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Bayesian methods in economics and finance: Editor's introduction

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Editorial

Bayesian Methods in Economics and Finance: **Editor's Introduction**

Modern days, Bayesian methods have gained prominence in theoretical work and applications in economics and finance due to the rapid development of computational technologies and their ability to learn. The special issue intends to examine central aspects in Bayesian analysis and applications, including prior choices, model selection with massive data and latent variables, hypothesis testing, Bayesian learning. In total, this special issue contains ten papers, all subject to the *Journal of Econometrics (JOE)*'s normal refereeing process. Most of these papers came from a conference held at the ESSEC Singapore campus on 10 December 2018.

The first five papers are more theoretically oriented.

The paper by Fan, Jiang and Sun considers regression models that allow for both strongly correlated covariates and idiosyncratic covariates. The strongly corrected covariates are modeled by a factor structure. A factor-adjusted sparse regression model is proposed, and a Bayesian method is developed for statistical analysis. The paper establishes the posterior contraction rate and model selection consistency. The method is illustrated using the U.S. bond risk premia.

The paper by Ando, Bai and Li considers a logistic panel regression model with interactive fixed effects. The model allows for high-dimensional cross-section dependence and heterogeneous regression coefficients. The paper proposes new Bayesian and maximum likelihood methods to estimate the parameters. The asymptotic properties of the estimators are obtained under the assumption of both N and T going to infinity. The Bayesian method is applied to study the efficiency performance of New York City medallion drivers.

The paper by Lopes, McCulloch and Tsay deals with a key challenging issue in Bayesian inference, the choice of prior, in the context of large-scale state-space models. A flexible specification prior, which is a mixture of four commonly used models, is proposed. Parsimony in high-dimensional systems is achieved due to the idea that some states may not be time-varying. The method is applied to model the time-varying conditional covariance matrices of daily log-returns of the components of S&P 100.

The paper by Norets and Pelenis proposes a new Bayesian nonparametric method to estimate a mixture of normal distributions whose mixing probabilities are dependent on covariates. The continuous latent variables are used to model the discrete part of the distribution while the marginal distribution of covariates is left unspecified. The frequentist adaptive optimal rate for contraction is obtained for the posterior. The method is illustrated using stock market trading activity.

The paper by Liu, Li, Yu and Zeng proposes two Wald-type statistics for hypothesis testing based on Bayesian posterior distributions, one under the correct model specification and the other under model misspecification. It is shown that the new statistics can be understood as the posterior version of the Wald statistics and enjoy several nice properties. The test statistics are applied to a microeconometric model and a financial econometric model.

The next five papers are more application-oriented.

The paper by Wan, Fulop and Li examines evidence of out-of-sample bond return predictability for a Bayesian investor who can learn about parameters, hidden states, and predictive models in real-time. They find statistical evidence in predicting returns using forward rates, but the statistical evidence does not translate into any economic value for investors. They also find that strong statistical and economic evidence of predictability from fully-revised macroeconomic data vanishes when real-time macroeconomic information is used.

The paper by Fisher and Jensen uses Bayesian nonparametric learning to estimate the skill of actively managed mutual funds and the population distribution of skill. The nonparametric approach is shown to be equivalent to an infinitely ordered mixture of normals. The method learns how to partition the funds into groups according to the average ability and the variability in the skill of a group and hence, resolving the uncertainty in the mixture. In the application, the paper finds the population distribution of skill has two distinct modes.

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The paper by Petrova proposes a robust Bayesian procedure that yields asymptotically correct posterior credible sets of the volatility matrix and the intercept vector without imposing normality assumptions in VAR models. The proposed Bayesian posteriors are based on the asymptotic covariance of the quasi-maximum likelihood estimators. In an application, the paper shows that neither the Gaussian assumption nor the homoskedasticity assumption on financial and uncertainty shocks is empirically unreasonable. Adopting these assumptions may lead to misleading conclusions.

The paper by Feng and He investigates the asset allocation problem when returns are predictable. It proposes a market-timing Bayesian hierarchical (BH) approach that jointly estimates the conditional expected returns and residual covariance. The hierarchical prior allows the modeling of different assets separately while sharing information across assets. Based on the U.S. equity market, the paper shows that the BH approach outperforms most alternative methods in terms of point prediction and interval coverage.

The paper by Hong, Niu and Zhang develops a parsimonious class of affine yield net models. It is arbitrage-free and allows for consistent bond pricing across maturities and issuers. The paper also obtains the risk-neutral process that guarantees joint identification of parameters and latent states. Using the marginal Metropolis–Hastings algorithm, the model is fitted to weekly Treasury yields of Germany, Italy, Spain, and Greece. Using a Bayesian specification test, the specification of the model is verified. Several interesting empirical results have been found.

The new Bayesian methods presented in this special issue are of theoretical interest and practical importance for applied work. Further theoretical research and empirical applications of these methods are to be expected in future work. It is my hope that the special issue will inspire others to pursue these ideas and use the techniques in applied work.

During the process of preparing the special issue, I had received a lot of help from many colleagues. In particular, I would like to thank Xiaohong Chen for handling one paper (submitted by Tao Zeng) as co-editor, Nick Polson for revising the application for the special issue submitted to the previous editorial team of JOE, and many referees, who have relevant domain knowledge, for reviewing the submissions.

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