

Editorial for the special issue on financial econometrics

Financial econometrics is an interdisciplinary area that integrates the fields of finance, economics, probability, statistics and applied mathematics. Its primary tasks stem from the particular nature of financial data and the body of financial theory that has been developed to explain the complex world of finance and financial instruments that surrounds us. Crudely speaking, therefore, financial econometrics may be regarded as the examination and modeling of financial data using the tools provided by its constituent disciplines, with the aim of developing a deeper understanding of the way in which financial markets work.

While the origins of financial econometrics may be traced back to early empirical studies of stock prices, bond yields and interest rates, the subject began to take aspects of its modern form during the 1980s. At this time, the methods of time series econometrics evolved in ways that were especially beneficial to studying financial data, such as the trending behavior of financial asset prices, the clustering of the volatility of financial returns and the availability of ultra-high frequency data. These methods together with a growing specialization amongst econometricians working with financial data helped to promote the development of a new discipline with the common goal of searching for a deeper understanding of the way in which financial markets work and financial asset prices are determined.

Partly because of this diversity, financial econometrics is a vast and growing discipline with applications that stretch across the social and business sciences. The papers collected in this volume are similarly diverse and belong to the rapidly growing literature that informs practical problems relating to financial data and also the deeper underpinnings of probability and mathematical finance.

A.S. Hurn, K.A. Lindsay and L. Xu, in “Revisiting the numerical solution of stochastic differential equations”, propose a numerical solution of stochastic differential equations, commonly used in continuous time financial econometrics models. Based on extrapolation, the proposed bias reducing method derives the optimal step size in the numerical solution. Theoretical analysis and simulations show that the proposed method provides improved accuracy compared with other methods in the literature.

Yi Luo and Yirong Huang, in “Long memory or structural break? Empirical evidences from index volatility in stock market”, study whether stock index volatility series exhibit properties of long memory and structural breaks. Using supF-type of test and sequential procedure, this paper finds that there exist several structural breaks in the volatility series of SSE composite index for the China stock market and S&P500 index for the US stock market. Estimation of long memory parameters indicates that both markets exhibit long memory and the Chinese market is less efficient than the US market. Empirical analysis indicates that AFIGARCH model fits the volatility series of both markets.

In “The economic value of using CAW-type models to forecast covariance matrix”, Shuran Zhao, Jinchun Li, Yaping Jiang and Peimin Ren examine the economic values of conditional autoregressive Wishart (CAW) type of models of covariance matrix. By introducing a heterogeneous leverage effect into CAW with a heterogeneous autoregressive (HAR) component, this paper proposes a more general LHAR-CAW model. Based on mean-variance framework, this paper analyzes the economic values of these CAW-type of models, using Sharpe ratio and other performance measures. Empirical results show that the economic values of three CAW-type of models are substantial and LHAR-CAW model performs the best.



Zhiwu Hong, Linlin Niu, and Gengmin Zeng, in “US and Chinese yield curve responses to RMB exchange rate policy shocks: an analysis with the arbitrage-free Nelson–Siegel Term Structure Model”, study how yield curves in USA and China reacts to Chinese exchange rate policy shocks, based on a discrete-time arbitrage-free Nelson–Siegel Term Structure Model. This paper decomposes the policy impact into two components: yield expectations and risk premia. Empirical analysis indicates that when policy shock occurs, change in risk premia is more pronounced than change in expectations. These empirical results are useful in understanding exchange rate risk as China continues to internationalize its currency.

In “A penalized expected risk criterion for portfolio selection”, Ronghua Luo, Yi Liu, and Wei Lan propose the penalized expected risk criterion (PERC) for portfolio selection. The PERC minimizes a weighted sum of the portfolio’s expected risk and the portfolio’s instability as measured by the variance of the estimated portfolio weights. Empirical results show that the PERC portfolio can be significantly better in terms of Sharpe ratio than other competing methods.

Miao Luo, Tao Chen, and Jun Cai, in “Stock return predictability when growth and accrual measures are negatively correlated”, study the issue of stock return predictability when the asset growth and current accrual are correlated, either positively or negatively. The paper finds that the growth and accrual effects remain robust in predicting future stock returns, even when they are negatively correlated. This finding supports the earnings fixation hypothesis that investors overvalue the accrual part of earnings.

As the financial universe grows, new challenges emerge for which models need to be created and econometric methodologies developed. Some of these challenges are posed by phenomena such as ultra-high frequency trading and the multidimensional nature of financial market microstructure; others arise from the requirements of high dimensional financial portfolio analysis, the nature of algorithmic trading and its wider impact on financial markets and financial stability. The more that is learnt about this rapidly evolving world of finance and its links with economic activity, the more there is yet to discover. It is hoped that readers of this special issue in financial econometrics will be inspired by these papers which represent a small contribution to the flourishing literature of this vibrant subject.

Xu Zheng and Stan Hurn