

STATE OF RHODE ISLAND

ASSET ALLOCATION FOLLOW UP

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

EXECUTIVE SUMMARY

NEPC, LLC

EQUITY OPTIONS PROCESS SUMMARY

- **As a reminder, the SIC approved a 2% allocation (~\$160M) to Equity Options, within it's Income bucket, at the December meeting**

		Current Target	Current Allocation
Income	Equity Options	2.0%	0.0%
	Liquid Credit	2.8%	3.6%
	EMD (Blended)	2.0%	0.0%
	HY Infrastructure	1%	1%
	REITs	1%	1%
	Private Credit	3.2%	2.0%
	TOTAL INCOME	12%	8%

- **Over the last several months, NEPC and Staff have conducted additional research to help inform how best to implement the allocation**
 - We've focused on strategies that sell (write) at the money puts
 - Effectively selling insurance and collecting a premium for doing so
- **NEPC & Staff conducted several manager interviews with the goal of finding the best firm to recommend to the SIC**
- **Neuberger Berman is scheduled to present its put-writing strategy today**
 - Manages \$4B in various option mandates with \$3.4B of that specific to put writing
 - Neuberger Berman has a 9+ year track record within put writing



NEUBERGER BERMAN MANAGER SUMMARY

General Firm & Strategy Information	
Firm Name	Neuberger Berman
Strategy Name	S&P 500 Put-Write
Strategy AUM	\$2.5 Billion (S&P 500) \$973 Million (Global)
Strategy Inception Date	July 2011 (S&P 500) March 2011 (Global)
NEPC' Product Rating	3 (Neutral)*
Representative List of Competitors	<ol style="list-style-type: none"> 1. Parametric Portfolio Associates 2. Gateway Investment Advisors 3. Geode 4. Harvest Volatility Managements 5. DGV Solutions 6. Russell Investments

General Firm & Strategy Information	
Strategy Description	Fundamentally, the strategy seeks to exploit the behavioral bias that investors overpay for insurance. It does so by writing (selling) at the money put options (insurance) and collecting a yield (implied vol. premium) for doing so. As such the strategy will seek to earn returns by collecting this premium over time as opposed to capital appreciation. The premium will fluctuate based on implied volatility versus realized volatility. However, the premium has proven to be fairly attractive over the long-term: 4.1% avg. implied vol. premium on S&P 500 30 Day option
Strategy Benchmark	S&P 500 Put-Write Index; the index writes a single ATM option once a month on the SPX. The options are collateralized with 1-3 month T-Bills which earn a small yield
Important Considerations	<ol style="list-style-type: none"> 1. Types of Collateral Used – do you allow them to improve on simply using T-Bills 2. Use of Leverage – should the portfolio be fully collateralized 3. Ranges Related to Options – how far out of the money can an option be written and what is the max tenor

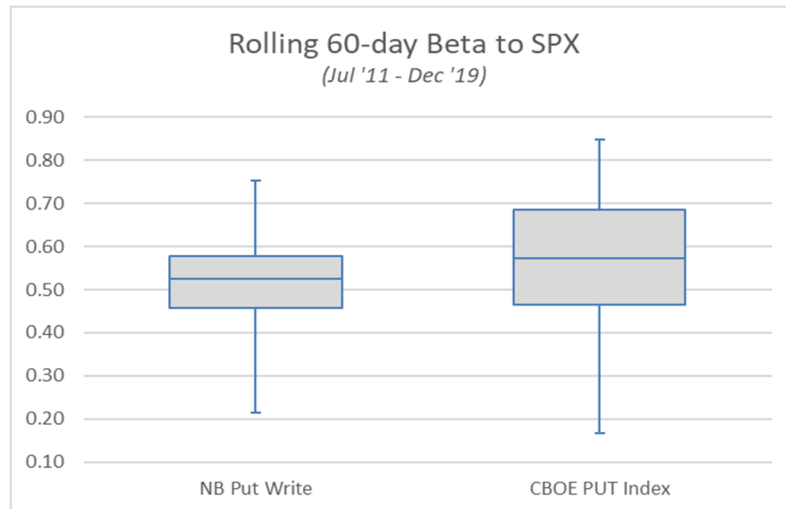
Fees	
Fee	<p><u>Commingled Fund:</u> 35 bps on \$200M 30 bps thereafter</p> <p><u>Separate Account:</u> Negotiable</p>



*NEPC does not have a formal FPL for Equity Option managers

PERFORMANCE SUMMARY

	Trailing Gross of Fee (12.31.19)				
	1 Year	3 Years	5 Years	7 Years	Since Inception
NB S&P 500 PutWrite (ATM)	16.67	7.05	7.45	8.29	8.47
CBOE S&P 500 Put-Write Index	13.51	5.78	6.30	7.14	7.16



Rolling 60-day Beta to SPX		
Jul '11 - Dec '19	NB Put Write	CBOE PUT Index
Avg. Beta	0.51	0.57
Std. Dev.	0.10	0.15
Max	0.75	0.85
25th %ile	0.58	0.69
Median	0.53	0.57
75th %ile	0.46	0.47
Min	0.22	0.17



EQUITY OPTIONS: NEXT STEPS

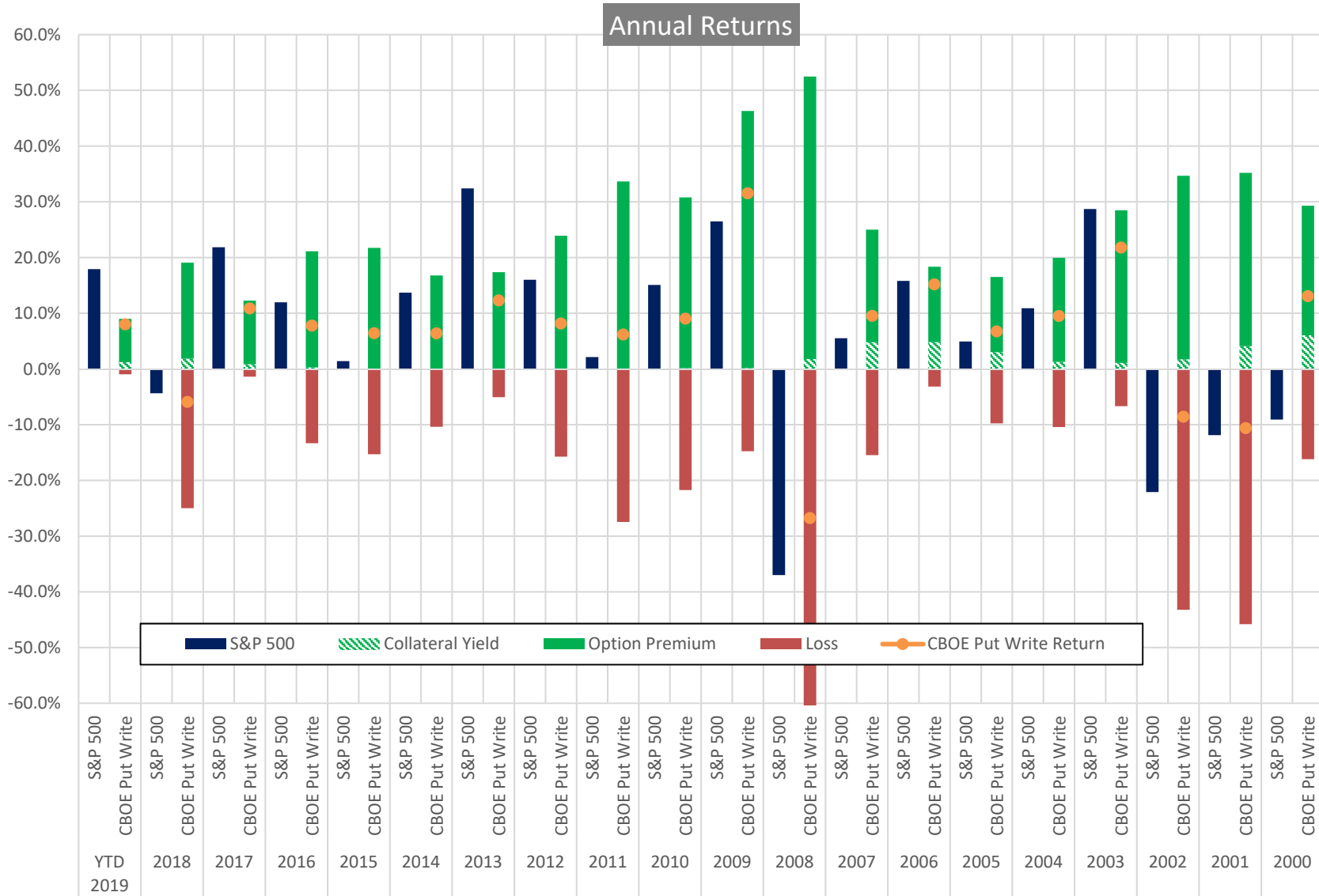
- **The Equity Options mandate (\$160M) will largely be funded from the plan's Core Bond allocations**
 - As a reminder, the Core Bond allocation was decreased from 11.5% to 6.5% as part of the most recent SAA study
- **NEPC & Staff will provide draft guidelines to the SIC to review prior to the funding of the allocation**
 - The IPS guidelines will specifically address a number of items including:
 - Leverage, collateral usage, option tenor, and fee structure



APPENDIX

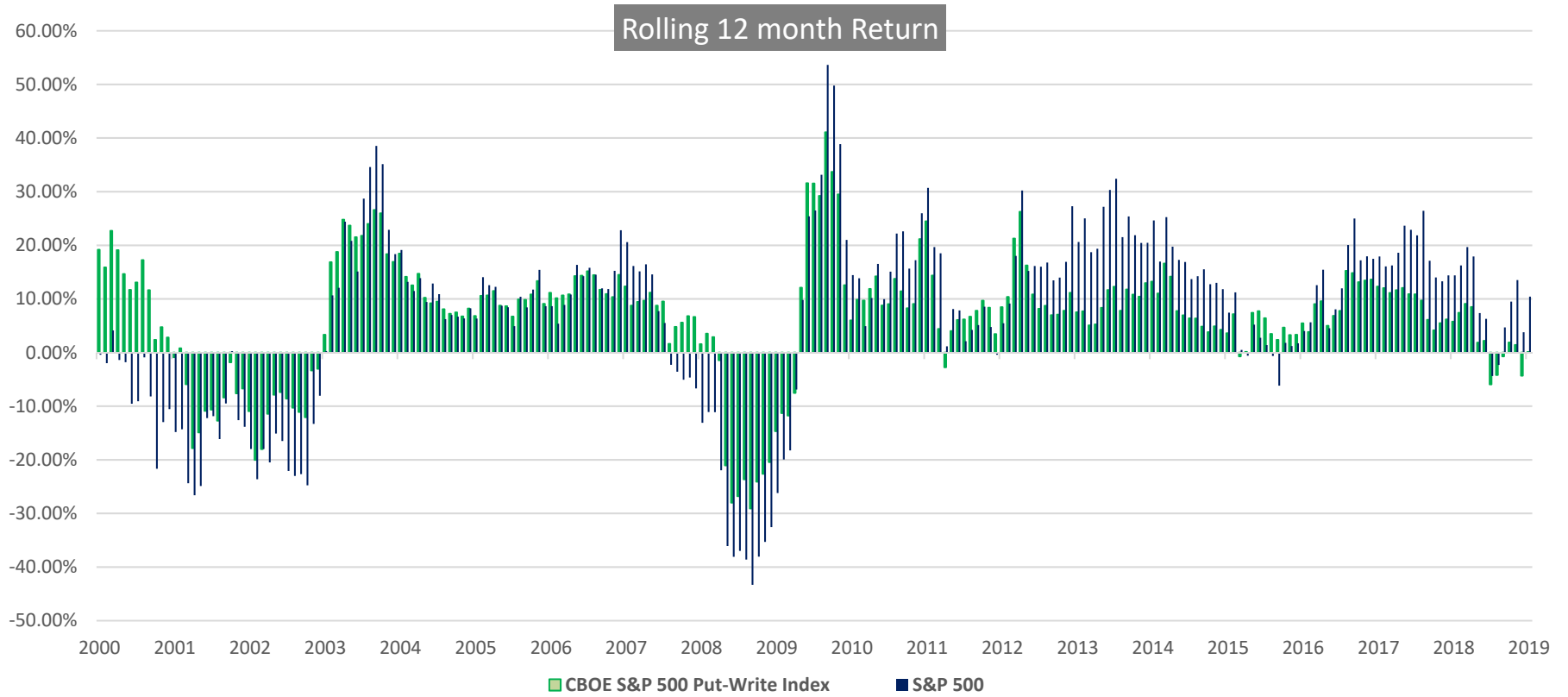
NEPC, LLC

ANNUAL PUT WRITING RETURNS VS. S&P 500



*As of June, 2019

ROLLING 12 MONTH PUT WRITING RETURNS VS. S&P 500



*As of June, 2019