

STOCHASTIC CONTRIBUTION RATE RESULTS

2025								
	Policy Target	Current Allocation	Mix 1	Mix 1 Long Treasuries	Mix 2	Mix 2 Long Treasuries	Mix 3 Long Term	Mix 4 Leverage
95th	23.7%	23.7%	23.7%	23.7%	23.7%	23.7%	23.7%	23.7%
75th	22.9%	22.9%	22.9%	22.9%	22.9%	22.9%	22.9%	22.9%
Median	22.3%	22.3%	22.3%	22.3%	22.3%	22.3%	22.3%	22.3%
25th	21.7%	21.7%	21.7%	21.7%	21.7%	21.7%	21.7%	21.7%
5th	20.9%	20.9%	20.9%	20.9%	20.9%	20.9%	20.9%	20.8%

2030								
	Policy Target	Current Allocation	Mix 1	Mix 1 Long Treasuries	Mix 2	Mix 2 Long Treasuries	Mix 3 Long Term	Mix 4 Leverage
95th	25.7%	25.7%	25.6%	25.6%	25.9%	25.6%	26.1%	25.6%
75th	22.5%	22.5%	22.5%	22.4%	22.4%	22.4%	22.6%	21.9%
Median	20.1%	20.1%	20.2%	20.1%	20.1%	20.1%	20.2%	19.4%
25th	17.7%	17.7%	17.8%	17.8%	17.7%	17.7%	17.6%	16.9%
5th	14.3%	14.3%	14.6%	14.7%	14.2%	14.3%	14.3%	13.2%

2035								
	Policy Target	Current Allocation	Mix 1	Mix 1 Long Treasuries	Mix 2	Mix 2 Long Treasuries	Mix 3 Long Term	Mix 4 Leverage
95th	20.3%	20.1%	20.0%	20.0%	20.2%	20.3%	20.7%	19.7%
75th	15.0%	15.0%	15.1%	15.1%	15.1%	14.9%	15.4%	13.9%
Median	11.3%	11.3%	11.7%	11.4%	11.3%	11.2%	11.6%	9.9%
25th	7.8%	7.8%	8.0%	7.8%	7.7%	7.5%	7.8%	5.8%
5th	1.3%	1.3%	1.5%	1.7%	1.0%	1.2%	0.9%	0.0%



CORE 10 YEAR RETURN ASSUMPTIONS

	Asset Class	10 Year Return	Change 2020-2019	Volatility	Change 2020-2019
	<i>SFERS Target Mix</i>	7.08%	-0.57%	10.93%**	+0.88%
	Cash	1.81%	-0.69%	1.00%	-
Equity	Large Cap Equities	4.98%	-1.02%	16.50%	-
	International Equities (Unhedged)	6.02%	-0.73%	20.50%	-
	Emerging International Equities	9.00%	-0.25%	28.00%	-
	<i>SFERS Public Equity*</i>	6.21%	-0.78%	17.79%	+0.22%
	<i>SFERS Private Equity*</i>	9.39%	-0.62%	27.06%	-0.12%
	Rates/Credit	<i>SFERS Int. Treasuries*</i>	2.00%	-0.51%	4.15%
<i>Core Bonds*</i>		2.51%	-0.53%	6.01%	-0.09%
<i>SFERS Liquid Credit*</i>		4.69%	-0.57%	10.30%	-0.27%
<i>SFERS Private Credit*</i>		6.64%	-0.59%	11.30%	-0.34%
Real Assets	<i>SFERS Natural Resources*</i>	9.09%	-0.41%	32.00%	+11.00%
	<i>SFERS Real Estate*</i>	6.08%	-0.62%	16.08%	+1.45%
	<i>SFERS Real Assets*</i>	7.88%	-0.16%	17.04%	+3.11%
Multi-Asset	<i>SFERS Absolute Return*</i>	5.07%	-0.78%	7.58%	-0.03%
	GTAA	5.35%	-	9.50%	-

*Calculated as a blend of other asset classes

**Smoothed volatility uses historical realized asset class volatility in private markets asset classes



CORE 30 YEAR RETURN ASSUMPTIONS

	Asset Class	30 Year Return	Change 2020-2019	Volatility	Change 2020-2019
	<i>SFERS Target Mix</i>	8.15%	-0.45%	10.93%**	+0.88%
	Cash	2.38%	-0.62%	1.00%	-
Equity	Large Cap Equities	6.71%	-0.79%	16.50%	-
	International Equities (Unhedged)	6.96%	-0.79%	20.50%	-
	Emerging International Equities	9.20%	-0.05%	28.00%	-
	<i>SFERS Public Equity*</i>	7.52%	-0.66%	17.79%	+0.22%
	<i>SFERS Private Equity*</i>	10.78%	-0.49%	27.06%	-0.12%
	Rates/Credit	<i>SFERS Int. Treasuries*</i>	2.72%	-0.94%	4.15%
<i>Core Bonds*</i>		3.42%	-0.85%	6.01%	-0.09%
<i>SFERS Liquid Credit*</i>		5.45%	-0.64%	10.30%	-0.27%
<i>SFERS Private Credit*</i>		7.75%	-0.31%	11.30%	-0.34%
Real Assets	<i>SFERS Natural Resources*</i>	9.01%	-0.49%	32.00%	+11.00%
	<i>SFERS Real Estate*</i>	6.96%	-0.01%	16.08%	+1.45%
	<i>SFERS Real Assets*</i>	8.50%	+0.23%	17.04%	+3.11%
Multi-Asset	<i>SFERS Absolute Return*</i>	5.83%	-0.94%	7.58%	-0.03%
	GTAA	5.72%	-	9.50%	-

*Calculated as a blend of other asset classes

**Smoothed volatility uses historical realized asset class volatility in private markets asset classes



2020 CAPITAL MARKET FORECASTS

Asset Class	10-Year	30-Year	Volatility
Inflation	2.3%	2.5%	-
Cash	1.8%	2.4%	1.00%
US Leverage Cost	2.1%	2.7%	1.00%
Non-US Cash	0.4%	2.1%	1.00%
Large Cap Equities	5.0%	6.7%	16.50%
Small/Mid Cap Equities	5.5%	7.2%	20.00%
Int'l Equities (Unhedged)	6.0%	7.0%	20.50%
Int'l Equities (Hedged)	6.2%	7.2%	17.50%
Int'l Sm Cap Equities (Unhedged)	6.4%	7.5%	22.00%
Emerging Int'l Equities	9.0%	9.2%	28.00%
Emerging Int'l Sm Cap Equities	9.2%	9.2%	31.00%
Absolute Return - Long/Short	4.8%	5.7%	11.50%
PE Buyout	7.4%	9.0%	18.50%
PE Growth	9.0%	10.4%	30.50%
PE Venture	10.6%	11.5%	45.00%
PE Secondary	6.9%	8.5%	21.00%
PE Non-US	10.7%	11.1%	33.00%
China Equity	8.8%	9.1%	29.50%
US Microcap Equity	7.0%	8.2%	25.00%

2020 CAPITAL MARKET FORECASTS

Asset Class	10-Year	30-Year	Volatility
TIPS	2.2%	2.7%	6.50%
Treasuries	1.9%	2.7%	5.50%
IG Corp Credit	3.4%	4.4%	7.50%
MBS	2.5%	3.4%	7.00%
High-Yield Bonds	4.1%	5.6%	12.50%
Bank Loans	4.8%	5.2%	9.00%
EMD (External)	4.1%	5.0%	13.00%
EMD (Local Currency)	5.4%	5.3%	13.00%
Non-US Bonds (Unhedged)	0.2%	2.1%	10.00%
Non-US Bonds (Hedged)	0.3%	2.3%	4.50%
Short TIPS (1-5 yr)	2.2%	2.8%	3.50%
Short Treasuries (1-3 yr)	2.1%	2.7%	2.50%
Short Credit (1-3 yr)	2.9%	3.6%	3.50%
Short HY (1-3 yr)	3.4%	4.1%	8.50%
Absolute Return- Credit	4.8%	5.9%	9.00%
PC Credit Opportunities	6.3%	7.5%	14.00%
PC Distressed	7.6%	8.3%	14.00%
PC Direct Lending	6.3%	7.5%	11.00%
US 10 yr Treasuries	1.9%	2.9%	7.50%

2020 CAPITAL MARKET FORECASTS

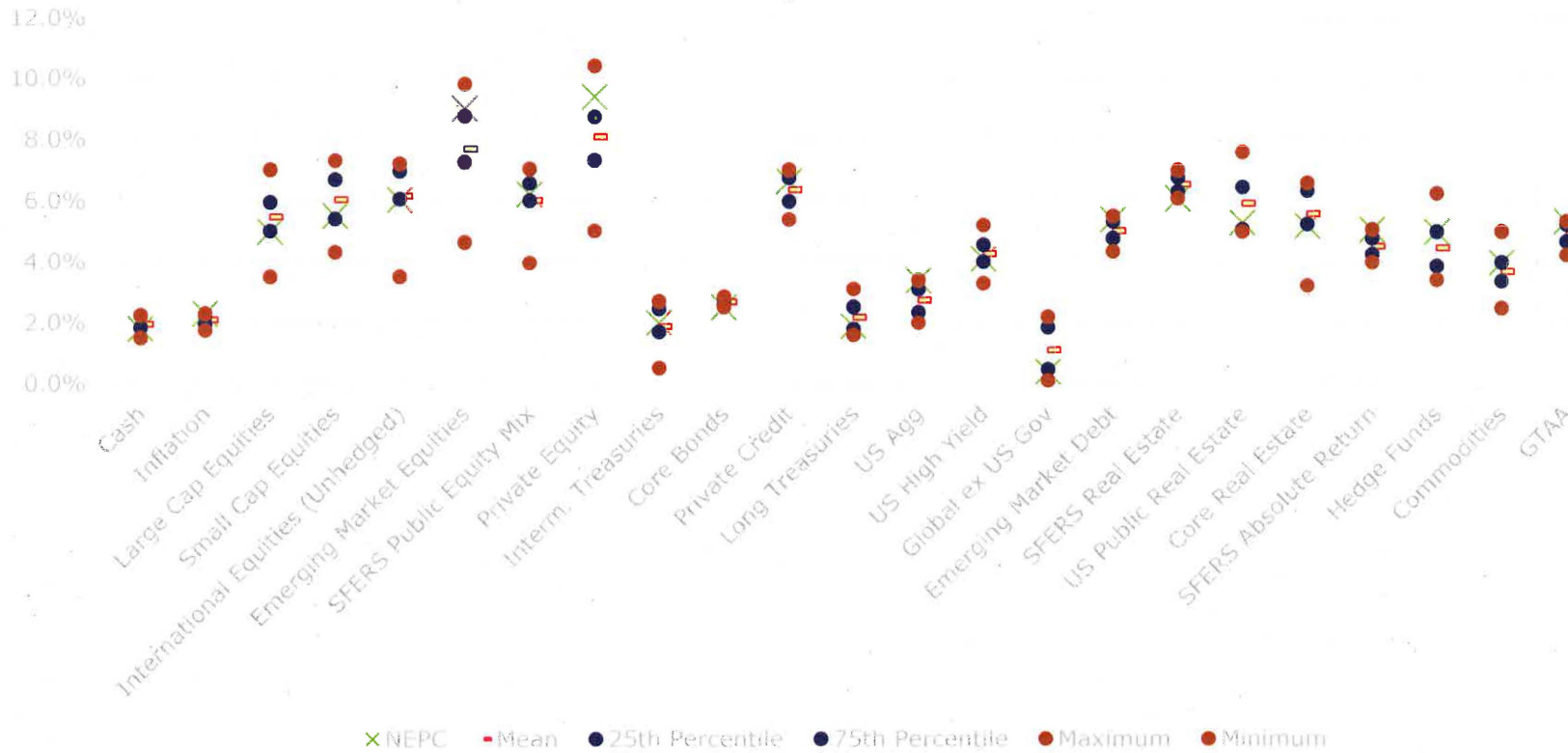
Asset Class	10-Year	30-Year	Volatility
Non-US 10-Year Sovereign (Hedged)	0.4%	2.6%	5.50%
Commodities	4.0%	4.8%	19.00%
Midstream Energy	7.4%	7.1%	18.50%
REITs	5.4%	6.5%	20.00%
Public Infrastructure	5.3%	6.1%	18.50%
Public Resource Equity	7.3%	7.4%	22.00%
Core Real Estate	5.2%	6.0%	13.00%
Non-Core Real Estate	6.4%	7.4%	19.50%
Private RE Debt	5.0%	5.7%	11.00%
Natural Resources	9.1%	9.0%	32.00%
Infrastructure/Land	5.9%	6.7%	12.00%
Absolute Return - Macro	5.0%	5.4%	9.50%
<i>Global Equity*</i>	6.2%	7.5%	17.79%
<i>Private Equity*</i>	9.4%	10.8%	27.06%
<i>Core Bonds*</i>	2.5%	3.4%	6.01%
<i>Private Credit*</i>	6.6%	7.8%	11.30%
<i>Long Govt/Credit*</i>	2.8%	3.9%	11.25%
<i>Absolute Return*</i>	5.0%	5.9%	8.18%
GTAA	5.4%	5.7%	9.50%

*Assumptions are derived from the underlying equity, credit, and real assets building blocks



NEPC CAPITAL MARKET ASSUMPTIONS VS PEERS

10-Year Return Forecasts: NEPC vs. Peers



- **Survey of 10 providers of capital markets assumptions**
- **NEPC's capital markets assumptions are close to the mean of the survey**
- **EM Equities return forecast is high: NEPC 9% vs 7.7% mean**
- **Private Equity return forecast is high: NEPC 9.4% vs 8.1% mean**



*Assumptions are as of 12/31/2019

CORRELATIONS

Asset Class	Cash	US Leverage Cost	Large Cap Equities	Small/Mid Cap Equities	Int'l Equities (Unhedged)	Emerging Int'l Equities	Absolute Return - Long/Short	PE Buyout	PE Growth	PE Venture	PE Non-US	Treasuries	IG Corp Credit	High-Yield Bonds	Bank Loans	EMD (External)	EMD (Local Currency)	Short Treasuries (1-3 yr)	Absolute Return - Credit	PD Credit Opportunities	PD Distressed	PD Direct Lending	Long Treasuries	US 10 yr Treasuries	Core Real Estate	Non-Core Real Estate	Natural Resources	Absolute Return - Macro
Cash	1.00	0.91	0.01	-0.03	-0.04	-0.02	0.05	0.00	-0.03	-0.02	-0.03	0.16	0.06	-0.05	-0.01	0.00	0.03	0.49	0.01	-0.05	-0.04	-0.01	0.05	0.09	-0.03	-0.04	0.06	0.06
US Leverage Cost	0.91	1.00	0.07	0.03	0.04	0.06	0.11	0.06	0.04	0.04	0.05	0.33	0.34	0.11	0.10	0.20	0.18	0.63	0.16	0.11	0.10	0.09	0.18	0.25	0.04	0.07	0.12	0.18
Large Cap Equities	0.01	0.07	1.00	0.87	0.75	0.69	0.79	0.96	0.79	0.76	0.70	-0.11	0.28	0.61	0.44	0.65	0.62	-0.10	0.67	0.57	0.66	0.42	-0.12	-0.12	0.37	0.46	0.34	0.32
Small/Mid Cap Equities	-0.03	0.03	0.87	1.00	0.70	0.69	0.71	0.90	0.91	0.87	0.66	-0.18	0.23	0.65	0.50	0.65	0.61	-0.18	0.68	0.61	0.73	0.48	-0.18	-0.18	0.42	0.50	0.38	0.32
Int'l Equities (Unhedged)	-0.04	0.04	0.75	0.70	1.00	0.73	0.70	0.74	0.64	0.62	0.88	-0.12	0.28	0.57	0.42	0.65	0.73	-0.12	0.59	0.53	0.59	0.40	-0.13	-0.13	0.33	0.42	0.38	0.45
Emerging Int'l Equities	-0.02	0.06	0.63	0.69	0.73	1.00	0.64	0.69	0.65	0.63	0.77	-0.16	0.25	0.61	0.49	0.77	0.84	-0.14	0.62	0.57	0.63	0.47	-0.16	-0.17	0.32	0.43	0.39	0.43
Absolute Return - Long/Short	0.05	0.11	0.79	0.71	0.70	0.64	1.00	0.77	0.64	0.62	0.65	-0.10	0.24	0.52	0.38	0.58	0.59	-0.07	0.57	0.49	0.56	0.37	-0.11	-0.11	0.31	0.39	0.31	0.32
PE Buyout	0.00	0.06	0.96	0.90	0.74	0.69	0.77	1.00	0.82	0.79	0.69	-0.13	0.26	0.62	0.45	0.65	0.61	-0.13	0.67	0.58	0.67	0.43	-0.14	-0.14	0.38	0.47	0.35	0.32
PE Growth	-0.03	0.04	0.79	0.91	0.64	0.65	0.64	0.82	1.00	0.84	0.61	-0.16	0.24	0.64	0.54	0.63	0.58	-0.16	0.66	0.60	0.71	0.52	-0.16	-0.17	0.40	0.49	0.35	0.31
PE Venture	-0.02	0.04	0.76	0.87	0.62	0.63	0.62	0.79	0.84	1.00	0.59	-0.16	0.24	0.64	0.55	0.62	0.57	-0.16	0.65	0.60	0.70	0.53	-0.16	-0.16	0.40	0.48	0.35	0.30
PE Non-US	-0.03	0.05	0.70	0.66	0.88	0.77	0.65	0.69	0.61	0.59	1.00	-0.12	0.26	0.55	0.42	0.65	0.72	-0.12	0.57	0.52	0.57	0.40	-0.13	-0.14	0.31	0.40	0.37	0.42
Treasuries	0.16	0.33	-0.11	-0.18	-0.12	-0.16	-0.10	-0.13	-0.16	-0.16	-0.12	1.00	0.71	-0.06	-0.23	0.19	0.11	0.81	-0.06	-0.05	-0.12	-0.22	0.93	0.98	0.00	-0.02	-0.08	0.13
IG Corp Credit	0.06	0.34	0.28	0.23	0.28	0.25	0.24	0.26	0.24	0.24	0.26	0.71	1.00	0.51	0.28	0.69	0.50	0.51	0.47	0.48	0.43	0.26	0.68	0.70	0.26	0.35	0.18	0.35
High-Yield Bonds	-0.05	0.11	0.61	0.65	0.57	0.61	0.52	0.62	0.64	0.64	0.55	-0.06	0.51	1.00	0.79	0.87	0.67	-0.08	0.93	0.94	0.93	0.76	-0.06	-0.07	0.46	0.66	0.35	0.36
Bank Loans	-0.01	0.10	0.44	0.50	0.42	0.49	0.38	0.45	0.54	0.55	0.42	-0.23	0.28	0.79	1.00	0.64	0.52	-0.17	0.73	0.74	0.80	0.96	-0.23	-0.24	0.39	0.54	0.30	0.28
EMD (External)	0.00	0.20	0.65	0.65	0.65	0.77	0.58	0.65	0.63	0.62	0.65	0.19	0.69	0.87	0.64	1.00	0.82	0.12	0.83	0.81	0.82	0.61	0.18	0.18	0.43	0.59	0.38	0.46
EMD (Local Currency)	0.03	0.18	0.62	0.61	0.73	0.84	0.59	0.61	0.58	0.57	0.72	0.11	0.50	0.67	0.52	0.82	1.00	0.11	0.66	0.62	0.65	0.49	0.06	0.09	0.36	0.47	0.42	0.60
Short Treasuries (1-3 yr)	0.49	0.63	-0.10	-0.18	-0.12	-0.14	-0.07	-0.13	-0.16	-0.16	-0.12	0.81	0.51	-0.08	-0.17	0.12	0.11	1.00	-0.06	-0.08	-0.13	-0.17	0.60	0.74	-0.04	-0.05	-0.05	0.15
Absolute Return - Credit	0.01	0.16	0.67	0.68	0.59	0.62	0.57	0.67	0.66	0.65	0.57	-0.06	0.47	0.93	0.73	0.83	0.66	-0.06	1.00	0.87	0.88	0.70	-0.06	-0.07	0.45	0.63	0.35	0.36
PD Credit Opportunities	-0.05	0.11	0.57	0.61	0.53	0.57	0.49	0.58	0.60	0.60	0.52	-0.05	0.48	0.94	0.74	0.81	0.62	-0.08	0.87	1.00	0.87	0.71	-0.05	-0.07	0.43	0.62	0.33	0.34
PD Distressed	-0.04	0.10	0.66	0.73	0.59	0.63	0.56	0.67	0.71	0.70	0.57	-0.12	0.43	0.93	0.80	0.82	0.65	-0.13	0.88	0.87	1.00	0.77	-0.12	-0.13	0.46	0.63	0.36	0.35
PD Direct Lending	-0.01	0.09	0.42	0.48	0.40	0.47	0.37	0.43	0.52	0.53	0.40	-0.22	0.26	0.76	0.96	0.61	0.49	-0.17	0.70	0.71	0.77	1.00	-0.22	-0.23	0.37	0.52	0.28	0.26
Long Treasuries	0.05	0.18	-0.12	-0.18	-0.13	-0.16	-0.11	-0.14	-0.16	-0.16	-0.13	0.93	0.68	-0.06	-0.23	0.18	0.06	0.60	-0.06	-0.05	-0.12	-0.22	1.00	0.95	0.01	-0.01	-0.13	0.06
US 10 yr Treasuries	0.09	0.25	-0.12	-0.18	-0.13	-0.17	-0.11	-0.14	-0.17	-0.16	-0.14	0.98	0.70	-0.07	-0.24	0.18	0.09	0.74	-0.07	-0.07	-0.13	-0.23	0.95	1.00	0.00	-0.03	-0.10	0.11
Core Real Estate	-0.03	0.04	0.37	0.42	0.33	0.32	0.31	0.38	0.40	0.40	0.31	0.00	0.26	0.46	0.39	0.43	0.36	-0.04	0.45	0.43	0.46	0.37	0.01	0.00	1.00	0.78	0.24	0.20
Non-Core Real Estate	-0.04	0.07	0.46	0.50	0.42	0.43	0.39	0.47	0.49	0.48	0.40	-0.02	0.35	0.66	0.54	0.59	0.47	-0.05	0.63	0.62	0.63	0.52	-0.01	-0.03	0.78	1.00	0.28	0.26
Natural Resources	0.06	0.12	0.34	0.38	0.38	0.39	0.31	0.35	0.35	0.35	0.37	-0.08	0.18	0.35	0.30	0.38	0.42	-0.05	0.35	0.33	0.36	0.28	-0.13	-0.10	0.24	0.28	1.00	0.52
Absolute Return - Macro	0.06	0.18	0.32	0.32	0.45	0.43	0.32	0.32	0.31	0.30	0.42	0.13	0.35	0.36	0.28	0.46	0.60	0.15	0.36	0.34	0.35	0.26	0.06	0.11	0.20	0.26	0.52	1.00



INFORMATION DISCLAIMER

Past performance is no guarantee of future results.

The goal of this report is to provide a basis for substantiating asset allocation recommendations. The opinions presented herein represent the good faith views of NEPC as of the date of this report and are subject to change at any time.

Information on market indices was provided by sources external to NEPC. While NEPC has exercised reasonable professional care in preparing this report, we cannot guarantee the accuracy of all source information contained within.

All investments carry some level of risk. Diversification and other asset allocation techniques do not ensure profit or protect against losses.

This report is provided as a management aid for the client's internal use only. This report may contain confidential or proprietary information and may not be copied or redistributed to any party not legally entitled to receive it.

