Investment Oversight

As at 31st January 2016 (Preliminary)

DALLAS
POLICE & FIRE
PENSION SYSTEM

Preliminary
Contents

January 2016 Snapshot

Preliminary
January 2016 Snapshot
Asset Allocation: Actual vs. Target

MAPLES FUND SERVICES

Gross Actual Allocation

Target Allocation

		Actual Allocation ($)	Net Actual Allocation (%)	Gross Actual Allocation (%)	Target Allocation (%)	Target Range (%)
	Liquid Assets					
Public Equity	Domestic Small Cap	48,252,215	1.78%	1.64%		
	Energy Public Equity	23,402,907	0.86%	0.79%		
	Global Core	109,105,912	4.02%	3.70%		
	Global Environmental Technology	609,232	0.02%	0.02%		
	Global Growth	193,085,580	7.11%	6.54%		
	Global REIT	20,926,604	0.77%	0.71%		
	Global Water Strategy	24,434,210	0.90%	0.83%		
	Sub-Total	**419,816,660**	**15.46%**	**14.23%**	**15%**	**12% - 18%**
Fixed Income	Emerging Market Debt	55,420,321	2.04%	1.88%		
	High Yield Global Fixed Income	55,745,400	2.05%	1.89%		
	Inv. Grade Global Fixed Income	125,801,459	4.63%	4.26%		
	Multistrategy Private Debt	20,290,727	0.75%	0.69%		
	Opportunistic Global Fixed Income	106,749,915	3.93%	3.62%		
	Senior Floating Rate	49,394,700	1.82%	1.67%		
	Sub-Total	**413,402,522**	**15.22%**	**14.01%**	**15%**	**13% - 17%**
Asset Allocation		**403,406,546**	**14.86%**	**13.67%**	**20%**	**18% - 22%**
Cash & Cash Equivalents		**52,582,403**	**1.94%**	**1.78%**	**0%**	
	Liquid Assets Total	*1,289,208,131*	*47.48%*	*43.69%*	*50%*	

		Actual Allocation ($)	Net Actual Allocation (%)	Gross Actual Allocation (%)	Target Allocation (%)	Target Range (%)
	Private Assets					
Natural Resources	Domestic Timberland	44,240,892	1.63%	1.50%		
	Global Agriculture	161,607,131	5.95%	5.48%		
	Global Timberland	82,259,374	3.03%	2.79%		
	Sub-Total	**288,107,397**	**10.61%**	**9.76%**	**10%**	**8% - 12%**
Infrastructure		**203,567,197**	**7.50%**	**6.90%**	**10%**	**8% - 12%**
Real Estate		**697,320,842**	**25.68%**	**23.63%**	**15%**	**10% - 20%**
Private Equity		**472,513,263**	**17.40%**	**16.01%**	**15%**	**10% - 20%**
	Private Assets Total	*1,661,508,699*	*61.19%*	*56.31%*	*50%*	

	Actual Allocation ($)	Net Actual Allocation (%)	Gross Actual Allocation (%)	Target Allocation (%)	
Gross Total	2,950,716,830	109%	100%	100%	
Plan Leverage Facility	(235,314,513)				
Net Total	2,715,402,317				

Preliminary
January 2016 Snapshot
Asset Allocation: Actual vs. Target (cont.)

		Actual Allocation ($)	Net Actual Allocation (%)	Gross Actual Allocation (%)	Target Allocation (%)
Equities	Public Equity	419,816,660	15.46%	14.23%	15%
	Private Equity	472,513,263	17.40%	16.01%	10%
	Sub-Total	**892,329,923**	**32.86%**	**30.24%**	**25%**
Credit	Fixed Income	352,326,696	12.98%	11.94%	15%
	Private Credit	61,075,826	2.25%	2.07%	5%
	Sub-Total	**413,402,522**	**15.22%**	**14.01%**	**20%**
Real Assets	Liquid Real Assets	0	0.00%	0.00%	0%
	Infrastructure	203,567,197	7.50%	6.90%	10%
	Natural Resources	288,107,397	10.61%	9.76%	10%
	Real Estate	697,320,842	25.68%	23.63%	15%
	Sub-Total	**1,188,995,436**	**43.79%**	**40.30%**	**35%**
Other	Asset Allocation	403,406,546	14.86%	13.67%	20%
	Cash & Cash Equivalents	52,582,403	1.94%	1.78%	0%
	Sub-Total	**455,988,949**	**16.79%**	**15.45%**	**20%**

Gross Total	2,950,716,830	109%	100%	100%
Plan Leverage Facility	(235,314,513)			
Net Total	2,715,402,317			

* Funds in the Private Credit bucket are not actually held separately, but are bucketed as such for future trend purposes. For details on the funds that will be reclassified, see appendix IV (page 41).

** Under current policy, the allocations to Private Equity and Private Credit are combined for a total of 15%.

Equity Holdings

January 2016 Estimated Values					
Holding	End NAV	Return	Benchmark	Benchmark Return	Alpha
Eagle Asset Management	48,252,215	-6.57%	Russell 2000	-8.79%	2.22%
Mitchell Group	23,402,883	-2.40%	Dow Jones Equal Weight US Oil & Gas	-7.73%	5.33%
OFI Global Institutional	113,714,503	-9.98%	MSCI World	-5.96%	-4.02%
Pyramis (Fidelity)	109,105,912	-9.74%	MSCI ACWI	-6.03%	-3.71%
RREEF	20,926,604	-3.61%	FTSE EPRA/NAREIT	-4.29%	0.68%
Sustainable Asset Management	24,434,210	-4.47%	MSCI World	-5.96%	1.49%
Walter Scott	79,371,076	-4.35%	MSCI ACWI	-6.03%	1.68%
Total	**419,207,403**	**-7.48%**	**MSCI ACWI**	**-6.03%**	**-1.45%**

Fixed Income Holdings

January 2016 Estimated Values					
Holding	End NAV	Return	Benchmark	Benchmark	Alpha
Ashmore EM Debt Fund	39,547,301	-3.07%	JPM GBI-EM Global Diversified	0.20%	-3.27%
Ashmore EM Local CCY	15,873,020	-0.78%	JPM GBI-EM Global Diversified	0.20%	-0.98%
Brandywine	85,441,701	0.55%	Barclays Global Aggregate	0.87%	-0.32%
Loomis Sayles	106,749,915	-3.20%	70% ML HY / 30% JPM EM	-1.05%	-2.15%
Loomis Sayles Sr. Floating Rate	49,394,700	-1.67%	S&P/LSTA Leveraged Loan Index	-1.13%	-0.54%
Mondrian Investment Partners	40,359,758	0.48%	Barclays Global Aggregate	0.87%	-0.39%
W.R. Huff High Yield	55,745,400	-1.54%	Citi HY Index	-3.67%	2.13%
Total	**393,111,795**	**-1.49%**	**Barclays Global Aggregate**	**0.87%**	**-2.36%**

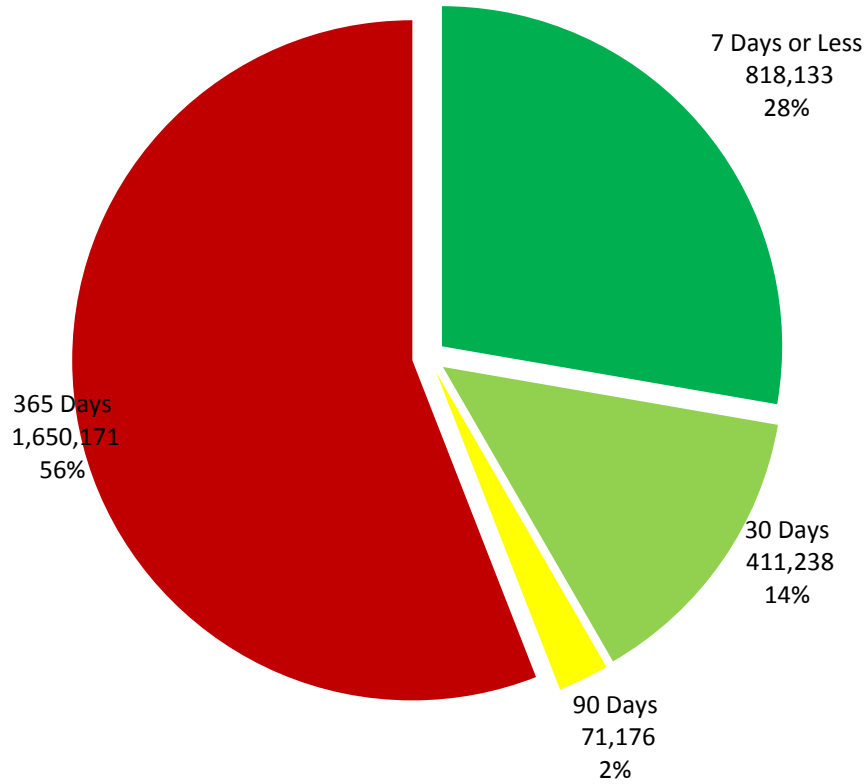**Positive Impact of Equity program redemptions:**

- Estimating Allianz and EOCM performance using the fund benchmarks as a proxy, redeeming from these funds in September and November 2015 saved DPFP roughly $5.5 million.
- Based on December 2015 and January 2016 performance, redeeming $130 million from the Eagle, Pyramis, RREEF, and Walter Scott in December 2015, saved DPFP roughly $11.5 million.

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Normal Market Conditions

7 Days or Less
818,133
28%

30 Days
411,238
14%

365 Days
1,650,171
56%

90 Days
71,176
2%

Stressed Scenario - 20% Market Drawdown

7 Days or Less
665,023
25%

30 Days
328,990
12%

365 Days
1,650,171
61%

90 Days
63,267
2%
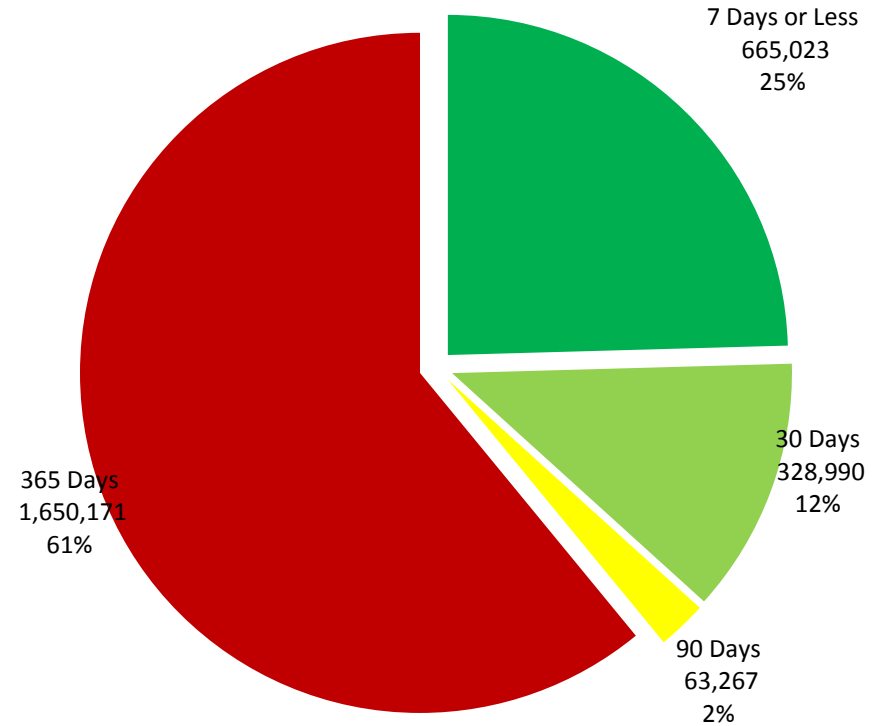
Amounts detailed are in thousands

Stressed scenario is a result of applying a 20% drawdown to the liquid portfolio.

7

December 2015

Preliminary – Data as at December 2015
Asset Class Performance: Actual vs. Policy

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One Month Performance as at Dec. 2015

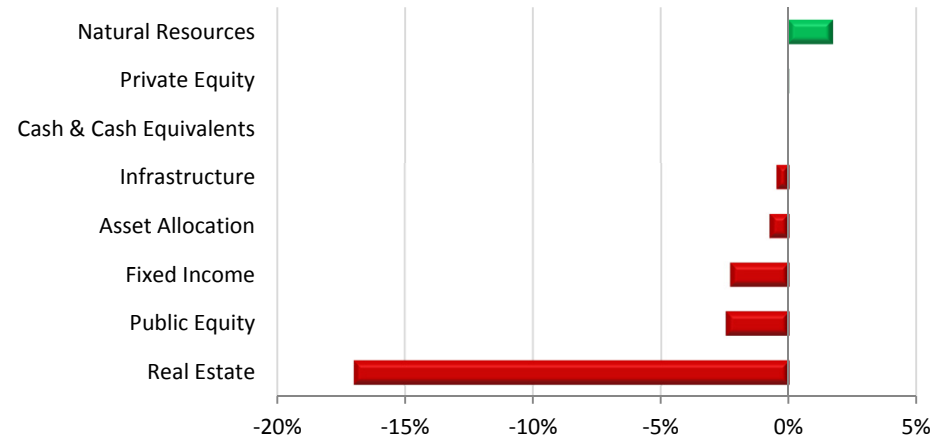|	One Month		
	DPFP Return	**Policy Return (Beta)**	**Alpha**
Public Equity	-2.48%	-1.80%	-0.68%
Fixed Income	-2.32%	0.53%	-2.85%
Asset Allocation	-0.78%	0.30%	-1.07%
Cash & Cash Equivalents	0.01%	0.00%	0.01%
Natural Resources	1.74%	2.12%	-0.38%
Infrastructure	-0.52%	0.30%	-0.82%
Real Estate	-17.00%	2.91%	-19.91%
Private Equity	0.03%	-1.41%	1.44%
Total	**-4.96%**	**0.33%**	**-5.30%**
Total ex Real Estate	**-0.95%**	**-0.10%**	**-0.85%**

Quarter-to-Date Performance as at Dec. 2015

	Quarter-to-Date		
	DPFP Return	**Policy Return (Beta)**	**Alpha**
Public Equity	4.54%	5.03%	-0.49%
Fixed Income	-2.91%	-0.93%	-1.98%
Asset Allocation	0.83%	1.35%	-0.51%
Cash & Cash Equivalents	0.03%	0.00%	0.03%
Natural Resources	0.42%	2.12%	-1.70%
Infrastructure	-1.45%	1.35%	-2.79%
Real Estate	-16.93%	2.91%	-19.84%
Private Equity	0.03%	7.56%	-7.53%
Total	**-3.76%**	**2.85%**	**-6.61%**
Total ex Real Estate	**0.69%**	**2.40%**	**-1.71%**
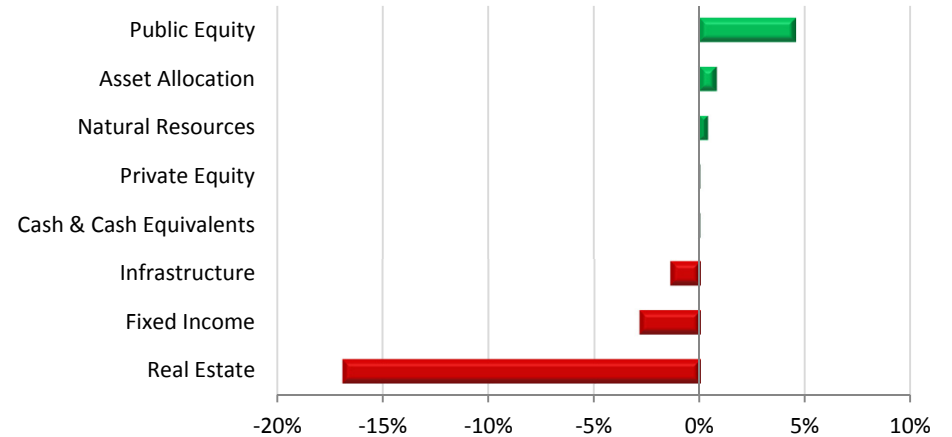
* Please see Appendix I (page 36) for details on the policy indexes.

** Returns presented are calculated using custodian bank year-end source data and values, which do not include subsequent valuation adjustments completed for audit and actuarial purposes. Therefore, the returns shown here will differ from actuary calculated returns, as well as the official investment returns presented by NEPC.

Preliminary – Data as at December 2015
## Asset Class Performance: Actual vs. Policy (cont.)

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One Year Performance as at Dec. 2015

	One Year		
	DPFP Return	**Policy Return (Beta)**	**Alpha**
Public Equity	-1.62%	-2.36%	0.74%
Fixed Income	-7.32%	-3.16%	-4.17%
Asset Allocation	-3.81%	5.69%	-9.50%
Cash & Cash Equivalents	0.22%	0.00%	0.22%
Natural Resources	11.06%	13.40%	-2.34%
Infrastructure	-6.18%	5.69%	-11.87%
Real Estate	-34.07%	13.33%	-47.40%
Private Equity	-8.62%	3.41%	-12.03%
Total	**-12.35%** [1]	**4.81%**	**-17.16%**
Total ex Real Estate	**-3.70%**	**2.83%**	**-6.54%**
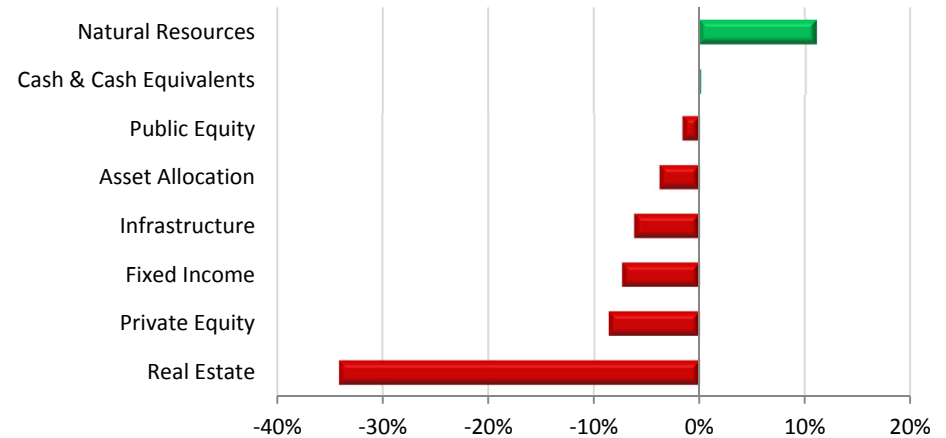
Three Year Performance as at Dec. 2015

	Three Year		
	DPFP Return	**Policy Return (Beta)**	**Alpha**
Public Equity	7.86%	7.69%	0.17%
Fixed Income	-0.99%	-1.74%	0.74%
Asset Allocation	2.23%	6.00%	-3.77%
Cash & Cash Equivalents	0.10%	0.00%	0.10%
Natural Resources	9.53%	13.96%	-4.43%
Infrastructure	0.65%	6.00%	-5.35%
Real Estate	-11.77%	12.04%	-23.81%
Private Equity	-1.19%	17.40%	-18.60%
Total	**-0.53%**	**8.40%**	**-8.93%**
Total ex Real Estate	**3.19%**	**6.55%**	**-3.35%**
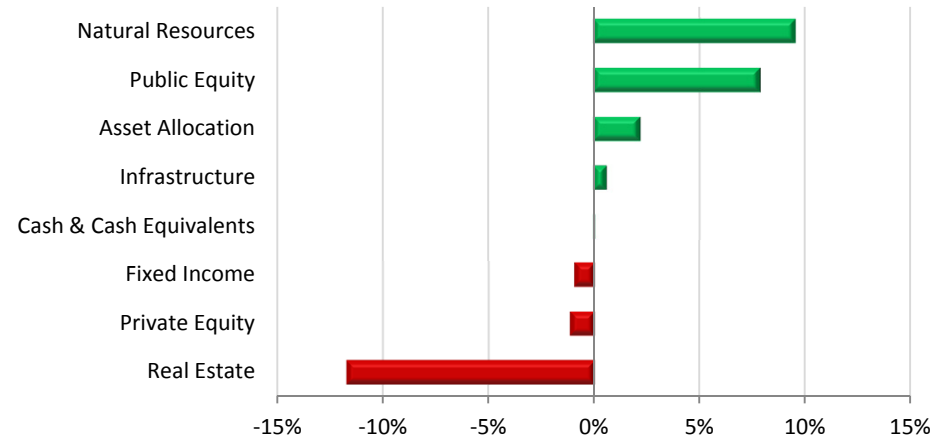
[1] *Approximately two-thirds of the one year loss relates to the lagged returns from Q4 2014 for private investments. These losses were reflected in the 2014 CAFR and 1/1/15 actuarial valuation*

* Please see Appendix I (page 36) for details on the policy indexes.

** Returns presented are calculated using custodian bank year-end source data and values, which do not include subsequent valuation adjustments completed for audit and actuarial purposes. Therefore, the returns shown here will differ from actuary calculated returns, as well as the official investment returns presented by NEPC.

Attribution Metrics

- Allocation refers to the proportion of the active return that can be attributed to tactical asset allocation decisions.

- Selection refers to the proportion of the active return that can be attributed to manager selection and subsequent performance of the selected managers.

- Interaction refers to the proportion of the active return that cannot be attributed solely to tactical asset allocation decisions or manager selection.

* Please see Appendix II (page 37) for details on the attribution calculation and methodology.

Preliminary – Data as at December 2015
Portfolio Attribution (cont.)

One Month as at Dec. 2015

Asset Class	Weights		Returns		Attribution			
	DPFP	Policy	DPFP	Policy	Allocation (1)	Selection (2)	Interaction (3)	Active Return (1+2+3)
Public Equity	18.36%	15.00%	-2.48%	-1.80%	-0.07%	-0.10%	-0.02%	-0.20%
Fixed Income	12.44%	15.00%	-2.32%	0.53%	-0.01%	-0.43%	0.07%	-0.36%
Asset Allocation	12.63%	20.00%	-0.78%	0.30%	0.00%	-0.21%	0.08%	-0.13%
Cash & Cash Equivalents	2.39%	0.00%	0.01%	0.00%	-0.01%	0.00%	0.00%	-0.01%
Natural Resources	8.83%	10.00%	1.74%	2.12%	-0.02%	-0.04%	0.00%	-0.05%
Infrastructure	6.11%	10.00%	-0.52%	0.30%	0.00%	-0.08%	0.03%	-0.05%
Real Estate	24.98%	15.00%	-17.00%	2.91%	0.26%	-2.99%	-1.99%	-4.72%
Private Equity	14.27%	15.00%	0.03%	-1.41%	0.01%	0.22%	-0.01%	0.22%
Total	100.00%	100.00%	-4.96%	0.33%	0.17%	-3.63%	-1.83%	-5.30%

Calendar YTD as at Dec. 2015

Asset Class	Weights		Returns		Attribution			
	DPFP	Policy	DPFP	Policy	Allocation (1)	Selection (2)	Interaction (3)	Active Return (1+2+3)
Public Equity	19.54%	15.00%	-1.62%	-2.36%	-0.44%	0.12%	0.05%	-0.28%
Fixed Income	12.80%	15.00%	-7.32%	-3.16%	0.18%	-0.58%	0.09%	-0.31%
Asset Allocation	11.95%	20.00%	-3.81%	5.69%	-0.05%	-1.72%	0.59%	-1.18%
Cash & Cash Equivalents	1.31%	0.00%	0.22%	0.00%	-0.09%	0.00%	0.00%	-0.08%
Natural Resources	8.03%	10.00%	11.06%	13.40%	-0.21%	-0.19%	0.00%	-0.39%
Infrastructure	5.57%	10.00%	-6.18%	5.69%	-0.04%	-1.16%	0.52%	-0.69%
Real Estate	26.17%	15.00%	-34.07%	13.33%	0.84%	-7.50%	-5.60%	-12.27%
Private Equity	14.63%	15.00%	-8.62%	3.41%	0.07%	-1.87%	-0.15%	-1.95%
Total	100.00%	100.00%	-12.35%[1]	4.81%	0.26%	-12.91%	-4.51%	-17.16%

One Year as at Dec. 2015

Asset Class	Weights		Returns		Attribution			
	DPFP	Policy	DPFP	Policy	Allocation (1)	Selection (2)	Interaction (3)	Active Return (1+2+3)
Public Equity	19.54%	15.00%	-1.62%	-2.36%	-0.44%	0.12%	0.05%	-0.28%
Fixed Income	12.80%	15.00%	-7.32%	-3.16%	0.18%	-0.58%	0.09%	-0.31%
Asset Allocation	11.95%	20.00%	-3.81%	5.69%	-0.05%	-1.72%	0.59%	-1.18%
Cash & Cash Equivalents	1.31%	0.00%	0.22%	0.00%	-0.09%	0.00%	0.00%	-0.08%
Natural Resources	8.03%	10.00%	11.06%	13.40%	-0.21%	-0.19%	0.00%	-0.39%
Infrastructure	5.57%	10.00%	-6.18%	5.69%	-0.04%	-1.16%	0.52%	-0.69%
Real Estate	26.17%	15.00%	-34.07%	13.33%	0.84%	-7.50%	-5.60%	-12.27%
Private Equity	14.63%	15.00%	-8.62%	3.41%	0.07%	-1.87%	-0.15%	-1.95%
Total	100.00%	100.00%	-12.35%[1]	4.81%	0.26%	-12.91%	-4.51%	-17.16%

[1] *Approximately two-thirds of the one year loss relates to the lagged returns from Q4 2014 for private investments. These losses were reflected in the 2014 CAFR and 1/1/15 actuarial valuation*

* Please see Appendix II (page 37) for details on the attribution calculation and methodology.

Preliminary – Data as at December 2015

Asset Allocations: Monthly Changes

The total NAV of the portfolio at December 31st 2015 is **2,788,049,357**

- P&L of the portfolio decreased by $162 million.
- 17 million was added in contributions, 38 million paid in benefit payments.
- No new managers were added during the month.
- No managers were liquidated during the month.

- Strategy with the largest cash inflow in Dec: Real Estate
- Strategy with the largest cash outflow in Dec: Public Equity
- Over the past 12 months, the largest increase in allocation was in Natural Res.
- Over the past 12 months, the largest decrease in allocation was in Real Estate.

Top Performing Asset Classes

Asset Class	Performance (Dec.)	
	$	%
Natural Resources	5,000,058	1.74%
Private Equity	143,133	0.03%
Cash & Cash Equivalents	6,538	0.01%

Bottom Performing Asset Classes

Asset Class	Performance (Dec.)	
	$	%
Real Estate	(138,506,057)	-17.00%
Public Equity	(14,847,513)	-2.48%
Fixed Income	(9,418,431)	-2.32%

Top Performing Holdings

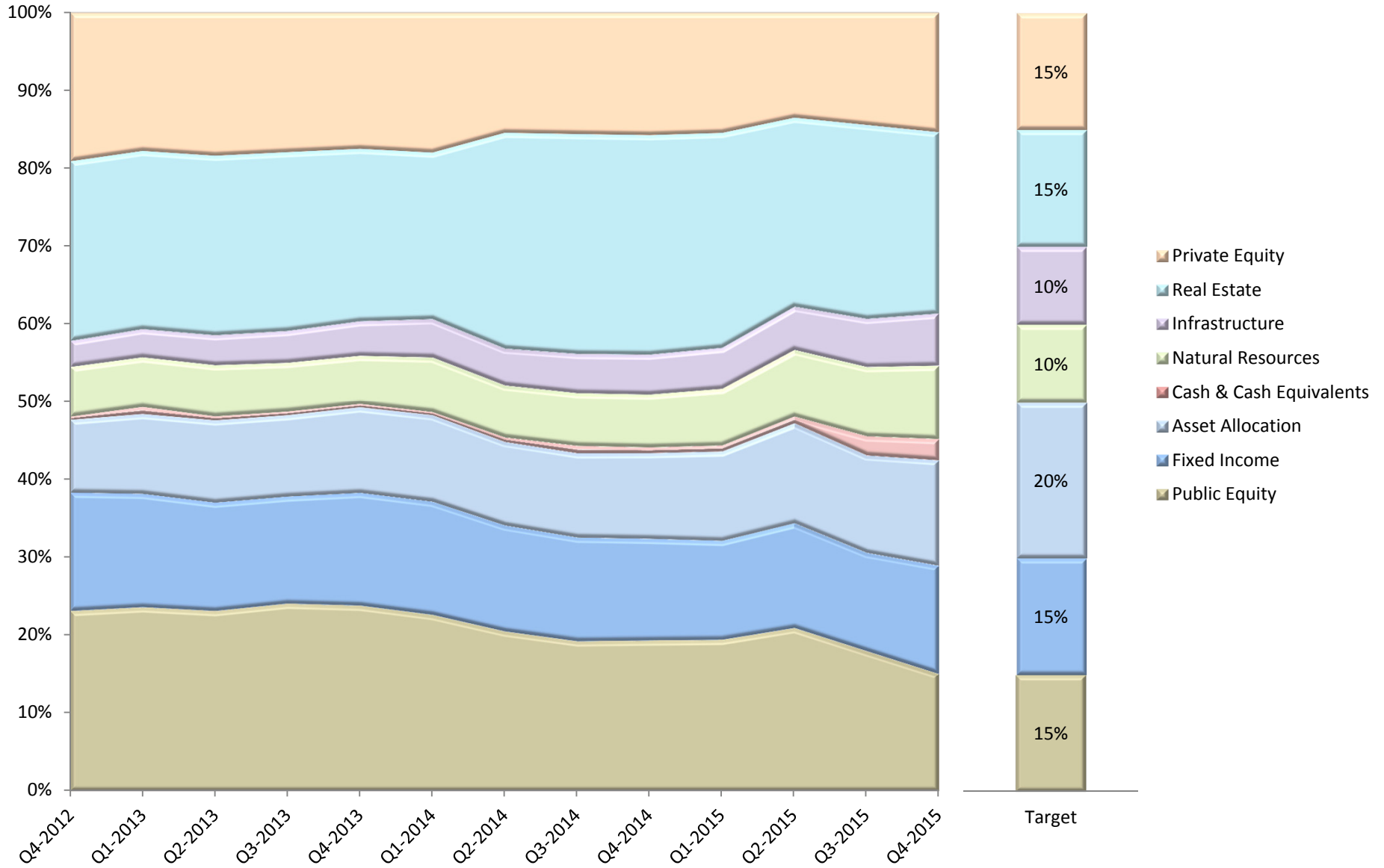| Manager	Performance (Dec.)	
	$	%
Hancock Agricultural	4,800,000	2.97%
Highland Capital Management	567,226	3.04%
NTE Segments 3	498,813	2.79%

Bottom Performing Holdings

Manager	Performance (Dec.)	
	$	%
RE Separate Accounts	(138,240,486)	-18.15%
Loomis Sayles	(6,231,472)	-5.35%
Mitchell Group	(4,092,433)	-14.58%

Twelve Month Performance by Asset Class as at Dec. 2015

Legend: Public Equity, Private Equity, Natural Resources, Fixed Income, Asset Allocation, Infrastructure, Real Estate, Cash & Cash Eq

13

Preliminary – Data as at December 2015
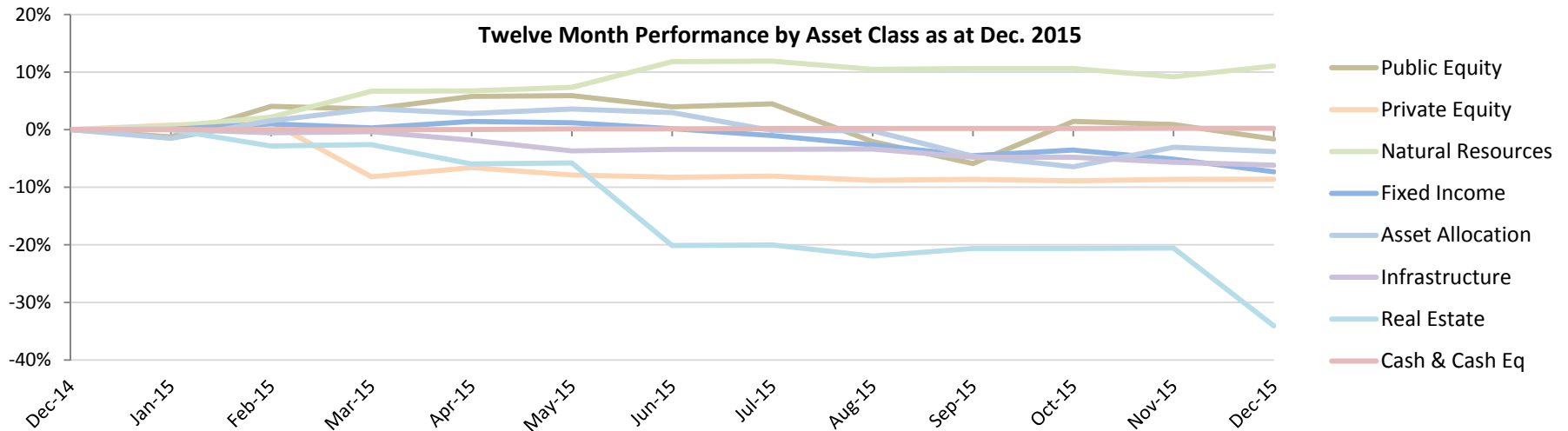
Asset Allocations: Over Time

Legend:
- Private Equity
- Real Estate
- Infrastructure
- Natural Resources
- Cash & Cash Equivalents
- Asset Allocation
- Fixed Income
- Public Equity

Target column values (top to bottom): 15%, 15%, 10%, 10%, 20%, 15%, 15%

Preliminary – Data as at December 2015
Long Term Plan Risk/Return vs Policy and 60/40

MAPLES FUND SERVICES

Trend Commentary

- The DPFP portfolio is less volatile than the 60/40 portfolio across all time horizons

- The DPFP portfolio is less volatile than the Policy benchmark across the 5 year time horizon.

Note: Higher allocations to illiquid assets tend to deemphasize volatility due to the infrequency of marks received. This may be particularly acute in the case of the DPFP plan portfolio.
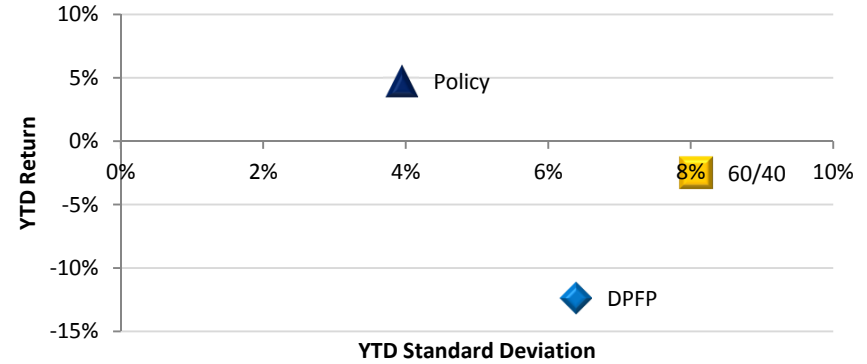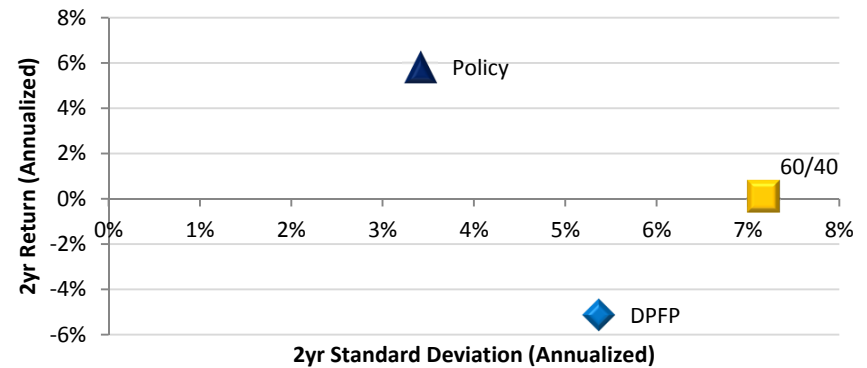
YTD

Policy
DPFP
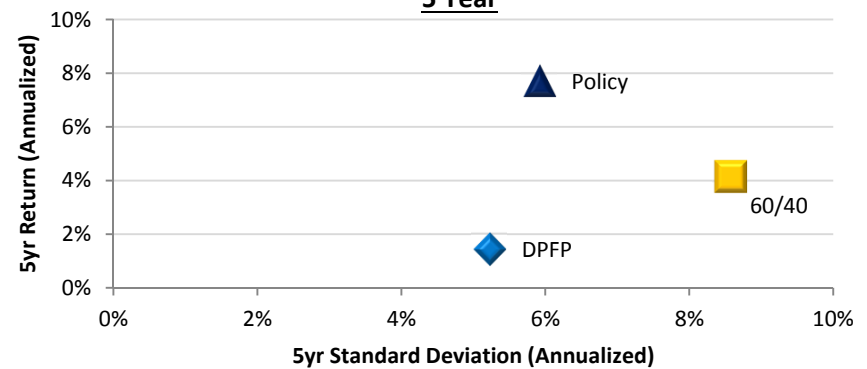60/40

YTD Return vs YTD Standard Deviation

1 Year

Policy
60/40
DPFP

1yr Return vs 1yr Standard Deviation

2 Year

Policy
60/40
DPFP

2yr Return (Annualized) vs 2yr Standard Deviation (Annualized)

3 Year

Policy
60/40
DPFP

3yr Return (Annualized) vs 3yr Standard Deviation (Annualized)

5 Year

Policy
60/40
DPFP

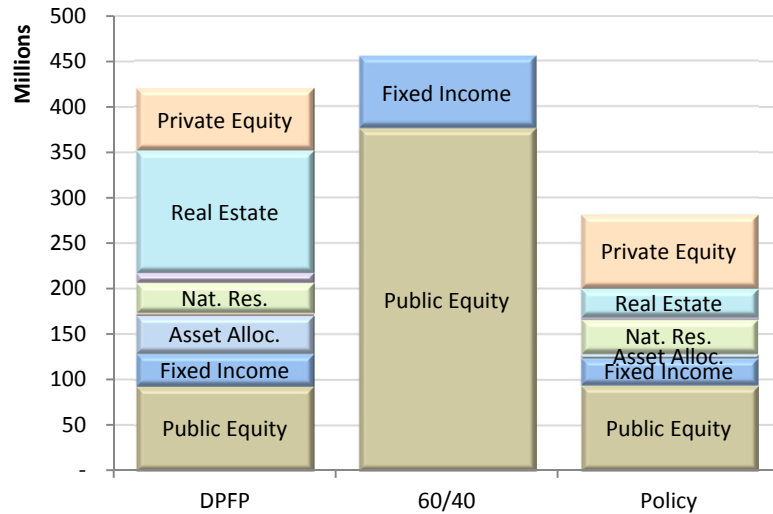5yr Return (Annualized) vs 5yr Standard Deviation (Annualized)
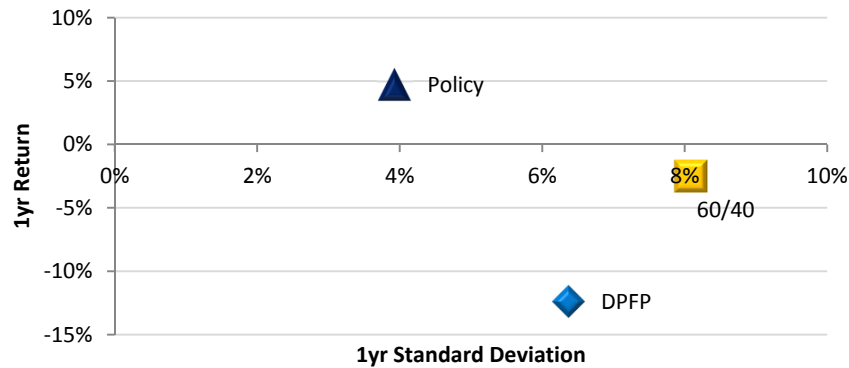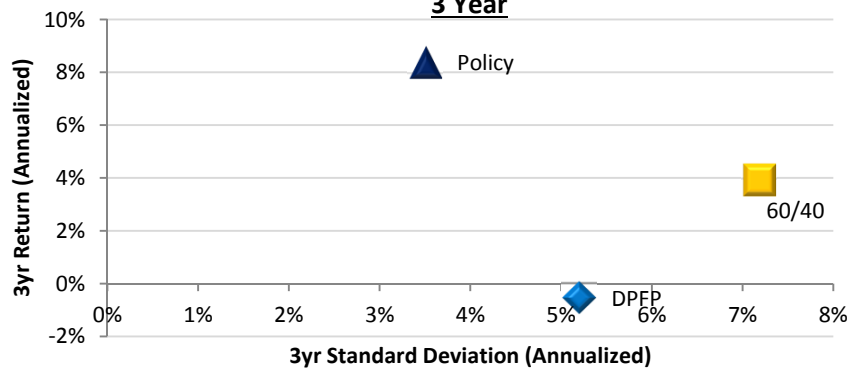
* Please see Appendix I (page 36) for details on the composition of the 60/40 and Policy benchmarks.
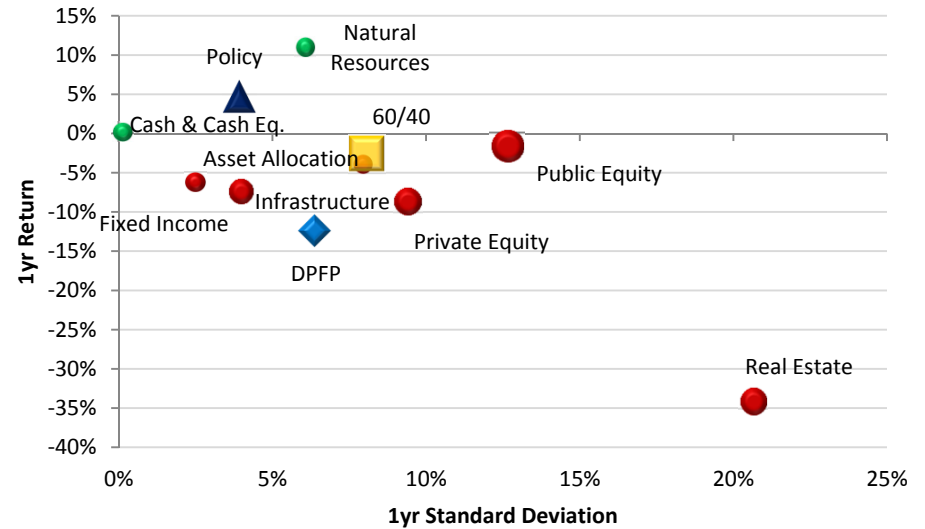
Preliminary – Data as at December 2015
**Risk Profile**

Five Year Value at Risk (95% Confidence Level)

Asset Class Risk vs Return (Sharpe)

Portfolio Stress Testing

Scenario	P&L ($)	P&L (%)
Equity Rebound (2009)	31,988,310	33.41%
Equities Up 10%	6,367,357	6.65%
EUR up 10% vs USD	958,973	1.00%
Libya Oil Shock (2011)	(789,715)	-0.82%
EUR down 10% vs USD	(958,962)	-1.00%
Japan Earthquake (2011)	(1,406,350)	-1.47%
Greece (2015)	(2,820,921)	-2.95%
Oil Prices Drop (2010)	(6,267,049)	-6.55%
Equities Down 10%	(6,367,336)	-6.65%
Debt Ceiling (2011)	(12,355,414)	-12.90%
Russian Financial Crisis (2008)	(14,659,752)	-15.31%
Lehman Default (2008)	(14,870,225)	-15.53%
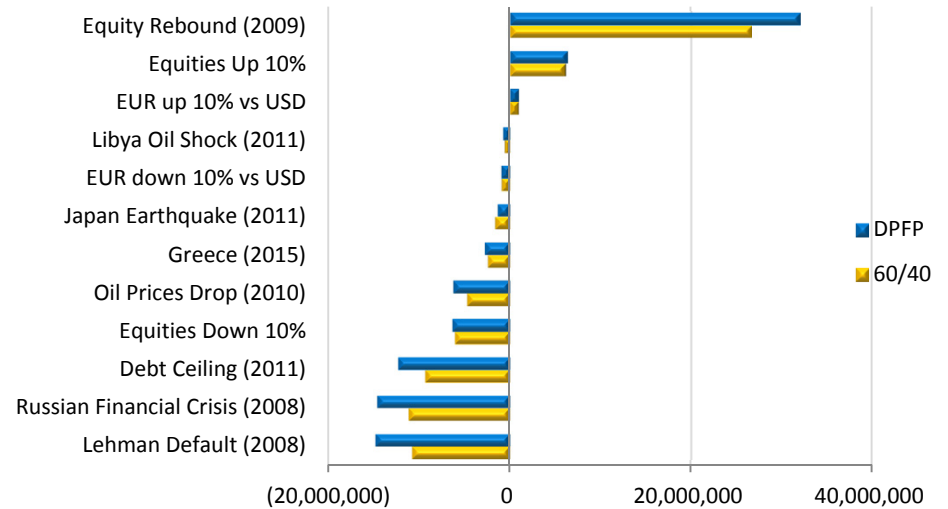
* Stress Test Scenarios and the proxy instruments used are detailed in Appendix I (page 36).

** Value at Risk on the DPFP portfolio is significantly higher than the policy, as realized losses and volatility are significant within the DPFP portfolio. This is particularly true in the case of the Real Estate Portfolio, which also contains leverage.
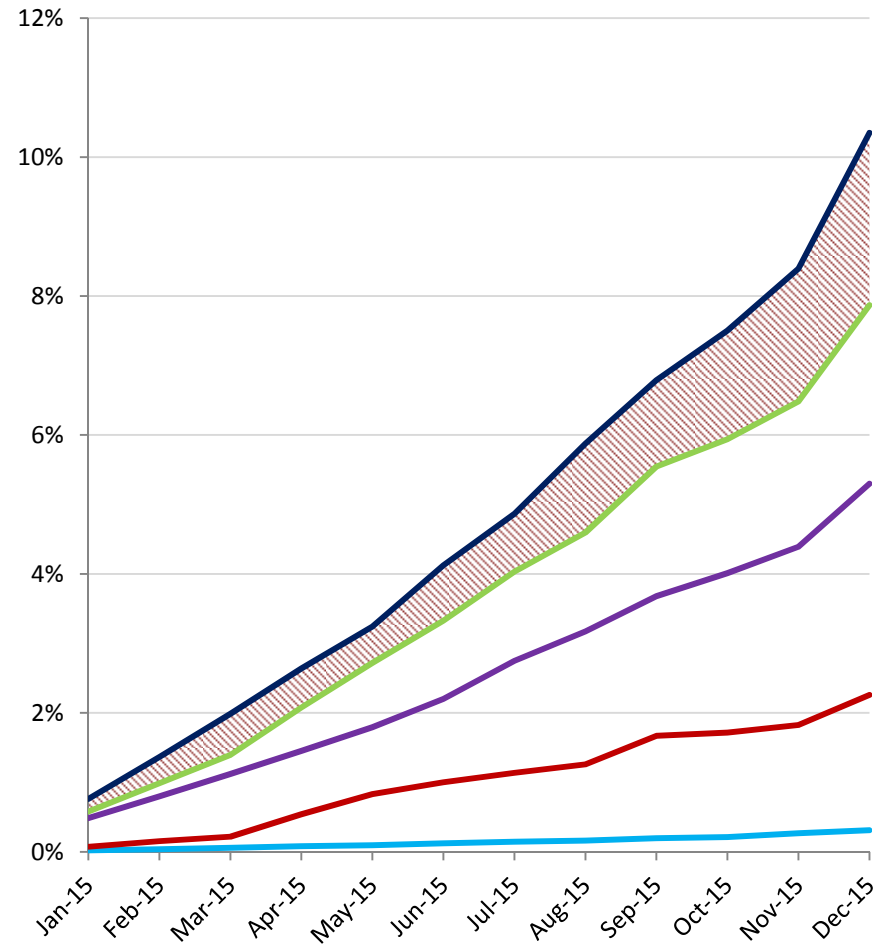
16

Preliminary – Data as at December 2015
Trailing 12 Month Funding Gap

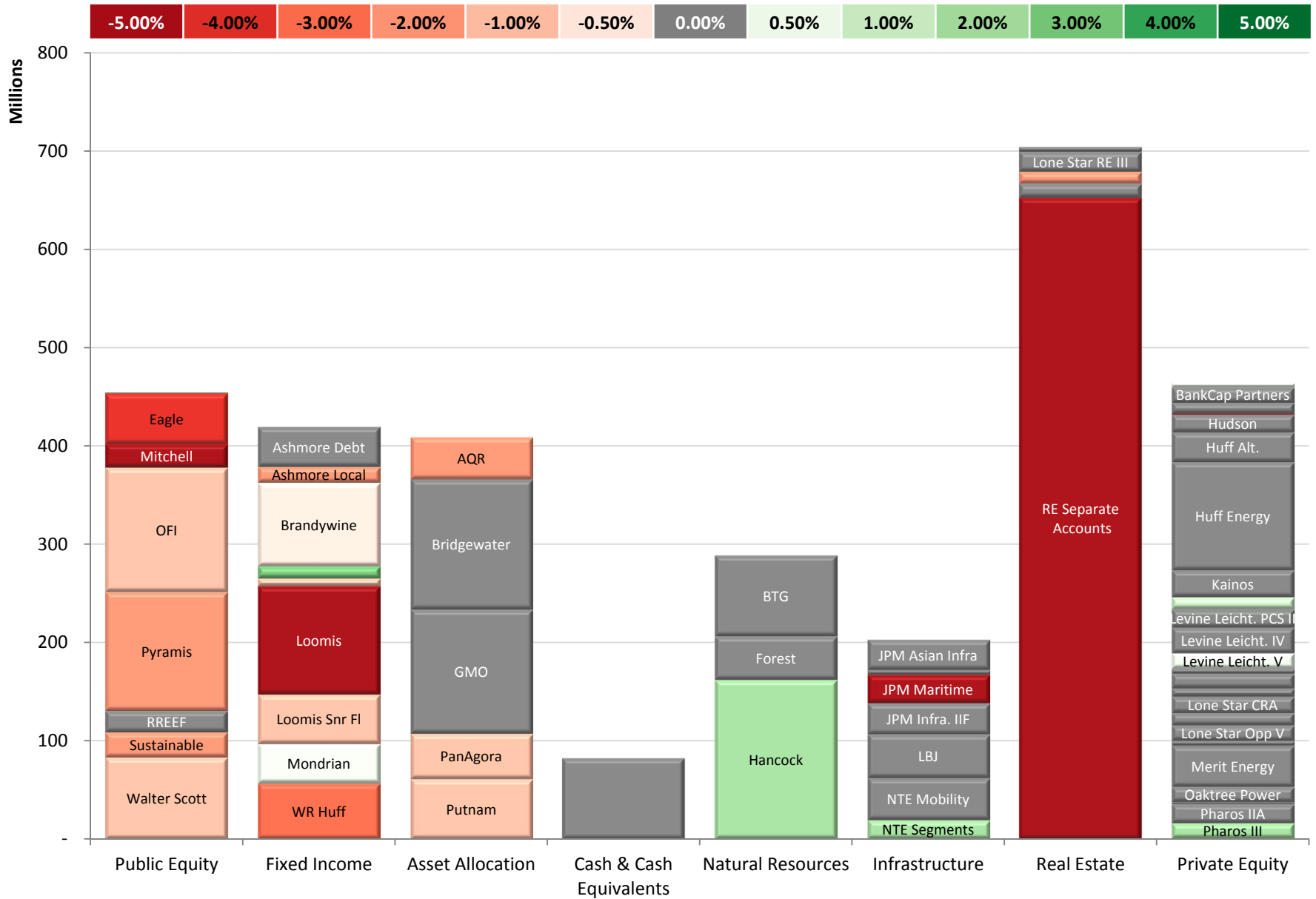MAPLES FUND SERVICES

Monthly Cumulative ($)
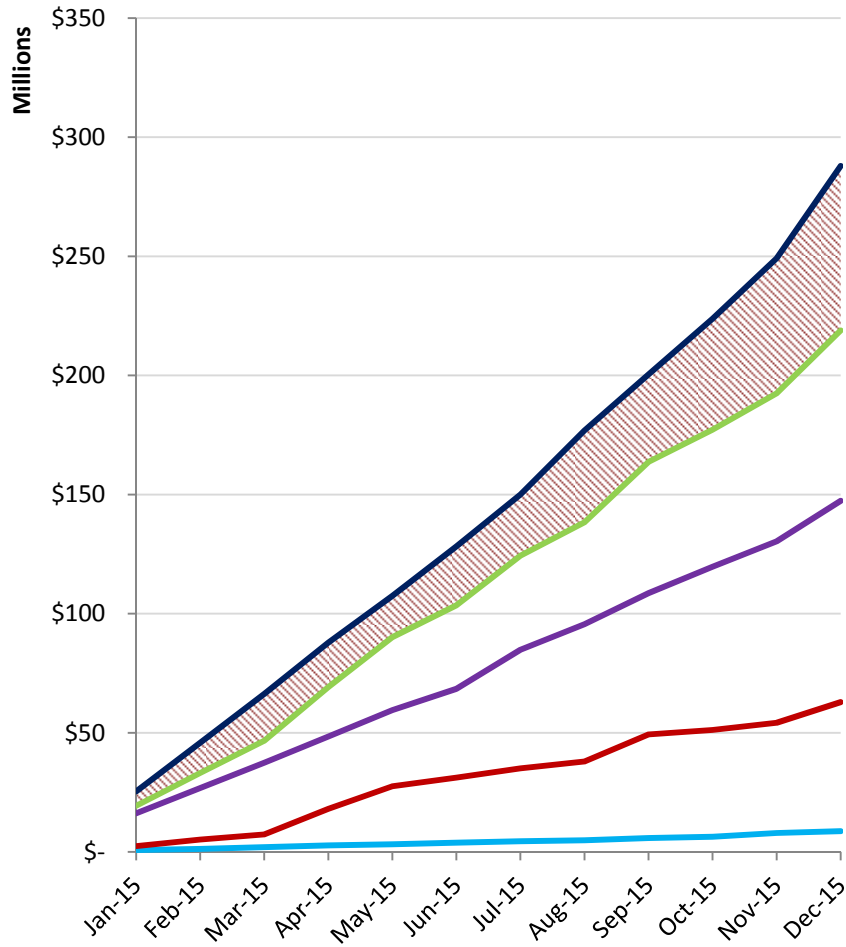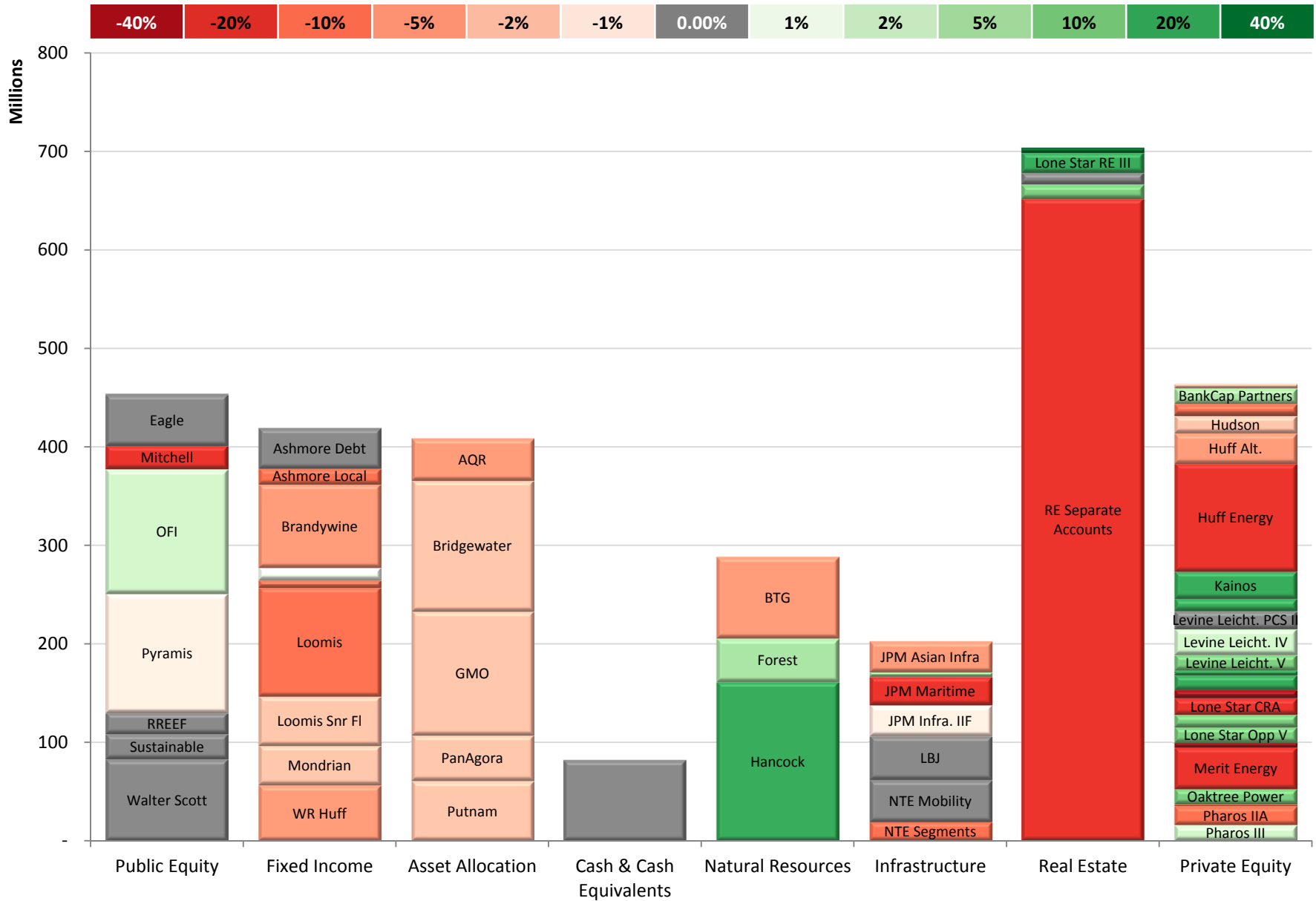
Monthly Cumulative (% of Plan NAV)

Legend: Funding Gap, Benefit Payments, Total Cash Inflows, Dividends, Interest, Contributions
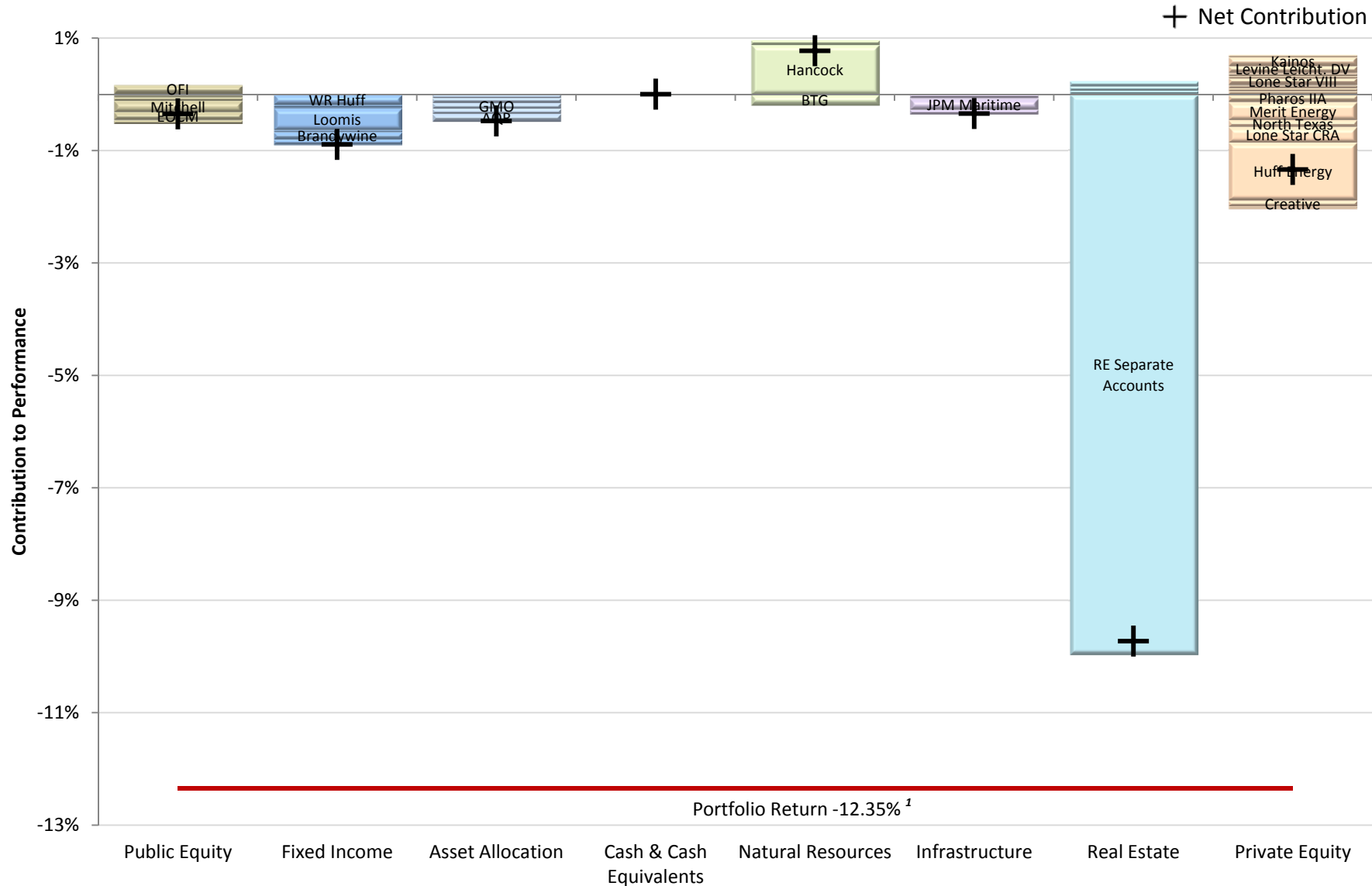
53 accounts are contributing income to the above figures.

17

Preliminary – Data as at December 2015
One Month Performance Heat Map

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One Month Performance Heat Map — stacked bar chart showing portfolio values (Millions) by asset category with performance heat-map coloring.

Heat map legend: -5.00% | -4.00% | -3.00% | -2.00% | -1.00% | -0.50% | 0.00% | 0.50% | 1.00% | 2.00% | 3.00% | 4.00% | 5.00%

Public Equity: Eagle, Mitchell, OFI, Pyramis, RREEF, Sustainable, Walter Scott

Fixed Income: Ashmore Debt, Ashmore Local, Brandywine, Loomis, Loomis Snr Fl, Mondrian, WR Huff

Asset Allocation: AQR, Bridgewater, GMO, PanAgora, Putnam

Cash & Cash Equivalents

Natural Resources: BTG, Forest, Hancock

Infrastructure: JPM Asian Infra, JPM Maritime, JPM Infra. IIF, LBJ, NTE Mobility, NTE Segments

Real Estate: Lone Star RE III, RE Separate Accounts

Private Equity: BankCap Partners, Hudson, Huff Alt., Huff Energy, Kainos, Levine Leicht. PCS II, Levine Leicht. IV, Levine Leicht. V, Lone Star CRA, Lone Star Opp V, Merit Energy, Oaktree Power, Pharos IIA, Pharos III

Preliminary – Data as at December 2015

Twelve Month Performance Heat Map

| -40% | -20% | -10% | -5% | -2% | -1% | 0.00% | 1% | 2% | 5% | 10% | 20% | 40% |

Preliminary – Data as at December 2015
Twelve Month Contribution to Performance

MAPLES FUND SERVICES

+ Net Contribution

OFI
Mitchell
EQM

WR Huff
Loomis
Brandywine

GMO
AJO

Hancock
BTG

JPM Maritime

RE Separate Accounts

Kainos
Levine Leicht. DV
Lone Star VIII
Pharos IIA
Merit Energy
North Texas
Lone Star CRA
Huff Energy
Creative

Contribution to Performance

Portfolio Return -12.35% [1]

Public Equity | Fixed Income | Asset Allocation | Cash & Cash Equivalents | Natural Resources | Infrastructure | Real Estate | Private Equity

[1] *Approximately two-thirds of the one year loss relates to the lagged returns from Q4 2014 for private investments. These losses were reflected in the 2014 CAFR and 1/1/15 actuarial valuation*

* Returns presented are calculated using custodian bank year-end source data and values, which do not include subsequent valuation adjustments completed for audit and actuarial purposes.
Therefore, the returns shown here will differ from actuary calculated returns.
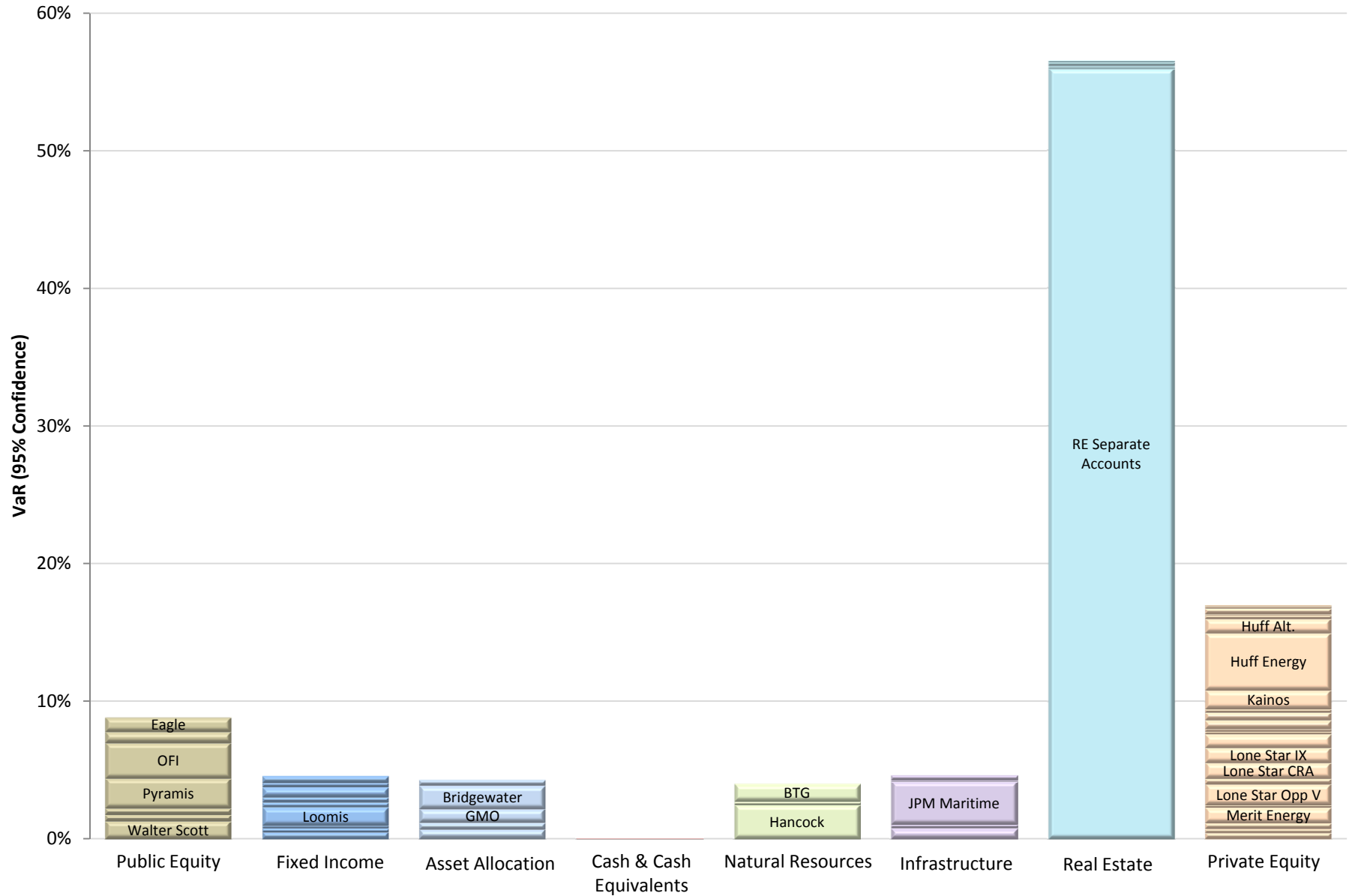
Preliminary – Data as at December 2015
Twelve Month Contribution to Performance excluding Real Estate
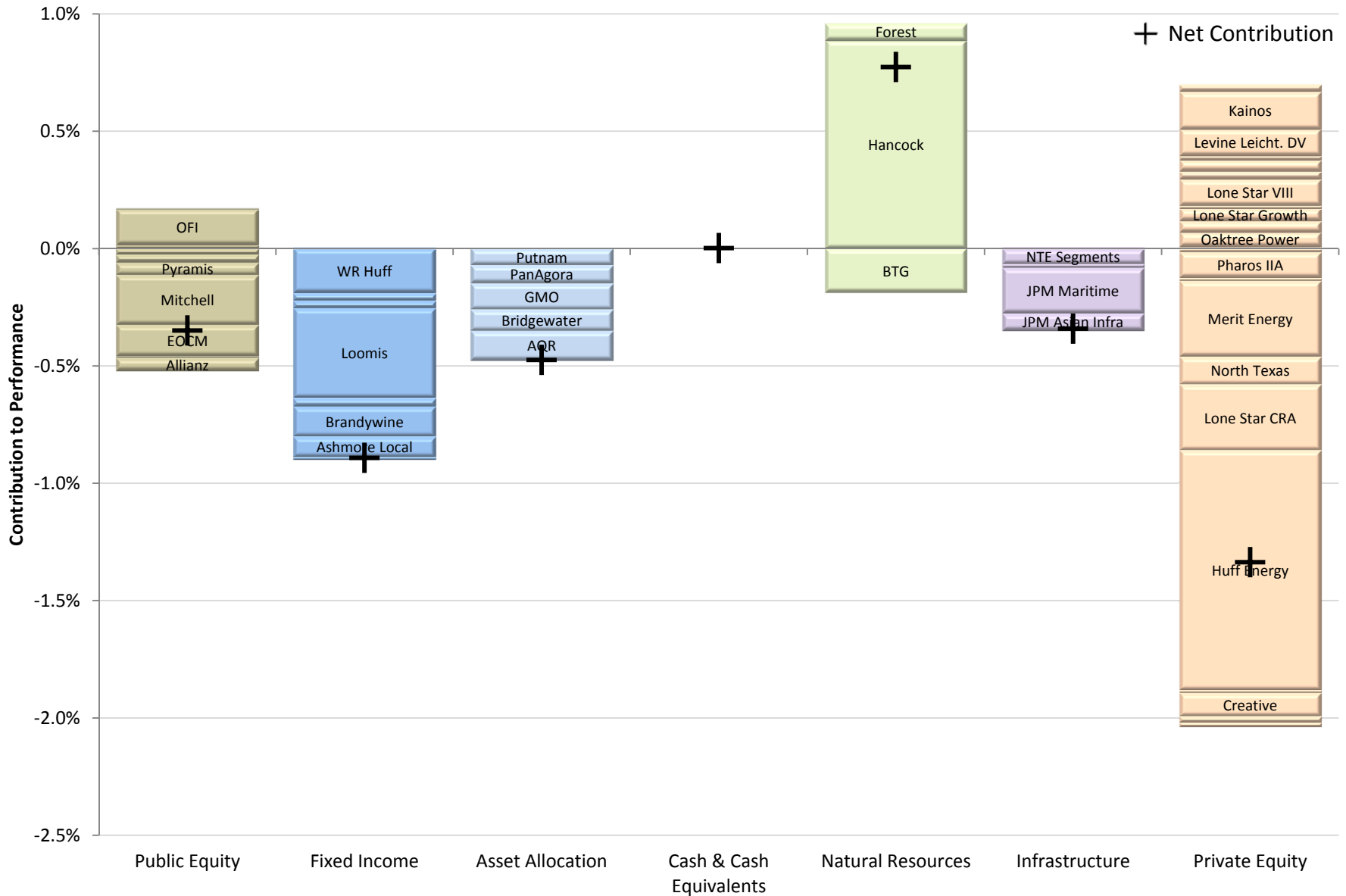
MAPLES
FUND SERVICES

* Returns presented are calculated using custodian bank year-end source data and values, which do not include subsequent valuation adjustments completed for audit and actuarial purposes. Therefore, the returns shown here will differ from actuary calculated returns.
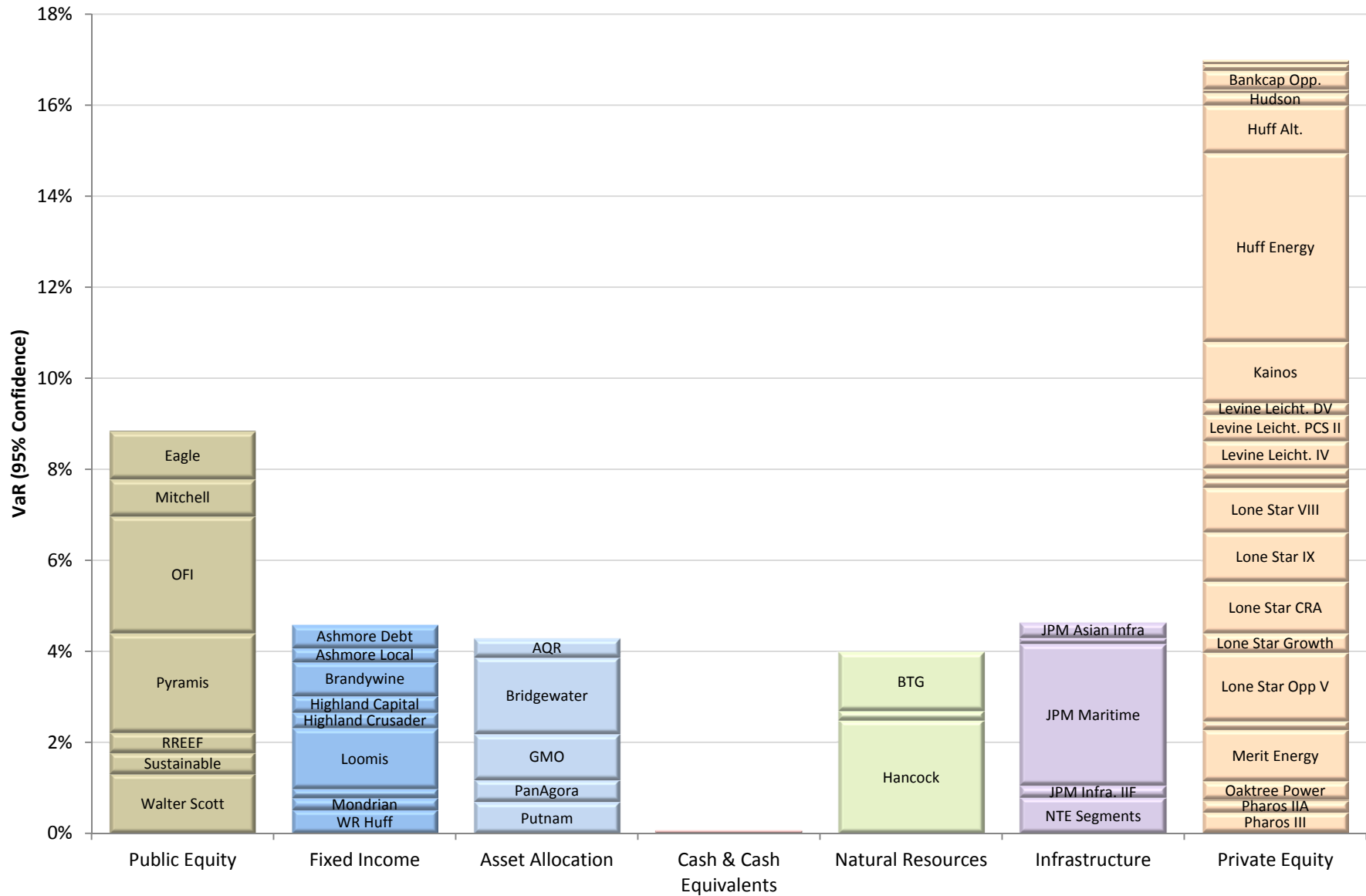
Preliminary – Data as at December 2015

Five Year Contribution to Risk

* VaR is expressed, on a position basis, as a percentage of the total portfolio VaR.

Preliminary – Data as at December 2015
Five Year Contribution to Risk
excluding Real Estate

VaR is expressed, on a position basis, as a percentage of the total portfolio VaR.

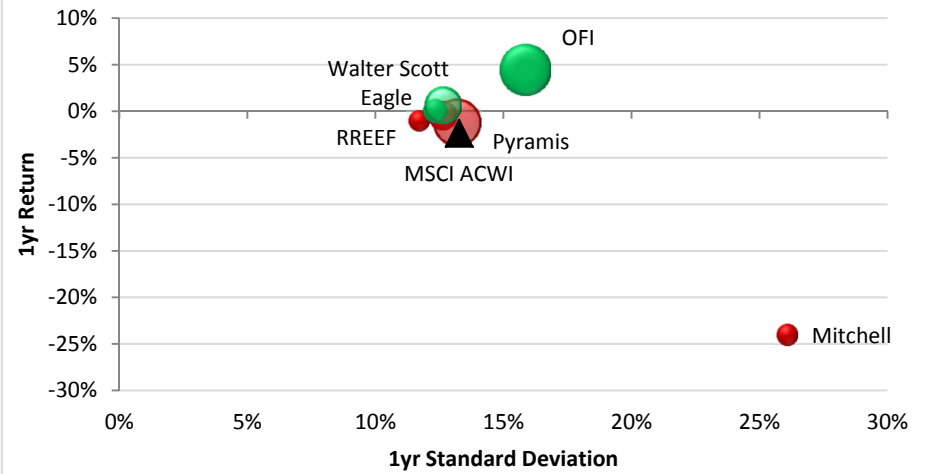**Preliminary – Data as at December 2015**
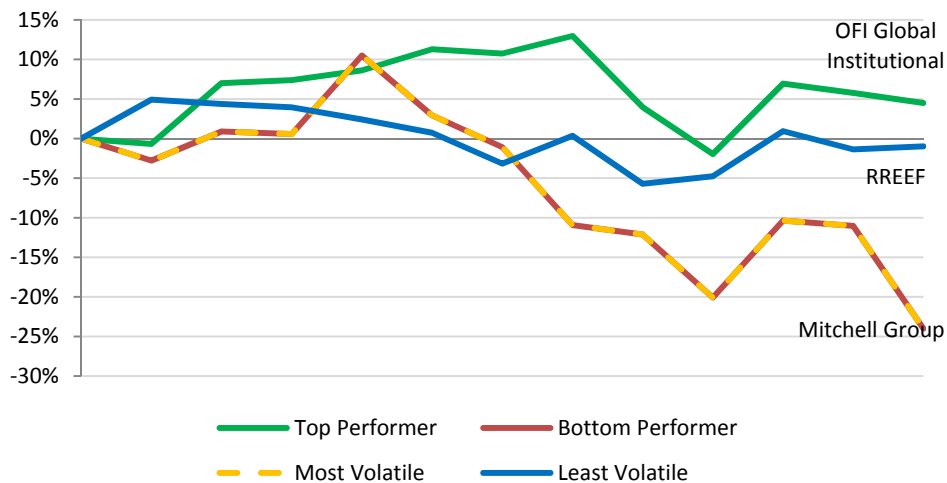**Public Equity Overview**

Commentary

- December capped off a challenging year for long/short managers, which was not surprising given the muted overall equity market returns. Managers struggled to generate meaningful alpha in their long portfolios, which performed well in the first half of the year and sold off sharply in the second half due to aggressive deleveraging in response to increased market volatility. Outsized losses were exhibited across many widely held names such as Williams, Valeant Pharmaceuticals, and Sunedison.

- While managers on average posted modest gains or losses for the year, there was very wide dispersion of returns based on style and geographic factors. In particular, managers with outsized long exposure to value stocks including energy lagged peers with exposure to growth stocks in technology including the "FANGS" (Facebook, Amazon, Netflix, Google), as investors paid a premium for companies which can deliver growth in a slowing economic environment. In addition, managers with greater exposure to international developed markets such as Europe and Japan which benefitted from Central Bank stimulus programs outperformed, and manager with exposure to emerging markets underperformed due to outsized losses in these markets.

- In response to recent heighted levels of market volatility, managers have reduced overall levels of risk (gross, net, and concentration). Morgan Stanley reported net exposures ended 2015 at 49%, down by 8% from 2014 and in the bottom quintile since 2010. Heading into 2016, managers remain overweight TMT and healthcare, and have been actively covering shorts in energy.
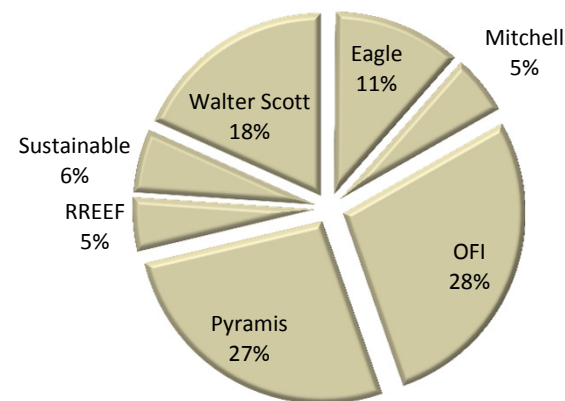
Source – Cliffwater

Manager Risk vs Return (Sharpe) as at Dec. 2015

Twelve Month Compounded Performance as at Dec. 2015

- Top Performer
- Bottom Performer
- Most Volatile
- Least Volatile

Exposure by Manager as at Dec. 2015

Eagle 11%
Mitchell 5%
Walter Scott 18%
Sustainable 6%
RREEF 5%
OFI 28%
Pyramis 27%

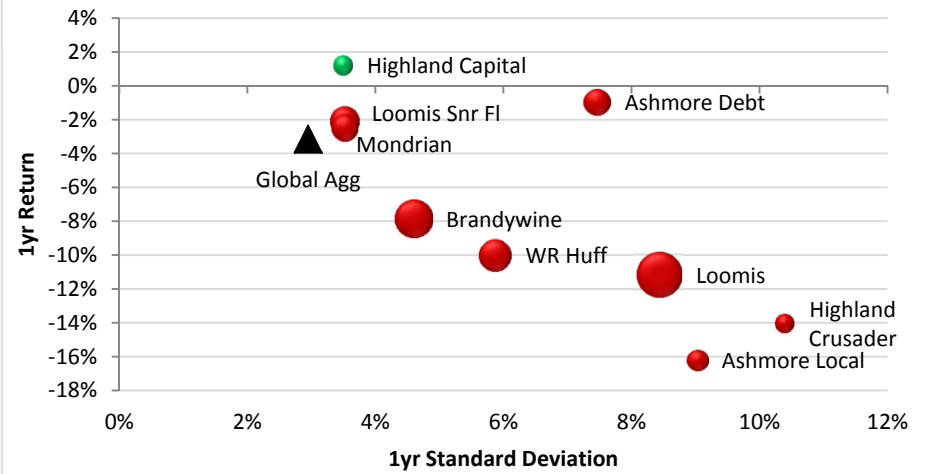**Preliminary – Data as at December 2015**
**Fixed Income Overview**

Commentary

- High yield bonds fell 3.0% in December, driven by CCCs that were down 5.3%. December's sell-off was attributable to further commodity price declines, uncertainty about the initial Fed rate hike, increased equity market volatility and heavy retail outflows. The HFRI ED: Distressed/Restructuring Index fell 2.4% in December and the HFRI RV: Fixed Income Corporate Index fell 0.2%.

- Credit hedge funds had a second consecutive year of disappointing performance as the high yield market finished 2015 with a 5.0% decline, with BBs, Bs and CCCs generating losses of 0.8%, 5.0% and 14.8%, respectively. The HFRI ED: Distressed/Restructuring Index was down 8.4% in 2015 and the HFRI RV: Fixed Income Corporate Index was down 0.8%. There was a wide dispersion of managers returns on the year (-25% to slightly positive). Poor results echoed the underperformance of lower-rated and commodities-related credits. In addition, many common holdings across hedge funds were stagnant or underperformed expectations: TXU, Lehman, Ally Financial, WAMU, Nortel, Caesars and Puerto Rico.

- Credit investors should anticipate increasing defaults for 2016, particularly in metals & mining, energy and even retail. Opportunities are greater on the long side, but still remain on the short side as leverage ratios remain elevated. Year-end redemptions were relatively light for most credit managers despite poor performance. The institutional demand for credit appears to be on the rise as the opportunity set in credit gets more attractive.
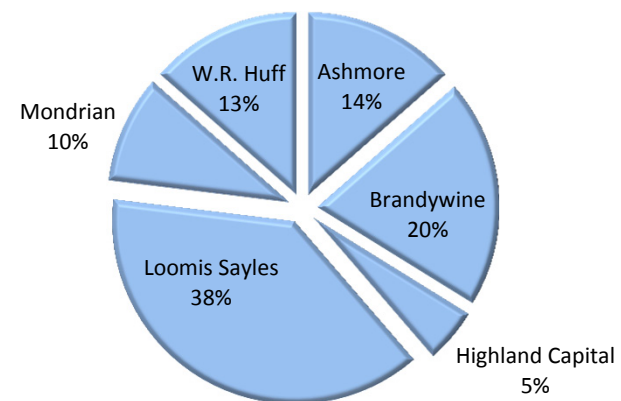
Source – Cliffwater

Manager Risk vs Return (Sharpe) as at Dec. 2015

Twelve Month Compounded Performance as at Dec. 2015
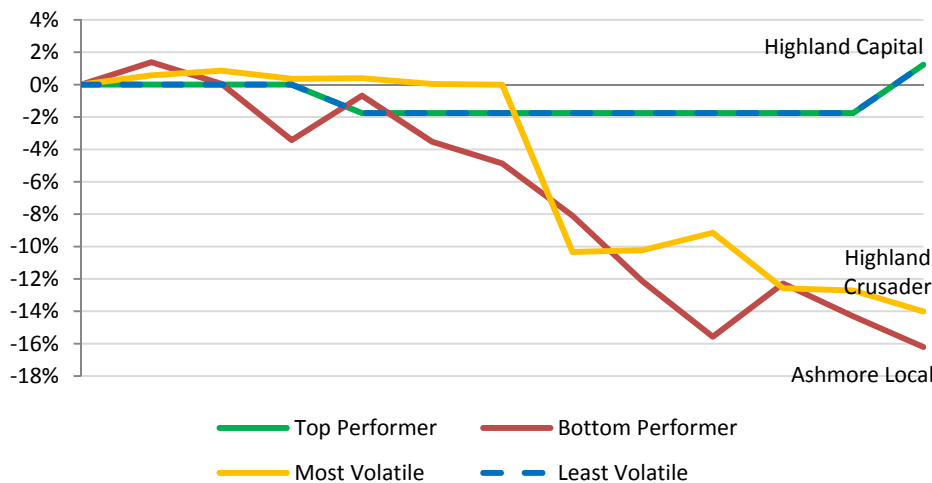
Exposure by Manager as at Dec. 2015

Preliminary – Data as at December 2015
## Asset Allocation Overview

**MAPLES** FUND SERVICES

Commentary

- December saw a simultaneous sell-off in global equities and global bonds, and while some hedge funds produced modest returns, headline hedge fund indices were slightly in the red. The HFRI Fund Weighted and Fund of Funds indices were down 0.9% and 0.6%, respectively.

- For the year, the HFRI Fund Weighted and Fund of Funds indices were down 0.9% and 0.4%, respectively. Absolute returns in 2015 were the worst levels since 2011 when the HFRI Fund Weighted and Fund of Funds indices were both down 5.3%. However, the silver lining was that many hedge funds produced positive returns in a negative market and outpaced many of the lackluster headline global indices.

- 2015 was the second worst year for both Equity Strategies (-0.1%) and Even Driven Strategies (-2.9%) since the financial crisis, as macro headwinds overwhelmed micro opportunities. Relative Value (-0.3%) strategies, which generally perform best in low volatility markets, was challenged by market dislocations.

- Global Macro (-1.3%) and Systematic Macro (-2.3%) underperformed for the year but provided strong diversification benefits when equities sold off. For example, Global Macro had its best month of the year in January when equities sold off and the strategy had a strong third quarter when many other hedge fund strategies struggled.
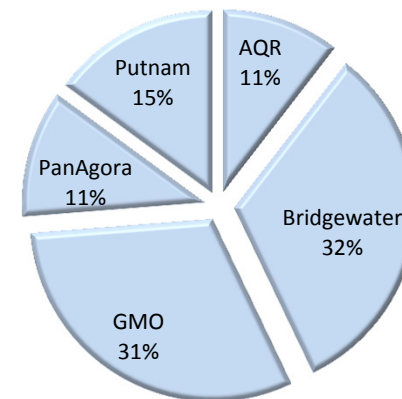
Source – Cliffwater
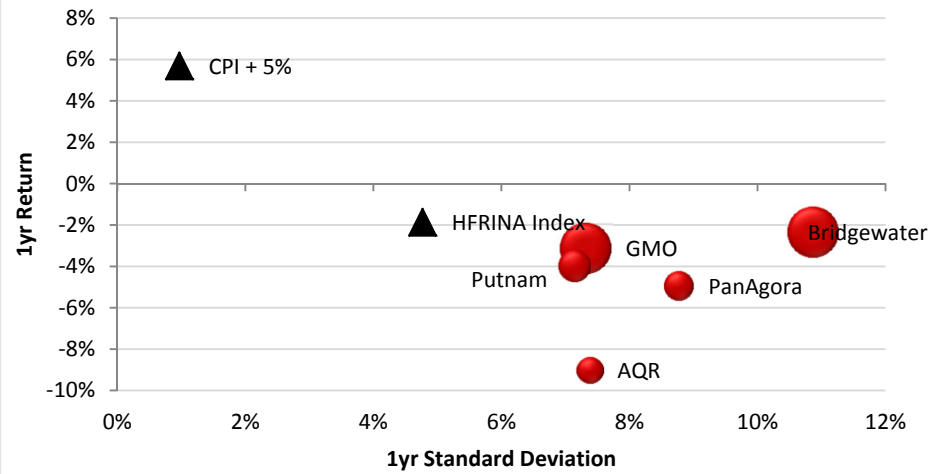
Manager Risk vs Return (Sharpe) as at Dec. 2015

Twelve Month Compounded Performance as at Dec. 2015
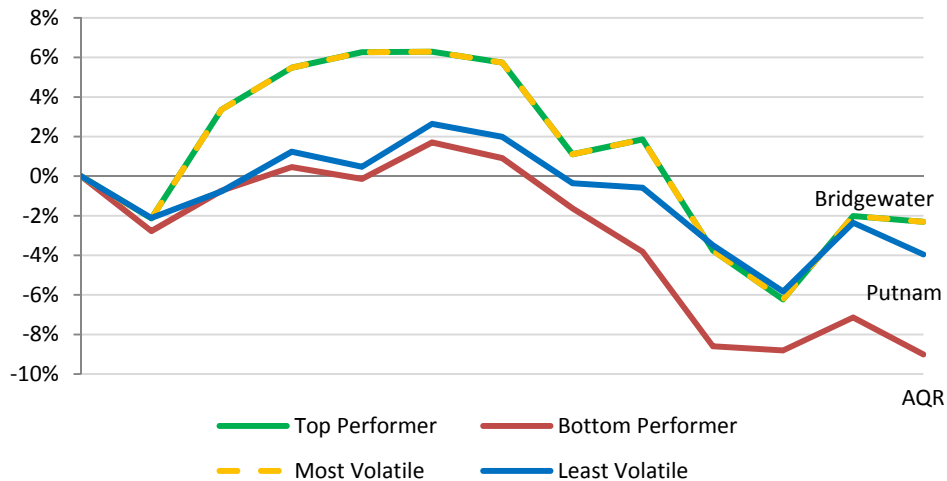
Exposure by Manager as at Dec. 2015

Preliminary – Data as at December 2015
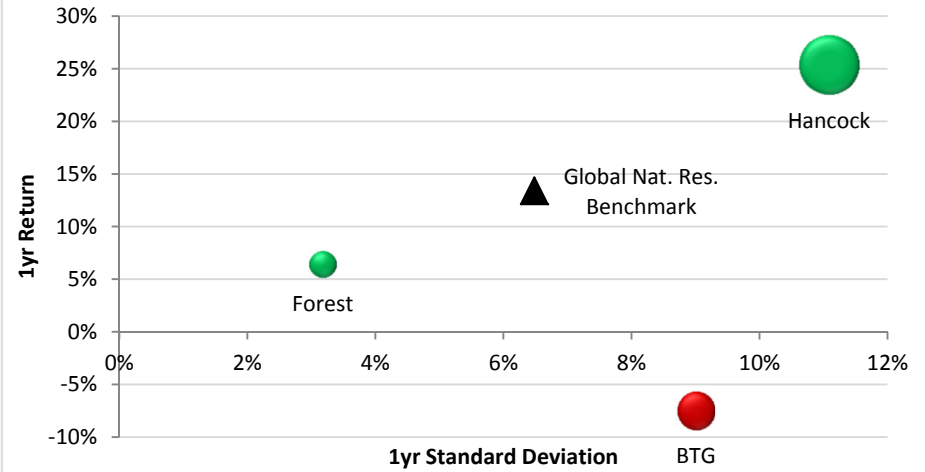## Natural Resources Overview

**MAPLES** FUND SERVICES

Commentary

- The energy sector (-38.9% total return in the index) captured the most attention during the year as members of OPEC, the Organization of Petroleum Exporting Countries, waged a protracted battle to capture global market share by cutting prices and increasing output in an effort to drive higher-cost sources of oil, such as U.S. shale producers, out of the market. U.S. oil output remained quite high, however, for a variety of reasons, resulting in swelling global inventories. In early December, OPEC essentially abandoned its oil production ceilings altogether and the cartel's output reached a three-year high, causing North Sea Brent (-45.6%) and West Texas Intermediate (-44.4%) crude oil prices to decline to their lowest levels since 2008.

- U.S. natural gas (-40.0%) prices fell to a 17-year low in December, a victim of unseasonably mild weather throughout the year and continued high production that sent inventories to a record-high four trillion cubic feet (some 13.5% above the commodity's five-year average), before a cooler weather forecast and increased demand helped pare the decline.

- In the precious metals sector, gold (-10.9%) and silver (-12.8%) prices were pressured by a rising dollar and increased bearish sentiment from a general expectation of an improving U.S. economy and rising "real" (inflation-adjusted) interest rates.

Source – Cohen and Steers

Manager Risk vs Return (Sharpe) as at Dec. 2015

Twelve Month Compounded Performance as at Dec. 2015
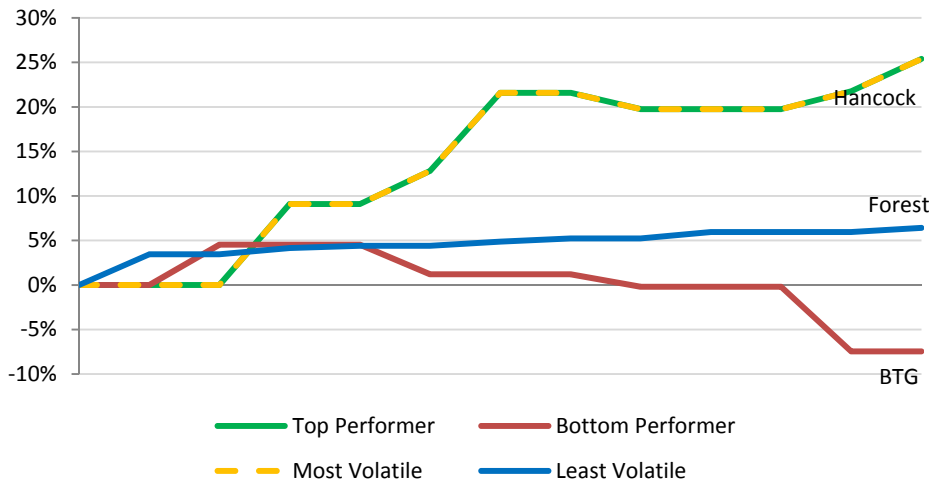
Exposure by Manager as at Dec. 2015
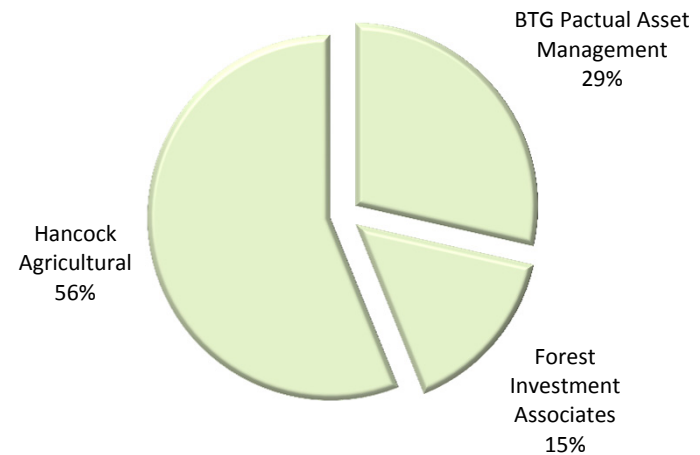
* Global Natural Resources Benchmark is the weighted average of NCREIF Farmland Single Use Perm/Mature Crops All and NCREIF Timberland South.

27

Preliminary – Data as at December 2015
Infrastructure Overview

Commentary

- Global listed infrastructure had a negative overall return for the year, as significant declines within the pipelines subsector overwhelmed generally positive returns in other categories. Developed economies showed modest improvement, with Europe in particular gaining momentum amid aggressive monetary easing by the European Central Bank. However, concerns over the slowdown in China and other emerging markets—as well as uncertainty leading up to the Federal Reserve's first interest-rate hike in years—led to a generally risk-averse market environment.

- Crude oil prices continued to fall precipitously in 2015, pressured by rising inventories, slowing demand from emerging markets and a strengthening U.S. dollar. The response from suppliers was relatively muted, particularly with OPEC (the Organization of Petroleum Exporting Countries) maintaining production levels in a fight for global market share at the expense of prices.

- Falling energy prices were detrimental to the pipelines subsector (–36.1% total return in the index). As energy producers slashed capital spending plans for 2016, markets anticipated slower pipeline volumes and reduced cash flow growth. Pipeline companies also faced difficulties in accessing capital and the challenge of balancing cash flows with refinancing needs and distribution expectations.
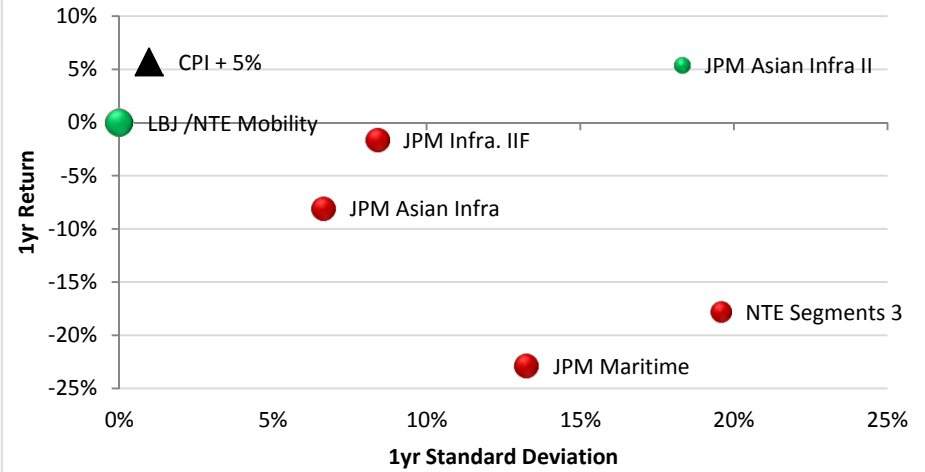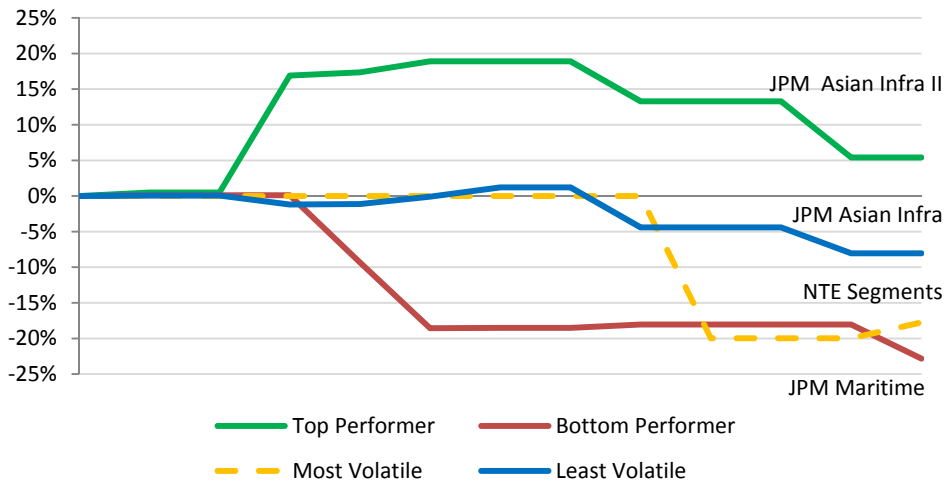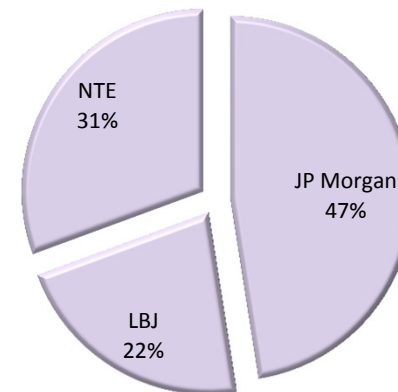
Source – Cohen and Steers

Manager Risk vs Return (Sharpe) as at Dec. 2015

Twelve Month Compounded Performance as at Dec. 2015

Exposure by Manager as at Dec. 2015

28

Preliminary – Data as at December 2015
Real Estate Overview

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Commentary

- Global real estate stocks had a total return of –0.8% for the year as measured by the FTSE EPRA/NAREIT Developed Real Estate Index (net of dividend withholding taxes). U.S. REITs digested the Fed's first rate hike in December and concerns of a slowing economy to end the year with a modestly positive total return. REITs outperformed the broader U.S. market, aided by continued strength in real estate fundamentals. Throughout the year, REITs generally exceeded or met the market's high earnings expectations, and many raised their guidance. Meanwhile, acquisition activity continued to confirm high property valuation levels, also helping REIT shares to recover from their mid-year lows.

- European real estate securities had sizable returns for the year in local currencies, overcoming periodic market setbacks. The group was lifted early on by improving economic data and the European Central Bank's (ECB) decision to launch quantitative easing (QE). Following a difficult August, when China worries spiked to rattle stocks around the world, European markets regained their footing as the ECB reiterated its desire to lift regional economic growth and inflation, suggesting yet more QE.

Manager Risk vs Return (Sharpe) as at Dec. 2015

Twelve Month Compounded Performance as at Dec. 2015
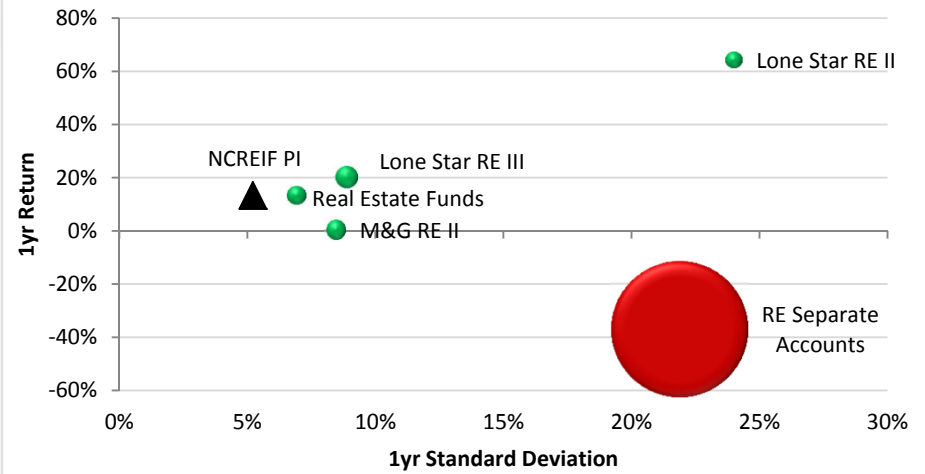

Exposure by Manager as at Dec. 2015

Preliminary – Data as at December 2015
Private Equity Overview

Commentary

- Unrealized Assets, drawing on data from Preqin's Secondary Market Monitor database on tail-end funds and their asset levels. Distributions from private equity funds have been very strong in recent years as managers have taken advantage of improving market conditions to realize value from the remaining assets in their portfolios. This has somewhat alleviated concerns regarding the overhang of unrealized value in ageing funds; however, the issue has not yet been fully rectified – particularly as funds raised in the boom years of 2005-2008 reach the 10-year mark. The chart below illustrates the aggregate remaining value in funds with a 2005 vintage and older, i.e. those that are very close to – or past – their original planned lifetime, with private equity funds typically having a 10-year term.

Source – Preqin

Manager Risk vs Return (Sharpe) as at Dec. 2015

Twelve Month Compounded Performance as at Dec. 2015

Exposure by Manager as at Dec. 2015
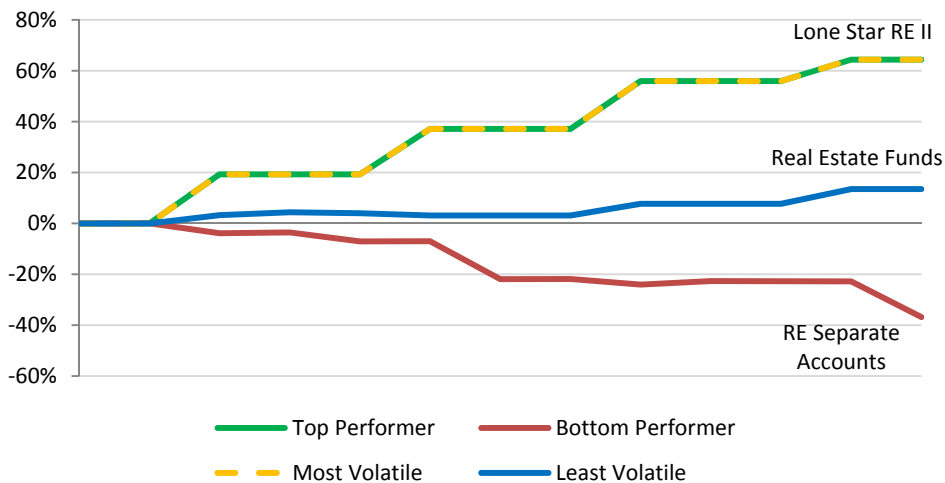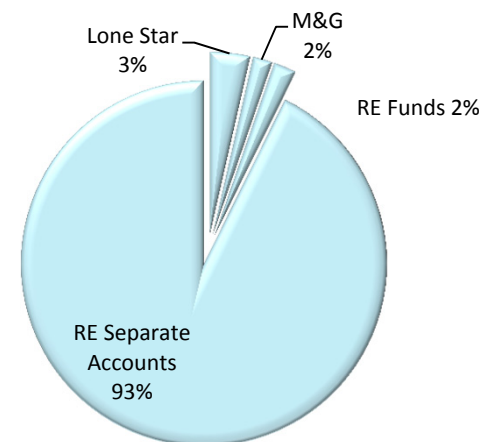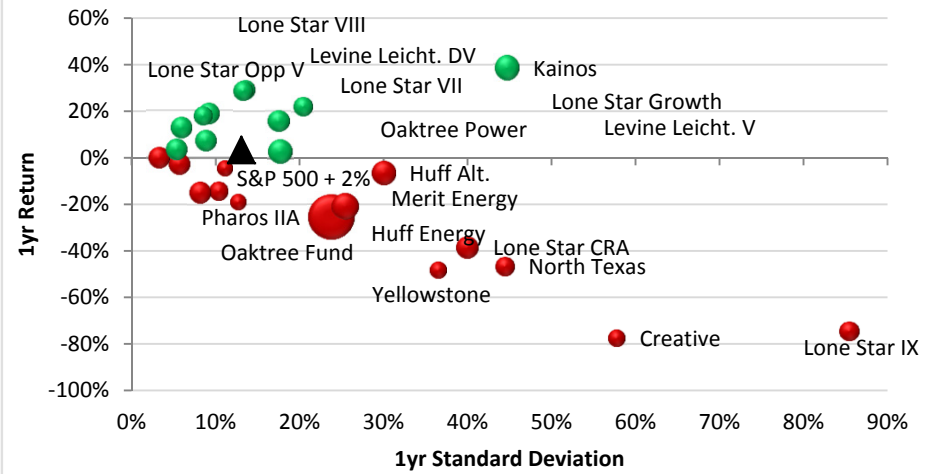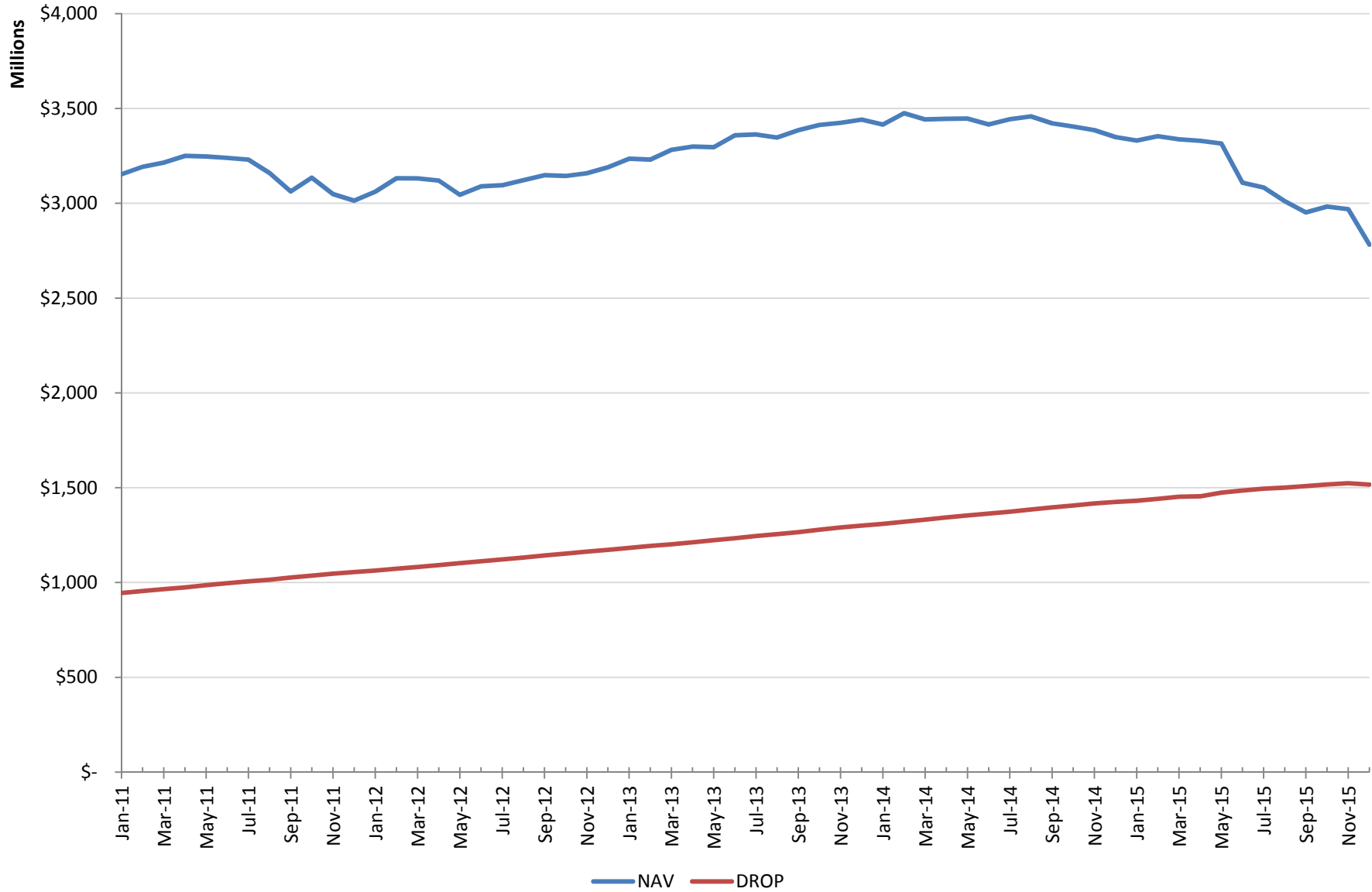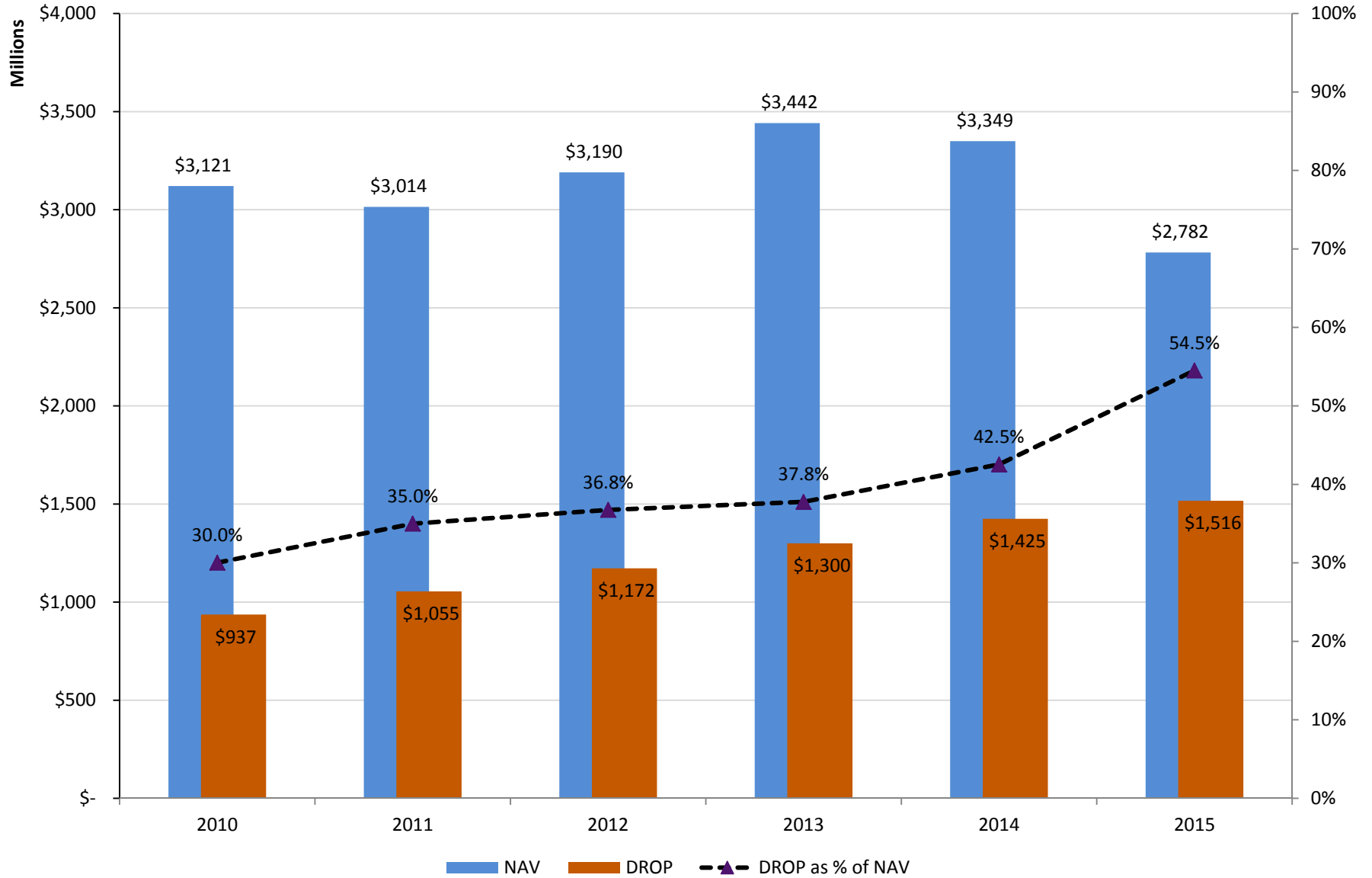

30
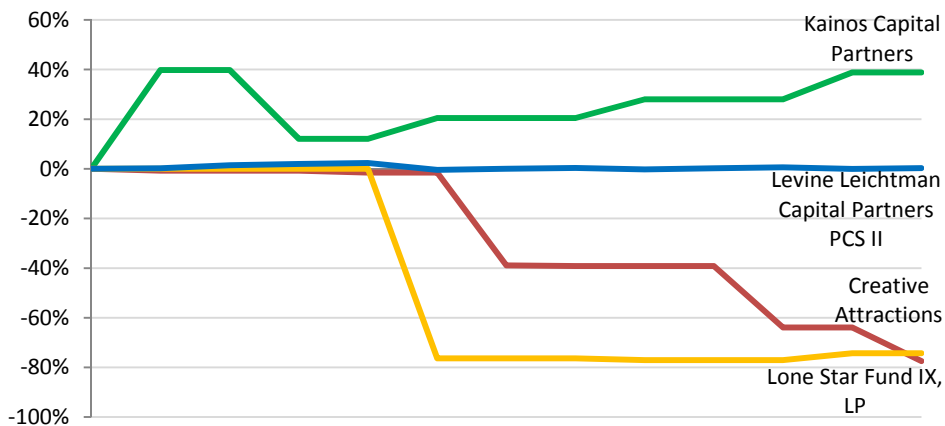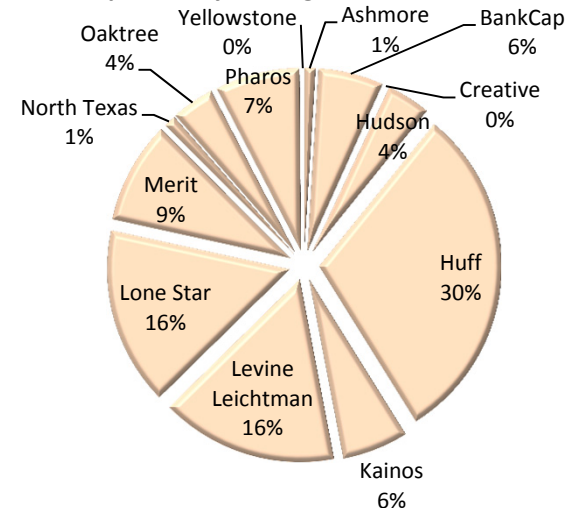
Preliminary – Data as at December 2015
Monthly NAV & Drop Balances

On a rolling five year basis.

Preliminary – Data as at December 2015
DROP as % of NAV

Preliminary – Data as at December 2015
Manager Overview

Fund	Inception Date	Current Exposure	Gross Allocation (%)	1M	3M	YTD	1yr	2yr	3yr	5yr
Portfolio	**Jun 1996**	**$ 3,023,363,870**		**-4.96%**	**-3.76%**	**-12.35%**	**-12.35%**	**-5.11%**	**-0.53%**	**1.45%**
Plan Leverage Facility		**$ (235,314,513)**		**0.00%**	**0.00%**	**0.88%**	**0.88%**	**1.72%**	**1.72%**	**1.72%**
Public Equity	**Jul 2006**	**$ 453,710,115**	**15.01%**	**-2.48%**	**4.54%**	**-1.62%**	**-1.62%**	**0.41%**	**7.86%**	**6.05%**
MSCI ACWI				*-1.80%*	*5.03%*	*-2.36%*	*-2.36%*	*0.85%*	*7.69%*	*6.09%*
Allianz EcoTrends	Nov 2008	$ 618,168	0.02%	7.31%	10.03%	-0.17%	-0.17%	-3.75%	7.62%	3.02%
Eagle Asset Management	Feb 2005	$ 51,647,989	1.71%	-4.01%	3.11%	-0.44%	-0.44%	3.48%	12.68%	9.37%
Energy Opportunities Capital Management	Jan 2008	$ 24	0.00%	0.08%	12.79%	-13.35%	-13.35%	-16.46%	-4.34%	-4.67%
Mitchell Group	Oct 2001	$ 23,977,625	0.79%	-14.58%	-4.91%	-24.00%	-24.00%	-18.69%	-7.32%	-4.70%
OFI Global Institutional	Oct 2007	$ 126,317,864	4.18%	-1.19%	6.59%	4.51%	4.51%	3.64%	11.39%	9.14%
Pyramis (Fidelity)	Mar 2002	$ 120,877,035	4.00%	-2.09%	4.78%	-1.17%	-1.17%	1.85%	8.93%	7.01%
RREEF	Feb 1999	$ 21,710,614	0.72%	0.39%	3.97%	-0.97%	-0.97%	7.30%	6.18%	7.47%
Sustainable Asset Management	Nov 2008	$ 25,578,562	0.85%	-2.44%	6.41%	0.08%	0.08%	1.50%	10.33%	6.58%
Walter Scott	Dec 2009	$ 82,982,234	2.74%	-1.41%	4.91%	0.67%	0.67%	1.75%	7.53%	7.68%
Fixed Income	**Jul 2006**	**$ 419,351,825**	**13.87%**	**-2.32%**	**-2.91%**	**-7.32%**	**-7.32%**	**-3.02%**	**-0.99%**	**3.55%**
Barclays Global Aggregate				*0.53%*	*-0.93%*	*-3.16%*	*-3.16%*	*-1.30%*	*-1.74%*	*0.90%*
Ashmore EM Debt Fund	Feb 2005	$ 40,798,148	1.35%	0.21%	1.77%	-0.95%	-0.95%	0.82%	-0.14%	4.23%
Ashmore EM Local CCY	Mar 2011	$ 15,997,026	0.53%	-2.22%	-0.74%	-16.20%	-16.20%	-11.33%	-11.29%	n/a
Brandywine	Oct 2004	$ 84,977,783	2.81%	-0.87%	-0.43%	-7.84%	-7.84%	-1.80%	-2.43%	2.35%
Highland Capital Management	Jan 2007	$ 12,431,892	0.41%	3.04%	3.04%	1.23%	1.23%	3.27%	12.73%	16.17%
Highland Crusader Fund	Jul 2003	$ 7,858,856	0.26%	-1.47%	-5.35%	-14.01%	-14.01%	-8.98%	-2.97%	11.28%
Loomis Sayles	Oct 1998	$ 110,275,429	3.65%	-5.35%	-6.55%	-11.14%	-11.14%	-4.23%	0.51%	4.25%
Loomis Sayles Sr. Floating Rate	Jan 2014	$ 50,231,064	1.66%	-1.54%	-3.40%	-2.08%	-2.08%	0.23%	n/a	n/a
Mondrian Investment Partners	Oct 2003	$ 40,166,274	1.33%	0.55%	-1.27%	-2.46%	-2.46%	-0.79%	-1.90%	0.56%
W.R. Huff High Yield	Jun 1996	$ 56,615,353	1.87%	-3.92%	-3.95%	-9.99%	-9.99%	-6.36%	-2.57%	1.82%
Asset Allocation	**Jul 2007**	**$ 408,839,945**	**13.52%**	**-0.78%**	**0.83%**	**-3.81%**	**-3.81%**	**1.73%**	**2.23%**	**4.66%**
CPI + 5%				*0.30%*	*1.35%*	*5.69%*	*5.69%*	*5.70%*	*6.00%*	*6.60%*
AQR	Oct 2013	$ 42,887,905	1.42%	-2.01%	-0.45%	-9.01%	-9.01%	-1.15%	n/a	n/a
Bridgewater	Sep 2007	$ 132,416,576	4.38%	-0.30%	1.50%	-2.31%	-2.31%	3.64%	2.09%	7.24%
GMO	Sep 2007	$ 126,224,536	4.17%	-0.24%	1.46%	-3.12%	-3.12%	0.42%	3.55%	5.12%
PanAgora	Nov 2013	$ 46,170,932	1.53%	-1.28%	0.22%	-4.94%	-4.94%	4.05%	n/a	n/a
Putnam	Dec 2009	$ 61,139,996	2.02%	-1.64%	-0.48%	-3.95%	-3.95%	0.47%	1.77%	4.83%
Cash & Cash Equivalents		**$ 82,301,741**	**2.72%**	**0.01%**	**0.03%**	**0.22%**	**0.22%**	**0.05%**	**0.10%**	**-0.90%**

[1] *Approximately two-thirds of the one year loss relates to the lagged returns from Q4 2014 for private investments. These losses were reflected in the 2014 CAFR and 1/1/15 actuarial valuation*

Fund	Inception Date	Current Exposure	Gross Allocation (%)	1M	3M	YTD	1yr	2yr	3yr	5yr
Natural Resources	Apr 2015	$ 288,096,673	9.53%	1.74%	0.42%	11.06%	n/a	n/a	n/a	n/a
"Global Nat. Res. Benchmark"				*2.12%*	*2.12%*	*13.40%*	*13.40%*	*9.97%*	*13.96%*	*9.54%*
BTG Pactual Asset Management	Oct 2006	$ 82,259,374	2.72%	0.00%	-7.28%	-7.46%	-7.46%	-5.26%	-6.69%	-3.66%
Forest Investment Associates	Jan 1992	$ 44,230,168	1.46%	0.45%	0.45%	6.43%	6.43%	7.70%	6.09%	3.70%
Hancock Agricultural	Dec 2002	$ 161,607,131	5.35%	2.97%	4.70%	25.39%	25.39%	19.53%	22.19%	20.07%
Infrastructure	Jul 2012	$ 202,663,939	6.70%	-0.52%	-1.45%	-6.18%	-6.18%	-2.03%	0.65%	n/a
CPI + 5%				*0.30%*	*1.35%*	*5.69%*	*5.69%*	*5.70%*	*6.00%*	*6.60%*
JP Morgan Asian Infrastructure	Aug 2008	$ 30,713,795	1.02%	0.00%	-3.80%	-8.04%	-8.04%	-1.03%	-1.04%	1.51%
JP Morgan Asian Infrastructure II	Mar 2014	$ 4,858,294	0.16%	0.00%	-6.97%	5.40%	5.40%	n/a	n/a	n/a
JP Morgan Global Maritime	Jun 2010	$ 29,092,589	0.96%	-5.84%	-5.84%	-22.82%	-22.82%	-3.54%	18.54%	-80.86%
JP Morgan Infrastructure IIF	Oct 2007	$ 31,628,689	1.05%	0.00%	-0.85%	-1.60%	-1.60%	0.32%	3.02%	4.21%
LBJ Infrastructure Group Holdings	Jun 2010	$ 44,346,035	1.47%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
NTE Mobility Partners	Dec 2009	$ 42,625,545	1.41%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
NTE Segments 3	Sep 2013	$ 19,398,994	0.64%	2.79%	2.79%	-17.75%	-17.75%	-8.94%	n/a	n/a
Real Estate	Mar 1985	$ 704,114,981	23.29%	-17.00%	-16.93%	-34.07%	-34.07%	-19.29%	-11.77%	-7.17%
NCREIF PI				*2.91%*	*2.91%*	*13.33%*	*13.33%*	*12.57%*	*12.04%*	*12.18%*
Lone Star RE II	Jul 1994	$ 4,805,298	0.16%	0.00%	5.40%	64.36%	64.36%	52.53%	41.63%	27.41%
Lone Star RE III	Sep 2011	$ 20,269,045	0.67%	0.00%	3.21%	20.34%	20.34%	10.34%	10.34%	n/a
M&G Real Estate Debt Fund II, LP	May 2014	$ 12,206,988	0.40%	-2.09%	-0.31%	0.57%	0.57%	n/a	n/a	n/a
RE Composite		$ 652,623,155	21.59%	-18.15%	-18.28%	-36.82%	-36.82%	-21.29%	-14.11%	-8.99%
Real Estate Funds		$ 14,210,495	0.47%	0.00%	5.41%	13.52%	13.52%	6.87%	5.52%	5.27%

"Real Estate Funds" includes LSF III – VI, LSREF, Hearthstone and Olympus funds.

Fund	Inception Date	Current Exposure	Gross Allocation (%)	1M	3M	YTD	1yr	2yr	3yr	5yr
Private Equity	Oct 2005	$ 464,284,651	15.36%	0.03%	0.03%	-8.62%	-8.62%	-3.41%	-1.19%	1.24%
S&P 500 + 2%				*-1.41%*	*7.56%*	*3.41%*	*3.41%*	*9.50%*	*17.40%*	*14.80%*
Ashmore GSSF IV	Oct 2007	$ 4,508,562	0.15%	0.78%	-1.00%	-4.14%	-4.14%	-9.32%	-10.67%	-12.48%
BankCap Partners	Feb 2007	$ 15,674,335	0.52%	0.00%	-0.69%	7.47%	7.47%	2.27%	2.14%	-0.39%
BankCap Opportunity Fund	Aug 2013	$ 11,114,580	0.37%	0.00%	-1.79%	-14.24%	-14.24%	-32.28%	n/a	n/a
Creative Attractions	Dec 2012	$ 1,085,223	0.04%	-37.48%	-62.92%	-77.44%	-77.44%	-74.00%	-59.40%	n/a
Hudson Clean Energy	Aug 2009	$ 17,977,837	0.59%	0.00%	-0.16%	-2.33%	-2.33%	1.31%	-11.65%	-5.25%
Huff Alternative Fund	Jun 2001	$ 30,390,587	1.01%	0.00%	-8.22%	-6.50%	-6.50%	-2.35%	4.42%	-7.79%
Huff Energy Fund LP	Dec 2005	$ 110,127,486	3.64%	0.00%	-0.08%	-25.22%	-25.22%	-12.31%	-9.54%	-4.25%
Kainos Capital Partners	Jan 2014	$ 27,241,869	0.90%	0.00%	8.45%	38.82%	38.82%	6.47%	n/a	n/a
Levine Leichtman Capital Partners Deep Value	Oct 2006	$ 12,294,522	0.41%	1.21%	0.26%	29.41%	29.41%	12.61%	-2.29%	2.82%
Levine Leichtman Capital Partners PCS II	Feb 2012	$ 18,509,916	0.61%	0.34%	0.07%	0.32%	0.32%	1.25%	4.92%	n/a
Levine Leichtman Capital Partners IV	Apr 2008	$ 26,173,240	0.87%	0.20%	9.18%	3.08%	3.08%	7.56%	10.80%	20.63%
Levine Leichtman Capital Partners V	Aug 2013	$ 15,823,521	0.52%	0.83%	2.34%	18.86%	18.86%	10.68%	n/a	n/a
Lone Star Fund VII, LP	Jul 2011	$ 5,058,332	0.17%	0.00%	11.80%	22.33%	22.33%	31.15%	65.38%	n/a
Lone Star Fund VIII, LP	Jun 2013	$ 14,897,830	0.49%	0.00%	5.94%	28.93%	28.93%	30.04%	n/a	n/a
Lone Star Fund IX, LP	Apr 2015	$ 8,345,572	0.28%	0.03%	12.06%	-74.29%	n/a	n/a	n/a	n/a
Lone Star CRA	Jul 2008	$ 16,699,959	0.55%	0.00%	1.48%	-38.35%	-38.35%	-11.24%	3.41%	19.50%
Lone Star Growth Capital	Dec 2006	$ 12,707,831	0.42%	0.00%	2.52%	17.86%	17.86%	-10.61%	1.16%	6.42%
Lone Star Opportunities V	Jan 2012	$ 15,465,246	0.51%	0.00%	1.17%	12.97%	12.97%	7.43%	36.83%	n/a
North Texas Opportunity Fund	Aug 2000	$ 5,046,915	0.17%	0.00%	-0.07%	-46.62%	-46.62%	-17.91%	-16.39%	-12.14%
Merit Energy E, F, G, H	Oct 2004	$ 41,999,379	1.39%	0.00%	-4.97%	-20.69%	-20.69%	-1.99%	-1.18%	-0.74%
Oaktree Power Opportunities Fund III	Apr 2011	$ 15,509,330	0.51%	0.00%	14.81%	16.04%	16.04%	11.76%	19.23%	n/a
Oaktree Fund IV & 2x Loan Fund	Jan 2002	$ 2,157,735	0.07%	0.00%	-12.19%	-18.73%	-18.73%	-4.97%	-2.01%	0.52%
Pharos IIA	Aug 2005	$ 19,295,670	0.64%	0.00%	-7.95%	-14.87%	-14.87%	-7.00%	-0.15%	5.68%
Pharos III	Dec 2012	$ 15,571,470	0.52%	2.22%	0.27%	3.81%	3.81%	-3.89%	-21.08%	n/a
Yellowstone Capital	Sep 2008	$ 607,703	0.02%	0.00%	-34.85%	-48.16%	-48.16%	-53.10%	-41.99%	-33.25%

Preliminary – Data as at December 2015
Appendix I – Stress Test Scenarios, Proxies, Policy Composition

Stress Test Scenarios

Scenario/Stress	Calculation Period	Description
Debt Ceiling Crisis & Downgrade (2011)	07/22/2011 - 08/08/2011	Debt ceiling crisis that led to USA credit downgrade. This stress scenario describes a 17-day period starting from 7/22/2011 when the market began to react to debt ceiling impasse. 8/8/2011 is the first business day after the downgrade announcement.
Equities Down 10%	Stress Test	Global market factors down 10%.
Equities Up 10%	Stress Test	Global market factors up 10%.
Equity Markets Rebound (2009)	03/04/2009 - 06/01/2009	Global equity markets rebound following 2008 drawdown.
EUR down 10% vs. USD	Stress Test	FX rate shift. EUR weakens 10% to USD.
EUR up 10% vs. USD	Stress Test	FX rate shift. EUR strengthens 10% to USD.
Greek Financial Crisis (2015)	06/22/2015 - 07/08/2015	Athens resistance via referendum and ultimately agreement to rush through long-resisted economic reforms, imposed by its creditors, in a bid to stay in the Eurozone
Lehman Default (2008)	09/15/2008 - 10/14/2008	Month immediately following default of Lehman Brothers in 2008.
Libya Oil Shock (2011)	02/14/2011 - 02/23/2011	Civil war in Libya breaks out on February 15th 2011, causing oil prices to surge.
Oil Prices Drop (2010)	05/03/2010 - 05/20/2010	The price of oil drops 20% due to concerns over how European countries would reduce budget deficits in the wake of the European economic crisis.
Russian Financial Crisis (2008)	08/07/2008 - 10/06/2008	War with Georgia and rapidly declining oil prices raise fears of an economic recession within the region.

Stress Test Proxies

Asset Class	Proxy
Public Equity	iShares MSCI ACWI ETF
Fixed Income	SPDR Barclays High Yield Bond ETF
Asset Allocation	Powershares Senior Loan Portfolio ETF
Cash & Cash Equivalents	n/a
Natural Resources	IQ ARB Global Resources ETF
Infrastructure	SPDR S&P Global Infrastructure ETF
Real Estate	Schwab US REIT ETF
Private Equity	iShares S&P 500 ETF

Policy Composition

Asset Class	Benchmark	Weight
Public Equity	MSCI ACWI	15%
Fixed Income	Barclays Global Aggregate	15%
Asset Allocation	90 Day T-Bill + 6%	20%
Cash & Cash Equivalents	n/a	0%
Natural Resources	"Global Nat. Res. Benchmark"	10%
Infrastructure	CPI + 5%	10%
Real Estate	NCREIF PI	15%
Private Equity	S&P 500 + 2%	15%

Proxies for stress tests are chosen based on correlation analysis of index returns to tradeable ETFs.

* 60/40 Portfolio is defined as 60% MSCI ACWI, 40% Barclays Global Aggregate.

Attribution details

Single period attribution uses arithmetic attribution per the Brinson Model

$$Asset\ Allocation = \sum_j \left(w_j^p - w_j^b\right) \times \left(r_j^b - r_{total}^b\right)$$

$$Stock\ Selection = \sum_j w_j^b \times \left(r_j^p - r_j^b\right)$$

$$Interaction = \sum_j \left(w_j^p - w_j^b\right) \times \left(r_j^p - r_j^b\right)$$

$$Total\ Value\ Added = \left(r_{total}^p - r_{total}^b\right)$$

where

$w_j^p = Weight\ of\ Portfolio\ component\ j$
$w_j^b = Weight\ of\ Benchmark\ component\ j$
$r_j^p = Return\ of\ Portfolio\ component\ j$
$r_j^b = Return\ of\ Benchmark\ component\ j$
$r_{total}^p = Total\ Return\ of\ Portfolio$
$r_{total}^b = Total\ Return\ of\ Benchmark$

Multi period attribution is calculated using the Frongello model to produce the cumulative effects of attribution across multiple periods.

$$F_{itb} = G_{itb} \left(\prod_{j=1}^{t-1}(1 + R_j)\right) + \bar{R}_t \left(\sum_{j=1}^{t-1} F_{ijb}\right)$$

In the Frongello method, each original attribute (G_{itb}) is scaled by the portfolio total return through the prior period ($1+R_j$) and the current period return of the benchmark ($\bar{R}_t$) compounds with the total return due to that attribute through the prior period (F_{ijb})

* For the one month attribution, the weights displayed on page 12 are the beginning weights for the period. For the Calendar YTD and One Year weights, they are the average of the beginning weights over the period

Investment Oversight

As at 31st January 2016
Dallas Police & Fire Pension System

Preliminary – Data as at December 2015
Appendix III – Investment Terms &
Performance Statistics

Active Premium: A measure of the investment's annualized return minus the benchmark's annualized return

Alpha: Return generated by the manager that is not explained by the returns of the benchmark. A measure of a fund's performance beyond what its benchmark would predict

Annual Return: The annual rate at which an investment would have grown, if it had grown at a steady rate. Also called "Compound Annual Growth Rate" (CAGR), or the "Compound Rate of Return Annualized" (Compound RoR)

Annual Volatility: A statistical measure of the dispersion of returns around the average (mean) return. Often used as a measure of investment risk with a higher value indicating higher risk

Arbitrage: The simultaneous purchase and sale of an asset in order to profit from a difference in the price

Beta: A measure of the risk of the fund relative to the benchmark. Beta describes the sensitivity of the investment to benchmark movements where the benchmark is always assigned a beta of 1.0

Calmar Ratio: A return/risk ratio calculated over the last three year period as [annual compounded return / (Maximum Drawdown)]

Capital Commitment: Every investor in a private equity fund commits to investing a specified sum of money in the fund partnership over a specified period of time.

Capital Distribution: The returns that an investor in a private equity fund receives; the income and capital realized from investments less expenses and liabilities

Carried Interest: The share of profits that the fund manager is due once it has returned the cost of investment to investors

Catch up: A clause that allows the general partner to take, for a limited period of time, a greater share of the carried interest than would normally be allowed. This continues until the time when the carried interest allocation, as agreed in the limited partnership, has been reached.

Clawback: Ensures that a general partner does not receive more than its agreed percentage of carried interest over the life of the fund

Correlation: A measure between +1 and -1 that explains the degree to which the returns of the fund and a benchmark are related

Down Capture: Measures how much of the benchmark's return the fund captures when the benchmark is negative

Down Number: The percentage of the time the fund was down when the benchmark was down

Drawdown: When a private equity firm has decided where it would like to invest, it will approach its own investors in order to draw down the money. The money will already have been pledged to the fund but this is the actual act of transferring the money so that it reaches the investment target

Excess Kurtosis: Measures the distribution of observed data around the mean with an emphasis on "outlier" data, both positive and negative

Exit: The means by which a fund is able to realize its investment in a company – by an initial public offering, a trade sale, selling to another private equity firm or a company buy-back

Fundraising: The process by which a private equity firm solicits financial commitments from limited partners for a fund

Investment Oversight

As at 31st January 2016

Dallas Police & Fire Pension System

Preliminary – Data as at December 2015
Appendix III – Investment Terms &
Performance Statistics (cont.)

General Partner: This can refer to the top-ranking partner(s) at a private equity firm as well as the firm managing the private equity fund

Gross Exposure: Aggregate of long and short investment positions in relation to the Net Asset Value (NAV)

Holding Period: The length of time that an investment is held

Information Ratio: The Active Premium divided by the Tracking Error. This measure explicitly relates the degree by which an investment has beaten the benchmark to the consistency by which the investment has beaten the benchmark

Internal Rate of Return: A time-weighted return expressed as a percentage that uses the present sum of cash drawdowns (money invested), the present value of distributions (money returned from investments) and the current value of unrealized investments and applies a discount

Leverage: Increasing exposure to markets (both long and short) by borrowing or the use of derivatives

Limited Partnership: The standard vehicle for investment in private equity funds

Long Position: Owning a security

Management Fee: The annual fee paid to the general partner

Max Drawdown: The largest percentage loss of Net Asset Value (NAV) as measured from peak-to-trough

Net Exposure: Difference between the long and short positions, representing the exposure to market fluctuations

Preferred Return: This is the minimum amount of return that is distributed to the limited partners until the time when the general partner is eligible to deduct carried interest

Omega Ratio: The weighted gain/loss ratio relative to the average monthly historical return; captures the effects of extreme returns and conveys the preference for positive volatility versus negative volatility

Sharpe Ratio: A return/risk ratio calculated as: [(annual compounded return - risk-free rate) / (annual volatility of returns)]

Skewness: A measure of the symmetry of return distribution, as compared with a normal (bell-shaped) distribution

Sortino Ratio: A return/risk ratio calculated as such: [(annual compounded return – minimum acceptable return (MAR) / (downside deviation of returns below MAR)]. This ratio was developed to differentiate between good (upside) and bad (downside) volatility

Standard Deviation: Measures the dispersal or uncertainty in a random variable (in this case, investment returns). It measures the degree of variation of returns around the mean (average) return

Short Position: Selling a security

Tracking Error: A measure of the unexplained portion of an investments performance relative to a benchmark

Investment Oversight

As at 31st January 2016
Dallas Police & Fire Pension System

Preliminary – Data as at December 2015
Appendix III – Investment Terms &
Performance Statistics (cont.)

Up Capture: Measures the percentage of the benchmark's return the fund captures when the benchmark is positive

Up Number: The percentage of the time the fund was up when the benchmark was up

Value at Risk (VAR): The maximum loss that can be expected within a specified holding period with a specified confidence level

Preliminary – Data as at December 2015
Appendix IV – Private Credit

Investment	Current Classification	Future Classification
Levine Leichtman Capital Partners Deep Value	Private Equity	Private Credit
Levine Leichtman Capital Partners PCS II	Private Equity	Private Credit
Lone Star Fund VII, LP	Private Equity	Private Credit
Lone Star Fund VIII, LP	Private Equity	Private Credit
Lone Star Fund IX, LP	Private Equity	Private Credit
Oaktree Fund IV & 2x Loan Fund	Private Equity	Private Credit