

## September 2020 Newsletter

Dear Investor,

The Global Volatility Summit (“GVS”) brings together volatility and tail hedge managers, institutional investors, thought-provoking speakers, and other industry experts to discuss the volatility markets and the roles volatility strategies can play in institutional investment portfolios. The GVS aims to keep investors updated on the volatility markets throughout the year, and educated on innovations within the space.

**Neuberger Berman has provided the latest piece in the GVS newsletter series.**

Cheers,  
Global Volatility Summit

## 11th Annual Global Volatility Summit

We are excited to announce the first ever Virtual Global Volatility Summit taking place from September 21 to September 23. Virtual GVS consists of thought-provoking panel discussions with managers and investors around the globe as well as a timely keynote from Demetri Sevastopulo (Washington Bureau Chief, Financial Times).

### 2020 Sponsor Participants

1798 Lombard Odier Investment Managers	Goldman Sachs
36 South Capital Advisors	III Capital Management
Bank of America	Ionic Capital Management
Barclays	LFIS
BNP Paribas	Man Group
Capstone Investment Advisors	Neuberger Berman
Capula Investment Managers	Parallax Volatility Advisors
Cboe Global Markets	Penso
CME Group	Quantitative Brokers
Dominicé & Co.	Societe Generale
Dyal Capital Partners	SpiderRock
EurekaHedge	Systematica Investments
Eurex	True Partner Capital

Questions? Please contact [info@globalvolatilitysummit.com](mailto:info@globalvolatilitysummit.com)  
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# Post-Modern Equity Portfolio Allocation

## The Rise of Index Options and Private Equity

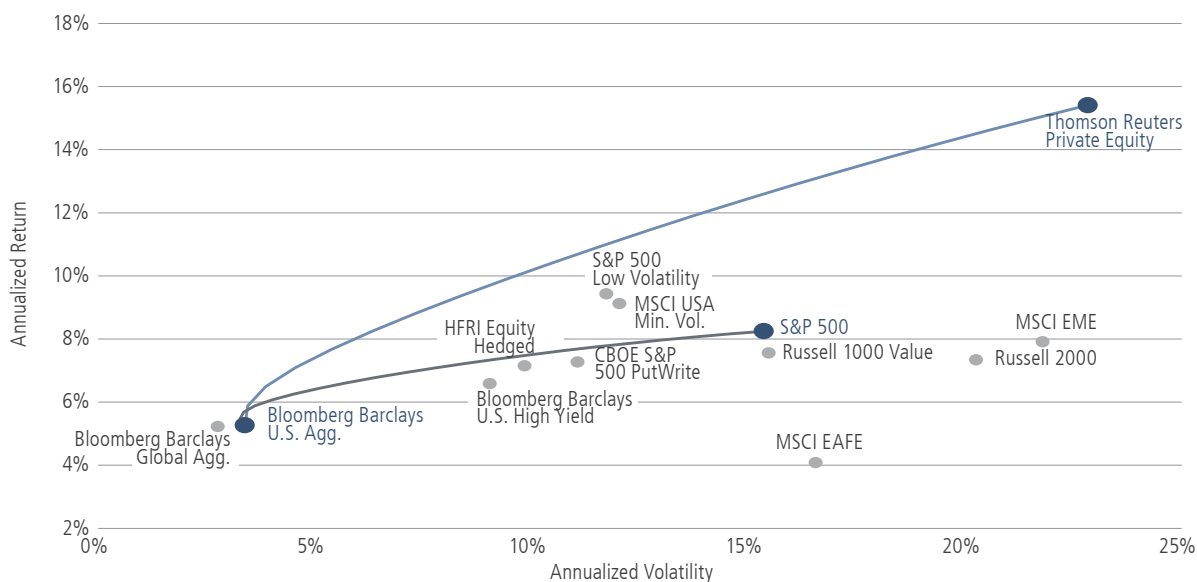
Economic globalization, coordinated Central Bank market interventions and the persistent success of private equity investing seem to be eroding many of the conditions that supported Modern Portfolio Theory. Going forward, we question whether higher risk public equity investments will consistently earn returns commensurate with their risk. In the absence of dynamic asset allocation and/or active stock selection, we explore whether investing solely in a diverse pool of equity indexes, which are long-held to be efficient diversifiers, may prove suboptimal over the long term. Hence, we believe long-term investors should prioritize diversification across payoff structures (income, dividends, capital appreciation, option premiums) over traditional sources of diversification (asset class, style, market capitalization, valuation). Said simply, focusing on how investors get paid may be more important than worrying about what they get paid for.

## Private Equity Raised the Bar

When combined with U.S. bond exposures, approximated by the Bloomberg Barclays U.S. Aggregate Index, the Thomson Reuters Private Equity Buyout Index creates a formidable 'post-modern' efficient frontier (light blue line in chart below) that dominates most every equity index allocation. Let's accept this as a new risk-efficiency hurdle that replaces the old S&P 500 frontier (dark gray line). The tectonic shift of institutional assets to private markets is well supported.

### RAISING THE BAR

December 31, 1996 – May 31, 2020



Source: Bloomberg LP. All index statistics are based on their longest common time period with the exception of the MSCI Emerging Market Equity Index, whose data is limited to its inception of December 31, 1998.

As private equity markets have grown to rival public markets as a source of capital, we hypothesize that private capital is routinely preventing many equity indexes from capturing excess returns by taking discounted public companies private and/or retaining strong performing businesses in the private ecosystem for extended periods. This systematic syphoning of alpha leaves many equity indexes without their historically rich sources of diversifying returns.

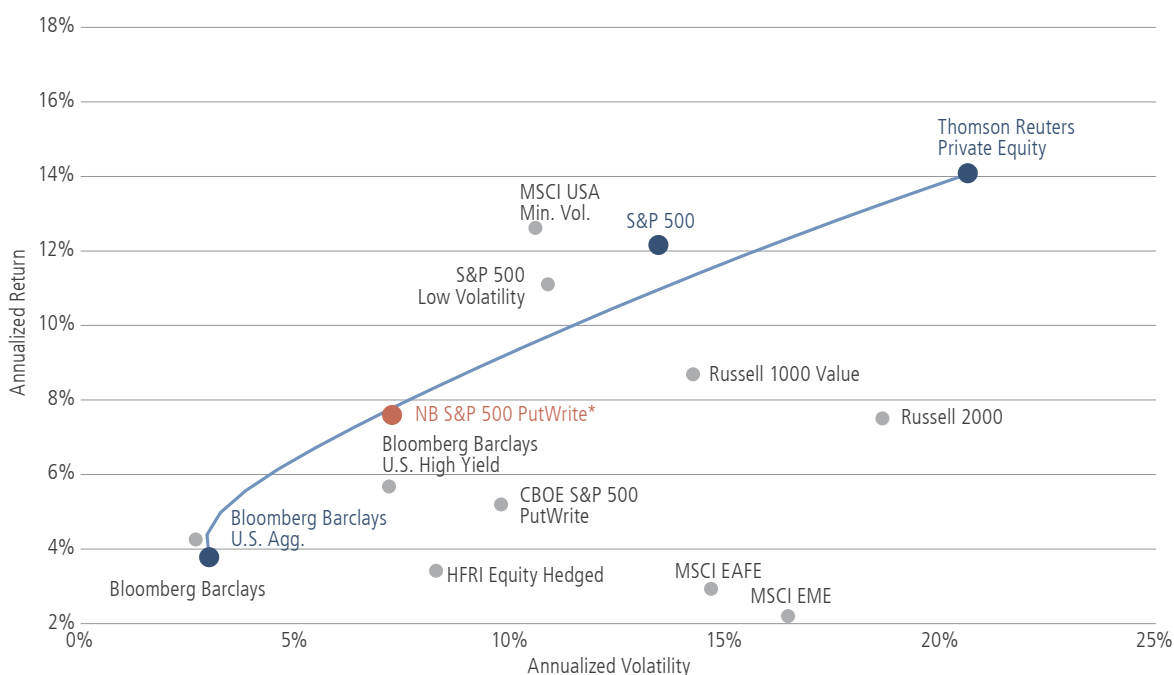
Anecdotally, we would speculate that increased deal competition has forced Warren Buffet to exercise tireless patience and to make increasingly larger acquisitions in order to find what he believes are 'good deals' for his Berkshire Hathaway. Considering the U.S. Fed's recent commitment to purchase U.S. corporate bonds, maybe the U.S. Fed will become one of the key competitors for private equity firms in the next decade. Much like index option markets that can profit from fear, private equity strategies arguably need discounted investments upon which to capitalize.

## One Public Equity Index to Rule Them All

Updating the chart above to the inception date of our S&P 500 Index PutWrite Strategy (2011) highlights the dominance of the S&P 500 among public market indices. Even knowing the extent of the support for the global economy over the last decade, the supremacy of the S&P 500 Index is striking. Moreover, the low volatility indexes appear to have reaped additional benefits from the persistent decline in interest rates and the increased demand for dividend income from investors. Poor 2020 performance for both the S&P 500 Low Volatility Index and the MSCI Minimum Volatility Index versus the S&P 500 illustrates the challenges of assuming subsets of the broader market can outperform indefinitely.

## ONE PUBLIC EQUITY INDEX TO RULE THEM ALL

July 31, 2011 – May 31, 2020



Source: Bloomberg LP. All index statistics are based on their longest common time period.

\* Returns are based on representative composite account(s) monthly gains/losses for fully collateralized put options for indicated index exposure. Representative account data is weighted by account notional exposure and is modified to reflect collateral assumed to be held in short-term U.S. Treasuries. Actual collateral of representative account differs and if such actual collateral were reflected, returns shown would have been higher. Return estimates include transaction costs. Returns are presented on a supplemental basis and are based upon the applicable index component (S&P 500) of representative fully collateralized NB Global PutWrite Equal Weight (ATM) composite account(s). No one received this representative account model performance from the period of 2011 – 2017 since it was managed as part of a larger strategy and not as a stand-alone strategy. From 2017 – present the representative account was managed as an actual strategy whose performance is presented at the end of this presentation as the S&P Index PutWrite (ATM) Composite. Please refer to the attached GIPS® compliant composite presentation for complete performance information. All returns are gross of fees.

Going forward, we believe the factors mentioned in the opening paragraph will continue to favor specific equity market indexes. In our minds, the S&P 500 Index has become, or is becoming, the ‘reserve’ equity index of global equity markets. It is a curated, liquid, almost free exposure to some of the most competitive and diversified global companies in the world. It is also accessible to just about every global investor looking to invest in equity markets, and most importantly, it appears backstopped by the U.S. political and Federal Reserve systems.<sup>1</sup>

With swollen coffers of private capital sourcing ‘quality’ investment opportunities from public markets, equity indexes that focus on narrower subsets of equity markets like small caps, value, momentum and emerging markets are becoming index exposures better suited for tactical allocations or constructing risk factor exposures than for long-term holdings. Even the growing demand for factor completion portfolios suggest many investors are trying to converge back to the S&P 500’s success.

### Options for the Future

In making the move to greater private market exposures, many investors and/or consultants are shifting their portfolio allocation frameworks from traditional ‘buckets’ segmented by characteristics like asset class, style and capitalization into broader categorizations based on investment pay-off structure. This new approach recognizes that asset class correlations are not necessarily stable over time and many modern strategies defy standard classifications despite exposures to well understood asset classes (bonds, equity, options, risk-

<sup>1</sup> We acknowledge there are many reasons international investors will continue to hold local broad-based equity indexes and hypothesize they are likely to experience a similar ‘preference’ effect. However, we would expect the impact to be less than that of the S&P 500.

premia, macro, commodities, risk parity, etc.). Blending diverse sets of pay-off profiles may offer more risk-efficient outcomes as structural characteristics can be more stable and rational across market environments.

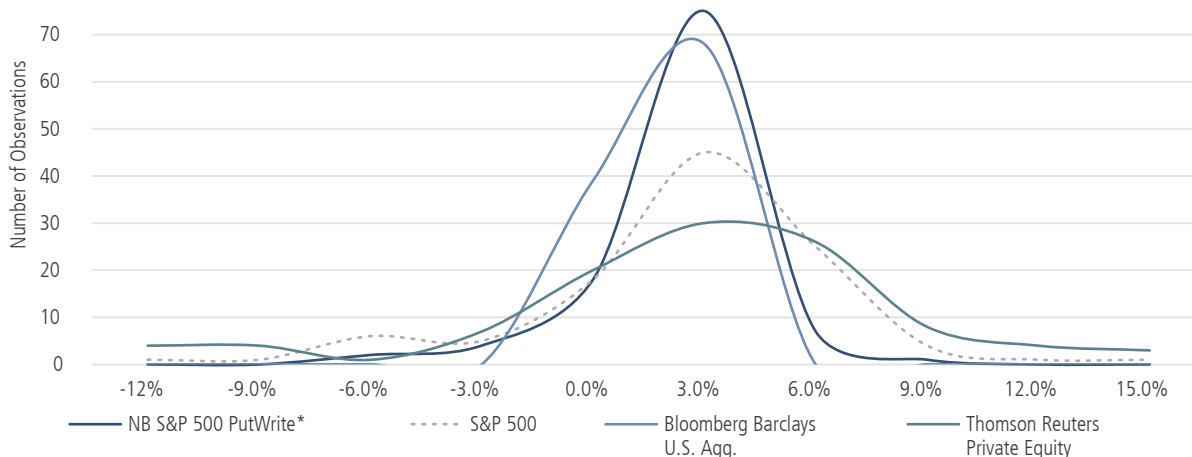
Specifically, unlike many equity index exposures that failed to achieve return levels commensurate with their realized volatility levels, our collateralized S&P 500 Index PutWrite Strategy results roughly matched the risk efficiency of our 'post-modern' efficient frontier while maintaining a diversifying pay-off profile derived directly from S&P 500 Index exposure. In practical terms, our S&P 500 Index PutWrite Strategy has approximated a portfolio consisting of 65% Bloomberg Barclays U.S. Aggregate Bond Index and 35% Thomson Reuters Private Equity Buyout Index. Both would have generated a return of about 7.5% with a volatility of around 7.3%. For investors that do not wish to hold large, illiquid, potentially high-fee, private equity positions or do not have access to such investment opportunities, blending putwrite with fixed income and equity allocations (S&P 500 Index) may suffice as a reasonable proxy.

More generally, we believe index putwrite strategies offer unique payoff structures and return sources (implied volatility premiums) that are natural complements to private equity investments. Option strategies can monetize relatively short-term risks that longer-term private equity strategies are not well suited to assume, especially in a market that increasingly seems to provide little opportunity to capitalize on market corrections. In addition, option strategies can help balance the need to maintain equity exposure over multi-year commitment periods with the need to maintain ample liquidity to meet capital calls. Importantly, index option strategies can help mitigate some of the additional expenses incurred by private investments (the J-curve). With hundreds of billions of dollars committed to private equity over the coming years, we believe investors will need return-enhancing strategies.<sup>2</sup>

To illustrate the different pay-off structures to which we are referring, the chart below plots the monthly return distributions for the Bloomberg Barclays U.S. Aggregate Bond Index, our S&P 500 Index PutWrite Strategy, the S&P 500 Index and the Thomson Reuters Private Equity Buyout Index. As many readers may expect, the Thomson Reuters Private Equity Buyout Index looks like a leveraged version of the S&P 500 with a notably wider right tail and a marginally fatter left tail. Our S&P 500 Index PutWrite Strategy has notably smaller left and right tails while maintaining a more robust positive apex, which suggests a more income- or bond-like pay-off structure for the equity risk it assumes. We often suggest that our put writing is a natural complement to investments with right-tailed distributions that essentially behave like long call options.

#### A FOUR-LEAF CLOVER

July 31, 2011 – May 31, 2020



Source: Bloomberg LP. All index statistics are based on their longest common time period.

\* Returns are based on representative composite account(s) monthly gains/losses for fully collateralized put options for indicated index exposure. Representative account data is weighted by account notional exposure and is modified to reflect collateral assumed to be held in short-term U.S. Treasuries. Actual collateral of representative account differs and if such actual collateral were reflected, returns shown would have been higher. Return estimates include transaction costs. Returns are presented on a supplemental basis and are based upon the applicable index component (S&P 500) of representative fully collateralized NB Global PutWrite Equal Weight (ATM) composite account(s). No one received this representative account model performance from the period of 2011 – 2017 since it was managed as part of a larger strategy and not as a stand-alone strategy. From 2017 – present the representative account was managed as an actual strategy whose performance is presented at the end of this presentation as the S&P Index PutWrite (ATM) Composite. Please refer to the attached GIPS® compliant composite presentation for complete performance information. All returns are gross of fees.

<sup>2</sup> For additional thoughts, we suggest Neuberger Berman *Insights*, March 2018: "Utilizing Options to Mitigate the J-Curve" by Kramer & Knutzen.

## A Post-Modern Normal

Portfolio construction seems more challenging today than it has been in past decades with a breadth of investment choices that is almost too much for any allocator to process in real time. Further, investors face the daunting task of consistently sourcing new metrics and optimizations to cope with an ever-changing financial landscape.

Keeping with our tradition of simplification, we wonder if investors are ‘naturally’ drifting away from overly complicated portfolios built on return optimizations using complex correlation estimates and/or risk parameters and drifting toward the stability of allocating to a sub-set of structured pay-off. We reason that stable pay-off structures reduce the challenges of optimizing on underlying return/factor regimes, which can require recalibration or time splicing whenever there is a shift in policy or investor behaviors. While index option and private equity strategy implementations are nuanced and areas of notable intricacies, most would agree that their basic investment premises are straightforward and intuitive.

Some investors and consultants have already built allocation models that facilitate the inclusion of hard to categorize investments that offer favorably structured pay-offs. We believe this innovation will continue to be disruptive as investor increasingly value pay-off structure/ cash flow timing as important as risk/return in the post-modern world.

## APPENDIX – Global Index PutWrite (ATM) Composite Investment Performance Disclosure Statement

	COMPOSITE		BENCHMARK	COMPOSITE					3 YEAR STANDARD DEVIATION	
	Total Return (%, Gross of Fees)	Total Return (%, Net of Fees)	Custom Blend (%)	No. of Accounts	Market Value (\$, m)	Total Firm Assets (\$, bn)	% of Firm Assets	Internal Dispersion	Composite (%)	Custom Blend (%)
<b>YTD Mar-2020</b>	<b>-16.45</b>	<b>-16.58</b>	<b>-23.43</b>	≤ 5	<b>671.1</b>	–	–	–	<b>9.24</b>	<b>12.03</b>
2019	13.58	12.85	8.83	≤ 5	809.1	355.8	0.23	–	6.05	6.6
2018	-6.02	-6.63	-6.93	6	963.9	304.1	0.32	0.22	5.85	6.5
2017	14.28	13.54	12.03	6	1,038.50	295.2	0.35	–	5.7	6.38
2016	5.27	4.59	4.89	≤ 5	258.4	255.2	0.1	–	6.19	7.26
2015	-0.27	-0.92	1.4	≤ 5	–	240.4	–	–	6.31	6.83
2014	2.96	2.3	2.62	≤ 5	–	250	–	–	7.09	6.47
2013	9.18	8.47	8.55	≤ 5	–	241.7	–	–	–	–
2012	21.61	20.83	10.21	≤ 5	–	205	–	–	–	–
10 Months 2011	3.24	2.68	3.97	≤ 5	–	193.1	–	–	–	–

### Compliance Statement

Neuberger Berman Group LLC (“NB”, “Neuberger Berman” or the “Firm”) claims compliance with the Global Investment Performance Standards (GIPS®) and has prepared and presented this report in compliance with the GIPS® standards. Neuberger Berman has been independently verified for the period January 1, 2011 to December 31, 2018. Verification assesses whether (1) the firm has complied with all the composite construction requirements of the GIPS® standards on a firm-wide basis and (2) the firm’s policies and procedures are designed to calculate and present performance in compliance with the GIPS® standards. The NB Global Index PutWrite (ATM) composite

has been examined for the periods January 1, 2017 to December 31, 2018. The verification and performance examination reports are available upon request.

The GIPS® firm definition was redefined effective January 1, 2011. For prior periods there were two separate firms for GIPS® firm definition purposes and such firms were independently verified for the periods January 1, 1997 to December 31, 2010 and January 1, 1996 to December 31, 2010, respectively.

### **Definition of the Firm**

The firm is currently defined for GIPS® purposes as Neuberger Berman Group LLC (“NB”, “Neuberger Berman” or the “Firm”), and includes the following subsidiaries: Neuberger Berman Investment Advisers LLC, Neuberger Berman Europe Ltd., Neuberger Berman Asia Ltd., Neuberger Berman East Asia Ltd., Neuberger Berman Singapore Pte. Ltd., Neuberger Berman Taiwan Ltd, Neuberger Berman Australia Ltd., Neuberger Berman Trust Company N.A., Neuberger Berman Trust Company of Delaware N.A., NB Alternatives Advisers LLC and Neuberger Berman Breton Hill ULC.

### **Policies**

Policies for valuing portfolios, calculating performance, and preparing compliant presentations are available upon request.

### **Composite Description**

The Global Index PutWrite (ATM) Composite (the “Composite”) includes the performance of all fee-paying Global Index PutWrite (ATM) portfolios, with no minimum investment, managed on a fully discretionary basis by the Option Group. The Global Index PutWrite (ATM) strategy sells at-the-money puts across U.S., Developed and Emerging markets. Options are fully collateralized by a fixed income portfolio predominantly consisting of short duration Treasuries. The strategy seeks to both increase long-term return potential and reduce investment volatility. Underlying index exposures are selected consistent with client asset allocations, and risk parameters are set with client’s risk/return objectives. Collateral investments reflect investor preferences and are managed with an emphasis on capital preservation. Option exposure is managed to increase diversification across tenors and strike prices and reduce downside risk from high delta option positions during down markets. Option positions with little remaining time values can be rolled to collect additional premiums and increase capital efficiency. The Composite was created in September 2017 and the performance inception date is March 2011. From March 2011 to September 2017, the performance track record is the performance of the Global PutWrite Equal Weight (ATM) composite. The Global PutWrite Equal Weight (ATM) composite represented the performance of all fee-paying Global PutWrite Equal Weight (ATM) strategy accounts managed by the Option Group on a fully discretionary basis regardless of market value. The Global PutWrite Equal Weight (ATM) strategy sold at-the-money puts with notional exposure equally weighted across U.S., EAFE and EM markets. The composite was created in January 2016. The performance history of the composite prior to January 1, 2016 was comprised of the performance history of the accounts managed by the portfolio management team while at a predecessor firm. A complete list of Neuberger Berman’s composites is available upon request.

### **Primary Benchmark Description**

The benchmark is a Custom Blend. The blend consists of 50% CBOE S&P 500 PutWrite Index, 35% CBOE MSCI EAFE PutWrite Index, and 15% CBOE MSCI Emerging Markets PutWrite Index. The blend is rebalanced monthly and is calculated on a total return basis. The CBOE S&P 500 PutWrite Index measures the performance of a hypothetical portfolio that sells S&P 500 Index (SPX) put options against collateralized cash reserves held in a money market account. The put strategy is designed to sell a sequence of one-month, at the money, S&P 500 Index puts and invest cash at one- and three-month Treasury Bill rates. The number of puts sold varies from month to month, but is limited so that the amount held in Treasury Bills can finance the maximum possible loss from final settlement of the SPX puts. The CBOE MSCI EAFE PutWrite Index is designed to track the performance of a hypothetical passive investment strategy that collects option premiums from writing an At-the-Money (ATM) MXEA Put option on a monthly basis and holds a rolling money market account invested in one-month T-bills to cover the liability from the short MXEA Put option position. The index is a total return index that is rebalanced monthly. The CBOE MSCI Emerging Markets PutWrite Index is designed to track the performance of a hypothetical passive investment strategy that collects option premiums from writing an At-the-Money (ATM) MXEF Put option on a monthly basis and holds a rolling money market account invested in one-month T-bills to cover the liability from the short MXEF Put option position. The index is a total return index that is rebalanced monthly.

## Reporting Currency

Valuations are computed and performance is reported in U.S. Dollars. Performance includes reinvestment of dividends and other earnings.

## Fees

Composite Gross of Fee returns are the return on investments reduced by any trading expenses incurred during the period. Composite Net of Fee returns are the Gross of Fee returns reduced by investment advisory fees.

## Fee Schedule

The annual investment advisory fee, generally payable quarterly, is as follows: 0.65% on the first \$50mn; 0.55% on the next \$50mn; 0.45% thereafter.

## Internal Dispersion

Internal dispersion is calculated using the asset-weighted standard deviation of annual gross returns of those portfolios that were in the Composite for the entire year. Internal dispersion is not calculated if the Composite does not contain at least 6 portfolios for the entire year.

## Annualized Standard Deviation

The three-year annualized standard deviation measures the variability of the Composite and the benchmark returns over the preceding 36-month period. The standard deviation is not required for periods prior to 2011.

## Additional Notes and Disclosures

As of December 2019, the composite primary benchmark changed from a custom blend of 50% ICE BofA 0-3 Month U.S. Treasury Bill Index/16.67% S&P 500 Index/16.67% MSCI EAFE (Net) Index (Europe, Australasia and Far East)/16.66% MSCI Emerging Markets (Net) Index to a custom blend of 50% CBOE S&P 500 PutWrite Index, 35% CBOE MSCI EAFE PutWrite Index, and 15% CBOE MSCI Emerging Markets PutWrite Index as the investment team believes the updated benchmark blend more appropriately reflects the composite investment strategy.

## APPENDIX – S&P Index PutWrite (ATM) Composite Investment Performance Disclosure Statement

	COMPOSITE		BENCHMARK		COMPOSITE					3 YEAR STANDARD DEVIATION		
	Total Return (% Gross of Fees)	Total Return (% Net of Fees)	CBOE S&P 500 PutWrite Index (%)	S&P 500 Index (%)	No. of Accounts	Market Value (\$ m)	Total Firm Assets (\$ bn)	% of Firm Assets	Internal Dispersion	Composite (%)	CBOE S&P 500 PutWrite Index (%)	S&P 500 Index (%)
YTD Mar-2020	-14.1	-14.2	-20.68	-19.6	≤ 5	1,308.10	–	–	–	9.18	11.83	15
2019	16.75	16.23	13.51	31.49	≤ 5	1,338.20	355.8	0.38	–	–	–	–
2018	-5.45	-5.87	-5.93	-4.38	≤ 5	713.9	304.1	0.23	–	–	–	–
10 Months 2017	8.06	7.66	7.45	15	≤ 5	263.2	295.2	0.09	–	–	–	–

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**Policies**

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**Composite Description**

The S&P Index PutWrite (ATM) Composite (the "Composite") includes the performance of all fee-paying S&P Index PutWrite (ATM) accounts with no investment minimum managed on a fully discretionary basis by the Option Group. The S&P Index PutWrite (ATM) strategy sells at-the-money puts with notional exposure to the S&P 500 Index. Options are fully collateralized by a fixed income portfolio predominantly consisting of short duration Treasuries. The strategy seeks to both increase long term return potential and reduce investment volatility. Underlying index exposures are selected consistent with client asset allocations, and risk parameters are set with client's risk/return objectives. Collateral investments reflect investor preferences and are managed with an emphasis on capital preservation. Option exposure is managed to increase diversification across tenors and strike prices and reduce downside risk from high delta option positions during down markets. Option positions with little remaining time values can be rolled to collect additional premiums and increase capital efficiency. The Composite was created in February 2017 and the performance inception date is March 2017. A complete list of Neuberger Berman's composites is available upon request.

**Primary Benchmark Description**

The benchmark is the CBOE S&P 500 PutWrite Index (the "Index"). The Index measures the performance of a hypothetical portfolio that sells S&P 500 index (SPX) put options against collateralized cash reserves held in a money market account. The put strategy is designed to sell a sequence of one-month, at the money, S&P 500 Index puts and invest cash at one and three month Treasury Bill rates. The number of puts sold varies from month to month, but is limited so that the amount held in Treasury Bills can finance the maximum possible loss from final settlement of the SPX puts.

**Secondary Benchmark Description**

The benchmark is the S&P 500 Index (the "Index"). The Index is a capitalization weighted index comprised of 500 stocks chosen for market size, liquidity and industry group representation. The S&P 500 Index is constructed to represent a broad range of industry segments in the U.S. economy. The S&P 500 Index focuses on the large-cap segment of the market with over 80% coverage of U.S. equities. Criteria for inclusion include financial stability (minimize turnover in the index), screening of common shares to eliminate closely held companies, and trading activity indicative of ample liquidity and efficient share pricing. Companies in merger, acquisition, leveraged-buy-outs, bankruptcy (Chapter 11 filing or any shareholder approval of recapitalization which changes a company's debt-to-equity ratio), restructuring, or lack of representation in their representative industry groups are eliminated from the index.

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**Fee Schedule**

The annual investment advisory fee, generally payable quarterly, is as follows: 0.45% on the first \$50mn; 0.40% on the next \$50mn; 0.35% thereafter.

**Internal Dispersion**

Internal dispersion is calculated using the asset-weighted standard deviation of annual gross returns of those portfolios that were in the Composite for the entire year. Internal dispersion is not calculated if the Composite does not contain at least 6 portfolios for the entire year.

### **Annualized Standard Deviation**

The three-year annualized standard deviation measures the variability of the Composite and the benchmark returns over the preceding 36-month period. The standard deviation is not required for periods prior to 2011.

## **APPENDIX – INDEX DESCRIPTIONS**

**The Bloomberg Barclays U.S. Aggregate Index** represents securities that are SEC-registered, taxable and dollar-denominated. The index covers the U.S. investment grade fixed rate bond market, with index components for government and corporate securities, mortgage pass-through securities, and asset backed securities. These major sectors are subdivided into more specific indices that are calculated and reported on a regular basis.

**The Bloomberg Barclays U.S. High Yield Bond Index** measures the USD-denominated, high yield, fixed-rate corporate bond market. Securities are classified as high yield if the middle rating of Moody's, Fitch and S&P is Ba1/BB+/BB+ or below. Bonds from issuers with an emerging markets country of risk, based on Barclays EM country definition, are excluded.

**The Bloomberg Barclays Global Aggregate Index** provides a broad-based measure of the global investment-grade fixed income markets. The three major components of this index are the Bloomberg Barclays U.S. Aggregate, the Bloomberg Barclays Pan-European Aggregate and the Bloomberg Barclays Asian-Pacific Aggregate Indices. The index also includes Eurodollar and Euro-Yen corporate bonds, Canadian government, agency and corporate securities, and USD investment grade 144A securities.

**The CBOE S&P 500 PutWrite Index (PUT)** is designed to track the performance of an index option put writing strategy that sells a sequence of one-month, at-the-money, S&P 500 Index puts and invest cash at one- and three-month Treasury Bill rates. The number of puts sold varies from month to month, but is limited so that the amount held in Treasury Bills can finance the maximum possible loss from final settlement of the SPX puts, i.e., put options are fully collateralized.

**The HFRI Equity Hedge Index** Investment Managers who maintain positions both long and short in primarily equity and equity derivative securities. A wide variety of investment processes can be employed to arrive at an investment decision, including both quantitative and fundamental techniques; strategies can be broadly diversified or narrowly focused on specific sectors and can range broadly in terms of levels of net exposure, leverage employed, holding period, concentrations of market capitalizations and valuation ranges of typical portfolios. EH managers would typically maintain at least 50% exposure to, and may in some cases be entirely invested in, equities, both long and short.

**MSCI EAFE Index (Europe, Australasia, Far East)** is a free float-adjusted market capitalization index that is designed to measure the equity market performance of developed markets, excluding the U.S. and Canada. The MSCI EAFE Index consists of the following 21 developed market country indices: Australia, Austria, Belgium, Denmark, Finland, France, Germany, Hong Kong, Ireland, Israel, Italy, Japan, the Netherlands, New Zealand, Norway, Portugal, Singapore, Spain, Sweden, Switzerland, and the United Kingdom.

**The MSCI Emerging Markets Index** is a free float-adjusted market capitalization index that is designed to measure equity market performance of emerging markets. The MSCI Emerging Markets Index consists of the following 23 emerging market country indices: Brazil, Chile, China, Colombia, Czech Republic, Egypt, Greece, Hungary, India, Indonesia, Korea, Malaysia, Mexico, Peru, Philippines, Poland, Qatar, Russia, South Africa, Taiwan, Thailand, Turkey and United Arab Emirates.

**The MSCI Minimum Volatility (USD) Index** aims to reflect the performance characteristics of a minimum variance strategy applied to the large and mid-cap USA equity universe. The index is calculated by optimizing the MSCI USA Index, its parent index, in USD for the lowest absolute risk (within a given set of constraints). Historically, the index has shown lower beta and volatility characteristics relative to the MSCI USA Index.

**The Russell 2000 Index** measures the performance of the small-cap segment of the U.S. equity universe. The Russell 2000 Index is a subset of the Russell 3000® Index representing approximately 8% of the total market capitalization of that index. It includes approximately 2,000 of the smallest securities based on a combination of their market cap and current index membership.

**The Russell 1000 Value Index** measures the performance of the large-cap value segment of the U.S. equity universe. It includes those Russell 1000 companies with lower price-to-book ratios and lower expected growth values. The Russell 1000 Index measures the performance of the large-cap segment of the U.S. equity universe. It is a subset of the Russell 3000 Index and includes approximately 1,000 of the largest securities based on a combination of their market cap and current index membership. The Russell 1000 represents approximately 90% of the U.S. market.

**The S&P 500** consists of 500 stocks chosen for market size, liquidity, and industry group representation. It is a market value weighted index (stock price times number of shares outstanding), with each stock's weight in the Index proportionate to its market value. The "500" is one of the most widely used benchmarks of U.S. equity performance. As of September 16, 2005, S&P switched to a float-adjusted format, which weights only those shares that are available to investors, not all of a company's outstanding shares. The value of the index now reflects the value available in the public market

**The S&P 500 Low Volatility Index** measures performance of the 100 least volatile stocks in the S&P 500. The index benchmarks low volatility or low variance strategies for the U.S. stock market. Constituents are weighted relative to the inverse of their corresponding volatility, with the least volatile stocks receiving the highest weights.

**The Thomson Reuters Private Equity Buyout Index** is an index made up of independent portfolios intended to track the return of the private equity universe by replicating movements in the Thomson Reuters Private Equity Buyout Research Index. The Thomson Reuters PE Buyout Index seeks to replicate the return profile of the private equity buyout asset class by constructing a combination of sector portfolio returns. These sector portfolios are designed to track the performance of private equity sector investments by holding liquid exchange traded instruments rather than investing directly in private equity firms.

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Options involve investment strategies and risks different from those associated with ordinary portfolio securities transactions. By writing put options, an investor assumes the risk of declines in the value of the underlying instrument and the risk that it must purchase the underlying instrument at an exercise price that may be higher than the market price of the instrument, including the possibility of a loss up to the entire strike price of each option it sells but without the corresponding opportunity to benefit from potential increases in the value of the underlying instrument. If there is a broad market decline and the investor is not able to close out its written put options, it may result in substantial losses to the investor. The investor will receive a premium from writing options, but the premium received may not be sufficient to offset any losses sustained from exercised put options. Put writing makes an explicit trade-off between up-market participation and down-market participation, while still seeking reasonable returns in flat markets. As such, in up markets, an investor typically will not participate in the full gain of the underlying index above the premium collected.

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