

Options for Managing Volatility

Historical Performance of Options-Related Strategies

- Income
- Diversification
- Risk-adjusted Returns

By

Matt Moran

VP, Chicago Board Options Exchange®

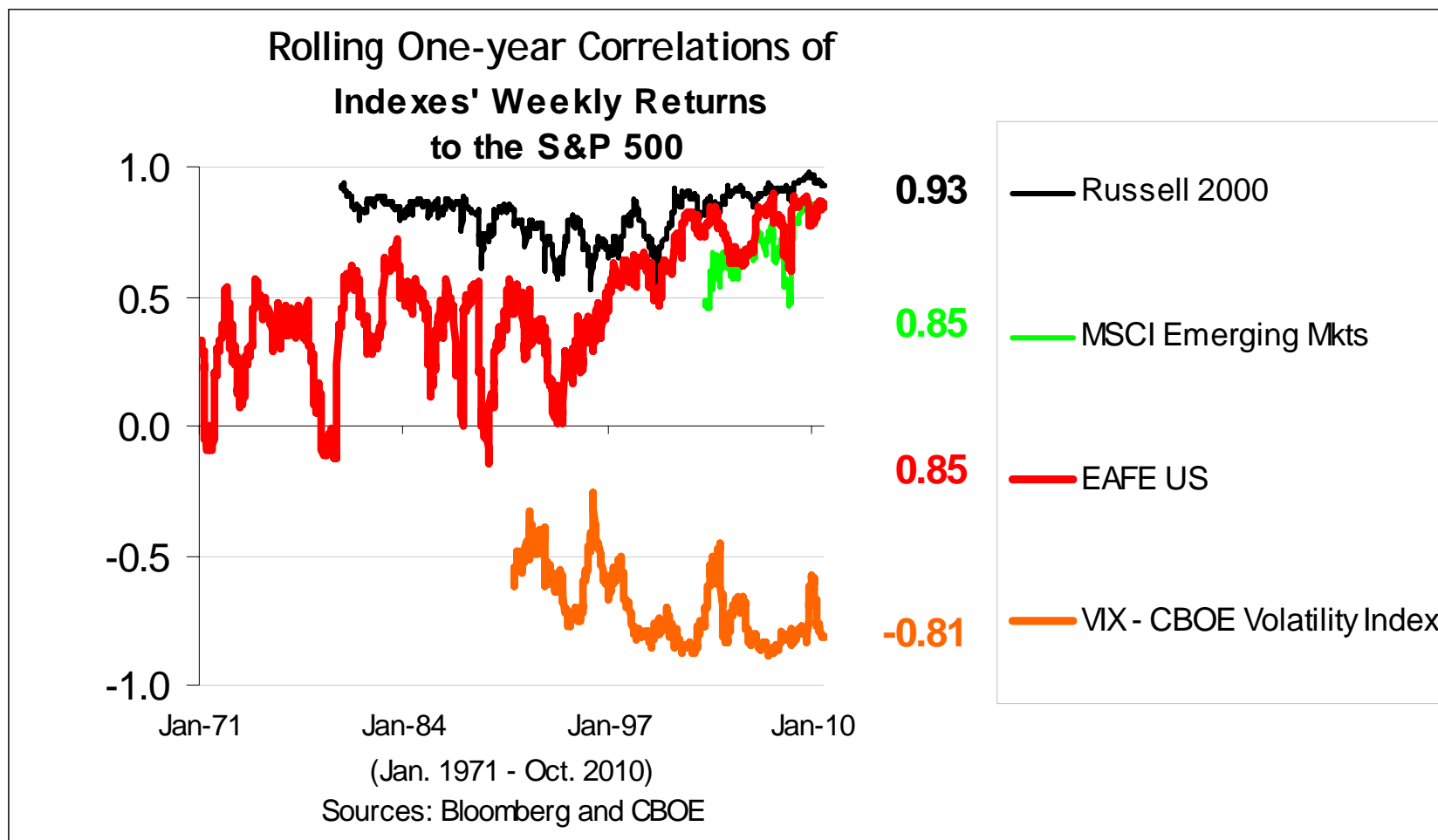
(312) 786-7249

Presentation on June 13, 2011

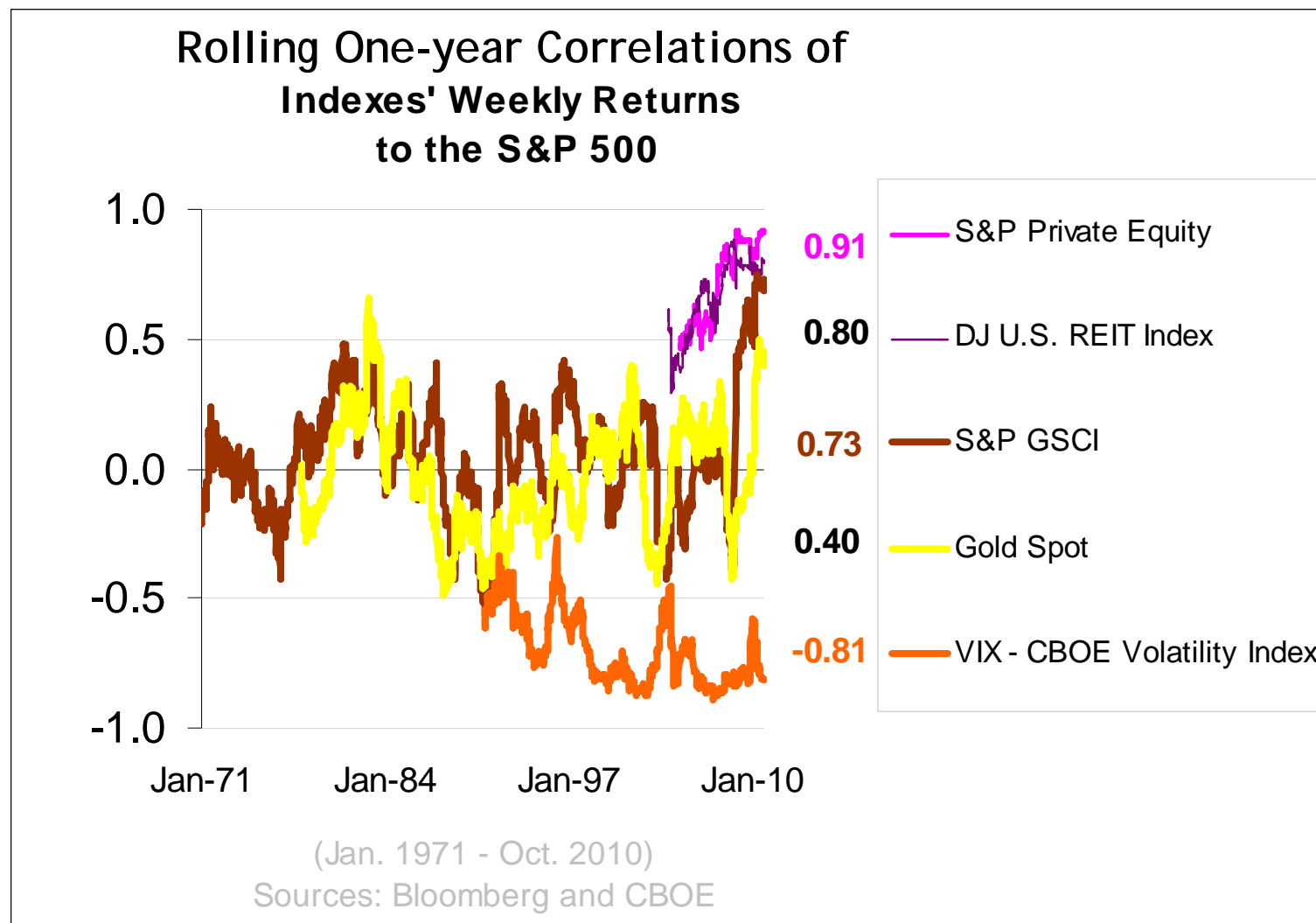
Hartford QWAFEFW

Please see the last slide for important disclosures

Higher Correlations for Stock Indexes

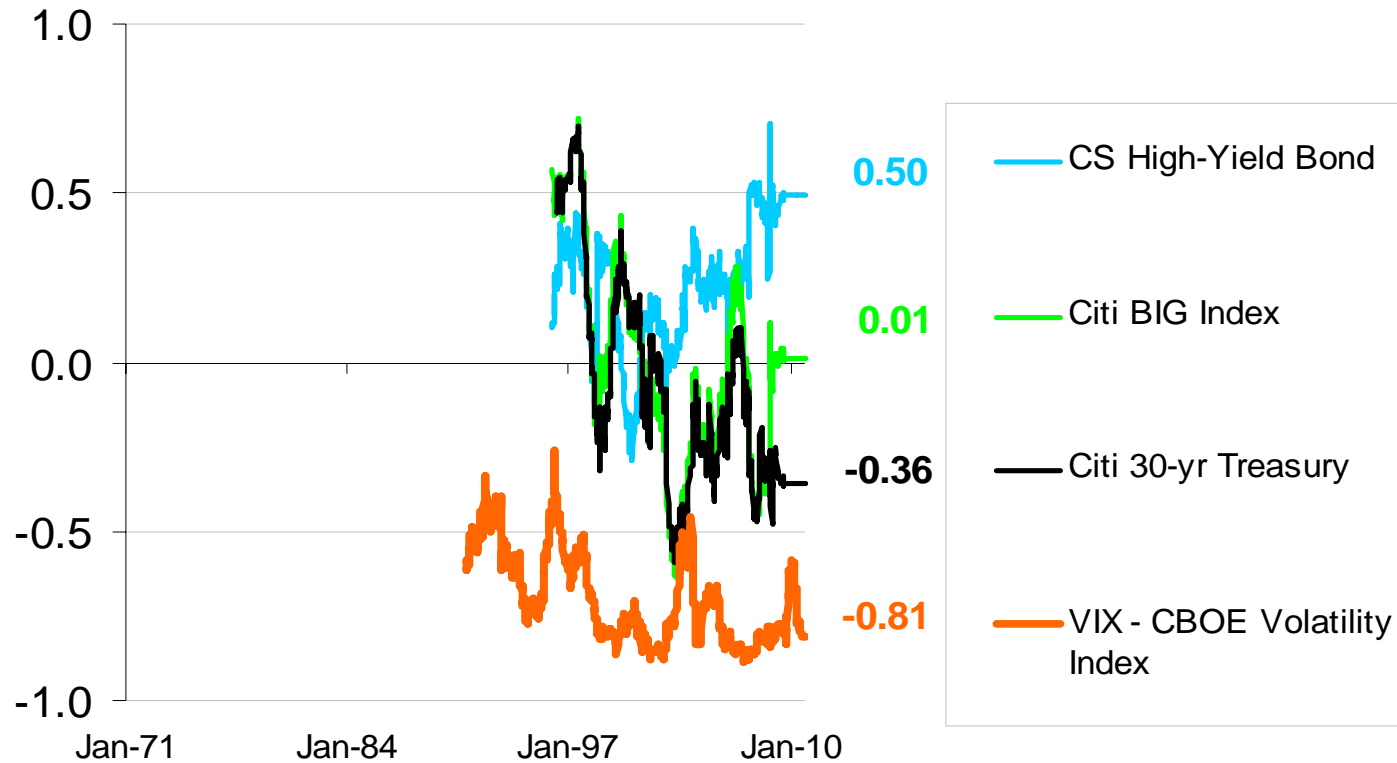


Higher Correlations for Alternatives Indexes



Correlations and Fixed Income Indexes

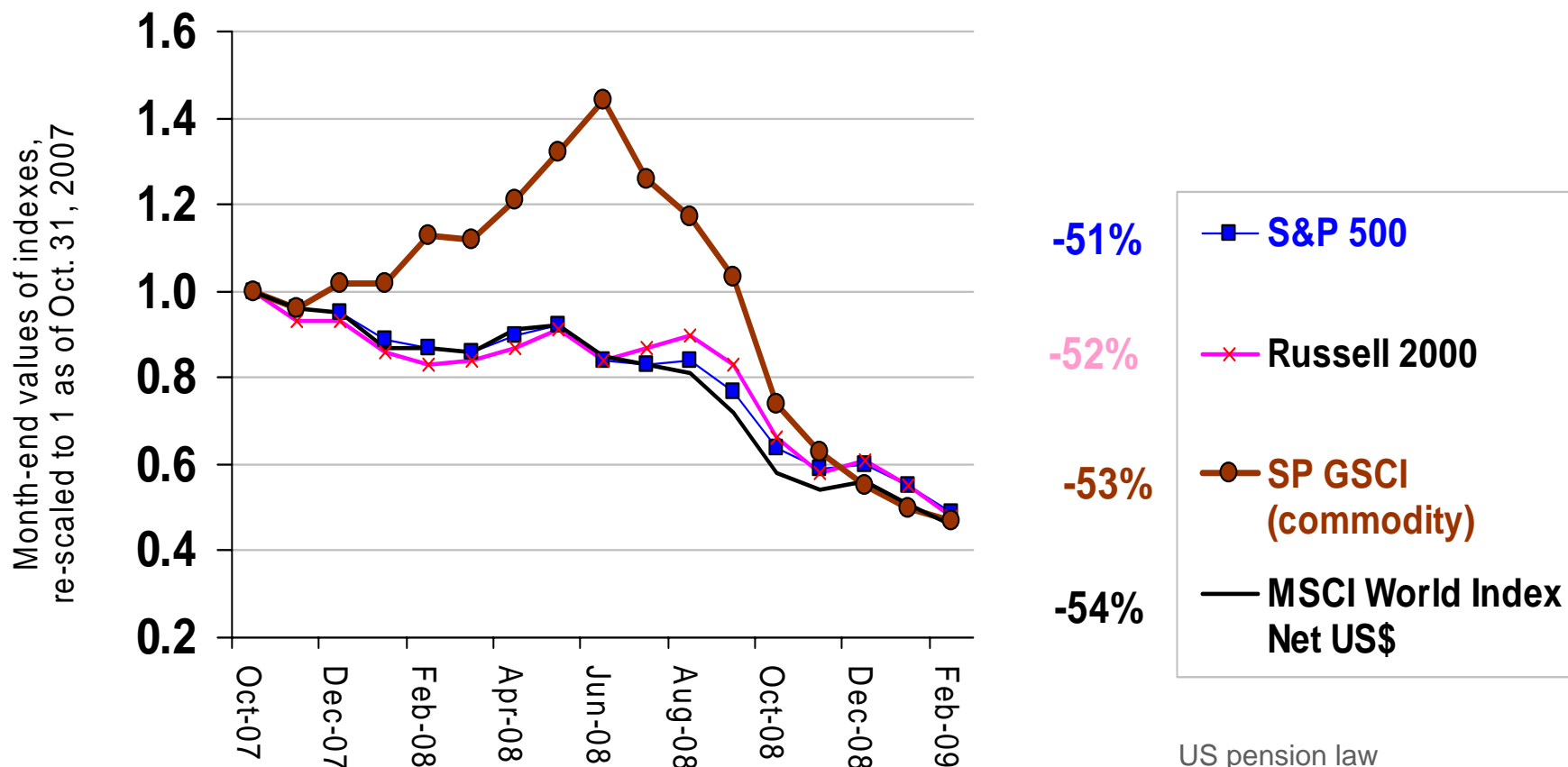
Rolling One-year Correlations of Indexes' Weekly Returns to the S&P 500 Index



(Jan. 1971 - Oct. 2010)
Sources: Bloomberg and CBOE

16 Challenging Months

Little diversification as stock and commodity indexes fell by more than 50%

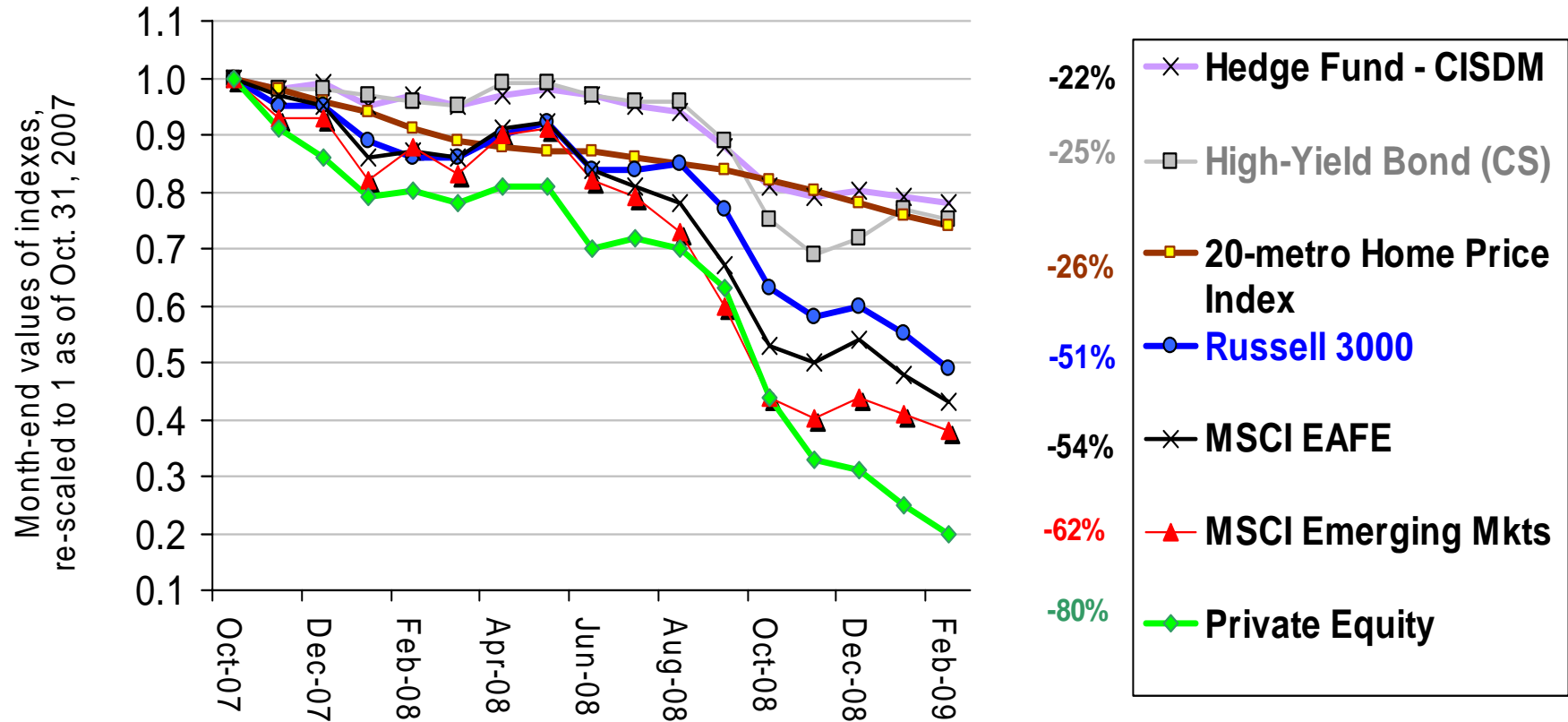


(Oct. 31, 2007 - Feb. 28, 2009)

Sources: CBOE and Bloomberg Total return indexes

US pension law requires pension fiduciaries to diversify so as to minimize the risk of large losses

16 Challenging Months for Alternatives



(Oct. 31, 2007 - Feb. 28, 2009)

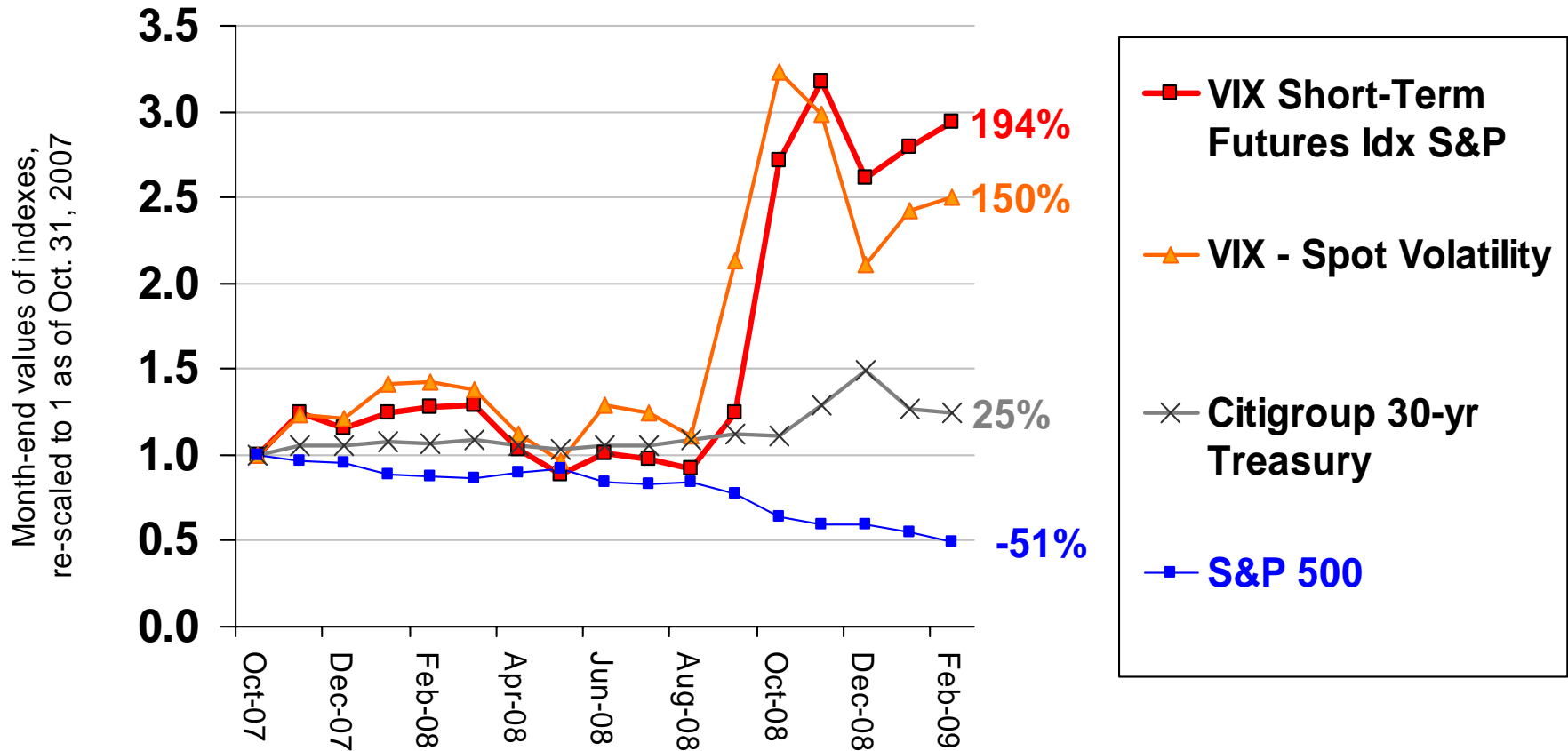
Sources: CBOE and Bloomberg Total return indexes are used for stocks. S&P Case-Shiller Home Price Index and S&P Private Equity Index are used.

Headlines on Diversification, etc.

- Bigda, Carolyn. “Crisis Rains On Diversification Parade; For Long-Term Investing, Managers Still Optimistic About Foreign Stocks.” Chicago Tribune (Nov 9, 2008). pg. 4.
- Clary, Isabelle. “Managers Turning to Futures, Options to Counter Volatility.” Pensions & Investments (March 31, 2008).
- Cui, Carolyn. “Commodities Zig; Stocks Do, Too; Parallel Drops Undermine Oil and Grains In Their Roles as Alternative Investments.” Wall Street Journal (Oct 17, 2008). pg. C.1.
- Evensky, Harold. “Is MPT Dead? Is Alpha Beta? And Other Interesting Questions.” Journal of Financial Planning (June 2009) pg. 30.
- Israelsen, Craig L. “All Together Now; Analyzing Correlation Patterns Shows That Some Assets Are Not Providing Hoped-For Diversification.” Financial Planning (April 2009) pg. 67.
- Karmin, Craig. “Calpers Has Worst Year, Off 23.4%.” Wall Street Journal (July 22, 2009) pg. C3.
- Karmin, Craig. “Ivy League Endowments Finally 'Dumb.'” Wall Street Journal (June 30, 2009) p. C1.
- Lauricella, Tom. “No Diversification: How Bond Funds Let Investors Down.” Wall Street Journal (June 1, 2009) pg. R.1.
- Lim, Paul. “25 Years of Conventional Wisdom, Down the Drain.” New York Times (Jan 4, 2009). pg BU.4.
- MarksJarvis, Gail. “Diversification Not Always Insulation.” Chicago Tribune (Feb 1, 2009).
- Shinkle, Kirk. “Why Plain-Vanilla Portfolios Fall Short; Today, Diversification Means More than Just Mixing Stocks, Bonds, and Cash.” U.S. News & World Report (Jul 1, 2009) pg. 70.

16 Challenging Months

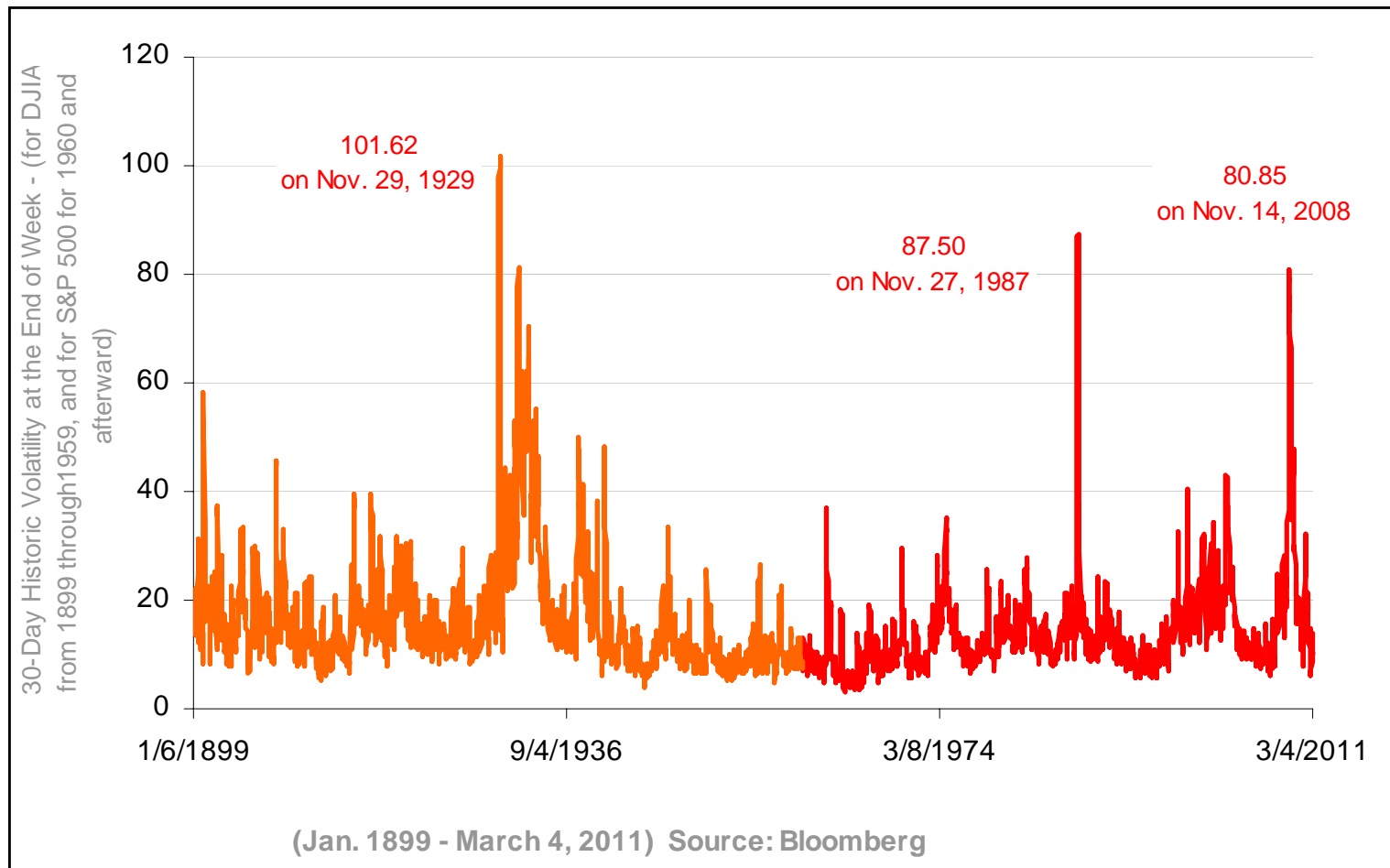
Can volatility diversify and lessen portfolio volatility?



(Oct. 31, 2007 - Feb. 28, 2009)

Sources: CBOE and Bloomberg

Historic Volatility Since 1899



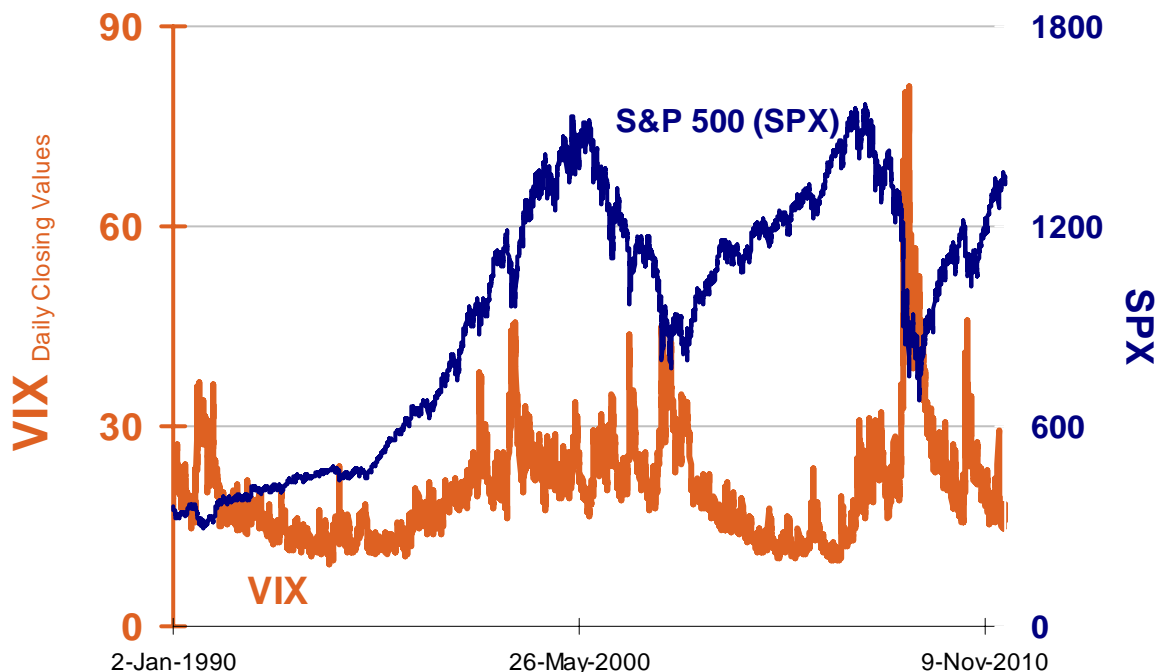
“Historic Volatility” is a measure of actual price changes during a specific time period in the past. Mathematically, historic volatility is the annualized standard deviation of daily returns during a specific past period.

High	101.62
Low	3.21
Mean	15.50
Median	12.91

CBOE Volatility Index[®] (VIX[®])

1. Premier barometer of investor sentiment and market volatility
2. Key measure of market expectations of near-term volatility conveyed by S&P 500 stock index option prices
3. Up-to-the-minute market estimate of expected volatility that is calculated by using real-time S&P 500 Index (SPX) option bid/ask quotes
4. Uses near-term and next-term out-of-the money SPX options with at least 8 days left to expiration, and then weights them to yield a constant, 30-day measure of the expected volatility of the S&P 500 Index
5. Related to amount of premium received by sellers of some index options
6. Data history back to 1990
7. www.cboe.com/VIX

VIX[®] and S&P 500[®] Indexes



Sources: CBOE and Bloomberg. (Jan. 1990 - May 18, 2011).
www.cboe.com/VIX

Statistics for VIX daily values from January 3, 1995* through March 1, 2011 (4,070 trading days) --

Highest intraday value -- 89.53 on Oct. 24, 2008

Highest daily closing value -- 80.86 on Nov. 20, 2008

Average daily closing value -- 21.51

Median daily closing value -- 20.41

Lowest closing value -- 9.89 on Jan. 24, 2007

• Pre-1995 data (some of it backtested) for VIX and VXO indexes are at www.cboe.com/VIX

Past performance does not guarantee future results.

One cannot invest directly in the VIX Index. Please read the last slide for more information.

Big Weekly % Moves for S&P 500

More interest in managing “left tail” or “black swan” risk

Weekly % Changes for Select Indexes (Jan. 5, 2001 - Feb. 25, 2011)

Week ending	S&P 500 (TR) <u>U.S. Large-Cap</u>	Russell 2000 (TR) <u>U.S. Small-Cap</u>	MSCI EAFE (US\$ Net TR) <u>Overseas Developed</u>	MSCI Emerging Markets (US\$ NetTR) <u>Overseas Emerging</u>	S&P GSCI (TR) <u>Commodities</u>	CBOE Volatility Index <u>Spot VIX</u>
10-Oct-2008	-18.1%	-15.6%	-21.7%	-20.2%	-14.7%	55.0%
21-Sep-2001	-11.6%	-14.0%	-7.0%	-5.8%	-9.8%	34.0%
3-Oct-2008	-9.3%	-12.1%	-7.6%	-9.9%	-11.2%	29.9%
21-Nov-2008	-8.3%	-10.9%	-10.3%	-11.8%	-9.1%	9.6%
19-Jul-2002	-8.0%	-6.5%	-2.9%	-2.0%	1.4%	15.9%
31-Oct-2008	10.5%	14.2%	8.9%	20.4%	5.0%	-24.3%
13-Mar-2009	10.8%	12.1%	6.0%	8.2%	0.6%	-14.1%
28-Nov-2008	12.1%	16.4%	11.9%	12.7%	6.0%	-23.9%

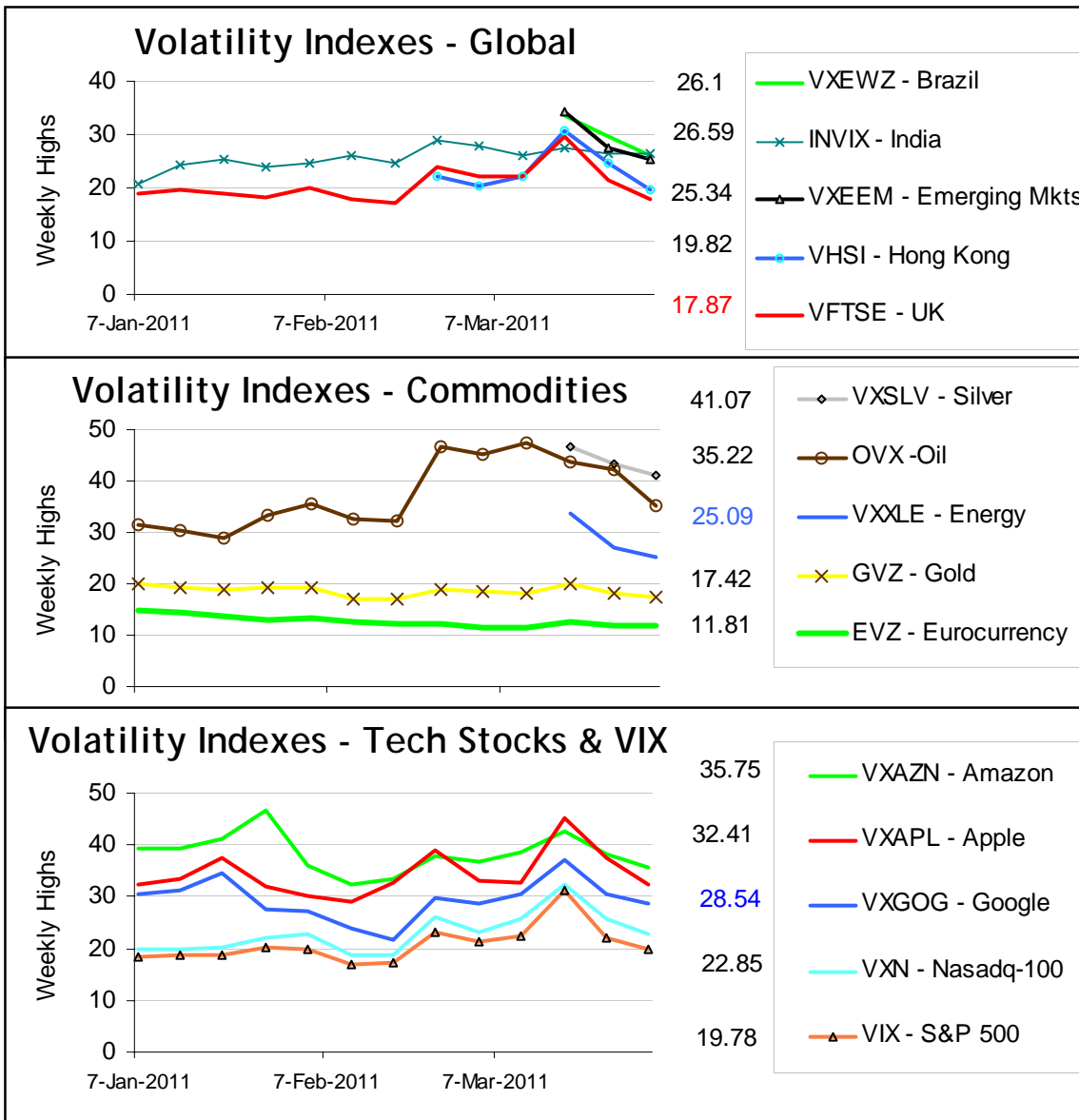
Sources: CBOE and Bloomberg.

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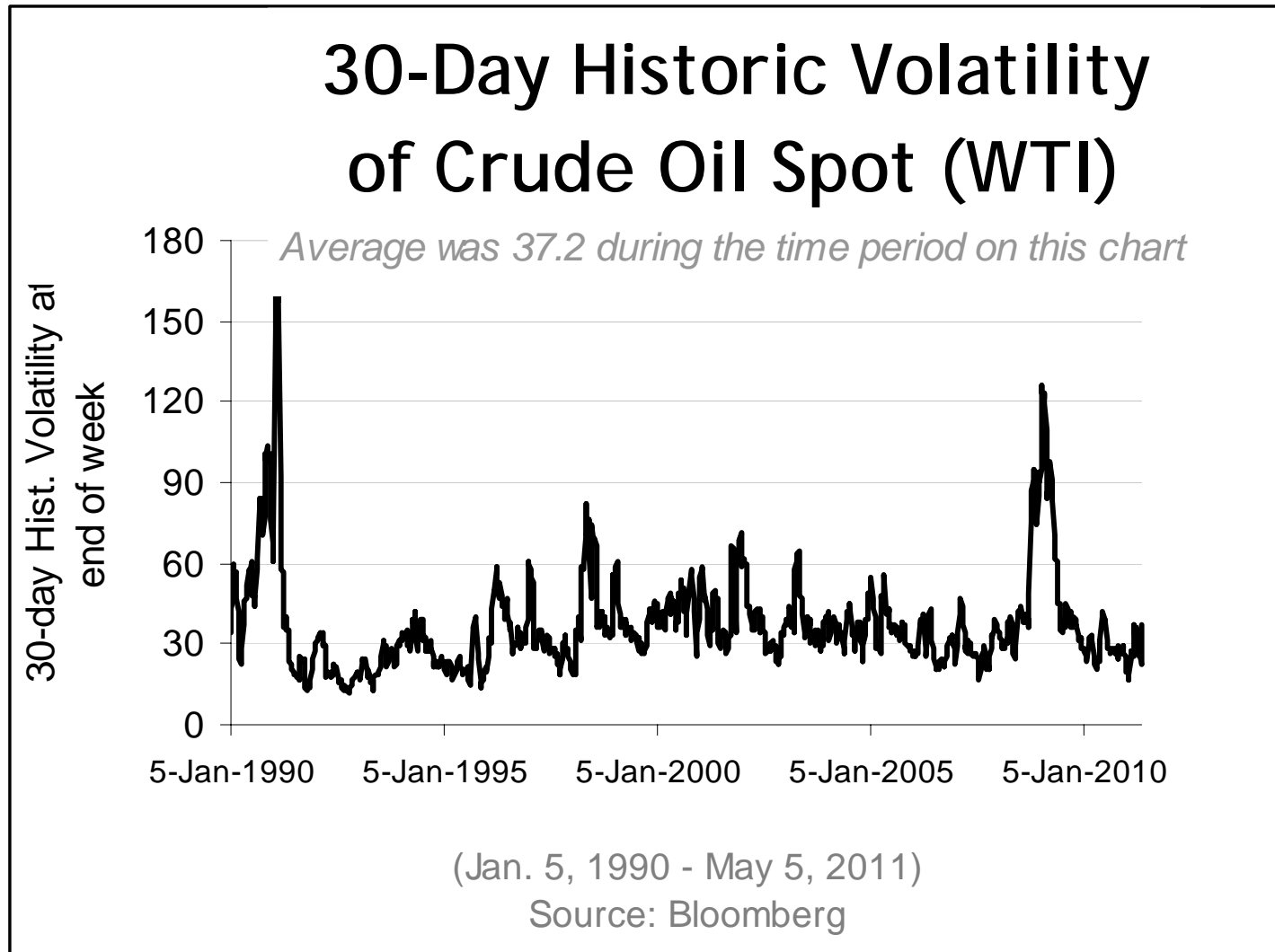
Implied Volatility Indexes in 2011

Weekly Highs through April 1st Sources: Bloomberg and CBOE

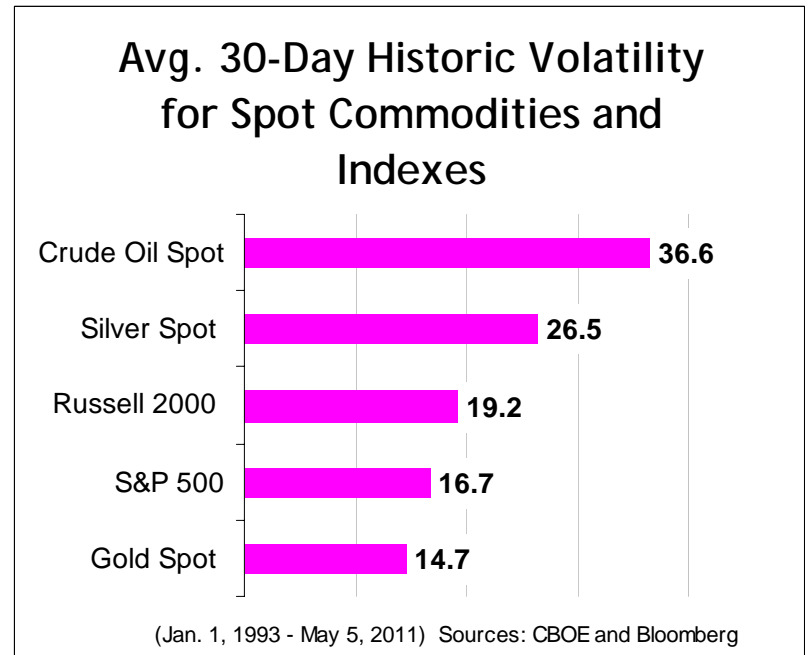
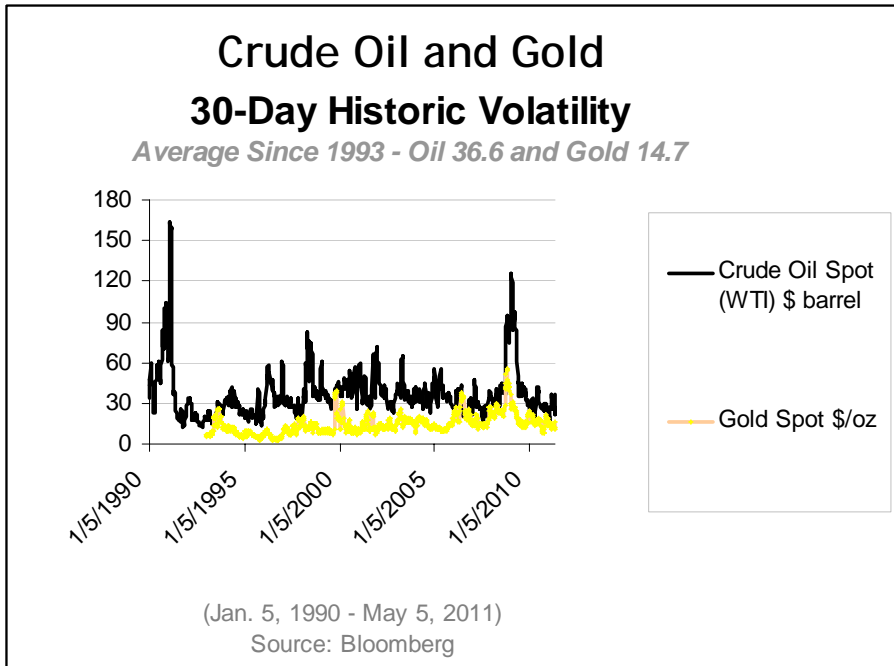


www.cboe.com/volatility

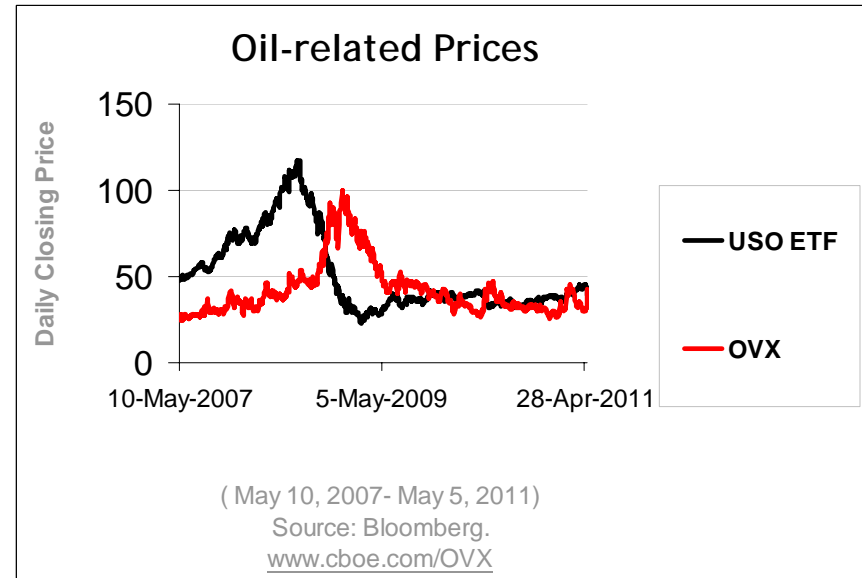
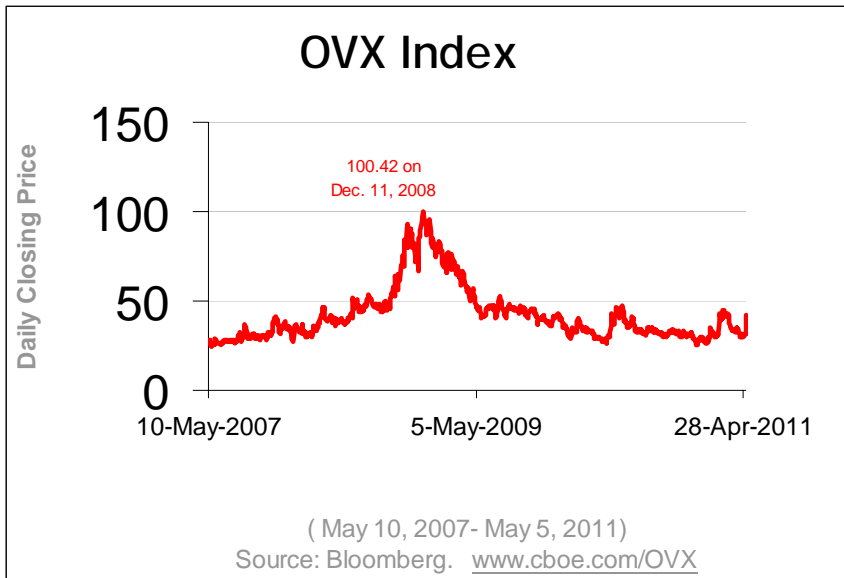
Historic Volatility Since 1990



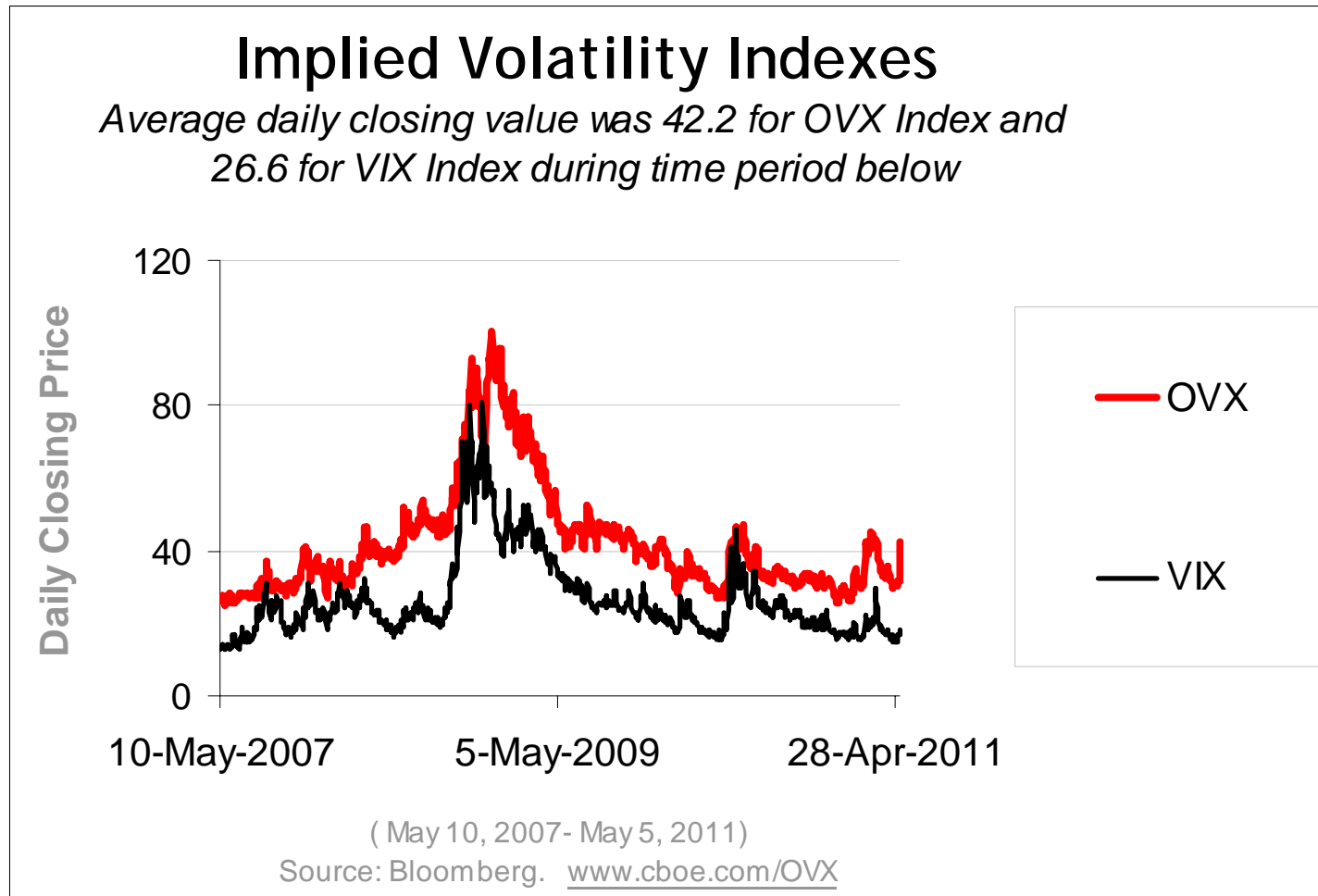
Historic Volatility of Spot Commodities and Indexes



Oil VIX (OVX) Index and USO ETF



OVX Index Usually Has Been Higher than VIX Index



Correlations in 2010

- > Indexes with negative correlations might have the potential to be used for diversification purposes
- > OVX Index had a negative 0.64 correlation to the USO ETF

Correlation of Daily Returns in 2010

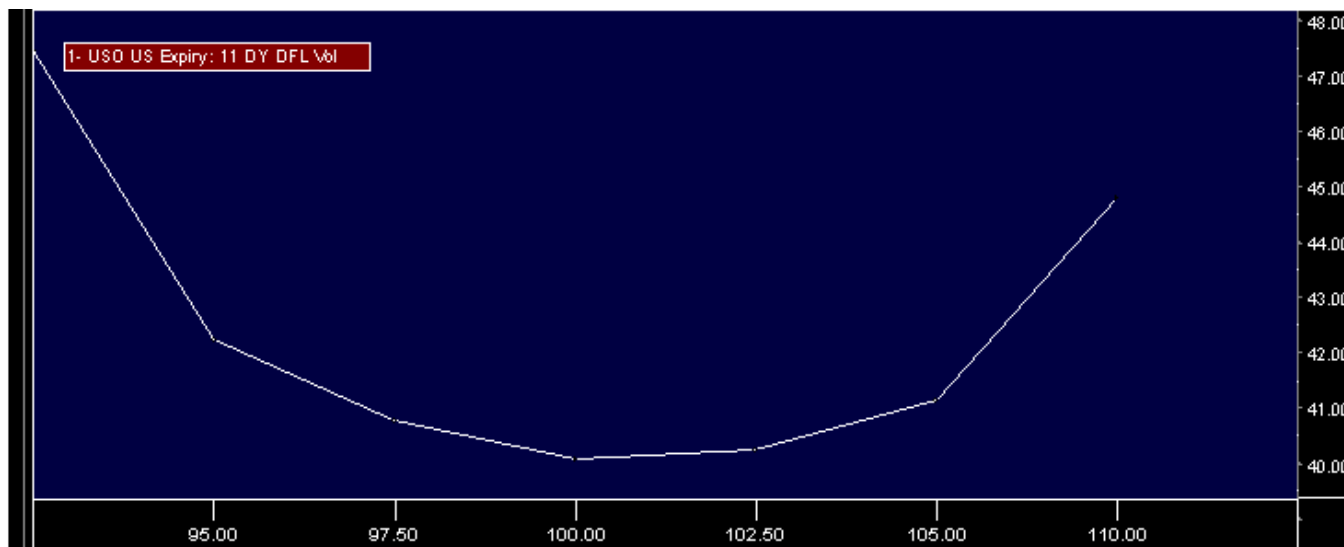
	OVX	USO ETF	Crude Oil Spot	GSCI TR	SPTR	SPX	VIX	GLD ETF	EEM ETF	SLV ETF	FXI ETF	EWZ ETF
OVX	1.00											
USO ETF	-0.64	1.00										
Crude Oil Spot	-0.58	0.94	1.00									
GSCI TR	-0.60	0.93	0.93	1.00								
SPTR	-0.63	0.72	0.63	0.66	1.00							
SPX	-0.63	0.72	0.63	0.66	1.00	1.00						
VIX	0.67	-0.59	-0.51	-0.53	-0.84	-0.84	1.00					
GLD ETF	-0.16	0.35	0.32	0.40	0.20	0.20	-0.14	1.00				
EEM ETF	-0.58	0.75	0.66	0.70	0.90	0.90	-0.78	0.26	1.00			
SLV ETF	-0.36	0.54	0.48	0.56	0.44	0.44	-0.35	0.81	0.52	1.00		
FXI ETF	-0.52	0.69	0.61	0.66	0.77	0.77	-0.67	0.26	0.91	0.49	1.00	
EWZ ETF	-0.54	0.70	0.62	0.65	0.82	0.82	-0.73	0.28	0.93	0.49	0.83	1.00

Option Skew – SPX and USO

SPX options



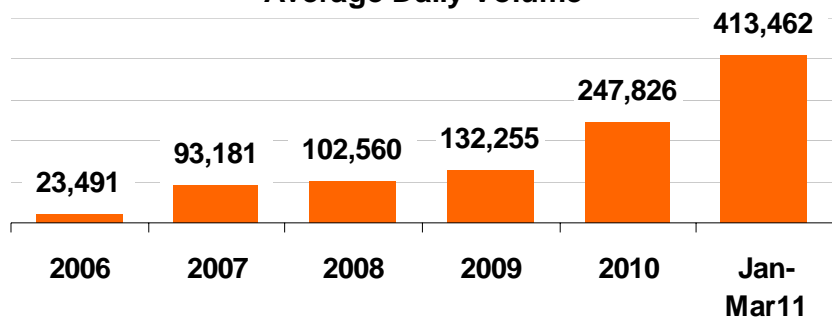
USO options



Key Specifications - VIX Futures and Options

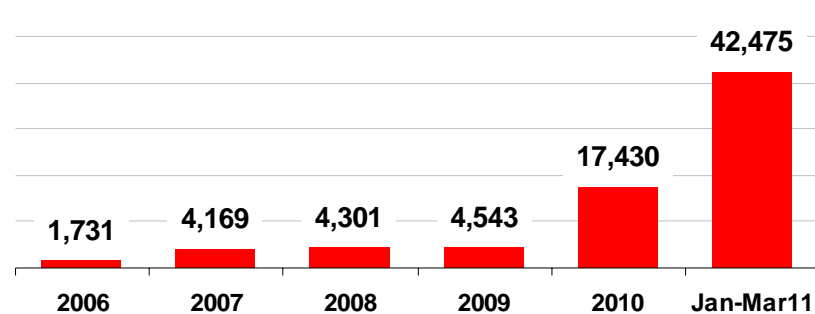
	<u>Futures</u>	<u>Options</u>
Exchange	CFE	CBOE
Ticker	VX	VIX
Multiplier	\$1,000 (and \$100 in March 2009)	\$100
Last Day of Trading	Generally on Tuesday , the day before expiration date.	
Expiration Date	Generally on Wednesday 30 days prior to the 3rd Friday of calendar month immediately following the expiring month.	

VIX Options
Average Daily Volume



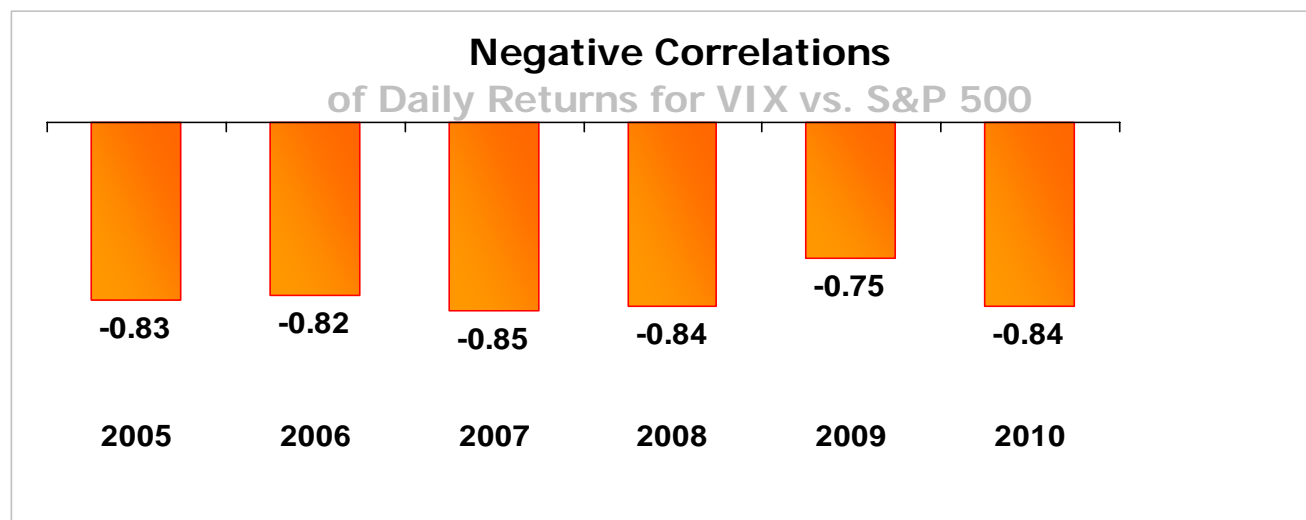
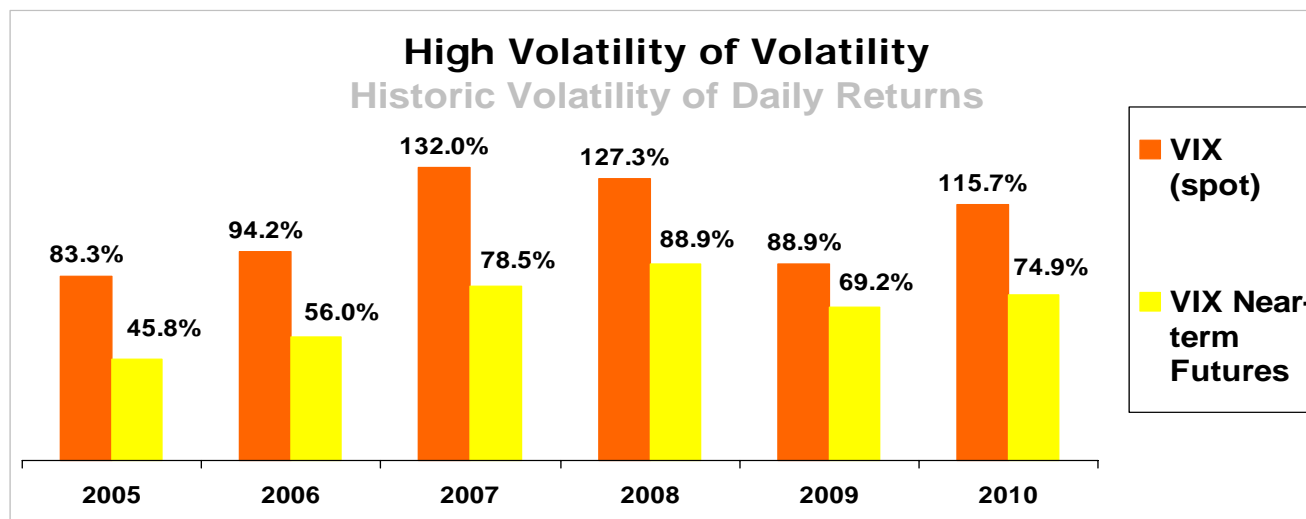
Source: CBOE www.cboe.com/VIX

VIX Futures
Average Daily Volume



Source: CFE

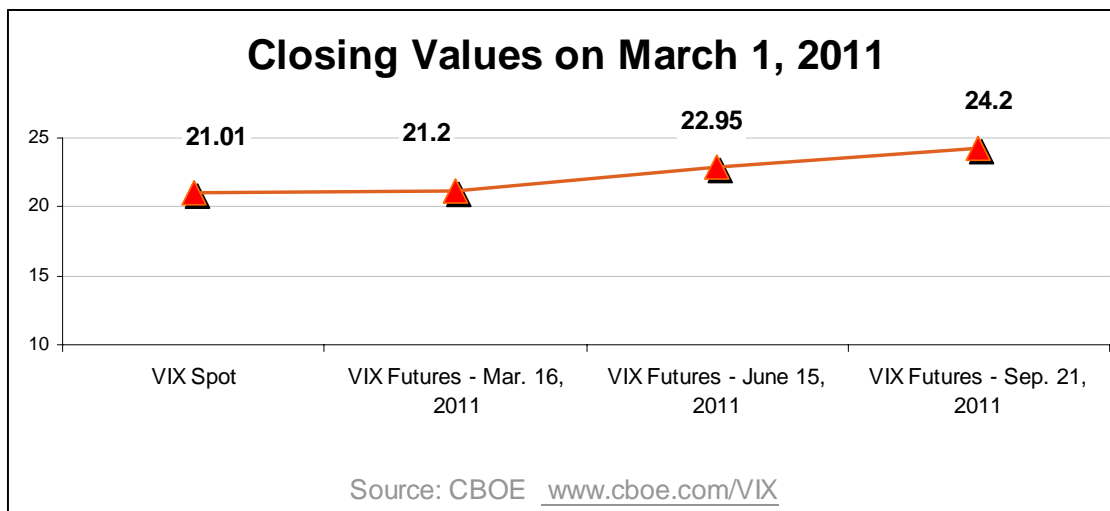
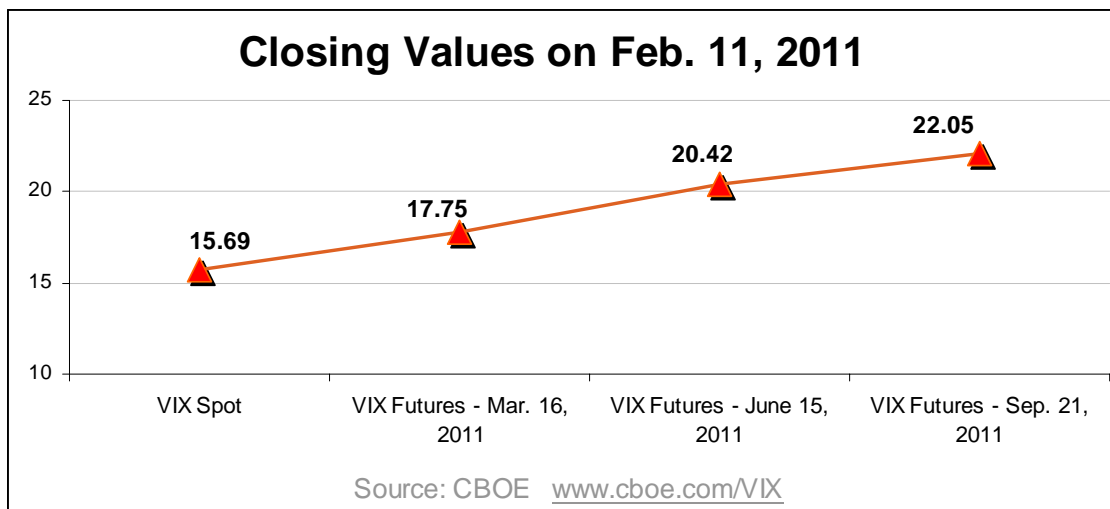
Key Features of VIX



Past performance does not guarantee future results.

Sources: CBOE and Bloomberg

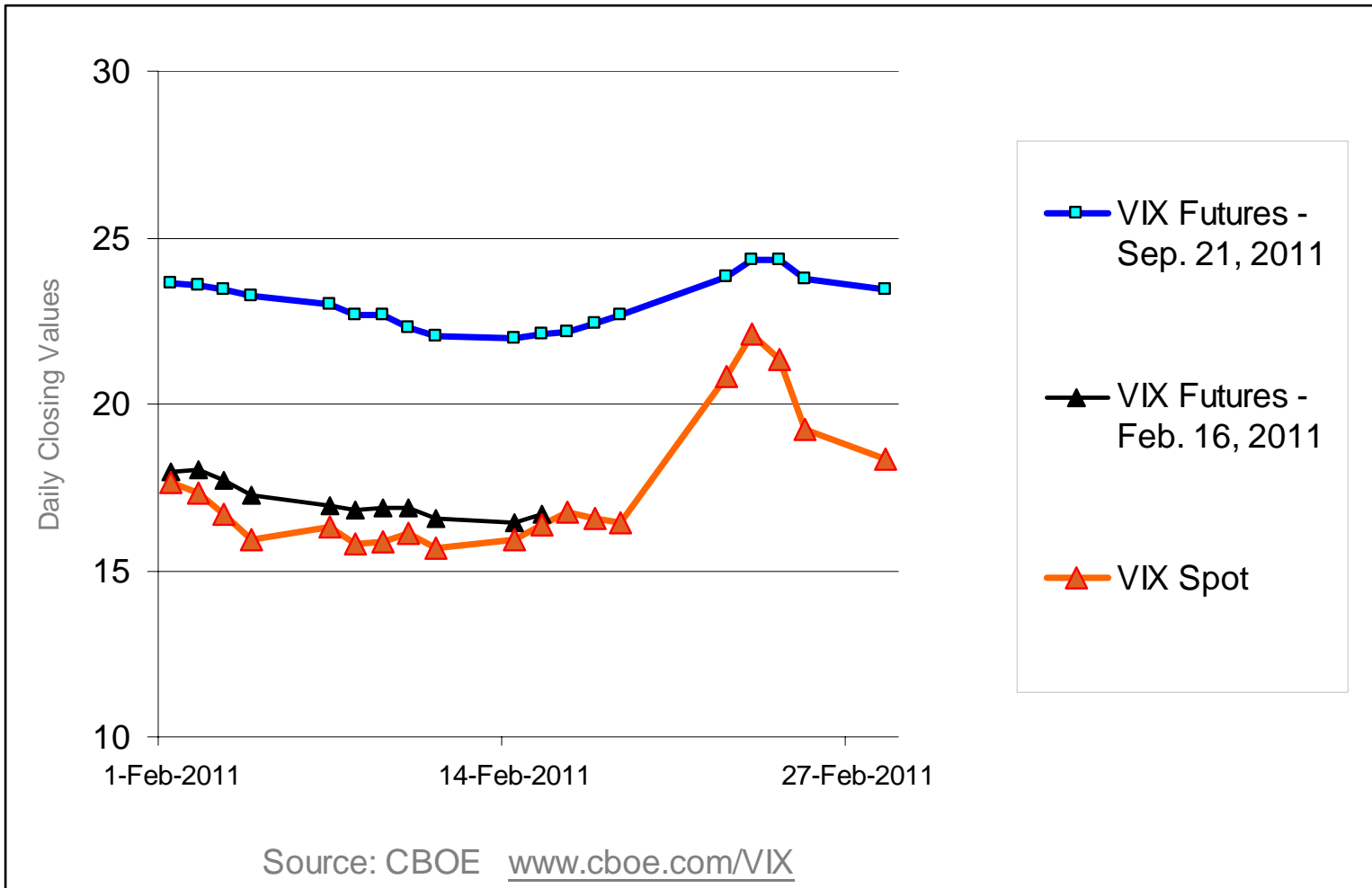
Forward Expectations of 30-Day Volatility



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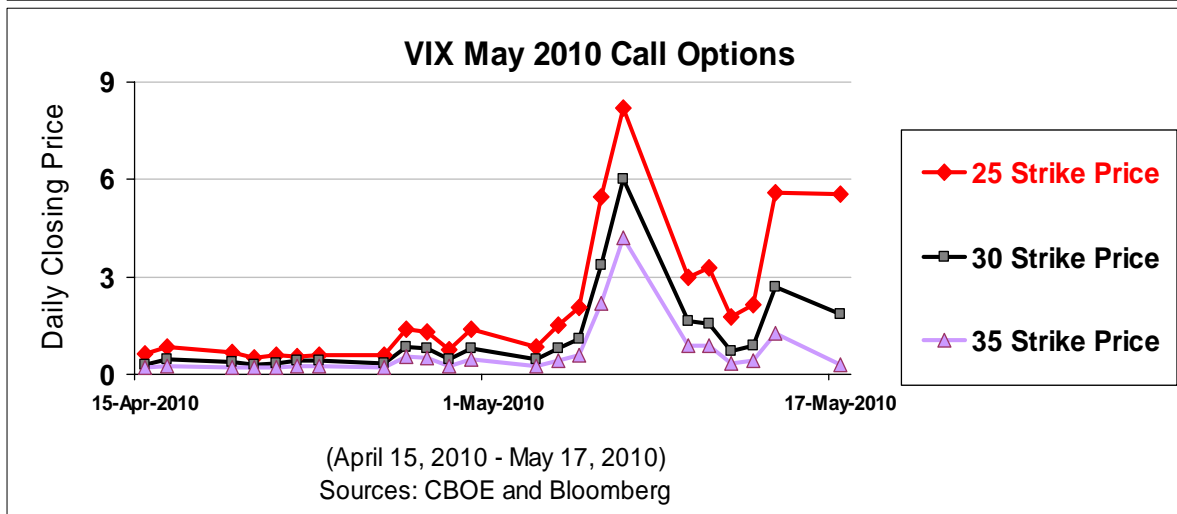
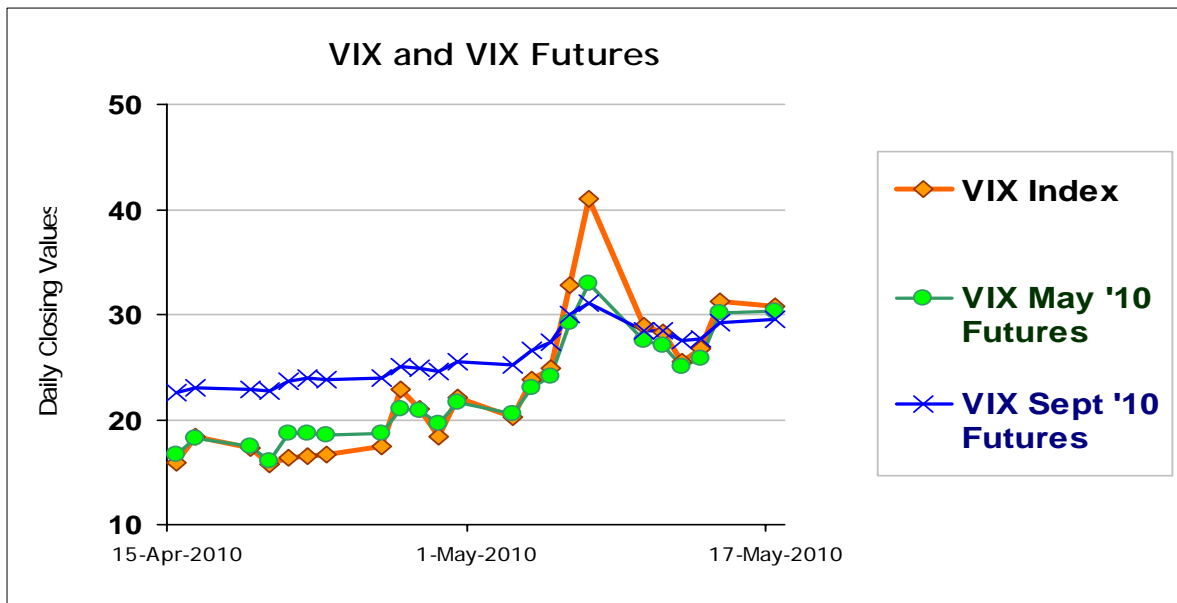
Visit www.cboe.com/vixterm for more information

VIX Spot and Futures in Feb. 2011



Past performance does not guarantee future results.

VIX Futures & Call Options in Spring 2010



Four Days --
% Change in Daily Closing Prices from May 3rd to May 7th --

S&P 500 Down 7.6%

VIX Index Up 103%

VIX May Fut. Up 60%

VIX Sept. Fut. Up 23%

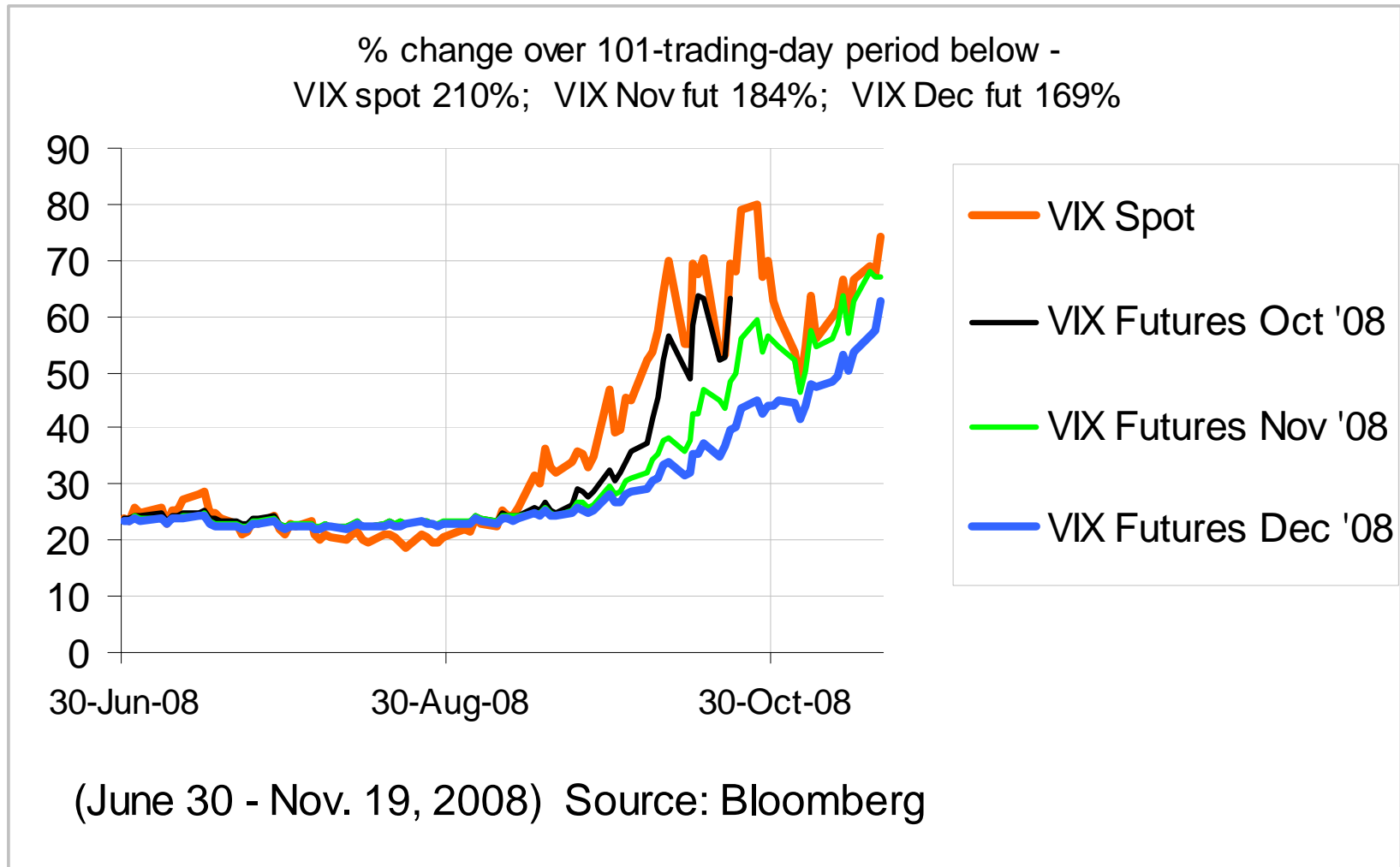
VIX May25 Calls Up 865%

VIX May30 Calls Up 1233%

VIX May35 Calls Up 1580%

Please read the risk disclosure at the last slide

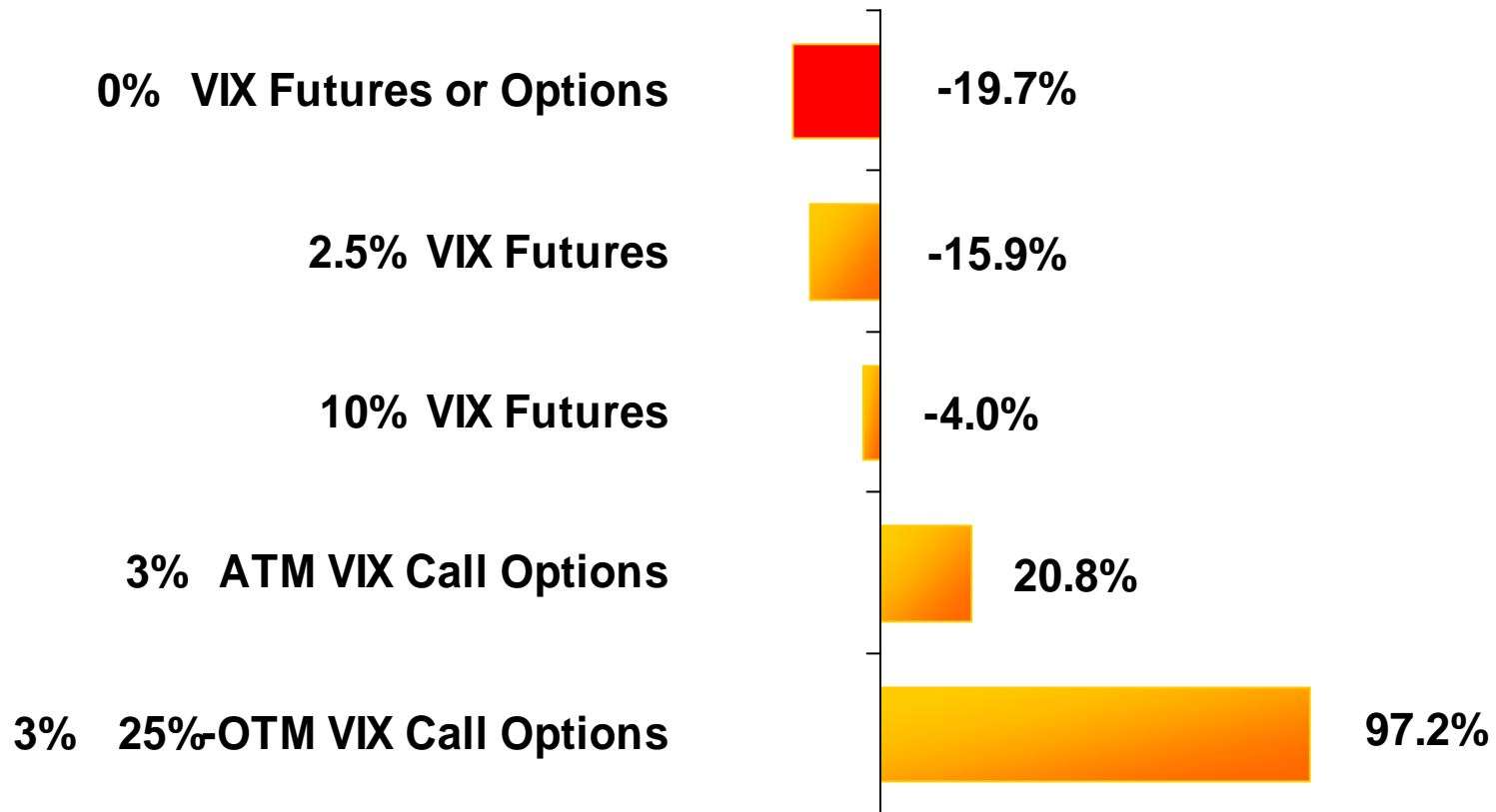
VIX Spot and Futures in 2008



Impact of Adding Long VIX Futures or Options

to a Traditional Portfolio During the 5-Month Period Aug. 2008 – Dec. 2008

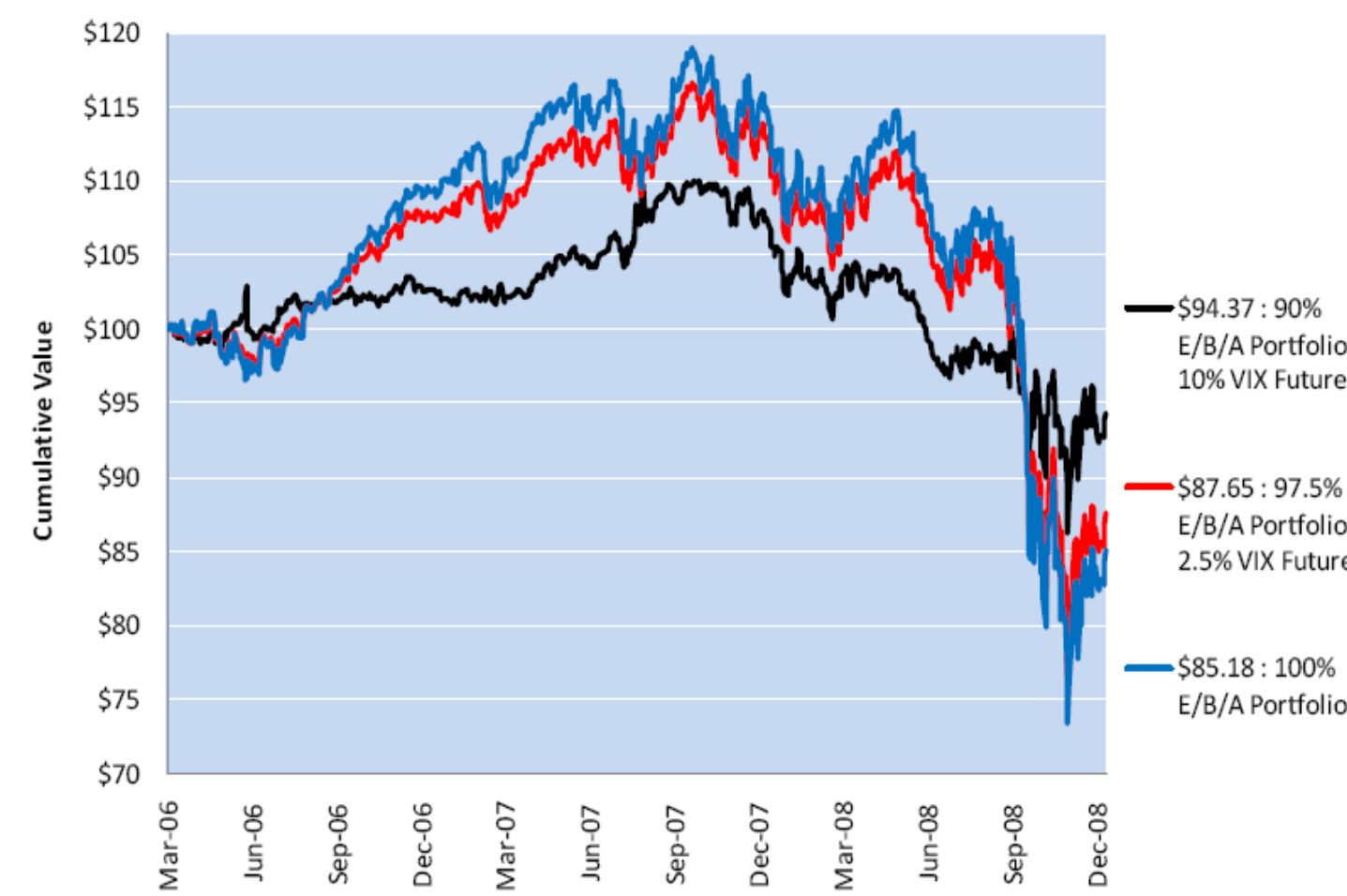
From: "VIX Futures and Options: A Case Study of Portfolio Diversification During the 2008 Financial Crisis." The Journal of Alternative Investments (Fall 2009)



Please see disclaimers at paper at www.cboe.com/VIX

UMass Study on Diversification with VIX Futures & Options

Figure 2: Portfolio Performance with VIX Futures Mar. 2006 to Dec. 2008

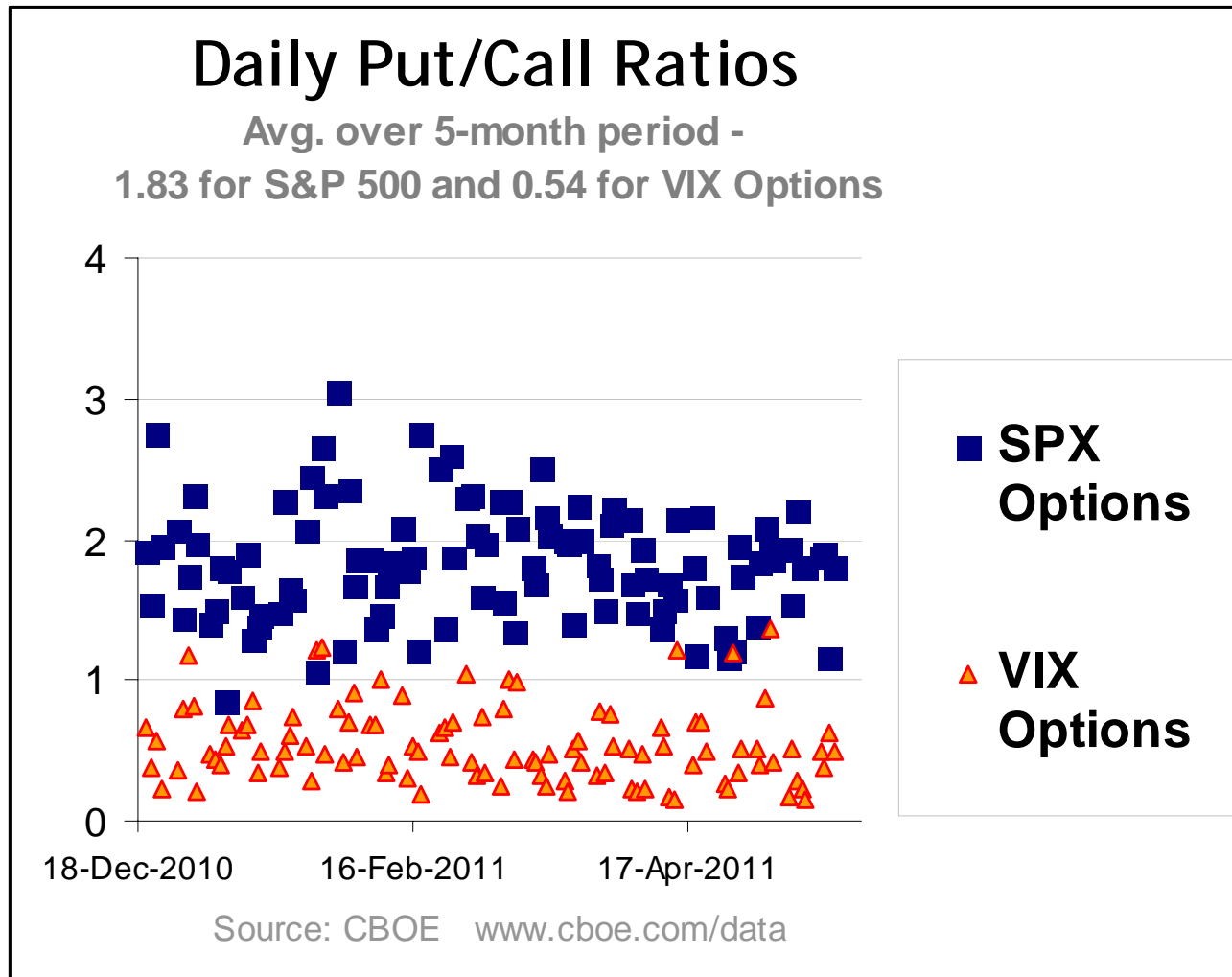


Portfolio with 10% allocation to VIX futures (in black) ended at \$94.37.

Portfolio with no allocation to VIX futures ended at \$85.18 (with 54% higher standard deviation).

From: "VIX Futures and Options - A Case Study of Portfolio Diversification During the 2008 Financial Crisis" (published in *The Journal of Alternative Investments* in 2009) by Edward Szado, CFA, Research Analyst at the Center for International Securities and Derivatives Markets (CISDM), University of Massachusetts, Amherst available at www.cboe.com/VIX Past performance does not guarantee future results.

Put/call Ratios

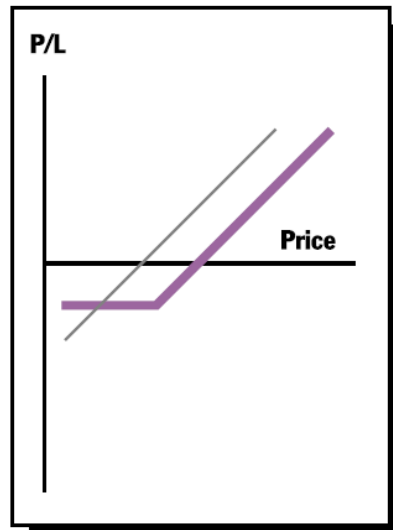


Simple Options Profit-and-Loss Diagrams

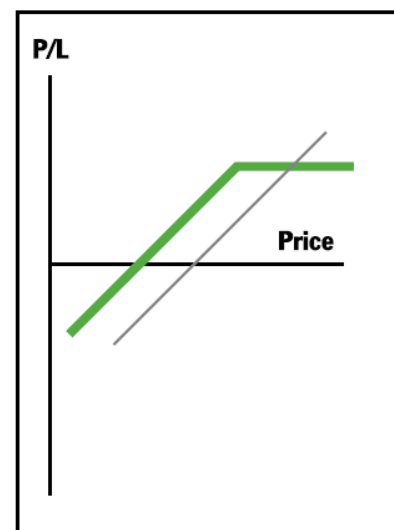
Long Call



Protective Put*



Buy-write*



Collar*



Long call gives the holder the right to buy the underlying security at a specified price for a certain, fixed period of time.

Protective put investor purchases a put (right to sell) while holding underlying security.

Buy-write investor buys a security and writes (sells) a covered call for income.

A collar investor owns securities, buys protective put(s), and writes covered call(s) for income.

* The colored line reflects a position with both options and stock at expiration, while the straight grey line reflects a long stock position.

CBOE Performance Benchmark Indexes

<u>Index</u>	<u>Ticker</u>	<u>Introduced</u>	<u>Data beginning</u>	<u>Website</u>
CBOE S&P 500 BuyWrite	BXM SM	2002	June 30, 1986	www.cboe.com/BXM
CBOE S&P 500 2%OTM BuyWrite	BXY SM	2006	June 1, 1988	www.cboe.com/BXY
CBOE Russell 2000 BuyWrite	BXR SM	2006	Dec. 29, 2000	www.cboe.com/BXR
CBOE DJIA BuyWrite	BXD SM	2005	Oct. 16, 1997	www.cboe.com/BXD
CBOE NASDAQ-100 BuyWrite	BXN SM	2005	Dec. 30, 1994	www.cboe.com/BXN
CBOE S&P 500 95-110 Collar	CLL SM	2008	June 30, 1986	www.cboe.com/CLL
CBOE S&P 500 PutWrite	PUT SM	2007	June 30, 1986	www.cboe.com/PUT

Bloomberg provides historical data for all seven indexes.

What is a “Buy-write”?

- **Buy** stocks, and **write** (or sell) a call option to gain premium income.
- Also known as a “covered call.”
- **Pros** – add premium income, can reduce portfolio volatility and boost risk-adjusted returns.
- **Cons** – forego some or all of the upside on stock position; underperformance in bull market.

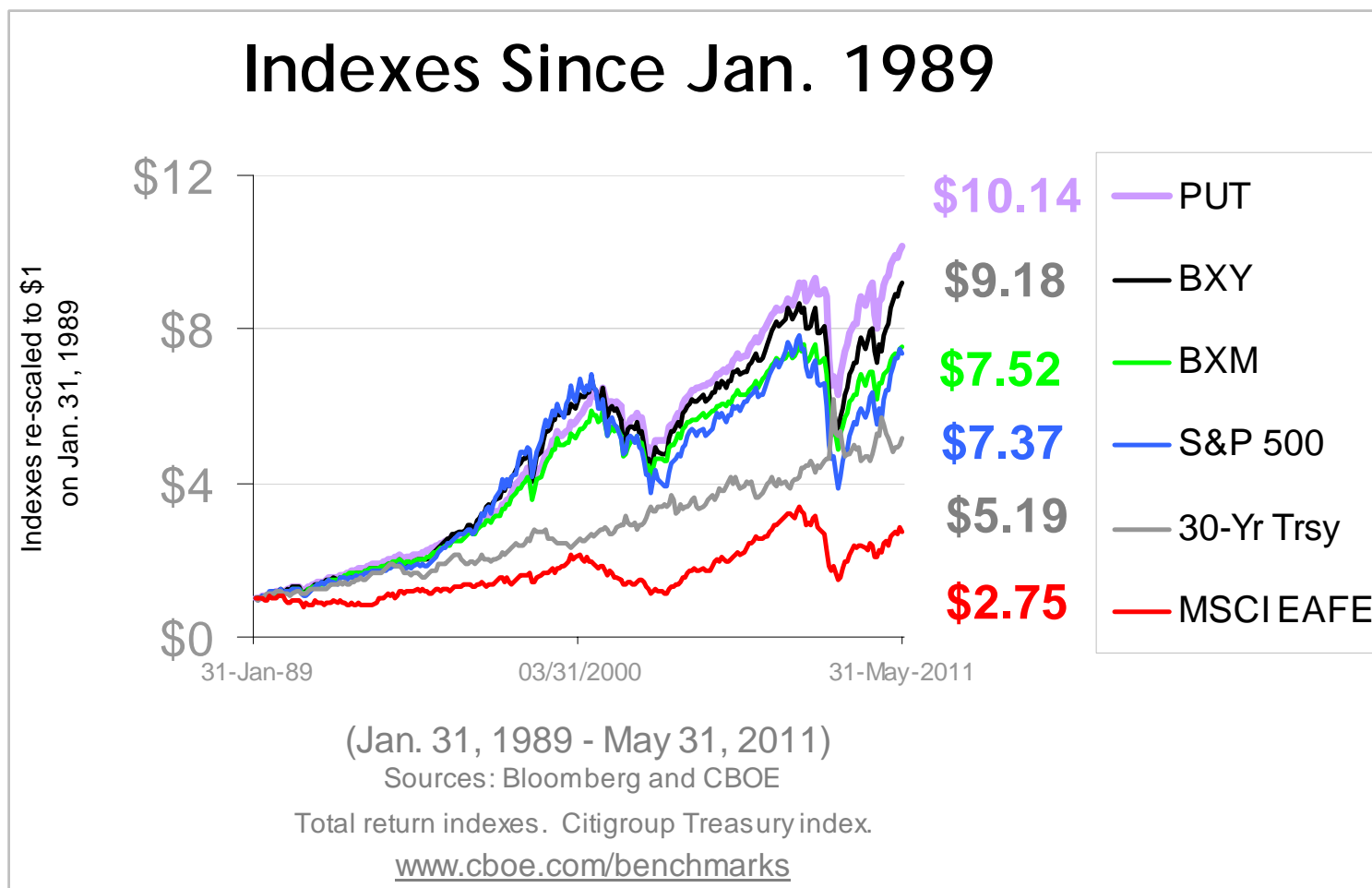
CBOE S&P 500 BuyWrite Index (BXM)

- Benchmark for strategy --
 - **buy** portfolio of S&P 500 stocks
 - **write** (sell) cash-settled S&P 500 Index options every 3rd Friday for income
- Announced in 2002 – study by Duke U.
- Data history back to June 30, 1986
- “Innovative Index of the Year” in 2004
- More than \$20 billion in buywrite funds
- www.cboe.com/BXM



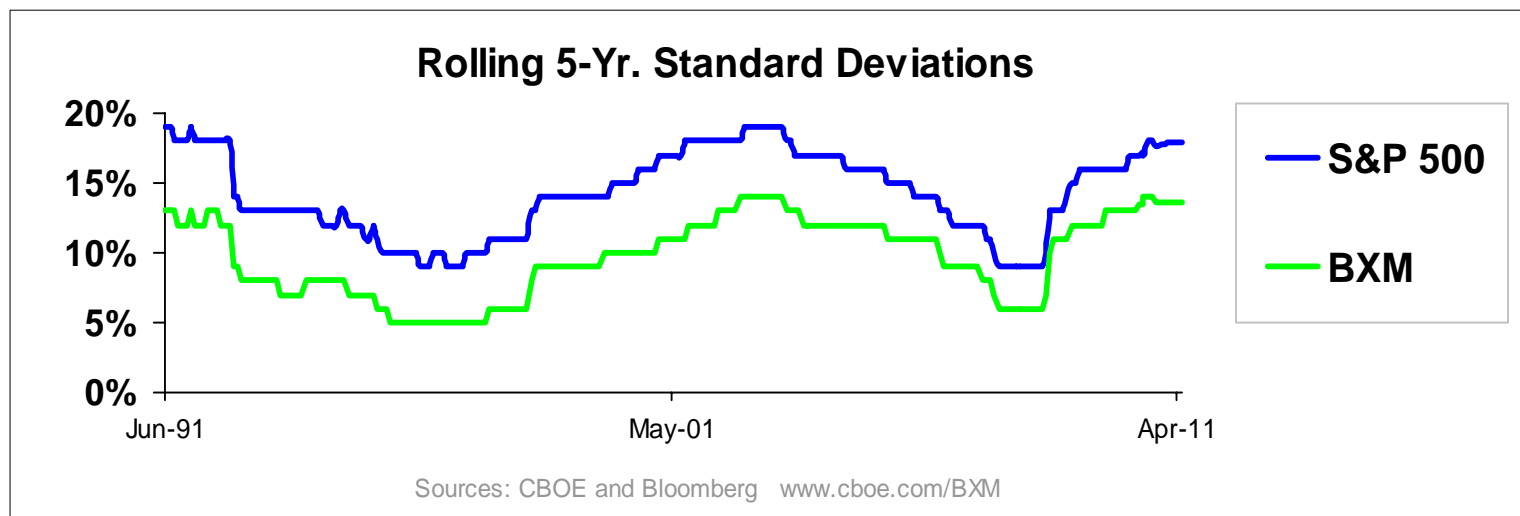
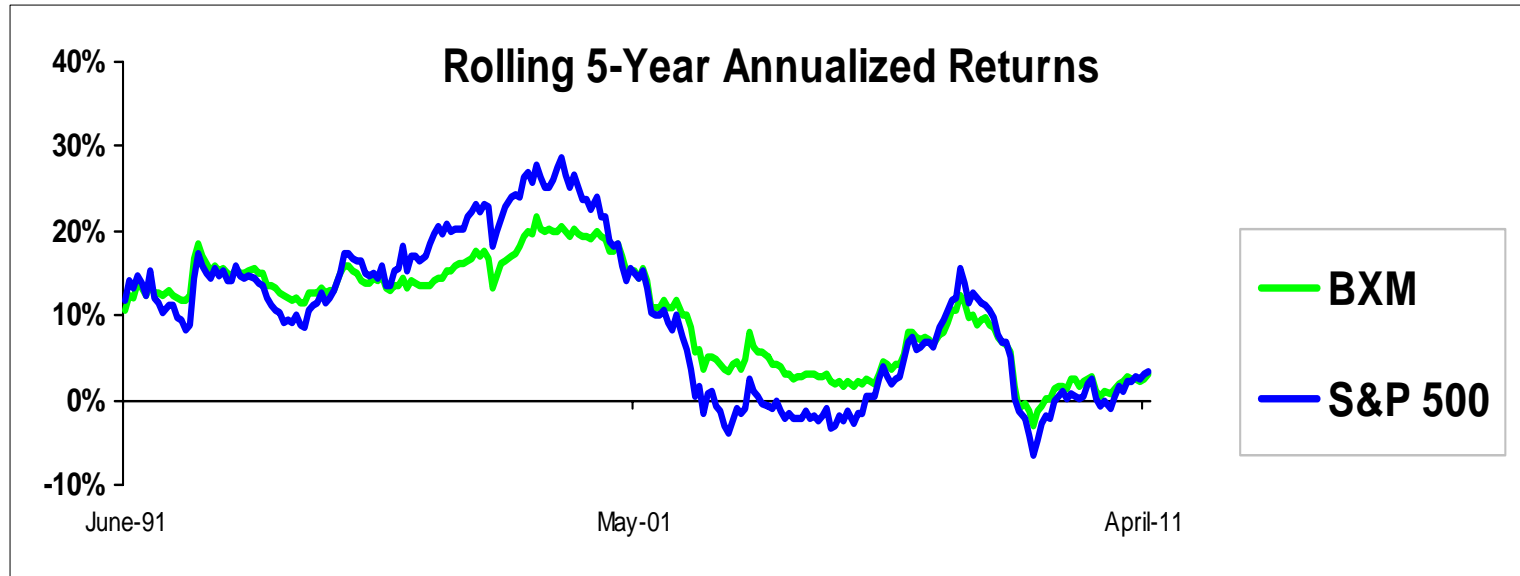
Growth of \$1

PUT – CBOE S&P 500 PutWrite Index
 BXM – CBOE S&P 500 BuyWrite Index
 BXY -- CBOE S&P 500 2% OTM BuyWrite Index



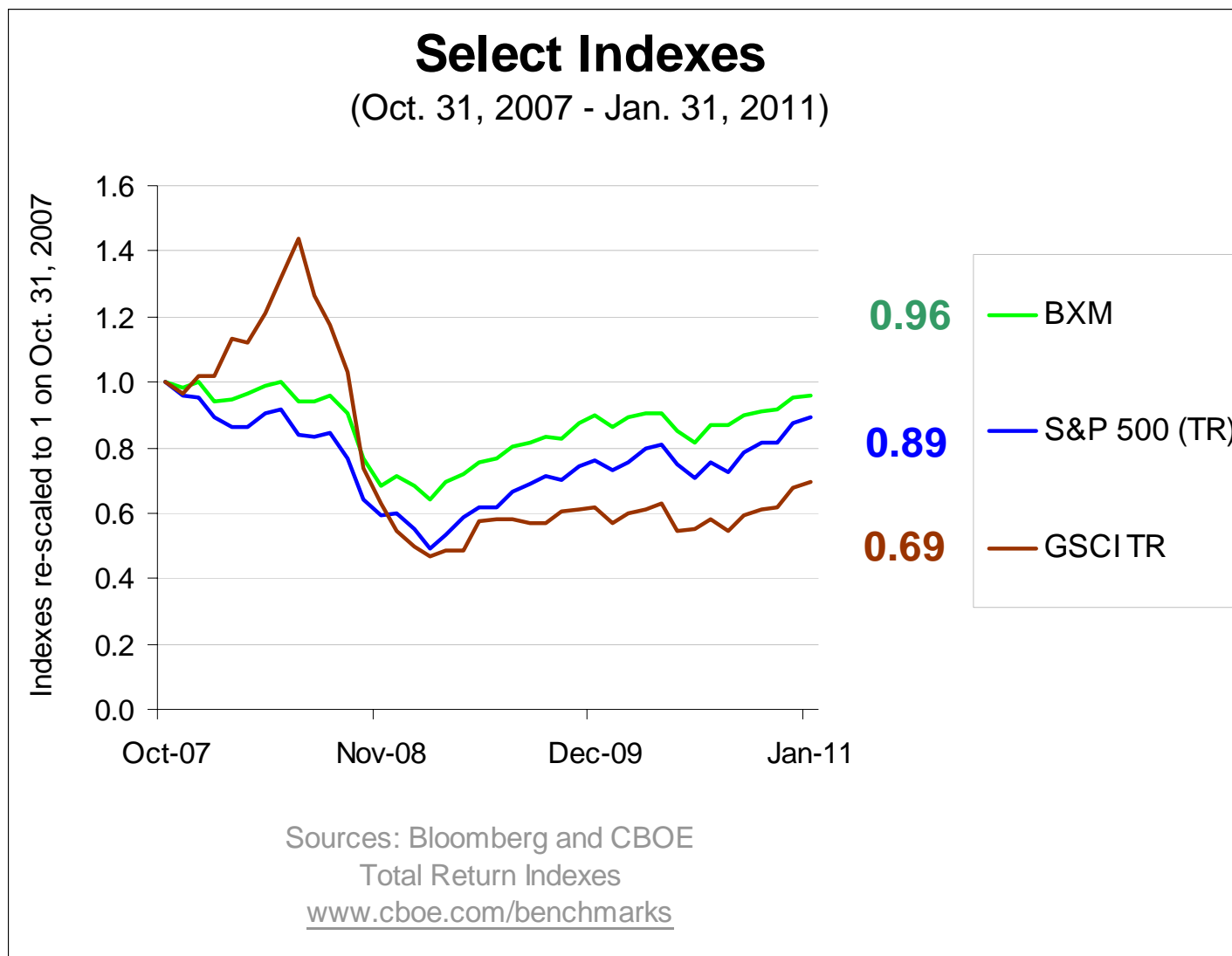
Rolling 5-year Annualized Data

(June 1991 – May 2011)



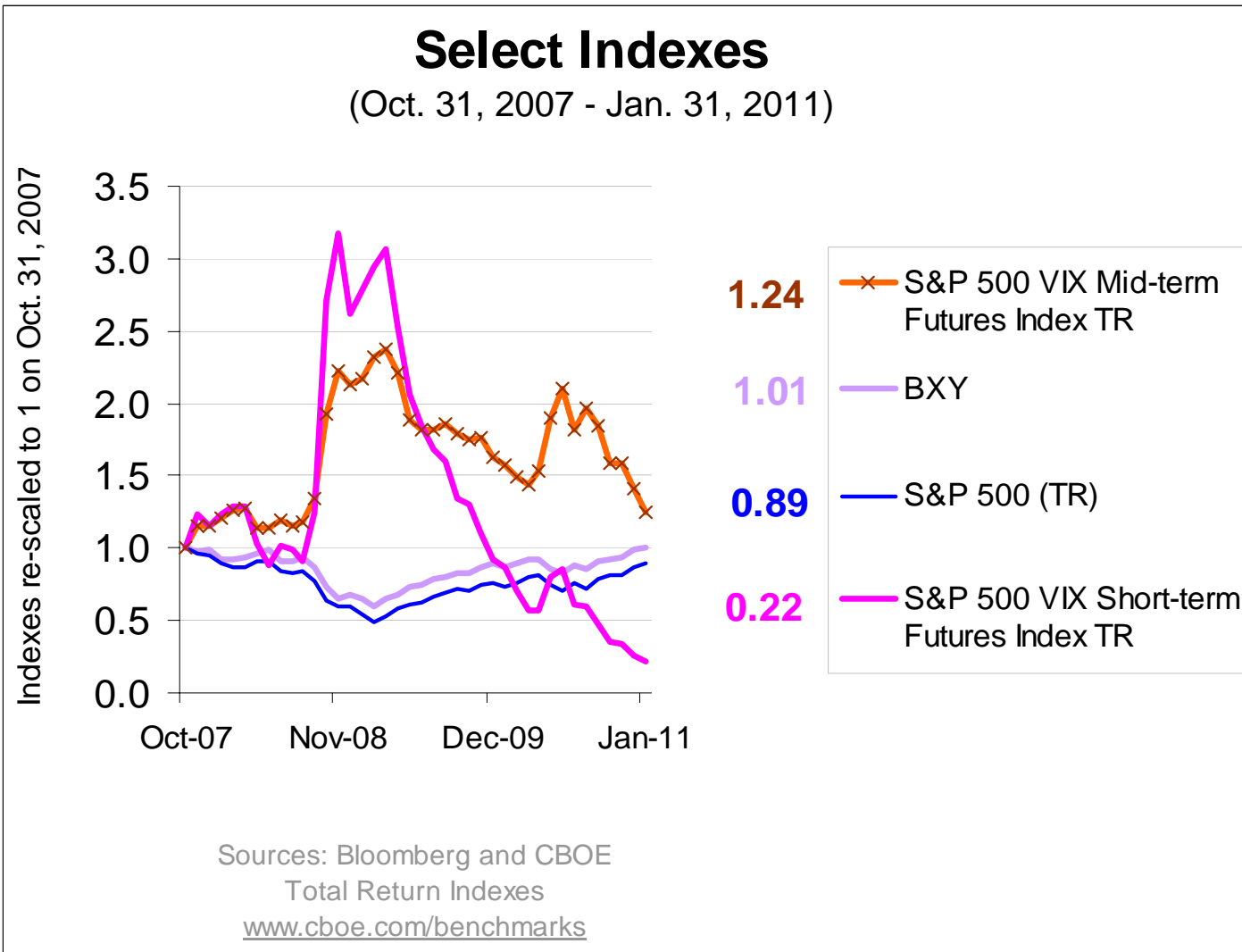
Sources: CBOE and Bloomberg www.cboe.com/BXM

39 Months



39 Months

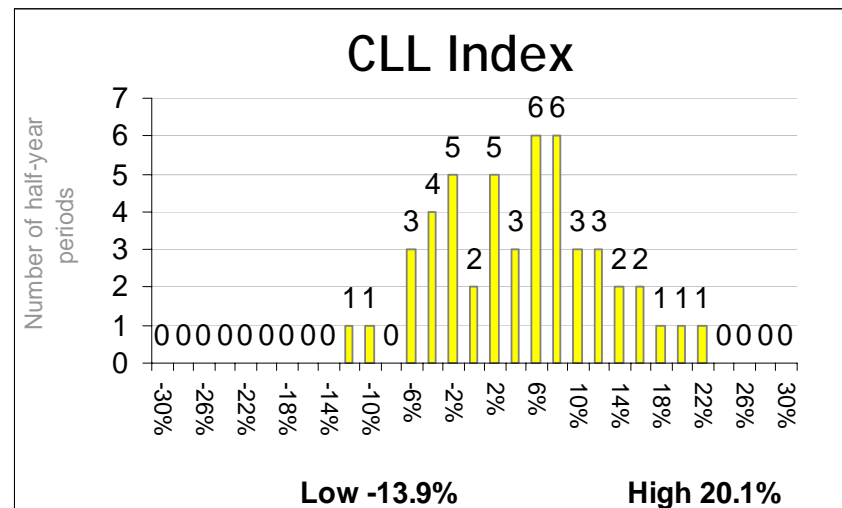
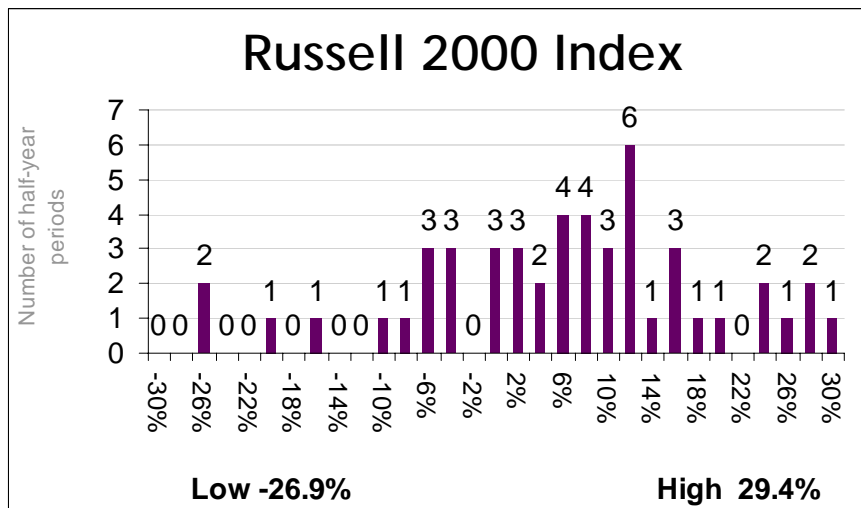
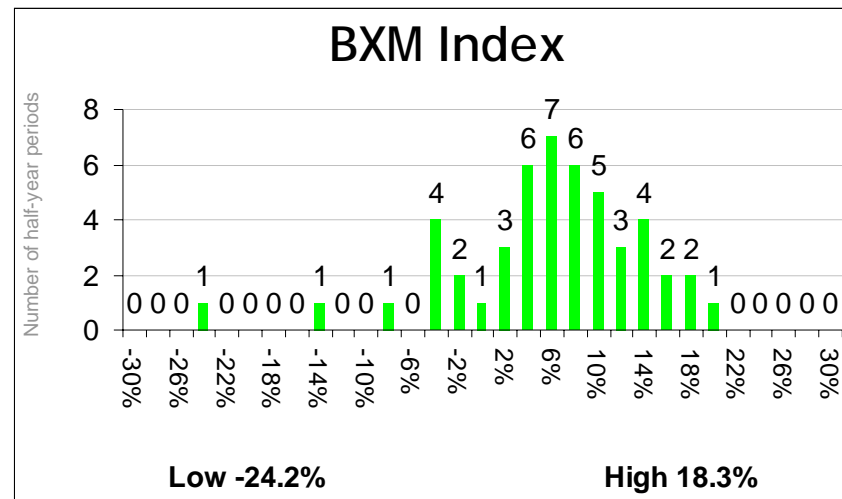
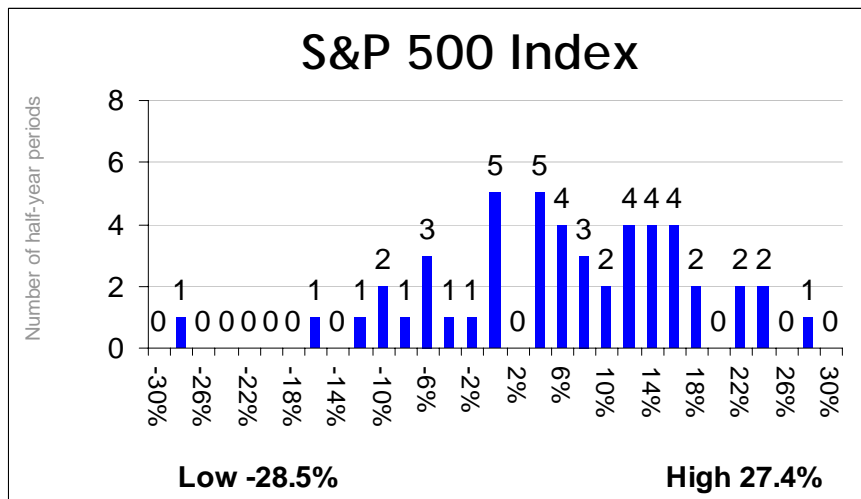
Diversification?



Histograms of Half-year Index Returns

(2nd Half of 1986 - 2010)

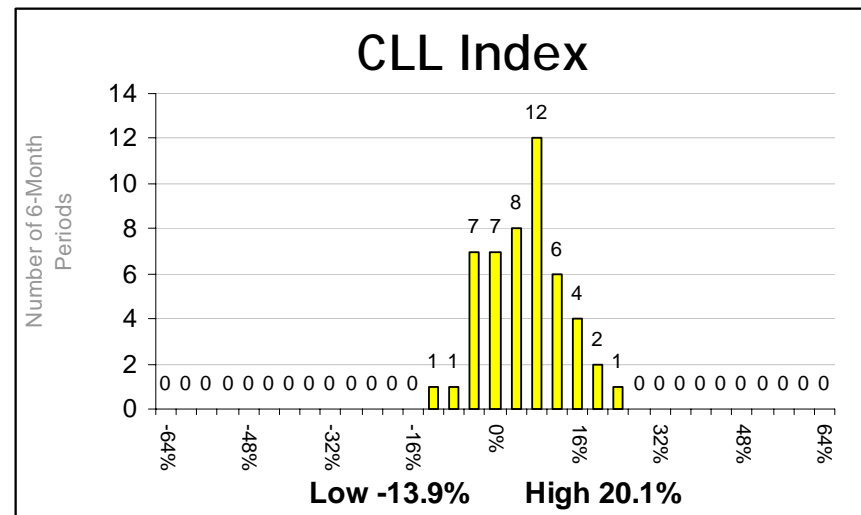
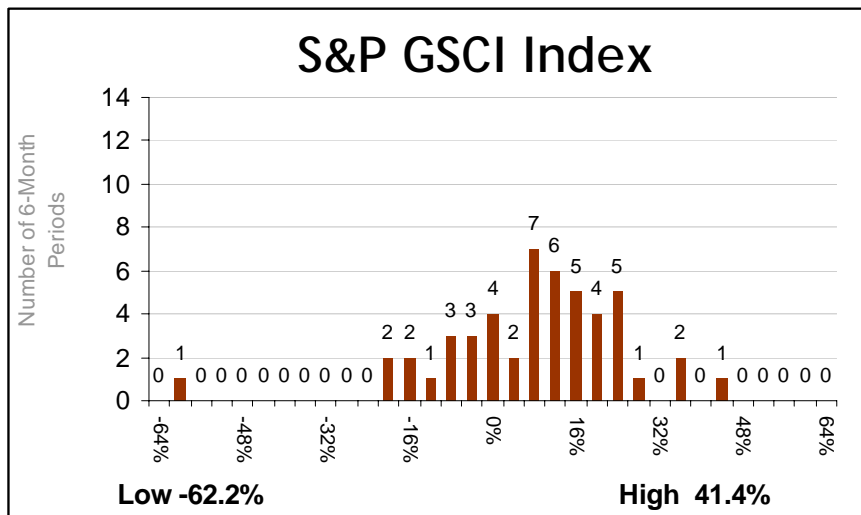
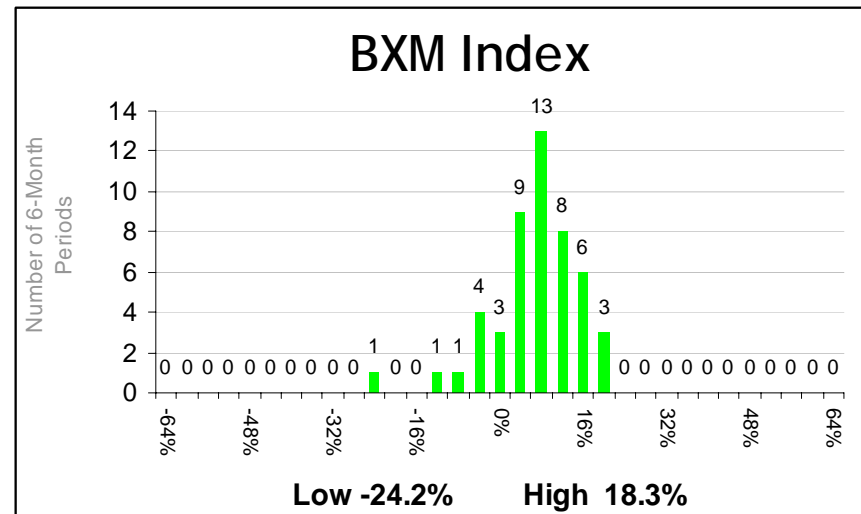
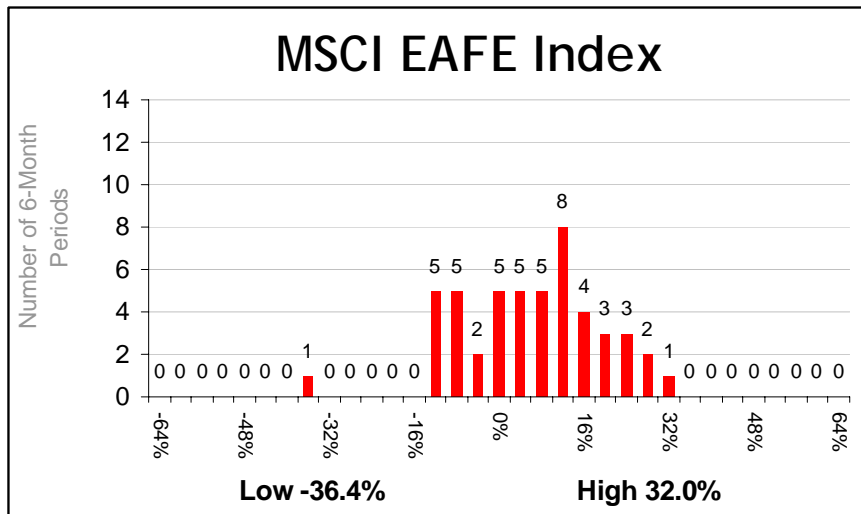
Sources: CBOE and Bloomberg



Histograms of Half-year Index Returns

(2nd Half of 1986 - 2010)

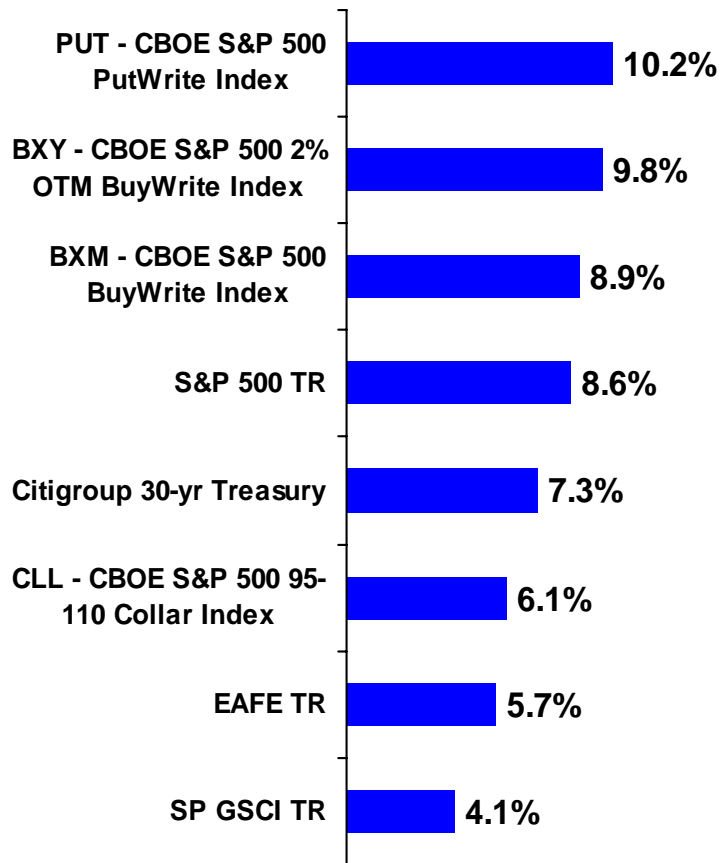
Sources: CBOE and Bloomberg



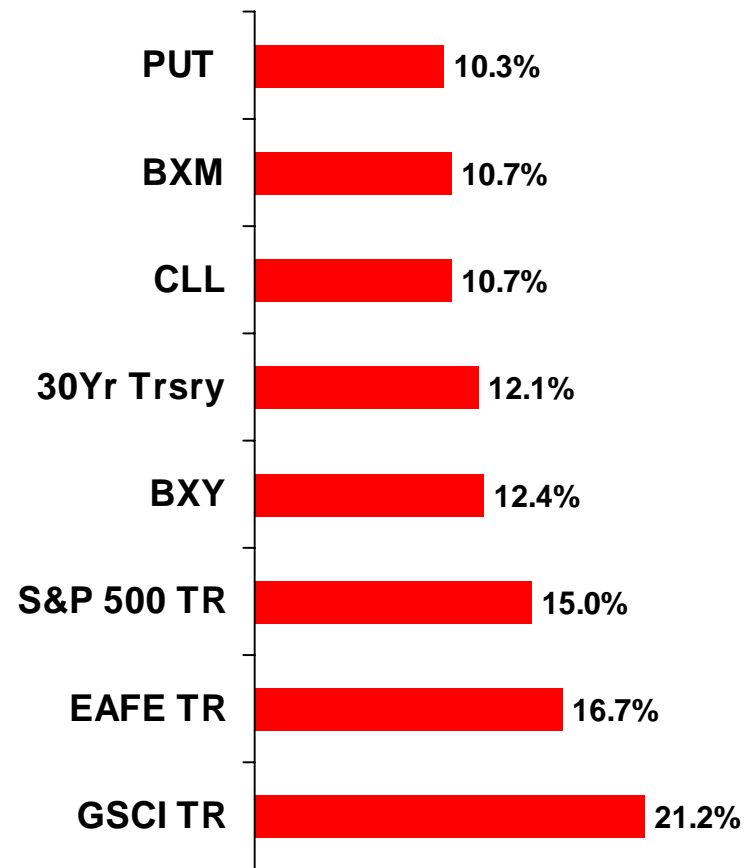
Returns and Volatility Over Two Decades

(May. 31, 1991 – May 31, 2011) Total Return Indexes

Annualized Returns



Standard Deviation

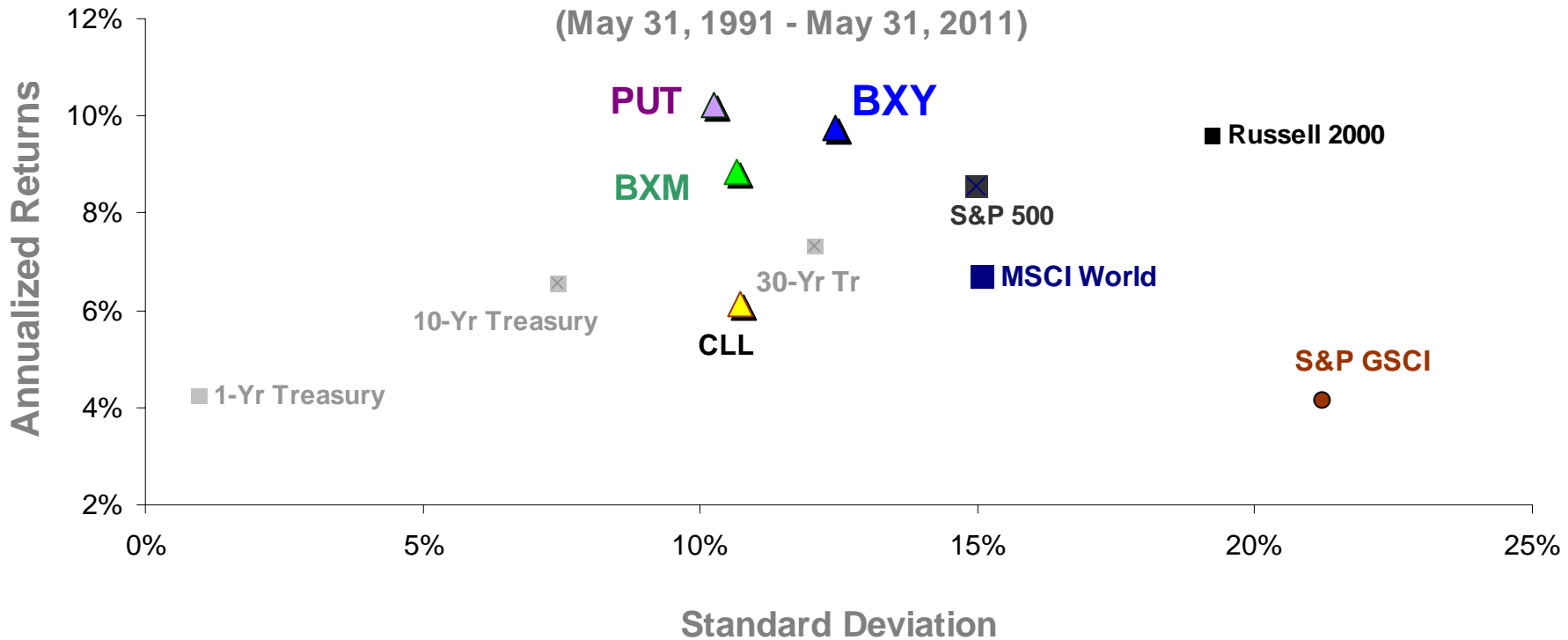


Two Decades

PUT – CBOE S&P 500 PutWrite Index
 BXM – CBOE S&P 500 BuyWrite Index
 BXY -- CBOE S&P 500 2% OTM BuyWrite Index
 CLL – CBOE S&P 500 95-110 Collar Index

Returns and Volatility

(May 31, 1991 - May 31, 2011)



Sources: CBOE, Bloomberg, Citigroup Fixed Income Indexes

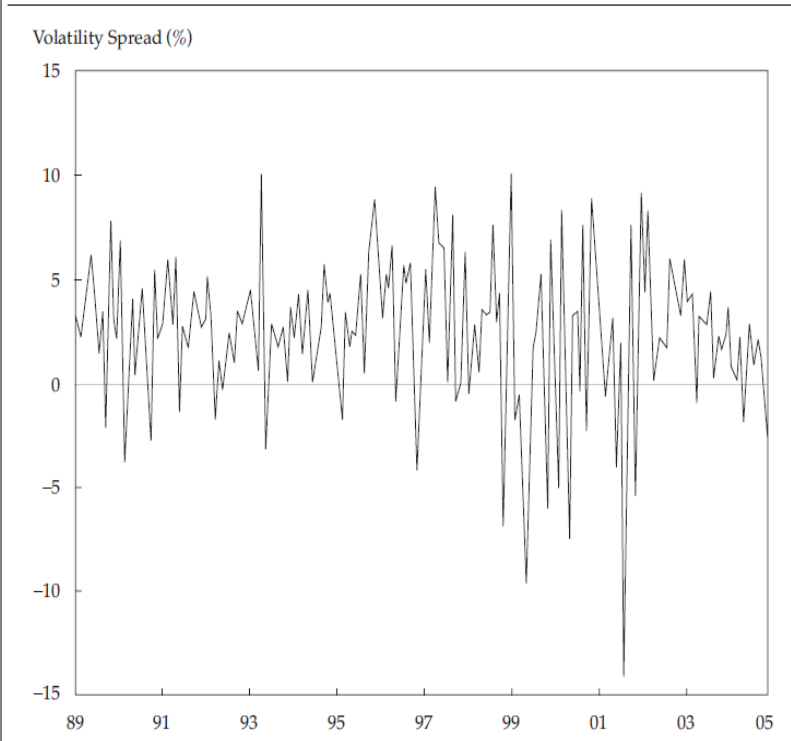
Please see risk disclosures. Past performance is not a guarantee of future returns.

From: "Finding Alpha via Covered Index Writing," Financial Analysts Journal (September/October 2006) by Goldman Sachs.

Source of return –
 Sell richly priced options

Compare trade-offs for ATM (at-the-money) and
 OTM (out-of-the money) options selling strategies

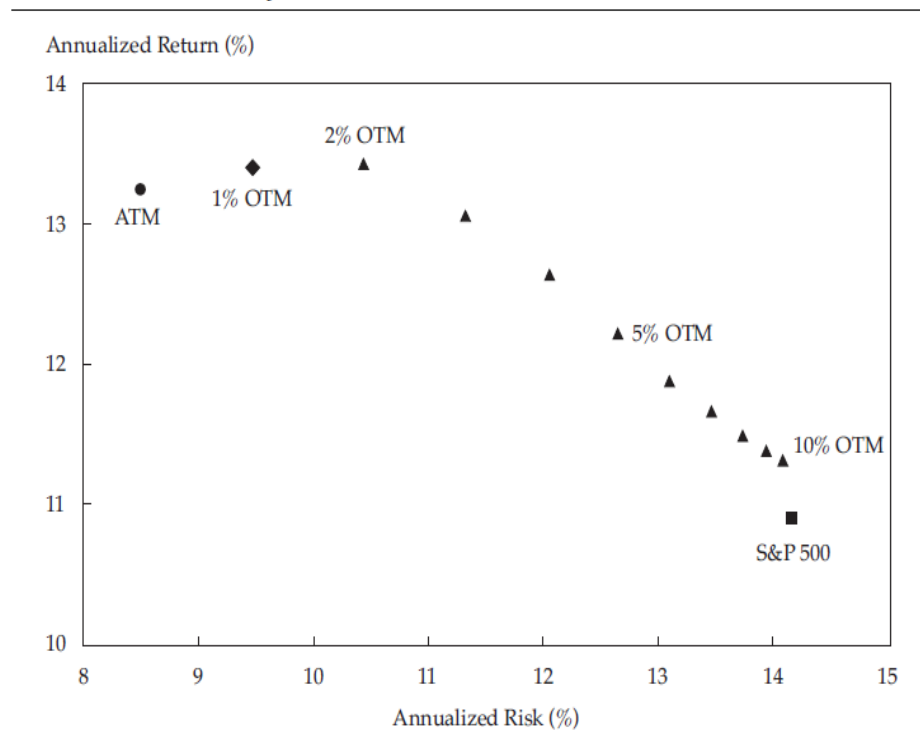
Figure 5. S&P 500 ATM One-Month Option: Implied vs. Realized Volatility Spread, 1 January 1990 to 31 October 2005



Note: The average spread was 2.4 percentage points; the median, 2.7 percentage points.

Source: Goldman Sachs.

Figure 7. Risk-Return Trade-Off for Call-Selling Strategies and the S&P 500, 18 January 1990 to 17 November 2005



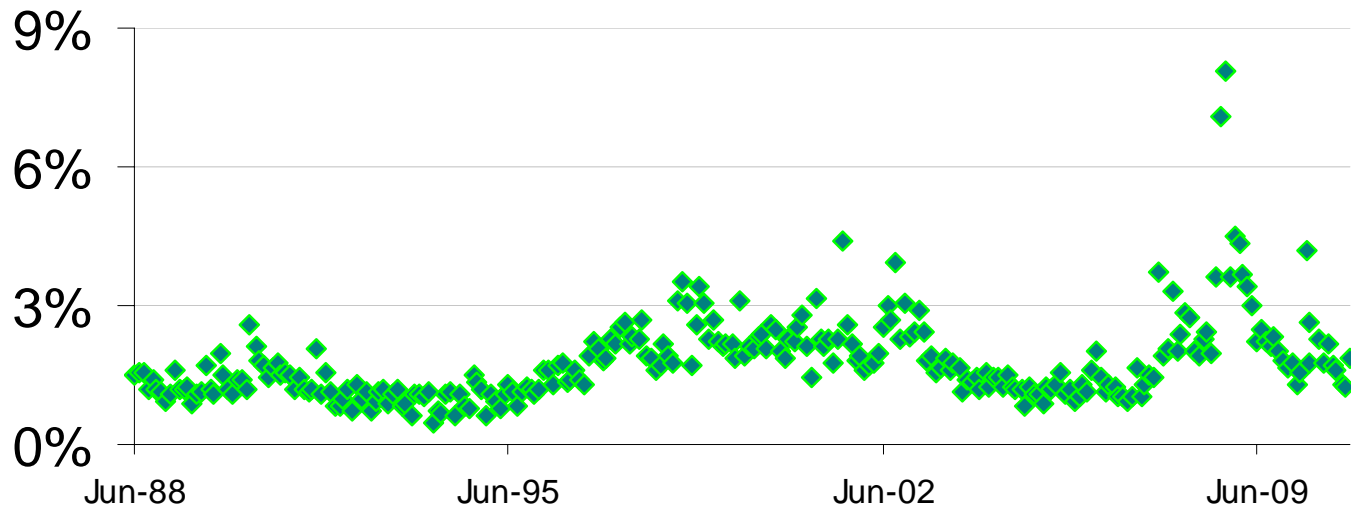
Sources: CBOE, Standard & Poor's, and Goldman Sachs.

Gross Monthly Income from Options Premiums

BXM Index - Monthly Premiums

Gross amount* received as a % of the underlying

Average was about 1.8% per month



(June 1988 - March 2011). Source: CBOE.

* Please note that these are gross amounts, and the net return usually will be less with a buywrite strategy. www.cboe.com/benchmarks

Studies on BuyWrites

- **Fund Evaluation Group.** Study of BXD and VXD Indexes (2007) at www.cboe.com/BXD <http://www.feg.com/documents/EvaluationofBuyWriteandVolatilityIndexes.pdf>
- **Callan Associates.** An Historical Evaluation of the CBOE S&P 500 BuyWrite Index (BXM). (Oct. 2006). at www.cboe.com/BXM http://www.cboe.com/micro/bxm/Callan_CBOE.pdf
- **Goldman Sachs.** "Finding Alpha via Covered Index Writing," Financial Analysts Journal. (September/October 2006). www.888options.com/institutional/research/pdfs/finding_alpha_via_covered_index_writing.pdf
- **Ibbotson Associates.** Feldman, Barry, and Dhruv Roy, "Passive Options-Based Investment Strategies: The Case of the CBOE S&P 500 BuyWrite Index." The Journal of Investing. (Summer 2005). at www.cboe.com/BXM www.cboe.com/micro/bxm/ibbotsonAug30final.pdf
- **Duke University.** Whaley, Robert. "Risk and Return of the CBOE BuyWrite Monthly Index" The Journal of Derivatives (Winter 2002).
- **University of Massachusetts.** Schneeweis, Thomas, and Richard Spurgin. "The Benefits of Index Option-Based Strategies for Institutional Portfolios" The Journal of Alternative Investments, (Spring 2001).

www.cboe.com/benchmarks

Study By Ibbotson Associates

IbbotsonAssociates

2004

Highlights from Case Study on BXM Buy-Write Options Strategy

Exhibit 6 – Risk Adjusted Returns (as measured by the Stutzer index) (June 1, 1988 – March 31, 2004)

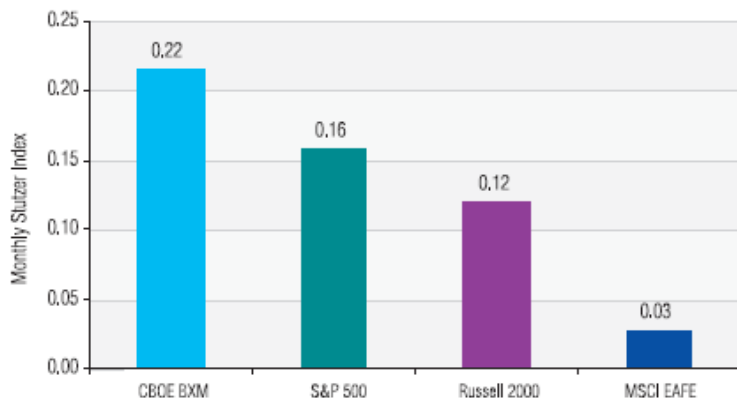


Exhibit 6: Monthly Stutzer index values for equity indexes, data from June 1988 to March 2004. The Stutzer (2000) index is a measure of risk-adjusted returns. It is a generalization of the Sharpe ratio that controls for skew and kurtosis in asset returns. The results indicate that the CBOE BXM has had considerably better risk-adjusted performance than the S&P 500. See Exhibit 7 for corresponding Sharpe ratios.

Sources of Returns

Selling index options 12 times a year can produce significant income. Over the 190-month period studied, the S&P 500 options were found to have an average implied volatility of 16.5% and a realized volatility of 14.9%. The average monthly premium was 1.69% of the underlying value.

Exhibit 8 – BXM Call Premiums as a Percentage of the Underlying Value (June 1, 1988 – March 31, 2004)

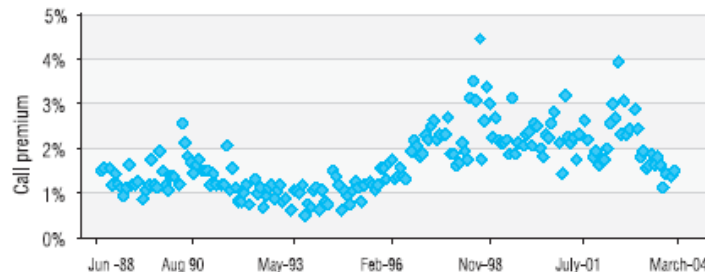


Exhibit 8: CBOE BXM call premiums earned as a percentage of underlying value, June 1988 to March 2004. The average monthly premium is 1.69%, an annualized rate of 22.31%.

A case study of a real-life BXM investment program is included. The study (both long and short versions) is available at www.cboe.com/BXM

2007 Study by Fund Evaluation Group

Evaluation of BuyWrite and Volatility Indexes
 Using the CBOE DJIA BuyWrite Index (BXD) and CBOE DJIA Volatility Index (VXD) for
 Asset Allocation and Diversification Purposes

Fund Evaluation Group, LLC 2007

Exhibit 6: Annualized Returns vs. Risk
 (Monthly Data October 31, 1997 through November 30, 2006)

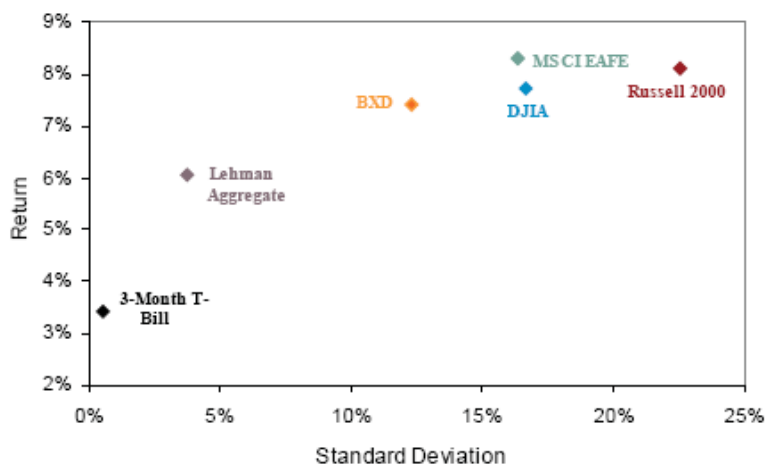
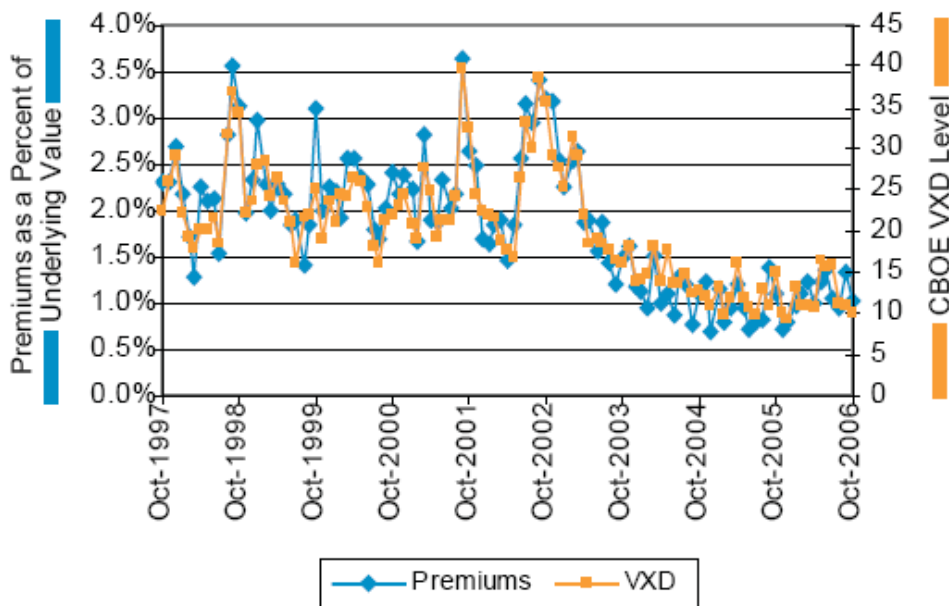


Exhibit 6: The graph above plots several indexes according to their respective risk and reward. Over the course of the study, the BXD posted annualized returns similar to equity indexes but experienced less volatility. The BXD's performance was superior to fixed income and cash, but exhibited greater volatility.

Exhibit 9: CBOE BXD Call Premiums and CBOE VXD Levels



2006 Study by Callan Associates

Exhibit 6 from the Callan Study

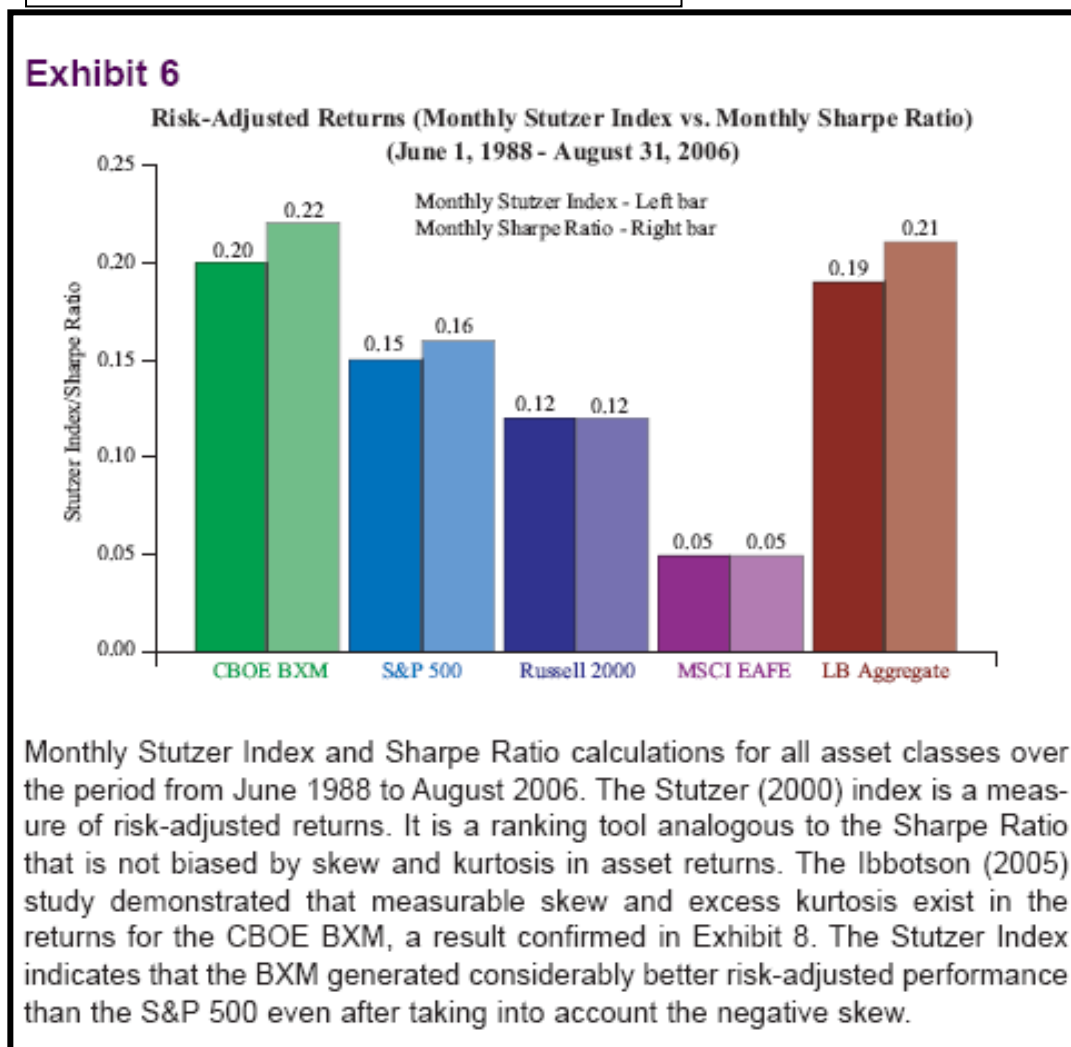
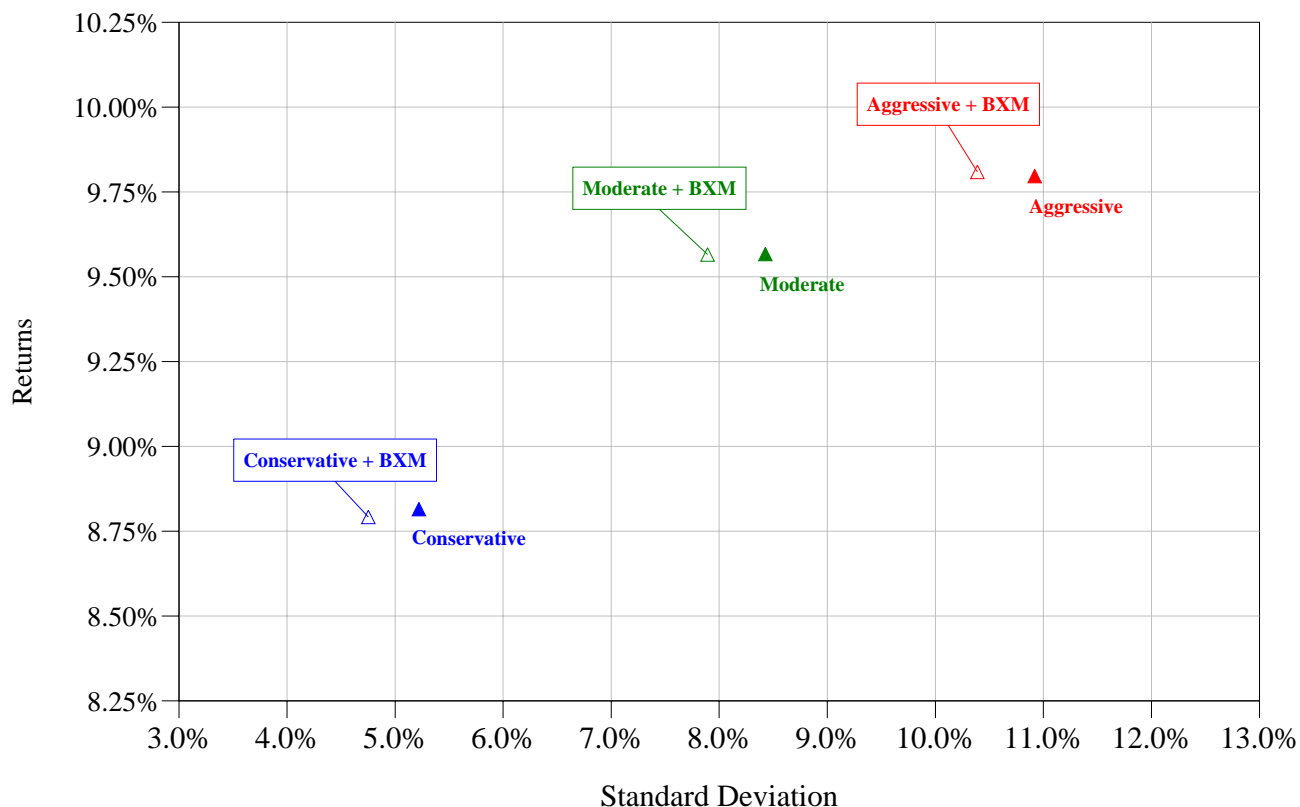


Exhibit 17 from Callan Associates' 2006 Study

Annualized Return versus Risk
(June 1, 1988 - August 31, 2006)



Measuring the impact of adding CBOE BXM to diversified portfolios. Calculated with monthly rebalancing over the period June 1, 1988 to August 31, 2006. BXM substituted for 10% of large cap equity exposure in each asset mix. In all cases, return is essentially unchanged while risk is reduced, improving the risk-adjusted return as measured by the Sharpe ratio.

2008 Study

by Ennis Knupp

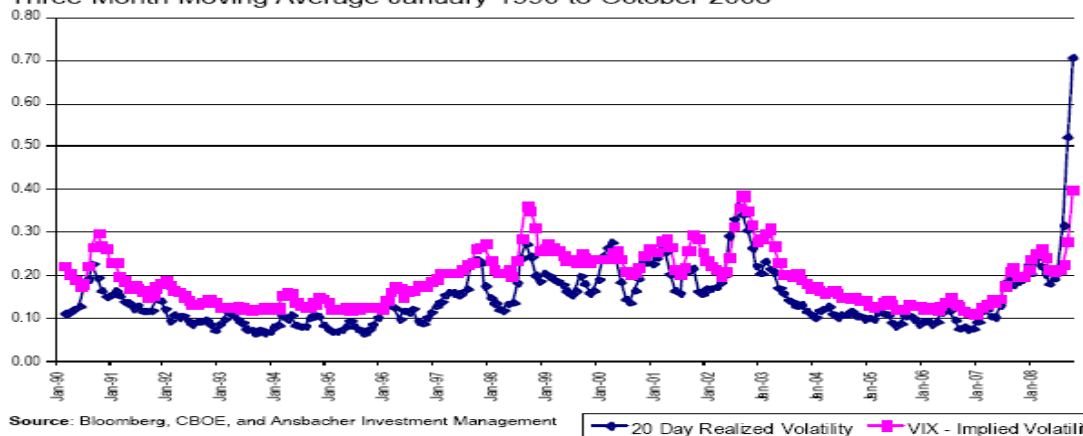
EVALUATING THE PERFORMANCE CHARACTERISTICS OF THE CBOE S&P 500 PUTWRITE INDEX

Exhibit 3: Key Statistics
June 30, 1986 to October 31, 2008

	Average Annual Return	Standard Deviation	Skewness	Kurtosis	Sharpe Ratio	Sortino Ratio
CBOE S&P 500 PutWrite Index	10.32%	9.91%	-2.72	13.15	0.63	0.86
S&P 500 Index	8.77%	15.39%	-0.92	3.06	0.30	0.49
MSCI EAFE Index	6.11%	17.39%	-0.49	1.26	0.12	0.19
Barclays Capital Aggregate Bond Index	7.16%	4.05%	-0.27	0.39	0.76	1.67
3-Month Treasury Bills	4.09%	0.53%	-0.04	-0.50	N/A	N/A

Source: Bloomberg and CBOE

Exhibit 10: S&P 500 Implied Volatility vs. Subsequent Realized Volatility
Three Month Moving Average January 1990 to October 2008



Pensions & Investments

Sept. 7, 2009 excerpts

Investors turn to options to hold gains while trimming losses

After the scalding they took from the financial crisis, more institutional investors are embracing options strategies both to lock in upside gains and limit downside losses.

"It's been going on for some time, but lately there's a lot more activity because of two things," said Terrence Ransford, director of trading for Northern Trust Securities, the broker/dealer subsidiary of Northern Trust Corp., Chicago.

"Money managers are extremely anxious to mitigate some of the volatility in their portfolios," he explained. "And when the VIX (the Chicago Board Options Exchange's gauge of stock market volatility) was hitting new highs, the swings were so dramatic that many end clients — foundations, endowments, corporate pensions — all became interested in ways to manage volatility."

And these days, because there are "no returns anywhere," investors are looking to options strategies to scrape any alpha they can out of the stock market, Mr. Ransford added.

tions. According to the minutes of the Indiana Public Employees' Retirement Fund's

May board meeting, trustees approved a plan that would allow staff to write up to \$500 million in notional value of call options on domestic equity indexes as a way to manage the \$12 billion fund's overweight position in domestic equities.

And in December, the board of the \$4.6 billion San Bernardino (Calif.) County Employees' Retirement Association approved a covered call strategy for its S&P 500 index mandate, which was valued at \$230.3 million at the end of last month. The strategy is managed by State Street Global Advisors, Boston. According to meeting minutes, the reasons for implementing the strategy included: record premium income from selling the options and the association's need for liquidity.

...

Returns and Volatility for Select Indexes

Total Return Indexes, for Time Periods Ending May 31, 2011

	PUT - CBOE S&P 500 PutWrite Index	BXM - CBOE S&P 500 BuyWrite Index	BXY - CBOE S&P 500 2% OTM BuyWrite Index	S&P 500 TR	EAFE TR	Citigroup 30- yr Treasury	SP GSCI TR
	PUT	BXM	BXY	S&P 500	EAFE TR	30Yr Trsry	GSCI TR
One-Year Annualized Return	21.2%	16.6%	23.2%	25.9%	30.7%	3.8%	33.7%
Three-Year Annualized Return	2.8%	-0.3%	2.4%	0.9%	-4.1%	6.5%	-17.8%
Five-Year Annualized Return	5.8%	3.0%	5.1%	3.3%	1.7%	7.3%	-4.9%
Ten-Year Annualized Return	5.2%	3.3%	4.3%	2.6%	5.4%	6.8%	3.5%
Twenty-Year Annualized Return	10.2%	8.9%	9.8%	8.6%	5.7%	7.3%	4.1%
Annualized Return Since 30-Jun-86	10.6%	9.3%		9.5%	7.0%	6.9%	8.0%
	PUT	BXM	BXY	S&P 500 TR	EAFE TR	30Yr Trsry	GSCI TR
One-Year Standard Deviation	10.0%	9.1%	11.0%	15.3%	18.0%	13.9%	16.9%
Three-Year Standard Deviation	17.5%	16.8%	19.0%	21.8%	26.3%	19.7%	30.8%
Five-Year Standard Deviation	14.0%	13.6%	15.4%	17.9%	21.5%	16.1%	27.4%
Ten-Year Standard Deviation	12.4%	12.2%	13.8%	15.8%	18.3%	14.3%	25.1%
Twenty-Year Standard Deviation	10.3%	10.7%	12.4%	15.0%	16.7%	12.1%	21.2%
Standard Deviation Since 30-Jun-86	10.4%	11.2%		15.8%	17.9%	11.8%	20.7%

Sources: CBOE and Bloomberg.
Please see the last slide for important risk disclosures.

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 (the "ODD"). The ODD and supporting documentation for any claims, comparisons, recommendations, statistics or other technical data in these materials are available by calling 1-888-OPTIONS, or contacting CBOE at www.cboe.com/Contact. The information in these materials is provided solely for general education and information purposes and therefore should not be considered complete, precise, or current. Many of the matters discussed are subject to detailed rules, regulations, and statutory provisions which should be referred to for additional detail and are subject to changes that may not be reflected in these materials. No statement within this material should be construed as a recommendation to buy or sell a security or to provide investment advice. The CBOE S&P 500 BuyWrite Index (BXMSM), CBOE S&P 500 2% OTM BuyWrite Index (BXYSM), CBOE DJIA BuyWrite Index (BXDSM), CBOE Russell 2000 BuyWrite Index (BXRSM) and CBOE NASDAQ-100 BuyWrite Index (BXNSM) (the "Indexes") are designed to represent proposed hypothetical buy-write strategies. Like many passive benchmarks, the Indexes do not take into account significant factors such as transaction costs and taxes. Transaction costs and taxes for a buy-write strategy could be significantly higher than transaction costs for a passive strategy of buying-and-holding stocks. Investors attempting to replicate the Indexes should discuss with their brokers possible timing and liquidity issues. Past performance does not guarantee future results. These materials contain comparisons, assertions, and conclusions regarding the performance of indexes based on backtesting, i.e., calculations of how the indexes might have performed in the past if they had existed. Backtested performance information is purely hypothetical and is provided in this document solely for informational purposes. The methodology of the Indexes is owned by Chicago Board Options Exchange, Incorporated (CBOE) may be covered by one or more patents or pending patent applications. Standard & Poor's®, S&P®, and S&P 500® are registered trademarks of The McGraw-Hill Companies, Inc. and are licensed for use by CBOE. "Dow Jones", "The Dow", "DJIA" and "Dow Jones Industrial Average" are trademarks of Dow Jones & Company, Inc. and have been licensed for use for certain purposes by CBOE. CBOE's options based on Dow Jones indexes and financial products based on the CBOE DJIA BuyWrite Index are not sponsored, endorsed, marketed or promoted by Dow Jones and Dow Jones makes no representations regarding the advisability of investing in such products. Nasdaq®, Nasdaq-100®, and Nasdaq-100 Index®, are trademarks of The Nasdaq Stock Market, Inc. (which with its affiliates is referred to as the "Corporations") and are licensed for use by CBOE. The CBOE NASDAQ-100 BuyWrite Index (the "BXN Index") is not derived, maintained, published, calculated or disseminated by the Corporations. CBOE Volatility Index®, VIX®, CBOE® and Chicago Board Options Exchange® are registered trademarks and BXM, BXD, BXN and BXY are servicemarks of CBOE. Copyright © 2011 Chicago Board Options Exchange, Incorporated. All Rights Reserved.