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EDITOR'S INTRODUCTION

Once Bayes' paradigm has been accepted as the appropriate tool for statistical analysis, it appears that one merely has to insert a particular prior and, given a likelihood function, Bayes' paradigm yields the posterior results. A direct extension of this approach yields predictive results as well. The advocated simplicity of the Bayesian approach is in contrast to classical estimation.

If matters were so simple, one can raise the question: 'Why are there relatively few applications of Bayesian statistical analysis?' There exist several reasons for this. Before inserting a specific prior in Bayes' paradigm, such a prior has to be formulated. This is far from trivial in most cases. Also, the computation of the posterior results is not straightforward in many models, in particular, in non-linear models. Further, verification of the plausibility of a Bayesian statistical model should include prediction and diagnostic checking of the assumptions. A common theme in the topics mentioned is the problem of statistical computation. Due to the advance of modern computer technology several practical applications can be studied using recently developed statistical computational methods. Other applications require yet the development of more statistical computational methods. The papers in this volume are therefore addressed *partly to applications* and *partly to statistical computations* (using a phrase from Kadane's paper). The ten papers deal with the following topics.

(1) *Computation of posterior moments and densities in high-dimensional cases using numerical integration.* Bauwens and Richard exploit the properties of the functional form of a certain class of posterior densities (so-called poly-t densities) in order to devise numerical integration methods using Monte Carlo. Posterior results for the demand for money function in the U.K. illustrate their approach. Van Dijk et al. present an algorithm for computing posterior moments and marginal posterior densities in cases where the posterior density is multivariate skew. Except for unimodality, no information on the functional form of the posterior density is used. The method is illustrated by analyzing the nomination process of a full professor in operations research.

(2) *Applications of Bayesian studies of non-linear models.* Kadane analyses multinomial, partly missing, data that relate to successive criminal victimization. Given his posterior density he discusses several statistical computational

methods for evaluating posterior moments. The papers by Lubrano, Pole and Smith and by Kooiman et al. are all addressed to the application of Bayesian methods to threshold switching models. In these models the endogenous variable is supposed to be generated by one of two possible regimes. The papers blend economic and statistical theory with applications. Both time-series data (Lubrano) and cross-section data (Kooiman et al.) are used. The papers in topic 1 concentrate more on computation and the papers in topic 2 more on application, but the classification is to a certain extent arbitrary.

(3) *Informative prior specification.* Garthwaite and Dickey introduce a method for specifying the parameters of an informative prior distribution. Lubrano discusses the specification of informative prior information in a disequilibrium model.

(4) *Model validation through prediction and diagnostic analysis.* Geisser gives a method for computing interval predictions for Pareto and exponential variables. Zellner and Moulton apply diagnostic checks on a.o. the functional form, outliers, influential data, and error analysis. This is a much neglected area in Bayesian statistical model building.

The four topics mentioned span a wide range, and the ten papers of this volume deal only with parts of these topics. More applications of Bayesian methods and more developments of statistical computational techniques are necessary in order to reach the stage where Bayesian analysis can be applied in a rather mechanical way.

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