



Has Volatility Reached a Permanently Low Plateau?

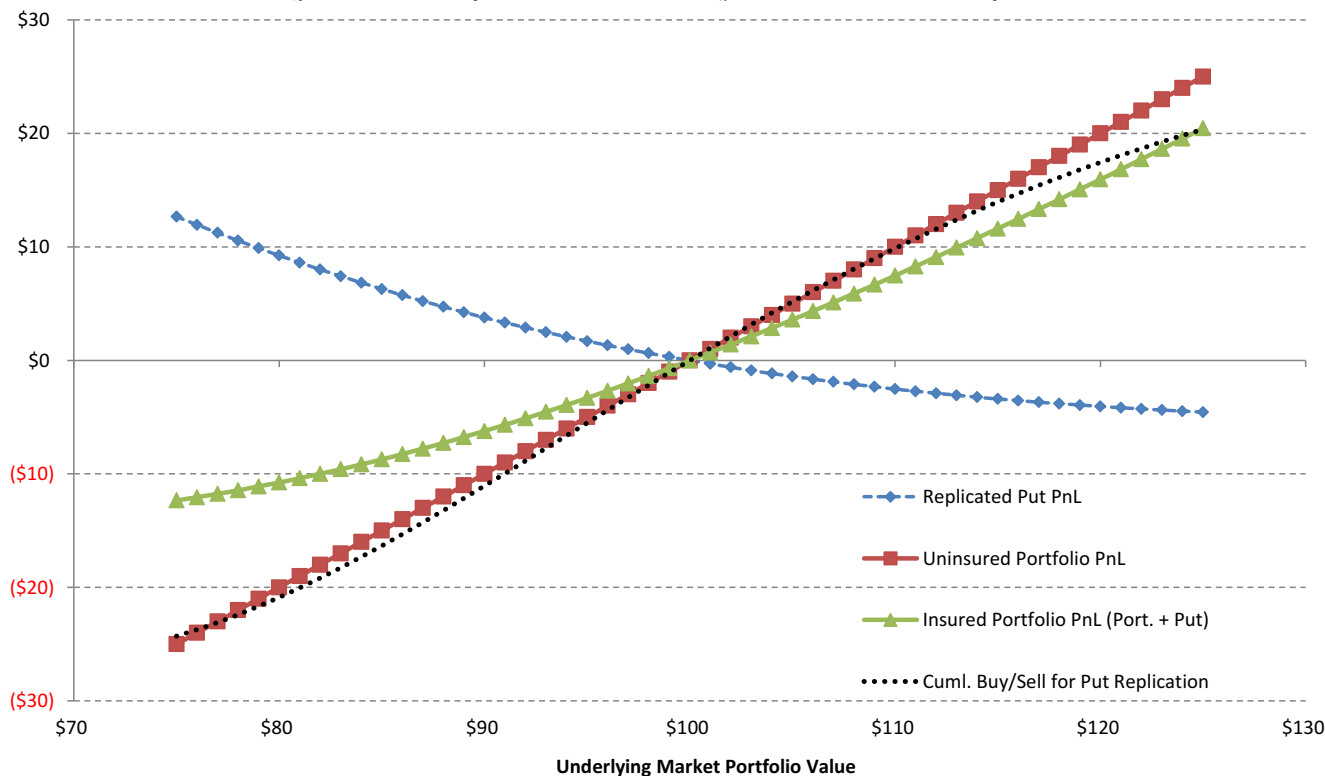
Frank Brosens

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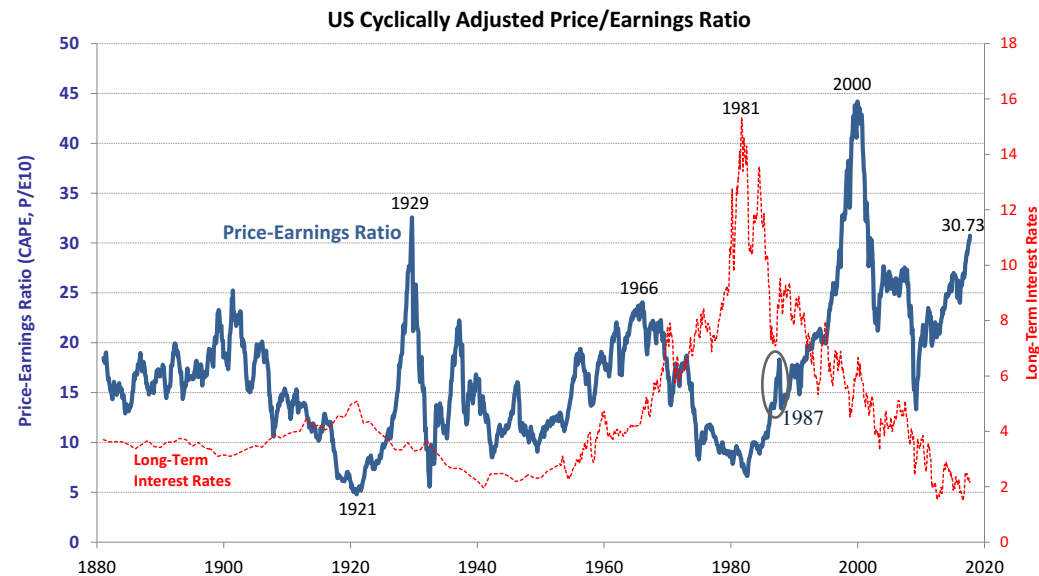
HOW DOES PORTFOLIO INSURANCE WORK?

\$PnL of Synthetic Put Replication

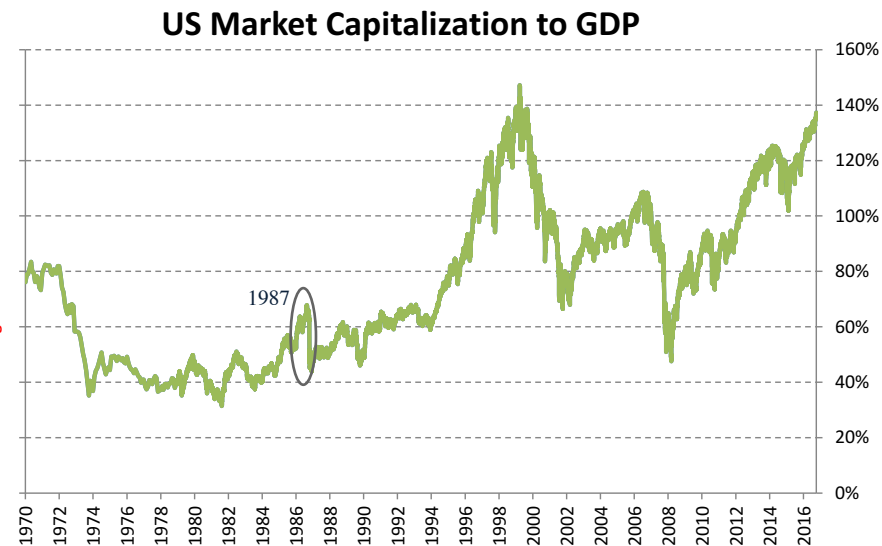
\$100 Portfolio, 2yr 10% OTM Put, Initial Hedge -\$30
Adjust futures position for every 1% move in the portfolio



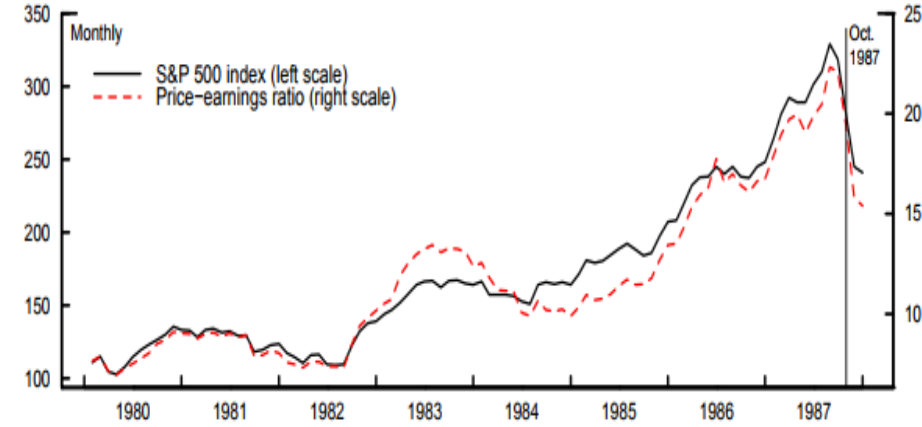
VALUATIONS THEN AND NOW



Source: Online Data by Robert Shiller
<http://www.econ.yale.edu/~shiller/data.htm>

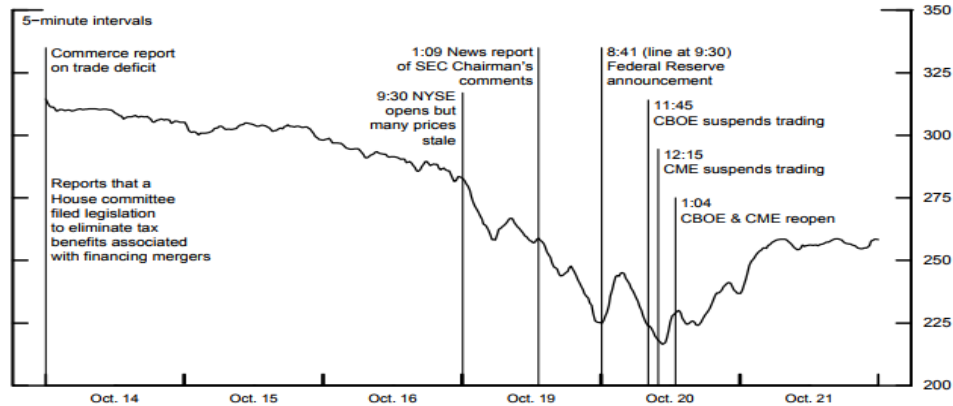


WHAT HAPPENED DURING THE 1987 CRASH?

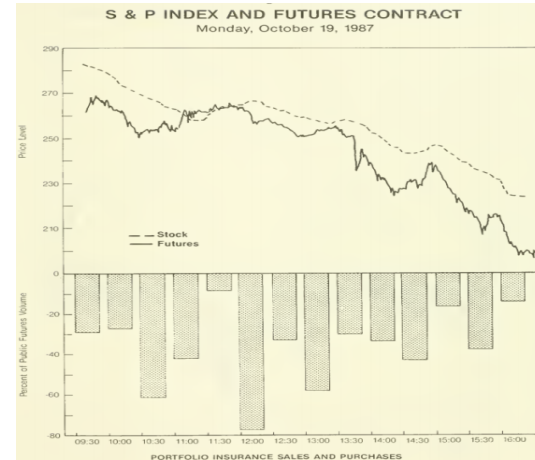
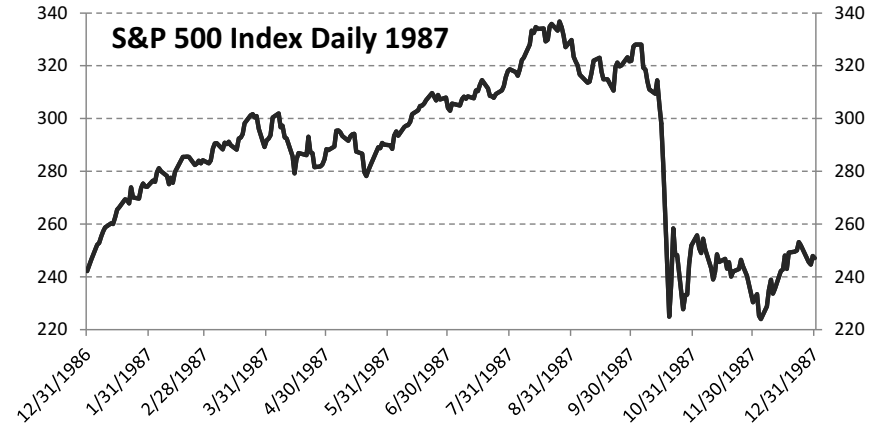


Source: A Brief History of the 1987 Stock Market Crash with a Discussion of the Federal Reserve Response (Carlson, 2013)

S&P 500 index around the time of the crash



Source: A Brief History of the 1987 Stock Market Crash with a Discussion of the Federal Reserve Response (Carlson, 2013)



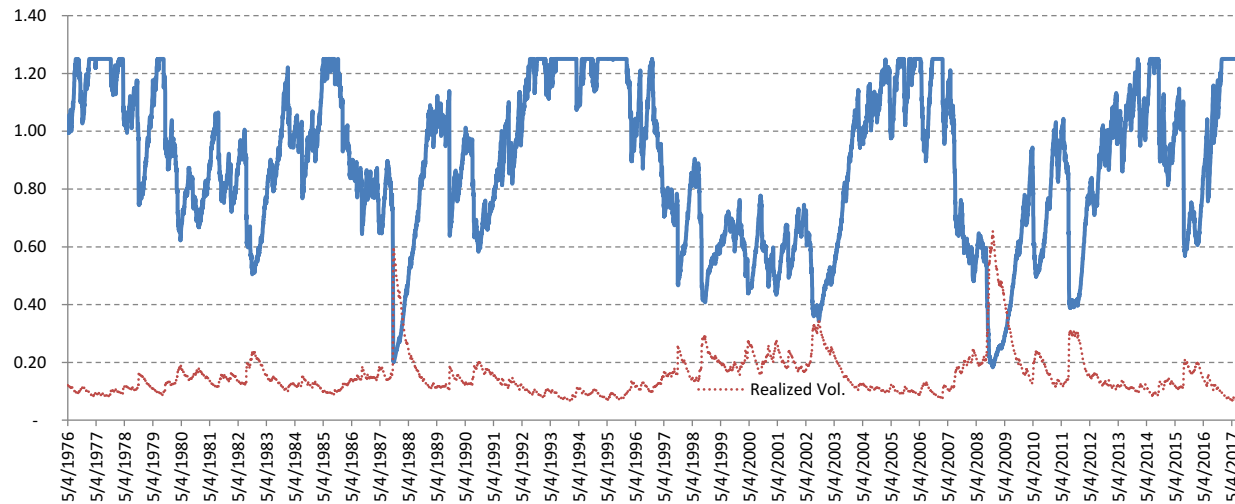
Source: Report of the Presidential Task Force on Market Mechanisms (Brady Report, 1988)

Strategies Similar to Portfolio Insurance Today

Volatility Targeting

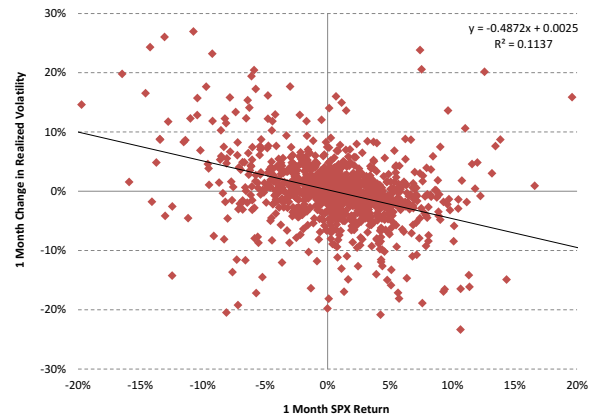
Tendency for Leverage to Decrease as Market Drops & Volatility Rises

Vol. Targeting Leverage Ratio (SPX, 12% Target, 1.25 Cap)

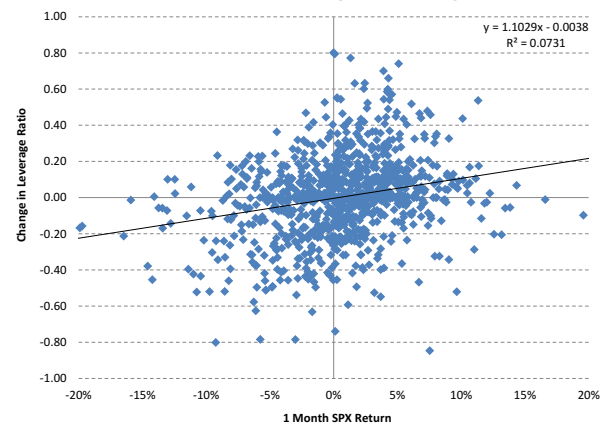


* 1-2 month half-life used for realized volatility

SPX Returns vs. Realized Volatility



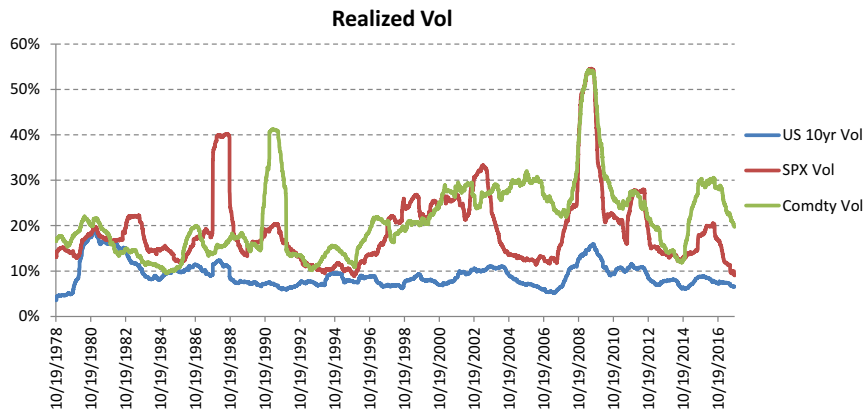
SPX Returns vs. Change in Leverage Ratio



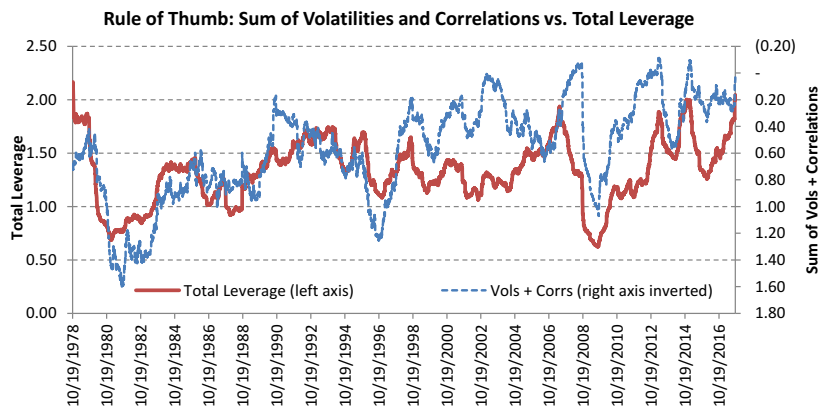
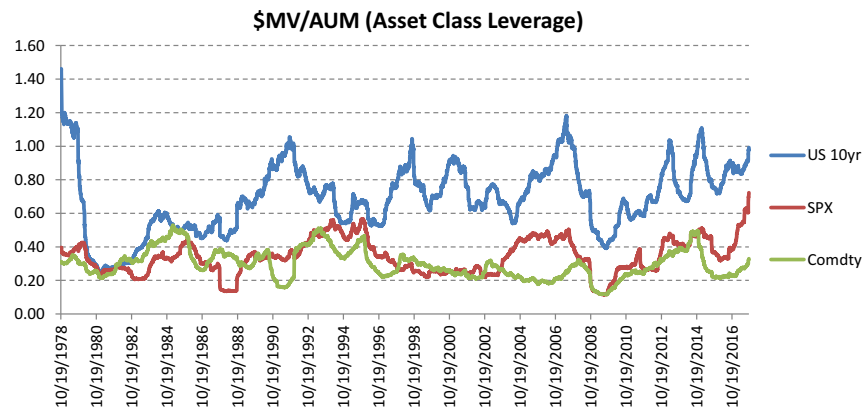
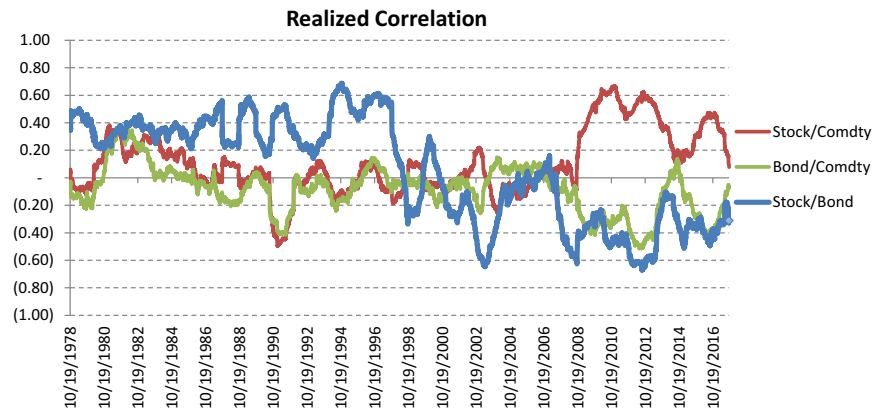
Strategies Similar to Portfolio Insurance Today

Risk Parity

Tendency for Leverage to Decrease as Market Drops & Vols (and Possibly Correlations) Rise



* 1 year lookback used for volatility & correlation statistics

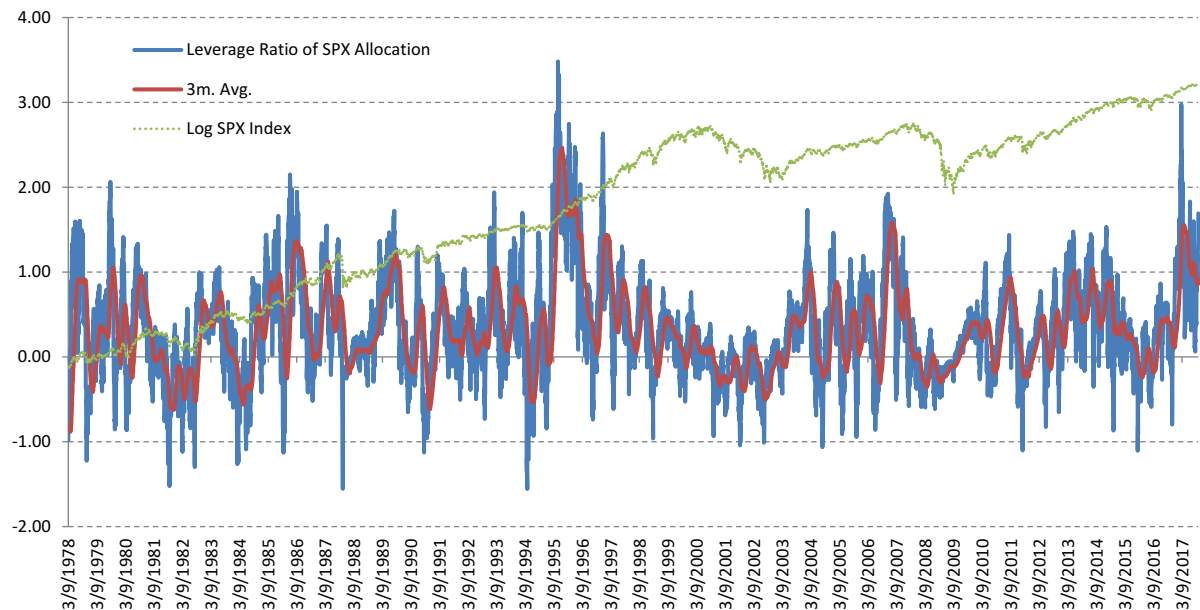


Strategies Similar to Portfolio Insurance Today

Trend Following CTAs

Equity Exposure Decreases and Eventually Goes from Long to Short as Market Drops

Leverage Ratio of SPX Allocation in CTA Model



* 1-4 month momentum signal, risk adjusted by recent volatility

SPX Returns vs. Change in Leverage Ratio of SPX Allocation

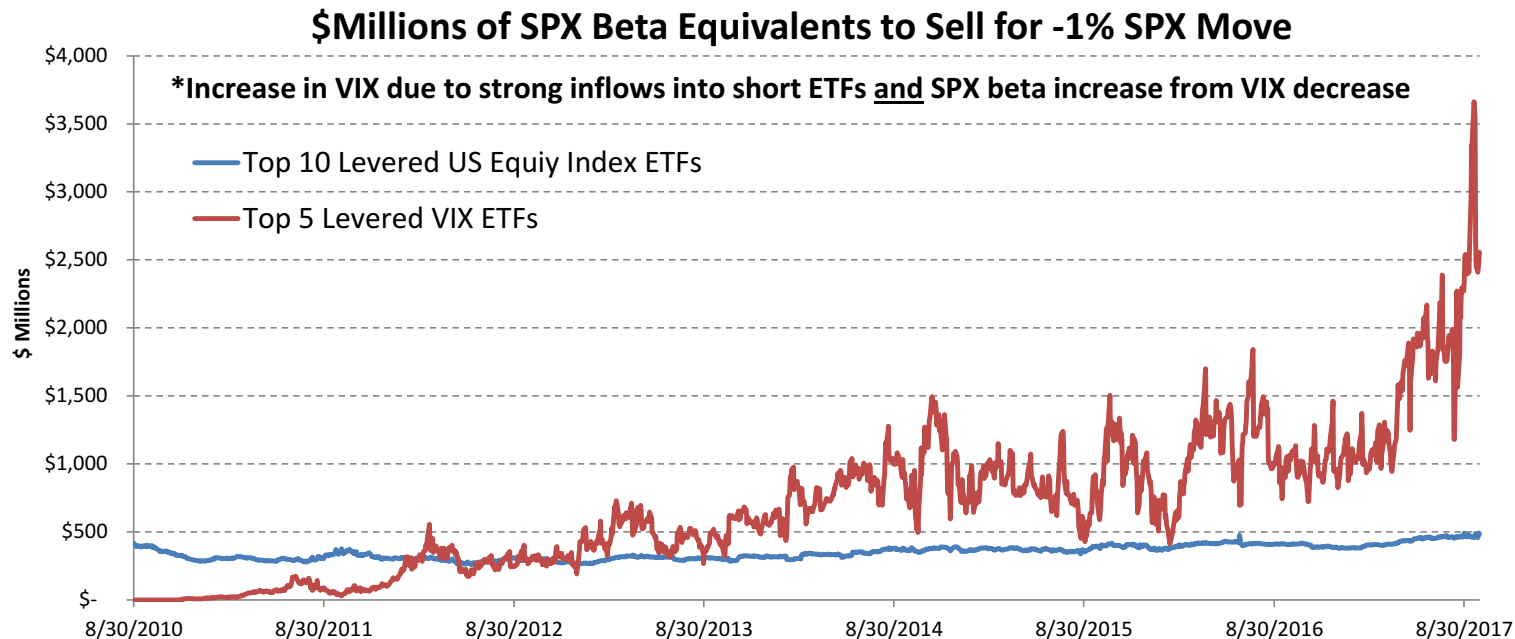


Strategies Similar to Portfolio Insurance Today

Daily Levered Equity Index and VIX ETFs

\$100 AUM Example	End of Previous Day			End Day Before Rebalance				Rebalance at Close	
Fund Type	Index Level	AUM	Net Assets Owned	Index Level	Net Assets Owned	\$PnL	AUM	\$Trade	Net Assets Owned
2x Long Fund	100	\$100	\$200	95	\$190	(\$10)	\$90	(\$10)	\$180
1x Short Fund	100	\$100	(\$100)	95	(\$95)	\$5	\$105	(\$10)	(\$105)

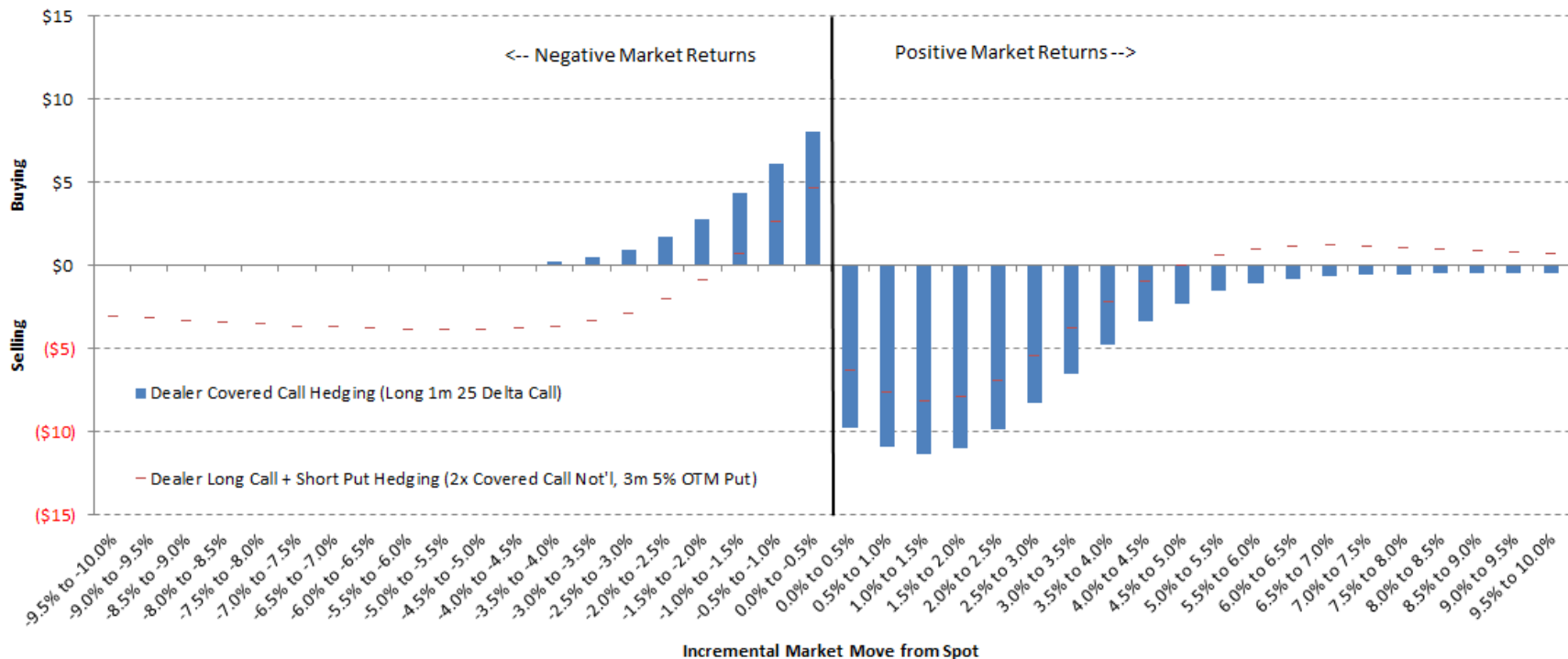
For 2x long and 1x short, funds need to buy/sell 2x percent of AUM for every percent move in Index to achieve Assets = Leverage (-1 for short) x AUM at close



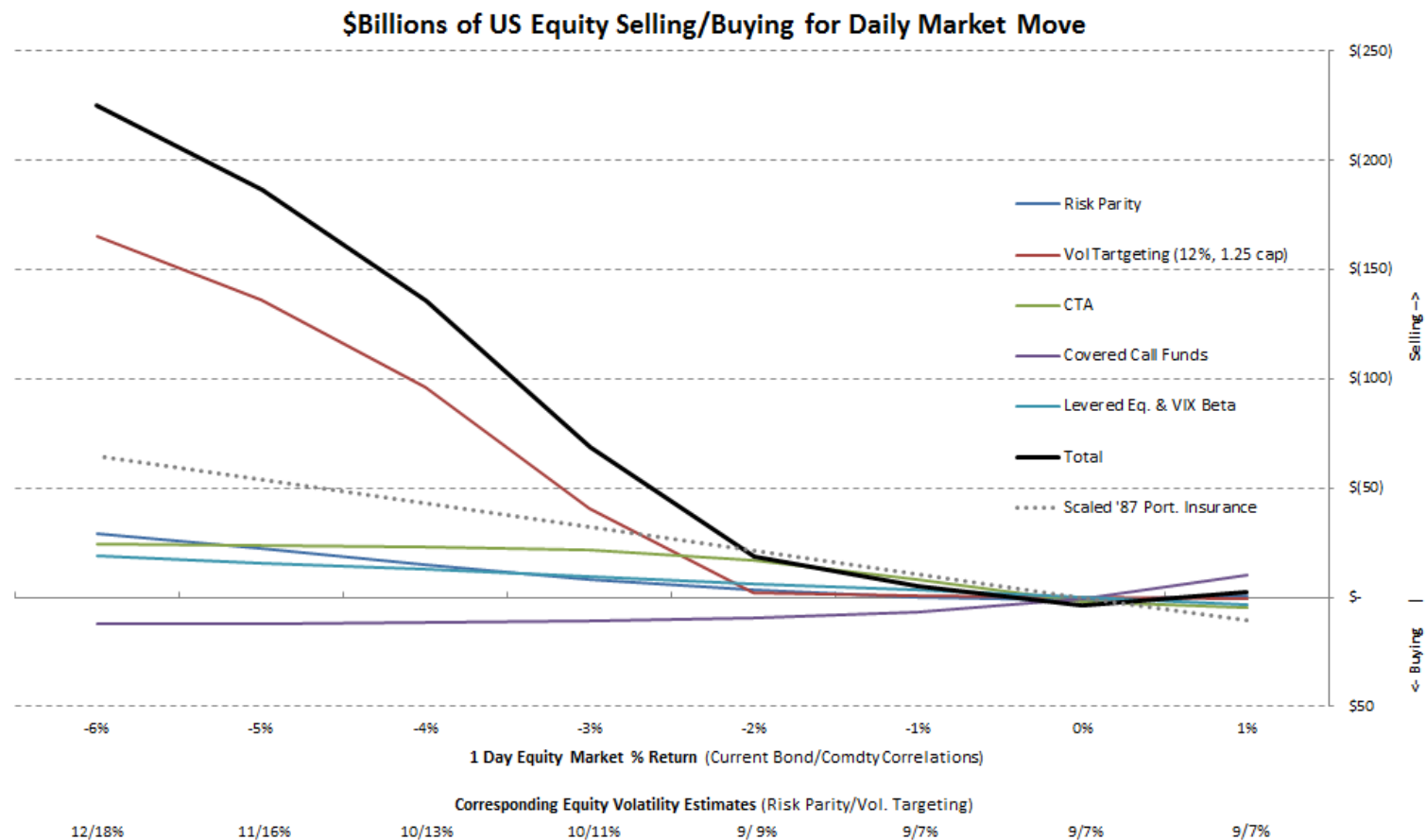
Dealer Option Positioning

Illustration Based on Covered Call Fund Positioning & Hypothetical Dealer Put Positioning

Dealer Buy/Selling For \$100 of Covered Call AUM per 50bp Moves in Index



ESTIMATED COMBINED SELLING IN MARKET DROP



HAS VOLATILITY REACHED A PERMANENTLY LOW PLATEAU?

