

Equity Volatility Management

- Income
- Diversification
- Risk-adjusted Returns

Please read disclosures at the last slide

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1. Writing of Index Options

Covered calls Buy-writes Put-writes Short straddles/strangles

Goals include – high income, lower volatility, strong risk-adjusted returns, capture a risk premium

Ten Studies

- **Asset Consulting Group.** An Analysis of Index Option Writing for Liquid Enhanced Risk-Adjusted Returns (January 2012)
- **Hewitt EnnisKnupp.** The CBOE S&P 500 BuyWrite Index (BXM) - A Review of Performance (2012)
- **Cambridge Associates, LLC.** Highlights from the Benefits of Selling Volatility (2011)
- **Russell Investments.** Capturing the Volatility Premium through Call Overwriting. (December 2010)
- **Ennis Knupp & Associates.** Evaluating the Performance Characteristics of the CBOE S&P 500 PutWrite Index (Dec. 2008)
- **Fund Evaluation Group.** Study of BXD and VXD Indexes (2007)
- **Callan Associates.** An Historical Evaluation of the CBOE S&P 500 BuyWrite Index (BXM). (Oct. 2006).
- **Goldman Sachs.** "Finding Alpha via Covered Index Writing," Financial Analysts Journal. (September/October 2006).
- **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).
- **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).

CBOE S&P 500 BuyWrite Index (BXM)

- Benchmark for strategy --
 - **buy** portfolio of S&P 500 stocks
 - **write** (sell) cash-settled S&P 500 call 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 \$25 billion in buywrite funds
- www.cboe.com/BXM



Excerpted from 2012 paper by Hewitt EnnisKnupp – “The CBOE S&P 500 BuyWrite Index (BXM) - A Review of Performance”

Risk-Return

Exhibit 6 - Risk-Return Tradeoff
(June 30, 1986 - January 31, 2012)

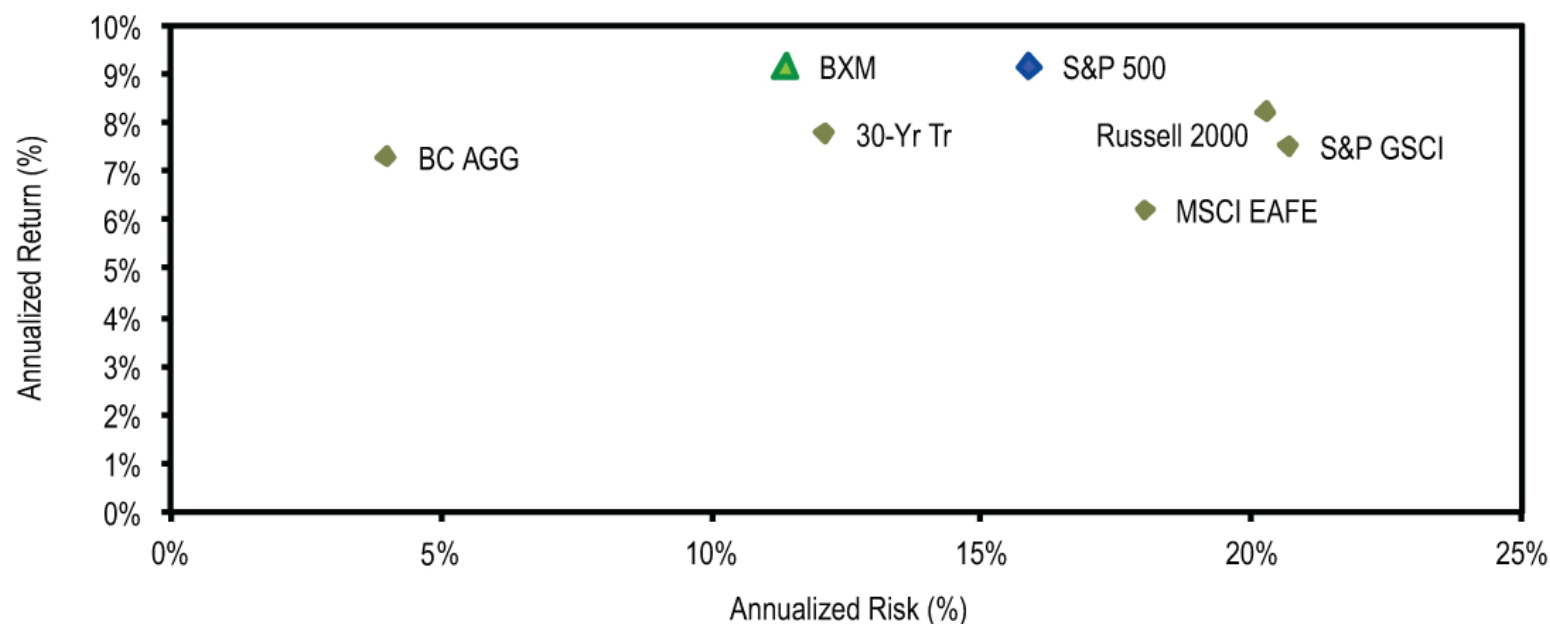


Exhibit 6 - Risk-Return Tradeoff of all asset classes under consideration from June 30, 1986 to January 31, 2012. The CBOE BXM has performed in-line with the S&P 500 on an annualized basis with a much lower annualized volatility.

**Excerpt from Jan. 2012 paper by Asset Consulting Group –
An Analysis of Index Option Writing for Liquid Enhanced Risk-Adjusted Returns**

Exhibit 5

Exhibit 5 : Return and Volatility (June 30, 1988 - December 31, 2011)

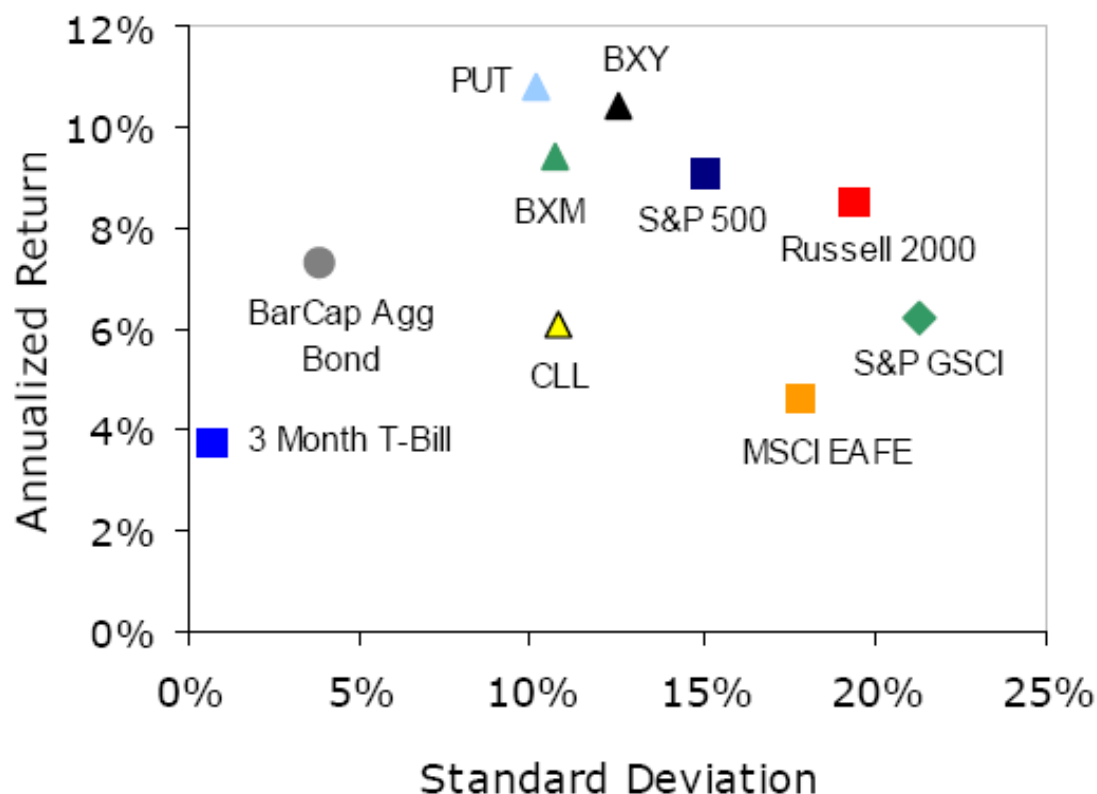


Exhibit 5: Compound annual returns and standard deviation for all asset classes from June 30, 1988 to December 31, 2011. Three of the CBOE indices outperformed the S&P 500 while also incurring less risk.

**Excerpt from Jan. 2012 paper by Asset Consulting Group –
An Analysis of Index Option Writing for Liquid Enhanced Risk-Adjusted Returns**

Exhibit 11

Exhibit 11: Risk-Adjusted Returns

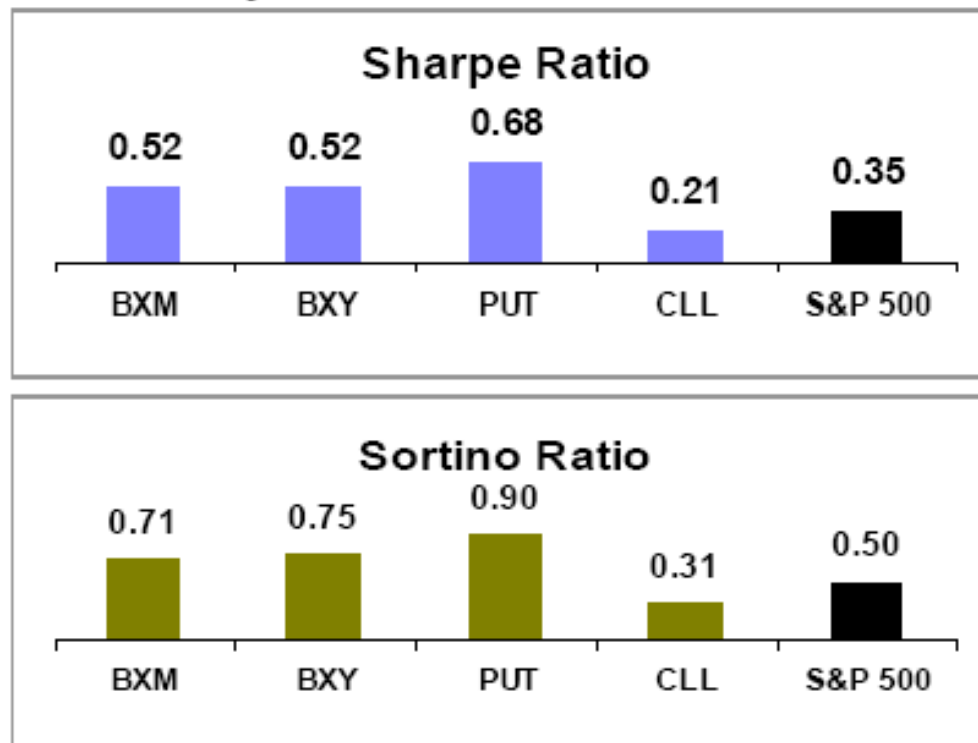
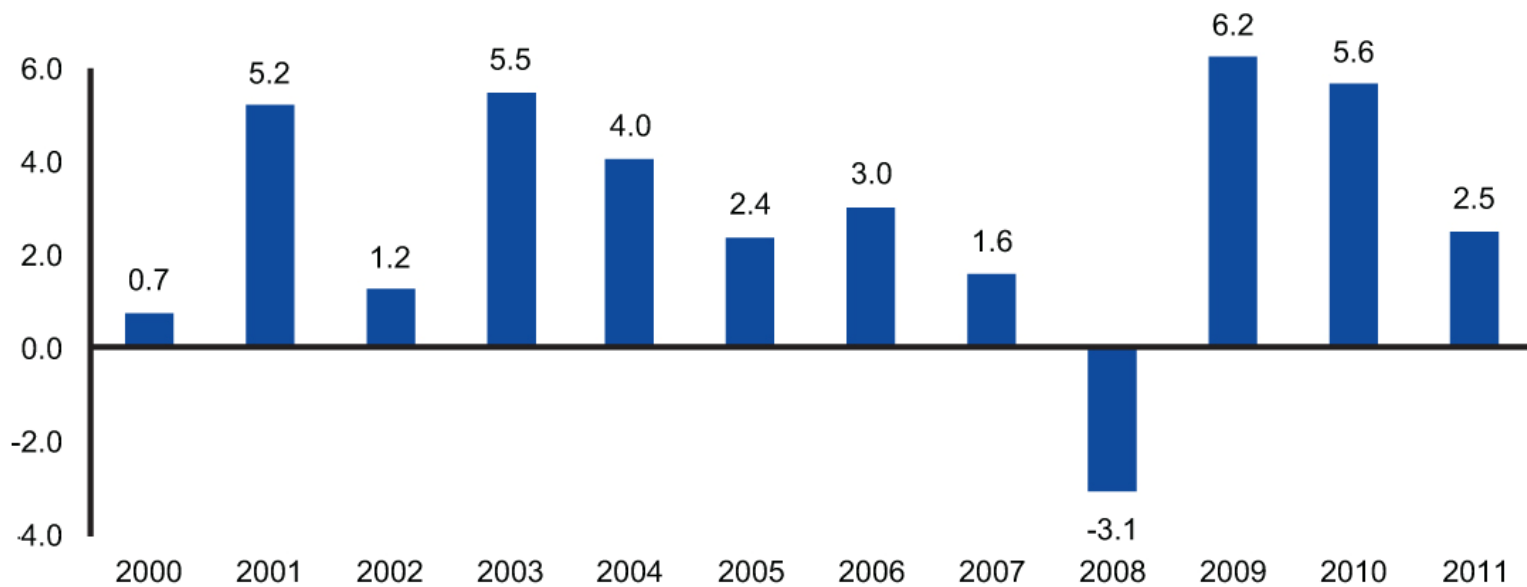


Exhibit 11: The BXM, BXY and PUT indexes had risk-adjusted performance that was superior to that of the S&P 500 per metrics such as the Sortino Ratio and Sharpe ratio. Please note that all the above indexes had negative skewness, and the measures of risk-adjusted returns are imperfect when measuring non-normal distributions.

Excerpted from 2012 paper by Hewitt EnnisKnupp – “The CBOE S&P 500 BuyWrite Index (BXM) - A Review of Performance”

Implied vs. Realized Volatility

Exhibit 12 - Implied Volatility (VIX) minus Subsequent S&P 500 Realized Volatility – Average Per Year (2000 - 2012)



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Implied Volatility	23.0	25.4	26.7	21.7	15.3	12.7	12.7	17.5	32.8	31.4	22.7	24.0
Realized Volatility of S&P 500	22.2	20.2	25.5	16.3	11.3	10.39	9.7	16.0	35.9	25.2	17.0	21.5

Cambridge Associates and the Short Strangle Strategy

“Over the past 20 years, a strategy of systematically selling out of the money puts and calls on the S&P 500 Index (a short strangle portfolio) would not only have soundly beaten equity returns with lower volatility, but also offered similar returns to the median hedge fund manager tracked by Cambridge Associates, albeit with slightly higher volatility (see chart ...). Such a strategy would also have offered significantly better transparency and liquidity than most hedge funds.”

From: Cambridge Associates. “Highlights from the Benefits of Selling Volatility” (2011) available at www.cboe.com/benchmarks

**Excerpt from Jan. 2012 paper by Asset Consulting Group –
An Analysis of Index Option Writing for Liquid Enhanced Risk-Adjusted Returns**

Exhibit 12

Exhibit 12: BXM Index - Monthly Gross Premiums

(June 1988 – December 2011)

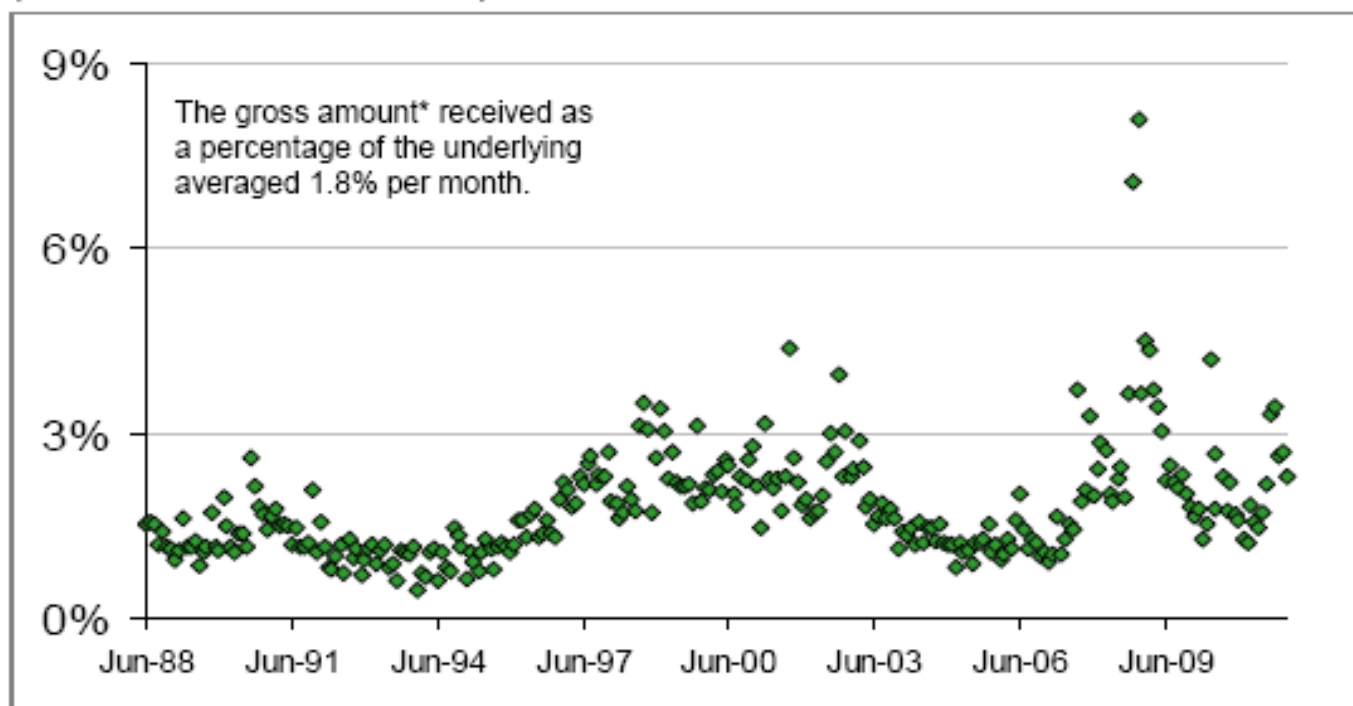


Exhibit 12: The BXM call premiums sold averaged about 1.8% per month. Consequently, on average, the BXM usually should outperform the S&P 500 in any expiration month that returned less than 1.8%. *Please note that these are gross amounts, and the net return usually will be less with a buywrite strategy. Source: CBOE.

Excerpted from 2012 paper by Hewitt EnnisKnupp – “The CBOE S&P 500 BuyWrite Index (BXM) - A Review of Performance”

Premium Income Component

Exhibit 13 - 12-Month Gross Premium Income Earned vs. CBOE BXM Return
(May 31, 1989 - January 31, 2012)

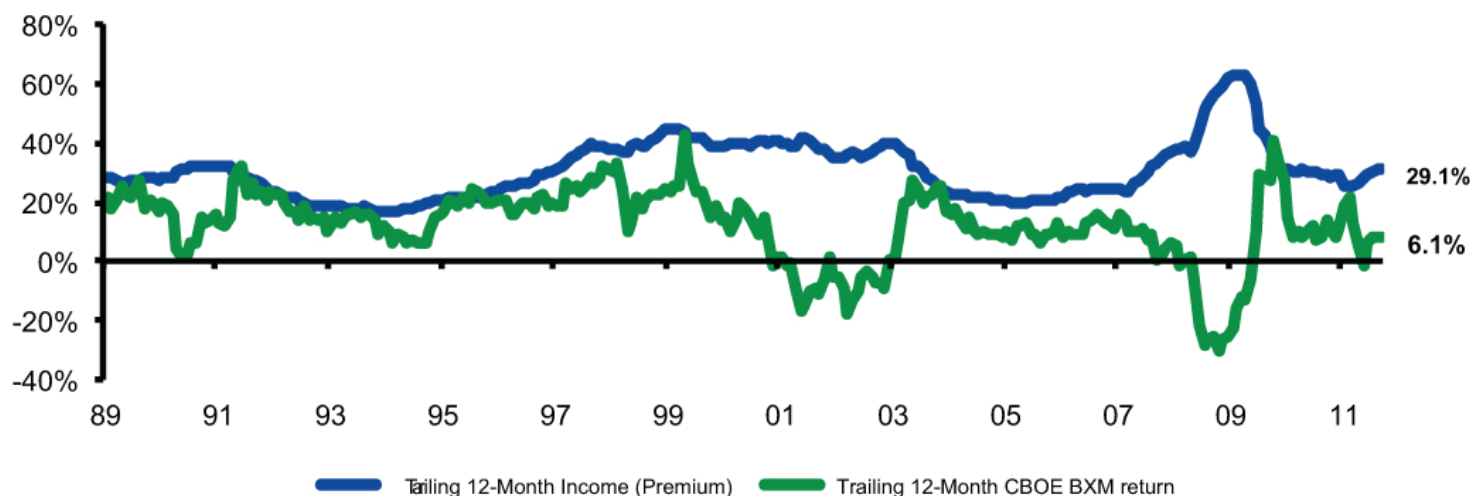


Exhibit 13 - The gross premiums earned by the BXM Index have averaged about 1.8% per month, or more than 21% per year. The issue of whether the net returns of the BXM Index can match gross premiums often is related to the severity of monthly declines in the S&P 500 Index. For example, in the year 1995 the S&P 500 Index had only one monthly decline (0.5%), and the BXM Index rose 21% that year. On the other hand, in 2008 the S&P 500 Index declined by 6% or more in five different months (and was down 37% for the year), while the BXM Index was down 29% for the year.

Pension Funds and BXM Index

Pensions Eye Buy-Writes

“... The Santa Barbara County Employees Retirement System, the Hawaii Employees Retirement System, the Los Angeles Department of Water and Power Employees Retirement Plan, the Seattle City Employee Retirement System and the Alaska Retirement Management Board are all in various stages of adopting buy-write strategies benchmarked against the Chicago Board Options Exchange's BXM index. The total to be hedged by all five plans could reach more than \$1 billion. ... ”

Traders Magazine, December 2011

Sampling of Option-oriented ETF and CEFs

This is NOT a solicitation or endorsement by CBOE. Please read the prospectus and note the risks and costs before investing.

PBP	PowerShares S&P 500 BuyWrite Portfolio ETF	EBI	Evergreen International Balanced Income Fd
LCM	Advent Claymore Enhanced Growth & Income Fd	HCE	Fiduciary/Claymore Dynamic Equity Income Fd
BFD	BlackRock Global Equity Income Trust	FFA	First Trust/Fiduciary Asset Management Covered Call Fd
BOE	BlackRock Global Opportunities Equity Trust	GGN	Gabelli Gold Natural Resources & Income Trust
BME	Blackrock Health Sciences Trust	IGA	ING Global Advantage and Premium Opportunity Fd
BWC	BlackRock World Investment Trust	IGD	ING Global Equity Dividend & Premium Opportunity Fd
GLQ	Clough Global Equity Fd	IID	ING International High Dividend Equity Income Fd
DPO	Dow 30 Enhanced Premium & Income Fd	MSP	Madison Strategic Sector Premium Fd
DPD	Dow 30 Premium & Dividend Income Fd Inc	MCN	Madison/Claymore Covered Call Fd
EOI	Eaton Vance Enhanced Equity Income Fd	QQQX	NASDAQ Premium Income & Growth Fd
EOS	Eaton Vance Enhanced Equity Income Fd II	NFJ	NFJ Dividend Interest & Premium Strategy Fd
ETJ	Eaton Vance Risk-Managed Diversified Equity Income Fd	NAI	Nicholas-Applegate International & Premium Strategy Fd
ETB	Eaton Vance Tax-Managed Buy-Write Income Fd	JLA	Nuveen Equity Premium Advantage Fd
ETV	Eaton Vance Tax-Managed Buy-Write Opportunities Fd	JPG	Nuveen Equity Premium and Growth Fd
ETY	Eaton Vance Tax-Managed Diversified Equity Income Fd.	JPZ	Nuveen Equity Premium Income Fd
EXG	Eaton Vance Tax-Managed Global Diversified Equ Inc Fd	JSN	Nuveen Equity Premium Opportunity Fd
ETW	Eaton Vance Tax-MgdGlobal Buy-Write Opportunity Fd	PGP	PIMCO Global StocksPLUS & Income Fd
ECV	Enhanced Equity Yield & Premium Fd Inc	RCC	Small Cap Premium & Dividend Income
EEF	Enhanced Equity Yield Fd Inc	RCC	Small Cap Premium & Dividend Income Fd Inc
EOD	Evergreen Global Dividend Opportunity Fd	EXD	Eaton Vance Tax-Advd Bond and Option Strategies Fd

Sample exchange-traded note (ETN)

BWV iPath CBOE S&P 500 BuyWrite Index ETN
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2. Interest in Hedging Tail Risk

Tail-risk hedging the talk of the town
Strategy generating interest and
questions about implementation.
Pensions & Investments (July 2010)

Pimco Sells Black Swan Protection
Bloomberg News (July 2010)

How To Hedge Tail Risk With The VIX
www.istockanalyst.com (July 2010)

The Universa approach to hedging tail
risk
Risk Magazine (January 2011)

Tail risk hedging strategies for corporate
pension plans
Journal of Derivatives & Hedge Funds
(2011)

Investors seek tail risk funds to cover
'black swan' events
Risk Magazine (04 Feb 2011)

The Vicissitudes of Hedging Tail Risks
International Business Times (July 23,
2010)

Benchmarking Tail Risk Management
Journal of Indexes (May-June 2012)

Implementable tail risk management: An
empirical analysis of CVaR-optimized
carry trade portfolios
Journal of Derivatives & Hedge Funds
(2011)

Excerpted from paper by Asset Consulting Group - "Key Tools for Hedging and Tail Risk Management" (February 2012)

Exhibit A

Exhibit A: Benchmark Indexes

<u>Index</u>	<u>Ticker (Bloomberg)</u>	<u>Options or Futures Position(s)</u>	<u>Hold stocks?</u>
CBOE S&P 500 95-110 Collar Index (CLL)	CLL <Index>	Buys three-month out-of-the-money S&P 500 put options at 95% of the S&P 500 value. Sells one-month out-of-the-money S&P 500 call options at 110% of the S&P 500 value.	S&P 500
CBOE VIX Tail Hedge Index (VXTH)	VXTH <Index>	Buys one-month 30-delta VIX call options. The weight of the VIX calls in the portfolio varies at each roll depending on the perceived likelihood that a "black swan" event could occur in the near future.	S&P 500
S&P 500 VIX Mid-term Futures Index (VXMT)	SPVIXMTR <Index>	Buys a combination of VIX futures positions in order to reflect the expectations of the VIX Index level in 5 months. Some of the VIX futures are rolled daily in order to maintain a constant average weighted five-month term.	No stocks
S&P 500 Dynamic VIX Futures Index (DyVX)	SPDVIXT <Index>	Buys a combination of VIX futures positions in order to reflect dynamic allocation between the S&P 500 Short-Term VIX Futures Index and S&P 500 Mid-Term VIX Futures Index. The rules-based allocation is done with the goal of aiming to lower the roll cost of investments linked to future implied volatility.	No stocks
S&P 500 VIX Futures Tail Risk Index - Short Term (VTRsk)	SPVXTRST <Index>	Calculated using a weight of 45% of 2x the S&P VIX Short-Term Futures Index and 55% of the Inverse S&P 500 Short-Term Futures Index. The goal of the index is to provide a long volatility exposure whose cost is partially or completely mitigated (due to negative roll yield) via a rebalanced short exposure.	No stocks
S&P 500 Index (Total Return)	SPTR <Index>	None	S&P 500

Excerpted from paper by Asset Consulting Group - “Key Tools for Hedging and Tail Risk Management” (February 2012)

Exhibit A Benchmark Indexes (cont.)

<u>Index</u>	<u>Ticker</u> <u>(Bloomberg)</u>	<u>Price History</u> <u>Begins</u>	<u>Annual % Return</u>			
			<u>2008</u>	<u>2009</u>	<u>2010</u>	<u>2011</u>
CBOE S&P 500 95-110 Collar Index (CLL)	CLL <Index>	June 1986	-23.6%	17.6%	4.1%	-8.8%
CBOE VIX Tail Hedge Index (VXTH)	VXTH <Index>	March 2006	-19.3%	16.0%	21.1%	5.9%
S&P 500 VIX Mid-term Futures Index (VXMT)	SPVIXMTR <Index>	Dec. 2005	83.9%	-23.6%	-13.2%	-7.6%
S&P 500 Dynamic VIX Futures Index (DyVX)	SPDVIXT <Index>	Dec. 2005	132.3%	0.7%	20.7%	8.8%
S&P 500 VIX Futures Tail Risk Index - Short Term (VTRsk)	SPVXTRST <Index>	Dec. 2005	174.3%	-21.0%	-3.0%	10.1%
S&P 500 Index (Total Return)	SPTR <Index>	Jan. 1970	-37.0%	26.5%	15.1%	2.1%

Excerpted from paper by Asset Consulting Group - "Key Tools for Hedging and Tail Risk Management" (February 2012)

Exhibit B

COLLAR OVER MORE THAN 25 YEARS

Exhibit B: Histogram with Frequency of Monthly Returns for CLL and S&P 500 (July 1986 - January 2012)

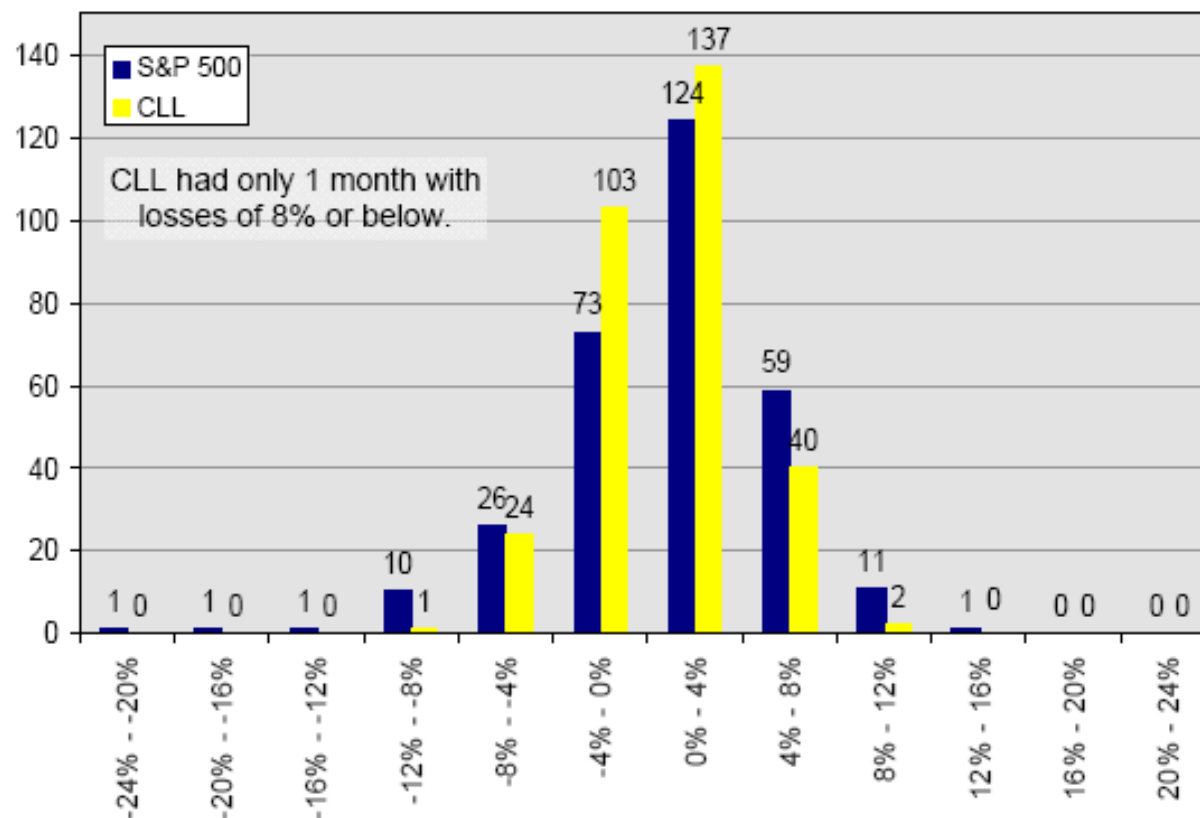


Exhibit B: Since mid-1986 the worst monthly declines for select indexes include: down 28.2% for the S&P GSCI Index, down 21.5% for S&P 500, down 20.2% for MSCI EAFE, down 17.4% for BXM, and a decline of only 8.6% for CLL Index.

Excerpted from paper by Asset Consulting Group - “Key Tools for Hedging and Tail Risk Management” (February 2012)

Exhibit I

Exhibit I: Return and Volatility (April 2006 - January 2012)

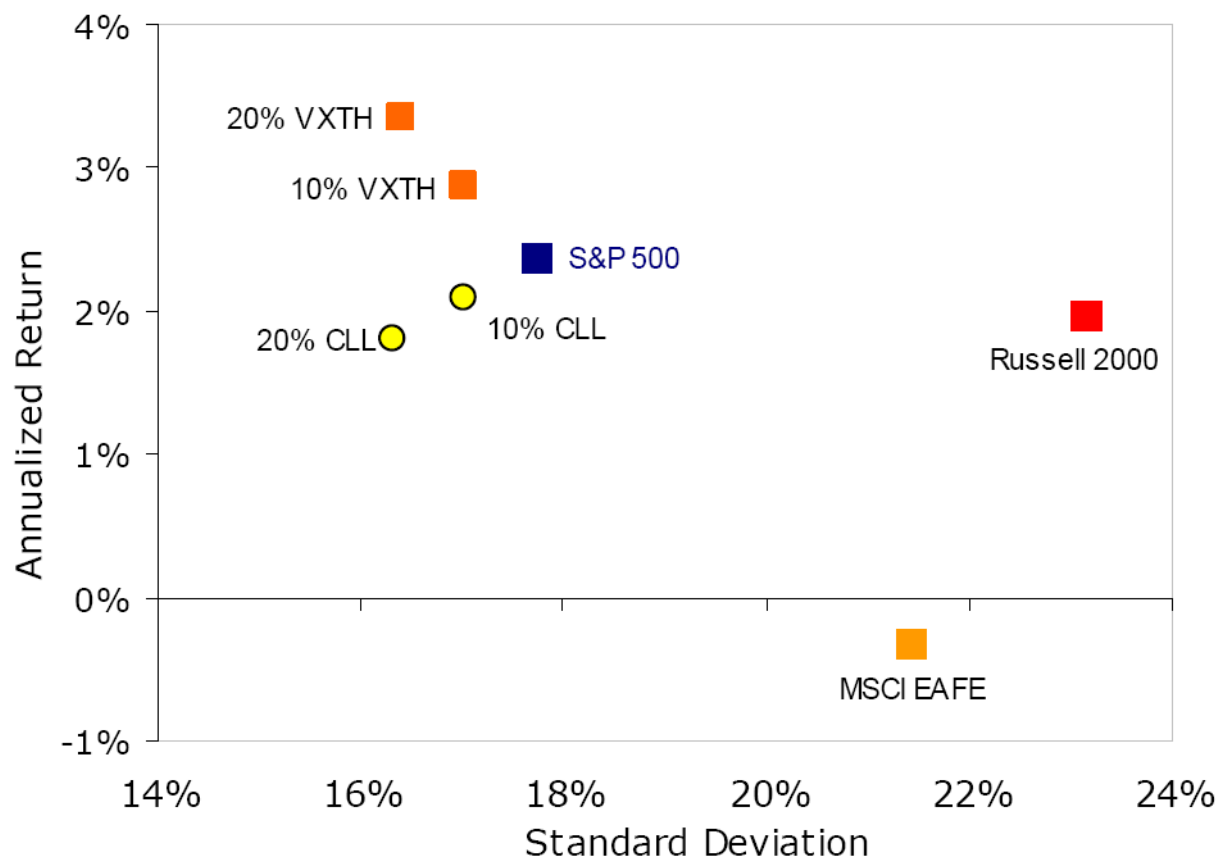


Exhibit I: The portfolio with an allocation of 20% VXTH and 80% S&P 500 had a return of 3.4% and standard deviation of 16.4%.

Excerpted from paper by Asset Consulting Group - “Key Tools for Hedging and Tail Risk Management” (February 2012)

Exhibit O Exhibit O: Returns and Volatility (April 2006 – January 2012)

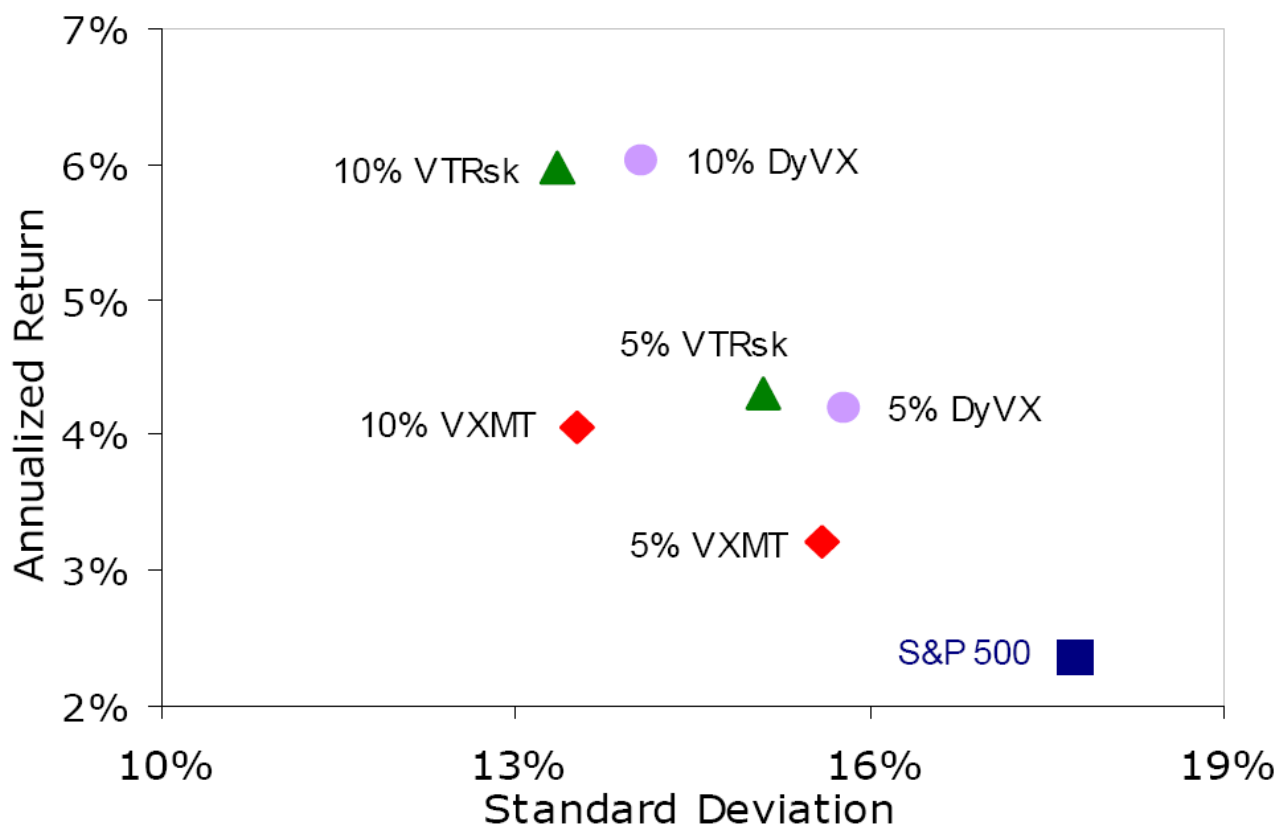


Exhibit O: The portfolio with an allocation of 10% VTRsk and 90% S&P 500 had a return of 6.0% and standard deviation of 13.4%.

Excerpted from paper by Asset Consulting Group - “Key Tools for Hedging and Tail Risk Management” (February 2012)

Exhibit P Exhibit P: Pricing of VIX Spot Index and VIX Futures

August - December 2008

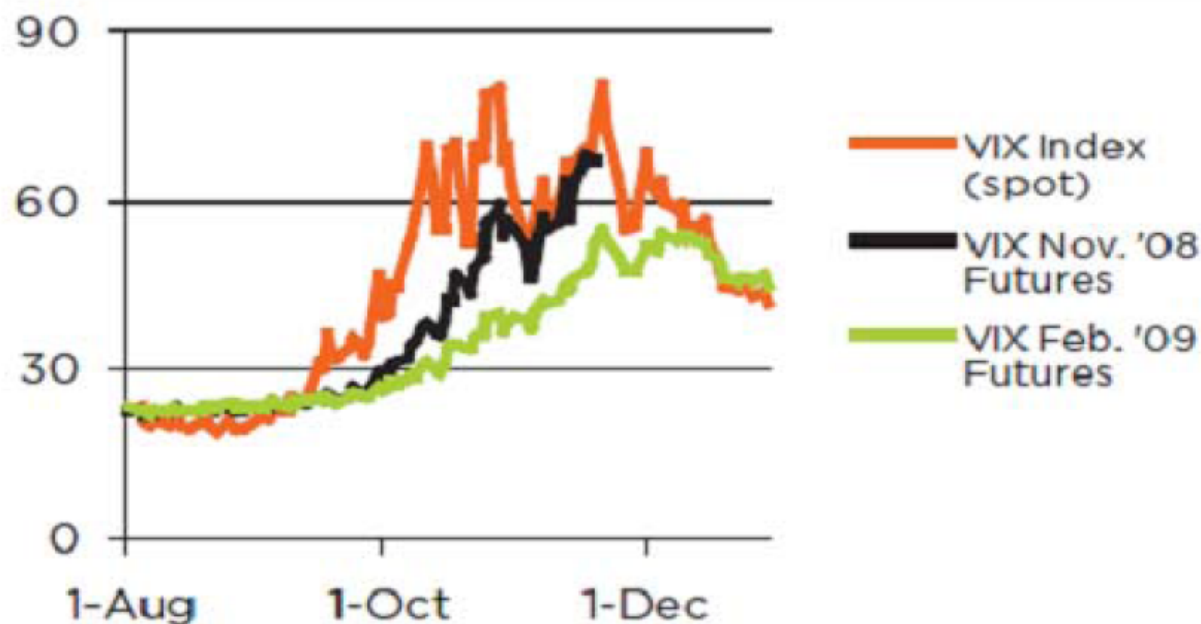


Exhibit P: The VIX Spot Index is not an investable index. The VIX future returns will differ over time depending upon market expectations. Note the difference in the VIX Spot Index versus two futures expirations during the very volatile August to December, 2008 period. “Contango” occurs when the futures are trading higher than the spot index. “Backwardation” occurs when the futures trade lower than the spot index.

Excerpted from paper by Asset Consulting Group - “Key Tools for Hedging and Tail Risk Management” (February 2012)

Exhibit R

CAPACITY

Exhibit R: Average Daily Volume for SPX Options, VIX Future and VIX Options (2004 – 2011)

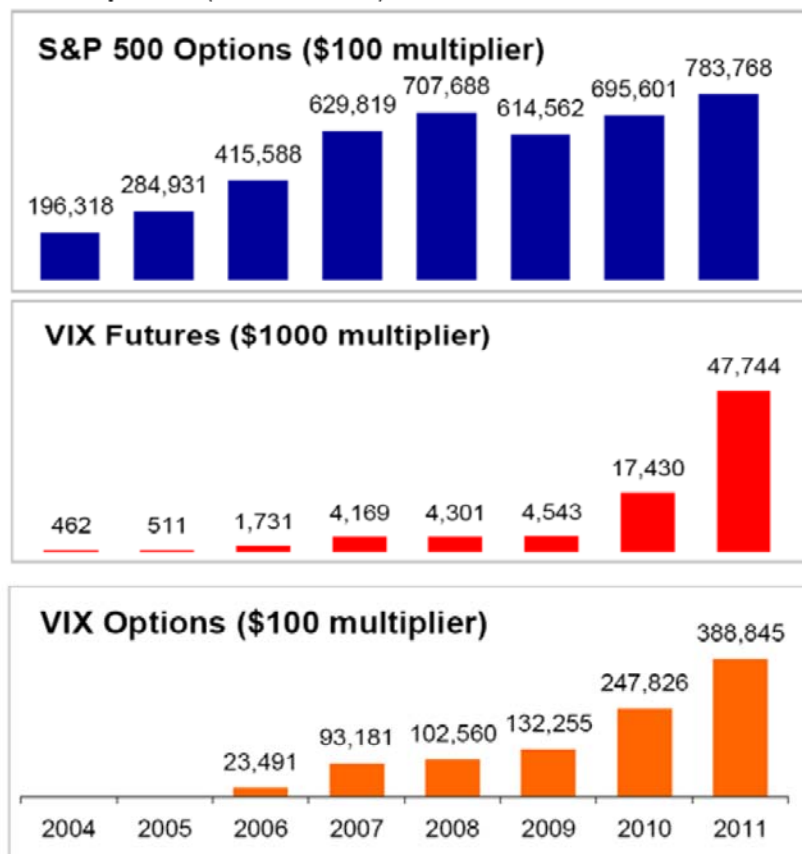


Exhibit R: Our rough estimates for average daily notional dollar value of trading in 2011 (with a delta-adjustment of 0.5 for options, and a beta adjustment of 3.0 for VIX products) are more than \$48 billion for SPX options, \$3 billion for VIX futures, and \$1 billion for VIX options. Assets in VIX-related exchange-traded products (ETPs) reached \$5 billion in February 2012.

VIX-related ETPs

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U.-S.-based Exchange-traded Notes (ETNs)			
<u>Ticker</u>	<u>Name</u>	<u>Inception date</u>	<u>Mgt Co.</u>
VXX	iPath S&P 500 Short-term VIX Futures ETN	1/29/2009	Barclays Capital Inc
VXZ	iPath S&P 500 Mid-term VIX Futures ETN		
XXV	iPath Inverse VIX Short-Term Futures ETN	7/19/2010	
VQT	Barclays S&P 500 Dynamic VEQTOR ETN	8/31/2010	
IVOP	iPath Inverse January 2021 Short-Term Futures ETN	1/14/2011	
VZZB	iPath Long Enhanced VIX Mid-Term Futures ETN	7/8/2011	
XVZ	iPath S&P 500 Dynamic VIX ETN	8/17/2011	
AAVX	ETRACS Daily Short 1-Month S&P 500 VIX Futures ETN	9/8/2011	UBS Securities LLC
BBVX	ETRACS Daily Short 2-Month S&P 500 VIX Futures ETN		
CCVX	ETRACS Daily Short 3-Month S&P 500 VIX Futures ETN		
DDVX	ETRACS Daily Short 4-Month S&P 500 VIX Futures ETN		
EEVX	ETRACS Daily Short 5-Month S&P 500 VIX Futures ETN		
FFVX	ETRACS Daily Short 6-Month S&P 500 VIX Futures ETN		
VXAA	ETRACS 1-Month S&P 500 VIX Futures ETN		
VXBB	ETRACS 2-Month S&P 500 VIX Futures ETN		
VXCC	ETRACS 3-Month S&P 500 VIX Futures ETN		
VXDD	ETRACS 4-Month S&P 500 VIX Futures ETN		
VXEE	ETRACS 5-Month S&P 500 VIX Futures ETN		
VXFF	ETRACS 6-Month S&P 500 VIX Futures ETN		
XVIX	UBS E-TRACS Daily Long-Short VIX ETN	12/1/2010	
TVIX	VelocityShares Daily 2X VIX Short-Term ETN	11/29/2010	VLS Securities LLC
TVIZ	VelocityShares Daily 2X VIX Medium-Term ETN		
VIIX	VelocityShares Daily Long VIX Short-Term ETN		
VIIZ	VelocityShares Daily Long VIX Medium-Term ETN		
XIV	VelocityShares Daily Inverse VIX Short-Term ETN		
ZIV	VelocityShares Daily Inverse VIX Medium-Term ETN		

VIX-related ETPs (cont.)

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U.-S.-based Exchange-traded Funds (ETFs)

<u>Ticker</u>	<u>Name</u>	<u>Inception date</u>	<u>Mgt Co.</u>
VIXM	ProShares VIX Mid-term Futures ETF	1/3/2011	ProShares Advisors LLC
VIXY	ProShares VIX Short-term Futures ETF	1/3/2011	
SVXY	ProShares Short VIX Short-Term Futures ETF	10/4/2011	
UVXY	Ultra VIX Short-Term Futures ETF	10/4/2011	

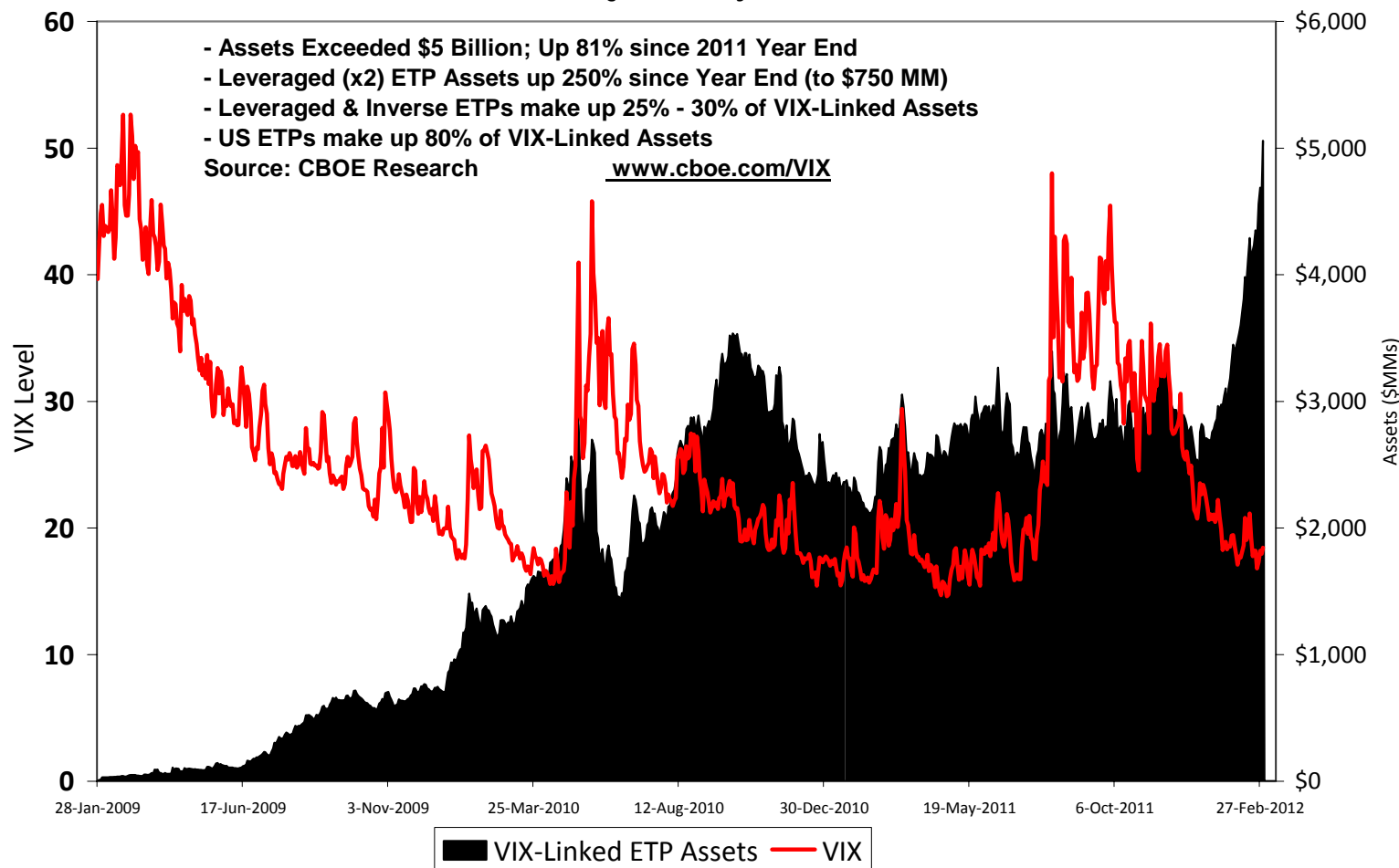
ETPs Based Outside the U.S.

<u>Ticker</u>	<u>Name</u>	<u>Inception date</u>	<u>Mgt Co.</u>
1552 JP	Kokusai S&P500 VIX Short Term Futures Index ETF	12/20/2010	Kokusai Asset Management Co Japan
1561 JP	Kokusai S&P500 VIX Mid-Term Futures Index ETF	12/1/2011	
HVU CN	Horizons Betapro S&P 500 VIX Short Term Futures Bull Plus ETF	12/16/2010	BetaPro Management Inc/Canada
HUV CN	Horizons Betapro S&P 500 VIX Short Term Futures ETF	12/16/2010	
LVIX FP	Lyxor ETF S&P 500 VIX Futures Enhanced Roll - USD	3/14/2012	Lyxor Asset Management
LVOL FP	LYXOR ETF S&P 500 VIX Futures Enhanced Roll	4/26/2011	
VIXS E1	S&P 500 VIX Short-Term Futures Source ETF		Source Markets PLC
VOLT LN	Nomura Voltage Mid-Term Source ETF	4/15/2011	
VSXX IM	iPath VSTOXX Short-Term Futures Total Return ETN - Italian Listing	11/5/2010	Barclays PLC
VSXX LN	iPath VSTOXX Short-Term Futures Total Return ETN	9/24/2010	
VSXY LN	iPath VSTOXX Mid-Term Futures Index	11/1/2010	
VXIM GR	iPath S&P 500 VIX Mid-Term Futures Index ETN	12/9/2009	
VXIS GR	iPath S&P 500 VIX Short-Term Futures Index ETN	12/9/2009	

VIX[®] Index and VIX-Linked ETP Assets

Global VIX-Linked ETP Assets

through February 29, 2012



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