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Personal Information:

1992/03/07, Male, Citizen of the People's Republic of China

Undergraduate Studies:

BSc, Mathematics, School of Mathematics and Statistics, Central China Normal University, 2014.

Masters Level Work:

Master, Economics, School of Economics and Management, Wuhan University, 2017.

Graduate Studies:

Ph.D., Economics, Singapore Management University, 2017 to 2022.

Thesis Title: "Bayesian and Machine Learning Methods with Applications in Asset Pricing".

Completion Date: (June 2022).

Thesis Committee and References:

Professor Jun Yu (Advisor)

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(Finance)**

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Teaching and Research Fields:

Primary fields: Bayesian Econometrics, Empirical Asset Pricing
Secondary fields: Machine Learning, Computational Economics

Teaching Experience:

- TA for *STAT151 Introduction to Statistical Theory*, Instructor: Professor Chow Hwee Kwan. Term: Academic Year 2018-19 Term 2.
- TA for *ECON206 Undergraduate Game Theory*, Instructor: Assistant Professor Jiangtao Li. Term: Academic Year 2019-20 Term 1.
- TA for *DSA201 Statistical Inference for Data Science*, Instructor: Associate Professor (Education) Daniel P. A. Preve. Term: Academic Year 2019-20 Term 2.
- TA for *ECON 681 Microeconomics Analysis (Master)*, Instructor: Professor Shurojit Chatterji. Term: Academic Year 2020-21 Term 1.
- TA for *ECON 601 Microeconomics (Ph.D.)*, Instructor: Professor Takashi Kunimoto. Term: Academic Year 2020-21 Term 1.
- TA for *ECON 670 and ECON 671 Financial Econometrics I & II (Master of Financial Economics)*, Instructor: Professor Jun Yu. Term: Academic Year 2020-2021 Term 2.
- TA for *ECON 601 Microeconomics (Ph.D.)*, Instructor: Professor Takashi Kunimoto. Term: Academic Year 2021-22 Term 1.
- TA for *ECON 696 Mathematical Methods for Economic Dynamics (Master & Ph.D.)*, Instructor: Professor Takashi Kunimoto. Term: Academic Year 2021-22 Term 1.

Research Experience:

- Research Assistant for Professor Danyang Xie (Master Supervisor, Acting Dean, Society Hub, HKUST(Guangzhou)), 2015-2016.
- Research Assistant for Assistant Professor Tao Zeng (Associate Professor, Zhejiang University), 2016-2017.

Professional Activities:

- Referee for *Journal of Econometrics*.

Conference and Seminar Presentations:

- Singapore Management University Weekly Econometrics workshop.
- The 2019 Financial Econometrics and New Finance Conference, June 10, 2019, Hangzhou, China.

Honors, Scholarships, and Fellowships:

SMU Interdisciplinary Doctoral Fellowship, 2017-2021.

Research Papers:

“**Alternative Parametric Models for Spot Volatility in High Frequency: A Bayesian Approach**” (2022, Jointly in cooperation with **Professor Jun Yu** and **Professor Jia Li**. Job Market Paper)

Abstract:

This paper proposes several alternative parametric models for spot volatility in high frequency, depending on whether or not jumps, seasonality, and announcement effects are included. Together with these alternative parametric models, nonlinear non-Gaussian state-space models are introduced based on the fixed-k estimator of spot volatility of Bollerslev, Li, and Liao (2021). According to Bollerslev, Li, and Liao (2021), the log fixed-k estimator of spot volatility equals the true log spot volatility plus a non-Gaussian random variable. Bayesian methods are introduced to estimate and compare these alternative

models and to extract volatility from the estimated models. Simulation studies suggest that the Bayesian methods can accurately estimate the parameters, select the true model, and extract volatility. Empirical studies using high-frequency market indexes and individual stock prices reveal several important results. As an application of extracting volatility, we quantify the strategic value of information.

“Sparse Structure of Stochastic Discount Factor in the Chinese Stock Market: A Bayesian Interpretable Machine-learning Approach” (2022)

Abstract:

This paper reviews a Bayesian interpretable machine-learning method proposed by Kozak, Nagel, and Santosh (2020). We show how the method can link two strands of literature, namely the literature on empirical asset pricing and the literature on statistical learning. Based on a recently developed data-cleaning technique, we obtain 123 financial and accounting cross-sectional equity characteristics in the Chinese stock market. When applying the method of Kozak, Nagel, and Santosh (2020) to the Chinese stock market, we find that it is futile to summarize the stochastic discount factor (SDF) in the Chinese stock market as the exposure of several dominant cross-sectional equity characteristics in-sample. A cross-validated out-of-sample analysis further supports this finding.

“Do Volatility-Managed Portfolios Work? Empirical Evidence from the Chinese Stock Market” (2021)

Abstract:

Using data from the Chinese stock market, we have found that the main empirical findings in Moreira and Muir (2017) break down. Based on the new empirical findings, we exploit a comprehensive set of 99 equity strategies in the Chinese stock market to analyze the economic value of managed portfolios. Based on these 99 equity trading strategies, we find that there exists no systematic gain from scaling the original portfolios using volatility. Our empirical results suggest that one should be careful to use volatility-managed portfolios in practice as the expected performance gains are rather limited.

“How is Fund Investment Exposed to Stock-level Characteristics? Evidence from U.S. Equity Market” (2021, Jointly in cooperation with Assistant Professor Xiaobin Liu and Associate Professor Tao Zeng. In progress)

Abstract:

This paper documents how the Instrumented Principal Component Analysis (IPCA) is applied in uncovering the driving factors associated with firm-level characteristics to which fund managers holding these stocks are exposed. IPCA is a specific statistical learning methodology featuring both latent factor structure and dynamic factor loading which accordingly can simultaneously handle dimensionality and time-varying parameter concerns for financial econometric modeling. Linear structure is retained and therefore the corresponding statistical hypothesis testing is possible to be implemented. In this paper, we first construct fund-level indices as the measure of exposure of each fund to firm-level characteristics (commonly referred to as “anomalies” in accounting or finance literature) and document the empirically stylized facts revealed from the constructed dataset. With the constructed fund-level index, we apply the novel IPCA methodology along with our proposed regularized IPCA to discuss how the mutual fund returns are exposed to characteristics of managed assets (specifically those firm-level characteristics of assets held by a fund).

“Estimating Expected Return Function Nonparametrically: Based on BART” (2020)

(This is perhaps a permanent working paper)

Abstract:

This paper documents the empirical implementation of estimating the expected return function nonparametrically using the Bayesian Additive Regression Tree (BART) method. Within this newly introduced nonparametric framework, general non-linearity is allowed for the specification of the model when the dimension of covariates used for prediction is large and the underlying non-linear relationship is hard to detect. By applying BART, we document which firm-level characteristics should be adopted as the most influential predictors for estimating expected return and the out-of-sample performance of

BART for prediction as well. I have also extended the whole framework to the China stock market and the global financial market for empirical comparison. Our finding suggests that (i) the performance of BART approximates the results obtained from neural-network, which is a specific machine-learning method documented with dominating out-of-sample prediction performance; (ii) The machine-learning-based method (specifically BART) surely outperforms the benchmark linear model, but in terms of investment strategy constructed from prediction, there is not much significant difference between machine-learning methods and linear benchmark; (iii) China stock market is relatively more predictable in comparison to the U.S. stock market in terms of out-of-sample prediction-accuracy measure.

Computer Skills:

R, MATLAB, C / C++ (Basic), Python, SAS

Languages:

Mandarin Chinese (Native), English (Fluent)