

HAOYU LIU

Department of Applied Economics
Guanghua School of Management, Peking University, P.R. China
+86 13718266919 | e: 1800015905@pku.edu.cn

EDUCATION

Peking University

Bachelor of Economics & Bachelor of Science in Mathematics

Beijing, China

Sep. 2018 – Present

- **Major GPA:** 3.92/4.00 (rank 3/153); **admitted on basis of performance on national college admissions exam in Beijing (rank 1/34952)**
- **Coursework in mathematics:** Advanced Mathematics, Mathematical Analysis, Probability and Statistics, Linear Algebra, Real Analysis, Mathematical Methods in Finance, Stochastic Analysis
- **Coursework in economics:** Microeconomics, Macroeconomics, Econometrics, Public Finance Theory and Policy, Financial Economics, Industrial Organization Analysis, Labor Economics
- **Selected awards:**
 - National Scholarship (2021)
 - First Prize in National Mathematics Competition (2019, 2020)
 - May 4th Scholarship, for high honors (2019, 2020)
 - Merit Student Pacesetter, for high individual honors (2020)
 - Academic Innovation Award, for outstanding academic performance (2021)
 - Fengqi Scholarship, for outstanding academic performance in Finance and Economics (2020)

University of California, Berkeley

Exchange Student

California, USA

Jan. 2021 – May 2021

- Undergraduate coursework: Applied Econometrics and Public Policy (A+), Topics in Economic Research (A)
- Graduate-level coursework: Mathematical Economics (A+), Public Economics (A+)

RESEARCH

On the Concavity of Consumption Function under Habit Formation

Independent research, submitted paper under review at *Theoretical Economics*

Jan. 2021 – Present

- Established a finite-horizon consumption-saving model with habit formation to analyze the optimal consumption rule; studied the effect of habits on the concavity of the consumption function.
- Applied discrete-time dynamic programming methods to analyze the model; used Python to conduct numerical simulations to demonstrate the results.
- Found that the consumption functions are more likely to be concave under habit formation; also found that the consumption functions can be convex in earlier periods and become concave when the consumer gets older.
- Paper submitted to *Theoretical Economics* (Available at <https://ssrn.com/abstract=3943097>).

A Counterexample for “Weak Monotone Comparative Statics”

Independent research

May 2021 – Jun. 2021

- Solved an open question on Theorem 5 in the working paper “Weak Monotone Comparative Statics” by Yeon-Koo Che et al. (2021).
- Used an example to prove that the concavity of utility functions cannot be dispensed with.
- Received positive commendations by the authors; findings on the theorem are now included in an updated version of the paper.

Long-term Contracting for Addictive Goods

Advisor: Prof. Xi Weng, *Peking University*

Jun. 2020 – Jan. 2021

- Established an innovative model for addictive goods; studied the optimal contract for an addictive good between a monopolist and a consumer whose preferences follow a Markov process.
- Analyzed the effect of addiction on the optimal price and quantity and the impact on social welfare.
- Used Python to conduct comparative statics analysis, finding that under certain conditions, the monopolist provides more goods to the consumer with lower marginal valuation to increase the probability that they become addicted.

Joint Estimation of Security Price and Option Price Time-series via Generative Adversarial Networks (GANs)

Advisors: Prof. Zeyu Zheng, *UC Berkeley*; Prof. Chenxu Li, *Peking University*

Jul. 2020 – Present

- Proposed a new framework for a neural network-assisted simulator to estimate and simulate the objective and risk-neutral dynamics jointly using security price and option price data.
- Analyzed the performance of different frameworks through numerical experiments in Pytorch.

How Does Election Affect a Team Leader's Risk Preference: An Experimental Study

Advisor: Prof. Yu Gao, *Peking University*

Nov. 2020 – May 2021

- Designed and conducted an experiment to test the shift of risk preference for individuals making decisions on behalf of a group rather than making decisions for themselves.
- Used the difference-in-difference method to analyze the causal relationship between being elected and the shift of risk preference, finding significant evidence that the representative becomes less risk averse when elected rather than designated.
- Won the highest prize in the "Challenge Cup" Competition of Peking University.

Family Response to Government Investment in Public Education in China

Advisor: Prof. Wanjun Lin, *Peking University*

Mar. 2020 – May 2021

- Examined the impact of Chinese government public investment in education on families' investment of time and money in children's education.
- Established a model to analyze the impact of government investment on a family's optimal choice.
- Conducted empirical analysis using family-level panel data in STATA, finding that increased government investment in education leads to an increase in a family's investment of time and a decrease in the investment of money.
- Won the first prize in the "Challenge Cup" Competition of Peking University.

SELECTED AWARDS AND HONORS

- | | |
|--|----------------------|
| • First Prize in National Mathematics Competition (top 1% of college students in Beijing) | 2019 and 2020 |
| • National Scholarship (the highest honor scholarship of college students in China) | 2021 |
| • May 4th Scholarship (the highest honor scholarship of Peking University) | 2019 and 2020 |
| • Merit student Pacesetter (the highest honor individual award, for outstanding comprehensive performance in academic, social work, volunteer service, cultural activities and sports) | 2020 |
| • Academic Innovation Award (awarded for outstanding academic performance) | 2021 |
| • Fengqi Scholarship (awarded for outstanding academic performance in Finance and Economics) | 2020 |
| • First Place in the "Challenge Cup" Competition of Peking University (the largest, most authoritative and influential student academic competition) | 2019 and 2020 |

ADDITIONAL INFORMATION

Professional and Extracurricular Experiences

- Headed the Department of Volunteers of the Guanghai International Student Association (2019 – 2020)
 - Organized and participated in the "Magic Hospital" voluntary activity in Huaxin Hospital.
- Headed the Editorial Department of GSM Inspire (2021)
 - Wrote articles to introduce economics to high school students.
 - Organized a summer camp program for high school students who are interested in economics.

Interests

- Bamboo flute: Level 10 (the highest level in China Nationalities Orchestra Society)
- Cross talk: 5 years' experience of performance, participating in more than 10 performances in and out of the college; ranked the first in the National Cross-talk Competition for college students in 2021.

Computer and Language Skills

- Language: Mandarin (Native), English (TOEFL 111/120, GRE V160+Q170+AW4.5)
- Computer skills: Python, C++, R, STATA