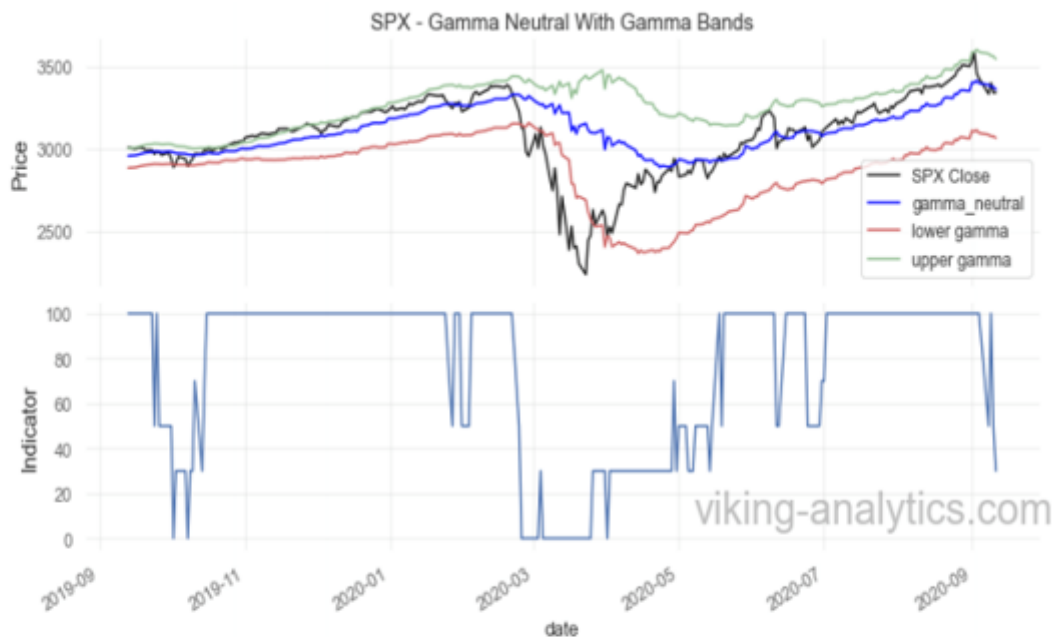


Viking Analytics: Weekly Gamma Band Update 9/14/2020

We are happy to share the Weekly Gamma Bands Update by Viking Analytics. The report uses options gamma to help you better manage risk and your equity allocations.

Gamma Band Update 09/14/20

- From an options market analysis perspective, we view the SPX to be at an important inflection point. Some of our indicators have turned cautious, while other options indicators remain bullish.
- As of Friday's close, the S&P 500 (SPX) is below Gamma Neutral.
- Since the SPX has higher volatility below Gamma Neutral, our indicator reduces SPX exposure to 30% out of 100%.
- Our model is also limiting exposure due to the negative slope of Gamma Neutral.
- **If the SPX closes on a daily basis below the lower band (currently near 3,070), our indicator will cut SPX exposure to 0%.**
- Our options Smart Money Indicator remains bullish, however, and we discuss that in greater detail below.

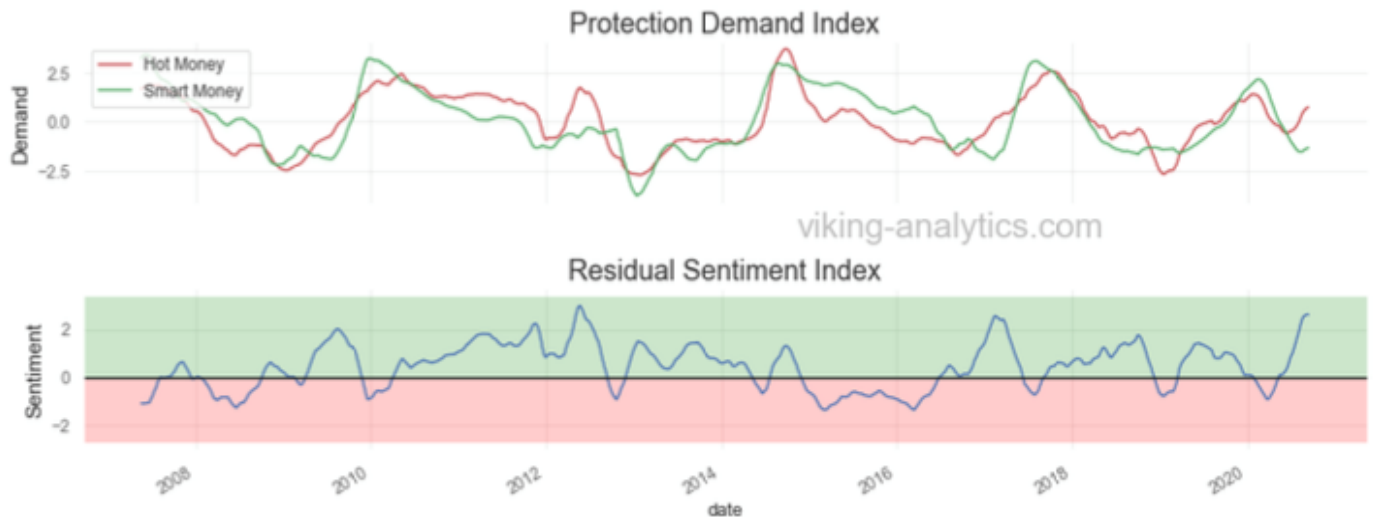


Date	Close	Upper Band	Gamma Neutral	Lower Band	Model Allocation*
08-28-20	3508.01	3521.20	3355.05	3078.14	100%
09-04-20	3426.96	3572.59	3397.15	3104.76	100%
09-11-20	3340.97	3532.51	3359.30	3070.63	30%

Smart Money Residual Index

We have developed another back-tested indicator that compares 'smart money' options buying versus 'hot money' options trading. Generally, smart money will purchase options to ensure stable returns over a longer-term. Smart money has in-depth knowledge and data in support of their options activity. In contrast, 'Hot money' acts based on speculation, seeking a large payoff.

Despite a lot of discussion about speculative call buying forcing market makers to buy stocks into the stratosphere, the overall data for SPX does not completely support this narrative. At the moment, hot money is more cautious than smart money. Accordingly, our indicator views this as generally bullish.



Gamma Band Background

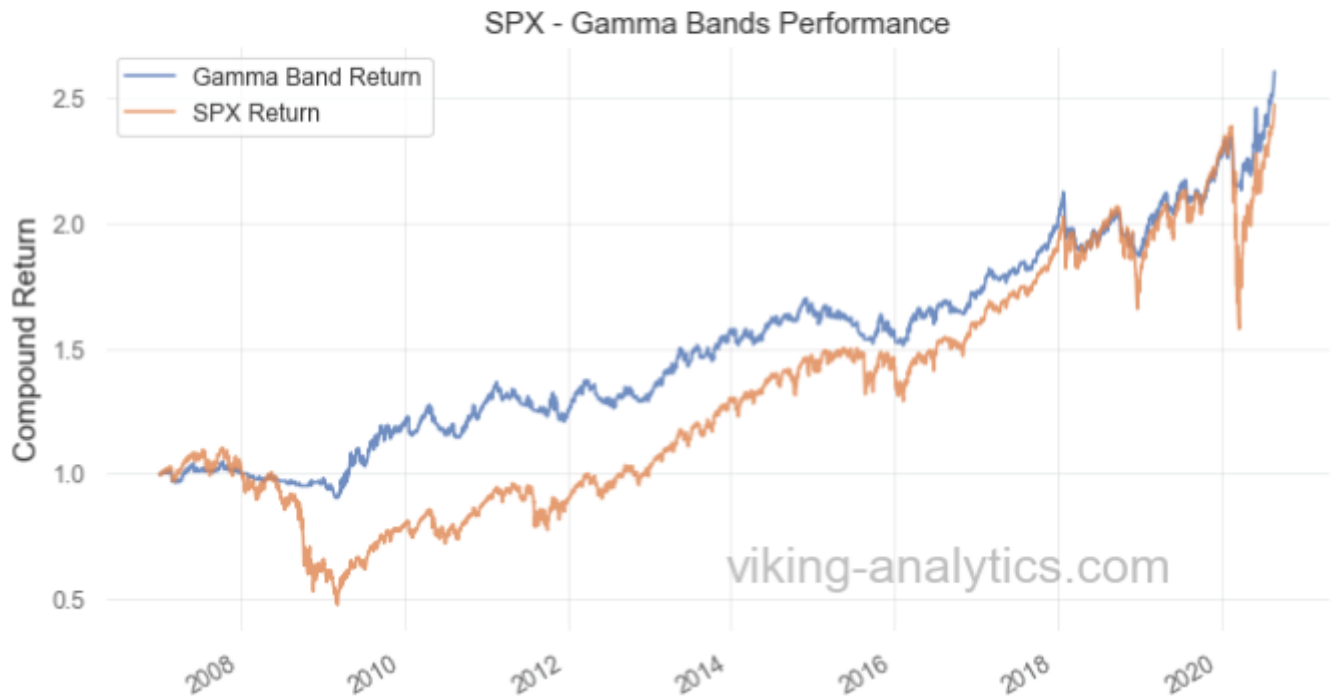
Market participants are increasingly aware of how the options markets can affect the equity markets in a way that can be viewed as the 'tail wagging the dog'.

We created a simple [Gamma Band indicator](#) to demonstrate the effectiveness of the Gamma Neutral level in reducing equity tail risk. In our model, we compare the daily close of the SPX to the Gamma Neutral and Lower band levels to adjust our equity exposure allocation from 0% to 100%. This is a 'slow' but reliable signal if one's goal is to increase risk-adjusted returns. We also publish faster, daily signals in a portfolio model which we call Thor's Shield. Free samples of our daily SPX report and Thor's Shield model can be downloaded from our [website](#).

We back-tested this strategy from 2007 to the present and realized an 80% increase in risk-adjusted returns (measured by the Sharpe ratio). The annual volatility of this approach, versus a long-only position, falls from 21% to 10%.

	sharpe	kurtosis	annual_vol
Gamma Band Return	0.76	8.44	0.10
SPX Return	0.42	12.86	0.21

* Gamma Bands improve backtested Sharpe by: 80.2%



Authors

Viking Analytics is a quantitative research firm that creates tools to navigate complex markets. If you would like to learn more, please visit our [website](#), or download a complimentary report.

Erik Lytikainen, the founder of Viking Analytics, has over twenty-five years of experience as a financial analyst, entrepreneur, business developer, and commodity trader. Erik holds an MBA from the University of Maryland and a B.S. in Mechanical Engineering from Virginia Tech.

Rob McBride has 15+ years of experience in the systematic investment space and is a former Managing Director at a multi-billion dollar hedge fund. Furthermore, he has deep experience with market data, software, and model building in financial markets. Rob has a M.S. in Computer Science from the South Dakota School of Mines and Technology.
