Zhixuan Feng

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EDUCATION

Ph.D. in Economics, North Carolina State University, Raleigh, NC 2022 – 2027 (Expected)

- Committee: Profs. Denis Pelletier (Advisor), Mehmet Caner, Ilze Kalnina, Zheng Li

Master of Statistics, North Carolina State University, Raleigh, NC 2025 – 2026

Master of Economics, North Carolina State University, Raleigh, NC 2021 – 2023

B.A. in Finance & B.S. in Electronic Information Engineering, UESTC, Chengdu, China 2017 – 2021

RESEARCH FIELDS

Financial Econometrics, High-Frequency Volatility Modeling, Time Series, Machine Learning

JOB MARKET PAPER

"Regime-Switching in Multivariate Realized GARCH: A Block-Constrained Hidden Markov Approach"

- **Abstract**: Proposes a two-stage Regime-Switching Multivariate Realized GARCH (RS-MRG) framework that embeds a Hidden Markov Model (HMM) into the joint measurement system of standardized returns and high-frequency realized covariance measures. To resolve the curse of dimensionality, introduces sector-specific block constraints mapped to industry classifications, achieving analytical trace projections in the M-step. Recovers robust standard errors via the Louis Formula to account for latent state allocation uncertainty. Empirically demonstrates statistically significant, regime-dependent asymmetric contagion during crisis periods; out-of-sample Model Confidence Set (MCS) evaluations and Global Minimum Variance Portfolio (GMVP) backtests confirm substantial reductions in annualized portfolio volatility over standard MRG, CCC$^+$, and DCC$^+$ benchmarks.

WORKING PAPERS

"Forecasting Multivariate Realized Kernel Covariance Matrices in High-Frequency Trading: A Comparative Analysis with Machine Learning"

- Constructs high-dimensional daily realized covariance matrices for a cross-section of 50 U.S. equities using Multivariate Realized Kernels (MRK) with pairwise refresh time and Parzen weights to correct for microstructure noise, Epps effect, and asynchronous trading, applying eigenvalue cleaning to ensure positive definiteness.
- Develops a high-dimensional forecasting framework by vectorizing the covariance dynamics (1,275 unique elements) into a VAR(5) structure; integrates Lasso (L_1), Ridge (L_2), and Elastic Net regularization to evaluate predictive performance against AR and HAR benchmarks across rolling out-of-sample horizons.

INDUSTRY EXPERIENCE

Quantitative Research Intern, Southwest Securities Co., Ltd., Chongqing, China 07/2026 – 08/2026

- Conducted quantitative research within the Equity Investment Department, extracting alpha signals from high-frequency futures data combined with underlying equity dynamics.
- Engineered volatility and momentum metrics to capture cross-asset mispricing; executed comprehensive backtesting across multiple rolling estimation windows.
- Evaluated factor effectiveness via Information Coefficient (IC/IR), turnover ratios, and risk-adjusted returns, identifying robust and decay-resistant alpha factors for live allocation strategies.

FinTech Analyst Intern, China Construction Bank, Chongqing, China 07/2019 – 09/2019

- Processed large-scale ETC customer transaction datasets using big data frameworks to optimize targeting strategies for personalized marketing campaigns.
- Assisted municipal government liaisons and FinTech sector leads in technical integration and documentation during the Smart China Expo Summit Forum.

TEACHING EXPERIENCE

Independent Instructor, North Carolina State University 2024 Fall

- Principles of Macroeconomics (EC 202): Designed curriculum, delivered lectures, and evaluated undergraduate students on macroeconomic modeling, monetary/fiscal policy, and aggregate market dynamics.

Graduate Teaching Assistant, North Carolina State University 2022 – Present

- Undergraduate Economics Courses: Facilitated weekly recitation sessions, organized exam review lectures, handled course grading, and held office hours.

TECHNICAL SKILLS & INFORMATION

- **Programming:** MATLAB, Python (NumPy, SciPy, Pandas, Scikit-Learn), R, SAS, Stata
- **Methodologies:** Time Series, Hidden Markov Models, High-Frequency Econometrics, Volatility Modeling, Factor Alpha Mining, Machine Learning
- **Tools & Systems:** LaTeX, Git
- **Languages:** English (Fluent), Chinese (Native)

REFERENCES

Prof. Denis Pelletier (Advisor)
Department Head and Professor of Economics
Department of Economics, Poole College of Management
North Carolina State University, Nelson Hall 4174
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