as follows:

- *Actively monitor the Tactical Asset Allocation Strategy to enhance the impacts of the strategy to the Total Fund performance.*

One of the two tactical asset allocation strategies was actively managed throughout the year, being both long and short equities, fixed income, and commodities. The notional exposure of the program was increased in July 2022 and the net zero leverage constraint was relaxed in October 2022 to reduce strategy performance volatility. The strategy has realized fiscal year to date losses totaling $5.2 million through March 2023 and the account was closed in April 2023. No trades have been initiated in the second tactical asset allocation strategy fiscal year to date.

- *Actively monitor the Active Currency Strategies to improve the program's risk and return characteristics.*

The strategy has been active in managing the size of the US dollar exposure relative to other major developed market currencies throughout the fiscal year. The notional exposure of the account was reduced in Q4 based on the view that the value of the US dollar may have peaked. The strategy has realized a fiscal year to date net loss of $7.5 million with losses in currencies offset by gains in precious metals.

FY2024 OBJECTIVES

Staff will focus on the following objectives in FY2024:

- Actively monitor the Tactical Asset Allocation Strategy to enhance the impacts of the strategy on the Total Fund performance.

- Actively monitor the Active Currency Strategy to improve the program's risk and return characteristics.

PORTFOLIO STRATEGY - Investment Risk Management & Analytics

Investment Risk Management and Analytics is responsible for the provision and communication of diligent, thorough, timely and forward-looking investment risk analytics and other investment analytics to the Board and Investment Staff.

Total Fund forecast volatility increased from 12.2% in December 2021 to 14.0% in December 2022 and 13.44% in March 2023 due to high inflation and increased interest rates. The 3-years realized risk of the Total Fund was 8.7% in March 2023.

The forecast risk is a forward-looking risk estimate based on a fund's current holdings at a point of time while the realized risk measures volatility of the historical return of the fund over a period of time; the former counteracts the smoothing effect of infrequent valuation of private investments that is inherent in the later. Hence, the forecast risk tends to be higher than the realized risk for a fund that includes private investments. The forward-looking risk is preferable for assessing allocation among assets and risk-return reward of an asset.

The Total Fund risk structure changed slightly with a 7% reduction in equity risk and a 7% increase in the private asset risk due to asset allocation changes for the period from December 2021 to March 2023 . As of March 2023, 75.6% of the Total Fund risk was equity risk and 24.4% was fixed income, private assets, and currency risk. The Total Fund's active risk stayed under the 3% limit stated in the Statement of Investment Policy as the 3-year realized active risk was 1.7% and forecast active risk was 1.6% in March 2023.

REVIEW OF FY2023 OBJECTIVES AND IMPLEMENTATION
The FY2023 Annual Investment Plan objectives and related activities are as follows:

- *Provide risk forecasts and analyses of the Total Fund and asset class portfolios.*

Staff utilized the risk system to generate risk analyses of the Total Fund and asset classes. The risk analyses based on SERS' investment holdings provide forecasted volatility of returns of portfolios. The analyses also provide portfolio risk decomposition by strategies, as well as by factors.

- *Report risk of the Total Fund to the Board on a quarterly basis.*

The quarterly risk report on the Total Fund is provided to the Board showing risk contribution of asset class weights, and active risk of asset classes and factor risks across the portfolio. The total risk decomposition by asset classes focused on their role in the Total Fund. The total risk decomposition by factors focused on cross factor exposures, especially equity factors among the asset class portfolios as the equity factors are the largest risk driver of the Total Fund. The active risk decomposition showed risk contribution from the investment implementation, which is comprised of active allocation among the asset classes and active selection of strategies and securities.

- *Communicate asset class portfolios' risk with asset class investment officer(s) and discuss any potential changes of the portfolio structure on a quarterly basis.*

Staff discussed the risk profile of asset class portfolios with each asset class team. The discussion was focused on i) trend and level of forecast risks, ii) the portfolio's risk structure in terms of manager line-up and factor tilts, and iii) the portfolio's sensitivity to market movements. The discussions assisted each asset class team in balancing their portfolio risks and minimizing unintended risk tilts.

- *Provide return attribution analyses of the Total Fund and asset classes of the Fund to the Investment Strategy Team.*

Staff reported monthly return attribution analyses of the Total Fund, analyzing effects of active weights on alpha generation of each asset class. The analyses were presented to the Investment Strategy Team. Staff also delivered to the Investment Strategy Team attribution reports of each asset class portfolio analyzing the contribution of each account within an asset class.

- *Perform other portfolio and market analyses and research as needed.*

Staff conducted analyses of the Total Fund liquidity and leverage. Staff also conducted portfolio and market analyses as needed or upon request.

PORTFOLIO STRATEGY - Investment Risk Management & Analytics

FY2024 OBJECTIVES
Staff will focus on the following objectives in FY2024:

- Provide risk forecasts and analyses of the Total Fund and asset class portfolios.
- Report risk of the Total Fund to the Board on a quarterly basis.
- Communicate asset class portfolios' risk with asset class investment officer(s) and discuss any potential changes of the portfolio structure on a quarterly basis.
- Provide return attribution analyses of the Total Fund and asset classes of the Fund to the Investment Strategy Team.
- Perform other portfolio and market analyses and research as needed.

Investment Operations

The Investment Operations area is responsible for managing administrative activities for the Investment department, assisting the CIO and investment officers, and providing reports and information to Staff and the Board. The objectives for FY2024 remain consistent with those of FY2023 as these broad categories reflect the primary duties of Investment Operations.

REVIEW OF FY2023 OBJECTIVES AND IMPLEMENTATION
The FY2023 Annual Investment Plan objectives and related activities are as follows:

- *Coordinate, assist and participate in organizational initiatives including Policies, Procedures and Practices; Information Governance Projects, fiscal budget; Subject Matter Experts (SMEs); and Emergency Response Program (ERP).*

Investment Operations assisted with the annual review and revisions to the Investment Department Policies and participated in the system-wide Information Governance Project to create a new SharePoint 365 Investments library, migrate existing electronic files, assign retention schedules and reclassify electronic fund manager agreements to ensure they were properly stored per SERS' retention schedules. Staff prepared and analyzed the fiscal budget for executive approval as well as participated in and provided feedback in relation to SME Communications and ERP activities.

- *Perform administrative duties and attend meetings for the Investment Committee, Strategy Team and Board meetings including establishing meeting dates and agendas, organizing and distributing documents to team members, producing reports and taking minutes.*

Operations attended all Investment Committee, Strategy Team and Board meetings. Agendas and documents were prepared and distributed, minutes taken and distributed in a timely manner. Staff assisted with processing documents associated with hiring, termination and redemption of managers.

- *Assist with projects for the CIO and Investment officers including revising the Annual Investment Plan, updating the Statement of Investment Policy as needed, new investment managers searches, and aiding with special projects for Staff.*

Operations coordinated revisions and produced the FY2023 Annual Investment Plan, the amended Statement of Investment Policy, and assisted with manager searches throughout the fiscal year.

FY2024 OBJECTIVES
Staff will focus on the following objectives in FY2024:

- Coordinate, assist, and participate in organizational initiatives including annual Policy review; Information Governance project; fiscal budget; Subject Matter Experts (SMEs); and Emergency Response Program (ERP).

- Perform administrative duties and attend meetings for the Investment Committee, Strategy Team and Board meetings including establishing meeting dates and agendas, organizing and distributing documents to team members, producing reports, and taking minutes.

- Assist with projects for the CIO and Investment officers including revising the Annual Investment Plan, updating the Statement of Investment Policy as needed, searches for Investment managers, and aiding with special projects for Staff.

Implementation Guidelines

IMPLEMENTATION GUIDELINES - Global Equities

I. ROLE

The role of Global Equities is to earn the equity risk premium over US Treasury bonds by investing in common stock of publicly listed companies.

II. ASSET ALLOCATION

	Total Fund Target	Range	
		Minimum	Maximum
Global Equity	40%	35%	45%

Global Equity is divided into two portfolios as follows:

Global Equity – Global Composite: Managers invest in securities from across all regional markets of the world including US, Non-US Developed Markets and Emerging Markets. This composite is benchmarked to the MSCI All Country World Net Total Return Index (MSCI ACWI).

Global Equity – Regional Composite: Managers invest in securities of assigned regional markets only. Staff manages the regional market allocation versus the MSCI ACWI. This composite is benchmarked to the MSCI ACWI. Typical benchmarks utilized within the regional market mandates are:

- US Equity: Russell 3000 Index
- Non-US Equity Developed Market: MSCI World ex-USA Net Total Return Index (USD)
- Non-US Equity Emerging Market: MSCI Emerging Markets Net Total Return Index (USD)

III. BENCHMARK:

The Global Equity benchmark is the MSCI All Country World Net Total Return Index (USD).

IV. PERFORMANCE OBJECTIVE

The annualized return objective, net of management fees, for both Global Equity portfolios is 30 basis points over the MSCI ACWI.

V. PORTFOLIO DESIGN AND CONSTRUCTION:

The *Global Composite* portfolio is currently run by one manager who selects securities from across the world, making their own active decisions between US, Non-US Developed Markets and Emerging Markets. This is a 100% active portfolio with a +/- 10% country range limit versus the MSCI ACWI.

The *Regional Composite* portfolio is constructed using a multi-manager line-up of US, Non-US Developed and Emerging Market mandates and a combination of active and passive strategies to deliver risk-adjusted performance relative to respective benchmarks. Portfolio design will consider risk/return characteristics, manager count and investment management fees.

The Global Equities portfolio may employ economic leverage via portfolio alpha overlay strategies where the equity market beta is derived from invested derivatives and the alpha is derived from an active market neutral strategy or an uncorrelated active manager. The leverage employed will be within the allowed Total Fund leverage parameters and portfolio tracking error will be maintained within stated ranges in Section VII. Risk Management.

PERMISSIBLE INVESTMENTS

Security Type	US Equity Portfolio	Non-US Equity Portfolio
Common Stock	Y	Y
Stock Treated as Common Stock	Y	Y

Cash / Treasuries	Y	Y
Preferred Stock	Y	Y
Convertible Rights	Y	Y
Warrants	Y	Y
Depository Receipts	Y	Y
REITS	Y	Y
Rule 144a Issues	Y	Y
Private Placement	Y	Y
IPOs	Y	Y
Commingled Funds	Y	Y
Exchange Traded Funds	Y	Y
Derivatives	Y	Y
Currency	N	Y
Country Funds	N	Y

VI. RISK MANAGEMENT

	Active Risk Target
Global Equity – Global Composite	Tracking Error of 3.0% with a range of 3.0% to 7.0%
Global Equity – Regional Composite	Tracking Error of 1.5% within a range of 0.50% to 2.5%

Below are the guidelines for the *Global Equity – Regional Composite* Portfolio:

US Equity Implementation Guidelines			
	Investment Benchmark	**Global Equity Target Allocation**	**Permissible Range**
US Equity Allocation	Russell 3000 Index	MSCI ACWI US Allocation	+/- 10%
Portfolio Structure			
Capitalization			
Large Cap Equity	Russell 1000 Index	Neutral to BM	+/- 5%
Large Cap Active	Manager Specific	-	0% - 30%
Large Cap Passive	Russell 1000 Index	-	70% - 100%
Small Cap Equity	Russell 2000 Index	Neutral to BM	+/- 10%
Small Cap Active	Manager Specific	100%	N/A
Style			
Growth	Manager Specific	Neutral to BM	+/- 5%
Value	Manager Specific	Neutral to BM	+/- 5%

Factors such as currency, sector and country limits are manager specific and outlined in each manager's Investment Guidelines. Aggregate portfolio characteristics such as P/E, B/P, yield, size, etc., shall be within a reasonable range of the US equity benchmark.

IMPLEMENTATION GUIDELINES - Global Equities

Non-US Equity Implementation Guidelines			
	Investment Benchmark	**Global Equity Target Allocation**	**Permissible Range**
Non-US Equity Developed Markets	MSCI World ex-USA Net Total Return Index (USD)	MSCI ACWI Non-US Developed Market Allocation	+/- 7%
Non-US Equity Emerging Markets	MSCI Emerging Markets Net Total Return Index (USD)	MSCI ACWI Emerging Market Allocation	+/- 7%
Broad Market Exposure			
Developed Markets Active	Manager Specific	--	75-100%
Developed Markets Passive	MSCI World ex US Index ($net)	--	0-25%
Emerging Markets Active	Manager Specific	100%	+/- 5%
Portfolio Structure			
Capitalization			
Large Cap Equity	Manager Specific	BM Weight	+/- 10%
Small to Mid-Cap Equity	Manager Specific	BM Weight	+/- 10%
Small Cap Equity	Manager Specific	BM Weight	+/- 10%
Micro Cap Equity	Manager Specific	BM Weight	+/- 5%
Style			
Growth	Manager Specific	Neutral to BM	+/- 10%
Value	Manager Specific	Neutral to BM	+/- 10%

Factors such as currency, sector and country limits are manager specific and outlined in each manager’s Investment Guidelines. Aggregate portfolio characteristics such as P/E, B/P, yield, size, etc., shall be within a reasonable range of the Non-US developed and emerging market equity benchmarks.

IMPLEMENTATION GUIDELINES – Global Private Equity

I. ROLE

SERS invests in Private Equity to provide returns in excess of those provided by publicly-traded equities to compensate for private equity's liquidity and concentration risk.

II. ASSET ALLOCATION

The Private Equity target asset allocation is established with periodic asset allocation studies. The most recent asset allocation study authorized a 14% allocation target to Private Equity with a range of 11%-17%.

III. BENCHMARK

Private Equity performance is benchmarked to the Burgiss All Private Equity benchmark, one quarter in arrears.

IV. PERFORMANCE OBJECTIVE

The performance objective for Private Equity is to provide net returns in excess of the Burgiss All Private Equity Benchmark. Over time periods of five years and longer Private Equity net returns are expected to exceed SERS Global Equity portfolio by 2%.

V. PORTFOLIO DESIGN AND CONSTRUCTION

Capital allocation among the various market segments is a critical driver for the long- term success of the Private Equity portfolio. Capital allocation risk is controlled in a portfolio structure incorporating long-term sub asset target allocations.

Long-term sub-asset target exposure is detailed below:

	Range	
	Minimum	**Maximum**
Buyout		
Small/Middle	50%	70%
Large/Mega	5%	25%
Total Buyout	55%	95%
Venture Capital	0%	10%
Special Situations	5%	25%
Total		
Domestic	55%	95%
International	5%	45%
Total		
Primary Commitments	75%	100%
Fund of Funds	0%	15%
Co-Investments	0%	25%
Total		

The portfolio is tilted toward buyout investments. There is no target allocation to venture capital due to higher risk and manager selection issues, however, there may be opportunistic allocations to venture capital up to 10% of the portfolio as shown in the accompanying table. Within buyouts, the preference is for small and middle market managers with a significant value creation approach and de-emphasizes larger firms with a financial engineering approach.

IMPLEMENTATION GUIDELINES – Global Private Equity

VI. PERMISSIBLE INVESTMENTS

Investment Structure	
Limited Partnership Interests	Y
Discretionary Managers investing in Private Equity Partnerships	Y
Co-Investments	Y
Separate Accounts	Y

Investment Type	
Buyouts	Y
Venture Capital	Y
Special Situations (secondary interests, distressed debt or equity, mezzanine, co-investments, energy, etc.)	Y

Buyout
Net Expected Return 10-15%, Moderate Risk
Capital is typically invested in more established companies, those further along the business life cycle having relatively predictable cash flows and the ability to raise capital along the entire capital structure, including secured and unsecured debt. Buyouts are targeted to represent 75% of the Private Equity portfolio.

Venture Capital
Net Expected Return: 15-25%, High Risk
Venture capital equity is targeted at companies in the earliest phases of a business life cycle. Companies may be classified as seed, early, middle and late stage and are characterized by their inability to access public equity and other forms of capital such as secured and unsecured debt. These companies have uncertain revenues and a need for cash to build their businesses and are subject to high failure rates. Venture capital is targeted to represent 0% of the portfolio.

Special Situations
Net Expected Return: 10-20%, Moderate Risk
Many private equity opportunities have characteristics of buyout or venture capital but have enough differences as to require separate classification. These investments include energy, distressed debt, mezzanine, opportunity and secondary funds. Special situations is targeted to represent 25% of the portfolio.

Co-Investments
Net Expected Return: 15-20%, Moderate Risk
Co-Investments are direct investments in a single asset of a multi-asset fund, made alongside the Fund's investment in the asset. Typically, co-investments are offered on more attractive economic terms and shorter time frames than those of the Fund. Co-Investments are targeted to represent up to 10% of the portfolio.

VII. RISK MANAGEMENT

The primary risk management tool in private equity is industry diversification as well as extensive due diligence of prospective investments. Monitoring is managed through a combination of quantitative and qualitative constraints. The following sections identify the most significant risks with private equity investments and the method of control.

Liquidity Risk
Private equity investments are illiquid and typically have expected holding periods of 10-12 years. Investments are typically held until maturity and selling prior to maturity typically results in a discount to fair market value. Liquidity risk is managed by minimizing the possibility of forced sales that may arise from exceeding maximum exposure limits or lowering asset allocation exposure limits.

Geographic Risk
Geographic risk is controlled through a long-term international target exposure of 25% by market value.

Vintage Risk
Vintage reflects the year of first capital draw and vintage risk refers to the variability of private equity commitments over time. The investment-pacing model controls the short and long-term private equity commitment amounts and attempts to minimize vintage risk while achieving targeted exposure. Commitments will be dependent on the availability of investments that meet SERS' investment criteria and will not be driven by the target investment pace in any given year.

Manager Risk
Manager risk consists of two elements, managing the exposure within a partnership and controlling the number of general partners in our private equity portfolio. Partnership exposure is controlled by limiting the commitment size within a partnership and the maximum commitment to a partnership will be 25% of a fund's size. The 25% limit does not apply to funds committed to a discretionary manager or a separate account. The maximum market value exposure to a single manager is targeted to be less than 20% of the portfolio. The optimum number of general partners in the portfolio varies with time.

Firm Risk
Firm risk is the exposure to a private equity general partner and is controlled by limiting the maximum commitment to funds operated by a general partner and its affiliates.

Currency Risk
The Private Equity program accepts the currency risks consistent with the geographic constraints. Private equity partnerships generally do not hedge currency risk and the private equity program will not implement currency hedges.

Industry Risk
Typically, private equity partnerships are permitted to invest in a wide variety of industries. Industry risk is controlled primarily through appropriate diversification across classes and subclasses.

Leverage Risk
General partners invest capital from private equity partnerships throughout the capital structure of firms. The capital markets control the maximum leverage available to the general partners and limited partners control leverage exposure through partnership selection and portfolio construction.

IMPLEMENTATION GUIDELINES – Global Fixed Income

I. ROLE

The primary role of diversified fixed income is to reduce the overall risk of the investment plan. Fixed income securities should provide stable income returns through yield-oriented assets. Fixed income provides risk reduction through lower correlations to the investment program.

II. ASSET ALLOCATION

The Global Fixed Income allocation is established with periodic asset allocation studies. The most recent asset allocation study authorized an 18% market value exposure to Global Fixed Income with a range of13%-23%.

III. BENCHMARK

Global Fixed Income performance is benchmarked to the Bloomberg US Aggregate Bond Index.

IV. PERFORMANCE OBJECTIVE

The annualized return objective for the Global Fixed Income portfolio is 60 basis points net of fees above the benchmark over rolling three year periods and is comprised of the following strategies:

Strategy	Expected Excess Return	Tracking Error	Benchmark
Core	20 basis points	N/A	Bloomberg US Aggregate Bond Index
Core Plus	60 basis points	N/A	Bloomberg US Aggregate Bond Index
Tactical & Diversifying	200 basis points	N/A	Bloomberg US Aggregate Bond Index
Total Portfolio	60 basis points	0 – 5%	Bloomberg US Aggregate Bond Index

V. PORTFOLIO DESIGN AND CONSTRUCTION

SERS seeks to obtain broad fixed income market exposure to gain diversification while receiving income. The portfolio is 100% externally managed in active strategies, in broad mandates of core, core plus, and Tactical & Diversifying strategies. Core mandates invest primarily in benchmark type securities and exposures. Core sector weightings can deviate from the benchmark, depending on the external manager's market views and strategies. Core plus mandates allow investments in all sectors of the Bloomberg US Aggregate Bond Index with additional allocations to the extended sectors of high yield, Non-US debt and emerging market debt. The Tactical & Diversifying sector invests in return seeking or diversification enhancing strategies and can provide high excess returns. The strategy invests in all sectors of the index in addition to emerging market debt, high yield, and long/short credit.

The portfolio may employ economic leverage to obtain benchmark or sector exposure to enhance the excess return of the portfolio. The leverage employed will be within the parameters of the Total Fund leverage policy and portfolio tracking error will be maintained within the range stated in Section IV.

Below are the current sector exposure limits:

Strategy	Range	
	Minimum	Maximum
Core	30%	70%
Core Plus	25%	50%
Tactical & Diversifying	0%	20%

VI. PERMISSIBLE INVESTMENTS

Security Type	Core	Core Plus	Tactical & Diversifying
Governments			
US Treasuries, TIPS and Agencies	Y	Y	Y
Sovereigns/Quasi-Sov. In US $	Y	Y	Y
Sovereigns/Quasi-Sov. In local currency	N	Y	Y
Corporates			
US Corporates	Y	Y	Y
Non-US Corporates in US $	Y	Y	Y
Non-US Corporates in local currency	N	Y	Y
High Yield	N	Y	Y
Bank Loans	N	Y	Y
Structured Credit			
Mortgages	Y	Y	Y
Asset Backed	Y	Y	Y
Collateralized Loan Obligations	N	Y	Y
Other			
144 (A)s	Y	Y	Y
Commingled Funds	Y	Y	Y
Convertibles	N	Y	Y
Currency	N	Y	Y
Derivatives	Y	Y	Y
Equity	N	Y	Y
Exchange Traded Funds	Y	Y	Y
Money Markets	Y	Y	Y
Municipals	Y	Y	Y
Repurchase Agreements	Y	Y	Y

VII. RISK MANAGEMENT

For strategies held in separate accounts, the following risk factors are controlled through limits specified in each manager's Investment Manager Agreement (IMA) and Investment Guidelines. Duration, sector and credit risk are reviewed on a total portfolio basis quarterly by SERS:

Interest Rate
Controlled by duration band limits around the benchmark duration.

Yield Curve Risk
Controlled by duration band limits around the benchmark duration.

Sector Risk
Riskier sectors like high yield, non-US, non-agency mortgages and CMBS are controlled around set limits with each individual manager. Portfolios are allowed 25% maximum exposure to any one industry.

Credit Risk
Portfolios must maintain a minimum exposure to investment grade securities. In addition, each manager of individual portfolios has an established average weighted credit quality that must be maintained at all times.

IMPLEMENTATION GUIDELINES – Global Fixed Income

Currency Risk
Currency is not hedged at the overall portfolio level. Managers who demonstrate skill are allowed to purchase non-US securities on a hedged or unhedged basis or take direct currency positions without owning securities.

Issuer Risk
Issuer limits are specified in each IMA investment guidelines.

Liquidity Risk
Accounts have a maximum 144(A) limit without registration rights.

Active Risk
Normal tracking error is expected to be 2-4% over any rolling three-year time horizon. During periods of increased volatility, tracking error should not exceed 5% over any rolling three-year time horizon.

IMPLEMENTATION GUIDELINES – Global Private Credit

I. ROLE

The role of SERS' Private Credit portfolio is to provide risk adjusted returns in excess of those provided by publicly traded fixed income securities and to generate a consistent cash yield.

II. ASSET ALLOCATION

SERS' Statement of Investment Policy sets the private credit target allocation at 5%, with a range of 3% to 7%.

III. BENCHMARK

The private credit benchmark is the 90-day Treasury bill rate + 4.5%, one quarter in arrears.

IV. PERFORMANCE OBJECTIVE

The performance objective of the Private Credit portfolio is to provide net returns in excess of the SERS Global Fixed Income portfolio over time periods five years and longer, with the income component of the return comprising a significant portion of the total return.

V. PORTFOLIO DESIGN AND CONSTRUCTION

The Private Credit portfolio is designed to gain exposure to various aspects of the private credit market with a focus on consistent income generation. It is expected that a greater portion of the Private Credit portfolio will be allocated to direct lending investments with higher expected cash yields.

Long-term sub asset target exposure is detailed below:

		Range	
	Target	**Minimum**	**Maximum**
Direct Lending	80%	60%	100%
Mezzanine	0%	0%	10%
Stressed/Distressed	10%	0%	15%
Asset Based Lending/Specialty Finance	10%	0%	15%
Total	100%		
Domestic	60%	40%	85%
International	40%	15%	60%
Total	100%		
Primary Commitments	100%	80%	100%
Secondaries	0%	0%	10%
Co-Investments	0%	0%	10%
Total	100%		

The portfolio is tilted toward direct lending investments and does not have a target allocation to mezzanine due to the structure of investments typically containing a less predictable cash income component than direct lending.

IMPLEMENTATION GUIDELINES – Global Private Credit

VI. PERMISSIBLE INVESTMENTS

Investment Structure	
Limited Partnership Interests	Y
Co-Investments	Y
Separate Accounts	Y

Investment Type	
Direct Lending	Y
Mezzanine	Y
Stressed/Distressed	Y
Asset Based Lending and Specialty Finance	Y

Direct Lending
Net Expected Return: 8-12%, Moderate Risk
Direct Lending represents loans made directly to small to medium size companies; secured by assets/cash flows/contracts, etc. depending on the type of loan. Direct Lending is targeted to represent 80% of the Global Private Credit portfolio.

Mezzanine
Net Expected Return: 10-15%, High Risk
Mezzanine debt is subordinated to senior loans and typically is structured as an unsecured fixed or floating rate loan with an equity component. Mezzanine is targeted to represent 0% of the Global Private Credit portfolio.

Stressed/Distressed
Net Expected Return: 12-25%, High Risk
Stressed/Distressed debt represents loans made to companies that are financially stressed and/or are likely to go through restructuring/bankruptcy. These investments typically have longer holding periods where the lender sometimes is seeking to take control of the company. Stressed/Distressed is targeted to represent 10% of the Global Private Credit portfolio.

Asset Based Lending/Specialty Finance
Net Expected Return: 10-15%, Moderate to High Risk
Asset based lending and specialty finance includes investments backed by financial and hard assets, as well as cash flows generated from differentiated sources other than traditional corporate lending. The types of investments may include auto loans, real estate loans, consumer loans, litigation finance, leasing, royalties, portfolio finance, and various other types. Asset based lending & other is targeted to represent 10% of the Global Private Credit portfolio.

VII. RISK MANAGEMENT

The primary risk management tool in private credit is extensive due diligence of prospective investments and diversification. The following sections identify the most significant risks of private credit investments and the method of control.

Credit Risk
Credit risk is the primary risk associated with the asset class. Thorough due diligence of investments will be completed to ensure the general partners have sufficient measures in place to monitor and assess the risks involved with underlying investments, as well as the capabilities to structure loans with adequate covenants to protect the lender.

Interest Rate Risk
Interest rate risk is inherent within the Private Credit portfolio since investments are typically structured as floating rate credit instruments and interest rates will fluctuate over time. The risk is managed by the general partners through the structuring process to ensure appropriate interest rate floors and other measures are in place to manage an acceptable level of interest income.

Liquidity Risk
Private credit investments are illiquid but have shorter holding periods than other private security types, with 3 – 5 years being a typical holding period. Investments are typically held until maturity and selling prior to maturity typically results in a discount to fair market value. Liquidity risk is managed through the portfolio construction process by limiting the amount of exposure to more illiquid areas of private credit, such as distressed debt.

Geographic Risk
International exposure refers to non-US investments and is limited to 60% of the portfolio.

Vintage Risk
Vintage reflects the year of first capital draw and vintage risk refers to the variability of private credit commitments over time. The investment-pacing model controls the short and long-term private credit commitment amounts and attempts to minimize vintage risk while achieving targeted exposure. Commitments will be dependent on the availability of investments that meet SERS' investment criteria and will not be driven by the target investment pace in any given year.

Manager Risk
Manager risk consists of two elements, managing the exposure within a partnership and controlling the number of general partners in the Global Private Credit portfolio. Partnership exposure is controlled by limiting the commitment size to 25% of the aggregate commitments to the partnership or master fund if more than one feeder vehicle exists. The 25% limit does not apply to funds committed to a discretionary manager or a separate account. The maximum market value exposure to a single manager is targeted to be less than 35% of the portfolio. The optimum number of general partners in the portfolio varies with time.

Firm Risk
Firm risk is the exposure to a private credit general partner and is controlled by limiting the maximum commitment to funds operated by a general partner and its affiliates.

Currency Risk
The Private Credit program does not hedge currency risk and relies upon its external managers to determine if such hedges are appropriate. Currency risk will be managed through geographic exposure limits, as shown above under geographic risks.

Industry/Sector Risk
Typically, private credit partnerships are permitted to invest in a wide variety of industries and sectors. Industry/Sector risk is controlled primarily through appropriate diversification across classes and subclasses.

Leverage Risk
The capital markets control the maximum leverage available to the general partners and limited partners control leverage exposure through partnership selection and portfolio construction. Leverage at an individual fund level is managed through the portfolio construction process.

Valuation Risk
The valuation frequency for private credit is dependent upon the external managers' internal and external valuation policies, which are reviewed during the operational due diligence process.

IMPLEMENTATION GUIDELINES – Global Real Assets

I. ROLE

The role of SERS' Global Real Assets portfolio is to provide a stable income return from tangible assets, to be a partial inflation hedge over the long term and to provide low correlation to equities.

II. ASSET ALLOCATION

SERS' Statement of Investment Policy sets the global real assets target allocation at 20%, with a permissible range of 17%-22%.

III. BENCHMARK

The global real assets benchmark is the NCREIF Property Index (NPI), one quarter in arrears.

IV. PERFORMANCE OBJECTIVE

The performance objective for Global Real Assets is to produce net of fee returns in excess of the benchmark over a market cycle, with the income component of the return comprising a significant portion of the total return.

V. PORTFOLIO DESIGN AND CONSTRUCTION

The Global Real Assets portfolio is designed to achieve the performance objective, to manage risks and to focus on the overall role of global real assets within the Total Fund. SERS' Global Real Assets Implementation Guidelines set the private market, public market and asset type exposures for Global Real Assets, as shown in the table below.

Strategy	Target	Range	
		Minimum	Maximum
Private Core Real Estate	60%	40%	80%
Private Non-Core Real Estate	5%	0%	15%
Private Infrastructure	30%	15%	40%
Public Market Real Assets	4%	0%	10%
Private Agriculture/Farmland	1%	0%	5%

Core real estate investments include substantially leased or fully operational institutional quality properties or projects located in developed markets. The revenue streams from core real estate are generally long duration and comprise a majority of the asset's total return. Core real estate strategies are typically implemented through open-end commingled funds.

Non-core real estate investments include value-added and opportunistic strategies in which properties or projects are re-leased, re-developed, or newly constructed, particularly in developing or transitional markets. This strategy has a higher return expectation but has higher reliance on capital appreciation (vs income return). Non-core real estate strategies are typically implemented through closed-end commingled funds.

Private infrastructure typically involves the movement of goods, people, water, and energy (definition provided by JP Morgan Asset Management). The sectors include, but are not limited to, power (including renewables), energy, utilities, transportation, communication, and social infrastructure sectors. Infrastructure revenue streams are typically long-dated, contractual and inflation linked. Private infrastructure is implemented through both open and closed end commingled funds, as well as co-investments.

Public market real assets are securities of companies whose primary source of revenue comes from the operation of tangible assets, including, but not limited to, real estate (REITs), listed infrastructure, natural resources, and master limited partnerships. While more liquid in nature, public market real assets exhibit greater volatility than privately held real assets. Master limited partnerships, or MLPs, are publicly traded limited partnerships that derive most of the partnership's cash flows from infrastructure and natural resource assets. The advantage of an MLP is that it combines the tax benefits of a limited partnership with the liquidity of a publicly traded company.

Private Farmland investments include annual row and permanent crops located throughout the United States. Core farmland will be substantially leased on long term contracts to top quality growers. Core farmland provides a strong income stream that will comprise the majority of the total return. Core farmland strategies are typically implemented through open-end funds.

Over time, Staff intends to judiciously increase exposure to co-investments in infrastructure and real estate through underwriting of individual assets as well via programmatic sidecar vehicles.

VI. PERMISSIBLE INVESTMENTS

The underlying investments included in the Global Real Assets portfolio generally are tangible assets, have long term investment horizons or holding periods, produce attractive income returns and cash yields and provide a partial inflation hedge over the long term. Permissible investment structures and types are as follows.

Investment Structure and Type	
Limited Partnership Interests	Y
Co-Investments	Y
Separate Accounts	Y
Commingled Funds	Y
Secondaries Vehicles	Y
Joint Ventures	Y
Real Estate Operating Companies (REOCs)	Y
Private Real Estate Equity and Debt	Y
Real Estate Investment Trusts (REITs)	Y
Exchange Traded Funds	Y
Private Infrastructure Equity and Debt	Y
Public Infrastructure Securities and MLPs	Y
Natural Resources and Commodities	Y

VII. RISK MANAGEMENT

Qualitative constraints and quantitative measures are used to manage risk in the Global Real Assets portfolio. The following sections identify the most significant risks with real asset investments and the method of control.

Real Estate Life Cycle Risk
Life cycle risk refers to the stage of an investment's life and generally falls into two categories, operating and non-operating investments. Operating investments are those that are leased or functioning at a level in which the contractual cash payments are supporting operations. Non-operating investments are those in pre-development, construction, conversion, or in a stage of major releasing. A significant portion of the private market real assets portfolio will be in operating investments in order to achieve Global Real Assets' role of providing income.

	Operating	Non-Operating
Target Exposure	≥85%	≤15%

Real Estate Property Type Risk
Property type risk refers to the level of exposure of the major property type categories in the private market real estate portfolio relative to the NCREIF Property Index. Property type risk will be managed through portfolio design and the use of commingled funds. At least 80% of the private market real estate portfolio will be invested in the four primary property type categories including apartment, industrial, office and retail.

IMPLEMENTATION GUIDELINES – Global Real Assets

(as of December 31, 2022)	NCREIF Property Index	Range
Apartment	28%	15% - 45%
Industrial	32%	15% - 45%
Office	26%	5% - 40%
Retail	14%	5% - 25%
Subtotal	*99%*	*80% - 100%*
Niche/Other	<1%	5% - 20%
Total	100%	

Real Estate Geographic Risk
Geographic risk can be broken down into two segments: US regional exposure and non-US exposure. US regional exposure refers to the level of exposure in the four US regions in the private market real estate portfolio relative to the NCREIF Property Index.

(as of December 31, 2022)	NCREIF Property Index	Range
West	42%	20% - 50%
East	29%	20% - 45%
Midwest	7%	5% - 20%
South	22%	10% - 35%
Total	100%	

Infrastructure Sector Risk
Infrastructure sector risks refers to the level of exposure to the major infrastructure sectors in the private markets infrastructure portfolio. Sector risk will be managed through portfolio design and the use of commingled funds and co-investments.

Infrastructure Geographic Risk
Infrastructure geographic risks is broken into the regional exposure of the private markets infrastructure portfolio. Geographic risks will be managed through portfolio design and the use of commingled funds and co-investments.

Global Real Assets Geographic Risk
Non-US exposure refers to the level of exposure of non-US investments in the total Global Real Assets portfolio. Non-US exposure will be limited to 35% of the private market portfolio.

Liquidity Risk
Private market real asset investments are illiquid, with both holding periods and commingled fund terms ranging from 7-10 years or longer. Liquidity risk will be managed through target allocations to private and public market real assets as well as vintage year diversification.

Leverage Risk
Private market real asset investments typically are acquired with a combination of equity capital and mortgage financing. The amount of leverage per asset or pool of assets depends on debt availability, property type, tenant quality, and asset life cycle. The amount of leverage and financing terms ultimately are the responsibility of SERS' external real asset managers and are governed and constrained by partnership agreements. The leverage maximum for the total private market real assets portfolio is 50% of the gross asset value of the private market real assets portfolio. Leverage risk will be managed through target allocations and portfolio design.

Currency Risk
The Global Real Assets program does not hedge currency risk and relies upon its external managers to determine if such hedges are appropriate. Currency risk will be managed through geographic exposure limits, as shown above under geographic risks.

IMPLEMENTATION GUIDELINES – Global Real Assets

Valuation Risk
The valuation frequency for private market real assets is dependent upon the external managers' internal and external valuation policies, which are reviewed during the operational due diligence process.

Manager Concentration Risk
A single manager utilizing core strategies shall not constitute more than 25% of the net assets of the Global Real Assets program. For non-core strategies, a single fund commitment shall not constitute more than 10% of the net assets of the Global Real Assets program and a single manager with multiple fund commitments, including co-investments, shall not constitute more than 20% of the net assets of the Global Real Assets program.

IMPLEMENTATION GUIDELINES – Cash Equivalents & Securities Lending

I. ROLE

Short-Term Cash should provide liquidity for funding investment capital calls and operational expenses. Cash should be invested in conservative, low risk securities/funds to preserve capital for future expenditures and investments.

II. ASSET ALLOCATION

The Cash allocation is established with periodic asset allocation studies. The most recent asset allocation study authorized a 3% exposure to cash with a range of 1%-5%.

III. BENCHMARK

The Short-Term cash benchmark is the FTSE 30 Day Treasury Bill.

IV. PERFORMANCE OBJECTIVE

The annualized return objective for the Short-Term portfolio is five basis points net of fees over the benchmark.

V. PORTFOLIO DESIGN AND CONSTRUCTION

The Cash portfolio is designed with preservation of capital in mind. A cash balance of one to three months of expenditures is usually maintained. A higher allocation to cash may also be used to preserve capital in volatile markets. The average weighted maturity of the portfolio will not exceed 20 days.

Risk is constantly assessed before investment purchases are made in the portfolio. Only top tier commercial paper is purchased. Money market holdings are also reviewed on a regular basis along with choosing a top tier money market provider with a deep credit analyst team and whose short-term investments are important to the organization.

The Securities Lending program is designed to be a low risk, intrinsic value focused strategy that can generate additional income for the system. The program is implemented through a third-party lending agent and collateral reinvestment manager. Separately, additional securities lending income is earned by the commingled passive global equity accounts.

VI. PERMISSIBLE INVESTMENTS

Security Type	
US Treasury Bills	Y
Commercial Paper rated A-1/P-1 or higher	Y
Money Market Funds rated at least A-1/P-1	Y
Unrated Market Funds comparable to an A-1/P-1 equivalent fund	Y

VII. RISK MANAGEMENT

Liquidity Risk
The weighted average maturity shall not exceed 20 days. All money market funds must provide daily liquidity.

Credit Risk
A commercial paper issuer must be on the approved credit list or approved by the Chief Investment Officer before purchasing. Market and issuer news are reviewed daily by the Senior Investment Officer – Global Fixed Income. Money market funds must regularly send a holdings report to SERS, where it is reviewed on a regular basis.

Issuer Risk
Single issuer commercial paper investments are limited to $20 million. Related entity commercial paper investments are limited to the lower of 30% of the short-term account or $40 million. Overnight commercial paper issuer maturities are limited to $50 million.

IMPLEMENTATION GUIDELINES – Cash Equivalents & Securities Lending

Securities Lending Risk

All loans will be collateralized with cash at 102% for US securities and 105% for non-US securities and marked-to-market daily. Collateral will be reinvested in government money market funds and/or repurchase agreements. Loans on fixed income securities will be subject to a ten-basis point minimum spread requirement at loan initiation. Loans to approved borrowers will be limited to 25% of the average monthly market value on loan for the prior calendar year.

IMPLEMENTATION GUIDELINES – Opportunistic & Tactical

I. ROLE

The role of SERS' Opportunistic portfolio is to earn a return above the Bloomberg US Aggregate Bond Index + 2% by investing in assets and strategies that do not fit within the existing asset classes. The investments are defined as tactical or non-traditional investment opportunities.

II. ASSET ALLOCATION

SERS' Statement of Investment Policy sets the opportunistic target allocation at 0%, with a range of 0%-5%.

III. BENCHMARK

The Opportunistic benchmark is the Bloomberg US Aggregate Bond Index + 2%.

IV. PERFORMANCE OBJECTIVE

The performance objective of the Opportunistic portfolio is to earn a net of fee return in excess of the Bloomberg US Aggregate Bond Index + 2%, with a meaningful component of the total return coming from current income.

V. PORTFOLIO DESIGN AND CONSTRUCTION

The Opportunistic portfolio may consist of a wide variety of investment types, structures and strategies targeting cash yield as well as price appreciation. Investment strategies include separate accounts, commingled funds, ETFs, co-investments and derivatives.

VI. PERMISSIBLE INVESTMENTS

Permissible investments include, but are not limited to, common stock, preferred stock, debt securities, currencies, commodities, etc.

VII. RISK MANAGEMENT

Leverage Risk
Leverage will be prudent for the given strategy and consistent with the fund's offering memorandum.

Liquidity Risk
Liquidity will be monitored regularly to ensure the portfolio can be traded or rebalanced within a reasonable timeframe. Liquidity risk will be managed through target allocations to private and public market assets as well as through portfolio design.

Currency Risk
The Opportunistic portfolio does not directly hedge foreign currency risk and relies upon its external managers to determine if such hedges are appropriate.

IMPLEMENTATION GUIDELINES – Overlay Program

I. ROLE

SERS invests in Overlay strategies that trade derivatives of the Total Fund's underlying asset exposures and currency exchange rates to enhance the Total Fund portfolio's efficiency. The Overlay program includes i) tactical asset allocation, and ii) active currency strategies.

The tactical asset allocation strategy aims to add value to the Total Fund performance through long and short positions based on short-term relative attractiveness of assets.

The active currency strategies aim to add value to the Total Fund on a risk-adjusted basis by employing long and short positions in various currency pairs based on relative attractiveness of the currencies. The strategies are expected to have low correlation to the major asset classes such as US equity and fixed income.

II. ASSET ALLOCATION

The target allocation of the tactical asset allocation and Currency program is 0% since long and short positions net out.

The tactical asset allocation program's notional exposure limit is +/-7% of the Total Fund to each of the following assets: US fixed income, US equity and Non-US equity. Since the tactical asset allocation positions are employed for short periods, the notional exposures are not subject to the policy asset allocation ranges set forth in the Statement of Investment Policy; however, the active risk contribution by the overlay program as a whole is subjected to the overall guideline on active risk for the management of the Total Fund specified in the Risk Management Policy.

The notional value of the active currency program is capped at 50% of the Non-US Equity portfolio's value.

III. BENCHMARK

The benchmark for the tactical asset allocation and Currency Overlay program is 0% since net exposure is 0%.

IV. PERFORMANCE OBJECTIVE

The Overlay program is expected to add 5 to 10 bps of excess return to the Total Fund's performance on a three to five year horizon.

V. PORTFOLIO DESIGN AND CONSTRUCTION

The mandates are unfunded. The Overlay strategies buy (long) or sell (short) futures or forwards contacts to get exposures to desired markets in order to exploit shifts in relative valuation of assets and currencies.

The tactical rebalancing strategy's net exposures, sum of long and short positions, are valued at zero on the initiating position time. Active currency strategies can go either net long or net short US dollar. Both tactical rebalancing and active currency aggregate portfolios are constructed to have no dependency on any single risk factor.

VI. PERMISSIBLE INVESTMENTS

Tactical asset allocation: equity, fixed income, commodity and precious metals futures and options on futures.

Currency Overlay: currency forwards, currency futures, gold forwards, gold futures, and limited currency options.

VII. RISK MANAGEMENT

Counter-party risk management

- Futures and exchange traded options are traded at exchanges thus having default risk only to the clearinghouse while having no credit risk to trade counterparties.
- Forward contacts and over-the-counter options entail default risk of the counterparties. Counterparty risk of these contracts is managed through ISDA (International Swaps and Derivatives Association) and EMIR (European Market Infrastructure Regulation) umbrella agreements with managers.

Volatility management

- The tactical asset allocation program's tracking error range is 5 to 15 bps.
- All active currency strategies have targeted tracking error equal to or less than 8%; the aggregate active currency program's tracking error is expected to be in the range of 5 to 8%.

Liquidity

- The use of derivatives requires initial margin as well as daily variation margin for futures. Liquidity risk will be managed by ensuring that an adequate reserve of cash is available to meet margin requirements at all times.

Sources

SOURCES

Economic Outlook:
Blue Chip Economic Indicators, March 2023.
International Monetary Fund World Economic Outlook, April 2023.
Yardeni Research, Inc. YRI S&P 500 Earnings Forecast. <https://www.yardeni.com/pub/>
FactSet. Earnings Insight. www.factset.com
University Of Michigan. Surveys of Consumers. <http://www.sca.isr.umich.edu>
US Bureau of Labor Statistics. <https://www.bls.gov/news.release/empsit.toc.htm>
US Department of the Treasury. <https://home.treasury.gov/resource-center/data-chart-center/interest-rates>

Global Equities:
Bloomberg. <http://www.bloomberg.com>
FTSE Russell US Indices. <https://www.ftserussell.com/products/indices/russell-us>
Goldman. “Goldman Market Monitor.” April 1, 2023.

Global Fixed Income:
BCA. “The Bank Credit Analyst.” April 2023
Goldman Sachs. “Global Fixed Income Monthly.” April 2023.
Ninety One. “Getting the most out of emerging market debt.” February 2023.
Western Asset Management Company. “US Core Plus Investment Highlights.” April 2023.

Global Private Credit
Pitchbook. <http://www.pitchbook.com>
Preqin. <http://www.preqin.com>
S&P Dow Jones Indices. <https://us.spindices.com>
J.P. Morgan Asset Management. “Guide to Alternatives.” November 2022.
New York Fed. <http://www.newyorkfed.org>
Federal Reserve. <http://www.federalreserve.gov>

Global Private Equity:
Bain and Company. “Global Private Equity Report 2023.’’ March 2023.
National Venture Capital Association. <http://www.nvca.org>
Pitchbook. <http://www.pitchbook.com>
Preqin. “2023 Preqin Global Private Equity & Venture Capital Report.”

Global Real Assets:
CBRE Research. <https://www.cbre.us/research-and-reports>
Clarion Research. <https://www.clarionpartners.com/insights>
NCREIF Benchmark. <https://www.ncreif.org>
PREA Consensus Survey March 31, 2023.

Opportunistic and Tactical:
Preqin. <http://www.preqin.com>
US Energy Information Administration. <https://www.eia.gov>
J.P. Morgan Asset Management; “Guide to Alternatives.” December 2022.

Cash Equivalents:
FitchRatings. “Global Money Market Funds Outlook 2023.” December 8, 2022.

Glossary

GLOSSARY

Active Risk – see Tracking Error.

Alpha – the premium an investment portfolio earns above a certain benchmark (such as the Standard & Poor's 500 Index). A positive alpha indicates the investor earned a return in excess of the index return.

Asset Allocation – the practice of allocating a certain percentage of a portfolio between different types of investment assets, such as stocks, bonds, real estate, cash, etc. By diversifying among asset classes, it is expected to create a favorable risk/reward ratio for the portfolio.

Basis Point – one hundredth of one percent. For example, an addition of 40 basis points to a yield of 7.50 percent would increase the yield to 7.90 percent. Basis points are normally used when quoting yields or returns, alpha, or fees paid to investment managers.

Benchmark – a measurement or standard that serves as a point of reference by which portfolio performance is measured. Benchmarks must meet standard criteria.

Bloomberg US Aggregate Bond Index – a market capitalization weighted US bond index published by Bloomberg LLC. Most US traded investment grade bonds are represented in the index. The Bloomberg US Aggregate Bond Index is SERS' global fixed income policy benchmark.

Burgiss All Private Equity (BAPE) – BAPE is comprised of data from more than 5,000 private equity funds contributed by limited partners that are Burgiss clients and use Burgiss' web-based institutional portfolio management platform Private i. The benchmark data is sourced from Burgiss' limited partner clients and includes complete transactional and valuation history between the limited partner and their fund investments. Burgiss publishes a detailed breakdown of the dataset every quarter allowing for increased transparency.

Co-investment – a direct investment in a single asset of a multi-asset Fund, made alongside the Fund's investment in the asset; typically involves terms that are more attractive and with shorter time frames than those of the Fund.

Derivatives (Derivative Instruments) – financial instruments (securities or contracts) whose values are derived from underlying financial assets, indices, or other instruments. Derivative performance is based on the performance of assets, interest rates, currency exchange rates and various domestic and foreign indices underlying the instruments. The common forms of derivatives are forward, futures, swap, and options contracts.

Diversification – the method of reducing risk by distributing investment assets among a variety of investment securities which have different risk/ reward ratios.

Due Diligence – an investigation or audit of a potential or existing investment.

Equity Investment – claims held by the residual owners of a firm. May also be referred to as common stock. Investments in Real Estate and certain Private Markets classifications may also be considered equity.

Fixed Income Investment – a security issued by a borrower that obligates the issuer to make specified payments to the holder over a specific period. May also be referred to as "debt" or "bonds."

FTSE 30 Day Treasury Bill – an index that measures the rate of return for 30-day US Treasury Bills, which are considered representative of the performance of Short-Term money market instruments. The FTSE 30 Day Treasury Bill is SERS' policy benchmark for Cash Equivalents.

Fund – fund means a limited partnership, trust or commingled investment vehicle in which SERS invests or may invest (e.g., private credit fund, private equity fund, or real estate fund).

Global Equities – reflects the consolidation of what had been treated by SERS as US Equity and Non-US Equity asset classes; includes equities of US and non-US origin, equities of various capitalizations (e.g., large cap, small cap, mid cap, etc.), equities from developed, emerging and frontier markets, growth and value equities and passive and active strategies. Investments in Global Equities strategies are made in accordance with established investment guidelines, and amended as necessary, by mutual agreement between the Chief Investment Officer and the Investment Consultant.

Guidelines – refers to an Investment Manager’s “Investment Guidelines,” established between the Investment Manager and Staff as part in an investment management agreement. Guidelines may be general or specific.

Investment Committee – a committee comprised of the Chief investment Officer and Investment Officers from SERS’ Investment Department who possess the Ohio State Retirement System Investment Officer (SRSIO) license, with clearly defined structure, rules, and procedures for reviewing and approving investments in a timely and prudent fashion.

Investment Consultant – any consultant hired by the Board or by Staff to advise or assist with the Investment Program in accordance with the Statement of Investment Policy. Board investment consultants must be approved by the Board. Staff investment consultants shall be approved by the Executive Director.

Investment Manager – a manager or potential manager of SERS assets, both public market and private market. Includes, but is not limited to managers of equity, fixed income, private credit, private equity, real estate, commodities, and cash.

Investment Staff – members of the investment department of SERS, including the Chief Investment Officer, Investment Officers, and other department personnel.

Leverage – in investments, this is the control of a large amount of money by a smaller amount of money, such as buying on margin. In finance, this is the relationship of debt to equity on a company’s balance sheet in the form of the debt/equity ratio.

Long a futures contract or a forward contract – buying exposure to the underlying assets of the contract without actually owing those assets. When the underlying assets deliver a positive return, the long position gains; when the underlying assets deliver a negative return, the reverse is true.

Morgan Stanley Capital International – All Country World Free ex-USA Index ($Net) – an equity index representing 44 developed and emerging countries. “Free” indicates the index reflects actual investable opportunities for global investors by taking into account local market restrictions on share ownership by foreigners. “Net” indicates that dividends are reinvested after the deduction of withholding taxes applicable to non-resident institutional investors. The MSCI-ACWI ex-USA Index, net of dividends reinvested is SERS’ policy benchmark for Non-US Equities.

NCREIF Property Index (NPI) – a quarterly time series composite total rate of return measure of investment performance of a very large pool of individual commercial real estate properties acquired in the private market for investment purposes only. The NCREIF Property Index is a component of SERS’ Global Real Estate Policy Benchmark.

Opportunistic and Tactical Investments – global opportunistic investments are tactical or non-traditional investment opportunities that may be short-term or may not fit within the generally accepted risk/return parameters of specific asset classes or strategy groupings. Such opportunities may involve capitalizing on short-term market dislocations or other such unique situations. Tactical investments may include strategies with dynamic allocations to single assets or across multiple asset types or other innovative approaches.

Options contract – a form of financial derivatives. In an options contract, two parties (buyer and seller) agree that the buyer, who pays an option premium to the seller, has the right to exercise an option whether to buy or sell a particular asset at a specified price at a specified future date.

Portfolio – a collection of investments owned, managed, or overseen by an individual or investment manager, a board, or an organization. Portfolio can mean a manager account or subset thereof (e.g., Goldman Sachs Core Plus account), an asset class (e.g., US Equity), or the entire fund (e.g., SERS’ Total Fund).

GLOSSARY

Rebalancing – adjusting asset class or portfolio allocations relative to their targets or ranges to adjust for actual or anticipated market movements.

Russell 3000 Index – a market-value weighted equity index published by the Frank Russell Company. The index measures the performance of the 3,000 largest US companies in terms of market capitalization. The Russell 3000 Index is SERS' Domestic Equity Policy Benchmark.

Secondaries – pre-existing investor capital commitments to private funds that are purchased in the secondary market.

Secured Overnight Financing Rate (SOFR) – SOFR is a broad measure of the cost of borrowing cash overnight collateralized by Treasury securities. There is a considerable volume of transactions executed that utilize SOFR and the rate is published on each business day.

Securities Lending – the temporary loan of a security from an institutional investor's portfolio to a broker/dealer to support the firm's trading activities. Loaned securities are collateralized with cash at 102-105% of the loan exposure. The lender retains the entitlement to all the benefits of the loaned security, including dividends and interest, except the right to vote proxies. The lender has a right to recall the loan at any time.

Short a futures contract or forward contract – selling exposure to the underlying assets of the contract without transferring the ownership of those assets to the buyers. When the underlying assets deliver a positive return, the short position experiences losses; when the underlying assets deliver a negative return, the reverse is true.

Style – style refers to an investment product, strategy or style offered by an Investment Management Firm and reflects how the assets are invested. For example, value versus growth; core versus value added; quantitative versus fundamental; etc.

T-bill – refers to Treasury Bill. Staff utilizes the 90-day T-bill rate as a reference benchmark.

Total Fund – refers to SERS' total investment assets.

Tracking Error – standard deviation of the excess return of the portfolio relative to the Benchmark, often measured over rolling three-year periods.

SCHOOL EMPLOYEES RETIREMENT SYSTEM OF OHIO
300 E. BROAD ST., SUITE 100, COLUMBUS, OHIO 43215-3746
614-222-5853 • Toll-Free 800-878-5853 • www.ohsers.org
Serving the People Who Serve Our Schools ®