Estimating Implied Volatilities Via Machine Learning And The Cross-Section of Option Returns*

Simon Fritzsch†
Universität Leipzig

Gregor Weiß‡
Universität Leipzig

June 29, 2020

ABSTRACT

We estimate conditional quantile curves of implied stock option volatilities using machine learning. We employ a new leveraged optimal quantization algorithm to quantify volatility mispricing in put options written on the constituents of the S&P 100. We find that a zero-cost trading strategy that is long (short) in the portfolio with low (high) implied volatility conditional on the options' moneyness and historical volatility produces an economically and statistically significant average monthly return. Using conditional quantile curves not only helps in distinguishing volatility mispricing from other effects, it also leads to returns that are higher than those reported in previous work on similar volatility strategies.

Keywords: Option returns, Implied volatility, Machine learning, Historical volatility, Volatility Mispricing.
JEL Classification Numbers: G11,G13,C14,C58,C45.

*Simon Fritzsch gratefully acknowledges financial support through a PhD scholarship by LBBW Asset Management, Stuttgart.

†Universität Leipzig, Wirtschaftswissenschaftliche Fakultät, e-mail: *fritzsch@wifa.uni-leipzig.de*.

‡Corresponding author: Universität Leipzig, Wirtschaftswissenschaftliche Fakultät, e-mail: *weiss@wifa.uni-leipzig.de*.