

Tianzong Wang

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EDUCATION

- The University of Manchester** *Ph.D. in Finance* 09/2020-02/2024, UK
Research Interest: Market Microstructure, High-Frequency Financial Econometrics, Machine Learning and Time Series analysis
Conferences: **SoFiE – Market Microstructure Session (2023)**, Financial Econometrics Conference: To mark Stephen Taylor's Retirement (2023) and Lancaster-Manchester PhD workshop
Teaching Assistant: Foundation of Finance I and II
- Case Western Reserve University** *Master of Science in Finance* 08/2015-05/2017, US
CFA Level 1, FRM Level 1
- Fudan University, China** *Bachelor's Degree in Physics and Accounting* 09/2010-01/2015, China
Academic Awards 2012-2013 and 2013-2014
- The Experimental High School Attached to Beijing Normal University** 01/2007-06/2010, China
First Prize of National Mathematics Olympic Competition, Ranked 14, Beijing China, 2010

SKILL SETS

Programming Skills | Python (main), MATLAB (main), R, SAS, Eviews, VBA, EXCEL, SQL, C++, CAD

Modeling Skills | Time Series Modeling (ARIMA, GARCH, State-Space Model/Kalman Filter), Bayesian and Frequentist Model Averaging, Agent-Based Model, Lasso, Elastic Net, Regression Tree, Random Forest and Large Language Models (Bert, GPT-3, llama, Pytorch/transformer)

INDUSTRIAL EXPERIENCE

- Quantitative Researcher Vice President, Bank of New York Mellon** | *Economic Forecasting Group* 02/2017 - 04/2019, US
- Developed tier 1 economic forecasting model set using R and EViews, replacing Moody's mainstream model, including Moody's benchmark model and bank-specific models.
 - This model is rooted in the forecast of the core macroeconomic prediction set by the Federal Reserve and further generates bank-specific variable predictions following assumptions from Fed reports and internal asset management groups.
 - The framework utilizes various time series and statistical models including Principal Component Analysis, ARIMA, Dynamic Factor Analysis, State Space Models, and the Kalman Filter.
 - Defended the model from internal model validation and user teams and answered the questions from the Federal Reserve.
- Data Scientist, Financial Network Analytics** | *Research and Development Team* 01/2020 - 02/2023, UK
- Developed the first agent-based simulator from comprehensive finance speculations that simulate the intraday markets microstructure patterns such as liquidity, gridlock, and bubbles of multiple assets with various investor classes.
 - Initiated the time series analysis on the FNAIab platform. Developed a comprehensive time series suite encompassing major models and algorithms in Python, including linear regression models, Garch family models, and related statistical tests (e.g. Granger Causality, ADF test, and PP test).
 - Supervised an intern within the Research & Development team, providing guidance and oversight

ACADEMIC RESEARCH

- Mispricing, Learning, and Price Discovery** | *Job Market Paper* [Link to Paper and Appendix](#)
- Presented on **SoFiE – Market Microstructure Session (2023)** and Financial Econometrics Conference: To mark Stephen Taylor's Retirement (2023)
 - We propose a new information share framework by extending the unobserved component information share framework of De Jong and Schotman (2010) by incorporating the additional endogenous error-correction mechanism proposed by Andersen et al. (2022) and a cross-sectional error-correction mechanism. The framework can capture the intraday level information share for the first time while estimating various error-correction mechanisms simultaneously.
 - Implement the model on the SPY and E-Mini market, capturing various intraday patterns with better accuracy and stability, and fewer numerical issues.

Information Share and Model Averaging | *Working Paper*

- Presented in Lancaster-Manchester PhD workshop
- Propose a new approach to information share with model averaging methodologies, which significantly increased the accuracy of information share and latent efficient price series estimation in various data-generating processes.
- We examine various classic and leading-edge model averaging methodologies including AIC Smooth, Bayesian Model Averaging, and Jackknife Model Averaging. The model is estimated by the Kalman filter and GMM approach.

Stock Market Simulator | *Working Paper*

- We develop a new framework to simulate centralized equity markets intraday, incorporating investors with diverse expectation formation and trading strategies.
- The simulator provides insights into how the proportions and interactions of different investor types can lead to varying realized prices, which may significantly deviate from fundamental values.
- The simulator also enables the assessment of how different market scenarios and shocks impact realized prices, investor behaviors, asset holdings, and cash balances.

Cross-Section Signal vs. Endogenous Market Microstructure Variables Across Frequencies, Solo Paper | *Working Progress*

- I examine the contribution proportion of cross-section sparse signals of return and various endogenous market microstructure variables, on the rolling forecast prediction power of stock return and market microstructure variables at different frequencies by several machine learning models (e.g. Lasso, regression tree, random forest, Adaboost, and GBDT).
- This study reports the preferred variable set and methodology for prediction, which is different across frequencies. Furthermore, I propose a forecasting model with the refined signal variable set for each frequency and compare it to existing models.

Beyond Sentiment, Machine Learning on Reports, Solo Paper | *Working Progress*

- Investigate the extent to which the incremental benefits of various machine learning sentiment indicators from dictionary indicators, derived from 10-K reports, on stock return prediction can be attributed to other variables within the report.
- Evaluate the supplementary contributions of variables present in the 10-K report towards the better prediction of stock returns with machine learning models, e.g. GPT-3, Bert, and Llama.