

2020 Q4 INVESTMENT SUMMARY: BOARD REPORT

MODOT & PATROL EMPLOYEES' RETIREMENT SYSTEM

February 2021

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BOSTON | ATLANTA | CHARLOTTE | CHICAGO | DETROIT | LAS VEGAS | PORTLAND | SAN FRANCISCO

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NEPC UPDATE

NEPC, LLC

2020 FOURTH QUARTER INSIGHTS AT NEPC

PRIVATE WEALTH

- Your Heirs and Wealth: Fostering Purpose
- The Election and Taxes: An Overview

ENDOWMENTS & FOUNDATIONS

- Market Chatter: Calling Tech Support Fiscal Year 2020 Mega Endowment Returns
- Peer Roundtable Series: The Balancing Act of Community Foundations
- NEPC's 2020 Higher Education COVID-19 Flash Poll

DEFINED BENEFIT

- Taking Stock: Are Pension Plans Leaving Money on the Table?
- NEPC's 2020 Defined Benefit Flash Poll: Managing a DB Plan During a Pandemic
- Taking Stock: NEPC's 2020 Q3 Pension Monitor
- Taking Stock: NEPC's 2020 October Pension Monitor
- Taking Stock: NEPC November 2020 Pension Monitor

GENERAL RESEARCH

- 2020 Third Quarter Market Thoughts
- Taking Stock: NEPC Asset Allocation Roundtable: The COVID-19 Edition
- Taking Stock: Rebalancing: The Cure for Investor Complacency
- NEPC's 2020 Hedge Fund Operational Due Diligence Survey Results
- Here's Why Investing in Fixed Income is Still Worthwhile

HEALTHCARE

- NEPC's 2020 Healthcare Operating Funds Survey Results

IMPACT INVESTING

- Taking Stock: Will the New DOL Rule Curb ESG Momentum?

WEBINAR REPLAYS

- NEPC's US Election Presentation on October 6, 2020
- NEPC's 2020 Q3 Quarterly Markets Outlook Webinar
- NEPC's Post-Election Webinar on November 5, 2020



To download NEPC's recent insights and webinar replays, visit: www.NEPC.com/insights

2020 FOURTH QUARTER UPDATES AT NEPC

We were excited to share the election of three new Partners and the promotion of four new Principals

OUR NEWEST PARTNERS



Margaret Belmondo, CIMA®



Cheneae Edwards, CPA



Judy Murphy, SPHR

OUR NEWEST PRINCIPALS



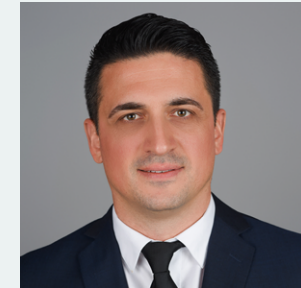
Rick Ciccione



Lynda Dennen Costello, ASA, EA



Will Forde, CFA, CAIA



Elton Thomaj, CAIA

IN CASE YOU MISSED IT



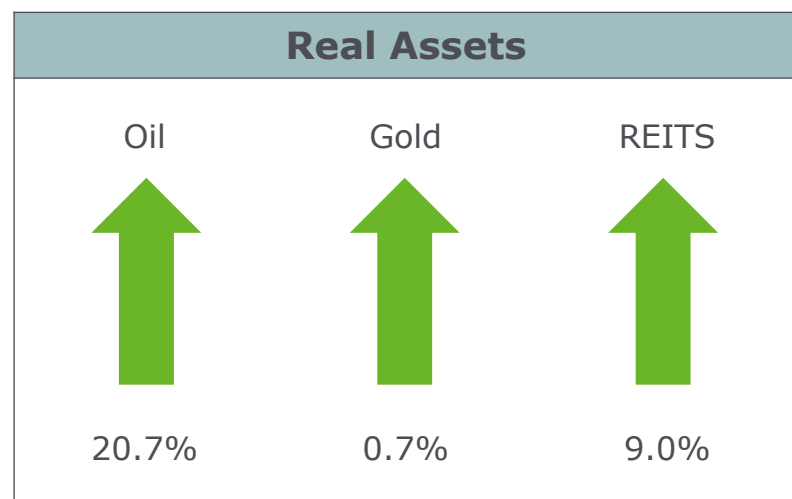
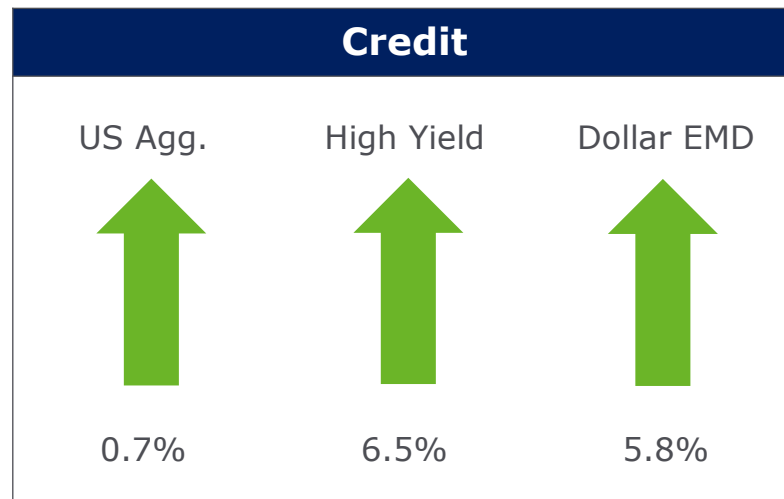
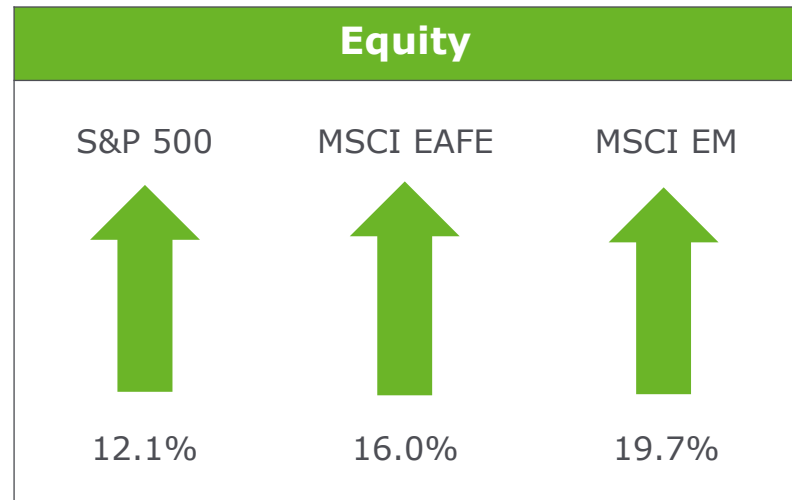
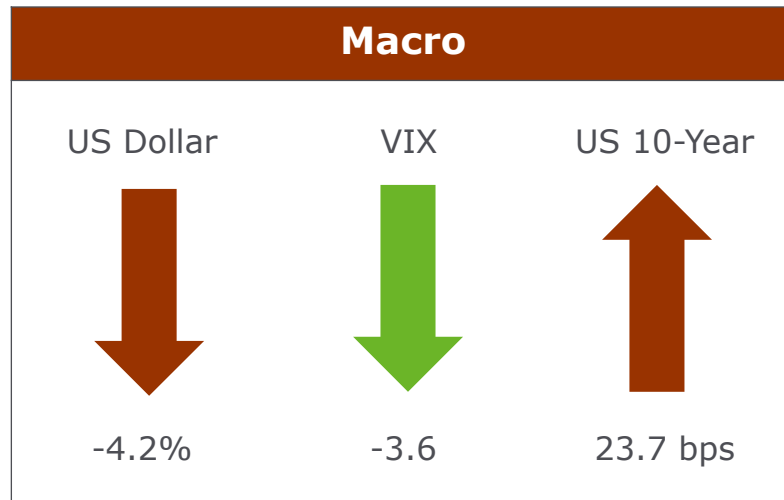
We announced that Scott Harsh, former CEO and president of FEG Investment Advisors, joined NEPC's Endowments and Foundations practice group as a principal and senior consultant



MARKET UPDATE

NEPC, LLC

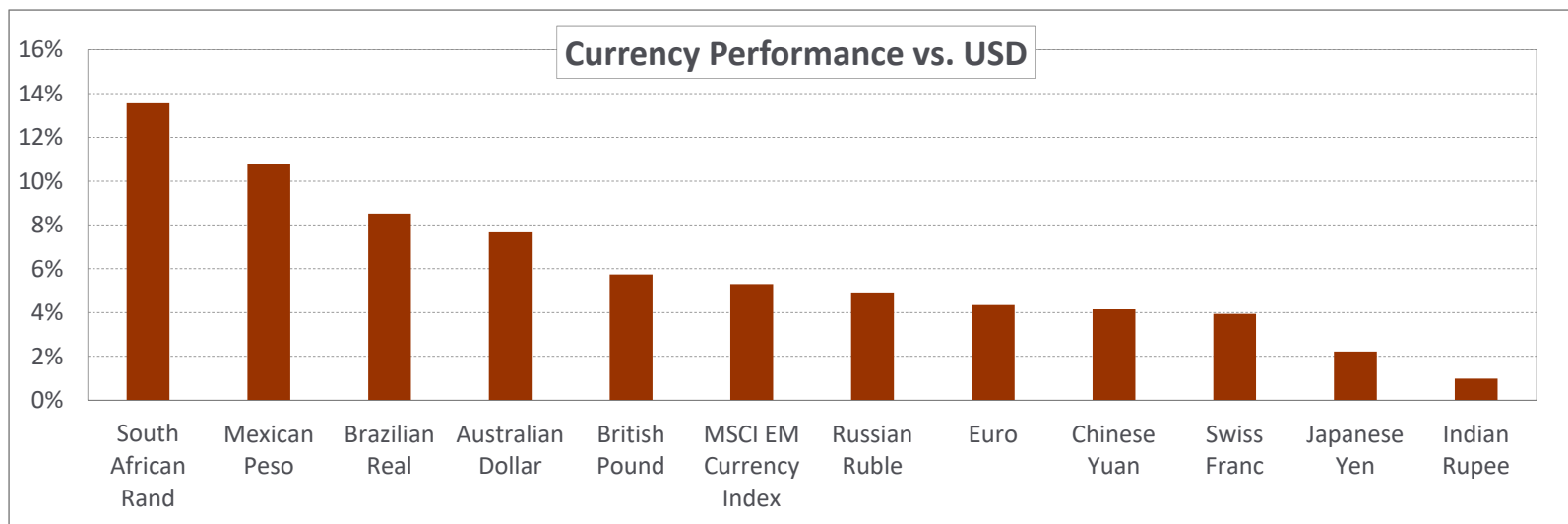
MARKET OVERVIEW



Market segment (index representation) as follows: US Dollar (DXY Index), VIX (CBOE Volatility Index), US 10-Year (US 10-Year Treasury Yield), S&P 500 (US Equity), MSCI EAFE Index (International Developed Equity), MSCI Emerging Markets (Emerging Markets Equity), US Agg (Barclays US Aggregate Bond Index), High Yield (Barclays US High Yield Index), Dollar EMD (JPM EMBI Global Diversified Index), Crude Oil (WTI Crude Oil Spot), Gold (Gold Price Spot), and REITS (NAREIT Composite Index). Source: FactSet



MACRO OVERVIEW



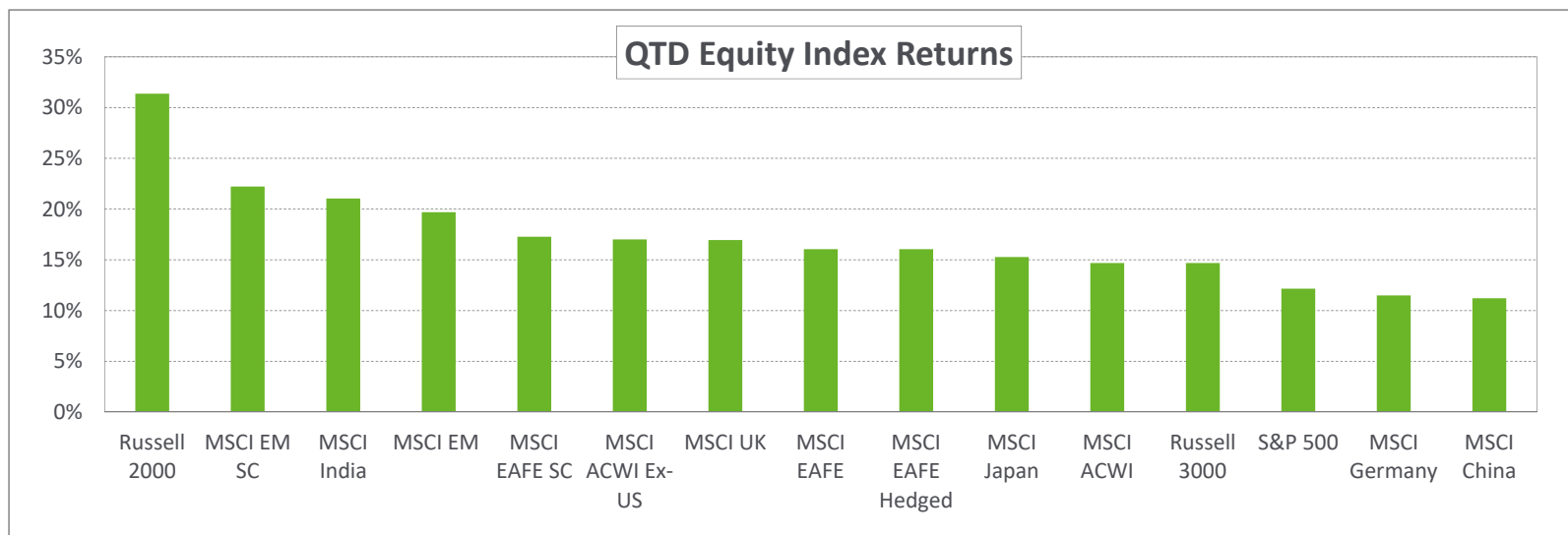
Source: MSCI, FactSet

Central Banks	Current Rate	CPI YOY	Notes from the Quarter
Federal Reserve	0.00% - 0.25%	1.2%	The Fed maintained current levels of monthly asset purchases and indicated that federal funds rate would remain near zero levels for the foreseeable future
European Central Bank	0.00%	-0.3%	The ECB increased its emergency bond-buying program by €500B to €1,850B and extended the program for nine months to the end of March 2022
Bank of Japan	-0.10%	-1.0%	The BoJ extended its pandemic support programs by six months and announced plans to review its current ultra-easy QE program to achieve its inflation target

Source: FactSet



EQUITY OVERVIEW



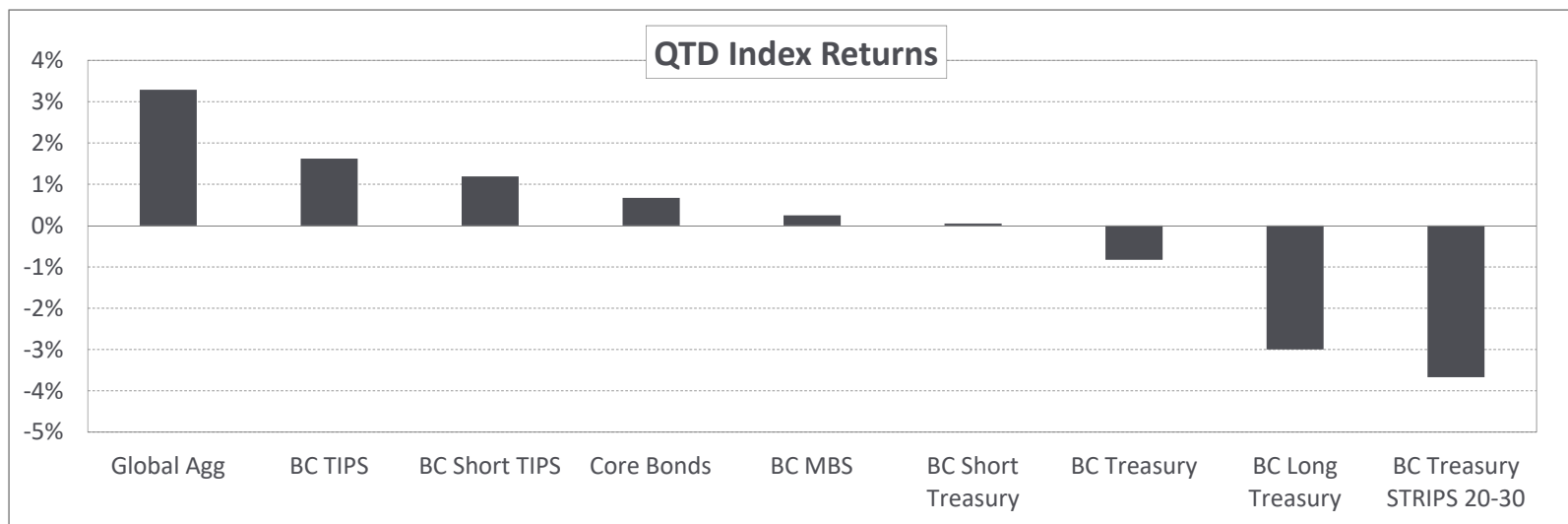
Source: S&P, MSCI, Russell, FactSet

Russell 3000 QTD Sector Returns	QTD	YTD
Technology	13.4%	46.5%
Health Care	10.1%	19.3%
Consumer Discretionary	16.2%	42.1%
Consumer Staples	7.8%	7.8%
Energy	31.9%	-28.9%
Materials & Processing	17.0%	19.2%
Producer Durables	16.9%	11.6%
Financial Services	24.5%	6.6%
Utilities	7.7%	0.3%

Source: FactSet



RATES OVERVIEW



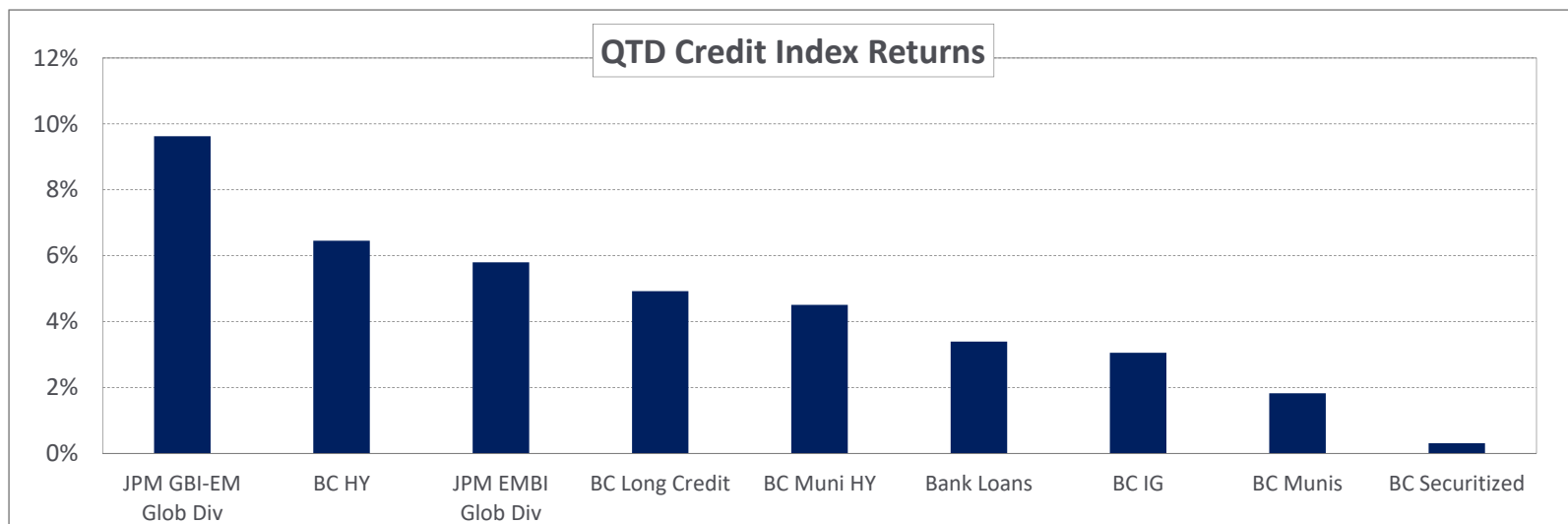
Source: S&P, MSCI, Russell, FactSet

	Previous Quarter Yield	Current Quarter Yield	\Delta
US 10-Year	0.68%	0.92%	0.24%
US 30-Year	1.45%	1.65%	0.20%
US Real 10-Year	-0.94%	-1.06%	-0.12%
German 10-Year	-0.53%	-0.58%	-0.05%
Japan 10-Year	0.03%	0.04%	0.01%
China 10-Year	3.16%	3.19%	0.03%
EM Local Debt	4.48%	4.22%	-0.26%

Source: Barclays, JPM, FactSet



CREDIT OVERVIEW



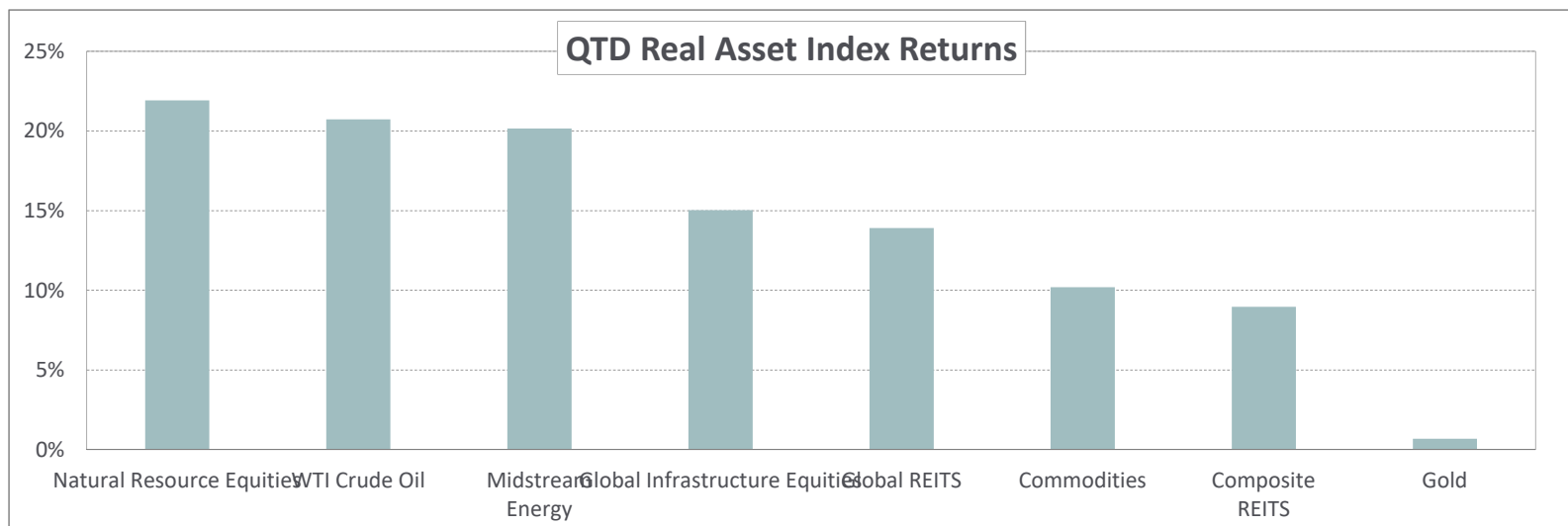
Source: S&P, MSCI, Russell, JPM, FactSet

	Previous Quarter Spread (bps)	Current Quarter Spread (bps)	\Delta	Median
BC IG Credit	136	96	-40	137
BC Long Credit	188	141	-47	176
BC Securitized	64	42	-22	49
BC High Yield	517	360	-157	479
Muni HY	454	382	-72	634
JPM EMBI Glob Div	432	352	-80	344
Bank Loans - Libor	469	374	-96	448

Source: Barclays, JPM, FactSet;
Medians calculated since 11/30/2000

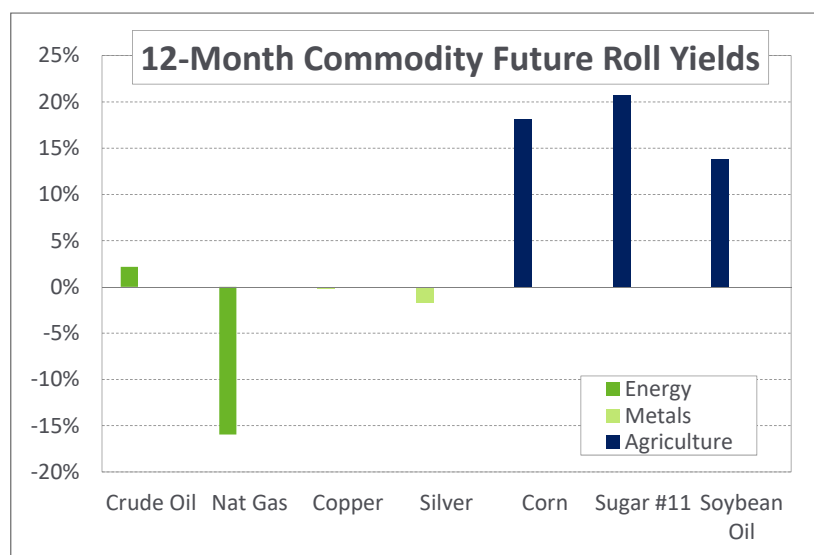


REAL ASSETS OVERVIEW



Source: S&P, MSCI, Russell, FactSet

Real Asset Yields	Previous Quarter	Current Quarter
Midstream Energy	9.9%	7.9%
Core Real Estate*	4.4%	4.3%
Composite REITS	4.1%	3.8%
Global REITS	4.8%	4.3%
Global Infrastructure Equities	4.1%	3.1%
Natural Resource Equities	4.5%	3.5%
Commodity Index Roll Yield	-6.7%	-0.1%



Source: FactSet

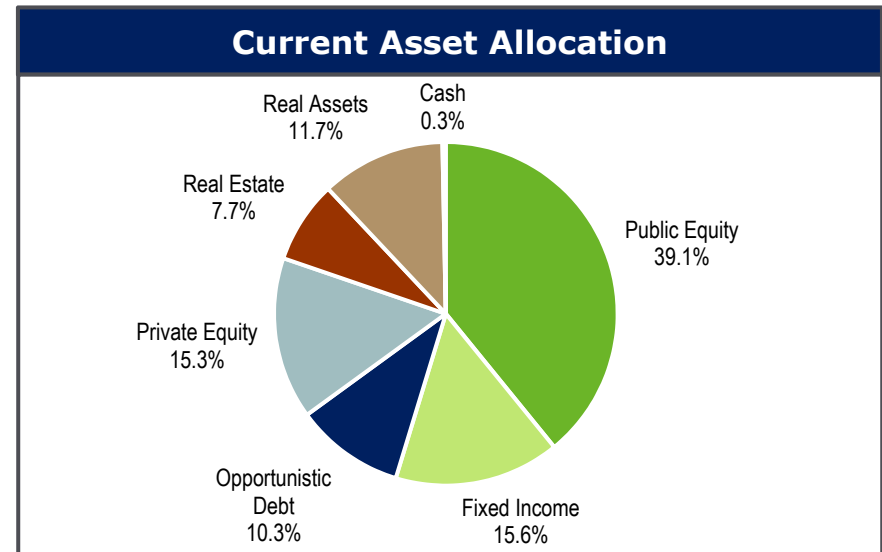
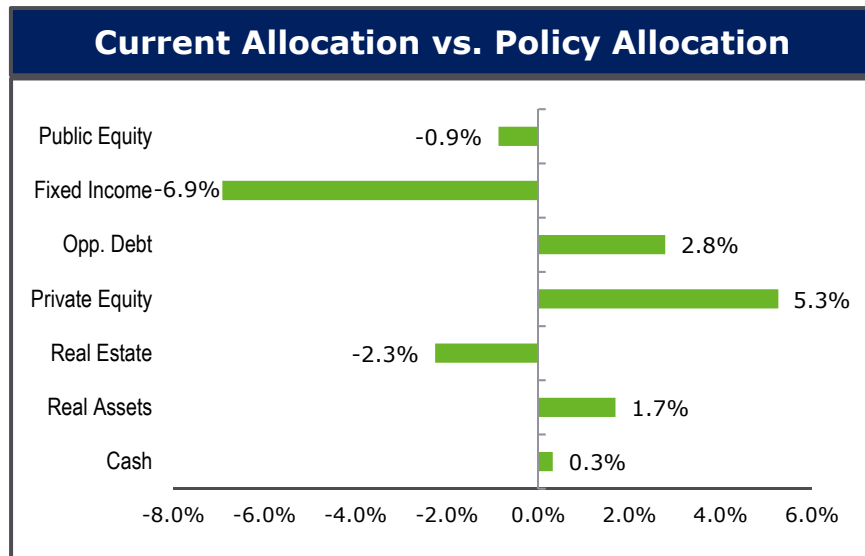
Sources: Alerian, NAREIT, Barclays, NEPC, FactSet
Core Real Estate* yields are subject to a one quarter lag



EXECUTIVE SUMMARY

NEPC, LLC

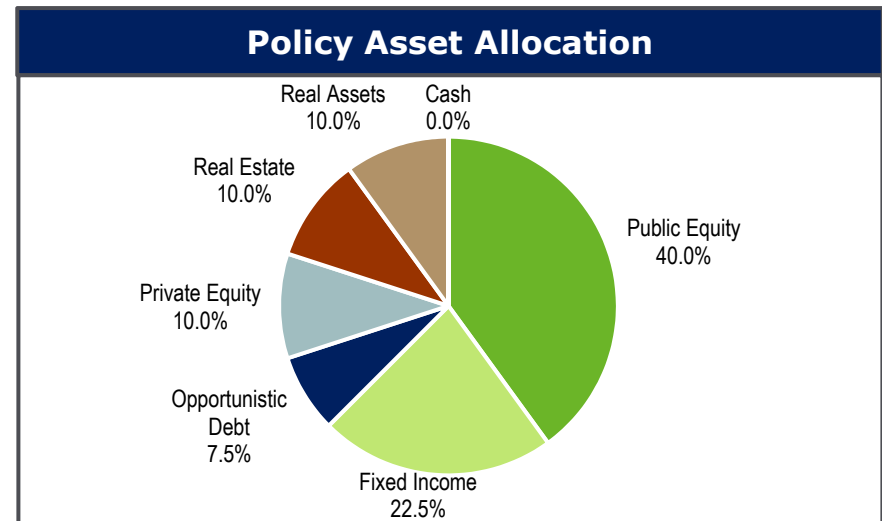
ASSET ALLOCATION – CURRENT vs. POLICY



Current Allocation vs. Policy Allocation

	Current	Policy	Current	Difference*
Public Equity	\$1,047,057,527	40.0%	39.1%	-0.9%
Fixed Income	\$416,807,501	22.5%	15.6%	-6.9%
Opportunistic Debt	\$275,164,384	7.5%	10.3%	2.8%
Private Equity	\$408,474,863	10.0%	15.3%	5.3%
Real Estate	\$207,091,661	10.0%	7.7%	-2.3%
Real Assets	\$312,904,214	10.0%	11.7%	1.7%
Cash	\$8,516,466	--	0.3%	-0.3%
Total	\$2,676,016,616	100.0%	100.0%	

*Difference between Policy and Current Allocation

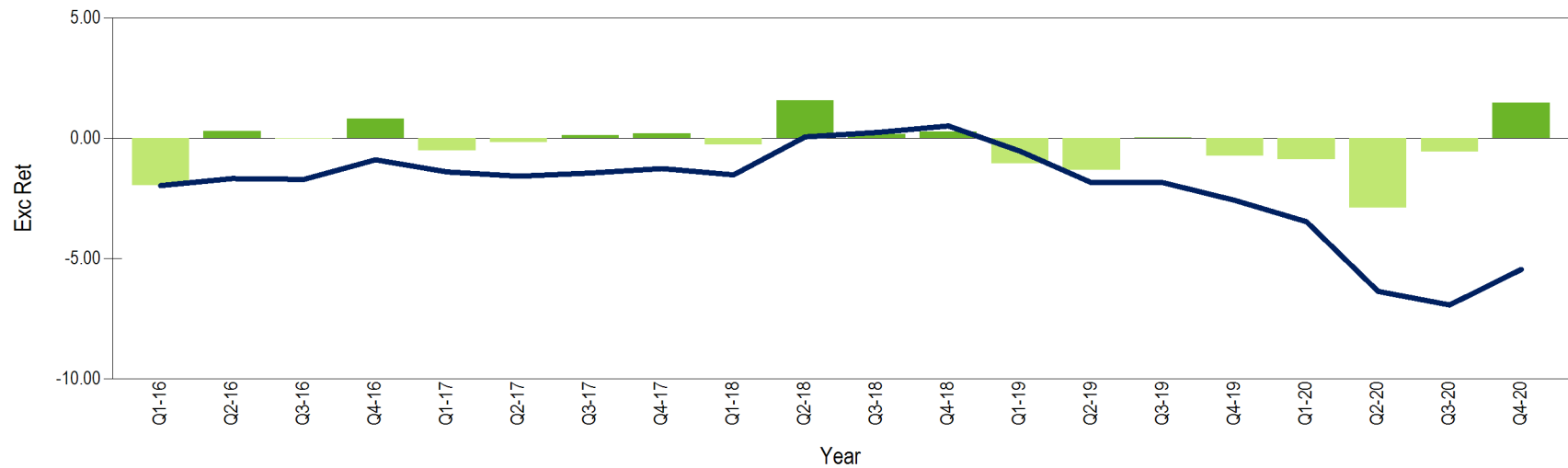


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TOTAL FUND PERFORMANCE SUMMARY

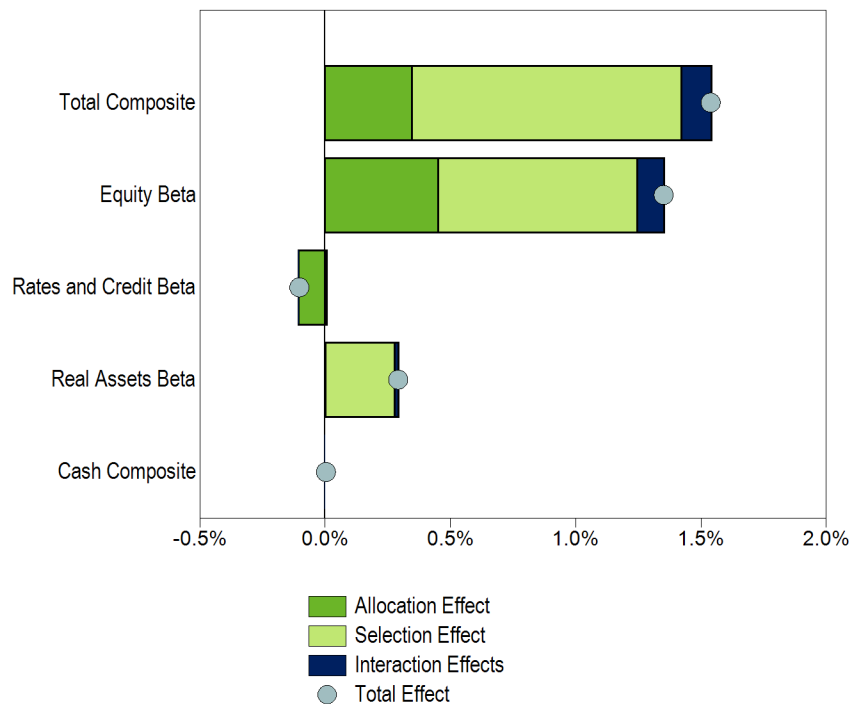
	Market Value	3 Mo	1 Yr	3 Yrs	5 Yrs	10 Yrs
Total Composite	\$2,676,016,616	9.23%	9.26%	8.01%	8.76%	8.94%
<i>Policy Index</i>		7.75%	12.46%	9.50%	9.93%	8.61%
<i>InvMetrics Public DB Net Median</i>		10.16%	12.81%	8.86%	9.76%	8.15%

Quarterly and Cumulative Excess Performance



TOTAL FUND ATTRIBUTION ANALYSIS

Attribution Effects
3 Months Ending December 31, 2020



	Wtd. Actual Return	Wtd. Index Return	Excess Return	Selection Effect	Allocation Effect	Interaction Effects	Total Effects
Equity Beta	15.5%	13.8%	1.7%	0.8%	0.2%	0.1%	1.1%
Rates and Credit Beta	2.2%	2.2%	0.0%	0.0%	0.2%	0.0%	0.2%
Real Asset Beta	2.4%	1.1%	1.3%	0.3%	-0.1%	0.0%	0.2%
Cash Composite	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Total	9.2%	7.8%	1.5%	1.1%	0.3%	0.1%	1.5%

Note: Plan attribution calculations are returns based and the results shown reflect the composites shown. As a result, the total returns shown may vary from the calculated return shown on the performance summary.

The target return shown for each composite is a custom index, based on aggregated policy indices. This policy index asset weights the underlying policy indices of each option in the plan and the respective benchmark return.

The allocation, selection, and interaction effects are calculated using the custom index described above along with the policy or target weight of each composite.

May not add due to rounding

Allocation Effect - The return attributable to the asset allocation of the portfolio

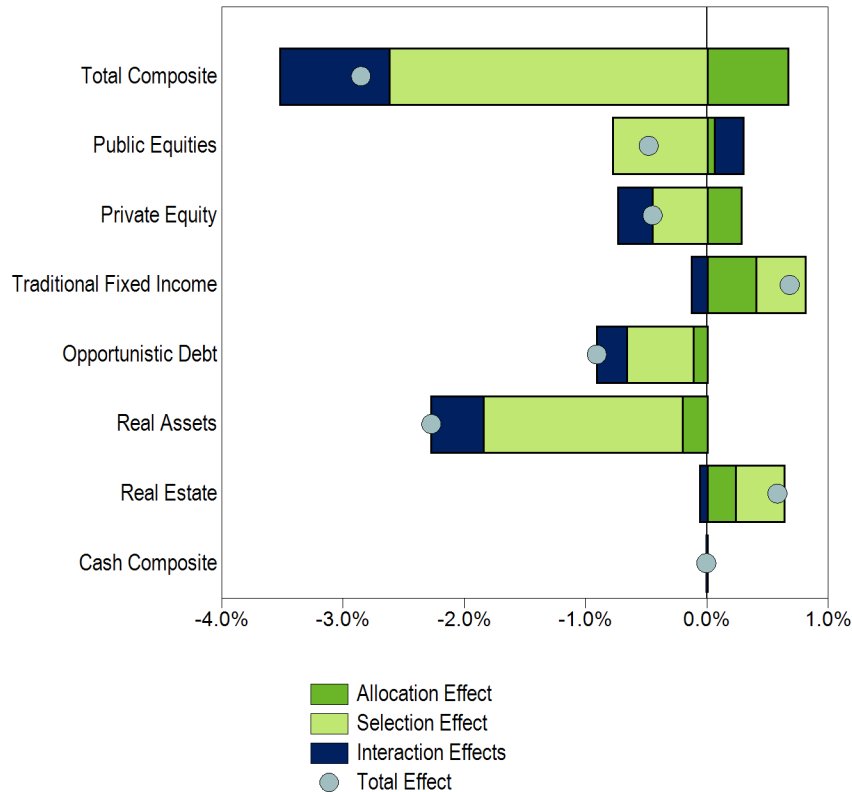
Selection Effect - The return attributable to the managers' security selection

Interaction Effect - The return attributable to the interaction between the Allocation and Selection Effects



TOTAL FUND ATTRIBUTION ANALYSIS

**Attribution Effects Relative to Policy Index
1 Year Ending December 31, 2020**



**Attribution Summary
1 Year Ending December 31, 2020**

	Wtd. Actual Return	Wtd. Index Return	Excess Return	Selection Effect	Allocation Effect	Interaction Effects	Total Effects
Public Equities	13.3%	16.3%	-3.0%	-0.8%	-0.1%	0.2%	-0.6%
Private Equity	15.9%	18.6%	-2.7%	-0.5%	0.2%	-0.2%	-0.4%
Traditional Fixed Income	10.6%	8.9%	1.7%	0.4%	0.4%	-0.1%	0.6%
Opportunistic Debt	0.7%	7.1%	-6.4%	-0.5%	-0.1%	-0.3%	-1.0%
Real Assets	-9.7%	5.4%	-15.1%	-1.6%	-0.2%	-0.4%	-2.3%
Real Estate	4.4%	0.8%	3.7%	0.4%	0.2%	-0.1%	0.5%
Cash Composite	0.5%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%
Total	9.3%	12.5%	-3.2%	-2.6%	0.4%	-0.9%	-3.2%

Note: Plan attribution calculations are returns based and the results shown reflect the composites shown. As a result, the total returns shown may vary from the calculated return shown on the performance summary.

The target return shown for each composite is a custom index, based on aggregated policy indices. This policy index asset weights the underlying policy indices of each option in the plan and the respective benchmark return.

The allocation, selection, and interaction effects are calculated using the custom index described above along with the policy or target weight of each composite.

May not add due to rounding

- Allocation Effect - The return attributable to the asset allocation of the portfolio
- Selection Effect - The return attributable to the managers' security selection
- Interaction Effect - The return attributable to the interaction between the Allocation and Selection Effects



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TOTAL COMPOSITE

	Policy %	% of Portfolio	Market Value (\$)	3 Mo (%)	Rank	1 Yr (%)	Rank	3 Yrs (%)	Rank	5 Yrs (%)	Rank	10 Yrs (%)	Rank
Total Composite	100.00	100.00	2,676,016,616	9.23	76	9.26	90	8.01	68	8.76	82	8.94	22
<i>Policy Index</i>				7.75	92	12.46	55	9.50	33	9.93	42	8.61	31
Equity Beta	50.00	54.39	1,455,532,390	15.52		14.87							
Public Equities *	40.00	39.13	1,047,057,527	17.62	33	13.29	62	7.26	67	10.17	60	8.78	64
<i>MSCI ACWI</i>				14.68	56	16.25	55	10.06	49	12.26	45	9.13	59
Private Equity	10.00	15.26	408,474,863	10.33		15.89		15.75		13.43		14.03	
<i>MO Hwy Priv. Equ. Index - Lagged</i>				9.72		18.57		15.62		17.54		17.12	
Rates and Credit Beta	30.00	25.86	691,971,885	2.22		6.84							
Traditional Fixed Income	22.50	15.58	416,807,501	0.35	99	10.63	28	6.99	10	6.56	34	6.94	4
<i>Fixed Income Custom Benchmark</i>				0.82	97	8.92	42	5.97	29	5.16	63	4.31	50
Opportunistic Debt	7.50	10.28	275,164,384	5.03	76	0.73	99	6.49	14				
<i>BBgBarc US High Yield TR</i>				6.45	32	7.11	30	6.24	18	8.59	15	6.80	17
Real Assets Beta	20.00	19.43	519,995,875	2.43		-4.02							
Real Assets	10.00	11.69	312,904,214	1.93		-9.70		0.67		2.11			
<i>CPI + 4% (Unadjusted)</i>				1.06		5.85		6.07		6.11		5.85	
Real Estate	10.00	7.74	207,091,661	3.20		4.43		7.49		8.30		11.02	
<i>MODOT Real Estate Blend</i>				1.16		0.75		4.38		5.67		9.06	
Cash Composite	--	0.32	8,516,466	0.02		0.49		1.46		1.07		0.51	
<i>91 Day T-Bills</i>				0.02		0.45		1.48		1.13		0.59	

* May include the use of derivatives

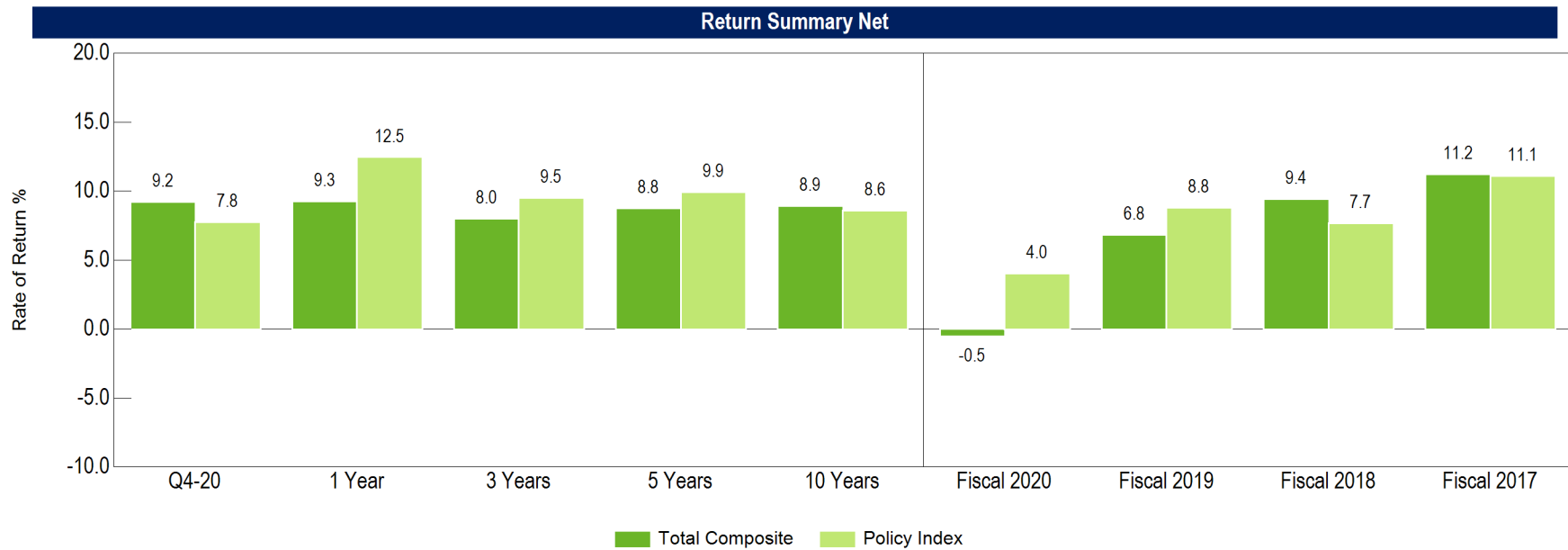
Total Composite is ranked in the IFx Public DB (peer) Net+ Universe

Public Equities Composite is ranked in the eV Global All Cap Equity Net Universe Fixed Income Composite is ranked in the eV All Global

Fixed Inc Net Universe Opportunistic Debt Composite is ranked in the eV US High Yield Fixed Inc Net Universe

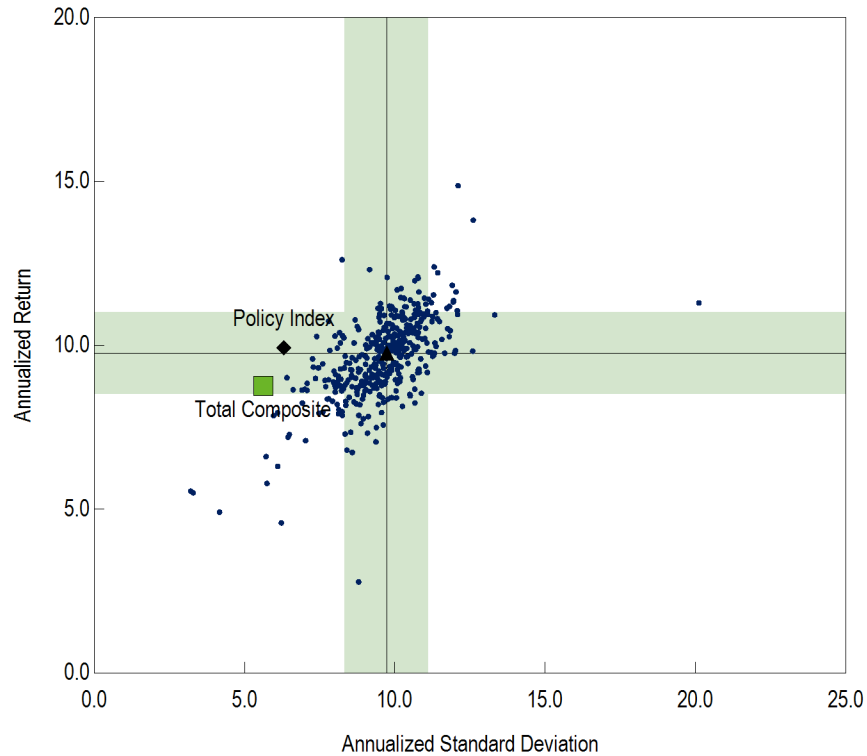


TOTAL FUND RETURN SUMMARY



TOTAL FUND RISK/RETURN - 5 YEARS

5 Years Ending December 31, 2020



- Total Composite
- ◆ Policy Index
- ▲ Universe Median
- 68% Confidence Interval
- InvMetrics Public DB Net

Statistics Summary
5 Years Ending December 31, 2020

	Anlzd Ret	Rank	Anlzd Std Dev	Rank
Total Composite	8.76%	82	5.61%	1
Policy Index	9.93%	42	6.30%	2

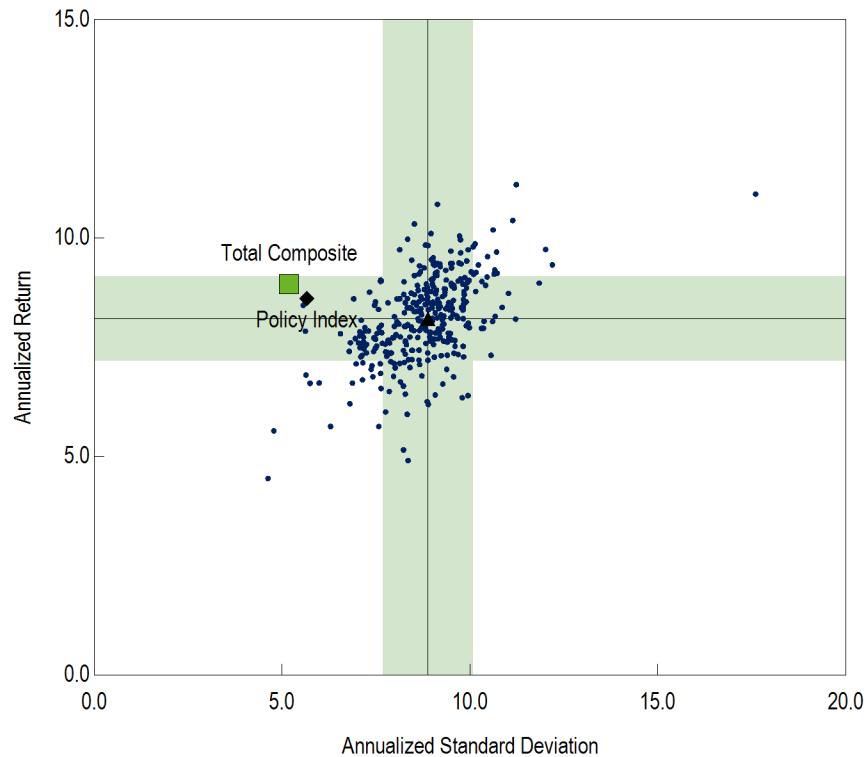
Statistics Summary
5 Years Ending December 31, 2020

	Sharpe Ratio	Rank
Total Composite	1.36	1
Policy Index	1.40	1



TOTAL FUND RISK/RETURN - 10 YEARS

10 Years Ending December 31, 2020



- Total Composite
- ◆ Policy Index
- ▲ Universe Median
- 68% Confidence Interval
- InvMetrics Public DB Net

349 Portfolios

Statistics Summary

10 Years Ending December 31, 2020

	Anlzd Ret	Rank	Anlzd Std Dev	Rank
Total Composite	8.94%	22	5.18%	1
Policy Index	8.61%	31	5.66%	2

Statistics Summary

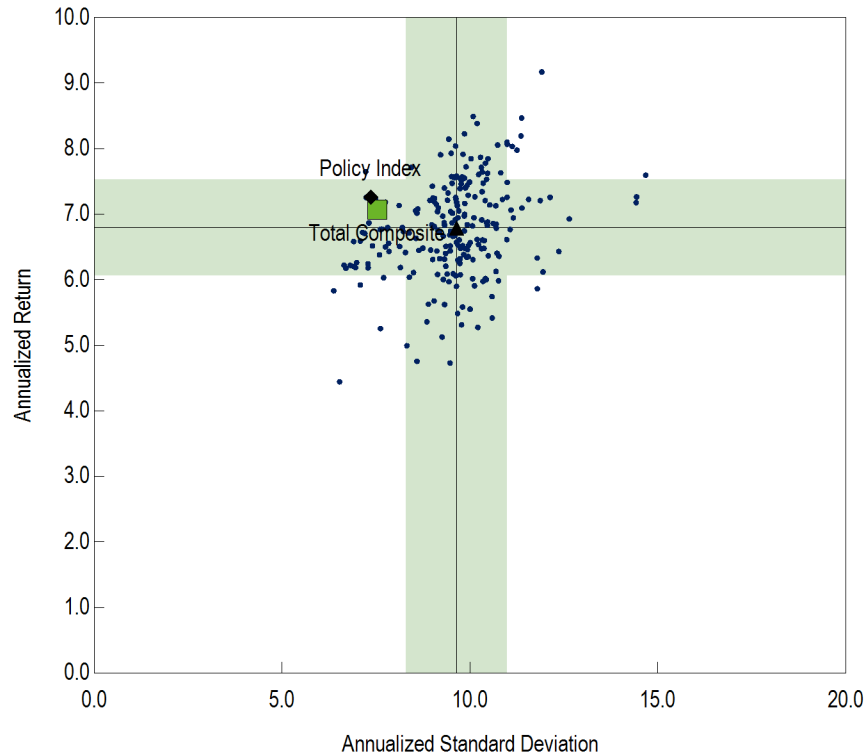
10 Years Ending December 31, 2020

	Sharpe Ratio	Rank
Total Composite	1.61	1
Policy Index	1.42	1



TOTAL FUND RISK/RETURN - 15 YEARS

15 Years Ending December 31, 2020



- Total Composite
- ◆ Policy Index
- ▲ Universe Median
- 68% Confidence Interval
- InvMetrics Public DB Net

231 Portfolios

Statistics Summary

15 Years Ending December 31, 2020

	Anlzd Ret	Rank	Anlzd Std Dev	Rank
Total Composite	7.07%	36	7.53%	10
Policy Index	7.26%	24	7.36%	8

Statistics Summary

15 Years Ending December 31, 2020

	Sharpe Ratio	Rank
Total Composite	0.79	3
Policy Index	0.83	1



TOTAL FUND PERFORMANCE

NEPC, LLC

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TOTAL FUND PERFORMANCE DETAIL

	Market Value (\$)	% of Portfolio	Policy %	3 Mo (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)
Total Composite	2,676,016,616	100.00	100.00	9.23	9.26	8.01	8.76	8.94
<i>Policy Index</i>				7.75	12.46	9.50	9.93	8.61
Equity Beta	1,455,532,390	54.39	50.00	15.52	14.87	--	--	--
Public Equities	1,047,057,527	39.13	40.00	17.62	13.29	7.26	10.17	8.78
<i>MSCI ACWI</i>				14.68	16.25	10.06	12.26	9.13
Global Public Equities w/ MLPs	907,893,548	33.93	--	17.76	13.75	6.98	10.66	12.66
MLPS	1	0.00	--	0.00	-6.09	-4.23	-0.68	5.20
<i>Tortoise</i>	1	0.00						
Global Public Equities	907,893,547	33.93	--	17.76	13.49	7.40	11.43	--
<i>MSCI ACWI</i>				14.68	16.25	10.06	12.26	9.13
International Public Equities	239,001,083	8.93	--	15.23	5.89	1.86	8.22	5.63
<i>MSCI ACWI ex USA</i>				17.01	10.65	4.88	8.93	4.92
Acadian Int'l Small Cap	50,790,623	1.90		15.29	13.31	3.99	9.76	--
<i>MSCI ACWI ex US Small Cap</i>				18.56	14.24	4.59	9.37	5.95
Acadian Non-US Microcap	40,691,850	1.52		15.85	20.00	6.94	--	--
<i>MSCI EAFE Small Cap</i>				17.27	12.34	4.85	9.40	7.85
Silchester	146,505,882	5.47		15.18	-0.46	0.03	6.50	7.07
<i>MSCI EAFE</i>				16.05	7.81	4.28	7.45	5.51
Transition Account	1,012,728	0.04		-2.32	-16.18	-6.88	-3.89	-6.57
Domestic Public Equities	668,892,464	25.00	--	18.64	16.46	10.39	13.17	12.77
<i>Russell 3000</i>				14.68	20.89	14.49	15.43	13.79
Large Cap US Public Equities	597,198,978	22.32	--	16.96	17.83	11.38	13.76	13.30
Cash Overlay *	284,922,807	10.65		12.01	12.84	9.79	13.00	--
<i>S&P 500</i>				12.15	18.40	14.18	15.22	13.88
Parametric Overlay	312,276,171	11.67		--	--	--	--	--
Small Cap US Public Equities	71,693,486	2.68	--	35.94	6.31	4.19	9.76	10.38
<i>Russell 2000</i>				31.37	19.96	10.25	13.26	11.20
Kennedy Capital	41,318,413	1.54		32.05	19.51	8.30	13.05	--
<i>Russell Microcap</i>				31.39	20.96	8.78	11.89	10.55
Kennedy Small-Cap Banking	30,375,073	1.14		41.60	-7.56	0.85	--	--
<i>Russell 2000 Value</i>				33.36	4.63	3.72	9.65	8.66

* May include the use of derivatives



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TOTAL FUND PERFORMANCE DETAIL

	Market Value (\$)	% of Portfolio	Policy %	3 Mo (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)
Hedge Equity *	139,163,979	5.20	0.00	16.69	10.39	8.31	7.05	11.82
Beta Overlay *	30,681,911	1.15	--	44.94	10.86	--	--	--
<i>HFRI Fund of Funds Composite Index</i>				8.05	10.82	4.86	4.55	3.32
Equity Oriented Hedge Funds	30,681,911	1.15		44.94	10.86	--	--	--
Equity Hedge Funds	108,482,068	4.05	--	9.95	0.88	3.17	3.97	3.87
Alpstone Capital	11,681,615	0.44		-2.54	-10.40	4.26	--	--
Bridgewater Pure Alpha	18,466,134	0.69		10.58	-12.37	0.00	0.80	4.20
Cevian	16,734,817	0.63		18.92	7.11	2.66	8.02	--
Indus Pacific Opp. Fund	18,100,279	0.68		12.27	43.65	6.56	9.42	--
Metacapital	4,242,788	0.16		6.60	-50.05	-15.35	-9.19	--
Millenium USA LP	23,279,437	0.87		5.09	20.98	11.74	9.48	--
Pentwater	15,976,998	0.60		17.07	4.47	8.54	11.31	--
ValueAct	0	0.00		--	--	--	--	--
Private Equity	408,474,863	15.26	10.00	10.33	15.89	15.75	13.43	14.03
<i>MO Hwy Priv. Equ. Index - Lagged</i>				9.72	18.57	15.62	17.54	17.12
PE Fund of Funds	215,959,666	8.07	--	11.32	13.12	14.50	12.55	13.43
Grove Street - MP Ventures	61,415,448	2.30		14.68	15.28	18.42	12.19	13.18
Grove Street - MP Ventures II	145,955,380	5.45		9.47	12.14	12.47	12.54	12.84
Vectis H & L II	8,588,838	0.32		18.30	13.81	25.80	26.77	19.50
PE Direct Funds	192,515,197	7.19	--	9.47	21.47	19.44	18.06	--
Abry Partners VI	212,715	0.01		4.98	10.40	27.25	33.31	28.30
Abry Partners VII	1,439,897	0.05		0.76	-15.38	-7.95	1.31	--
Aisling	12,312,721	0.46		6.27	26.66	14.91	--	--
Arrowroot Capital III	15,053,906	0.56		4.03	1.15	16.19	--	--
Arrowroot Capital IV	14,167,989	0.53		49.47	47.64	--	--	--
Blackstone Asia	9,160,309	0.34		16.79	25.11	13.44	--	--
DC Capital Partners	9,878,669	0.37		-0.32	11.35	38.43	--	--
Drive Overdrive I	7,792,651	0.29		46.49	46.05	--	--	--
Drive III	2,082,931	0.08		16.93	-37.65	--	--	--
DYAL IV	5,036,096	0.19		-9.87	9.49	--	--	--
Heartwood Partners II	13,942,260	0.52		1.91	7.74	9.61	13.21	--
Heartwood Partners III	7,902,496	0.30		6.12	5.91	-1.86	--	--
KPS IV	9,007,174	0.34		11.56	11.51	13.17	--	--

* May include the use of derivatives



MPERS

TOTAL FUND PERFORMANCE DETAIL

	Market Value (\$)	% of Portfolio	Policy %	3 Mo (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)
KPS Mid Cap	2,023,066	0.08		-1.69	-11.23	--	--	--
KPS V	2,810,687	0.11		1.11	--	--	--	--
Long Ridge II	14,945,108	0.56		8.42	84.16	51.62	--	--
Monomoy Capital Partners III	7,064,332	0.26		16.77	54.10	15.14	--	--
Newquest Fund	7,716,166	0.29		0.76	4.46	10.20	--	--
Nexus	10,917,387	0.41		5.99	48.09	--	--	--
Opengate Capital II	4,623,524	0.17		4.50	20.25	--	--	--
Opengate Capital Partners	11,150,644	0.42		8.42	8.28	15.26	--	--
Pfingsten Fund V	6,470,047	0.24		22.48	-14.72	1.00	--	--
Shore Capital Partners GP I LP	14,374,532	0.54		0.08	56.59	45.92	39.15	--
Shoreline China Valu III	2,429,890	0.09		-1.33	6.05	0.06	4.34	--
<i>MO Hwy Priv. Equ. Index - Lagged</i>				9.72	18.57	15.62	17.54	17.12
Rates and Credit Beta	691,971,885	25.86	30.00	2.22	6.84	--	--	--
Traditional Fixed Income	416,807,501	15.58	22.50	0.35	10.63	6.99	6.56	6.94
<i>Fixed Income Custom Benchmark</i>				0.82	8.92	5.97	5.16	4.31
Core Fixed Income	217,006,455	8.11	10.00	1.17	4.99	4.40	3.77	4.17
<i>BBgBarc US Govt/Credit TR</i>				0.82	8.92	5.97	4.98	4.19
Aberdeen	8,384,280	0.31		1.29	3.42	4.65	5.74	6.48
<i>BBgBarc US Aggregate TR</i>				0.67	7.51	5.34	4.44	3.84
Internal Fixed - Core	158,722,410	5.93		0.85	4.87	4.36	2.99	--
<i>BBgBarc US Govt/Credit TR</i>				0.82	8.92	5.97	4.98	4.19
Octagon Senior Debt	29,968,906	1.12		1.93	3.45	2.58	3.54	--
<i>BBgBarc US Aggregate TR</i>				0.67	7.51	5.34	4.44	3.84
Principal CMBS Fixed	19,930,859	0.74		2.15	0.91	5.29	4.55	--
<i>BBgBarc US CMBS Investment Grade</i>				1.25	7.61	5.58	4.75	4.53
Long Duration	159,146,062	5.95	7.50	-0.75	14.24	8.88	7.50	7.16
<i>BBgBarc US Govt Long TR</i>				-2.95	17.55	9.83	7.84	7.74
Internal Fixed - Long Duration	159,146,062	5.95		-0.75	14.24	8.88	7.50	7.52
<i>BBgBarc US Aggregate TR</i>				0.67	7.51	5.34	4.44	3.84
US TIPS	40,654,984	1.52	5.00	1.01	11.14	5.84	5.32	4.43
Internal US TIPS	40,654,984	1.52		1.01	11.14	5.84	5.32	4.43
<i>BBgBarc US TIPS TR</i>				1.62	10.99	5.92	5.08	3.81

Fixed Income Custom Benchmark was BBgBarc US Universal TR preceding 01/01/2017. As of 01/01/2017 the benchmark is BBgBarc US Agg Govt/Credit.



MPERS

TOTAL FUND PERFORMANCE DETAIL

	Market Value (\$)	% of Portfolio	Policy %	3 Mo (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)
Opportunistic Debt	275,164,384	10.28	7.50	5.03	0.73	6.49	--	--
<i>BBgBarc US High Yield TR</i>				6.45	7.11	6.24	8.59	6.80
Direct Lending	146,606,191	5.48	--	4.97	-2.38	--	--	--
Core Direct Lending	69,420,148	2.59	--	9.70	-1.15	--	--	--
Ares BDC	32,337,634	1.21		14.76	--	--	--	--
Internal Fixed - Nonrated	11,539,846	0.43		0.31	1.71	5.78	6.22	--
M&G III	1,394,049	0.05		4.07	4.46	5.89	4.80	--
MGG	14,321,924	0.54		3.21	7.18	--	--	--
Owl Rock	9,826,694	0.37		12.33	-8.66	7.20	--	--
Opportunistic Direct Lending	77,186,043	2.88	--	1.04	-3.35	--	--	--
Audax Mezzanine II	0	0.00						
GSO Energy II	711,022	0.03		9.96	23.42	--	--	--
GSO Energy Select Opps	3,608,882	0.13		3.45	-17.46	-2.13	7.12	--
GSO I	188,024	0.01		10.62	-6.49	-22.63	-18.17	-0.54
GSO II	1,730,009	0.06		6.34	-14.38	-2.42	0.73	--
GSO III	12,487,866	0.47		2.71	2.99	8.59	--	--
Northern Shipping II	3,669,128	0.14		-0.10	-10.20	2.29	3.79	--
Northern Shipping III	8,968,502	0.34		2.15	9.12	8.78	--	--
OCP Asia	27,531,239	1.03		1.49	4.74	8.29	10.88	--
Riverstone Credit Partners	7,804,042	0.29		-3.66	-21.74	-1.47	4.59	--
Riverstone Credit Partners II	10,487,329	0.39		-0.46	-10.25	--	--	--
Distressed /Special Sits	91,164,965	3.41	--	3.77	9.61	--	--	--
Anchorage Capital III	644,137	0.02		0.00	-34.81	-12.75	-7.08	--
Anchorage Illiquid Opps V	14,416,151	0.54		0.00	5.78	8.11	8.71	--
Banner Ridge III	18,460,283	0.69		5.59	24.55	--	--	--
CVI Credit Value	215,180	0.01		-0.17	2.62	9.87	11.24	--
CVI Credit Value Fund III	6,133,109	0.23		1.87	2.68	3.67	7.91	--
CVI Global Value	28,375	0.00		-2.66	3.62	5.61	4.47	8.46
Fortress Credit Opps. Fund	1,250,000	0.05		--	--	--	--	--
FP Credit Partners	2,921,869	0.11		7.66	--	--	--	--
Longford II	8,765,875	0.33		4.63	9.60	--	--	--
Longford III	844,199	0.03		-6.09	--	--	--	--
Miravast ILS Credit Opp	11,773,066	0.44		5.09	8.67	--	--	--
Siguler Guff Sec Opps	0	0.00						



MPERS

TOTAL FUND PERFORMANCE DETAIL

	Market Value (\$)	% of Portfolio	Policy %	3 Mo (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)
Silver Point Distressed	13,194,653	0.49		7.50	36.15	--	--	--
Varde Asia Credit Fund	12,518,068	0.47		2.40	11.57	--	--	--
Liquid Credit	37,393,228	1.40	--	7.90	1.71	--	--	--
ABRY ASF	120,186	0.00		-6.75	-15.65	-12.96	-5.83	8.63
Anchorage Structured Credit	16,207,772	0.61		0.00	8.61	--	--	--
GSO Credit Alpha Fund	9,201,051	0.34		15.16	-3.45	0.53	5.96	--
Och-Ziff Struct Products II	443,625	0.02		9.07	6.17	13.74	17.44	--
Octagon Opportunistic	11,420,594	0.43		15.37	7.00	1.78	7.71	--
Real Assets Beta	519,995,875	19.43	20.00	2.43	-4.02	--	--	--
Real Assets	312,904,214	11.69	10.00	1.93	-9.70	0.67	2.11	--
<i>CPI + 4% (Unadjusted)</i>				<i>1.06</i>	<i>5.85</i>	<i>6.07</i>	<i>6.11</i>	<i>5.85</i>
Natural Resources	176,967,948	6.61	--	1.23	-16.13	-1.59	1.58	--
Ares Energy	8,986,768	0.34		-4.28	-54.12	--	--	--
Blue Road	12,602,072	0.47		2.84	12.36	11.95	10.15	--
EMG I	3,619,400	0.14		1.80	-5.97	-3.49	-6.40	--
EMG II	8,949,243	0.33		2.03	-3.30	3.65	4.19	--
EMG III	12,191,751	0.46		-0.68	-36.51	-16.44	-11.55	--
EMG IV	18,458,885	0.69		1.34	-14.11	4.06	8.51	--
EMG V	10,862,715	0.41		2.48	10.79	--	--	--
Grey Rock Energy Fund II	8,807,186	0.33		-5.44	-15.37	0.11	--	--
Grey Rock Energy Fund III	12,379,283	0.46		5.56	-3.98	--	--	--
NGP IX	211,332	0.01		-6.32	-14.99	44.98	21.89	--
NGP X	1,750,095	0.07		-7.52	-43.11	-24.91	-12.12	--
NGP XI	10,139,462	0.38		-3.04	-26.82	-8.39	2.70	--
Orion II	17,849,960	0.67		3.83	40.77	18.62	--	--
Orion III	8,424,393	0.31		1.39	17.58	--	--	--
Orion Mine Finance Fund I	6,350,761	0.24		0.18	-9.73	-7.35	4.94	--
Orion Mineral Royalty	7,463,995	0.28		2.19	21,322,746.06	--	--	--
Quantum VII	7,735,594	0.29		0.11	-19.08	-5.61	--	--
Ridgewood Energy	6,771,862	0.25		6.82	-42.41	-8.17	-2.44	--
Ridgewood III	6,867,669	0.26		14.79	-1.06	13.64	-7.92	--
Ridgewood IV	130,128	0.00		--	--	--	--	--
Turnbridge Capital Partners I	6,415,394	0.24		-6.56	-44.74	-6.43	-8.39	--



MPERS

TOTAL FUND PERFORMANCE DETAIL

	Market Value (\$)	% of Portfolio	Policy %	3 Mo (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)
Infrastructure & Transport	38,472,189	1.44	--	5.47	4.83	6.79	5.09	--
American Infrastructure I MLP	6,689,409	0.25		1.94	20.02	6.47	6.72	--
American Infrastructure II MLP	2,900,547	0.11		18.28	36.78	23.48	11.70	--
Apollo Aviation III	1,954,953	0.07		11.09	-9.33	19.73	15.68	--
CIM INFRA FUND II	8,240,271	0.31		7.23	15.98	--	--	--
Columbia Spectrum IV-A	1,624,836	0.06		--	--	--	--	--
Corrum Capital Aviation	12,751,018	0.48		-2.19	-8.76	4.90	--	--
EIF - US Power III	2,028,000	0.08		-0.43	-19.55	-15.13	-8.49	--
Sciens Marine Investments	2,283,155	0.09		8.46	-40.56	-13.63	-14.43	--
<i>CPI + 4% (Unadjusted)</i>				<i>1.06</i>	<i>5.41</i>	<i>5.92</i>	<i>6.02</i>	<i>5.80</i>
Timber	97,464,077	3.64	--	1.63	-2.21	2.64	1.84	--
MP Timber	38,390,951	1.43		2.73	-3.98	3.70	--	--
MPATC	29,329,623	1.10		-0.90	-3.55	-2.99	--	--
MPCTT	1,509,338	0.06		32.69	39.18	53.82	--	--
MPMCB	27,350,933	1.02		1.73	3.46	0.44	--	--
Russellville Land Timber	883,232	0.03		-1.44	-1.44	-0.99	--	--
<i>NCREIF Timberland 1 Qtr. Lag</i>				<i>0.04</i>	<i>0.19</i>	<i>2.08</i>	<i>2.58</i>	<i>4.42</i>
Real Estate	207,091,661	7.74	10.00	3.20	4.43	7.49	8.30	11.02
<i>MODOT Real Estate Blend</i>				<i>1.16</i>	<i>0.75</i>	<i>4.38</i>	<i>5.67</i>	<i>9.06</i>
REITS	8,422,101	0.31	--	13.01	-5.12	2.44	3.20	3.78
CBRE Investors	8,422,101	0.31		13.01	-5.12	2.44	3.20	3.78
<i>FTSE NAREIT Developed</i>				<i>13.26</i>	<i>-9.04</i>	<i>1.52</i>	<i>3.74</i>	<i>5.44</i>
Core	73,933,106	2.76	--	1.94	2.87	6.16	7.33	11.84
Clarion Partners Lion Prop Fd	17,961,653	0.67		1.76	2.91	6.04	6.81	9.81
Principal CMBS	1,072,346	0.04		2.05	6.44	19.31	13.61	17.75
Principal Enhanced Property	54,152,837	2.02		1.99	3.59	5.62	7.95	12.21
Principal U.S. Property Fund	746,270	0.03		1.64	1.34	5.11	6.46	9.87
Non-Core	124,736,454	4.66	--	3.34	6.01	9.22	9.93	10.27
Value-Add	113,313,447	4.23	--	3.59	6.50	8.64	10.09	8.16
Centersquare III	24,969,821	0.93		1.86	7.46	15.59	--	--
Centersquare IV	29,725,582	1.11		3.43	8.49	--	--	--
M&G II	742,294	0.03		6.15	7.20	8.62	7.19	--
New Mountain	6,076,027	0.23		9.44	13.30	--	--	--



MPERS

TOTAL FUND PERFORMANCE DETAIL

	Market Value (\$)	% of Portfolio	Policy %	3 Mo (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)
Oak Street IV	13,286,465	0.50		3.13	8.71	6.69	--	--
Och Ziff RE Credit FD LP	7,837,017	0.29		2.33	8.79	8.13	--	--
Torchlight Debt Opp II	59,386	0.00						
Torchlight Debt Opp III	36,280	0.00		0.00	-1.90	-9.25	-2.63	--
Torchlight Debt Opps V	4,149,350	0.16		0.67	0.82	7.73	8.73	--
Tristan EPI SO	1,128,442	0.04		7.55	-18.30	-24.90	-11.95	-1.91
Tristan EPI SO 3	4,376,924	0.16		5.46	-14.18	-7.90	6.82	--
Tristan EPI SO 4	15,272,565	0.57		6.09	9.42	8.75	6.96	--
Tristan EPI SO 5	5,653,293	0.21		3.21	-26.25	--	--	--
<i>NCREIF Property Index</i>				1.15	1.61	4.89	5.91	9.00
Opportunistic	11,423,008	0.43	--	0.67	1.97	16.74	12.78	17.14
AEW Partners V	32,574	0.00						
Apollo European III	95,677	0.00		1.15	-2.86	-32.66	-20.71	-9.07
Apollo Real Estate	17,579	0.00		2.17	66.66	48.12	29.85	21.18
Clarion Part Lion Mexico Fund	936,010	0.03		-3.97	-9.41	-13.96	-19.44	-11.76
Colony Capital VIII	166,800	0.01		-4.79	-16.77	-5.77	-6.40	-3.81
Och-Ziff	1	0.00						
Och-Ziff RE III	3,321,451	0.12		4.22	8.97	17.70	16.59	--
Sculptor IV	2,742,706	0.10		4.30	--	--	--	--
Stockdale I-A	4,110,210	0.15		-2.44	--	--	--	--
<i>NCREIF Property Index</i>				1.15	1.61	4.89	5.91	9.00
Cash Composite *	8,516,466	0.32	0.00	0.02	0.49	1.46	1.07	0.51
<i>91 Day T-Bills</i>				0.02	0.45	1.48	1.13	0.59

* May include the use of derivatives

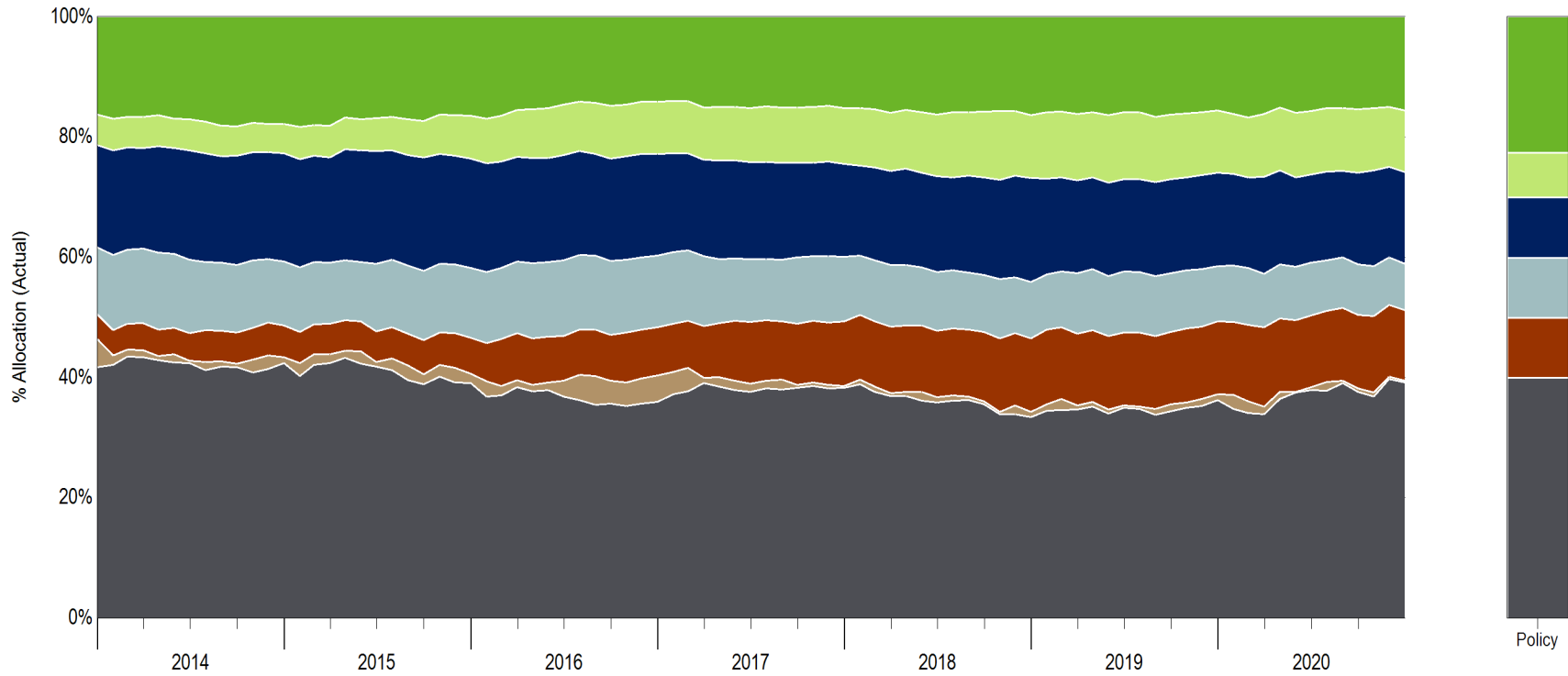


APPENDIX

NEPC, LLC

TOTAL FUND ASSET ALLOCATION HISTORY

Asset Allocation History

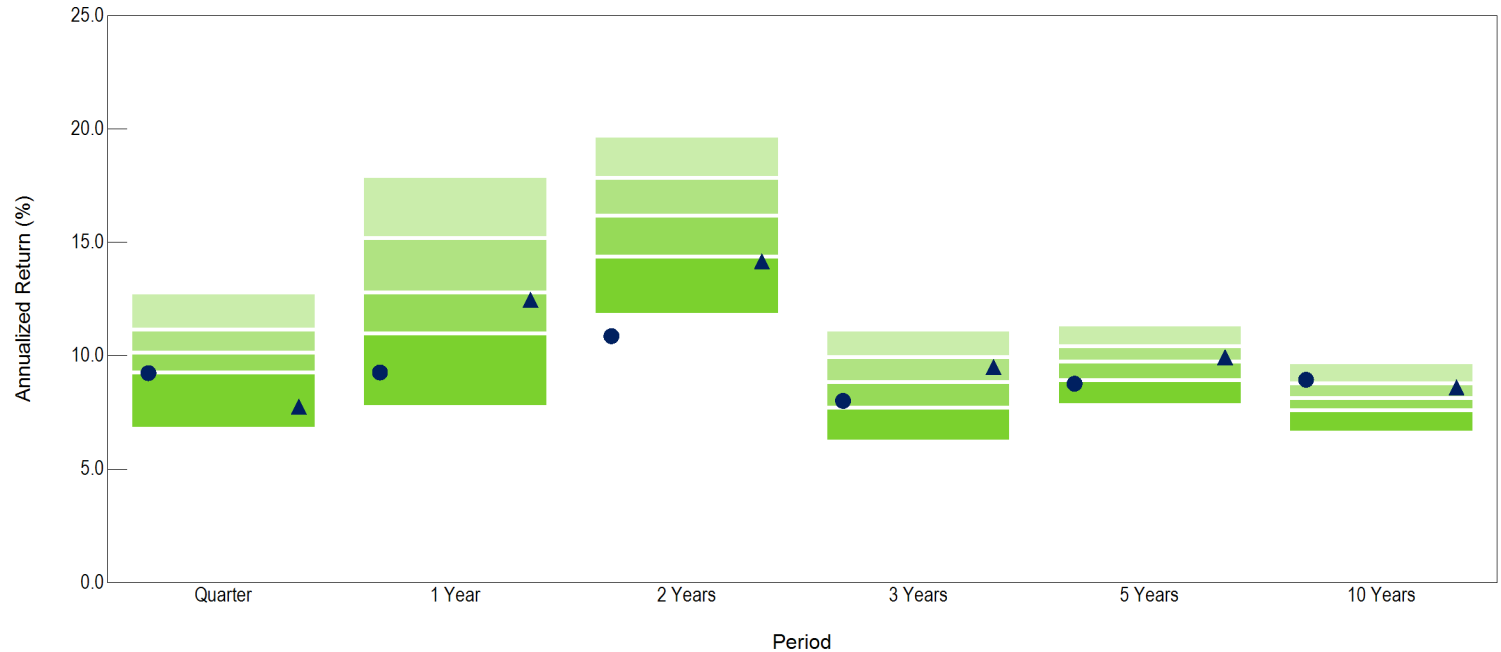


- Fixed Income
- Opportunistic Fixed Income
- Private Equity
- Real Estate
- Real Assets
- Cash
- Public Equity



TOTAL FUND RETURN SUMMARY VS. PEER UNIVERSE

Total Composite vs. InvMetrics Public DB Net

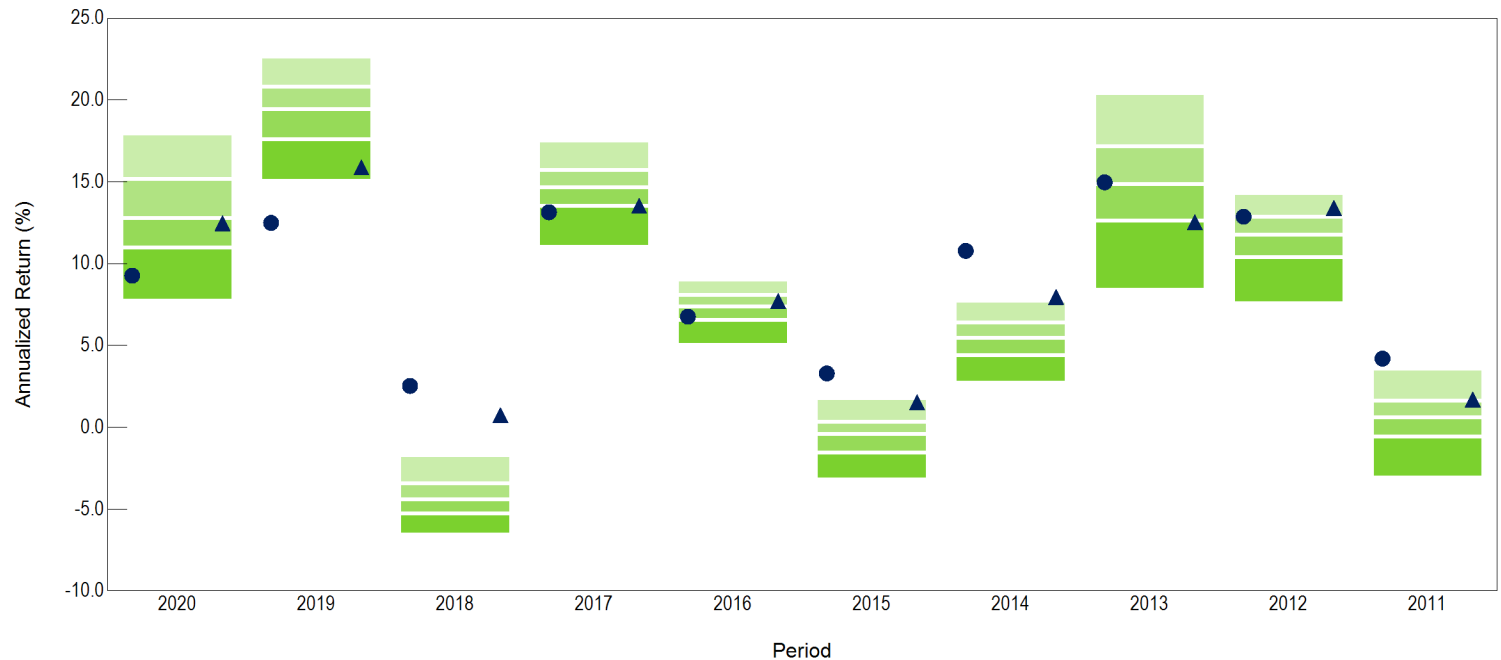


	Return (Rank)											
5th Percentile	12.8		17.9		19.7		11.1		11.4		9.7	
25th Percentile	11.2		15.2		17.9		10.0		10.4		8.8	
Median	10.2		12.8		16.2		8.9		9.8		8.2	
75th Percentile	9.3		11.0		14.4		7.7		8.9		7.6	
95th Percentile	6.8		7.7		11.8		6.2		7.8		6.6	
# of Portfolios	467		464		458		450		433		349	
● Total Composite	9.2	(76)	9.3	(90)	10.9	(98)	8.0	(68)	8.8	(82)	8.9	(22)
▲ Policy Index	7.8	(92)	12.5	(55)	14.2	(77)	9.5	(33)	9.9	(42)	8.6	(31)



TOTAL FUND RETURN SUMMARY VS. PEER UNIVERSE

Total Composite vs. InvMetrics Public DB Net



	Return (Rank)													
	2020	2019	2018	2017	2016	2015	2014	2013	2012	2011				
5th Percentile	17.9	22.6	-1.7	17.5	9.0	1.7	7.7	20.4	14.3	3.6				
25th Percentile	15.2	20.8	-3.4	15.8	8.1	0.4	6.4	17.2	12.9	1.6				
Median	12.8	19.5	-4.4	14.7	7.4	-0.4	5.5	14.9	11.8	0.6				
75th Percentile	11.0	17.6	-5.2	13.6	6.6	-1.5	4.4	12.7	10.4	-0.5				
95th Percentile	7.7	15.1	-6.5	11.1	5.0	-3.2	2.7	8.4	7.6	-3.1				
# of Portfolios	464	550	496	269	269	262	210	191	159	137				
● Total Composite	9.3 (90)	12.5 (99)	2.5 (1)	13.1 (83)	6.8 (70)	3.3 (1)	10.8 (1)	15.0 (49)	12.9 (26)	4.2 (3)				
▲ Policy Index	12.5 (55)	15.9 (92)	0.7 (1)	13.5 (76)	7.7 (39)	1.5 (7)	8.0 (4)	12.5 (76)	13.4 (15)	1.7 (24)				



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Reporting Methodology

- The client's custodian bank is NEPC's preferred data source unless otherwise directed. NEPC generally reconciles custodian data to manager data. If the custodian cannot provide accurate data, manager data may be used.
- Trailing time period returns are determined by geometrically linking the holding period returns, from the first full month after inception to the report date. Rates of return are annualized when the time period is longer than a year. Performance is presented gross and/or net of manager fees as indicated on each page.
- For managers funded in the middle of a month, the "since inception" return will start with the first full month, although actual inception dates and cash flows are taken into account in all Composite calculations.
- This report may contain forward-looking statements that are based on NEPC's estimates, opinions and beliefs, but NEPC cannot guarantee that any plan will achieve its targeted return or meet other goals.

