



An Artificial Neural Networks Approach in Estimating Implied Volatility

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Abstract

Implied volatility is a crucial indicator in financial markets, representing the market's expectations of future volatility and serving as a cornerstone for option pricing, risk management, and asset allocation. Accurate tracking and forecasting of implied volatility are essential for investors and portfolio managers aiming to optimize returns and mitigate risks. This paper explores the effectiveness of different modeling approaches for tracking the implied volatility of the S&P500 index, focusing specifically on a comparison of exponential autoRegressive conditional heteroskedasticity (EARCH), long short-term memory (LSTM) neural networks and Nonlinear autoregressive with exogenous input (NARX) models, both types of artificial neural networks. Our empirical study shows that the LSTM model improves our estimation over NARX model.

Keywords: Implied volatility, LSTM neural network, NARX model

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