
# NEW YORK STATE DEPARTMENT OF FINANCIAL SERVICES

# REPORT ON EXAMINATION

# OF THE

# NEW YORK STATE TEACHERS' RETIREMENT SYSTEM

CONDITION: JUNE 30, 2016

DATE OF REPORT: JANUARY 31, 2018

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EXAMINER: FLORA EGBUCHULAM

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NEW YORK STATE
DEPARTMENT*of*
FINANCIAL SERVICES

Andrew M. Cuomo
Governor

Maria T. Vullo
Superintendent

January 10, 2019

Honorable Maria T. Vullo
Superintendent of Financial Services
New York, New York 10004

Madam:

In accord with instructions contained in Appointment No. 31555, dated December 12**,** 2016 and annexed hereto, an examination has been made into the condition and affairs of the New York State Teachers Retirement System, hereafter referred to as "the System", at its home office located at 10 Corporate Woods Drive, Albany, New York 12211.

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. SCOPE OF EXAMINATION

The examination covers the five-year period from July 1, 2011 through June 30, 2016. The examination was conducted observing the guidelines established by the Government Accounting Standards Board and by the Actuarial Standards Board. As necessary, the examiner reviewed transactions occurring subsequent to June 30, 2016, but prior to the date of this report (i.e., the completion date of the examination).

In the course of the examination, a review was made of the manner in which the System conducts its operations and fulfills its contractual obligations to members and claimants. The results of this review are contained in item 3 of this report.

The examination included a verification of assets and actuarial present values as of June 30, 2016, to determine whether the System's filed June 30, 2016 annual statement fairly presents its funding status. The examination also included a review of the following matters:

History of the system
Governance and management
Accounts and records
Financial statements
Actuarial issues
Treatment of members
Member benefits

## 2. SYSTEM OVERVIEW

### A. History

The New York State Teachers' Retirement System was created in 1921 by an act of State legislature to succeed the New York State Teachers' Retirement Fund and a number of local teachers' systems. The System is a public agency, having the powers and privileges of a corporation, in which eligible New York State public school teachers employed outside of New York City are members.

### B. Management

Control of the administration and operation of the System is vested in a ten-member board, known as the "Retirement Board," which sets policies and oversees operations consistent with applicable laws. Three members of the board are elected from the membership. Two members are school administrators who are appointed by the Commissioner of Education. Two present or former local school board members, experienced in the fields of finance and investment, are appointed by the Board of Regents, one of whom must be or have been an executive of an insurance company. The Board of Regents also appoints a present or former bank executive to the board. The ninth member is the Comptroller of the State or his designee. The tenth member of the Retirement Board is elected from among the retired members of the System. The board members normally serve three year terms.

The System's trustees, in their individual and collective capacities, are fiduciaries and must:

(1) Act solely in the interests of the members and beneficiaries of the System; and

(2) Perform their responsibilities in a manner consistent with those of a reasonably prudent person exercising care, skill and caution.

New York Insurance Regulation No. 85, NYC11, Section 136-1.6(a) states:

> "The administrative heads are fiduciaries and as such shall act solely in the interests of the members and beneficiaries of the systems they administer. They shall perform their responsibilities in a manner consistent with those of a responsibly prudent person exercising care, skill and caution."

The System is among the largest financial intermediaries in the United States and its investment purposes and operations may be analogized to those of similarly sized insurers. As such, the System's fidelity bond and/or crime insurance coverage assessment was based on its size, specifically, on its assets value as of the examination date of June 30, 2016.

While the need for fidelity bond coverage varies from entity to entity, and from one retirement system to another, a best practice or recommendation is that individuals who have access to cash and investments be adequately bonded. These individuals include, but are not limited to those people who have the ability to authorize wire transfers, write checks and those who can buy, sell, or transfer investments. Alternatively, entities may buy crime coverage (general insurance policy), however, crime coverage will be an acceptable alternative to fidelity bonds if it provides coverage that is at least as broad as the coverage provided by a fidelity bond.

The System's fidelity bond and crime insurance policies show a total of $5.0 million fidelity bond and crime insurance coverage. The examination utilized the National Association of Insurance Commissioner's ("NAIC") recommended fidelity bond test formula for entities of similar size, and based upon the System's asset value of $107 billion as of June 30, 2016, the examination determined that the System needs an approximate minimum of $13.5 million in fidelity bond or crime insurance coverage.

After consideration of the size of its invested assets, as well as the numerous international and domestic internal and external (U.S. based employees and third-parties) individuals who authorize significant cash transactions, investment purchases and sales on behalf of the Retirement System, the examiner believes that in the event of actual material acts of theft or dishonesty by any of the identified individuals, the System's current $5 million fidelity bond and crime insurance coverage would not be sufficient to cover the acts

The examiner recommends that the System review its fidelity bond coverage and increase it accordingly.

C. Growth

The change of the System assets and liabilities from the beginning to the end of the period under review is illustrated by the table below ($000):

| | 6/30/2011 | 6/30/2016 | Increase / (Decrease) |
|---|---|---|---|
| Investments | $88,149,250 | $105,143,303 | $16,994,053 |
| Receivables for investments sold | 289,187 | 13,642 | (275,545) |
| Receivables for employer and member | 1,475,674 | 2,148,330 | 672,656 |
| Receivables for member loans | 181,801 | 239,645 | 57,844 |
| Other assets | 2,672,139 | 1,970,456 | (701,683) |
| Total assets | $92,768,051 | $109,515,376 | $16,747,325 |
| Payables for investment securities purchases | $ 111,262 | $ 0 | $ (111,262) |
| Mortgage escrows and deposits | 1,743 | 278 | (1,465) |
| Other liabilities: | 98,041 | 132,675 | 34,634 |
| Payables for securities lending transactions | 2,667,281 | 1,890,030 | (777,251) |
| Total liabilities | $ 2,878,327 | $ 2,022,983 | $ (855,344) |
| Deferred outflows of resources: change in net pension liability | $ 0 | $ 15,834 | $ 15,834 |
| Deferred inflows of resources: change in net pension liability | 0 | 2,085 | 2,085 |
| Net change in pension liability | $ 0 | $ 13,749 | $ 13,749 |
| Net position restricted for pensions | $89,889,724 | $107,506,142 | $17,616,418 |

As of June 30, 2016**,** the System's invested assets were mainly comprised of domestic and international equities, domestic and global fixed income securities, mortgages and real estate, alternative investments, and cash and cash equivalents.

The table below shows the annual change in the plan net assets ($000):

| | Fiscal Year ending June 30, | | | | |
|---|---|---|---|---|---|
| **Additions:** | **2012** | **2013** | **2014** | **2015** | **2016** |
| Investment income: | | | | | |
| Net appreciation in fair value of investments | $ 659,957 | $ 9,635,631 | $ 14,601,733 | $ 3,294,147 | $ 258,356 |
| Interest income | 744,984 | 650,539 | 650,905 | 688,937 | 711,388 |
| Dividend income | 898,813 | 1,198,994 | 1,287,878 | 1,259,370 | 1,286,827 |
| Real estate – net operating income | 251,832 | 302,520 | 308,474 | 350,388 | 362,798 |
| Securities lending – gross income | 12,335 | 8,703 | 670 | 6,003 | 10,814 |
| Other – net | 8,713 | 35,416 | 22,483 | 13,896 | (3,018) |
| | 2,576,634 | 11,831,803 | 16,872,143 | 5,612,741 | 2,627,165 |
| Less: | | | | | |
| Investment expenses | 205,827 | 212,639 | 229,376 | 228,351 | 239,412 |
| Securities lending: | | | | | |
| Broker rebates | (3,355) | (10,002) | (10,123) | (13,154) | (7,486) |
| Management fees | 1,676 | 1,910 | 1,704 | 1,869 | 1,838 |
| Depreciation (appreciation) Of collateral | (2,776) | (9,224) | (13,517) | (4,590) | 1,047 |
| Net investment income | $ 2,375,262 | $11,636,480 | $ 16,664,703 | 5,400,265 | 2,392,354 |
| Contributions: | | | | | |
| Employer contributions | 1,627,593 | 1,734,908 | 2,400,386 | 2,633,682 | 2,046,562 |
| Employer incentives | 898 | | | | |
| Member contributions | 138,583 | 128,903 | 120,762 | 119,411 | 124,587 |
| Transfers in/out - net | 4,188 | 4,522 | 1,365 | 3,213 | 4,014 |
| Total contributions | 1,771,262 | 1,868,333 | 2,522,513 | 2,756,306 | 2,175,163 |
| Net additions | $ 4,146,524 | $13,504,813 | $ 19,187,216 | $ 8,156,571 | $ 4,567,517 |
| **Deductions:** | | | | | |
| Retirement benefit payments – periodic | $ 5,849,376 | $ 6,062,304 | $ 6,273,994 | $ 6,461,313 | $ 6,644,785 |
| Beneficiary payments | 58,419 | 56,545 | 50,552 | 52,618 | 56,852 |
| Return of contributions | 19,732 | 20,869 | 18,992 | 17,209 | 18,229 |
| Administrative expenses | 52,457 | 54,338 | 55,616 | 56,948 | 60,426 |
| Total deductions | $ 5,979,984 | $ 6,194,056 | $ 6,399,154 | $ 6,588,088 | $ 6,780,292 |
| Net increase (decrease) | $ (1,833,460) | $ 7,310,757 | $ 12,788,062 | $ 1,568,483 | $(2,212,775) |
| Net position restricted for pensions: | | | | | |
| Beginning of year | $89,889,724 | $88,056,264 | $ 95,367,021 | $108,155,083 | $109,718,917 |
| Net increase (decrease) | (1,833,460) | 7,310,757 | 12,788,062 | 1,568,483 | (2,212,775) |
| Cumulative effect of change in accounting principle | 0 | 0 | 0 | (4,649) | 0 |
| End of year | $88,056,264 | $95,367,021 | $108,155,083 | $109,718,917 | $107,506,142 |

The following table indicates the change of the System's membership during the period under examination (annually 6/30):

| | 6/30/2012 | 6/30/2013 | 6/30/2014 | 6/30/2015 | 6/30/2016 |
|---|---|---|---|---|---|
| Active members | 277,273 | 273,328 | 270,039 | 267,715 | 266,350 |
| Service pensioners | 144,438 | 147,291 | 150,268 | 152,608 | 155,163 |
| Beneficiaries | 5,374 | 5,531 | 5,663 | 5,850 | 5,985 |
| Total | 427,085 | 426,150 | 425,970 | 426,173 | 427,498 |

## 3. 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 review of member complaints revealed that the Systems complaint log was not maintained in a columnar format, and did not include the following key fields that were necessary to complete planned complaint procedures:

- The name of the System's staff member that the complaint was referred to in the complaint unit
- The date of such referral
- The subject matter of the complaint
- The results of the complaint investigation and the action taken

Complaint logs are required to be maintained in a columnar format that contains, at the minimum, the following items:

a) The date the complaint was received in-house
b) The name of the complainant/member and the member number
c) The person with whom the complainant has been dealing or to whom the complaint was addressed
d) The person to whom the matter has been referred for review
e) The date of such referral
f) The subject matter of the complaint
g) The date of acknowledgement of the complaint
h) The date of the response
i) The results of the complaint investigation and the action taken
j) Remarks about internal remedial action taken as a result of the investigation

The examiner recommends that all future complaint logs maintained by the System are to be maintained in a columnar format that contains, at the minimum, all items noted above.

# 4. ACTUARIAL

## A. Annual Statement Liabilities

Shown below are the plan liabilities as reported in the System's annual statements for the five years under review. These liabilities are used for developing plan contribution requirements, as described later in this report.

| Year Ending June 30 | 2012 | 2013 | 2014 | 2015 | 2016 |
|---|---|---|---|---|---|
| **Present Value of Benefits Currently Being Paid (In Millions):** | | | | | |
| Service Retirement Benefits | $50,435 | $51,808 | $53,208 | $58,062 | $59,301 |
| Disability Retirement Benefits | $279 | $286 | $287 | $322 | $331 |
| Death Benefits | $3 | $2 | $3 | $2 | $2 |
| Survivor Benefits | $687 | $733 | $778 | $884 | $933 |
| Cost-of-Living Allowance | $4,634 | $4,666 | $4,696 | $4,991 | $5,013 |
| Total Present Value of Benefits Presently Being Paid | $56,038 | $57,495 | $58,972 | $64,261 | $65,580 |
| **Present Value of Benefits Payable in the Future to Current Active Members (In Millions):** | | | | | |
| Service Retirement Benefits | $48,418 | $49,065 | $49,824 | $48,422 | $50,051 |
| Disability Retirement Benefits | $220 | $224 | $228 | $203 | $209 |
| Termination Benefits | $1,797 | $1,807 | $1,824 | $1,956 | $2,001 |
| Death and Survivor Benefits | $439 | $443 | $449 | $349 | $363 |
| Cost-of-Living Allowance | $1,021 | $1,024 | $1,027 | $1,255 | $1,277 |
| Total Active Member Liabilities | $51,895 | $52,563 | $53,352 | $52,185 | $53,901 |
| **Present Value of Benefits Payable in the Future to Current Inactive (Vested) Members (In Millions):** | | | | | |
| Retirement Benefits | $229 | $247 | $265 | $315 | $339 |
| Death Benfits | $0 | $0 | $0 | $0 | $0 |
| Cost-of-Living Allowance | $5 | $5 | $5 | $27 | $28 |
| Total Vested Liabiliies | $234 | $252 | $270 | $342 | $367 |
| Unclaimed Funds | $10 | $11 | $13 | $13 | $15 |
| Total Actuarial Present Value of Future Benefits | $108,177 | $110,321 | $112,607 | $116,801 | $119,863 |

*Note: Totals may not sum due to rounding*

B. Actuarial Cost Method and Employer Contributions

The ultimate cost of a defined benefit pension plan is the benefits paid. That cost is paid for by employer contributions, any employee contributions, and investment earnings. An actuarial cost method is the technique by which the amount of employer contributions is allocated to time periods.

Beginning with the 1995 fiscal year, the actuarial cost method used has been the Aggregate Cost Method. Under this method, the present value of future employer contributions is determined by subtracting the actuarial value of plan assets and the present value of future employee contributions from the present value of future plan benefits; i.e., PVFutureErCont = PVFutureBen − Assets − PVFutureEeCont. The resulting present value of future employer contributions is then 'spread' or allocated to plan years in the future in such a way that the employer contribution for each year is a constant percentage of expected payroll in that year. This is done by dividing the present value of future employer contributions by the present value of expected future payroll. The resulting percentage is called the 'normal cost rate' and is then multiplied by the payroll for the fiscal year ending 2 years after the valuation date to yield the amount of contribution to be made for a plan year, as follows:

- NCRate = PVFutureErCont ÷ PVFuturePayroll
- ErCont = NCRate x Payroll

As described later in this report, the assumptions which underlie the development of the present value of future benefits are never exactly realized; investment earnings, mortality, etc., will turn out to be different from what had been assumed. The actuarial cost method is a self-correcting process that causes future contribution rates to be adjusted automatically, based on the deviation of actual experience from what had been assumed.

The normal cost rate ("NCRate") is the rate developed for most, but not all, of the benefits and expenses the plan will incur. Separate rates are developed for the following:

- Group Life, which is the first $50,000 of member death benefit;
- Excess Benefit Plan, which provides retirement benefits in excess of the Internal Revenue Code Section 415 limits; and
- Expenses, which are the estimated administrative expenses exclusive of investment expenses.

The rates for the above separate items are calculated, essentially, on a one-year term basis, i.e., the expected payout for the following year is divided by the expected payroll base for the year.

The rate for the group life benefit, if calculated based on the normal one-year term basis as described above, would have decreased over the last several years from its current .13% level. However, the rate is being held constant at .13% in anticipation of rising payouts in the future.

The Excess Benefit Plan is permitted by Section 538 of the Education Law, which was added by Laws of 1998, Chapter 595. The System has obtained a determination letter from the IRS, indicating that this plan meets the IRS requirements for qualification.

The total Employer Rate is the sum of the normal cost rate and the separate rates described above. For the five years under review, the Employer Rate has been:

## Total Employer Rate

| Year Ending June 30 | 2012 | 2013 | 2014 | 2015 | 2016 |
|---|---|---|---|---|---|
| Normal Rate | 15.85% | 17.13% | 12.85% | 11.31% | 9.40% |
| Expense Rate | 0.27% | 0.27% | 0.27% | 0.27% | 0.27% |
| Group Life Insurance Rate | 0.13% | 0.13% | 0.13% | 0.13% | 0.13% |
| Excess Benefit Plan Rate | 0.00% | 0.00% | 0.01% | 0.01% | 0.00% |
| Employer Contribution Rate | 16.25% | 17.53% | 13.26% | 11.72% | 9.80% |

The actuarial valuation, which is the process whereby the employer contribution is determined, performed "as of" June 30, the last day of each fiscal year; i.e., the census data, plan provisions and asset values are determined as of the valuation date of June 30. However, the contribution payments based on that valuation date are made more than two years later.

As a result of the lag, the assets used in a valuation will recognize as receivables those employer contributions that were determined as of the previous two valuations but not yet collected.

The participants fall into one of six tiers, based on the date of initial participation, with successively decreasing benefit levels among the tiers. The valuation is run as a single group, with subtotals determined by tier.

**Calculation of Employer Contributions**
($000,000 omitted)

| Valuation Year Ending June 30 | 2012 | 2013 | 2014 | 2015 | 2016 |
|---|---|---|---|---|---|
| **Contributions for Fiscal Year** | **2014** | **2015** | **2016** | **2017** | **2018** |
| Present Value of Benefits | $108,177 | $110,321 | $112,608 | $116,801 | $119,863 |
| Actuarial Value of Assets (less group life insurance fund net asset value) | $82,682 | $82,532 | $89,774 | $99,047 | $106,774 |
| Present Value of Future Employee Contributions | $510 | $530 | $615 | $632 | $709 |
| Other (receivable collected in fall of year following valuation date, receivable collected in fall one year after valuation date, retirement incentive payments) | $3,077 | $3,790 | $4,622 | $4,318 | $1,538 |
| Present Value of Future Normal Cost | $21,908 | $23,469 | $17,597 | $12,804 | $10,842 |
| Present Value of Future Compensation | $138,217 | $137,003 | $136,938 | $113,224 | $115,395 |
| Normal Cost Rate | 15.85% | 17.13% | 12.85% | 11.31% | 9.40% |
| Expenses | 0.27% | 0.27% | 0.27% | 0.27% | 0.27% |
| Other (group life rate, excess benefit plan rate) * | 0.13% | 0.13% | 0.14% | 0.14% | 0.13% |
| Employer Contribution | 16.25% | 17.53% | 13.26% | 11.72% | 9.80% |

* Starting in 2016, the receivable collected in fall of year following valuation date is included in the actuarial value of assets in row 2 rather than in Other.

C. Actuarial Present Value of Future Benefits

Each year an actuarial valuation determines the present value of future benefits (PVB) which is the present value of retirement and ancillary benefit payments, excluding group life insurance benefits, that the Retirement System can expect to pay in the future to current retirees and members. The PVB is based upon both service and salary projected to retirement.

The results of the five most recent actuarial valuations are displayed in the following table:

| Year Ending June 30 | 2016 | 2015 | 2014 | 2013 | 2012 |
|---|---|---|---|---|---|
| **Active Participants (In Millions):** | | | | | |
| Service Pension | $49,568 | $47,983 | $49,428 | $48,682 | $48,044 |
| Post Retired Death over $50,000 | $31 | $30 | $78 | $74 | $72 |
| Disability Pension | $209 | $203 | $228 | $224 | $220 |
| Post Disabled Death over $50,000 | $4 | $4 | $7 | $7 | $7 |
| Refund on Active Death | $48 | $44 | $45 | $43 | $41 |
| Active Death over $50,000 | $269 | $263 | $312 | $311 | $312 |
| Refund on Quit | $153 | $145 | $169 | $168 | $170 |
| Vested Pension | $2,665 | $2,560 | $2,309 | $2,258 | $2,215 |
| Death Benefit after 10-year Withdrawal over $50,000 | $4 | $4 | $5 | $5 | $4 |
| Refund on Death after Vested Withdrawal | $1 | $1 | $1 | $1 | $2 |
| Annuity Savings Fund | $0 | $1 | $2 | $5 | $9 |
| COLA | $1,305 | $1,282 | $1,033 | $1,029 | $1,026 |
| Total Active Participant PVB | $54,257 | $52,520 | $53,617 | $52,807 | $52,122 |
| **Non-active Participants (In Millions):** | | | | | |
| Retired Pension | $59,181 | $57,933 | $53,077 | $51,668 | $50,287 |
| Retired Annuity | $120 | $129 | $131 | $140 | $148 |
| Disability Pension | $331 | $322 | $287 | $286 | $278 |
| Disability Annuity | $1 | $1 | $1 | $1 | $1 |
| Beneficiary Pension | $919 | $870 | $764 | $719 | $672 |
| Beneficiary Annuity | $8 | $9 | $8 | $8 | $9 |
| DBA Pension | $5 | $5 | $5 | $6 | $6 |
| DBA Annuity | $0 | $0 | $0 | $0 | $0 |
| Escalation | $5 | $5 | $4 | $5 | $5 |
| Post Retired Death over $50,000 | $2 | $2 | $2 | $2 | $2 |
| COLA | $4,605 | $4,524 | $4,200 | $4,104 | $4,001 |
| Catch-Up & Prior §532 Supp | $403 | $462 | $492 | $557 | $629 |
| Total Non-active Participant PVB | $65,580 | $64,262 | $58,971 | $57,496 | $56,038 |
| **Miscellaneous (In Millions):** | | | | | |
| Incurred Death but not Paid | $11 | $9 | $10 | $9 | $8 |
| Unclaimed Non-Member Funds | $15 | $13 | $13 | $11 | $10 |
| Total Miscellaneous | $26 | $22 | $23 | $20 | $18 |
| Total Present Value of Benefits | $119,863 | $116,804 | $112,611 | $110,323 | $108,178 |
| Accumulated Employee Contributions | $4,658 | $4,555 | $4,458 | $4,366 | $4,256 |

D. Actuarial Asset Valuation Method

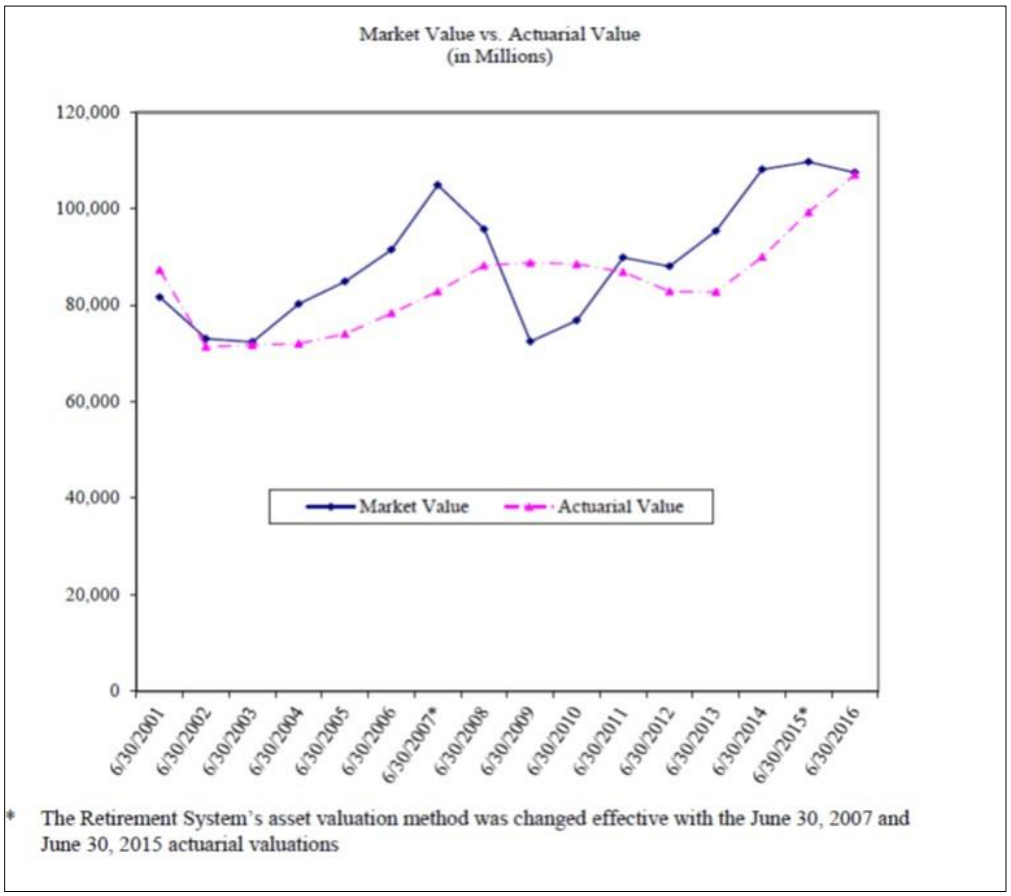
As described earlier in this report, the calculation of the employer contribution amount involves the calculation of the excess (if any) of the present value of future benefits over plan assets. Some of the asset classes can be fairly volatile, and the use of market values for those classes can result in undesirable fluctuations in the calculated cost of the plan. To reduce those fluctuations, the System uses an actuarial asset valuation method which smooths the peaks and valleys of a market value measurement.

The actuarial value of assets for the normal rate is determined by recognizing each year's net investment income/loss in excess of (or less than) 7.5% at a rate of 20% per year, until fully recognized after five years. For fiscal years ending prior to June 30, 2015, realized and unrealized appreciation in excess of (or less than) the assumed inflationary rate of 3% is recognized at a rate of 20% per year, until fully recognized after five years.

The table below shows the reconciliation between the admitted assets in the statement and the actuarial value of assets for each of the examination years.

| (In Thousands) | 2016 | 2015 | 2014 | 2013 | 2012 |
|---|---|---|---|---|---|
| Current Total Assets (excluding contributions receivable) | $105,357,811 | $106,997,313 | $105,671,560 | $93,531,255 | $86,303,987 |
| Less: Expense Fund | $60,157 | $58,851 | $58,398 | $55,581 | $52,478 |
| Less: Group Life Insurance Fund | $264,892 | $255,144 | $233,417 | $210,764 | $189,559 |
| Plus: Assets Receivable from Normal Rate or amortization payments | $3,479,689 | $4,318,077 | $4,621,860 | $3,790,180 | $3,076,841 |
| Plus: Member Contributions Receivable | $805,730 | $631,550 | $615,325 | $529,792 | $509,634 |
| Adjusted Market Value of Assets for Normal Rate | | | | | |
| Less: 5 Year Smoothing Adjustment | $296,394 | $7,636,646 | $15,606,038 | $10,733,157 | $3,380,095 |
| Actuarial Value of Assets for Normal Rate Valuation Purposes | $109,021,787 | $103,996,299 | $95,010,892 | $86,851,725 | $$86,268,330 |

The following chart compares the market value of assets to the actuarial value of assets for each valuation date from 2001 to 2016.




E. Funding Ratios

A basic measure of funding adequacy is the ratio of assets available for active members to the liability attributed to those members.

Another measure of funded status is a comparison between the actuarial asset value and the actuarial accrued liability. The actuarial accrued liability does not represent a liability for benefits owed to participants; it could be thought of as a theoretical value of assets that would exist if (1) the current plan provisions and assumptions had always been in place, (2) the employer had always contributed the actuarially-determined contribution, and (3) plan economic and demographic experience had always matched the assumptions.

Statement No. 50 of the Government Accounting Standards Board (GASB 50), effective for periods beginning after June 15, 2007, specifies the use of such a funded ratio. GASB 50

requires that, if the actuarial cost method is the aggregate cost method, the actuarial accrued liability is to be determined on an entry age cost method. The System developed funding ratios on this basis beginning with the 2006 actuarial valuation.

The following table shows, starting with the fiscal year ended June 30, 2007, the funding ratios calculated as both the ratio of the actuarial value of assets to the actuarial accrued liability and as the market value of assets to the actuarial accrued liability.

Analysis of Funding Process
(in Millions)

| Fiscal Year Ended | Market Value of Assets (MVA) | Actuarial Value of Assets (AVA)[1] | Actuarial Accrued Liability [2] | Percent Funded Based on MVA | Percent Funded Based on AVA |
|---|---|---|---|---|---|
| 2007 | $104,912.9 | $82,858.9 | $79,537.2 | 131.9% | 104.2% |
| 2008 | 95,769.3 | 88,254.7 | 82,777.5 | 115.7 | 106.6 |
| 2009 | 42,471.8 | 88,805.5 | 86,062.0 | 84.2 | 103.2 |
| 2010 | 76,844.9 | 88,544.4 | 88,138.8 | 87.0 | 100.3 |
| 2011 | 89,889.7 | 86,892.2 | 89,824.9 | 100.1 | 96.7 |
| 2012 | 88,056.3 | 82,871.4 | 92,250.9 | 95.5 | 89.8 |
| 2013 | 95,367.0 | 82,742.5 | 94,583.8 | 100.8 | 87.5 |
| 2014 | 108,155.1 | 90,007.1 | 96,904.5 | 111.6 | 92.9 |
| 2015 | 109,718.9 | 99,301.8 | 105,401.8 | 104.1 | 94.2 |
| 2016 | 107,506.1 | 107,039.2 | 109,305.1 | 98.4 | 97.9 |

[1] The Retirement System's asset valuation method was changed effective with the June 30, 2007 and June 30, 2015 actuarial valuations.

[2] Effective June 30, 2006, the Actuarial Accrued Liability is calculated under the Entry Age Normal Cost Method as was required by Governmental Accounting Standards Board (GASB) Statement No. 50 prior to its replacement by GASB Statement No. 67. The Retirement System is funded in accordance with the Aggregate Cost Method. GASB Statement No. 50 required that the Entry Age Normal Cost Method be used to calculate the accrued liability for purposes of presenting the funded percentage.

## F. Unfunded Accrued Liability

The unfunded accrued liability ("UAL") of a pension plan refers to the present value of required employer contributions other than normal contributions. The UAL may result from items such as prior service, deferred employer contributions, retirement incentive programs, or change of assumptions.

Generally, the existence and magnitude of the UAL is a function of the actuarial cost method. Under the Aggregate Cost Method, a UAL does not exist. However, a modified version of the Aggregate Cost Method may recognize certain components of liability, such as legislated benefit increases, and amortize those liability components separately, generally over a fixed number of years. Those liability components are then subtracted from the total present value of benefits, along with assets and future employee contributions, to yield the present value of future normal cost.

The System handles these liability components differently; it treats each component of additional liability as a receivable; i.e., as a form of plan assets. The formula for the present value of future employer contributions is:

PVFutureErCont = PVFutureBen − (Assets + Rec) − PVFutureEeCont.

A primary reason the System treats the additional liability components as receivables instead of UAL components to be amortized over a fixed schedule is that the contributions to pay for those liabilities are made by the school districts that make up the System. Each school district can choose to pay its portion of liability faster than the traditional amortization schedule would dictate, and many do so. Therefore, in practice, the additional liability amounts are paid for faster than would be the case if a traditional amortization schedule were followed.

The UAL as of the end of the year reflects the beginning-of-year UAL, contributions received during the year, interest on those values, and other adjustments made by school districts which can increase or decrease the UAL. The other adjustments can include determining, even a few years after enactment of legislation, that a member or group of members is eligible for a retirement incentive; this would increase the UAL.

## G. Gain and Loss

The required employer contribution is determined each year by the actuarial valuation. Projections of current plan members are made using actuarial assumptions regarding probabilities of retiring, withdrawing, dying or becoming disabled each year in the future. Active member salaries are projected to increase according to assumed percentages. Expected benefit payments are calculated for the assumed events of retirement, withdrawal, etc., based on service and salary history at the time of event. The resulting projected benefits are discounted at the assumed interest

rate. That final discounted value is the present value of future benefits, which is then used in determining the normal contribution rate.

Actual experience will rarely match the various assumptions mentioned above. The comparison between actual experience and that predicted by actuarial assumptions is called gain and loss analysis. The comparison is most useful when it measures the gain/loss of individual assumptions. The sum of the individual gain/loss components is the total plan gain/loss.

Gain/loss can be expressed in terms of the change in liability resulting from the experience of a specific assumption being different from that which was assumed. For example, if salaries increased more during a year than was predicted by the salary scale assumption (and all other assumptions were exactly realized), and if the resulting plan liability at the new valuation is higher by $100 million than would be the case if the salary assumption were exactly realized, then there has been a $100 million loss due to salary scale assumption.

Another way of expressing gain/loss is to indicate what the change in the normal cost rate would be as a result of the liability change mentioned above. This is the manner in which the System presented the results of its gain/loss analysis.

**Gain/Loss by Source for Each Year**

| | 2015-2016 | 2014-2015 | 2013-2014 |
|---|---|---|---|
| **Mortality** | **0.03%** | **0.02%** | **0.04%** |
| **Retirement** | **-0.15%** | **-0.01%** | **0.03%** |
| **Pension Payments** | **-0.01%** | **-0.01%** | **0.03%** |
| **Pay-As-You-Go Benefits** | **-0.01%** | **0.00%** | **0.01%** |
| **Investments** | **-1.61%** | **-2.69%** | **-3.52%** |
| **Salary/Service** | **0.03%** | **-0.63%** | **-0.50%** |
| **New Entrants** | **-0.09%** | **-0.13%** | **-0.19%** |
| **Withdrawal** | **-0.05%** | **-0.03%** | **-0.09%** |
| **COLA** | **-0.08%** | **-0.07%** | **-0.07%** |
| **Return to Active Service** | **0.02%** | **0.01%** | **-0.01%** |
| **Disability** | **0.00%** | **0.00%** | **0.00%** |

Negative numbers above represent a gain; positive numbers represent a loss. For example, for the 2015-2016 fiscal year, the withdrawal component is -.05%. For the year ending June 30,

2016, more members withdrew from active service than predicted by the withdrawal assumptions. As a consequence, there will be fewer members than expected to receive retirement benefits. The resulting decrease in liability generates a decrease in the normal cost rate of .05%.

H. Actuarial Assumptions

Each of the actuarial assumptions can be grouped into one of two categories: demographic or economic. The assumptions that would be considered demographic are mortality, disability, withdrawal and retirement. The economic assumptions are interest and salary scale. Withdrawal and retirement are, to some extent, influenced by economic factors, but they are generally considered to be in the demographic category.

The System conducts an experience study each year to monitor the appropriateness of the assumptions. If the results of an experience study suggest that assumptions be changed, the System will recommend to the retirement board ("Board") that new assumptions be adopted.

The mortality assumptions consist of sets of rates for each of three classes of members of the System. Those classes are: (1) active employees; (2) service retirees and deferred service members (those who have terminated employment with a vested right to receive a later service retirement benefit) and beneficiaries of members; and (3) disabled annuitants. Each of the sets contains rates that vary by age and sex.

The disability assumption consists of a set of rates for active members; the rates vary by age and sex.

The retirement and withdrawal assumption consists of a set of rates for active members; the rates vary by tier group, age, length of service, and sex.

The salary increase assumption, or salary scale, consists of a set of rates that vary by age and sex. Each rate shows the expected ratio of salary one year in the future to the current salary.

The interest rate assumption is 7.5%, which consists of two components: an inflation component of 2.5% and a real rate of return component of 5.0%.

The first table below shows actual historical annualized rates of return of plan assets over the different time periods. The second table compares actual and expected inflation over different historical time periods.

Annualized rates of return as of 6/30/2016 over the last:

| | Based Upon Market Value of Assets | Based Upon Actuarial Value of Assets |
|---|---|---|
| 1 Year: | 2.3% | 10.0% |
| 3 Years: | 8.4% | 13.2% |
| 5 Years: | 8.3% | 9.0% |
| 10 Years: | 6.2% | 8.3% |
| 15 Years: | 6.4% | 6.4% |
| 20 Years: | 7.6% | |
| 25 Years: | 8.7% | |

Annualized inflation as of 6/30/2016 over the last:

| | Inflation Assumption | | COLA Benefit | |
|---|---|---|---|---|
| | Actual | Expected | Actual | Expected |
| 1 Year: | 0.85% | 2.5% | 1.0% | 1.5% |
| 3 Years: | 0.76% | 2.5% | 1.0% | 1.5% |
| 5 Years: | 1.28% | 2.5% | 1.1% | 1.5% |

## 5. SUMMARY AND CONCLUSIONS

Following are the recommendations contained in this report:

| Item | Description | Page No. |
|---|---|---|
| A | The examiner recommends that the System review its fidelity bond coverage and increase it accordingly. | 4 |
| B | The examiner recommends that all future complaint logs maintained by the System are to be maintained in a columnar format that contains, at the minimum, all items noted above. | 8 |

Respectfully submitted,

/s/
Flora Egbuchulam
Associate Insurance Examiner

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

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

/s/
Flora Egbuchulam

Subscribed and sworn to before me

this_____ day of _____

*APPOINTMENT NO. 31555*

*NEW YORK STATE*

# *DEPARTMENT OF FINANCIAL SERVICES*

*I, **MARIA T. VULLO**, 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:*

***FLORA EGBUCHULAM***

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

***NEW YORK STATE TEACHERS' 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 12th day of December, 2016*

*MARIA T. VULLO*
*Superintendent of Financial Services*

*By:* Mark M Leod

*MARK MCLEOD*
*DEPUTY CHIEF - LIFE BUREAU*