SWAN GLOBAL INVESTMENTS

Seeking Options: Defining and Managing Risk

Options-Based Strategies as an Asset Class

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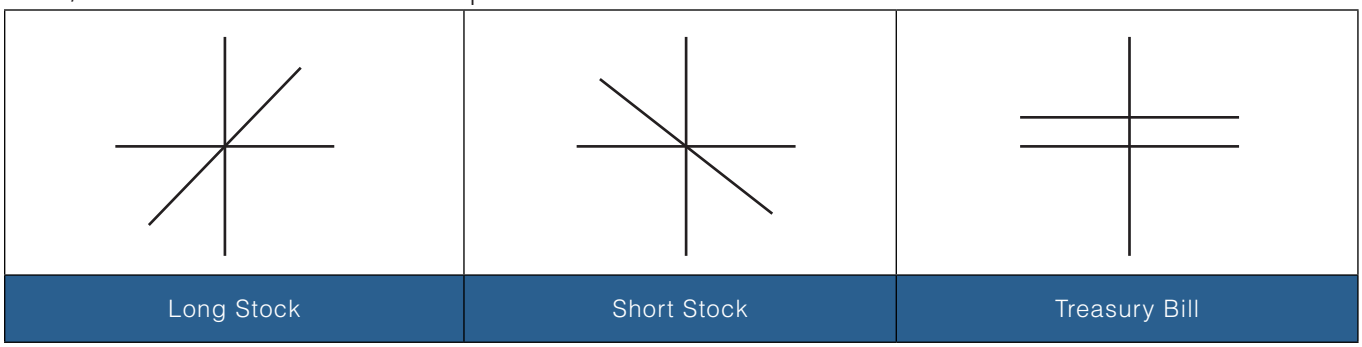
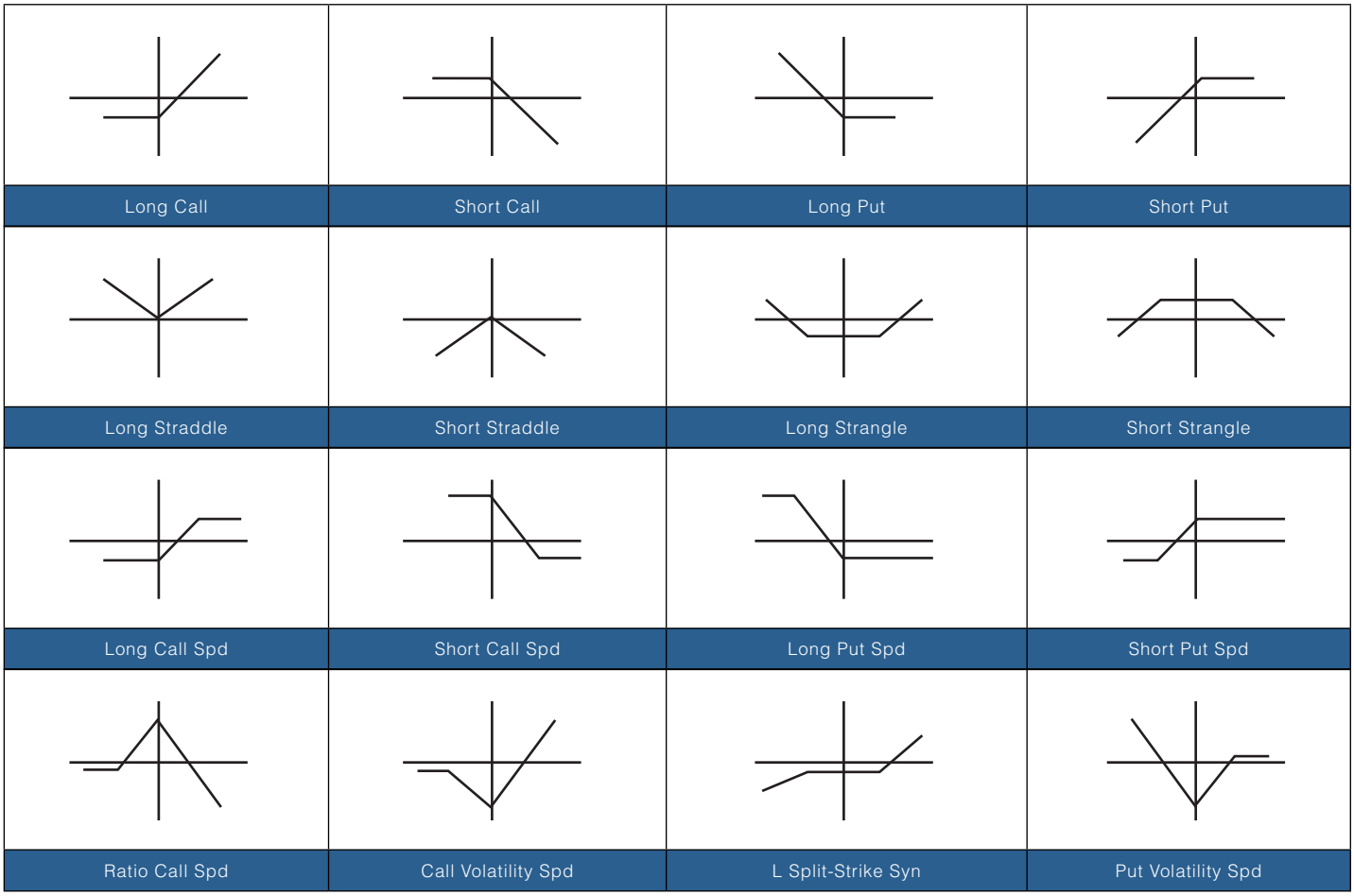
SEEKING OPTIONS: DEFINING AND MANAGING RISK - OPTIONS-BASED STRATEGIES AS AN ASSET CLASS

In today's low yield, high-risk investment environment, traditional choices for investors seemingly have become more limited and often times dangerous. However, over the past several decades other "options", pun intended, has arisen for investors – option-based strategies. Option-based strategies have proven themselves through difficult market environments for equities, bonds, and other liquid assets. These strategies seek to define the risk and reward over a particular time frame through the usage of options. Options have become a new weapon of choice that can be used to change investment outcomes based upon the preferences of the investor. Investors literally have more options.

Profit/Loss of Investments *Without* Options



Profit/Loss Possibilities *With* Options



Source: Investopedia

Historically, the use of options has often been unfairly dismissed as a viable investment solution and oftentimes been viewed as anathema in the investment world. Derivatives have often been blamed for a lot of the financial mishaps of financial institutions, hedge funds, and markets in general. Perhaps it is natural to fear something that isn't properly understood, and thus the importance of education and knowledge in this area.

At Swan, we believe it is vital to educate investors on how options can be a key portfolio management tool. Options are not a scary, esoteric, rarely used tool used only by speculators or sophisticated investors like financial institutions. In fact, investors have used options for decades in many different ways to hedge risk and/or generate income. Swan's option-based solutions have been used for almost twenty years to define and structure acceptable risks and returns and pay someone else to assume unwanted risk in a portfolio.

This concept is becoming more accepted since diversification or modern portfolio theory ("MPT") has proved to be partially flawed. MPT did not provide its intended risk mitigation over the past two decades. The faith-like belief in MPT and diversification has crumbled as more investors realize that market risk by definition, cannot be diversified away; it must be hedged. Diversification and MPT is only part of the solution, not the entire solution. With the failure of MPT to adequately protect during the Tech crash in 2000-2002 and in the most recent financial crisis in 2007-2009, more investors are utilizing options as an investment solution and the usage and knowledge of them continues to grow. This has been largely due to the generation of educational resources, studies, and positive press on options usage, mostly spearheaded by three key organizations: the Chicago Board of Options Exchange (CBOE), the Options Industry Council (OIC), and the Options Clearing Corporation (OCC).

The CBOE is the largest U.S. options exchange and creator of listed options and a leading force for options trading through product innovation, trading technology, and investor education. The OIC hosts options seminars, videos and podcasts, distributes educational literature, and provides valuable insight on the challenges and successes that investors encounter when trading options. In addition, they team up with industry professionals to create the content used in the OIC's educational offerings. Swan's founder, CEO, and Lead Portfolio Manager Randy Swan serves on the Advisory Leadership Council of the OIC. The Options Clearing Corporation (OCC) is described by CBOE as such:

"The OCC is recognized as the vital mechanism which provides market and systemic safety to the listed securities options markets in the U.S. As the issuer of exchange listed options, OCC in effect becomes the buyer to every clearing member representing a seller and the seller to every clearing member representing a buyer. The OCC's role is supported by a three-tiered safeguard system. OCC's qualifications for membership are stringent to protect OCC and its clearing members. Each clearing member applicant is subject to a thorough initial assessment of its operational capability, the experience and competence of its personnel, and its financial condition in relation to predefined standards. After tough membership standards, OCC's second line of defense against clearing member default is member margin deposits. OCC currently holds billions in aggregate clearing member margin deposits. The third line of defense is the clearing members' contributions to the clearing fund. A member's clearing fund deposit is based upon its options activity and is computed monthly. OCC's clearing fund totals hundreds of millions of dollars." These safeguards are in addition to safeguards put in place by the CBOE and the SEC as it relates to options trading.

These organizations have one goal in mind: to provide a financially sound and efficient

marketplace where investors can hedge investment risk and find new opportunities for profiting from market participation. Education is one of main areas that assist in accomplishing that goal. As part of the educational goals of the CBOE and the OIC, numerous detailed studies have been conducted on how options can be used to increase returns, lower volatility, mitigate absolute risk, and more.

But what exactly is an option? It's important to establish this basic definition before reviewing some of the great papers and studies available today on options and their usage in portfolio management. In its simplest form, an option is an investable security that is usually exchange-traded, similar to stocks and bonds. According to Investopedia, it is a contract sold by one party (option writer) to another party (option buyer). The contract offers the option buyer the right, but not the obligation, to buy or sell a security or other asset at an agreed-upon price during a certain period of time or on a specific date (exercise date), depending on the type or style of option (American or European).

As stated previously, when used correctly options can be a valuable tool offering great flexibility within a portfolio. Options have been used successfully for decades across the investment world. They are a building block and a key component of what we at Swan believe is a better approach to long-term investing; hedged investing.

Is important to note that option-based strategies are not solely related to equities. Strategies exist on many publicly traded assets, for those with sufficient liquidity in both the underlying asset and the options on the underlying. For example, most world equity markets have options (S&P 500, small and midcap stocks, emerging markets, and foreign developed) as do many non-equity exchange-traded markets like gold, U.S. Treasuries, and commodities. We refer to option-based strategies that focus on direct risk mitigation as hedged equity or hedged investing, regardless of the underlying asset class being hedged.

Hedged equity can be defined as an allocation to equities combined with a position to hedge out some or most of the risk of the underlying equity position(s). A distinction must be made from long/short equity strategies (labeled in the hedge fund industry as "equity hedge"), which are usually referred to as hedged. A long/short equity strategy is not a hedged equity strategy. Long and short stocks can have long positions fall and short positions rise and, as a result, losses can and do occur on both types of trades. In other words, they do not provide an actual hedge to the equity positions. Long-short strategies may have the intention to hedge out some of the long equity exposure, but the effect is undefined since the long and short securities might not be inversely correlated.

With this difference in mind, we believe there are four basic ways to invest in equities:

1. Passive equity
2. Active equity
3. Tactical equity
4. Hedged equity

1. Passive equity investing: You can buy the market through an index ETF or fund. Your returns will closely track the market, true, but what the market returns will be is an unknown with limitless downside. A committee usually creates such indices or sometimes they are constructed from a formula devised by an investment group. In other words, even an index ETF is not purely passive, but its as close to passive as an investor can get.

2. Active equity investing: You can buy an investment that is actively managed and get its unknown returns and its unknown pattern of returns. Some active managers are just closet indexers and their pattern of returns will probably just match the market's, while others are stock pickers and their distribution of return might be

different. It is extremely difficult, if not impossible, to consistently pick good active managers. Studies have shown that over 80% of active managers underperform their benchmarks on a 5-year and 10-year basis, in both the domestic and international equity space (Source: S&P Dow Jones Indices).

3. Tactical equity investing: Tactical investing is another form of active investing, whether tactical active or tactical passive. You will get an unknown series of returns and an unknown distribution of returns as well. But, there is still no telling what returns you might get. Timing, stock selection, or tactical decisions can lead to excellent performance for many years and then the investment reverses going forward. These strategies can massively underperform or outperform the market and they are unpredictable.

4. Hedged equity: Hedged equity involves investing in equities while also hedging that exposure with an inversely correlated asset, such as put options. Investing in a proven hedged equity strategy such as the DRS gains exposure to the long-term growth of equities, while also always remaining hedged to protect against large downside losses. By using options to re-structure the return distribution as noted previously, an investor can minimize the uncertainty and unknown that normally comes with equity returns.

	Passive Equities	Active Equities	Tactical	Hedged Equity
Loss / Risk Mitigation	Undefined Risk	Undefined Risk	Tactical	**Defined Risk**
Actively Seeking to Minimize Volatility	No	No	Yes	**Yes**
Annual Loss Level Target	No	No	Sometimes	**Yes**
Uncertainty Mitigation	No	No	No	**Yes**
Rules Based	Yes	Sometimes	Sometimes	**Yes**
Transparent	Yes	Yes	Sometimes	**Yes**

Hedged equity strategies usually are linked by the usage of options. So, how have hedged equity and option-based strategies performed compared to other types of equity exposure, and what research has been done on this topic? We will review dozens of related research pieces

WHO IS USING OPTIONS?

and studies, but first, let's look at who is using options.

The best overview of funds using options can be found on the Chicago Board of Options Exchange website, here: http://www.cboe.com/micro/buywrite/performance-options-based-funds.pdf?content=/micro/ndx/pdf/nasdaq-100%20qqq%20prospectus.pdf

This white paper titled "Performance Analysis of Options-Based Equity Mutual Funds, CEFs, and ETFs", by Keith Black and Edward Szado, reviews the growth in options usage amongst mutual funds and highlights numerous types of funds that use options. In addition, the paper highlights the potential improvements of lower volatility, lower maximum drawdown, higher Sharpe ratio, higher returns, and other performance metrics from funds and indices using options, as seen below. Other papers are available that

Exhibit 9 - Summary Statistics - Options-Based Funds and Benchmark Indices
(Jan. 1, 2000 to Dec. 31, 2014)

January 2000 to December 2014	Options-Based Funds	S&P 500	BXM - CBOE S&P 500 BuyWrite	S&P GSCI	Citi Treasury 30 Yr
Annualized Return	4.21%	4.24%	4.07%	1.04%	8.17%
Standard Deviation	11.06%	15.26%	11.36%	23.40%	13.83%
Semi-Standard Deviation	12.78%	17.70%	14.16%	24.95%	14.11%
Average Monthly Return	0.40%	0.44%	0.39%	0.32%	0.74%
Skew	-0.80	-0.58	-1.11	-0.46	0.27
Kurtosis	2.17	1.01	3.79	1.30	3.01
Auto-correlation	0.15	0.12	0.12	0.19	0.03
Maximum Drawdown	-42.24%	-50.95%	-35.81%	-69.38%	-25.96%
Beta to S&P 500	0.65	1.00	0.66	0.44	-0.27
Correlation with S&P 500	0.90	1.00	0.89	0.29	-0.29
Annual Sharpe Ratio	0.27	0.23	0.25	0.09	0.51
Stutzer Index	0.27	0.23	0.25	0.09	0.51
Sortino Ratio	0.23	0.20	0.20	0.08	0.50
Jensen's Annual Alpha	0.65%	0.00%	0.52%	0.46%	7.99%
Leland's Annual Alpha	0.65%	0.00%	0.48%	0.25%	7.90%
M-Squared	5.88%	5.34%	5.64%	3.11%	9.55%

Exhibit 9: The return and risk of Options-Based Funds compare favorably to long-only equity indices. Stutzer Index and Leland's Alpha are alternatives to the Sharpe Ratio and Jensen's Alpha, respectively, that compensate for non-Normal return distributions.

Sources: Morningstar and Bloomberg.

Source: Performance Analysis of Options-Based Equity Mutual Funds, CEFs, and ETFs", by Keith Black and Edward Szado

Exhibit 18 - Summary Statistics Table Since Mid-1988 - Benchmark Indices
(Jul. 1, 1988 - Dec. 31, 2014)

Jul. 1, 1988 to Dec. 31, 2014	BXM - CBOE S&P 500 BuyWrite	PUT - CBOE S&P 500 PutWrite Index	BXY - CBOE S&P 500 2% OTM BuyWrite	CLL - CBOE S&P 500 95-110 Collar Index	S&P 500	S&P GSCI	Citi Treasury 30 Yr
Annualized Return	9.25%	10.57%	10.60%	6.86%	10.33%	3.87%	8.17%
Standard Deviation	10.26%	9.78%	12.05%	10.49%	14.49%	20.90%	12.15%
Semi-Standard Deviation Below Mean	13.23%	12.83%	14.37%	11.06%	16.61%	21.33%	12.20%
Average Monthly Return	0.78%	0.88%	0.90%	0.60%	0.91%	0.50%	0.72%
Skew	-1.30	-1.99	-0.91	-0.17	-0.61	-0.18	0.23
Kurtosis	4.86	9.51	2.75	-0.22	1.27	2.09	3.20
Auto-correlation	0.08	0.12	0.05	0.03	0.04	0.20	0.07
Beta to S&P 500	0.62	0.55	0.78	0.66	1.00	0.24	-0.07
Correlation with S&P 500	0.88	0.82	0.93	0.92	1.00	0.17	-0.09
Maximum Drawdown	-35.81%	-32.66%	-40.31%	-35.47%	-50.95%	-69.38%	-25.96%
Annual Sharpe Ratio	0.61	0.76	0.64	0.39	0.54	0.14	0.45
Stutzer Index	0.59	0.71	0.62	0.39	0.53	0.14	0.45
Sortino Ratio	0.47	0.58	0.54	0.37	0.47	0.13	0.45
Treynor Ratio	0.10	0.13	0.10	0.06	0.08	0.12	-0.74
Jensen's Annual Alpha	1.44%	3.13%	1.66%	-1.10%	0.00%	0.98%	6.03%
Leland's Annual Alpha	1.23%	2.85%	1.54%	-0.86%	0.00%	0.33%	5.99%
M-Squared	11.99%	14.17%	12.42%	8.75%	10.93%	5.13%	9.67%

Exhibit 18: BXM, PUT, and BXY had a positive alpha and a lower standard deviation of returns than the S&P 500 Index.
Sources: Morningstar and Bloomberg.

Source: Performance Analysis of Options-Based Equity Mutual Funds, CEFs, and ETFs", by Keith Black and Edward Szado

specifically highlight the benefits of strategies or benchmarks that employ options. These papers provide support for the passive or active usage of options, and give credence to the idea that options have a place in portfolio management. Below we have highlighted and linked to some of this research, much of it by the Options Industry Council and the CBOE. Although we believe there are both positives and negatives to some of these strategies and concepts covered in these papers, we believe these documents can help provide a better foundational education for those unfamiliar with options and their place in portfolio management. Once this foundation is established, it is then beneficial to consider each idea separately to analyze the best and most efficient option strategies available to investors. However, these foundational research pieces provide many reasons as to why options are being used by portfolio managers.

WHY (AND HOW) ARE THEY USING OPTIONS?

Here we have included a brief summary and link to a dozen of what we believe to be the most important and foundational research papers related to the usage of options in portfolio management. These groundbreaking studies support the idea that hedged equity is a viable and strong alternative to passive, active, or tactical equity exposure.

1. Risk Mitigating Collar Strategy - Loosening Your Collar: Alternative Implementations of QQQ Collars by Edward Szado and Thomas Schneeweis

This paper builds on some earlier work by Szado and Hossein Kazemi and their groundbreaking

paper Collaring the Cube: Protection Options for a QQQ ETF Portfolio. In this follow-up paper, Szado and Schneeweis have updated the data and expanded the work from the original collar study. The study shows the potential of a collar strategy as compared to buy-and-hold. A collar strategy buys a long protective put while also selling calls to help pay for the hedge. The appendix to the paper found that a long protective collar strategy using 6-month puts and selling consecutive 1-month calls earned better returns compared to a buy-and-hold strategy while also reducing risk by around 65%.

This study can be found here:
http://www.optionseducation.org/documents/literature/files/oic-collar-qqq.pdf

2. Risk Mitigating Collar Strategy – Option-Based Risk Management in a Multi-Asset World by Edward Szado and Thomas Schneeweis

The OIC explained the thesis of this paper as: "The contagion across asset classes during the 2008-2009 financial crisis suggests that protective option-based investment strategies such as collars, when implemented on a wide range of asset classes, could provide portfolios with greater downside risk protection than standard multi-asset diversification programs." The paper was a summary of a more in-depth work, a book titled "Option Based Risk Management in a Multi-Asset World." Szado and Schneeweis in this book (and this paper) expanded on their prior research on the performance of equity-based collar strategies by considering the impact of collar strategies across asset classes, including U.S. and foreign equity, commodity, fixed income, currency, and real estate. The results of their work showed that for most of the asset classes, an option-based collar strategy using six-month put purchases and consecutive one-month call writes, provided risk reduction and improved risk-adjusted performance. Eleven out of seventeen outperformed a buy-and-hold approach and 17 out of 17 had a reduction in risk. Numerous other types of collars were also examined.

To view this study, visit this link:
http://www.optionseducation.org/documents/literature/files/options-based-risk-mgmt-summary.pdf

Exhibit 2: summary statistics 5% OTM 1-Month Call/6-Month Put Collars (study period 55 months except GLD*)

	ETF Symbol	ETF Annualized Return	5% OTM collar Annualized Return	ETF Annualized Std Deviation	5% OTM collar Annualized Std Deviation	ETF Cumulative Return	5% OTM collar Cumulative Return	ETF Maximum drawdown	5% OTM Collar Maximum drawdown	Months in Cash
Emerging Market Index - iShares	EEM	-0.43%	5.87%	30.95%	14.05%	-1.97%	29.88%	-60.44%	-17.61%	1
EAFE Index - iShares MSCI	EFA	-7.32%	-3.66%	24.52%	12.24%	-29.43%	-15.73%	-57.38%	-31.84%	0
Australian Dlr Tr. - CurrencyShares	FXA	8.96%	5.24%	18.24%	10.92%	48.16%	26.36%	-31.75%	-18.82%	0
British Pound Tr. - CurrencyShares	FXB	-3.98%	-2.78%	10.78%	7.00%	-16.99%	-12.13%	-28.09%	-18.41%	0
Canadian Dlr Tr. - CurrencyShares	FXC	1.95%	2.84%	12.66%	8.19%	9.26%	13.67%	-23.74%	-9.13%	1
Euro Tr. - CurrencyShares	FXE	0.31%	0.73%	13.62%	9.27%	1.43%	3.40%	-21.19%	-13.20%	0
Swiss Franc Tr. - CurrencyShares	FXF	6.09%	6.63%	14.70%	9.51%	31.10%	34.20%	-17.65%	-10.37%	0
Japanese Yen Tr. - CurrencyShares	FXY	10.14%	8.77%	10.37%	8.13%	55.69%	47.00%	-9.36%	-7.79%	0
Gold Tr. - SPDR *	GLD	15.64%	8.80%	22.82%	13.65%	66.29%	34.35%	-21.95%	-11.30%	0
GSCI Commodity Tr. - S&P	GSG	-4.74%	2.62%	28.83%	11.37%	-19.95%	12.59%	-67.85%	-19.34%	5
Hi Yield Corp. Bond -iBoxx	HYG	5.29%	0.54%	17.01%	7.26%	26.63%	2.50%	-30.28%	-15.30%	9
Russell 2000 - iShares	IWM	-1.51%	-0.09%	25.13%	14.17%	-6.72%	-0.42%	-52.42%	-23.87%	0
DJ US Real Estate - iShares	IYR	-4.02%	-1.46%	33.27%	13.33%	-17.14%	-6.51%	-67.89%	-32.58%	0
NASDAQ 100 - PowerShares	QQQ	4.25%	1.75%	22.79%	13.16%	21.01%	8.28%	-49.74%	-28.80%	0
S&P 500 - SPDR	SPY	-2.14%	3.03%	19.46%	10.42%	-9.45%	14.64%	-50.80%	-19.81%	0
Barclays 20+ Treasury Bond - iShares	TLT	12.29%	5.85%	16.85%	10.97%	70.12%	29.76%	-21.80%	-17.02%	0
U.S. Oil Fund - U.S. Commodity Funds	USO	-5.32%	5.19%	37.79%	17.03%	-22.16%	26.11%	-76.20%	-33.76%	0

* The inception date for the GLD ETF was November 18, 2004, with option data available from June 20, 2008. Study period = 42 months

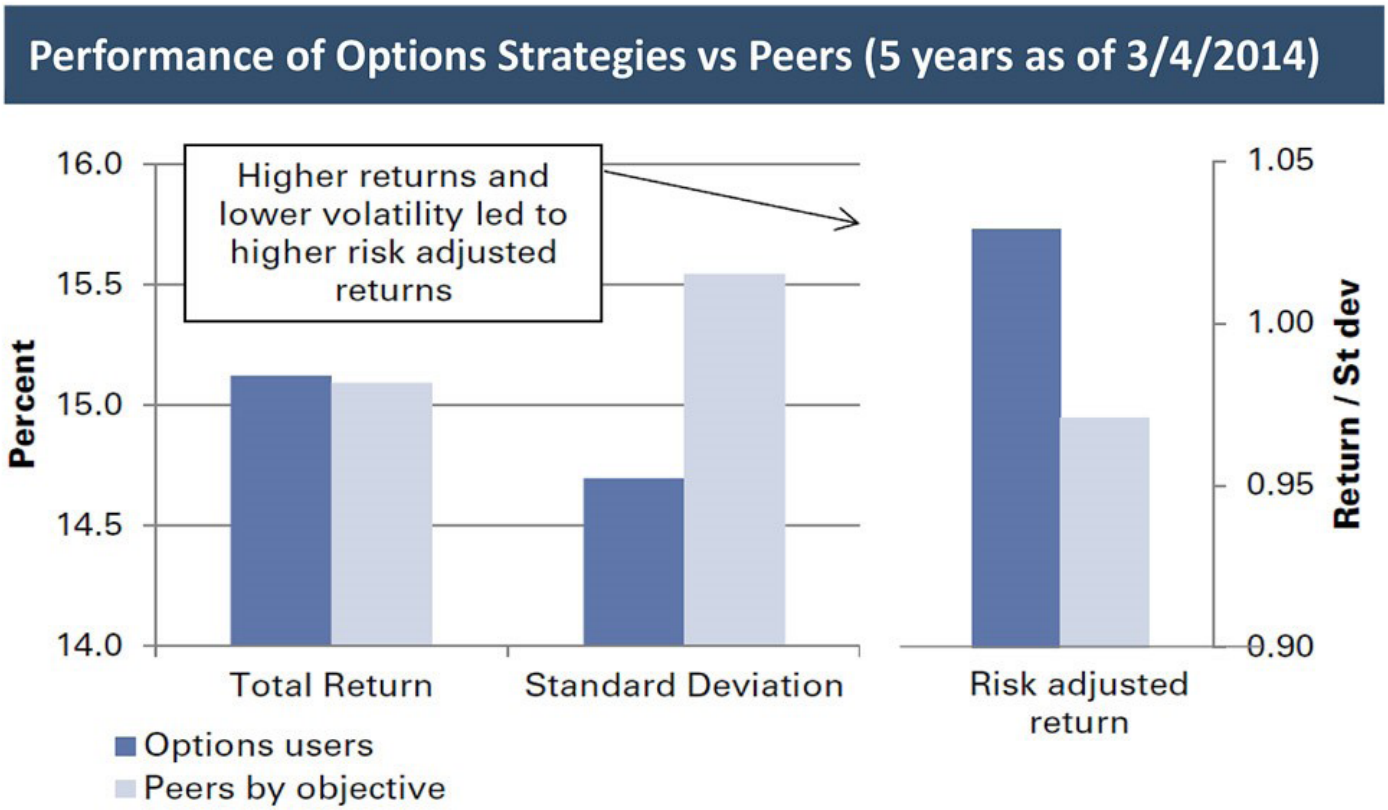
Source: Risk Mitigating Collar Strategy – Option-Based Risk Management in a Multi-Asset World by Edward Szado and Thomas Schneeweis

3. Mutual Fund Use of Options: Public Holdings and Trends by John Marshall, Goldman Sachs

This 2014 paper from Goldman Sachs on the usage of options by mutual funds had a number of interesting findings.

1. Five of the top 15 fund families have funds that use options.
2. At least 196 funds use options and these funds had more than $480 billion in assets under management at the end of 2013.
3. For the funds using options, the percentage of positions in each options strategy was 64% in short calls, 22% in short puts, 8% in long puts, and 6% in long calls.
4. The paper found that over the 5-year period ending March 4, 2014, the funds that used options had lower volatility, higher returns, and higher risk-adjusted returns than their peer funds not using options.

The study is not publicly available, but a summary by the CBOE's Matt Moran of some of the findings such as the ones listed above can be found here: http://www.cboeoptionshub.com/2014/03/19/new-study-goldman-sachs-196-funds-use-options-lower-volatility-higher-returns/



Source: Goldman Sachs Global Investment Research, SEC filings, Strategic Insight (March 4, 2014)

4. The Benefits of Option Use by Mutual Funds by Markus Natter, Martin Rohleder, Dominik Schulte, and Marco Wilkens, University of Augsburg

This paper undertaken by the University of Augsburg had some similar conclusions to the Goldman Sachs paper on options usage amongst mutual funds. The Augsburg writers found that:

- The use of options by mutual funds yielded higher risk-adjusted performance compared with funds not using options.
- Funds using options showed significantly lower systematic risk because many use options for hedging strategies.
- Mutual funds' short positions were the main driver of the performance-enhancing outcome, consistent with covered call and put writing studies.
- In addition, consistent with protective put strategies for hedging, long option positions were the main contributor to the risk-reduction effect of options.

This study can be found here: http://swfa2015.uno.edu/C_Mutual_Fund_Performance_I/SWFA2015_Paper_179.pdf

5. Performance Analysis of CBOE S&P 500 Options-Selling Indices by Keith Black and Edward Szado

This key study was sponsored by the CBOE to take a look at six different S&P 500 option-selling indices, analyzing 29 1⁄2 years of performance. The study reviewed indices based on the following strategies: iron butterfly, at-the-money buy-write, 30-delta buy-write, covered combo, iron condor, and a put-write index. Key findings of the new study were:

- The options-selling indices generally had similar returns to the S&P 500 but with much lower volatility and lower maximum drawdowns.
- The options-selling indices exhibited less tail risk with less likelihood of large gains and losses and a tighter distribution of returns than the S&P 500.
- Lower betas and positive alphas were exhibited by the options-selling indices.
- Two of the options-selling indices had higher returns and lower volatility than the S&P 500.
- The study concludes that a key source of alpha for the indices comes from the fact that index options have usually been richly priced.

The findings of this study provide conclusive evidence that over a full market cycle, selling index options in a passive, systematic way generally coincides with improved risk-adjusted returns compared to a buy-and-hold S&P 500

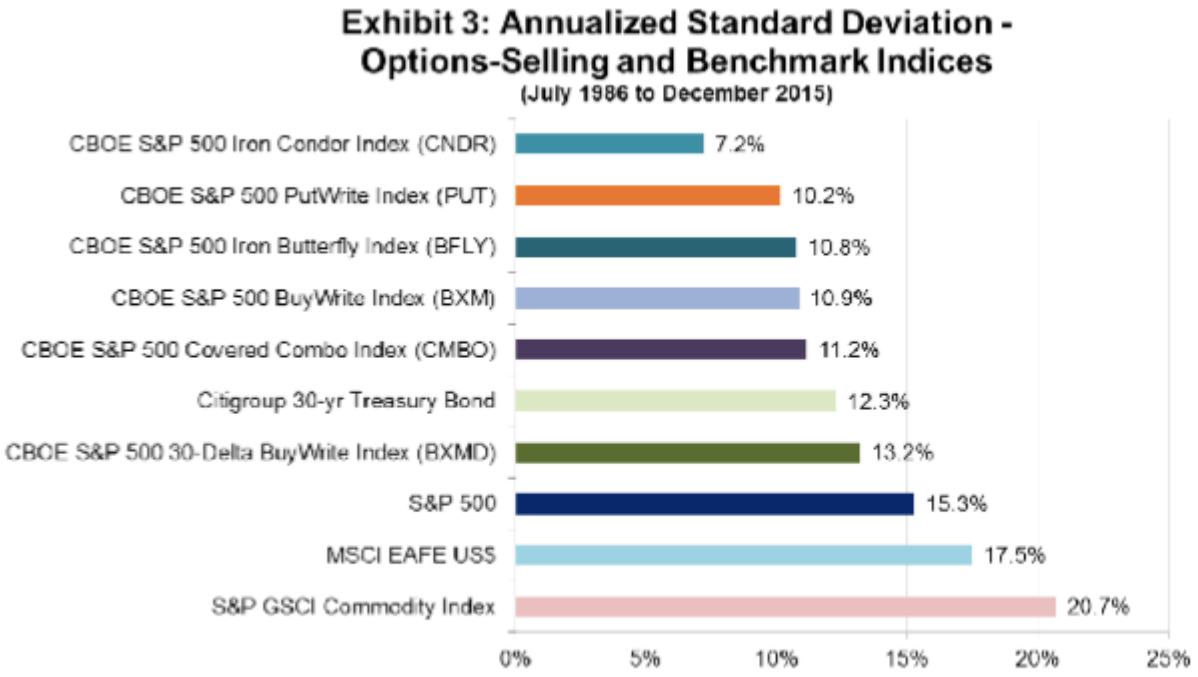


Exhibit 3: Five of the Options-selling indices had a lower standard deviation than the T-bond, stock and commodity indices.
Source: Bloomberg.

Source: Performance Analysis of CBOE S&P 500 Options-Selling Indices

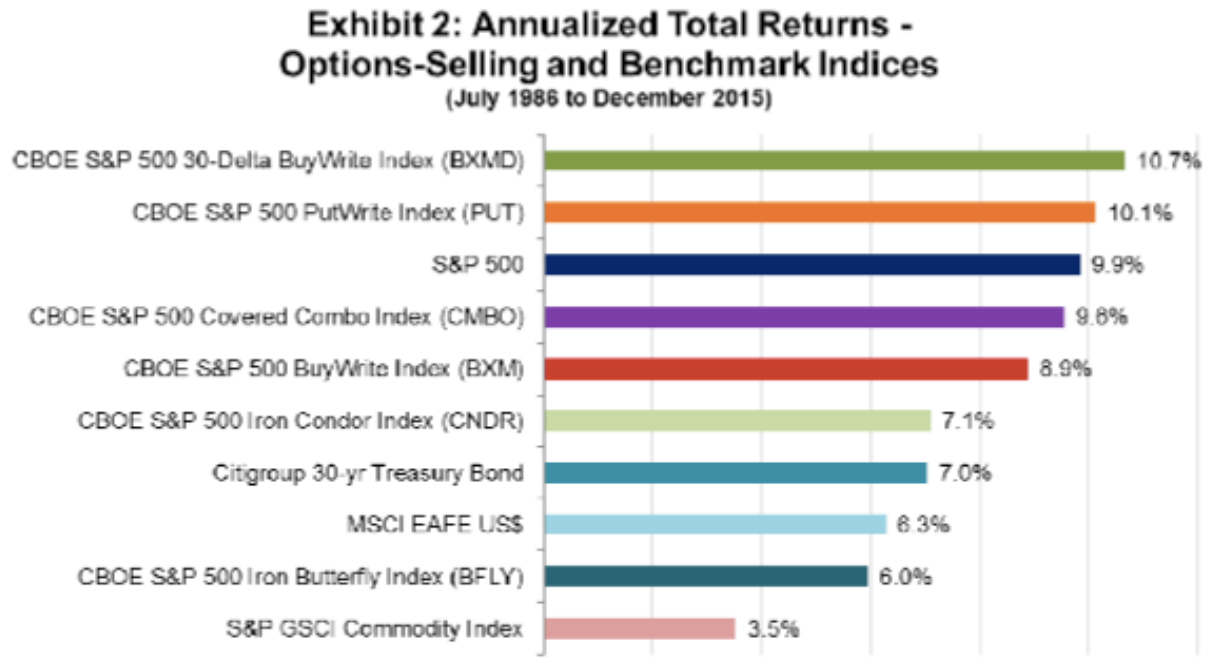


Exhibit 2: This exhibit provides annualized compound total returns for Options-selling and benchmark indices. Annualized compound total returns represent the total cumulative growth over the period converted into an annual compounded return. Two of the Options-selling indices compare favorably to the S&P 500 over the period of study from a total return perspective.
Sources: Bloomberg

Source: Performance Analysis of CBOE S&P 500 Options-Selling Indices

approach.

The full analysis can be found here: http://www.cboe.com/micro/buywrite/cboe-feb08-2016-kwc-ingarm.pdf

6. Three Decades of Options-Based Benchmark Indices with Premium Selling or Buying: A Performance Analysis by Wilshire Analytics Applied Research Group

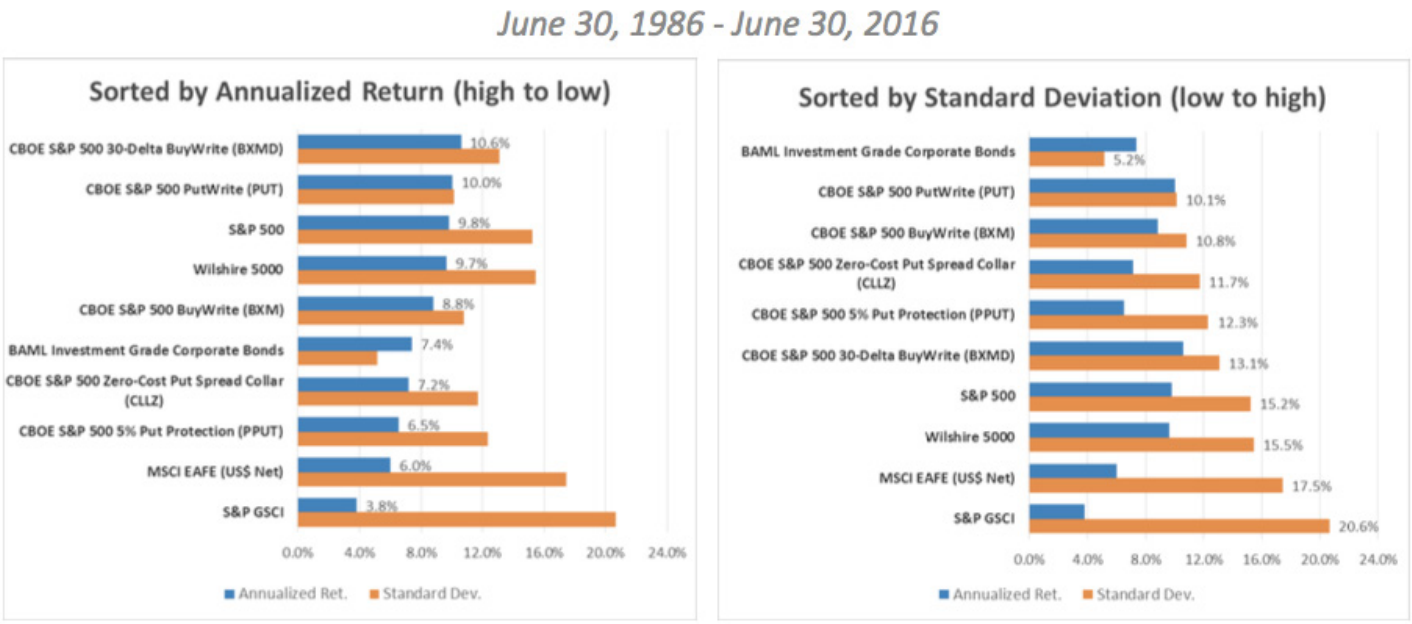
Another more recent study sponsored by the CBOE found very similar results as Black and Szado's performance analysis of S&P 500 option-selling indices. This study from Wilshire Analytics reviewed three of the same indices, as well as two others, expanding to indices that buy S&P 500 index options. Wilshire Analytics analyzed the performance of these indices that sell or buy options on the S&P 500 over a period of 30 years, from June 30, 1986 through June 30, 2016:

- CBOE S&P 500 BuyWrite Index (BXM)
- CBOE S&P 500 30-Delta BuyWrite Index (BXMD)
- CBOE S&P 500 Zero-Cost Put Spread Collar Index (CLLZ)
- CBOE S&P 500 5% Put Protection Index (PPUT)
- CBOE S&P 500 PutWrite Index (PUT)

The study found that over the past 30 years, two option-based indices that sold index options (BXMD and PUT) had higher returns than the equity markets (both large cap and total market). The key findings were similar to prior studies:

- Higher absolute and risk-adjusted returns for two of the indices that sold SPX options every month to collect option premium income.
- Lower volatility for each of the five option-based indices than all the other indices included in the study, other than the fixed-income index.
- Maximum drawdown for the options-based indexes was 24 percent lower, on average, than for the S&P 500.

The study also reviews the growing usage of index options as well as practical implementations for pension plans and the impact of allocating to option-writing strategies.



Over 30 years, the volatility of all five option-based indices was lower than for the equity and commodity indices; only the bond market index volatility was lower. The PUT and BXM Indexes, which write at-the-money (ATM) options, were the least volatile of the equity-based indices.

Even with their relatively low volatilities, option-writing strategies delivered strong returns over this period. The BXMD and PUT indices had the highest annualized returns across all indices, which represent a wide spectrum of asset classes.

Past performance is not predictive of future returns. Sources: Bloomberg, CBOE, St. Louis Federal Reserve Bank and Wilshire Associates.

Source: Wilshire and CBOE

This study can be found here: http://www.cboe.com/micro/buywrite/wilshire-2016-benchmarks-30-years.pdf

7. Harvesting the Equity Insurance Risk Premium: Know Your Options by Aon Hewitt

Aon Hewitt summarizes their paper and its key points as such:

- Options selling strategies harvest the equity insurance risk premium and have attractive performance attributes over the long term. Their returns are comparable to equity, with less volatility but still offering diversification benefits.
- The options market is mature, widely traded, and highly regulated; products have evolved to accommodate a variety of implementations to suit return expectations and risk tolerance.
- There is a range of approaches that clients can pursue from simple, rules-based strategies to more active, dynamic strategies.
- We believe options selling strategies represent an attractive and timely opportunity, and many institutional investors should consider such an investment.

The paper succinctly reviews options, the equity risk premium and index options, various option buying and selling strategies, as well as the differences between rules-based and actively managed options strategies.

The white paper can be found here: http://www.aon.com/attachments/human-

capital-consulting/harvesting-equity-insurance-risk-premium.pdf

8. An Analysis of Index Option Writing for Liquid Enhanced Risk-Adjusted Returns by Asset Consulting Group

This older study (2012) from Asset Consulting Group analyzed four CBOE options-based indices and compared to them to various benchmarks over a 23-year period. Unsurprisingly, findings

Exhibit 6: Various Time Periods

(Returns and Volatility for Periods Ending December 31, 2011)

	BXM	BXY	PUT	CLL	S&P 500	Bond
One-Year Annualized Return	5.7%	7.2%	6.2%	-8.8%	2.5%	7.8%
Three-Year Annualized Return	12.1%	15.9%	15.0%	3.7%	14.3%	6.8%
Five-Year Annualized Return	1.4%	2.6%	4.1%	-3.0%	-0.2%	6.5%
Ten-Year Annualized Return	4.2%	5.3%	6.2%	0.8%	3.0%	5.8%
Twenty-Year Annualized Return	8.3%	9.2%	9.7%	5.3%	7.8%	6.5%
Annualized Return Since 30-Jun-86	9.14%	N/A	10.4%	6.2%	9.03%	7.3%
One-Year Standard Deviation	14.3%	15.8%	13.9%	10.8%	16.0%	2.4%
Three-Year Standard Deviation	13.7%	15.7%	13.9%	12.8%	19.0%	2.8%
Five-Year Standard Deviation	14.9%	16.7%	15.2%	12.0%	18.9%	3.6%
Ten-Year Standard Deviation	12.3%	14.0%	12.2%	10.4%	15.9%	3.7%
Twenty-Year Standard Deviation	11.0%	12.7%	10.6%	10.8%	15.0%	3.7%
Standard Deviation Since 30-Jun-86	11.4%	N/A	10.6%	11.1%	15.9%	4.0%

Exhibit 6: The BXM, BXY, and PUT generally had higher returns and lower volatility than the S&P 500 over longer time periods. Relative performance varies dependent on the time frame. The BXM Index was introduced in 2002, and now has a backtested daily price history dating back to June 30, 1986.

Source: Asset Consulting Group

were similar to most of the other research on the CBOE indices; improved risk-adjusted returns through the usage of options-based strategies.

The study can be found here: http://www.cboe.com/micro/buywrite/pap-assetconsultinggroup-cboe-feb2012.pdf

9. An Analysis of Index Option Writing with Monthly and Weekly Rollover by Oleg Bondarenko

Another study recently published in early 2016, by Oleg Bondarenko from the University of Illinois at Chicago, has thorough analysis of both monthly and weekly put writing on the indices. His key findings closely resembled many of the other studies on the CBOE indices, finding the following:

- Over the past 30 years, the CBOE PUT index outperformed the traditional indices on a risk-adjusted basis.
- Over the last 10 years, the WPUT and PUT index delivered similar risk-adjusted returns, while both outperformed the S&P 500.
- Over the same 10 years, the WPUT and PUT index had lower standard deviation, lower beta, and lower max drawdown compared to the S&P 500.

Click on this link to view Bondarenko's study: http://www.cboe.com/micro/buywrite/put-oleg.pdf

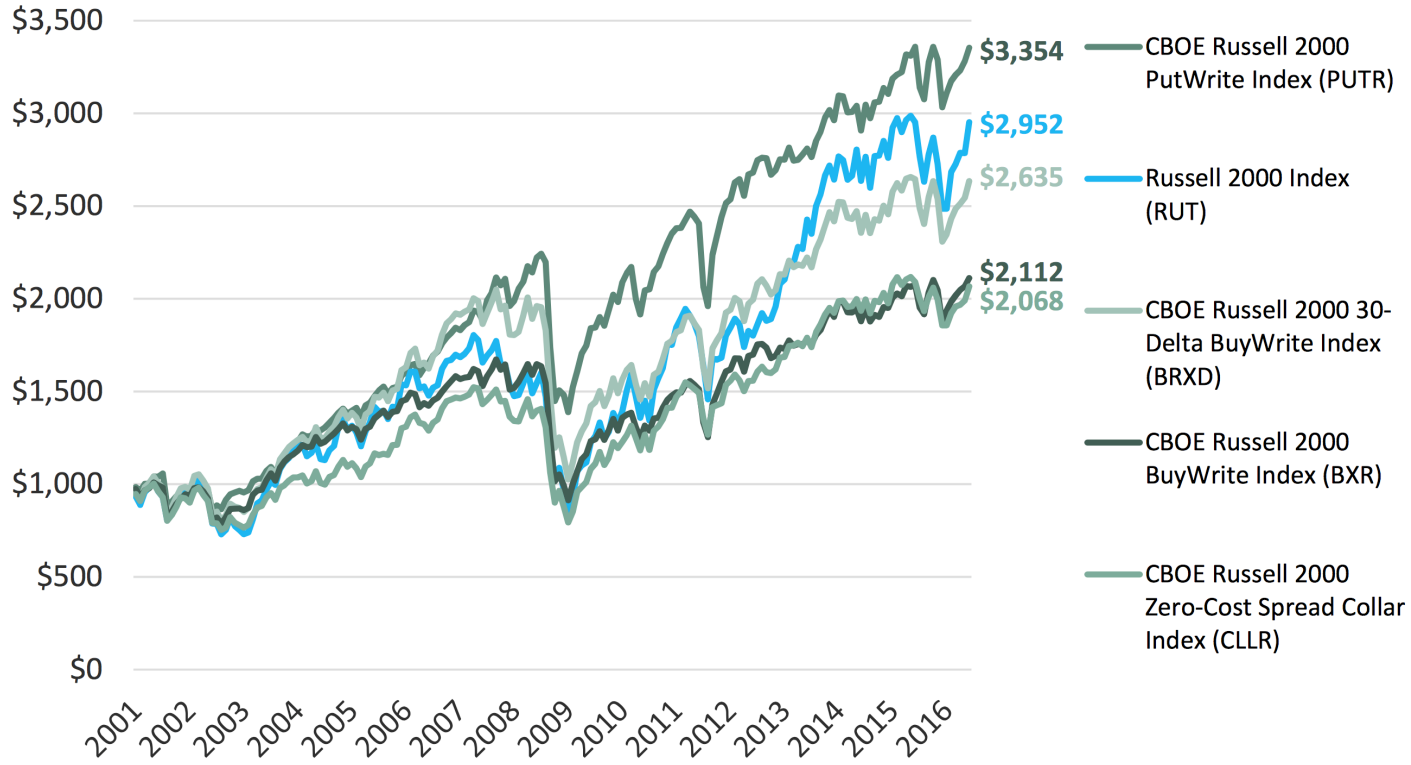
10. Evaluating Options for Enhanced Risk-Adjusted Returns: CBOE Russell 2000 Option Benchmark Suite and Case Studies on Fund Use of Options by Fund Evaluation Group

The study analyzed four CBOE Russell 2000 indices,

- CBOE Russell 2000 BuyWrite Index (BXR),
- CBOE Russell 2000 30-Delta BuyWrite Index (BXRD),
- CBOE Russell 2000 PutWrite Index (PUTR),
- CBOE Russell 2000 Zero-Cost Spread Collar Index (CLLR).

Analysis was also done on the CBOE Russell 2000 One-Week PutWrite Index (WPTR). This particular study solely focused on CBOE indices on the Russell 2000 Index (RUT), or U.S. Small Cap stocks. The indices differed in terms of structure and strategy. This white paper also

EXHIBIT 4: GROWTH OF $1,000



Data Sources: Bloomberg, CBOE; data from January 31, 2001 to July 31, 2016

Source: Fund Evaluation Group

The RUT-based option indices studied had similar results to the various other Large Cap focused option-selling and buying strategies focused on in most other research papers. The CBOE Russell 2000 PutWrite Index outperformed the RUT, while all indices had reduced standard deviation and max drawdown. The study in essence builds on an earlier work by Nikunj Kapadia and Edward Szado back in 2007 entitled "Risk and Return Characteristics of the Buy-Write Strategy on the Russell 2000 Index."

Fund Evaluation Group's detailed research can be found here:
http://www.cboe.com/micro/buywrite/cboe-russell-2000-option-benchmark-suite.pdf

11. Options Investing Strategies: The Drivers and Outlook for Pension Plans, Endowments, and Institutional Asset Managers by TowerGroup

Options strategies can play an important role of risk control and potentially performance enhancement. Many institutions have embraced options' role within a portfolio for decades, with rapid growth especially in the last ten years. Institutional investors' growing acceptance of options usage is well documented in this study from TowerGroup, sponsored by the Options Industry Council (OIC). The effectiveness of options strategies in helping achieve investment goals is clearly demonstrated through many of the other papers listed in this document. However, this paper analyzes a survey of 30

institutions and asset managers with the primary goal to discern the role that options investing plays in institutional investors' portfolios.

You can see this study here:
http://www.optionseducation.org/documents/literature/files/oic-towergroup-survey.pdf

12. The Performance of Options-Based Investment Strategies: Evidence for Individual Stocks During 2003-2013 by Michael Hemler and Thomas Miller

This study examined the performance of four options strategies versus buy-and-hold long equity across ten widely held individual stocks from 2003 through 2013. The study is unique compared to many of the other studies in that it focused on options strategies implemented on individual stocks and not just a broader index such as the S&P 500 or the Russell 2000. The investment strategies examined were buy-and-hold long stock, covered call, protective put, collar, and covered combination (long stock, plus short call and short put). The study ignored early exercise for simplicity sake and found the following: the covered combination and covered call strategies generally outperformed the long stock strategy, which in turn generally outperformed the collar and protective put strategies (although these latter two strategies led to lower volatility). These findings matched closely the broader studies done on market indices, showing the potential improvements to risk-adjusted returns is not just limited to index-based strategies.

This white paper can be found here:
http://www.optionseducation.org/content/dam/oic/documents/literature/files/perf-options-strategies.pdf

CONCLUSION

Most of these papers support the use of options through either a simple, passive manner such as a buy-write or put-write strategy or through a collar-based approach (traditionally, buying shorter-term puts to hedge a position and selling shorter-term calls). The documents help establish that there are numerous potential benefits from a regular, disciplined, long-term approach that sells options. This is because short term options are frequently overpriced with respect to the subsequent movement in their corresponding underlying. That has been the case for decades, and we believe it will continue to be that way for the decades to come.

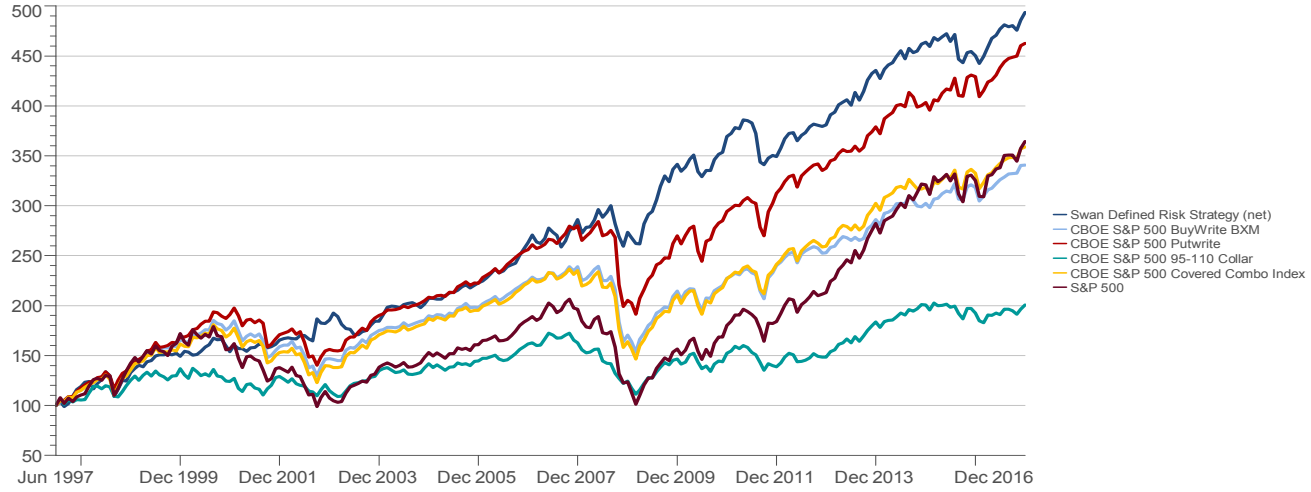
At Swan, we believe a combination of some of these aforementioned option strategies actually provides the best balance of protection, premium collection, diversification, and risk reduction. Our Defined Risk Strategy (DRS) builds upon the ideas presented in some of these studies, but adds our own key distinct features. At Swan, we have been utilizing options since 1997 to help investors gain a more consistent, smoother and beneficial, long-term investment experience. We do this by seeking capital appreciation over time while always seeking protection from large losses. We believe that the most beneficial way to use options is through active management, not a passive approach. The unique structure and implementation of options within the DRS, where we actively manage option positions with long ETF holdings, has provided better risk-adjusted and absolute returns to the S&P 500 over a full market cycle.

Zephyr StyleADVISOR

Zephyr StyleADVISOR: Informa Investment Solutions

Manager Performance

July 1997 - December 2016 (Single Computation)



Multi-Statistic (Custom Table)

July 1997 - December 2016: Summary Statistics

	Return	Cumulative Return	Standard Deviation (Population)	Beta vs. Market	Excess Return vs. Market	Sharpe Ratio
Swan Defined Risk Strategy (net)	8.53%	393.46%	9.63%	0.30	1.68%	0.67
CBOE S&P 500 BuyWrite BXM	6.49%	240.81%	11.21%	0.65	-0.36%	0.39
CBOE S&P 500 Putwrite	8.17%	362.52%	11.00%	0.61	1.32%	0.55
CBOE S&P 500 95-110 Collar	3.63%	100.55%	10.70%	0.64	-3.22%	0.14
CBOE S&P 500 Covered Combo Index	6.77%	258.84%	11.70%	0.70	-0.08%	0.40
S&P 500	6.85%	264.27%	15.24%	1.00	0.00%	0.31

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To review some of our own research and white papers related to how we utilize options to help investors reach their goals, please visit our Content Research page.

You can find some of our white papers directly, at the following links:

The Swan Defined Risk Strategy - A Full Market Cycle Strategy

Math Matters: Rethinking Investment Returns and How Math Impacts Results

The Retirment Conundrum: Untying the Gordian Knot

Where Does Hedged Equity Fit? The Roles the Swan DRS Can Serve in a Portfolio

Portfolio Optimization: Thinking Outside the Style Box

Asset Allocation Strategies: Comparison and Analysis

A treasure trove of additional white papers and research briefs related to options, covered call strategies, put writing strategies, and many other option-related topics can be found at the following links:

http://www.optionseducation.org/news/white_papers.html

http://www.optionseducation.org/news/research_articles.html

http://www.cboe.com/institutional/reports.aspx

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Swan Global Investments, LLC ("Swan") is an independent Investment Advisory headquartered in Durango, Colo. registered with the U.S. Securities and Exchange Commission under the Investment Advisers Act or 1940. Being an SEC-registered advisor implies no special qualification or training. Swan offers and manages its Defined Risk Strategy to individuals, institutions and other advisory firms. All Swan products utilize the Defined Risk Strategy ("DRS"), but may vary by asset class, regulatory offering type, etc. Accordingly, all Swan DRS product offerings will have different performance results due to offering differences and comparing results among the Swan products and composites may be of limited use.

There are eight DRS Composites offered: 1) The DRS Select Composite which includes non-qualified accounts; 2) The DRS IRA Composite which includes qualified accounts; 3) The DRS Composite which combines the DRS Select and DRS IRA Composites; 4) The DRS Institutional Composite which includes high net-worth, non-qualified accounts that utilize cash-settled, index-based options held at custodians that allow participation in Clearing Member Trade Agreement (CMTA) trades; 5) The Defined Risk Fund Composite which includes mutual fund accounts invested in the S&P 500; 6) The DRS Emerging Markets Composite which includes mutual fund accounts invested in emerging markets; 7) The DRS Foreign Developed Composite which includes all research and development account(s), and mutual fund accounts invested in foreign developed markets; 8) The DRS U.S. Small Cap Composite which includes all research and development account(s), and mutual fund accounts invested in U.S. small cap issues. Additional information regarding Swan's policies and procedures for calculating and reporting performance returns is available upon request. Swan claims compliance with the Global Investment Performance Standards (GIPS) and has prepared and presented this report in compliance with GIPS standard. Swan's compliance with GIPS has been independently verified from its inception on July 1, 1997 through December 31, 2015. A copy of the verification report is available upon request. To receive copies of the report please call 970.382.8901 or email operations@swanglobalinvestments.com. 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 performance in compliance with the GIPS standards. Verification does not ensure the accuracy of any specific composite presentation.

The Defined Risk Strategy Select Composite demonstrates the performance of all non-qualified assets managed by Swan Global Investments, LLC since inception. It includes discretionary individual accounts whose account holders seek the upside potential of owing stock, and the desire to eliminate most of the risk associated with owning stock. The composite relies on LEAPS and other options to manage this risk. Individual accounts own S&P 500 exchange-traded funds, LEAPS associated with the ETFs, as well as option strategies based on other widely traded indices. The Defined Risk Strategy Select Composite includes all non-qualified discretionary accounts which are solely invested in the Defined Risk Strategy. The Defined Risk Strategy was designed to protect investors from substantial market declines, provide income in flat or choppy markets, and to benefit from market appreciation. Stock and options are the primary components of the strategy. The performance benchmark used for the Defined Risk Strategy is the S&P 500 Index comprised of 500 large-capitalization stocks, and which does not charge fees.

041-SGI-020717

ABOUT SWAN GLOBAL INVESTMENTS

Randy Swan started Swan Global Investments in 1997 looking to supply investment management services that were not available to most investors. Early in his financial career, Randy saw that options provided an opportunity to minimize investment risk.

His innovative solution was the proprietary Swan Defined Risk Strategy, which has provided market leading, risk-adjusted return opportunities through a combination of techniques that seek to hedge the market and generate market-neutral income.

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