Highlights of "Performance Analysis of Options-Based Equity Mutual Funds, CEFs, and ETFs"

Keith Black, Ph.D., CAIA, CFA
Managing Director of CAIA (Chartered Alternative Investment Analyst Association)

Edward Szado, Ph.D., CFA
Assistant Professor of Finance, Providence College
Director of Research, INGARM (Institute for Global Asset and Risk Management)

www.INGARM.org

January 12, 2015

Introduction

Executive Summary

- The first SEC-registered funds focused on the trading of options were launched in the U.S. in 1977, and by 2003 there were twelve such funds. Over the last ten years the category has grown substantially, to the point where there are now at least 119 SEC-registered funds (including mutual funds (MFds), closed-end funds (CEFs), and exchange-traded funds (ETFs)), with an aggregate of more than $46 billion in assets under management (AUM), that are focused on the use of exchange-listed options for portfolio management purposes. The fund performance analysis in this paper examines a subset of 80 (of the 119) funds that focus on the use of options in portfolios with broadly diversified U.S. equity holdings.
- There are several strategies that an options-based fund may follow, including selling covered calls, selling cash-secured puts, buying protective put options, or investing in collars. The Chicago Board Options Exchange® (CBOE®), which sponsored this study, lists several benchmark indices (including the BXM℠, BXY℠ and PUT℠ indexes) that follow these strategies.

Summary of Results

Key findings of the new study include:

- **GROWTH IN NUMBER OF FUNDS**. An annual chart in the study shows that the number of Options-Based Funds grew from 10 in 2000 to 119 in 2014.
- **15-YEAR ANALYSIS OF FUNDS**. The study performed an analysis of the equal-weighted performance of 80 Options-Based Funds that focus on use of U.S. stock index options and/or equity options during the 15-year period from 2000 through 2014, and found that –
- **HIGHER RISK-ADJUSTED RETURNS**. The Options-Based Funds had similar returns as the S&P 500® Index with lower volatility and lower maximum drawdowns. The Options-Based Funds had higher risk-adjusted returns, as measured by the Sharpe Ratio, Sortino Ratio, and Stutzer Index.
- **ANALYSIS OF OPTIONS-BASED BENCHMARKS OVER 26½ YEARS**. The study also performed an analysis of the performance over the period from mid-1988 through the end of 2014 for various options-based benchmark indexes that use S&P 500 (SPX℠) options and for some traditional benchmark indexes.
- **STRONG PERFORMANCE FOR BENCHMARKS THAT USE SPX INDEX OPTIONS**. During the 26 ½ year-time period, both the CBOE S&P 500 PutWrite Index (PUT) and the CBOE S&P 500 2% OTM BuyWrite Index (BXY) had higher returns and lower volatility than the S&P 500 Index. A key source of strong risk-adjusted returns has been the fact that the index options usually have been richly priced.

Please email comments to eszado@providence.edu, kblack@caia.org or institutional@cboe.com.

Co-authors of the Study

Keith Black, Ph.D., CAIA, CFA

Keith Black has over twenty years of financial market experience, serving approximately half of that time as an academic and half as a trader and consultant to institutional investors. He currently serves as Managing Director of Curriculum and Exams for the CAIA Association. During his most recent role at Ennis Knupp + Associates, Keith advised foundations, endowments and pension funds on their asset allocation and manager selection strategies in hedge funds, commodities and managed futures. Prior experience includes commodities derivatives trading at First Chicago Capital Markets, stock options research and CBOE market-making for Hull Trading Company, and building quantitative stock selection models for mutual funds and hedge funds for Chicago Investment Analytics. Dr. Black previously served as an assistant professor and senior lecturer at the Illinois Institute of Technology's Stuart school, where he taught courses in both traditional and alternative investments.

He contributes regularly to *The CFA Digest*, and has published in a number of journals, including *The Journal of Trading* and *The Journal of Alternative Investments*. He is the author of the book "Managing a Hedge Fund," as well as a contributor to the second and third editions of the CAIA Level I and Level II textbooks. Dr. Black was named to Institutional Investor magazine's list of "Rising Stars of Hedge Funds" in 2010.

Dr. Black earned a BA from Whittier College, an MBA from Carnegie Mellon University, and a PhD from the Illinois Institute of Technology. He has earned the Chartered Financial Analyst (CFA) designation and was a member of the inaugural class of the Chartered Alternative Investment Analyst (CAIA) candidates.

Edward Szado, Ph.D., CFA

Edward Szado is Assistant Professor of Finance, Providence College. He is also the Director of Research at the Institute for Global Asset and Risk Management and received his Ph.D. in Finance from the Isenberg School of Management, University of Massachusetts, Amherst. He has taught Risk Management at the Boston University School of Management, Derivatives at Clark University and a range of finance courses at the University of Massachusetts Amherst. He is a former options trader and his experience includes product development in the areas of volatility based investments and structured investment products. He is also a Chartered Financial Analyst and has consulted for the Options Industry Council, the Chicago Board Options Exchange, the Chartered Alternative Investment Analyst Association and the Commodity Futures Trading Commission.

Methodology

- In November 2014, we undertook a comprehensive search for SEC-registered investment companies that invest in options, building on data sourced through Bloomberg and Morningstar. Using keyword searches for funds with options trading activity, we narrowed the list to those funds benchmarked to a broad US equity index. Funds with objectives other than broad-based US equities were eliminated, excluding the categories of fixed income, currencies, commodities, international and global equity, narrow sector funds (such as master limited partnerships), and futures-based products (such as the CBOE Volatility Index® (VIX®)).
- Once the candidate funds were identified, we confirmed each fund's options trading activity using portfolio disclosures or summary fund descriptions provided in public filings or on the web site of each fund manager. Based on position information and strategy descriptions we excluded funds that used options sporadically and funds whose option positions were a trivial part of their overall portfolio. The goal was to include only broad-based US equity funds that used options as an integral part of their investment strategy.
- The sample utilized in the performance analysis of this study (in Exhibits 2 through 22) consists of 80 investment companies -- 51 open-end mutual funds (MFd), 22 closed-end funds (CEF), and 7 exchange-traded index funds (ETF). While we acknowledge that this study may have survivorship bias, we believe this to be of little impact due to the relatively new nature of this fund category and the minimal news on the liquidation of these publicly-traded funds. Our sample of 80 investment companies had assets under management (AUM) of $27.6 billion at the end of 2014.
- In Exhibit 1 only, we also included 39 additional options-based funds with non-US equity objectives, so that Exhibit 1 has 119 funds with an aggregate total AUM of $46 billion at the end of 2014. Tables with lists of the names and ticker symbols for the 119 funds are provided in Exhibit 24. Funds benchmarked to indices beyond US equities are beyond the scope of this study.
- In order to analyze the performance of the Options-Based Funds, we created an equal-weighted (EW) index of the funds starting in January, 2000. This entailed calculating the average returns each month across all option-based funds that existed that month. While only six mutual funds were included in the Option-Based Funds EW category for the first month, additional MFs, CEFs and ETFs were added in subsequent months and the number of funds included in the calculation grew monthly as new funds entered the sample ultimately reaching 80 funds by December, 2014. In Exhibit 2 through 22, we provide a performance analysis for total return indices that are pre-tax and that include (for stock indexes) reinvested dividends.

Strategy Descriptions

	Strategy	Year Introduced	Earliest Historical Price
CBOE S&P 500 BuyWrite Index (BXM)	Purchase stocks in the S&P 500 index, and each month sell at-the-money index call options	2002	June 30, 1986
CBOE S&P 500 2% OTM BuyWrite Index (BXY)	Purchase stocks in the S&P 500 index, and each month sell index call options 2% out-of-the-money	2006	June 1, 1988
CBOE S&P 500 PutWrite Index (PUT)	Purchase Treasury bills and sell cash-secured put options on the S&P 500 index	2007	June 30, 1986
CBOE S&P 500 95-110 Collar Index (CLL)	Purchase stocks in the S&P 500 index, and each month sell index call options at 110% of the index value, and each quarter purchase index put options at 95% of the index value	2008	June 30, 1986
Options-Based Funds (OBF)	Actively-managed and index funds trading options on US stocks and stock indices. Strategies can vary, but are most likely to sell calls or sell puts against stock, index, or cash holdings	2015	January 1, 2000

Returns to CBOE indices are presented gross of fees, while Options-Based Fund returns are calculated net of fees.

Exhibit 1 - Number of Option-Based Funds in Sample

(Dec. 31, 2000 to Dec 31, 2014)

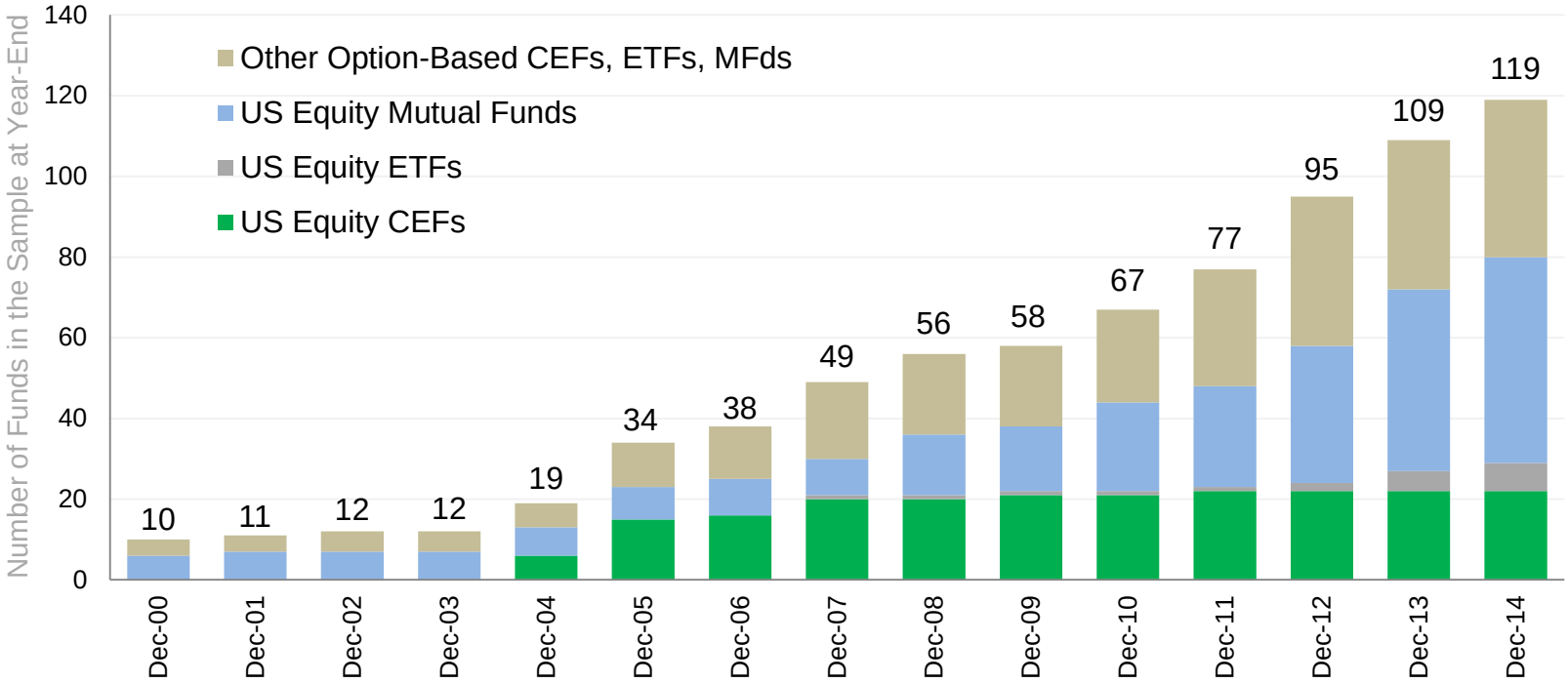

Exhibit 1: Number of option-based funds included in the sample at year-end. Option-based funds benchmarked to a broad US equity index are included in the analysis. The "Other" category includes option-based closed-end, exchange traded and mutual funds which are excluded from the analysis since they have objectives other than broad-based US equities. These include fixed income, currencies, commodities, international and global equity, narrow sector funds (such as master limited partnerships), and futures based products (such as VIX). While CEF growth peaked in 2007, option-based mutual funds have been growing significantly in number since late-2008, and more recently, option-based ETFs have exhibited strong growth. While the exhibit only shows growth since 2000, the fund with the earliest inception date included in the study dates back to 1977.

Sources: Morningstar and Bloomberg.

Exhibit 2 - Options-Based Funds and Stock Indices - Cumulative Growth of $100

(Jan. 1, 2000 to Dec. 31, 2014)

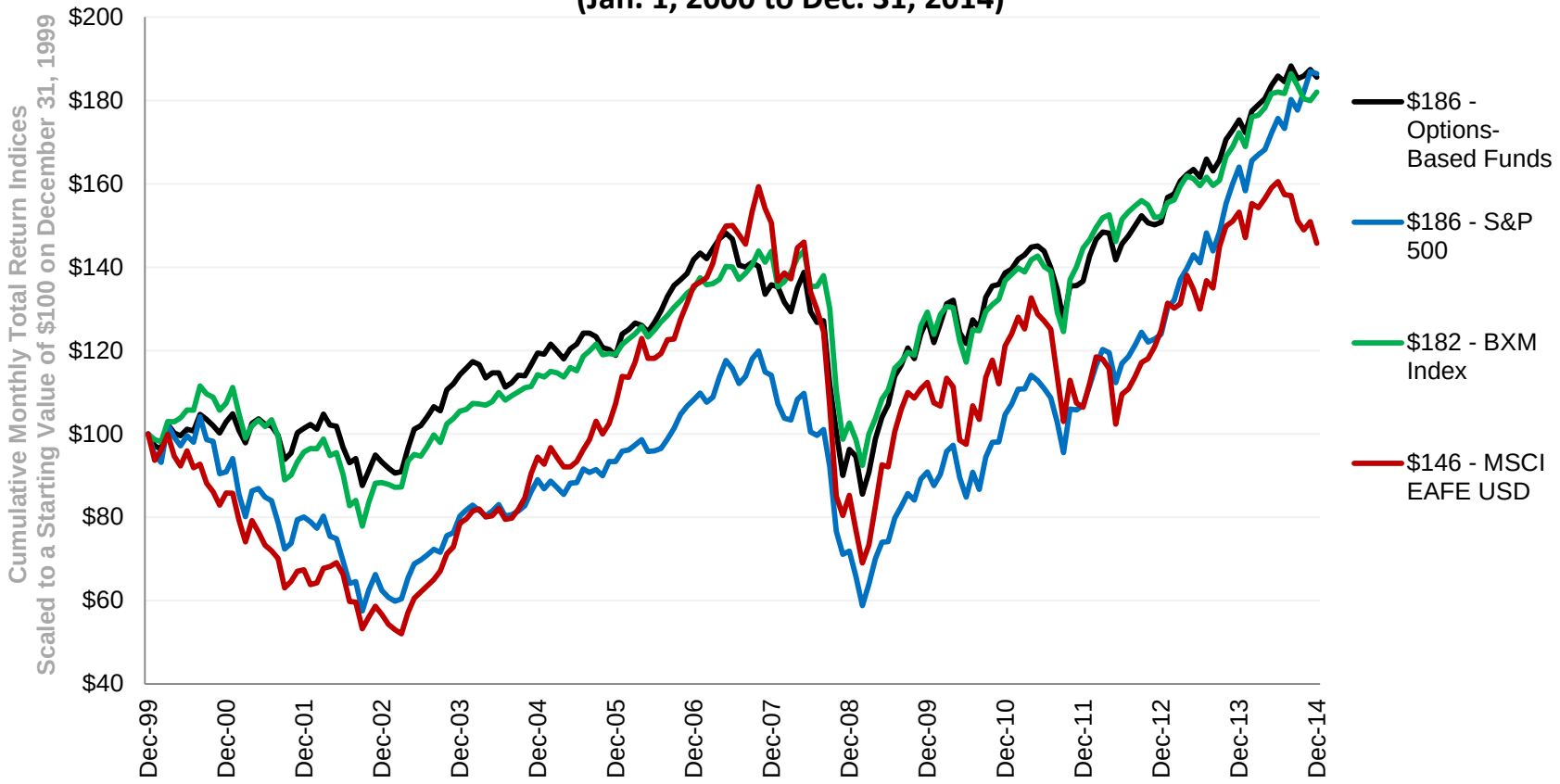

Exhibit 2: Cumulative monthly total return since December 31, 1999 for a monthly rebalanced equally weighted portfolio of Options-Based Funds, the BXM index and various traditional indices. Performance is scaled to represent a starting value of $100 on December 31, 1999 for all indices. Performance of the Equally Weighted Option-Based Fund Portfolio closely tracks the BXM index. The Equally Weighted Option-Based Fund Portfolio returns are calculated by averaging the returns across all constituents in the sample available at each month-end. The number of funds included in the calculation grows monthly as new funds enter the sample.

Sources: Bloomberg and Morningstar

Exhibit 3 - Annualized Total Returns - Options-Based Funds and Benchmark Indices

(Jan. 1, 2000 to Dec. 31, 2014)

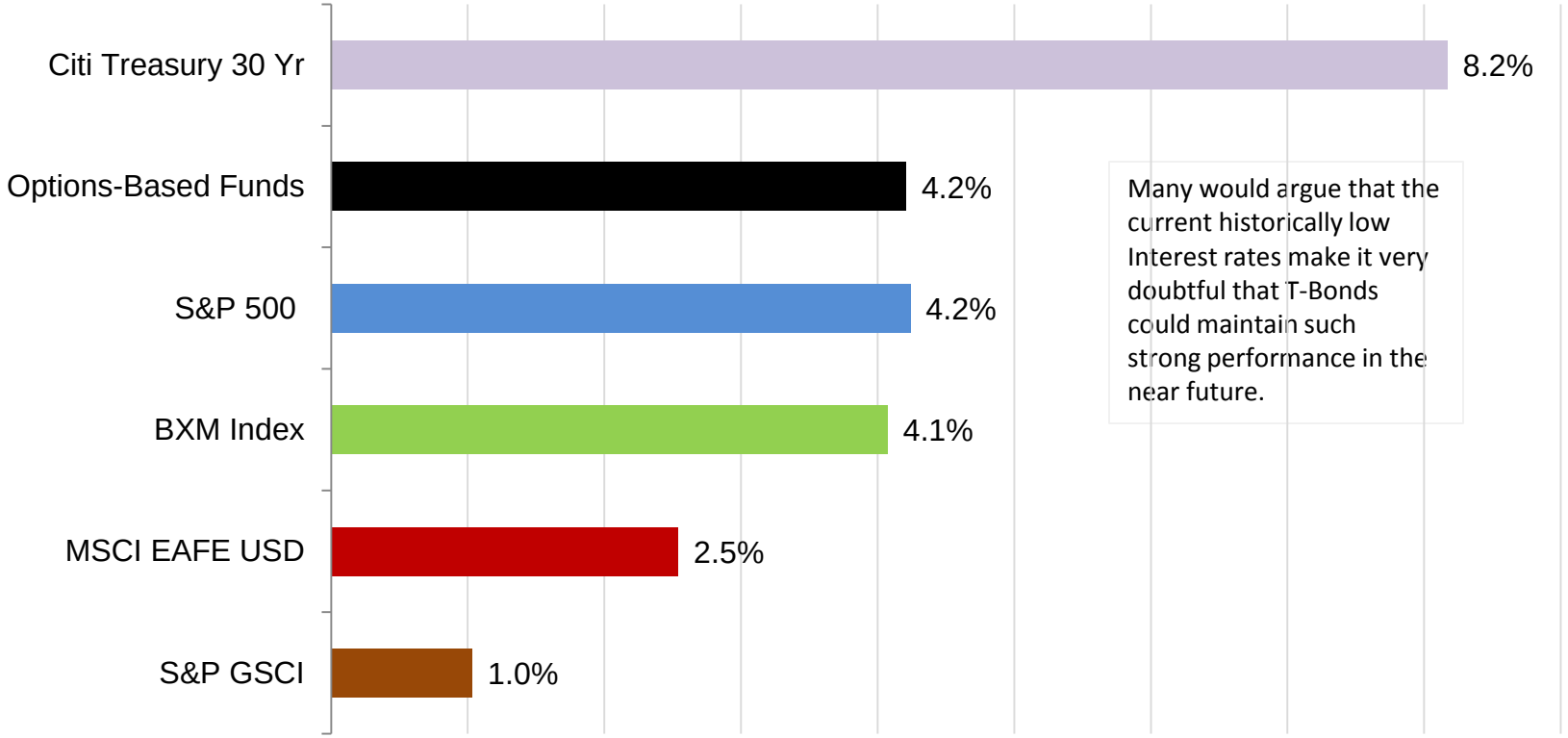

Exhibit 3: Annualized compound total returns for monthly rebalanced equal weighted index of Options-Based Funds and traditional indices. Annualized compound total returns represent the total cumulative growth over the period converted into an annual compounded return. Options-Based Funds have slightly outperformed the S&P 500 on a raw-return basis since January 1, 2000.

Sources: Bloomberg and Morningstar

Exhibit 4 - Annualized Standard Deviation - Options-Based Funds and Benchmark Indices

(Jan. 1, 2000 to Dec. 31, 2014)

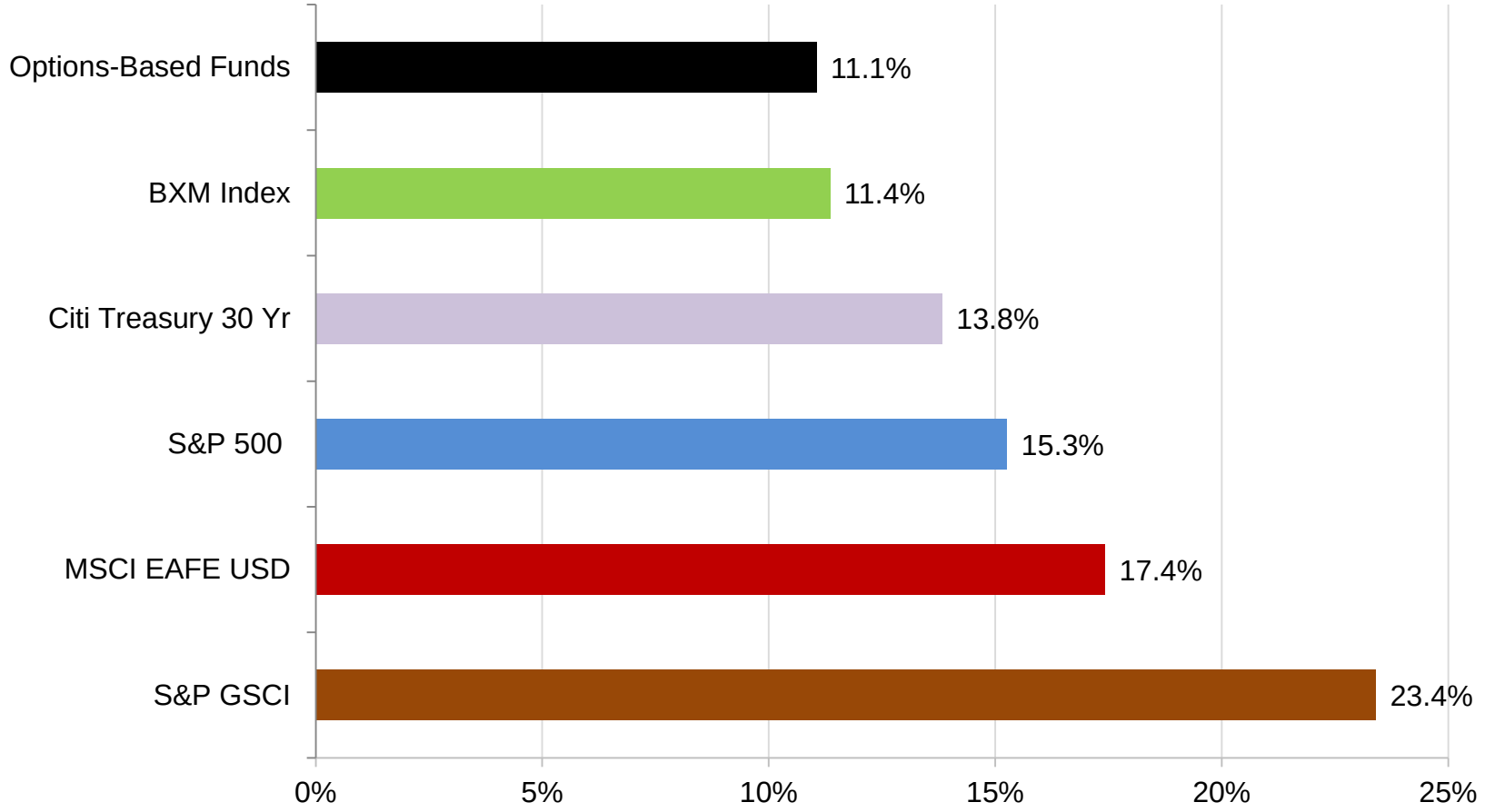

Exhibit 4: In addition, Options-Based Funds had a lower standard deviation than the S&P 500 Index

Sources: Morningstar and Bloomberg.

Exhibit 5 - Maximum Drawdown - Options-Based Funds and Benchmark Indices

(Jan. 1, 2000 to Dec. 31, 2014)

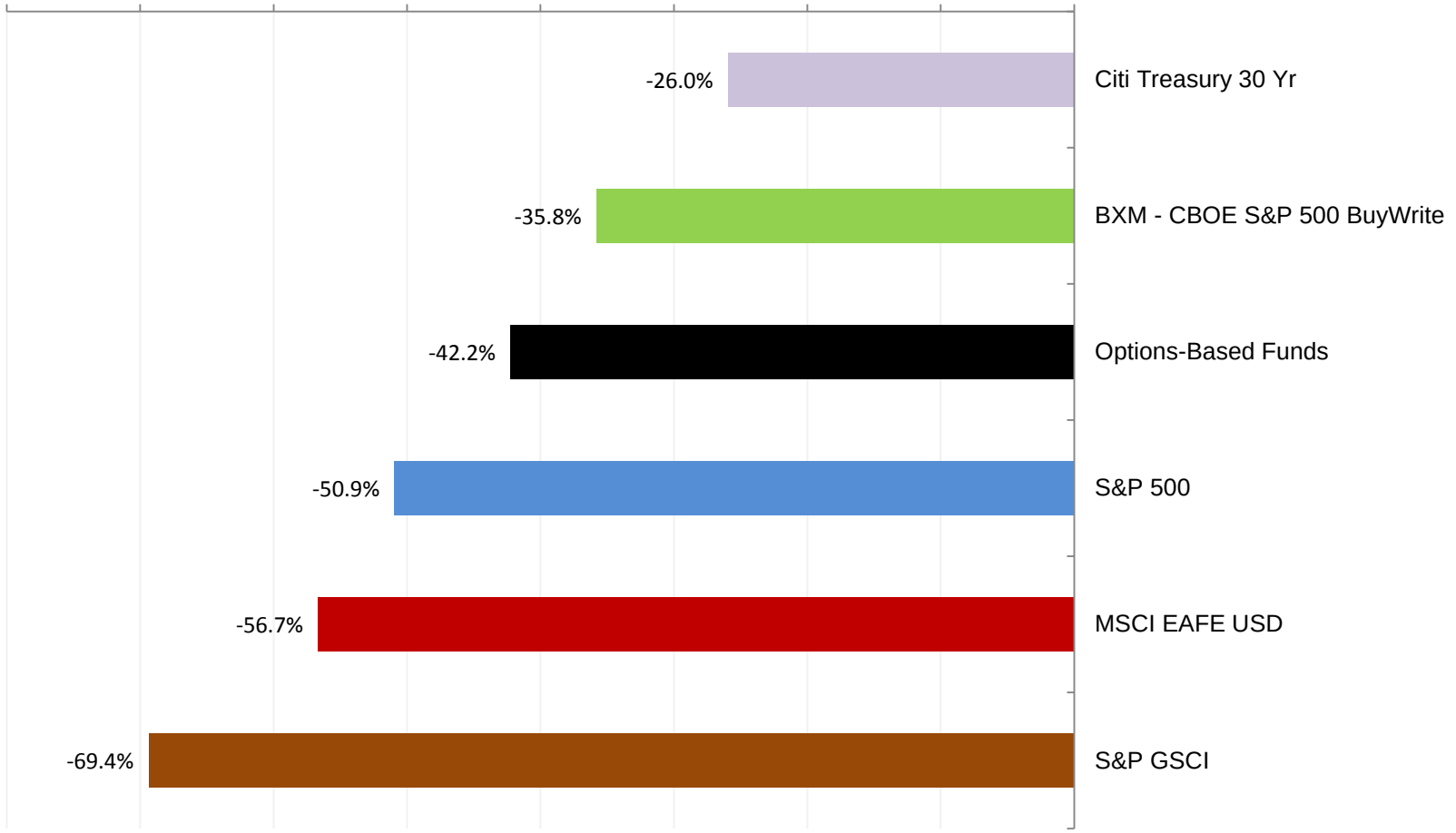

Exhibit 5: Maximum Drawdown is an indicator of the worst loss an investment could have exhibited in a historical period. Options-Based Funds had lower drawdown risk than the S&P 500 Index.

Sources: Morningstar and Bloomberg.

Exhibit 6 - Return in 2008: Option-Based and Traditional Indices

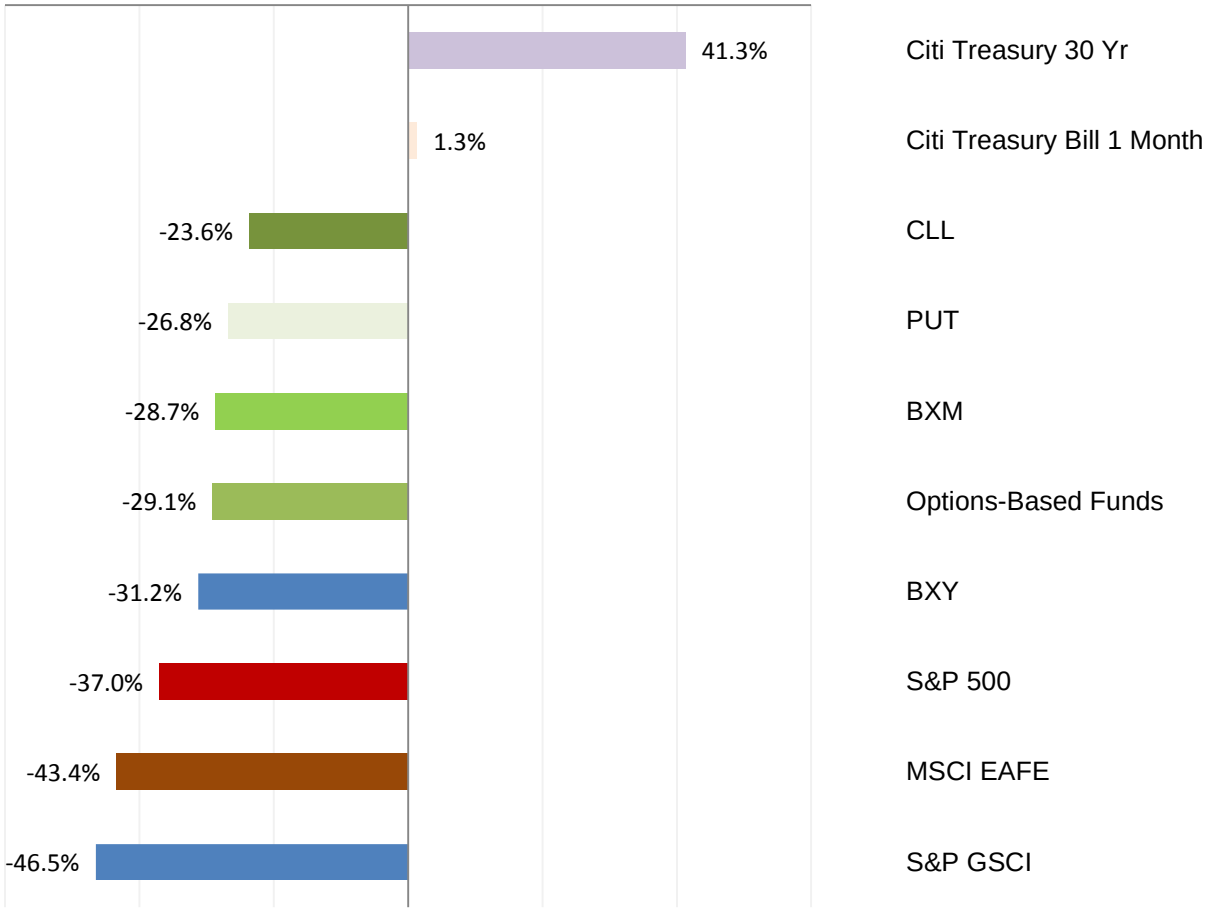

Exhibit 6: Options-Based Indices experienced much lower losses in 2008 than the S&P 500 Index.

Sources: Morningstar and Bloomberg.

Exhibit 7 - Rolling 36-Month Historical Annualized Returns

(Jan. 1, 2000 to Dec. 31, 2014)

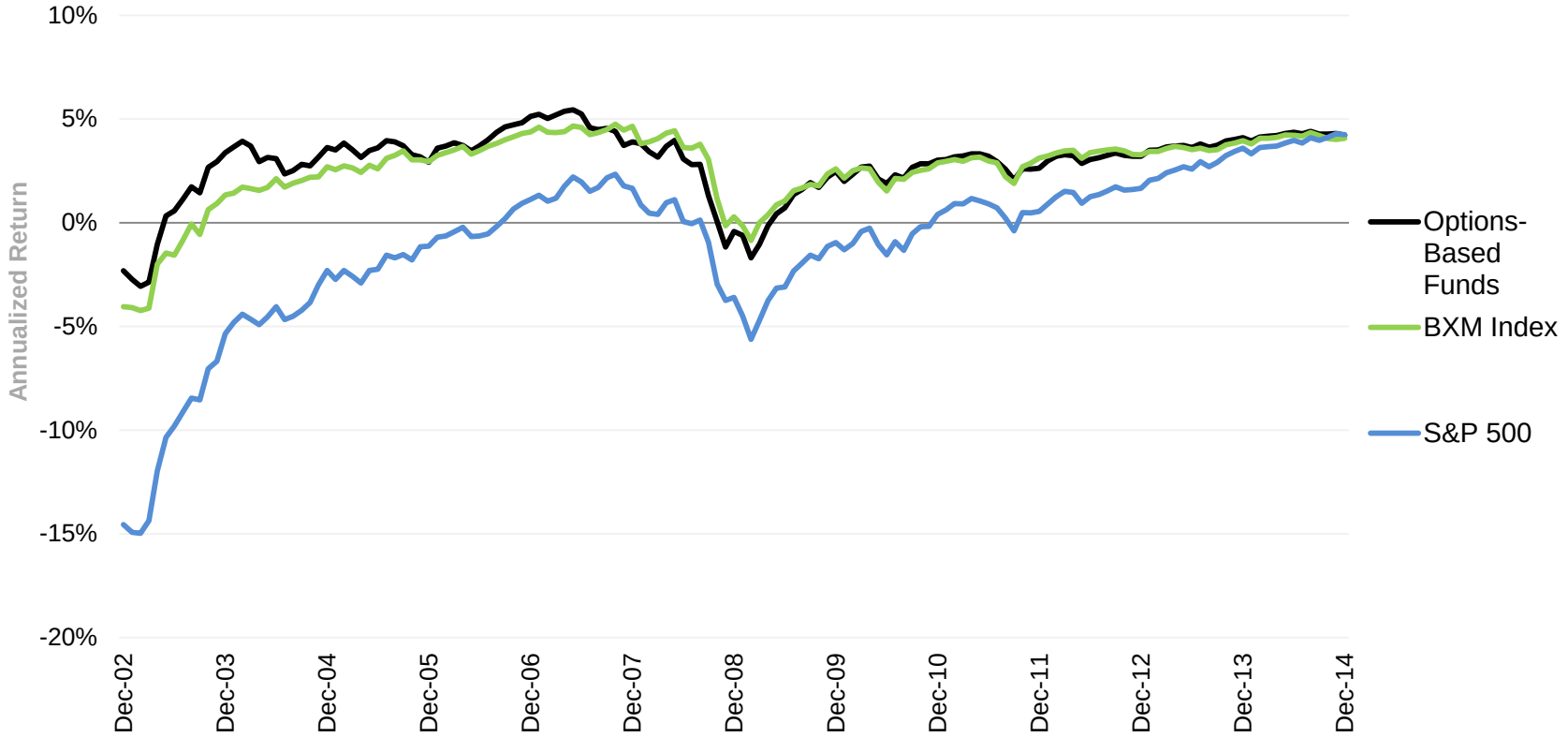

Exhibit 7: Options-Based Funds typically outperform the S&P 500 in down markets and underperform in strong markets, while exhibiting lower risk than the S&P 500 Index. A high correlation of returns is noted between the options-based funds and the BXM Index.

Sources: Morningstar and Bloomberg.

Exhibit 8 - Rolling 36-Month Historical Annualized Standard Deviation

(Jan. 1, 2000 to Dec. 31, 2014)

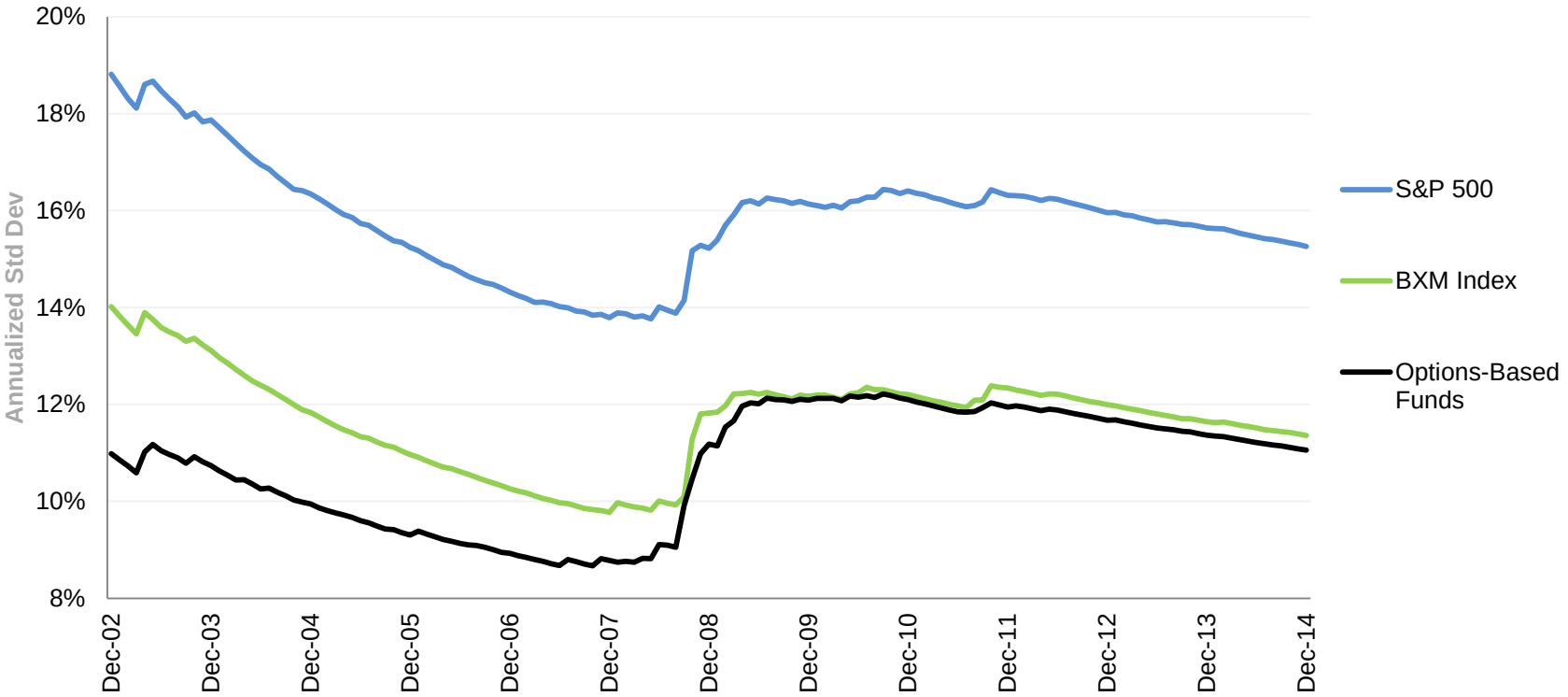

Exhibit 8: Options-Based Funds typically outperform the S&P 500 in down markets and underperform in strong markets, while exhibiting lower risk than the S&P 500 Index. A high correlation of returns is noted between the options-based funds and the BXM Index.

Sources: Morningstar and Bloomberg.

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.

Exhibit 10 - Return-to-Risk Ratios – Options-Based Funds and Benchmark Indices

(Jan. 1, 2000 to Dec. 31, 2014)

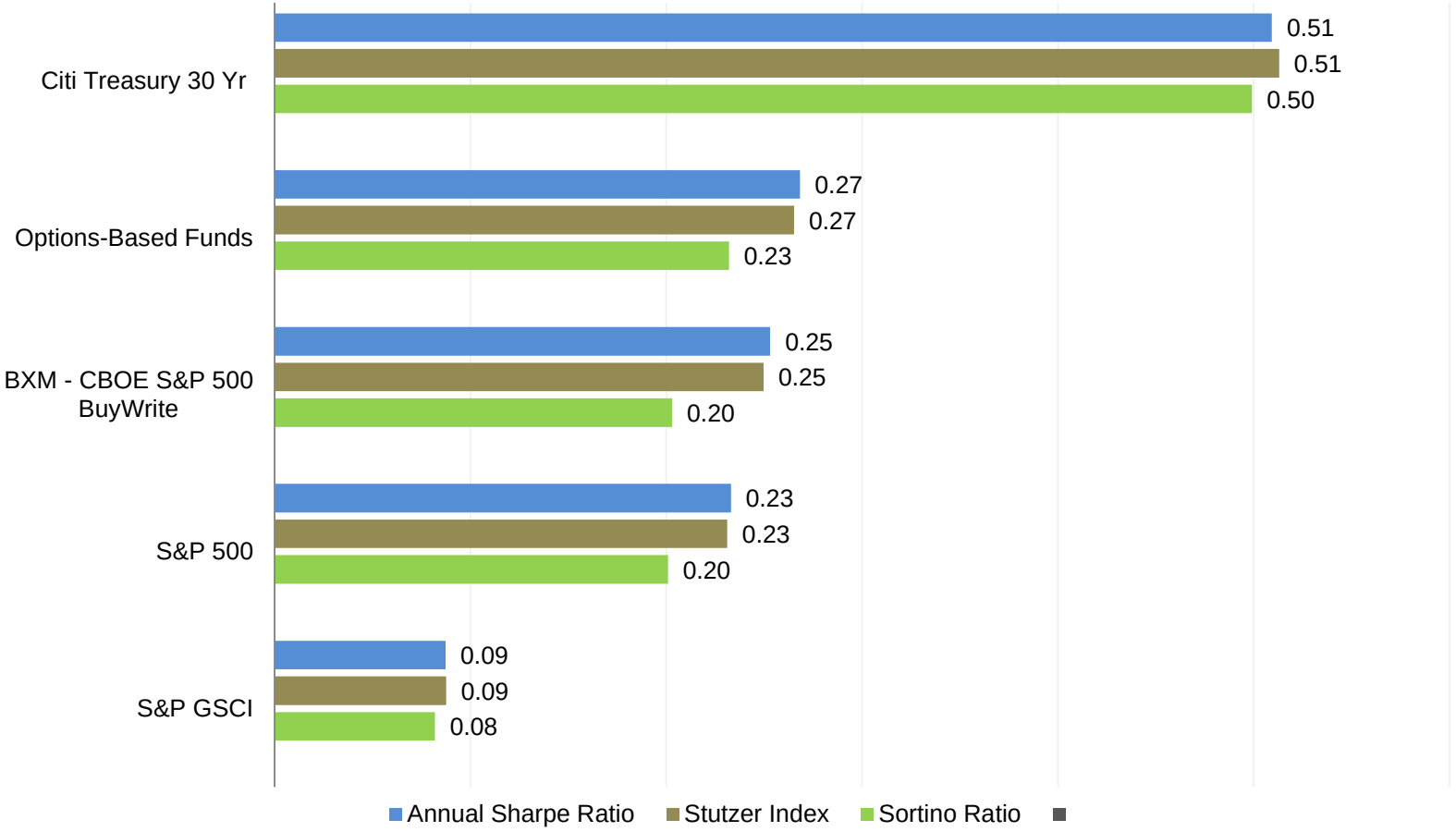

Exhibit 10: Options-Based Funds had higher risk-adjusted returns than the S&P 500 Index. The Sortino ratio compares downside risk, while the Stutzer Index accounts for skewness and kurtosis in the risk measures.

Sources: Morningstar and Bloomberg.

Exhibit 11 - Risk-Adjusted Return Measures – Options-Based Funds and Benchmark Indices

(Jan. 1, 2000 to Dec. 31, 2014)

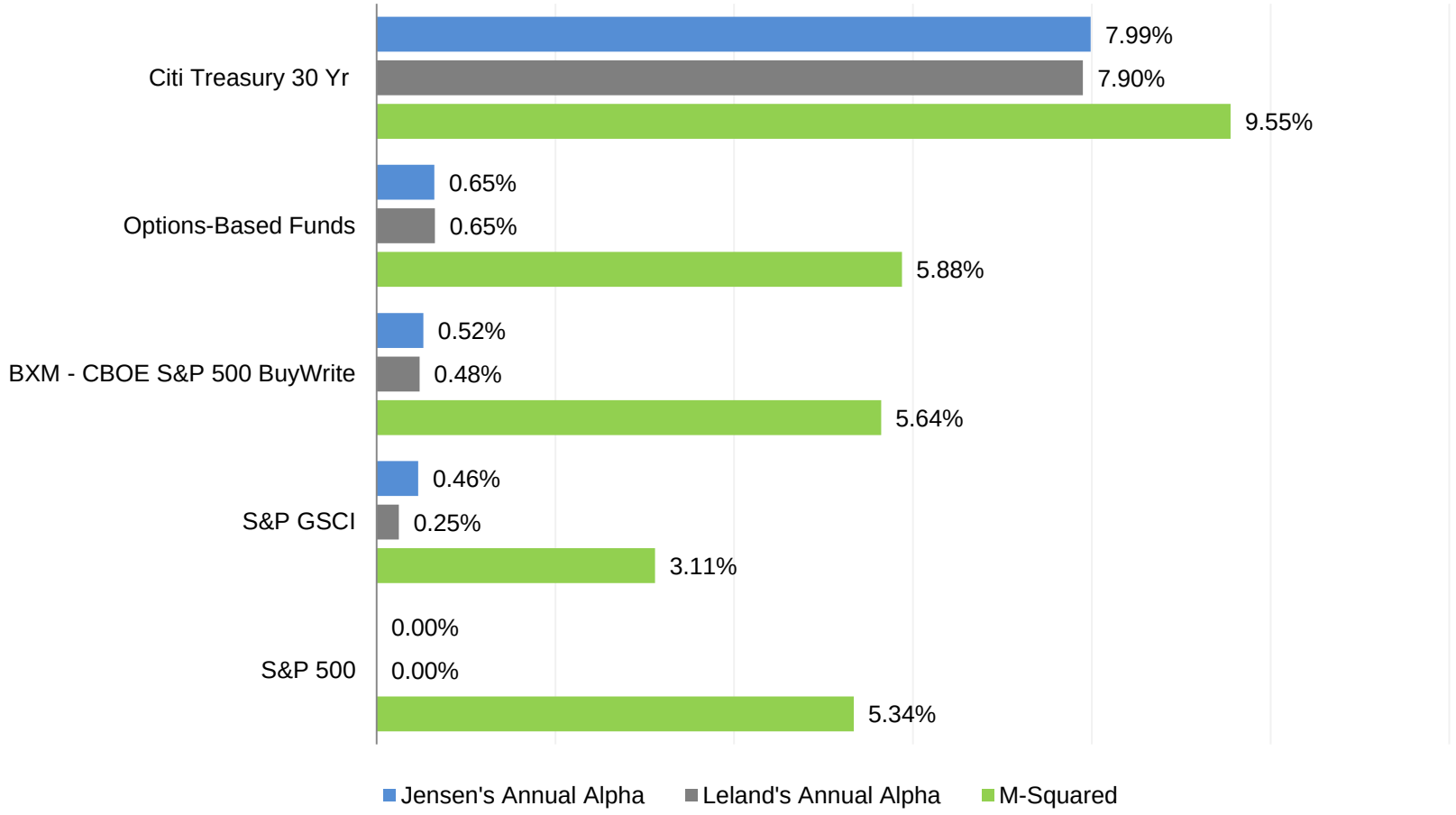

Exhibit 11: Jensen's Alpha, Leland's Alpha and M2 all provide measures of risk-adjusted performance relative to the S&P 500. Leland's alpha accounts for skewness and kurtosis in the return distributions. Options-Based Funds had higher risk-adjusted returns than the S&P 500 Index by all three measures.

Sources: Morningstar and Bloomberg.

Exhibit 12 - Options-Based Funds Annual Distribution Yield

(Jan. 1, 2000 to Dec. 31, 2014)

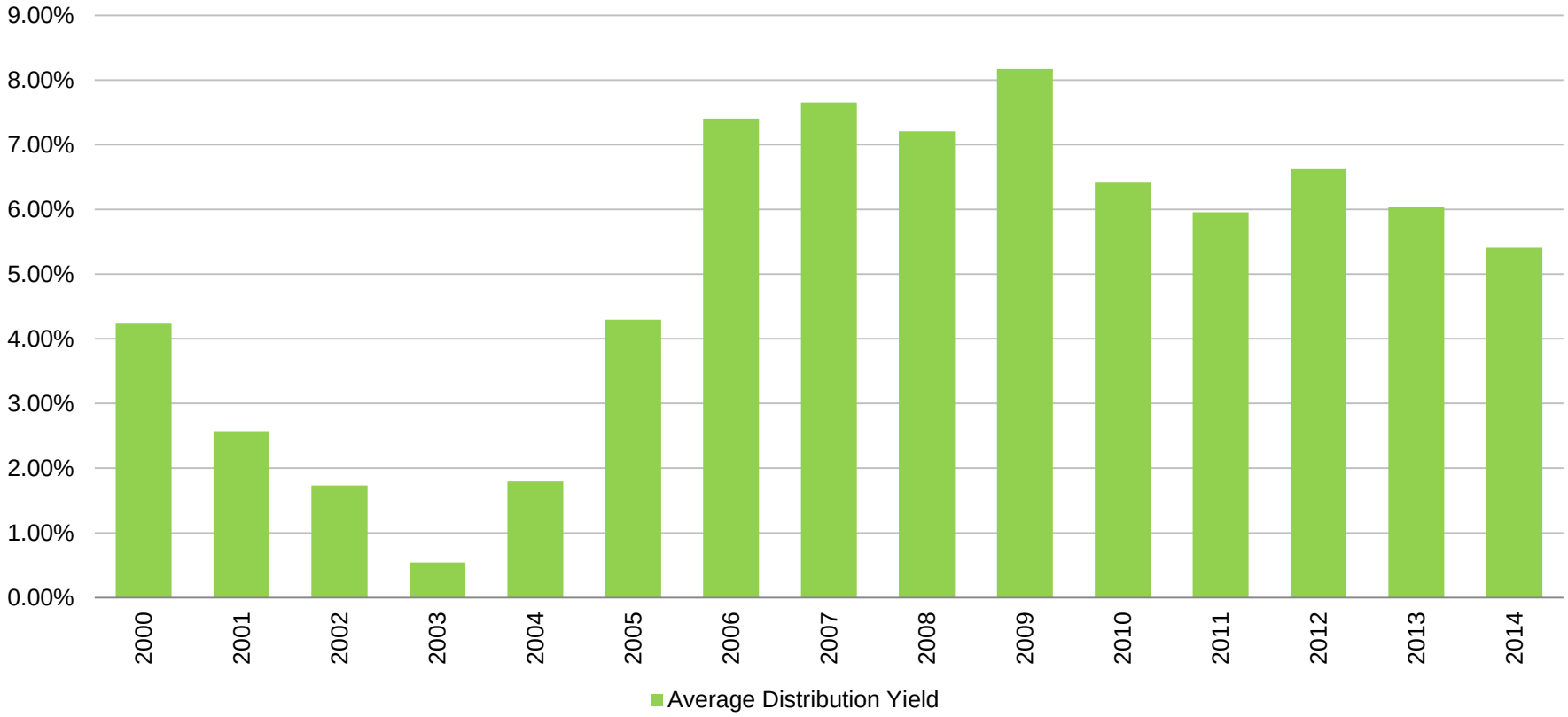

Exhibit 12: The exhibit provides the annual average distribution yield calculated as the total distributions for each fund over a calendar year divided by the ending price of the fund for the previous year, and averaged across all funds in the Options-Based Funds index.

Sources: Morningstar and Bloomberg.

Exhibit 13 - Risk/Return Trade-Off - Options-Based Funds and Benchmark Indices

(Jan. 1, 2000 to Dec. 31, 2014)

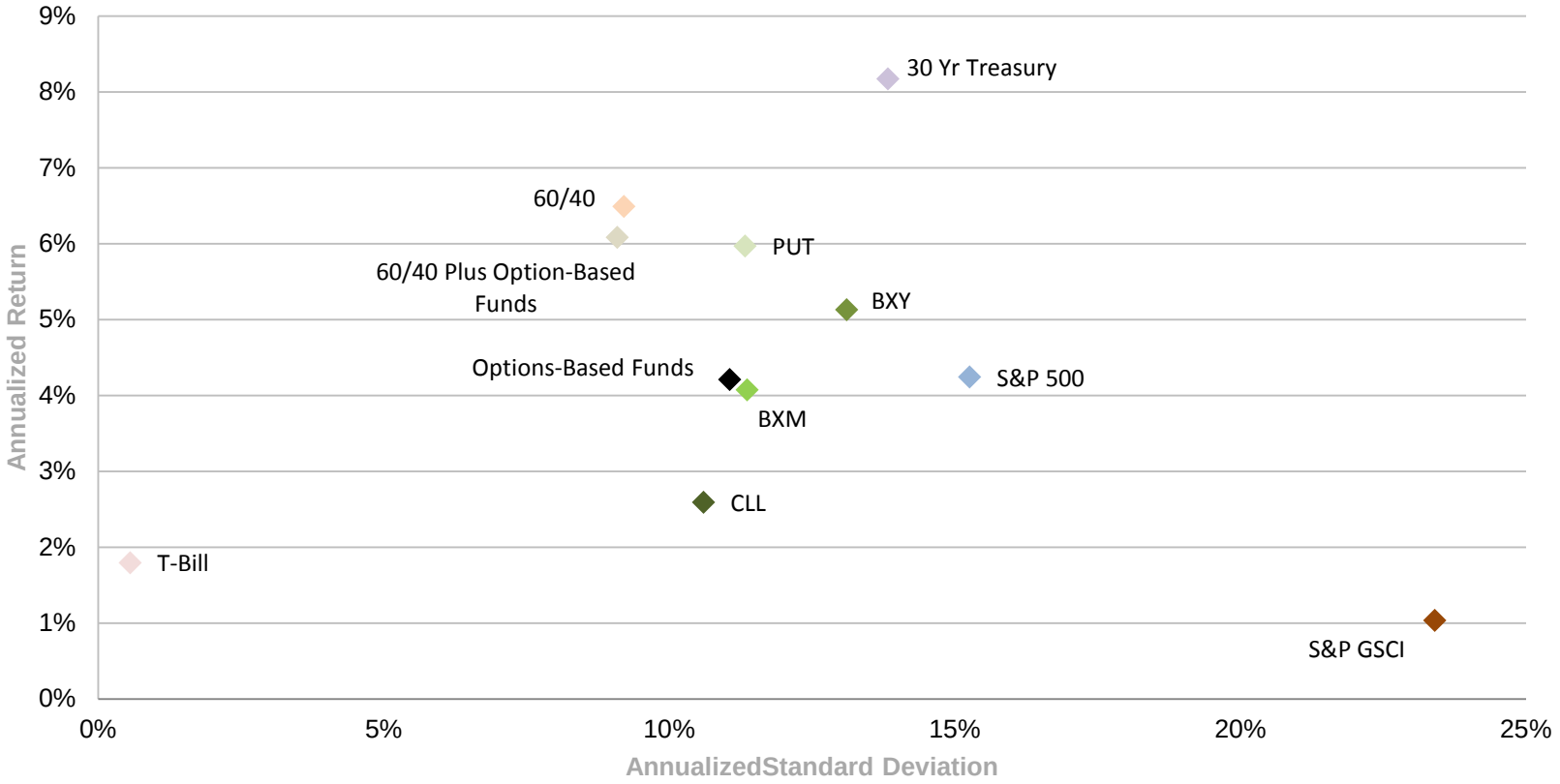

Exhibit 13: Options-Based Funds had risk and return more similar to a 60% stock, 40% bond portfolio rather than a long-only equity investment.
Sources: Morningstar and Bloomberg.

Exhibit 14 - Index Cumulative Growth of $100 Since Mid-1988 – Benchmark Indices

(Jul. 1, 1988 to Dec. 31, 2014)

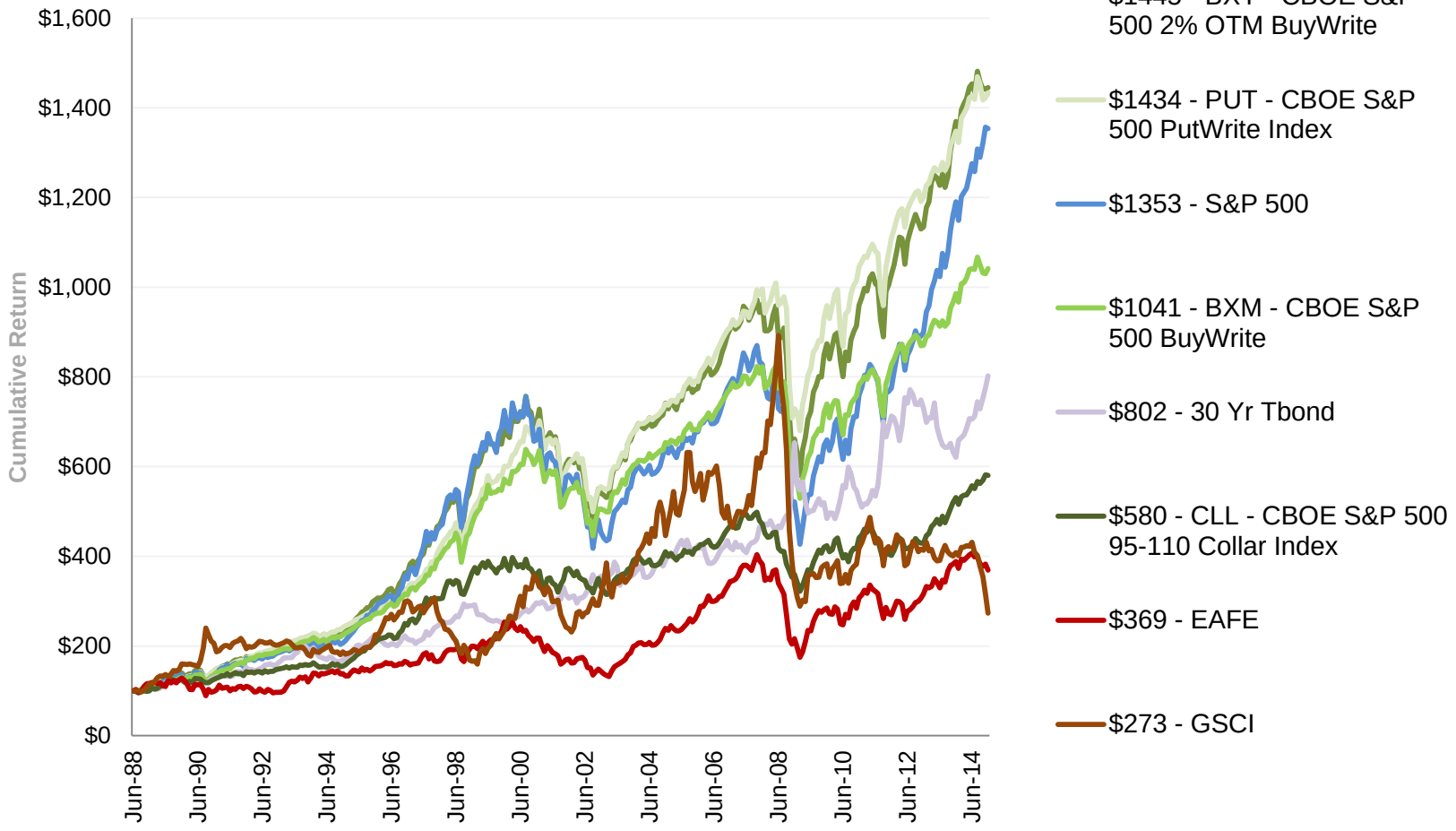

Exhibit 14: Cumulative monthly total return since July 1, 1988 for the BXM index and various traditional indices. Performance is scaled to represent a starting value of $100 on June 30, 1988 for all indices

Sources: Bloomberg and Morningstar.

Exhibit 15 - Annualized Returns Since Mid-1988 – Benchmark Indices

(Jul. 1, 1988 to Dec. 31, 2014)

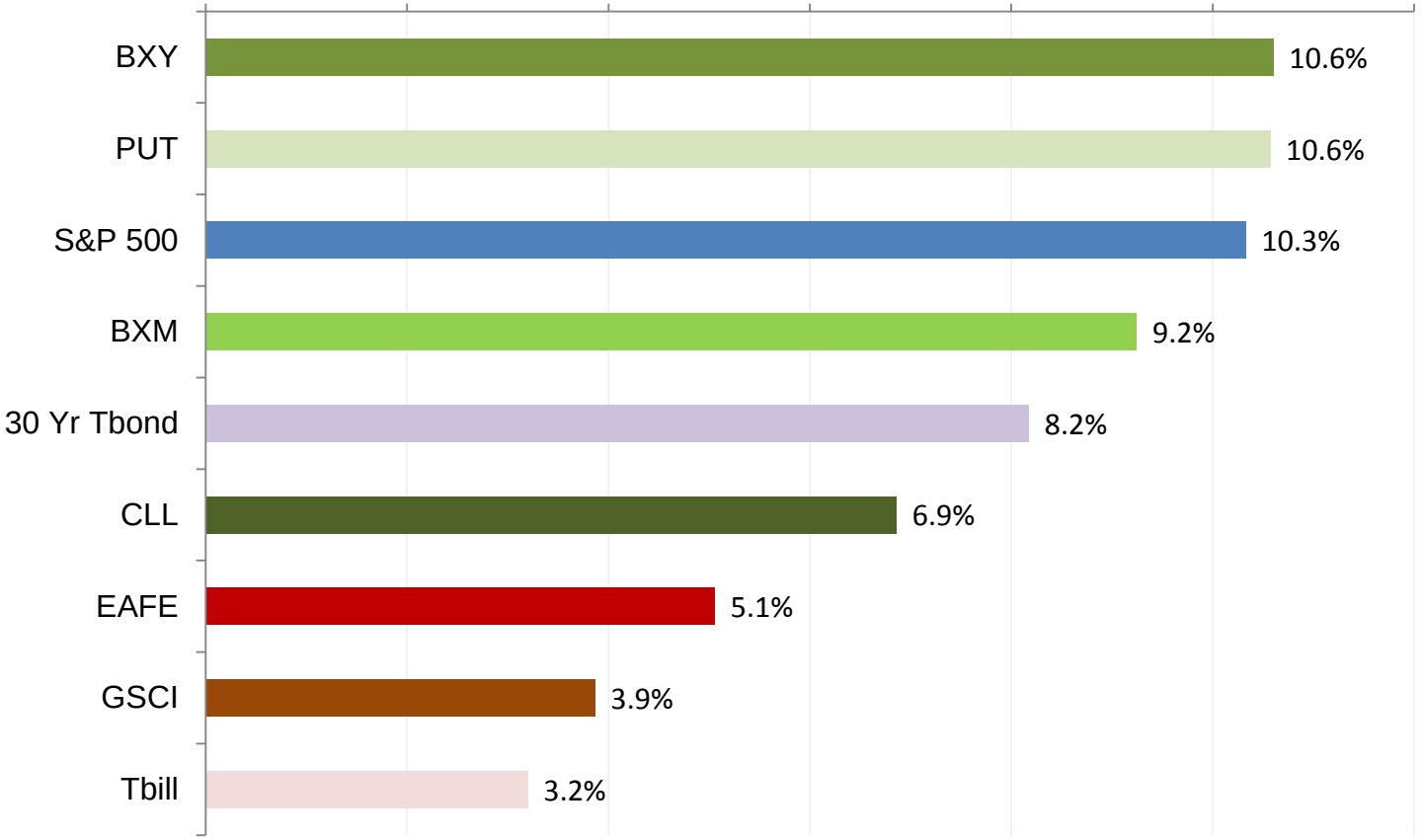

Exhibit 15: Options-Based Strategy Indices have a longer track record than most Options-based Funds (if the backtested history is included. Over 25 years, BXY and PUT had a higher total return than the S&P 500.

Sources: Morningstar and Bloomberg.

Exhibit 16 - Annualized Standard Deviation Since Mid-1988 – Benchmark Indices

(Jul. 1, 1988 to Dec. 31, 2014)

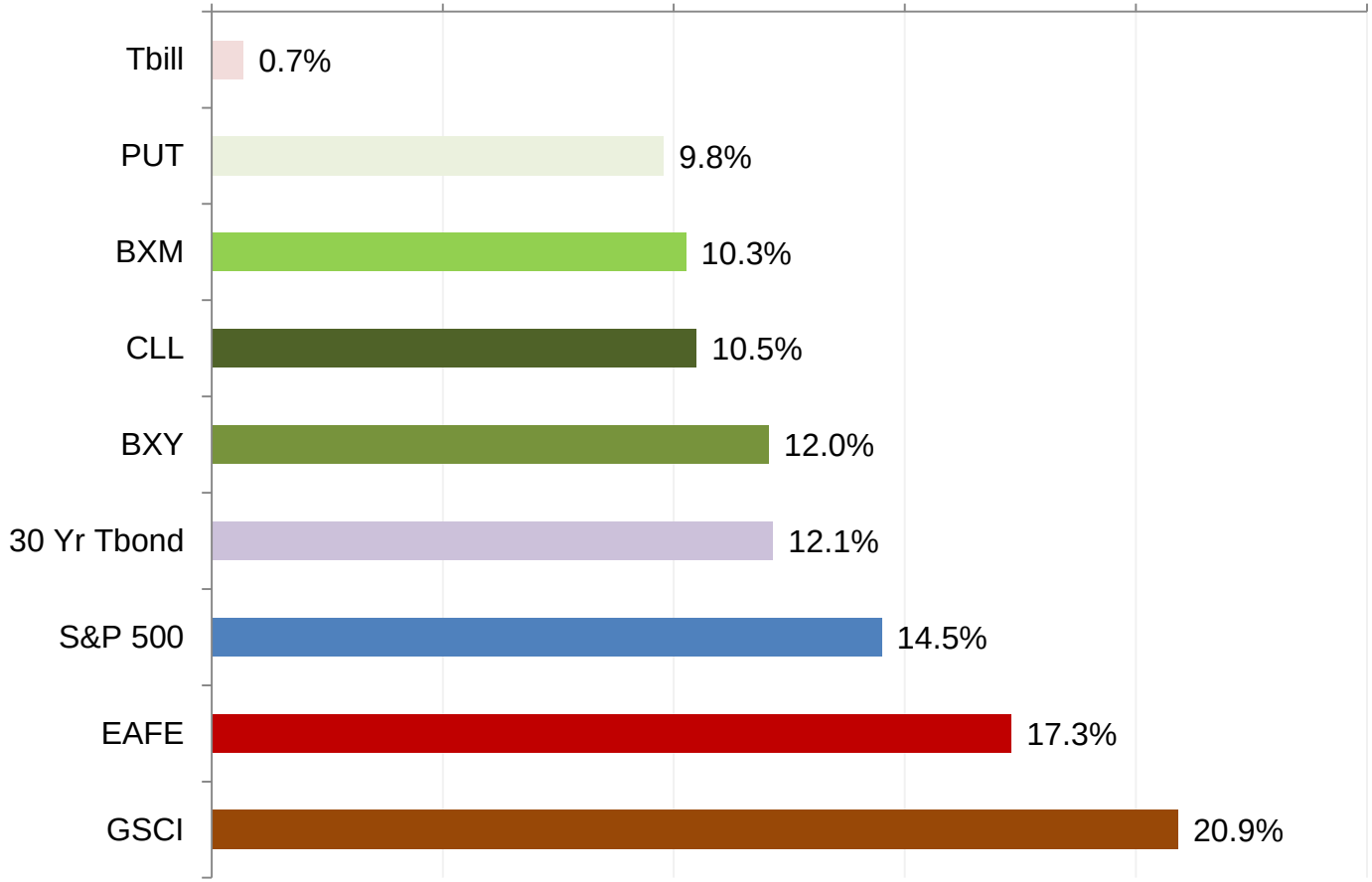

Exhibit 16: While BXY and PUT had a higher total return than the S&P 500, they also had a lower standard deviation.

Sources: Morningstar and Bloomberg.

Exhibit 17 – Risk/Return Trade-Off Since Mid-1988 – Benchmark Indices
(Jul. 1, 1988 to Dec. 31, 2014)

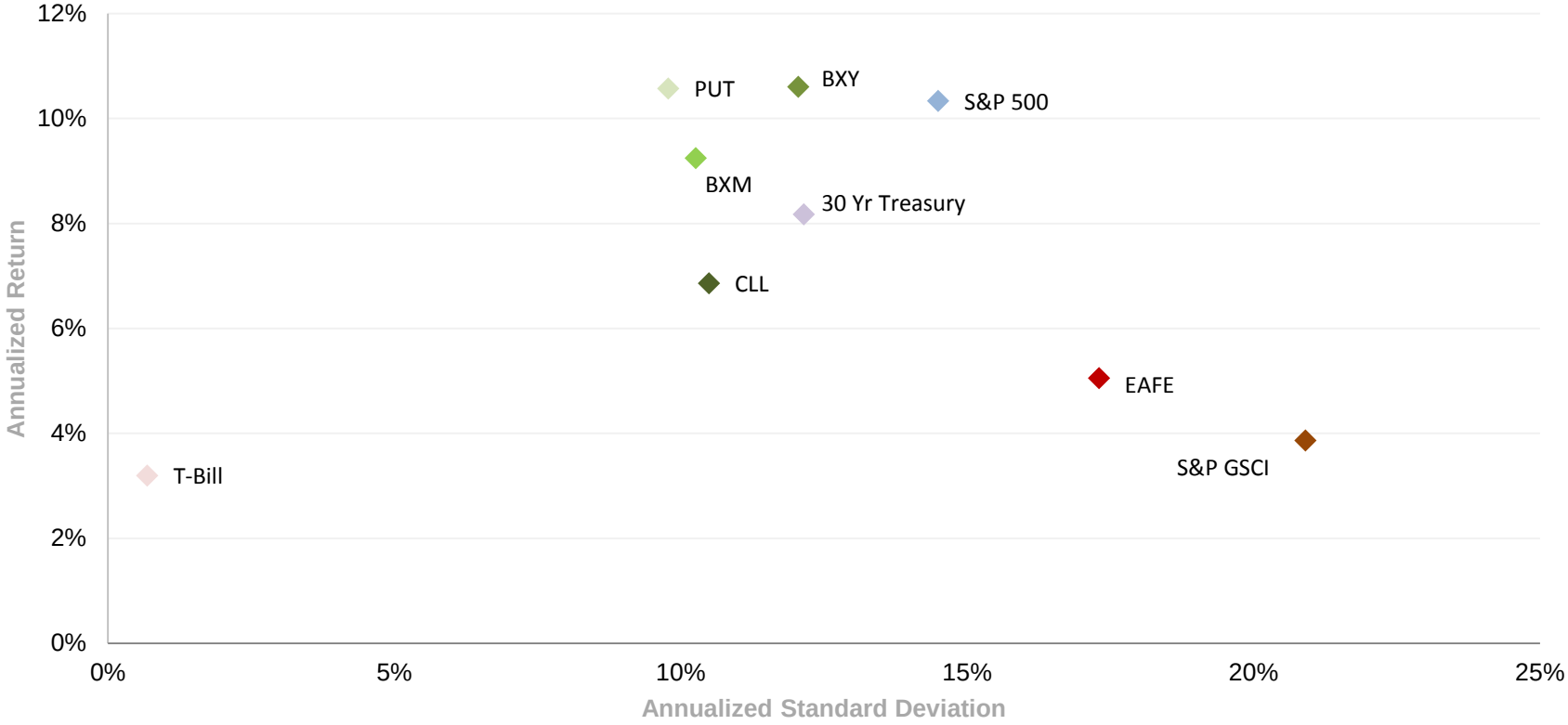

Exhibit 17: Options-Based Strategy Indices can build more efficient portfolios, with similar return and lower risk than the S&P 500 Index.
Sources: Morningstar and Bloomberg.

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.

Exhibit 19 - Monthly Options Premiums (Gross) Received by BXM Index

(Jun. 17, 1988 – Dec. 19, 2014)

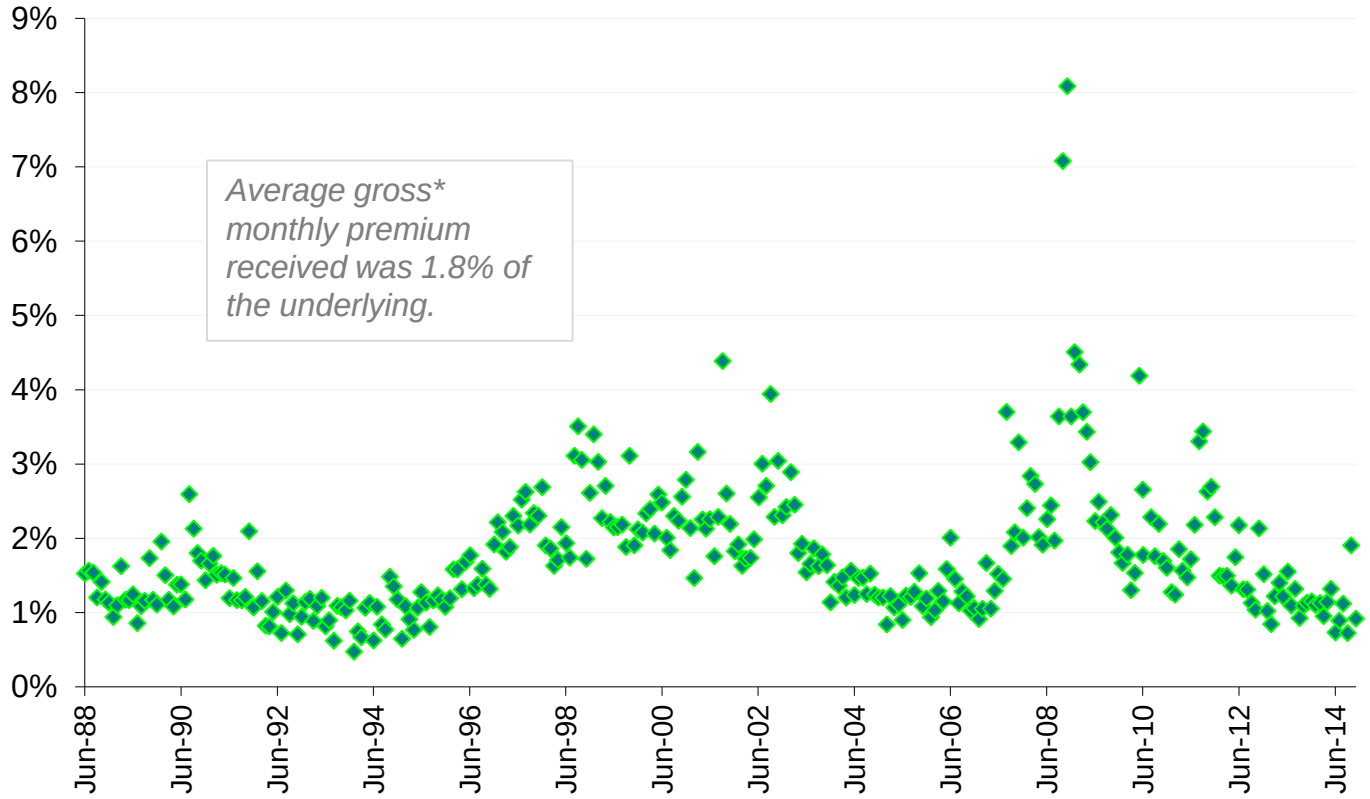

Exhibit 19: The BXM, BXY, and PUT strategies regularly sell S&P 500 Index options. The premium earned varies over time, but has averaged 1.8% per month for BXM. Premiums earned can support a high income yield for Options-Based Funds. Since mid-1988 the SPX call options monthly premium received per the hypothetical BXM strategy averaged 1.8% of the value of the stock position held.

* Please note that while these gross amounts are positive values, a buy-write strategy can have negative net returns if the value of the stocks held declines.

Source: www.cboe.com/buywrite .

Exhibit 20 - Quarterly Average 30-Day Richness of S&P 500 (SPX) Options

(Jan. 1, 1990 to Dec. 31, 2014)

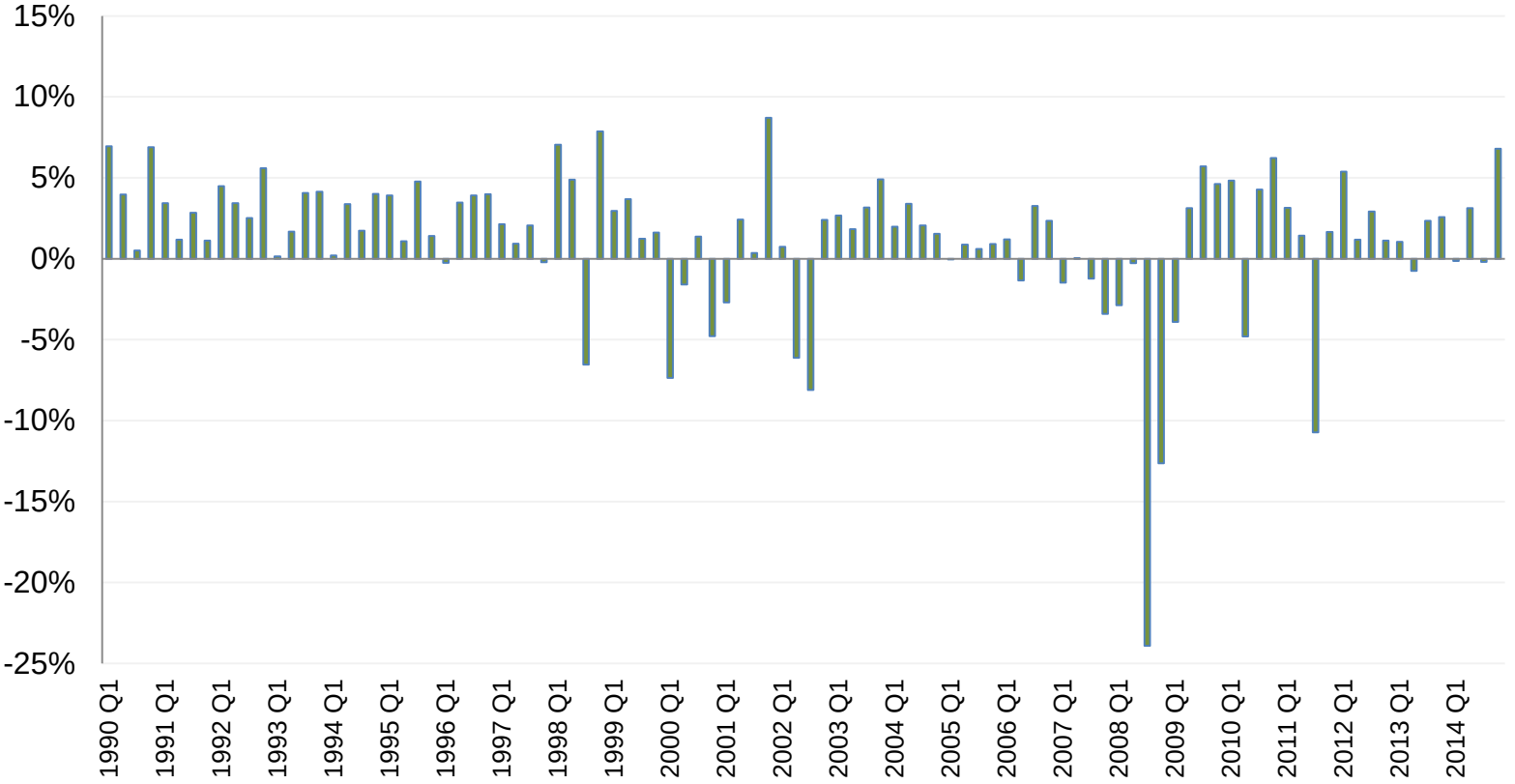

Exhibit 20: Richness is calculated as the level of VIX Index at the start of a 30-day period (implied volatility) minus the annualized standard deviation of returns of the S&P500 that is actually realized in that 30-day period (realized volatility). Since the VIX Index is a forward looking measure, each VIX Index level corresponds with the same 30-day period as the forward looking annualized standard deviation calculation. During times when this richness measure is positive, sellers of options may earn a profit of the amount by which implied volatility exceeds realized volatility. During the 25-year period shown in this chart, the average level of the VIX Index was about 20.0 and the average realized volatility was 18.8%, so the S&P 500 Index options were richly priced by about 1.2%. Please note that the final calculation in this time series is made on Dec. 2, 2014 to cover data through Dec. 31, 2014 since these measures are forward looking.

Sources: Morningstar and Bloomberg.

Exhibit 21 - Notional Value of Average Daily Volume in S&P 500 (SPX) Options (in $ Billions) (2000-2014)

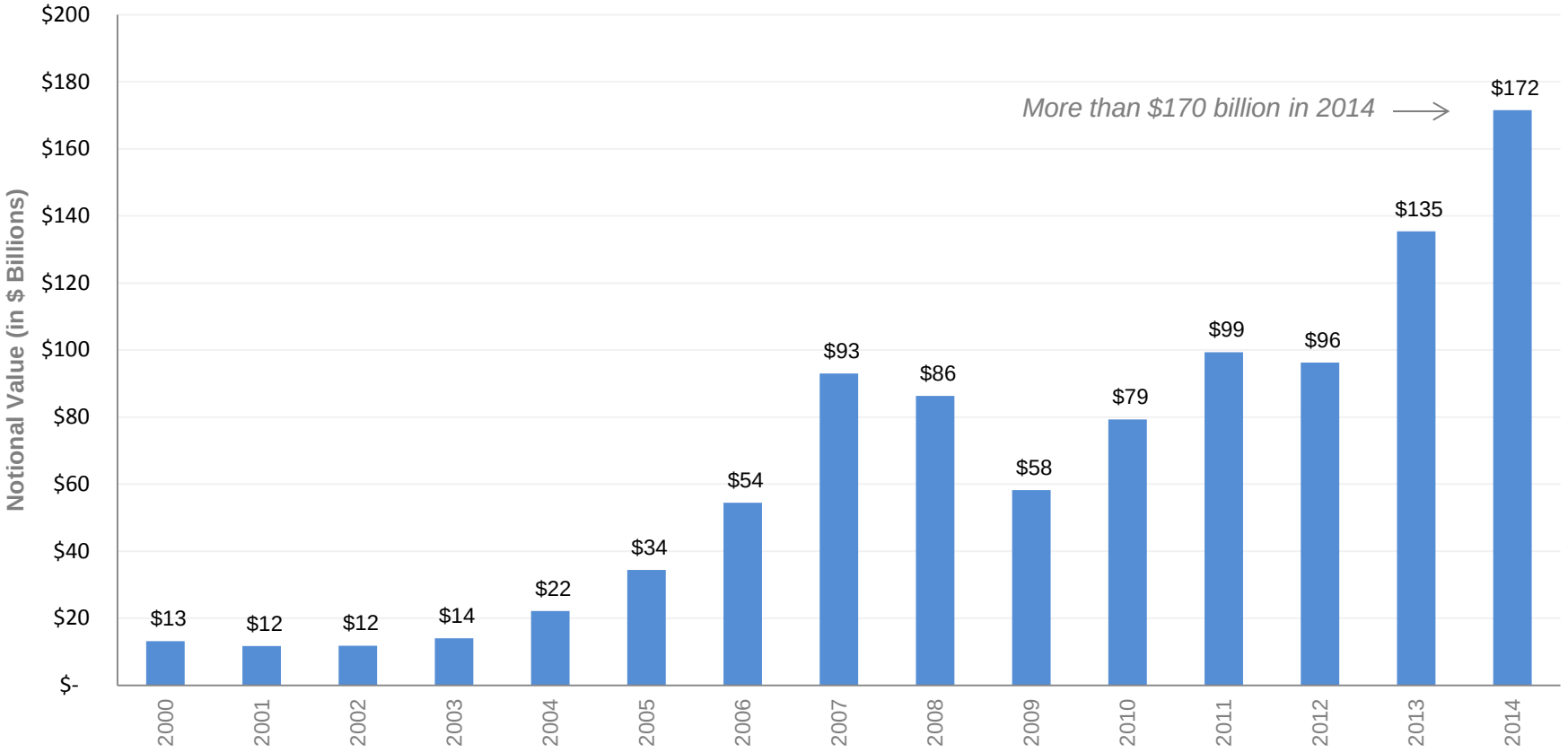

Exhibit 21: Fund managers examine trading liquidity and capacity when considering investment vehicles. The approximate daily notional value of trading in SPX options in 2014 can be estimated by multiplying the average daily volume (888,089 contracts) times the value of the S&P 500 Index (average of 1931) times the $100 options contract multiplier, for a value of more than $170 billion per day. Some investors use a delta-weighting multiplier to develop a more conservative estimate for notional value of options trading. *Sources: Bloomberg and CBOE.*

Exhibit 22 - Annual Returns - Options-Based Funds and Benchmark Indices

(1987 - 2014)

	BXM	Options-Based Funds	PUT	BXY	CLL	S&P 500	GSCI	30 Yr TBond	EAFE
1987	-3.0%		-2.6%		12.4%	5.3%	23.8%	-8.0%	24.6%
1988	21.0%		19.7%		6.1%	16.6%	27.9%	8.1%	28.3%
1989	25.0%		24.6%	32.6%	26.0%	31.7%	38.3%	20.3%	10.5%
1990	4.0%		8.9%	1.9%	-0.1%	-3.1%	29.1%	4.8%	-23.4%
1991	24.4%		21.3%	22.9%	13.6%	30.5%	-6.1%	17.3%	12.1%
1992	11.5%		13.8%	11.0%	4.3%	7.6%	4.4%	6.8%	-12.2%
1993	14.1%		14.1%	11.0%	6.2%	10.1%	-12.3%	18.3%	32.6%
1994	4.5%		7.1%	4.6%	-2.0%	1.3%	5.3%	-11.9%	7.8%
1995	21.0%		16.9%	33.2%	34.4%	37.6%	20.3%	33.5%	11.2%
1996	15.5%		16.4%	19.8%	18.5%	23.0%	33.9%	-4.4%	6.0%
1997	26.6%		27.7%	29.7%	23.9%	33.4%	-14.1%	15.4%	1.8%
1998	18.9%		18.5%	21.2%	18.8%	28.6%	-35.7%	16.5%	20.0%
1999	21.2%		21.0%	19.7%	9.0%	21.0%	40.9%	-14.9%	27.0%
2000	7.4%	2.9%	13.1%	2.0%	-9.1%	-9.1%	49.7%	20.0%	-14.2%
2001	-10.9%	-1.5%	-10.6%	-11.4%	3.8%	-11.9%	-31.9%	3.4%	-21.4%
2002	-7.6%	-8.0%	-8.6%	-12.3%	-11.1%	-22.1%	32.1%	16.2%	-15.9%
2003	19.4%	22.5%	21.8%	24.9%	17.9%	28.7%	20.7%	0.8%	38.6%
2004	8.3%	4.6%	9.5%	9.7%	4.9%	10.9%	17.3%	8.7%	20.2%
2005	4.2%	-0.5%	6.7%	4.4%	2.0%	4.9%	25.6%	8.8%	13.5%
2006	13.3%	19.4%	15.2%	17.1%	11.7%	15.8%	-15.1%	-1.1%	26.3%
2007	6.6%	-4.3%	9.5%	6.1%	0.9%	5.5%	32.7%	10.2%	11.2%
2008	-28.7%	-29.1%	-26.8%	-31.2%	-23.6%	-37.0%	-46.5%	41.3%	-43.4%
2009	25.9%	32.5%	31.5%	32.1%	17.6%	26.5%	13.5%	-25.9%	31.8%
2010	5.9%	8.7%	9.0%	9.8%	4.1%	15.1%	9.0%	8.7%	7.8%
2011	5.7%	-1.5%	6.2%	7.2%	-8.8%	2.1%	-1.2%	35.4%	-12.1%
2012	5.2%	10.4%	8.1%	10.2%	6.8%	16.0%	0.1%	2.4%	17.3%
2013	13.3%	16.3%	12.3%	20.8%	23.8%	32.4%	-1.2%	-15.0%	22.8%
2014	5.6%	5.8%	6.4%	5.5%	9.2%	13.7%	-33.1%	29.3%	-4.9%

Exhibit 22: Annual returns for each year since 1987 of Options-Based Funds and benchmark indices.

Sources: Morningstar and Bloomberg.

Exhibit 23 - List of 80 Options-Based Funds (focused on U.S. Equities)

The largest funds in the sample are *GATEX* ($8.2B), *ETY* ($1.8B), *BDJ* ($1.7B) and *NFJ* ($1.7B), while *GATEX* (1977), *TDEYX* (1978) and *MEQFX* (1992) have the earliest inception dates.

	TYPE	NAME	TICKER
1	MFd	Alliance Bernstein/TWM Global Equity & Covered Call Strategy Fund - Institutional	TWMLX
2	CEF	AllianzGI NFJ Dividend Interest & Premium Common	NFJ
3	MFd	AllianzGI Structured Return A-Class	AZIAX
4	MFd	AllianzGI US Equity-Hedged - Institutional	AZUIX
5	MFd	AMG FQ US Equity - Institutional	MEQFX
6	MFd	Arin Large Cap Theta - Institutional	AVOLX
7	MFd	ASTON/Anchor Capital Enhanced Equity - Institutional	AMDSX
8	CEF	BlackRock Enhanced Capital & Income Common	CII
9	CEF	BlackRock Enhanced Equity Dividend Common	BDJ
10	MFd	BPV Low Volatility	BPVLX
11	MFd	BPV Wealth Preservation Advisor	BPAPX
12	MFd	Bridgeway Managed Volatility	BRBPX
13	MFd	Camelot Excalibur Small Cap Income - Class A	CEXAX
14	MFd	Camelot Premium Return - Class A	CPRFX
15	MFd	Catalyst/Lyons Hedged Premium Return - A	CLPAX
16	MFd	Catalyst/MAP Global Capital Appreciation - A	CAXAX
17	MFd	Catalyst/SMH Total Return Income - Class A	TRIFX
18	MFd	Centaur Total Return	TILDX
19	CEF	Columbia Seligman Premium Technology	STK
20	MFd	Covered Bridge - Class A	TCBAX
21	MFd	Credit Suisse Volaris US Strategies - Class A	VAEAX
22	MFd	Crow Point Defined Risk Global Equity Income - Class A	CGHAX
23	MFd	Dividend Plus Income Fund - Institutional	MAIPX
24	MFd	Dunham Monthly Distribution Fund - Class A	DAMDX
25	CEF	Eaton Vance Enhanced Equity Income Common	EOI
26	CEF	Eaton Vance Enhanced Equity Income II Common	EOS
27	MFd	Eaton Vance Hedged Stock - Institutional	EROIX
28	CEF	Eaton Vance Risk-Managed Diversified Equity Income Common	ETJ
29	CEF	Eaton Vance Tax-Managed Buy-Write Income Common	ETB
30	CEF	Eaton Vance Tax-Managed Buy-Write Opportunities Common	ETV
31	CEF	Eaton Vance Tax-Managed Dividend Equity Income Common	ETY
32	CEF	First Trust Enhanced Equity Income Common	FFA
33	ETF	First Trust High Income ETF	FTHI
34	ETF	First Trust Low Beta Income ETF	FTLB
35	MFd	Frost Cinque Large Cap Buy-Write Equity - A	FCAWX
36	MFd	Gateway - Class A	GATEX
37	MFd	Gateway Equity Call Premium - Class A	GCPAX
38	MFd	Glenmede Secured Options	GTSOX
39	MFd	GMO Risk Premium - Class III	GMRPX
40	CEF	Guggenheim Enhanced Equity Income Common	GPM
41	CEF	Guggenheim Enhanced Equity Strategy Common	GGE
42	CEF	Guggenheim EW Enhanced Equity Common	GEQ
43	MFd	Hatteras Disciplined Opportunity - Institutional	HDOIX
44	ETF	Horizons S&P 500® Covered Call ETF	HSPX
45	ETF	Horizons US Equity Managed Risk ETF	HUS.U
46	MFd	Hussman Strategic Growth	HSGFX
47	MFd	ICON Risk-Managed Balanced - Class A	IOCAX
48	MFd	Investment Partners Opportunities - Class A	IPOFX
49	MFd	Iron Horse - Class A	IRHAX
50	MFd	Ironclad Managed Risk	IRONX
51	MFd	JHancock Redwood - Class A	JTRAX
52	MFd	KF Griffin Blue Chip Covered Call - Class A	KFGAX
53	MFd	Kinetics Multi-Disciplinary Advisor - Class A	KMDAX
54	MFd	KKM ARMOR A	RMRAX
55	MFd	KKM US Equity ARMOR A	UMRAX
56	MFd	Leigh Baldwin Total Return	LEBOX
57	MFd	LS Theta - Institutional	LQTIX
58	MFd	Madison Covered Call & Equity Income - Class A	MENAX
59	CEF	Madison Covered Call & Equity Strategy	MCN
60	CEF	Madison Strategic Sector Premium Common	MSP
61	MFd	MD Sass Equity Income Plus Fund - Institutional	MDEIX
62	CEF	Nuveen Core Equity Alpha Common	JCE
63	CEF	Nuveen Dow 30 Dynamic Overwrite	DIAX
64	CEF	Nuveen NASDAQ 100 Dynamic Overwrite	QQQX
65	CEF	Nuveen S&P 500 Buy-Write Income	BXMX
66	CEF	Nuveen S&P 500 Dynamic Overwrite	SPXX
67	CEF	Nuveen Tax-Advantaged Dividend Growth Common	JTD
68	ETF	PowerShares S&P 500 Buy-Write ETF	PBP
69	ETF	Recon Capital NASDAQ 100 Covered Call ETF	QYLD
70	MFd	RiverNorth Managed Volatility - Class R	RNBWX
71	MFd	RiverPark Structural Alpha - Institutional	RSAIX
72	MFd	RiverPark/Gargoyle Hedged Value - Institutional	RGHIX
73	MFd	Russell Strategic Call Overwriting - Class S	ROWSX
74	MFd	Schooner - Class A	SCNAX
75	MFd	Swan Defined Risk - Class I	SDRIX
76	MFd	Touchstone Dynamic Equity - Class Y	TDEYX
77	ETF	US Equity High Volatility Put Write ETF	HVPW
78	MFd	Virtus Low Volatility Equity - Class A	VLVAX
79	MFd	WP Large Cap Income Plus - Institutional	WPLCX
80	MFd	YCG Enhanced	YCGEX

Exhibit 23: 80 options-based equity funds are used in the analysis. These funds consist of 51 mutual funds (MFd), 22 closed-end funds (CEF), and 7 exchange-traded index funds (ETF). The sample has a current AUM of $27.6 billion.

As shown in this exhibit, 39 additional options-based funds with objectives other than diversified US equity have been identified, bringing the AUM to over $46 billion. Funds benchmarked to indices other than US equities are beyond the scope of this study.

Sources: Morningstar and Bloomberg.

Exhibit 24 - List of 39 Additional Options-Based Funds (Not Included in Analysis)

	TYPE	NAME	TICKER
1	ETF	AdvisorShares STAR Global Buy-Write ETF	VEGA
2	CEF	AllianzGI Equity & Convertible Income	NIE
3	MFd	AMG FQ Global Risk-Balanced - Institutional	MMAFX
4	CEF	BlackRock Global Opportunities	BOE
5	CEF	BlackRock Health Sciences	BME
6	CEF	BlackRock Resources & Commdity	BCX
7	CEF	BlackRock Utility & Infrastructure Trust	BUI
8	MFd	Catalyst/MAP Global Capital Appreciation - Class A	CAXAX
9	MFd	Catalyst/MAP Global Total Return Income - Class A	TRXAX
10	CEF	Central Securities Corporation	CET
11	CEF	Clough Global Opportunities	GLO
12	CEF	EV Tax-Managed Global Diversity Equity Income	EXG
13	CEF	Fiduciary/Claymore MLP Opportunity	FMO
14	ETF	First Trust CBOE® S&P 500 VIX®Tail Hedge ETF	VIXH
15	CEF	First Trust MLP & Energy Income Fund	FEI
16	CEF	Gabelli Equity Trust	GAB
17	CEF	GAMCO Global Gold Natural Resource & Income	GGN
18	CEF	GAMCO Natural Resource Gold & Income	GNT
19	MFd	Gateway International - Class A	GAIAX
20	MFd	Glenmede International Secured Options	NOVIX
21	CEF	JH Hedged Equity & Income Fund	HEQ
22	CEF	JH Tax Advantaged Global Shareholder Yield	HTY
23	CEF	Kayne Anderson Midstream Energy	KMF
24	MFd	Kinetics Alternative Income - No Load	KWINX
25	MFd	Kinetics Multi-Disciplinary - No Load	KMDNX
26	CEF	MS India Investment	IIF
27	CEF	Nuveen Diversified Commodity	CFD
28	CEF	Nuveen Long/Short Commodity Total Return	CTF
29	MFd	Regal Total Return - Class A	RTRTX
30	MFd	Robeco Boston Partners All Cap Value - Institutional	BPAIX
31	CEF	Salient Midstream & MLP	SMM
32	MFd	Sandalwood Opportunity - Class A	SANAX
33	MFd	Virtus Strategic Income - Class A	VASBX
34	CEF	Voya Global Advantage and Premium Opportunity	IGA
35	CEF	Voya Global Equity Dividend&Premium Opportunity	IGD
36	CEF	Voya Infrastructure Industrials & Materials	IDE
37	CEF	Voya International High Dividend Equity Income	IID
38	CEF	Voya Natural Resources Equity Income	IRR
39	CEF	Wells Fargo Adv Global Dividend Opportunity	EOD

Exhibit 24: 39 Additional Options-Based Funds with $18.6 billion AUM (not used in performance analysis). These include 26 CEFs with AUM of $16.9 Billion, 11 Mutual Funds with AUM of $1.7 Billion and 2 ETFs with AUM of $30 Million. Additionally, two ETNs where identified (GLDI and BWV) which are not included in the above list.

Sources: Morningstar and Bloomberg.

The inclusion of references to registered funds in this paper should not be construed as an endorsement or an indication of the value of any product, security, fund, service, or other website. Such financial products are not sponsored, endorsed, sold or promoted by CBOE or INGARM. CBOE and INGARM make no representation regarding the advisability of investing in such products. An investor should consider the investment objectives, risks, charges, and expenses of these products carefully before investing. Before investing in any fund or security, please read closely the applicable prospectus and other legal information. Chicago Board Options Exchange® (CBOE®) provided financial support for the research for this paper.

Options involve risk and are not suitable for all investors. Prior to buying or selling an option, a person must receive a copy of Characteristics and Risks of Standardized Options. Copies are available from your broker, by calling 1-888-OPTIONS, or from The Options Clearing Corporation at www.theocc.com. The information in this paper is provided for general education and information purposes only. No statement within this paper should be construed as a recommendation to buy or sell a security or to provide investment advice. The BXM, BXY, CLL and PUT indices (the "Indexes") are designed to represent proposed hypothetical options strategies. The actual performance of investment vehicles such as mutual funds or managed accounts can have significant differences from the performance of the Indexes. Investors attempting to replicate the Indexes should discuss with their advisors possible timing and liquidity issues. Like many passive benchmarks, the Indexes do not take into account significant factors such as transaction costs and taxes. Transaction costs and taxes for strategies such as the Indexes could be significantly higher than transaction costs for a passive strategy of buying-and-holding stocks. Investors should consult their tax advisor as to how taxes affect the outcome of contemplated options transactions.

Past performance does not guarantee future results. This document contains index performance data based on back-testing, i.e., calculations of how the index might have performed prior to launch. Backtested performance information is purely hypothetical and is provided in this paper solely for informational purposes. Back-tested performance does not represent actual performance and should not be interpreted as an indication of actual performance. It is not possible to invest directly in an index. CBOE calculates and disseminates the Indexes. Supporting documentation for any claims, comparisons, statistics or other technical data in this paper is available from CBOE upon request.

More information (including a later version of this paper) is or will be available at **www.ingarm.org** and **www.cboe.com/funds**.

Please **email comments** to **eszado@providence.edu, kblack@caia.org** and/or **institutional@cboe.com.**