MATTHEW SON

☎ +1 (352)-328-9955 ✉ gunsu.son@warrington.ufl.edu https://matthewgson.github.io/homepage
Stuzin Hall 303J, University of Florida, Gainesville, FL, 32611, USA

EDUCATION

Ph.D. Finance, University of Florida — Expected 2023

M.A. Economics and Finance, University of Alberta — 2018

B.A. Economics, Korea University
B.Sc. Public Health, Korea University — 2011
· Top of the class with a GPA of 4.39/4.5

TEACHING INTERESTS

Investments, Derivatives, Corporate Finance, Financial Modeling, Business Analytics, ML/AI Applications in Finance

TEACHING

Financial Modeling, Instructor, *In-person & Online Hybrid course* — 2021
Department of Finance, Insurance and Real Estate, University of Florida
Excellence in Teaching Award Winner, Instructor rating: **4.88/5.00** (Dept. mean : 3.81)
Financial modeling with spreadsheets and object-oriented programming, Introduction to machine learning and data analysis with Python, R, EXCEL

Quantitative Methods in Economics, Lab Instructor — 2016-2017
Department of Economics, University of Alberta
Econometric analysis and computing with EXCEL/STATA

Teaching Assistant

Introduction to ML/AI Applications in Finance (MBA), *full-online course* — 2022
Department of Finance, Insurance and Real Estate, University of Florida
Assist on cloud-computing (HiPerGator; supercomputer), coding assistance on machine learning, write quizzes, resolving technical issues

Corporate Finance (MBA), *full-online course* — 2022
Department of Finance, Insurance and Real Estate, University of Florida
Case-based course; Evaluate cases, grade students' presentations and exams

Financial Management, *undergraduate capstone course* — 2018-2021
Department of Finance, Insurance and Real Estate, University of Florida
Case-based course; Evaluate cases, grade exams

Debt and Money Markets — 2018
Department of Finance, Insurance and Real Estate, University of Florida
Grade exams, proctor exams and answering student questions

RESEARCH INTERESTS

Big data/Machine learning, FinTech, Investments, Derivatives, Market microstructure, Mutual funds

RESEARCH

Working Papers

High-Frequency Trading in the Options Market and Order Flow Toxicity

Job Market Paper

The behavior and impact of HFTs in terms of market quality has mainly focused on the stock market and options market have received less attention. Options exchanges identify high-frequency/algorithmic traders as Professional customers (PCs). In this study, we use a granular data that identifies trades by customers, PCs, and Market makers (MMs). We find that PCs mainly trade as a counterparty to customers, similar to MMs. However, the liquidity provision by PCs leads to order flow toxicity: PCs use a "cream skimming" strategy that imposes adverse selection costs to MMs. PCs mainly trade with uninformed customers, and strategically pick resting orders, most likely leveraging their speed advantage. PCs provide less liquidity when the market and stock volatility are high. Customer call option trades made with PCs have one-tenth of price impact and no return or volatility predictability, while there are significant price impact in addition to return and volatility predictability when executed against MMs during the next 30 minutes. Our findings on HFTs' non-arbitrage channel of order flow toxicity is new and suggests that the role of HFTs should be better understood in the context of the options market structure.

· FMA Doctoral (2022), FMA Asia (2022), FMA Global (2022), UF Brown Bag (2022)

It is Better to be Yourself: A Network Analysis on Mutual Fund Distinctiveness and Performance

In this study, we analyze the information content of active mutual fund holdings using a network model. By analyzing 48 million of fund network connections, we document two main findings: First, we find a strong association between portfolio distinctiveness and its long-term risk-adjusted return. We measure funds' distinctiveness in two dimensions: centrality and clusteredness. The centrality measures the overall commonness of a fund's portfolio, while clusteredness measures how strongly a fund is forming a clique (localized strategy).We find funds that hold assets commonly held by others (high centrality) underperform by 60bps, while funds with localized and distinctive portfolio (high clusteredness) outperform 140 bps in a year. Second, we find effect of peer competition that monotonically harms the fund's performance. Funds that are located in lowest quintile of competition outperforms 240bps in a year compared to top quintile funds. All results hold significance for more than 24 months. Our network-based approach overcomes potential confounding effects from style misclassifications and mixed-style funds.

· WFBS (2021), UF Brown Bag (2021)

Work-in-Progress

An Efficient Estimate of Closing Option Price using Machine Learning *with Alejandro Lopez-Lira and Mahendrajah Nimalendran*

U.S. stock exchanges have closing auctions that generate robust benchmark closing prices; however, options markets do not have closing auctions. Exchanges and brokerages use mid-quote at close and funds use the last trade as the benchmark price. The closing quotes are noisy because the options trading near the market close is very volatile. In this study, we estimate a more robust and efficient closing option price using the closing stock price with a machine learning model. We consider several machine learning algorithms: Gradient Boosting Machine (GBM), Extreme gradient boosting, Random forest, Deep learning, and Elastic net. We obtain a reliable option price estimator by combining Black-Scholes option prices and the machine learning algorithm (GBM), with an out-of-sample r-squared of 99.8%. We test the reliability of our estimate and analyze the price discrepancy between the 4pm mid-quote and our estimates. Unlike stocks, most (75%) of estimated options' closing prices lie within the bid-ask spread, likely due to the wide option spreads at the close. We find that the price deviation of the ML estimate and mid-quote at the close is particularly large for 1) large firms, 2) out-of-the-money options, and 3) short expiration options. Formal regression tests show consistent results that options that are actively traded, and that have larger spreads exhibit greater deviations. Our result shed light on the validity of using the end-of-day mid-quote as a benchmark option price.

ACADEMIC ACTIVITIES

Conference Presentations

FMA Asia Conference	Scheduled, 2022
FMA Doctoral Consortium	Scheduled, 2022
FMA Global Conference	Scheduled, 2022
World Finance and Banking Symposium	2021

Conference Discussions

World Finance and Banking Symposium: "Volatility Forecasting for the Coronavirus Pandemic using Quasi-score-driven EGARCH Models" 2021

Professional Development

UFIT Research Computing and AI Training	2021
Princeton University Financial Economics of Insurance Workshop	2020
University of Chicago Summer School on the Econometrics of Mixed Frequency Data	2020

FELLOWSHIPS, AWARDS AND HONORS

Warrington College of Business Excellence in Teaching Award	2022
Doctoral Fellowship, Warrington College of Business, University of Florida	2018-Present
Maurice, Mary, and Max Stewart Scholarship in Economics, University of Alberta	2017,2018
Ad O'Brien Graduate Scholarship in Public Finance, University of Alberta	2017
Queen Elizabeth II Graduate Scholarship, University of Alberta	2017
Nothern Alberta Scholarship in Economics, University of Alberta	2017-2018
Graduate Assistant Fellowship, University of Alberta	2016-2018
The Woo-Yang Scholarship, Seoul, Korea	2010
Gyeonggi-Do Provincial Award, Korea	2009-2010
The Shilla Culture Scholarship (Full-Ride), Seoul, Korea	2008-2010
Undergraduate Academic Scholarship, Korea University	2008-2009
The Korea Exchange Bank Foundation Scholarship, Seoul, Korea	2007
Entrance Scholarship, Korea University	2007

WORK EXPERIENCE

Finance and Accounting Officer, 1st Lieutenant, Republic of Korea Air Force 2011-2015
U.S. Airbase, Air defense and Control Command
Senior officer, managed general government accountancy; budget compilation, procurement and construction contracts, preparing financial statements

TECHNICAL PROFICIENCIES

Programming languages	*C/C++(rcpp), Python, R, PostgreSQL*
Server/Cloud Computing	*SLURM (HiPerGator 3.0), Univa Grid Engine, RStudio-Server*
Big Data/Distributed computing	*Apache-Spark, Futures-R, Dask, PySpark, Sparklyr*
Machine Learning	*Scikit-learn, Keras, H2O.ai, Tensorflow-R*
Network/Textual Analysis	*igraph-R, Spacy, nltk, Textblob*
Others	*REST APIs, Selenium, httr, Beautifulsoup, Apache-Arrow*

LANGUAGE

English (Fluent), Korean (Native)

CITIZENSHIP

Canada (Permanent Resident), Korea (Citizen)

REFERENCES

Mahendrajah Nimalendran, Ph.D. (Chair)
John H. and Mary Lou Dasburg Chair, Professor
Warrington College of Business, University of Florida
✉ mahen.nimalendran@warrington.ufl.edu
☎+1 (352) 392-9526

Andy Naranjo, Ph.D.
John B. Hall Professor & Chair
Warrington College of Business, University of Florida
✉ andy.naranjo@warrington.ufl.edu
☎+1 (352) 392-3781

Yuehua Tang, Ph.D.
Emerson-Merrill Lynch Associate Professor
Warrington College of Business, University of Florida
✉ yuehua.tang@warrington.ufl.edu
☎+1 (352) 392-9985

To request letters of recommendation, please contact Ms. Deborah Himes at debbie.himes@warrington.ufl.edu or (352) 392-0154.