



New York City
Fire Department Pension Fund, Subchapter Two
Performance Overview as of December 31, 2018

Total Fund Overview

New York City Fire Department Pension Fund, Subchapter Two

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BROAD MARKET COMMENTARY

The new year couldn't come quickly enough for investors. Not only did most major asset classes end 2018 in the red, but also US equities suffered their worst December since the 1930s. This wave of risk aversion was felt broadly as safe-haven fixed income rallied with Treasury yields declining in the final weeks of last year. Still, those looking to 2019 for respite may be disappointed. We believe investors, accustomed to the extended period of calm in the markets, need to reset their expectations and brace for higher levels of volatility. In addition, the US economy has entered the late stage of its expansionary cycle, negatively skewing the range of market outcomes in the coming years. As a result, our investment outlook reflects a more risk-averse posture. That said, the late stage of an expansionary economic cycle does not imply the end of the cycle. For now, we see scant evidence to suggest a recession is imminent in the United States. To this end we caution investors from shunning equities as stocks can still offer positive returns in the near term.

We believe equities offer an attractive entry point with the potential of rebounding from their December lows. We encourage investors to rebalance their developed market equity exposure and increase US stocks closer to index target weights. At the same time, we maintain our overweight position in emerging-market stocks. Despite the negative sentiment related to emerging economies in 2018, we see trade relations potentially improving between the United States and China, offering a tail wind for investors this year. Looking back, investors had few places to hide in 2018. Using a proxy of 10 major asset classes, core bonds were the only ones to avoid negative territory, finishing a rounding error above zero. While the magnitude of losses for 2018 was far less than 2008 or 2000, the breadth of asset classes performing poorly was unparalleled over the last 30 years.

While we believe the widespread selloff in equities in December presents an appealing rebalancing opportunity, our longer-term view underscores our more defensive stance. The US economy being in the late phase of a market cycle will be a focal point for investors, with economic risks and credit defaults likely becoming more pronounced in the years to come. As such, we have reset our outlook relative to the start of 2018 with a bias towards selling low-quality credit and increasing safe-haven fixed-income exposure. Economic trends suggest higher levels of volatility are in the offing, a common occurrence during the late phase of a market cycle. Where there is volatility, there is not only higher risk, but also greater tactical opportunities for investors. Investors should be prepared to take advantage of these dynamic opportunities in a volatile market environment by deploying safe-haven debt back into US equities and other risky assets. While 2019 may prove to be a challenging year, investment opportunities can be found in emerging markets and US equities should we see a selloff like the one in December. However, on balance, we encourage investors to adopt a more risk-averse stance by raising their holdings of safe-haven fixed income and reducing lower-quality credit exposure. While we do not believe a recession is imminent, the potential for adverse economic outcomes has expanded. As such, we are evaluating the movement of market metrics, such as the Treasury yield curve, which would warrant a more

Through December 31, 2018



defensive position; should the curve invert, we are likely to encourage investors to materially increase holdings of safe-haven fixed income.

We hope to expand on these thoughts and themes at NEPC's 24th Annual Investment Conference on May 7-8 in Boston. We plan to explore a wide variety of topics through the prism of this year's theme, *Transitions*. In addition, we are excited to bring you a roster of accomplished external speakers. We hope you can join us and we look forward to seeing you in May.

EQUITY

Stocks across the board took a severe beating in the fourth quarter with the MSCI ACWI Index down 12.8%; energy, the worst performing sector, lost 20.2%. The MSCI EAFE Index was in the red at 12.5%. In the US, stocks recorded their worst quarter in more than seven years with the S&P 500 bleeding 13.5% as investors fretted over the trade dispute between the United States and China, and the pace of interest rate increases. Domestic equities also posted their worst December since the 1930's as large-cap equities outperformed small caps and value bested growth. Emerging market stocks, which underwent a correction earlier in the year, outperformed developed markets with the MSCI EM Index falling 7.47% for the quarter. Brazil was the best performing country, buoyed by President-elect Jair Bolsonaro's pick for chief economic advisor and his pledge to sell state-owned companies. Asia lagged, pulled down by declines in China, Korea and Taiwan. Healthcare and information technology were among the worst performing sectors, losing 15.4% and 15.1%, respectively.

CREDIT

In the US, high-yield spreads— particularly in the lower-rated CCC segment— widened significantly in the fourth quarter. The burgeoning BBB-rated segment is a concern for investment-grade and high-yield debt investors. Double the size of the high-yield market, the growth in the BBB-segment has been driven largely by issuance, an increase in mergers and acquisitions, and credit downgrades from A to BBB. Widespread downgrades among BBBs could lead to an oversupply in high-yield securities and pressure prices.

For the three months ended December 31, the Bloomberg Barclays Aggregate rose 1.6% and the Bloomberg Barclays US Long Treasury was up 4.2%. The Bloomberg Barclays High Yield fell 4.5% and the S&P LSTA Leveraged Loan Index lost 3.5% during the same period. Within hedge funds, distressed and restructuring strategies were down 5.6% in the fourth quarter, losing 1.6% in 2018, according to the HFRI ED: Distressed/Restructuring Index. The HFRI ED: Credit Arbitrage Index declined 2.1% in the fourth quarter, but was up 2.1% for the year.

Outside the US, emerging markets were in the red for 2018 with local debt, the worst performing, down

6.2% for the year. However, local currency debt proved to be one of the few bright spots for the quarter, posting a gain of 2.1%. We believe the cyclical growth of credit markets, deteriorating quality and high leverage are creating opportunities for distressed debt investors. Safe haven fixed-income assets are also becoming increasingly appealing, given the lack of adequate compensation for taking on credit risk. However, select opportunities may exist in niche lending and collateralized loan obligations (CLOs).

REAL ASSETS

The Bloomberg Commodity Index declined 9.4% in the fourth quarter and 11.2% for the year. Most commodities (and the index) remain in contango—when the futures price of a commodity is above the expected future spot price—resulting in negative roll yield. We maintain a neutral view on commodities. Energy was the worst performing sub-sector, as oil prices were pressured by concerns of oversupply fueled by high inventories and stronger-than-expected production in Iran.

Natural gas posted losses of 2.3% in a volatile quarter marked by low inventory levels and fluctuating weather forecasts. Precious metals strengthened towards the end of 2018, bolstered by the selloff in equities and expectations for higher real interest rates. We remain positive on natural resource equities, believing they offer a more efficient exposure to commodity markets. However, they are also not immune to market volatility, losing 16.8% and 12.6% for the fourth quarter and year, respectively. The lack of recent investment in energy and mining has constrained supply; however, demand forecasts remain solid. For both sectors, we believe there are attractive opportunities for private equity and debt investment, though implementation options remain limited in the mining sector. Meanwhile, in real estate, real estate investment trusts (REITs) were down 6.0% in the fourth quarter. There is meaningful dispersion across property types in both valuation levels and capital flows. Broadly speaking, REITs, hurt by rising interest rates, are trading at discounts to their private-market counterparts.

In private core real estate, the NCREIF ODCE Index posted another year of stable returns, generating 8.4% in 2018. As yield spreads continue to tighten, we still favor managers capable of growing income at the property level, rather than relying on general market appreciation (which we expect will slow). We also prefer certain core-plus, real estate debt, or tactical core strategies to augment existing core real estate allocations. In the non-core real estate space, we believe that demographically-driven sectors (healthcare, data centers, workforce housing) and select international exposures offer the potential to outperform the broad market.

PERFORMANCE (NET OF FEES)

For the quarter, the Fund returned -6.03%, beating the policy index by 26 basis points. Over the trailing 3-year period, the Fund returned 7.22% versus the index return of 7.15%, outperforming the index by 7 basis points.

EQUITY COMPOSITE (NET OF FEES)

At the end of the quarter, the Fund held \$8.1 billion (63.11%) in equity securities. The total equity composite returned -9.36% for the quarter.

For the quarter, the portfolio held \$3.60 billion (27.98% of the total fund) in domestic equity assets. The Total Domestic Equity Portfolio returned -14.52%, lagging the Russell 3000 Index by 22 basis points. The domestic equity portfolio is lagging its index by 29 basis points for the fiscal year end ("FY) period. For the quarter, the best performing portfolio within the domestic equity composite was small cap, which bested its index by 20 basis points. Alternatively, the worst performing composite was the mid cap portfolio which lagged its index by 330 basis points for the quarter.

For the quarter, the portfolio held \$983 million (7.65% of the total fund) in developed international equity assets. The total developed international equity portfolio returned -13.91%, lagging its index, which had a return of -13.28%, by 63 basis points. For the quarter, the small cap (active) composite was the best performing composite, besting its index by 58 bps. Alternatively, the worst performing composite was the large/mid cap (active) portfolio underperformed its index by 88 basis points for the quarter.

For the quarter, the portfolio held \$175 million (1.36% of the total fund) in global equity assets. The total global equity portfolio returned -12.96%, lagging its index, which had a return of -12.75% by 21 basis points. The portfolio was funded in May of 2018.

FIXED INCOME COMPOSITE (NET OF FEES)

At the end of the quarter, the Fund held \$4.74 billion (36.88% of the total fund) in fixed income securities. The Total Fixed Income portfolio returned -0.07% for the quarter. For the FY period, the portfolio has posted a return of 0.18%. For the quarter, the worst performing composite was the core fixed income portfolio, which lagged its index by 125 basis points. The convertible debt portfolio was the strongest performing composite, for the quarter the portfolio outpaced its index by 381 basis points.

REAL ESTATE AND INFRASTRUCTURE COMPOSITES

Through December 31, 2018



For the quarter, the Fund had \$157 million (1.22% of the total fund) in Real Estate Equity Securities ("REIT). In the quarter, the REIT portfolio returned -7.46% (net of fees), underperforming its index by 86 basis points.

For the quarter, the Fund had \$559 million (4.35% of the total fund) in private real estate investments. For the quarter, the real estate portfolio returned 2.43% (gross of fees), outperforming NCREIF NFI-ODCE Net +100 basis points index, by 66 basis points.

For the quarter, the Fund had \$100 million (0.78% of the total fund) in private infrastructure investments. For the quarter, the infrastructure portfolio returned 3.83% (gross of fees), outperforming CPI +4% index by 255 basis points.

PRIVATE EQUITY COMPOSITES

For the quarter, the Fund had \$942 million (7.33% of the total fund) in private equity investments. For the quarter, the private equity portfolio returned 3.89% (gross of fees), underperforming NYC R3000+3% lagged index basis points index, by 401 basis points.

HEDGE FUND COMPOSITES

NYC Total HF Allocations (Direct + Permal holdings):

The allocation to hedge funds as of December 31, 2018 was \$667.4 million, 5.2% of the total fund. The fourth quarter return for the hedge fund portfolio was -1.7%, outperforming the HFRI FOF Composite Index +1% return of -4.6%, and underperforming the 1 Yr. T-bill yield + 4% return of 2.3%.

NYC's Direct HF allocations only:

The allocation to hedge funds as of December 31, 2018 was \$666.8 million, 5.2% of the total fund. The fourth quarter return for the hedge fund portfolio was -1.7%, outperforming the HFRI FOF Composite Index +1% return of -4.6%, and underperforming the 1 Yr. T-bill yield + 4% return of 2.3%.

Note: 1Yr. T-bill + 4% calculated using Barclays U.S. Treasury: 1-3 Year + 4%

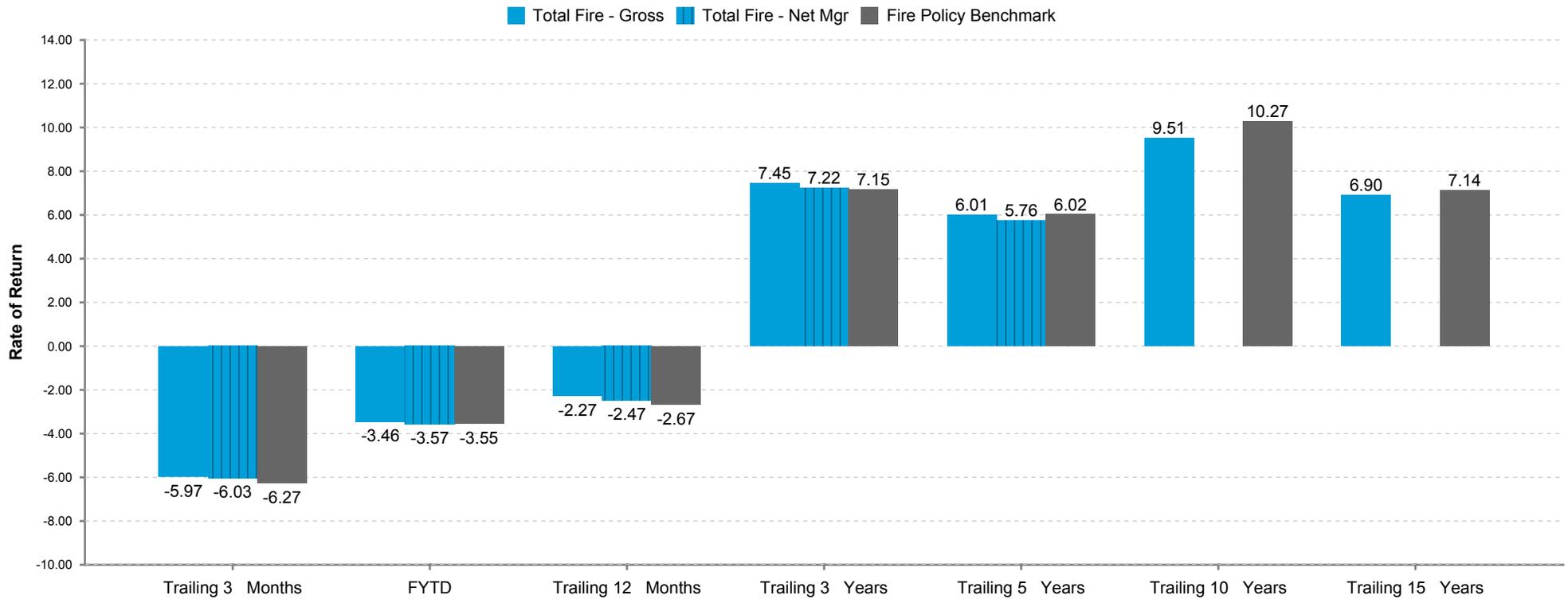
Total Portfolio Returns: December 31, 2018



TOTAL FIRE

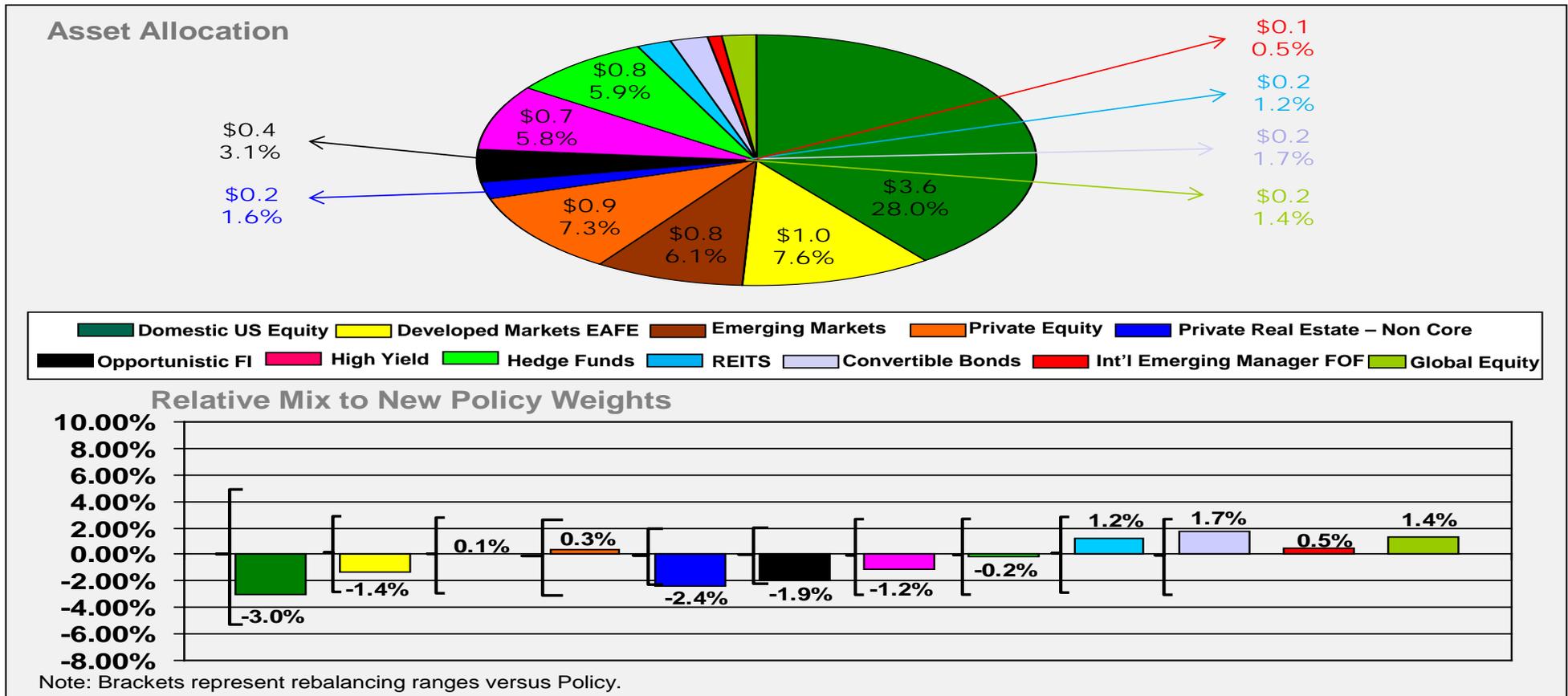
Market Value (Billions)

\$12.9



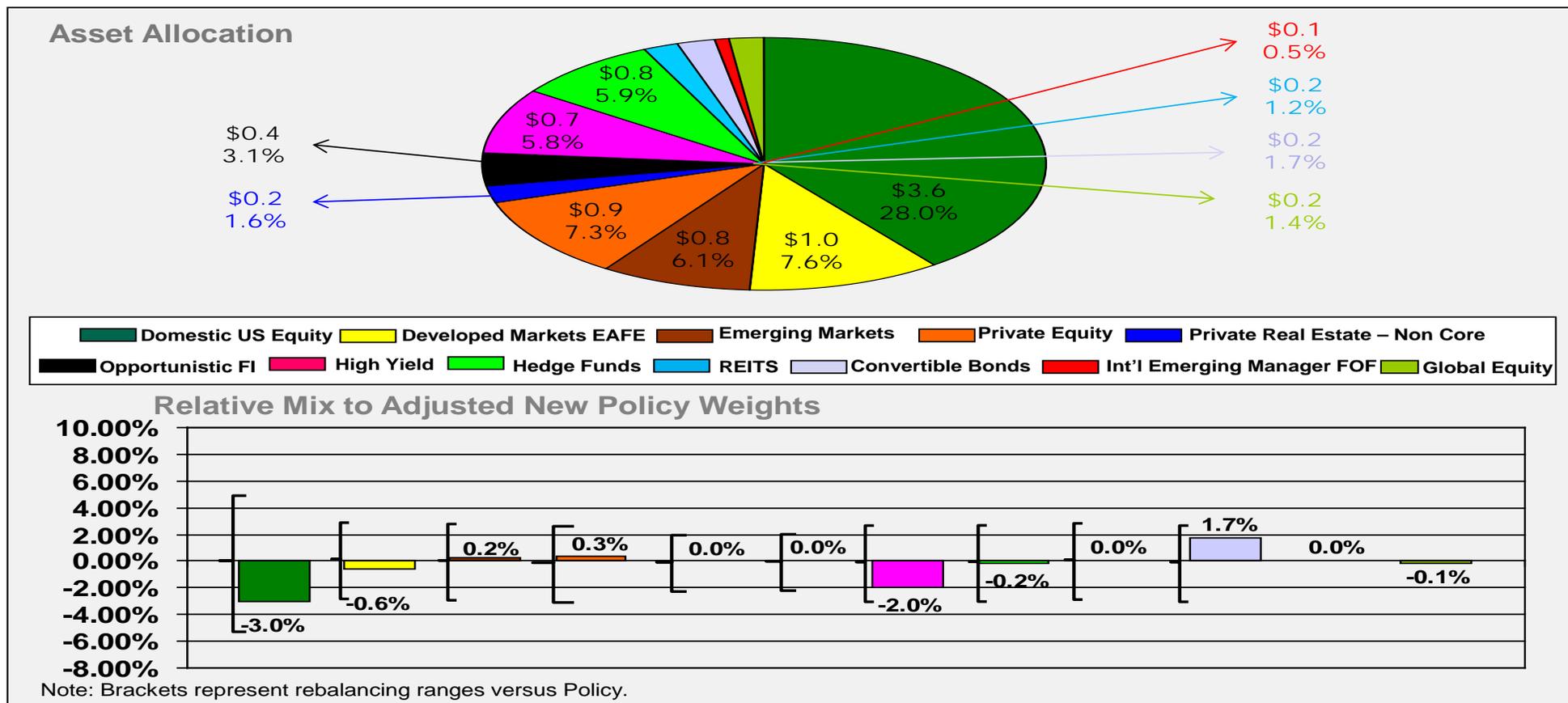
	Plan 3 Years	Benchmark 3 Years	Plan 5 Years	Benchmark 5 Years	Plan 10 Years	Benchmark 10 Years
Standard Deviation						
TOTAL FIRE	5.7	5.7	6.0	5.7	8.3	9.5

Portfolio Asset Allocation – Growth



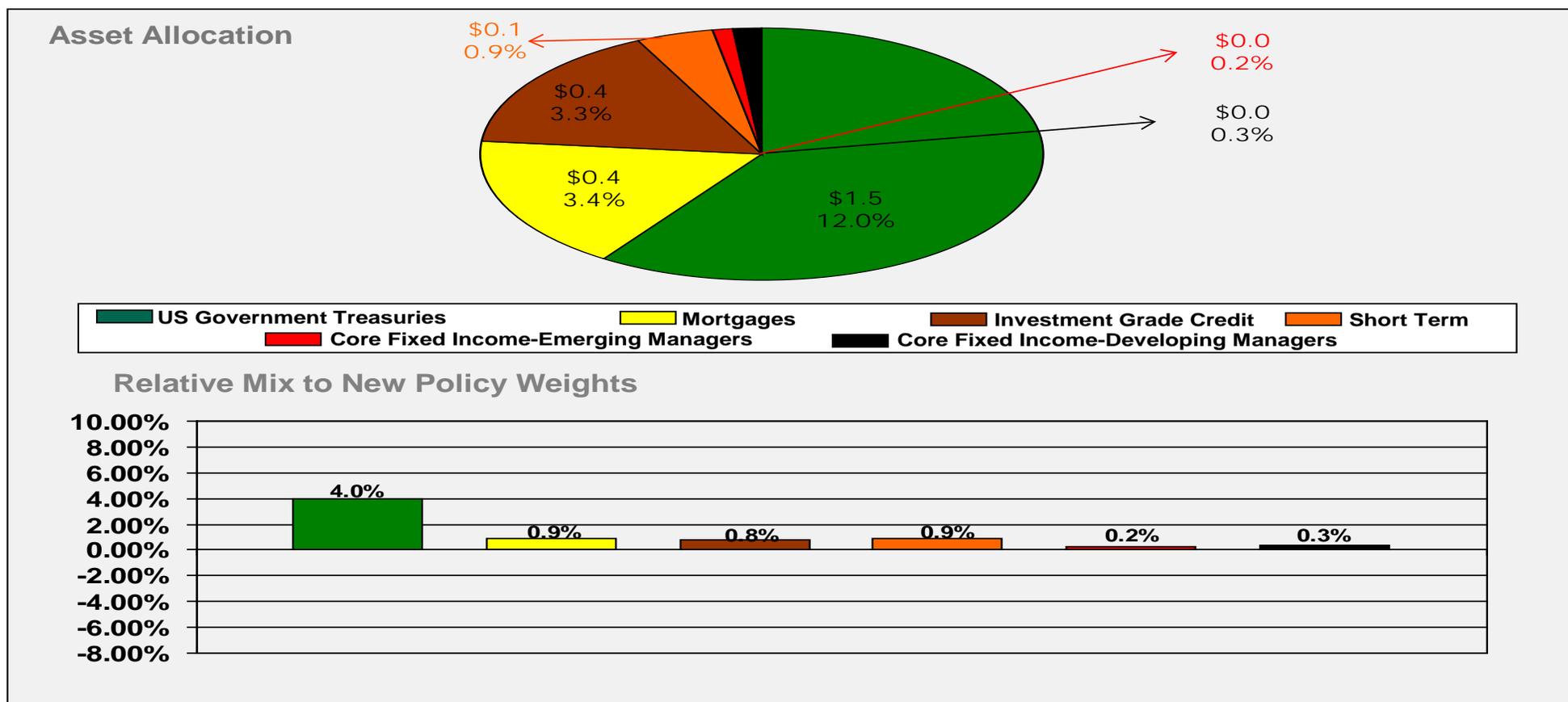


Portfolio Asset Allocation – Growth

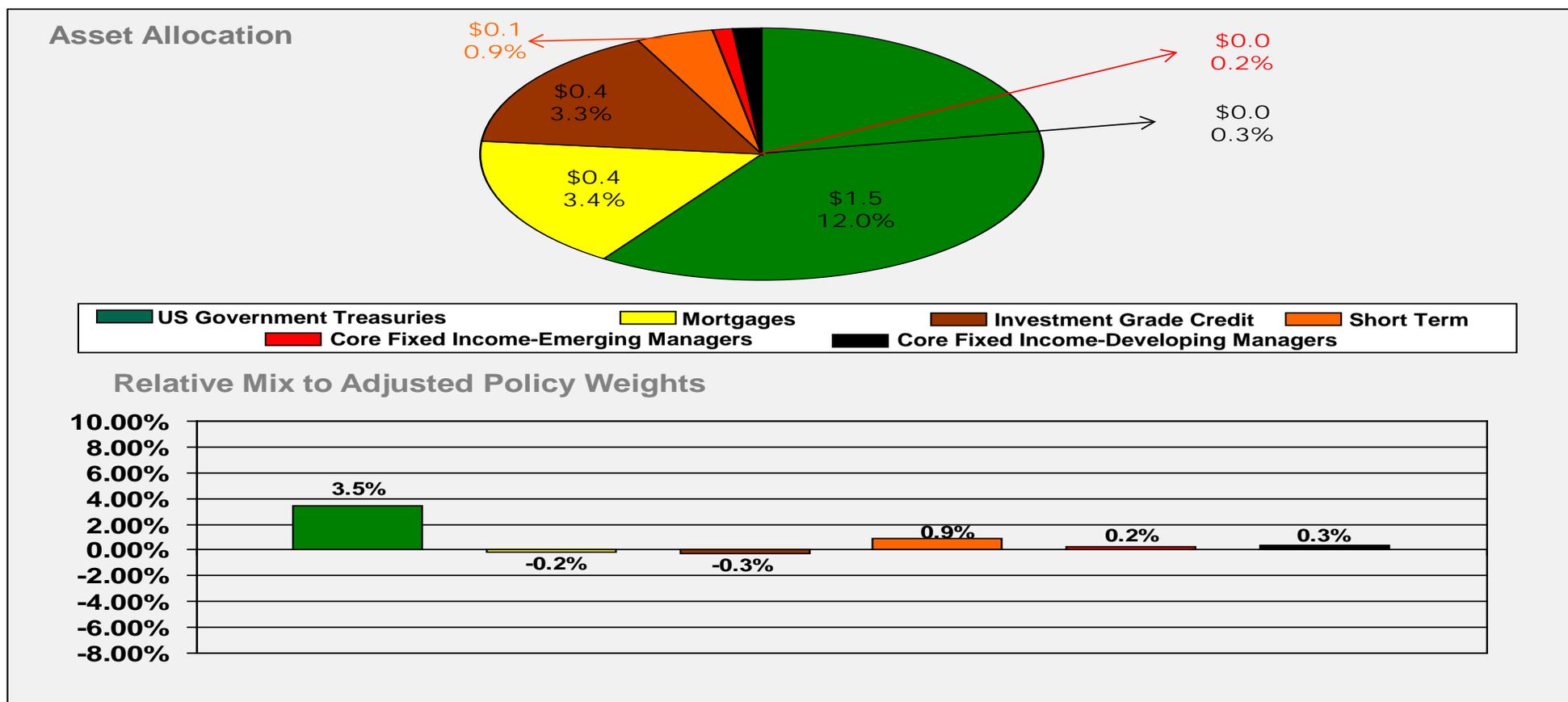


Note: On December 31, 2018 Fire's combined Fixed Income and Cash portfolios have a duration of 6.3 years. The duration of the Barclays US Aggregate Index was 5.9 years on that date.

Portfolio Asset Allocation – Deflation Protection

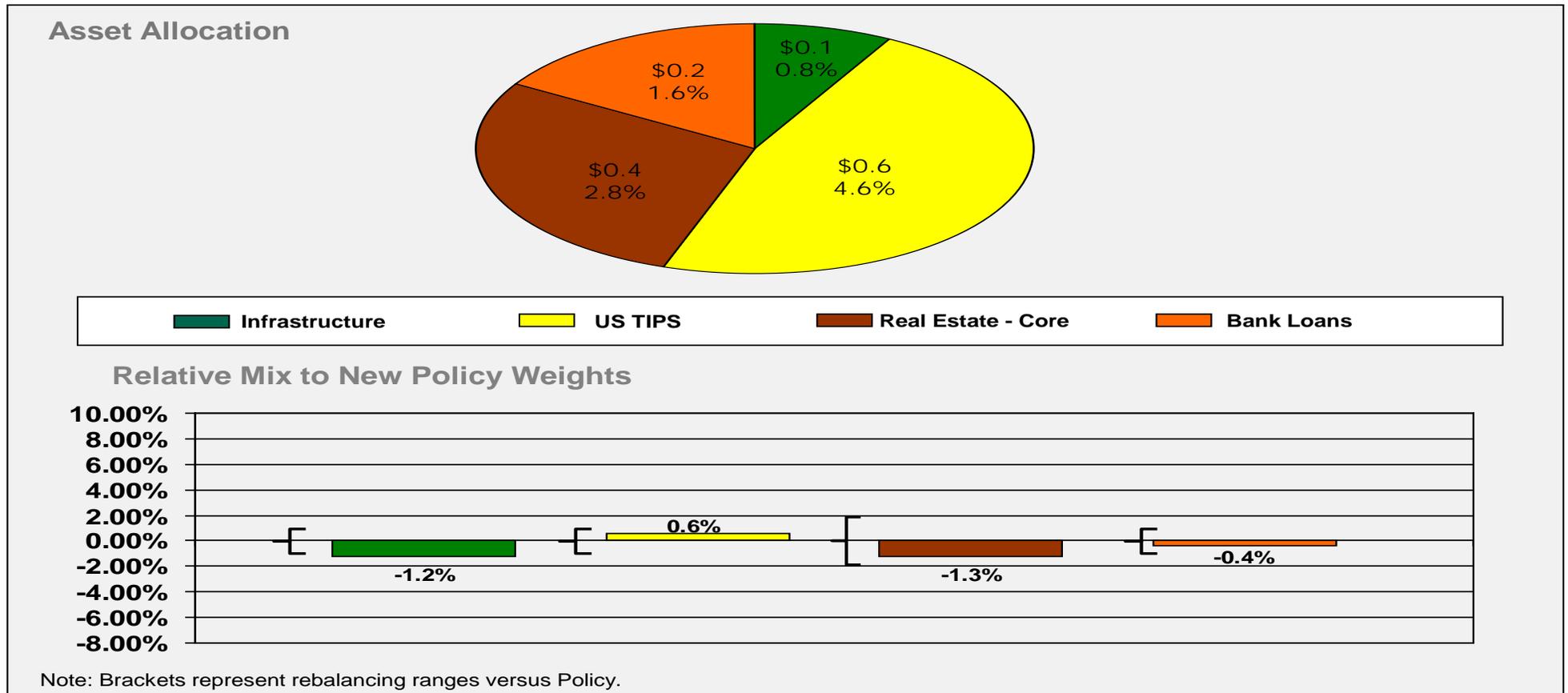


Portfolio Asset Allocation – Deflation Protection

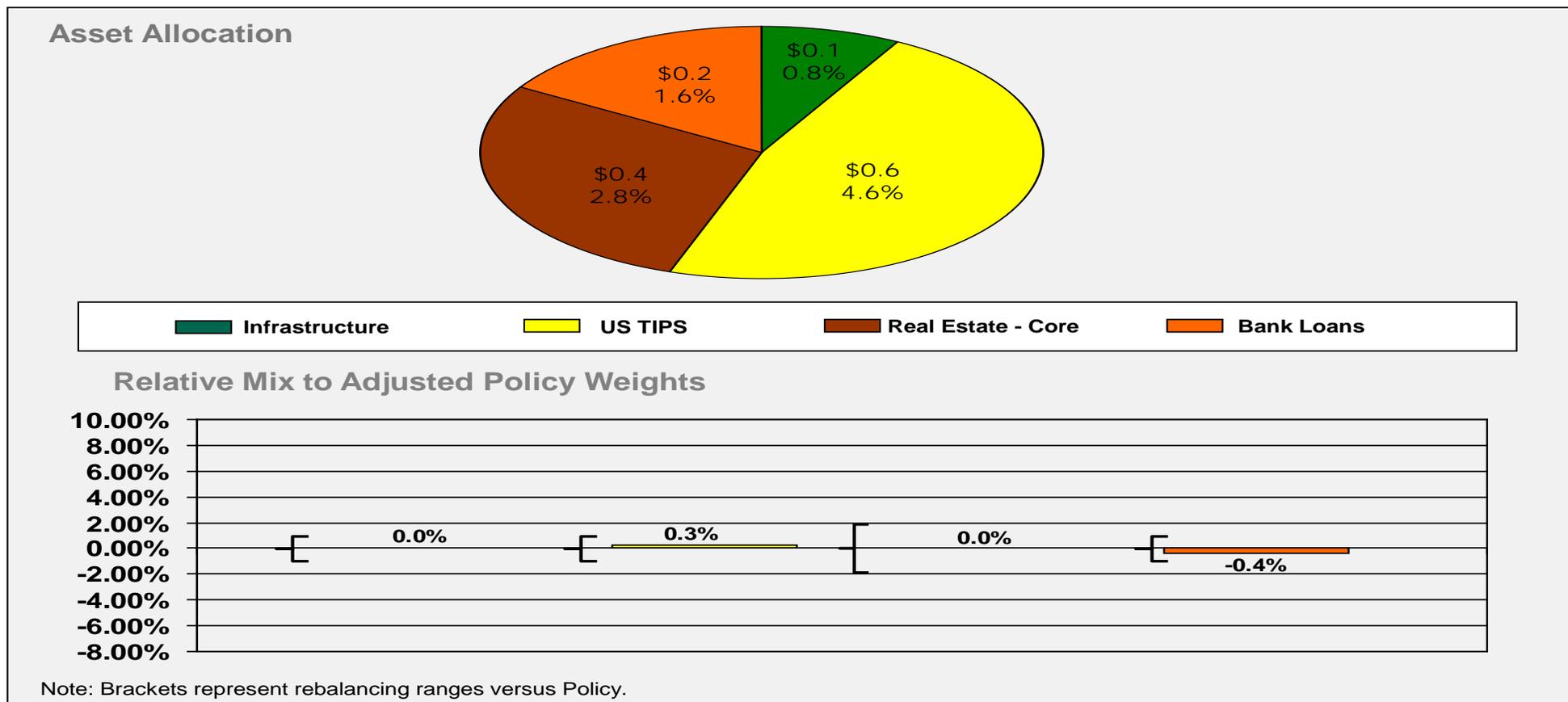


Note: On December 31, 2018 Fire's combined Fixed Income and Cash portfolios have a duration of 6.3 years. The duration of the Barclays US Aggregate Index was 5.9 years on that date.

Portfolio Asset Allocation – Inflation Protection

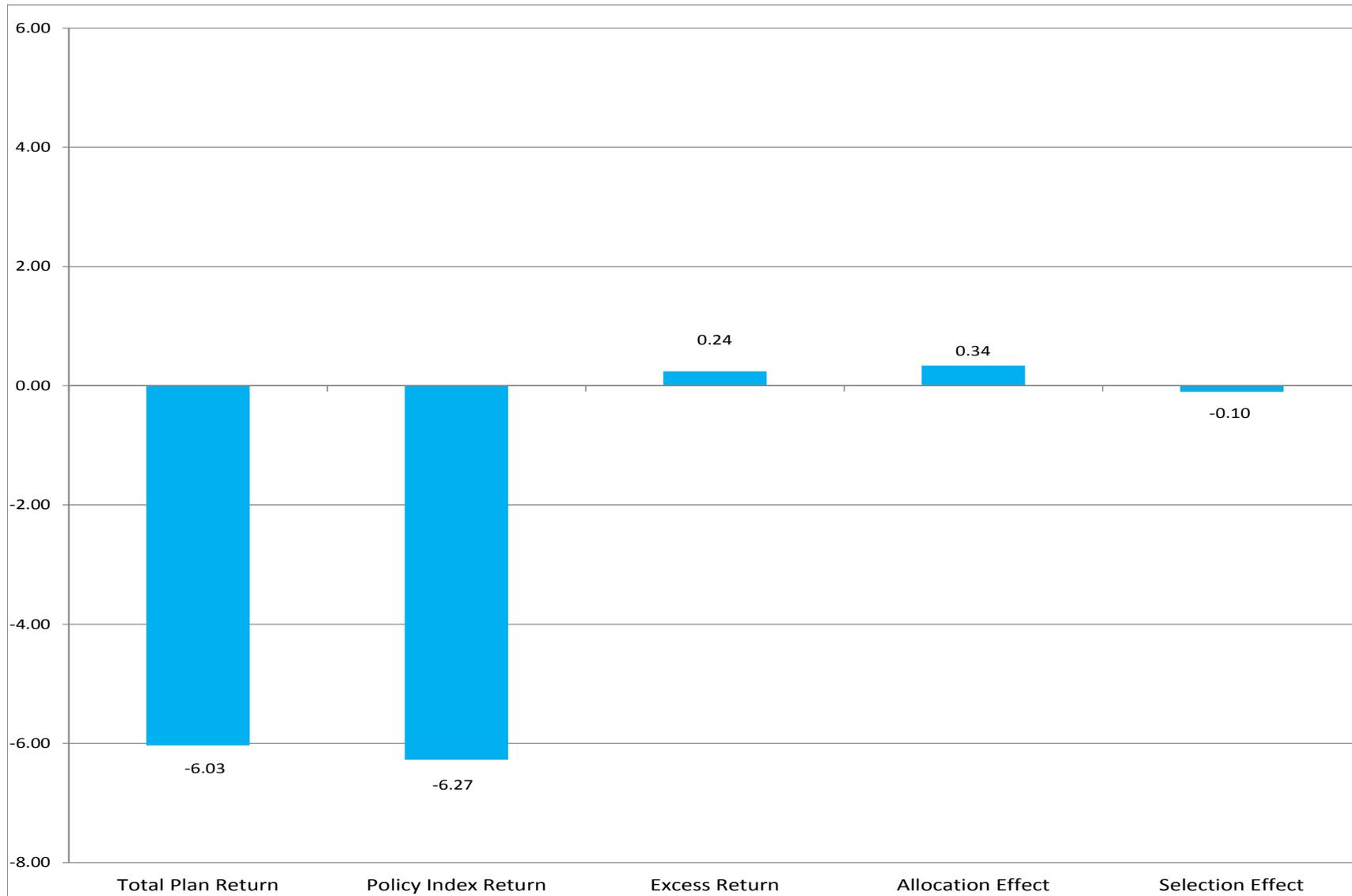


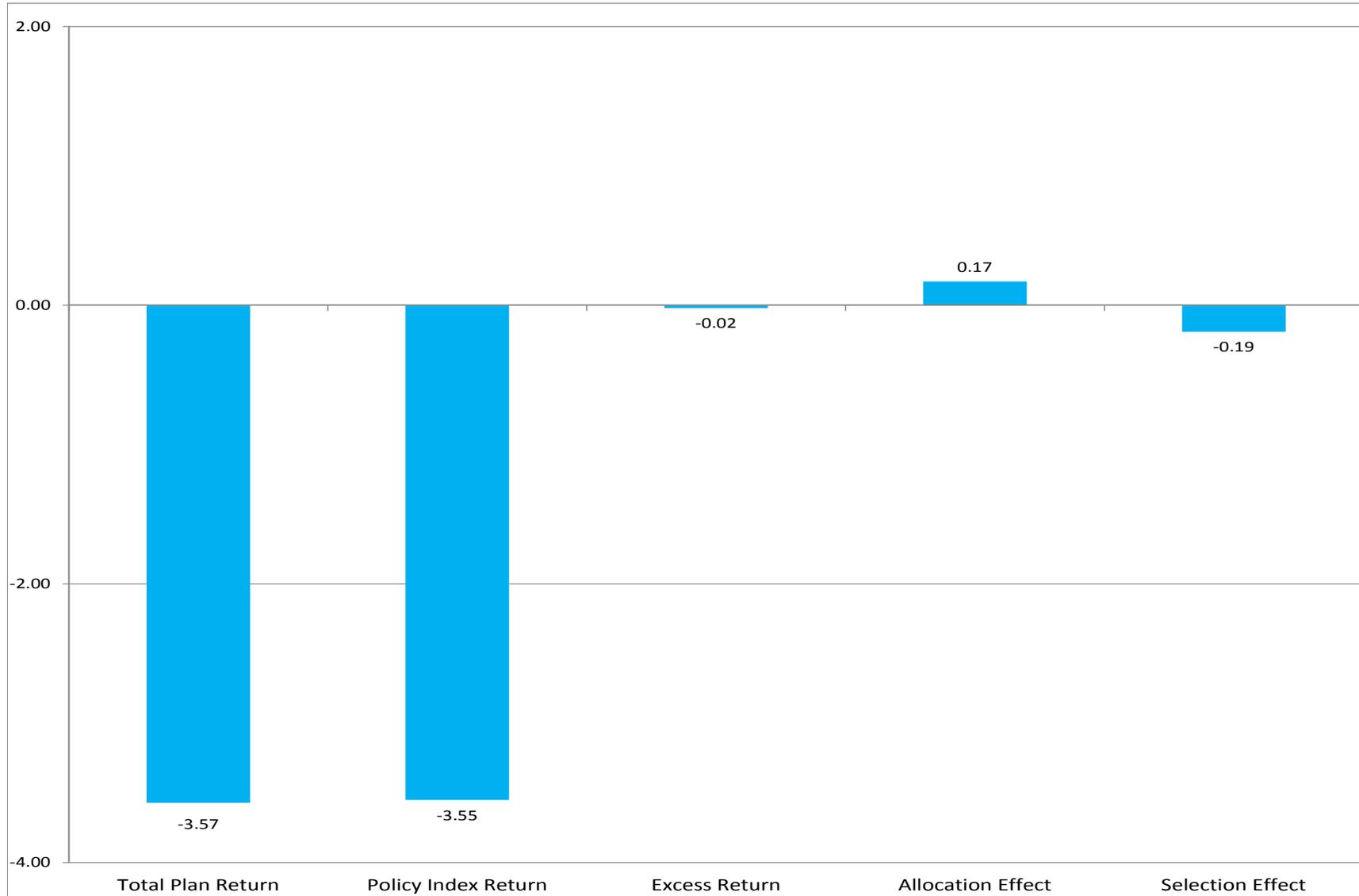
Portfolio Asset Allocation – Inflation Protection



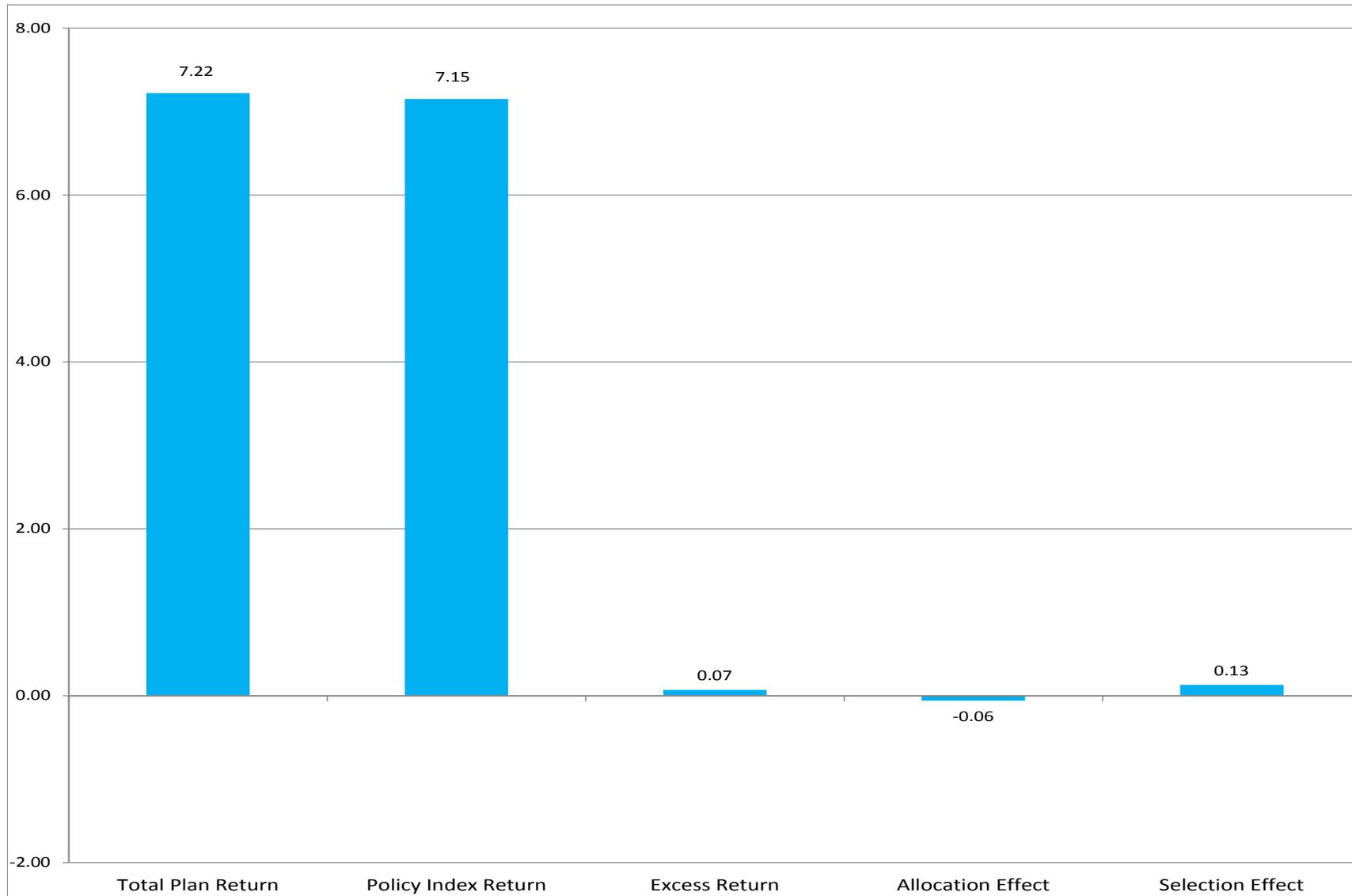
Note: On December 31, 2018 Fire's combined Fixed Income and Cash portfolios have a duration of 6.3 years. The duration of the Barclays US Aggregate Index was 5.9 years on that date.

Performance Attribution: Total Plan - Quarter Ending: December 31, 2018





Performance Attribution: Total Plan - 3 Years Ending: December 31, 2018





Allocation Effect - Asset Class Breakdown				
	Quarter	FYTD	3 Years	Benchmark
TOTAL FIRE	0.34	0.17	-0.06	Fire Policy Benchmark
TOTAL DOMESTIC EQUITY	0.27	0.17	0.01	RUSSELL 3000
TOTAL DEVELOPED EQUITY	0.02	0.00	0.00	MSCI World Ex USA IMI Net
TOTAL EMERGING MARKETS	-0.01	-0.05	-0.02	MSCI Emerging Markets
TOTAL GLOBAL EQUITY	0.00	-0.02	0.00	MSCI AC WORLD
TOTAL INTERNATIONAL FOF	0.00	0.00	0.00	MSCI ACWI Ex US IMI Net
TOTAL HEDGE FUNDS	-0.01	-0.01	-0.01	HFRI Fund of Funds Composite Index plus 1%
TOTAL REAL ESTATE SECURITIES	0.00	-0.03	-0.08	Dow Jones US Select Securities Index
TOTAL PRIVATE EQUITY	-0.01	-0.02	0.00	Russell 3K + 300bps
TOTAL PRIVATE REAL ESTATE - CORE	-0.01	-0.02	-0.01	NCREIF ODCE net
TOTAL PRIVATE REAL ESTATE - NON CORE	-0.01	-0.01	0.00	NCREIF ODCE net + 200bps
TOTAL INFRASTRUCTURE	0.00	0.00	0.00	CPI + 4%
TOTAL US TREASURY SHORT TERM	0.54	0.45	0.07	FTSE USBIG Treasury 1-3 Y Index
TOTAL US TREASURY INTERMEDIATE	0.00	0.00	-0.02	FTSE USBIG Treasury/Agency 1-10 y
TOTAL ACTIVE GOVERNMENT	0.21	0.12	-0.12	NYC - Treasury Agency Plus Five
TOTAL US TREASURY LONG DURATION	-0.53	-0.29	0.17	FTSE Treasury 10+
TOTAL INVESTMENT GRADE CREDIT	-0.04	-0.03	-0.09	NYC - Investment Grade Credit
TOTAL MORTGAGES	-0.04	-0.02	0.02	FTSE MORTGAGE INDEX
TOTAL ETI	0.00	0.00	0.00	ETI Custom Benchmark
TOTAL CORE FI- DEVELOPING MGRS	0.02	0.02	-0.01	BBG BARC Agg
TOTAL CORE FI- EMERGING MGRS	0.02	0.01	-0.01	BBG BARC Agg
TOTAL HIGH YIELD	-0.07	-0.06	0.09	High Yield Custom Benchmark
TOTAL BANK LOANS	-0.02	-0.01	0.01	Credit Suisse Lev Loan Index
TOTAL TIPS MANAGERS	0.00	0.00	-0.02	BBG BARC Gbl Inf-Lk: US TIPS (Dly)
TOTAL CONVERTIBLE BONDS	-0.05	-0.04	0.01	Merrill All US Converts
TOTAL OPPORTUNISTIC FIXED	-0.01	-0.01	0.00	OFI - JPMGHY / CSFB 50/50 Blend Plus 300
TOTAL CASH	0.06	0.03	-0.11	

Selection Effect - Asset Class Breakdown				
	Quarter	FYTD	3 Years	Benchmark
TOTAL FIRE	-0.10	-0.19	0.13	Fire Policy Benchmark
TOTAL DOMESTIC EQUITY	-0.07	-0.13	-0.04	RUSSELL 3000
TOTAL DEVELOPED EQUITY	-0.05	-0.11	0.24	MSCI World Ex USA IMI Net
TOTAL EMERGING MARKETS	-0.02	0.04	0.02	MSCI Emerging Markets
TOTAL GLOBAL EQUITY	0.00	-0.04	-0.02	MSCI AC WORLD
TOTAL INTERNATIONAL FOF	0.00	-0.01	0.00	MSCI ACWI Ex US IMI Net
TOTAL HEDGE FUNDS	0.16	0.22	0.09	HFRI Fund of Funds Composite Index plus 1%
TOTAL REAL ESTATE SECURITIES	-0.01	-0.01	-0.01	Dow Jones US Select Securities Index
TOTAL PRIVATE EQUITY	-0.27	-0.29	-0.28	Russell 3K + 300bps
TOTAL PRIVATE REAL ESTATE-CORE	0.02	0.03	0.02	NCREIF ODCE net
TOTAL PRIVATE REAL ESTATE-NON CORE	0.00	0.00	0.03	NCREIF ODCE net + 200bps
TOTAL INFRASTRUCTURE	0.01	0.03	0.03	CPI + 4%
TOTAL US TREASURY SHORT TERM	0.00	0.00	0.00	FTSE USBIG Treasury 1-3 Y Index
TOTAL US TREASURY INTERMEDIATE	0.00	0.00	0.00	FTSE USBIG Treasury/Agency 1-10 y
TOTAL ACTIVE GOVERNMENT	0.00	0.00	0.00	NYC - Treasury Agency Plus Five
TOTAL US TREASURY LONG DURATION	0.00	0.00	0.00	FTSE Treasury 10+
TOTAL INVESTMENT GRADE CREDIT	-0.01	-0.01	0.01	NYC - Investment Grade Credit
TOTAL MORTGAGES	0.00	0.00	0.00	FTSE MORTGAGE INDEX
TOTAL ETI	0.00	0.00	0.00	ETI Custom Benchmark
TOTAL CORE FI- DEVELOPING MGRS	0.00	0.00	0.00	BBG BARC Agg
TOTAL CORE FI- EMERGING MGRS	0.00	0.00	0.00	BBG BARC Agg
TOTAL HIGH YIELD	0.01	-0.03	-0.03	High Yield Custom Benchmark
TOTAL BANK LOANS	0.00	0.00	-0.01	Credit Suisse Lev Loan Index
TOTAL TIPS MANAGERS	0.00	0.00	0.00	BBG BARC Gbl Inf-Lk: US TIPS (Dly)
TOTAL CONVERTIBLE BONDS	0.06	0.05	-0.04	Merrill All US Converts
TOTAL OPPORTUNISTIC FIXED	0.07	0.08	0.01	OFI - JPMGHY / CSFB 50/50 Blend Plus 300
TOTAL CASH	0.00	0.00	0.01	

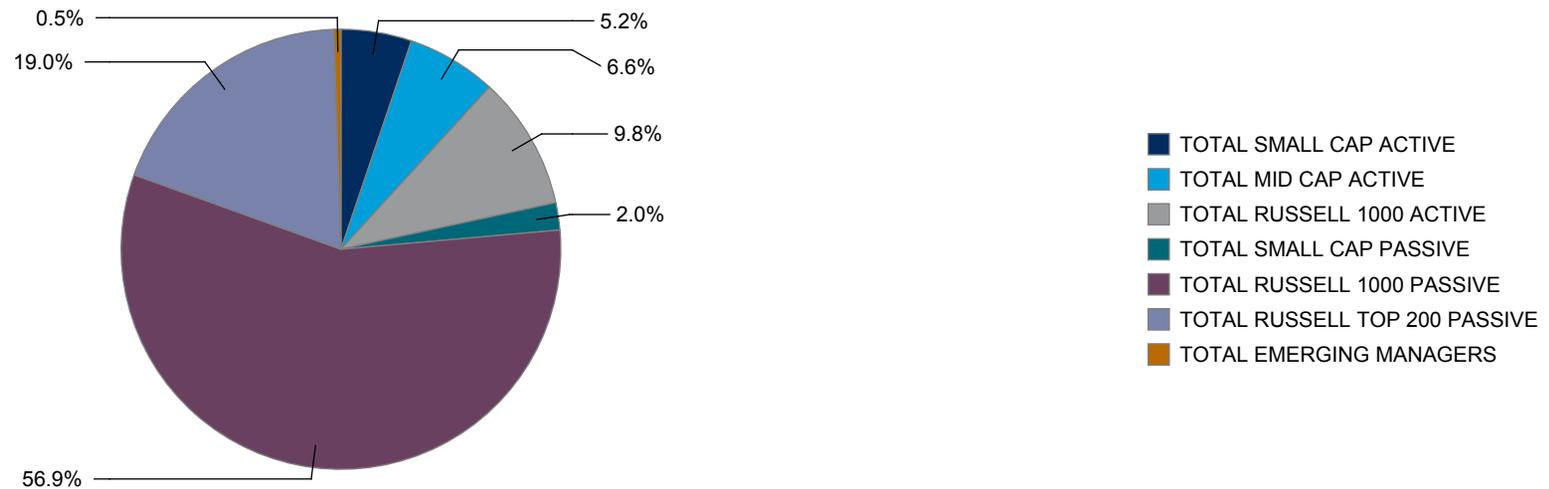
Total Domestic Equity Asset Allocations: December 31, 2018



Market Value (Billions)

TOTAL DOMESTIC EQUITY

\$3.6

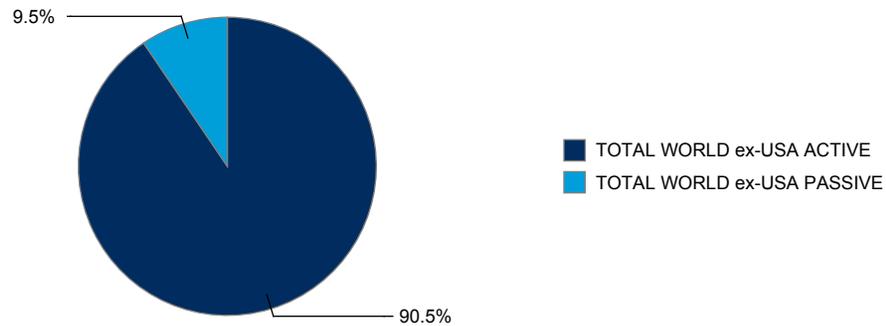


	<u>Policy Weight</u>	<u>Actual Weight</u>	<u>Under/Over Weight</u>	<u>Quarterly Returns</u>		
				<u>Fund</u>	<u>Benchmark</u>	<u>Excess</u>
TOTAL SMALL CAP ACTIVE	4.9	5.2	0.3	(19.5)	(20.2)	0.7
TOTAL MID CAP ACTIVE	7.0	6.6	(0.4)	(18.7)	(15.4)	(3.3)
TOTAL RUSSELL 1000 ACTIVE	18.0	9.8	(8.2)	(14.1)	(13.8)	(0.2)
TOTAL SMALL CAP PASSIVE	2.2	2.0	(0.2)	(21.4)	(20.2)	(1.2)
TOTAL RUSSELL 1000 PASSIVE	49.8	56.9	7.1	(13.7)	(13.8)	0.1
TOTAL RUSSELL TOP 200 PASSIVE	17.6	19.0	1.4	(13.2)	(13.2)	0.1
TOTAL EMERGING MANAGERS	0.6	0.5	(0.1)	(18.2)	(20.2)	2.0

World ex-USA Equity Asset Allocation: December 31, 2018



	<u>Market Value (Billions)</u>	<u>% of Plan</u>
TOTAL WORLD ex-USA	\$1.0	7.6

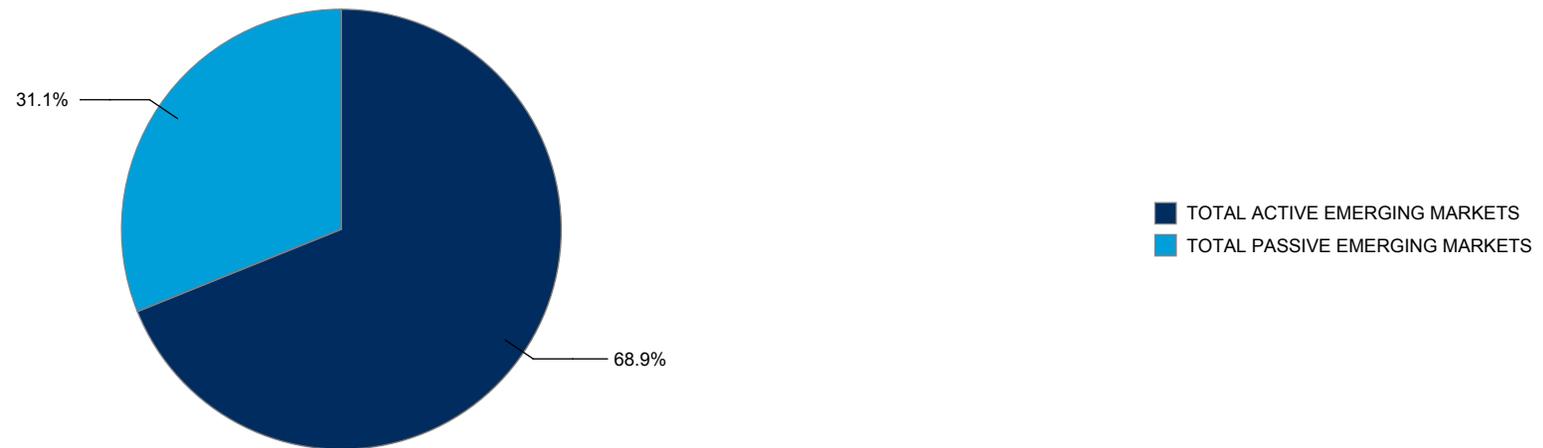


	<u>Asset Class Weight</u>	<u>Quarterly Returns</u>		
		<u>Fund</u>	<u>Benchmark</u>	<u>Excess</u>
TOTAL WORLD ex-USA LARGE & MID ACTIVE	79.40	(13.66)	(12.78)	(0.88)
TOTAL WORLD ex-SMALL CAP ACTIVE	11.10	(15.84)	(16.42)	0.58
TOTAL WORLD ex-USA SMALL CAP PASSIVE	3.11	(16.10)	(16.16)	0.07
TOTAL WORLD ex-USA LARGE & MID CAP PASSIVE	6.39	(12.47)	(12.78)	0.32
TOTAL WORLD ex-USA	100.00	(13.91)	(13.28)	(0.63)

Emerging Markets Equity Asset Allocation: December 31, 2018



	<u>Market Value (Millions)</u>	<u>% of Plan</u>
TOTAL EMERGING MARKETS	\$782.6	6.1

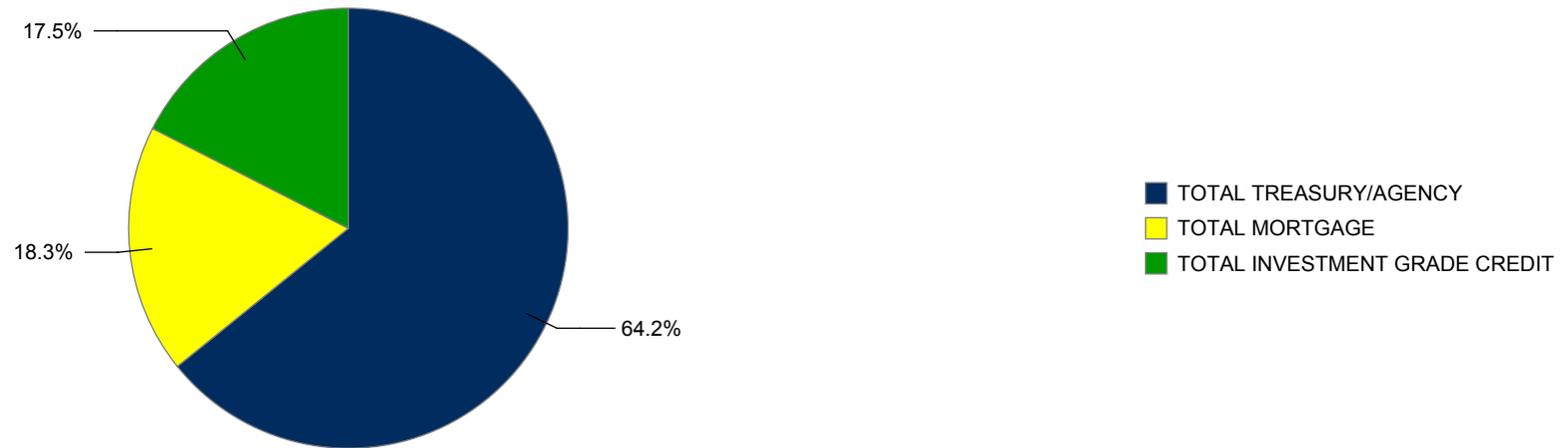


	<u>Asset Class Weight</u>	<u>Quarterly Returns</u>		
		<u>Fund</u>	<u>Benchmark</u>	<u>Excess</u>
TOTAL ACTIVE EMERGING MARKETS	68.90	(7.85)	(7.46)	(0.38)
TOTAL PASSIVE EMERGING MARKETS	31.10	(7.46)	(7.46)	0.01
TOTAL EMERGING MARKETS	100.00	(7.72)	(7.46)	(0.26)

Structured Fixed Income Asset Allocation: December 31, 2018



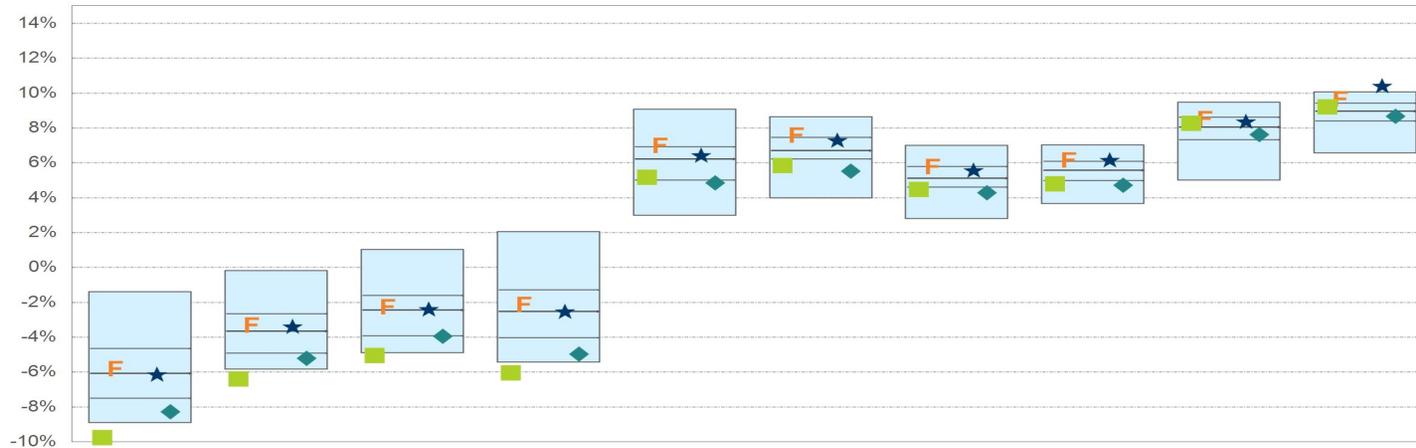
	<u>Market Value (Billions)</u>	<u>% of Plan</u>
TOTAL STRUCTURED+ETI	\$2.4	18.7



	<u>Policy Weight</u>	<u>Actual Weight</u>	<u>Under/Over Weight</u>	<u>Quarterly Returns</u>		
				<u>Fund</u>	<u>Benchmark</u>	<u>Excess</u>
TOTAL TREASURY/AGENCY	61.54	64.17	2.63	2.59	4.17	(1.58)
TOTAL MORTGAGE	19.23	18.28	(0.95)	2.03	2.09	(0.05)
TOTAL INVESTMENT GRADE CREDIT	19.23	17.55	(1.68)	(0.24)	0.17	(0.41)



**City of New York
Performance Comparison**
Total Returns of Master Trusts - Public : Plans > \$1 Billion
Cumulative Periods Ending : December 31, 2018



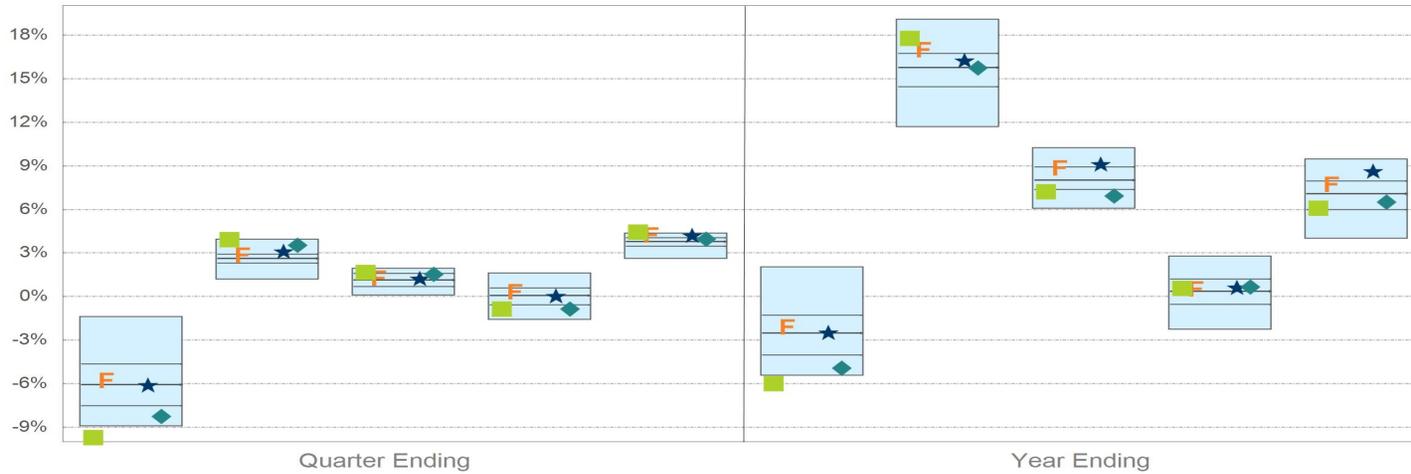
Percentile Rankings	1 Qtr	2 Qtrs	3 Qtrs	1 Year	2 Years	3 Years	4 Years	5 Years	7 Years	10 Years
5th	-1.39	-0.18	1.03	2.05	9.09	8.64	7.01	7.04	9.49	10.08
25th	-4.64	-2.65	-1.61	-1.29	6.94	7.47	5.79	6.08	8.61	9.44
50th	-6.06	-3.65	-2.44	-2.51	6.22	6.70	5.12	5.58	8.07	8.97
75th	-7.51	-4.92	-3.92	-4.03	5.02	6.22	4.61	4.99	7.32	8.41
95th	-8.89	-5.83	-4.90	-5.43	2.99	3.99	2.82	3.66	5.02	6.58
No. Of Obs	66	66	66	66	66	66	65	65	65	62
F Total System - Fire	-5.97 (45)	-3.46 (45)	-2.41 (46)	-2.27 (45)	6.84 (29)	7.45 (26)	5.63 (29)	6.01 (26)	8.37 (35)	9.51 (18)
★ Fire Policy Benchmark	-6.28 (54)	-3.55 (48)	-2.54 (53)	-2.67 (51)	6.28 (46)	7.15 (34)	5.43 (37)	6.02 (25)	8.21 (42)	10.27 (1)
■ Public Mkt Equiv 25	-9.91 (97)	-6.56 (99)	-5.21 (97)	-6.20 (100)	5.02 (75)	5.68 (85)	4.32 (79)	4.63 (84)	8.10 (46)	9.04 (46)
◆ Public Mkt Equiv 35	-8.45 (85)	-5.38 (81)	-4.10 (81)	-5.12 (93)	4.70 (78)	5.37 (88)	4.12 (83)	4.56 (84)	7.47 (70)	8.51 (68)

Wilshire Trust Universe Comparison Service® (TUCS®)



City of New York Performance Comparison

*Total Returns of Master Trusts - Public : Plans > \$1 Billion
Consecutive Time Periods: December 31, 2018*



Percentile Rankings	Dec 18	Sep 18	Jun 18	Mar 18	Dec 17	Dec 18	Dec 17	Dec 16	Dec 15	Dec 14
5th	-1.39	3.94	1.95	1.63	4.37	2.05	19.09	10.25	2.78	9.47
25th	-4.64	2.93	1.60	0.58	4.06	-1.29	16.74	8.92	1.21	7.94
50th	-6.06	2.62	1.13	0.08	3.78	-2.51	15.77	8.03	0.35	7.09
75th	-7.51	2.29	0.70	-0.57	3.47	-4.03	14.43	7.37	-0.54	5.99
95th	-8.89	1.19	0.12	-1.58	2.64	-5.43	11.71	6.08	-2.25	4.03
No. Of Obs	66	66	66	66	66	66	66	66	65	65
F Total System - Fire	-5.97 (45)	2.67 (48)	1.09 (56)	0.14 (48)	4.05 (26)	-2.27 (45)	16.81 (20)	8.68 (35)	0.34 (51)	7.55 (42)
★ Fire Policy Benchmark	-6.28 (54)	2.91 (28)	1.05 (56)	-0.14 (65)	4.01 (34)	-2.67 (51)	16.07 (43)	8.91 (26)	0.43 (46)	8.43 (19)
■ Public Mkt Equiv 25	-9.91 (97)	3.72 (7)	1.45 (35)	-1.05 (87)	4.25 (10)	-6.20 (100)	17.58 (11)	7.01 (84)	0.35 (50)	5.88 (76)
◆ Public Mkt Equiv 35	-8.45 (85)	3.35 (17)	1.35 (40)	-1.06 (87)	3.77 (50)	-5.12 (93)	15.53 (51)	6.73 (87)	0.46 (43)	6.31 (73)

Wilshire Trust Universe Comparison Service® (TUCS®)

FIRE RETIREMENT SYSTEM
ACTUAL FEES FOR FISCAL YEAR ENDED JUNE 30, 2018 AND ESTIMATED FEES FOR FY 2019 UPDATED THROUGH SEPTEMBER 2018

INVESTMENT STYLE (EQUITIES)	Avg. MV FY 2018 (\$MM)	Mgmt. Fees (\$M)	Partnership Expenses (\$M)	Actual 2018			Total Fees & Expenses in (\$M)		Avg. MV FYTD 09-30-18 (\$MM)	Estimates 2019	
				Mgmt. Fees / Partnership Expenses in BPS	Incentive Fees in (\$M)	Incentive Fees in BPS	Total Fees & Expenses in (\$M)	Total Fees & Expenses in BPS		Mgmt. Fees (\$M)	Mgmt. Fees in BPS
Total US Equities	6,512.85	3,011.61		4.62	479.58	-	3,491.20	5.36	3,993.90	3,491.65	8.74
Small Cap Active											
Small Cap Growth	206.48	1,388.08		67.22	-	-	1,388.08	67.22	234.66	1,610.35	68.63
Small Cap Value	59.25	589.31		99.47	-	-	589.31	99.47	73.22	731.88	99.96
	147.24	798.78		54.25	-	-	798.78	54.25	161.44	878.48	54.42
Mid Cap Active											
Mid Cap Growth	276.52	1,148.77		41.54	479.58	17.34	1,628.36	58.89	293.74	1,212.25	41.27
Mid Cap Value	-	-		-	-	-	-	-	-	-	-
Mid Cap Core	127.07	702.72		55.30	-	-	702.72	55.30	126.00	706.18	56.05
	149.45	446.05		29.85	479.58	32.09	925.64	61.94	167.75	506.07	30.17
Russell 1000 Fundamental	191.28	221.68			-	-	221.68	11.59	407.24	468.71	11.51
Active Emerging Managers (U.S. Equities)	21.10	98.29		46.59	-	-	98.29	46.59	22.29	111.25	49.90
Total US Active Equities	695.38	2,856.82		41.08	479.58	6.90	3,336.41	47.98	957.93	3,402.56	35.52
Small Cap Passive											
Small Cap Passive	37.94	1.58		0.42	-	-	1.58	0.42	90.21	3.82	0.42
Russell / S&P Passive											
Russell 1000 Growth Passive	799.71	36.56		0.46	-	-	36.56	0.46	1.16	-	-
Russell 1000 Value Passive	730.57	33.22		0.45	-	-	33.22	0.45	1.14	-	-
Russell 1000 Core Passive	2,609.38	13.72		0.05	-	-	13.72	0.05	2,171.30	43.41	0.20
Passive Russell 3000	924.46	60.13		0.65	-	-	60.13	0.65	0.00	-	-
Passive S&P 500	-	-		-	-	-	-	-	-	-	-
Passive Russell Top 200	715.41	9.58		0.13	-	-	9.58	0.13	772.15	41.86	0.54
Total US Passive Equities	5,817.47	154.79		0.27	-	-	154.79	0.27	3,035.97	89.09	0.29

FIRE RETIREMENT SYSTEM ACTUAL FEES FOR FISCAL YEAR ENDED JUNE 30, 2018 AND ESTIMATED FEES FOR FY 2019 UPDATED THROUGH SEPTEMBER 2018

	Actual 2018								Estimates 2019		
	Avg. MV FY 2018 (\$MM)	Mgmt. Fees (\$M)	Partnership Expenses (\$M)	Mgmt. Fees / Partnership Expenses in BPS	Incentive Fees in (\$M)	Incentive Fees in BPS	Total Fees & Expenses in (\$M)	Total Fees & Expenses in BPS	Avg. MV FYTD 09-30- 18 (\$MM)	Mgmt. Fees (\$M)	Mgmt. Fees in BPS
Total International Equities	2,122.25	6,109.77		28.79	-	-	6,109.77	28.79	2,076.27	5,808.85	27.98
Global Equity	100.11	65.03			-	-	65.03	6.50	200.55	900.89	44.92
Total Global Equities	100.11	65.03			-	-	65.03	6.50	200.55	900.89	44.92
Active EAFE Equities	1,085.77	3,345.37		30.81	-	-	3,345.37	30.81	1,038.19	3,124.13	30.09
World Ex-USA Large & Mid Active	922.60	2,582.09		27.99	-	-	2,582.09	27.99	907.40	2,523.52	27.81
World Ex-USA Small Cap Active	163.10	763.29		46.80	-	-	763.29	46.80	130.78	600.61	45.92
Total World Ex USA	0.07	-		-	-	-	-	-	0.01	-	-
Active Emerging Markets	570.72	2,367.23		41.48	-	-	2,367.23	41.48	589.70	2,331.09	39.53
Total Active Int'l Fund of Funds	73.80	257.42		34.88	-	-	257.42	34.88	73.24	253.79	34.65
Total Active International Equities	1,730.29	5,970.02		34.50	-	-	5,970.02	34.50	1,701.13	5,709.01	33.56
Int'l Passive Equities											
World Ex-USA Small Cap Passive	36.37	17.76		4.88	-	-	17.76	4.88	36.62	18.34	5.01
World Ex-USA Large & Mid Cap Passive	71.39	8.08		1.13	-	-	8.08	1.13	71.90	8.36	1.16
Passive Emerging Markets	284.20	113.92		4.01	-	-	113.92	4.01	266.62	73.15	2.74
Total Int'l Passive Equities	391.97	139.75		3.57	-	-	139.75	3.57	375.14	99.84	2.66
REITS Active Equities	199.95	778.89		38.95	-	-	778.89	38.95	171.60	714.57	41.64

FIRE RETIREMENT SYSTEM
ACTUAL FEES FOR FISCAL YEAR ENDED JUNE 30, 2018 AND ESTIMATED FEES FOR FY 2019 UPDATED THROUGH SEPTEMBER 2018

	Actual 2018						Total Fees & Expenses in (\$M)		Avg. MV FYTD 09-30- 18 (\$MM)	Estimates 2019	
	Avg. MV FY 2018 (\$MM)	Mgmt. Fees (\$M)	Partnership Expenses (\$M)	Mgmt. Fees / Partnership Expenses in BPS	Incentive Fees in (\$M)	Incentive Fees in BPS	Total Fees & Expenses in (\$M)	Total Fees & Expenses in BPS		Mgmt. Fees (\$M)	Mgmt. Fees in BPS
INVESTMENT STYLE (FIXED INCOME)											
Total Fixed Income	4,116.89	5,269.86		12.80	25.20	0.06	5,295.06	12.86	4,551.45	5,060.94	11.12
Structured Program	2,116.17	1,094.72		5.17	25.20	0.12	1,119.92	5.29	2,473.86	876.28	3.54
Government Treas/Agency Sector	718.53	338.55		4.71	25.20	0.35	363.74	5.06	1,266.65	277.59	2.19
Long Duration Treasury	429.39	41.49		0.97			41.49		453.29	45.95	1.01
Mortgage Sector	332.06	163.45		4.92	-	-	163.45	4.92	331.59	164.86	4.97
Investment Grade Credit Sector	636.20	551.24		8.66	-	-	551.24	8.66	422.33	387.88	9.18
Developing Managers	44.02	87.15		19.80	-	-	87.15	19.80	43.80	87.52	19.98
Emerging Managers	30.09	103.08		34.25	-	-	103.08	34.25	30.01	103.79	34.58
TIPS	553.68	98.24		1.77	-	-	98.24	1.77	592.04	106.33	1.80
Active TIPS Managers	140.54	77.80		5.54	-	-	77.80	5.54	150.41	84.03	5.59
Passive TIPS Managers	413.14	20.45		0.49	-	-	20.45	0.49	441.63	22.30	0.50
High Yield	634.27	1,937.20		30.54	-	-	1,937.20	30.54	629.70	1,748.55	27.77
Bank Loans	201.83	729.21		36.13	-	-	729.21	36.13	208.12	741.45	35.63
Convertible Bonds	211.70	951.85		44.96	-	-	951.85	44.96	233.85	1,125.80	48.14
ETI - Access - RBC	25.01	46.40		18.55	-	-	46.40	18.55	26.69	49.23	18.44
ETI - AFL-CIO HIT	54.97	222.00		40.39	-	-	222.00	40.39	54.55	222.00	40.70
Total Public Markets (Externally managed)	12,806.89	15,235.16		11.90	504.78	0.39	15,739.94	12.29	10,734.95	15,976.91	14.88
Other ETI Programs	17.43	-		-	-	-	-	-	17.75	-	-
In-House Short Term	227.74	-		-	-	-	-	-	241.08	-	-
Total Public Markets	13,052.06	15,235.16		11.67	504.78	0.39	15,739.94	12.06	10,993.77	15,976.91	14.53

FIRE RETIREMENT SYSTEM
ACTUAL FEES FOR FISCAL YEAR ENDED JUNE 30, 2018 AND ESTIMATED FEES FOR FY 2019 UPDATED THROUGH SEPTEMBER 2018

INVESTMENT STYLE (PRIVATE MARKETS)	Avg. MV FY 2018 (\$MM)	Mgmt. Fees (\$M)	Partnership Expenses (\$M)	Actual 2018			Total Fees & Expenses in (\$M)	Total Fees & Expenses in BPS	Avg. MV FYTD 09-30-18 (\$MM)	Estimates 2019	
				Mgmt. Fees / Partnership Expenses in BPS	Incentive Fees in (\$M)	Incentive Fees in BPS				Mgmt. Fees (\$M)	Mgmt. Fees in BPS
Hedge Funds	664.49	7,425.47	-	111.75	9,656.24	145.32	17,081.71	257.06	729.78	7,945.26	108.87
Private Equity	892.21	10,552.74	3,741.62	160.21	21,921.29	245.70	36,215.64	405.91	921.27	15,683.38	170.24
Private Real Estate	541.74	5,425.91	1,773.88	132.90	7,360.98	135.88	14,560.77	268.78	555.21	5,839.47	105.18
Infrastructure	58.31	1,669.19	690.75	131.47	115.07	19.73	2,475.01	125.35	82.40	2,315.38	117.26
Opportunistic Fixed Income	372.36	3,388.53	2,587.11	160.48	1,098.09	29.49	7,073.73	189.97	391.00	3,416.67	87.38
Total Private Markets	2,529.11	28,461.84	8,793.36	147.31	40,151.66	158.76	77,406.86	306.06	2,679.66	35,200.15	131.36
Total Overall	13,126.35	43,697.00	8,793.36	39.99	40,656.44	30.97	93,146.81	70.96	13,673.44	51,177.06	37.43

The overall carried interest and incentive fees paid by FIRE in Fiscal Year 2018: 30.97 BPS

General Footnotes:

- 1) Private Markets data reflect: carried interest realized and/or incentive fees as stated by its corresponding partnership. Management fees reported are inclusive of partnership expenses associated with the partnership for the stated fiscal year.
- 2) Infrastructure's expense data is based off the total committed amounts rather than current market value due to its early fund life juncture.
- 3) Estimated Fees for the Public Markets data does not take into account major rebalancing shifts and is calculated at a fixed NAV. Estimates fees for the Private Markets data is based solely off gross management fee data and is not inclusive of any offsets. Both estimates are considered to be equitably conservative and should be construed as such. Estimates for FY 2018 for Private Equity is provided by the Consultant.

NYC FIRE DEPARTMENT PENSION FUND
SECURITIES LENDING INCOME
December 31, 2018

	U. S. FIXED INCOME	U. S. EQUITY	INTERNATIONAL EQUITY	TOTAL
1989	109,000	-	-	109,000
1990	104,000	-	-	104,000
1991	157,000	-	-	157,000
1992	429,000	47,000	48,000	524,000
1993	762,000	146,000	102,000	1,010,000
1994	693,000	267,000	102,000	1,062,000
1995	495,000	306,000	96,000	897,000
1996	455,000	228,000	179,000	862,000
1997	473,000	512,000	257,000	1,242,000
1998	789,000	552,000	356,000	1,697,000
1999	716,000	690,000	408,000	1,814,000
2000	734,000	897,000	408,000	2,039,000
2001	1,176,000	1,286,000	561,000	3,023,000
2002	671,000	1,162,000	506,000	2,339,000
2003	349,000	644,000	452,000	1,445,000
2004	505,000	670,000	462,000	1,637,000
2005	740,000	1,070,000	574,000	2,384,000
2006	599,000	1,753,000	713,000	3,065,000
2007	1,437,000	3,180,000	786,000	5,403,000
2008	4,172,000	6,798,000	1,236,000	12,206,000
2009	1,606,000	3,588,000	817,000	6,011,000
2010	760,000	2,047,000	563,000	3,370,000
2011	977,000	2,674,000	927,000	4,578,000
2012	1,229,000	3,324,000	832,000	5,385,000
2013	893,000	3,467,000	704,000	5,064,000
2014	756,000	2,028,000	1,739,000	4,523,000
2015	788,000	2,034,000	2,407,000	5,229,000
2016	807,000	3,245,000	2,094,000	6,146,000
2017	1,285,000	2,515,000	1,574,000	5,374,000
2018	1,100,230	2,442,001	1,489,477	5,031,708
Since Inception	25,766,230	47,572,001	20,392,477	93,730,708

**New York City
Fire Department Pension Fund, Subchapter Two**

Appendix A

Consolidated Performance Report

Consolidated Performance Report

Through December 31, 2018



	Market Value (\$MM)	% of Total	3 Month	FYTD	CYTD	2017	2016	2015	2014	2013	3 Year	5 Year	10 Year	ITD	Inception Date	
SYSTEM RETURN SUMMARY																
5	FIRE-TOTAL PORTFOLIO - GROSS	12,853	100.00	(5.97)	(3.46)	(2.27)	16.81	8.68	0.34	7.55	15.87	7.45	6.01	9.51	8.35	07/01/1987
	FIRE - ESTIMATED INVESTMENT FEES			(0.05)	(0.10)	(0.19)	(0.26)	(0.25)	(0.25)	(0.29)		(0.23)	(0.25)			
	EST MANAGEMENT FEES - PUBLIC MARKET (ACCRUAL)			(0.03)	(0.06)	(0.11)	(0.12)	(0.13)	(0.15)	(0.16)		(0.12)	(0.14)			
	EST MANAGEMENT FEES - ALTERNATIVE MARKETS (CASH)			(0.02)	(0.04)	(0.08)	(0.14)	(0.12)	(0.10)	(0.13)		(0.11)	(0.11)			
	EST INCENTIVE FEES															
	EST OTHER FEES															
	EST FEE OFFSETS															
	FIRE-TOTAL PORTFOLIO - NET MGR			(6.03)	(3.57)	(2.47)	16.55	8.43	0.09	7.26		7.22	5.76			
	FIRE POLICY BENCHMARK			(6.27)	(3.55)	(2.67)	16.06	8.91	0.43	8.43	14.29	7.15	6.02	10.27		
	EXCESS RETURN			0.25	(0.02)	0.20	0.49	(0.48)	(0.33)	(1.17)	1.58	0.07	(0.26)	(0.76)		
EQUITY RETURN DETAIL																
26	FIRE-TOTAL EQUITY (INCL PE & RA) - GROSS	8,112	63.11	(9.30)	(5.61)	(3.59)	22.64	10.08	0.68	8.36	23.36	9.18	7.26	11.35	7.50	04/01/2004
	ESTIMATED INVESTMENT FEES			(0.06)	(0.13)	(0.23)	(0.32)	(0.31)	(0.34)	(0.37)		(0.29)	(0.31)			
	EST MANAGEMENT FEES			(0.06)	(0.13)	(0.23)	(0.32)	(0.31)	(0.34)	(0.37)		(0.29)	(0.31)			
	EST INCENTIVE FEES															
	EST OTHER FEES															
	EST FEE OFFSETS															
	FIRE-TOTAL EQUITY (INCL PE & RA) - NET MGR			(9.36)	(5.74)	(3.82)	22.32	9.77	0.35	7.99		8.90	6.95			
34	FIRE-TOTAL DOMESTIC EQUITY - GROSS	3,597	27.98	(14.51)	(8.55)	(5.45)	20.97	12.97	0.19	11.05	35.79	8.92	7.53	13.14	11.90	08/01/1979
	ESTIMATED INVESTMENT FEES			(0.02)	(0.04)	(0.08)	(0.10)	(0.13)	(0.15)	(0.17)		(0.10)	(0.13)			
	FIRE-TOTAL DOMESTIC EQUITY - NET MGR			(14.52)	(8.59)	(5.53)	20.88	12.84	0.04	10.88		8.82	7.41			
	RUSSELL 3000 (DAILY)			(14.30)	(8.20)	(5.24)	21.13	12.74	0.48	12.56	33.55	8.97	7.91	13.18	11.29	
	EXCESS RETURN			(0.22)	(0.39)	(0.29)	(0.25)	0.10	(0.44)	(1.67)	2.24	(0.15)	(0.51)	(0.04)	0.62	
44	FIRE-TOTAL SMALL CAP - GROSS	260	2.02	(19.91)	(15.75)	(9.88)	15.49	23.36	(0.80)	4.08	38.55	8.69	5.80	12.65	6.56	04/01/2004
	ESTIMATED INVESTMENT FEES			(0.10)	(0.21)	(0.47)	(0.69)	(0.75)	(0.60)	(0.55)		(0.63)	(0.61)			
	FIRE-TOTAL SMALL CAP - NET MGR			(20.01)	(15.96)	(10.34)	14.80	22.62	(1.41)	3.52		8.06	5.19			
	RUSSELL 2000 (DAILY)			(20.20)	(17.35)	(11.01)	14.65	21.31	(4.41)	4.89	38.82	7.36	4.41	11.97	7.18	
	EXCESS RETURN			0.20	1.39	0.67	0.15	1.31	3.01	(1.37)	(0.27)	0.70	0.78	0.68	(0.62)	
54	FIRE-TOTAL MID CAP - GROSS	238	1.85	(18.59)	(17.10)	(14.39)	24.69	10.84	0.19	9.81	37.17	5.77	5.42	13.26	7.37	04/01/2004
	ESTIMATED INVESTMENT FEES			(0.08)	(0.17)	(0.35)	(0.47)	(0.59)	(0.52)	(0.46)		(0.47)	(0.48)			
	FIRE-TOTAL MID CAP - NET MGR			(18.67)	(17.27)	(14.74)	24.22	10.25	(0.33)	9.35		5.30	4.94			
	RUSSELL MIDCAP (DAILY)			(15.37)	(11.14)	(9.06)	18.52	13.80	(2.44)	13.22	34.76	7.04	6.26	14.03	8.67	
	EXCESS RETURN			(3.30)	(6.13)	(5.68)	5.70	(3.55)	2.11	(3.87)	2.40	(1.74)	(1.32)	(0.77)	(1.30)	
64	FIRE-TOTAL RUSSELL 1000 - GROSS	2,399	18.67	(13.75)	(7.36)									(3.89)	04/01/2018	
	ESTIMATED INVESTMENT FEES			(0.00)	(0.01)									(0.01)		
	FIRE-TOTAL RUSSELL 1000 - NET MGR			(13.76)	(7.37)									(3.90)		
	RUSSELL 1000 (DAILY)			(13.82)	(7.42)									(4.12)		
	EXCESS RETURN			0.06	0.05									0.22		

Consolidated Performance Report

Through December 31, 2018



	Market Value (\$MM)	% of Total	3 Month	FYTD	CYTD	2017	2016	2015	2014	2013	3 Year	5 Year	10 Year	ITD	Inception Date
EQUITY RETURN DETAIL															
76	FIRE-TOTAL RUSSELL TOP 200 PASSIVE - GROSS	682	5.30	(13.17)	(5.90)									(2.80)	05/01/2018
	ESTIMATED INVESTMENT FEES			0.01	(0.01)									(0.02)	
	FIRE-TOTAL RUSSELL TOP 200 PASSIVE - NET MGR			(13.16)	(5.91)									(2.82)	
	RUSSELL TOP 200 INDEX (DAILY)			(13.23)	(5.95)									(2.84)	
	EXCESS RETURN			0.07	0.04									0.02	
86	FIRE-TOTAL FUND OF FUNDS - GROSS	18	0.14	(18.07)	(14.06)	(7.75)								(0.63)	05/01/2017
	ESTIMATED INVESTMENT FEES			(0.10)	(0.21)	(0.46)								(0.59)	
	FIRE-TOTAL FUND OF FUNDS - NET MGR			(18.17)	(14.28)	(8.21)								(1.22)	
	RUSSELL 2000 (DAILY)			(20.20)	(17.35)	(11.01)								(0.91)	
	EXCESS RETURN			2.03	3.07	2.80								(0.31)	

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EQUITY RETURN DETAIL																
98	FIRE-TOTAL WORLD ex-USA - GROSS	983	7.65	(13.85)	(13.37)	(14.17)	31.56	4.14	(1.08)	(5.07)	21.59	5.55	2.00	7.69	5.41	04/01/2004
	ESTIMATED INVESTMENT FEES			(0.06)	(0.12)	(0.24)	(0.33)	(0.30)	(0.29)	(0.27)		(0.29)	(0.29)			
	FIRE-TOTAL WORLD ex-USA - NET MGR			(13.91)	(13.49)	(14.41)	31.22	3.83	(1.37)	(5.34)		5.26	1.72			
	WORLD EX USA CUSTOM BM			(13.28)	(12.43)	(14.68)	26.40	1.15	0.49	(4.90)	23.54	2.94	0.84	6.79	4.79	
	EXCESS RETURN			(0.63)	(1.05)	0.28	4.82	2.68	(1.86)	(0.44)	(1.95)	2.32	0.88	0.91	0.62	
108	FIRE-TOTAL WORLD ex-USA LARGE & MID ACTIVE - GROSS	780	6.07	(13.60)	(12.81)	(13.36)	32.16	4.51	(3.31)	(4.49)		6.17	2.02	2.46	11/01/2013	
	ESTIMATED INVESTMENT FEES			(0.06)	(0.12)	(0.24)	(0.32)	(0.30)	(0.28)	(0.27)		(0.29)	(0.28)	(0.28)		
	FIRE-TOTAL WORLD ex-USA LARGE & MID ACTIVE - NET MGR			(13.66)	(12.93)	(13.60)	31.84	4.21	(3.59)	(4.76)		5.88	1.74	2.18		
	NYC CUSTOM WORLD EX-USA LG & MID ACT INDEX			(12.78)	(11.64)	(14.09)	25.18	1.00	(0.81)	(4.90)		2.79	0.49	0.91		
	EXCESS RETURN			(0.88)	(1.29)	0.49	6.66	3.21	(2.78)	0.15		3.09	1.25	1.27		
118	FIRE-TOTAL WORLD ex-USA SMALL CAP ACTIVE - GROSS	109	0.85	(15.74)	(16.95)	(18.26)	35.60	3.35	10.82	(4.78)		4.63	3.87	6.10	05/01/2013	
	ESTIMATED INVESTMENT FEES			(0.10)	(0.19)	(0.39)	(0.65)	(0.50)	(0.54)	(0.47)		(0.50)	(0.50)			
	FIRE-TOTAL WORLD ex-USA SMALL CAP ACTIVE - NET MGR			(15.84)	(17.14)	(18.65)	34.95	2.85	10.28	(5.25)		4.13	3.36			
	S&P EPAC SMALL CAP USD NET			(16.42)	(16.80)	(18.58)	33.47	1.34	8.58	(3.43)		3.27	2.92	5.10		
	EXCESS RETURN			0.58	(0.34)	(0.07)	1.49	1.51	1.69	(1.82)		0.86	0.44	1.00		
128	FIRE-TOTAL WORLD ex-USA SMALL CAP PASSIVE - GROSS	31	0.24	(16.09)	(16.73)	(17.95)	33.51	2.79	9.88			4.04		3.78	02/01/2014	
	ESTIMATED INVESTMENT FEES			(0.01)	(0.02)	(0.02)	(0.08)	(0.02)	(0.02)			(0.04)		(0.03)		
	FIRE-TOTAL WORLD ex-USA SMALL CAP PASSIVE - NET MGR			(16.10)	(16.75)	(17.97)	33.43	2.77	9.86			4.00		3.75		
	WORLD EX USA SC PASSIVE CUSTOM BM			(16.16)	(16.88)	(18.07)	33.31	2.18	9.59			3.73		3.44		
	EXCESS RETURN			0.07	0.13	0.10	0.12	0.59	0.27			0.27		0.31		
138	FIRE-TOTAL WORLD ex-USA LARGE & MID CAP PASSIVE - GROSS	63	0.49	(12.47)	(11.25)	(13.63)	24.44	1.30	(0.53)	(4.73)	23.13	2.88	0.63	3.24	02/01/2011	
	ESTIMATED INVESTMENT FEES			(0.00)	(0.00)	(0.01)	(0.00)	(0.02)	0.00	(0.01)		(0.01)	(0.01)			
	FIRE-TOTAL WORLD ex-USA LARGE & MID CAP PASSIVE - NET MGR			(12.47)	(11.26)	(13.64)	24.43	1.28	(0.53)	(4.75)		2.86	0.62			
	NYC CUSTOM WORLD EX US INDEX			(12.78)	(11.64)	(14.09)	24.12	1.00	(0.81)	(4.90)	22.78	2.50	0.31	2.92		
	EXCESS RETURN			0.32	0.39	0.45	0.32	0.28	0.29	0.16	0.35	0.36	0.30	0.32		

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EQUITY RETURN DETAIL																
150	FIRE-TOTAL ACTIVE EMERGING MARKETS - GROSS	539	4.20	(7.75)	(7.45)	(14.39)	41.09	10.79	(13.23)	(0.48)	1.87	10.20	2.93	9.35	8.39	04/01/2004
	ESTIMATED INVESTMENT FEES			(0.09)	(0.19)	(0.34)	(0.62)	(0.53)	(0.44)	(0.50)		(0.48)	(0.48)			
	FIRE-TOTAL ACTIVE EMERGING MARKETS - NET MGR			(7.85)	(7.63)	(14.73)	40.47	10.27	(13.67)	(0.98)		9.72	2.46			
	MSCI EMERGING MARKETS			(7.46)	(8.48)	(14.57)	37.28	11.19	(14.92)	(2.19)	(2.60)	9.25	1.65	8.02	7.37	
	EXCESS RETURN			(0.38)	0.85	(0.16)	3.18	(0.92)	1.24	1.21	4.47	0.46	0.81	1.32	1.02	
160	FIRE-TOTAL PASSIVE EMERGING MARKETS - GROSS	243	1.89	(7.46)	(8.47)	(14.44)	37.41	11.23	(14.86)	(2.23)	(1.97)	9.35	1.71	0.04	04/01/2011	
	ESTIMATED INVESTMENT FEES			(0.00)	(0.01)	0.01	(0.15)	(0.06)	(0.05)	(0.06)		(0.06)	(0.06)			
	FIRE-TOTAL PASSIVE EMERGING MARKETS - NET MGR			(7.46)	(8.48)	(14.43)	37.25	11.17	(14.91)	(2.29)		9.30	1.65			
	MSCI EMERGING MARKETS			(7.46)	(8.48)	(14.57)	37.28	11.19	(14.92)	(2.19)	(2.60)	9.25	1.65	(0.01)		
	EXCESS RETURN			0.01	(0.00)	0.14	(0.03)	(0.02)	0.01	(0.10)	0.63	0.04	0.00	0.05		
170	FIRE-TOTAL INTERNATIONAL FUND OF FUNDS - GROSS	64	0.50	(11.68)	(12.21)	(14.36)								(0.78)	05/01/2017	
	ESTIMATED INVESTMENT FEES			(0.08)	(0.15)	(0.30)								(0.34)		
	FIRE-TOTAL INTERNATIONAL FUND OF FUNDS - NET MGR			(11.76)	(12.36)	(14.65)								(1.12)		
	MSCI ACWI EX USA IMI NET			(11.87)	(11.53)	(14.76)								(0.80)		
	EXCESS RETURN			0.12	(0.83)	0.10								(0.32)		
180	FIRE-TOTAL GLOBAL EQUITY - GROSS	175	1.36	(12.85)	(12.38)									(13.13)	06/01/2018	
	ESTIMATED INVESTMENT FEES			(0.11)	(0.22)									(0.26)		
	FIRE-TOTAL GLOBAL EQUITY - NET MGR			(12.96)	(12.60)									(13.39)		
	MSCI AC WORLD (DAILY CONST)			(12.75)	(9.02)									(9.51)		
	EXCESS RETURN			(0.21)	(3.58)									(3.87)		

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EQUITY RETURN DETAIL															
198	FIRE-TOTAL HEDGE FUNDS* - NET MGR	750	5.84	(2.03)	(1.14)	2.09	9.80	3.20	(1.68)	5.35	4.92	4.98	3.68	3.65	07/01/2011
	HFRI FUND OF FUNDS COMPOSITE INDEX + 1%			(4.71)	(4.24)	(3.06)	8.84	1.52	0.73	4.40	10.04	2.32	2.41	2.98	
	EXCESS RETURN			2.68	3.10	5.15	0.96	1.68	(2.41)	0.95	(5.12)	2.66	1.27	0.67	
208	FIRE-TOTAL DIRECT HEDGE FUNDS* - NET MGR	750	5.83	(2.02)	(1.14)	2.17	10.56	3.00	(1.36)	5.76	4.20	5.17	3.95	4.69	01/01/2012
	HFRI FUND OF FUNDS COMPOSITE INDEX + 1%			(4.71)	(4.24)	(3.06)	8.84	1.52	0.73	4.40	10.04	2.32	2.41	3.95	
	EXCESS RETURN			2.68	3.11	5.23	1.71	1.48	(2.09)	1.37	(5.84)	2.86	1.54	0.73	
218	FIRE-TOTAL PERMAL HEDGE FUNDS OF FUNDS* - NET MGR	1	0.01	(2.93)	(3.01)	(0.84)	2.07	4.58	(3.52)	3.11	7.73	1.91	1.04	1.89	07/01/2011
	HFRI FUND OF FUNDS COMPOSITE INDEX + 1%			(4.71)	(4.24)	(3.06)	8.84	1.52	0.73	4.40	10.04	2.32	2.41	2.98	
	EXCESS RETURN			1.78	1.23	2.22	(6.77)	3.06	(4.26)	(1.28)	(2.31)	(0.40)	(1.37)	(1.10)	

* INFORMATION PROVIDED BY ALPHA FRONTIER

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EQUITY RETURN DETAIL																
226	FIRE-TOTAL REAL ESTATE SECURITIES - GROSS ESTIMATED INVESTMENT FEES	157	1.22	(7.36)	(6.42)	(6.09)	8.71	3.95	1.39	28.21	2.72	2.00	6.65	12.35	10.35	01/01/2003
	FIRE-TOTAL REAL ESTATE SECURITIES - NET MGR			(0.10)	(0.20)	(0.39)	(0.42)	(0.28)	(0.34)	(0.46)		(0.36)	(0.38)			
	DJ US SELECT REAL ESTATE SECURITIES INDEX			(7.46)	(6.61)	(6.48)	8.30	3.67	1.05	27.75		1.64	6.27			
	EXCESS RETURN			(6.61)	(5.93)	(4.22)	3.76	6.65	4.46	31.85	1.31	1.96	7.86	12.07	9.73	
				(0.86)	(0.68)	(2.26)	4.53	(2.98)	(3.41)	(4.11)	1.41	(0.32)	(1.59)	0.28	0.62	
236	FIRE-TOTAL PRIVATE EQUITY (TIME WEIGHTED) NYC R3000 +3% LAGGED	942	7.33	3.89	9.38	18.87	23.66	10.84	11.71	15.81	12.72	17.67	16.08	12.39	13.78	04/01/2004
	EXCESS RETURN			7.90	12.92	21.06	22.22	18.37	2.49	21.24	24.53	20.54	16.83	16.03	13.56	
				(4.01)	(3.53)	(2.19)	1.45	(7.54)	9.22	(5.43)	(11.81)	(2.87)	(0.75)	(3.63)	0.22	
246	FIRE-TOTAL PRIVATE REAL ESTATE (TIME WEIGHTED) NCREIF NFI-ODCE NET + 100 BP	559	4.35	2.43	4.67	10.88	11.52	11.46	15.25	17.21	12.58	11.29	13.24	5.66	8.43	04/01/2004
	EXCESS RETURN			1.77	3.93	8.43	7.72	8.86	15.08	12.56	14.02	8.34	10.50			
				0.66	0.74	2.45	3.79	2.60	0.17	4.65	(1.44)	2.95	2.74			
256	FIRE-TOTAL INFRASTRUCTURE (TIME WEIGHTED) CPI + 4%	100	0.78	3.83	7.54	10.05	27.94	10.72	15.95	20.21		15.95	16.79	16.49	12/01/2013	
	EXCESS RETURN			1.28	2.74	6.02	6.20	6.17	4.69	4.69		6.13	5.55	5.58		
				2.55	4.80	4.03	21.74	4.55	11.26	15.52		9.82	11.24	10.91		

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	Market Value (\$MM)	% of Total	3 Month	FYTD	CYTD	2017	2016	2015	2014	2013	3 Year	5 Year	10 Year	ITD	Inception Date	
FIXED INCOME RETURN DETAIL																
268	FIRE-TOTAL FIXED INCOME - GROSS	4,740	36.88	(0.04)	0.24	(0.38)	5.40	5.66	(0.43)	5.94	0.68	3.52	3.19	5.46	7.95	02/01/1980
	ESTIMATED INVESTMENT FEES			(0.03)	(0.06)	(0.12)	(0.13)	(0.14)	(0.09)	(0.15)		(0.13)	(0.13)			
	EST MANAGEMENT FEES			(0.03)	(0.06)	(0.12)	(0.13)	(0.14)	(0.09)	(0.15)		(0.13)	(0.13)			
	EST INCENTIVE FEES															
	EST OTHER FEES															
	EST FEE OFFSETS															
	FIRE-TOTAL FIXED INCOME - NET MGR			(0.07)	0.18	(0.50)	5.27	5.52	(0.52)	5.79		3.39	3.07			
276	FIRE-TOTAL STRUCTURED FIXED INCOME - GROSS	2,299	17.89	2.02	1.51	(0.85)	5.22	3.97	0.17	7.66	(1.86)	2.75	3.19	4.72	7.50	01/01/1985
	ESTIMATED INVESTMENT FEES			(0.01)	(0.02)	(0.04)	(0.06)	(0.07)	(0.07)	(0.08)		(0.06)	(0.07)			
	FIRE-TOTAL STRUCTURED FIXED INCOME - NET MGR			2.01	1.49	(0.89)	5.16	3.90	0.10	7.57		2.69	3.12			
	NYC CUSTOM STRUCTURED INDEX-FIRE			3.03	1.29	(1.29)	6.95									
	EXCESS RETURN			(1.02)	0.20	0.40	(1.78)									
286	FIRE-TOTAL CORE FI- DEVELOPING MGRS - GROSS	44	0.34	0.43	0.90	(1.01)	4.16	3.89	1.36	5.74	(1.20)	2.32	2.80	4.44	05/01/2009	
	ESTIMATED INVESTMENT FEES			(0.05)	(0.10)	(0.20)	(0.20)	(0.21)	(0.19)	(0.17)		(0.20)	(0.19)			
	FIRE-TOTAL CORE FI- DEVELOPING MGRS - NET MGR			0.38	0.80	(1.21)	3.95	3.68	1.17	5.57		2.11	2.61			
	BBG BARC AGG (DLY)			1.64	1.65	0.01	3.54	2.65	0.55	5.97	(2.02)	2.06	2.52	3.53		
	EXCESS RETURN			(1.25)	(0.86)	(1.22)	0.41	1.04	0.62	(0.39)	0.82	0.06	0.09	0.90		
296	FIRE-TOTAL CORE FI- EMERGING MGRS - GROSS	30	0.24	1.51	1.65	0.29	4.51	3.19	1.13	6.21	(1.58)	2.65	3.04	2.95	03/01/2012	
	ESTIMATED INVESTMENT FEES			(0.09)	(0.18)	(0.34)	(0.48)	(0.22)	(0.35)	(0.36)		(0.35)	(0.35)			
	FIRE-TOTAL CORE FI- EMERGING MGRS - NET MGR			1.42	1.47	(0.05)	4.02	2.97	0.78	5.85		2.30	2.69			
	BBG BARC AGG (DLY)			1.64	1.65	0.01	3.54	2.65	0.55	5.97	(2.02)	2.06	2.52	2.02		
	EXCESS RETURN			(0.21)	(0.19)	(0.06)	0.48	0.32	0.23	(0.12)	0.45	0.24	0.17	0.93		
306	FIRE-TOTAL TIPS - GROSS	587	4.56	(0.44)	(1.27)	(1.25)	3.06	4.65	(1.31)	3.59	(8.32)	2.12	1.71	3.58	3.52	06/01/2005
	ESTIMATED INVESTMENT FEES			(0.00)	(0.01)	(0.02)	(0.02)	(0.02)	(0.03)	(0.07)		(0.02)	(0.03)			
	FIRE-TOTAL TIPS - NET MGR			(0.45)	(1.28)	(1.27)	3.04	4.63	(1.34)	3.52		2.10	1.68			
	BBG BARC GBL INF-LK: US TIPS (DLY)			(0.42)	(1.24)	(1.26)	3.01	4.68	(1.44)	3.64	(8.61)	2.11	1.69	3.64	3.40	
	EXCESS RETURN			(0.03)	(0.04)	(0.01)	0.03	(0.05)	0.09	(0.12)	0.28	(0.01)	(0.01)	(0.06)	0.13	
316	FIRE-TOTAL HIGH YIELD - GROSS	749	5.83	(4.26)	(2.70)	(2.94)	7.53	14.46	(3.07)	2.54	7.15	6.11	3.50	9.46	7.77	12/01/1994
	ESTIMATED INVESTMENT FEES			(0.09)	(0.14)	(0.29)	(0.32)	(0.37)	(0.34)	(0.35)		(0.33)	(0.34)			
	FIRE-TOTAL HIGH YIELD - NET MGR			(4.34)	(2.85)	(3.24)	7.21	14.09	(3.40)	2.19		5.78	3.16			
	HIGH YIELD CUSTOM BENCHMARK			(4.54)	(2.24)	(2.34)	7.03	15.48	(4.21)	2.78	6.17	6.47	3.51	9.37	6.72	
	EXCESS RETURN			0.20	(0.60)	(0.90)	0.18	(1.39)	0.81	(0.59)	0.98	(0.70)	(0.35)	0.09	1.06	
326	FIRE- TOTAL BANK LOANS - GROSS	203	1.58	(3.09)	(1.03)	1.18	4.51	8.55	1.47	2.82	7.00	4.71	3.67	4.26	12/01/2012	
	ESTIMATED INVESTMENT FEES			(0.09)	(0.18)	(0.36)	(0.38)	(0.41)	(0.38)	(0.39)		(0.38)	(0.38)			
	FIRE-TOTAL BANK LOANS - NET MGR			(3.18)	(1.21)	0.81	4.14	8.15	1.09	2.43		4.32	3.29			
	CSFB LEVERAGED LOAN INDEX			(3.08)	(1.21)	1.14	4.25	9.88	(0.38)	2.06	6.15	5.03	3.33	3.86		
	EXCESS RETURN			(0.10)	(0.00)	(0.33)	(0.11)	(1.73)	1.48	0.38	0.85	(0.70)	(0.04)	0.40		

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FIXED INCOME RETURN DETAIL																
338	FIRE-TOTAL CONVERTIBLE BONDS - GROSS	222	1.73	(5.31)	(2.76)	(1.44)	8.44	7.74	(0.91)	5.16	14.14	4.81	3.71	8.82	5.66	07/01/2008
	ESTIMATED INVESTMENT FEES			(0.11)	(0.24)	(0.48)	(0.52)	(0.54)	(0.51)	(0.54)		(0.51)	(0.52)			
	FIRE-TOTAL CONVERTIBLE BONDS - NET MGR			(5.42)	(2.99)	(1.92)	7.92	7.20	(1.42)	4.62		4.30	3.19			
	BOFAML ALL CONVERTIBLE EX M AI (DAILY)			(9.24)	(5.59)	0.65	15.70	11.71	(2.75)	9.33	25.00	9.16	6.70	12.60	8.10	
	EXCESS RETURN			3.81	2.59	(2.57)	(7.78)	(4.51)	1.32	(4.71)	(10.87)	(4.86)	(3.51)	(3.79)	(2.45)	
348	FIRE-TOTAL OPPORTUNISTIC FIXED INCOME	394	3.07	(0.12)	2.40	6.54	8.42	9.53	(3.02)	7.41	17.25	8.16	5.68	10.03	8.47	11/01/2007
	OPPORTUNISTIC FIXED INCOME JPMGHY / CSFB 50/50 BLEND PLUS 300			(2.79)	(0.05)	2.36	9.42	17.40	0.63	4.93	9.99	9.56	6.78	13.12	8.69	
	EXCESS RETURN			2.67	2.46	4.18	(1.00)	(7.87)	(3.65)	2.48	7.27	(1.40)	(1.11)	(3.09)	(0.22)	
358	FIRE-TOTAL TARGETED INVESTMENTS (NO CASH) - GROSS	101	0.79	2.28	2.36	0.93	3.98	2.37	3.06	6.90	(1.71)	2.42	3.43	3.94	7.16	12/01/1984
	ESTIMATED INVESTMENT FEES			(0.08)	(0.15)	(0.28)	(0.30)	(0.32)	(0.32)	(0.36)	(0.36)	(0.30)	(0.32)	(0.35)	(0.18)	
	FIRE-TOTAL TARGETED INVESTMENTS (NO CASH) - NET MGR			2.20	2.22	0.65	3.68	2.04	2.73	6.54	(2.08)	2.12	3.11	3.59	6.98	
	FIRE CUSTOM BENCHMARK (NO CASH)			1.86	1.87	0.68	3.19	2.46	1.05	5.75	(1.74)	2.11	2.61	3.33		
	EXCESS RETURN			0.34	0.35	(0.04)	0.49	(0.41)	1.68	0.79	(0.33)	0.01	0.50	0.27		
CASH SUMMARY																
370	FIRE SHORT TERM - GROSS	110	0.86	0.58	1.09	1.97	1.13	0.88	0.32	0.21	0.24	1.33	0.90	0.73	3.55	12/01/1989
	ESTIMATED INVESTMENT FEES			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
	FIRE SHORT TERM - NET MGR			0.58	1.09	1.97	1.13	0.88	0.32	0.21	0.24	1.33	0.90	0.73		
374	KKR SP CASH ACCOUNTS	1	0.00													
376	CASH ACCOUNTS	-	0.00													
378	SECURITY LENDING	-	0.00													

New York City
Fire Department Pension Fund, Subchapter Two

Appendix B

Public Markets Manager Performance Detail

Public Markets Manager Performance Detail



Net Returns Through December 31, 2018

	Market Value (\$MM)	% of Total	3 Month	FYTD	CYTD	2017	2016	2015	2014
EQUITY SUMMARY									
US EQUITY									
NYC FIRE BLACKROCK R2000 GROWTH	68	0.53	(21.58)	(17.20)	(9.14)	22.26	11.29	(1.29)	5.50
RUSSELL 2000 GROWTH DAILY			(21.65)	(17.33)	(9.31)	22.17	11.32	(1.38)	5.60
Excess			0.07	0.12	0.17	0.09	(0.02)	0.09	(0.11)
NYC FIRE BLACKROCK R2000 VALUE	3	0.03	(18.74)	(17.38)	(12.79)	7.34	31.71	(7.33)	3.80
RUSSELL 2000 VALUE DAILY			(18.67)	(17.36)	(12.86)	7.84	31.74	(7.47)	4.22
Excess			(0.07)	(0.01)	0.08	(0.49)	(0.03)	0.13	(0.41)
Brown AM - SCG	58	0.45	(22.65)	(13.81)	1.06	28.87	10.25	8.61	2.92
RUSSELL 2000 GROWTH DAILY			(21.65)	(17.33)	(9.31)	22.17	11.32	(1.38)	5.60
Excess			(1.00)	3.52	10.37	6.70	(1.07)	9.99	(2.68)
CEREDEX SCV	76	0.59	(16.67)	(15.46)	(11.72)	10.66	29.36	(4.73)	2.54
RUSSELL 2000 VALUE DAILY			(18.67)	(17.36)	(12.86)	7.84	31.74	(7.47)	4.22
Excess			2.00	1.91	1.14	2.83	(2.38)	2.74	(1.68)
Dalton Greiner Sm Cap-Value	55	0.43	(19.67)	(17.23)	(17.30)	8.38	25.01	(3.32)	4.47
RUSSELL 2000 VALUE DAILY			(18.67)	(17.36)	(12.86)	7.84	31.74	(7.47)	4.22
Excess			(1.01)	0.14	(4.43)	0.55	(6.73)	4.15	0.25
Iridian Asset Mgmt. MCV	99	0.77	(20.35)	(21.59)	(23.30)	23.23	4.19	(3.71)	14.03
RUSSELL MIDCAP (DAILY)			(15.37)	(11.14)	(9.06)	18.52	13.80	(2.44)	13.22
Excess			(4.98)	(10.45)	(14.24)	4.71	(9.60)	(1.27)	0.82
Wellington Mgmt. MCC	139	1.08	(17.42)	(13.88)	(7.35)	25.09	12.29	1.78	10.93
S&P 400 MIDCAP INDEX (DAILY)			(17.28)	(14.08)	(11.08)	16.24	20.74	(2.18)	9.77
Excess			(0.15)	0.20	3.74	8.84	(8.45)	3.95	1.17

Public Markets Manager Performance Detail



Net Returns Through December 31, 2018

	Market Value (\$MM)	% of Total	3 Month	FYTD	CYTD	2017	2016	2015	2014
NYC FIRE BLACKROCK R1000 GROWTH	1	0.01				30.24	7.16	5.66	12.91
RUSSELL 1000 GROWTH - DAILY						30.21	7.08	5.67	13.05
Excess						0.03	0.08	(0.01)	(0.14)
NYC FIRE BLACKROCK R1000 VALUE	0	0.00				13.65	17.48	(3.90)	13.39
RUSSELL 1000 VALUE (DAILY)						13.66	17.34	(3.83)	13.45
Excess						(0.01)	0.14	(0.08)	(0.06)
NYC FIRE BLACKROCK R1000 CORE	2,044	15.90	(13.71)	(7.27)					
RUSSELL 1000 (DAILY)			(13.82)	(7.42)					
Excess			0.11	0.15					
RAFI - LC Fundamental	354	2.76	(14.06)	(7.92)	(6.74)	16.88			
RUSSELL 1000 (DAILY)			(13.82)	(7.42)	(4.78)	21.69			
Excess			(0.24)	(0.50)	(1.96)	(4.81)			
SSGA Russell Top 200	682	5.30	(13.16)	(5.91)					
RUSSELL TOP 200 INDEX (DAILY)			(13.23)	(5.95)					
Excess			0.07	0.04					
FUND OF FUNDS									
FIRE-TOTAL FUND OF FUNDS	18	0.14	(18.17)	(14.28)	(8.21)				
RUSSELL 2000 (DAILY)			(20.20)	(17.35)	(11.01)				
Excess			2.03	3.07	2.80				
FIRE-TOTAL LEGATO	18	0.14	(18.17)	(14.28)	(8.19)				
RUSSELL 2000 (DAILY)			(20.20)	(17.35)	(11.01)				
Excess			2.03	3.07	2.82				

Public Markets Manager Performance Detail



Net Returns Through December 31, 2018

	Market Value (\$MM)	% of Total	3 Month	FYTD	CYTD	2017	2016	2015	2014
NON - US EQUITY									
Baillie Gifford	165	1.28	(19.39)	(21.12)	(15.37)	44.17	0.70	(3.81)	(6.77)
NYC Developed Growth Benchmark			(12.78)	(11.64)	(14.09)	27.77	(3.04)	4.09	(4.43)
Excess			(6.61)	(9.48)	(1.28)	16.40	3.74	(7.90)	(2.34)
Walter Scott	218	1.70	(10.28)	(7.65)	(7.65)	28.12	5.03	0.28	(3.76)
NYC Developed Growth Benchmark			(12.78)	(11.64)	(14.09)	27.77	(3.04)	4.09	(4.43)
Excess			2.50	3.99	6.44	0.35	8.07	(3.81)	0.67
Causeway	179	1.39	(14.97)	(13.63)	(18.34)	28.22	0.52	(2.39)	(4.91)
NYC Developed Value Benchmark			(12.78)	(11.64)	(14.09)	22.77	5.02	(5.68)	(5.39)
Excess			(2.19)	(1.99)	(4.25)	5.45	(4.51)	3.29	0.48
Sprucegrove	218	1.70	(11.08)	(10.37)	(13.67)	27.20	11.10	(9.44)	(3.32)
NYC Developed Value Benchmark			(12.78)	(11.64)	(14.09)	22.77	5.02	(5.68)	(5.39)
Excess			1.71	1.27	0.42	4.44	6.08	(3.75)	2.07
Acadian	67	0.52	(15.56)	(16.68)	(19.22)	38.38	6.41	8.68	(4.92)
S&P EPAC Small Cap USD NET			(16.42)	(16.80)	(18.58)	33.47	1.34	8.58	(3.43)
Excess			0.86	0.12	(0.65)	4.91	5.07	0.09	(1.49)
Pyramis	43	0.33	(16.27)	(17.72)	(18.22)	31.28	(0.80)	11.96	(5.60)
S&P EPAC Small Cap USD NET			(16.42)	(16.80)	(18.58)	33.47	1.34	8.58	(3.43)
Excess			0.15	(0.92)	0.36	(2.19)	(2.14)	3.38	(2.17)
SSGA	63	0.49	(12.47)	(11.26)	(13.64)	24.43	1.28	(0.55)	(4.75)
NYC Custom World ex US Index			(12.78)	(11.64)	(14.09)	24.12	1.00	(0.81)	(4.90)
Excess			0.32	0.39	0.45	0.32	0.28	0.27	0.15
SSGA World ex USA Small Cap ¹	31	0.24	(16.10)	(16.75)	(17.97)	33.43	2.77	9.86	
World ex USA SC PASSIVE CUSTOM BM			(16.16)	(16.88)	(18.07)	33.31	2.18	9.59	
Excess			0.07	0.13	0.10	0.12	0.59	0.27	

¹ Name changed from SSGA MSCI EAFE Small Cap Index to SSGA World ex USA Small Cap 12.2017

² Assets were in transition as of 9/29/17

³ Assets were in transition from 9/29/17 to 11/30/17

Public Markets Manager Performance Detail



Net Returns Through December 31, 2018

	Market Value (\$MM)	% of Total	3 Month	FYTD	CYTD	2017	2016	2015	2014
EMERGING MARKETS									
Baillie Gifford	139	1.08	(8.62)	(8.18)	(15.37)	54.13	2.78	(7.99)	0.10
MSCI EMERGING MARKETS			(7.46)	(8.48)	(14.57)	37.28	11.19	(14.92)	(2.19)
Excess			(1.15)	0.30	(0.80)	16.85	(8.41)	6.92	2.28
ACADIAN									
Baillie Gifford	127	0.98	(8.74)	(9.72)	(17.27)	40.45	12.65	(15.05)	3.79
MSCI EMERGING MARKETS			(7.46)	(8.48)	(14.57)	37.28	11.19	(14.92)	(2.19)
Excess			(1.27)	(1.24)	(2.70)	3.16	1.46	(0.13)	5.97
PARAMETRIC EM									
Baillie Gifford	138	1.07	(6.71)	(7.34)	(14.33)	29.65	13.85	(15.72)	(3.88)
MSCI EMERGING MARKETS			(7.46)	(8.48)	(14.57)	37.28	11.19	(14.92)	(2.19)
Excess			0.75	1.14	0.24	(7.63)	2.67	(0.81)	(1.69)
DFA									
Baillie Gifford	136	1.05	(7.35)	(5.31)	(12.06)	33.64	17.36	(19.25)	(4.39)
MSCI EMERGING MARKETS			(7.46)	(8.48)	(14.57)	37.28	11.19	(14.92)	(2.19)
Excess			0.11	3.17	2.51	(3.64)	6.17	(4.33)	(2.20)
CONY GT FIRE Blackrock-MSCI EM MK									
Baillie Gifford	243	1.89	(7.46)	(8.48)	(14.43)	37.25	11.17	(14.91)	(2.29)
MSCI EMERGING MARKETS			(7.46)	(8.48)	(14.57)	37.28	11.19	(14.92)	(2.19)
Excess			0.01	(0.00)	0.14	(0.03)	(0.02)	0.01	(0.10)
INTERNATIONAL FOF									
FIRE-TOTAL INTERNATIONAL FOF	64	0.50	(11.76)	(12.36)	(14.65)				
MSCI ACWI ex USA IMI Net			(11.87)	(11.53)	(14.76)				
Excess			0.12	(0.83)	0.10				
FIRE-TOTAL INTERNATIONAL FIS	64	0.50	(11.76)	(12.36)	(14.65)				
MSCI ACWI ex USA IMI Net			(11.87)	(11.53)	(14.76)				
Excess			0.12	(0.83)	0.10				

1 Name changed from SSGA MSCI EAFE Small Cap Index to SSGA World ex USA Small Cap 12.2017

2 Assets were in transition as of 9/29/17

3 Assets were in transition from 9/29/17 to 11/30/17

Public Markets Manager Performance Detail



Net Returns Through December 31, 2018

	Market Value (\$MM)	% of Total	3 Month	FYTD	CYTD	2017	2016	2015	2014
GLOBAL EQUITY									
FIERA CAPITAL-WORLD	92	0.71	(10.49)						
MSCI World Index			(13.42)						
Excess			2.92						
Morgan Stanley-ACWI	83	0.65	(15.52)	(16.37)					
MSCI AC WORLD (Daily Const)			(12.75)	(9.02)					
Excess			(2.77)	(7.35)					
REAL ESTATE SECURITIES									
FIRE-MS REIT	63	0.49	(9.10)	(7.95)	(7.88)	9.26	3.49	(1.63)	30.72
Morgan Stanley Custom RESI Index			(5.09)	(5.51)	(5.46)	10.27	2.37	(1.53)	31.85
Excess			(4.01)	(2.45)	(2.42)	(1.01)	1.13	(0.11)	(1.13)
Adelante (Lend Lease Rosen) (REIT)	94	0.73	(6.33)	(5.69)	(5.49)	7.34	3.90	4.82	33.07
DJ US SELECT REAL ESTATE SECURITIES INDEX			(6.61)	(5.93)	(4.22)	3.76	6.65	4.46	31.85
Excess			0.28	0.24	(1.27)	3.58	(2.75)	0.36	1.21
FIXED INCOME SUMMARY									
STRUCTURED FIXED INCOME									
Taplin Canida Habacht - Credit	52	0.40	(1.37)	(0.32)	(3.48)	8.08	9.52	(3.74)	7.73
NYC - Investment Grade Credit			0.17	1.05	(1.90)	6.04	5.56	(0.65)	7.04
Excess			(1.54)	(1.37)	(1.58)	2.05	3.97	(3.10)	0.69
T. Rowe Price - Credit	178	1.38	0.04	0.94	(2.41)	6.89	6.00	0.16	7.74
NYC - Investment Grade Credit			0.17	1.05	(1.90)	6.04	5.56	(0.65)	7.04
Excess			(0.13)	(0.11)	(0.51)	0.86	0.44	0.80	0.70
Blackrock - Credit	110	0.85	(0.39)	0.75	(2.01)	6.12	5.43	(0.61)	7.43
NYC - Investment Grade Credit			0.17	1.05	(1.90)	6.04	5.56	(0.65)	7.04
Excess			(0.56)	(0.30)	(0.11)	0.09	(0.13)	0.04	0.39

Public Markets Manager Performance Detail



Net Returns Through December 31, 2018

	Market Value (\$MM)	% of Total	3 Month	FYTD	CYTD	2017	2016	2015	2014
Prudential - Credit	82	0.64	0.06	1.00	(1.81)	6.32	5.97	(0.18)	7.19
NYC - Investment Grade Credit			0.17	1.05	(1.90)	6.04	5.56	(0.65)	7.04
Excess			(0.11)	(0.05)	0.09	0.28	0.41	0.47	0.14
Blackrock - Mortgage	233	1.81	1.96	1.90	0.97	2.66	2.19	1.72	6.77
FTSE MORTGAGE INDEX			2.09	2.00	1.01	2.47	1.59	1.56	6.12
Excess			(0.13)	(0.10)	(0.04)	0.19	0.60	0.16	0.64
Neuberger Berman - Mortgage	105	0.81	2.01	1.87	0.81	2.42	1.52	1.38	6.66
FTSE MORTGAGE INDEX			2.09	2.00	1.01	2.47	1.59	1.56	6.12
Excess			(0.08)	(0.13)	(0.20)	(0.05)	(0.06)	(0.18)	0.54
Fischer Francis - Govt	0	0.00				4.67	1.35	0.52	11.44
NYC - Treasury Agency Plus Five						4.66	1.21	0.72	12.38
Excess						0.01	0.14	(0.20)	(0.94)
State Street - Gov't	303	2.35	3.57	2.03	(0.20)	4.81	1.47	0.47	12.15
NYC - Treasury Agency Plus Five			3.69	2.12	(0.05)	4.66	1.21	0.72	12.38
Excess			(0.12)	(0.09)	(0.15)	0.16	0.26	(0.25)	(0.23)
SSGA Int Gov Bond Index ²	1	0.01	0.60	1.14	2.03				
FTSE USBIG Treasury/Agency 1-10 y			2.18	2.08	1.42				
Excess			(1.58)	(0.94)	0.61				
91 DAY TREASURY BILL (DAILY)			0.56	1.06	1.87				
Excess			0.03	0.08	0.16				
SSGA 1-3 Treasury Index ³	771	6.00	1.29	1.49	1.53	1.78			
FTSE USBIG Treasury 1-3 Y Index			1.27	1.47	1.56	0.42			
Excess			0.02	0.01	(0.03)	1.36			
91 DAY TREASURY BILL (DAILY)			0.56	1.06	1.87	0.86			
Excess			0.73	0.43	(0.35)	0.92			

¹ Name changed from SSGA MSCI EAFE Small Cap Index to SSGA World ex USA Small Cap 12.2017

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³ Assets were in transition from 9/29/17 to 11/30/17

Public Markets Manager Performance Detail



Net Returns Through December 31, 2018

	Market Value (\$MM)	% of Total	3 Month	FYTD	CYTD	2017	2016	2015	2014
SSGA Long Duration Treasury	465	3.62	4.21	1.14	(1.83)	8.54			
FTSE Treasury 10+			4.17	1.09	(1.89)	8.60			
Excess			0.04	0.06	0.05	(0.07)			
CORE FI-EMERGING MANAGERS									
Hillswick	3	0.02	2.41	2.06	0.33	2.64	2.61	0.61	7.09
BBG BARC Agg (Dly)			1.64	1.65	0.01	3.54	2.65	0.55	5.97
Excess			0.78	0.41	0.32	(0.90)	(0.03)	0.06	1.13
Integrity	3	0.02	1.44	1.53	(0.03)	3.93			
BBG BARC Agg (Dly)			1.64	1.65	0.01	3.54			
Excess			(0.20)	(0.13)	(0.04)	0.39			
NEW CENTURY	8	0.06	1.56	1.50	0.12	4.04	2.37	(0.30)	6.53
BBG BARC Agg (Dly)			1.64	1.65	0.01	3.54	2.65	0.55	5.97
Excess			(0.08)	(0.15)	0.11	0.50	(0.28)	(0.85)	0.56
PUGH CAP	9	0.07	1.30	1.39	(0.42)	4.12	3.48	0.79	5.88
BBG BARC Agg (Dly)			1.64	1.65	0.01	3.54	2.65	0.55	5.97
Excess			(0.34)	(0.27)	(0.43)	0.58	0.83	0.24	(0.09)
Ramirez Asset	8	0.06	1.06	1.28	0.07	4.47	3.64	1.12	
BBG BARC Agg (Dly)			1.64	1.65	0.01	3.54	2.65	0.55	
Excess			(0.58)	(0.37)	0.06	0.93	0.99	0.57	
HIGH YIELD									
Brigade Capital	50	0.39							
BBG BARC US HY - 2% Issr Cap									
Excess									

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3 Assets were in transition from 9/29/17 to 11/30/17

Public Markets Manager Performance Detail



Net Returns Through December 31, 2018

	Market Value (\$MM)	% of Total	3 Month	FYTD	CYTD	2017	2016	2015	2014
Loomis Sayles - High Yield	0	0.00				7.32	19.72	(8.98)	2.88
BofAML HIGH YIELD MASTER II (DAILY)						7.48	17.49	(4.64)	2.50
Excess						(0.16)	2.23	(4.33)	0.37
Eaton Vance - HY	80	0.62							
BBG BARC US HY - 2% Issr Cap									
Excess									
MacKay Shields	77	0.60							
BBG BARC US HY - 2% Issr Cap									
Excess									
Nomura HY	50	0.39							
BBG BARC US HY - 2% Issr Cap									
Excess									
Penn Capital Mgt	-0	-0.00				6.63	11.92	(1.31)	0.39
FTSE BB & B						7.03	15.48	(4.21)	2.78
Excess						(0.40)	(3.55)	2.90	(2.39)
Shenkman - High Yield	141	1.10							
BBG BARC US HY - 2% Issr Cap									
Excess									
T. Rowe Price - High Yield	350	2.72	(3.66)	(1.48)	(2.34)	7.29	12.24	(1.28)	2.91
BBG BARC US HY - 2% Issr Cap			(4.54)	(2.24)	(2.08)	7.50	17.13	(4.43)	2.46
Excess			0.87	0.76	(0.26)	(0.22)	(4.89)	3.16	0.45
High Yield Transition	2	0.01							

Public Markets Manager Performance Detail



Net Returns Through December 31, 2018

	Market Value (\$MM)	% of Total	3 Month	FYTD	CYTD	2017	2016	2015	2014
BANK LOANS									
Babson BL	100	0.78	(3.89)	(1.69)	0.38	4.47	8.46	0.12	1.99
CSFB LEVERAGED LOAN INDEX			(3.08)	(1.21)	1.14	4.25	9.88	(0.38)	2.06
Excess			(0.81)	(0.49)	(0.76)	0.22	(1.41)	0.50	(0.07)
Guggenheim BL									
Guggenheim BL	103	0.80	(2.47)	(0.73)	1.24	3.82	7.84	2.07	2.88
CSFB LEVERAGED LOAN INDEX			(3.08)	(1.21)	1.14	4.25	9.88	(0.38)	2.06
Excess			0.61	0.48	0.10	(0.43)	(2.03)	2.45	0.83
TIPS									
Blackrock TIPS	149	1.16	(0.44)	(1.28)	(1.18)	2.98	4.75	(1.24)	3.74
BBG BARC Gbl Inf-Lk: US TIPS (Dly)			(0.42)	(1.24)	(1.26)	3.01	4.68	(1.44)	3.64
Excess			(0.02)	(0.05)	0.08	(0.02)	0.07	0.20	0.10
State Street TIPS Passive									
State Street TIPS Passive	438	3.40	(0.45)	(1.28)	(1.30)	3.06	4.59	(1.35)	3.57
BBG BARC Gbl Inf-Lk: US TIPS (Dly)			(0.42)	(1.24)	(1.26)	3.01	4.68	(1.44)	3.64
Excess			(0.03)	(0.04)	(0.04)	0.05	(0.09)	0.09	(0.07)
CONVERTIBLE BONDS									
Advent - Conv Bonds	222	1.73	(5.42)	(2.99)	(1.92)	7.92	7.20	(1.42)	4.62
BofA ML U.S. Convertible Yield Alternative			(4.96)	(3.79)	(0.42)	9.45	9.96	(8.77)	2.75
Excess			(0.46)	0.79	(1.51)	(1.53)	(2.76)	7.35	1.87
CORE FI-DEVELOPING MANAGERS									
LM Capital CoreCPlus	23	0.18	0.52	0.94	(1.30)	3.92	3.43	1.02	5.57
BBG BARC Agg (Dly)			1.64	1.65	0.01	3.54	2.65	0.55	5.97
Excess			(1.11)	(0.71)	(1.32)	0.38	0.78	0.47	(0.39)
GIA									
GIA	21	0.17	0.24	0.65	(1.11)	3.99	3.96		
BBG BARC Agg (Dly)			1.64	1.65	0.01	3.54	2.65		
Excess			(1.40)	(1.01)	(1.12)	0.45	1.31		

Public Markets Manager Performance Detail



Net Returns Through December 31, 2018

	Market Value (\$MM)	% of Total	3 Month	FYTD	CYTD	2017	2016	2015	2014
ECONOMICALLY TARGETED INVESTMENTS									
AFL-CIO HOUSING INV TRUST	56	0.43	1.95	1.77	0.16	3.17	1.94	1.13	6.10
BBG BARC Agg (Dly)			1.64	1.65	0.01	3.54	2.65	0.55	5.97
Excess			0.31	0.11	0.15	(0.38)	(0.71)	0.58	0.14
ACCESS RBC	27	0.21	2.04	1.88	0.49	2.64	1.61	1.83	6.66
Access RBC Benchmark			2.11	1.98	1.17	1.96	1.52	1.40	5.08
Excess			(0.07)	(0.10)	(0.69)	0.69	0.09	0.43	1.58
CPC CONST FACILITY	2	0.01	1.49	2.05	4.14	6.06	(3.95)	12.90	
CPC CONST BENCHMARK			1.05	2.05	3.99	3.34	3.03	2.90	
Excess			0.44	(0.00)	0.15	2.73	(6.99)	10.01	
BOA-PPAR (FNMA)	3	0.02	3.34	3.90	2.33	5.21	4.07	42.03	13.31
FNMA Plus 85bps			2.33	2.41	1.86	3.61	2.38	2.50	7.13
Excess			1.01	1.49	0.47	1.60	1.69	39.53	6.19
CCD-PPAR (FNMA)	2	0.02	4.21	4.93	2.63	5.26	3.71	6.69	25.71
FNMA Plus 85bps			2.33	2.41	1.86	3.61	2.38	2.50	7.13
Excess			1.88	2.52	0.77	1.65	1.33	4.20	18.58
CCD-PPAR (GNMA)	1	0.01	1.96	4.55	1.90	3.10	2.78	5.08	15.37
GNMA Plus 65bps			2.16	2.30	1.63	2.53	2.28	2.02	6.65
Excess			(0.20)	2.25	0.27	0.57	0.50	3.06	8.72
CFSB-PPAR (GNMA)	0	0.00	2.53	3.98	0.99	3.83	3.21	5.90	15.34
GNMA Plus 65bps			2.16	2.30	1.63	2.53	2.28	2.02	6.65
Excess			0.37	1.68	(0.65)	1.30	0.93	3.88	8.69
CPC-PPAR (FNMA)	2	0.02	3.26	4.45	2.31	5.06	6.15	8.96	13.91
FNMA Plus 85bps			2.33	2.41	1.86	3.61	2.38	2.50	7.13
Excess			0.93	2.04	0.45	1.45	3.77	6.46	6.78

Public Markets Manager Performance Detail

Net Returns Through December 31, 2018



	Market Value (\$MM)	% of Total	3 Month	FYTD	CYTD	2017	2016	2015	2014
JPMC-PPAR (FNMA)	5	0.04	3.31	4.08	1.68	9.96	7.94	6.18	11.95
FNMA Plus 85bps			2.33	2.41	1.86	3.61	2.38	2.50	7.13
Excess			0.98	1.67	(0.18)	6.35	5.56	3.68	4.82
LIIF-PPAR (FNMA)	2	0.02	4.02	4.70	2.27	9.55	5.03	6.29	38.12
FNMA Plus 85bps			2.33	2.41	1.86	3.61	2.38	2.50	7.13
Excess			1.68	2.29	0.41	5.94	2.65	3.79	30.99
LIIF-PPAR (GNMA)	0	0.00	2.32	3.49	2.53	2.52	3.88	3.92	9.74
GNMA Plus 65bps			2.16	2.30	1.63	2.53	2.28	2.02	6.65
Excess			0.16	1.19	0.89	(0.01)	1.61	1.91	3.09
LISC-PPAR ETI MTA 2013	1	0.01							
FNMA Plus 85bps									
Excess									
NCBCI-PPAR (FNMA)	0	0.00	0.75	5.02	2.00	1.75	3.46	4.97	14.93
FNMA Plus 85bps			2.33	2.41	1.86	3.61	2.38	2.50	7.13
Excess			(1.58)	2.61	0.15	(1.86)	1.07	2.47	7.81
NCBCI-PPAR (GNMA)	0	0.00	1.43	4.02	1.23	3.01	3.51	5.53	16.66
GNMA Plus 65bps			2.16	2.30	1.63	2.53	2.28	2.02	6.65
Excess			(0.73)	1.72	(0.41)	0.48	1.23	3.52	10.01
WELLS FARGO-PPAR MTA 2013 (FNMA)	0	0.00	3.19	5.86					
FNMA Plus 85bps			2.33	2.41					
Excess			0.86	3.44					

1 Name changed from SSGA MSCI EAFE Small Cap Index to SSGA World ex USA Small Cap 12.2017

2 Assets were in transition as of 9/29/17

3 Assets were in transition from 9/29/17 to 11/30/17

Public Markets Manager Performance Detail

Net Returns Through December 31, 2018



	Market Value (\$MM)	% of Total	3 Month	FYTD	CYTD	2017	2016	2015	2014
CASH									
FIRE SHORT TERM	110	0.86	0.58	1.09	1.97	1.13	0.88	0.32	0.21
91 DAY T-BILL			0.56	1.06	1.87	0.86	0.33	0.05	0.02
Excess			0.02	0.03	0.09	0.27	0.56	0.27	0.19
KKR SP CASH ACCOUNT									
	1	0.00							
Cash Accounts									
	0	0.00							
SECURITY LENDING									
	0	0.00							

**New York City
Fire Department Pension Fund, Subchapter Two**

Appendix C

Alternative Assets Manager Performance Detail

Alternative Assets Manager Performance Detail

Through September 30, 2018



	Vintage Year (Cash Flow)	Commitments	Contributions	Distributions	Market Value	Investment Multiple	ITD IRR%
TOTAL PRIVATE EQUITY		2,083,028,730	1,703,117,472	1,589,450,404	952,869,538	1.49	11.6%
TOTAL LIQUIDATED		132,532,336	147,629,839	197,443,319	-	1.34	8.9%
TOTAL ACTIVE		1,950,496,394	1,555,487,633	1,392,007,085	952,869,538	1.51	12.0%
TOTAL ACTIVE							
Cypress Merchant Banking Partners II, L.P.	1999	22,586,486	26,972,134	25,292,077	13,825	0.94	-1.2%
Lincolnshire Equity Fund II, L.P.	1999	6,899,005	7,223,050	14,015,738	255,991	1.98	24.6%
SCP Private Equity Partners II, L.P.	2000	15,000,000	16,834,296	6,514,303	1,927,511	0.50	-7.8%
Apollo Investment Fund V, L.P.	2001	15,000,000	23,379,009	46,104,652	248,254	1.98	38.8%
CVC European Equity Partners III, L.P.	2001	10,000,000	11,880,366	29,775,858	715,285	2.57	41.0%
Landmark Equity Partners XI, L.P.	2002	5,000,000	4,753,167	7,305,360	11,927	1.54	23.3%
FS Equity Partners V, L.P.	2003	10,000,000	8,567,981	16,744,589	754,606	2.04	15.4%
Blackstone Capital Partners IV, L.P.	2003	13,875,989	17,160,208	40,767,600	1,530,802	2.46	36.3%
Ares Corporate Opportunities Fund, L.P.	2003	5,000,000	5,998,308	8,941,880	303,070	1.54	13.4%
Markstone Capital Partners, LP	2004	5,000,000	5,862,384	2,477,825	34,027	0.43	-46.7%
Euro Choice II (Delaware) L.P.	2004	6,753,003	6,714,168	9,386,997	394,364	1.46	7.0%
FdG Capital Partners II LP	2004	5,000,000	5,387,768	6,228,579	376,125	1.23	3.9%
Paladin Homeland Security Fund (NY City), L.P.	2004	7,500,000	8,256,642	3,105,734	53,380	0.38	-14.2%
Lincolnshire Equity Fund III, L.P.	2004	5,000,000	4,987,885	7,066,602	1,939,131	1.81	28.7%
Yucaipa American Alliance Fund I, LP	2004	5,000,000	7,491,869	6,493,831	2,646,811	1.22	4.8%
New York/Fairview Emerging Managers Fund, L.P.-Tranche 1	2004	2,000,000	2,053,879	1,881,945	462,895	1.14	2.3%
Aurora Equity Partners III L.P.	2004	5,000,000	5,412,677	8,743,588	37,589	1.62	13.5%
Trilantic Capital Partners III L.P.	2004	5,000,000	4,499,867	7,377,336	10,685	1.64	14.6%
Medica III Investments (International) L.P.	2004	3,000,000	2,992,836	1,267,948	722,000	0.66	-8.3%
Palladium Equity Partners III, L.P.	2005	10,000,000	10,566,304	19,259,231	1,516,076	1.97	15.9%
New Mountain Partners II, L.P.	2005	2,580,650	2,337,304	4,502,540	48,637	1.95	13.7%
VSS Communications Partners IV, L.P.	2005	2,469,034	2,843,972	2,101,835	4,124	0.74	-5.1%
Carlyle Partners IV, L.P.	2005	5,000,000	5,153,158	10,078,088	140,993	1.98	13.0%
Prism Venture Partners V-A, L.P.	2005	7,500,000	7,690,681	4,765,525	105,104	0.63	-8.9%
Snow Phipps Group, L.P.	2005	5,000,000	5,956,871	5,223,117	2,555,303	1.31	6.1%
GI Partners Fund II L.P.	2005	2,500,000	2,532,382	4,070,090	3,898	1.61	7.7%
Blackstone Mezzanine Partners II, L.P.	2005	2,561,603	2,866,163	3,810,696	30,025	1.34	7.8%
Psilos Group Partners III, L.P.	2005	2,500,000	2,657,559	1,282,054	1,599,487	1.08	1.3%
FirstMark Capital I, L.P. (fka FirstMark IV)	2005	1,500,000	1,639,064	4,406,223	6,262,888	6.51	34.3%

Information provided by the New York City Fire Retirement System Consultants

Alternative Assets Manager Performance Detail

Through September 30, 2018



	Vintage Year (Cash Flow)	Commitments	Contributions	Distributions	Market Value	Investment Multiple	ITD IRR%
USPF II Institutional Fund, L.P.	2005	5,000,000	6,594,940	6,511,264	2,181,522	1.32	4.7%
JP Morgan Fleming (Tranche A)	2005	3,000,000	2,979,502	2,761,587	1,185,170	1.32	5.4%
Arlington Capital Partners II, L.P.	2005	4,000,000	4,069,527	6,842,637	272,599	1.75	11.2%
Aisling Capital II, LP	2006	1,000,000	1,177,912	1,004,989	215,109	1.04	0.6%
InterMedia Partners VII, L.P.	2006	2,500,000	2,919,819	2,959,171	158,373	1.07	1.0%
Terra Firma Capital Partners III, L.P.	2006	5,223,356	5,291,682	1,502,709	919,070	0.46	-9.7%
Fenway Partners Capital Fund III, L.P.	2006	5,000,000	5,743,510	4,831,708	2,159,005	1.22	3.5%
Blackstone Capital Partners V, L.P.	2006	9,448,250	10,048,538	15,570,525	906,554	1.64	8.1%
Avista Capital Partners, L.P.	2006	5,000,000	6,573,992	8,004,066	148,891	1.24	4.6%
Apollo Investment Fund VI, L.P.	2006	20,000,000	25,741,832	34,603,068	4,459,362	1.52	8.8%
Ares Corporate Opportunities Fund II, L.P.	2006	5,000,000	5,476,087	8,835,217	361,064	1.68	13.2%
CCMP Capital Investors II, L.P.	2006	5,000,000	5,486,988	9,439,624	5,030	1.72	13.5%
CLP 2014 (fka Perseus Partners VII)	2006	5,000,000	5,849,915	2,300,086	(5,555)	0.39	-20.8%
Euro Choice III L.P.	2006	5,313,724	5,347,612	5,512,868	766,062	1.17	3.2%
Thomas, McNerney & Partners II, L.P.	2006	3,000,000	3,035,394	6,119,246	519,174	2.19	16.4%
Catterton Partners VI, L.P.	2006	5,000,000	5,693,763	8,062,209	2,699,772	1.89	12.0%
First Reserve Fund XI, L.P.	2006	5,000,000	5,313,265	3,318,369	405,570	0.70	-7.8%
Permira IV, L.P.	2006	5,498,994	5,968,502	8,625,746	699,464	1.56	8.7%
Arsenal Capital Partners II, LP	2006	4,000,000	4,982,154	7,865,472	1,055,489	1.79	11.4%
GF Capital Private Equity Fund, L.P.	2006	3,000,000	3,074,084	3,916,818	1,824,180	1.87	13.2%
RRE Ventures IV, L.P.	2006	2,500,000	3,162,574	1,754,151	3,015,576	1.51	6.3%
Coller International Partners V, L.P.	2006	5,000,000	4,372,182	5,625,744	563,488	1.42	8.2%
MidOcean Partners III, L.P.	2006	9,705,796	11,564,899	20,149,008	3,764,779	2.07	13.1%
The Fourth Cinven Fund	2006	2,726,643	2,870,272	4,120,624	2,118	1.44	7.3%
Falconhead Capital Partners II, L.P.	2006	4,000,000	4,476,188	4,458,709	1,304,443	1.29	4.7%
Atlantic Equity Partners IV, L.P.	2006	3,768,757	3,464,833	477,590	1,812,990	0.66	-5.0%
Capital Partners Private Equity Income Fund, L.P.	2006	2,000,000	1,922,430	3,964,519	411,764	2.28	20.8%
Pegasus Partners IV, L.P.	2007	7,500,000	9,062,505	5,963,628	2,794,589	0.97	-0.7%
Olympus Capital Asia III, L.P.	2007	5,000,000	5,851,116	2,965,253	2,189,525	0.88	-2.9%
FTVentures III, LP	2007	2,500,000	2,743,841	4,778,178	1,249,306	2.20	15.9%
Highland Consumer Fund I LP	2007	2,000,000	2,003,212	1,068,222	596,465	0.83	-2.6%
Montreux Equity Partners IV, L.P.	2007	5,000,000	5,000,000	2,761,158	4,593,909	1.47	6.2%
Gleacher Mezzanine Fund II, L.P.	2007	3,000,000	2,752,429	3,651,296	25,133	1.34	10.6%
SCP Vitalife Partners II Fund	2007	5,000,000	5,024,924	395	2,488,499	0.50	-9.1%

Information provided by the New York City Fire Retirement System Consultants

Alternative Assets Manager Performance Detail

Through September 30, 2018



	Vintage Year (Cash Flow)	Commitments	Contributions	Distributions	Market Value	Investment Multiple	ITD IRR%
Constellation Venture Capital III, L.P.	2007	5,000,000	5,715,007	2,799,144	1,808,493	0.81	-3.6%
United States Power Fund III, L.P.	2007	5,000,000	5,915,665	5,950,852	1,783,277	1.31	4.9%
Carlyle Partners V, L.P.	2007	10,000,000	10,306,406	16,590,797	1,806,281	1.79	13.9%
PCG Clean Energy & Technology Fund (East), LLC	2007	10,000,000	9,047,736	1,557,008	2,626,753	0.46	-11.1%
GSO Capital Opportunities Fund LP	2007	7,500,000	11,229,550	15,937,873	156,019	1.43	17.4%
New Mountain Partners III, L.P.	2007	10,000,000	10,169,722	13,050,342	7,189,588	1.99	13.6%
Vista Equity Partners Fund III, L.P.	2007	7,500,000	8,037,081	18,480,896	2,157,255	2.57	27.4%
Trilantic Capital Partners IV L.P.	2007	7,236,332	7,558,018	11,215,634	994,240	1.62	14.0%
Pine Brook Capital Partners, L.P.	2007	7,500,000	8,437,475	9,665,328	1,725,475	1.35	8.1%
Princeton Capital Corp. (fka Capital Point)	2007	3,000,000	3,497,432	2,182,562	1,140,457	0.95	-1.2%
Post Capital Equity Partners II LP	2007	3,000,000	2,142,326	4,000,455	478,324	2.09	15.5%
Paladin III (NY City), L.P.	2008	7,500,000	9,958,306	7,067,571	7,654,791	1.48	8.5%
Relativity Fund, L.P.	2008	1,631,513	1,612,064	790,446	17,450	0.50	-10.7%
Apollo Investment Fund VII, L.P.	2008	25,000,000	30,130,256	46,968,477	5,600,435	1.74	23.2%
NGN BioMed Opportunity II, L.P.	2008	5,000,000	4,787,955	3,336,553	2,625,790	1.25	3.5%
Riverstone/Carlyle Global Energy & Power Fund IV, L.P.	2008	7,500,000	8,475,973	7,016,703	3,441,661	1.23	5.5%
Yucaipa American Alliance Fund II, LP	2008	15,000,000	20,468,035	12,161,707	21,138,807	1.63	9.7%
Levine Leichtman Capital Partners IV, L.P.	2008	5,000,000	5,353,601	7,555,518	1,618,805	1.71	18.9%
Lee Equity Partners Fund, L.P.	2008	6,490,574	8,915,115	10,837,960	37,302	1.22	6.3%
New York/Fairview Emerging Managers Fund, L.P.-Tranche 2	2008	5,000,000	4,962,147	4,309,659	4,472,334	1.77	14.2%
Yucaipa Corporate Initiatives Fund II, LP	2008	4,676,976	4,588,700	1,665,200	2,753,062	0.96	-0.6%
CVC European Equity Partners V, L.P.	2008	13,663,942	14,791,218	22,876,677	4,826,794	1.87	16.2%
GI Partners Fund III L.P.	2008	7,500,000	8,103,000	12,197,506	534,189	1.57	13.1%
Ares Corporate Opportunities Fund III, L.P.	2008	10,000,000	12,052,802	17,608,554	7,768,064	2.11	21.0%
GCM Grosvenor NYCFDPF Emerging Manager Fund, L.P.	2008	8,979,798	11,084,623	8,776,139	6,555,706	1.38	10.0%
First Reserve Fund XII, L.P.	2008	5,000,000	5,554,103	2,724,175	1,060,105	0.68	-9.0%
Landmark Equity Partners XIV, L.P.	2008	13,630,000	13,200,646	14,061,794	3,236,950	1.31	9.8%
Crestview Partners II, L.P.	2008	7,500,000	8,431,836	9,815,703	4,586,094	1.71	13.7%
NB New York City Growth Fund IA	2008	1,208,990	1,208,990	417,624	387,445	0.67	-5.6%
Milestone Partners III, L.P.	2008	3,000,000	3,213,247	2,719,121	577,216	1.03	0.5%
Euro Choice IV L.P.	2008	6,470,747	5,971,363	4,818,575	3,747,257	1.43	7.8%
Avista Capital Partners II, L.P.	2008	10,000,000	12,960,801	20,021,237	2,523,469	1.74	15.8%
Bridgepoint Europe IV	2008	6,664,992	6,691,525	6,762,728	2,849,501	1.44	9.1%
Blue Wolf Capital Fund II, L.P.	2008	3,000,000	3,252,569	3,768,005	741,135	1.39	7.8%

Information provided by the New York City Fire Retirement System Consultants

Alternative Assets Manager Performance Detail

Through September 30, 2018



	Vintage Year (Cash Flow)	Commitments	Contributions	Distributions	Market Value	Investment Multiple	ITD IRR%
Aisling Capital III, LP	2008	3,500,000	3,948,536	6,506,018	2,172,613	2.20	25.3%
Onex Partners III LP	2008	5,000,000	5,438,585	6,855,160	2,588,718	1.74	13.7%
NorthBound Emerging Manager Custom Fund LP	2009	5,000,000	4,317,619	5,282,670	2,231,743	1.74	14.4%
Welsh, Carson, Anderson & Stowe XI, L.P.	2009	7,500,000	7,500,000	9,638,469	2,842,514	1.66	12.9%
Scale Venture Partners III, LP	2009	5,000,000	4,947,453	10,020,531	3,753,364	2.78	23.4%
FS Equity Partners VI, L.P.	2009	12,500,000	12,527,662	25,878,811	9,356,882	2.81	23.8%
Lincolnshire Equity Fund IV, L.P.	2009	2,500,000	2,658,442	2,279,887	1,838,138	1.55	11.1%
Lexington Capital Partners VII, L.P.	2009	10,000,000	8,840,064	10,644,255	3,203,907	1.57	14.4%
Snow Phipps II, L.P.	2010	7,500,000	8,355,111	5,970,399	4,908,333	1.30	8.7%
Trident V, L.P.	2010	15,000,000	16,874,905	16,308,710	11,186,362	1.63	11.8%
Comvest Investment Partners IV, L.P.	2010	20,000,000	20,052,821	25,871,580	10,770,836	1.83	30.5%
Blackstone Capital Partners VI, L.P.	2011	10,000,000	10,249,278	6,110,172	10,593,273	1.63	14.9%
Ampersand 2011	2011	5,000,000	5,000,000	5,891,410	7,188,972	2.62	21.3%
BDCM Opportunity Fund III, L.P.	2011	10,000,000	13,364,944	4,606,283	13,402,332	1.35	8.7%
AXA Secondary Fund V B L.P.	2011	40,000,000	32,763,005	45,157,687	8,833,947	1.65	16.6%
Wellspring Capital Partners V, L.P.	2011	7,500,000	7,557,319	8,245,493	3,423,424	1.54	15.9%
EQT VI, L.P.	2011	17,706,484	18,364,492	16,812,557	14,145,645	1.69	14.6%
Pegasus Partners V, L.P.	2011	6,236,975	7,387,476	4,515,527	7,855,894	1.67	14.5%
BC European Capital IX	2011	21,898,304	23,682,986	15,573,674	18,467,509	1.44	11.7%
American Securities Partners VI, L.P.	2011	20,000,000	21,446,823	30,824,989	10,098,523	1.91	22.2%
Vista Equity Partners Fund IV, L.P.	2011	30,000,000	30,671,980	34,645,144	27,536,036	2.03	19.8%
Warburg Pincus Private Equity XI, L.P.	2012	35,000,000	37,237,928	24,047,785	33,448,497	1.54	14.5%
Summit Partners Growth Equity Fund VIII-A, L.P.	2012	30,000,000	33,380,927	39,313,428	23,896,521	1.89	24.9%
<u>NYCFPF - 2012 Emerging Manager Program</u>	<u>2012</u>	<u>23,700,000</u>	<u>22,122,623</u>	<u>7,515,271</u>	<u>23,481,055</u>	<u>1.40</u>	<u>14.2%</u>
Trilantic Capital Partners V L.P.	2012	10,000,000	10,396,925	8,878,636	6,619,232	1.49	19.0%
Palladium Equity Partners IV, L.P.	2012	10,000,000	8,055,704	4,470,998	7,692,193	1.51	15.2%
Ares Corporate Opportunities Fund IV, L.P.	2012	20,000,000	20,418,848	10,649,128	18,781,574	1.44	13.5%
Green Equity Investors VI, L.P.	2012	25,000,000	26,814,025	15,851,201	26,311,091	1.57	16.1%
Platinum Equity Capital Partners III, L.P.	2012	25,000,000	20,573,530	22,295,530	18,006,790	1.96	40.2%
Carlyle Partners VI, L.P.	2013	20,000,000	20,655,887	7,555,603	19,268,829	1.30	12.8%
Carlyle Partners VI, L.P. (Side Car)	2014	2,200,000	1,567,135	84,077	1,584,206	1.06	2.4%
Landmark Equity Partners XV, L.P.	2013	26,000,000	17,707,577	11,219,158	11,784,565	1.30	15.2%
Landmark - NYC Fund I, L.P.	2013	9,000,000	7,315,620	3,974,597	6,564,798	1.44	18.4%
Apollo Investment Fund VIII, L.P.	2013	40,000,000	34,434,051	10,395,784	35,798,842	1.34	14.9%

Information provided by the New York City Fire Retirement System Consultants

Alternative Assets Manager Performance Detail

Through September 30, 2018



	Vintage Year (Cash Flow)	Commitments	Contributions	Distributions	Market Value	Investment Multiple	ITD IRR%
CVC Capital Partners VI, L.P.	2014	35,353,910	30,727,067	7,480,657	30,539,981	1.24	11.6%
Crestview Partners III, L.P.	2013	24,000,000	12,098,194	1,855,167	14,254,993	1.33	15.5%
Crestview Partners III (Co-Investment B), L.P.	2013	8,000,000	6,259,572	393,924	7,336,359	1.23	11.7%
Olympus Growth Fund VI, L.P.	2014	15,000,000	12,241,675	5,076,946	11,161,259	1.33	16.9%
ASF VI B L.P.	2014	30,000,000	20,212,615	9,066,405	20,305,505	1.45	15.1%
ASF VI B NYC Co-Invest L.P.	2014	10,000,000	7,525,827	5,369,697	5,074,137	1.39	13.5%
Vista Equity Partners Fund V, L.P.	2014	40,000,000	45,928,228	26,962,400	53,358,995	1.75	24.2%
Lexington Capital Partners VIII, L.P.	2014	40,000,000	25,374,507	9,711,590	25,890,364	1.40	27.2%
Siris Partners III, L.P.	2015	5,500,000	3,998,627	1,354,688	3,779,030	1.28	15.7%
Centerbridge Capital Partners III, L.P.	2015	4,200,000	2,287,282	623,370	2,295,460	1.28	13.7%
Welsh, Carson, Anderson & Stowe XII, L.P.	2015	14,000,000	8,488,138	1,654,200	10,395,018	1.42	22.3%
Warburg Pincus Private Equity XII, L.P.	2015	36,000,000	23,549,942	781,740	26,510,065	1.16	12.8%
ASF VII B L.P.	2015	17,000,000	5,119,357	83,217	6,829,274	1.35	25.4%
ASF VII B NYC Co-Invest L.P.	2015	9,000,000	4,364,788	-	6,840,919	1.57	66.7%
EQT VII, L.P.	2015	28,618,602	19,896,706	3,173,119	21,186,751	1.22	14.3%
American Securities Partners VII, L.P.	2015	14,000,000	8,026,277	198,308	8,194,853	1.05	3.3%
Bridgepoint Europe V L.P.	2015	11,437,239	8,893,224	1,098,544	9,879,968	1.23	16.9%
Bridgepoint Europe V Co-Invest	2015	3,494,073	3,269,568	-	4,314,973	1.32	28.6%
<u>NYCFPF - 2015 Emerging Manager Program</u>	<u>2015</u>	<u>31,300,000</u>	<u>7,078,682</u>	<u>320,820</u>	<u>8,414,339</u>	<u>1.23</u>	<u>31.0%</u>
Vista Equity Partners Fund VI, L.P.	2016	28,000,000	25,554,189	737,068	31,236,907	1.25	18.3%
Platinum Equity Capital Partners IV, L.P.	2016	19,000,000	11,515,746	1,570,528	12,164,045	1.19	NM
Platinum Equity Capital Partners IV Co-Investment, L.P.	2018	3,000,000	2,100,000	-	1,528,845	0.73	NM
Apax IX USD, L.P.	2016	22,000,000	9,741,190	208,652	11,696,772	1.22	NM
Green Equity Investors VII, L.P.	2017	17,000,000	7,631,607	67,318	7,631,669	1.01	NM
Ares Corporate Opportunities Fund V, L.P.	2017	17,000,000	6,369,910	230,890	6,174,445	1.01	NM
KKR Americas Fund XII, L.P.	2017	28,000,000	3,967,383	-	4,504,778	1.14	NM
BC European Capital X	2017	16,324,354	3,974,105	-	3,815,368	0.96	NM
BCEC X Co-Investment	2017	6,531,823	3,800,427	-	3,811,831	1.00	NM
Warburg Pincus Financial Sector, L.P.	2017	21,000,000	4,183,272	1,071,000	2,705,359	0.90	NM
Platinum Equity Small Cap Fund, L.P.	2018	8,000,000	345,600	-	287,990	0.83	NM
EQT VIII, L.P.	2018	22,655,725	195,980	-	28,849	0.15	NM
EQT VIII Co-Investment	2018	8,238,573	-	-	-	-	N/A
CVC Capital Partners VII, L.P.	2018	31,369,950	-	-	422,549	-	NM
Vista Equity Partners Fund VII, L.P.	2018	35,500,000	-	-	(25,004)	-	NM

Information provided by the New York City Fire Retirement System Consultants

Alternative Assets Manager Performance Detail

Through September 30, 2018



	Vintage Year				Investment		
	(Cash Flow)	Commitments	Contributions	Distributions	Market Value	Multiple	ITD IRR%
Apollo Investment Fund IX, L.P.	2018	52,000,000	-	-	(294,735)	-	NM
Bridgepoint Europe VI	2018	24,398,850	-	-	(93,358)	-	NM
Bridgepoint Europe VI Co-Invest	2018	6,099,713	-	-	-	-	N/A
Crestview Partners IV, L.P.	2018	14,000,000	-	-	-	-	N/A
Crestview Partners IV (Co-Investment), L.P.	2018	4,666,667	-	-	-	-	N/A
Siris Partners IV, L.P.	2018	18,000,000	-	-	-	-	N/A
Welsh, Carson, Anderson & Stowe XIII, L.P.	2019	18,000,000	-	-	-	-	N/A

Information provided by the New York City Fire Retirement System Consultants

Alternative Assets Manager Performance Detail

Through September 30, 2018



	Vintage Year	Style Sector	Original Commitment	Total Contributions	Total Distributions	Market Value	Total Value Multiple	Net IRR%
TOTAL PRIVATE REAL ESTATE			903,379,893	757,827,961	507,689,367	561,978,437	1.40	8.1%
TOTAL PRIVATE REAL ESTATE								
PRISA SA	2006	Core Portfolio	7,000,000	7,530,220	2,684,358	9,810,214	1.66	4.8%
Prologis Targeted U.S. Logistics Fund	2006	Core Portfolio	5,000,000	6,745,383	2,049,109	8,934,396	1.63	5.3%
RREEF America REIT II	2006	Core Portfolio	7,000,000	9,178,399	4,628,474	9,991,538	1.59	5.3%
UBS Trumbull Property Fund	2006	Core Portfolio	27,000,000	40,811,715	11,316,679	51,258,148	1.53	7.2%
Colony Realty Partners II	2007	Core Portfolio	5,000,000	5,355,052	1,384,970	-	0.26	-13.4%
Heitman HART	2007	Core Portfolio	9,000,000	13,977,293	4,977,293	19,703,366	1.77	8.1%
JP Morgan Special Situation Property Fund	2007	Core Portfolio	5,000,000	5,870,702	1,963,153	7,127,376	1.55	4.6%
JP Morgan Strategic Property Fund	2007	Core Portfolio	22,000,000	24,459,391	-	49,542,716	2.03	8.4%
PRISA II	2007	Core Portfolio	20,228,233	21,417,377	6,335,750	30,231,227	1.71	5.9%
LaSalle Property Fund	2010	Core Portfolio	30,000,000	30,000,000	10,305,001	43,561,004	1.80	10.9%
NYC Asset Investor #2 LLC	2013	Core Portfolio	9,000,000	8,637,851	2,332,688	11,448,732	1.60	15.1%
MetLife Core Property Fund	2014	Core Portfolio	15,000,000	15,000,000	2,683,266	18,654,914	1.42	11.0%
Exeter Industrial Core Club Fund II	2016	Core Portfolio	6,000,000	3,106,517	305,336	3,545,959	1.24	15.3%
Jamestown Premier Property Fund	2016	Core Portfolio	8,000,000	9,314,604	3,956,455	7,195,318	1.20	10.3%
NYCRS Artemis Co-Investment (SEM)	2016	Core Portfolio	11,000,000	9,126,373	3,365,271	7,728,360	1.22	24.2%
USAA Eagle Real Estate Fund	2016	Core Portfolio	12,000,000	12,000,000	-	14,499,105	1.21	9.0%
Brookfield Premier Real Estate Partners	2017	Core Portfolio	19,000,000	20,068,429	1,297,496	23,140,287	1.22	13.3%
Carlyle Property Investors	2017	Core Portfolio	19,000,000	19,619,723	843,169	20,215,628	1.07	7.8%
Lion Industrial Trust - 2007	2017	Core Portfolio	12,000,000	12,854,839	761,671	15,179,933	1.24	14.6%
Almanac Realty Securities VIII	2019	Core Portfolio	10,500,000	-	-	(10,557)	N/A	N/A
Heitman Core Real Estate Debt Income Trust	2019	Core Portfolio	8,000,000	-	-	-	N/A	N/A
Blackstone Fund IV	2004	Non-Core Portfolio	5,000,000	6,406,782	8,268,880	751,173	1.41	10.3%
The City Investment Fund I	2004	Non-Core Portfolio	35,000,000	34,515,181	34,904,154	72,280	1.01	0.3%
Canyon Johnson Urban Fund II	2005	Non-Core Portfolio	10,000,000	8,988,710	3,974,652	34,453	0.45	-10.5%
Blackstone Real Estate Partners VI	2007	Non-Core Portfolio	10,000,000	11,168,487	21,037,989	1,096,018	1.98	13.3%
Carlyle Realty Partners V	2007	Non-Core Portfolio	5,000,000	6,311,803	7,388,819	1,554,196	1.42	8.4%
Colony Investors VIII	2007	Non-Core Portfolio	20,000,000	21,249,679	9,077,467	480,478	0.45	-11.4%
Metropolitan Workforce Housing Fund (SEM)	2007	Non-Core Portfolio	3,500,000	3,503,257	4,117,421	133,311	1.21	3.9%
AG Realty Fund VII	2008	Non-Core Portfolio	15,000,000	14,100,000	20,646,846	817,765	1.52	12.8%
American Value Partners Fund I (SEM)	2008	Non-Core Portfolio	5,000,000	3,785,294	3,382,450	550,947	1.04	0.7%
Ares European Real Estate Fund III, LP	2008	Non-Core Portfolio	15,000,000	15,243,750	16,338,750	610,538	1.11	2.7%
Silverpeak Legacy Partners III	2008	Non-Core Portfolio	5,000,000	2,216,844	400,706	446,488	0.38	-10.6%
Stockbridge Real Estate Fund III	2008	Non-Core Portfolio	13,500,000	13,499,074	8,414,877	7,336,909	1.17	2.4%
Thor Urban Property Fund II	2009	Non-Core Portfolio	5,000,000	6,849,514	6,847,656	2,149,846	1.31	8.0%
Walton Street Real Estate Fund VI	2009	Non-Core Portfolio	5,000,000	4,432,393	4,786,027	2,099,003	1.55	9.2%

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Alternative Assets Manager Performance Detail

Through September 30, 2018



	Vintage Year	Style Sector	Original Commitment	Total Contributions	Total Distributions	Market Value	Total Value Multiple	Net IRR%
Blackstone Real Estate Partners Europe III (USD Vehicle)	2010	Non-Core Portfolio	5,000,000	5,191,123	6,816,492	1,086,100	1.52	11.8%
Canyon Johnson Urban Fund III	2010	Non-Core Portfolio	5,000,000	4,931,163	6,664,557	6,069	1.35	11.9%
Westbrook Real Estate Fund VIII	2010	Non-Core Portfolio	5,000,000	5,954,974	6,780,163	1,097,758	1.32	11.7%
Carlyle Realty Partners VI	2011	Non-Core Portfolio	20,000,000	19,123,535	30,221,872	3,060,636	1.74	25.7%
H/2 Special Opportunities Fund II	2011	Non-Core Portfolio	10,000,000	10,000,001	12,208,227	3,223,016	1.54	14.7%
Blackstone Real Estate Partners VII	2012	Non-Core Portfolio	30,000,000	36,566,631	37,340,065	23,217,245	1.66	18.3%
Brookfield Strategic Real Estate Partners	2012	Non-Core Portfolio	15,000,000	16,704,394	15,996,292	17,383,552	2.00	22.6%
Divco West Fund III	2012	Non-Core Portfolio	30,000,000	29,429,127	49,058,784	1,622,123	1.72	23.9%
Taconic New York City Investment Fund LP	2012	Non-Core Portfolio	20,000,000	8,363,637	13,396,035	1,017,815	1.72	15.5%
NYC Asset Investor #1 LLC	2013	Non-Core Portfolio	5,000,000	5,462,433	1,351,000	5,523,694	1.26	7.1%
NYC Asset Investor #3 LLC	2013	Non-Core Portfolio	6,000,000	3,765,178	661,497	4,213,658	1.29	11.0%
Blackstone Real Estate Partners Europe IV (USD Vehicle)	2014	Non-Core Portfolio	26,000,000	25,024,502	22,600,645	15,165,342	1.51	16.5%
Carlyle Realty Partners VII	2014	Non-Core Portfolio	15,000,000	11,956,706	6,493,931	9,807,200	1.36	15.9%
Divco West Fund IV	2014	Non-Core Portfolio	30,000,000	29,131,906	41,679,866	6,780,169	1.66	26.3%
Lone Star Real Estate Fund III	2014	Non-Core Portfolio	25,000,000	23,435,387	25,832,943	5,886,904	1.35	15.3%
Avanath Affordable Housing Fund II (SEM)	2015	Non-Core Portfolio	2,220,000	2,158,370	121,475	2,974,055	1.43	12.6%
Blackstone Real Estate Partners VIII	2015	Non-Core Portfolio	31,500,000	22,714,470	7,908,268	21,373,495	1.29	17.5%
H/2 Special Opportunities Fund III	2015	Non-Core Portfolio	15,000,000	15,000,000	6,236,152	12,916,533	1.28	12.5%
European Property Investors Special Opportunities IV (EPISO IV)	2016	Non-Core Portfolio	10,059,238	6,034,332	442,785	6,232,493	1.11	8.6%
PW Real Estate Fund III LP	2016	Non-Core Portfolio	9,562,261	4,524,107	753,265	5,580,097	1.40	27.6%
Westbrook Real Estate Fund X	2016	Non-Core Portfolio	8,000,000	3,637,521	712,981	3,324,707	1.11	11.4%
Divco West Fund V	2017	Non-Core Portfolio	12,000,000	4,390,253	-	4,621,360	1.05	4.6%
DRA Growth and Income Fund IX	2017	Non-Core Portfolio	8,000,000	3,682,637	864,086	3,480,378	1.18	19.5%
Exeter Industrial Value Fund IV	2017	Non-Core Portfolio	10,000,000	4,500,000	-	4,785,959	1.06	12.2%
H/2 Special Opportunities Fund IV	2017	Non-Core Portfolio	19,000,000	2,073,750	-	2,099,168	1.01	0.7%
KKR CMBS B-Piece SMA	2017	Non-Core Portfolio	25,000,000	14,871,921	858,300	14,884,975	1.06	8.4%
Lone Star Real Estate Fund V	2017	Non-Core Portfolio	23,100,000	2,895,450	81,573	2,482,022	0.89	-15.1%
Pramerica Real Estate Capital VI (PRECap VI)	2017	Non-Core Portfolio	10,040,161	4,094,524	1,655,183	3,245,571	1.20	22.5%
Basis Investment Group Fund I (SEM)	2018	Non-Core Portfolio	4,100,000	1,116,108	62,911	1,189,111	1.12	20.0%
KKR Real Estate Partners Americas II	2018	Non-Core Portfolio	20,070,000	3,749,185	113,186	3,918,959	1.08	26.8%
Brookfield Strategic Real Estate Partners III	2019	Non-Core Portfolio	30,000,000	-	-	(112,796)	N/A	N/A

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

Alternative Assets Manager Performance Detail

Through September 30, 2018



	Vintage Year	Original Commitment	Total Contributions	Total Distributions	Market Value	Total Value Multiple	Net IRR%
TOTAL INFRASTRUCTURE		196,340,246	83,244,782	13,880,560	88,283,628	1.23	13.9%
TOTAL INFRASTRUCTURE INVESTMENTS							
Brookfield Infrastructure Fund II, L.P.	2013	15,000,000	12,133,873	2,856,859	14,360,257	1.42	12.4%
KKR Global Infrastructure Investors II L.P.	2014	12,000,000	10,456,836	1,046,290	11,256,144	1.18	11.2%
IFM Global Infrastructure Fund	2014	10,000,000	13,351,525	3,351,525	15,052,184	1.38	12.8%
Global Energy & Power Infrastructure Fund II	2014	10,000,000	7,466,626	4,770,475	5,952,033	1.44	41.2%
Global Infrastructure Partners III-A/B, L.P.	2016	22,000,000	16,211,185	318,072	17,457,139	1.10	11.3%
Brookfield Infrastructure Fund III, L.P.	2016	19,000,000	5,791,908	489,727	6,099,174	1.14	10.5%
Actis Energy 4	2016	12,900,000	3,822,989	671	4,009,000	NM	NM
NYCRS EIG Energy Partners, L.P.	2017	15,300,000	1,524,046	32,306	1,543,245	NM	NM
EQT Infrastructure III (No.2) SCSp	2017	11,404,966	5,407,215	469,013	5,640,864	NM	NM
Axiom Infrastructure North America	2017	15,515,280	6,059,738	29,024	6,071,571	NM	NM
ASF VII Infrastructure L.P.	2017	15,000,000	1,018,840	516,598	871,725	NM	NM
NYCRS EIG Energy Partners Co-Investment, L.P.	2018	3,820,000	-	-	-	NM	NM
KKR Global Infrastructure Investors III L.P.	2018	17,200,000	-	-	(29,708)	NM	NM
Global Energy & Power Infrastructure Fund III, L.P.	2018	17,200,000	-	-	-	NM	NM

Information provided by the New York City Fire Retirement System Consultants

Alternative Assets Manager Performance Detail

Through December 31, 2018



	Vintage Year	Commitment - Closing (Base)	Contributions Cumulative (Local)	Distributions Cumulative	Final Market Value	3 Month Base%	Inception IRR%
TOTAL OPPORTUNISTIC FIXED INCOME		525,523,386	493,880,075	229,737,522	395,002,081	-1.19%	7.15%
Avenue Special Situations Fund V, L.P.	2007	5,052,332	5,130,079	6,706,716	-		NM
Avenue Europe Special Sit. Fund, L.P.	2008	5,096,054	4,495,867	8,970,029	-		NM
PIMCO DiSCO Fund, L.P.	2008	25,000,000	25,071,292	34,076,267	-		11.23%
Torchlight Debt Opportunity Fund III, LLC	2009	15,000,000	16,001,292	23,792,157	11,736	0.00%	13.36%
Avenue Special Situations Fund VI (A), L.P.	2011	15,000,000	15,378,545	15,272,631	1,070,641	0.00%	1.42%
GoldenTree Managed Account	2011	32,000,000	30,000,730	-	45,508,287	-1.83%	6.72%
Marathon Centre Street Partnership, L.P. - Asset Class	2011	46,875,000	58,125,000	17,625,000	62,258,094	-1.63%	7.04%
AG Centre Street Partnership, L.P. - CC Asset Class	2012	35,000,000	29,750,000	9,260,636	29,801,500	-3.20%	5.88%
Apollo Centre Street Partnership, L.P.	2012	50,000,000	62,597,367	36,219,516	35,771,302	-0.61%	4.76%
FCO MA Centre Street L.P.	2012	30,000,000	54,236,430	32,530,187	33,317,137	0.00%	8.80%
OHA Centre Street Partnership, L.P.	2012	37,500,000	48,648,968	14,990,431	48,942,333	-0.59%	7.74%
Contrarian Centre Street Partnership, L.P. - Asset Class	2013	15,000,000	15,000,000	-	16,586,399	-9.32%	2.67%
Oaktree Opportunities Fund IX, L.P.	2013	30,000,000	30,000,000	9,868,629	24,220,757	0.00%	3.07%
Ares Centre Street Partnership, L.P.	2014	30,000,000	27,453,659	-	37,262,156	1.06%	9.59%
Brightwood Capital Fund III, L.P.	2015	8,000,000	6,492,299	2,258,683	5,327,872	0.00%	5.38%
Torchlight Debt Opportunity Fund V, LP	2015	20,000,000	12,000,000	1,313,668	14,155,347	-0.77%	13.74%
Brightwood Capital Fund IV, LP	2016	20,000,000	8,000,000	664,285	8,071,055	0.00%	10.02%
ICG Centre Street Partnership, L.P.	2017	30,000,000	24,527,208	14,469,937	11,205,165	0.00%	6.60%
KKR OFI SMA	2017	55,000,000	14,437,500	1,718,750	14,890,260	0.00%	20.38%
Maranon Centre Street Partnership, L.P.	2018	21,000,000	6,533,841	-	6,602,039	1.00%	3.55%

Information provided by Alpha Frontier
Above data is not final and subject to change

Alternative Assets Manager Performance Detail

Through December 31, 2018



	Market Value	MTD Return%	3 Month Return%	FYTD Return%	YTD Return%	1 Year Return%	3 Year Return%	ITD Return%	ITD Cumulative Return%
TOTAL HEDGE FUNDS	750,213,428	0.25%	-2.03%	-1.14%	2.09%	2.09%	4.98%	3.70%	31.33%
TOTAL DIRECT HEDGE FUNDS	749,570,452	0.25%	-2.02%	-1.14%	2.17%	2.17%	5.17%	4.63%	37.80%
FUND OF FUNDS HEDGE FUNDS	642,976	-1.64%	-2.93%	-3.01%	-0.84%	-0.84%	1.91%	1.89%	15.04%
TOTAL DIRECT HEDGE FUNDS									
Caspian Select Credit Fund, L.P.	24,413,296	-1.29%	-2.20%	-0.28%	0.98%	0.98%	5.47%	3.66%	27.08%
D.E. Shaw Composite Fund, L.L.C.	84,845,916	3.54%	2.25%	5.92%	11.65%	11.65%	9.62%	12.97%	134.81%
Relative Value	109,259,212	2.42%	1.22%	4.47%	8.99%	8.99%	8.51%	9.22%	85.44%
AlphaQuest Original LLC	51,046,924	0.88%	-10.25%	-13.19%	3.42%	3.42%		1.92%	3.06%
Brevan Howard AH Fund, L.P.	60,344,193	1.93%	-1.68%	-7.10%	27.24%	27.24%		9.36%	16.07%
Florin Court Capital Fund	33,687,951	3.62%	-4.38%	2.08%	2.08%			2.08%	2.08%
GSA Trend Fund LP	58,732,565	1.93%	-2.88%	2.46%	-6.53%	-6.53%		-2.88%	-4.76%
Key Square Partners LP	60,070,342	-3.04%	-2.76%	-5.53%	-1.87%	-1.87%		-3.40%	-5.33%
Pharo Gaia Fund, LTD.	56,365,458	1.46%	3.61%	5.64%	0.03%	0.03%	13.00%	13.10%	46.18%
Pharo Macro Fund, Ltd.	49,644,204	0.41%	1.45%	1.43%	2.14%	2.14%	8.55%	8.62%	57.55%
Tactical Trading	369,891,636	0.82%	-2.42%	-2.69%	2.45%	2.45%	3.89%	2.51%	19.18%
DL Partners Opportunities Fund LP	38,528,007	-4.96%		-2.46%	-2.46%			-2.46%	(0.02)
Fir Tree Value Fund, L.P.	38,530,815	-4.37%	-5.92%	-6.56%	-8.14%	-8.14%	-1.64%	-0.33%	(0.02)
Luxor Capital Partners Liquidating SPV, LLC.	495,848	-0.02%	15.40%	15.40%	15.40%			15.40%	15.40%
Luxor Capital Partners, LP	56,742,643	4.92%	-2.34%	0.77%	13.80%	13.80%	16.27%	2.83%	13.66%
Perry Partners L.P.	1,109,198	-5.20%	-5.20%	-13.84%	-22.48%	-22.48%	-5.45%	-5.07%	-25.22%
Standard General Fund II L.P.	15,368,419	1.56%	-8.33%	-3.29%	6.15%	6.15%		6.54%	12.91%
Event Driven	150,774,929	-0.62%	-4.75%	-2.82%	3.75%	3.75%	8.49%	3.24%	20.74%
Altimeter Partners Fund LP	24,016,675	-5.98%	-3.97%	8.71%	18.24%	18.24%		11.84%	37.32%
Gotham Targeted Neutral, LP	12,031,926	0.01%	0.42%	0.51%	-1.37%	-1.37%	2.00%	-0.46%	-1.78%
SRS Partners US, LP	43,458,980	-1.03%	6.72%	-0.46%	5.00%	5.00%	4.60%	7.05%	31.32%
Turiya Fund LP	40,137,095	-1.96%	-6.88%	-3.31%	-21.01%	-21.01%	-3.90%	-2.60%	-8.80%
Long/Short Equity	119,644,675	-2.27%	-0.97%	0.35%	-4.06%	-4.06%	2.28%	3.94%	23.67%
FUND OF FUNDS HEDGE FUNDS									
Fund of Funds Hedge Funds	642,976	-1.64%	-2.93%	-3.01%	-0.84%	-0.84%	1.91%	1.89%	15.04%

Information provided by Alpha Frontier

**New York City
Fire Department Pension Fund, Subchapter Two**

Appendix D

Footnotes

Through December 31, 2018



- The Barclays Capital Aggregate (then known as the Lehman Brothers Aggregate) was used prior to 1/1/89. Effective 1/1/89, in the Government Sector, maturities of less than 5 years were dropped from the Salomon and Lehman indices. From that date until 7/1/99 the benchmark was the NYC Core + 5, from Lehman.
- Effective 7/1/94, the NYC Core + 5 Index includes BBB rated securities.
- Effective 7/1/99, the basis of the NYC Index was changed from Lehman Brothers to Salomon. Also effective 7/1/99, only Salomon indices have been used to compare all fixed income managers.
- Effective 4/1/03, the name of the benchmark provider was changed from Salomon to Citigroup.
- Effective 7/1/09, the Core+5 program was restructured.
 - The U.S. Gov't sector benchmark Index was changed from the Citigroup Core+5 Treasury/Gov't Sponsored Index to the Citigroup Core+5 Treasury/Agency Index.
 - The Corporate and Yankee sectors were combined to form the new Investment Grade Credit sector. The benchmark for the new combined sector is the customized Citigroup Credit Index. For historical performance purposes, the old Corporate sector Index is linked to the new Credit sector Index.
 - There were no changes to the Mortgage sector Index.
 - The total Core+5 results and benchmark returns combine the three sectors. Historical total Core+5 returns continue to include the old Corporate and Yankee sector returns.

General Notes

- Estimated management fees for public market investments are calculated on an accrual basis without adjustment for management fee caps. Alternative investment fees are recorded on a cash basis. Since not all alternative managers currently provide detailed fee disclosure, the alternative investment fees noted here are not comprehensive.
- Public Market returns are Net of Manager Fees for periods after January 2014 and Gross of investment advisory fees for other periods unless otherwise indicated.
- Public market excess returns for periods prior to 2014 are based on Gross performance.

Page Specific

Pages 9 - 14 - Portfolio Asset Allocation

- **Rebalancing Ranges:** the minimum and maximum weights that actual Asset Allocation may reach before rebalancing between Asset Classes is necessary.

Pages 15 - 17 - Performance Attribution: Total Plan

- **Plan Return at Policy Weights:** the return of the Total Plan assuming actual Asset Class results were maintained at target (Adjusted Policy) weights. *Figure = (Return of Asset Class 1 * Target Weight) plus (Return Of Asset Class 2 * Target Weight) plus (.....)*
- **Allocation Effect** = Total Plan Return minus Plan Return At Adjusted Policy Weights. Allocation is the Contribution to Performance resulting from an overweight or underweight to an asset class. E.g. an underweight to an Asset Class that under-performs results in a positive Allocation Effect and vice versa.
- **Selection Effect** = Equal to the Custom Benchmark (Adjusted Policy Index) Return minus Plan Return at Adjusted Policy Weights. This illustrates how the Managers have added or removed value based on their Security Selection decisions, e.g., *If the manager's Actual Returns are higher than the Implied Return there will be a positive Selection Effect.*
- **Policy Index = Custom Benchmark**
The "policy index" is a custom benchmark representing the weighted average return of the weighted benchmark indexes for each major investment program. Weights may reflect an adjustment of actual policy for outstanding commitments for new or revised programs, such as for private market programs, which are invested gradually, or for any new or updated program requiring the completion of RFPs and contracts. The policy index/custom benchmark is calculated monthly based on adjusted policy weights at the beginning of each month.

Glossary of Terms

Through December 31, 2018



The indexes and most recent policy weights are as follows:

*U.S. Equity: Russell 3000 * 32.29%*

International Developed (EAFE) Markets: MSCI World ex USA IMI Net 8.30%*

*International Active – Global: MSCI ACWI * 1.48%*

*Emerging Markets: MSCI Emerging Markets * 5.87%*

*International Emerging Managers FOF: MSCI ACWI Ex US IMI Net * 0.50%*

*REITs: Dow Jones Real Estate Securities * 0.00%*

*Private Equity: Russell 3000 + 300 b.p. per annum * 7.00%*

*Private Real Estate – Core: NFI - ODCE Net * 2.87%*

*Private Real Estate – Non Core: NFI - ODCE Net + 200bps * 1.73%*

*Infrastructure: CPI + 4% * 0.75%*

*Hedge Funds: HFRI Fund of Funds Composite Index plus 1% *6.00%*

*US Treasury Short Term: FTSE USBIG Treasury 1-3Y * 0.00%*

*US Treasury Intermediate: FTSE USBIG Treasury/Agency 1-10Y * 0.00%*

*Active Government: NYC Treasury Agency + 5 * 0.00%*

*US Treasury Long Duration: FTSE Treasury 10+ * 8.56%*

*Core FI-Developing Mgrs: BBG Barc Agg * 0.00%*

*Core FI-Emerging Mgrs: BBG Barc Agg * 0.00%*

*Mortgage: FTSE Mortgage Index * 2.87%*

*ETI: ETI Custom Benchmark * 0.75%*

*Investment Grade Credit: NYC – Investment Grade Credit * 3.62%*

*High Yield: Bloomberg Barclays US High Yield 2% Issuer Capped * 7.91%*

*Bank Loans: Credit Suisse Leveraged Loan * 2.00%*

*TIPS: BBG BARC Gbl Inf-Lk: US TIPS * 4.31%*

*Convertible Bonds: BofAML All Convertibles Ex Mandatory * 0.00%*

*Opportunistic Fixed: OFI - JPMGHY / CSFB 50/50 Blend Plus 300 b.p. per annum * 3.18%*

Page 18 – Allocation and Selection Effects - Asset Class Breakdown

- This chart aims to break down the Allocation and Selection Effects shown on the Performance Attribution pages. The aim of the Page is to show the asset classes where Managers are either out performing or under performing their benchmark and to show the basis point effect that this is having on Plan performance.