

Post-Shock Volatility Forecasting Using Similarity-based Shock Aggregation

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Abstract

We develop a procedure for forecasting the volatility of a time series immediately following a news shock. Adapting the similarity-based framework of Lin and Eck (2021), we exploit series that have experienced similar shocks. We aggregate their shock-induced excess volatilities by positing the shocks to be affine functions of exogenous covariates. The volatility shocks are modeled as random effects and estimated as fixed effects. The estimates are then aggregated into a scalar quantity and used to adjust the GARCH volatility forecast of the time series under study by an additive term. The adjusted and unadjusted forecasts are evaluated using the unobservable but easily-estimated realized volatility (RV). Numerical simulations are provided to illustrate conditions and hyperparameters under which our method thrives. A detailed real data application for forecasting volatility after the outcome of the 2016 United States presidential election demonstrates the applicability of the method.

Keywords: Data Integration, Prospective forecasting, Risk reduction, Residual bootstrap, Cross validation

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