

Tuesday Talks: Market Structure and the Recent Meltdown

April 7th, 2020



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Featuring Dr. Hari P. Krishnan

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Biography

PhD

Dr. Hari P. Krishnan is a portfolio manager at Doherty Advisors in New York, responsible for the VXR (VIX replication strategy) and hedging solutions business. He was formerly a fund manager at CrossBorder Capital in London, with an emphasis on volatility and systematic currency strategies. Dr. Krishnan was an executive director at Morgan Stanley from 2001 to 2007, specializing in asset allocation across hedge funds, private equity and traditional asset classes. He was also an options trading strategist for a market making firm at the CBOE and a senior economist at the Chicago Board of Trade. He holds a PhD in applied math from Brown University, was a research scientist at the Columbia University Earth Institute and is the author of a book on extreme event hedging, published by Wiley in 2017.



Fault Lines for a Market Crisis

What To Do After
a Crisis Hits

Identifying Pre-Conditions
For a Crisis



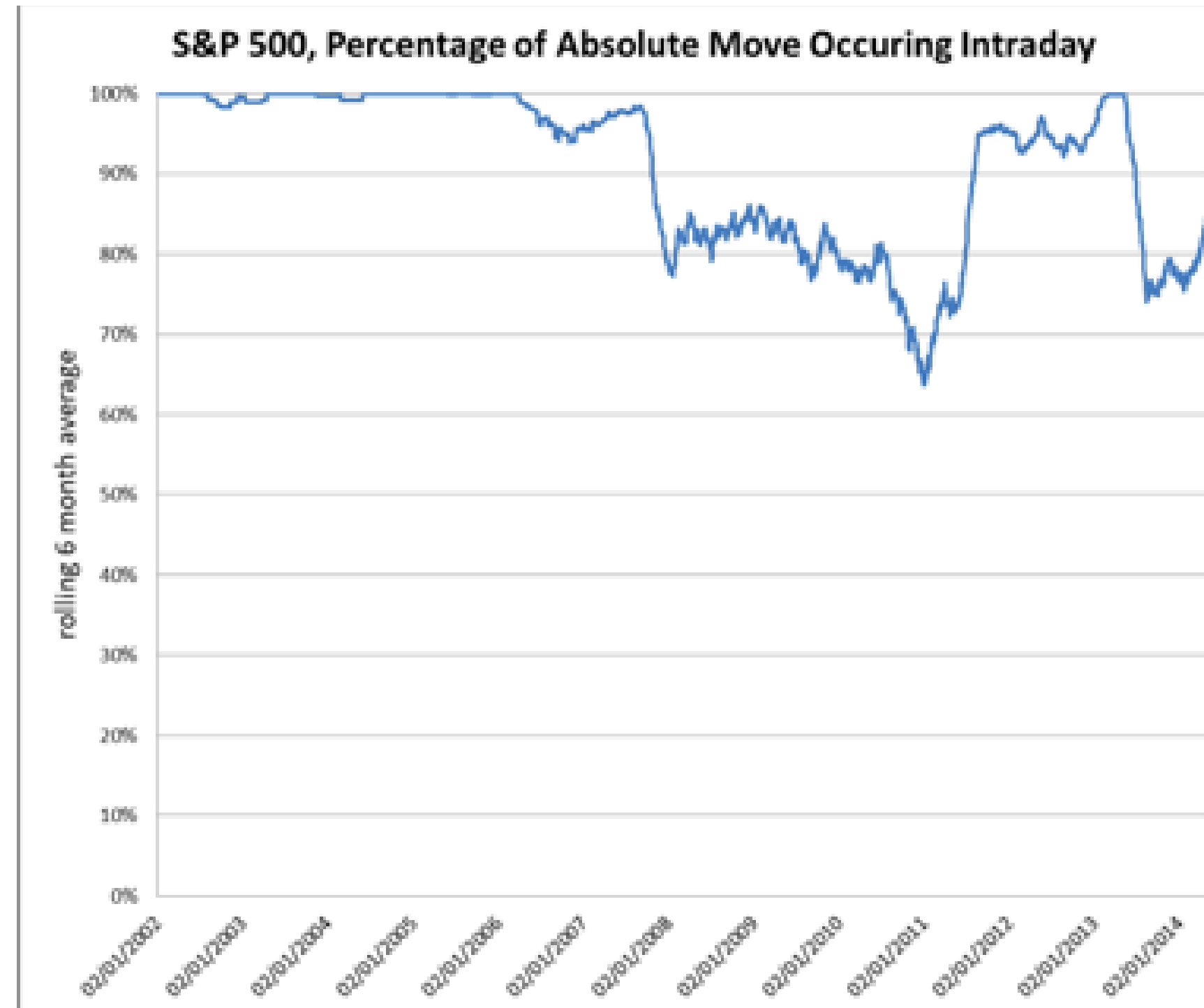
Market Tremors

(work in progress)

Equity Indices

Harder to Trade from a
Fundamental Perspective

- The graph takes the absolute value of the return from yesterday's close to today's open and the absolute value of the return from today's open to today's close
- It then calculates the ratio of today's open to close return (absolute value) to the sum of the two terms above
- Clearly, more is going on overnight than previously
- The effect seems particularly dramatic during crisis and post-crisis periods, dominated by Central Bank interventions and synchronized selling across major economies

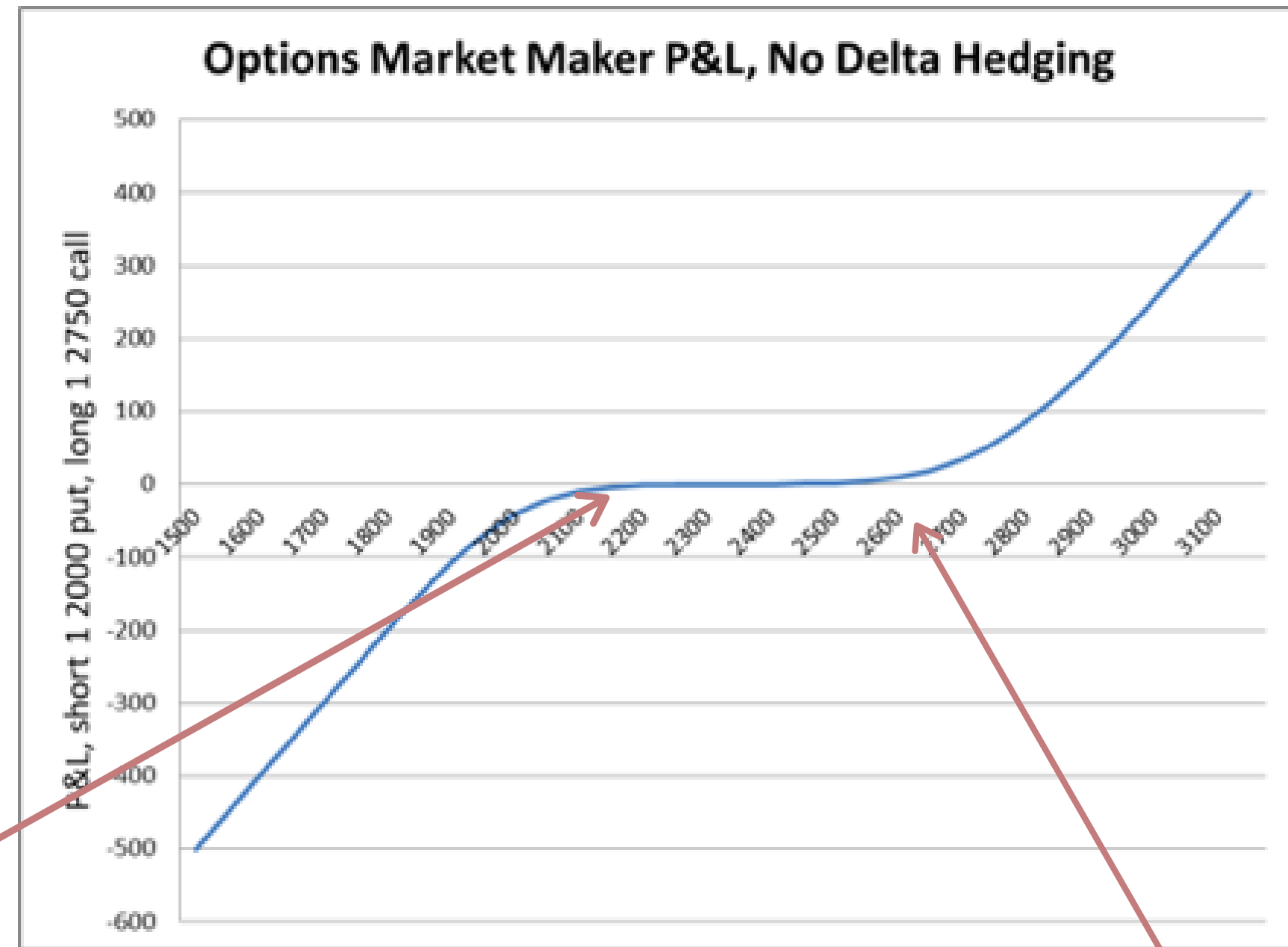


Default Market Maker Positioning

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- Institutional demand for “collar” type structures on equity indices
- Harvest income by selling calls, protect capital with downside puts
- Self-financing requires further OTM puts than calls
- Market makers take other side of position
- Need to rebalance hedges aggressively near convex, high “gamma” zones



MMs short gamma, hedging is destabilizing

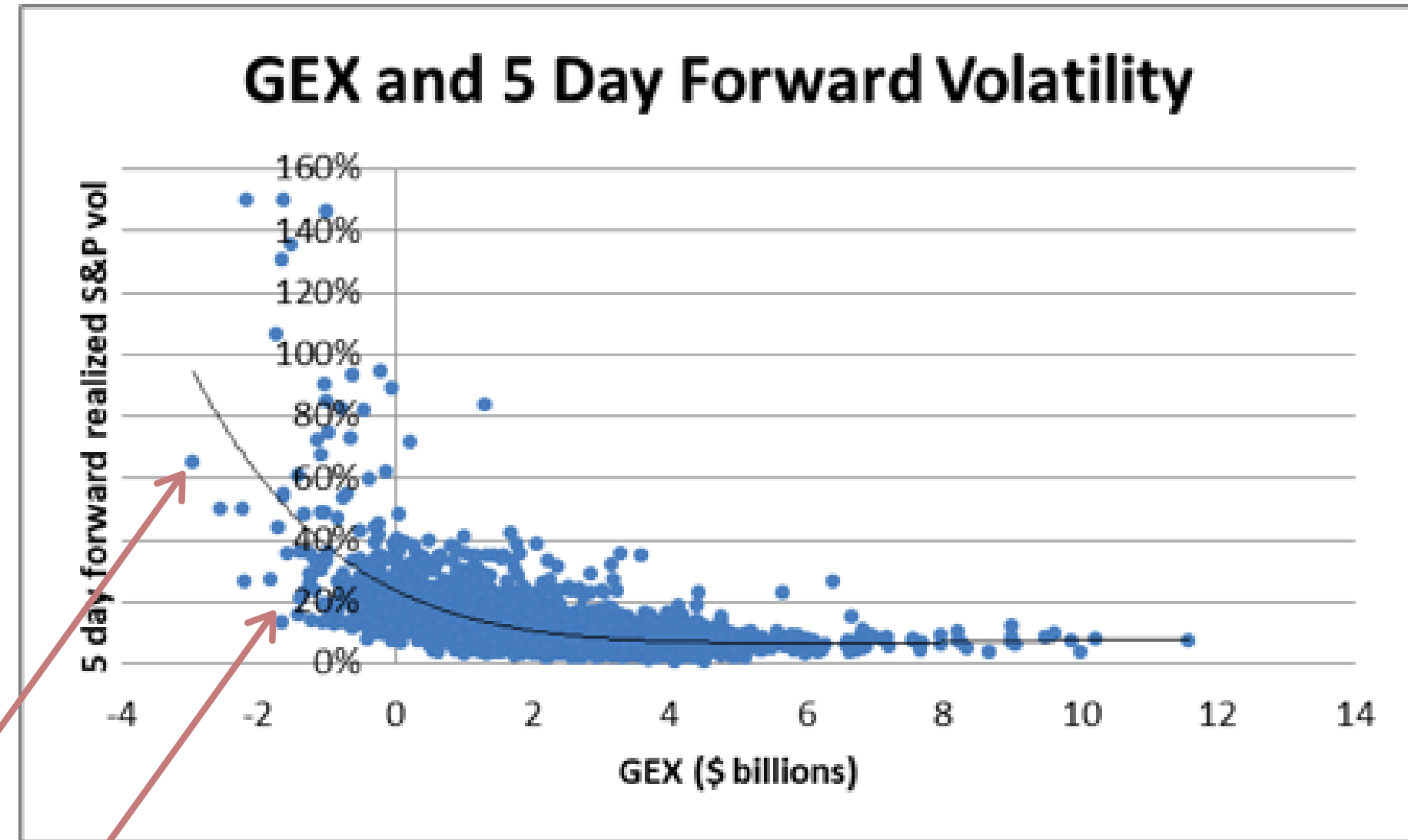
MMs long gamma, hedging compresses volatility

GEX as Short-Term Vol Predictor

08



- At close of each trading day, multiply gamma at each strike by open interest at the strike
- Sum of these terms generates the GEX index
- GEX high and positive: MMs stabilize price action
- Negative GEX: MM delta hedging exaggerates up and down moves



February 27, 2020

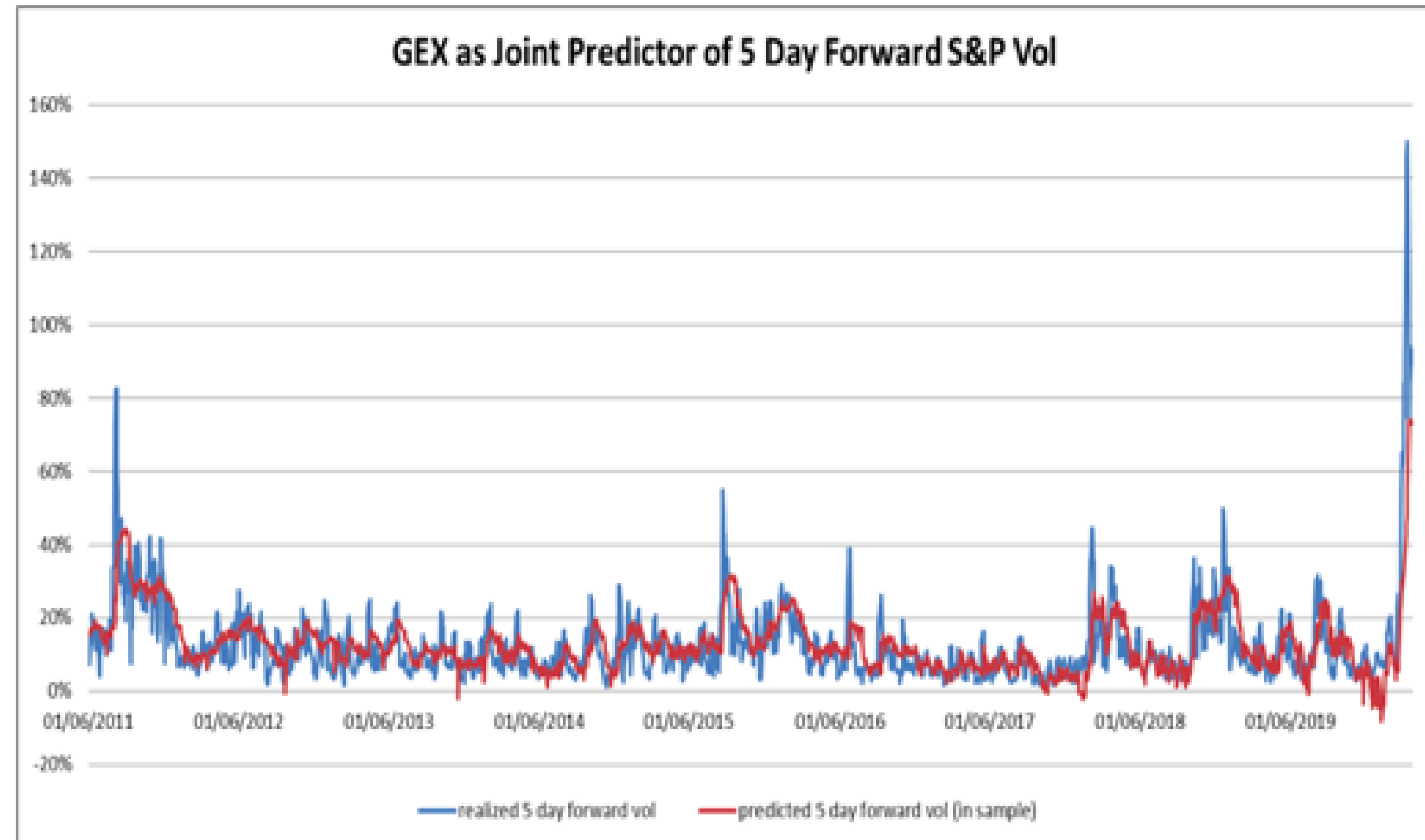
December 17, 2018

Data: www.squeezemetrics.com
Yahoo! Finance

2 Factor Regression Results



- Graph predicts 5 day forward realized S&P volatility with 2 factor regression against 1 month trailing S&P volatility and GEX
- GEX and S&P trend are correlated, so factors are not independent
- However, GEX significantly improves explanatory power over trailing 9 year horizon

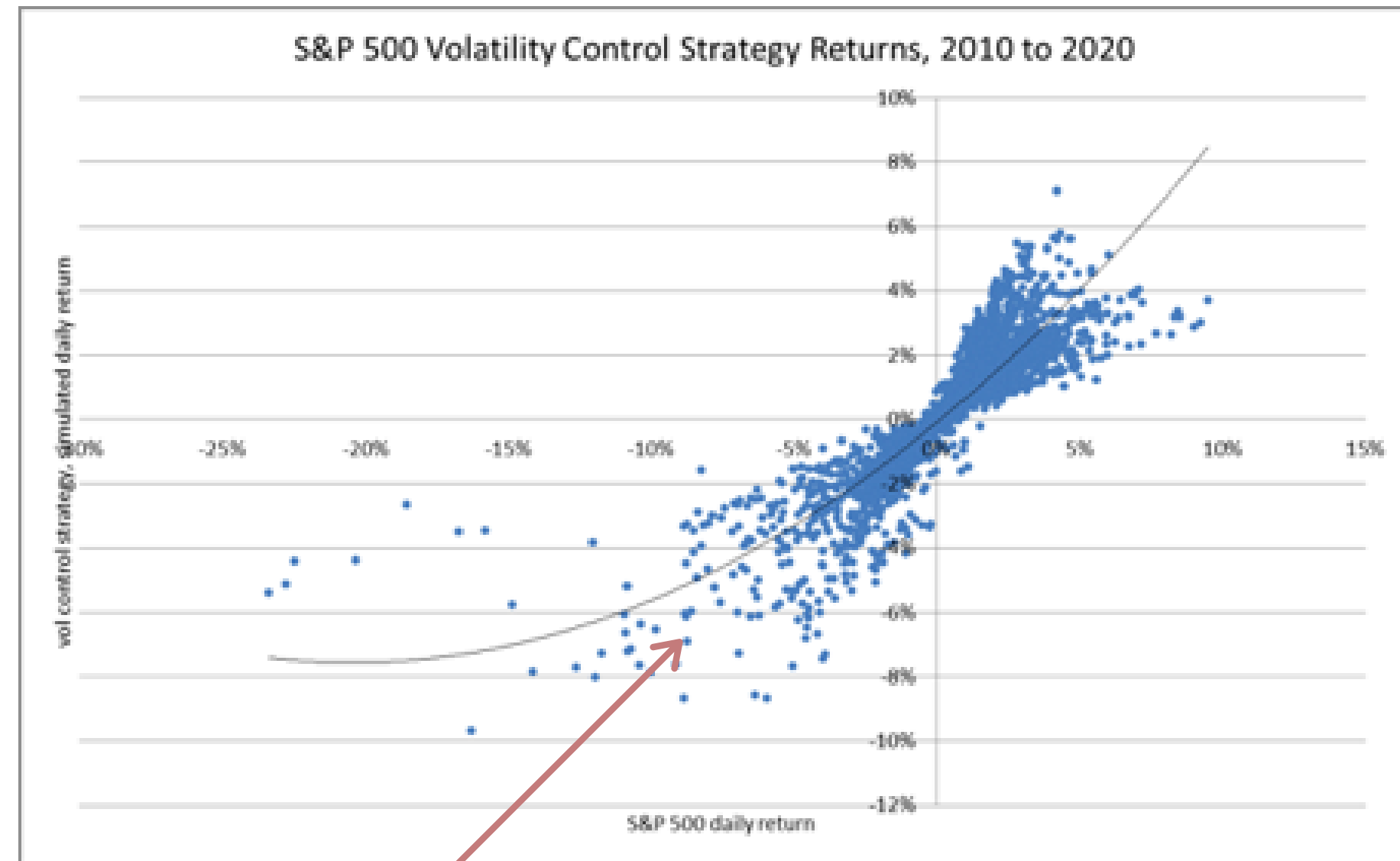


Data: www.squeezemetrics.com
Yahoo! Finance

Volatility Control Funds

Analogy with
Portfolio Insurance
Strategy

- Volatility control funds have been increasingly popular to pensions and insurance companies over time
- Historically, they appear to offer relatively high quality returns when applied to equity indices
- As we'll see, trend followers have increasingly applied risk budgeting techniques to their strategies
- However, vol control can be highly destabilizing to the market, amplifying selling pressure during liquidations



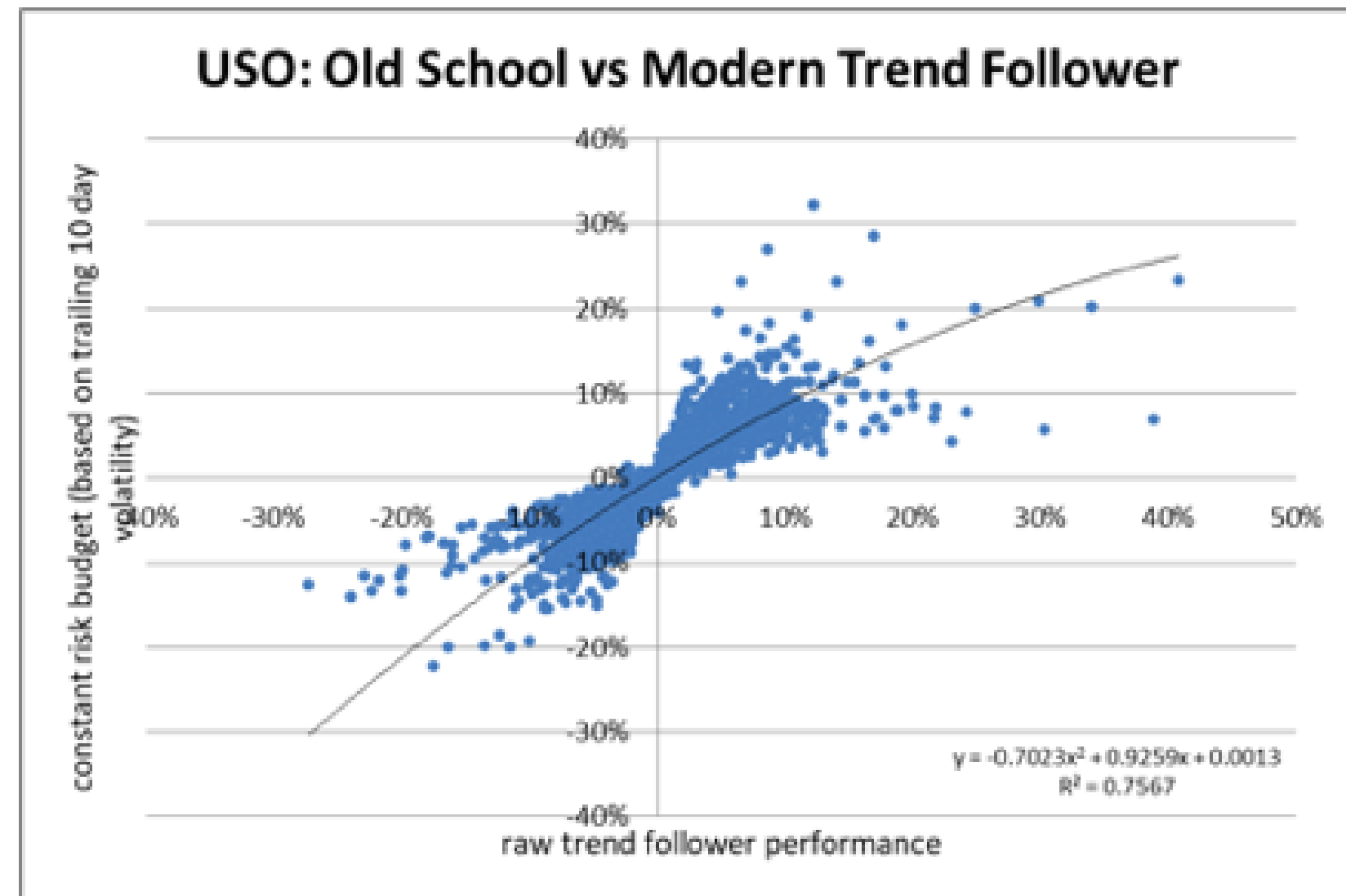
Heavy selling required as S&P drops
and more directly, realized volatility spikes

Data: www.squeezemetrics.com
Yahoo! Finance

CTAs

Risk Budgeting Reduces
Protection During
Extreme Market Conditions

- Volatility sizing can improve performance for equity indices and other risky asset classes
- However, it reduces the positive skewness (i.e. the probability of large positive return surprises) of trend following returns in commodities
- This can dampen the contribution of CTAs during periods of extreme volatility with a directional trend
- CTAs should be a staple part of the institutional investor's portfolio; proper portfolio construction and understanding the CTAs role in the portfolio over the long run is nuanced and critically important.



Data: www.squeezemetrics.com
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