JARS–**Quant** | Table 8
Reporting Standards for Studies Using Bayesian Techniques

Model

- Completely specify both the systematic and the stochastic parts of the analyzed model, and give the rationale for choices of functional forms and distributions.

Distributions

- Describe the prior distribution(s) for model parameters of interest. If the priors are informative, state the rationale for that choice, and conduct a sensitivity analysis to check the dependence of the results on the prior distribution.
- Describe the posterior distribution(s) for substantive model parameters and important functions of the parameters. If feasible, report the highest posterior density (HPD) interval for each parameter or function.
- Plot or describe the joint distribution if substantive parameters are correlated.
- If predictions are made for observable quantities, make available either the actual predictive distribution and parameter estimates, report summary statistics that describe the distribution, or provide a graphical summary.

Likelihood

- Describe the unnormalized or normalized likelihood if the prior distribution is informative.

Plots

- Include the prior distribution, likelihood, and posterior distribution in a single plot (i.e., a triplot) if the prior distribution is informative and plots are to be presented.

Decisions

- Report the utilities, or costs and benefits, and explain how they were derived if the data are used for decision making about possible actions. Also provide a sensitivity analysis for various prior distributions or assumptions about utilities for the decision.

Special Cases

- Explain the rationale for assuming exchangeability (or conditional exchangeability if there are covariates) for multilevel analyses. If relevant to the research context, present plots or tables of shrinkage-adjusted estimates and their confidence intervals.
- Report forest plots or caterpillar plots that include original and shrinkage-corrected estimates of effect sizes for each study with confidence intervals for meta-analytic summaries. If feasible for the analytic method, provide a parameter trace plot where shrinkage-adjusted estimates are shown against the standard deviation of the residual effects, combined with the posterior distribution of the residual variance.
- Describe the details of all decision rules, if these rules were decided (before or during the study), and the consequences (results) of each decision in adaptive designs.

Computations

- Describe in detail, including the number of chains, the number of burn-in iterations for each chain and thinning if Markov chain Monte Carlo (MCMC) or another sampling procedure is used. Specify the methods used to check for convergence and their results.

Model Fit

- Describe the procedures used to check the fit of the model and the results of those checks.

Bayes Factors

- Specify the models being compared if Bayes Factors are calculated.
  - Report the Bayes Factors and how they were interpreted.
  - Test the sensitivity of the Bayes Factors to assumptions about prior distributions.

Bayesian Model Averaging

- State the parameter or function of parameters being estimated in Bayesian model averaging. Either plot the distribution or list the mean and standard deviation if it is near normal; otherwise, list a number of percentiles for the distribution if it is not near normal.
- Describe how the models were generated and, if a reduced set was used for averaging, how the selection was made and which models were used in the averaging.

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