Bayesian Analysis

Submission BA2006-004

Peer Review

Decision date: 2020-06-19 **Decision:** Reject

Comments to the author:

The manuscript describes a Bayesian sequential decision framework for identifying a structural break in a time series. The sequential decision problem minimizes the Bayes risk at each time t: after each new observation arrives, a new sequential problem is updated with using the posterior as the new prior, and minimizes a “forward” Bayes risk function using the available information. There is a wide literature concerning Bayesian analysis of change points and structural breaks in time series, starting perhaps from Barry and Hartigan (1993) A Bayesian Analysis for Change Point Problems, JASA. However, this submission only compares with frequentist CUSUM statistics. The use of a decision-theoretic approach is potentially of interest to our readership. However, the loss function (2.10) can be seen as a compound function of false positives and false negative contributions, once evaluated across \tau. Hence, I believe that the optimal Bayes rule can be expressed as a threshold on the posterior probability of the alternative hypothesis. See, e.g., Muller, Parmigiani, Rice (2006) FDR and Bayesian Multiple Comparisons Rules; see also Sun and Cai (2009) Large-scale multiple testing under dependence, JRSSB for a related (frequentist) discussion on dependent/temporal data. It would have been interesting if the manuscript had explored the relationships with these earlier approaches. In addition, the manuscript does not comment on the computational complexity of the proposed approach, and the simulations appear to be based on relatively simple data-generating mechanisms. It is also not clear if the approach extends to the case where multiple structural breaks are present. In short, my impression is that the manuscript - while providing a potentially interesting take to the detection of structural breaks in dynamic regression models, suffers from some major limitations with respect to the current state of Bayesian literature on the topic.

Report files

No report files.