Xize Ye

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EDUCATION

Western University **Expected Aug 2025**
PhD *in Statistics, Financial Modelling* *London, ON*

- Graduate Affairs Committee (GAC) member; Society of Graduate Students (SOGS) councillor
- Graduate Teaching Assistant Award 2023 - 2024

Western University **2019 - 2021**
MSc *in Statistics, Financial Modelling; Avg: 94.5/100* *London, ON*

Thesis: On the Estimation of HN-GARCH Using Returns and/or Options: A Simulation-based Approach

University of Waterloo **2015 - 2019**
BMath *in Mathematical Finance; minor in Pure Mathematics; graduated with distinction* *Waterloo, ON*

Awards: UWaterloo President's Scholarship 2015-2019; Faculty of Mathematics' Entrance Scholarship

PUBLICATIONS

- Escobar-Anel, M. Stentoft, L. **Ye, X.** Analytical Fixed Income Pricing in Discrete-Time: A New Family of Models. *Submitted to Pacific-Basin Finance Journal.*
- Escobar-Anel, M. Stentoft, L. **Ye, X.** Setting the VIX Free: A Generalized Affine GARCH Model. *Submitted to The Review of Asset Pricing Studies. In revision.*
- Escobar-Anel, M. Stentoft, L. **Ye, X.** Not all VIXs are (Informationally) equal: Evidence from affine GARCH option pricing models. *Finance Research Letters*, 2024. *In press.*
- Escobar-Anel, M. Stentoft, L. **Ye, X.** The Benefits of Returns and Options in the Estimation of GARCH Models. A Heston-Nandi GARCH Insight. *Econometrics and Statistics*, 2023. *In press.*

ACADEMIC EXPERIENCE

PhD Researcher | Western University **2021 - present**

- Investigated the time series and cross-sectional characteristics of the market option data and the volatility indices (CBOE VIXs) of various maturity, with emphasis on their term structures and levels of persistence
- Proposed a novel type of GARCH model for pricing return and volatility derivative products by directly incorporating the observable volatility indices, and combined with a generalized pricing kernel
- Empirically estimated the model parameters, examined the model fit and model performances; pertinence of the model is documented via a 70% reduction in out-of-sample pricing compared to the benchmark

MSc Researcher | Western University **2020 - 2021**

- Explored the theoretical validity of likelihood-based estimation approaches using stock return and option data jointly for the Heston-Nandi GARCH model under a specific vega-weighted Gaussian structure of option noises
- Empirically studied statistical properties of such joint estimators via simulation-based experiments, and further demonstrated the superiority of option price-based estimation over the traditional returns-only MLE approach
- Quantified such improvements across options with different maturities and strike prices

RESEARCH TALKS

Departmental Colloquium "GARCSH: Motivation and Applications" | Western University **Dec 2023**

- Presented original research on a novel class of Generalized Autoregressive Conditionally Stochastic Heteroskedasticity (GARCSH) models
- Discussed the motivation, implementation and financial applications of GARCSH models

Workshop Presentation "Affine GARCH option valuation models" | The 3rd iCAIR Workshop **Oct 2020**

- Presented on the 3rd iCAIR (The international Center for Asset Management, Insurance and Risk Management) Online Workshop overviewing the historical evolution of GARCH models, their benefits and limitations, and gave an outlook of future extensions

TEACHING EXPERIENCE

Graduate Teaching Assistant | Western University **Jan 2020 - present**

- Dedicated and compassionate TA with years of experience in marking assignments and exams, delivering reviews and problem-solving sessions for undergraduate and graduate courses in mathematics, statistics, and finance
- Regularly assigned as lead TA to coordinate other TAs in marking assignments and exams, produce marking schemes, preparing curriculum for tutorials and review sessions, and other managerial duties

Data Science Lab Instructor | Western University **Winter 2020 & Winter 2024**

- Delivered hands-on Python and R coding curriculum with applications to data science and statistical analysis to undergraduate students through lecture-like classroom formats
- Provided individual code review and answered questions to assist students in troubleshooting

PROJECTS

Workshop Project: Deep Hedging | The 3rd iCAIR Online Workshop **Oct 2020**

- Implemented a long short-term memory (LSTM) recurrent neural network (RNN) that receives historical daily asset prices and produces a self-updating hedging strategy with the objective to minimize the 99% conditional Value-at-Risk (CVaR) of the combined portfolio, without any distributional assumptions on the asset returns
- Simulated stock prices from the standard Black-Scholes model; trained the recurrent neural network and compared out-of-sample performance with the Black-Scholes' discretized delta hedging as a benchmark; The RNN model achieved higher average portfolio PnL and also reduced 99% cVaR by 20% compared to benchmark

Sentiment Analysis using Neural Networks | Western University **Dec 2019**

- Analyzed and pre-processed web comments; applied two pre-trained embeddings, fastText and GloVe, to transform text into vectors in the purpose of conducting statistical analysis and predictive modelling
- Designed a sequential neural network with 2 convolution layers, and a graph model with 4 parallel sequences of layers to predict the sentiment (either positive or negative) of online comments
- Trained the models using Keras; tuned learning rate, dropout rate and other parameters to maximize performance; examined goodness of model from confusion matrix and ROC plot
- The final graph model (using pre-trained fastText as an embedding) achieved 89% out-of-sample accuracy

Credit Risk Analytics and Modelling for Lending Club | Western University **Sep 2019**

- Executed data cleaning processes with advanced data frame operations to lending club's 2 million loan records with 150 variables; conducted variable selection based on Weight of Evidence (WoE) and Information Value (IV)
- Constructed a scorecard based on logistic regression, and 2 Loss Given Default (LGD) models using Random Forest and XGBoosting; estimate the model via an exhaustive search; executed cross-validation to assess model performance
- Calibrated a long-run Probabilily of Default (PD) model with relevant macroeconomic variables

ADDITIONAL INFORMATION

Graduate Affairs Committee student member | Department of Statistical and Actuarial Sciences **2023 - present**

- Provided recommendation on a broad range of issues related to the department's graduate programs, including admission requirements and processes, program design and branding, student accommodation needs, and etc.

Western Certificate in University Teaching and Learning (WCUTL), in progress **2021 - present**

- Actively and consistently developed and sharpened university teaching and communication skills to foster a student-centered learning environment and bring active learning techniques to mathematical-heavy classrooms, therefore ultimately enhancing learning experiences and learning outcomes
- Completed Teaching Mentor Program (TMP) and Advanced Teaching Program (ATP) to learn and practice course design strategies and active learning principles; self-reflect and self-improve with peer feedback

Other information:

- **Programming Languages**: Matlab (proficient); Python (NumPy, SciPy, Pandas, Matplotlib, Seaborn, Scikit-learn, XGBoost, TensorFlow, PyTorch, Keras, and etc.); R; SAS (SAS Base Certificate holder)
- **Exams/Certificates**: Passed Society of Actuaries (SOA) Exam P (Grade 10) and FM (Grade 9); Working towards Financial Risk Manager (FRM) Certification, passed level 1 exam
- **Communication**: Mandarin (native); English (full professional proficiency; IELTS 7.5 overall, 8 in writing)
- **Hobbies**: Basketball, pickle ball, hiking, piano, and singing