Minimizing post-shock forecasting error through aggregation of outside information

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Abstract

We develop a forecasting methodology for providing credible forecasts for time series that have recently undergone a shock. We achieve this by borrowing knowledge from other time series that have undergone similar shocks for which post-shock outcomes are observed. Three shock effect estimators are motivated with the aim of minimizing average forecast risk. We propose risk-reduction propositions that provide conditions that establish when our methodology works. Bootstrap and leave-one-out cross validation procedures are provided to prospectively assess the performance of our methodology. Several simulated data examples, and two real data examples of forecasting Conoco Phillips and Apple stock price are provided for verification and illustration.

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

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