Financial time series project (Group 4)

GAMMA EXPOSURE (GEX) BASED TRADING STTATEGIES

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Objective:

Gamma is the rate of change of an option's delta for each change of one point in the underlying, which is the first derivative of delta. The share impact of that prospective change in delta on a market-book maker's must be determined in order to compute the GEX of an option. Our objective with this project is to forecast Gamma Exposure (GEX).

Background:

The need for option dealers' (market makers') re-hedging activities ultimately drives the predictive capability of GEX. An option market-maker must minimize his exposure to deltas in order to reduce risk and realize profit.

As no two market-makers' books are identical, the main flaw in utilizing option pricing to predict future volatility is that a narrow spread from one market-maker entirely masks the risk tolerance of all the others. The GEX of options that are known to be in circulation can be calculated, and future return distributions can be derived from the historical market effect of such contracts.

Proposal and modeling approach:

We'll download the data from the official website of CBOE. To find the zero-gamma exposure, we also need to find the total gamma exposure for both summon and drop.
We calculate the gamma exposure (GEX) of each alert signal by multiplying the gamma values of each option for all calls and offers by their respective open interest. After that we multiply them by 100 because each option represents 100 shares.
We can compare the GEX calculated using the formula and try to fit an ARIMA or ARIMA-GARCH model to this data. Forecasting GEX can provide a better tool for hedging (for market-makers) and we can develop a trading strategy based on this.