Chaoyi Zhao

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Research Interests

Investments: Factor investing, High-frequency investing/trading, Sustainable investing
Statistics: High-dimensional statistics, Machine learning & deep learning
Actuarial Sciences

Education

Peking University — Beijing, China
Ph.D. Candidate in Statistics — 2019 – Present
Supervisor: Prof. Lan Wu

Peking University — Beijing, China
B.S. in Mathematics and Applied Mathematics — 2015 – 2019
B.S. (Double Degree) in Computer Science and Technology — 2016 – 2019
Elite Undergraduate Program of Applied Mathematics — 2017 – 2019

Honors

Awards

S&P Global Academic ESG Research Award	2022
Merit Student	2016, 2020, 2021
Excellent Graduate, Beijing Outstanding Graduate	2019
The Student of The Year (10 students per year)	2018
Merit Student Pacesetter	2018
Beijing Merit Student	2018
Excellent Student Leader	2017

Scholarships

President Scholarship	2019 – 2023
Huatai Science and Technology Scholarship	2021
CETC the 14th Research Institute Glarun Scholarship	2020
National Scholarship	2018
The National Southwest Associated University Scholarship	2018
Shenzhen Finance Institute Scholarship, the Chinese University of Hong Kong, Shenzhen	2017
Founder Scholarship	2016

Publications

Factor Investing

1. Breaking the Factor Zootopia: Factor Selection via Significant Tests of Multi-Task Lasso
   Chaoyi Zhao and Lan Wu.
   Working Paper.

High-Frequency Investing/Trading

2. High-Frequency Liquidity in the Chinese Stock Market: Measurements, Patterns, and Determinants
   Ruixun Zhang, Chaoyi Zhao, Yufan Chen, Lintong Wu, Yuehao Dai, Ermo Chen, Zhiwei Yao, Yihao Zhou, and Lan Wu.
   Under review. [SSRN]
3. Order Types and Natural Price Change: Model and Empirical Study of the Chinese Market
   Siyu Liu, Chaoyi Zhao, and Lan Wu.
   International Journal of Financial Engineering, 2022, Forthcoming.

Sustainable Investing

4. Optimal Impact Portfolios with General Dependence and Marginals
   Andrew W. Lo, Lan Wu, Ruixun Zhang, and Chaoyi Zhao.
   Working paper. [SSRN]
5. Measuring and Optimizing the Risk and Reward of Green Portfolios
   Andrew W. Lo, Ruixun Zhang, and Chaoyi Zhao.
   Under review. [SSRN] Winner of the S&P Global Academic ESG Research Award.

Machine/Deep Learning and Their Applications in Finance

6. Channel and Spatial Attention CNN: Predicting Price Trends from Images
   Ruixun Zhang, Guanglian Lin, and Chaoyi Zhao.
   Under review. [SSRN]
7. The Success of AdaBoost and its Application in Portfolio Management
   Yijian Chuan, Chaoyi Zhao, Zhenrui He, Lan Wu.
   International Journal of Financial Engineering, 8(02), 2142001, 2021. [PDF]

Actuarial Sciences

8. Construct Smith-Wilson Risk-Free Interest Rate Curves with Endogenous and Positive Ultimate Forward Rates
   Chaoyi Zhao, Zijian Jia, Lan Wu.
   Under review.

Books

9. The Maths Book (in Chinese)
   Dorling Kindersley Ltd. Translated by Chaoyi Zhao.
   Publishing House of Electronics Industry, 2021. [Link]
10. Financial Market Risk Management Analytics (in Chinese)
    Frank H. Koger. Translated by Chaoyi Zhao.
    Truth & Wisdom Press, 2022.
11. Quantitative Investing (in Chinese)
    Jian Sun, Lan Wu, and Chaoyi Zhao.
    Science Press, Forthcoming.

Research Projects

High-Frequency T+0 Quantitative Trading Strategy Based on Deep Learning
Peking University and Founder Securities — 2019 – 2020

Gradient Optimization Model Based on Genetic Programming Algorithm
Ernst & Young (China) Advisor Ltd — 2019

Multi-Factor Alpha Strategy Based on the AdaBoost Algorithm
Peking University and Founder Securities — 2018 – 2019

Application of Statistical Learning in Modeling the Relationship Between Stock Index and Futures
Undergraduate Research, Peking University — 2017 – 2018

Teaching Experience

Teaching Assistant for Peking University

Quantitative Trading — Fall 2022
Elective for Graduate and Senior Undergraduate Students. Instructor: Prof. Lan Wu

Theory and Practice for Futures and Other Derivatives — Spring 2022
Elective for Graduate and Senior Undergraduate Students. Instructor: Prof. Lan Wu *et al.*

Exercise Class for Mathematical Analysis III — Fall 2021
Core Class for Undergraduate Students. Instructor: Prof. Jiazhong Yang

Practice for Fixed Income Securities — Fall 2021
Elective for Graduate and Senior Undergraduate Students. Instructor: Prof. Lan Wu *et al.*

Exercise Class for Mathematical Analysis II — Spring 2021
Core Class for Undergraduate Students. Instructor: Prof. Jiazhong Yang

Risk Management and Financial Regulation — Spring 2021
Core Class for Graduate Students. Instructor: Prof. Lan Wu

Quantitative Trading — Fall 2020
Elective for Graduate and Senior Undergraduate Students. Instructor: Prof. Jian Sun

Exercise Class for Probability and Statistics — Spring 2020
Elective for Undergraduate Students.

Introduction to Financial Mathematics — Fall 2019
Core Class for Undergraduate Students. Instructor: Prof. Lan Wu

Teaching Assistant for Master Program of Tulane University & University of Chinese Academy of Social Sciences

Fixed Income Analysis — 2020, 2021
Core Class for Graduate Students. Instructor: Prof. Bill W. Reese

Investment and Asset Pricing — 2020, 2021
Core Class for Graduate Students. Instructor: Prof. Frank H. Koger

Risk Management — 2019, 2020, 2021
Core Class for Graduate Students. Instructor: Prof. Frank H. Koger

Options and Other Derivatives — 2019, 2020, 2021
Core Class for Graduate Students. Instructor: Prof. Paul A. Spindt and Josh Pierce

Valuation — 2020, 2021
Core Class for Graduate Students. Instructor: Prof. Peggy Huang

Portfolio Management — 2020, 2021
Core Class for Graduate Students. Instructor: Prof. Helmuth Chavez

Talks

High-Frequency Liquidity in the Chinese Stock Market: Measurements, Patterns, and Determinants

2022 INFORMS Annual Meeting October 17, 2022

Speaker of the FinTech Session. [Link]

11th World Congress of Bachelier Finance Society June 15, 2022

Session chair and speaker of the Market Microstructure II Session. [Link]

Statistical Patterns of High-Frequency Data for A-share stocks in Shenzhen Stock Exchange

3rd Seminar for Young Scholars in Financial Engineering and Risk Management June 12, 2021

Invited talk. [Link]

Construct Smith-Wilson Interest Rate Curves with Endogenous Ultimate Forward Rates

United As One: 24th International Congress on Insurance: Mathematics and Economics June 5, 2021

Speaker of the Quantitative Finance session. [Link]

Speech for the Opening Ceremony of School of Mathematical Sciences

Opening Ceremony, School of Mathematical Sciences, Peking University September 15, 2018

Representative of seniors. [Link]

Skills

Programming: Python, C/C++, MATLAB, R, Java, SQL
Languages: Chinese, English, Chinese sign language
Hobbies: Swimming, Ukulele