



**REPORT ON EXAMINATION**

**OF THE**

**NEW YORK STATE AND LOCAL EMPLOYEES’**

**AND THE**

**NEW YORK STATE AND LOCAL POLICE AND FIRE**

**RETIREMENT SYSTEMS**

**AS OF MARCH 31, 2021**

**EXAMINER:**

**KE XU, CFE**

**DATE OF REPORT:**

**JANUARY 18, 2024**

## TABLE OF CONTENTS

<u>Section</u>	<u>PAGE NO.</u>
1. Executive summary	2
2. Scope of examination	4
3. System overview	6
A. History	6
B. Management	7
1) Common Retirement Fund and the New York State and Local Retirement System	7
2) New York Public Employees' Group Life Insurance Plan	16
C. Growth of Common Retirement Fund	17
4. Financial statements	19
A. Employees' Retirement System – Statement of fiduciary net position	19
B. Employees' Retirement System – Statement of changes in fiduciary net position	20
C. Police and Fire Retirement System – Statement of fiduciary net position	21
D. Police and Fire Retirement System – Statement of changes in fiduciary net position	22
E. Reserves	23
5. Treatment of members	25
A. Required minimum distributions	25
B. Benefit calculations	25
6. Investment examination report	27
7. Actuarial	28
A. Annual statement liabilities	28
B. Annual statement development of 2023 employer contribution	30
C. Actuarial valuation development of 2023 employer contribution rates	31
D. Actuarial cost methods	36
E. Asset valuation method	37
F. Aggregate actuarial cost method	39

<u>Section</u>	<u>PAGE NO.</u>
G. Events after the measurement date	42
H. Funding and cost recognition of other benefit plans	42
I. Funding ratios	43
J. Actuarial assumptions	44
K. Valuation data	46
L. Gain/Loss analysis	47
8. Prior report summary and conclusions	49
9. Summary and conclusions	50

---

KATHY HOCHUL  
Governor



KAITLIN ASROW  
Acting Superintendent

March 11, 2026

Honorable Kaitlin Asrow  
Acting Superintendent of Financial Services  
New York, New York 10004

Dear Kaitlin Asrow:

In accord with instructions contained in Appointment No. 32442, dated August 8, 2022, and annexed hereto, an examination has been made into the condition and affairs of the New York State and Local Employees' Retirement System, the New York State and Local Police and Fire Retirement System, and the New York State Common Retirement Fund, hereafter referred to as "the System." The System's home office is located at 110 State Street, Albany, New York 12257.

Wherever "Department" appears in this report, it refers to the New York State Department of Financial Services.

The report indicating the results of this examination is respectfully submitted.

## 1. EXECUTIVE SUMMARY

During the examination of the System, several areas for consideration by the System were identified and are summarized below. A separate examination of the investments and investment practices of the System was performed. The Investment Examination Report is submitted with this report as a separate document as referenced in section 6. The following areas for consideration are noted:

- The System should consider exploring other resources available for analyzing valuation data and performing actuarial valuations, including the use of commercial actuarial valuation software. (See section 7K of this report.)
- The System should consider contacting appropriate tax and legal experts, including the Governmental Accounting Standards Board (“GASB”) and the Internal Revenue Service (“IRS”), for guidance on the financial reporting and funding of the New York State Public Employees Group Life Insurance Plan post-retirement death benefits. (See section 7H of this report.)
- The System should consider reviewing whether the aggregate actuarial cost method used is consistent with a method defined by the Actuarial Standards Board (“ASB”). If the System retains its current method, then the System should consider describing the implications of its method on future expected contributions and funded status in its actuarial reports in accordance with generally accepted actuarial practices. (See section 7F of this report.)
- The System should consider reviewing the methodology used to determine the Normal rates to ensure it is justified under applicable New York Retirement and Social Security Law (“RSSL”), appropriate under 11 CRR-NY 136.2, and reflects the contributions needed to fund benefits attributed to the specific plan, tier, and option. (See section 7C of this report.)
- The System should consider reviewing whether the events that occurred after the valuation date are reflected appropriately and in accordance with generally accepted actuarial practices. (See section 7G of this report.)

- The System should consider reviewing current and former members and payees to identify all affected members under Internal Revenue Code (“IRC”) Section 401(a)(9) and initiating corrective action in accordance with the IRS Employee Plans Compliance Resolution System. (See section 5 of this report.)

## 2. SCOPE OF EXAMINATION

The examination covers the five-year period from April 1, 2016, through March 31, 2021. As necessary, the examiner reviewed transactions occurring subsequent to March 31, 2021, but prior to the date of this report (i.e., the completion date of the examination).

The Superintendent has the authority under New York Insurance Law Section 314(b)(3) “to make an examination into the affairs” of the System. The examination provides an independent review of the System to better enable the System’s Trustee to determine appropriate action as may be needed in the interest of the System and to assist the System’s Trustee in meeting its obligations in overseeing the affairs of the System. The examination was conducted in accordance with New York Insurance Law Section 310. In accordance with the direction in New York Insurance Law Section 314(b)(3), the objective of this examination was to review and report on the System’s governance, including but not limited to fiduciary, financial, actuarial, investment, risk management, information technology, and member treatment.

The examination included a verification of assets and actuarial present values as of March 31, 2021, to determine whether the System’s filed March 31, 2021, annual statement fairly presents its funding status. The examination included a review of the following matters:

- History of the System
- Management and control
- Accounts and records
- Financial statements
- Member benefits
- Investments
- Actuarial

Sections 1 to 5 of this report on examination are confined to financial statements and comments on those matters that involve laws, regulations or rules, or which require explanation or description.

A separate examination on the investments and investment practices of the System was performed. The Investment Examination Report is submitted with this report as a separate document as referenced in section 6.

The actuarial review is included under section 7 of this report.

The examiner reviewed the corrective actions taken by the System with respect to the recommendation contained in the prior report on examination. The results of the examiner's review are contained in section 8 of this report.

### 3. SYSTEM OVERVIEW

#### A. History

The New York State and Local Retirement System (“NYSLRS”) was established by the enactment of Chapter 741 of the Laws of 1920 and began operations effective January 1, 1921.

The original legislation provided for the membership of state employees. Subsequent amendments authorized the inclusion of political subdivisions of the state, public and quasi-public organizations and certain New York City libraries as participating employers and extended membership to their employees.

The retirement law was contained in Articles 4 and 5 of the Civil Service Law until July 1, 1956. Effective July 1, 1956, all provisions concerning retirement contained therein were incorporated in RSSL. Effective April 1, 1967, Chapter 1,000 of the Laws of 1966, Article 8 amended RSSL and established a separate retirement system for policemen and firemen, which was called the New York State Policemen’s and Firemen’s Retirement System.

Effective July 30, 1987, Chapter 506 of the Laws of 1987 amended the official titles of the two retirement systems to the New York State and Local Employees’ Retirement System (“ERS”) and the New York State and Local Police and Fire Retirement System (“PFRS”).

Article 8, Title 3, Section 315 of RSSL states that the police and fire retirement system, established by such article, shall be subject to the supervision of the Superintendent of Insurance. Such supervision shall be in accordance with the provisions of the New York Insurance Law to the extent that such provisions are applicable to the police and fire retirement system and are not inconsistent with the provisions of such article. Article 2, Title 2, Section 15 of RSSL states that the employees’ retirement system, continued by such article, shall be subject to the supervision of the Superintendent of Insurance. Such supervision shall be in accordance with the provisions of RSSL to the extent that such provisions are applicable to the employees’ retirement system and are not inconsistent with the provisions of such article. Section 314 of the New York Insurance Law provides the Superintendent with the authority to examine the affairs of the Systems at least once every five years. Section 14 of RSSL, designates the Attorney General of the State as the legal adviser of the Systems.

## B. Management

### 1) Common Retirement Fund and the New York State and Local Retirement System

Control of the administration and operation of the System is vested in the Comptroller of the State of New York. The State Comptroller (“Comptroller”) is sole trustee of the New York State Common Retirement Fund (“CRF”), and is directly accountable for the performance, oversight and management of the Fund. As the administrative head of the System and trustee of its assets, the Comptroller is a fiduciary. That is, the Comptroller must: act solely in the interest of the System’s members and beneficiaries; and must perform his responsibilities with the “care, skill, prudence and diligence under the circumstances then prevailing that a prudent person acting in a like capacity and familiar with such matters would use in the conduct of an enterprise of a like character and with like aims.” The Comptroller has the authority to adopt or amend rules and regulations for the administration and transaction of the business of the Systems and for the custody and control of their funds. The Comptroller is also responsible for the maintenance of all necessary accounting records and data needed for the actuarial valuation of the various funds of the Systems. The Comptroller is required to establish funds which, in his judgment, are necessary or required for proper fiscal management and to perform such other functions as are required for the execution of the provisions of RSSL.

The Comptroller has the authority to employ such other necessary technical and administrative assistants as necessary. During the period under review, the Comptroller employed administrative officers (directors) to manage the day-to-day operations of the NYSLRS’ fifteen separate bureaus.

#### Accounting Bureau

The Accounting Bureau maintains accurate, independent accounting records and provides timely and accurate reporting to internal and external customers. The bureau prepares and distributes the System’s annual financial statements and participates in the preparation of the System’s Annual Comprehensive Financial Report (“ACFR”). Investment data regarding stocks, bonds, money markets, mortgages, real estate and other investments are processed daily. This requires ongoing interaction with the Division of Pension Investment and Cash Management (“PICM”) and the Fund’s master custodian, currently JP Morgan Chase. This bureau also works with the Information Technology Services bureau to produce federal tax forms for the System’s

membership and provides customers with timely and accurate tax information. In addition, this bureau monitors changes in accounting standards and laws that affect qualified pension plans and ensures compliance with its governing bodies. This bureau is managed by one director and two assistant directors.

#### Actuarial Bureau

The Actuarial Bureau ensures that the Retirement System's service and disability retirement, death and withdrawal benefits are properly funded and that adequate assets are available to pay benefits as they become due. This involves analyzing trends in retirements, withdrawal and mortality for the members, retirees and beneficiaries to project what may occur in the future. An actuarial valuation is performed each year by the Actuarial Bureau using this analysis and economic assumptions to project benefit amounts for every member, retiree and beneficiary. This bureau also analyzes proposed laws and provides fiscal costs for hundreds of legislative proposals every year. This bureau is managed by one director and one assistant director.

The actuarial reports prepared by the Actuarial Bureau are required to be published on or before October 15<sup>th</sup> of each fiscal year in accordance with RSSL Section 11(d). The examiner's review noted actuarial reports were published after October 15<sup>th</sup> in 2020 and 2021. In addition, the reports were not dated or formally signed by the actuary and lacked qualification statements by the actuary in accordance with generally accepted actuarial practices. The examiner also noted that completed actuarial reports did not appear to be publicly available on the State Comptroller's website.

The System should consider preparing and publishing actuarial reports in accordance with RSSL Section 11(d) and making these reports available on its website.

#### Administrative Services/Quality Performance Bureau

The Administrative Services/Quality Performance Bureau supports all division bureaus in workforce development, internal controls, budgeting, financial tracking, purchasing, personnel, labor relations, emergency management planning, space planning and performance consulting. This support enables staff to achieve the division's goals and objectives and helps the bureaus better serve the employees, members, retirees, employers and other customers. This bureau is managed by one director and one assistant director.

### Advisory Council Affairs Bureau

Advisory Council Affairs Bureau provides outreach to improve communication between the Retirement System and its stakeholders. This includes Employee Representatives (Unions), Municipal Representatives (Employers), Pensioner Representatives (Retirees), and others. This bureau's starting point is the Comptroller's Advisory Council to the Retirement Systems, which includes statewide representatives from those entities mentioned. This bureau is managed by one director and one assistant director.

### Benefits Calculation and Disbursement Services Bureau

The Benefit Calculations and Disbursement Services Bureau is responsible for all major benefit determinations, from establishing members' eligibility for benefits through payment of service retirement, disability retirement, and death benefits. Upon request, this bureau also provides benefit estimates and service credit totals to members. This bureau is managed by one director and three assistant directors who oversee the various aspects of estimates and disbursements calculations.

### Benefit Information Services Bureau

The Benefit Information Services Bureau is comprised of two main areas: Information Services, which represents consultation sites in Albany, Hauppauge and Buffalo, and the Call Center, located at 800 North Pearl Street in Menands. Information Services employees provide individual consultations (either in person, via telephone or video conferencing) and conduct meetings with members. The Call Center is the primary contact for Retirement System members and retirees, and provides customer service through a variety of platforms. The Call Center also mails forms and booklets, takes death reports, changes addresses and provides other types of assistance to members and their employers. This bureau is managed by one director and three assistant directors.

### Disability Services Bureau

The Retirement System provides disability retirement benefits to members who become permanently disabled during the course of their public service careers and are unable to perform the duties of the position in which they were serving at the time they apply for the benefit. This

bureau is managed by one director and two assistant directors, who maintain the different disability retirement benefits and accidental death benefit programs for each membership tier.

### Executive Bureau

The Executive Bureau provides leadership and direction for all other bureaus of the Retirement System. The Executive Deputy Comptroller, with the help of the Deputy Comptroller and the Assistant Comptroller, establish administrative policies and allocate staffing and financial resources. Working closely with bureau directors and their staff, the Executive Bureau establishes policies and procedures relating to Retirement System benefits, membership and employer contributions. This bureau also recommends new retirement legislation or changes to existing legislation and represents the Retirement System regarding Federal legislation affecting public retirement benefits. The Executive Bureau authorizes and sponsors the Redesign Project, which is in the midst of a multi-year initiative to design, develop and implement a new web-based information system that will facilitate the work performed within the division as well as provide the System's members, retirees and employers with secure access to their accounts. The Executive Bureau is under the leadership of the Executive Deputy Comptroller, one Deputy Comptroller, and one Assistant Comptroller.

### Hearing Administration and Matrimonial Bureau

The mission of the Hearing Administration and Matrimonial Bureau is to ensure accurate and timely implementation of court orders directing the System to divide pension benefits as a marital asset for divorce litigation. The Hearing Administrative and Matrimonial Bureau is responsible for scheduling and supervising the quasi-judicial hearings required under the Retirement and Social Security Law and the State Administrative Procedures Act. The staff conducts pre-hearing review, recruits and supervises hearing officers and outside court reporters, schedules hearings, prepares and distributes verbatim hearing records, reviews the hearing officer's recommended decisions and distributes the Comptroller's final hearing decisions. This bureau is managed by a director and an assistant director.

### Member & Employer Services Bureau

The Member & Employer Services bureau has two major functional areas. Member Services is responsible for the registration of individuals to membership in ERS or PFRS and the maintenance of their accounts until membership has ended. This includes transfers between public retirement systems, service credit purchases, refund of excess contributions, loans from member contribution, beneficiary changes and tier reinstatements. This bureau is also responsible for the storage and maintenance of member files. Employer Services is the primary contact between the Retirement System and participating employers. This bureau's staff processes employer reports, issues employer invoices, conducts employer training and education, and manages employer participation and new plan adoptions and issues employer invoices. This bureau is managed by one director and four assistant directors.

### Pension Integrity Bureau

The Pension Integrity Bureau's mission is to ensure that the retirement data is accurate, complete and reliable and the bureau has three teams that work together to accomplish this mission. The Independent Contractor/Employee ("ICE") Team identifies, reviews and prepares cases where there is some question as to the members' status as an employee or independent contractor. Much of the ICE team's work involves corresponding with employers, members and their legal representatives to collect sufficient information to use in making final benefit determinations. The Compliance Audit Team audits retirement data to ensure that the data is reported and recorded correctly. This is accomplished through desk and field audits by Pension Integrity Bureau staff, and by coordinating with the Office of the New York State Comptroller's ("OSC's") State and Local Government Accountability and Internal Audit staff. The Quality Assurance Team identifies division-wide vulnerabilities and inconsistencies and assists bureaus by analyzing unique cases or situations. The team also works closely with other bureaus to improve the reliability of retirement data. The Pension Integrity Bureau is managed by one director and an assistant director.

### Program Optimization, Support & Transformation Bureau

The bureau's mission is to provide exceptional business support services for the System's partners. This bureau is responsible for assisting with the maintenance and enhancement of the

existing business processes related system components being used by the staff to service customers and other stakeholders. This includes playing an active role in all phases of the System Development Life Cycle. The goal of this bureau is to provide any assistance that the Retirement System's customers and business partners may need by continually maintaining and enhancing their existing business processes and systems. This Bureau provides a comprehensive and coordinated array of services and expertise designed to adapt effectively to each unique business challenge. This bureau is managed by one director and four assistant directors.

### The Redesign Bureau

The Redesign Project is transforming the way the System does business. The Retirement System's primary information system (MEBEL) has been in operation for more than 30 years and the System embarked on a major project to replace its legacy system and expand its service channels to better meet its membership needs. This multi-year program has been released incrementally – in 2015 the System Portal was introduced as a new tool for the staff to do their work. In 2016, Retirement Online was introduced, a new self-service application for members, retirees, employers and others who work with the System. Core business functionality and member self-service were implemented in 2019. The final phase involving pension payroll, tax services and payments was scheduled to go live in January 2023. This bureau is managed by one director and two assistant directors.

### Retirement Communications Bureau

The Retirement Communications Bureau is responsible for creating information resources for members, retirees and employers, as well as Retirement System employees. The bureau also provides services for other OSC divisions and outside agencies. This bureau produces a wide variety of multimedia, video and print material. In addition, they design and maintain the Retirement System's public website and the division's Intranet website. This bureau is managed by one director and one assistant director.

### Advisory Committees<sup>1</sup>

The Comptroller also maintains several advisory committees that meet periodically throughout the year and provide independent, expert assistance in guiding the CRF and the System. For the period under review, these advisory committees included: the Advisory Audit Committee, the Advisory Council for the Retirement System; the Investment Advisory Committee; the Real Estate Advisory Committee; and the Actuarial Advisory Committee.

### Advisory Audit Committee

The Advisory Audit Committee, appointed by the Comptroller pursuant to Insurance Regulation 85 (11 NYCRR 136-2), reviews and reports to the Comptroller on the annual internal and external audit process related to the System and the CRF, and on the Annual Comprehensive Financial Report. This committee serves the Comptroller in an advisory capacity only. The audit committee charter indicates that the committee shall be comprised of no less than three and no more than seven members as determined by the Comptroller. One member will reflect the interests of public employees, and one member will reflect the interests of public employers. All members are required to be financially literate and unaffiliated, and at least one member will be a financial expert. This committee meets three times each year, or as frequently as circumstances dictate. All Advisory Audit Committee members are expected to attend each meeting, in person or via telephone-conference or video conference. This committee may meet periodically with management, the Chief Audit Executive, the Director of Compliance, and the external auditor. Starting December 2021, this committee shall meet in executive session with the Chief Audit Executive at least once each year. The purpose of such executive meeting without management is to provide the opportunity for Internal Audit to discuss confidential and sensitive issues candidly. This committee's duties include but are not limited to reviewing the process for selecting the external auditors, review of the external auditors' audit plan and engagement letter, review of the annual audited financial statements of the System, including the impact of recent regulatory and professional pronouncements, review with management and the external auditors, all required communication to the committee under generally accepted auditing standards. This committee also reviews the Office of Internal Audit's plan, activities, staffing, organizational reporting

---

<sup>1</sup> The Advisory Committees are governed by the complete policies. The summary overviews provided are therefore qualified in their entirety by reference to such policies.

relationship, and reports resulting from its audit engagements pertaining to the System. Starting December 2021, this committee shall review the Internal Audit charter annually.

#### Actuarial Advisory Committee

The Actuarial Advisory Committee (“AAC”) is appointed by the Comptroller pursuant to Insurance Regulation 85 (11 NYCRR 136-2.6). The AAC provides advice on decisions regarding the Retirement System and the CRF that must be made for the exclusive benefit of members, retirees and beneficiaries of the Retirement System. The AAC also provides assistance to the System’s actuary and the Comptroller regarding the proper funding of the Retirement System. At a minimum, the AAC annually reviews the setting of the actuarial assumptions used in determining annual employer contributions. The AAC is to have no fewer than five members, and who must be “unaffiliated persons,” as defined in 11 NYCRR 136-2.2(j). AAC Members are to have expertise and experience in actuarial science. The AAC holds annual meetings, called and chaired by the Comptroller; additional meetings may be held as deemed necessary by the Comptroller or a majority of the AAC. The AAC may determine additional rules and procedures to govern it. The AAC’s duties include review and discussion of the actuarial soundness and financial condition of the Fund; annual review of actuarial assumptions and employer contributions; and discussion of other actuarial items such as the application of emerging, developing, and current actuarial standards and disclosures. The AAC also reviews and discusses any actuarial reports that will be issued by an actuarial consultant prior to issuing such report and it discusses any report recommendations at its next meeting following the issuance of the report.

The examiner’s review revealed AAC members appeared to have received limited information from the System. Generally, AAC members only received a draft assumptions report for review prior to the AAC annual meeting. Actuarial valuation reports and Reports of the Actuary do not appear to have been reviewed with or provided to AAC members. In addition, external reviews, including recommendations from the Department and auditors, do not appear to have been discussed with the AAC.

The System should consider providing AAC members with actuarial valuation reports, including draft reports, and reviews and recommendations made by other parties to the System regarding the actuarial work each year.

### Investment Advisory Committee

The Investment Advisory Committee (“IAC”) is appointed by the Comptroller pursuant to RSSL Section 423. The IAC advises the Comptroller on general investment issues. This committee reviews the investment policy statement and gives advice to the Comptroller regarding amendments as needed. This committee consists of not less than seven members who are appointed by the Comptroller, to serve for the Comptroller’s term of office. A vacancy occurring from any cause other than expiration of the Comptroller’s term shall be filled by the Comptroller for the remainder of the term. No officer or employee of any state department or agency is eligible for membership on this committee. Each member will be an “unaffiliated person: as defined in the regulations of the Department of Financial Services (11 NYCRR 136-2.2(j)). Members are required to be experienced in the investment field and shall have served, or shall be serving, as a senior officer or member of the board of an insurance company, banking corporation or other financial or investment organization authorized to do business in the state of New York. This committee provides advice to the Comptroller on investment policies relating to monies of the CRF and also reviews the investment portfolio of the Fund and makes such recommendations as may be deemed necessary. The members of this committee shall be entitled to reimbursement for their actual and necessary expenses but shall receive no compensation for their services.

### Real Estate Advisory Committee

The Real Estate Advisory Committee (“REAC”) is appointed by the Comptroller, with the consent of the IAC, pursuant to RSSL Section 423. The REAC reviews proposed mortgage and real estate investments. In the event the REAC disapproves a proposed mortgage or real estate investment, the investment will not be presented to the Comptroller and therefore the CRF cannot make the investment. No officer or employee of any state department or agency is eligible for membership on this committee. Each member will be an “unaffiliated person”: as defined in the regulations of the Department of Financial Services (11 NYCRR 136-2.2(j)). This committee convenes periodically on call of the Comptroller or the chairman. This committee meets monthly, or as otherwise directed by the Comptroller. The members of this committee shall be entitled to reimbursement for their actual and necessary expenses, but shall receive no compensation for their services.

Advisory Council of the Retirement Systems:

The Advisory Council for the Retirement System, appointed by the Comptroller pursuant to regulations of the Comptroller (2 NYCRR Part 320), advises and makes recommendations to the Comptroller on the formulation of policies in relation to the administration and management of the CRF and the Retirement System. Membership for the Advisory Council is drawn from employee and retiree representatives, municipal representatives, state and agency representatives, business representatives, labor and business organizations and legislative representatives.

2) New York Public Employees' Group Life Insurance Plan ("GLIP")

Pursuant to RSSL, a death benefit is payable upon the death of a member who dies in service. Since the receipt of such a benefit may result in unfavorable income tax consequences for beneficiaries under the Internal Revenue Code, the Legislature of the State of New York enacted Chapters 336 and 371, Laws of 1969, and Chapter 581, Laws of 1970, which became RSSL Sections 185 and 186. These provisions authorize the Comptroller to take the necessary steps to provide for a more favorable tax treatment of the ordinary death benefit. Accordingly, effective January 1, 1970, the GLIP was established for the purpose of providing group life insurance ordinary death benefits not in excess of \$50,000 in accordance with the appropriate sections of RSSL. Each qualified NYSLRS member is insured under the GLIP from January 1, 1970.

Effective April 1, 1996, post-retirement ordinary death is also covered under the group life insurance plan. This benefit is paid to beneficiaries of NYSLRS members.

Annually, the actuary shall investigate the plan's claims experience. On the basis of these investigations, and upon the recommendation of the actuary, the Comptroller shall certify the premium rates computed to be necessary to fund the group term life insurance authorized to be paid by the plan, as follows: As soon as practicable after the beginning of each fiscal year, the actuary shall estimate the amount which will be necessary to maintain a reserve which will be sufficient to pay at least one-half the amount of benefits estimated to become payable during a fiscal year. On the basis of such estimate, the Comptroller shall certify the premium which the State of New York and participating employers in the retirement systems are required to pay into the reserve funds to discharge the obligations of the plan. A statement of the amount so payable is submitted to the State of New York and to each participating employer in accordance with the appropriate RSSL sections.

### C. Growth of Common Retirement Fund<sup>2</sup>

The assets of the Systems are invested through the CRF with each system being credited, at the end of each fiscal year, with a participating interest in the CRF in proportion and percentage that the interest attributable to each System bears to the total assets of the CRF after considering contributions, earnings, disbursements and expenses attributable to each system.

<b>Plan Net Assets</b> (end of fiscal year March 31, (000))	<b>2017</b>	<b>2021</b>	<b>Change</b>
Assets:			
Investments	\$192,410,603	\$258,135,801	\$65,725,198
Securities lending collateral - invested	4,793,249	16,923,148	12,129,899
Receivables and other assets	<u>6,219,937</u>	<u>3,317,830</u>	<u>(2,902,107)</u>
Total assets	<u>\$203,423,789</u>	<u>\$278,376,779</u>	<u>\$74,952,990</u>
Liabilities:			
Securities lending obligations	\$ 4,801,017	\$ 16,930,860	\$12,129,843
Payables and other liabilities	<u>1,020,579</u>	<u>1,364,836</u>	<u>344,257</u>
Total liabilities	<u>\$ 5,821,596</u>	<u>\$ 18,295,696</u>	<u>\$12,474,100</u>
<b>Net assets held in trust for pension benefits</b>	<u>\$197,602,193</u>	<u>\$260,081,083</u>	<u>\$62,478,890</u>

As of March 31, 2021, the CRF's invested assets were mainly comprised of domestic equity (34.96%), global fixed income (18.48%), international equity (16.48%), and private equity (11.41%).

<b>Invested Assets</b> (end of fiscal year March 31, (000))	<b>2017</b>	<b>2021</b>	<b>Change</b>
Domestic equity	\$ 69,851,696	\$ 90,263,828	\$20,412,132
Global fixed income	44,002,645	47,722,955	3,720,310
International equity	33,836,667	43,480,400	9,643,733
Private equity	15,348,492	29,470,165	14,121,673
Real estate	12,937,452	17,647,993	4,710,541
Short-term Investments	5,653,335	11,082,651	5,429,316
Absolute return strategy investments	7,523,769	3,828,149	(3,695,620)
Opportunistic funds	2,065,686	1,187,930	(877,757)
Mortgage loans	800,287	1,043,621	243,334
Real assets	390,574	3,929,594	3,539,020
Credit	0	8,478,516	8,478,516
<b>Total investments</b>	<u>\$192,410,603</u>	<u>\$258,135,801</u>	<u>\$65,725,198</u>

<sup>2</sup> All tables are as of end of each fiscal year March 31.

The decrease in the Absolute Return Strategy (“ARS”) investments reflects redemptions in the ARS portfolio and a reclassification of assets into the credit portfolio, which was established in the new asset allocation policy.

<b>Changes in net assets (000)</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>
<b><u>Additions:</u></b>					
Net investment income (loss)	\$ 20,225,244	\$ 21,338,033	\$ 10,761,776	\$ (8,798,771)	\$ 70,649,606
Total contributions	<u>5,352,191</u>	<u>5,388,310</u>	<u>5,300,982</u>	<u>5,383,166</u>	<u>5,638,783</u>
Total additions	<u>\$ 25,577,435</u>	<u>\$ 26,726,343</u>	<u>\$ 16,062,758</u>	<u>\$ (3,415,605)</u>	<u>\$ 76,288,389</u>
<b><u>Deductions:</u></b>					
Total benefits paid	\$ 11,508,313	\$ 12,128,919	\$ 12,833,931	\$ 13,311,136	\$ 14,121,971
OPEB expense	-	-	-	223,608	-
Administrative expenses	<u>107,134</u>	<u>122,806</u>	<u>136,477</u>	<u>139,050</u>	<u>165,097</u>
Total deductions	<u>\$ 11,615,447</u>	<u>\$ 12,251,725</u>	<u>\$ 12,970,408</u>	<u>\$ 13,673,794</u>	<u>\$ 14,287,068</u>
Net increase (decrease)	<u>\$ 13,961,988</u>	<u>\$ 14,474,618</u>	<u>\$ 3,092,350</u>	<u>\$(17,089,399)</u>	<u>\$ 62,001,321</u>
<b>Net assets held in trust, beginning of year</b>	\$183,640,205	\$197,602,193	\$212,076,811	\$215,169,161	\$198,079,762
<b>Net assets held in trust, end of year</b>	\$197,602,193	\$212,076,811	\$215,169,161	\$198,079,762	\$260,081,083

The net investment loss in 2020 is primarily attributable to the net depreciation in fair value of investments from 2019 to 2020.

4. FINANCIAL STATEMENTSA. Employees' Retirement System – Statement of fiduciary net position

<b>Assets (000)</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>
<u>Investments:</u>					
Domestic equity	\$ 59,321,566	\$ 64,324,699	\$ 62,209,365	\$ 53,060,278	\$ 76,558,006
Global fixed income	37,369,255	38,049,777	38,742,369	38,521,993	40,476,616
International equity	28,735,796	33,130,137	30,769,587	26,020,729	36,878,258
Private equity	13,034,710	14,856,740	16,761,726	17,232,705	24,995,362
Real estate	10,987,134	12,040,115	13,305,653	13,313,079	14,968,290
Opportunistic funds and Absolute return strategy	8,143,846	8,817,297	9,034,721	8,382,901	4,254,428
Short-term investments	4,801,096	2,857,987	5,192,895	4,833,403	9,399,841
Mortgage loans	679,644	715,997	761,236	858,357	885,156
Real assets	331,695	1,289,208	1,884,032	2,617,613	3,332,917
Credit	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>7,191,123</u>
<b>Total investments</b>	<b>163,404,742</b>	<b>176,081,957</b>	<b>176,661,584</b>	<b>164,841,058</b>	<b>218,939,997</b>
Securities lending collateral	4,070,668	4,759,905	4,873,586	5,823,749	14,353,507
Forward foreign exchange contracts	94,132	36,970	15,224	3,659	58,388
<u>Receivables:</u>					
Employers' contributions	3,342,802	2,909,718	2,448,689	1,941,827	662,316
Members' contributions	3,929	7	2,687	4,606	5,336
Member loans	1,057,543	1,025,657	1,018,678	1,015,318	916,146
Investment income	341,055	335,299	331,014	305,559	294,396
Investment sales	235,768	206,706	248,470	224,059	281,386
Other	<u>180,860</u>	<u>58,898</u>	<u>296,140</u>	<u>152,664</u>	<u>153,670</u>
<b>Total receivables</b>	<b>5,161,927</b>	<b>4,536,285</b>	<b>4,345,678</b>	<b>3,644,033</b>	<b>2,313,250</b>
Capital assets	218,425	263,699	323,467	386,323	451,491
<b>Total Assets</b>	<b>172,949,894</b>	<b>185,678,816</b>	<b>188,219,539</b>	<b>174,698,822</b>	<b>236,116,633</b>
<u>Liabilities:</u>					
Security lending obligations	4,077,265	4,766,651	4,879,031	5,836,665	14,360,048
Forward foreign exchange contracts	93,873	36,932	15,060	3,670	58,338
Accounts payable	434,020	401,394	304,953	252,761	570,758
Benefits payable	186,005	117,585	125,120	102,088	125,644
Other liabilities	<u>154,368</u>	<u>183,109</u>	<u>177,251</u>	<u>387,956</u>	<u>421,262</u>
<b>Total liabilities</b>	<b>4,945,531</b>	<b>5,505,671</b>	<b>5,501,415</b>	<b>6,583,140</b>	<b>15,536,050</b>
<b>Net position, restricted for pension benefits</b>	<b>\$ 168,004,363</b>	<b>\$ 180,173,145</b>	<b>\$ 182,718,124</b>	<b>\$ 168,115,682</b>	<b>\$ 220,580,583</b>

B. Employees' Retirement System – Statement of changes in fiduciary net position

<b>Amounts (000)</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>
<u>Additions:</u>					
Net appreciation in fair value	\$ 14,387,065	\$ 15,173,823	\$ 6,098,261	\$ (10,303,481)	\$ 57,377,655
Interest income	1,147,400	1,115,206	1,122,135	1,121,799	1,015,078
Dividend income	1,370,368	1,464,640	1,550,157	1,523,205	1,321,312
Other income	806,758	939,230	946,751	832,080	987,386
Less investment expenses	<u>(565,294)</u>	<u>(584,666)</u>	<u>(614,230)</u>	<u>(666,722)</u>	<u>(767,490)</u>
<b>Total income from investing activities</b>	<b>17,146,297</b>	<b>18,108,233</b>	<b>9,103,074</b>	<b>(7,493,119)</b>	<b>59,933,941</b>
<u>Income from securities lending activities:</u>					
Securities lending income	63,274	62,500	148,975	118,187	40,225
Securities lending rebates	(10,031)	(39,434)	(107,406)	(93,288)	(7,601)
Less securities lending management fees	<u>(5,273)</u>	<u>(2,306)</u>	<u>(4,156)</u>	<u>(2,322)</u>	<u>(2,522)</u>
<b>Total from securities lending activities</b>	<b>47,970</b>	<b>20,760</b>	<b>37,413</b>	<b>22,577</b>	<b>30,102</b>
<b>Total net investment income</b>	<b>17,194,267</b>	<b>18,128,993</b>	<b>9,140,487</b>	<b>(7,470,542)</b>	<b>59,964,043</b>
<u>Contributions:</u>					
Employers	3,949,710	3,949,873	3,890,125	3,920,360	4,062,302
Members	306,218	318,439	345,846	395,338	427,032
Interest - accounts receivable	123,184	113,574	94,893	74,737	63,096
Other	<u>77,195</u>	<u>68,151</u>	<u>65,538</u>	<u>64,122</u>	<u>40,845</u>
<b>Total contributions</b>	<b>4,456,307</b>	<b>4,450,037</b>	<b>4,396,492</b>	<b>4,454,557</b>	<b>4,593,275</b>
<b>Total additions</b>	<b>21,650,574</b>	<b>22,579,030</b>	<b>13,536,979</b>	<b>(3,015,985)</b>	<b>64,557,318</b>
<u>Deductions:</u>					
Retirement benefits	9,532,296	10,008,626	10,578,972	11,053,512	11,606,094
Death benefits	207,976	191,579	202,809	154,249	244,443
Other, net	<u>65,261</u>	<u>103,071</u>	<u>90,915</u>	<u>64,699</u>	<u>97,646</u>
<b>Total benefits paid</b>	<b>9,805,533</b>	<b>10,303,276</b>	<b>10,872,696</b>	<b>11,272,460</b>	<b>11,948,183</b>
Administrative expenses	93,943	106,972	119,304	121,694	144,234
OPEB expense	0	0	0	192,303	0
<b>Total deductions</b>	<b>9,899,476</b>	<b>10,410,248</b>	<b>10,992,000</b>	<b>11,586,457</b>	<b>12,092,417</b>
<b>Net increase</b>	<b>11,751,098</b>	<b>12,168,782</b>	<b>2,544,979</b>	<b>(14,602,442)</b>	<b>52,464,901</b>
<b>Net position, restricted for pension benefits – beginning of year</b>	<b>156,253,265</b>	<b>168,004,363</b>	<b>180,713,145</b>	<b>182,718,124</b>	<b>168,115,682</b>
<b>Net position, restricted for pension benefits – end of year</b>	<b>\$ 168,004,363</b>	<b>\$ 180,173,145</b>	<b>\$ 182,718,124</b>	<b>\$ 168,115,682</b>	<b>\$ 220,580,583</b>

## C. Police and Fire Retirement System – Statement of fiduciary net position

<b>Assets (000)</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>
<b><u>Investments:</u></b>					
Domestic equity	\$ 10,530,130	\$ 11,446,664	\$ 11,094,287	\$ 9,487,990	\$ 13,705,822
Global fixed income	6,633,390	6,771,007	6,909,233	6,888,322	7,246,339
International equity	5,100,871	5,895,551	5,487,384	4,652,905	6,602,142
Private equity	2,313,782	2,643,776	2,989,251	3,081,472	4,474,803
Real estate	1,950,318	2,142,554	2,372,902	2,380,582	2,679,703
Opportunistic funds and Absolute return strategy	1,445,609	1,569,050	1,611,233	1,498,991	761,650
Short-term investments	852,239	508,582	926,090	864,287	1,682,810
Mortgage loans	120,643	127,413	135,757	153,487	158,465
Real assets	58,879	229,416	335,994	468,069	596,677
Credit	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>1,287,393</u>
<b>Total investments</b>	<b>29,005,861</b>	<b>31,334,013</b>	<b>31,862,131</b>	<b>29,476,105</b>	<b>39,195,804</b>
Securities lending collateral	722,581	847,031	869,145	1,041,376	2,569,641
Forward foreign exchange contracts	16,709	6,579	2,715	654	10,453
<b><u>Receivables:</u></b>					
Employers' contributions	455,936	441,307	398,915	342,676	266,847
Members' contributions	135	0	223	426	617
Member loans	3,179	3,891	4,817	6,029	6,807
Investment income	60,540	59,667	59,032	54,639	52,704
Investment sales	41,851	36,784	44,312	40,065	50,375
Other	<u>128,331</u>	<u>93,308</u>	<u>116,629</u>	<u>86,177</u>	<u>26,069</u>
<b>Total receivables</b>	<b>689,972</b>	<b>634,957</b>	<b>623,928</b>	<b>530,012</b>	<b>403,419</b>
Capital assets	38,772	46,926	57,686	69,081	80,829
<b>Total Assets</b>	<b>30,473,895</b>	<b>32,869,506</b>	<b>33,415,605</b>	<b>31,117,228</b>	<b>42,260,146</b>
<b><u>Liabilities:</u></b>					
Security lending obligations	723,752	848,232	870,116	1,043,685	2,570,812
Forward foreign exchange contracts	16,663	6,572	2,686	656	10,444
Accounts payable	77,043	71,429	54,385	45,198	102,180
Benefits payable	36,289	14,082	13,352	6,073	11,641
Other liabilities	<u>22,318</u>	<u>25,525</u>	<u>24,029</u>	<u>57,536</u>	<u>64,569</u>
<b>Total liabilities</b>	<b>876,065</b>	<b>965,840</b>	<b>964,568</b>	<b>1,153,148</b>	<b>2,759,646</b>
<b>Net position, restricted for pension benefits</b>	<b>\$ 29,597,830</b>	<b>\$ 31,903,666</b>	<b>\$ 32,451,037</b>	<b>\$ 29,964,080</b>	<b>\$ 39,500,500</b>

## D. Police and Fire Retirement System – Statement of changes in fiduciary net position

Amounts (000)	2017	2018	2019	2020	2021
<u>Additions:</u>					
Net appreciation in fair value	\$ 2,536,138	\$ 2,685,946	\$ 1,081,673	\$ (1,831,872)	\$ 10,224,678
Interest income	202,258	197,402	199,039	199,435	180,883
Dividend income	241,561	259,256	274,960	270,797	235,453
Other income	142,210	166,253	167,930	147,928	175,949
Less investment expenses	<u>(99,647)</u>	<u>(103,492)</u>	<u>(108,949)</u>	<u>(118,531)</u>	<u>(136,764)</u>
<b>Total income from investing activities</b>	<b>3,022,520</b>	<b>3,205,365</b>	<b>1,614,653</b>	<b>(1,332,243)</b>	<b>10,680,199</b>
<u>Income from securities lending activities:</u>					
Securities lending income	11,154	11,063	26,424	21,012	7,168
Securities lending rebates	(1,768)	(6,980)	(19,051)	(16,585)	(1,354)
Less securities lending management fees	<u>(929)</u>	<u>(408)</u>	<u>(737)</u>	<u>(413)</u>	<u>(450)</u>
<b>Total from securities lending activities</b>	<b>8,457</b>	<b>3,675</b>	<b>6,636</b>	<b>4,014</b>	<b>5,364</b>
<b>Total net investment income</b>	<b>3,030,977</b>	<b>3,209,040</b>	<b>1,621,289</b>	<b>(1,328,229)</b>	<b>10,685,563</b>
<u>Contributions:</u>					
Employers	837,253	873,434	854,094	862,346	967,488
Members	22,609	30,950	40,673	58,360	65,309
Interest - accounts receivable	17,068	15,867	15,109	11,902	12,529
Other	<u>18,954</u>	<u>18,022</u>	<u>(5,386)</u>	<u>(3,999)</u>	<u>182</u>
<b>Total contributions</b>	<b>895,884</b>	<b>938,273</b>	<b>904,490</b>	<b>928,609</b>	<b>1,405,508</b>
<b>Total additions</b>	<b>3,926,861</b>	<b>4,147,313</b>	<b>2,525,779</b>	<b>(399,620)</b>	<b>11,731,071</b>
<u>Deductions:</u>					
Retirement benefits	1,700,236	1,817,463	1,947,974	2,033,131	2,158,674
Death benefits	8,174	9,673	11,857	5,261	13,556
Other, net	<u>5,630</u>	<u>1,493</u>	<u>1,404</u>	<u>284</u>	<u>1,558</u>
<b>Total benefits paid</b>	<b>1,702,780</b>	<b>1,825,643</b>	<b>1,961,235</b>	<b>2,038,676</b>	<b>2,173,788</b>
Administrative expenses	13,191	15,834	17,173	17,356	20,863
OPEB expense	0	0	0	31,305	0
<b>Total deductions</b>	<b>1,715,971</b>	<b>1,841,477</b>	<b>1,978,408</b>	<b>2,087,337</b>	<b>2,194,651</b>
<b>Net increase</b>	<b>2,210,890</b>	<b>2,305,836</b>	<b>547,371</b>	<b>(2,486,957)</b>	<b>9,536,420</b>
<b>Net position, restricted for pension benefits – beginning of year</b>	<b>27,386,940</b>	<b>29,597,830</b>	<b>31,903,666</b>	<b>32,451,037</b>	<b>29,964,080</b>
<b>Net position, restricted for pension benefits – end of year</b>	<b>\$ 29,597,830</b>	<b>\$ 31,903,666</b>	<b>\$ 32,451,037</b>	<b>\$ 29,964,080</b>	<b>\$ 39,500,500</b>

### E. Reserves

The System's 2021 Annual Comprehensive Financial Report disclosed the following reserves as of March 31, 2021:

	(Dollars in Thousands)	
	ERS	PFRS
Annuity savings	\$ 2,540	\$ 70,608
Annuity reserve	54,527	23,179
Pension accumulation	91,304,618	14,535,155
Pension reserve	120,197,818	24,663,154
Designated annuitant	53,494	22,305
Loan insurance	1,275	112
Group Life Insurance Plan reserve	161,746	3,161
COESC contribution	8,804,565	182,826
<b>Total</b>	<b>\$ 220,580,583</b>	<b>\$ 39,500,500</b>

However, it appears that not all the reserves were separately disclosed by plan and not held for pension. Reserves for the Excess Benefit Plans, non-qualified plans for providing benefits in excess of the benefits provided under the qualified pension plans of ERS and PFRS, were not separately disclosed. The System indicated that over \$3.05 million and \$0.89 million as of March 31, 2021 were held in the Excess Benefit Plans for ERS and PFRS, respectively. However, reserves for the Excess Benefit Plans were not disclosed. In addition, while Group Life Insurance Plan reserves were disclosed, it appears that these reserves were included as pension plan assets (i.e., fiduciary net position) and further did not include all of the Group Life Insurance Plan liability (see section 7H of this report) in the System's pension plan financial reporting as shown below.

	(Dollars in Thousands)		
	Employees' Retirement System	Police and Fire Retirement System	Total
Employers' total pension liability	\$ 220,680,157	\$ 41,236,775	\$ 261,916,932
Fiduciary net position	220,580,583	39,500,500	260,081,083
<b>Employers' net pension liability</b>	<b>\$ 99,574</b>	<b>\$ 1,736,275</b>	<b>\$ 1,835,849</b>
Ratio of fiduciary net position to the employers' total pension liability	99.95%	95.79%	99.30%

The System should consider disclosing the reserves held for each benefit plan and updating the financial reporting for each plan to reflect only the assets and obligations attributed to that plan.

## 5. TREATMENT OF MEMBERS

The examiner reviewed a sample of various types of retirement benefits to members and beneficiaries. The examiner also reviewed the various controls involved, checked the accuracy of the computations, and traced the accounting data to the books of account.

### A. Required Minimum Distributions

The System is subject to required minimum distributions under IRC Section 401(a)(9) as stated in 2 CRR-NY 379.2 below:

“Notwithstanding any other provision of law to the contrary, the Retirement System shall comply with Internal Revenue Code section 401(a)(9), including the minimum distribution incidental benefit rule of the Internal Revenue Code section 401(a)(9)(G), pursuant to a reasonable and good faith interpretation of Internal Revenue Code section 401(a)(9)-1.”

The examiner noted that the April 1, 2021 actuarial valuation data listed 1,626 ERS and 23 PFRS members that did not appear to have commenced payment of retirement benefits by their required beginning date of April 1, 2020, in accordance with 2 NYCRR 379.2 and IRC Section 401(a)(9).

The System should consider reviewing current and former members and payees to identify all affected members under IRC Section 401(a)(9) and initiating corrective action in accordance with the IRS Employee Plans Compliance Resolution System.

### B. Benefit Calculations

The examiner performed a limited review for a sampling of benefit calculations. The examiner did not have sufficient data to verify annual service credit accruals or annual salaries as determined by and used by the System. The System indicated that many of the benefit calculation functions are automated. This includes annual salary and final average salary calculations as well as service credit determinations. The System indicated automated functions are programmed with the required laws, policies, and procedures necessary to calculate the final average salary and the annual service credit for each member.

Based on this limited review, the examiner identified two ERS payees which the System confirmed had an error in the calculated benefit amount. The System indicated that these benefits will be corrected, including any under or overpayments.

6. INVESTMENT EXAMINATION REPORT

The Investment Examination Report is submitted with this report as a separate document and includes all related findings and recommendations.

7. ACTUARIALA. Annual Statement Liabilities1) ERS

Shown below are the plan liabilities as reported in the annual statements to the Department for the five-year examination period. Amounts shown are rounded to millions of dollars.

<b>ERS Present Value of Future Benefits (PVB) in millions</b>					
Fiscal Year Ended March 31 <sup>st</sup>	2021	2020	2019	2018	2017
<b>Active Participants</b>					
Service	\$ 121,483	\$ 104,416	\$ 102,689	\$ 100,029	\$ 98,497
Ordinary & IPOD Disability	1,225	1,035	1,349	1,314	1,302
Accidental Disability	471	418	500	482	470
Ordinary Death	1,152	1,065	1,117	1,040	963
Accidental Death	27	23	32	31	29
Sick Leave	778	673	679	663	641
Withdrawal Tier 3-6 Funds	989	847	668	593	522
<b>Total Active Participant PVB</b>	<b>\$ 126,125</b>	<b>\$ 108,477</b>	<b>\$ 107,034</b>	<b>\$ 104,152</b>	<b>\$ 102,425</b>
<b>Non-active Participants</b>					
Service	\$ 115,943	\$ 103,167	\$ 98,446	\$ 94,332	\$ 87,687
Ordinary Disability	2,565	2,407	2,480	2,448	2,372
Accidental Disability	1,120	1,034	994	929	879
Accidental Death	36	37	46	47	47
Post Retirement Death	7	5	3	2	2
Designated Annuitant	53	52	49	52	53
Disability Beneficiary	581	551	572	551	527
COLA	11,083	9,458	9,117	9,144	8,753
<b>Total Non-active Participant PVB</b>	<b>\$ 131,389</b>	<b>\$ 116,711</b>	<b>\$ 111,708</b>	<b>\$ 107,506</b>	<b>\$ 100,320</b>
<b>Total Present Value of Benefits</b>	<b>\$ 257,515</b>	<b>\$ 225,188</b>	<b>\$ 218,742</b>	<b>\$ 211,658</b>	<b>\$ 202,745</b>

2) PFRS

Shown below are the plan liabilities as reported in the annual statements to the Department for the five-year examination period. Amounts shown are rounded to millions of dollars.

<b>PFRS Present Value of Future Benefits (PVB) in millions</b>					
Fiscal Year Ended March 31 <sup>st</sup>	2021	2020	2019	2018	2017
<b>Active Participants</b>					
Service	\$ 22,618	\$ 18,861	\$ 17,570	\$ 17,220	\$ 16,789
Ordinary & IPOD Disability	24	20	40	39	39
Accidental Disability	1,615	1,355	1,638	1,603	1,583
Ordinary Death	134	125	253	250	241
Accidental Death	24	20	51	47	44
Sick Leave	44	37	33	32	30
One Year Final Average Salary	287	259	275	276	267
Withdrawal Tier 3-6 Funds	20	19	27	22	17
<b>Total Active Participant PVB</b>	<b>\$ 24,765</b>	<b>\$ 20,695</b>	<b>\$ 19,887</b>	<b>\$ 19,490</b>	<b>\$ 19,011</b>
<b>Non-active Participants</b>					
Service	\$ 20,865	\$ 18,012	\$ 16,738	\$ 15,604	\$ 14,456
Ordinary Disability	211	135	78	73	71
Accidental Disability	3,442	3,175	3,134	2,929	2,774
Accidental Death	225	193	206	179	166
Post Retirement Death	0	0	0	0	0
Designated Annuitant	22	22	20	20	21
Disability Beneficiary	112	104	100	96	84
COLA	1,599	1,396	1,349	1,364	1,348
<b>Total Non-active Participant PVB</b>	<b>\$ 26,477</b>	<b>\$ 23,038</b>	<b>\$ 21,625</b>	<b>\$ 20,265</b>	<b>\$ 18,920</b>
<b>Total Present Value of Benefits</b>	<b>\$ 51,242</b>	<b>\$ 43,733</b>	<b>\$ 41,512</b>	<b>\$ 39,755</b>	<b>\$ 37,931</b>

**B. Annual Statement Development of 2023 Employer Contribution**

Shown below is the development of the employer contribution for the fiscal year ended March 31, 2023 as reported in annual statements submitted to the Department in 2022.

<b>Development of Employer Contribution</b>			
Retirement System		ERS	PFRS
Valuation Date		4/1/2021	4/1/2021
Contributions for fiscal year ending		3/31/2023	3/31/2023
(1)	Present Value of Benefits	\$257,514,713,680	\$51,241,874,728
(2)	Actuarial Value of Assets	220,349,078,561	39,424,420,634
(3)	Present Value of Future Employee Contributions	7,032,748,919	1,137,120,196
(4)	Unfunded Actuarial Accrued Liability		
(5)	Others (Receivables and Late Start Contributions)	4,015,460,401	1,017,661,187
(6)	Present Value of Future Normal Costs: [(1) – (2) – (3) – (4) – (5)]	26,117,425,799	9,662,672,711
(7)	Present Value of Future Compensation	\$265,963,097,574	\$41,416,278,637
(8)	Normal Cost Rate: [(6) ÷ (7)]	0.0982	0.2333
(9)	Salaries	\$28,712,276,447	\$4,045,268,298
(10)	Normal Cost: [(8) × (9)]	2,819,529,312	943,785,991
(11)	Amortization Payments		
(12)	Interest Adjustment	137,960,432	46,179,738
(13)	Expenses	172,273,659	28,316,878
(14)	Others (GLIP, Sick Leave, Other Electable Benefits)	87,466,419	15,629,795
(15)	Employer Contribution	\$3,331,369,446	\$1,093,795,654

During the examination, the System provided an allocation of the estimated employer contribution for fiscal year ended March 31, 2023, which is summarized below:

<b>Estimated Employer Contribution for fiscal year ended March 31, 2023</b>				
Retirement System	Normal, including Options	Administrative Expenses	Group Life Insurance Plan	Total
ERS	\$3,104,429,873	\$172,273,659	\$54,665,915	\$3,331,369,446
PFRS	\$1,065,478,776	\$28,316,878	\$0	\$1,093,795,654

Please note the actual employer contribution for each fiscal year are based on the reported earnings for each member and the applicable contribution rates determined for each member's plan, tier, and option.

### C. Actuarial Valuation Development of 2023 Employer Contribution Rates

Each year an actuarial valuation, which is separate from the annual statement filing with the Department, is prepared by the System's actuary for determining the contribution rates charged to participating employers as directed by RSSL Section 11(c) for ERS and Section 311(c) for PFRS. The System's funding objective is that employer contributions together with member contributions and investment income from System assets accumulated over the working lifetime of its members are sufficient to pay benefits as they become due.

The actuarial valuation is based on fiscal and member information as of April 1<sup>st</sup>. The employer contribution rates determined in the actuarial valuation are for the fiscal year starting one year after the valuation date. For example, the results of the April 1, 2021 actuarial valuation are used to determine the employer contribution rates for the fiscal year April 1, 2022 to March 31, 2023. Historically, the fiscal year employer contribution rates were applied to salaries for the same fiscal year. However, Chapter 94 of the Laws of 2015 changed the System's funding policy to provide current fiscal year employer contributions to be based on salaries from the prior fiscal year. The lag between the valuation date and fiscal year employer contributions allows participating employers to budget for upcoming pension costs and provides the System with information to make appropriate decisions.

Separate employer contribution rates are developed for expected administrative expenses ("Admin rate"), the New York State Public Employees Group Life Insurance Plan ("GLIP rate"), and System benefits ("Normal rate"). Employer contribution rates for the fiscal year ended March 31, 2023, are determined from the April 1, 2021 actuarial valuation as summarized below.

#### 1) Admin Rate

The administration contribution is defined under RSSL Section 23(b)(3) and is designed to fund administrative expenses on a year-by-year basis. This method is commonly referred to as a "pay-as-you-go." The development of the Admin rate for the fiscal year ended March 31, 2023 is shown below:

<b>Development of Admin Rate</b>			
Retirement System		ERS	PFRS
Valuation Date		4/1/2021	4/1/2021
Contributions for fiscal year ending		3/31/2023	3/31/2023
(1)	Administrative expenses in fiscal year ended 2021	\$144,234,076	\$20,862,584
(2)	Administrative overbill account at 3/31/2021	\$(11,937,697)	\$2,120,876
(3)	Admin rate for fiscal year ending 2022	0.6%	0.4%
(4)	Projected billed salary for fiscal year ending 2022	\$27,976,135,294	\$3,862,735,472
(5)	Estimated contribution for fiscal year ending 2022: [(3) × (4)]	167,856,812	15,450,942
(6)	Estimated admin expenses for fiscal year ending 2022: [(1) × (1 + inflation assumption*)]	148,128,397	21,425,874
(7)	Estimated administrative overbill account on 3/31/2022: [(2) + (5) – (6)]	7,790,718	(3,854,056)
(8)	Estimated admin expenses for fiscal year ending 2023: [(6) × (1 + inflation assumption*)]	152,127,864	22,004,373
(9)	Estimated contribution required for fiscal year 2023: [(8) – (7)]	144,337,146	25,858,429
(10)	Projected billed salary for fiscal year ending 2023	\$28,712,276,447	\$4,045,268,298
(11)	Admin Rate: [(9) ÷ (10)], expressed as smallest 1/10 <sup>th</sup> of one percent to ensure a positive overbill account	0.6%	0.7%

## 2) GLIP Rate

The GLIP rate is defined under 2 NYCRR 312.5. The contribution determined under this defined method for the fiscal year is intended to maintain a reserve sufficient to pay at least one-half of the benefits expected to be payable during a fiscal year. In practice, the contribution rate is effectively a pay-as-you-go method with an asset cushion equal to roughly one-half years' worth of expected benefit payments. The development of the GLIP rate for the fiscal year ended March 31, 2023 is shown below.

<b>Development of GLIP Rate</b>			
Retirement System		ERS	PFRS
Valuation Date		4/1/2021	4/1/2021
Contributions for fiscal year ending		3/31/2023	3/31/2023
(1)	GLIP claims paid in fiscal year ended 2021	\$102,497,345	\$632,520
(2)	GLIP reserve fund at 3/31/2021	161,746,118	3,160,934
(3)	Estimated unreported claims (2 months) and claims to the next 12/15 billing date (8.5 months): [(1) × (2+8.5)/12]	89,685,177	553,455
(4)	Estimated GLIP fund on 12/15/2021: [(2) – (3)]	\$72,060,941	\$2,607,479
(5)	Special plans GLIP rate for fiscal year ending 2022	0.1%	N/A
(6)	Regular plans GLIP rate for fiscal year ending 2022	0.4%	0.0%
(7)	Special plans projected billed salary for fiscal year ending 2022	\$2,684,529,114	N/A
(8)	Regular plan projected billed salary for fiscal year ending 2022	25,291,606,179	3,862,735,472
(9)	Estimated contribution for fiscal year ending 2022: [((5) × (7)) + ((6) × (8))]	103,850,954	0
(10)	Estimated GLIP claims from 12/15/2021 to 12/15/2022: [(1)]	102,497,345	632,520

(11)	Estimated GLIP fund on 12/15/2022: [(4) + (9) – (3)]	73,414,550	1,974,960
(12)	Estimated GLIP claims from 12/15/2022 to 12/15/2023: [(1)]	102,497,345	632,520
(13)	Special plans projected billed salary for fiscal year ending 2023	\$2,758,795,532	N/A
(14)	Special plans GLIP rate for fiscal year ending 2023	0.1%	N/A
(15)	Estimated special plans contributions for fiscal year ending 2023: [(13) × (14)]	\$2,758,796	N/A
(16)	Estimated regular plans contribution required for fiscal year 2023: [(12) – (11) – (15)]	26,324,000	(1,342,440)
(17)	Projected regular plans billed salary for fiscal year ending 2023	\$25,953,480,915	\$4,045,268,298
(18)	Admin Rate: [(16) ÷ (17)] multiplied by 1.25 for ERS or increased by 0.03% for PFRS with final rate expressed as smallest 1/10 <sup>th</sup> of one percent to ensure a positive GLIP Fund. Final rate not less than zero.	0.2%	0.0%

### 3) Normal Rate

The employer normal contribution rate is defined under RSSL Section 23(b)(1) for ERS and Section 323(b)(1) for PFRS which state the following:

“Normal contribution. The rate of such contribution shall be applied to the member’s annual compensation earned during the previous fiscal year. **Such rate shall be a uniform and constant rate per centum of annual compensation.** When applied to the compensation of the average new entrant during the remaining period of his or her membership, such rate shall be computed to be sufficient to provide all the benefits...”

While not explicitly defined in RSSL, the System indicated that an aggregate funding method was used for determining the Normal rate as stated in the April 1, 2021 actuarial valuation that “the System uses the aggregate funding method which has a funding objective of employer contributions that, over time are a level percentage of payroll.” However, rather than using a single employer contribution rate to apply to all members, as shown in section 7B “Development of Employer Contribution”, the System instead determines separate employer contribution rates for each benefit plan, tier, and option provided on an individual basis.

Separate employer contribution rates are determined by the System’s actuary from a baseline Normal rate or Basic rate. The April 1, 2021 actuarial valuation established the ERS Basic rate to be Plan 15 (Tier 3&4) and Plan 384D (Tier 3&4) for PFRS. The calculation of the Basic Rate for the fiscal year ended March 31, 2023 from the April 1, 2021 actuarial valuation report is summarized below.

<b>Development of Basic Rate</b>			
Retirement System		ERS	PFRS
Plan		A15	384D
Tier		3&4	2&3
Valuation Date		4/1/2021	4/1/2021
Contributions for fiscal year ending		3/31/2023	3/31/2023
(1)	Present value of future benefits at valuation date	\$257,514,713,680	\$51,241,874,728
(2)	Actuarial value of assets* at valuation date	220,349,078,561	39,424,420,634
(3)	Present value of future member contributions at valuation date	7,032,748,919	1,137,120,195
(4)	Receivable employer billing for fiscal year ending 3/31/2022	4,015,460,401	1,017,661,187
(5)	Indexed present value of projected compensation at the valuation date	\$226,868,144,617	\$35,820,424,610
(6)	Basic Rate assuming contributions are paid on 4/1: [[ (1) – (2) – (3) – (4) ] / (5)]	11.5121609%	26.9753159%
(7)	Interest adjustment factor if contributions paid on the following 2/1: [(1.059) <sup>(10/12)</sup> ]	1.048930306	1.048930306
(8)	Basic rate assuming contributions paid on the following 2/1: [(6) × (7)]	12.0755%	28.2952%
(9)	Basic Rate: [(8) rounded to 0.1%]	12.1%	28.3%

\* reduced for dedicated assets

Members covered under the baseline plans (Plan A15 for ERS Tier 3&4; Plan 384D for PFRS Tier 2&3) have a Normal rate equal to the Basic Rate. However, members not covered under the baseline plans have Normal rates which are adjusted by the System's actuary to reflect the level of benefits provided. Such members have a Normal rate equal to the Basic rate times an adjustment factor or Index factor. The Index factor is based on the ratio for the estimated new entrant cost of the plan to the estimated new entrant cost of the baseline plan. The determination of the Index factor and resulting Normal rate from the April 1, 2021 actuarial valuation for a sampling of plans is illustrated below.

<b>Sample ERS Normal Rates from April 1, 2021 Actuarial Valuation</b>						
Plan	Tier	Present Value of Benefits at Entry (PVFBE) \$	Present Value of Compensation at Entry (PVFCE) \$	New Entrant Rate (NER)*	Index Factor**	Normal Rate <sup>^</sup>
A15	3&4	2,244,630,306	15,616,039,838	0.150772	1.000000	12.1%
75E	1	2,671,420,180	15,291,213,455	0.183251	1.215420	14.7%
71A	2	1,366,756,961	16,256,466,387	0.088188	0.584913	7.1%
89V	5	2,199,132,555	12,500,583,798	0.184530	1.223904	14.8%
WCI04	5	2,423,781,458	10,953,356,190	0.232109	1.539474	18.6%

\* NER = (PVFBE / PVFCE) × (1.059)<sup>(10/12)</sup>  
\*\* Index Factor = Plan NER / Plan A15 (Tier 3&4) NER  
<sup>^</sup> Normal Rate = Basic Rate × Index Factor

<b>Sample PFRS Normal Rates from April 1, 2021 Actuarial Valuation</b>						
Plan	Tier	Present Value of Benefits at Entry (PVFBE) \$	Present Value of Compensation at Entry (PVFCE) \$	New Entrant Rate (NER)*	Index Factor**	Normal Rate <sup>^</sup>
384D	2&3	2,840,070,734	11,403,668,469	0.261235	1.000000	28.3%
381B	1	3,207,888,773	11,636,164,629	0.289172	1.106942	31.3%
371A	2&3	1,266,601,390	13,896,794,830	0.095603	0.365966	10.4%
375H	2&3	2,317,784,395	13,896,794,830	0.174946	0.669690	18.9%
384Dc	6	2,477,306,608	11,469,214,851	0.226565	0.867284	24.5%
* NER = (PVFBE / PVFCE) × (1.059) <sup>(10/12)</sup>						
** Index Factor = Plan NER / Plan 384D (Tier 2&3) NER						
^ Normal Rate = Basic Rate × Index Factor						

The April 1, 2021 actuarial valuation report determined more than 180 Normal rates covering ERS and PFRS members under different tiers and retirement plans alone. These Normal rates were then used for determining employer contributions for the fiscal year ended March 31, 2023 and generally ranged from 7.1% to 24.5% for ERS and from 3.4% to 31.3% for PFRS. The System's use of different Normal rates raises the question if such rates are uniform in accordance with RSSL Section 23(b)(1) and Section 323(b)(1).

The System stated that the Comptroller has sole discretion to select the appropriate funding methodology. However, the methodology for determining Normal rates by plan, tier, and option did not appear to be clearly defined under RSSL or in the actuarial valuation reports so the examiner or other interested parties could evaluate whether the Normal rates were determined in a consistent manner from year to year or in accordance with the Comptroller's direction.

The examiner's review of the System's methodology for determining separate Normal rates by plan, tier, and option in the April 1, 2021 actuarial valuation report also raised questions regarding their appropriateness and whether they were equitably determined. An aggregate cost method is generally utilized with the intent of having uniform pension costs. For example, New York State Teachers' Retirement System which also uses an aggregate cost method charges the same employer contribution rate for all members covering six different tiers of benefits. Using an aggregate cost method as a basis for determining separate Normal rates does not appear to follow the method's intended purpose as the method does not separately consider the amount attributed to a specific plan, tier, or option for each component used to calculate a Normal rate (e.g., present value of future benefits, assets, future salaries, and future member contributions). Consequently, the System's methodology is expected to determine Normal rates which either underfund or overfund benefits attributed to a specific plan, tier, and option for current members. It follows that

the System's methodology would then favor certain participating employers while disadvantage others since the contribution charged to participating employers is not intended to fund benefits attributed to their employees.

The System should consider reviewing the methodology used to determine the Normal rates to ensure it is justified under applicable RSSL, appropriate under 11 CRR-NY 136.2, and reflects the contributions needed to fund benefits attributed to the specific plan, tier, and option.

The System should also consider more completely memorializing the methodology used for determining Normal rates in the actuarial valuation reports for greater transparency.<sup>3</sup>

#### D. Actuarial Cost Methods

The ultimate cost of a defined benefit pension plan is the benefits and plan expenses paid. However, the ultimate cost is not known until all benefits and expenses have been paid. An actuarial valuation determines the estimated cost in the interim. The actuarial valuation projects future expected events (e.g., retirement, disability, death, etc.) and the present value of benefits payable from such events. An actuarial cost method is then used to allocate the estimated cost or present value of projected benefits to time periods before the benefits are expected to be paid. The cost allocated to a time period, generally one-year, is call a normal cost ("NC").

There are various actuarial cost methods which may be used to allocate costs. Costs may be determined on an individual member or group basis, but the allocation should relate to expected compensation or service or the benefit formula on which the projected benefit is based. Under an actuarial cost method, the present value of future benefits ("PVFB") should equal the sum of the present value of future normal costs ("PVFNC") and the actuarial accrued liability<sup>4</sup> ("accrued liability" or "AL") as show in the formula below.

$$PVFB = AL + PVFNC$$

---

<sup>3</sup> The System is called to maintain a high level of operational transparency in accordance with 11 CRR-NY 136-2.1

<sup>4</sup> Defined under Actuarial Standard of Practice No. 4 (Doc. No. 205) as the portion of the actuarial present value of projected benefits (and expenses, if applicable), as determined under a particular actuarial cost method that is not provided for by future normal costs. Under certain actuarial cost methods, the actuarial accrued liability is dependent upon the actuarial value of assets.

As benefits are generally accrued and allocated over long periods (i.e., working lifetime of members), an actuarial cost method is a fundamental component for calculating an actuarially determined contribution each year. However, the actuarial cost method alone does not necessarily determine the required employer contribution or an actuarially determined contribution. Additional considerations, such as the level of assets as of the valuation date and any expected member contributions may affect the required employer contribution or an actuarially determined contribution for the year.

The actuarial cost method used by the System is described later in section 7F, Aggregate Cost Method.

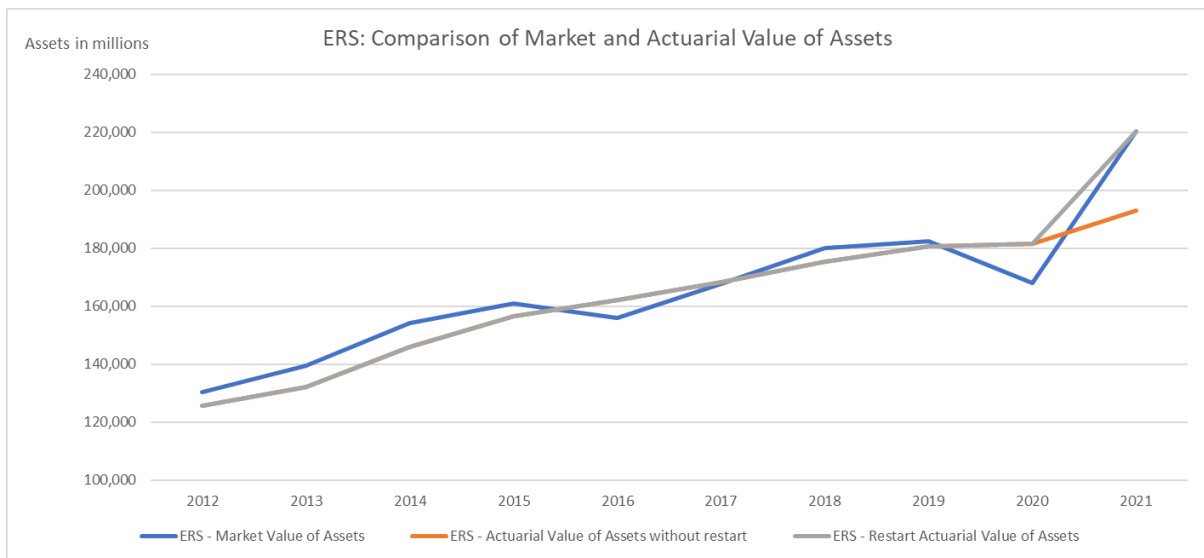
#### E. Asset Valuation Method

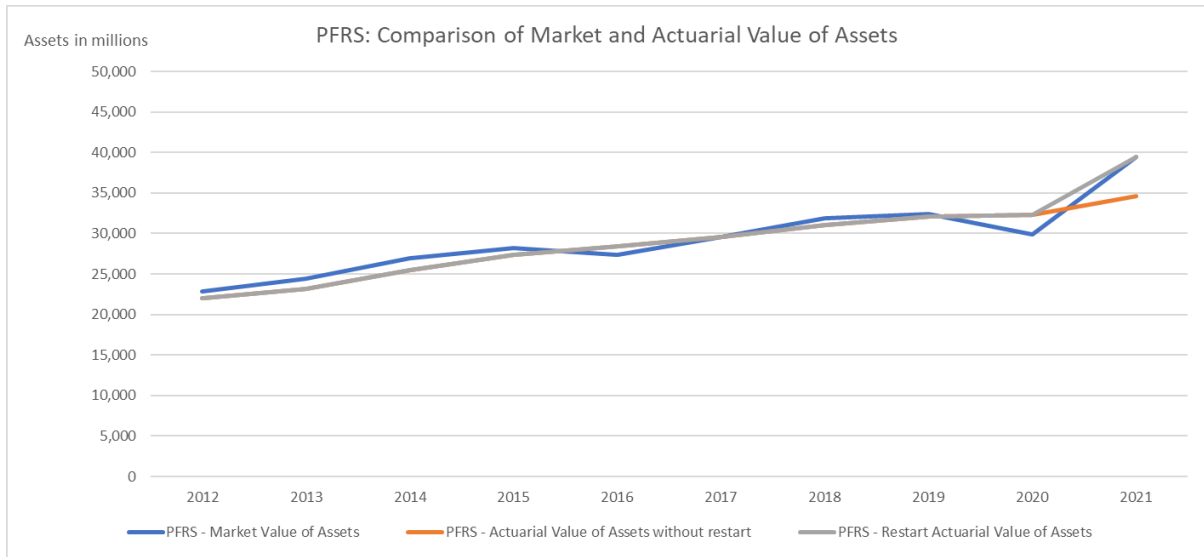
The level of assets used in the actuarial valuation is determined under an asset valuation method. Often, the level of assets used is not the same as the market value of assets (“MVA”). As required employer contribution rates are determined each year, fluctuations in the MVA can lead to dramatic changes in the employer contribution rate from year to year. To mitigate these fluctuations, actuaries often use an actuarial value of assets (“AVA”) determined under an asset valuation method in place of the MVA. AVA is typically designed to provide a more stable and predictable value of assets from year to year often by recognizing investment gains or losses over a period of time instead of immediately under the MVA. However, the AVA should still relate to the MVA within a reasonable range and recognize investment gains and losses over a reasonable period of time.

The System uses an asset valuation method that recognizes investment gains and losses over a five-year period. The annual percentage recognized each year is 20%. Investment gains and losses are determined each year based on the actual net investment income against the expected investment return based on the assumed investment rate of return for the year. The method does not include a corridor around the MVA to ensure the AVA stays within a reasonable range of the MVA. Effective for the April 1, 2021 actuarial valuation, the asset valuation method was “restarted” at the MVA. The AVA calculation as of April 1, 2021 is summarized below.

<b>Development of Actuarial Value of Assets (AVA)</b>			
Retirement System		ERS	PFRS
Valuation Date (VD)		04/01/2021	04/01/2021
(1)	Market value of assets as of VD	\$220,580,583,468	\$39,500,500,018
(2)	Expected investment income on MVA for fiscal year ended 3/31/2021	11,090,028,667	1,977,442,107
(3)	Actual investment income on MVA for fiscal year ended 3/31/2021	59,964,041,200	10,685,561,627
(4)	Investment gain/(loss) for fiscal year ended 3/31/2021: [(3) – (2)]	48,874,012,533	8,708,119,520
Historical investment gain/(loss) for last five years:			
(5)	Fiscal year ended 3/31/2021: [(4)]	48,874,012,533	8,708,119,520
(6)	Fiscal year ended 3/31/2020	(19,568,997,912)	(3,476,819,635)
(7)	Fiscal year ended 3/31/2019	(3,154,878,225)	(555,275,775)
(8)	Fiscal year ended 3/31/2018	6,664,881,613	1,188,417,191
(9)	Fiscal year ended 3/31/2017	6,534,929,913	1,161,422,653
(10)	Deferred investment gain/(loss): [(.8) × (5) + (.6) × (6) + (.4) × (7) + (.2) × (8) + (0) × (9)]	27,428,836,313	4,895,976,962
(11)	AVA at VD, prior to restart: [(1) – (10)]	193,151,747,155	34,604,523,056
(12)	AVA at VD with restart at MVA: [(1)]	\$220,580,583,468	\$39,500,500,018

Charts of the MVA and AVA for each System over the last ten years are provided below. Restarting the asset valuation method on April 1, 2021 increased the AVA by roughly \$27 billion for ERS and \$5 billion for PFRS.





#### F. Aggregate Actuarial Cost Method

Actuarial valuation reports during the examination period stated that “the System uses the aggregate funding method which has a funding objective of employer contributions that, over time are a level percentage of payroll.” This defined method does not appear to exactly follow the aggregate actuarial cost method as defined by the ASB. The ASB defines the aggregate actuarial cost method as:

“A method under which the excess of the actuarial present value of projected benefits of the group included in an actuarial valuation over the actuarial value of assets is allocated on a level basis over the earnings or service of the group between the valuation date and assumed exit. This allocation is performed for the group as a whole, not as a sum of individual allocations. That portion of the actuarial present value allocated to a valuation year is called the normal cost. The actuarial accrued liability is equal to the actuarial value of assets. (ASOP No. 4)”

The ASB definition requires the entire PVFB to be allocated on a level basis. However, the method used by the System only allocates *a portion* of the PVFB on a level basis as NCs. Under the method used by the System, the “employer” portion of the PVFB is allocated on a level basis as the NC or employer contribution. The “employee” portion of the PVFB is then allocated each year as the expected employee contribution for the year that may increase, decrease, or even stop based on the member’s benefit plan or tier. As a result, the total NC (or NC) is not determined

on a level basis each year in accordance with the ASB definition of the aggregate actuarial cost method.

The development of the NC under the ASB aggregate actuarial cost method is illustrated below:

Actuarial Cost Method:  $PVFB = AL + PVFNC$

Reflect Asset Valuation Method:  $PVFB = AL + PVFNC - AVA + AVA$

Since the aggregate actuarial cost method sets the AL equal to the AVA the equation simplifies to:

$$PVFB = PVFNC + AVA$$

The normal cost accrual rate as a level percentage of salaries then equals the PVFNC divided by the present value of future salaries (“PVFSAL”) as shown below.

$$\text{Normal Cost Accrual Rate} = \frac{[PVFB - AVA]}{PVFSAL} = \frac{PVFNC}{PVFSAL}$$

The NC under the ASB definition of the aggregate actuarial cost method for any future year would then be the normal cost accrual rate multiplied by the expected future salary for that year. However, as shown in the section 7B, annual statement development of 2023 employer contribution, line 6, the PVFNC used for calculating the normal cost rate is reduced for the present value of future employee contributions. Consequently, the method used by the System does not appear to follow the aggregate actuarial cost method as defined by the ASB.

The impact of the System’s method for reflecting the present value of future employee contributions is dependent on the amount and timing of future expected employee contributions. For example, if future employee contributions as a percentage of future salaries are expected to increase (e.g., ERS Tier 6), then the System would be expected to be lower funded than under the ASB defined method while if future employee contributions were expected to decrease or stop (e.g., PFRS Article 14), then the System would be expected to be better funded than under the ASB defined method. This estimated impact from the ASB defined method is based on applying

the ASB defined method where the employer contribution each year is equal to the total NC for the year minus the expected employee contribution for the year.<sup>5</sup> The actuarial valuation reports during the examination period did not appear to disclose this deviation from the ASB defined aggregate actuarial cost method or its implications on future contributions and funded status.

The examiner also noted that System's funding policy under Chapter 94 of the Laws of 2015 is expected to determine a different employer contribution amount from what would be determined under the ASB defined aggregate actuarial cost method. This is due to the System's funding policy of using prior year salaries instead of current year expected salaries when calculating the current year employer contribution. Actuarial cost methods should determine normal costs only over the member's assumed period of employment. Thus, if a member is expected to earn \$100,000 during the member's assumed last year of employment in 2021, a normal cost would be determined for 2021 and would be based on the \$100,000 salary. No normal cost would be determined for 2022. However, the System's funding policy would determine an employer contribution due for 2022 based on the \$100,000 salary; the year following when the member was assumed to retire. Actuarial valuation reports during the examination period did not appear to disclose implications of the System's funding policy under Chapter 94 of the Laws of 2015 from an actuarially determined contribution under the ASB defined aggregate actuarial cost method.

The System should consider reviewing whether the aggregate actuarial cost method used is consistent with a method defined by the ASB. If the System retains its current method, then the System should consider describing the implications of its method on future expected contributions and funded status in its actuarial reports in accordance with generally accepted actuarial practices.<sup>6</sup>

The System should also consider adding disclosures to the valuation report regarding expected member contributions and the impact of member contributions toward ERS and PFRS overall funding. Possible additions include listing expected member contributions as a separate component of the actuarial contribution for the fiscal year, disclosing expected member contributions as a percentage of salary for the fiscal year, or disclosing historical member contributions made each year. If member contributions are expected to increase or decrease in

---

<sup>5</sup> Actuarial Best Practices and Resources – Texas Pension Review Board, Pension Terminology, normal cost

<sup>6</sup> ASOP 4 (Doc. No. 205), Section 4.1(w)

future years, disclosing the expected impact of changing member contributions on the System's funding in the valuation report would provide useful information to any interested parties.

#### G. Events after the Measurement Date

The April 1, 2021 valuation report indicates the valuation date as April 1, 2021. This is the date on which the value of pension obligations and assets are determined. However, the April 1, 2021 valuation report is used to determine the employer contribution rates starting one year after the valuation date, from April 1, 2022 to March 31, 2023. When determining the employer contribution rates, the calculation included receivable employer contributions attributed to the fiscal year ended March 31, 2022, as assets as of April 1, 2021 (see section 7B, annual statement development of 2023 employer contribution, line 5). System financial statements as of March 31, 2021, did not include this employer contribution receivable as assets since the employer contribution is for a fiscal year starting after March 31, 2021 and is attributed to service after the April 1, 2021 valuation date.

While events occurring after the valuation may be reflected, such events should be reflected appropriately. If the System is reflecting contributions attributed to the next future fiscal year, then a corresponding adjustment to PVFSAL as of the valuation date was expected be made to reduce future salaries and therefore future contributions by one year to avoid double counting one year of future expected employer contributions after March 31, 2021. However, PVFSAL does not appear to have been reduced. As a result, it appears that assets and liabilities may not have been determined at the same date and that future events may not have been reflected appropriately.

The System should consider reviewing whether the events that occurred after the valuation date are reflected appropriately and in accordance with generally accepted actuarial practices.<sup>7</sup>

#### H. Funding and Cost Recognition of Other Benefit Plans

In addition to the qualified pension plans of ERS and PRFS, the System administers the following benefit plans:

- New York State Public Employees Group Life Insurance Plan
- New York State and Local Employees' Retirement System Excess Benefit Plan
- New York State and Local Police and Fire Retirement System Excess Benefit Plan

---

<sup>7</sup> ASOP 4 (Doc. No. 205), Sections 2.16 and 3.4.2

These plans provide additional benefits to members not otherwise payable from ERS or PFRS qualified pension plan. For instance, the GLIP provides a tax-free death benefit of up to \$50,000 upon an eligible member's pre-retirement or post-retirement death while each of the excess benefit plans provide replacement benefit payments for those retirees that have their retirement benefits from the qualified pension plan limited due to the maximum pension benefit requirements of IRC Section 415.

According to the applicable provisions governing each of these plans, each plan's assets are held in separate funds where the assets of each plan may only be used to provide benefits for that plan. These other benefit plans are funded on a pay-as-you-go basis as noted in section 7C(2) for GLIP and by allocating a portion of the employer contribution every year to the excess benefit plans.

Liabilities and annual costs attributed to the excess benefit plans are generally included in the calculations for the respective ERS or PFRS qualified pension plan. However, long-term obligations, specifically post-retirement death benefits under the GLIP, are not reflected in the System's actuarial valuation or financial reporting. Post-retirement death benefits represent a long-term benefit obligation to be reflected in System liabilities and financial reporting. Further, as GLIP benefits, including GLIP post-retirement death benefits, are funded on a pay-as-you-go basis, this obligation is essentially unfunded and will require greater contributions from current and future active members to fund existing retiree benefits.

The System should consider contacting appropriate tax and legal experts, including GASB and the IRS, for guidance on the financial reporting and funding of GLIP post-retirement death benefits.

## I. Funding Ratios

One measure commonly used to evaluate a pension plan's funding adequacy is the funding ratio or funded status. Specifically, it is the ratio of AVA to AL as of the valuation date. A funding ratio of 100% signifies the AVA is sufficient to cover all benefit costs or NCs attributed to service or salaries rendered to date, and that future contribution will be needed to pay only for benefit costs attributed to future service or salaries, specifically future NCs. However, a plan will rarely have a funding ratio of exactly 100%. Plan experience, the difference between what was assumed in the actuarial valuation and what occurred each year, will cause the plan to deviate from a funding ratio

of 100%. For purposes of determining the funding ratio, the System uses the entry age normal actuarial cost method for calculating AL. The funded ratio of ERS and PFRS for the last ten years as disclosed on page 164 of the 2022 annual comprehensive financial report are provided below.

(Dollars in Millions)

Valuation Date	Market Value of Assets (MVA)	Actuarial Value of Assets (AVA)	Actuarial Accrued Liability (AL)	Ratio of Assets to AL based on	
				MVA	AVA
<b>ERS</b>					
4/1/12	\$ 130,349	\$ 125,688	\$ 144,107	90.5%	87.2%
4/1/13	139,580	132,067	149,211	93.5	88.5
4/1/14	154,119	145,985	158,638	97.2	92.0
4/1/15	161,065	156,648	167,065	96.4	93.8
4/1/16	156,088	162,119	172,246	90.6	94.1
4/1/17	167,820	168,246	178,216	94.2	94.4
4/1/18	179,995	175,430	184,504	97.6	95.1
4/1/19	182,541	180,723	189,751	96.2	95.2
4/1/20	167,933	181,509	195,734	85.8	92.7
4/1/21	220,349	220,349	219,298	100.5	100.5
<b>PFRS</b>					
4/1/12	\$ 22,837	\$ 22,009	\$ 25,048	91.2%	87.9%
4/1/13	24,436	23,112	25,815	94.7	89.5
4/1/14	26,961	25,474	27,377	98.5	93.0
4/1/15	28,154	27,330	29,336	96.0	93.2
4/1/16	27,337	28,362	30,620	89.3	92.6
4/1/17	29,539	29,586	31,776	93.0	93.1
4/1/18	31,838	31,009	32,989	96.5	94.0
4/1/19	32,386	32,050	34,260	94.5	93.5
4/1/20	29,896	32,303	36,170	82.7	89.3
4/1/21	39,424	39,424	41,083	96.0	96.0

ERS has maintained a funded percentage between 87.2% and 95.2% from 2012 to 2020 based on AVA. Similarly, PFRS has maintained a funded percentage between 87.9% and 94.0% over the same period. With the asset valuation method having been restarted as the MVA on April 1, 2021, the funded percentage increased to 100.5% for ERS and 96.0% for PFRS.

#### J. Actuarial Assumptions

Actuarial valuations utilize numerous assumptions to value expected future distributions from the System. Actuarial assumptions commonly found for pension valuations include:

- (i) Expected rates of decrement from active service for causes such as withdrawal from employment, death, disability, and retirement;

- (ii) Post-retirement mortality for healthy members, disabled members, and beneficiaries;
- (iii) Assumed interest rate (i.e., the expect long-term investment return on the System's investments);
- (iv) Expected salary increases; and
- (v) Inflation

Each year the System's actuary reviews the actuarial experience and future expectations of the assumptions to monitor the appropriateness of the assumptions. The results of this review are shared with the AAC and are presented as a separate report to the Comptroller. Based on the extent of the deviation of experience from the assumptions and expected future experience, the report will recommend that the assumptions either remain unchanged for the next year or be changed. While assumptions are monitored each year, a more robust experience study of virtually all valuation assumptions is performed every five years pursuant to RSSL Sections 11 and 311. Most of the actuarial assumptions used in the April 1, 2021 valuation report are based on the latest experience study for the period April 1, 2015 to March 31, 2020. Below is a summary of the assumptions recommended for the April 1, 2021 valuation report as provided in the August 2021 Annual Report to the Comptroller on Actuarial Assumptions.

**Summary of Assumptions and Methods**

Assumption or Method	Recommendation
<b>Inflation / COLA</b>	<b>2.7% / 1.4%</b> (from 2.5 % / 1.3%)
<b>Investment Return</b>	<b>5.9%</b> (from 6.8 %)
<b>ERS Salary Scale</b>	4.4% average (using FY 2021 data) Indexed by Service
<b>PFRS Salary Scale</b>	<b>6.2%</b> average (using FY 2021 data) Indexed by Service
<b>Asset Valuation Method</b>	<b>Market Restart</b> (from 5-year level smoothing of gains or losses above or below the assumed return applied to all assets and cash flows)
<b>Pensioner Mortality</b>	Gender/Collar specific tables based upon FY 2016-2020 experience with Society of Actuaries' Scale <b>MP-2020</b> loading for mortality improvement (from MP-2019).
<b>Active Member Decrements</b>	Based upon FY 2016-2020 experience

The examiner noted that pre-retirement mortality rates assumed no future mortality improvement and that rates for other pre-retirement events such as mortality, death, disability, and withdrawal were disclosed and applied as central rates. Mortality improvement scales released by the Society of Actuaries, such as the MP-2020 used by the System above for post-retirement mortality improvement, were developed and intended to apply to both pre-retirement and

post-retirement mortality rates. In fact, historical mortality improvement tended to be greater for individuals under age 65 than individuals aged 65 and over.<sup>8</sup> Not assuming mortality improvement for pre-retirement deaths appears to be inconsistent with assuming post-retirement mortality improvement and experience reflected in the MP-2020 mortality improvement scales. Also, the examiner noted that use of central rates is unique to all retirement systems subject to Department examination. While actuarial texts provide for central rates, they are “commonly used in population statistics but not directly used by most actuaries.”<sup>9</sup> Pension actuaries generally do not use central rates as they do not represent probabilities or independent rates which are normally disclosed in actuarial valuation reports and more readily understood by interested parties of these reports.

The System should consider disclosing in the actuarial reports the single decrement rates or probabilities which are equivalent to the central rates used. In addition, the System should consider applying a mortality improvement assumption to the pre-retirement mortality tables used.

#### K. Valuation Data

Each year the System compiles member information as of the April 1<sup>st</sup> valuation date. The System’s actuary reviews the data for reasonableness and consistency. If certain member data is missing and is necessary to perform the actuarial valuation, then assumptions may be made to the valuation data by the System’s actuary. The assumptions may apply generally to the valuation data (such as assuming female mortality for retirees with an unknown gender), may be based on other available data (such as prior year valuation data), or may be determined on a case-by-case basis. However, a summary or report of the changes or assumptions applied to the valuation data did not appear to have been disclosed in the actuarial valuation reports.

During the examination, the examiner identified duplicate records in the April 1, 2021 valuation data. This consisted of 1,215 ERS and 124 PFRS members listed as both a payee and as an active/inactive member. Based on the valuation results provided by the System, the examiner estimated the AL as of April 1, 2021, was overstated by roughly \$535 million for ERS and \$119 million for PFRS. Other inconsistencies in the valuation data were identified but were expected

---

<sup>8</sup> October 2020 Society of Actuaries Mortality Improvement Scale MP-2020 Report, Section 5

<sup>9</sup> October 2016 (revised November 2016) Society of Actuaries Experience Study Calculations

to have a lower impact on System liabilities. The System attributed the data inconsistencies to the conversion from a legacy system to Oracle PeopleSoft and, as a result, the ongoing changes to the data process. In addition, the System indicated that its in-house program used for the actuarial valuation does not track individual members' values from year to year for monitoring changes in the data or the experience gains or losses attributed to a member.

The System should consider tracking changes made to member data for valuation purposes and disclosing a summary of the significant steps the System has taken to improve the valuation data as part of the valuation report or as a separate report referenced by the valuation report.

The System should consider exploring other resources available for analyzing valuation data and performing actuarial valuations, including the use of commercial actuarial valuation software.

#### L. Gain/Loss Analysis

The System incurs an actuarial gain or loss each year due to the difference between what was expected to happen and the actual events that occurred during the year. Expected experience is based on the actuarial assumptions, assets, and valuation data as of the prior valuation date projected to the current valuation date. Actual experience is based on the assets and valuation data as of the current valuation date.

An analysis of the gain/loss provides a better understanding of the underlying causes for the change liability attributed to assumptions such as salary increases, cost of living increases, investment returns, rates or retirement, death, disability, withdrawal, and other assumptions. Gains and losses attributed to assets are often due to investment returns. Gain/loss analysis is commonly performed using the same actuarial cost method for calculating the actuarially determined contribution. However, since an aggregate cost method is used by the System (which does not calculate an AL or UAL), the gain/loss analysis is expressed in terms of changes to the contribution rate. The table below from page 17 of the August 2021 Annual Report to the Comptroller on Actuarial Assumptions shows the change in the estimated contribution rate attributed to various sources.

	ERS		PFRS	
<b>2021 Estimated Contributions (2/1/22 Payment)</b>	16.2%		28.3%	
<b>Changes Due to Gains/Losses In:</b>				
Assumed return reduction from 6.8% to 5.9%	10.7%		14.4%	
FYs 2017–2021 Investment Return (after restart)	-13.9%		-16.0%	
<i>FY 2017 Investment Performance (11.5% v 7.0%)</i>		-0.52%		-0.59%
<i>FY 2018 Investment Performance (11.4% v 7.0%)</i>		-0.53%		-0.60%
<i>FY 2019 Investment Performance ( 5.2% v 7.0%)</i>		0.25%		0.28%
<i>FY 2020 Investment Performance (-2.7% v 6.8%)</i>		1.54%		1.76%
<i>FY 2021 Investment Performance (33.6% v 6.8%)</i>		-3.86%		-4.41%
<i>Market Restart (immediate recognition of remaining FY 2018 – 2021 Investment Performance)</i>		-10.82%		-12.40%
CPI-U increase from 2.5% to 2.7%	0.4%		0.3%	
Mortality Improvement Scale MP-2019 to MP-2020	-0.5%		-0.4%	
PFRS Salary Scale			-0.2%	
PFRS Tiers 5&6 Overtime Limit Adjustment			1.7%	
FY 2021 Experience	-0.9%		-1.0%	
Tier 6 New Entrant	-0.1%		-0.3%	
GLIP, Administrative Contributions	-0.2%		0.3%	
Miscellaneous	-0.1%		-0.1%	
<b>Net Change</b>	-4.6%		-1.3%	
<b>2022 Estimated Contributions (2/1/23 Payment)</b>	11.6%		27.0%	

## 8. PRIOR REPORT SUMMARY AND CONCLUSIONS

Following is the recommendation contained in the prior report on examination and the subsequent actions taken by the System:

<u>Item</u>	<u>Description</u>
A	<p>The examiner recommends that the System include a fraud warning statement on its disability claim forms as a best practice, and that warning statement be placed immediately above the space provided for the signature of the person executing the claim form and shall be printed in type which will produce a warning statement of conspicuous size.</p> <p>The System revised its disability application to incorporate the recommendation by adding a warning statement.</p>

## 9. SUMMARY AND CONCLUSIONS

Below are the recommendations contained in this report. Recommendations and comments regarding the System' investments and investment practices are contained in a separate document, which is submitted with this report as referenced in section 6.

<u>Item</u>	<u>Description</u>	<u>Page No.</u>
A	The System should consider preparing and publishing actuarial reports in accordance with RSSL Section 11(d) and making these reports available on its website.	8
B	The System should consider providing AAC members with actuarial valuation reports, including draft reports, and reviews and recommendations made by other parties to the System regarding the actuarial work each year.	14
C	The System should consider disclosing the reserves held for each benefit plan and updating the financial reporting for each plan to reflect only the assets and obligations attributed to that plan.	24
D	The System should consider reviewing current and former members and payees to identify all affected members under IRC Section 401(a)(9) and initiating corrective action in accordance with the IRS Employee Plans Compliance Resolution System.	25
E	The System should consider reviewing the methodology used to determine the Normal rates to ensure it is justified under applicable RSSL, appropriate under 11 CRR-NY 136.2, and reflects the contributions needed to fund benefits attributed to the specific plan, tier, and option.	36
F	The System should also consider more completely memorializing the methodology used for determining Normal rates in the actuarial valuation reports for greater transparency.	36
G	The System should consider reviewing whether the aggregate actuarial cost method used is consistent with a method defined by the ASB. If the System retains its current method, then the System should consider describing the implications of its method on future expected contributions and funded status in its actuarial reports in accordance with generally accepted actuarial practices.	41

<u>Item</u>	<u>Description</u>	<u>Page No.</u>
H	The System should also consider adding disclosures to the valuation report regarding expected member contributions and the impact of member contributions toward ERS and PFRS overall funding.	41
I	The System should consider reviewing whether the events that occurred after the valuation date are reflected appropriately and in accordance with generally accepted actuarial practices.	42
J	The System should consider contacting appropriate tax and legal experts, including GASB and the IRS, for guidance on the financial reporting and funding of GLIP post-retirement death benefits.	43
K	The System should consider disclosing in the actuarial reports the single decrement rates or probabilities which are equivalent to the central rates used. In addition, the System should consider applying a mortality improvement assumption to the pre-retirement mortality tables used.	46
L	The System should consider tracking changes made to member data for valuation purposes and disclosing a summary of the significant steps the System has taken to improve the valuation data as part of the valuation report or as a separate report referenced by the valuation report.	47
M	The System should consider exploring other resources available for analyzing valuation data and performing actuarial valuations, including the use of commercial actuarial valuation software.	47

Respectfully submitted,




Ke Xu, CFE

INS Regulatory Insurance Services, Inc.


STATE OF NORTH CAROLINA    )  
  )SS:  
COUNTY OF WAKE                    )

Ke Xu, being duly sworn, deposes and says that the foregoing report, subscribed by her, is true to the best of her knowledge and belief.

  
Ke Xu

Subscribed and sworn to before me

this 5<sup>th</sup> day of <sup>KP</sup>~~Feb~~ March 2026



**KUNTAL PATEL**  
Notary Public  
Wake Co., North Carolina  
My Commission Expires October 16, 2028

Jason Fesmire performed an actuarial review of the April 1, 2021, actuarial valuation report of the New York State and Local Retirement System. The results of this review are provided in section 7 of this report.

The purpose of the actuarial review is to determine whether the plans noted above are being funded on an adequate basis using actuarial methods and assumptions that are reasonable, consistent, follow generally recognized and accepted actuarial principles and practices which are consistent with Actuarial Standards of Practice, and regarding actuarial matters whether the plans are in compliance with applicable law, plan provisions, and policies.

In preparing this report, Mr. Fesmire relied on, without audit, information provided by the New York State and Local Retirement System and the Actuarial Bureau. This information included member data, financial information, plan provisions, policies, and actuarial and annual reports.

Jason Fesmire is a member of the American Academy of Actuaries, an Enrolled Actuary under ERISA, and meets the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained in section 7 of this report. This review was conducted in accordance with the applicable standards of practice prescribed by the Actuarial Standards Board.

This report was prepared under the direction of the New York State Department of Financial Services. The significant findings and recommendations are included herein.

STATE OF NEW YORK  
COUNTY OF ALBANY

Jason Fesmire, being duly sworn, deposes and says that the foregoing report sections, subscribed by him, are true to the best of his knowledge and belief.

\_\_\_\_\_  
/s/  
Jason Fesmire, EA, MAAA  
Retirement Systems Actuary

STATE OF NEW YORK  
COUNTY OF ALBANY

Sworn to before me this: \_\_\_\_\_ day of \_\_\_\_\_ 20\_\_\_\_

\_\_\_\_\_  
Notary Public

Respectfully submitted,

\_\_\_\_\_  
/s/  
Courtney Williams  
Supervising Insurance Examiner

STATE OF NEW YORK     )  
                                  )SS:  
COUNTY OF NEW YORK )

Courtney Williams, being duly sworn, deposes and says that the foregoing report, subscribed by him, is true to the best of his knowledge and belief.

\_\_\_\_\_  
/s/  
Courtney Williams

Subscribed and sworn to before me  
this \_\_\_\_\_ day of \_\_\_\_\_

*APPOINTMENT NO. 32442*

*NEW YORK STATE*

***DEPARTMENT OF FINANCIAL SERVICES***

*I, ADRIENNE A. HARRIS, Superintendent of Financial Services of the State of New York, pursuant to the provisions of the Financial Services Law and the Insurance Law, do hereby appoint:*

***KE XU**  
(INS REGULATORY INSURANCE SERVICES)*

*as a proper person to examine the affairs of the*

***NEW YORK STATE & LOCAL RETIREMENT SYSTEM***

*and to make a report to me in writing of the condition of said*

***SYSTEM***

*with such other information as she shall deem requisite.*

*In Witness Whereof, I have hereunto subscribed my name  
and affixed the official Seal of the Department  
at the City of New York*

*this 8th day of August, 2022*

*ADRIENNE A. HARRIS  
Superintendent of Financial Services*

*By:*

*Mark McLeod*

\_\_\_\_\_  
*MARK MCLEOD  
DEPUTY CHIEF - LIFE BUREAU*





# **NEW YORK STATE COMMON RETIREMENT FUND**

## **INVESTMENT ANALYSIS REPORT**

**EXAMINERS:**

**CHIA-LING HSU, CFA  
ROBERT J. NOSKIEWICZ  
ROBERT D. SELVAGGIO, Ph.D.**

**Rutter Associates, LLC**

**DATE OF REPORT:**

**January 8, 2024**

**Revised:**

**February 12, 2026**

## Table of Contents

Executive summary .....	3
Scope of examination.....	8
(#1) Risk Profile, Guidelines and Practices .....	8
(#2) Reasonableness of the Risk Profile .....	12
(#3) Required Risk Signoffs and Escalation Procedures .....	14
(#4) Duration and Convexity .....	15
(#5) Liquidity Management.....	16
(#6) Stated Risk and Return Expectations.....	17
(#7) Asset Valuation .....	20
(#8) Securities Lending.....	22
(#9) Portfolio Credit Risk Metrics and Management .....	24
(#10) Derivative Usage and Counterparty Credit Risk Management.....	27
(#11) Asset Allocation .....	28
(#12) Background and Diligence of Investment Managers .....	30
(#13) Investment Fees and Expenses.....	32

## Executive summary

Rutter Associates, LLC (“Rutter Associates”) partnered with the New York State Department of Financial Services (“DFS”) professionals to examine the risk and return management processes of the New York State Common Retirement Fund (“NYSCRF”, or alternatively “the System” or “the Fund”). The exam team reviewed numerous documents including risk reports, investment and risk management policy statements and guidelines, asset allocation studies, committee charters, and annual reports and statements. Key staff were interviewed including:

Chief Investment Officer (“CIO”)  
Deputy Chief Investment Officer (“Deputy CIO”) and Director, Alternatives/Opportunistic  
Chief Risk Officer (“CRO”)  
Investment Advisor  
Director, Fixed Income  
Director, Private Equity  
Director, Global Equities  
Director, Real Estate & Real Assets  
Director, Credit  
Program Director, Sustainable Investments & Climate Solutions  
Executive Director, Corporate Governance

These interviews and extensive reviews of literature such as risk reports, guidelines, asset allocation and asset-liabilities studies, leads us to conclude that the NYSCRF investment and risk teams are professional and competent, and they take their fiduciary responsibilities of loyalty, care, and prudence seriously.

As of March 31, 2023, NYSCRF net assets were \$248.5 billion and its 1-year, 3-year, 5-year, and 10-year annualized time-weighted returns “gross of certain fees” were (4.14%), 11.92%, 7.50% and 8.02% respectively. The following table from the 2023 Annual Comprehensive Financial Report (“ACFR”) presents time-weighted portfolio performance gross of certain investment fees in aggregate and relative to benchmarks as of March 31, 2023. For the 3-, 5- and 10-year periods, aggregate total fund portfolio return performance against benchmarks has been very good<sup>1</sup>.

---

<sup>1</sup> The System explains its 5-year and 10-year underperformance in the Private Equity, O/ARS and Credit asset classes on pages 92-95 in its 2023 Annual Comprehensive Financial Report.

**Investment Performance Results  
(Time-Weighted, Gross of Certain Investment Fees)**

	Annualized Rate of Return			
	1 Year	3 Years	5 Years	10 Years
<b>Total Fund</b>	<b>(4.14)%</b>	<b>11.92%</b>	<b>7.50%</b>	<b>8.02%</b>
Public Equity	(7.27)	16.50	8.26	9.70
Benchmark: MSCI All Country World Index	(7.44)	15.36	6.93	8.06
Private Equity	(2.87)	18.28	15.21	13.78
Benchmark: Cambridge U.S. Private Equity Index (1Q Lag)	(2.05)	19.05	16.25	15.10
Real Estate	5.66	11.22	8.56	10.45
Real Estate Benchmark	7.26	9.68	8.17	9.18
Credit	(0.62)	8.72	5.06	–
Benchmark: Credit Suisse Leveraged Loan Index + 2.5%	4.67	11.07	6.13	–
Opportunistic/Absolute Return Strategy Funds (O/ARS)	1.54	10.58	5.85	5.40
Benchmark: CRF Actuarial Return + 2%	8.80	8.80	8.80	9.00
Real Assets	14.23	12.50	10.52	–
Benchmark: U.S. CPI + 5%	9.80	10.55	9.02	–
Fixed Income	(4.33)	(1.59)	1.30	1.51
Benchmark: Bloomberg Barclays Aggregate Bond Index	(4.78)	(2.77)	0.91	1.36
Short-Term Investments	2.84	1.22	1.73	1.28

The exam team also observed the more standard U.S. generally accepted accounting principles (“GAAP”) money-weighted returns on plan investments, “net of expenses” for each of the past ten fiscal years and compared these to a very simple allocation to two liquid asset classes: 70% to a Vanguard exchange traded funds (“ETF”) tracking the S&P 500 stock index (Vanguard 500 Index Fund ETF) and 30% to a Vanguard ETF tracking the Bloomberg Aggregate Bond Index (Vanguard Total Bond Market Index Fund ETF). The two Vanguard ETFs have annual expenses of 3 basis points which are netted out from numbers below. The simple 70/30 allocation outperformed in all but one year:

	2023	2022	2021	2020	2019	2018	2017	2016	2015	2014	Geometric Mean	Arithmetic Mean
<b>NYSCRF:</b>	-4.430%	9.440%	33.430%	-2.640%	5.140%	11.290%	11.400%	0.030%	6.980%	13.020%	7.915%	8.366%
<b>70/30 ETF Portfolio:</b>	-6.906%	9.631%	39.990%	-2.468%	7.939%	10.220%	12.071%	1.815%	10.511%	15.218%	9.188%	9.802%

The exam team requested reports of risk-adjusted return by asset class against benchmarks, which NYSCRF personnel sourced for us. The exam team observed favorable Sharpe and Information ratios. However, the exam team’s review did not indicate that monitoring risk adjusted return below the aggregate portfolio level is a significant NYSCRF concern. The CIO informed us that at the asset class level, tracking error versus benchmarks is generally monitored with a targeted maximum of 1%.

Similarly, the consistency of a very healthy funded ratio over a 10-year period is indicative of a well-managed investment portfolio and provides assurance of continued low risk to current and future pensioners (as does, of course, a statute guaranteeing actuarially required contributions from state taxpayers).

**Funded Ratio<sup>2</sup> Based on Market Value of Assets (\$1000)**

	<b>Fiduciary Net Position</b>	<b>Employers' Total Pension Liability</b>	<b>Funded Ratio</b>
2023	249,508,086	276,462,592	90.25%
2022	273,718,723	266,112,180	102.86%
2021	260,081,083	261,916,932	99.30%
2020	198,079,762	229,905,278	86.16%
2019	215,169,161	223,931,529	96.09%
2018	212,076,811	216,315,013	98.04%
2017	197,602,193	209,071,069	94.51%
2016	183,640,205	202,651,271	90.62%
2015	189,412,416	193,065,921	98.11%
2014			92.2%

In interviews with the CIO, the exam team was told that NYSCRF’s position on Environment Social and Governance (“ESG”) is that the goal of maximizing risk-adjusted return (the System’s fiduciary responsibility) is never subordinated to non-economic ESG considerations, but where such considerations are consistent with and necessary for risk/return maximization, they are important. The CIO explained that some ESG factors present direct risks that must be considered and compensated (or avoided if not compensated), and some other factors present value-adding investment opportunities in entities that are themselves profiting as such risks are addressed.

The exam team believes this is a proper approach to integrating environmental, social and governance risk factors into investment decision making.

The exam team has several observations and suggestions based on the exam team’s review; some as part of the assigned scope of the examination and explained in the body of the report and some others that the exam team noted along the way. These are:

1. The exam team suggests that NYSCRF consider writing a more focused Risk Appetite Statement and a separate and concise Risk Tolerance Statement with quantitative expression of risk tolerance based on limits on risk metrics such as, for example, the probabilities associated with penetration of the  $\alpha$ ,  $\beta$ ,  $\gamma$ , and  $\Omega$  risk levels, value-at-risk (“VaR”), Stress Scenarios, Duration and/or other. (See “Risk Profile, Guidelines and Practices” and “Reasonableness of the Risk Profile” below).

---

<sup>2</sup> Data from 2015 through 2023 published in 2023 Annual Comprehensive Financial Report (ACFR) based on combined total for the New York State and Local Police and Fire Retirement System (PFRS) and the New York State and Local Employees’ Retirement System (ERS). The combined assets of ERS and PFRS are held in the NYSCRF and managed by the Division of Pension Investment and Cash Management (PICM). 2014 data from <https://www.osc.ny.gov/files/press/pdf/funded-ratio-nyslrs.pdf>.

2. In discussions with CIO and Deputy CIO, Rutter Associates and DFS were informed that the NYSCRF Information Technology systems were not able to incorporate in one place, and on a daily basis, all the investment position data that they would like to see from the sources in which they are reported each day. In a follow up conversation with the Deputy CIO and a member of the Information Technology team, the exam team was told it would take about three years to develop this functionality. Rutter Associates suggests applying best efforts to speed up this critical development because it is essential for optimal portfolio management that the investment and risk teams be able to monitor and review the NYSCRF's investment portfolio and corresponding risks on a timely and regular basis.

The exam team suggests that a more timely and cost-effective solution might be to adopt standard industry practice and implement a commercial system minimizing the need for any proprietary build-out.

3. The Deputy Superintendent and Assistant Deputy Superintendent from the DFS Climate Division joined the exam team for discussions with the CIO, CRO, Director of Sustainable Investments and Climate Solutions, and Head of the Corporate Governance in which the exam team covered issues in climate risk measurement and management. The Program Director, Sustainable Investments & Climate Solutions and Executive Director, Corporate Governance report directly to the Deputy CIO and are part of the first line of defense investment function.

Rutter Associates suggests that the CRO designate a second line of defense risk manager to work with the Program Director, Sustainable Investments & Climate Solutions and the Executive Director, Corporate Governance to develop climate risk metrics and limits around those metrics that will be monitored and reported in the risk reports distributed by the Office of the CRO. The potential for losses in shareholder value and credit defaults from physical and transitional climate risks as well as government policy needs to be accounted for within market and credit risk assessments.

The exam team also concurs with the recommendations made in a separate report by the Deputy Superintendent and Assistant Deputy Superintendent from the DFS Climate Division.

4. Rutter Associates suggests involving the CRO in any decision-making about modifying documented Asset Allocation Rebalancing procedures (see item 11 below).
5. While monitoring and reporting duration and convexity metrics to the CIO and the Risk Committee is important and best practice, the exam team has observed no specific limits on the variances of durations and convexity from benchmarks in the reports; Rutter Associates suggests that establishing tolerance ranges for these risk metrics would enhance risk control.

6. Rutter Associates suggests that an internal credit rating be assigned to every credit risky investment asset that has no Nationally Recognized Statistical Rating Organizations (“NRSRO”) rating (e.g., Moody’s, S&P and Fitch). Further, the exam team suggests that all Loan to Value (“LTV”) and Debt Service Coverage Ratio (“DSCR”) metrics be maintained and reported on an annual basis for all commercial mortgage loans.
7. Rutter Associates notes that there are no specific “portfolio” credit risk metrics being reported as of August 2023. The System might choose to implement a Credit Value at Risk metric going forward using the functionality embedded in Blackrock’s Aladdin product (NYSCRF currently employs this Blackrock product) or other. Such a tool would permit enhanced ability to spot credit deteriorations and understand credit correlations.
8. Rutter Associates notes that the System indicated that it could not provide certain data requested by the exam team. The exam team was informed that equity components of the System’s “Risk Aware Low Emissions” (“RALE”) investment could not be provided because of a non-disclosure agreement (“NDA”) signed with a leading Asset Management firm that prevented disclosure to the Regulator. Rutter Associates suggests that NDAs with such provisions not be signed in the future; in this case, such non-disclosure agreement prevented NYDFS and Rutter Associates from performing adequate regulatory diligence.

The exam team also notes that the investment returns and risk adjusted returns reported by Callan to the NYSCRF<sup>3</sup> are measured against the Financial Times Stock Exchange (“FTSE”) Russell Custom 1000 GSAM “Risk Aware Index”. As explained to us by the Chief Investment Officer, from the basket of equities comprising the Russell 1000 index, the Asset Management firm selects a subset of “low carbon emission” names to create an index that replicates the FTSE Russell 1000 index up to a maximum tracking error of 25bps. It is expected that the RALE investment would outperform the unadjusted FTSE Russell 1000 index should the government impose a carbon tax. Given that the System enters this investment to track the Russell 1000 index unless a carbon tax is imposed, the Russell 1000 index itself is the correct benchmark for Callan to report, not the Custom 1000 GSAM index.

---

<sup>3</sup> Callan, “New York State Common Retirement Fund Investment Measurement Service Quarterly Review” June 30, 2023

## Scope of examination

The following 13 items constitute the full scope of the exam Rutter Associates was assigned. Through most of these Rutter Associates worked in collaboration with a team from DFS.

### (#1) Risk Profile, Guidelines and Practices

#### **Investment Risk Management:**

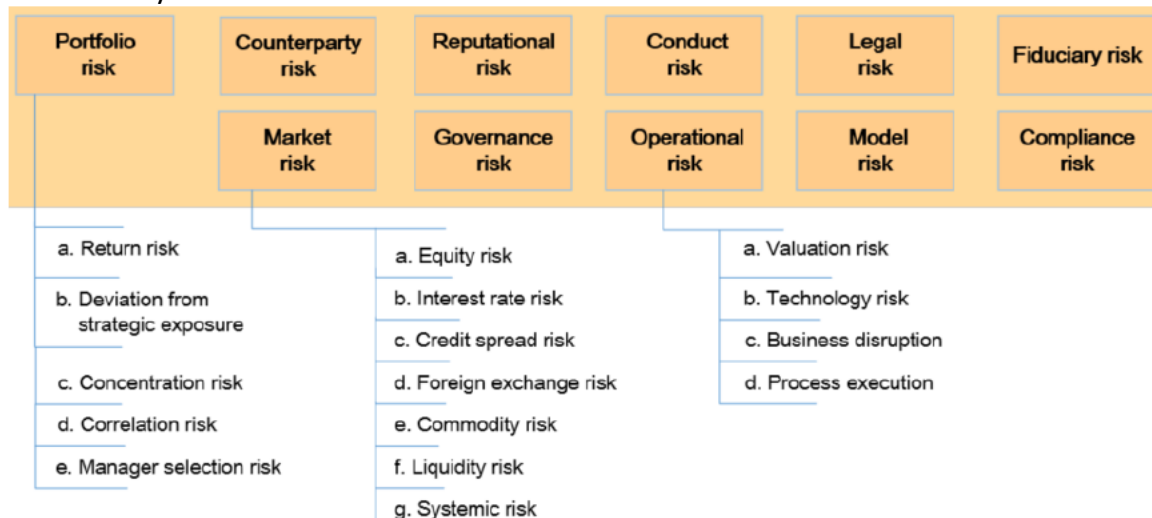
The stated main objective of investment risk management for the NYSCRF is:

**“...to identify, understand, mitigate, and ideally prevent a variety of risks** that are presented to the value, safety, and liquidity of Fund assets and to reputation of the Fund in the investment decision making process and the investment-related operations of the Fund.”<sup>4</sup>

The stated risk appetite of NYSCRF states:

**“provide a secure pension for generations of NYSCRF members, retirees, and beneficiaries. In the decision making, the Trustee and staff of the CRF may take prudent investment risk when compensated by higher expected return in order to generate stronger long-term performance. Regardless of potential returns, the CRF endeavors to avoid the risk of loss of asset value that could compromise the economic viability of the current plan structure or call into question the integrity and responsibility of the CRF or its staff. The CRF diligently seeks to identify and avoid such risk.”<sup>5</sup>**

NYSCRF’s Key identified risks<sup>6</sup> are listed as follows:



<sup>4</sup> PICM Policies and Procedures Manual - June 2021 page 180

<sup>5</sup> Ibid, page 181

<sup>6</sup> “Pension Risk Management-Manual\_FINAL\_03072023” page 4.

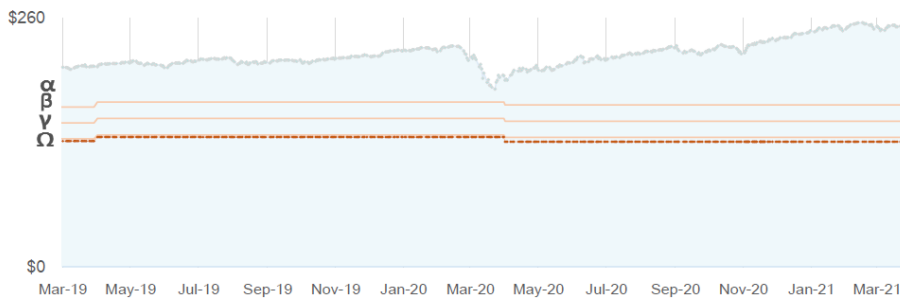
NYSCRF’s investment risk levels serve as a mark that if breached would result in increases in employer (i.e., taxpayer) contributions<sup>7</sup>. The levels are provided by the actuary to the risk team once a year. The definitions of and dollar values of risk levels in 2023, i.e. alpha, beta, gamma, and omega, are presented below:

### Risk Level Definitions



<p>Alpha (<math>\alpha</math>) \$169.2b</p>	<p>Fifteen percent change in employer contribution rates, or three percentage-point increase in contributions for each of next 5 years, after smoothing. Breached in 2003; resulted in Chapter 49 of Laws of 2003 (temporary regime of contribution smoothing).</p>	<p>First significant onset of stress to employers from higher Normal contributions. Many employers use Contribution Stabilization Program to amortize difference between Normal Rate and smaller Graded Rate.</p>
<p>Beta (<math>\beta</math>) \$152.3b</p>	<p>Ninety percent of Alpha, about five percentage-point increase in employer contribution rates for each of next five years, after smoothing. Breached in 2009; resulted in the current Contribution Stabilization Program, and in Tiers 5 and 6.</p>	<p>Intensifying stress from even higher Normal contributions increases pressure to implement Tier VII (reduction in liabilities for new entrants to NYSLRS).</p>
<p>Gamma (<math>\gamma</math>) \$135.4b</p>	<p>Eighty percent of Alpha.</p>	<p>Intensifying stress from even higher Normal contributions increases pressure to implement Tier VII (reduction in liabilities for new entrants to NYSLRS).</p>
<p>Omega (<math>\Omega</math>) \$130.8b</p>	<p>Similar to Gamma, but persists for several years. Normal contributions become so high that it becomes cheaper to implement a pay-as-you-go (PAYG) type plan.</p>	<p>Ultimate risk level, assuming no significant asset recovery. Extraordinary measures would have to be taken, for example, resorting to public finance, to preserve benefits, even for current pensioners and beneficiaries.</p>

Portfolio Trend vs Risk Levels, MV \$b



To assess whether the Fund is exceeding its risk appetite, NYSCRF estimates probabilities, at the beginning of the fiscal year, of risk-level penetration at each risk level at the end of the fiscal year.

<sup>7</sup> Ibid page 7.

The exam team has not seen any formal limits on those probabilities or action plans for limit breaches. Such limits could provide the basis for a formal NYSCRF Risk Tolerance Statement.

### **Risk Reporting**

Risk reports<sup>8</sup> are provided at various frequencies and include (but are not limited to):

- Daily Risk Dashboard.
- Monthly Rebalance Committee Materials.
- Quarterly Risk Committee Materials and
- Annual Risk Appetite Calibration.

The daily risk dashboard includes metrics covering the total plan risk as well as the risk contributions by asset class, sectors, and geographic regions. The trend analysis comparing CRF's portfolio to its benchmarks as well as a 252-day, 99% Confidence Interval Parametric VaR are included.

In addition to the Daily Risk Dashboard, the Quarterly Risk Committee Report includes historical and hypothetical scenarios analyses, systematic stress tests, factor contribution analyses, concentration analyses, risk limit exceedances if any and a liquidity dashboard.

The Rebalance Committee is discussed below.

### **Internal Committees:**

While NYSCRF does not have a Board of Trustees (hence no Board-level risk committee), the System does maintain an internal Risk Committee, which meets quarterly. Members of this Committee include the CRO (as Chair), the CIO, the Deputy CIO, Director of Operations, Director of Compliance, Director of Global Equity and Director of Fixed Income. The CIO may invite other asset class heads to attend and the CRO may nominate additional members of the Committee from the Office of the Comptroller organization outside of Portfolio Investment and Cash Management ("PICM").

NYSCRF also has a Rebalancing Committee, staffed by members of PICM at the invitation of the CIO and/or CRO, that meets monthly to address two discrete situations. The first is to identify any near-term liquidity needs and the second is to implement a strategic rebalancing program.

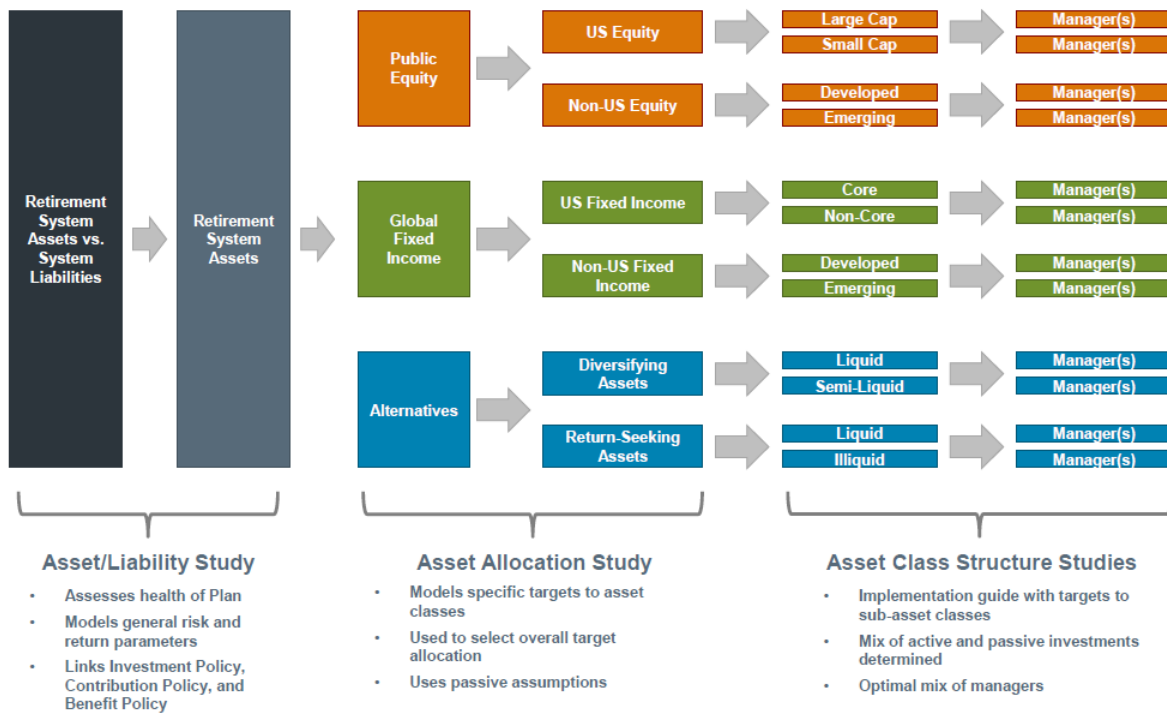
### **Asset Liability Study<sup>9</sup>:**

NYSCRF's consultant, RVK, provides NYSCRF with an Asset Liability ("A/L") study at least every 5 years. The last study was conducted in April 2020 (a month into the global pandemic).

---

<sup>8</sup> Key reporting from other areas includes (but is not limited to) 'Asset Allocation' and 'Performance' reporting from the Fund's custodian and various exposure and analysis reports from the asset class consultants.

<sup>9</sup> 2020-04 NYSCRF Asset Liability Executive Summary.pdf page 3



The main conclusions of the April 2020 A/L study were:

1. “Given the current capital markets environment, with reduced expected return opportunities looking forward, **the stochastic projections show median outcomes leaving funding levels moderately lower than current levels.**”
2. “While this should not be unexpected given the current expectation of generally lower investment returns looking forward from today’s vantage point, this **does not in our opinion suggest immediate and abrupt changes in the investment approach.**”
3. “We emphasize that **the primary objective of this study** and, the more cautious capital markets assumptions they employ, **is to examine the tradeoffs between various levels of risk and return and integrate them with liabilities and contributions.**”

This study did not reflect a significant change from the previous asset allocation study or suggest a higher expected return/risk portfolio.

The basket clause constraint (discussed further below) is a key limit preventing NYSCRF from moving to a significantly higher expected return and higher-risk portfolio. The basket clause constraint was increased from 25% to 35% in 2023. However, based on the exam team’s interviews, NYSCRF does not plan to move away from its current asset allocation.

**Conclusion:**

Rutter Associates observes that NYSCRF articulates an investment risk appetite (see Section 2, “Reasonableness of Risk Profile” for more on this discussion). NYSCRF’s risk profile is consistent

with risk/return optimization as its asset allocation is targeted to a position on the efficient frontier<sup>10</sup> (as defined by consultant RVK) subject to basket constraints.

Rutter Associates observes the “Policies and Procedures Manual”, the “Risk Principles and Framework” and the “Strategic Asset Allocation Rebalancing Policy and Procedures” documents contain all of the System’s risk management objectives and guidelines. The Risk Committee, the Rebalancing Committee and the risk reports published by the risk management group support the maintenance of portfolio risk within the NYSCRF stated risk appetite, and implied tolerances.

## (#2) Reasonableness of the Risk Profile

The exam team observes that the risk profile of the NYSCRF investment portfolio appears oriented to assure that the portfolio is structured over time to achieve maximum return at any given level of investment risk, or equivalently, minimize investment risk for any given level of expected return. It also appears oriented toward avoiding catastrophic downside risk. However, its risk appetite statement<sup>11</sup> does not support this appearance very well and does not imply risk tolerances and the controls the CRO has put in place:

### **“Risk Appetite Statement**

The CRF is dedicated to providing a secure pension for generations of NYSLRS members, retirees and beneficiaries. In the pursuit of this mission, the CRF is committed to the highest standards of ethics and prudent investment management. In their decision making, the Trustee and staff of the CRF may take prudent investment risks when compensated by higher expected returns in order to generate stronger long-term performance. Regardless of potential returns, the CRF endeavors to avoid the risk of a loss of asset value that could compromise the economic viability of the current plan structure or call into question the integrity and responsibility of the CRF or its staff. Therefore, the CRF diligently seeks to identify and avoid such risk.”

The exam team suggests a slight re-working of the risk appetite statement with a clearer focus on the relationship between risk of investment loss and the expected return targeted. For example, “NYSCRF has appetite for risks that are fully compensated by expected return, subject to limits on the probability of losses that could compromise the viability of the current plan structure.” This will tie back clearly to the Alpha, Beta, Gamma, and Omega risk definitions discussed above.

Additionally, the exam team notes that in August 2021, the System’s actuary reduced the Actuarial Interest Rate to 5.9% explaining that the fund would have less than a 50% probability of

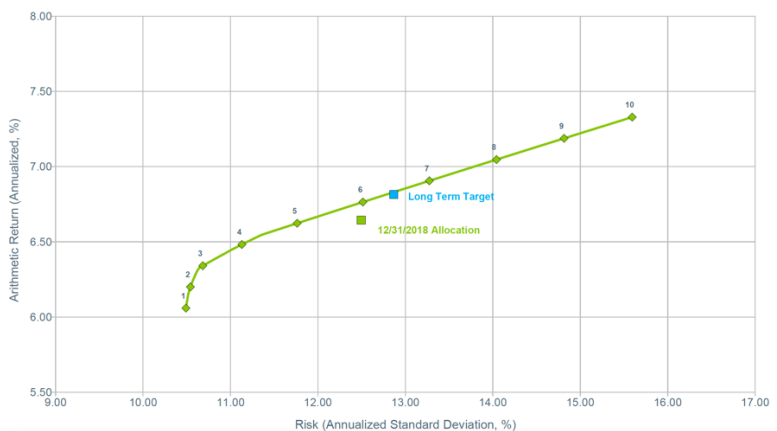
---

<sup>10</sup> The “efficient frontier” is the set of portfolios which maximizes expected return for a given level of risk as measured by standard deviation. When riskless borrowing and lending is included in the investment set, this frontier becomes linear and is often referred to as the “capital market line”.

<sup>11</sup> 2023 Annual Comprehensive Financial Report, page 100

a shortfall from this expected return target based on the most recently provided comprehensive asset/liability analysis<sup>12</sup>. Expressing the requirement of a maximum 50% shortfall probability (or any other chosen level of probability) from an expected return that is chosen along the efficient frontier is a good way of defining risk appetite.

The exam team has observed a rigorous asset allocation program oriented toward achieving the efficient frontier and risk reports showing target allocations on that frontier. The July 2019 NYSCRF Risk Committee Meeting presented the July 2019 RVK efficient frontier, the System’s end of 2018 position within it and the System’s target:



RVK provides the System with a range of risk-expected return efficient asset allocations given the selected asset classes and constraints on minimum and maximum allocations to each asset class. While the System considers the actual RVK set of efficient allocations to be confidential intellectual property and requested that we not reproduce them in our report in order to protect its competitive position, we observed that they do map out an efficient frontier in which RVK asserts “additional expected return can only be achieved by undertaking additional risk when the portfolio is allocated properly.”

We observed a small difference between the System’s target allocation and its actual year-end allocation. This portfolio imbalance can occur because of differential returns among the various asset groups with some perhaps falling in value and other rising and to some extent to changes in capital market assumptions. For large imbalances especially between (relative illiquid) private assets and public assets as was seen going into 2023, it can take months for a portfolio the size of the NYSCRF portfolio to rebalance to target without suffering adverse market impacts.

The risk profile is defended by an active CRO organization that produces and distributes frequent risk reports including a daily risk dashboard, monthly Rebalance Committee presentations and quarterly Risk Committee presentations. Quantitative metrics include Stress Testing, Value at Risk, Tracking Error against benchmark indexes, Liquidity estimates and asset allocation variances

<sup>12</sup> Actuarial-assumptions-2021.pdf

to the target allocation that achieves the targeted expected return at minimum portfolio standard deviation and probabilities associated with breaching alpha, beta, gamma, and omega risk levels. The exam team suggests the creation of a Risk Tolerance statement expressing *formal limits* on these and perhaps other metrics. Separately, guidelines for curing these limit breaches would best be documented in the Risk Management Guidelines document.

The exam team has seen many internal documents that address risk appetite and risk tolerance; these can be used in the development of concise and well-focused Risk Appetite and Risk Tolerance Statements.

That said, Rutter Associates sees no evidence that the System's investment risk profile is other than reasonable.

### (#3) Required Risk Signoffs and Escalation Procedures

Rutter Associates notes that the NYSCRF Risk Management Policy Manual (*Risk Principles and Framework: Pension Risk Management*, March 2023) identifies three distinct "lines of defense."

The office of the CIO practices the day-to-day management of the portfolio and its trading positions and is part of the "first line of defense." The first line of defense "owns" the risk.

The office of the CRO is part of the "second line of defense." The CRO articulates standards and expectations for the effective management of risk and controls and produces independent risk assessments that are reported to (first line) senior management. The independence of the second-line risk management organization from the first line of defense is critical and is assured by the CRO reporting functionally to the Executive Deputy Comptroller for Retirement Services ("EDCRS") and not to the CIO (to whom there is a purely *administrative* line designed to encourage risk transparency). This independence is important; a 2015 Bank for International Settlements ("BIS") Occasional Paper<sup>13</sup> argues that:

*"...the second line of defence defines preventive and detective control requirements and ensures that such requirements are embedded in the policies and procedures of the first line. The second line must be independent of the first line and apply controls either on an ongoing (e.g., daily) or periodical basis. It must also be based on clear risk assessment criteria..."*

Generally, the exam team views the CRO having a line into the Board of Trustees of pension systems as best practice, but as no Board of Trustees exists for NYSCRF, the exam team considers a direct line to the EDCRS to be an acceptable alternative, and the exam team believes that the Risk Management organization is sufficiently independent from the office of the CIO.

NYSCRF is a relatively lean organization with few administrative levels. The CRO is continuously on top of the portfolio's risk profile and her team produces several risk reports at various

---

<sup>13</sup> Arndorfer, I and A. Minto, 2015, *The Four Lines of Defense Model* for Financial Institutions

frequencies including a “Daily Risk Dashboard”, “Strategic Risk Report”, monthly “Rebalance Committee Materials”, quarterly “Risk Committee Materials” and annual “Risk Appetite Calibration”. These reports are provided to the Comptroller and to the CIO as well as to the Investment Advisory Committee (“IAC”), the Risk Committee, and the Rebalance Committee.

The daily communication of risk metrics and frequent distribution of risk reports to the few key NYSCRF executive decision-makers, most notably the EDCRS who reports directly to the Comptroller, make formal risk sign-offs unnecessary by providing constant “escalation” to the first line of defense and senior-most executives.

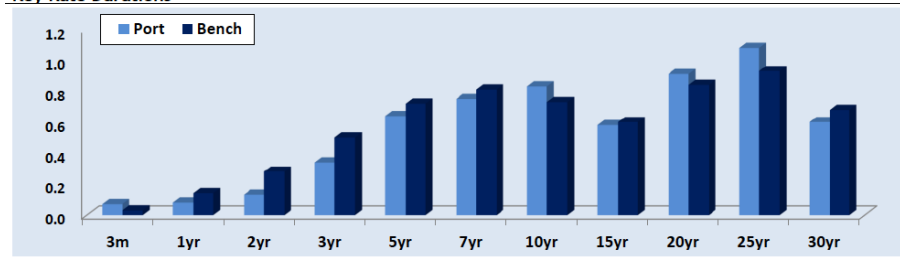
#### (#4) Duration and Convexity

The risk reports the CRO provides to the CIO, the EDCRS and the IAC include duration, key rate duration, spread duration and convexity (all versus benchmarks) for both the core and non-core fixed income portfolios. The following are snapshots from the March 31, 2021 IAC Risk Report (the entire report is comprehensive and provides an excellent risk snapshot of the total NYSCRF plan).

#### Core Portfolio at December 31,2020 (\$ thousands)

Port Nav	\$47,949,777	Yield	Port 1.33	Bench 1.10	Active 0.23
Benchmark	Barclays Agg	Duration	Port 6.00	Bench 6.26	Active (0.26)
Benchmark Rating-S&P	AA-	Convexity	Port 0.57	Bench 0.20	Active 0.37
Portfolio Rating-S&P	AA-	WAL	Port 8.19	Bench 8.11	Active 0.08
Portfolio Rating-Moody's	Aa2	OAS	Port 66	Bench 41	Active 25
		Spread Duration	Port 3.57	Bench 3.92	Active (0.35)

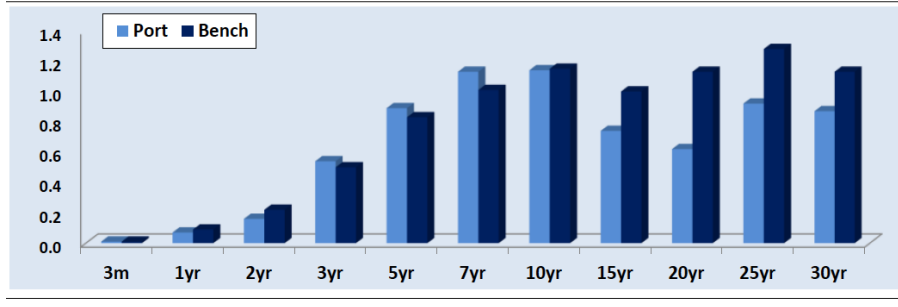
#### Key Rate Durations



### Non-Core Portfolio at December 31, 2020

Portfolio Information (000's)		Port	Bench	Active
Port Nav	\$15,079,970	1.67	1.67	0.00
Benchmark	LEH_CREDIT	7.11	8.35	(1.25)
Benchmark Rating-S&P	A-	0.8	1.3	(0.49)
S&P Rating	A-	10.4	11.8	(1.37)
Moody's Rating	A3	96	91	6
		7.3	8.4	(1.05)

Key Rate Durations



While reporting these metrics to the CIO and the EDCRS is important and best practice, the exam team has observed no specific limits on the variances of durations and convexity from benchmarks in the reports. The exam team suggests that establishing tolerance ranges for these risk metrics would enhance risk control and constitute best practice.

The exam team notes that the investment team generally aims to maintain the duration of the core fixed income portfolio within 0.25 “years” of the “Barclays Aggregate” benchmark (the name was recently changed to the “Bloomberg Aggregate Bond Index”).

### (#5) Liquidity Management

Liquidity inadequacy is a key risk to a pension fund as its main responsibility is to pay benefits when due.

The NYSCRF seeks to maintain a portfolio that is largely invested in liquid assets that provide both regular cash flows and the ability to sell without adverse market impact. Each asset class is assigned a liquidity “factor” from 0 to 100% with cash equivalents assigned a 100% score, US aggregate fixed income 87%, broad US equity 70%, and broad international equity 60%. All other asset classes (including all private investments) are at 0%. These factors are supplied by AM Best and are not unreasonable. The market value-weighted average factor provides a measure of potential liquid resources and is reported in the CRO’s regular Risk Committee Report.

As of the June 2021 Annual Liquidity Review, those potential liquid resources totaled \$142 billion with an aggregate AM Best liquidity factor of 57%-- an amount NYSCRF reported being 10 times the anticipated yearly benefit payment. Thus, near-term liquidity appears adequate even when stressing liquidity by haircutting further the assumed liquidity factors and/or accounting for asset value volatility.

## CRF Potential resource as of March 31, 2021

Asset Class	Current MV, \$b	AM Best Liquidity	Potential Resource, \$b
Broad US Equity	93.70	70%	65.59
Broad International Equity	40.78	60%	24.47
US Agg Fixed Income	53.08	87%	46.18
Cash Equivalents	5.89	100%	5.89
Other assets	60.03	0%	-
<b>Total</b>	<b>253.47</b>	<b>57%</b>	<b>142.12</b>

- Potential resource is estimated using AM best liquidity ratios.
- AM Best is a ratings firm specializing in rating insurance companies' claims-paying ability.

The NYSCRF System's actuary provides projections of retirement payments and other benefits due to the RVK Asset Liability studies<sup>14</sup>, and NYSCRF projects separately its net capital funding obligations for private asset classes. These annual projections are augmented with asset cash flow projections and valuations to quantify pension fund liquidity needs/risks on a monthly and quarterly basis via the "Tactical Liquidity Report" and Rebalance Committee Liquidity snapshots.

Rutter Associates observes that NYSCRF liquidity measurement and management is adequate.

### (#6) Stated Risk and Return Expectations

NYSCRF expresses investment objectives consistent with maximizing risk-adjusted returns (after management and transactions costs) at the portfolio level subject to basket constraints<sup>15</sup>. The System does not articulate its risk tolerance (e.g., a quantitative statement of maximum acceptable probability of loss or limits on other risk metrics) nor does it articulate a specific approach to determining an expected return target such as the current 5.9% Actuarial Interest Rate ("AIR") used as the discount rate applied to pension liabilities. As discussed above, Rutter Associates suggests a formal Risk Tolerance statement relative to both would be desirable.

NYSCRF states in its General Investment Policies that an asset liability study must be conducted at least once every 5 years. That study includes a review of asset class expected returns and standard deviations as well as correlation assumptions across asset classes and ultimately a set of alternative asset allocations that maximize expected portfolio return at every given level of risk (expressed at standard deviation).

Based on the study, the NYSCRF can choose the allocation that balances its expected return goals with its risk tolerance.

<sup>14</sup> Payments and benefits due are projected separately for the Police & Fire Retirement System and for the Employees Retirement System. Projections exclude those attributed to the group life insurance plan. *RVK Asset Liability Study*, April 2020, p.53

<sup>15</sup> *Policies and Procedures Manual*, New York State Common Retirement Fund

The following was its recent policy allocation:

#### Policy Allocation Portfolio

Broad US Equity	32%
Broad International Equity	15%
US Aggregate Fixed Income	23%
Credit	4%
Real Estate	9%
Private Equity	10%
ARS - Opportunistic	3%
Real Assets	3%
Cash	1%

Rutter Associates reviewed NYSCRF’s latest asset allocation study (in 2019) conducted by RVK, the general consultant. The asset allocation process is based on modern portfolio theory, which is market standard practice and consistent with the approach taken by other pension systems. Rutter Associates reviewed RVK’s assumptions about expected return, standard deviation, and correlation for each asset class.

While the System considers the actual RVK capital market assumptions to be confidential intellectual property and requested that we not reproduce them in our report in order to protect its competitive position, we observed that the expected returns, standard deviations, and correlations, while not *identical* to the capital market assumptions of other institutions, are broadly consistent with those of other Institutions. For example, the exam team sees higher expected return and standard deviation on equities than on fixed income; higher expected return and standard deviation on private market investments (private equity and private debt); low correlation between equity and traditional fixed income, while positive correlation between equity and private credit/opportunistic. Also, the numbers fall into ranges broadly consistent with capital market assumptions from other Institutions.

The following lists the expected return for each asset class from alternative sources<sup>16</sup>.

	NYSLRS 10Y (2019)	RVK (2022)	Wells Fargo (2023)	Callan (10Y) (2022)	BNY (10Y) (2023)	BNY (10Y) (2022)	Barclays (30Y) (2023)	JPM (Long-Term) (2023)	JPM (Long-Term) (2022)
U.S. Equity	6.80%	5.93%	7.53%	6.60%	6.50%	5.90%	7.60%	8.00%	4.27%
Non-US Equity	8.90%	8.53%	6.93%	6.70%	8.10%	6.70%	7.80%	9.74%	6.59%
Real Estate Equity	7.93%	7.08%	7.30%	5.75%	6.00%	4.70%	5.70%	7.08%	6.78%
Private Equity	8.53%	9.00%	11.30%	8.00%	8.20%	7.90%	11.62%	9.90%	8.10%
Private Debt	6.93%	7.25%	8.50%	5.50%	NA	NA	7.80%	7.80%	6.90%
Core US Fixed Income	3.75%	2.50%	3.38%	1.75%	4.10%	1.20%	4.30%	4.62%	2.37%
Cash	3.00%	1.50%	1.90%	1.20%	NA	NA	2.95%	2.40%	1.30%

<sup>16</sup> For Real Estate Equity, Rutter Associates took the average of the NYSCRF Real Estate return and the NYSCRF Real Asset return for comparison purposes. For Private Equity, Rutter Associates took the average of the NYSCRF Private Equity return and the NYSCRF CIO (Opportunistic) return for comparison purposes.

Having been provided with the RVK capital market assumptions and its range of efficient allocations (the System requested us not to reproduce these in this report), Rutter Associates was able to achieve results the exam team deems sufficiently close to the results<sup>17</sup> of the RVK’s asset allocation using a simple EXCEL optimization with the constraint of the basket clause limits that put restrictions on the total allocation for certain asset classes at 25%<sup>18</sup>.

Basket Clause Limits:

**New York State Public Pension Fund Statutory Limits for Asset Allocation**

- Overall “basket assets” are capped to no more than 25% of total Plan assets

Asset Class	Legal List	Basket
US Equity	Up to 70% of which 10% can be Non-US Equity	Securities <\$1B market cap
Non US Equity ( Developed and EM)	Up to 10%	All assets above 10% Legal list
US Investment Grade FI	√	
High Yield FI		√
Non-US FI Developed		√
Emerging Markets Debt		√
Bank Loans		√
Hedge Funds		√
Private Equity		√
Real Estate Equity	Up to 10%	All assets above 10% Legal list
Infrastructure		√
Timber		√
Commodities		√
Real Estate Debt – Core	Up to 30%	All assets above 30% Legal List
Real Estate Debt – Non-Core		√

**Conclusion**

The asset allocation process used by RVK is based on modern portfolio theory, which is standard market practice.

The expected returns, standard deviations, and correlations input to the RVK model, while not identical to the capital market assumptions of other institutions, are not inconsistent with those of other institutions.

Rutter Associates was able to replicate the results of the RVK asset allocation study using the RVK inputs. The exam team notes no exceptions to the assumptions, processes, and results of NYSCRF’s asset allocation study conducted by RVK.

<sup>17</sup> Rutter Associates’ optimization is purely mathematical. NYSCRF’s final asset allocation may include some un-modeled institutional preferences and a preference for gradual adjustments from previous allocations out of cost considerations (e.g., potential market impact).

<sup>18</sup> This was increased to 35% in 2023.

Rutter Associates finds no deficiencies in the assumptions, the process, and the results of the NYSCRF asset allocation process.

## (#7) Asset Valuation

NYSCRF's audit firm KPMG, LLP ("KPMG") performed a thorough examination of the investment portfolio's listed asset values. The table below summarizes assets and liabilities carried at fair value based on levels from the fair value hierarchy as of March 31, 2021, and other assets carried at either net asset value ("NAV") or cost also for reconciliation to the statement of fiduciary net position (dollars in thousands):

	Total	Level 1	Level 2	Level 3
<b>Assets:</b>				
<b>Investments by fair value level:</b>				
<b>Fixed income securities:</b>				
Short-term instruments	\$ 10,475,420	\$ —	\$ 10,475,420	\$ —
Global fixed income securities	47,407,021	588,256	46,818,765	—
<b>Total fixed income securities</b>	<b>57,882,441</b>	<b>588,256</b>	<b>57,294,185</b>	<b>—</b>
<b>Equity securities:</b>				
Domestic equities	84,941,220	84,941,032	—	188
International equities	40,356,404	40,355,685	460	259
<b>Total equity securities</b>	<b>125,297,624</b>	<b>125,296,717</b>	<b>460</b>	<b>447</b>
Mortgages	1,043,621	—	—	1,043,621
Private equity	364,292	—	—	364,292
Credit	12,601	—	—	12,601
Real estate	1,116,584	—	—	1,116,584
Securities lending collateral	13,799,671	—	13,799,671	—
Forward foreign exchange contracts	68,841	—	68,841	—
<b>Total investment assets by fair value level</b>	<b>\$ 199,585,675</b>	<b>\$ 125,884,973</b>	<b>\$ 71,163,157</b>	<b>\$ 2,537,545</b>
<b>Investments measured at cost:</b>				
Securities lending collateral	\$ 3,123,477			
<b>Total investments measured at cost</b>	<b>\$ 3,123,477</b>			
<b>Investments measured at Net Asset Value (NAV):</b>				
Global fixed income securities <sup>1</sup>	\$ 315,934			
Domestic equities <sup>2</sup>	5,322,608			
International equities <sup>3</sup>	3,123,996			
<b>Alternative investments:<sup>4</sup></b>				
Private equity	29,105,873			
Opportunistic/ARS	5,016,078			
Real assets	3,929,594			
Credit	8,465,915			
Real estate	16,531,409			
<b>Total alternative investments</b>	<b>63,048,869</b>			
<b>Total investments measured at NAV</b>	<b>\$ 71,811,407</b>			
Investment related cash and cash equivalents not included in above	607,231			
<b>Total investment assets</b>	<b>\$ 275,127,790</b>			
<b>Liabilities:</b>				
<b>Investments by fair value level:</b>				
Forward foreign exchange contracts	(68,782)	—	(68,782)	—
<b>Total investment liabilities by fair value level</b>	<b>\$ (68,782)</b>	<b>\$ —</b>	<b>\$ (68,782)</b>	<b>\$ —</b>

Source: 2021 Annual Comprehensive Financial Report ("ACFR"), page 69

The fair value hierarchy is defined as follows (2021 ACFR, page 68):

**Level 1** – Investment fair values based on prices quoted or published in active markets for identical assets.

**Level 2** – Investment fair values based on observable inputs for the assets either directly or indirectly, other than those considered Level 1 inputs, which may include quoted or published prices for identical assets in markets that are not considered to be active and quoted or published prices of similar assets in active or inactive markets.

**Level 3** – Investment fair values based on unobservable inputs.

The categorization of investments within the hierarchy above is based solely upon the objectivity of the inputs used in the measurement of the fair value of the investments and does not reflect the level of risk associated with the investments.

Investments classified in Level 1 of the fair value hierarchy are valued from predetermined external pricing vendors or primary dealers who source quoted or published prices in active markets which are readily attainable exit values of these securities.

Investments classified in Level 2 are subject to alternative pricing sources, including a combination of price sources, descriptive data and pricing models based on attributes such as spread data, sector, quality, duration, and prepayment characteristics.

Investments classified as Level 3 are valued using best available sources such as property appraisals, discounted cash flow models and public market comparables of similar assets where applicable. The values are supplied by advisors or general partners who hold those or similar assets in investment vehicles they oversee. These pricing sources may or may not be indicative of realizable exit values attainable for the assets.

#### **Net Asset Value (NAV) investments:**

Global fixed income, domestic equities and international equities holdings classified as valued at NAV contain funds in which the System is the only investor or commingled funds. KPMG stated that “Almost all the alternative investments prepare their financial statements in accordance with FASB investment company guidance or consistently with FASB investment company guidance, and therefore NAV is used as a practical expedient.”

The distribution of the investment assets across the levels of fair value hierarchy as of March 31, 2021 was as follows:

Level 1	45.8%
Level 2	25.9%
Level 3	0.9%
Net Asset Value	26.1%

After reviewing the System’s distribution across these levels, KPMG’s “Leveling Memo” concluded that: “KPMG believes that sufficient audit evidence has been obtained and concludes that over the presentation of the GASB 72 Leveling Footnote is reasonable for the year ended March 31, 2021.”

KPMG’s National Pricing Desk (“NPD”) was sent to all securities determined to have “a not-significant inherent valuation risk”, Level 1 and level 2. Given audit parameters, the Domestic Equities, International Equities and Long Term (“LT”) Bonds Non-Significant positions showed “not passing measurement – immaterial.” The finding “not passing measurement – immaterial” means that the price differences individually or in aggregate were below the audit threshold. Short Term Bond and Significant LT Bond positions showed “no measurement exceptions.” Commingled NPD were foreign funds and showed “the USD price was within USD ranges therefore passing the measurement test.” Given audit parameters, KPMG identified no material failures in valuation.

KPMG sampled funds and reviewed documentation, including audited financial statements, for positions valued at NAV, primarily alternative investments. Additionally, Level 3 assets are valued “using best available sources” and are primarily mortgages and real estate. The values are supplied by advisors or general partners.

## **Conclusion**

KPMG concluded that: “KPMG believes that sufficient audit evidence has been obtained to permit conclusion over the valuation and existence assertions of the System’s investments at March 31, 2021.”

Rutter Associates notes no concern with KPMG’s conclusion.

## [\(#8\) Securities Lending](#)

A Securities Lending agreement is the loan of an owned security in return for collateral (cash or acceptable securities) with an agreement to return the collateral to the borrower in return for an identical security in the future while passing through an equivalent amount of all distributions

(e.g., dividends and interest) to the lender and a borrowing fee. Title passes from borrower to lender and voting rights typically follow title.

NYSCRF, through a lending agent, lends securities to “further enhance overall performance.” For fiscal year 2022, total securities lending income amounted to \$30.5 million. Securities may be lent to broker-dealers or to New York State or nationally chartered banks for a period not to exceed one year. Loans may be term loans (up to a term of one year) or demand loans; the borrower and the lender have the right to terminate demand loans at any time with three business days’ notice, and term loans can be terminated by borrower or lender with three business days’ notice if each party agrees to negotiate in good faith a new term loan of equivalent market value.

The System may only lend marketable securities that are freely traded on recognized exchanges or marketplaces in return for collateral in the form of cash (U.S. dollars), U.S. Government Securities<sup>19</sup>, and performance letters of credit (drawn on a bank with capital, surplus and undivided earnings more than \$100 million). All rights of ownership to securities pledged as collateral remain with the borrower. Initial cash and non-cash collateral received must be at least 102% of the market value of U.S. securities lent or 105% of the market value of non-U.S. securities lent, plus accrued interest, if applicable. Securities on loan and the collateral supporting the loan are marked to market each business day and the collateral required from borrowers is augmented via collateral call if required using the target of 102% for U.S. securities on loan and 105% for non-U.S. securities lent.

All cash collateral received is invested in short-term investments that are legal for the Fund. These include domestic corporate and bank notes, U.S. Treasury obligations, obligations of federal agencies, repurchase agreements, and specific asset-backed securities.

NYSCRF has two securities lending providers: Securities Finance Trust, and JPMorgan. They provide securities lending services pursuant to the guidelines outlined in the Securities Lending Agreements and the JPMorgan Master Custody Agreement. Reporting and Controls are outlined in the June 2021 New York State Common Retirement Fund Policies and Procedures Manual.

Rutter Associates observes that NYSCRF employs market-standard controls over its securities lending program.

---

<sup>19</sup> U.S. Treasuries and U.S. Treasury Strips, U.S. Government agencies and Government sponsored enterprises, excluding interest-only or principal-only Issues and GNMA, FNMA, and FHLMC RMBS excluding interest-only or principal-only issues.

## (#9) Portfolio Credit Risk Metrics and Management

As of March 31, 2021 the Fixed Income Portfolio was comprised of the following (dollars in thousands):

Category	Fair Value	Percentage of Portfolio
<b>Global fixed income:</b>		
<b>Core Portfolio:</b>		
Treasury	\$ 13,439,002	28.2%
Treasury Inflation-Protected Securities (TIPS)	2,110,359	4.4
Federal agency	698,271	1.5
Corporate	15,301,141	32.1
Asset-backed	1,819,641	3.8
Commercial mortgage-backed	1,830,010	3.8
Mortgage-backed	6,888,716	14.4
Collateralized loan obligations	2,898,394	6.1
Municipal bonds	612,624	1.3
<b>Core Portfolio</b>	<b>45,598,158</b>	<b>95.6</b>
<b>Externally managed funds:</b>		
Advent Capital	480,884	1.0
Calvert Research and Management	254,105	0.5
DoubleLine Capital	283,264	0.6
New Century Advisors	531,805	1.1
Semper Capital	315,934	0.7
Teachers Advisors (Nuveen)	258,805	0.5
<b>Total global fixed income</b>	<b>\$ 47,722,955</b>	<b>100.0%</b>
<b>Mortgage loans:</b>		
Berkadia	552,872	53.0
CPC	490,749	47.0
<b>Total Mortgage loans</b>	<b>\$ 1,043,621</b>	<b>100.0%</b>
<b>Total</b>	<b>\$ 48,766,576</b>	

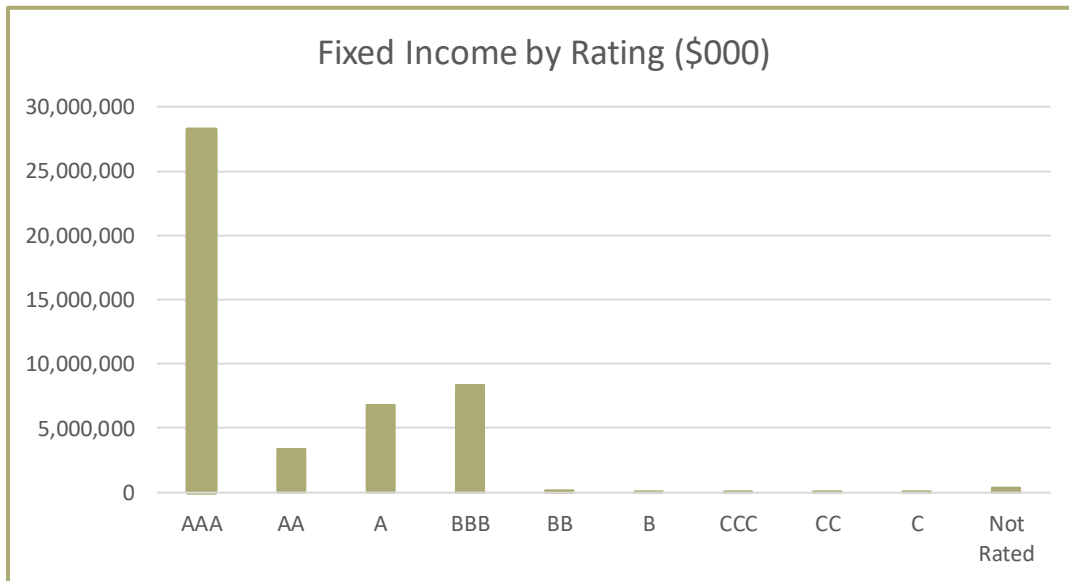
Source: 2021 Annual Comprehensive Annual Financial Report, page 60

Credit ratings for the global fixed income portfolio, obtained from several Nationally Recognized Statistical Rating Organizations (NRSROs), were as follows (dollars in thousands):

Quality Rating	Fair Value	Percentage of Fair Value
<b>Global fixed income:</b>		
AAA	\$ 28,228,352	59.15%
AA	3,404,294	7.13
A	6,805,349	14.26
BBB	8,388,306	17.58
BB	169,865	0.36
B	31,208	0.06

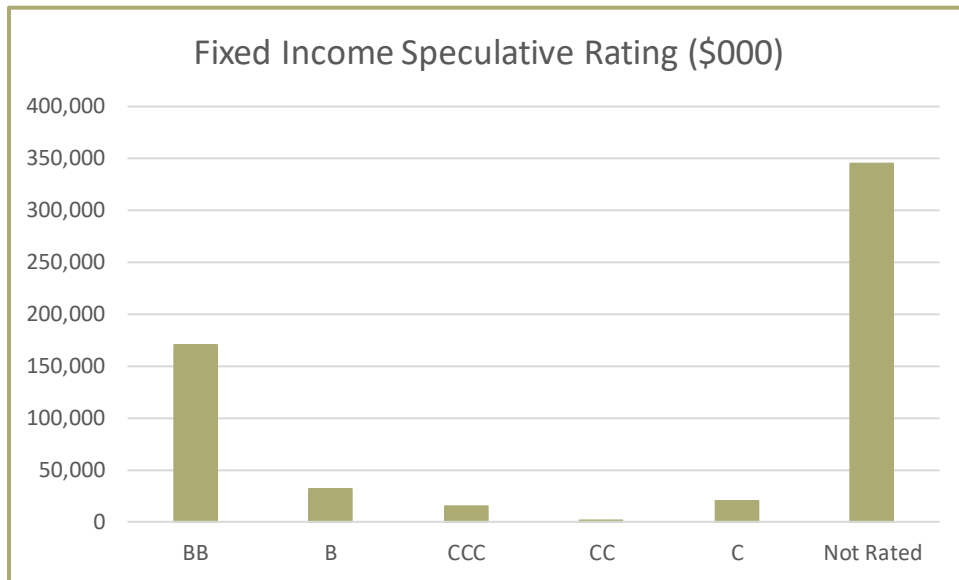
CCC	14,459	0.03
CC	339	0.01
C	20,220	0.04
Not Rated	344,629	0.72
Externally managed funds of one: *		
Semper Capital	315,934	0.66
<b>Total Global fixed income</b>	<b>\$ 47,722,955</b>	<b>100.0%</b>
<b>Mortgage loans:</b>		
Not Rated	\$ 1,043,621	100.0%
<b>Total</b>	<b>\$ 48,766,576</b>	
* These externally managed funds are considered investments under the "basket clause," subject to the standards of prudence. All or a part of the holdings can be non-investment grade. While this fund is not rated, the underlying securities credit ratings range from AAA to CCC & Not Rated.		

Source: 2021 Annual Comprehensive Financial Report, page 61



Semper Capital not included in the graph. See note (\*) regarding the fund above.

Of the rated assets in the portfolio, 59% are rated AAA and 99% are rated investment grade. The remaining 1% falls into the speculative (below investment grade or "junk") category:



Rutter Associates suggests that the System determine and attach *internal credit ratings* to assets for which there are no ratings from NRSROs.

**Mortgage Loans**

Mortgage loans account for approximately 2% of the fixed income portfolio. The Community Preservation Corporation (“CPC”) originates construction loans and converts them to permanent loans acquired by the System. The loans, accounting for 47% of the mortgage portfolio, are 100% insured by the State of New York Mortgage Agency (“SONYMA”) which was rated AA by Fitch *until ratings were withdrawn in June 2023* as the Agency has chosen not to participate in the rating process going forward.

One office loan and three retail loans comprise 53% of the mortgage portfolio; they are serviced by Berkadia and are not insured. A single retail loan accounts for 72% of the Berkadia-serviced exposure. This \$400 million loan is for 754 Fifth Avenue in NYC (The Bergdorf Goodman Building) and has an associated DSCR of 2.06 and an LTV ratio of 41% -- both strong credit positives.

While LTV was not part of the initial data set provided for our review (loans as of March 31, 2021), an update was subsequently prepared by the DFS Principal Real Estate Appraiser and provided to the exam team in a memo dated April 10, 2023. An examination of 26 mortgage loans with debt service coverage ratios of less than 1.10 was undertaken. Of the examined loans, there were five deemed to be temporarily impaired. The loans are to be reported to SONYMA for surveillance.

The updated mortgage loan data (as of the April 10, 2023 memo) provided available DSC ratios, LTVs and identified about \$200 million of loans that had paid off. The paid off loans were removed from the March 31, 2021 data resulting in the following DSCR table:

DSC Range	Principal Balance	# of Loans	Avg LTV
0 to 1.00	21,416,716	15	104%
1.01 to 1.20	35,229,480	18	53%
1.21 to 1.40	93,739,466	33	52%
1.41 to 1.60	27,340,162	16	53%
1.61 to 1.80	16,241,410	13	45%
1.81 to 2.00	108,141,593	18	44%
>2.00	466,493,145	45	25%
NA	69,014,411	50	38%
<b>Grand Total</b>	<b>837,616,383</b>	<b>208</b>	<b>48%</b>

Given that the SONYMA NRSRO credit rating has been recently withdrawn, reporting DSCRs and LTV data for the CPC-originated loans becomes more critical. The office and retail loans show low LTVs (which is good). These loans should be continued to be monitored for both DSCR and LTV.

Rutter Associates suggests that NYSCRF enhance its ongoing monitoring of DSCR and LTV for the mortgage portfolio.

Rutter Associates notes that there are no specific “portfolio” credit risk metrics being reported across the NYSCRF book of credit-risky assets as of August 2023. The System might choose to implement a CreditVaR going forward using the functionality embedded in Blackrock’s Aladdin product or other. Such a tool would permit enhanced ability to spot credit deteriorations and understand credit correlations.

#### (#10) Derivative Usage and Counterparty Credit Risk Management

Rutter Associates interviewed the Deputy CIO, Director of Fixed Income, and Director of Credit regarding derivative usage within the Fund. Each confirmed that there were no derivatives internally at the time of the interviews. However, as a matter of policy, the Fund may use exchange traded equity index futures and interest rate futures to meet its rebalancing objectives for the portfolio as authorized by the CIO.

External managers do employ derivatives within their investment activities.

Investment managers must be specifically authorized to use derivatives by the Fund in the Investment Guidelines of their investment management or other governing agreements (investment management agreements) with the Fund and such authorization is subject to the approval of the Fund’s CIO. Investment managers may transact in exchange traded and over the counter derivatives in accordance with those agreements and CIO approval.

The Fund relies on the external managers to monitor the creditworthiness of its derivative counterparties on an ongoing basis. Per the Fund’s policy, the investment managers shall have written counterparty policies and credit risk management systems in place that support pre-trade credit quality reviews as well as post-trade monitoring of counterparty risks.

As the Fund is permitted to use only exchange traded futures contracts, credit risk is de minimis as the initial margin and variation margin are exchanged with highly rated clearinghouses.

The Fund permits the managers of direct investment in international equities to use forward currency contracts to manage their exposure to foreign currencies. Where the Fund participates in commingled funds, limited partnerships, or other investment arrangements, the decision whether to use forward currency contracts (of up to one year) to manage their foreign currency exposure is left up to the individual investment managers.

Rutter Associates notes no concern about derivative usage and counterparty credit risk within the Fund's investments.

### (#11) Asset Allocation

Rutter Associates reviewed Annual Reports, the Policies and Procedures Manual, and NYSCRF's latest Asset Allocation Study.

The following shows the actual asset allocations as of 3/31/2022 and 3/31/2021, comparing both with the Long-Term Policy Allocation.

Asset Type	Allocation as of March 31, 2022	Long-Term Policy Allocation
<b>Equity</b>		
Domestic Equity	36.15%	32.0%
International Equity	13.55	15.0
<b>Alternative Assets</b>		
Private Equity	13.64%	10.0%
Real Estate	7.86	9.0
Opportunistic/Absolute Return Strategy	2.09	3.0
Credit	3.39	4.0
Real Assets	2.14	3.0
<b>Fixed Income</b>	<b>20.46%</b>	<b>23.0%</b>
Cash	0.72%	1.0%

Asset Type	Allocation as of March 31, 2021	Long-Term Policy Allocation
<b>Equity</b>		
Domestic Equity	36.79%	32.0%
International Equity	16.03	15.0
<b>Alternative Assets</b>		
Private Equity	10.57%	10.0%
Real Estate	6.75	9.0
Opportunistic/Absolute Return Strategy	1.97	3.0
Credit	3.26	4.0
Real Assets	1.49	3.0
<b>Fixed Income</b>	<b>20.82%</b>	<b>23.0%</b>
Cash	2.32%	1.0%

NYSCRF has an active rebalancing program directed by the Rebalancing Committee as discussed above.

Asset allocation tolerance ranges of the NYSCRF portfolio include:

	Minimum	Lower Midpoint	Policy Allocation	Upper Midpoint	Maximum
Equity	38%	42.5%	47%	51.5%	56%
Fixed Income	18%	20.5%	23%	25.5%	28%
Cash	0%	0.5%	1%	2.5%	4%
Alternatives	12%	20.5%	29%	37.5%	46%

Rebalancing Policies and Procedures include the following:

If there is a breach of the Minimum or Maximum ranges for Equity **or** Fixed Income, the Director of Fixed Income will calculate the asset movements required to bring the out of compliance asset class to 1% inside the breached range. The result will be reallocated **within the next ten business days**, or another period as dictated by the CIO. Rutter Associates suggests that any decision to exceed the ten-business day standard be made in consultation with the CRO.

If both Equity **and** Fixed Income are not between their respective Lower and Upper Midpoints, the Director of Fixed Income will calculate the difference between the Equity Policy Allocation and its Minimum (Maximum) point. This amount will be divided by twelve and the result **will be reallocated within the next ten business days**. In each of the following months, the Director of Fixed Income will recalculate the difference between the Equity Policy Allocation and its Minimum (Maximum) point. Each time, the amount will be divided by twelve and the result will be reallocated within the next ten business days. Depending on overall market movements, this might be repeated between six and fifteen months, until both Equity and Fixed Income are between their respective Lower and Upper Midpoints.

At all times, the CIO retains the ability to modify the Rebalancing Procedures due to unusual market conditions. Rutter Associates suggest that such modification be made in consultation with the CRO.

It should be noted that any policy breach in the Alternatives asset classes, namely Private Equity, Credit, O/ARS, Real Estate or Real Assets, will require an extended period to remedy and is outside the scope of these rebalancing procedures.

**Rutter Associates notes that all asset classes as of 3/31/2022 and 3/31/2021 were within Policy Ranges.**

## (#12) Background and Diligence of Investment Managers

### Backgrounds and Diligence of Investment Managers

Rutter Associates interviewed the Managing Directors of each asset class and reviewed the responses to examination correspondence regarding both retaining and ongoing diligence of investment managers.

### The responses to examination correspondence regarding retaining and diligence of Investment Managers:

Broadly, NYSCRF approval of an investment manager requires a detailed analysis and recommendation by staff and a review and recommendation by the asset class consultant. Potential investments being considered by staff are discussed at asset class team meetings and in monthly asset class meetings with the CIO to review salient initial screening criteria, including reviewing for appropriateness for NYSCRF, reviewing manager qualifications and reputation, and reviewing investment detail. If the vetting processes at those meetings do not identify a reason not to proceed, the detailed analysis of the diligence process continues and staff prepares a presentation for the Internal Investment Committee or the Real Estate Investment Committee, as appropriate, supported by the consultant recommendation.

The detail analysis of the diligence process includes risk assessment, independent verification of investment performance and track record, consulting outside resources, meeting with manager or General Partner, conducting site visits as applicable (i.e., Real Estate), confirming that the manager conforms to the Placement Agent Fee Disclosure<sup>20</sup> requirements and has not used a placement agent in the process of this investment proposal, reviewing manager response to Due Diligence Questionnaire, performing detailed analysis of fee structure and terms, and negotiating reduced fees or other concessions when possible.

Each asset class may also have additional steps for the due diligence review process that includes specific criteria for the investment type. In addition, staff, the consultant, or committee discussion may result in additional issues that require further review. Some tasks may be performed by the outside consultant in coordination with NYSCRF staff. The CIO also meets with the investment manager.

### The responses to examination correspondence regarding ongoing diligence of Investment Managers:

Broadly, NYSCRF staff continually monitors investment manager performance in the normal course of business. This includes:

---

<sup>20</sup> NYSCRF has a policy to prohibit the Fund (directly or indirectly) from engaging, hiring, investing with, or committing to, an outside investment manager ("Investment Manager") that is using the services of a placement agent, registered lobbyist, or other intermediary (collectively, "Placement Agent")

- Regular meetings with the investment manager
- Review of all managers reporting and performance documentation
- Ongoing consultation with the asset class advisor on manager performance, including performance versus relevant benchmarks
- Monthly Asset Class meetings with the CIO and the Deputy CIO
- Discussions with the Investment Advisory Committee, including portfolio reports, investment reviews, and presentations
- Informal team meetings

In addition to the overall monitoring, each asset class will have additional review processes that are specific to each investment type.

For Private Equity:

- Staff reviews all correspondence from General Partners, including capital calls, distribution notices, periodic financial reports, and annual reports.
- Staff meets periodically with the various General Partners to discuss investment activity and performance.
- Whenever possible, staff attends the General Partners' Annual Meeting. When attendance is not feasible, meeting materials are provided to staff for review.
- For many funds, NYSCRF is a member of the Limited Partner Advisory Committee that has additional meetings and other informational materials for staff review.
- Staff meets periodically with Investment Advisors regarding existing investments and at least annually to discuss overall Investment Advisor performance. These meetings include manager performance and performance versus relevant benchmarks.

For Real Estate:

- Staff reviews manager quarterly reports to evaluate performance and reports are compared to the appropriate benchmarks.
- Portfolio performance and reviews are discussed at the Real Estate Advisory Committee meetings.
- Whenever possible, Staff participates or attends annual meetings of commingled investments. Meeting materials are also provided for review.
- Advisors prepare annual business plans for all joint venture investments.
- The Real Estate Consultant conducts an Annual Review of all investments. One example is that commingled fund performance is compared to other funds in the consultant's database for a ranking for performance and benchmarking.

- Performance of joint ventures are evaluated against actual targeted returns of the specific investment and relevant benchmarks.

Other asset classes may also work with external consultants to monitor and review the performance of each manager.

The DFS and Rutter Associates teams did not review the repository of documents containing the diligences described above.

#### Conclusion:

Rutter Associates notes no finding that external manager due diligence is other than sufficiently thorough.

#### (#13) Investment Fees and Expenses.

Investment management fees and expenses are listed in the 2021 Annual Comprehensive Financial Report (pages 116 to 134). Fees are presented by asset class and expenses by type of expense. Consultant and advisor fees are listed by service provider on page 135. All-in investment expenses for fiscal year ended March 21, 2021 were \$904.3 million. Given total invested assets of \$258.2 billion, this amounts to 35 basis points (“bps”) of assets under management.

Using 2021 data from the Center for Retirement Research at Boston College (“BC”), the exam team reviewed investment expenses for public pension plans with assets under management (“AUM”) over \$10 billion. Of the 74 plans ranked from highest to lowest in the BC database, NYSCRF ranked 33<sup>rd</sup> highest at 34.8 bps (the average among the 74 was 39.3 bps).

The System reported to the exam team that “PICM (*Portfolio Investment and Cash Management*) staff reviews fees with the asset class consultant to determine the impact on returns and for reasonableness. The asset class consultant conducts a review of the proposed fees considering current market pricing. NYSCRF consultants have a broad client base, which allows them to have a deep knowledge about the fees being charged for similar products across the institutional investment landscape. As part of their recommendation, they opine on the reasonableness of the fee. Monthly fees are monitored closely and reported to the Trustees in each ‘Consolidated Board Report.’”

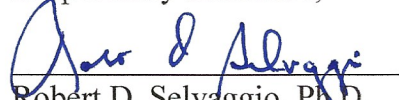
In addition, the exam team was informed that private asset fees are reviewed and certified by the relevant asset class consultant to be consistent with each Limited Partnership Agreement.

NYSCRF does not conduct formal audits of fees charged and paid to managers, but the System reported to the exam team that, “the PICM and Accounting reviews are *prior* to advancing

payment. In addition to asset class consultant certifications on the private assets previously mentioned, we note further that PICM and Accounting reviews on the public asset class managers entail independently calculating investment management fees and confirming whether the calculated amount matches the invoice received.”

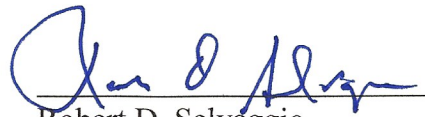
Rutter Associates notes no concern that the level of investment fees and expenses is excessive or about the diligence conducted in monitoring them and assuring accuracy.

Respectfully submitted,

  
Robert D. Selvaggio, Ph.D.  
Rutter Associates, LLC

STATE OF NEW YORK     )  
                  Westchester    ) SS:  
COUNTY OF ~~NEW YORK~~    )

Robert D. Selvaggio, being duly sworn, deposes and says that the foregoing report, subscribed by him, is true to the best of his knowledge and belief.

  
Robert D. Selvaggio

Subscribed and sworn to before me

this 10 day of March 2026



Melissa N Vasami  
Notary Public, State of New York  
Reg. No. 01VA0018901  
Qualified in Westchester County  
Commission Expires December 19, 2027