Board of Education Retirement System
of the City of New York

# *Monthly Performance Review*
# *November 2017*

*Prepared for the New York City*

*Board of Education Retirement System*

*01.2018*

THE CITY OF NEW YORK
OFFICE OF THE COMPTROLLER

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STATE STREET

## MARKET INDICATORS

| | 1 Month | 3 Month | Fiscal YTD | 1 Year | 2 Year | 3 Year | 5 Year | 10 Year |
|---|---|---|---|---|---|---|---|---|
| S&P 500 | 3.07 | 7.65 | 10.20 | 22.87 | 15.23 | 10.91 | 15.74 | 8.30 |
| S&P 400 MIDCAP | 3.68 | 10.17 | 9.44 | 18.53 | 15.85 | 11.37 | 15.46 | 9.92 |
| RUSSELL 1000 | 3.05 | 7.66 | 10.13 | 22.61 | 15.08 | 10.73 | 15.69 | 8.40 |
| RUSSELL 2000 | 2.88 | 10.23 | 9.64 | 18.34 | 15.16 | 11.14 | 15.02 | 8.75 |
| RUSSELL 3000 | 3.04 | 7.85 | 10.10 | 22.27 | 15.08 | 10.75 | 15.63 | 8.43 |
| RUSSELL 3000 GROWTH | 3.03 | 8.56 | 13.16 | 30.25 | 16.53 | 12.95 | 17.03 | 9.82 |
| RUSSELL 3000 VALUE | 3.05 | 7.14 | 7.14 | 14.70 | 13.64 | 8.53 | 14.16 | 6.95 |
| | | | | | | | | |
| MSCI EAFE NET | 1.05 | 5.14 | 8.13 | 27.27 | 10.73 | 5.97 | 8.24 | 1.55 |
| MSCI EMF NET | 0.20 | 3.30 | 11.90 | 32.82 | 20.03 | 6.15 | 4.61 | 1.36 |
| MSCI WORLD NET | 2.17 | 6.43 | 9.13 | 23.66 | 12.94 | 8.19 | 11.75 | 4.76 |
| MSCI EUROPE SMID CAP NET | 0.05 | 4.43 | 9.28 | 34.54 | 12.12 | 9.87 | 12.12 | 3.64 |
| MSCI AC WORLD ex US NET | 0.81 | 4.62 | 9.04 | 27.59 | 12.94 | 5.74 | 7.06 | 1.47 |
| | | | | | | | | |
| NYC - TREASURY AGENCY PLUS FIVE | 0.07 | (1.61) | 0.45 | 3.60 | 2.44 | 2.25 | 1.73 | 5.00 |
| Citigroup USBIG Treasury 1-3 Y Index | (0.20) | (0.44) | (0.03) | 0.44 | 0.58 | 0.51 | 0.56 | 1.44 |
| Citigroup USBIG Treasury/Agency 1-10 y | (0.30) | (1.00) | (0.08) | 1.06 | 0.98 | 1.01 | 0.87 | 2.74 |
| Citigroup Treasury 10+ | 0.71 | (1.53) | 1.22 | 6.19 | 4.01 | 3.22 | 2.79 | 6.37 |
| | | | | | | | | |
| CITIGROUP MORTGAGE | (0.11) | (0.39) | 0.81 | 2.18 | 1.88 | 1.82 | 2.00 | 3.85 |
| | | | | | | | | |
| NYC - INVESTMENT GRADE CREDIT | (0.12) | (0.02) | 1.45 | 5.70 | 4.96 | 3.29 | 3.01 | 5.18 |
| CITIGROUP BROAD INVESTMENT GRADE | (0.12) | (0.54) | 0.76 | 3.24 | 2.72 | 2.12 | 1.98 | 4.04 |

*NCREIF NFI - ODCE NET index return calculated on a quarterly basis

STATE STREET

## MARKET INDICATORS

| | 1 Month | 3 Month | Fiscal YTD | 1 Year | 2 Year | 3 Year | 5 Year | 10 Year |
|---|---|---|---|---|---|---|---|---|
| NYC - CORE PLUS FIVE | (0.07) | (0.49) | 1.02 | 4.03 | 3.33 | 2.54 | 2.39 | 4.68 |
| BARCLAYS AGGREGATE | (0.13) | (0.55) | 0.78 | 3.21 | 2.69 | 2.11 | 1.98 | 3.99 |
| | | | | | | | | |
| CITIGROUP BB & B | (0.14) | 1.10 | 2.24 | 8.50 | 9.57 | 5.17 | 5.49 | 6.51 |
| CITIGROUP BB & B CAPPED | (0.13) | 1.14 | 2.28 | 8.40 | 9.34 | 5.06 | 5.43 | 6.76 |
| BofA ML HIGH YIELD MASTER II | (0.27) | 1.02 | 2.15 | 9.28 | 10.75 | 5.76 | 6.08 | 7.89 |
| | | | | | | | | |
| CSFB LEVERAGED LOAN | 0.12 | 1.19 | 1.85 | 5.03 | 6.31 | 3.98 | 4.40 | 4.56 |
| | | | | | | | | |
| BARCLAYS GLOBAL US TIPS | 0.13 | (0.30) | 1.21 | 1.97 | 2.96 | 1.36 | (0.18) | 3.42 |
| | | | | | | | | |
| BofA ML U.S. Convertible – Yield Alternative | 0.94 | 1.55 | 2.39 | 9.47 | 7.69 | 2.49 | 4.70 | 4.80 |
| BofA ML US Invt Grade Conv Bond Index | 0.57 | 7.20 | 11.30 | 25.38 | 17.93 | 12.09 | 14.81 | 7.10 |
| BofA ML ALL CONVERTIBLES EX MANDATORY | (0.11) | 3.80 | 6.37 | 17.18 | 12.47 | 7.57 | 11.83 | 7.98 |
| | | | | | | | | |
| DJ US SELECT REAL ESTATE | 3.07 | 2.22 | 2.34 | 8.60 | 6.31 | 5.56 | 9.89 | 6.38 |
| NCREIF NFI - ODCE NET* | 0.00 | 1.64 | 1.64 | 6.70 | 7.89 | 9.84 | 10.57 | 4.08 |
| CPI + 4% | 0.72 | 2.04 | 3.23 | 6.32 | 6.04 | 5.51 | 5.43 | |
| | | | | | | | | |
| 91 DAY TREASURY BILL | 0.08 | 0.26 | 0.44 | 0.79 | 0.55 | 0.37 | 0.25 | 0.41 |

*NCREIF NFI - ODCE NET index return calculated on a quarterly basis

STATE STREET

## MARKET INDICATORS

| | 1 Month | 3 Month | Fiscal YTD | 1 Year | 2 Year | 3 Year | 5 Year | 10 Year |
|---|---|---|---|---|---|---|---|---|
| S&P 500 | 1.11 | 6.64 | 11.42 | 21.83 | 16.79 | 11.41 | 15.79 | 8.50 |
| S&P 400 MIDCAP | 0.22 | 6.25 | 9.68 | 16.24 | 18.47 | 11.14 | 15.01 | 9.97 |
| RUSSELL 1000 | 1.11 | 6.59 | 11.36 | 21.69 | 16.77 | 11.23 | 15.71 | 8.59 |
| RUSSELL 2000 | (0.40) | 3.34 | 9.20 | 14.65 | 17.93 | 9.96 | 14.12 | 8.71 |
| RUSSELL 3000 | 1.00 | 6.34 | 11.20 | 21.13 | 16.86 | 11.12 | 15.58 | 8.60 |
| RUSSELL 3000 GROWTH | 0.73 | 7.61 | 13.98 | 29.59 | 17.97 | 13.51 | 17.16 | 9.93 |
| RUSSELL 3000 VALUE | 1.28 | 5.08 | 8.51 | 13.19 | 15.77 | 8.71 | 13.95 | 7.19 |
| | | | | | | | | |
| MSCI EAFE NET | 1.61 | 4.23 | 9.86 | 25.03 | 12.38 | 7.80 | 7.90 | 1.94 |
| MSCI EMF NET | 3.59 | 7.44 | 15.92 | 37.28 | 23.55 | 9.10 | 4.35 | 1.68 |
| MSCI WORLD NET | 1.35 | 5.51 | 10.61 | 22.40 | 14.71 | 9.26 | 11.64 | 5.03 |
| MSCI EUROPE SMID CAP NET | 2.48 | 3.42 | 11.99 | 32.50 | 13.89 | 11.34 | 11.81 | 4.18 |
| MSCI AC WORLD ex US NET | 2.24 | 5.00 | 11.48 | 27.19 | 15.29 | 7.83 | 6.80 | 1.84 |
| | | | | | | | | |
| NYC - TREASURY AGENCY PLUS FIVE | 0.74 | 0.67 | 1.20 | 4.66 | 2.92 | 2.18 | 2.10 | 5.07 |
| Citigroup USBIG Treasury 1-3 Y Index | 0.01 | (0.26) | (0.02) | 0.42 | 0.64 | 0.60 | 0.55 | 1.41 |
| Citigroup USBIG Treasury/Agency 1-10 y | 0.02 | (0.40) | (0.06) | 1.11 | 1.09 | 1.11 | 0.90 | 2.71 |
| Citigroup Treasury 10+ | 1.73 | 2.36 | 2.97 | 8.60 | 4.90 | 2.80 | 3.55 | 6.60 |
| | | | | | | | | |
| CITIGROUP MORTGAGE | 0.28 | 0.10 | 1.09 | 2.47 | 2.03 | 1.87 | 2.02 | 3.85 |
| | | | | | | | | |
| NYC - INVESTMENT GRADE CREDIT | 0.80 | 1.02 | 2.27 | 6.04 | 5.80 | 3.60 | 3.16 | 5.25 |
| CITIGROUP BROAD INVESTMENT GRADE | 0.47 | 0.39 | 1.23 | 3.60 | 3.13 | 2.25 | 2.09 | 4.07 |

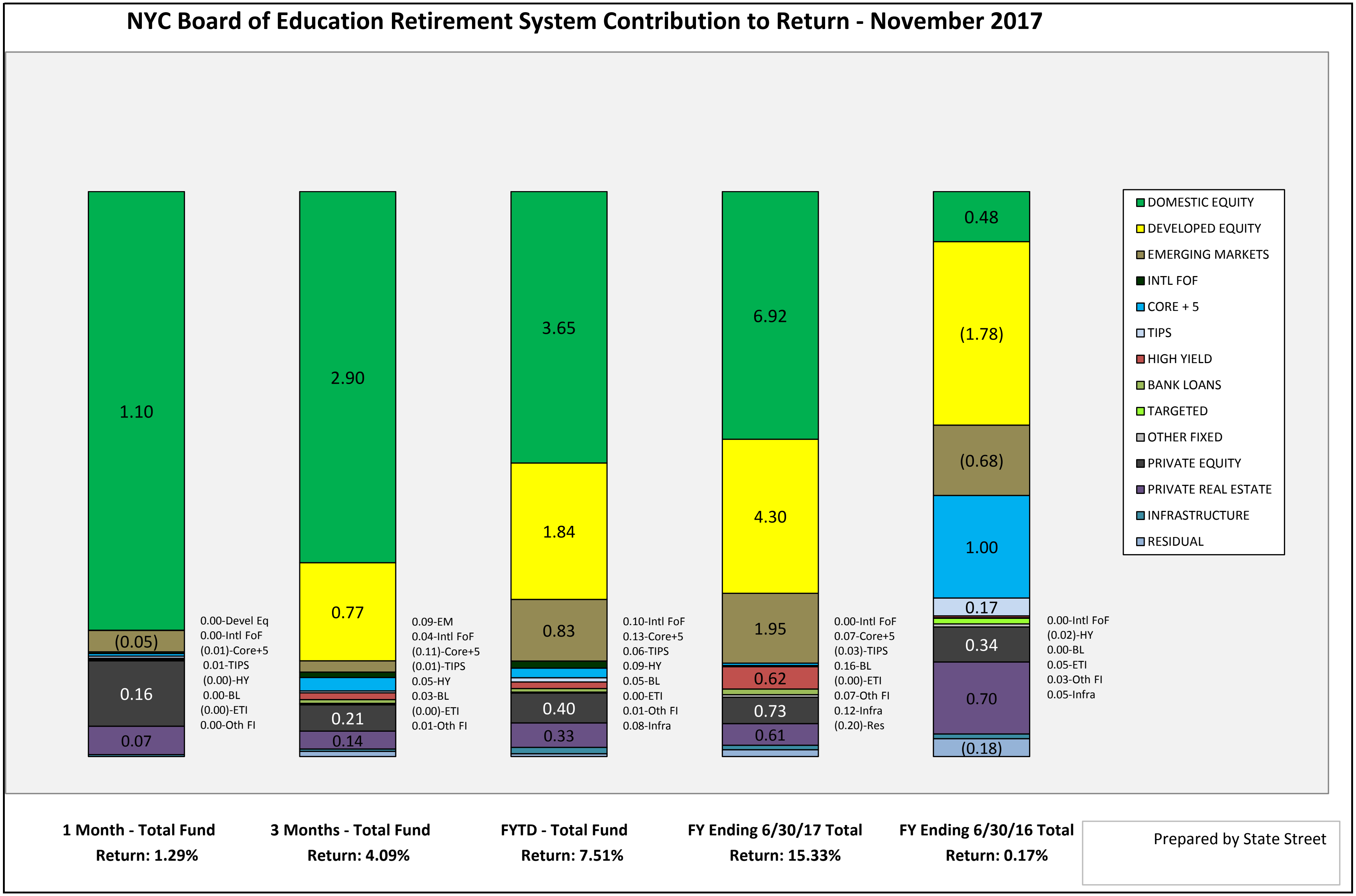
*NCREIF NFI - ODCE NET index return calculated on a quarterly basis

STATE STREET

## MARKET INDICATORS

| | 1 Month | 3 Month | Fiscal YTD | 1 Year | 2 Year | 3 Year | 5 Year | 10 Year |
|---|---|---|---|---|---|---|---|---|
| NYC - CORE PLUS FIVE | 0.61 | 0.63 | 1.64 | 4.51 | 3.85 | 2.69 | 2.54 | 4.73 |
| BARCLAYS AGGREGATE | 0.46 | 0.39 | 1.24 | 3.54 | 3.09 | 2.24 | 2.10 | 4.01 |
| | | | | | | | | |
| CITIGROUP BB & B | 0.28 | 0.52 | 2.52 | 7.03 | 11.17 | 5.79 | 5.26 | 6.50 |
| CITIGROUP BB & B CAPPED | 0.27 | 0.56 | 2.56 | 6.94 | 10.95 | 5.66 | 5.19 | 6.73 |
| BofA ML HIGH YIELD MASTER II | 0.29 | 0.41 | 2.45 | 7.48 | 12.37 | 6.39 | 5.80 | 7.89 |
| | | | | | | | | |
| CSFB LEVERAGED LOAN | 0.39 | 1.17 | 2.24 | 4.25 | 7.03 | 4.50 | 4.33 | 4.57 |
| | | | | | | | | |
| BARCLAYS GLOBAL US TIPS | 0.92 | 1.26 | 2.14 | 3.01 | 3.84 | 2.05 | 0.13 | 3.53 |
| | | | | | | | | |
| BofA ML U.S. Convertible – Yield Alternative | 0.57 | 1.31 | 2.97 | 9.45 | 9.70 | 3.16 | 4.47 | 5.07 |
| BofA ML US Invt Grade Conv Bond Index | (0.96) | 4.64 | 10.23 | 20.99 | 17.56 | 12.01 | 14.57 | 7.08 |
| BofA ML ALL CONVERTIBLES EX MANDATORY | 0.01 | 1.83 | 6.38 | 15.70 | 13.69 | 7.92 | 11.43 | 8.11 |
| | | | | | | | | |
| DJ US SELECT REAL ESTATE | 0.03 | 1.98 | 2.37 | 3.76 | 5.20 | 4.95 | 9.08 | 6.98 |
| CPI + 4% | 0.48 | 1.64 | 3.73 | 6.20 | 6.19 | 5.69 | 5.46 | |
| | | | | | | | | |
| 91 DAY TREASURY BILL | 0.11 | 0.28 | 0.55 | 0.86 | 0.59 | 0.41 | 0.27 | 0.39 |

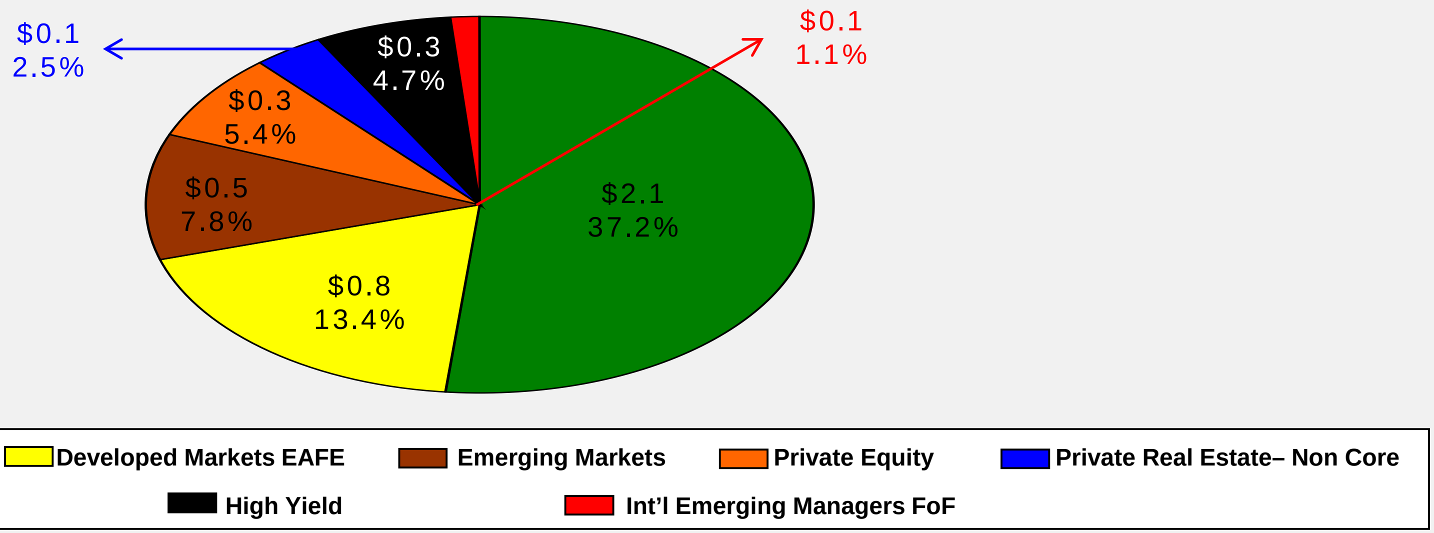
*NCREIF NFI - ODCE NET index return calculated on a quarterly basis


NYC Board of Education Retirement System Contribution to Return - November 2017
1.10
(0.05)
0.16
0.07
0.00-Devel Eq
0.00-Intl FoF
(0.01)-Core+5
0.01-TIPS
(0.00)-HY
0.00-BL
(0.00)-ETI
0.00-Oth FI
2.90
0.77
0.21
0.14
0.09-EM
0.04-Intl FoF
(0.11)-Core+5
(0.01)-TIPS
0.05-HY
0.03-BL
(0.00)-ETI
0.01-Oth FI
3.65
1.84
0.83
0.40
0.33
0.10-Intl FoF
0.13-Core+5
0.06-TIPS
0.09-HY
0.05-BL
0.00-ETI
0.01-Oth FI
0.08-Infra
6.92
4.30
1.95
0.62
0.73
0.61
0.00-Intl FoF
0.07-Core+5
(0.03)-TIPS
0.16-BL
(0.00)-ETI
0.07-Oth FI
0.12-Infra
(0.20)-Res
0.48
(1.78)
(0.68)
1.00
0.17
0.34
0.70
(0.18)
0.00-Intl FoF
(0.02)-HY
0.00-BL
0.05-ETI
0.03-Oth FI
0.05-Infra
DOMESTIC EQUITY
DEVELOPED EQUITY
EMERGING MARKETS
INTL FOF
CORE + 5
TIPS
HIGH YIELD
BANK LOANS
TARGETED
OTHER FIXED
PRIVATE EQUITY
PRIVATE REAL ESTATE
INFRASTRUCTURE
RESIDUAL
1 Month - Total Fund Return: 1.29%
3 Months - Total Fund Return: 4.09%
FYTD - Total Fund Return: 7.51%
FY Ending 6/30/17 Total Return: 15.33%
FY Ending 6/30/16 Total Return: 0.17%
Prepared by State Street

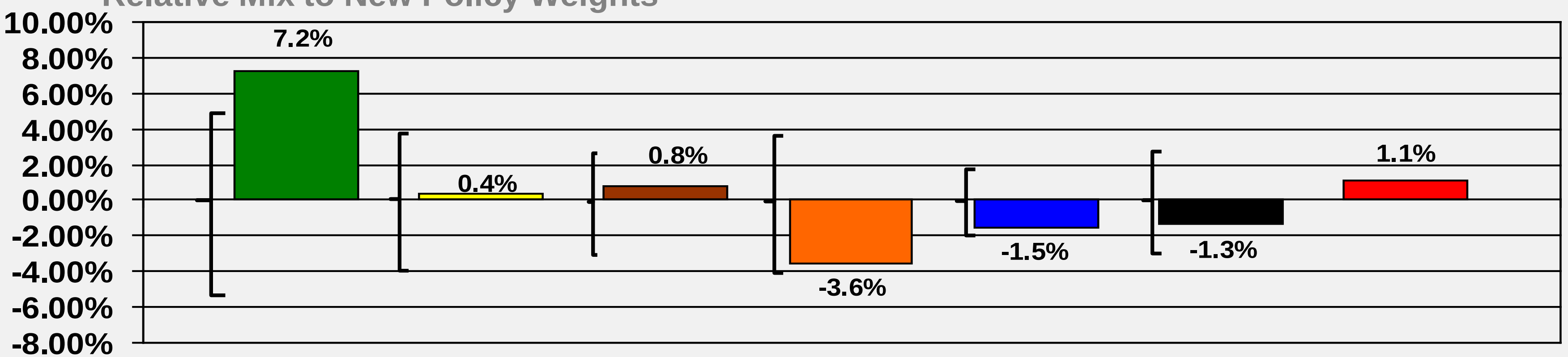
# Portfolio Asset Allocation – Growth : November 30, 2017

**$5.8B Under Management**

## Asset Allocation




## Relative Mix to New Policy Weights

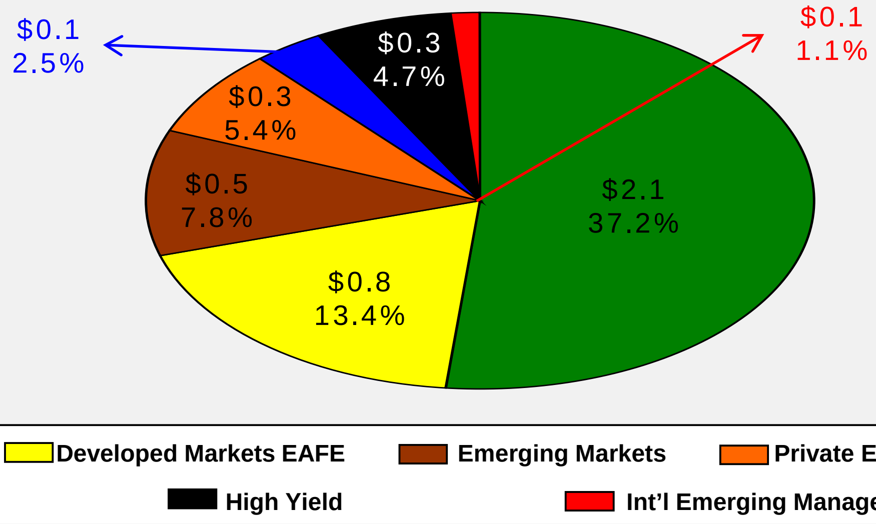



Note: Brackets represent rebalancing ranges versus Policy.

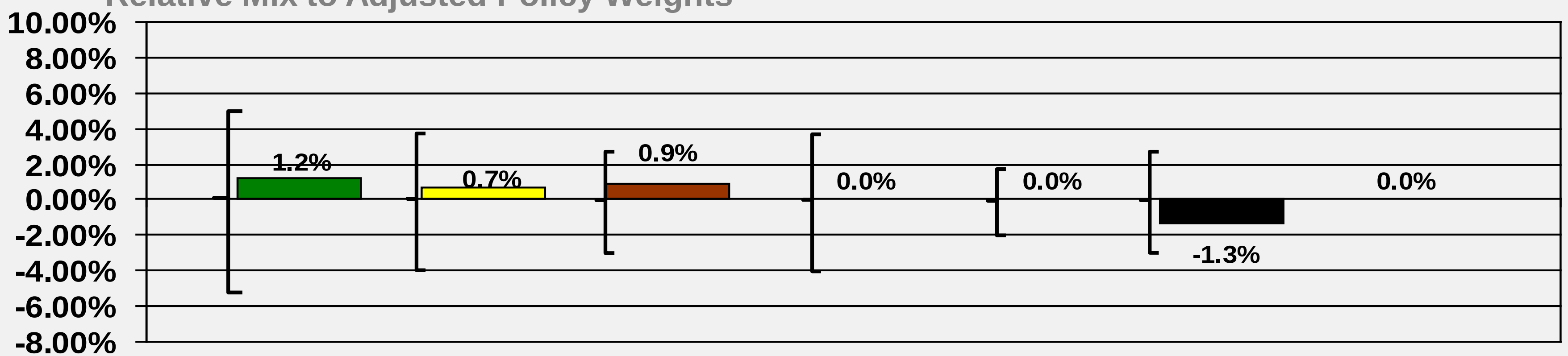
# Portfolio Asset Allocation – Growth : November 30, 2017

**$5.8B Under Management**

## Asset Allocation




## Relative Mix to Adjusted Policy Weights




Note: Brackets represent rebalancing ranges versus Policy.

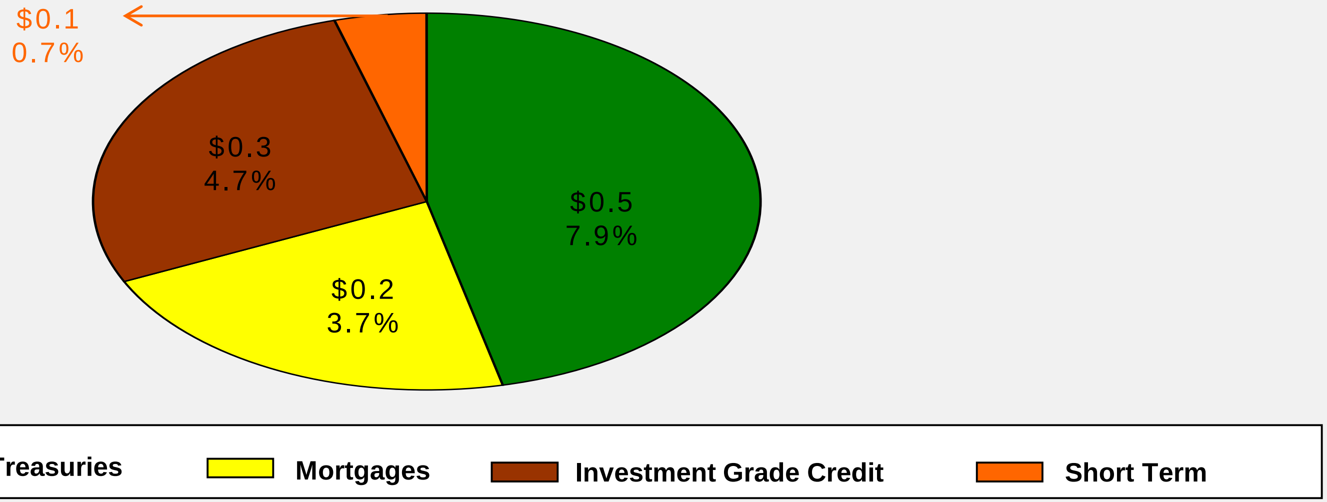
New York City Board of Education Retirement System
Performance Overview as of November 30, 2017
Prepared by State Street

Note: On November 30, 2017 BERS' combined Fixed Income and Cash portfolios have a duration of 6.3 years. The duration of the Barclays US Aggregate Index was 5.9 years on that date.

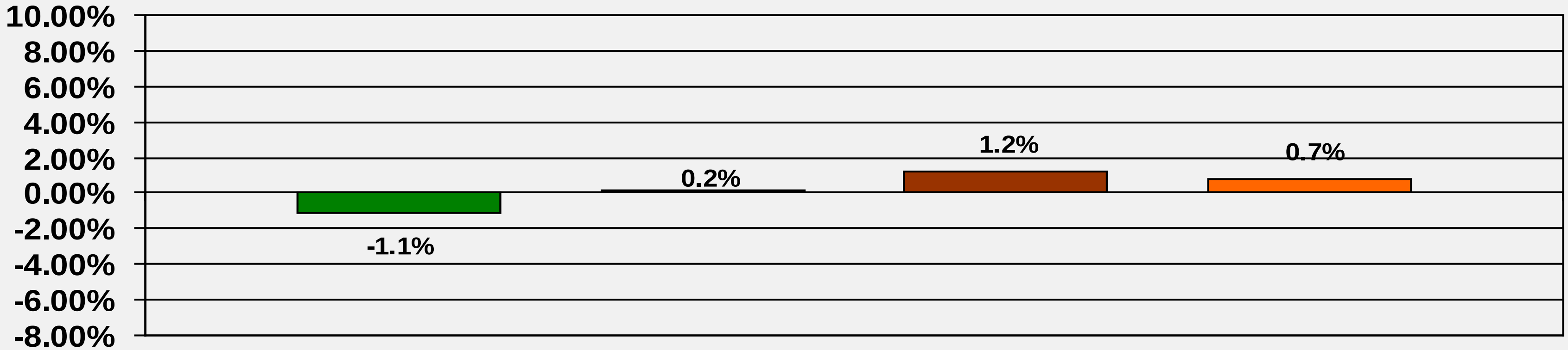
# Portfolio Asset Allocation – Deflation Protection : November 30, 2017

**$5.8B Under Management**

## Asset Allocation



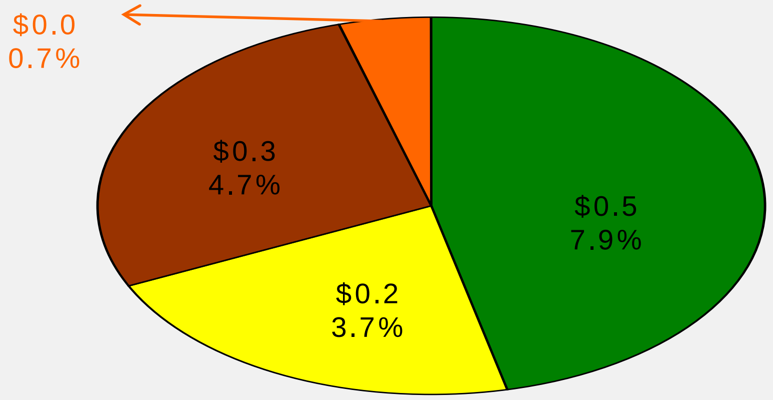

## Relative Mix to New Policy Weights



# Portfolio Asset Allocation – Deflation Protection : November 30, 2017

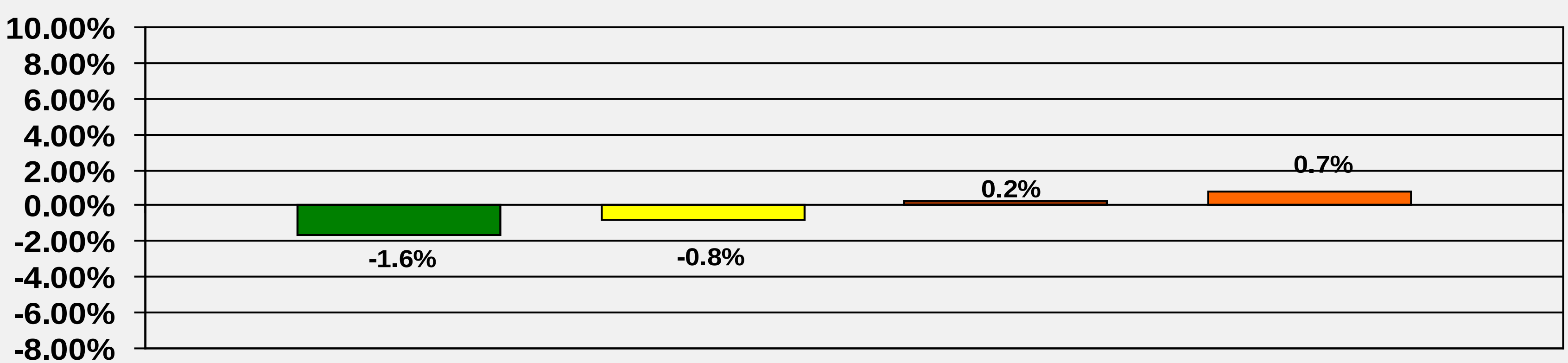
**$5.8B Under Management**

## Asset Allocation




US Government Treasuries | Mortgages | Investment Grade Credit | Short Term

## Relative Mix to Adjusted Policy Weights



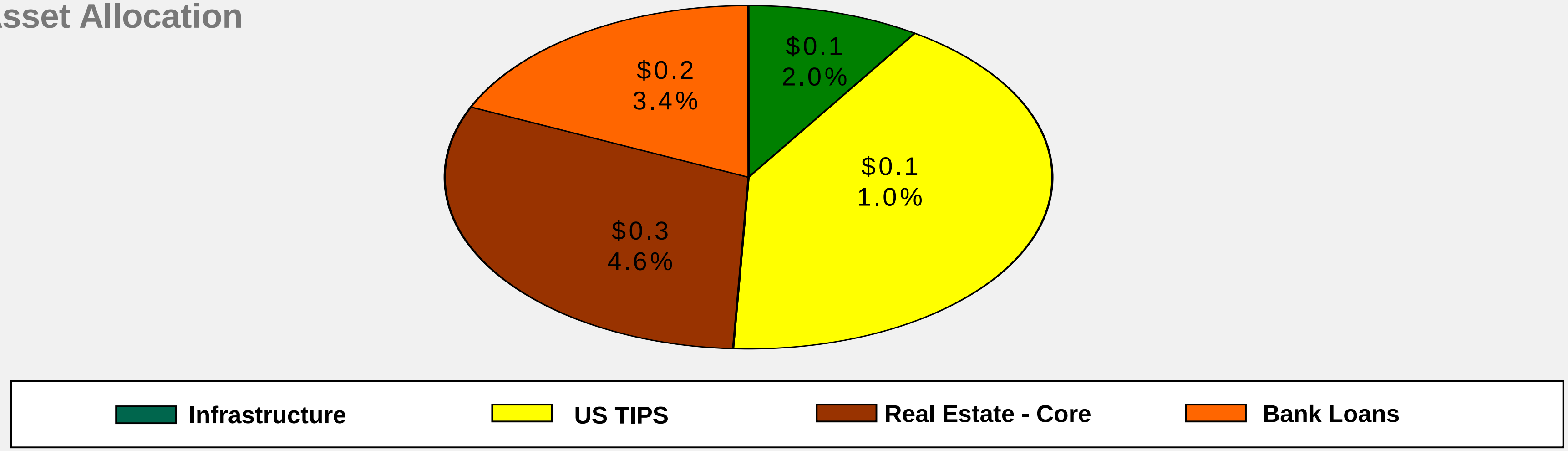



Note: On November 30, 2017 BERS' combined Fixed Income and Cash portfolios have a duration of 6.3 years. The duration of the Barclays US Aggregate Index was 5.9 years on that date.

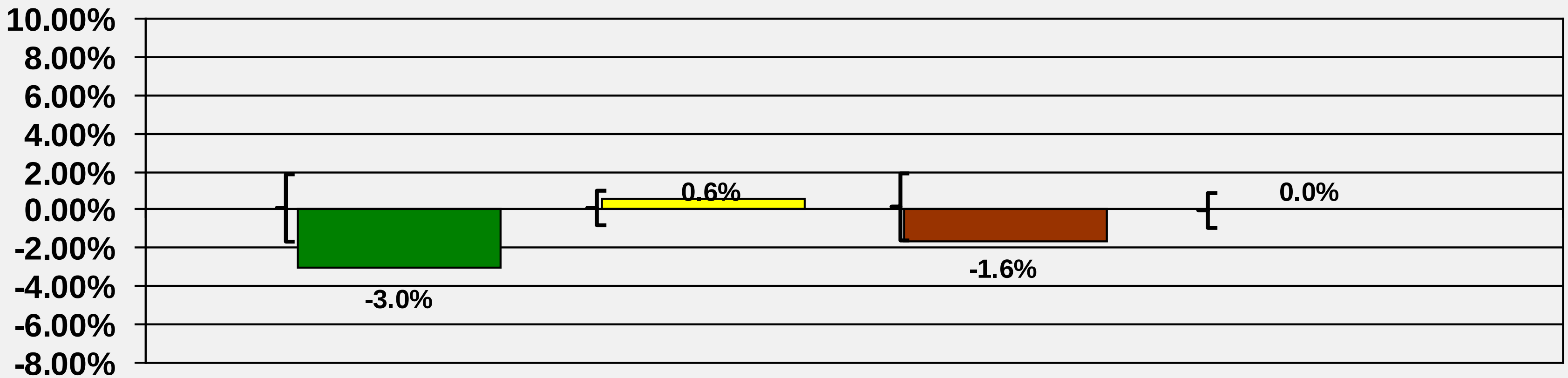
# Portfolio Asset Allocation – Inflation Protection : November 30, 2017

**$5.8B Under Management**

## Asset Allocation




## Relative Mix to New Policy Weights

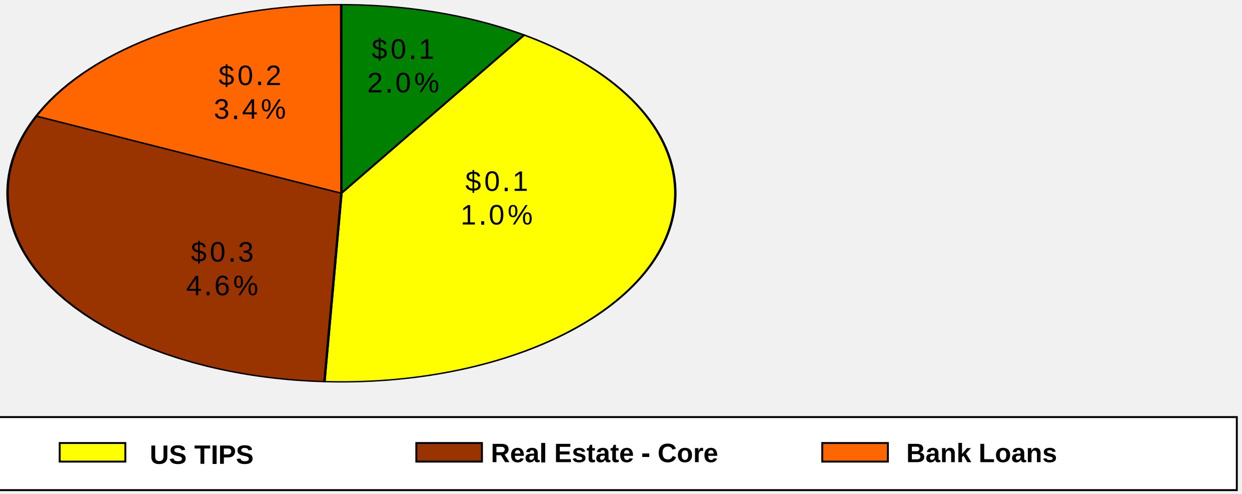



Note: Brackets represent rebalancing ranges versus Policy.

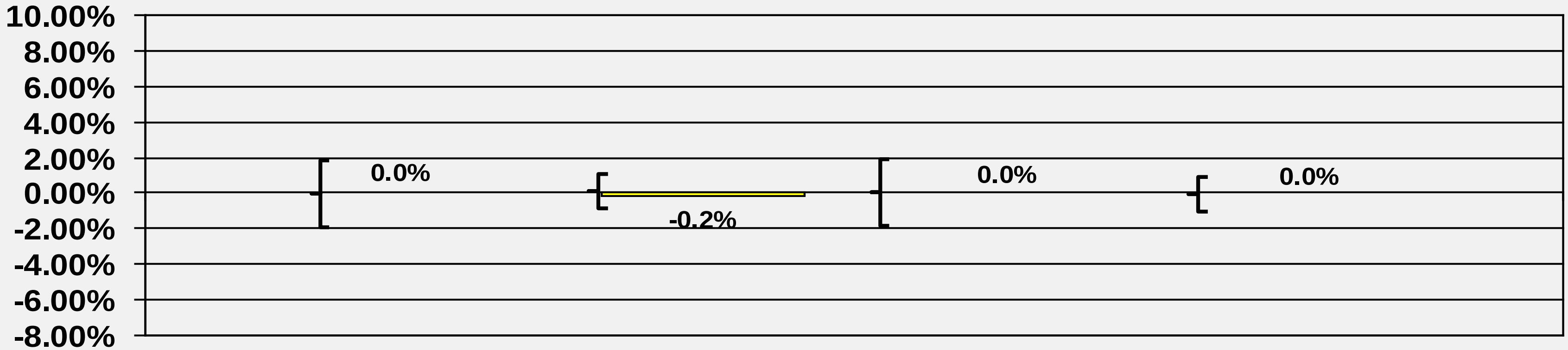
# Portfolio Asset Allocation – Inflation Protection : November 30, 2017

**$5.8B** Under Management

## Asset Allocation




## Relative Mix to Adjusted Policy Weights




Note: Brackets represent rebalancing ranges versus Policy.



Note: On November 30, 2017 BERS' combined Fixed Income and Cash portfolios have a duration of 6.3 years. The duration of the Barclays US Aggregate Index was 5.9 years on that date.

# NEW YORK CITY BOARD OF EDUCATION RETIREMENT SYSTEM
# CLASSIFICATION OF INVESTMENTS
# (as of November 30th, 2017)

| ASSET CLASS ALLOCATIONS | In $MM | Actual | Policy Target | *Adjustment* | *Adjusted Policy* | *Adjusted Target Range**** |
|---|---|---|---|---|---|---|
| *TOTAL EQUITIES* | $4,127.4 | 71.7% | 72.0% | *NA* | *68.9%* | *63.9% - 73.9%* |
| *TOTAL FIXED INCOME* | $1,627.2 | 28.3% | 28.0% | *NA* | *31.1%* | *26.1% - 36.1%* |
| *TOTAL ASSETS* | $5,754.6 | 100.0% | 100.0% | *NA* | *100.0%* | |

| | In $MM | Actual | Policy Target | *Adjustment* | *Adjusted Policy* | *Adjusted Target Range**** |
|---|---|---|---|---|---|---|
| US Equities | $2,137.9 | 37.2% | 30.0% | *6.0%* | *36.0%* | *31.0% - 41.0%* |
| Non-US Equities/EAFE | $772.7 | 13.4% | 13.0% | *0.1%* | *13.1%* | *9.1% - 17.1%* |
| Emerging Markets | $451.3 | 7.8% | 7.0% | *0.5%* | *7.5%* | *4.5% - 10.5%* |
| Non-US Emerging Mgrs. FoF | $61.2 | 1.1% | 0.0% | *NA* | *0.0%* | - |
| *TOTAL PUBLIC EQUITY* | $3,423.1 | 59.5% | 50.0% | *6.7%* | *56.7%* | |
| * *REAL ESTATE - CORE* | $193.8 | 3.4% | 5.0% | *NA* | *3.4%* | *1.4% - 5.4%* |
| * *REAL ESTATE - OPPORTUNISTIC* | $143.2 | 2.5% | 4.0% | *NA* | *2.5%* | *0.5% - 4.5%* |
| * *PRIVATE EQUITY* | $309.1 | 5.4% | 9.0% | *NA* | *5.4%* | *1.4% - 9.4%* |
| *PRIVATE INFRASTRUCTURE* | $58.1 | 1.0% | 4.0% | *NA* | *1.0%* | *-1.0% - 3.0%* |
| *TOTAL EQUITIES* | $4,127.4 | 71.7% | 72.0% | *NA* | *68.9%* | *63.9% - 73.9%* |

| | In $MM | Actual | Policy Target | *Adjustment* | *Adjusted Policy* | *Adjusted Target Range**** |
|---|---|---|---|---|---|---|
| U.S. Treasuries – All Maturities | $452.4 | 7.9% | 0.0% | *NA* | *0.0%* | *-5.0% - 5.0%* |
| U.S. Treasuries - Longer Than Five Years | $0.0 | 0.0% | 9.0% | *0.5%* | *9.5%* | *4.5% - 14.5%* |
| Core Mortgage-Backed Securities | $177.2 | 3.1% | 1.5% | *0.9%* | *2.4%* | *1.4% - 3.4%* |
| *Credit - Investment Grade Corporates* | $268.9 | 4.7% | 3.5% | *0.9%* | *4.4%* | *3.4% - 5.4%* |
| High Yield | $271.0 | 4.7% | 6.0% | *NA* | *6.0%* | *3.0% - 9.0%* |
| Bank Loans | $116.6 | 2.0% | 2.0% | *NA* | *2.0%* | *1.0% - 3.0%* |
| Total High Yield & Bank Loans | $387.6 | 6.7% | 8.0% | *0.0%* | 8.0% | *3.0% - 9.0%* |
| TIPS | $264.8 | 4.6% | 4.0% | *0.7%* | *4.7%* | *3.7% - 5.7%* |
| **ETI | $33.8 | 0.6% | 2.0% | *NA* | *2.0%* | *1.0% - 3.0%* |
| Cash | $42.6 | 0.7% | 0.0% | *NA* | *0.0%* | *0.0% - 0.0%* |
| *TOTAL PUBLIC FIXED INCOME* | $1,627.2 | 28.3% | 28.0% | *NA* | *31.1%* | |
| *TOTAL FIXED INCOME* | $1,627.2 | 28.3% | 28.0% | NA | *31.1%* | 26.1% - 36.1% |

* Ranges for illiquid asset classes represent minimums and maximums which will be monitored and will influence pacing analysis but will not necessarily result in purchases or sales.

** ETIs have a policy of 2% of the total Fund. The ETI adjusted policy % is shown for illustrative purposes only and is not included in the sub-totals. The ETI policy % is included within the policy % of the other asset classes.

*** Adjusted Target Ranges are calculated as follows: Total Equities: +/-5%; Total Fixed Income: +/-5%; US Equities: +/-5%; Non-US Equities/EAFE: +/-4%; Emerging Markets: +/-3%; Real Estate Core: +/-2%; Real Estate Opportunistic: +/-2%; Private Equity: +/-4%; US Treasuries All Maturities: +/-5%; US Treasuries Longer than 5 Years: +/-5%; Mortgage Backed Securities: +/-1%; Investment Grade Corporates: +/-1%; TIPS: +/-1%; High Yield: +/-3%; Bank Loans: +/-1%.

# NEW YORK CITY BOARD OF EDUCATION RETIREMENT SYSTEM
# CLASSIFICATION OF INVESTMENTS
# (as of November 30th, 2017)



**Adjustments to Long-Term Asset Allocation**

1) **Private Equity**
   100% of uninvested commitments will be invested in Domestic Equity.

2) **Real Estate Core**
   40% of uninvested commitments will be invested in US Equity, 12% of uninvested commitments will be invested in US Treasuries, 24% of uninvested commitments will be invested in Investment Grade Corporates, and 24% of uninvested commitments will be invested in Mortgage Backed Securities.

3) **Real Estate Opportunistic**
   60% of uninvested commitments will be invested in US Equity, 8% of uninvested commitments will be invested in US Treasuries, 16% of uninvested commitments will be invested in Investment Grade Corporates, and 16% of uninvested commitments will be invested in Mortgage Backed Securities.

4) **Infrastructure**
   27% of uninvested commitments will be invested in US Equity, 18% of uninvested commitments will be invested in Developed Ex-US Equity, 5% of uninvested commitments will be invested in Emerging Markets Equity, 5% of uninvested commitments will be invested in US Treasuries, 10% of uninvested commitments will be invested in Investment Grade Corporates, 10% of uninvested commitments will be invested in Mortgage Backed Securities, and 25% of uninvested commitments will be invested in TIPS.

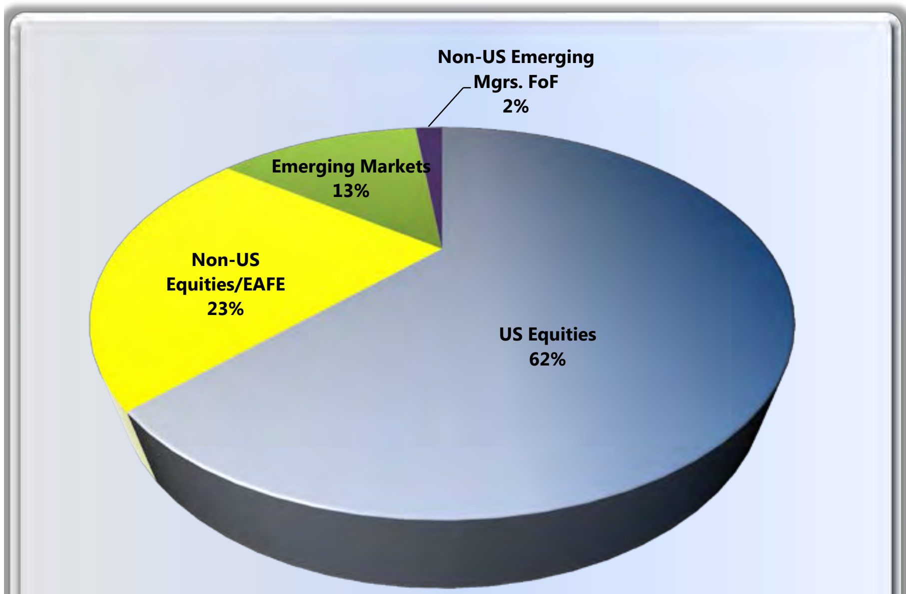
**Impact of Adjustments**

| | |
|---|---|
| **1) U.S. Treasuries - Longer Than Five Years** | **9.0%** |
| 12% of uninvested Real Estate Core | 0.2% |
| 8% of uninvested Real Estate Opportunistic | 0.1% |
| 5% of uninvested Private Infrastructure | 0.1% |
| **Total U.S. Treasuries - Longer Than Five Years** | **9.5%** |
| | |
| **2) Credit - Investment Grade Corporates** | **3.5%** |
| 24% of uninvested Real Estate Core | 0.4% |
| 16% of uninvested Real Estate Opportunistic | 0.2% |
| 10% of uninvested Private Infrastructure | 0.3% |
| **Total Credit - Investment Grade Corporates** | **4.4%** |
| | |
| **3) Core Mortgage-Backed Securities** | **1.5%** |
| 24% of uninvested Real Estate Core | 0.4% |
| 16% of uninvested Real Estate Opportunistic | 0.2% |
| 10% of uninvested Private Infrastructure | 0.3% |
| **Total Core Mortgage-Backed Securities** | **2.4%** |
| | |
| **4) Domestic Equity** | **30.0%** |
| 100% of uninvested Private Equity | 3.6% |
| 40% of uninvested of uninvested Real Estate Core | 0.7% |
| 60% of uninvested Real Estate Opportunistic | 0.9% |
| 27% of uninvested Private Infrastructure | 0.8% |
| **Total Domestic Equity** | **36.0%** |

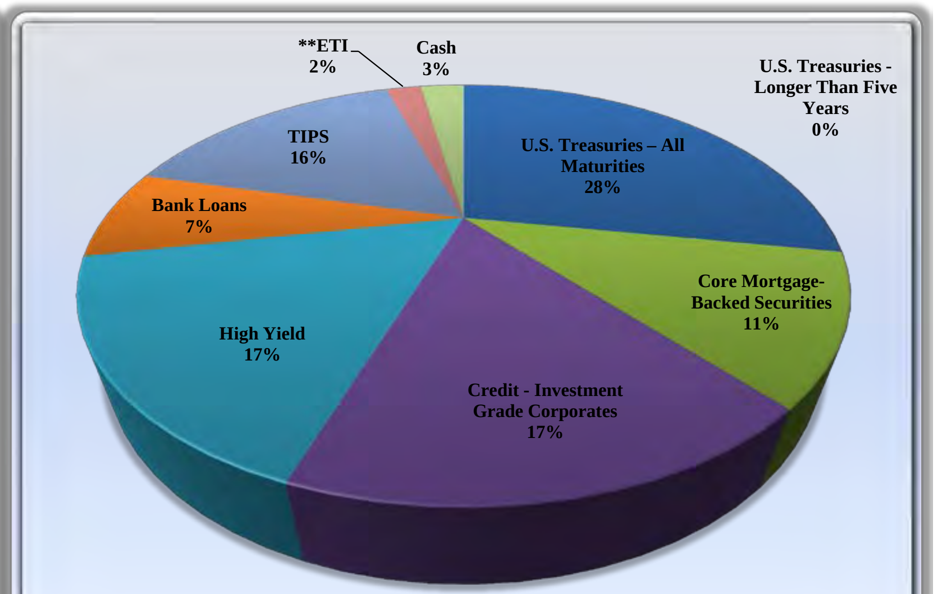
# NEW YORK CITY BOARD OF EDUCATION RETIREMENT SYSTEM
# CLASSIFICATION OF INVESTMENTS
# (as of November 30th, 2017)



| | |
|---|---|
| **5) Treasury Inflation Protected Securities** | **4.0%** |
| 25% of uninvested Private Infrastructure | 0.7% |
| Total Treasury Inflation Protected Securities | 4.7% |
| | |
| **6) Non-U.S. Equity - Emerging Markets** | **7.0%** |
| 5% of uninvested Private Infrastructure | 0.1% |
| **Total Non-U.S. Equity - Emerging Markets** | **7.1%** |
| | |
| **7) Non-U.S. Equity - Developed Mkts.** | **13.0%** |
| 18% of uninvested Private Infrastructure | 0.5% |
| **Total Non-U.S. Equity** | **13.5%** |

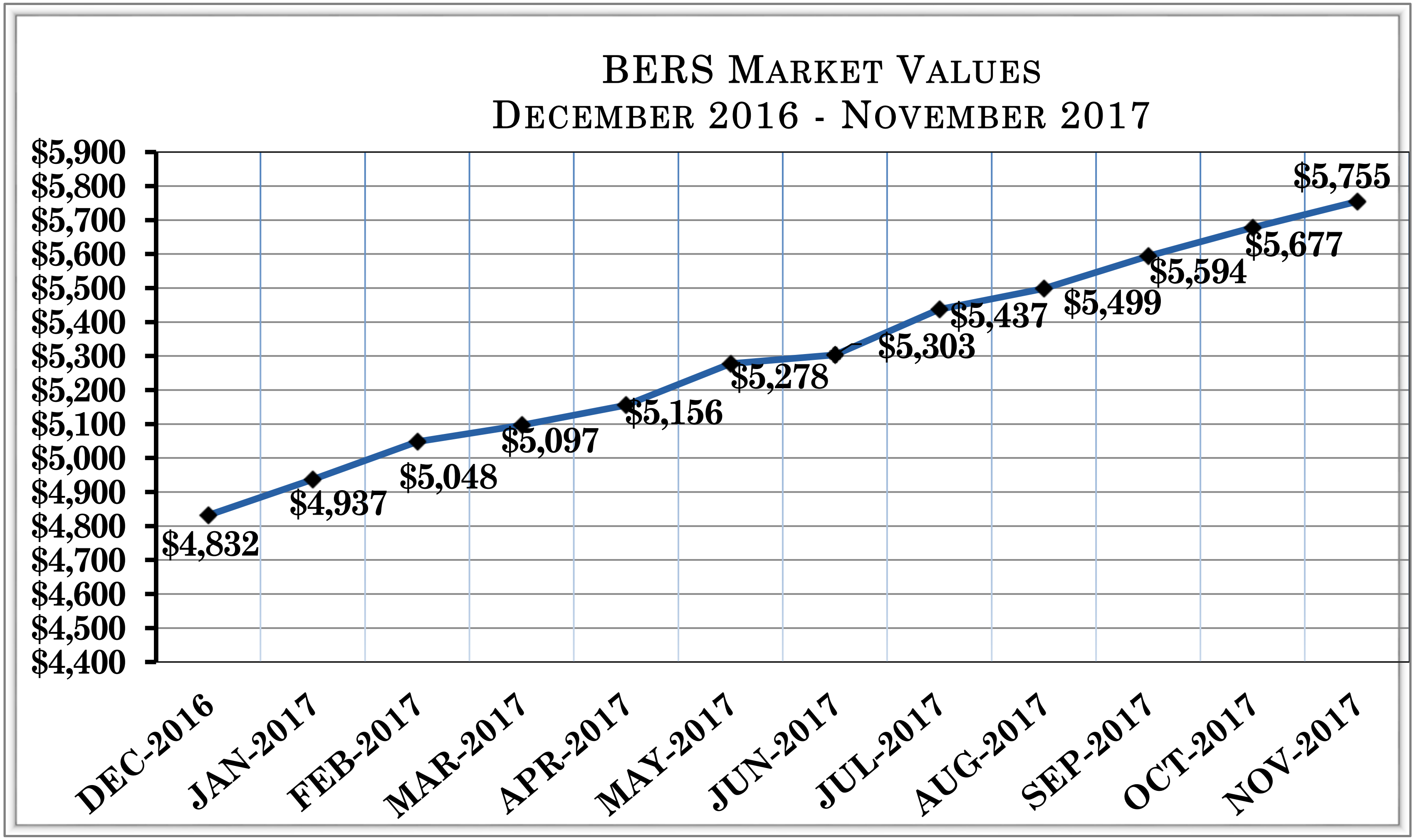



Total Public Equities

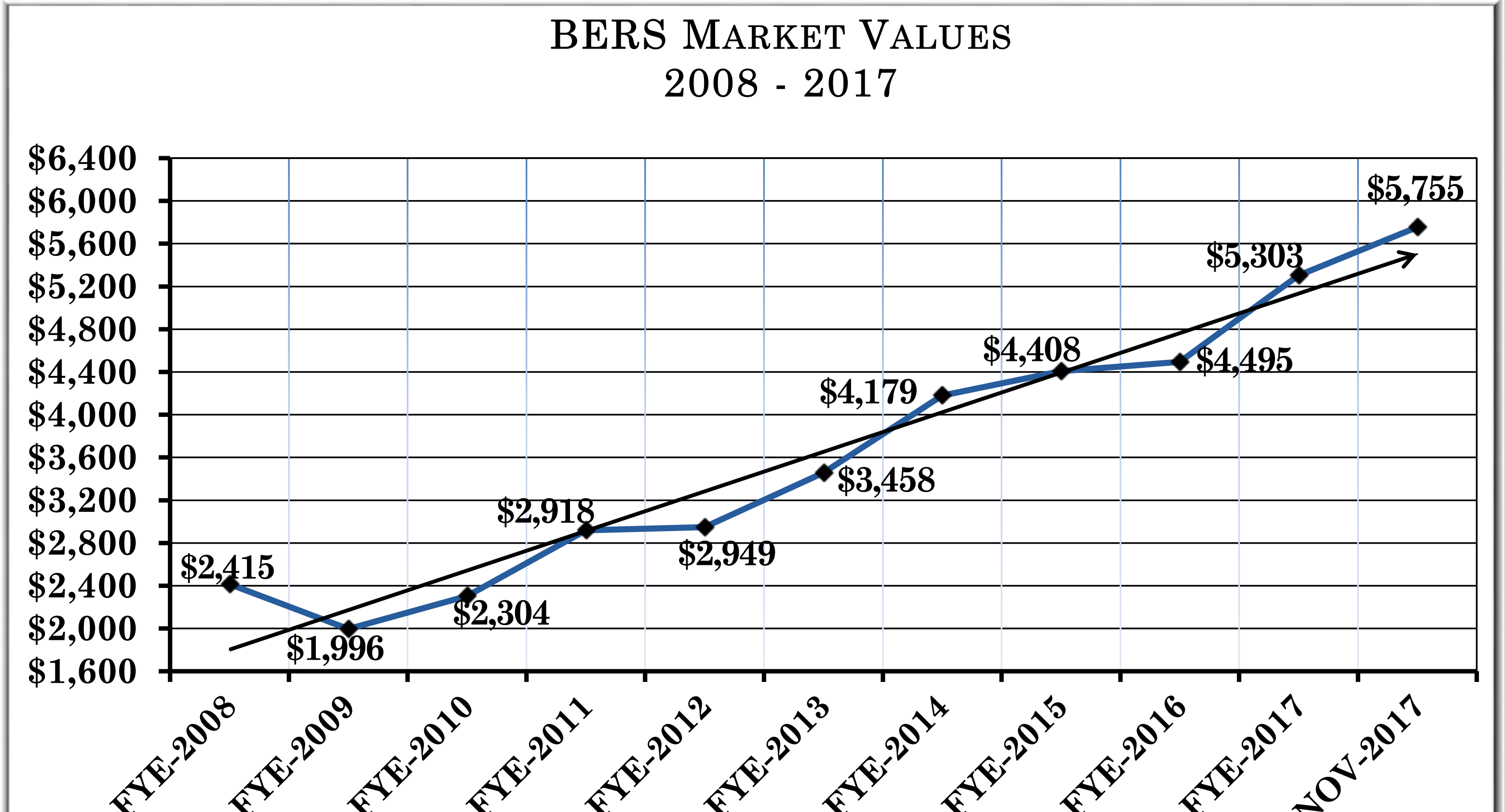



Total Fixed Income

Note: Totals may not equal 100% due to rounding



BERS Market Values
December 2016 - November 2017
$5,900
$5,800
$5,700
$5,600
$5,500
$5,400
$5,300
$5,200
$5,100
$5,000
$4,900
$4,800
$4,700
$4,600
$4,500
$4,400
$4,832
$4,937
$5,048
$5,097
$5,156
$5,278
$5,303
$5,437
$5,499
$5,594
$5,677
$5,755
DEC-2016
JAN-2017
FEB-2017
MAR-2017
APR-2017
MAY-2017
JUN-2017
JUL-2017
AUG-2017
SEP-2017
OCT-2017
NOV-2017




The 10 Year Return for BERS as of November 30, 2017 is 6.54%.

# New York City Board of Education Retirement System

## Manager / Benchmark Comparison Report

Rates of Return - Net Mgr

### Periods Ending November 30, 2017

| | Assets ($MM) | % of Total | Trailing 1 Month | Trailing 3 Month | FYTD | CYTD | FYE 6/30/17 | CYE 12/31/16 | CYE 12/31/15 | CYE 12/31/14 | Trailing 1 Year | Inception Date |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ASSET CLASS SUMMARY | | | | | | | | | | | | |
| BERS-TOTAL DOM EQUITY | 2,137.89 | 37.15 | 3.02 | 8.01 | 10.16 | 20.27 | 19.03 | 12.57 | 0.39 | 11.14 | 22.53 | Sep-01-91 |
| BERS-TOTAL DEVELOPED EQUITY | 772.71 | 13.43 | 0.00 | 5.70 | 13.07 | 32.49 | 26.55 | 5.93 | (4.98) | (5.04) | 35.25 | Nov-01-92 |
| BERS-TOTAL EMERGING (INTL) | 451.34 | 7.84 | (0.67) | 1.10 | 10.45 | 33.27 | 30.10 | 12.53 | (15.14) | 3.77 | 34.06 | Nov-01-97 |
| BERS-TOTAL INTL FOF | 61.20 | 1.06 | 0.40 | 3.98 | 8.93 | | | | | | | May-01-17 |
| BERS-TOTAL STRUCTURED | 898.40 | 15.61 | (0.04) | (0.66) | 0.80 | 3.48 | 0.48 | 3.89 | 0.20 | 7.58 | 3.75 | Jan-01-85 |
| BERS-TOTAL TIPS MANAGERS | 264.80 | 4.60 | 0.11 | (0.30) | 1.23 | 2.09 | (0.68) | 4.78 | (0.85) | 3.27 | 1.97 | Jun-01-05 |
| BERS-TOTAL HIGH YIELD | 271.04 | 4.71 | (0.05) | 1.09 | 1.80 | 6.47 | 11.98 | 15.60 | (4.66) | 2.75 | 8.51 | Aug-01-97 |
| BERS-TOTAL BANK LOANS | 116.56 | 2.03 | 0.13 | 1.43 | 2.28 | 4.05 | 6.82 | 8.48 | 0.12 | 1.99 | 5.21 | Dec-01-12 |
| TOTAL BOE ETI (w/o cash) | 33.79 | 0.59 | (0.08) | (0.83) | 0.61 | 3.65 | (0.05) | 2.31 | 3.30 | 6.96 | 3.02 | Dec-01-84 |
| BERS-TOTAL PRIVATE EQUITY | 309.14 | 5.37 | 3.12 | 3.92 | 7.72 | 16.82 | 14.62 | 9.19 | 12.71 | 20.52 | 17.94 | Jul-01-06 |
| BERS-TOTAL PRIVATE REAL ESTATE | 336.98 | 5.86 | 1.23 | 2.40 | 5.66 | 12.28 | 10.79 | 10.16 | 14.98 | 12.58 | 12.63 | Dec-01-10 |
| BERS-TOTAL INFRASTRUCTURE | 58.13 | 1.01 | 0.49 | 2.03 | 9.79 | 21.34 | 14.78 | 8.08 | 9.15 | 9.58 | 22.72 | Dec-01-13 |
| BERS-TOTAL CASH | 36.56 | 0.64 | 0.11 | 0.27 | 0.51 | 1.02 | 0.73 | 0.56 | 0.40 | 0.27 | 1.07 | Apr-01-04 |
| SECURITY LENDING | 6.04 | 0.10 | | | | | | | | | | Apr-01-04 |
| **BERS-TOTAL BOARD OF ED.** | **5,754.57** | **100.00** | **1.29** | **4.09** | **7.51** | **17.34** | **15.33** | **9.19** | **(0.44)** | **6.39** | **18.87** | **Jul-01-87** |
| | | | | | | | | | | | | |
| BERS-TOTAL EQUITY | 3,423.13 | 59.49 | 1.78 | 6.45 | 10.94 | 25.12 | 22.49 | 10.66 | (2.33) | 5.91 | 27.36 | Apr-01-04 |
| BERS-TOTAL FIXED INCOME (MINUS SS) | 1,584.59 | 27.54 | (0.01) | (0.15) | 1.14 | 3.71 | 2.82 | 6.51 | (0.81) | 5.53 | 4.32 | Apr-01-04 |
| BERS-TOTAL PRIVATE EQUITY | 309.14 | 5.37 | 3.12 | 3.92 | 7.72 | 16.82 | 14.62 | 9.19 | 12.71 | 20.52 | 17.94 | Jul-01-06 |
| BERS-TOTAL PRIVATE REAL ESTATE | 336.98 | 5.86 | 1.23 | 2.40 | 5.66 | 12.28 | 10.79 | 10.16 | 14.98 | 12.58 | 12.63 | Dec-01-10 |
| BERS-TOTAL INFRASTRUCTURE | 58.13 | 1.01 | 0.49 | 2.03 | 9.79 | 21.34 | 14.78 | 8.08 | 9.15 | 9.58 | 22.72 | Dec-01-13 |
| BERS-TOTAL CASH | 36.56 | 0.64 | 0.11 | 0.27 | 0.51 | 1.02 | 0.73 | 0.56 | 0.40 | 0.27 | 1.07 | Apr-01-04 |
| SECURITY LENDING | 6.04 | 0.10 | | | | | | | | | | Apr-01-04 |
| **BERS-TOTAL BOARD OF ED.** | **5,754.57** | **100.00** | **1.29** | **4.09** | **7.51** | **17.34** | **15.33** | **9.19** | **(0.44)** | **6.39** | **18.87** | **Jul-01-87** |
| Board of Education Policy Benchmark | | | 1.29 | 3.97 | 6.46 | 15.10 | 13.39 | 8.66 | (0.08) | 6.93 | 16.74 | Jun-01-94 |

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# New York City Board of Education Retirement System

## Manager / Benchmark Comparison Report

Rates of Return - Net Mgr

Periods Ending November 30, 2017

| | Ending Market Value ($MM) | % of Total | 1 Month | 3 Month | FYTD | CYTD | 2016 | 2015 |
|---|---|---|---|---|---|---|---|---|
| **ASSET CLASS SUMMARY** | | | | | | | | |
| **BERS-TOTAL BOARD OF ED.** | **5,755** | **100.00** | **1.29** | **4.09** | **7.51** | **17.34** | **9.19** | **(0.44)** |
| Board of Education Policy Benchmark | | | 1.29 | 3.97 | 6.46 | 15.10 | 8.66 | (0.08) |
| Excess | | | 0.00 | 0.12 | 1.06 | 2.24 | 0.53 | (0.36) |
| BERS-TOTAL EQUITY (INCL PE & RA) | 4,127 | 71.72 | 1.81 | 5.87 | 10.24 | 23.37 | 10.42 | (0.43) |
| BERS-TOTAL FIXED INCOME (MINUS SS) | 1,585 | 27.54 | (0.01) | (0.15) | 1.14 | 3.71 | 6.51 | (0.81) |
| **EQUITY SUMMARY** | | | | | | | | |
| **US EQUITY** | | | | | | | | |
| NYC BERS BLACKROCK R2000 GROWTH | 97 | 1.68 | 2.86 | 10.12 | 10.96 | 22.05 | 11.29 | (1.30) |
| RUSSELL 2000 GROWTH DAILY | | | 2.87 | 10.15 | 10.96 | 22.03 | 11.32 | (1.38) |
| Excess | | | (0.01) | (0.03) | 0.00 | 0.02 | (0.02) | 0.08 |
| NYC BERS BLACKROCK R2000 VALUE | 89 | 1.55 | 2.85 | 10.26 | 8.24 | 8.23 | 31.71 | (7.38) |
| RUSSELL 2000 VALUE DAILY | | | 2.89 | 10.32 | 8.29 | 8.88 | 31.74 | (7.47) |
| Excess | | | (0.04) | (0.06) | (0.05) | (0.65) | (0.03) | 0.09 |
| Wellington Mgmt MCC | 147 | 2.56 | 2.94 | 9.51 | 10.30 | 24.16 | 12.28 | 1.76 |
| S&P MID CAP 400 | | | 3.68 | 10.17 | 9.44 | 15.99 | 20.74 | (2.18) |
| Excess | | | (0.73) | (0.67) | 0.86 | 8.17 | (8.45) | 3.94 |
| NYC BERS BLACKROCK R1000 GROWTH | 909 | 15.80 | 3.03 | 8.42 | 13.34 | 29.23 | 7.06 | 5.78 |
| RUSSELL 1000 GROWTH - DAILY | | | 3.04 | 8.42 | 13.34 | 29.21 | 7.08 | 5.67 |
| Excess | | | (0.01) | 0.00 | (0.01) | 0.03 | (0.02) | 0.12 |
| NYC BERS BLACKROCK R1000 VALUE | 885 | 15.38 | 3.05 | 6.87 | 7.04 | 12.01 | 17.31 | (3.81) |
| RUSSELL 1000 VALUE (DAILY) | | | 3.06 | 6.89 | 7.04 | 12.03 | 17.34 | (3.83) |
| Excess | | | (0.01) | (0.01) | 0.00 | (0.02) | (0.03) | 0.01 |
| **FUND OF FUNDS** | | | | | | | | |
| BERS-TOTAL FUND OF FUNDS | 11 | 0.19 | 2.56 | 10.51 | 8.58 | | | |
| RUSSELL 2000 (DAILY) | | | 2.88 | 10.23 | 9.64 | | | |
| Excess | | | (0.32) | 0.27 | (1.06) | | | |

# New York City Board of Education Retirement System

## Manager / Benchmark Comparison Report

Rates of Return - Net Mgr

Periods Ending November 30, 2017

| | Ending Market Value ($MM) | % of Total | 1 Month | 3 Month | FYTD | CYTD | 2016 | 2015 |
|---|---|---|---|---|---|---|---|---|
| BERS-TOTAL LEGATO | 11 | 0.19 | 2.57 | 10.53 | 8.65 | | | |
| RUSSELL 2000 (DAILY) | | | 2.88 | 10.23 | 9.64 | | | |
| Excess | | | (0.31) | 0.30 | (0.99) | | | |
| LEG-ALTRAVUE SCV | 2 | 0.03 | (0.40) | 10.97 | 8.53 | | | |
| RUSSELL 2000 VALUE DAILY | | | 2.89 | 10.32 | 8.29 | | | |
| Excess | | | (3.29) | 0.65 | 0.24 | | | |
| LEG-BOWLING SCV | 2 | 0.03 | 2.03 | 9.88 | 9.77 | | | |
| RUSSELL 2000 VALUE DAILY | | | 2.89 | 10.32 | 8.29 | | | |
| Excess | | | (0.86) | (0.45) | 1.48 | | | |
| LEG-BRIDGE CITY SCG | 2 | 0.04 | 3.99 | 12.21 | 9.29 | | | |
| RUSSELL 2000 GROWTH DAILY | | | 2.87 | 10.15 | 10.96 | | | |
| Excess | | | 1.12 | 2.06 | (1.67) | | | |
| LEG-DEAN SCV | 2 | 0.04 | 3.95 | 10.58 | 6.03 | | | |
| RUSSELL 2000 VALUE DAILY | | | 2.89 | 10.32 | 8.29 | | | |
| Excess | | | 1.06 | 0.26 | (2.26) | | | |
| LEG-ESSEX SCG | 2 | 0.03 | 2.34 | 10.95 | 12.80 | | | |
| RUSSELL 2000 GROWTH DAILY | | | 2.87 | 10.15 | 10.96 | | | |
| Excess | | | (0.54) | 0.80 | 1.84 | | | |
| LEG-PACIFIC SCG | 2 | 0.03 | 2.94 | 8.06 | 5.48 | | | |
| RUSSELL 2000 GROWTH DAILY | | | 2.87 | 10.15 | 10.96 | | | |
| Excess | | | 0.07 | (2.09) | (5.48) | | | |
| **NON - US EQUITY** | | | | | | | | |
| Sprucegrove MTA (BOE) | 322 | 5.60 | 0.34 | 5.67 | 11.05 | 23.54 | 11.14 | (9.56) |
| NYC Developed Value Benchmark | | | 1.01 | 5.05 | 8.53 | 20.60 | 5.02 | (5.68) |
| Excess | | | (0.67) | 0.63 | 2.52 | 2.94 | 6.12 | (3.87) |
| Baillie Gifford MTA | 332 | 5.78 | (0.39) | 5.88 | 15.26 | 42.93 | 0.70 | (3.81) |
| NYC Developed Growth Benchmark | | | 1.01 | 5.05 | 7.57 | 25.51 | (3.04) | 4.09 |
| Excess | | | (1.40) | 0.83 | 7.70 | 17.42 | 3.74 | (7.90) |

# New York City Board of Education Retirement System

## Manager / Benchmark Comparison Report

Rates of Return - Net Mgr

Periods Ending November 30, 2017

| | Ending Market Value ($MM) | % of Total | 1 Month | 3 Month | FYTD | CYTD | 2016 | 2015 |
|---|---|---|---|---|---|---|---|---|
| Acadian | 118 | 2.05 | 0.19 | 5.35 | 12.65 | 34.51 | 6.41 | 8.68 |
| S&P EPAC Small Cap USD NET | | | 1.87 | 6.29 | 10.65 | 29.88 | 1.34 | 8.58 |
| Excess | | | (1.69) | (0.94) | 2.00 | 4.63 | 5.07 | 0.09 |
| BERS-TOTAL INTL FOF | 61 | 1.06 | 0.40 | 3.98 | 8.93 | | | |
| MSCI ACWI ex USA IMI Net | | | 0.91 | 4.76 | 9.25 | | | |
| Excess | | | (0.51) | (0.77) | (0.32) | | | |
| BERS-TOTAL INTL FIS | 61 | 1.06 | 0.40 | 3.98 | 8.93 | | | |
| MSCI ACWI ex USA IMI Net | | | 0.91 | 4.76 | 9.25 | | | |
| Excess | | | (0.51) | (0.77) | (0.32) | | | |
| FIS-ALGERT EAFE SC | 3 | 0.06 | 0.90 | 5.38 | 11.86 | | | |
| MSCI EAFE SMALL CAP NET (DAILY) | | | 1.58 | 6.25 | 11.00 | | | |
| Excess | | | (0.68) | (0.87) | 0.86 | | | |
| FIS-ATIVO EAFE | 9 | 0.15 | 0.90 | 6.21 | 9.80 | | | |
| MSCI EAFE + Canada Net Index | | | 1.01 | 5.05 | 8.15 | | | |
| Excess | | | (0.11) | 1.16 | 1.65 | | | |
| FIS-CHANGE GLOBAL EM | 8 | 0.14 | (1.87) | (1.53) | 6.02 | | | |
| MSCI EMERGING MARKETS | | | 0.20 | 3.30 | 11.90 | | | |
| Excess | | | (2.07) | (4.83) | (5.88) | | | |
| FIS-DENALI EAFE | 11 | 0.19 | 0.60 | 4.70 | 9.61 | | | |
| MSCI EAFE + Canada Net Index | | | 1.01 | 5.05 | 8.15 | | | |
| Excess | | | (0.41) | (0.34) | 1.47 | | | |
| FIS-DUNDAS EAFE | 10 | 0.18 | 1.33 | 4.56 | 6.87 | | | |
| MSCI EAFE + Canada Net Index | | | 1.01 | 5.05 | 8.15 | | | |
| Excess | | | 0.32 | (0.49) | (1.28) | | | |
| FIS-METIS EAFE | 6 | 0.10 | (0.34) | 4.20 | 7.68 | | | |
| MSCI EAFE | | | 1.05 | 5.14 | 8.13 | | | |
| Excess | | | (1.38) | (0.94) | (0.45) | | | |

# New York City Board of Education Retirement System

## Manager / Benchmark Comparison Report

Rates of Return - Net Mgr

Periods Ending November 30, 2017

| | Ending Market Value ($MM) | % of Total | 1 Month | 3 Month | FYTD | CYTD | 2016 | 2015 |
|---|---|---|---|---|---|---|---|---|
| FIS-AUBREY EM | 5 | 0.09 | 0.09 | 2.88 | 16.04 | | | |
| MSCI EMERGING MARKETS | | | 0.20 | 3.30 | 11.90 | | | |
| Excess | | | (0.11) | (0.42) | 4.14 | | | |
| FIS-OSMOSIS EAFE | 8 | 0.15 | 1.31 | 5.93 | 8.25 | | | |
| MSCI EAFE | | | 1.05 | 5.14 | 8.13 | | | |
| Excess | | | 0.26 | 0.80 | 0.12 | | | |
| **EMERGING MARKETS** | | | | | | | | |
| ACADIAN | 326 | 5.66 | (0.97) | 0.31 | 9.95 | 33.46 | 12.74 | (15.14) |
| MSCI EMERGING MARKETS | | | 0.20 | 3.30 | 11.90 | 32.53 | 11.19 | (14.92) |
| Excess | | | (1.17) | (2.99) | (1.95) | 0.94 | 1.55 | (0.22) |
| CONY GT EM BLACKROCK | 125 | 2.18 | 0.13 | 3.22 | 11.74 | 32.68 | | |
| MSCI EMERGING MARKETS | | | 0.20 | 3.30 | 11.90 | 32.53 | | |
| Excess | | | (0.07) | (0.09) | (0.16) | 0.15 | | |
| **FIXED INCOME SUMMARY** | | | | | | | | |
| **STRUCTURED FIXED INCOME** | | | | | | | | |
| Blackrock Mortgages | 177 | 3.08 | (0.15) | (0.32) | 0.87 | 2.85 | 2.32 | 1.73 |
| CITIGROUP MORTGAGE INDEX | | | (0.11) | (0.39) | 0.81 | 2.18 | 1.59 | 1.56 |
| Excess | | | (0.04) | 0.07 | 0.06 | 0.67 | 0.73 | 0.17 |
| Prudential - Credit | 144 | 2.51 | (0.06) | 0.03 | 1.63 | 5.31 | 5.86 | (0.22) |
| NYC - Investment Grade Credit | | | (0.12) | (0.02) | 1.45 | 5.19 | 5.56 | (0.65) |
| Excess | | | 0.06 | 0.06 | 0.17 | 0.11 | 0.30 | 0.43 |
| Taplin Canida Habacht - Credit | 124 | 2.16 | (0.14) | 0.23 | 1.67 | 6.11 | 8.02 | (3.01) |
| NYC - Investment Grade Credit | | | (0.12) | (0.02) | 1.45 | 5.19 | 5.56 | (0.65) |
| Excess | | | (0.03) | 0.25 | 0.21 | 0.92 | 2.46 | (2.36) |
| State Street Govt | 373 | 6.49 | 0.09 | (1.61) | 0.48 | 4.14 | 1.23 | 0.45 |
| NYC - Treasury Agency Plus Five | | | 0.07 | (1.61) | 0.45 | 3.88 | 1.21 | 0.72 |
| Excess | | | 0.02 | 0.00 | 0.03 | 0.26 | 0.01 | (0.27) |

# New York City Board of Education Retirement System

## Manager / Benchmark Comparison Report

Rates of Return - Net Mgr

Periods Ending November 30, 2017

| | Ending Market Value ($MM) | % of Total | 1 Month | 3 Month | FYTD | CYTD | 2016 | 2015 |
|---|---|---|---|---|---|---|---|---|
| SSGA 1-3 Treasury Index | 79 | 1.37 | (0.21) | (0.44) | (0.03) | 0.44 | | |
| Citigroup USBIG Treasury 1-3 Y Index | | | (0.20) | (0.44) | (0.03) | 0.41 | | |
| Excess | | | 0.00 | 0.00 | 0.00 | 0.03 | | |
| **HIGH YIELD** | | | | | | | | |
| Loomis Sayles - High Yield | 135 | 2.34 | (0.08) | 0.89 | 1.27 | 6.56 | 19.92 | (7.07) |
| NYC-Loomis (BoA MLMSTII 7-03/BB&B PRIOR) | | | (0.27) | 1.02 | 2.15 | 7.17 | 17.49 | (4.64) |
| Excess | | | 0.19 | (0.13) | (0.88) | (0.61) | 2.44 | (2.43) |
| Shenkman - High Yield | 136 | 2.37 | (0.03) | 1.29 | 2.32 | 6.39 | 11.62 | (1.97) |
| CITIGROUP BB & B | | | (0.14) | 1.10 | 2.24 | 6.73 | 15.48 | (4.21) |
| Excess | | | 0.12 | 0.19 | 0.09 | (0.34) | (3.85) | 2.24 |
| **BANK LOANS** | | | | | | | | |
| Babson BL | 117 | 2.03 | 0.13 | 1.43 | 2.28 | 4.05 | 8.48 | 0.12 |
| CSFB LEVERAGED LOAN INDEX | | | 0.12 | 1.19 | 1.85 | 3.85 | 9.88 | (0.38) |
| Excess | | | 0.01 | 0.24 | 0.43 | 0.21 | (1.39) | 0.51 |
| **TIPS** | | | | | | | | |
| SSGA TIPS | 265 | 4.60 | 0.11 | (0.30) | 1.23 | 2.09 | 4.78 | |
| BBG BARC Gbl Inf-Lk: US TIPS (Dly) | | | 0.13 | (0.30) | 1.21 | 2.07 | 4.68 | |
| Excess | | | (0.02) | 0.00 | 0.02 | 0.02 | 0.09 | |
| **OTHER FIXED** | | | | | | | | |
| AFL-CIO HOUSING INV TRUST | 16 | 0.28 | 0.01 | (0.50) | 0.74 | 2.90 | 1.94 | 1.13 |
| BBG BARC Agg (Dly) | | | (0.13) | (0.55) | 0.78 | 3.07 | 2.65 | 0.55 |
| Excess | | | 0.14 | 0.05 | (0.04) | (0.17) | (0.71) | 0.58 |
| ACCESS RBC | 9 | 0.15 | (0.25) | (0.39) | 0.74 | 2.36 | 1.61 | 1.83 |
| Access RBC Benchmark | | | (0.19) | (0.62) | 0.47 | 1.74 | 1.52 | 1.40 |
| Excess | | | (0.05) | 0.22 | 0.27 | 0.62 | 0.09 | 0.43 |
| CPC CONST FACILITY | 1 | 0.01 | (0.04) | 1.50 | 2.22 | 4.93 | (3.95) | 12.90 |
| CPC CONST BENCHMARK | | | 0.28 | 0.84 | 1.43 | 3.04 | 3.03 | 2.90 |
| Excess | | | (0.33) | 0.65 | 0.79 | 1.90 | (6.99) | 10.01 |

# New York City Board of Education Retirement System

## Manager / Benchmark Comparison Report

Rates of Return - Net Mgr

Periods Ending November 30, 2017

| | Ending Market Value ($MM) | % of Total | 1 Month | 3 Month | FYTD | CYTD | 2016 | 2015 |
|---|---|---|---|---|---|---|---|---|
| CFSB-PPAR (GNMA) | 0 | 0.00 | (0.12) | (1.73) | (0.34) | 3.20 | 3.21 | 5.90 |
| GNMA Plus 65bps | | | (0.10) | (0.15) | 1.07 | 2.27 | 2.28 | 2.02 |
| Excess | | | (0.03) | (1.57) | (1.41) | 0.93 | 0.93 | 3.88 |
| CCD-PPAR (GNMA) | 0 | 0.01 | (0.32) | (1.81) | (0.33) | 2.41 | 2.78 | 5.08 |
| GNMA Plus 65bps | | | (0.10) | (0.15) | 1.07 | 2.27 | 2.28 | 2.02 |
| Excess | | | (0.22) | (1.66) | (1.39) | 0.14 | 0.50 | 3.06 |
| CCD-PPAR (FNMA) | 1 | 0.02 | (0.09) | (2.01) | (0.02) | 3.80 | 3.71 | 6.69 |
| FNMA Plus 85bps | | | (0.02) | (0.21) | 1.19 | 3.20 | 2.38 | 2.50 |
| Excess | | | (0.07) | (1.80) | (1.20) | 0.60 | 1.33 | 4.20 |
| CPC-PPAR (FNMA) | 1 | 0.02 | (0.01) | (1.86) | 1.15 | 4.50 | 6.15 | 8.96 |
| FNMA Plus 85bps | | | (0.02) | (0.21) | 1.19 | 3.20 | 2.38 | 2.50 |
| Excess | | | 0.01 | (1.65) | (0.04) | 1.29 | 3.77 | 6.46 |
| JPMC-PPAR (FNMA) | 3 | 0.05 | (0.12) | (2.00) | (0.06) | 8.65 | 7.94 | 6.18 |
| FNMA Plus 85bps | | | (0.02) | (0.21) | 1.19 | 3.20 | 2.38 | 2.50 |
| Excess | | | (0.10) | (1.79) | (1.24) | 5.44 | 5.56 | 3.68 |
| BOA-PPAR (FNMA) | 1 | 0.02 | (0.14) | (2.10) | (0.14) | 4.62 | 4.07 | 42.03 |
| FNMA Plus 85bps | | | (0.02) | (0.21) | 1.19 | 3.20 | 2.38 | 2.50 |
| Excess | | | (0.12) | (1.89) | (1.33) | 1.41 | 1.69 | 39.53 |
| LIIF-PPAR (GNMA) | 0 | 0.00 | 0.17 | (0.67) | 0.43 | 2.64 | 3.88 | 3.92 |
| GNMA Plus 65bps | | | (0.10) | (0.15) | 1.07 | 2.27 | 2.28 | 2.02 |
| Excess | | | 0.27 | (0.51) | (0.64) | 0.37 | 1.61 | 1.91 |
| NCBCI-PPAR (GNMA) | 0 | 0.00 | (0.13) | (1.61) | (0.01) | 2.55 | 3.51 | 5.53 |
| GNMA Plus 65bps | | | (0.10) | (0.15) | 1.07 | 2.27 | 2.28 | 2.02 |
| Excess | | | (0.04) | (1.46) | (1.08) | 0.28 | 1.23 | 3.52 |
| LIIF-PPAR (FNMA) | 2 | 0.03 | (0.09) | (2.02) | 0.16 | 8.64 | 5.03 | 6.29 |
| FNMA Plus 85bps | | | (0.02) | (0.21) | 1.19 | 3.20 | 2.38 | 2.50 |
| Excess | | | (0.07) | (1.81) | (1.03) | 5.43 | 2.65 | 3.79 |

# New York City Board of Education Retirement System

**Manager / Benchmark Comparison Report**

Rates of Return - Net Mgr

Periods Ending November 30, 2017

| | Ending Market Value ($MM) | % of Total | 1 Month | 3 Month | FYTD | CYTD | 2016 | 2015 |
|---|---|---|---|---|---|---|---|---|
| NCBCI-PPAR (FNMA) | 0 | 0.00 | 0.44 | (1.43) | 1.06 | 1.33 | 3.46 | 4.97 |
| FNMA Plus 85bps | | | (0.02) | (0.21) | 1.19 | 3.20 | 2.38 | 2.50 |
| Excess | | | 0.45 | (1.22) | (0.13) | (1.88) | 1.07 | 2.47 |
| BOARD OF ED. SHORT TERM | 37 | 0.64 | 0.09 | 0.23 | 0.48 | 0.99 | 0.55 | 0.39 |
| 91 DAY T-BILL | | | 0.08 | 0.26 | 0.44 | 0.74 | 0.33 | 0.05 |
| Excess | | | 0.00 | (0.03) | 0.04 | 0.24 | 0.23 | 0.35 |
| C/D - FAIL FLOAT EARNINGS | 0 | 0.00 | | | | | | |
| SECURITY LENDING | 6 | 0.10 | | | | | | |
| **PRIVATE EQUITY** | | | | | | | | |
| BERS-TOTAL PRIVATE EQUITY | 309 | 5.37 | 3.12 | 3.92 | 7.72 | 16.82 | 9.19 | 12.71 |
| BERS-TOTAL PRIVATE REAL ESTATE | 337 | 5.86 | 1.23 | 2.40 | 5.66 | 12.28 | 10.16 | 14.98 |
| BERS-TOTAL INFRASTRUCTURE | 58 | 1.01 | 0.49 | 2.03 | 9.79 | 21.34 | 8.08 | 9.15 |

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**NYC Board of Education Retirement System**
**Private Equity Portfolio**
**As of June 30, 2017 (in USD)**

| Vintage Year | Investment | First Drawdown | Committed Capital | Paid-In Capital | Distributed Capital | Market Value | Multiple | IRR[1] | PME Benchmark[2] | PME Spread[3] |
|---|---|---|---|---|---|---|---|---|---|---|
| **Active Investments** | | | | | | | | | | |
| 2005 | Mesirow Financial Private Equity Partnership Fund III, L.P. | 7/20/2006 | $ 57,000,000 | $ 55,093,273 | $ 70,716,309 | $ 20,842,091 | 1.66x | 8.51% | 8.51% | 0.01% |
| 2006 | Mesirow Financial Private Equity Partnership Fund IV, L.P. | 3/31/2008 | 25,000,000 | 22,842,233 | 21,125,104 | 16,541,947 | 1.65x | 10.41% | 12.25% | (1.85%) |
| 2006 | New York Fairview Private Equity Fund, L.P. | 7/14/2006 | 19,000,000 | 17,320,307 | 15,123,127 | 8,243,543 | 1.35x | 5.94% | 9.28% | (3.34%) |
| 2009 | Mesirow Financial Private Equity Partnership Fund V, L.P. | 3/7/2011 | 45,000,000 | 36,014,326 | 20,482,954 | 40,828,459 | 1.70x | 16.36% | 13.31% | 3.05% |
| 2012 | Platinum Equity Capital Partners III, L.P. | 1/14/2013 | 15,000,000 | 14,218,681 | 12,921,051 | 11,323,222 | 1.71x | 46.95% | 13.54% | 33.41% |
| 2012 | Warburg Pincus Private Equity XI, L.P. | 7/17/2012 | 25,000,000 | 23,574,624 | 6,279,427 | 26,414,106 | 1.39x | 13.06% | 12.41% | 0.66% |
| 2013 | Apollo Investment Fund VIII, L.P. | 12/11/2013 | 20,000,000 | 13,219,725 | 2,159,642 | 13,901,841 | 1.21x | 14.10% | 11.97% | 2.13% |
| 2013 | Carlyle Partners VI, L.P. | 7/3/2013 | 20,000,000 | 14,672,305 | 3,631,139 | 14,157,548 | 1.21x | 11.81% | 10.60% | 1.20% |
| 2013 | Landmark Equity Partners XV, L.P. | 10/30/2013 | 19,000,000 | 9,301,821 | 4,111,833 | 7,120,398 | 1.21x | 12.38% | 11.11% | 1.27% |
| 2013 | Landmark Equity Partners XV, L.P. - Side Car | 12/24/2013 | 6,000,000 | 3,267,826 | 1,381,046 | 3,050,222 | 1.36x | 17.03% | 8.81% | 8.22% |
| 2013 | CVC Capital Partners VI, L.P. | 2/18/2014 | 17,424,492 | 9,612,514 | 203,584 | 11,407,046 | 1.21x | 13.32% | 12.35% | 0.97% |
| 2013 | Crestview Partners III, L.P. | 3/3/2015 | 15,000,000 | 4,598,843 | 75,827 | 4,650,509 | 1.03x | 1.73% | 10.97% | (9.24%) |
| 2013 | Crestview Partners III (Co-Investment B), L.P. | 12/17/2015 | 5,000,000 | 3,067,127 | 72,440 | 3,507,028 | 1.17x | N/M | N/M | N/M |
| 2014 | ASF VI, L.P. | 5/9/2014 | 15,000,000 | 8,800,287 | 1,626,338 | 9,949,369 | 1.32x | 14.98% | 11.06% | 3.92% |
| 2014 | ASF VI NYC Co-Invest, L.P. | 5/9/2014 | 5,000,000 | 3,363,884 | 1,362,947 | 3,330,404 | 1.40x | 17.16% | 8.11% | 9.05% |
| 2014 | Carlyle Partners VI, L.P. - Side Car | 9/23/2014 | 2,200,000 | 1,193,842 | - | 1,249,377 | 1.05x | 2.26% | 11.24% | (8.98%) |
| 2014 | Lexington Capital Partners VIII, L.P. | 1/8/2015 | 20,000,000 | 5,625,142 | 2,554,470 | 5,419,219 | 1.42x | 30.36% | 12.91% | 17.45% |
| 2014 | Vista Equity Partners Fund V, L.P. | 9/8/2014 | 25,000,000 | 25,006,780 | 4,663,717 | 25,461,650 | 1.20x | 11.25% | 10.59% | 0.66% |
| 2015 | Centerbridge Capital Partners III, L.P. | 5/21/2015 | 2,500,000 | 704,548 | 33,074 | 849,836 | 1.25x | 14.46% | 11.56% | 2.90% |
| 2015 | Siris Partners III, L.P. | 5/4/2015 | 3,500,000 | 1,763,940 | 109,916 | 1,673,130 | 1.01x | 1.12% | 13.42% | (12.30%) |
| 2012 | NYCBERS - 2012 Emerging Manager Program* | 10/31/2014 | 25,000,000 | 10,133,493 | 1,003,083 | 11,001,128 | 1.18x | 11.89% | 10.71% | 1.18% |
| 2015 | American Securities Partners VII, L.P. | 7/8/2016 | 8,000,000 | 2,861,782 | 73,119 | 3,037,444 | 1.09x | N/M | N/M | N/M |
| 2015 | ASF VII, L.P. | 12/29/2015 | 10,000,000 | 1,122,637 | 80,842 | 1,427,045 | 1.34x | N/M | N/M | N/M |
| 2015 | ASF VII B NYC Co-Invest, L.P. | 12/29/2015 | 6,000,000 | 68,075 | - | 613,140 | 9.01x | N/M | N/M | N/M |
| 2015 | NYCBERS - 2015 Emerging Manager Program** | 2/22/2016 | 30,000,000 | 1,272,064 | 20,487 | 1,551,324 | 1.24x | N/M | N/M | N/M |
| 2015 | Warburg Pincus Private Equity XII, L.P. | 12/21/2015 | 21,500,000 | 6,838,951 | 94,077 | 6,655,057 | 0.99x | N/M | N/M | N/M |
| 2015 | Welsh, Carson, Anderson & Stowe XII, L.P. | 8/26/2015 | 10,000,000 | 2,815,523 | 138,026 | 3,480,868 | 1.29x | N/M | N/M | N/M |
| 2015 | Bridgepoint Europe V, L.P. | 2/8/2016 | 8,413,147 | 3,831,531 | 769,344 | 3,843,819 | 1.20x | N/M | N/M | N/M |
| 2015 | Bridgepoint Europe V Co-Invest | 8/16/2016 | 2,819,634 | 968,615 | - | 1,080,834 | 1.12x | N/M | N/M | N/M |
| 2015 | EQT VII, L.P. | 1/8/2016 | 16,954,069 | 6,251,764 | 30,712 | 7,190,861 | 1.16x | N/M | N/M | N/M |
| 2016 | Vista Equity Partners Fund VI, L.P. | 6/28/2016 | 16,000,000 | 7,728,910 | 129,290 | 7,509,336 | 0.99x | N/M | N/M | N/M |
| 2016 | Apax IX USD, L.P. | 5/12/2017 | 13,000,000 | 455,000 | - | 317,021 | 0.70x | N/M | N/M | N/M |
| 2017 | Ares Corporate Opportunities Fund V, L.P. | 6/22/2017 | 10,000,000 | 448,901 | - | 378,849 | 0.84x | N/M | N/M | N/M |
| 2017 | Green Equity Investors VII, L.P. | 5/12/2017 | 10,000,000 | 1,023,200 | - | 967,461 | 0.95x | N/M | N/M | N/M |
| 2017 | BC European Capital X, L.P. | N/A | 11,423,284 | - | - | - | N/A | N/M | N/M | N/M |
| 2017 | BC European Capital X Metro Co-Investment L.P. | 3/24/2017 | 4,536,441 | 400,104 | - | 399,523 | 1.00x | N/M | N/M | N/M |
| 2017 | Platinum Equity Capital Partners IV, L.P. | 3/21/2017 | 11,500,000 | 1,192,135 | 184,345 | 1,355,689 | 1.29x | N/M | N/M | N/M |
| 2017 | CVC Capital Partners VII, L.P. | N/A | 19,419,583 | - | - | - | N/A | N/M | N/M | N/M |
| 2017 | Apollo Investment Fund IX, L.P. | N/A | 32,000,000 | - | - | - | N/A | N/M | N/M | N/M |
| **Total Portfolio** | | | **$ 628,190,650** | **$ 320,674,712** | **$ 171,157,270** | **$ 280,730,342** | **1.41x** | **10.89%** | **10.41%** | **0.48%** |

| Vintage Year | Investment | First Drawdown | Committed Capital | Net Contributed Capital | Net Distributed Capital | Market Value | Multiple | IRR[1] | PME Benchmark[2] | PME Spread[3] |
|---|---|---|---|---|---|---|---|---|---|---|
| **Commitments Closed Subsequent to as of Date** | | | | | | | | | | |
| 2017 | Capital Partners Private Equity Income Fund III L.P. | N/A | $ 2,750,000 | - | - | - | N/A | N/A | N/A | N/A |
| 2017 | ICV Partners IV, L.P. | N/A | 3,000,000 | - | - | - | N/A | N/A | N/A | N/A |
| 2017 | KKR Americas Fund XII, L.P. | N/A | 16,000,000 | - | - | - | N/A | N/A | N/A | N/A |
| 2017 | Valor Equity Partners IV, L.P. | N/A | 4,500,000 | - | - | - | N/A | N/A | N/A | N/A |
| **Total Commitments Closed Subsequent to as of Date** | | | **$ 26,250,000** | **$ -** | **$ -** | **$ -** | **N/A** | **N/A** | **N/A** | **N/A** |

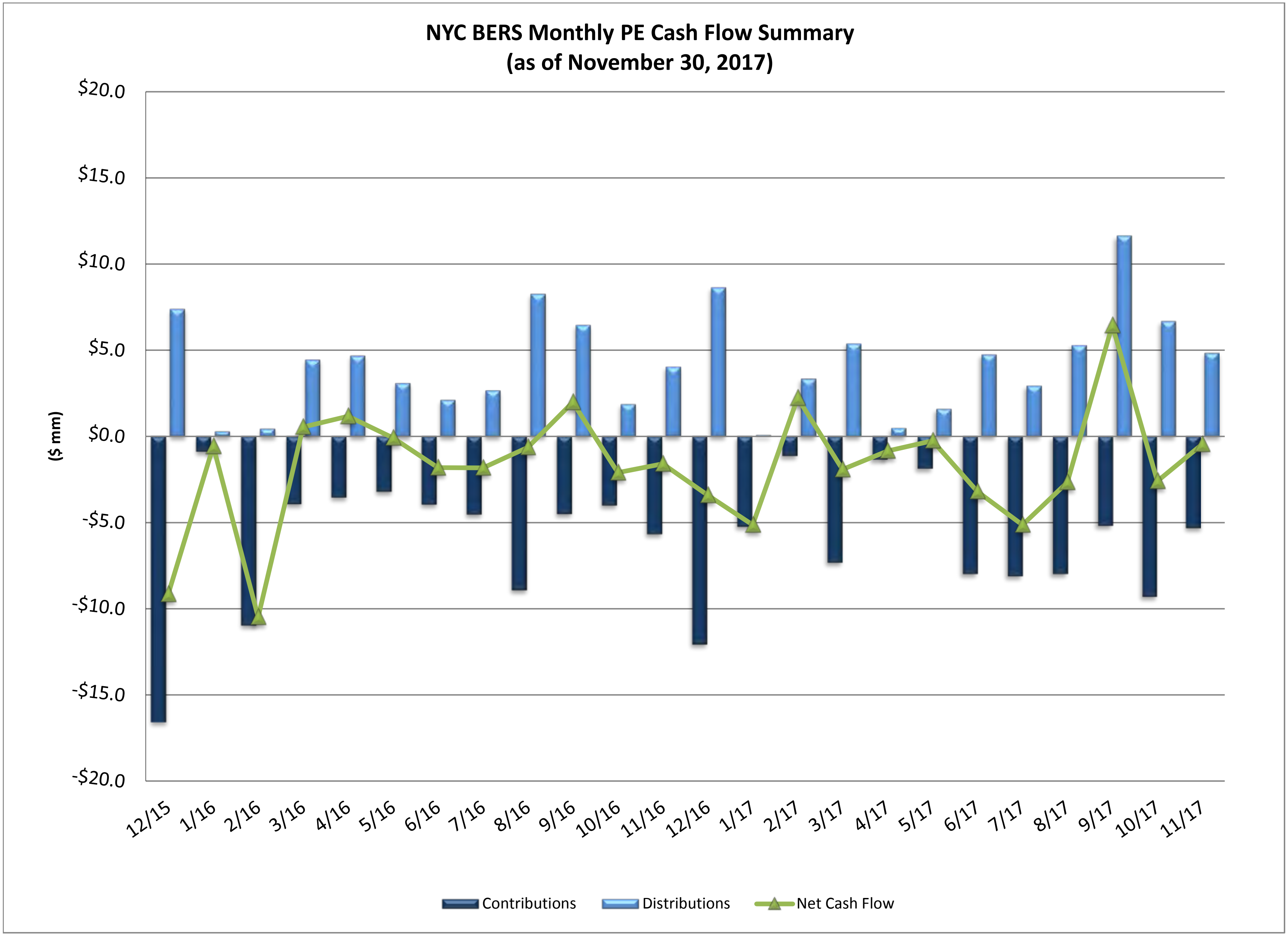
*Please note that the NYCBERS - 2012 Emerging Manager Program total commitment amount includes the full amount allocated to the Program, of which $14.7 million has been committed as of June 30, 2017.

**Please note that the NYCBERS - 2015 Emerging Manager Program total commitment amount includes the full amount allocated to the Program, of which $7.5 million has been committed as of June 30, 2017.

[2] The total PME is the Russell 3000 Total Return Index and incorporates the PME + methodology for all partnerships where distributions have occurred, and incorporates the and incorporates the Long Nickel methodologies for those partnerships that have not yet had any distributions to date. The fund PME is the Russell 3000 Total Return Index and incorporates the PME + methodology for all partnerships where distributions have occurred.

[3]PME Spread is the percentage difference between the IRR and PME Benchmark for each respective partnership.

Note: Where available, June 30, 2017 reported valuations were used. In the absence of June 30, 2017 reported values, market values have been adjusted forward using interim cash flows through June 30, 2017. The IRR calculated in the early years of a fund is not meaningful given the j-curve effect. The aggregate portfolio performance figures for IRR and multiple are as of June 30, 2017.


NYC BERS Monthly PE Cash Flow Summary
(as of November 30, 2017)
$20.0
$15.0
$10.0
$5.0
$0.0
-$5.0
-$10.0
-$15.0
-$20.0
($ mm)
12/15
1/16
2/16
3/16
4/16
5/16
6/16
7/16
8/16
9/16
10/16
11/16
12/16
1/17
2/17
3/17
4/17
5/17
6/17
7/17
8/17
9/17
10/17
11/17
Contributions
Distributions
Net Cash Flow

## FOIL

| Vintage Year | Investments by Strategy | Committed Capital | Contributions | Distributions | Market Value | Equity Multiple | IRR[3] |
|---|---|---|---|---|---|---|---|
| 2016 | Brookfield Premier Real Estate Partners | $10,000,000 | $9,298,363 | $0 | $9,962,236 | N/M | N/M |
| 2016 | Exeter Industrial Core Club Fund II | $10,000,000 | $3,410,000 | ($174,592) | $3,533,548 | 1.1x | 11.8% |
| 2016 | Jamestown Premier Property Fund | $5,000,000 | $5,287,663 | ($692,513) | $4,949,820 | 1.1x | 6.7% |
| 2010 | LaSalle Property Fund | $27,600,000 | $27,600,000 | ($6,801,901) | $37,304,309 | 1.6x | 11.3% |
| 2017 | Lion Industrial Trust - 2007 | $10,000,000 | $10,000,000 | $0 | $10,496,942 | N/M | N/M |
| 2014 | MetLife Core Property Fund | $15,000,000 | $15,000,000 | ($1,582,525) | $17,587,065 | 1.3x | 10.5% |
| 2013 | NYC Asset Investor #2 LLC (Related) | $11,000,000 | $10,783,052 | ($1,713,106) | $12,920,180 | 1.4x | 15.0% |
| 2016 | NYCRS Artemis Co-Investment [1] | $11,000,000 | $4,678,025 | ($3,194,160) | $2,727,571 | 1.3x | 40.1% |
| 2011 | UBS Trumbull Property Fund | $41,400,000 | $56,928,307 | ($12,426,565) | $76,151,566 | 1.6x | N/M |
| 2015 | USAA Eagle Real Estate Fund | $10,000,000 | $8,134,668 | $0 | $9,244,172 | 1.1x | 10.3% |
| **Core Portfolio** | | **$151,000,000** | **$151,120,077** | **($26,585,361)** | **$184,877,409** | **1.4x** | **10.3%** |
| 2017 | Basis Investment Group Real Estate Fund I [1,2] | $1,200,000 | $0 | $0 | $0 | N/M | N/M |
| 2013 | Blackstone Real Estate Partners Europe IV | $32,500,000 | $30,622,838 | ($7,473,516) | $33,597,810 | 1.3x | 15.8% |
| 2015 | Blackstone Real Estate Partners VIII | $16,500,000 | $8,320,945 | ($2,296,009) | $7,805,926 | 1.2x | 19.3% |
| 2012 | Brookfield Strategic Real Estate Partners | $10,000,000 | $11,189,727 | ($5,681,551) | $12,193,000 | 1.6x | 19.7% |
| 2014 | Carlyle Realty Partners VII | $25,000,000 | $15,266,534 | ($754,924) | $18,873,515 | 1.3x | 19.8% |
| 2016 | Divco West Fund V | $10,000,000 | $1,605,851 | $0 | $1,591,536 | N/M | N/M |
| 2017 | DRA Growth and Income Fund IX | $10,000,000 | $2,339,661 | ($299,690) | $2,175,537 | N/M | N/M |
| 2017 | DRA Growth and Income Fund IX Co-investment | $2,000,000 | $0 | $0 | $0 | N/M | N/M |
| 2015 | European Property Investors Special Opp IV | $11,176,931 | $2,770,999 | ($125,073) | $2,689,511 | 1.0x | 1.9% |
| 2016 | Exeter Industrial Value Fund IV | $10,000,000 | $0 | $0 | $0 | N/M | N/M |
| 2011 | Franklin Templeton Private Real Estate Fund | $30,000,000 | $33,866,149 | ($38,527,671) | $7,282,754 | 1.4x | 20.7% |
| 2014 | H/2 Special Opportunities Fund III [2] | $15,000,000 | $12,993,856 | ($964,106) | $15,282,932 | 1.3x | 18.3% |
| 2016 | H/2 Special Opportunities Fund IV [2] | $10,000,000 | $860,955 | $0 | $849,129 | N/M | N/M |
| 2017 | Lone Star Real Estate Fund V [2] | $23,164,910 | $0 | $0 | $0 | N/M | N/M |
| 2013 | NYC Asset Investor #1 LLC (Vanbarton) | $10,000,000 | $10,804,860 | ($1,499,210) | $12,222,756 | 1.3x | 10.7% |
| 2013 | NYC Asset Investor #3 LLC (Hudson) | $8,000,000 | $4,089,034 | ($798,737) | $3,900,956 | 1.1x | 8.3% |
| 2017 | NYCRS-KKR CMBS Retention Partners [2] | $13,000,000 | $0 | $0 | $0 | N/M | N/M |
| 2016 | Pramerica Real Estate Capital VI [2] | $10,352,480 | $2,341,644 | ($53,586) | $2,543,811 | N/M | N/M |
| 2016 | PW Real Estate Fund III LP | $10,624,734 | $3,187,867 | $0 | $3,008,615 | N/M | N/M |
| 2016 | Westbrook Real Estate Fund X | $10,000,000 | $1,635,521 | ($87,719) | $1,613,504 | 1.0x | 6.8% |
| **Non-Core Portfolio** | | **$268,519,055** | **$141,896,440** | **($58,561,793)** | **$125,631,292** | **1.3x** | **17.2%** |
| Emerging Manager | | $12,200,000 | $4,678,025 | ($3,194,160) | $2,727,571 | 1.3x | 40.1% |
| Debt | | $72,717,390 | $16,196,455 | ($1,017,692) | $18,675,872 | 1.2x | 18.1% |
| **Total Portfolio** | | **$419,519,055** | **$293,016,518** | **($85,147,154)** | **$310,508,701** | **1.4x** | **12.2%** |

**Additional Funds Closed**

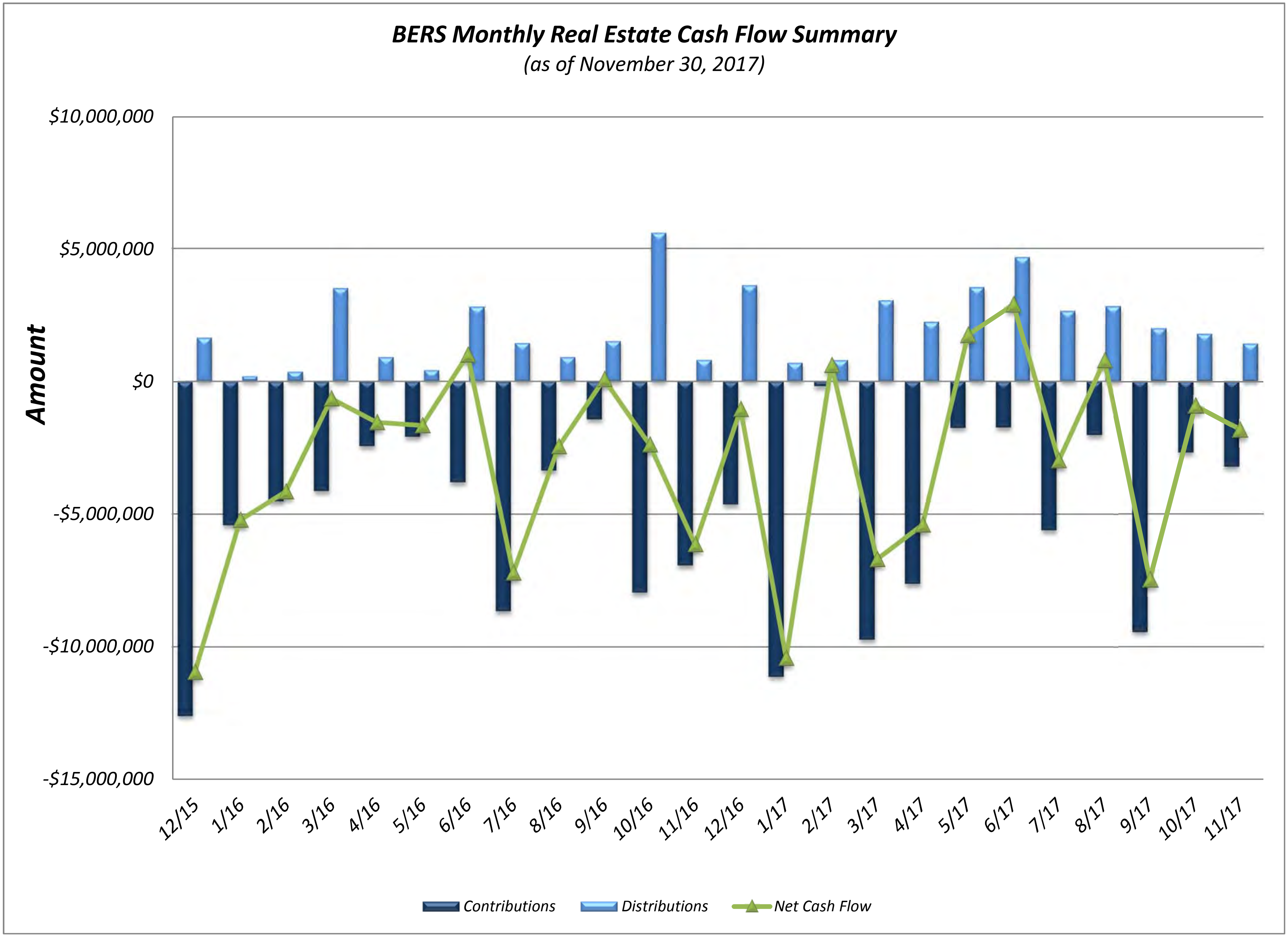
| | | |
|---|---|---|
| 2017 | KKR - RECOP | 25,000,000 |

[1] *Emerging managers*

[2] *Debt investments*

[2] *Returns as per custodian provided data*

*Information provided by the New York City Retirement Systems Consultants. Interim returns are subject to change and may differ due to differences in accounting and performance methodologies.*


BERS Monthly Real Estate Cash Flow Summary
(as of November 30, 2017)
Amount
$10,000,000
$5,000,000
$0
-$5,000,000
-$10,000,000
-$15,000,000
12/15
1/16
2/16
3/16
4/16
5/16
6/16
7/16
8/16
9/16
10/16
11/16
12/16
1/17
2/17
3/17
4/17
5/17
6/17
7/17
8/17
9/17
10/17
11/17
Contributions
Distributions
Net Cash Flow