

The York-Hiroshima Joint Symposium on Statistical Penalisation Methods and Dimension Reduction Methods for Economic and Financial Analysis. University of York, 24-25 September 2018

This two-day symposium hosted discussions on state-of-the-art statistical methods for ‘big data’ and their applications to economics and finance amongst world leading experts in Hiroshima and York, as well as in Cambridge, Oxford and the Bank of England. A total of more than 50 people attended the symposium from the UK and Hiroshima. Professor Jo Swaffield, the Head of the Department of Economics and Related Studies (DERS), University of York, and Professor Nobuo Ueno, the Director of JSPS London, opened the symposium by kindly welcoming the participants with supporting comments. A short presentation about JSPS activities and funding opportunities by Mr Ryo Satomura followed. During the symposium, in a friendly atmosphere, the participants had stimulating discussions during the main talks and relaxed conversations in the breaks, lunch, and symposium dinner. The symposium venue, King’s Manor, embodies the long history of York itself, since it was built in the 16th Century to house the Abbots of St Mary’s Abbey.

Statistical “Penalisation” methods are used to eliminate “noises” and pick up a handful of relevant factors. These includes regularisation methods such as LASSO and factor component analysis, which are developed in the areas of statistics and machine learning. These methods have been rapidly developed in recent years, and are potentially applicable for analysing Big Data and high dimensional data in economics and finance. This symposium was held with the aim of seeking illuminating research directions for such analyses.

The first invited speaker, Prof Alexey Onatskiy (University of Cambridge), in his talk “*Spurious Factor Analysis*,” sounded a note of caution for routine applications of widely used principal component analysis. The findings show that conventional methods can detect common factors in analysis of finance and economics data, even if there are no such factors in data. This phenomenon is a factor analysis version of the findings of the celebrated paper “Spurious regressions in econometrics” by Nobel laureate Clive Granger, co-authored by Paul Newbold in 1974.

The second invited speaker, Dr Anders Kock (University of Oxford), in his talk entitled “*Power in High-Dimensional Testing Problems*,” showed the conditions for the existence of ways to enhance the power of a statistical test when the dimension of the parameters subject to the test rises as the sample size increases. This is a very interesting and important general result, as it might force any researchers (including myself) to discuss power enhancement in all future papers if the test of interest satisfies the conditions!

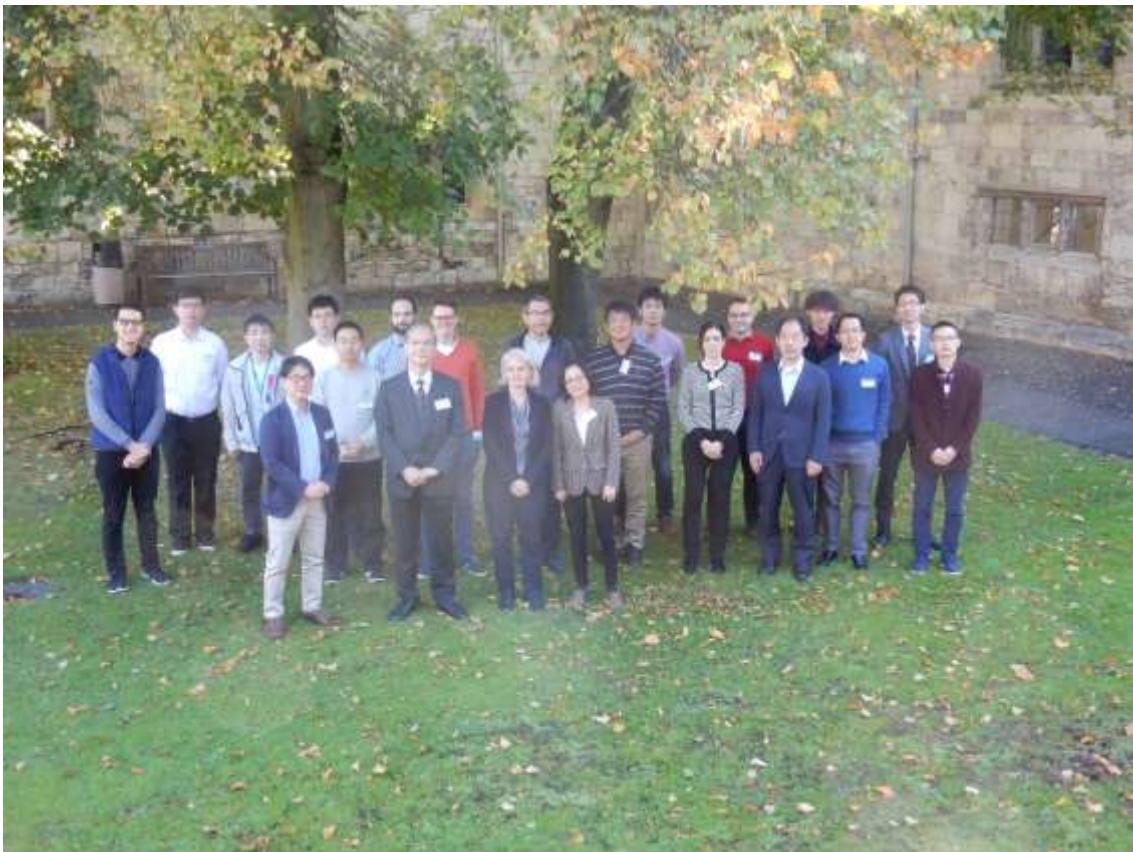
The third invited speaker, Dr Daniele Massacci (Bank of England), in his talk entitled “*Unstable Diffusion Indexes: With an Application to Bond Risk Premia*,” talked about a new factor analysis method for forecasting, which is more robust to a change of the structure of the factor component over time. This research is an important step towards more accurate economic forecasting after the recent financial crisis.

The speakers from the University of York and Hiroshima University showcased their research excellence in the symposium theme. The members of the Centre for Panel Data Analysis (PanDA, DERS), Professor Takashi Yamagata, Professor Yongcheol Shin, Dr Jia Chen and Dr

Vanessa Smith all talked about exciting novel estimation and inferential methods for panel data analysis, with applications to economics and finance. Dr Adriana Cornea-Madeira (York Management School) proposed a novel bootstrap based test, and Dr Degui Li (Mathematics), proposed a new method to estimate the 'long-range dependent curve.' Professor Hiroshi Yamada talked about filtering methods for smoothing univariate time-series; Professor Kazuhiko Hayakawa proposed a new method to analyse panel regression models with an error factor structure, Dr Shintaro Hashimoto proposed a robust Bayesian inference via weighted likelihood functions.

Through this symposium, the ties between York and Hiroshima have certainly strengthened. The interaction between York and Hiroshima was first initiated when I was invited to Hiroshima as a JSPS invitational fellow by Professor Kazuhiko Hayakawa in the summer of 2015. Since then, Kazuhiko and I have visited each other every year. Last summer, Professor Hiroshi Yamada visited Dr Adriana Cornea-Madeira (Management, York). We are very grateful to JSPS London for its indispensable support for the symposium, which has fostered a research collaboration between York and Hiroshima that is now deep and substantial in scale.

- **Professor Takashi Yamagata.**



Symposium Attendees