

Wilshire

Prepared for



Public Employees Retirement Association of New Mexico

Investment Performance Review

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Q2 FY23

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Scorecard

Scorecard: Strategic Asset Allocation

- As of December 31, 2022, PERA is below the assumed rate of return for most time periods, but above the assumed rate of return since inception.
- The 20-year period includes the Great Recession and Dotcom era bust. Returns are at 6.65%.

PERA Investment Goal	Measurement	Total Fund Results	Assumed Return	Excess Return	Scorecard
Set Strategic Asset Allocation (Policy Portfolio) to meet the assumed return and funding goals over the long-term (10 years and longer)	•FYTD	-0.70%	3.56%	-4.26%	Below
	•1 year	-8.36%	7.25%	-15.61%	Below
	•3 years	4.51%	7.25%	-2.74%	Below
	•5 Years	5.00%	7.25%	-2.25%	Below
	•7 years	6.55%	7.29%	-0.74%	Below
	•10 years	6.62%	7.43%	-0.81%	Below
	•20 years	6.65%	7.59%	-0.94%	Below
	•30 years	7.61%	7.64%	-0.03%	Below
	NOTE: 7.25 Annual (7.75 before July 2016)				
	•ITD	8.56%	7.66%	0.90%	Meets

Scorecard: Strategic Asset Allocation, continued

- ✓ PERA's capital allocations were in line with SAA targets:

Capital Allocation				
Asset Class	Target %	Actuals %	Difference Δ	IPS Ranges %
Global Equity	35.5%	37.5%	2.0%	+/- 5%
Credit	15.0%	18.9%	3.9%	+/- 4%
Risk Mitigation	19.5%	17.1%	-2.4%	+/- 3%
Real Assets	20.0%	18.1%	-2.0%	+/- 4%
Multi-Risk	10.0%	8.5%	-1.5%	+/- 4%
Total Fund	100.0%	100.0%		

- PERA's 4-year tracking error was outside of ranges, while excess return was within ranges:

Active Risk Allocation versus Policy Portfolio			
	4-Year Results	Target	Range
Ex-Post Actionable Total Fund Tracking Error	0.97%	1.25%	1.0% - 2.0%
Ex-Post Total Fund Tracking Error	5.25%	2.50%	2.0% - 3.0%
Ex-Post Excess Return	0.10%	1.0%	0.0% - 2.0%
Source: Board Risk Report (BNYM) / Calculations are based on NOF figures.			

- ✓ PERA's liquidity allocations were in line with liquidity guidelines:

Liquidity Allocation			
Tier	Actuals \$M	Actuals %	Guideline
Tier 1 (1-5 Days)	\$2,329	14%	Tier 1 Assets ≥ 10% Fund NAV
Tier 2 (5-90 Days)	\$6,516	40%	
Tier 3 (90-365 Days)	\$1,076	7%	
Tier 4 (1 Year +)	\$6,264	39%	
	\$16,185	100%	

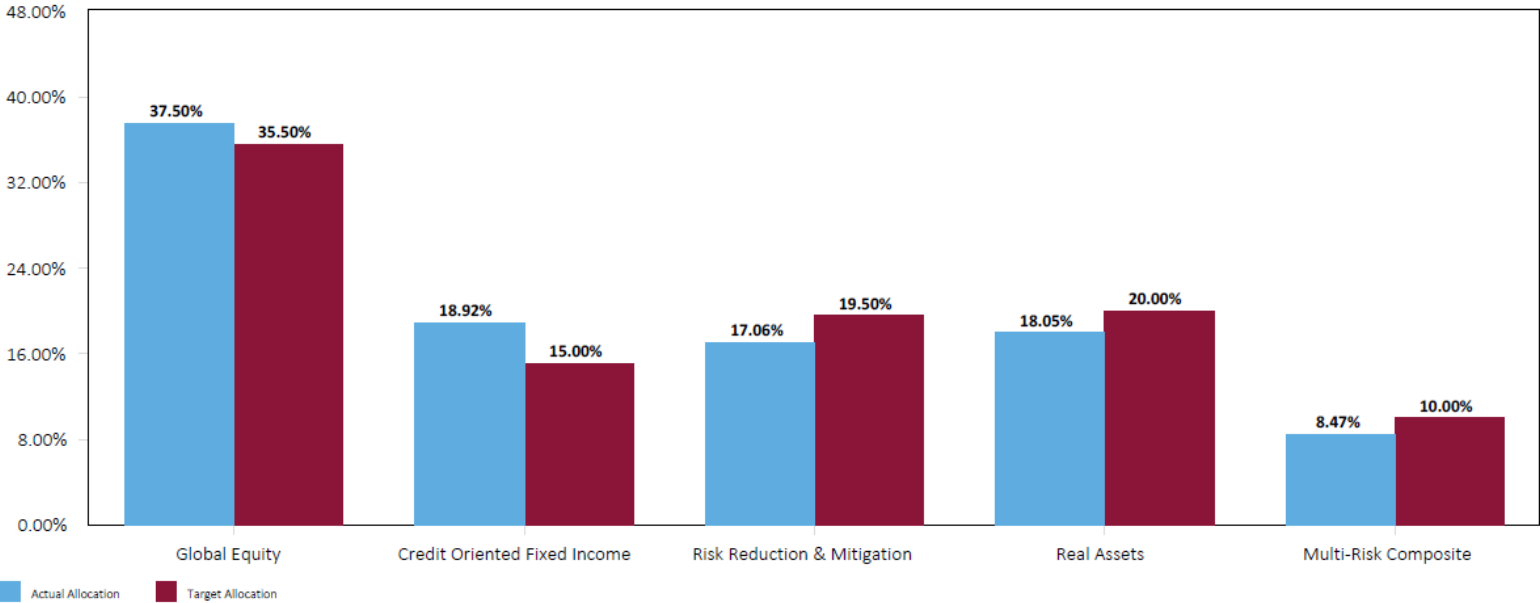
Scorecard: Market Performance

PERA Investment Goal	Measurement	Total Fund Results	Benchmark Return	Excess Return	Scorecard
Produce returns that meet or exceed Board approved Total Fund benchmarks:	Policy Portfolio:				
	•FYTD	-0.70%	-0.01%	-0.69%	Below
	•1 Year	-8.36%	-14.17%	5.81%	Meets
	•3 years	4.51%	1.18%	3.33%	Meets
	•5 Years	5.00%	3.04%	1.96%	Meets
	•7 years	6.55%	5.24%	1.31%	Meets
	•10 years	6.62%	5.67%	0.95%	Meets
	•20 years	6.65%	6.54%	0.11%	Meets
	•30 years	7.61%	6.88%	0.73%	Meets
	•ITD	8.56%	8.13%	0.43%	Meets
Meet or exceed the Policy Portfolio over the long-term	Peer Rankings				
	Fund Sharpe	Fund Ranking	No. of Funds		
	•1 Year	-1.13	67	59	Below
	•3 years	0.45	26	57	Meets
	•5 Years	0.50	25	57	Meets
	•7 Years	0.77	25	57	Meets
Median risk adjusted peer performance ranking over the long-term (InvestMetrics)	•10 years	0.84	36	54	Meets
	ITD Reference Portfolio Benchmark Return: 58% MSCI ACWIIMI (\$n), 42% Bloomberg Barclays U.S. Aggregate 12/31/08 - Present, 62% MSCI ACWIIMI (\$n), 38% Bloomberg Barclays U.S. Aggregate from 05/31/94 - 12/31/08, 62% Russell 3000 Index, 38% Bloomberg Barclays U.S. Aggregate from Inception - 05/31/94.				

Total Fund

Total Fund Asset Allocation

December 31, 2022

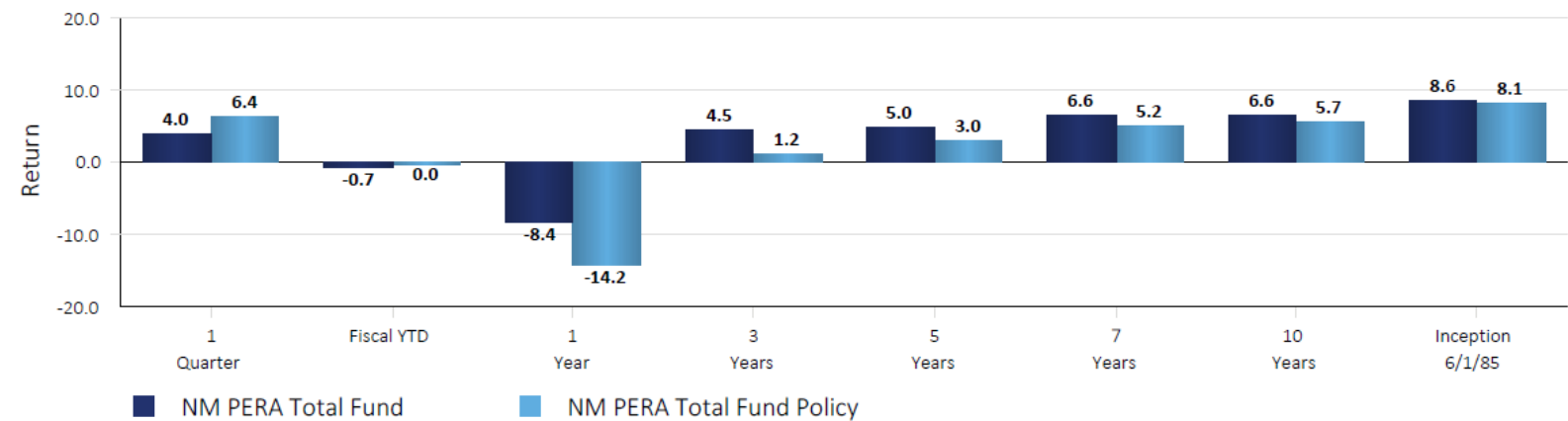


December 31, 2022			
	Market Value \$	Allocation (%)	Target (%)
Global Equity	6,069,195,632	37.50	35.50
Credit Oriented Fixed Income	3,062,175,227	18.92	15.00
Risk Reduction & Mitigation	2,761,045,148	17.06	19.50
Real Assets	2,921,193,295	18.05	20.00
Multi-Risk Composite	1,371,033,202	8.47	10.00
Total Fund	16,184,642,503	100.00	100.00

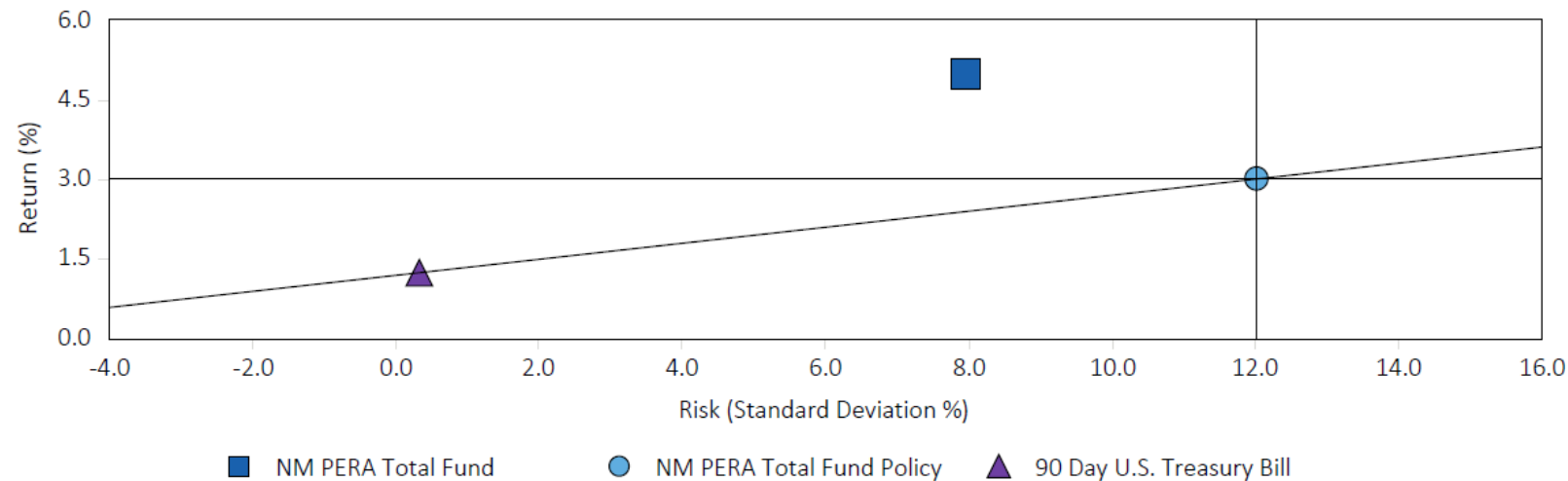
STO Balance as of 12/31/22 is \$24,402,091; Total Market Value with STO is \$16,209,044,594

Total Fund Performance Summary as of December 31, 2022

Comparative Performance



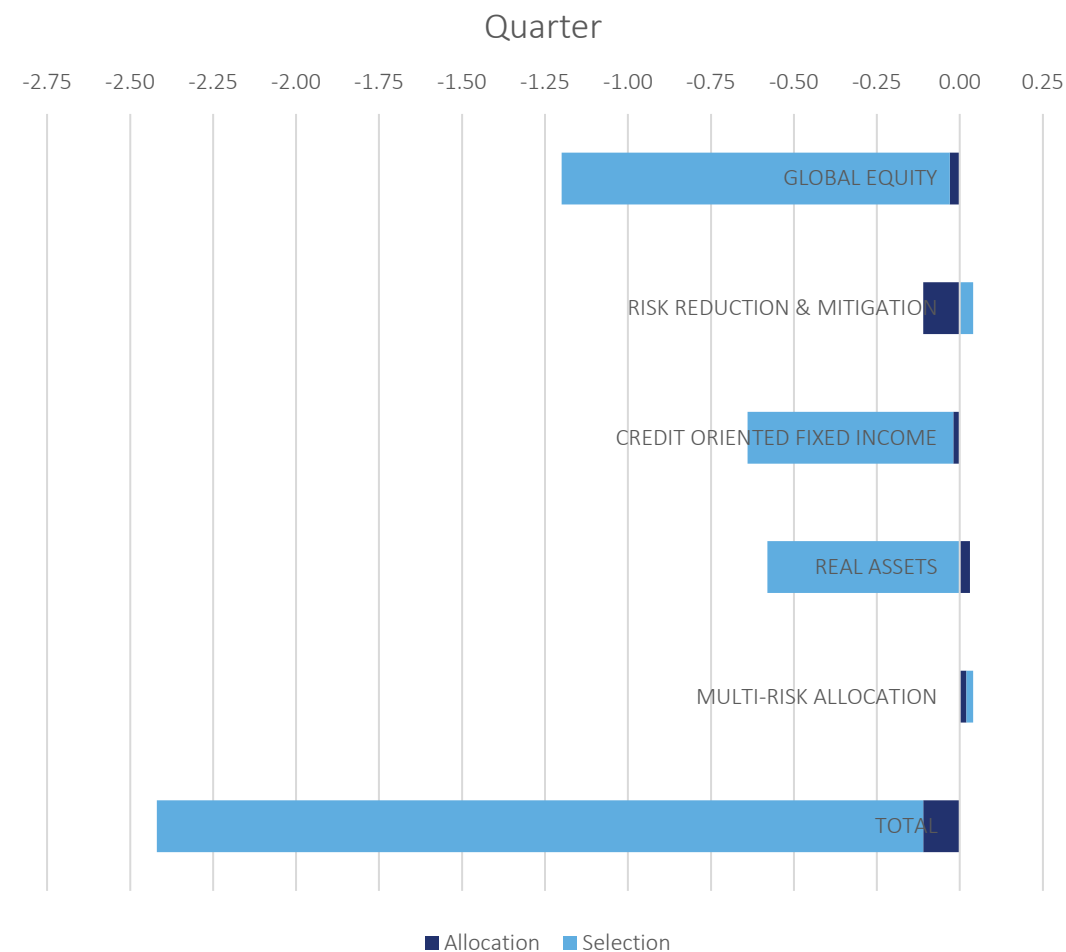
Risk vs. Return - 5 Years



Total Fund Composites

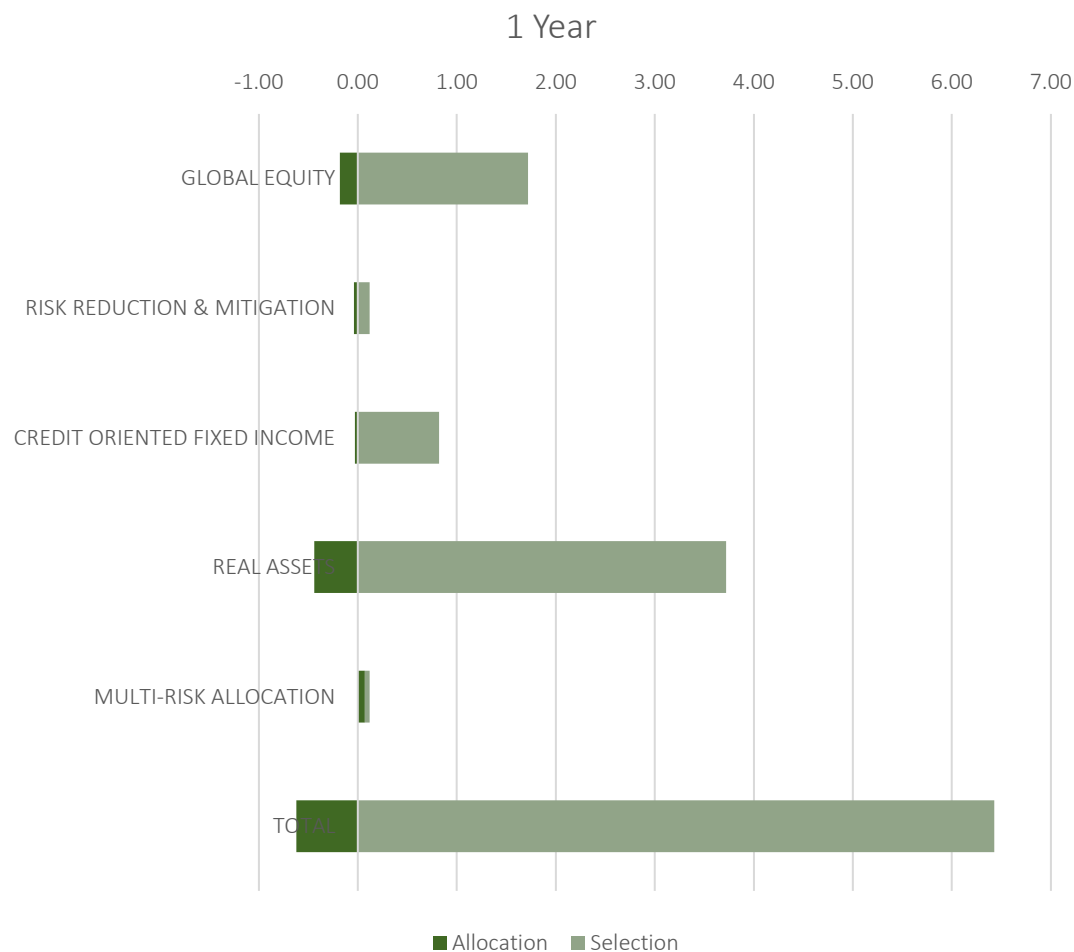
COMPOSITE/MANAGER	Quarter	FYTD	CYTD	1 Year	3 Years	5 Years	7 Years	ITD	Inception Date	Market Value	% of Total
NEW MEXICO PERA TOTAL FUND	3.99	-0.70	-8.36	-8.36	4.51	5.00	6.55	8.56	6/1/1985	\$ 16,184,642,503	100.00
Total Policy Benchmark	6.41	-0.01	-14.17	-14.17	1.18	3.04	5.24	8.13			
Excess Return	-2.42	-0.69	5.81	5.81	3.33	1.96	1.31	0.43			
7.25 Annual (7.75 before 7/16)	1.77	3.56	7.25	7.25	7.25	7.25	7.29	7.66			
Excess Return	2.23	-4.26	-15.61	-15.61	-2.74	-2.25	-0.74	0.90			
GLOBAL EQUITY	6.21	-0.71	-12.37	-12.37	7.95	7.71	10.06	9.11	4/1/2013	\$ 6,069,195,632	37.50
80.28% MSCI ACWI IMI (\$N)/19.72% MSCI ACWI Min Vol	9.58	2.46	-16.82	-16.82	3.47	5.07	8.13	8.20			
Excess Return	-3.37	-3.17	4.44	4.44	4.48	2.64	1.93	0.91			
CREDIT ORIENTED FIXED INCOME	1.84	0.03	-6.82	-6.82	2.75	3.16	4.53	4.05	4/1/2013	\$ 3,062,175,227	18.92
80% BBG Global HY Hdg/20% JPM EMD Blend	6.77	4.62	-11.77	-11.77	-2.09	0.40	3.27	3.01			
Excess Return	-4.93	-4.59	4.94	4.94	4.85	2.76	1.26	1.04			
RISK REDUCTION & MITIGATION	1.64	-3.03	-12.02	-12.02	-2.10	0.46	1.40	1.45	4/1/2013	\$ 2,761,045,148	17.06
87.18% Bloomberg US Agg/12.82% Bloomberg Global Agg Hdg	1.76	-2.89	-12.78	-12.78	-2.69	0.07	0.93	1.15			
Excess Return	-0.12	-0.14	0.76	0.76	0.60	0.39	0.47	0.30			
REAL ASSETS	3.76	3.44	10.70	10.70	8.72	7.17	6.90	6.13	4/1/2013	\$ 2,921,193,295	18.05
10% Alerian MLP/15%US TIPS/20%DJ Global Infra/20% Commodity	5.82	-1.51	-6.98	-6.98	4.34	4.36	5.15	4.84			
Excess Return VS Real Assets BM	-2.05	4.95	17.68	17.68	4.38	2.82	1.75	1.29			
MULTI-RISK ALLOCATION	4.93	-6.87	-25.55	-25.55	-3.57			0.85	5/1/2019	\$ 1,371,033,202	8.47
Wilshire Risk Parity 15% Target Volatility Index	4.65	-7.65	-26.06	-26.06	-3.73			1.05			
Excess Return	0.28	0.78	0.51	0.51	0.15			-0.20			

Total Fund Attribution – Quarter



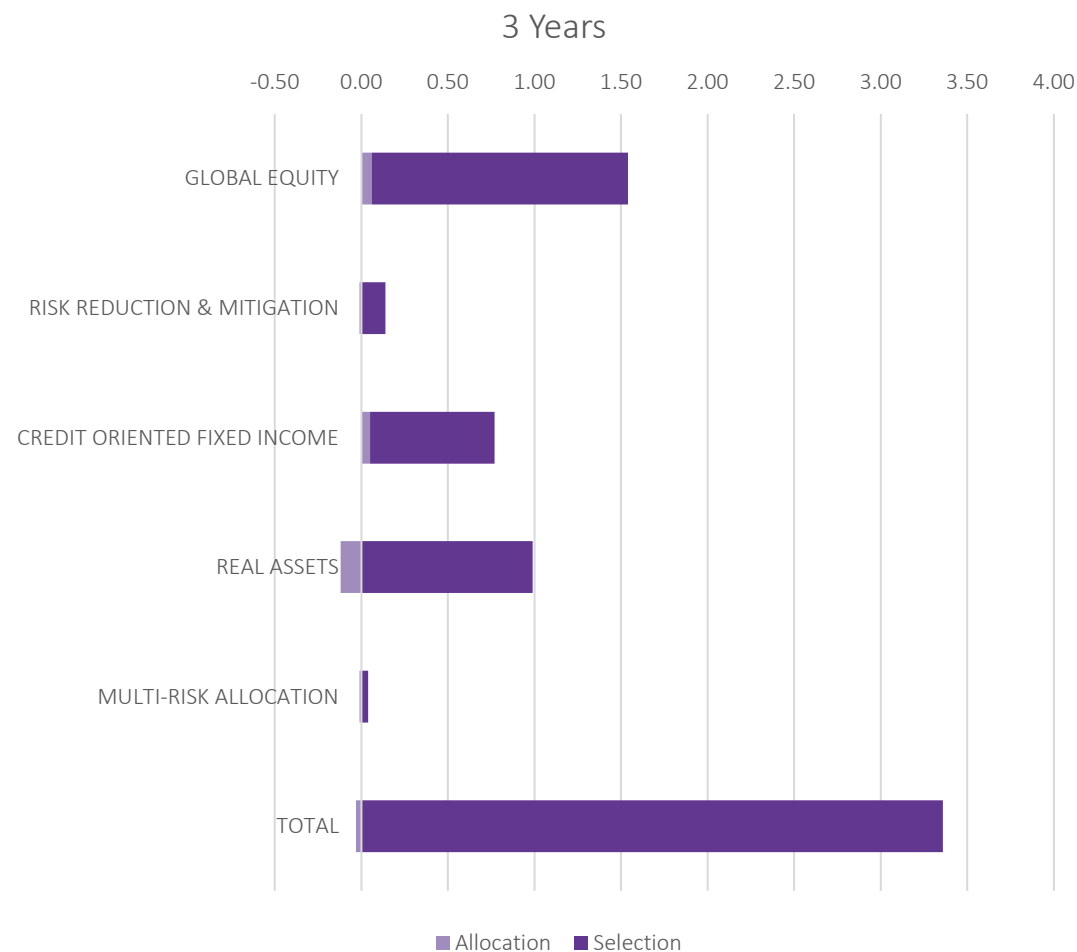
Quarter - 12/31/2022	NM PERA		Policy		Net Management Effects		
	Weight	Return	Weight	Return	Allocation	Selection	Total
COMPOSITE							
GLOBAL EQUITY	35.25	6.22	35.50	9.58	-0.03	-1.17	-1.20
Global Public Stock	15.96	10.37	19.50	9.84	-0.17	0.08	-0.10
Global Low Volatility	5.24	8.53	7.00	8.48	-0.04	0.00	-0.03
Private Equity	14.05	1.08	9.00	9.84	0.18	-1.25	-1.06
RISK REDUCTION & MITIGATION	19.50	1.64	19.50	1.73	-0.11	0.04	-0.07
Domestic Core Fixed Income	11.19	1.89	12.00	1.87	0.03	0.00	0.03
Bonds Plus	5.15	1.72	5.00	1.87	-0.02	-0.01	-0.03
Global Core Fixed Income	2.05	4.71	2.50	0.99	-0.02	0.04	0.02
Cash	1.10	-2.71	0.00	0.00	-0.09	0.00	-0.09
CREDIT ORIENTED FIXED INCOME	14.91	1.84	15.00	6.77	-0.02	-0.62	-0.65
Liquid Credit	4.55	8.41	2.00	6.38	0.11	0.05	0.16
Emerging Market Debt	1.28	0.12	3.00	8.29	-0.12	-0.10	-0.22
Illiquid Credit	2.32	2.67	6.00	6.38	0.00	-0.09	-0.09
Alt Liquid Credit	6.77	-0.66	4.00	6.38	-0.01	-0.49	-0.50
REAL ASSETS	21.80	3.76	20.00	5.82	0.03	-0.58	-0.54
Liquid Real Estate	0.56	2.60	2.00	5.81	0.02	-0.01	0.00
Illiquid Real Estate	9.21	2.85	5.00	5.81	-0.02	-0.29	-0.31
Liquid Real Assets	4.26	3.19	5.00	5.40	0.03	-0.16	-0.12
Illiquid Real Assets	7.76	4.50	8.00	6.01	0.00	-0.12	-0.12
Market Neutral HF	0.00	0.66	0.00	0.00	0.00	0.00	0.00
MULTI-RISK ALLOCATION	8.54	4.93	10.00	4.65	0.02	0.02	0.04
TOTAL	100.00	3.99	100.00	6.41	-0.11	-2.31	-2.42

Total Fund Attribution – 1 Year



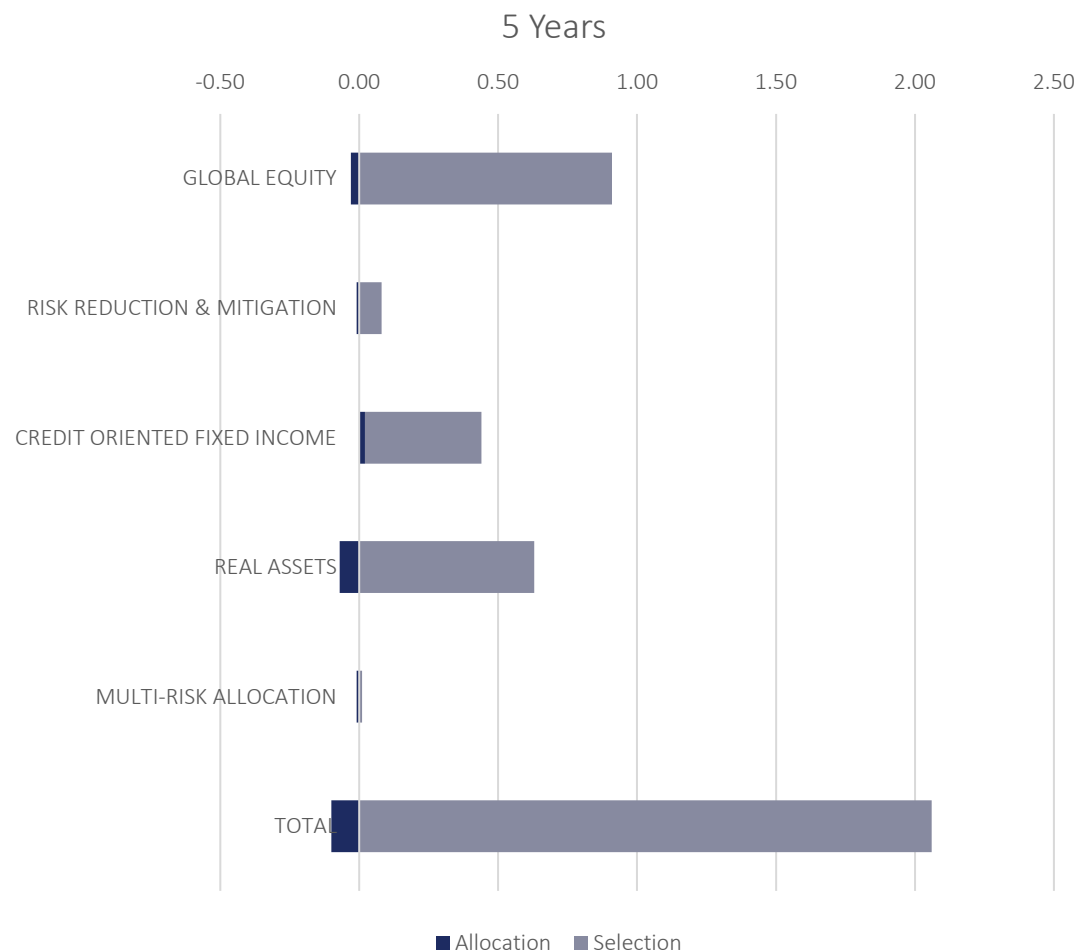
1 year -12/31/2022	NM PERA		Policy		Net Management Effects		
	Weight	Return	Weight	Return	Allocation	Selection	Total
COMPOSITE							
GLOBAL EQUITY	35.12	-12.37	35.50	-16.82	-0.18	1.72	1.53
Global Public Stock	16.48	-20.41	19.50	-18.40	0.01	-0.38	-0.37
Global Low Volatility	5.16	-9.98	7.00	-10.31	-0.08	0.02	-0.06
Private Equity	13.48	-1.43	9.00	-18.40	-0.12	2.08	1.97
RISK REDUCTION & MITIGATION	19.44	-12.02	19.50	-12.78	-0.04	0.12	0.08
Domestic Core Fixed Income	11.27	-13.76	12.00	-13.01	-0.04	-0.09	-0.12
Bonds Plus	5.09	-9.67	5.00	-13.01	-0.01	0.17	0.16
Global Core Fixed Income	2.35	-7.81	2.50	-11.22	-0.02	0.04	0.02
Cash	0.75	-9.45	0.00	0.00	0.01	0.00	0.01
CREDIT ORIENTED FIXED INCOME	14.89	-6.83	15.00	-11.77	-0.03	0.82	0.80
Liquid Credit	3.39	-9.62	2.00	-11.05	0.14	0.02	0.16
Emerging Market Debt	2.23	-23.56	3.00	-14.75	-0.11	-0.15	-0.25
Illiquid Credit	2.29	9.34	6.00	-11.05	-0.12	0.43	0.31
Alt Liquid Credit	6.97	-4.09	4.00	-11.05	0.06	0.52	0.58
REAL ASSETS	21.30	10.70	20.00	-6.98	-0.44	3.72	3.28
Liquid Real Estate	0.92	-21.97	2.00	-26.13	0.16	0.05	0.20
Illiquid Real Estate	8.13	20.70	5.00	-26.13	-0.39	3.35	2.96
Liquid Real Assets	5.49	-3.77	5.00	4.09	0.21	-0.45	-0.24
Illiquid Real Assets	6.76	17.56	8.00	4.98	-0.42	0.77	0.35
Market Neutral HF	0.01	-24.32	0.00	0.00	0.00	0.00	0.00
MULTI-RISK ALLOCATION	9.25	-25.54	10.00	-26.06	0.07	0.05	0.12
TOTAL	100.0	-8.36	100.0	-14.17	-0.62	6.43	5.81

Total Fund Attribution – 3 Years



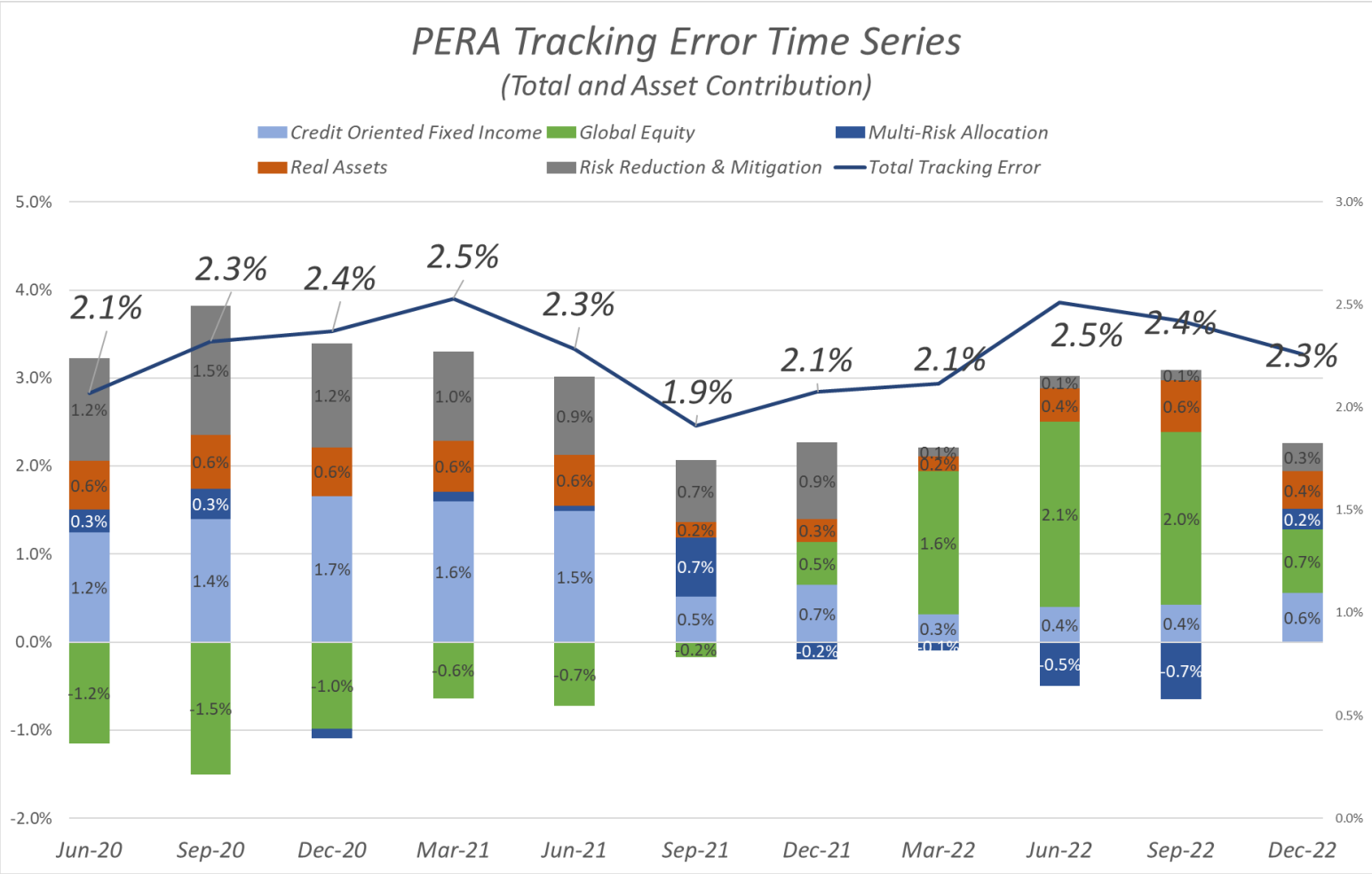
3 Years - 12/31/2022	NM PERA		Policy		Net Management Effects		
	Weight	Return	Weight	Return	Allocation	Selection	Total
COMPOSITE							
GLOBAL EQUITY	36.11	7.95	35.68	3.47	0.06	1.48	1.54
Global Public Stock	19.02	1.69	19.68	3.89	0.05	-0.41	-0.35
Global Low Volatility	6.38	1.87	7.00	1.62	-0.04	0.02	-0.03
Private Equity	10.70	23.11	9.00	3.89	-0.03	1.87	1.84
RISK REDUCTION & MITIGATION	19.15	-2.10	19.55	-2.69	-0.01	0.14	0.13
Domestic Core Fixed Income	11.48	-3.35	12.88	-2.71	0.27	-0.12	0.14
Bonds Plus	3.77	4.29	4.17	-2.71	-0.09	0.24	0.15
Global Core Fixed Income	2.51	-1.38	2.50	-2.59	-0.02	0.02	0.00
Cash	1.07	-1.26	0.00	0.00	-0.10	0.00	-0.10
CREDIT ORIENTED FIXED INCOME	14.72	2.76	15.00	-2.09	0.05	0.72	0.77
Liquid Credit	3.34	-1.40	2.44	-1.21	0.04	0.04	0.08
Emerging Market Debt	2.37	-6.34	3.00	-5.66	-0.01	0.01	0.01
Illiquid Credit	3.64	7.15	6.00	-1.21	0.02	0.16	0.19
Alt Liquid Credit	5.30	0.00	3.56	0.00	-0.06	0.52	0.46
REAL ASSETS	20.59	8.72	20.00	4.34	-0.12	0.99	0.86
Liquid Real Estate	1.57	0.59	2.00	-2.45	0.06	0.04	0.11
Illiquid Real Estate	6.45	11.58	5.00	-2.45	-0.09	1.04	0.96
Liquid Real Assets	6.81	4.11	5.00	7.53	0.05	-0.24	-0.18
Illiquid Real Assets	5.76	9.73	8.00	7.71	-0.14	0.16	0.02
Market Neutral HF	0.01	-1.03	0.00	0.00	0.00	0.00	0.00
MULTI-RISK ALLOCATION	9.44	-3.28	9.77	-3.73	-0.01	0.04	0.03
TOTAL	100.00	4.51	100.00	1.18	-0.03	3.36	3.33

Total Fund Attribution – 5 Years



5 Years - 12/31/2022	NM PERA		Policy		Net Management Effects		
	Weight	Return	Weight	Return	Allocation	Selection	Total
COMPOSITE							
GLOBAL EQUITY	38.76	7.71	38.48	5.07	-0.03	0.91	0.88
Global Public Stock	23.48	3.37	22.63	4.97	0.02	-0.33	-0.31
Global Low Volatility	6.24	4.89	6.07	4.57	-0.01	0.02	0.01
Private Equity	8.92	19.37	8.94	6.07	-0.06	1.22	1.16
RISK REDUCTION & MITIGATION	19.94	0.46	20.26	0.07	-0.01	0.08	0.07
Domestic Core Fixed Income	13.85	-0.34	15.16	0.02	0.16	-0.07	0.09
Bonds Plus	2.26	0.00	2.50	0.00	-0.05	0.15	0.09
Global Core Fixed Income	2.62	0.67	2.52	0.36	-0.01	0.01	0.01
Cash	1.01	2.01	0.08	0.00	-0.07	0.00	-0.07
CREDIT ORIENTED FIXED INCOME	14.81	3.17	15.00	0.40	0.02	0.42	0.44
Liquid Credit	4.13	0.53	2.67	0.95	0.01	0.02	0.02
Emerging Market Debt	2.55	-3.27	3.00	-1.86	-0.02	-0.02	-0.04
Illiquid Credit	3.74	7.07	6.00	0.95	0.02	0.12	0.14
Alt Liquid Credit	3.18	0.00	2.13	0.00	-0.04	0.31	0.28
REAL ASSETS	20.41	7.17	20.00	4.36	-0.07	0.63	0.57
Liquid Real Estate	2.21	3.81	2.00	1.96	0.05	0.02	0.07
Illiquid Real Estate	5.34	11.93	5.00	1.96	-0.07	0.65	0.58
Liquid Real Assets	7.56	3.24	6.20	5.35	0.03	-0.16	-0.13
Illiquid Real Assets	5.28	7.24	6.80	5.12	-0.08	0.13	0.05
Market Neutral HF	0.02	1.63	0.00	0.00	0.00	0.00	0.00
MULTI-RISK ALLOCATION	6.08		6.26		-0.01	0.01	0.01
TOTAL	100.0	5.00	100.0	3.04	-0.10	2.06	1.96

Forecasted Risk Snapshot

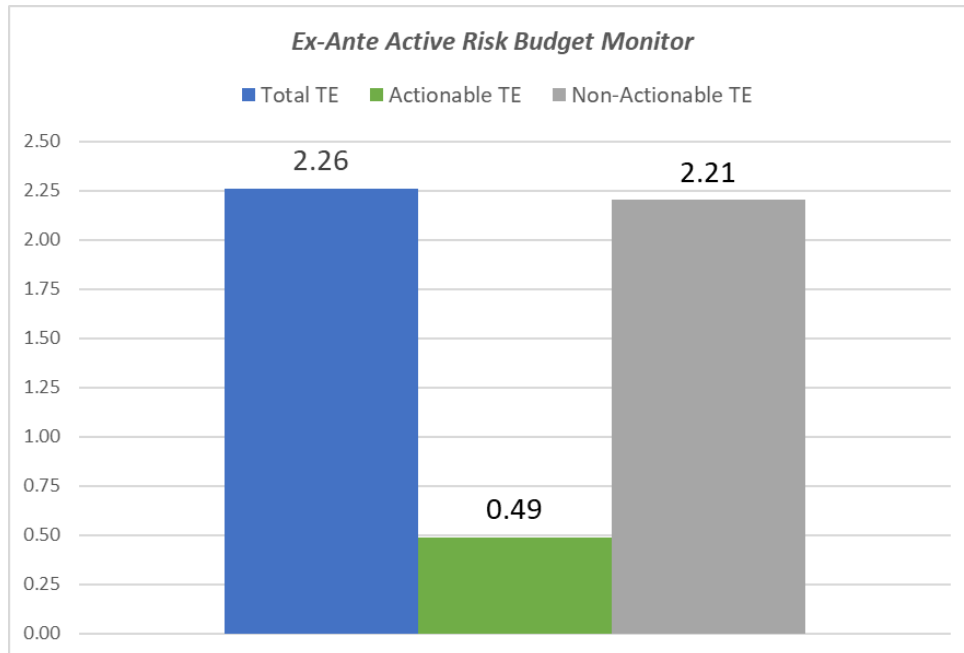


- ***This chart tracks the time series of total plan ex-ante tracking error (line) and contribution to tracking error by composite (bars)***
- *Ex-Ante risk measurement is forward looking and is based on the portfolio holdings on the date of analysis*
- *This tracking error analysis over time should help provide the board additional context for the range of TE over time and provide perspective for any potential reaction to a higher or lower level of TE relative to history*

Tracking Error and Contributions are calculated using factor exposures, asset class allocations, and utilizes Wilshire’s factor risk covariance matrix

PERA Ex-Ante Risk Dashboard Snapshot

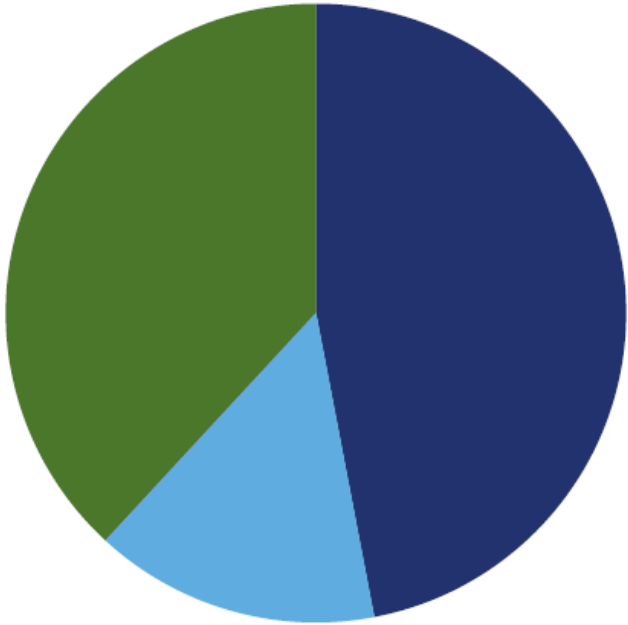
Composite	Benchmark	Weight	Tracking Error vs Composite Benchmark	Total Plan Tracking Error Contribution	Total Plan Tracking Error Contribution(%)	Total Portfolio Absolute Risk Contribution(%)
Credit Oriented FI	TOT CREDIT POLICY	18.87%	3.59	0.56	24.65%	1.75%
Global Equity	TOT GLB EQ POLICY	37.44%	5.50	0.72	31.83%	72.75%
Multi Risk	Risk Parity	8.46%	0.00	0.23	10.00%	4.35%
Real Assets	TOT REAL ASTS POLICY	18.05%	10.73	0.43	19.19%	16.18%
Risk Reduction	TOT RISKMIT POLICY	17.18%	0.65	0.32	14.33%	4.96%
Total		100.00%	2.26	2.26	100.00%	100.00%



- **Ex-Ante Tracking Error (TE) Target is 2.5% (Range 2-3%)**
- **Actionable Ex-Ante TE Target is 1.25%**
 - Current measured actionable is well below that (0.49%)
 - Over the last 4 years the realized actionable risk is also well below the target (0.97%)
- Actionable Tracking Error is defined as the portion of tracking error in the plan/composite attributable to the public market segments of the plan
- Non-Actionable Tracking Error is defined as the remaining portion of overall tracking error in the plan/composite
 - This is the inherent tracking error risk in the plan vs. the policy. Largely, this portion comes from the overall nature of private markets, the difficulty in rebalancing these assets, and their benchmarking to public market assets

Global Equity

Global Equity Composite

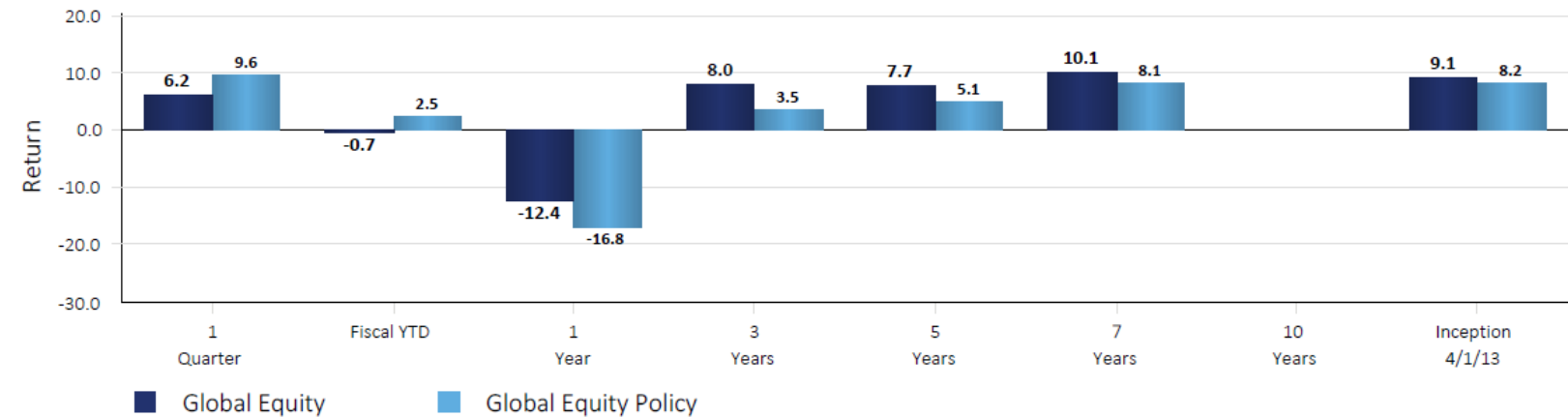


Dec-2022 : 6,069,195,632

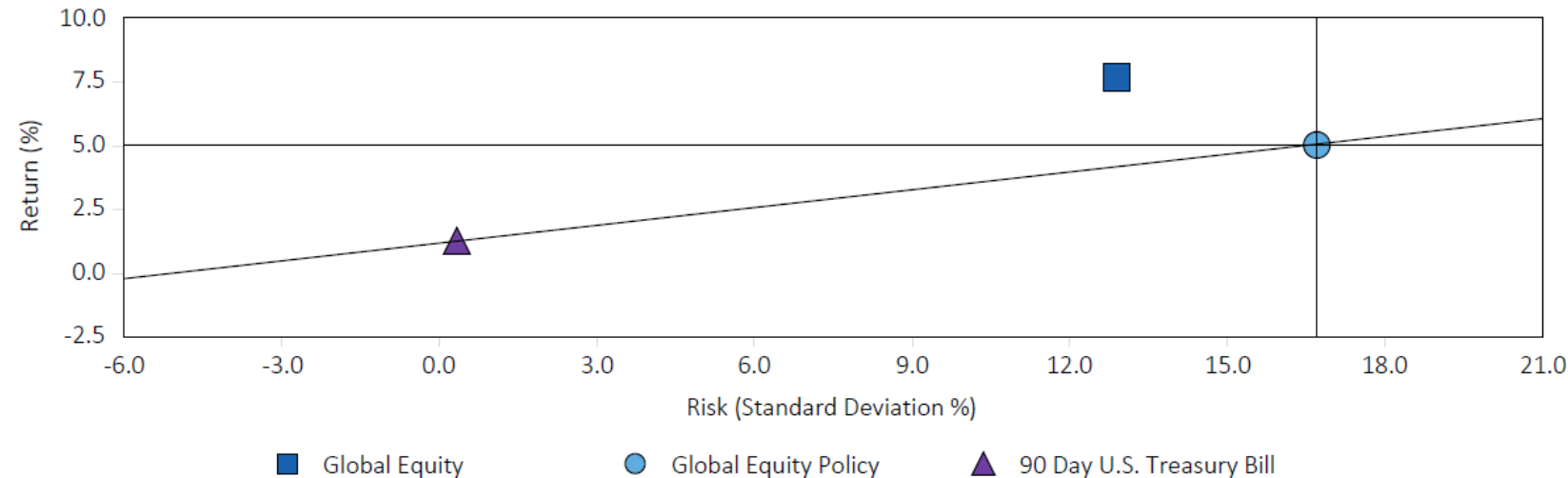
	Market Value	Allocation
	\$	(%)
Global Public Stock	2,852,347,577	47.0
Global Low Volatility Equity	902,376,311	14.9
Hedged Equity Comp	635,739	0.0
Private Equity Comp	2,313,836,004	38.1

Global Equity Composite Performance Summary

Comparative Performance



Risk vs. Return - 5 Years



Global Equity Performance – Composites

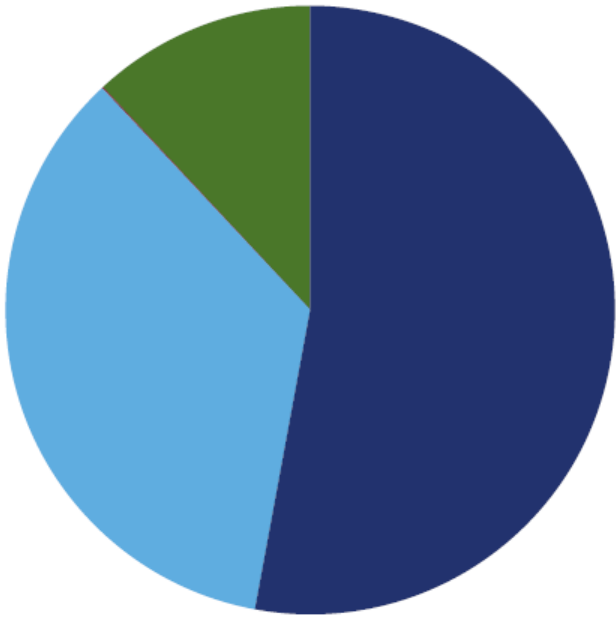
COMPOSITE/MANAGER	Quarter	FYTD	CYTD	1 Year	3 Years	5 Years	7 Years	ITD	Inception Date	Market Value	% of Total
GLOBAL EQUITY	6.21	-0.71	-12.37	-12.37	7.95	7.71	10.06	9.11	4/1/2013	\$ 6,069,195,632	37.50
80.28% MSCI ACWI IMI (\$N)/19.72% MSCI ACWI Min Vol	9.58	2.46	-16.82	-16.82	3.47	5.07	8.13	8.20			
Excess Return	-3.37	-3.17	4.44	4.44	4.48	2.64	1.93	0.91			
Global Public Stock	10.37	2.53	-20.41	-20.41	1.69	3.37	7.18	6.90	10/1/2004	\$ 2,852,347,577	17.62
MSCI ACWI IMI (\$N) Index	9.84	2.56	-18.40	-18.40	3.89	4.96	8.00				
Excess Return	0.52	-0.03	-2.00	-2.00	-2.20	-1.59	-0.82				
Global Low Volatility Equity	8.53	1.90	-9.98	-9.98	1.87	4.92		6.93	11/1/2016	\$ 902,376,311	5.58
MSCI ACWI Min Vol (\$N)	8.48	1.93	-10.31	-10.31	1.62	4.57		6.52			
Excess Return VS MSCI ACWI Min Vol (\$N)	0.05	-0.03	0.33	0.33	0.25	0.35		0.41			
Hedged Equity	-2.10	-8.52	-4.84	-4.84	-5.53	0.12	1.09	2.09	4/1/2013	\$ 635,739	0.00
MSCI ACWI Min Vol (\$N)	8.48	1.93	-10.31	-10.31	1.62	4.57	6.80	6.75			
Excess Return VS MSCI ACWI Min Vol (\$N)	-10.57	-10.45	5.47	5.47	-7.16	-4.45	-5.70	-4.65			
Private Equity	1.08	-5.08	-1.43	-1.43	23.11	19.40	17.72	8.98	12/1/2006	\$ 2,313,836,004	14.30
MSCI ACWI IMI (\$N) Index	9.84	2.56	-18.40	-18.40	3.89	6.07	9.83				
Excess Return	-8.76	-7.63	16.98	16.98	19.21	13.33	7.89				

Global Equity Performance – Managers

COMPOSITE/MANAGER	Quarter	FYTD	CYTD	1 Year	3 Years	5 Years	7 Years	ITD	Inception Date	Market Value	% of Total
SSGA ACWI IMI	10.05	2.84	-17.32	-17.32	4.43	5.46		8.27	10/1/2016	\$ 606,463,622	3.75
MSCI ACWI IMI (\$N) Index	9.84	2.56	-18.40	-18.40	3.89	4.96		7.80			
Excess Return VS MSCI ACWI IMI (\$N) Index	0.21	0.28	1.09	1.09	0.54	0.50		0.47			
SSGA R1000 Index	7.34	2.39	-19.01	-19.01				-16.11	11/1/2021	\$ 936,014,299	5.78
R1000 Benchmark	7.24	2.30	-19.13	-19.13				-16.20			
Excess Return VS R1000 Benchmark	0.10	0.09	0.11	0.11				0.09			
Kayne Anderson SCC	8.22	5.48	-11.19	-11.19	8.06			8.43	9/1/2018	\$ 242,741,786	1.50
Russell 2000 Index	6.23	3.91	-20.44	-20.44	3.10			1.60			
Excess Return VS Russell 2000 Index	1.99	1.57	9.25	9.25	4.96			6.83			
Acadian Intl Equity	14.85	5.28	-18.48	-18.48	2.80			2.27	5/1/2018	\$ 256,301,654	1.58
MSCI EAFE (\$N)	17.34	6.36	-14.45	-14.45	0.87			1.50			
Excess Return VS MSCI EAFE (\$N)	-2.49	-1.08	-4.03	-4.03	1.94			0.78			
Alliance Bernstein	11.90	2.42						-5.17	6/1/2022	\$ 244,007,491	1.51
MSCI ACWI IMI (\$N) Index	9.84	2.56						-6.29			
Excess Return VS MSCI ACWI IMI (\$N) Index	2.06	-0.14						1.13			
MFS	11.85	3.62	-24.76	-24.76	-1.23	1.85	4.75	7.23	4/1/2010	\$ 199,798,052	1.23
MSCI EAFE (\$N)	17.34	6.36	-14.45	-14.45	0.87	1.54	4.53	4.43			
Excess Return VS MSCI EAFE (\$N)	-5.49	-2.74	-10.31	-10.31	-2.10	0.31	0.22	2.80			
AXIOM INVESTORS	6.44	-8.30	-30.53	-30.53	-4.97			1.95	1/1/2019	\$ 244,455,635	1.51
MSCI Emg Mkts (\$N)	9.70	-2.99	-20.09	-20.09	-2.69			2.20			
Excess Return VS MSCI Emg Mkts (\$N)	-3.26	-5.30	-10.44	-10.44	-2.28			-0.25			
Parametric Gbl Equity Overlay	10.19	2.27	-17.04	-17.04	-14.44	-5.67		-0.40	7/1/2016	\$ 116,963,641	0.72
MSCI ACWI IMI (\$N) Index	9.84	2.56	-18.40	-18.40	-15.57	-7.32		-1.50			
Excess Return VS MSCI ACWI IMI (\$N) Index	0.35	-0.28	1.36	1.36	1.12	1.65		1.11			
Portable Alpha	-2.01	-7.72	-11.61	-11.61	-0.18	4.12	6.44	5.39	10/1/2007	\$ 2,681,659	0.02
S&P 500 - Total Return + 1%	7.87	2.92	-17.11	-17.11	8.68	10.44	12.49	9.43			
Excess Return VS S&P 500 - Total Return + 1%	-9.88	-10.64	5.50	5.50	-8.87	-6.32	-6.06	-4.04			

Credit Oriented Fixed Income

Credit Oriented Fixed Income Composite

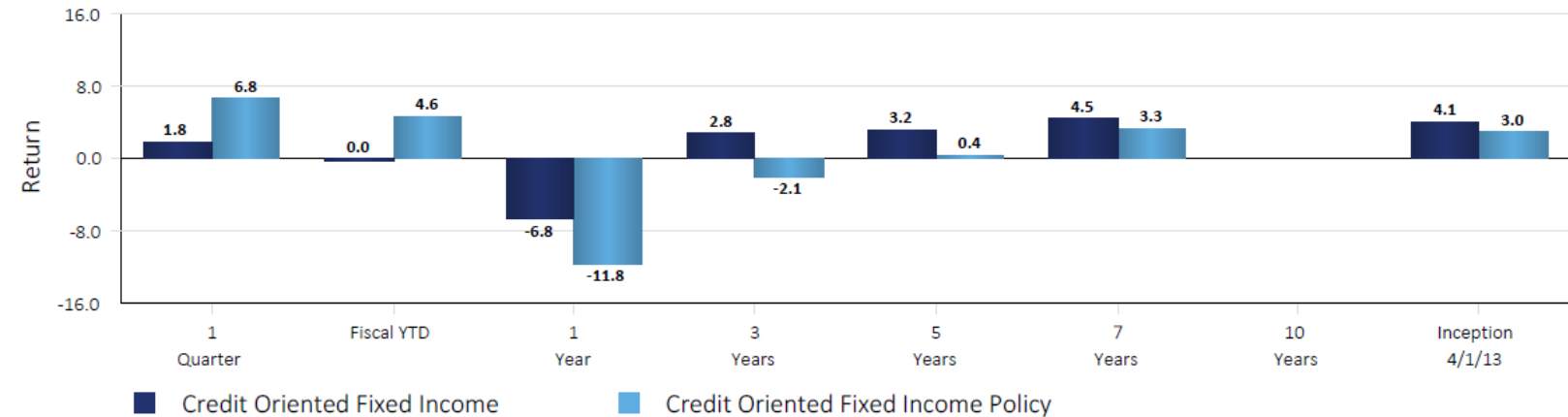


Dec-2022 : 3,062,175,227

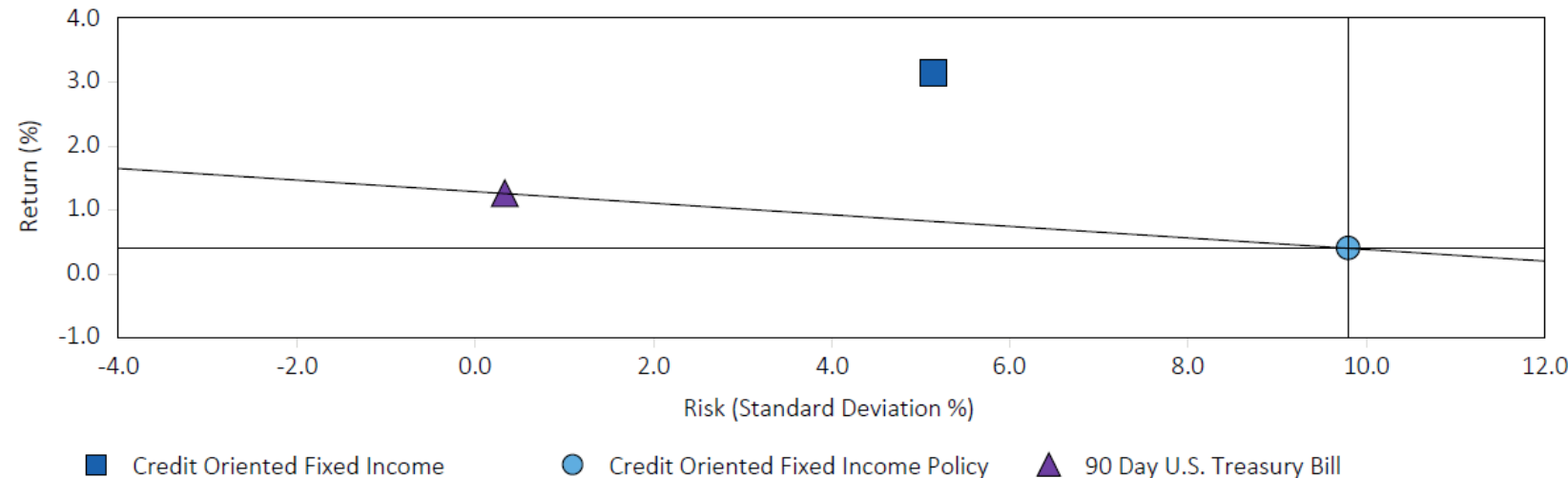
	Market Value \$	Allocation (%)
Liquid Credit	1,620,057,151	52.9
Alternative Liquid Credit	1,075,054,643	35.1
Emerging Markets Debt Composite	2,030,852	0.1
Illiquid Credit Comp	365,032,582	11.9

Credit Oriented Fixed Income Composite Performance Summary

Comparative Performance



Risk vs. Return - 5 Years



Credit Oriented Fixed Income Performance – Composites

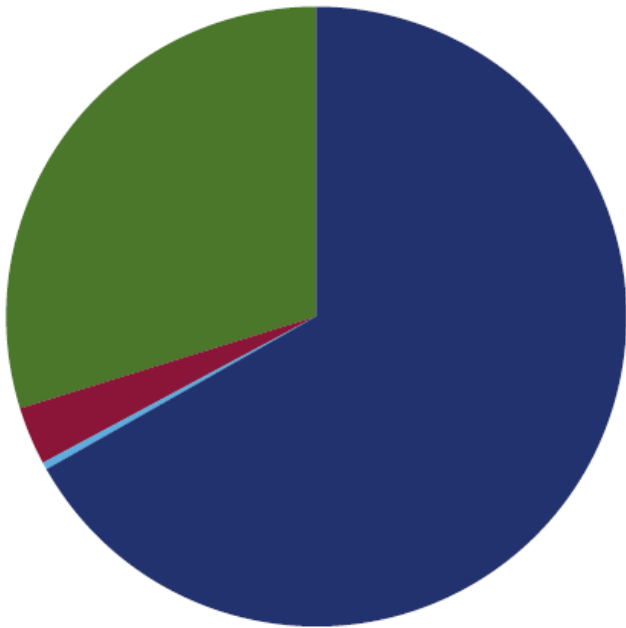
COMPOSITE/MANAGER	Quarter	FYTD	CYTD	1 Year	3 Years	5 Years	7 Years	ITD	Inception Date	Market Value	% of Total
CREDIT ORIENTED FIXED INCOME	1.84	0.03	-6.82	-6.82	2.75	3.16	4.53	4.05	4/1/2013	\$ 3,062,175,227	18.92
80% BBG Global HY Hdg/20% JPM EMD Blend	6.77	4.62	-11.77	-11.77	-2.09	0.40	3.27	3.01			
Excess Return VS Credit Oriented FI BM	-4.93	-4.59	4.94	4.94	4.85	2.76	1.26	1.04			
Liquid Credit	8.41	5.21	-9.61	-9.61	-1.40	0.53	2.74	1.59	4/1/2013	\$ 1,620,057,151	10.01
Bloomberg Global High Yield (USDH)	6.38	4.93	-11.05	-11.05	-1.20	1.23	4.19	3.63			
Excess Return VS Bloomberg Global High Yield (USDH)	2.03	0.28	1.44	1.44	-0.19	-0.71	-1.45	-2.04			
Alternative Liquid Credit	-0.66	-1.95	-4.09	-4.09				13.66	5/1/2020	\$ 1,075,054,643	6.64
Bloomberg Global High Yield (USDH)	6.38	4.93	-11.05	-11.05				2.96			
Excess Return VS Bloomberg Global High Yield (USDH)	-7.03	-6.88	6.96	6.96				10.70			
Emerging Markets Debt	0.12	-5.25	-23.56	-23.56	-6.34	-3.27	-0.23	-0.59	8/1/2015	\$ 2,030,852	0.01
JPM EMD Blend (\$0v50/LM50)~	8.29	3.27	-14.75	-14.75	-5.66	-1.86	1.77	1.02			
Excess Return VS JPM EMD Blend (\$0v50/LM50)~	-8.17	-8.52	-8.81	-8.81	-0.68	-1.41	-2.00	-1.62			
Illiquid Credit	2.67	5.32	9.34	9.34	7.15	7.07	7.72	7.53	12/1/2006	\$ 365,032,582	2.26
Bloomberg Global High Yield (USDH)	6.38	4.93	-11.05	-11.05	-1.20	0.95	4.09				
Excess Return VS Illiquid Credit BM	-3.71	0.39	20.39	20.39	8.35	6.12	3.63				

Credit Oriented Fixed Income Performance – Managers

COMPOSITE/MANAGER	Quarter	FYTD	CYTD	1 Year	3 Years	5 Years	7 Years	ITD	Inception Date	Market Value	% of Total
PINEBRIDGE HY	7.05	4.66	-12.38	-12.38	-1.53			1.06	10/1/2018	\$ 1,448,182,090	8.95
Bloomberg Global High Yield (USDH)	6.38	4.93	-11.05	-11.05	-1.20			1.36			
Excess Return VS Bloomberg Global High Yield (USDH)	0.68	-0.27	-1.33	-1.33	-0.32			-0.31			
EAGLE POINT	0.00	-12.15	25.82	25.82	18.02	10.08		9.74	11/1/2017	\$ 9,281,171	0.06
Bloomberg Global High Yield (USDH)	6.38	4.93	-11.05	-11.05	-1.20	1.23		1.20			
Excess Return VS Bloomberg Global High Yield (USDH)	-6.38	-17.08	36.87	36.87	19.23	8.85		8.54			
Eagle Point Credit PRT	-7.23	-1.84	-10.51	-10.51				-10.51	1/1/2022	\$ 85,132,382	0.53
Bloomberg Global High Yield (USDH)	6.38	4.93	-11.05	-11.05				-11.05			
Excess Return VS Bloomberg Global High Yield (USDH)	-13.60	-6.77	0.54	0.54				0.54			
Ellington HF	0.56	-2.54	-6.85	-6.85	1.24	2.58		2.79	1/1/2017	\$ 155,696,945	0.96
Bloomberg Global High Yield (USDH)	6.38	4.93	-11.05	-11.05	-1.20	1.23		2.40			
Excess Return VS Bloomberg Global High Yield (USDH)	-5.82	-7.47	4.20	4.20	2.45	1.35		0.40			
Mudrick Stressed CR FKA CVC	-1.60	-1.20	0.27	0.27	8.22	4.29	5.18	4.84	11/1/2015	\$ 162,153,014	1.00
Bloomberg Global High Yield (USDH)	6.38	4.93	-11.05	-11.05	-1.20	1.23	4.19	3.60			
Excess Return VS Bloomberg Global High Yield (USDH)	-7.98	-6.13	11.32	11.32	9.42	3.06	1.00	1.25			
NAPIER PARK CLASS A	2.72	2.66	1.75	1.75				11.04	8/1/2020	\$ 150,175,308	0.93
Bloomberg Global High Yield (USDH)	6.38	4.93	-11.05	-11.05				-1.10			
Excess Return VS Bloomberg Global High Yield (USDH)	-3.65	-2.27	12.80	12.80				12.14			
NAPIER PARK CLASS B	-2.53	-3.14	-11.17	-11.17	-1.49			-1.49	1/1/2020	\$ 200,557,039	1.24
Bloomberg Global High Yield (USDH)	6.38	4.93	-11.05	-11.05	-1.20			-1.20			
Excess Return VS Bloomberg Global High Yield (USDH)	-8.91	-8.07	-0.12	-0.12	-0.29			-0.29			
Wheeler Peak Rotational Credit	-0.01	-8.15	-6.92	-6.92				5.67	4/1/2020	\$ 144,428,384	0.89
Bloomberg Global High Yield (USDH)	6.38	4.93	-11.05	-11.05				4.48			
Excess Return VS Bloomberg Global High Yield (USDH)	-6.39	-13.08	4.13	4.13				1.19			
Parametric Credit Cash Overlay	6.00	5.50	-9.19	-9.19	-1.26			0.38	5/1/2019	\$ 171,879,798	1.06
Bloomberg Global High Yield TR Value Index Hedged	9.95	6.47	-12.36	-12.36	-2.06			-0.22			
Excess Return	-3.95	-0.96	3.17	3.17	0.80			0.60			

Risk Reduction & Mitigation

Risk Reduction & Mitigation Composite

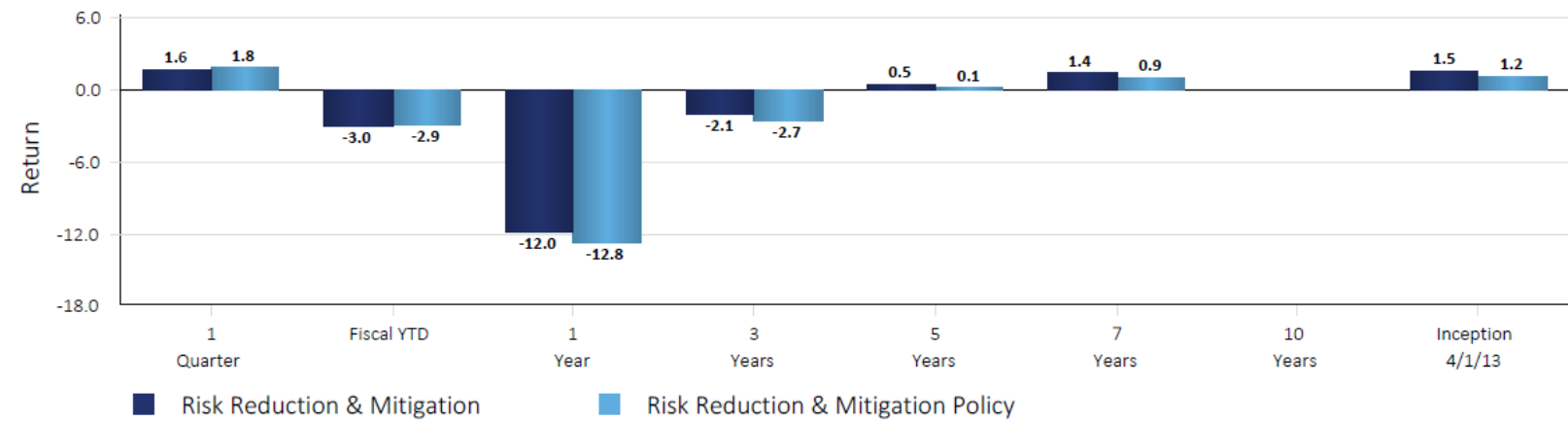


Dec-2022 : 2,761,045,148

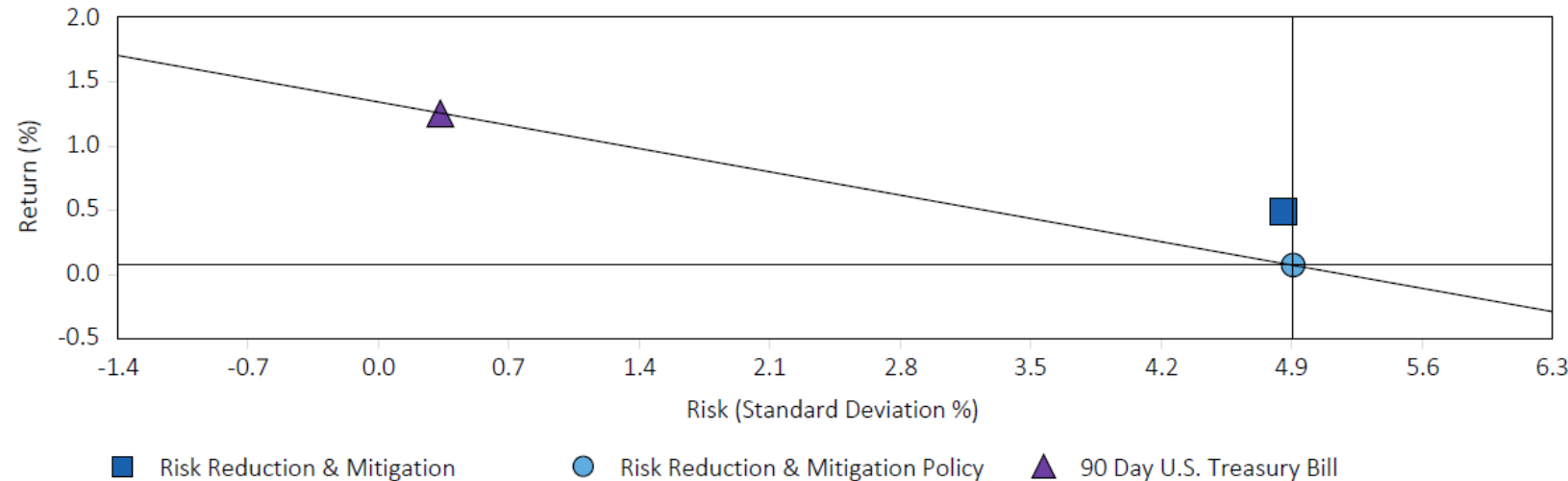
	Market Value \$	Allocation (%)
Domestic Core Fixed Income	1,844,111,249	66.8
Global Core Fixed Income	10,396,775	0.4
Cash Composite	83,893,490	3.0
Bonds Plus Composite	822,643,633	29.8

Risk Reduction & Mitigation Composite Performance Summary

Comparative Performance



Risk vs. Return - 5 Years



Risk Reduction & Mitigation Performance – Composites

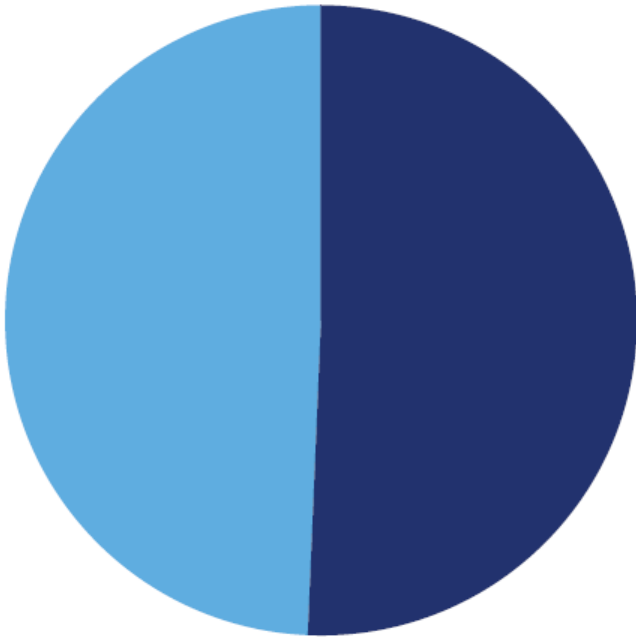
COMPOSITE/MANAGER	Quarter	FYTD	CYTD	1 Year	3 Years	5 Years	7 Years	ITD	Inception Date	Market Value	% of Total
RISK REDUCTION & MITIGATION	1.64	-3.03	-12.02	-12.02	-2.10	0.46	1.40	1.45	4/1/2013	\$ 2,761,045,148	17.06
87.18% Bloomberg US Agg/12.82% Bloomberg Global Agg Hdg	1.76	-2.89	-12.78	-12.78	-2.69	0.07	0.93	1.15			
Excess Return VS Risk Reduction & Mitigation BM	-0.12	-0.14	0.76	0.76	0.60	0.39	0.47	0.30			
Domestic Core Fixed Income	1.33	-3.89	-14.23	-14.23	-2.91	-0.03	0.89	6.21	6/1/1985	\$ 1,844,111,249	11.39
Bloomberg U.S. Aggregate Bond Index	1.87	-2.97	-13.01	-13.01	-2.71	0.02	0.89	5.82			
Excess Return VS Bloomberg U.S. Aggregate Bond Index	-0.54	-0.92	-1.22	-1.22	-0.19	-0.06	0.00	0.38			
Bonds Plus	1.72	-2.47	-9.67	-9.67	-0.67			-0.67	1/1/2020	\$ 822,643,633	5.08
Bloomberg U.S. Aggregate Bond Index	1.87	-2.97	-13.01	-13.01	-2.71			-2.71			
Excess Return VS Bloomberg U.S. Aggregate Bond Index	-0.15	0.50	3.34	3.34	2.04			2.04			
Global Core Fixed Income	4.71	1.11	-7.81	-7.81	-1.37	0.60	1.51	2.77	5/1/2011	\$ 10,396,775	0.06
Bloomberg Global Aggregate (USDH)	0.99	-2.38	-11.22	-11.22	-2.59	0.36	1.24	2.34			
Excess Return VS Bloomberg Global Aggregate (USDH)	3.72	3.48	3.41	3.41	1.21	0.24	0.26	0.44			
Cash	3.84	4.32	8.23	8.23	5.04	5.27	4.38	4.77	3/1/1989	\$ 83,893,490	0.52
ICE BofA 3-Mo T-Bill	0.85	1.32	1.47	1.47	0.73	1.27	1.07	2.88			
Excess Return VS ICE BofA 3-Mo T-Bill	2.99	3.00	6.76	6.76	4.31	4.01	3.31	1.89			

Risk Reduction & Mitigation Performance – Managers

COMPOSITE/MANAGER	Quarter	FYTD	CYTD	1 Year	3 Years	5 Years	7 Years	ITD	Inception Date	Market Value	% of Total
BlackRock Core	1.77	-3.38	-14.14	-14.14	-2.37	0.36	1.20	4.69	7/1/1995	\$ 1,257,354,308	7.77
Bloomberg U.S. Aggregate Bond Index	1.87	-2.97	-13.01	-13.01	-2.71	0.02	0.89	4.32			
Excess Return VS Bloomberg U.S. Aggregate Bond Index	-0.10	-0.41	-1.13	-1.13	0.34	0.33	0.31	0.37			
Prudential	2.17	-2.99	-13.06	-13.06	-2.73	0.01	0.89	1.80	6/1/2012	\$ 541,821,742	3.35
Bloomberg U.S. Aggregate Bond Index	1.87	-2.97	-13.01	-13.01	-2.71	0.02	0.89	1.17			
Excess Return VS Bloomberg U.S. Aggregate Bond Index	0.30	-0.02	-0.05	-0.05	-0.02	-0.01	0.00	0.63			
Dorsal	0.05	-1.97	-2.83	-2.83				2.48	6/1/2020	\$ 89,157,556	0.55
Libor + 30 bps 1 MA	1.00	1.64	2.09	2.09				1.12			
Excess Return VS Libor + 30 bps 1 MA	-0.96	-3.61	-4.92	-4.92				1.36			
ELLIOTT	1.12	1.02	10.38	10.38	10.60			10.60	1/1/2020	\$ 136,531,269	0.84
Libor + 30 bps 1 MA	1.00	1.64	2.09	2.09	1.24			1.24			
Excess Return VS Libor + 30 bps 1 MA	0.12	-0.62	8.29	8.29	9.37			9.37			
Garda	3.28	6.05	13.74	13.74				8.57	7/1/2020	\$ 61,415,997	0.38
Libor + 30 bps 1 MA	1.00	1.64	2.09	2.09				1.13			
Excess Return VS Libor + 30 bps 1 MA	2.28	4.41	11.65	11.65				7.44			
Glazer	3.14	5.11	1.89	1.89				19.43	6/1/2020	\$ 105,586,625	0.65
Libor + 30 bps 1 MA	1.00	1.64	2.09	2.09				1.12			
Excess Return VS Libor + 30 bps 1 MA	2.14	3.47	-0.20	-0.20				18.31			
Marshall Wace Eureka	0.93	2.18	5.09	5.09				10.37	8/1/2020	\$ -	0.00
Libor + 30 bps 1 MA	1.00	1.64	2.09	2.09				1.15			
Excess Return VS Libor + 30 bps 1 MA	-0.07	0.54	3.00	3.00				9.22			
Millenium	1.66	4.90	11.71	11.71				12.70	10/1/2020	\$ 113,689,934	0.70
Libor + 30 bps 1 MA	1.00	1.64	2.09	2.09				1.19			
Excess Return VS Libor + 30 bps 1 MA	0.65	3.26	9.62	9.62				11.50			
Pacific AA	-0.69	-1.10	-0.23	-0.23				2.79	6/1/2020	\$ 104,709,837	0.65
Libor + 30 bps 1 MA	1.00	1.64	2.09	2.09				1.12			
Excess Return VS Libor + 30 bps 1 MA	-1.69	-2.74	-2.32	-2.32				1.67			
Pharo Gaia Fund	-4.11	-6.50	-18.55	-18.55				-7.70	6/1/2020	\$ 32,516,810	0.20
Libor + 30 bps 1 MA	1.00	1.64	2.09	2.09				1.12			
Excess Return VS Libor + 30 bps 1 MA	-5.11	-8.14	-20.64	-20.64				-8.83			
SYSTEMATICA	0.11	5.25	20.61	20.61				17.13	6/1/2020	\$ 89,249,967	0.55
Libor + 30 bps 1 MA	1.00	1.64	2.09	2.09				1.12			
Excess Return VS Libor + 30 bps 1 MA	-0.89	3.61	18.52	18.52				16.01			
TWO SIGMA	0.78	5.02	12.92	12.92				9.20	5/1/2021	\$ 46,321,615	0.29
Libor + 30 bps 1 MA	1.00	1.64	2.09	2.09				1.43			
Excess Return VS Libor + 30 bps 1 MA	-0.22	3.38	10.83	10.83				7.77			
Parametric Bonds Plus	0.88	-4.51	-14.65	-14.65	-3.76			-3.76	1/1/2020	\$ 43,464,023	0.27
Blackrock Glb Fixed Income										\$ 10,396,775	0.06

Real Assets

Real Assets Composite

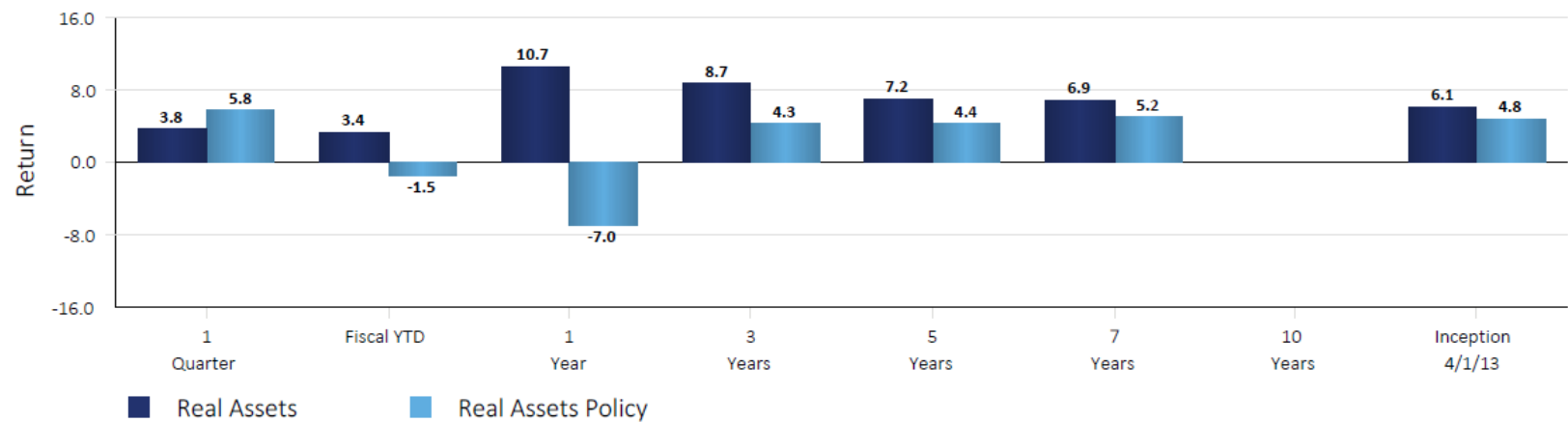


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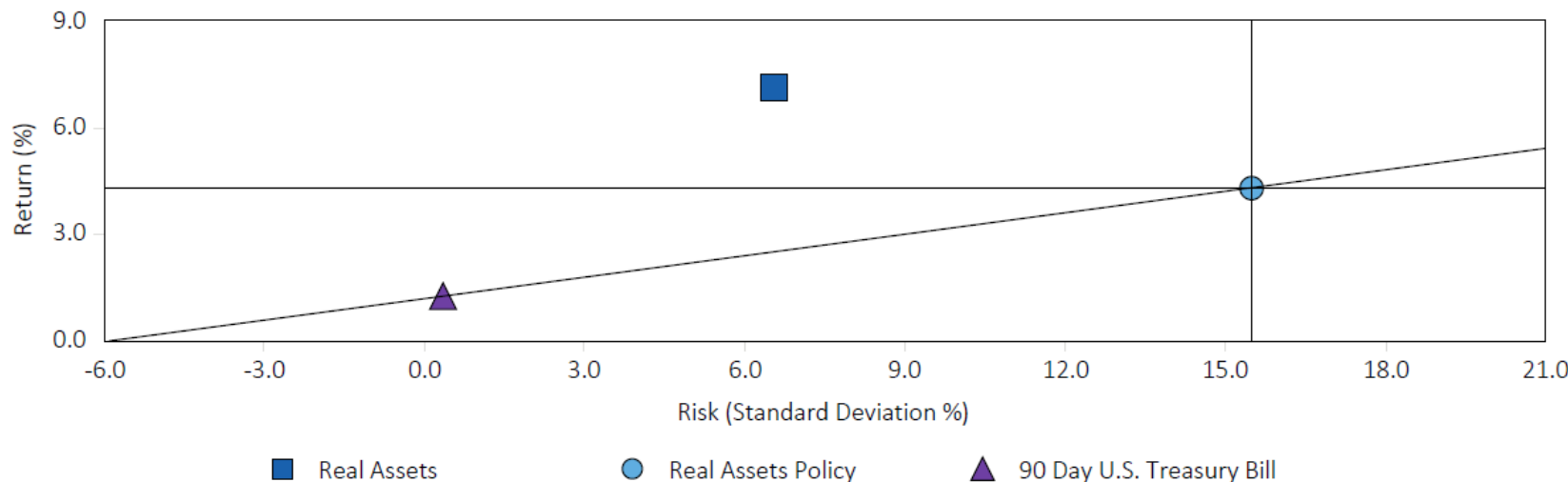
	Market Value \$	Allocation (%)
Real Estate Only Comp	1,480,201,121	50.7
Real Assets Only Comp	1,440,331,506	49.3
Market Neutral Hedge Fund Comp	660,668	0.0

Real Assets Composite Performance Summary

Comparative Performance



Risk vs. Return - 5 Years

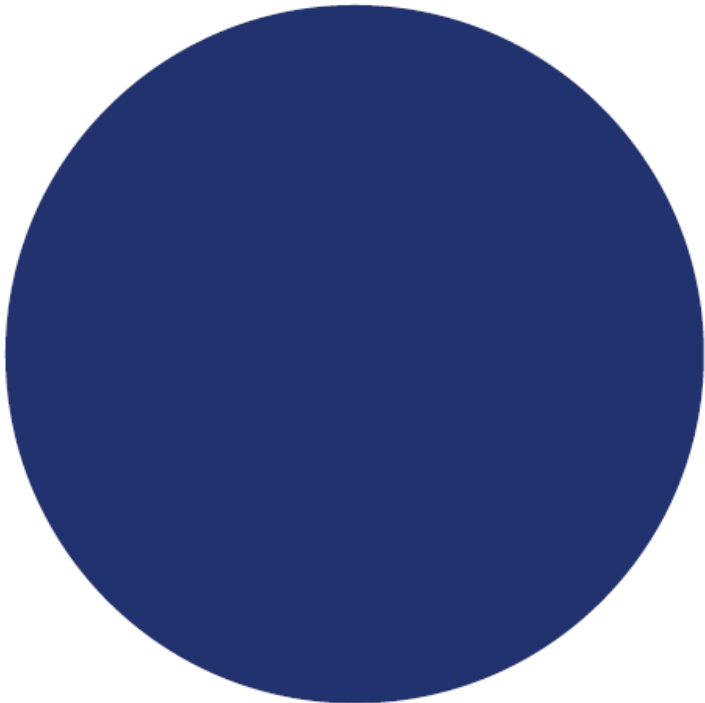


Real Assets Performance – Composites

COMPOSITE/MANAGER	Quarter	FYTD	CYTD	1 Year	3 Years	5 Years	7 Years	ITD	Inception Date	Market Value	% of Total
REAL ASSETS	3.76	3.44	10.70	10.70	8.72	7.17	6.90	6.13	4/1/2013	\$ 2,921,193,295	18.05
10% Alerian MLP/15%US TIPS/20%DJ Global Infra/20% Commodity	5.82	-1.51	-6.98	-6.98	4.34	4.36	5.15	4.84			
Excess Return VS Real Assets BM	-2.05	4.95	17.68	17.68	4.38	2.82	1.75	1.29			
Liquid Real Estate	2.60	-5.50	-21.97	-21.97	0.59	3.80	4.87	9.26	12/1/2008	\$ 446,867	0.00
Liquid Real Estate Dyn BM	4.77	-6.10	-25.96	-25.96	-2.33	2.02	3.24				
Excess Return VS Liquid Real Estate Dyn BM	-2.17	0.60	3.98	3.98	2.92	1.78	1.63				
Illiquid Real Estate	2.85	4.54	20.70	20.70	11.58	11.93	10.64	7.82	5/1/2007	\$ 1,479,754,255	9.14
Wilshire Global REIT TR Index	5.81	-5.99	-26.13	-26.13	-2.45	1.96	3.31	2.97			
Excess Return VS Wilshire Global REIT TR Index	-2.95	10.53	46.83	46.83	14.03	9.97	7.33	4.86			
Liquid Real Assets	3.19	-3.17	-3.77	-3.77	4.11	3.24	3.86	0.47	9/1/2009	\$ 162,404,131	1.00
60% Bloomberg US TIPS/40% Alerian MLP	5.40	5.45	4.09	4.09	7.53	5.35	5.30				
Excess Return	-2.21	-8.63	-7.87	-7.87	-3.42	-2.11	-1.43				
Illiquid Real Assets	4.50	7.23	17.56	17.56	9.73	7.24	6.93	-7.18	1/1/2007	\$ 1,277,927,375	7.90
50% DJ Global Infra/50% Bloomberg Commoity TR	6.01	-1.98	4.98	4.98	7.71	5.12	5.11				
Excess Return	-1.52	9.21	12.58	12.58	2.02	2.12	1.83				
Market Neutral Hedge Fund	0.66	0.20	-24.32	-24.32	-1.03	1.62	0.84	1.76	4/1/2013	\$ 660,668	0.00
Libor + 2% 1 MA	1.40	2.45	3.79	3.79	2.94	3.48	3.32	3.02			
Excess Return VS Libor + 2% 1 MA	-0.74	-2.25	-28.11	-28.11	-3.97	-1.86	-2.48	-1.26			

Multi-Risk Allocation

Multi-Risk Allocation Composite

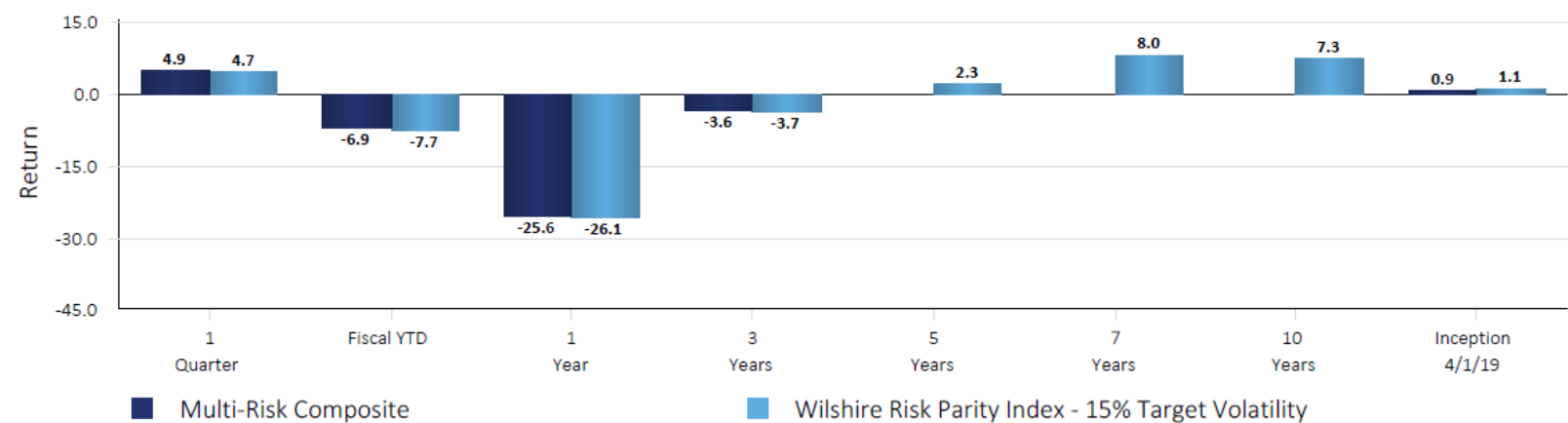


Dec-2022 : 1,371,033,202

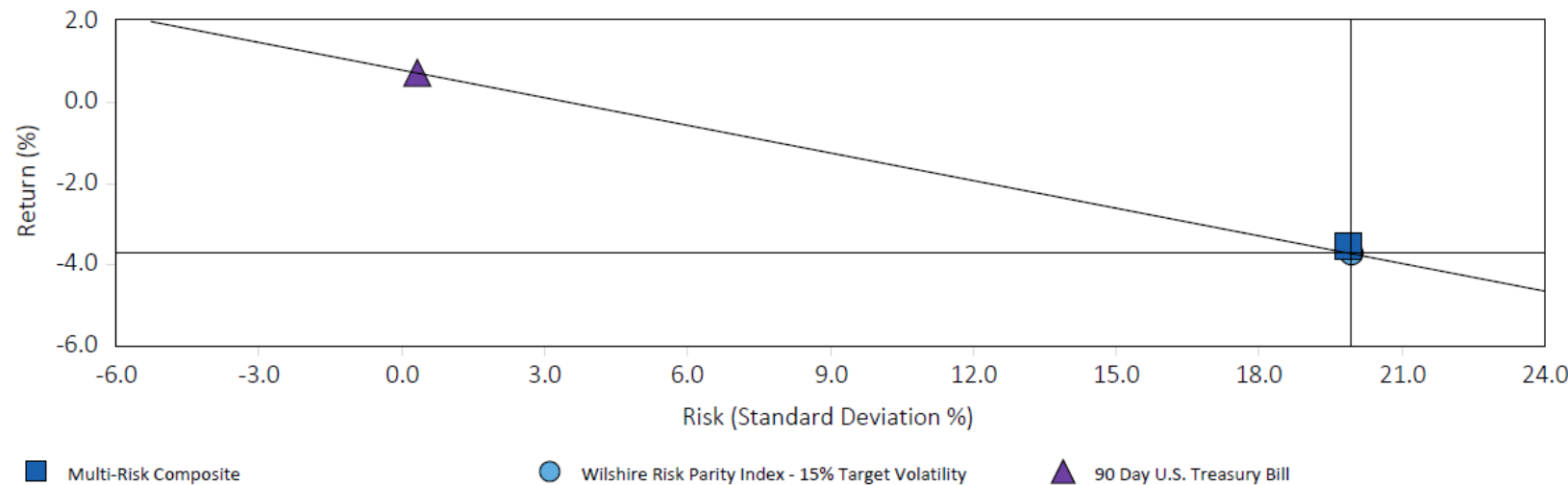
	Market Value \$	Allocation (%)
■ Zia Risk Parity Fund	1,371,033,202	100.0

Multi-Risk Allocation Composite Performance Summary

Comparative Performance

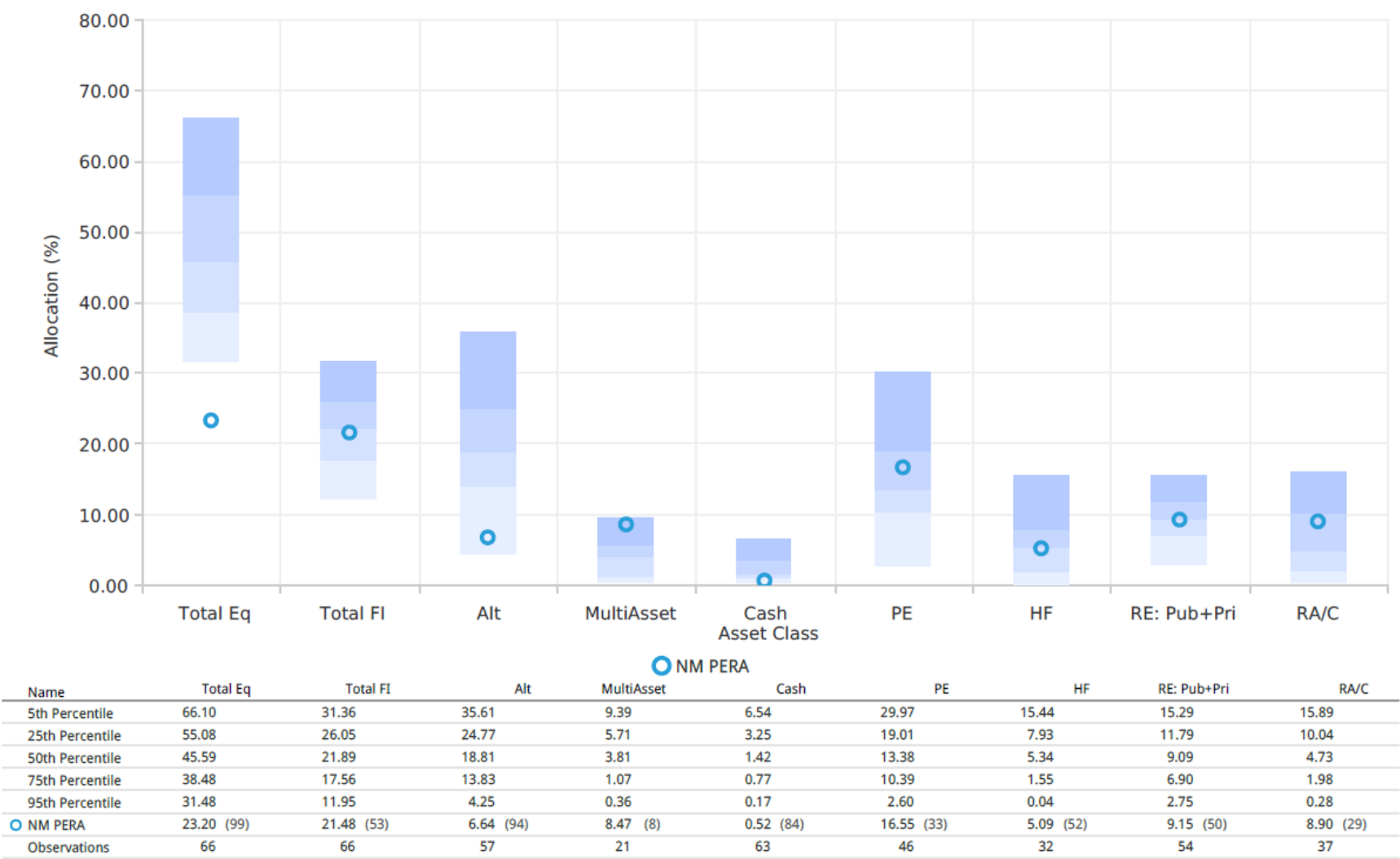


Risk vs. Return - 3 Years



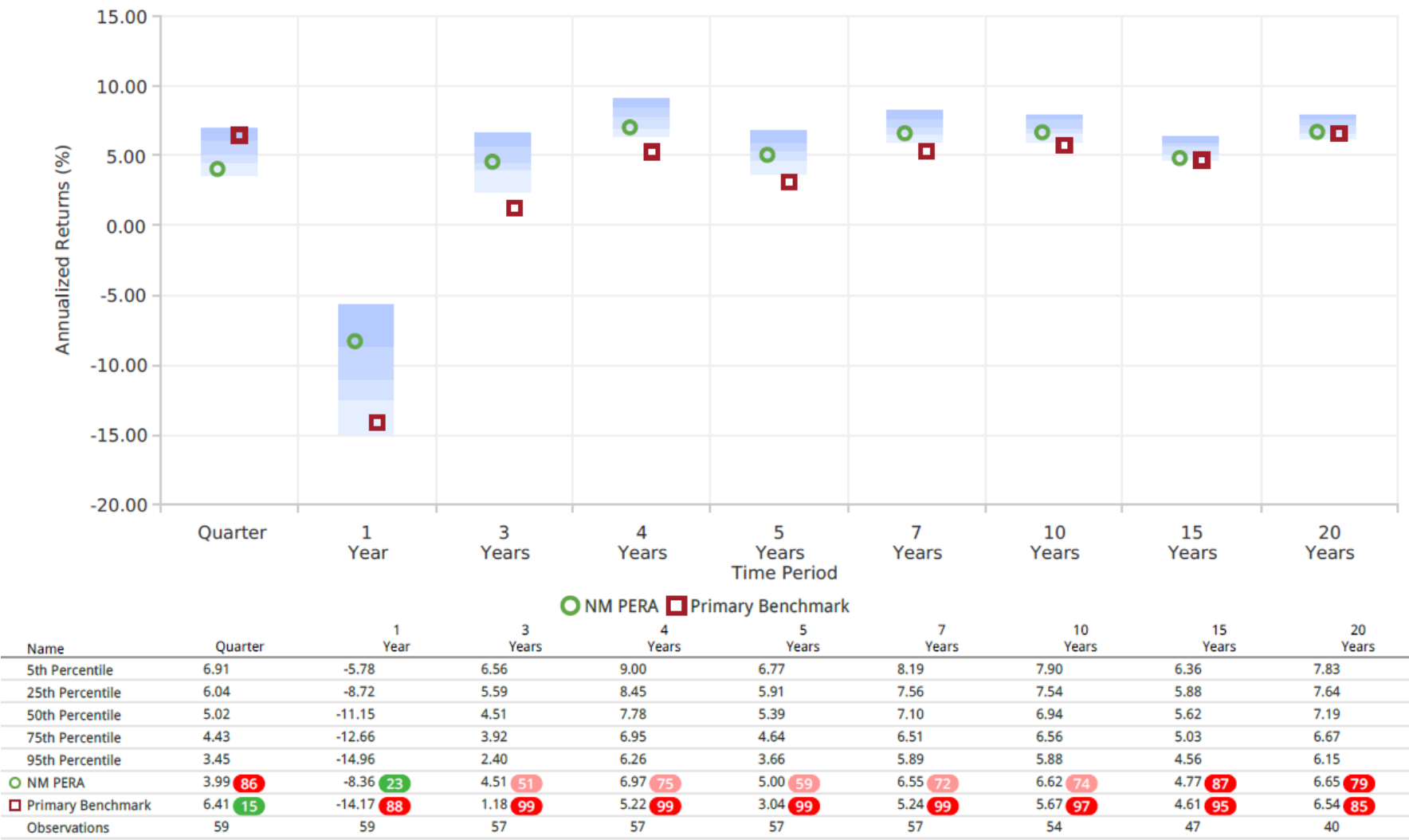
Peer Review

Asset Allocation Comparison



Performance is NOF, calculated and provided by BNY Mellon. Universe source: InvestmentMetrics, Public >\$1B.

Total Fund – Return Comparison



Performance is NOF, calculated and provided by BNY Mellon. Universe source: InvestmentMetrics. , Public >\$1B.

Total Fund – Sharpe Ratio Comparison



Performance is NOF, calculated and provided by BNY Mellon. Universe source: InvestmentMetrics. , Public >\$1B.

Total Fund – Standard Deviation Comparison



Performance is NOF, calculated and provided by BNY Mellon. Universe source: InvestmentMetrics , Public >\$1B.

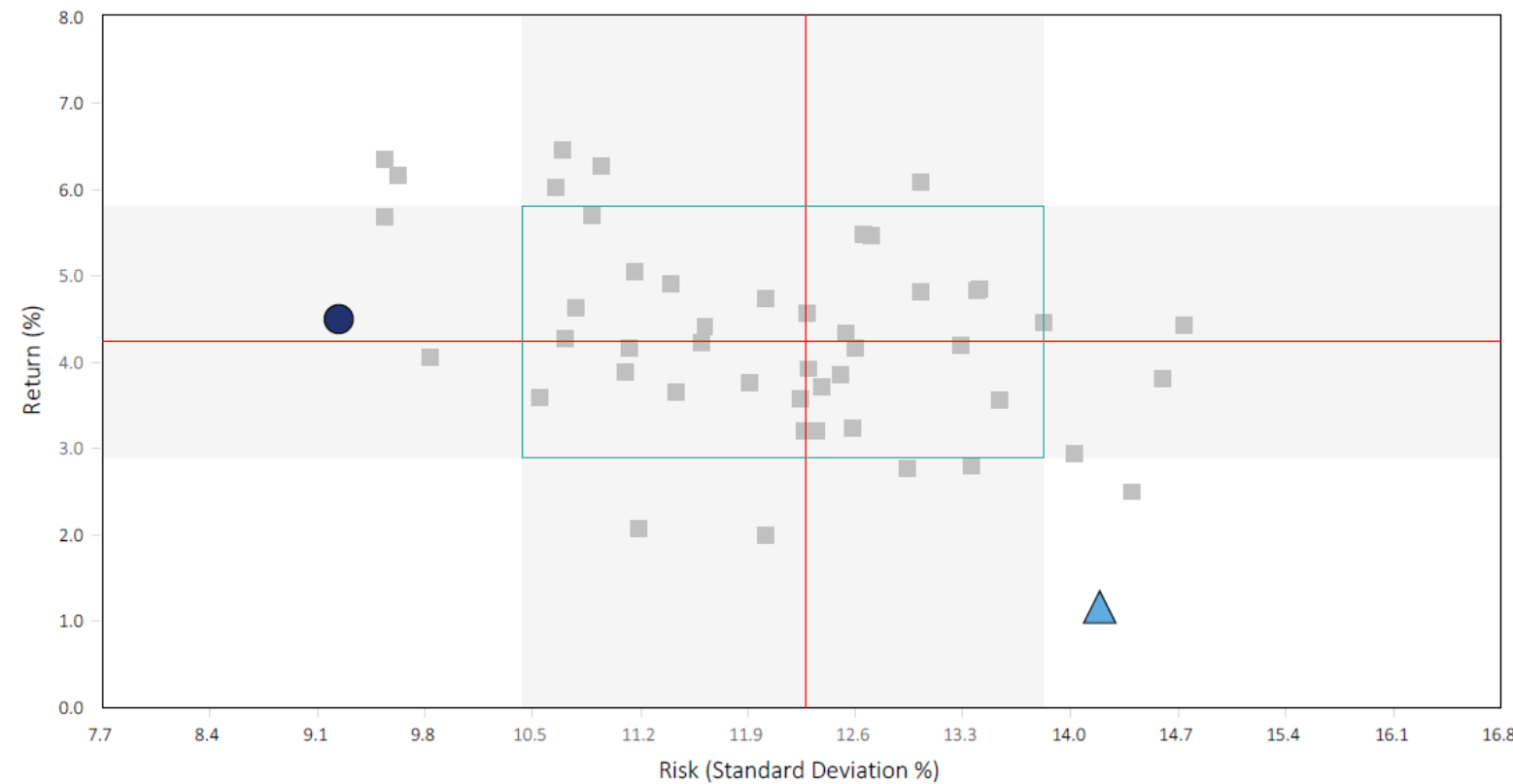
Total Fund – Information Ratio Comparison



Performance is NOF, calculated and provided by BNY Mellon. Universe source: InvestmentMetrics , Public >\$1B.

Total Fund – Scattergram (3-year)

NM PERA Total Fund vs All Public Plans > \$1B-Total Fund
Periods Ended 3 Years Ending December 31, 2022

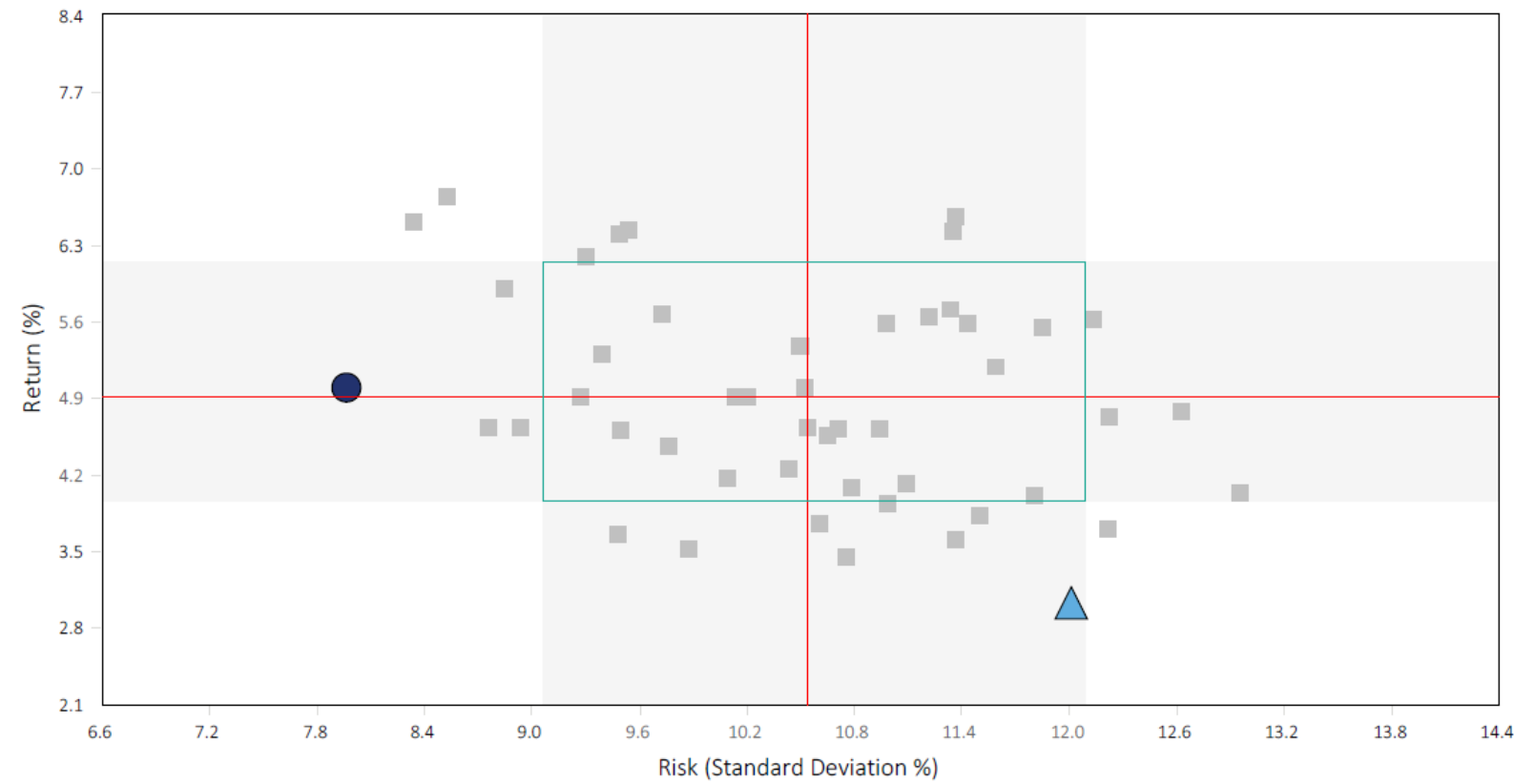


	Return	Standard Deviation
● NM PERA Total Fund	4.51	9.24
▲ NM PERA Total Fund Policy	1.18	14.19
— Median	4.25	12.28

Performance is NOF, calculated and provided by BNY Mellon. Universe source: InvestmentMetrics. , Public >\$1B.

Total Fund – Scattergram (5-year)

NM PERA Total Fund vs All Public Plans > \$1B-Total Fund
Periods Ended 5 Years Ending December 31, 2022



	Return	Standard Deviation
● NM PERA Total Fund	5.00	7.97
▲ NM PERA Total Fund Policy	3.04	12.01
— Median	4.91	10.54

Performance is NOF, calculated and provided by BNY Mellon. Universe source: InvestmentMetrics. , Public >\$1B.

Manager Listing

Manager Listing

As of December 31, 2022

	Total Fund	
	\$	%
NM PERA Total Fund	16,184,642,503	100.00
Global Equity	6,069,195,632	37.50
Global Public Stock	2,852,347,577	17.62
BlackRock Equity Transition	14,285	0.00
NT MSCI ACWI X US Index Fund	267,252	0.00
SSgA ACWI IMI Index Fund	606,463,622	3.75
Active US Equity	245,423,714	1.52
DFA US Target Value	269	0.00
Kayne Anderson SCC	242,741,786	1.50
TimesSquare Capital SMID Cap Growth		0.00
Portable Alpha Composite	2,681,659	0.02
Portable Alpha	2,681,659	0.02
Active Non-US Developed Equity	701,146,092	4.33
Alliance Bernstein	244,007,491	1.51
Acadian International Equity	256,301,654	1.58
KBI Global Investors EAFE Developed	371,646	0.00
MFS International Value Equity	199,798,052	1.23
Principal Intl Small Cap Equity	495,691	0.00
Schroder Intl Small Composite	171,558	0.00
Active Emerging Markets Equity	246,054,671	1.52
Axiom Investors	244,455,635	1.51
Russell Transition	1,599,036	0.01
Global Equity Overlay	116,963,641	0.72
SSGA Russell 1000 Index Fund	936,014,299	5.78
Global Low Volatility Equity	902,376,311	5.58
BlackRock MSCI ACWI Minimum Volatility	902,376,311	5.58
Hedged Equity Comp	635,739	0.00
TPG-Axon Partners, LP	635,739	0.00

Manager Listing

As of December 31, 2022

	Total Fund	
	\$	%
Private Equity Comp	2,313,836,004	14.30
Altaris Con Partners IV	24,165,380	0.15
Altaris Health Partners IV	37,822,484	0.23
CVC European Equity Partners V	807,156	0.00
CVC VII	178,096,523	1.10
Carlyle Partners VI LP	21,061,702	0.13
Carlyle Partners V, L.P.	1,922,906	0.01
Century Focused Fund IV	32,341,039	0.20
Charterhouse Capital Partners IX	885,486	0.01
Charterhouse Capital Partners X	83,189,599	0.51
Collier International Partners V, L.P.	78,918	0.00
DFJ Fund XII LP	67,615,567	0.42
Draper Fisher Jurveston X, LP	16,250,562	0.10
FountainVest Fund II	76,699,491	0.47
GTCR XI, L.P.	46,594,712	0.29
GTCR X, L.P.	188,908	0.00
Hellman & Friedman Cap. Partners VII	3,854,190	0.02
Hellman & Friedman Cap. Part. VI		0.00
Glide Buy-Out Fund IV	1,432,853	0.01
Institutional Venture Partners XIV LP	23,667,136	0.15
Institutional Venture Partners XIII	3,820,746	0.02
JMI Equity Fund VII, L.P.	2,434,915	0.02
JMI Equity Fund VI, L.P.	386,178	0.00
KRG Capital Fund IV, L.P.	1,255,778	0.01
Kelso Investment Associates IX	11,008,668	0.07
Kelso Investment Advisors IX	30,924,682	0.19
Kelso Investments Assoc. VIII, L.P.	1,431,605	0.01
Kelso Investment Associates X	85,714,145	0.53
Helm & Frid Spock 1	11,243,673	0.07

Manager Listing

As of December 31, 2022

	Total Fund	
	\$	%
Lincolnshire Equity Fund IV, L.P.	6,496,932	0.04
Linsalata Capital Partners Fund VI, LP		0.00
Madison Dearburn Cap. Partners VI, LP	2,904,220	0.02
New Enterprise Associates 13	5,134,404	0.03
New Enterprise Associates 14	40,370,584	0.25
Nordic Capital Fund VII	1	0.00
Onex Partners IV L.P.	28,193,973	0.17
Onex Partners V, L.P.	72,241,548	0.45
Onex Partners III, L.P.	3,892,557	0.02
Patria PE Fund VI	38,684,093	0.24
Petershill	88,351,067	0.55
Pine Bridge Passport I	128,251,939	0.79
Providence Equity Partners VI, L.P.	670,043	0.00
RCP Fund of One	92,381,510	0.57
RRJ Capital Master Fund III LP	16,823,162	0.10
Ristra MDP Co Invest	10,148,323	0.06
Sun Capital Partners V, L.P.	1,880,334	0.01
TPG Asia V, L.P.	3,030,862	0.02
TPG Partners VI, LP	1,720,163	0.01
Technology Crossover Ventures VII, L.P	1,807,569	0.01
Technology Crossover Ventures IX, LP	51,646,300	0.32
Technology Crossover Ventures X, LP	85,197,901	0.53
The Resolute Fund II,L.P.		0.00
The Resolute Fund III, L.P.	21,042,615	0.13
The Resolute Fund IV, L.P.	98,531,172	0.61
Trident IX LP	9,126,550	0.06
Trinity Ventures XII	60,579,717	0.37
Warburg Pincus PE XII	107,309,869	0.66
Warburg Pincus 14	19,324,372	0.12

Manager Listing

As of December 31, 2022

	Total Fund	
	\$	%
Warburg Pincus GG	134,359,544	0.83
Petershill IV	15,025,863	0.09
Enchantment PH Co-Invest	24,801,783	0.15
Hellman Arrow 1	6,207,076	0.04
ON Dearborn VIII	43,034,213	0.27
Hellman Samsn Hcky 1	5,464,096	0.03
Hellman Samsn Shield	9,939,818	0.06
Montagu VI	47,638,889	0.29
Altaris Health Partners V	40,199,604	0.25
Hellman Samson Brunello SPV	3,701,191	0.02
Madison Dearborn Patriot SPV	6,096,978	0.04
Tenex Capital Partners III	26,068,381	0.16
White Sands Tenex Co-Inv	17,573,684	0.11
General Catalyst Endurance	27,345,328	0.17
General Catalyst Ignition	11,518,153	0.07
The Resolute Fund V, L.P.	85,135,175	0.53
Hellman X	24,529,419	0.15
Orchid Asia	8,178,441	0.05
1912 Orchid Asia Coinvest	1,325,505	0.01
Montagu Petroglyph Coinvest	10,856,568	0.07
General Catalyst XI CRTN	4,199,516	0.03
LGIMA Global Equity Overlay		0.00
Credit Oriented Fixed Income	3,062,175,227	18.92
Liquid Credit	1,620,057,151	10.01
High Yield Debt Composite	1,448,177,353	8.95
Guggenheim Global High Yield	-4,737	0.00
PineBridge High Yield	1,448,182,090	8.95
Parametric Credit Cash Overlay	171,879,798	1.06

Manager Listing

As of December 31, 2022

	Total Fund	
	\$	%
Alternative Liquid Credit	1,075,054,643	6.64
Leveraged Loans/Structured Credit	757,248,935	4.68
Mudrick Stressed CR FKA CVC	162,153,014	1.00
Ellington HF	155,696,945	0.96
Eagle Point	9,281,171	0.06
Eagle Point Credit PRT	85,132,382	0.53
Napier Park Class B	200,557,039	1.24
Wheeler Peak Rotational Credit	144,428,384	0.89
Credit Oriented Hedge Funds	317,805,707	1.96
Canyon Value Realization Fund, L.P.	41,634,571	0.26
King Street Capital, L.P.	2,804,519	0.02
Silver Point Capital Fund, L.P.	51,962,823	0.32
Anchorage	71,228,487	0.44
Napier Park Class A	150,175,308	0.93
LGIMA Credit Overlay		0.00
Emerging Markets Debt Composite	2,030,852	0.01
Lazard Emerging Markets Debt	2,030,852	0.01
Illiquid Credit Comp	365,032,582	2.26
Atalaya SOF VI	5,362,719	0.03
Athyrium Opportunities Fund II, L.P.	15,589,624	0.10
Cerberus Global RPL	160,625,077	0.99
Cerberus Inst. Partners L.P.- Series 4	525,138	0.00
Cheyne V	49,287,669	0.30
European Real Estate Debt Fund III	43,270,777	0.27
European Real Estate Debt Fund II	2,014,723	0.01
Garrison Opportunity Fund IV A LLC	22,081,675	0.14
Madison Real Estate Debt	41,470,596	0.26
OCM Opportunities Fund VII, L.P.	161,071	0.00
OCM Opportunities Fund VIIb, L.P.	9,837	0.00

Manager Listing

As of December 31, 2022

	Total Fund	
	\$	%
OCM Opportunities Fund VIII, L.P	140,337	0.00
Oaktree Eur. Prin. Fund III(US), LP	7,158,149	0.04
Selene Res. Mortgage Opp. Fund II LP		0.00
Sixth Street Ops III	11,276,662	0.07
Wayzata Opportunities Fund II, L.P.		0.00
Wayzata Opportunities Fund III, L.P.	4,465,163	0.03
HIG Bayside Loan Opportunity Fund II	1,593,365	0.01
Risk Reduction & Mitigation	2,761,045,148	17.06
Domestic Core Fixed Income	1,844,111,249	11.39
BlackRock Core Active	1,257,354,308	7.77
MacKay Shields Core Investment Grade	-1	0.00
Prudential Core Conservative	541,821,742	3.35
Risk Mitigation Overlay	44,935,201	0.28
Global Core Fixed Income	10,396,775	0.06
Manulife Core Global Agg. Fixed Income		0.00
BlackRock Global FI	10,396,775	0.06
Cash Composite	83,893,490	0.52
Cash Account	79,000,270	0.49
Cash-Corporate Action	4,893,220	0.03
LGIMA Overlay		0.00
LGIMA TAA Overlay		0.00
Bonds Plus Composite	822,643,633	5.08
Elliot	136,531,269	0.84
Parametric Bonds Plus	43,464,023	0.27
Pharo Gaia Fund	32,516,810	0.20
Dorsal	89,157,556	0.55
Garda	61,415,997	0.38
Glazer	105,586,625	0.65

Manager Listing

As of December 31, 2022

	Total Fund	
	\$	%
Pacific AA	104,709,837	0.65
Systematica	89,249,967	0.55
Marshall Wace Eureka		0.00
Millenium	113,689,934	0.70
Two Sigma	46,321,615	0.29
Real Assets	2,921,193,295	18.05
Real Estate Only Comp	1,480,201,121	9.15
Liquid Real Estate Comp	446,867	0.00
DFA Real Estate Securities	288,122	0.00
Security Capital Alpha	158,742	0.00
Security Capital Beta	2	0.00
Illiquid Real Estate Comp	1,479,754,255	9.14
Aermont Cap RE Fund IV	34,400,874	0.21
BPG Investment Partnership VIII		0.00
Blackstone Real Estate Partners VII	8,490,408	0.05
Blackstone Real Estat Part Euro III LP	1,794,928	0.01
Carlyle Realty Partners VI, L.P.	1,701,238	0.01
Carlyle Realty Partners V L.P.	58,204	0.00
Harrison Street Real Estate Partners V	26,010,519	0.16
Harrison Street Real Estate Partners VII	64,480,082	0.40
KSL Capital Partners IV	64,383,050	0.40
North Haven VII	210,431	0.00
Rockwood Cap. Real Estate Part. IX, LP	6,158,250	0.04
Rockwood Cap. Real Estate Part. X, LP	39,354,039	0.24
Starwood Global Opportunity VIII, LP	1,660,841	0.01
Starwood Opportunity Fund X	13,406,757	0.08
Starwood Global Opportunity XI	64,084,680	0.40
Starwood Distressed Opportunity IX, LP	1,915,368	0.01

Manager Listing

As of December 31, 2022

	Total Fund	
	\$	%
Walton Street Real Estate Fund VI	12,225,168	0.08
Wheelock Street Real Estate Fund II	18,444,403	0.11
Rockpoint Fund II	63,071,577	0.39
Perella Weinberg III	27,240,302	0.17
Harrison Street Real Estate Partners VI	49,845,667	0.31
Sarofim		0.00
NEW ROCK CORE FUND	280,126,781	1.73
GEM RLTY EVERGREEN	131,429,994	0.81
Rockwood Cap. Real Estate XI	39,437,919	0.24
Rockpoint Fund III	24,177,021	0.15
Rockwood MultiFamily PT LP	108,894,862	0.67
Stockbridge NLF	274,743,887	1.70
Harrison Street Real Estate VIII	49,062,546	0.30
Stockbridge Value Fund IV	61,625,080	0.38
Starwood XII	11,319,378	0.07
Real Assets Only Comp	1,440,331,506	8.90
Liquid Real Assets Comp	162,404,131	1.00
PIMCO Commodities	705,747	0.00
PIMCO TIPS	1,246,199	0.01
Deutsche Listed Infrastructure	53,754,104	0.33
Harvest MLP Alpha	435,916	0.00
Real Assets Cash Overlay	106,262,166	0.66
Pavilion Global Transition		0.00
Illiquid Real Assets Comp	1,277,927,375	7.90
ACM II	27,384,063	0.17
Antin III	84,124,766	0.52
Ardian V	49,308,245	0.30
Ardian Infrastructure IV	43,012,657	0.27
BEP Legacy A LP	36,681	0.00

Manager Listing

As of December 31, 2022

	Total Fund	
	\$	%
Brookfield Infrastructure Fund II LP	34,685,966	0.21
Brookfield Infrastructure Fund III	65,615,811	0.41
Carlyle Power Partners II	72,717,329	0.45
Denham Cap. Part. VI Coinvestment	49,127	0.00
Denham Commodity Partners Fund VI, LP	10,682,650	0.07
Encap Energy Capital VIII, L.P.	10,457,786	0.06
Encap Energy Capital Fund IX, L.P.	10,909,340	0.07
EnCap Flatrock Midstream Fund III	22,871,363	0.14
EnCap Energy Capital XI, L.P.	104,492,091	0.65
Encap Energy Capital VII, L.P.	1	0.00
First Reserve Fund XII, LP	49,172	0.00
IFM Global Infrastructure Fund, L.P.	191,119,079	1.18
KKR Global Infrastructure Investors II	25,323,896	0.16
Kayne Anderson Energy Fund V, LP	4,722,275	0.03
Lime Rock Partners VI, L.P.		0.00
Lime Rock Resources III	34,404,272	0.21
Lime Rock Partners V, L.P.	1,523,157	0.01
MINA III	55,293,618	0.34
Natural Gas Partners Fund IX	103,625	0.00
Natural Gas Partners X	3,547,385	0.02
NGP Natural Resources XI, L.P.	40,482,556	0.25
NGP XII	61,272,040	0.38
Paine and Partners Capital Fund IV	36,244,366	0.22
Quantum Energy Partners IV, L.P.		0.00
Quantum Energy Partners V, L.P.	1,926,051	0.01
R/C Renewable and Alt. Energy II	209,602	0.00
Riverstone Global Energy & Power Fd V	11,852,287	0.07
R/C Global Energy & Power Fund IV	49,625	0.00
Tillridge	35,036,174	0.22

Manager Listing

As of December 31, 2022

	Total Fund	
	\$	%
Mass Ascension Co-Invest	141,093,929	0.87
Four Corners FF	88,981,607	0.55
Ardian Americas V	5,996,832	0.04
Market Neutral Hedge Fund Comp	660,668	0.00
Farallon Capital Inst. Partners, LP	121,541	0.00
AG Super Fund L.P.		0.00
Stark Investments	539,127	0.00
Multi-Risk Composite	1,371,033,202	8.47
Zia Risk Parity Fund	1,371,033,202	8.47

Placement Agent Disclosure

Pursuant to New Mexico statute PERA shall not make any investment, other than investments in publicly traded equities or publicly traded fixed-income securities, unless the recipient of the investment discloses the identity of any third-party marketer who rendered services on behalf of the recipient in obtaining the investment and discloses the amount of any fee, commission or retainer paid to the third-party marketer for the services rendered. “Third-party marketer” means a person who, on behalf of an investment fund manager or other person seeking an investment from the fund and under a written or implied agreement, receives a fee, commission, or retainer for such services from the person seeking an investment from the fund.

The following investments were approved during the quarter, with disclosures made under the policy:

Kelso Chimayo Co-Invest – NM PERA committed \$15 million to PERA Chimayo Kelso Co-Invest, a 2022 vintage year in the Private Equity allocation. Kelso Investment Associates has stated that they did not use a placement agent while soliciting PERAs investment.

Investments approved prior to the current quarter for which the fund engaged a placement agent follow:

Antin Infrastructure Partners Fund V – NM PERA committed €100 million to Antin Infrastructure Partners Fund V, a 2022 vintage year in the Real Asset allocation. Antin Infrastructure Partners has confirmed that Evercore Group LLC was engaged as placement agent for Fund V. NM PERA will not be liable for any placement agent fees in relation to its commitment to Antin Fund V. Neither Evercore nor Antin has compensated or agreed to compensate, directly or indirectly, any Person or entity to act as a placement agent in connection with any commitment by NM PERA.

Warburg Pincus Global Growth 14 – NM PERA committed \$100 million to Warburg Pincus LLC a 2022 vintage year in the Equity allocation. Warburg Pincus has engaged and expects to engage placement agents and/or feeder sponsors in certain jurisdictions, including outside of the United States. In connection with these engagements, the firm expects to pay placement fees that it believes are customary in each respective jurisdiction. Warburg Pincus Global Growth 14, L.P. will not be responsible for placement fees payable to any placement agents. The firm has also engaged and expects to engage financial institutions to sponsor or arrange feeder funds that target high net worth individuals. In connection with the engagements, the firm may pay placement fees to such financial institutions. Any placement fees paid to such financial institutions would be borne by Warburg Pincus and/or the respective feeder fund.

JMI Equity Fund XI, L.P. – NM PERA committed \$50 million to JMI Equity Fund XI, L.P., a 2022 vintage year in the Equity allocation. JMI Equity Fund XI, L.P. has stated that they did use a placement agent, however, no placement agent has provided any services or is expected to provide any services related to PERA’s commitment, thus no fees will be paid in relation to PERA’s commitment.

Rockwood Multifamily Partners, L.P. Fund – NMPERA committed \$100 million to Rockwood Multifamily Partners Fund, a 2021 vintage year in the Real Estate allocation. Rockwood Multifamily Partners, L.P. Fund has stated that they did not use a placement agent while soliciting PERAs investment.

Placement Agent Disclosure

As provided by PERA of New Mexico

Stockbridge Niche Logistics Fund – NM PERA committed an additional \$100 million to Stockbridge Niche Logistics Fund, a 2020 vintage year in the Real Estate allocation. Stockbridge Niche Logistics Fund has stated that they did not use a placement agent while soliciting PERAs investment.

General Catalyst XI; Creation, Endurance, Ignition – NMPERA committed \$85 million to General Catalyst XI, a 2021 vintage year in the Equity allocation. General Catalyst XI has stated that they did not use a placement agent while soliciting PERAs investment.

Kelso Investment Associates XI– NM PERA committed \$60 million to Kelso Investment Associates XI, a 2021 vintage year in the Equity allocation. Kelso Investment Associates has stated that they did not use a placement agent while soliciting PERAs investment.

Trident IX– NM PERA committed \$50 million to Trident IX, a 2021 vintage year in the Equity allocation. Trident has stated that they did not use a placement agent while soliciting PERAs investment.

Orchid Asia VIII– NM PERA committed \$75 million to Orchid Asia VIII, a 2021 vintage year in the Equity allocation. Orchid Asia has stated that they did not use a placement agent while soliciting PERAs investment.

Hellman & Freidman X– NM PERA committed \$50 million to Hellman & Freidman X, a 2021 vintage year in the Equity allocation. Hellman & Freidman has stated that they did not use a placement agent while soliciting PERAs investment.

Ristra MDP Co-Invest– NM PERA committed \$20 million to Ristra MDP Co-Invest, a 2021 vintage year in the Equity allocation. MDP has stated that they did not use a placement agent while soliciting PERAs investment.

Ardian Americas Infrastructure Fund V– NM PERA committed \$75 million to Ardian Americas Infrastructure Fund V, a 2021 vintage year in the infrastructure allocation. Ardian Americas has stated that they did not use a placement agent while soliciting PERAs investment.

D.E. Shaw – NM PERA committed u\$120 million to D.E. Shaw Composite Fund and/or Multi-Asset Fund, diversified multi-strategy fund. This is a portable alpha allocation. D.E. Shaw & Co. has stated that they did not use a placement agent while soliciting PERAs investment.

Starwood XIII – NM PERA committed \$50 million to Starwood XIII a 2020 vintage year in the Real Estate allocation. Starwood XIII has stated that they did not use a placement agent while soliciting PERAs investment.

Harrison Street Real Estate Fund VIII – NM PERA has committed \$75 million to Harrison Street Real Estate Fund VIII a 2020 vintage year in the Real Estate allocation. Harrison Street Real Estate has stated that they did not use a placement agent while soliciting PERAs investment.

Stockbridge Niche Logistics Fund – NM PERA committed \$100 million to Stockbridge Niche Logistics Fund a 2020 vintage year in the Real Estate allocation. Stockbridge Niche Logistics Fund has stated that they did not use a placement agent while soliciting PERAs investment.

Two Sigma – NM PERA has committed \$75 million to Two Sigma a Portable Alpha allocation. Two Sigma has stated that they did not use a

Placement Agent Disclosure

As provided by PERA of New Mexico

placement agent while soliciting PERAs investment.

Millennium USA Fund – NM PERA increased commitment by \$50 million to Millennium USA Fund in the Portable Alpha allocation. Millennium has stated that they did not use a placement agent while soliciting PERAs investment.

Stockbridge Value Fund IV, LP – NM PERA committed \$75 million to Stockbridge Value Fund IV, LP's 2020 vintage year in the Real Estate allocation. Stockbridge Core and Value-Add Advisors, LLC ("CVA") stated that they did not use placement agents during the fundraising period.

Montagu VI, LP – NM PERA increased commitment by \$25 million to Montagu VI in the Equity allocation. Montagu Private Equity LLP has stated that it did not use placement agents during the fundraising period.

Millennium USA Fund – NM PERA committed \$100 million to Millennium USA Fund a Portable Alpha allocation. Millennium has stated that they did not use a placement agent while soliciting PERAs investment.

Marshall Wace Fund – NM PERA committed \$50 million to Marshall Wace Fund a Portable Alpha allocation. Marshall Wace has stated that they did not use a placement agent while soliciting PERAs investment.

Tenex Capital Partners III L.P. & PERA White Sands Tenex Co-Invest – NM PERA committed \$45 million to Tenex Capital Partners III L.P. & PERA White Sands Tenex Co-Invest a 2020 vintage year in the Private Equity allocation. The Tenex Capital has stated that they did not use a placement agent while soliciting PERAs investment.

Jordan Resolute V, L.P. – NM PERA committed \$75 million to Jordan Resolute V, L.P. a 2020 vintage year in the Private Equity allocation. The Jordan Company, LP has stated that they did not use a placement agent while soliciting PERAs investment.

Garda FIRVO Fund – NM PERA committed \$50 million to Garda FIRVO Fund a Portable Alpha allocation. Garda Capital Partners has stated that they did not use a placement agent during fundraising.

Ardian NM Co-Invest (Mass Ascension), L.P. – NM PERA committed \$125 million to Ardian NM Co-invest a 2020 vintage year in the Real Assets allocation. Ardian FRANCE has stated that they may use placement agents in certain geographies where they do not have a presence. However, in any case, placement fees would not be payable by the fund.

AgIS Club Fund (Four Corners), L.P. – NM PERA committed \$150 million to Agis Club Fund a 2020 vintage year in the Real Asset allocation. AgIS Capital LLC has stated that they did not use a placement agent during fundraising, however in any case, placement fees would not be payable by the fund.

Altaris Health Partners V, L.P. – NM PERA committed \$75 million to Altaris Health Partners V, L.P. a 2020 vintage year in the Private Equity allocation. Altaris Capital Partners, LLC has stated that they did not use a placement agent during fundraising, however in any case, placement

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fees would not be payable by the fund.

Systematica Alternative Markets Fund – NM PERA committed \$75 million to Systematica Alternative Markets Fund a Portable Alpha allocation. Systematica has stated that they did not use a placement agent during fundraising, however in any case, placement fees would not be payable by the fund.

Pharo Gaia Fund – NM PERA committed \$40 million to Pharo Gaia Fund a Portable Alpha allocation. Pharo Management has stated that they did not use a placement agent during fundraising, however in any case, placement fees would not be payable by the fund.

Pacific Alliance Asia Opportunity Fund – NM PERA committed \$70 million to Pacific Alliance Asia Opportunity Fund a 2020 vintage year in the Portable Alpha allocation. PAG has stated that they did not use a placement agent during fundraising, however in any case, placement fees would not be payable by the fund.

Glazer Enhanced Fund – NM PERA committed \$40 million to Dorsal Enhanced Fund a Portable Alpha allocation. Glazer Capital Management has stated that they did not use a placement agent during fundraising, however in any case, placement fees would not be payable by the fund.

Dorsal Fund – NM PERA committed \$70 million to The Dorsal Fund a Portable Alpha allocation. Dorsal Capital Management has stated that they did not use a placement agent during fundraising, however in any case, placement fees would not be payable by the fund.

Madison Dearborn Capital Partners VIII, L.P. – NM PERA committed \$75 million to Madison Dearborn Capital Partners VIII, L.P. a 2019 vintage year in the Equity allocation. Madison Dearborn Capital Partners has stated that a placement agent was used for certain funds, but these fees are offset 100% by managements fees.

TSSP NM Contingent Capital Fund NM PERA committed \$150 million to TSSP NM Contingent Capital Funs a 2019 vintage year in the Private Credit allocation. TPG Sixth Street Partners Group has stated that they did not use a placement agent during fundraising, however in any case, placement fees would not be payable by the fund.

Petershill IV, L.P. – NM PERA committed \$70 million to Petershill IV, L.P. a 2019 vintage year in the Equity allocation. The Goldman Sachs Group, Inc. AIMS Group has stated that it did not use placement agents during the fundraising period.

Rockwood Capital Real Estate Partners Fund XI, L.P. – NM PERA committed \$50 million to Rockwood Capital a 2019 vintage year in the Real Estate allocation. Rockwood Capital has stated that it does use placement agent fees in some situations. However, all placement agent fees are incurred by the General Partner or its affiliates and not by the Fund.

Montagu VI, LP – NM PERA committed \$75 million to Montagu Private Equity LLP a 2019 vintage year in the Real Estate allocation. Montagu

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Private Equity LLP has stated that it did not use placement agents during the fundraising period.

Ardian Infrastructure V, L.P. – NM PERA committed €60 million to Ardian Group a 2018 vintage year Real Assets allocation. Ardian Group has stated that it does use placement agent fees in some situations. However, all placement agent fees are incurred by the General Partner or its affiliates and not by the Fund. Axiom Emerging Markets Equity Fund. – Axiom Investors received final approval in the quarter for an investment of \$215 million in the Liquid Equity Assets allocation. Axiom Investors did not use placement agents for our investment in the fund.

Aermont Capital Real Estate Fund IV SCPs –NM PERA committed €50 million to Aermont Capital LLP a 2018 vintage year in the Real Estate allocation. Aermont Capital LLP has stated that the Fund will pay all fees, costs and expenses relating to the formation and launch of the Fund, the General Partner and any Feeder Fund provided that the amount of such costs and expenses will not exceed 0.15% of Total Commitments (inclusive of VAT). Any fees, costs and expenses in excess of such amount will be borne by Aermont

Harrison Real Estate Partners VII, L.P. – NM PERA committed \$75 million to Harrison Street Real Estate Capital, LLC a 2018 vintage year in the Real Estate allocation. Harrison Street Real Estate Capital, LLC has confirmed that no placement agents were used for this commitment.

TCV X, L.P. – NM PERA has committed \$70 million to Technology Crossover Ventures a 2018 vintage year in the Equity allocation. Technology Crossover Ventures has stated that all placement agent fees will be borne by the GP.

Kayne Anderson Rudnick Investment Management LLC – NM PERA committed up to \$350 million to Kayne Anderson Rudnick Investment Management LLC a 2018 vintage year in the Equity allocation. Kayne Anderson Rudnick Investment Management LLC has confirmed that no placement agents were used for this commitment.

Pine Bridge High Yield Fixed Income – NM PERA committed \$350 million to PineBridge Investments a 2018 vintage year in the Risk Mitigation allocation. PineBridge Investments has confirmed that no placement agents were used for this commitment.

Rock Point Growth and Income Real Estate Fund III, L.P. – NM PERA committed \$60 million to Rockpoint Group LLC a 2018 vintage year in the Equity allocation. Rockpoint Group LLC may engage one or more placement agents on a limited basis for engagement solely with a small number of investors outside of the United States. If a placement agent fee is paid in connection with Growth and Income Fund III, the General Partner will be responsible for all such fees and expenses.

Warburg Pincus Global Growth, L.P. – NM PERA committed \$115 million to Warburg Pincus LLC a 2018 vintage year in the Equity allocation. Warburg Pincus LLC does not expect to engage a placement agent in the U.S., although the firm has engaged financial institutions to sponsor or arrange feeder funds that target high net worth individuals to invest in WPGG. In connection with the engagements, the firm may pay customary fees to such financial institutions. Any fees paid to such financial institutions would be borne by Warburg Pincus and/or the respective feeder fund.

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Kelso Investment Associates X, L.P. – NM PERA committed \$60 million to Kelso Investment Associates X, L.P. a 2018 vintage year Equity allocation. Kelso & Company has confirmed that it did use placement agents for this commitment. It was stated that “Kelso will bear the economic burden of all placement agent fees.”

Acadian Asset Management LLC – NM PERA committed \$285 million to Acadian Asset Management LLC a 2018 vintage year in the Equity allocation. Acadian Asset Management has confirmed that no placement agents were used for this commitment.

Patria Private Equity VI, L.P. – NM PERA committed \$50 million to Patria Finance Limited a 2018 vintage year Real Assets allocation. Patria Finance Limited has confirmed that no placement agents were used for this commitment.

Jordan Resolute IV, L.P. – NM PERA committed \$65 million to The Jordan Company a 2018 vintage year in the Real Assets allocation. The Jordan Company has confirmed that no placement agents were used for this commitment.

PIMCO Liquid Real Assets Completion Portfolio – NM PERA committed \$300 million to Pacific Investment Management Company a 2017 vintage year in the Real Assets allocation. There was no placement agent was engaged.

NGP Natural Resources XII, L.P. – NM PERA committed \$75 million to Natural Gas Partners a 2017 vintage year in the Real Assets allocation. Natural Gas Partners has confirmed that placement fees will be paid by the fund. However, all placement agent fees paid by the fund will be offset.

Altaris Health Partners IV, L.P. – NM PERA committed \$50 million to Altaris Health Partners a 2017 vintage year in the Private Equity allocation. Altaris Health Partners has confirmed that no placement agent was engaged.

Altaris Constellation Partners IV, L.P. – NM PERA committed \$25 million to Altaris Health Partners a 2017 vintage year in the Private Equity allocation. Altaris Constellation Partners has that there was no placement agent used for fundraising

CVC Capital Partners VII, L.P. – NM PERA committed €100 million to CVC Capital Partners a 2017 vintage year in the Real Estate allocation. CVC Capital Partners has confirmed that CVC Funding, LLC is to conduct activities as a distributor and/or placement agent for private funds managed by or otherwise affiliated with CVC Credit Partners or a CVC Entity. The Distributor does not sit within the same corporate group as the General Partner. No placement agent fees, or expenses will be borne by the Fund.

EnCap Energy Capital Fund XI, L.P. – NM PERA committed \$100 million to EnCap Investments. L.P. a 2017 vintage year in the Private Equity allocation. EnCap Investments. L.P. has confirmed that there was no placement agent used for fundraising.

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Cerberus Global Residential Mortgage Opportunity Fund, L.P. – NM PERA committed \$100 million to Cerberus Capital Management a 2017 vintage year in the Credit allocation. Cerberus Capital Management has confirmed that there was no placement agent used for fundraising.

Eagle Point Credit Partners, L.P. – NM PERA committed \$100 million to Eagle Point Credit Partners, L.P. a 2017 vintage year in the Credit allocation. Eagle Point Credit Partners, L.P. has confirmed that there was no placement agent used for fundraising.

Meridiam Infrastructure North America Fund III, LP. – NM PERA committed \$75 million to Meridiam Infrastructure Partners a 2017 vintage year in the Real Assets allocation. Meridiam Infrastructure Partners has confirmed that they have used CL to act as placement agent for the Fund. Meridiam or its affiliates will bear the cost of all placement fees.

Onex Partners V, L.P. – NM PERA committed \$75 million to Onex Partners Manager LP a 2017 vintage year in the Private Equity allocation. Onex Partners Manager LP Partners has confirmed that Credit Suisse to act as placement agent for the Fund. Meridiam or its affiliates will bear the cost of all placement fees. 100% of any advisory, monitoring, transaction, topping, break-up, or directors' fees and other fees received, including placement agent fees will be offset by management fees.

Cheyne Real Estate Credit Fund V –Opportunistic L.P. – NM PERA committed \$90 million to Cheyne Real Estate Credit Fund V –Opportunistic L.P. a 2016 vintage year in the Credit allocation. Cheyne Capital has communicated that there was no placement agent used for fundraising

Rockpoint Growth and Income Real Estate Fund II – NM PERA committed \$75 million to Rockpoint Growth and Income Real Estate Fund II, L.P a 2017 vintage year in the Real Estate allocation. Rockpoint Group, L.L.C. has confirmed that Hodes Weill UK LLP on a limited basis for engagement solely with a small number of investors outside of the United States. If a placement agent fee is paid in connection with Growth and Income Fund II, the General Partner will be responsible for all such fees and expenses.

NewRock Core Real Estate (Rockwood Capital) – NM PERA committed \$150 million to NewRock a 2017 vintage year in the Real Estate allocation. Rockwood Capital, L.L.C. has communicated that there was no placement agent used for fundraising.

GEM Realty Evergreen Fund, L.P. –NM PERA committed \$100 million to GEM Realty Evergreen Fund, L.P. a 2017 vintage year in the Real Estate allocation. GEM Realty Capital, Inc. has confirmed that they have not engaged a private placement agent to assist with its current fundraising efforts.

Petershill Private Equity L.P. – NM PERA committed \$150 million to Petershill Private Equity LP. a 2017 vintage year in the illiquid Private Equity allocation. GSAM –Petershill Alternative Investments & Manager Selection (AIMS) has communicated that there was no placement agent used for fundraising.

Antin Infrastructure Partners III, L.P. – NM PERA committed \$76 million to Antin Infrastructure Partners III, L.P. a 2017 vintage year in the

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Real Assets allocation. Antin Infrastructure Partners has confirmed that Campbell Lutyens & Co. Ltd are engaged as placement agent. The fee terms are as follows: GP will incur all costs associated with the hiring of said placement agent.

Tennenbaum Capital Partners, Direct Lending Fund of One – NM PERA committed \$200 million to Tennenbaum Capital Partners, Direct Lending Fund of One a 2017 vintage year the Credit allocation. Tennenbaum Capital Partners has they did not engage a placement agent or third-party marketer with respect to the NM PERA commitment.

RCP Small & Emerging Manager Fund of One – NM PERA committed \$75 million to RCP Small & Emerging Manager Fund of One a 2017 vintage year in the Global Equity allocation. RCP Advisors has confirmed that they did not engage a placement agent or third-party marketer with respect to the NM PERA commitment.

Napier Park Global Capital Specialized & Complex Credit – NM PERA committed \$300 million to Napier Park Global Capital Specialized & Complex Credit a 2016 vintage year in the Credit allocation. Napier Park Global Capital (US) has confirmed that they did not engage a placement agent or third-party marketer with respect to the NM PERA commitment.

FountainVest China Capital Partners III, L.P. – NM PERA committed \$83 million to FountainVest China Capital Partners III, L.P. a 2016 vintage year in the Global Equity allocation. FountainVest Advisors Ltd. has confirmed that UBS are engaged as placement agent. The fee terms are as follows: FountainVest believes that the amount that will be paid to UBS which relates to NM PERA's investment is between 0.3% and 1.75% of NM PERA's commitment. The actual dollar amount of placement fees payable being US\$685,201. As per the LPA, as the entire placement agent fee is not treated as a fund expense but a GP expense, NM PERA will in effect be paying US\$0 to the placement agent.

Harrison Street Real Estate Partners VI, L.P. – NM PERA committed \$75 million to Harrison Street Real Estate Partners VI, L.P. a 2016 vintage year in the Real Estate allocation. Harrison Street Real Estate Capital, LLC has confirmed that they did not engage a placement agent or third-party marketer with respect to the NM PERA commitment.

Tillridge Global Agribusiness Partners II, L.P. – NM PERA committed \$75 million to Tillridge Global Agribusiness Partners II, L.P. a 2016 vintage year in the Real Assets allocation. Tillridge is a NGP affiliate, a 35% owner. Tillridge Capital Partners, LLC has confirmed that they did not engage a placement agent or third-party marketer with respect to the NM PERA commitment.

Charterhouse Capital Partners X, L.P. – NM PERA committed \$117 million to Charterhouse Capital Partners X, L.P. a 2016 vintage year in the Illiquid Credit allocation Charterhouse Capital Partners LLP LLC has confirmed that they did not engage a placement agent or third party marketer with respect to the NM PERA commitment.

ACM Fund II, LLC. – NM PERA committed \$40 million to ACM Fund II, LLC. a 2016 vintage year in the Real Assets allocation. ACM Management Company, LLC. ACM is working with Equilibrium Capital to fundraise for Fund II. Equilibrium Capital is a founding member of ACM, a significant

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minority shareholder and a member of the Investment and Management Committees. For the current Fund, ECS will receive 1.5 percent of total committed capital paid over two years, as compensation for these services. For Fund I, ECS was also paid 1.5 percent of total committed capital, paid over three years, for these services. No placement fees will be paid by the Fund. The GP will pay placement costs out of its management fee. The amount relating to NM PERA commitment of \$40 million is therefore \$600,000.

DRC European Real Estate Debt Fund III, L.P. – NM PERA committed \$73 million to DRC European Real Estate Debt Fund III, L.P. a 2016 vintage year in the Private Credit allocation. DRC Capital Partners has confirmed that Evercore Partners International are engaged as placement agent. The fee terms are as follows: “New” Capital Commitments (new investors & element of re-ups exceeding Fund II commitment level) – 1.5%. “Existing” Capital Commitments (existing investors with re-ups up to Fund II commitment level) – 1.0%

Starwood XI Management, L.P. – NM PERA committed \$75 million to Starwood XI Management, L.P. a 2016 vintage year in the Real Estate allocation. Starwood Capital has confirmed that they did not engage a placement agent or third-party marketer with respect to the NM PERA commitment.

Brookfield Infrastructure Fund III, L.P. – NM PERA committed \$75 million to Brookfield Infrastructure Fund III, L.P. a 2016 vintage year in the Real Assets allocation. Brookfield Asset Management Inc. has confirmed that they did not engage a placement agent or third-party marketer with respect to the NM PERA commitment.

TCV IX Fund – NM PERA committed \$65 million to TCV IX Fund, L.P. a 2016 vintage year in the Private Equity allocation. Technology Crossover Ventures has confirmed that they did not engage a placement agent or third-party marketer with respect to the NM PERA commitment.

PineBridge Passport I, L.P. – NM PERA committed \$150 million to PineBridge Passport I, L.P. a 2016 vintage year in the Private Equity allocation. PineBridge has confirmed that they did not engage a placement agent or third-party marketer with respect to the NM PERA commitment.

Carlyle Power Partners II, L.P. – NM PERA committed \$65 million to Carlyle Power Partners II, L.P. a 2015 vintage year in the Private Equity allocation. Carlyle has confirmed that they did not engage a placement agent or third-party marketer with respect to the NM PERA commitment.

Warburg Pincus Private Equity XII, L.P. – NM PERA committed \$85 million to Warburg Pincus Private Equity XII, L.P. a 2015 vintage year in the Private Equity allocation. Warburg Pincus has confirmed that they did not engage a placement agent or third-party marketer with respect to the NM PERA commitment.

Madison Realty Capital Debt Fund III, L.P. – NM PERA committed \$50 million to Madison Realty Capital Debt Fund III, L.P. a 2015 vintage year in the Real Estate allocation. Madison has confirmed that they did not engage a placement agent or third-party marketer with respect to the NM PERA commitment.

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Century Focused Fund IV, L.P. – NM PERA committed \$30 million to Century Focused Fund IV, L.P. a 2015 vintage year in the Private Equity allocation. Century Capital Management has confirmed that they did not engage a placement agent or third-party marketer with respect to the NM PERA commitment.

Trinity Ventures XII, L.P. – NM PERA committed \$30 million to Trinity Ventures XII, L.P. a 2015 vintage year in the Private Equity allocation. Trinity Ventures has confirmed that they did not engage a placement agent or third-party marketer with respect to the NM PERA commitment.

RRJ Capital Master Fund III, L.P. – NM PERA committed \$65 million to RRJ Capital Master Fund III, L.P. a 2015 vintage year in the Private Equity allocation. RRJ Capital III Ltd. has confirmed that they did not engage a placement agent or third-party marketer with respect to the NM PERA commitment.

Rockwood X, L.P. – NM PERA committed \$60 million to Rockwood X, L.P. a 2015 vintage year in the Real Estate allocation. Rockwood Capital has confirmed that they did not engage a placement agent or third-party marketer with respect to the NM PERA commitment.

Ardian Infrastructure IV, L.P. – NM PERA committed \$69 million to Ardan Infrastructure IV, L.P. a 2015 vintage year in the Real Assets allocation. Ardan has confirmed that they did not engage a placement agent or third-party marketer with respect to the NM PERA commitment.

Atalaya Special Opportunities Fund VI, L.P. – NM PERA committed \$50 million to Atalaya Special Opportunities Fund VI, L.P. a 2015 vintage year in the Private Equity-Credit allocation. Atalaya Capital Management has confirmed that they did not engage a placement agent or third-party marketer with respect to the NM PERA commitment.

Charterhouse Capital Partners X, L.P. – NM PERA committed \$117 million to Charterhouse Capital Partners X, L.P. a 2015 vintage year in the Private Equity allocation. Charterhouse Capital Partners LLP has confirmed that they did not engage a placement agent or third-party marketer with respect to the NM PERA commitment.

Athyrium Opportunities Fund II, L.P. – NM PERA committed \$57.9 million to Athyrium Opportunities Fund II, L.P. a 2015 vintage year in the Private Equity allocation. Neuberger Berman Alternatives Advisers LLC and its affiliates (“Neuberger Berman”) provide sub-advisory services and other ancillary services to Athyrium Capital Management LLC, including assistance with fundraising and marketing of the Fund. For investors introduced by Neuberger Berman, Neuberger Berman typically receives approximately 60% of one year’s management fee, paid out over a three-year period. Such fees are not paid by the fund, rather out of the management fee collected by Athyrium Capital Management, LLC. Neuberger Berman, LLC. is a FINRA regulated broker dealer.

KSL Capital Partners IV, L.P. – NM PERA committed \$60 million to KSL Capital Partners IV, L.P. a 2015 vintage year in the Real Estate allocation. KSL Capital Partners, LLC has confirmed that they did not engage a placement agent or third-party marketer with respect to the NM PERA commitment.

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Garrison Opportunity Fund IV-A, LLC – NM PERA committed \$60 million to Garrison Opportunity Fund IV-A, LLC a 2014 vintage year in the Private Equity allocation. Garrison Investment Group confirmed that they did not engage a placement agent or third-party marketer with respect to the NM PERA commitment.

Harrison Street Real Estate Partners V, L.P. – NM PERA committed \$45 million to Harrison Street Real Estate Partners V, L.P. a 2014 vintage year in the Real Estate allocation. Harrison Street confirmed that they did not engage a placement agent or third-party marketer with respect to the NM PERA commitment.

Paine & Partners Capital Fund IV, L.P. – NM PERA committed \$45 million to Paine & Partners Capital Fund IV, L.P. a 2014 vintage year in the Real Assets allocation. Paine & Partners confirmed that they did not engage a placement agent or third-party marketer with respect to the NM PERA commitment.

Kelso Investments Associates IX – NM PERA committed \$60 million to Kelso Investment Associates IX a 2014 vintage year in the Private Equity allocation. Kelso disclosed that TransPacific Group LLC and TransPacific Group (Asia) Ltd will act as a placement agent in relation to the targeted marketing of limited partner interests in KIA IX to certain specified prospective investors in East Asia and Hong Kong & China respectively. Kelso was introduced to Mark Mason, the founder of the TransPacific companies, by a former executive of a limited partner. KTB Investment & Securities Co., Ltd. is the sub-agent in Korea. The placement agent fee is 100% offset to management fees.

KKR Global Infrastructure Fund II – NM PERA committed \$50 million KKR Global Infrastructure Fund a 2014 vintage year in the Real Assets allocation. KKR confirmed that they did not engage a placement agent or third-party marketer with respect to the NM PERA commitment.

Natural Gas Partners XI – NM PERA committed \$50 million to Natural Gas Partners XI a 2014 vintage year in the Real Assets allocation. NGP confirmed that they did not engage a placement agent or third-party marketer with respect to the NM PERA commitment.

Starwood Global Opportunity X – NM PERA committed \$60 million to Starwood Global Opportunity X a 2014 vintage year for the Real Estate allocation. Starwood confirmed that they did not engage a placement agent or third-party marketer with respect to the NM PERA commitment.

EnCap Flatrock Midstream Energy III – NM PERA committed \$30 million to EnCap Flatrock III a 2014 vintage year for the Real Asset allocation. EnCap disclosed that no placement agent or third-party marketer was used.

Harvest MLP – NM PERA committed \$140 million a 2014 vintage year in the Real Assets allocation. Harvest disclosed that no placement agent or third-party marketer was used.

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DRC European Real Estate Debt Fund II – NM PERA committed £26 million to DRC a 2013 vintage year fund in the Real Estate allocation. DRC engaged EverCore Private Funds Group for the marketing of ERED II in North America. The GP pays up to 2% on amounts raised by Evercore payable in installments over 3 years, or up to 520,000 on PERA’s £26 million commitment. The GP pays the placement fee.

Onex Partners IV, LP – NM PERA committed \$45 million to Onex IV a 2013 vintage year fund in the US buyout allocation. Onex engage Credit Suisse for the marketing of Fund IV. Onex pays a flat fee. The GP pays the placement fee.

Blackstone Real Estate Partners VII – NM PERA committed \$35 million to Blackstone VII a 2012 vintage year fund in the Real Estate allocation. Blackstone engaged Park Hill Group LLC for the marketing of BREP VII. Although Blackstone engaged Park Hill in connection for certain clients, Park Hill was not used in connection with PERA’s commitment, thus PERA did not pay any placement fees.

Gilde Buyout Fund IV – NM PERA committed €15 million Euro to Gilde IV a 2011 vintage year fund in the non-US buyout allocation. Gilde engaged MVision for the marketing of Fund IV. Gilde pays a 0.35% fee on aggregate commitments, or €52,500 on PERA’s €15 million commitment. The GP pays the placement fee.

Selene Residential Mortgage Opportunity Fund II – NM PERA committed \$20 million to Selene II a 2011 vintage year fund in the Real Estate allocation. Selene engaged Capstone Partners for the marketing of Fund II. Selene pays a 1% fee, or \$200,000 on PERA’s \$20 million commitment. The fee is offset by the management fee.

Blackstone Real Estate Partners Europe III – NM PERA committed \$25 million to BREP Europe III a 2008 vintage year fund in the Real Estate allocation. Blackstone engaged Park Hill Group LLC for the marketing of BREP Europe III. BREP’s agreement is to pay Park Hill 1% on aggregate commitments, or \$250,000 on PERA’s \$25 million commitment.

Onex Partners III – NM PERA committed \$25 million to Onex III a 2008 vintage year fund in the Private Equity buyout allocation. Onex engaged Credit Suisse for the marketing of Fund III. The approximate fee paid on PERA’s \$25 million commitment was \$325,000.

Selene Residential Mortgage Opportunity Fund I – NM PERA committed \$30 million to Selene I, a 2008 vintage year fund in the Real Estate allocation. Selene engaged Capstone Partners for the marketing of Fund II. Selene pays a 1% fee, or \$300,000 on PERA’s \$30 million commitment. The fee is offset by the management fee.

Jordan Resolute Fund II – NM PERA committed \$25 million to Jordan Resolute II a 2007 vintage year fund in the Private Equity buyout allocation. Jordan engaged Credit Suisse for the marketing of Fund II. Jordan pays Credit Suisse 0.5%, or \$113,354 on PERA’s \$25 million commitment.

Kelso Investment Associates VIII, L.P. – NM PERA committed \$30 million to Kelso III a 2007 vintage year fund in the Private Equity buyout

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allocation. Kelso engaged Credit Suisse for the marketing of Fund VIII. Kelso pays Credit Suisse 0.143%, or \$43,045 on PERA's \$30 million commitment.

Wayzata Opportunities Fund II, L.P. – NM PERA committed \$30 million to Wayzata II a 2007 vintage year fund in the distressed private equity allocation. Wayzata engaged Park Hill Group LLC for the marketing of Fund II. Wayzata pays a fee of 0.35% on aggregate commitments, or \$105,000 on PERA's \$30 million commitment. Wayzata II is now classified as an Illiquid Credit manager.

Cerberus Institutional Partners Series IV, L.P. – NM PERA committed \$25 million to Cerberus IV a 2006 vintage year fund in the distressed Private Equity allocation. Cerberus engaged Monument Group for the marketing of Fund IV.

Coller International Partners V, L.P. – NM PERA committed \$25 million to Coller V a 2006 vintage year fund in the Private Equity portfolio. Coller engaged Credit Suisse for the marketing of Fund V.

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Additional Information

Benchmarks

2022 - 2023 SAA changes											
Composites	4/1/2021 - 12/31/2022						Composites	12/31/2022 - Present			
	SAA	Policy Portfolio Targets	Composite %	Custom Benchmark Membership %				SAA	Policy Portfolio Targets	Composite %	Custom Benchmark Membership %
Global Equity	35.50%	35.50%	100.00%	100.00%			Global Equity	38.00%	38.00%	100.00%	100.00%
Global Public Stock	19.50%	28.50%	54.93%	80.28%		MSCI ACWI IMI (\$net)	Global Public Stock	16.00%	33.00%	42.11%	86.84%
Global Low Volatility Equity	7.00%	7.00%	19.72%	19.72%		MSCI ACWI Minimum Volatility (\$net)	Global Low Volatility Equity	5.00%	5.00%	13.16%	13.16%
Private Equity	9.00%		25.35%				Private Equity	17.00%		44.74%	
Risk Reduction & Mitigation	19.50%	19.50%	100.00%	100.00%			Risk Reduction & Mitigation	17.00%		100.00%	100.00%
Core Fixed Income	12.00%	17.00%	61.54%	87.18%		Barclays U.S. Aggregate	Core Fixed Income	17.00%		100.00%	100.00%
BONDS PLUS	5.00%		25.64%	12.82%		Barclays Global Aggregate (Hedged)					
Global Core Fixed Income	2.50%	2.50%	12.82%								
Credit Oriented Fixed Income	15.00%	15.00%	100.00%	100.00%			Credit Oriented Fixed Income	19.00%	19.00%	100.00%	100.00%
Liquid Credit	2.00%	12.00%	13.33%	80.00%		Barclays Global High Yield (Hedged)	Liquid Credit	4.00%	19.00%	21.05%	100.00%
ALT LIQUID CREDIT	4.00%		26.67%	20.00%		50% JP Morgan EMBI Global Diversified (\$), 50% JPM GBI (\$)	ALT LIQUID CREDIT	7.00%		36.84%	
Emerging Market Debt (\$)	3.00%	3.00%	20.00%								
Illiquid Credit	6.00%		40.00%				Illiquid Credit	8.00%		42.11%	
Real Assets	20.00%	20.00%	100.00%	100.00%	100.00%		Real Assets	18.00%	18.00%	100.00%	100.00%
Liquid Real Estate	2.00%		10.00%	10.00%	35.00%	Wilshire Global REIT	Illiquid Real Estate	7.00%	7.00%	38.89%	38.89%
Illiquid Real Estate	5.00%	7.00%	25.00%	25.00%		Wilshire Global REIT					
Liquid Real Assets	5.00%	5.00%	25.00%	10.00%	10.00%	40% Alerian - MLP Index	Liquid Real Assets	3.00%	3.00%	16.67%	16.67%
				15.00%	15.00%	60% Bloomberg Barclays - U.S. TIPS					
Illiquid Real Assets	8.00%	8.00%	40.00%	20.00%	20.00%	50% Dow Jones - Brookfield Global Infrastructure Index	Illiquid Real Assets	8.00%	8.00%	44.44%	22.22%
				20.00%	20.00%	50% Bloomberg Commodity - Commodity Index (Total Return)				22.22%	50% Dow Jones - Brookfield Global Infrastructure Index 50% Bloomberg Commodity - Commodity Index (Total Return)
Multi Risk	10.00%						Multi Risk	8.00%		100.00%	100.00%
											Wilshire Risk Parity 15%

Glossary

Term	Definition
Absolute Return	An investment in a fund with a goal of consistent positive returns, one sub-category is referred to as "market neutral"
Actual Allocation	The actual current percentage weightings of a portfolio
Alpha	A measure of performance on risk-adjusted basis. Alpha takes the volatility of a fund and compares its risk-adjusted performance to a benchmark index. The excess return of the fund relative to the return of the benchmark index is a fund's alpha.
Arithmetic Excess	Excess return calculated by simply subtracting manager's return from index return for same period
Asset Allocation Effect (Group Weight)	Variance attributable to asset allocation decisions, deviations from target policy.
Beta	Volatility of portfolio versus market. Beta = 1: portfolio will move with the market. Beta < 1: portfolio will be less volatile than market.
Duration	Duration is a measure of the price volatility of fixed income securities. The greater the duration of the product, the greater its percentage value volatility. Options include: 1) short/cash duration focus of 0-3 years; 2) intermediate duration focus of 3-5 years; 3) core/market duration focus of 5-7 years; 4) long duration focus of 7+ years.
Geometric Excess	Excess return calculated using the following formula: $(1 + \text{Manager}) / (1 + \text{Index}) - 1$
Holdings-based Attribution	US Equity, Non-US Equity, and Fixed Income tables are holdings-based. The table details various attribution subcategories which impacted each manager's performance such as: selection, weighting, duration, yield, quality, etc.
Information Ratio	A ratio of portfolio returns above the returns of a benchmark (usually an index) to the volatility of those returns. The information ratio (IR) measures a portfolio manager's ability to generate excess returns relative to a benchmark, but also attempts to identify the consistency of the investor. In other words, a measure of risk-adjusted return of actively managed portfolio. This ratio will identify if a manager has beaten the benchmark by a lot in a few months or a little every month. The higher the IR, the more consistent a manager is and consistency is an ideal trait. Defined as amount of excess return per unit of excess risk taken, as in $IR = \text{excess return ("alpha")} / \text{tracking error (excess risk)}$.
Interaction Effect (Selection)	Part of return variance that cannot be attributed solely to Asset Allocation Effect or Manager Performance. Mathematically, Interaction is the product of each group's active weight (i.e., over/underweight) and active return (i.e., out/underperformance). For example, a group with an overweight that outperformed its benchmark would contribute positively to Interaction.
Internal Rate of Return (IRR)	The discount rate often used in capital budgeting that makes the net present value of all cash flows from a particular project equal to zero. A preferred method of calculating Private Equity performance
R-squared	A statistical measure that describes how much of the fund's movements are explained by movements in an index. Its value ranges from 0 to 1.00. An R-squared of 1.00 means that all movements of a fund are completely explained by movements in the index. A fund with a low R-squared does not act much like the index.

Glossary

Term	Definition
Semi-Variance	Measure of variability (or dispersion) of all returns that fall <u>below</u> mean. Measures only downside risk, or negative asset class or alpha returns. Estimates average loss that portfolio could incur.
Sharpe Ratio	A risk-adjusted measure calculated by using standard deviation and excess return to determine reward per unit of risk. The higher the Sharpe Ratio, the better the fund's historical risk-adjusted performance. For example, the one-year Sharpe Ratio, defined as the one-year return of the product minus the risk-free rate (90 day T-Bill), divided by the standard deviation of the product returns.
Standard Deviation	A measure of variability (or dispersion) of returns around mean return. A low standard deviation (e.g., 5%) indicates returns tend to be very close to mean return, whereas high standard deviation (e.g., 20%) indicates returns can be far from mean return. A manager with a one-year return of 5% and a standard deviation of 5 indicates the range of returns for this manager will likely fall between 0% and 10% during most annual time periods.
Time Weighted Return	The actual rate of return or earnings for the particular period, adjusted for cash flow additions or deletions
Total Alpha	Total Variance: sum of Asset Allocation, Interaction, Manager Performance, and Trading.
Total Return	The return of a particular portfolio that includes both increases or decreases in asset values as well as dividends received
Tracking Error	Standard deviation of excess return. Measure of closely portfolio follows index to which it is benchmarked. Traditional actively managed portfolio has higher tracking error (i.e., >4%). Passively managed portfolio has tracking error close to zero. / A measure of the difference between returns of the portfolio and that of the benchmark it was attempting to imitate; reported as a "standard deviation percentage" difference.
Trading Effect	Difference between buy/hold and total return.
TUCS (Trust Universe Comparison Service)	A collaborative effort between Wilshire Associates and custodial organizations. Custodians submit asset positions and performance data to be pooled into universes of managed tax-exempt portfolios. TUCS is a widely accepted benchmark for the performance of institutional assets.
Variance	Refers to the amount of movement in prices of a particular portfolio; a portfolio that moves a lot has a higher variance

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