

Improving AR-GARCH prediction

In finance and econometrics, there has been an explosion of papers analysing time series by adopting AR-GARCH-type models. Of crucial interest in this context is the ability of these models to forecast the return and volatility at time $t+1$ conditional on the available information at time t . The nature of the applications drives the choice of these models to be based on forecasting power rather than the ability to explain the data generation mechanism.

In this work we present a Bayesian modelling framework for multivariate AR-GARCH type models that utilizes a prior density placed on each ARMA-GARCH parameter in a way that it is possible to compute posterior probabilities that any subset of parameters across time series belongs to the same cluster. Within each cluster, the parameters are assumed to be exchangeable so the borrowing strength effect pools information for parameter estimation. This can be viewed as a model averaging or model mixing strategy that offers forecasts that take into account model uncertainty.

The benefits of the proposed model over existing methods are illustrated in a real case scenario when the prediction of returns and volatilities of the one hundred stocks of the financial index SP100 in day $t + 1$ are required.

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