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 Supervisor: Prof. Lan Wu	2019 – Present
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, 2022
Excellent Graduate of Elite Undergraduate Program of Applied Mathematics	2019
Peking University 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
Leo KoGuan Scholarship	2022
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. Measuring and Optimizing the Risk and Reward of Green Portfolios
   Andrew W. Lo#, Ruixun Zhang#*, and Chaoyi Zhao#*.
   The Journal of Impact and ESG Investing, 2022, Forthcoming. [SSRN] Winner of the S&P Global Academic ESG Research Award.

5. Optimal Impact Portfolios with General Dependence and Marginals
   Andrew W. Lo#, Lan Wu#, Ruixun Zhang#*, and Chaoyi Zhao#*.
   Working paper. [SSRN]

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, and 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, and Lan Wu.
   Under review.

Books

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

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	
	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 2020, 2022
	Elective for Graduate and Senior Undergraduate Students. Instructor: Prof. Jian Sun and Lan Wu	
	Practice for Fixed Income Securities	Fall 2021, 2022
	Elective for Graduate and Senior Undergraduate Students. Instructor: Prof. Lan Wu *et al.*	
	Theory and Practice for Futures and Other Derivatives	Spring 2022
	Elective for Graduate and Senior Undergraduate Students. Instructor: Prof. Lan Wu *et al.*	
	Mathematical Analysis III (Including Exercise Class)	Fall 2021
	Core Class for Undergraduate Students. Instructor: Prof. Jiazhong Yang	
	Mathematical Analysis II (Including Exercise Class)	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	
	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