# Volatility Risk Premium: New Dimensions

Section 2: the starting point is to discover the primary drivers of option returns.

* Naked option return => driven by underlying return
* Delta-hedged option return => driven by volatility
* PCA demonstrates the existence of “VRP”

Section 3: pros and cons of following major strategy

* Cross-Market replication
* Market timing
* Buying tail options

Q: what are these strategies?

Section 4: First approach to improve VRP strategy – “modelling of P-distribution”

* Mean Estimation
* Variance estimation
  1. Multivariate risk factor model
  2. Regime-dependent GARCH Model
  3. Event-specific volatility model
* Describe the higher moments of P-distribution model for “VPR”
* Thorough assessment of comparison between “VRP forecast” vs. “benchmarks”.

Q1: what is the P-distribution?

Section 5: Second approach to improve VRP strategy – “Description of Alternative delta hedging”

* Description of Alternative delta hedging
  + Grid-search
  + Moving averages
  + Break outs
  + Expected returns
  + Modified version of Whalley & Wilmott
* These methods are tested under both simulated and real market data.

Q2: what is the alternative delta hedging?

Section 6: Uncover new “VRP” strategy

* Fine tuning of signal
* Add alternative delta hedging to the mix
* Deal with timing via different signals
  + Global Sentiment Indicator
  + Long-term volatility reversals
  + Near-term volatility changes

Q3: what’s logic between Section 6 and former sections?

Q4: what are different signals ?

Section 7: Conclusion

Dataset :

As such, our analysis covers all 4 asset classes: equity indices, commodities, currencies, and global Treasuries. We look at options in the S&P 500, Eurostoxx 50, Nikkei 225, Bovespa, EUR/USD, USD/JPY AUD/USD, USD/BRL, Gold, WTI, Corn, Copper, 10Y US Treasuries, 10Y Bunds and 10Y JGBs. While their liquidity characteristics are distinctly different, each should represent a regional hub inside the asset class and allows us to understand the volatility premia more holistically.

The standardization went as follows:

* we took daily returns of each option for a given market and divided by its 1-year volatility.
* We then estimated the PC1 loadings using a correlation matrix with 5 years of daily data and calculated the most recent PC1 value from the loadings.
* We repeated the exercise daily.
* We then averaged the PC1 values for each asset class and plotted the cumulative values.