Guoliang Ma
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EDUCATION

Iowa State University, Department of Statistics   June 2023 (expected)
Ph.D. in Statistics

Iowa State University, Department of Statistics   August 2020
M.S. in Statistics

Fudan University, School of Management   June 2016
B.S. in Statistics

WORKING PAPERS

A Semiparametric Causal Estimator with Nonignorability
with Cindy Yu

- Studied causal effects of a binary treatment with nonignorable assignments and heterogeneous outcomes

- Proposed an iterative estimation procedure for multiple causal effects estimations, proved the consistency of the estimator with a controllable bias, and derived the asymptotic variance of the estimator

Cross-Sectional Analysis of Conditional Stock Returns: Quantile Regression with Machine Learning
with Haitao Li and Cindy Yu
Student Paper Award, American Statistical Association B&E Section, 2022

- Developed methods that combine machine learning algorithms (including principal component regression, Lasso, deep neural network, quantile random forest, and LightGBM) and quantile regression to forecast the monthly conditional distributions of all U.S. listed stocks from January 1987 to December 2016

- Proposed multiple long-short investment strategies that combine the distributional information and produce significant positive alphas against several classic factor models

Fundamental Anomalies
with Erica X.N. Li, Shujing Wang, and Cindy Yu
SSRN: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3783526   Submitted

- Studied the investment CAPM at the firm level by replicating potentially *any* anomalies and introduced a time-varying and industry-dependent parameter structure

- Proposed an MCMC algorithm with Metropolis-Hastings embedded Gibbs sampling, derived the posterior distributions and the symmetric proposal distributions of 1063 parameters, and implemented the algorithm from scratch in MATLAB to estimate firm-level stock returns

- Empirically studied the investment CAPM and addressed Campbell (2017)'s critique by finding a generally applicable estimation method that applies to all types of anomalies

PUBLICATIONS

Optimal Policy Mechanism Design for Cross-Sector and Multi-Stage Pollution Control with a Bilevel Model: Application to SO2 Emission in China
with Xu Li, Zimeng Liu, Qing Xu, and Zhongyi Jiang   2017
Environmental Modeling & Assessment, 22(3), 243-255

- Studied bilevel programming where the government in the first stage aims to control the aggregated social cost of emission abatement by choosing a tax rate and firms in the second stage aim to minimize the sums of taxes and abatement costs

- Proved the feasibility of the problem with KKT conditions, solved the problem empirically using emission data of China, and compared the proposed model to the compulsory engagement and a single-layer model

WORK IN PROGRESS

Conditional Portfolio Policies
with Haitao Li and Cindy Yu

- Designed a strategy to make portfolio choices with conditional distributional information of asset returns

- Solved the cross-sectional portfolio choice problem each month with parameterized portfolio weights and under quadratic utility (i.e., classic Markowitz mean-variance optimization)

Portfolio Construction Using Predicted Extreme Stock Returns in the Cross Section: Classification Task with Machine Learning
with Zihao Chen, Haitao Li, and Cindy Yu

- Proposed a portfolio policy that selects stocks with high probabilities of exhibiting extreme future returns by stock classification that can flexibly describe the extremity of future returns
- Implemented machine learning algorithms (principal component logistic regression, gradient boosting trees, and random forest) to classify stocks and tuned hyperparameters with Bayesian optimization in Python
- Achieved 1814% cumulative simple returns empirically over a 27-year out-of-sample period with the proposed policy that covers around 20% of the stock universe in long-short investing

OTHER RESEARCH & TEACHING EXPERIENCES

Center for Survey Statistics and Methodology, Iowa State University   July 2019 – Present
Research Assistant

- National Resources Inventory (NRI) Grazingland Survey, National Resources Conservation Service (NRCS) of USDA
  - Assisted in single-year and multi-year weights calculation for NRI pastureland and rangeland surveys to help assess the status of health conditions in non-federal grazing lands
  - Assisted in adjusting weights for old and new sampling designs by developing an R package that more effectively computes the survey sampling weights
- Bureau of Land Management (BLM) Rangeland Survey, Department of The Interior (DOI)
  - Assisted in designing a new BLM Rangeland survey sample by change point detection techniques
- Conservation Effects Assessment Project Grazingland Survey, NRCS of USDA
  - Assisted in reweighting points from different surveys in areas of Major Land Resource Areas

STAT 101 (for undergraduate), Iowa State University
Instructor   *Fall 2018 & Spring 2019*
Lab instructor   *Fall 2017 & Spring 2018*

STAT 305, STAT 406 (Undergraduate), Iowa State University
Grader   *Fall 2017*

AWARDS AND HONORS

Vince Sposito Statistical Computing Award, Iowa State University	2022
Best Student Paper Award, 2022 ASA B& E Section	2022
George W. Snedecor Award (first place in the Ph.D. qualification exam), Iowa State University	2020
HSBC Cup SAS Data Mining Contest (rank: 4/658), HSBC	2016
Fudan University Excellent Student, Fudan University	2013-2014

PRESENTATIONS

In-person session, 2022 Financial Management Association Annual Meeting, Atlanta, GA	October 2022
Poster, The 75th anniversary of the Iowa State University Department of Statistics, Ames, IA	Sept. 2022
Paper presentation session, SoFiE Financial Econometrics Summer School 2022, Online	August 2022
Student paper award talk, Joint Statistical Meeting (JSM), Washington, DC	August 2022
Invited talk, 5th International Conference on Econometrics and Statistics, Online	June 2022
Video poster, NISS Graduate Student Research Conference, Online	May 2022
Speed round, Joint Statistical Meeting (JSM), Online	August 2021

SKILLS

Languages: Mandarin (native), English (fluent)
Programming: Python, R, SAS, MATLAB, Linux/Bash