JMSE **2018**, 3(4), 179–182 http://www.jmse.org.cn/
doi:10.3724/SP.J.1383.304010 http://engine.scichina.com/publisher/CSPM/journal/JMSE

Editorial

Econometric Modeling and Economic Forecasting

Zongwu Cai [1,*], Hongmiao Hong [2] and Shouyang Wang [3]

[1] Department of Economics, University of Kansas, Lawrence, KS 66045, USA
[2] Department of Economics and Department of Statistical Sciences, Cornell University, Ithaca, NY 14850, USA; yh20@cornell.edu
[3] Academy of Mathematics and Systems Science, Chinese Academy of Sciences, Beijing 100190, China; sywang@amss.ac.cn
* Correspondence: caiz@ku.edu

Received: 23 January 2019; Accepted: 23 January 2019; Published: 15 February 2019

Editorial Introduction

This special issue is dedicated to forecasting and modeling which are well regarded as two of the most challenging tasks in economics and finance because of the complexities of economic and financial data, such as nonlinearity, non-stationarity, and irregularities. How to forecast economic and financial data accurately is still an open question in the profession and practice. The aim of this special issue is to provide high-quality focus on some recent theoretical and empirical developments in econometric and financial modeling and economic forecasting, as well as related areas. The collection of papers in this volume grew out of invitation contributions made by scholars mainly from outside of China, including Zongwu Cai, Jiti Gao, Yongmiao Hong, Tae-Hwy Lee, Aman Ullah, Shouyang Wang, Cindy Yu, Xinyu Zhang and Guofu Zhou. The nine papers will be divided into two groups to appear in two separate issues. The first group includes the first four of the following papers and covers econometric and financial modeling; the second consists of the last five papers and covers economic forecasting.

The paper "Assessing Tail Risk Using Expectile Regressions with Partially Varying Coefficients" by Cai et al. (2018) investigates a class of conditional (dynamic) expectile models with partially varying coefficients in which some coefficients are allowed to be constants but others are allowed to be unknown functions of random variables, to characterize heteroskedasticity and nonlinearity as well as asymmetry in tail risk. They propose a three-stage estimation procedure to estimate both the parametric constant coefficients and nonparametric functional coefficients. Furthermore, they derive asymptotic properties under a time series context, together with a new simple and easily implemented goodness of fit test and a bandwidth selector based on newly defined cross-validatory estimation for the expected forecasting expectile errors. The proposed methodology is data-analytic and has sufficient flexibility to analyze complex and multivariate nonlinear structures without

suffering from dimensionality. Finally, the proposed model is applied to analyze the daily data of the S&P500 return series; the findings are interesting.

Cheng et al. (2018) paper considers "A New Regime Switching Model with State-Varying Endogeneity." They extend a state-varying endogenous regime switching (SERS) model which includes the endogenous regime switching model by Chang et al. (2017), the CCP model, as a special case. To estimate the unknown parameters in the SERS model, they propose a maximum likelihood estimation method. The Monte Carlo simulation results show that in the absence of state-varying endogeneity, the SERS and CCP models display similar performance, while in the presence of state-varying endogeneity, the SERS model outperforms the CCP model. Finally, they use the SERS model to analyze the Chinese stock market. Returns and empirical results show evidence of strong state-varying endogeneity in volatility switching in the Shanghai Composite Index returns. Moreover, the SERS model can indeed produce a much more realistic assessment for the regime switching process than the CCP model can.

Zhang et al. (2018) consider "Nowcasting China's GDP Using a Bayesian Approach." They explore real-time nowcasting, which is an assessment of current-quarter GDP from timely released economic and financial series before the GDP figure is disseminated. Providing a reliable current quarter nowcast in real time based on the most recently released economic and financial monthly data is crucial for central banks to make policy decisions and for longer-term forecasting exercises. To do so, they propose using dynamic factor models to bridge monthly information with quarterly GDP and achieve reduction in the dimensionality of the monthly data. Moreover, they develop a Bayesian approach to provide a way to deal with the unbalanced feature of the dataset and to estimate latent common factors. Furthermore, they demonstrate the validity of the proposed approach through simulation studies, and explore its applicability through an empirical study in nowcasting China's GDP using 117 monthly data series of several categories in the Chinese market. Finally, their simulations and empirical study demonstrate that the proposed Bayesian approach may be a viable option for nowcasting China's GDP.

The paper by Jiang et al. (2018) considers "Firm Characteristics and Chinese Stocks." They conduct a comprehensive study on predicting cross sections of Chinese stock market returns with a large panel of 75 individual firm characteristics. They use not only the traditional Fama–MacBeth regression, but also "big-data" econometric methods, principal component analysis (PCA), partial least squares (PLS), and forecast combination, to extract information from all the 75 firm characteristics. They find that firm characteristics are important return predictors, significant both statistically and economically. Furthermore, firm characteristics that are related to trading frictions, momentum, and profitability are the most effective predictors for future stock returns in the Chinese stock market.

"Out-of-Sample Forecasts for China's Economic Growth and Inflation Using Rolling Weighted Least Squares" by Sun et al. (2019) investigates macroeconomic forecasting in China, which is essential for the government to make proper policy decisions on government expenditure, money supply, and other areas. One crucial issue with rolling out-of-sample forecasts is how to choose an optimal window to estimate parameters, which is unclear in the existing literature on forecasting China's macroeconomic variables. Therefore, they fill this gap to forecast economic growth and inflation in China, by using rolling weighted least squares (WLS) with the practically feasible cross-validation (CV) procedure of Hong et al. (2018) to choose an optimal estimation window. Additionally, they undertake an empirical analysis of monthly data on up to 30 candidate indicators (mainly asset prices) for a span of up to 17 years (2000–2017). It is documented that the forecasting performance

of rolling estimation is sensitive to the selection of rolling windows. The empirical analysis shows that the rolling WLS with the CV-based rolling window outperforms other rolling methods on univariate regressions in most cases. One possible explanation for this is that these macroeconomic variables often suffer from structural changes because of changes in institutional reforms, policies, crises, and other factors. Furthermore, they find that in most cases, asset prices are key variables for forecasting macroeconomic variables, especially the output growth rate.

Tu and Lee (2019) paper, "Forecasting Using Supervised Factor Models," examines the theoretical and empirical properties of a supervised factor model based on combining forecasts using principal components (CFPC). They compare it with two other supervised factor models (the PLS regression and the principal covariate regression, PCovR) and with an unsupervised principal component regression(PCR). The supervision refers to training the predictors for a variable to forecast. They compare the performance of the one unsupervised and three supervised factor models in the forecasting of US consumer price index (CPI) inflation rate. The main finding is that the predictive ability of the supervised models outperforms the unsupervised model. The computation of the factors can be doubly supervised together with variable selection, which can further improve the forecasting performance. Among the three supervised factor models, the CFPC performs best and is also most stable. While the PCovR also performs well and is stable, the performance of the PLS is less stable over different out-of-sample forecasting periods. The supervision effect becomes even larger as the forecast horizon increases. Supervision helps to reduce the number of factors and lags needed in modeling economic structure, achieving more parsimony.

Huang et al. (2019) consider "A Combined Random Effect and Fixed Effect Forecast for Panel Data Models." They investigate the problem that the random effect (RE) estimator becomes inconsistent while the fixed effect (FE) estimator is consistent, when some of the regressors in a panel data model are correlated with random individual effects. Depending on the various degrees of such correlation, they combine the RE and FE estimators to form a combined estimator which may be better than each individually. Their focus is on whether the combined estimator may be used to make a combined forecast to improve upon the RE and FE forecasts in out-of-sample forecasting. Their simulation experiment shows that the combined forecast does dominate the FE forecast for all degrees of endogeneity in terms of mean squared forecast errors (MSFE). This demonstrates that the theoretical results of the risk dominance for the in-sample estimation carry over to the out-of-sample forecasting. It also shows that the combined forecast can reduce MSFE relative to the RE forecast for moderate to large degrees of endogeneity and for large degrees of heterogeneity in individual effects.

The paper by Wei et al. (2019) considers "A Decomposition Clustering Ensemble Learning Approach for Forecasting Foreign Exchange Rates." They propose a decomposition clustering ensemble (DCE) learning approach to forecast foreign exchange rates by integrating the variational mode decomposition (VMD), the self-organizing map (SOM) network, and the kernel extreme learning machine (KELM). First, the exchange rate time series is decomposed into N subcomponents using the VMD method. Second, each subcomponent series is modeled by KELM. Third, the SOM neural network is introduced to cluster the subcomponent forecasting results of the in-sample dataset to obtain cluster centers. Finally, each cluster"s ensemble weight is estimated by another KELM and the final forecasting results are obtained by the corresponding clusters" ensemble weights. The empirical results illustrate that their proposed DCE learning approach can significantly improve forecasting performance and statistically outperform other benchmark models in directional and level forecasting accuracy.

The paper by Qiu et al. (2019) considers "Versatile HAR Model for Realized Volatility: A Least Square Model Averaging Perspective." A rapidly growing body of literature has documented improvements in forecasting financial return volatility measurement using various heterogeneous autoregression (HAR) type models. Most HAR-type models use a fixed lag index of (1, 5, 22) to mirror the daily, weekly, and monthly components of the volatility process, but they ignore model specification uncertainty. Qiu et al. (2019) propose applying the least squares model averaging approach to HAR-type models with signed realized semi-variance to account for model uncertainty and to allow for a more flexible lag structure. They also denote this approach as MARS and prove that the MARS estimator is asymptotically optimal in the sense of achieving the lowest possible mean squared forecast error. The lag combination in the the model averaging heterogeneous autoregressive models (MARS) method is selected by the data-driven model averaging method and changes with various data series and different forecast horizons. Employing high frequency data on the NASDAQ 100 index and its 104 constituents, their empirical results demonstrate that acknowledging model uncertainty under the HAR framework and solving with the model averaging method can significantly improve the forecasting accuracy of financial return volatility.

Finally, we wish to express our sincere gratitude to the many reviewers whose conscientious remarks were of great help to various contributors and of great assistance to the editorial board.

References

Cai, Z., Fang, Y. and Tian, D. (2018). Assessing tail risk using expectile regressions with partially varying Coefficients.

Chang, Y., Choi, Y. and Park, J. (2017). A new approach to model regime switching. Journal of Econometrics, 196, 127–143.

Cheng, T., Gao, J. and Yan, Y. (2018). A new regime switching model with state-varying endogeneity.

Hong, Y., Sun, Y. and Wang, S. (2018). Selection of an optimal rolling window in time-varying predictive regression. Manuscript, Cornell University.

Huang, B., Lee, T.-H. and Ullah, A. (2019). A combined random effect and fixed effect forecast for panel data models.

Jiang, F., Tang, G. and Zhou, G. (2018). Firm characteristics and Chinese stocks.

Sun, Y., Hong, Y. and Wang, S. (2019). Out-of-sample forecasts for China's economic growth and inflation using rolling weighted least squares.

Tu, Y. and Lee, T.-H. (2019). Forecasting using supervised factor models.

Wei, Y., Sun, S., Ma, J., Wang, S. and Lai, K.K. (2019). A decomposition clustering ensemble learning approach for forecasting foreign exchange rates.

Qiu, Y., Zhang, X., Xie, T. and Zhao, S. (2019). Versatile HAR model for realized volatility: A least square model averaging perspective.

Zhang, Y., Yu, C.L., Li, H. and Hong, Y. (2018). Nowcasting Chinese GDP using a Bayesian approach.