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Quantifying Security Volatility and Volume and IV-Based Momentum Options Pricing and Stagnation

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Abstract
Increased volatility in the financial technology sector can give exposure to possible alpha in gamma scraping. By observing when the price of an option is stagnant on a shorter time frame while the same security has less than average volume or liquidity whereas the actual stock price had somewhat more movement or volatility, IV arbitrage can be found and predicted. Another sector that can be analyzed are securities that have a high percentage of retail ownership or retail volume.

Introduction
Finding opportunities for gamma scraping will be observed on more volatile securities, particularly those in the financial technology sector. We can evaluate which securities to use based on holdings in Fintech ETFs, such as $ARKF, $FINX, and others. The main security that will be analyzed in this proposal is $SOFI.

Strategy Overview
This strategy would count as low frequency overall but it would require real time LII orderbook data. Because the options that we will be considering may already have more expensive options chains (increased base IV), we can consider the other greeks and also try to do our own forecast and calculation of near-future IV. After using an algorithm to recognize options that have a stagnating price, possibly lower delta and IV that we may recognize as priced in or maybe stagnating in relation to the overall volatility of the security, or the inverse, we could purchase calendar spreads, butterfly spreads and its variations, straddles, and other options strategies that are able to capitalize off of an increase or decrease of IV.

Factors to Consider
Security price, historical security price, volume, volatility of security, option strike price, vega, delta, gamma, lambda, vomma, zomma, IV, HV. There are possibly more factors such as second/third derivative greeks, but these are the initial ones to be considered for now. There's a lot of nuance that I have (not) calculated that comes with using these factors, calculating our own, and weighting importance/accuracy for use in our strategy.

Basis of Hypothesis
Unfortunately, I wasn't able to gather enough data and write scripts to get a general idea of if there is past performance. Instead, I will explain the basis of the strategy. Given that an option is stagnant in pricing and volume, it would imply a stagnant stock price. We can observe the correlation of this happening

through the greeks. Normally, IV would price-in the expected future volatility of a stock that is more volatile, even when the price is not moving at the moment. This strategy aims to find moments where we believe IV is not priced properly, or when there are temporary changes in IV that we determine are statistically advantageous. This can happen whenever there is a large imbalance of volume between the underlying security and its options, or if there is a large amount of retail trading activity with a lack of market-makers. This strategy is similar to many other gamma-scraping/IV arbitrage strategies, so using a small spin/looking at different factors to predict opportunities will be the main focus and the hardest part of this strategy.

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