Using the Prediction Error Criterion as a Selection Method in Forecasting Option Prices: A Simulation Approach

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Abstract

Degiannakis and Xekalaki (1999) compare the forecasting ability of Autoregressive Conditional Heteroscedastic (ARCH) models using the Correlated Gamma Ratio (CGR) distribution. According to the PEC model selection algorithm, the models with the lowest sum of squared standardized one-step-ahead prediction errors are the most appropriate to exploit future volatility. Based on Engle et al. (1993), an economic criterion to evaluate the PEC model selection algorithm is applied: the cumulative profits of the participants in an options market in pricing one-day index straddle options based on the variance forecasts. An options market consisting of 104 traders is simulated. Each participant applies his/her own variance forecast algorithm to price a straddle on Standard and Poor’s 500 (S&P500) index for the next day. Traders who based their selection on the PEC model selection algorithm achieve the highest profits. Thus, the PEC selection method appears to be a tool in guiding one’s choice of the appropriate model for estimating future volatility in pricing derivatives.

Keywords and Phrases: ARCH models, Forecast Volatility, Model selection, Predictability, Correlated Gamma Ratio Distribution, Prediction Error Criterion, Option Pricing.