Implied Volatility Spread, Options’ Greeks and the Cross-Section of Stock Returns

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Abstract
This paper examines the relation between the information contained in the three first Greeks of options - Delta, Gamma, and - and the pricing of stocks. More precisely, I sort the cross section of US equity stocks on a Probability Adjusted Implied Volatility Spread (PAVS). As defined in the difference between the ratio Delta/Gamma of a zero-delta straddle strategy. I show that a zero-cost trading strategy on this measure provides statistically significant average monthly returns. This measure improves the spread from the deviation of the Put-Call parity of Cremers and Wei nbaum (2010) as it implicitly re- solves the probability distribution of stock returns, contained in the option pricing model, to get the views of market participants about future stock prices.

The Paper in a Nutshell
A spread on the ratio Delta/Gamma between an ATM call and ATM put (30-day maturity) has stronger monotonic relationship with stock returns than a spread between the implied volatility of an ATM call and ATM put (Bali and Hovakimian 2009, Cremers and Wei nbaum 2010), i.e. 6.6% vs 9.1%. The monotone relationship test follows the empirical evidence of up trends in sorting stocks on PAVS. Findings are not persistent when sorting stocks on VS.

Option Metrics and the Overnight Bias
A possible concern is the non-synchronicity between OptionMetrics and CRSP stock price quotes: option markets close two minutes after the underlying stock markets until 2008 in OptionMetrics. To mitigate the look-ahead bias, the purchaser and seller of stock trade at the opening of trading on the day after the option signal is observed, thus ignoring the first overnight return.


Data
OptionMetrics and CRSP/Compustat

Empirical Evidence
Monotonic Relationships
Significant evidence of up trends in sorting stocks on PAVS. Findings are not persistent when sorting stocks on VS.

Spanning Regressions
Estimations of the spread from the PAVS decile portfolios over the VS remains significant for value-weighted portfolios (t-stat>3.81).

Transaction Costs
The spread remains also significant after accounting for transaction costs (CW t-stat>2.28, EW t-stat>3.31). Transaction costs are computed following Hackbarth (2009) method and Novshek-Max (2015) application to complete the set of transaction costs for all individual stocks (euclidean distance between size and idiosyncratic volatility).

Additional Control Variables
BETA: One-Year regression based on daily data. The model is the FF-3 Factors model.
SIZE: log(Market equity)

Double Conditional Sort
First sort on VS, then a second sort on PAVS. With

Main Findings
My main results are easily summarized.

Forthcoming Research

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