Application for the NBER 18th Annual Entrepreneurship Research Boot Camp

Geyue Sun

Ph.D. Candidate in Economics, The George Washington University

Name: Geyue Sun

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School: Department of Economics, The George Washington University

Area of Interest:
International Macroeconomics, Capital Flows, and Monetary Policy, Development Economics, Financial Market Development

Year of Entry into Ph.D. Program: 2021

Expected Year of Completion: 2026

Faculty Member Supplying Recommendation Letter:

- Main Advisor: Prof. Tomas Williams, The George Washington University
  Email: tomaswilliams@email.gwu.edu
- Co-author: Prof. Roberto Samaniego, The George Washington University
  Email: roberto@email.gwu.edu

I am particularly interested in the intersection of financial markets, macroeconomic policies, and development economics, with a focus on how capital flows and financial regulations shape entrepreneurial activity. My current research explores the development of a high-frequency capital control index, and its implications for financial market stability and investment decisions. Additionally, I examine firm-level commodity carry trade, analyzing how businesses engage in these trades to optimize liquidity and manage financial constraints. Understanding the dynamics of entrepreneurial finance within this framework is crucial for assessing how liquidity constraints, policy interventions, and macroeconomic conditions influence firm formation and growth. Participation in the NBER Entrepreneurship Research Boot Camp will provide a valuable opportunity to deepen my understanding of these issues, engage with leading scholars in the field, and refine my approach to studying the financial constraints and opportunities faced by entrepreneurs in global markets.

Geyue (Grace) Sun

Washington D.C., US

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PROFILE

An accomplished researcher with a robust six-year track record in open macroeconomics, international finance, and capital flows. My academic pursuits are deeply rooted in international macroeconomics and monetary policy, where I have honed a proficiency in managing complex data sets and leveraging AI-driven methodologies for quantitative modeling. I bring a proven ability to write effectively, communicate across cultures, and collaborate within diverse teams to drive project success. I am committed to applying my analytical acumen and technical expertise toward pioneering research that shapes our understanding of global economic trends and policies.

Research Field: International Macroeconomics, Financial Stability & Risks, Public Finance, Development Economics

EDUCATION

Ph.D. in Economics **Expected graduation: June 2026**
The George Washington University *Washington D.C., US*

- Honors and Awards: Graduate Merit Fellowship, John Whitefield Kendrick Graduate Fellowship

Master's degree in Economics **2024**
George Washington University *Washington D.C.*

- Honors and Awards: Graduate Merit Fellowship

Master's degree in International Economics **2021**
University of International Business and Economics (UIBE) *Beijing, China*

- Honors and Awards: Outstanding Freshman Scholarship (Distinction), Excellent Graduate Student Scholarship

International Exchange Program **2020**
University of California, Berkeley *California, US*

- Honors and Awards: International Exchange Student Scholarship

Bachelor's degree in Finance (Summa cum laude) **2018**
Jiangxi University of Finance and Economics (JUFE) *Jiangxi, China*

- Honors and Awards: Yinxing Hong Alumni Scholarship, Outstanding Graduates Awards, Outstanding College-Level Academic Project Award

COURSEWORKS & SKILLS

- Macroeconomics and Microeconomics Theory
- International Finance Theory and Application
- Computational Application of Macroeconomics
- Machine Learning
- Large Language Models
- Applied Econometrics
- Large-Scale Data Processing
- Theory of Probability
- Game Theory
- Stochastic Dynamic Programming
- Statistical Learning and Data Mining

PUBLICATIONS

[1] G. Sun et al. RMB Carry Trade and the Theoretical Framework of "Impossible Trinity" Theory: An Empirical Analysis Based on TVP-SV-VAR Model *Finance Forum,* 2022.

- This paper evaluated China's capital account liberalization and exchange rate marketization by integrating carry trade into the Impossible Trinity framework. Built a theoretical model and using TVP-SV-VAR analysis to examine the short- and long-term impulse responses between carry trade, capital controls, exchange rate stability, and monetary policy independence. Findings revealed that carry trade significantly impacts the independence of monetary policy, supporting a phased approach to capital account liberalization, starting with Portfolio Investment, followed by Financial Derivatives and FDI accounts.

[2] G. Sun. Impact of the Opening of Shanghai Free Trade Area on the Port Economy in Hong Kong *China Circulation Economy,* 2017.

- Investigated the impact of the Shanghai Free Trade Area (FTA) on Hong Kong's port economy using a Difference-in-Differences (DID) approach and border analysis. The analysis revealed a crowding-out effect of the Shanghai FTA on Hong Kong's import-export market, attributed to Hong Kong's dependence on sales and import volume rather than production innovation and R&D capabilities.

SELECTED RESEARCH EXPERIENCE

Bypassing Capital Interventions: Carry Trades via Commodity Futures Market, 2024

- *Advisor: Prof.Tomas Williams*
- Conducted empirical research on commodity carry trade in developing countries, testing two key hypotheses: (1) Commodity liquidity risk significantly reduces carry trade returns (estimated impact: -0.226); (2) The negative impact of liquidity risk is amplified by capital controls.
- Utilized a Staggered-DID model to investigate bypass mechanisms in response to various capital control policies. The analysis was based on daily capital intervention data (4,000 events) from the Global Trade Alert (GTA) dataset.
- Built a Large Language Model (LLM) to extract regional information from 25,035 commodity contracts in the Refinitiv dataset. Merged with Bloomberg's daily carry trade returns to assess the influence of liquidity risk on carry trade returns and develop a quantitative model for the commodity-carry trade market equilibrium.
- Presented at 2024 Southern Economics Association (SEA) 94th Annual Meeting on Nov. 2024.

AI Meets Policies: Daily Capital Control Indexing, 2024-present

- *Joint-work with Prof.Roberto Samaniego and Prof.Tomas Williams*
- Developed a high-frequency Daily Capital Control Index for 119 countries, spanning from January 1, 2000 till today, capturing six categories of capital account interventions. This dynamic index enables real-time tracking and analysis of global capital control policies.
- Powered ML techniques, including Linear Regression and LASSO, to enhance the precision of the Capital Control Index, trained on the Ka-open Index based on IMF's Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER).
- Built a new dataset and provided a website to enable real-time updates and dynamic access to the dataset.

Dumping the Dumps: A Quirky Dive into How the SUTA Act Shook Up Firm's locations, 2023

- Investigated how State Unemployment Insurance Tax (SUTA) variations influence firm location decisions, particularly in labor-intensive industries post the 2004 SUTA Dumping Prevention Act.
- Conducted a DiD and DDD analysis using QCEW data (2000-2022), which initially comprised a substantial 739,968 observations across 53 states. Found a notable uptick in manufacturing within labor-intensive industries by using Stata.
- Examined the differential impact of the SUTA Dumping Prevention Act on firms of different sizes, uncovering that smaller firms were more substantially affected.

International Capital Flows: Open-End Funds and the Impact of AI, 2022-2024

- *Research Assistant with Prof. Tomas Williams*
- Collected and cleaned large dataset of 320,231 Open-End Funds data by countries and SECID from Morningstar Direct. Applied with Excel VBA and Python to automate the data downloading process.
- Utilized the collected dataset to analyze the impact of AI on international capital flows. Applied quantitative and DID methods to identify how AI-driven investment strategies influence fund allocations, cross-border capital movements, and market efficiency.

Analysis on the Market Risk Model of China's Pension Management and Countermeasures, May 2016 – May 2017

- *Advisor: Prof. Jiahong Chen, JUFE*
- Led a 6-person team to assess whether China's pension funds should be listed and analyzed their market risk and interest rate risk after entering the asset market; studied pension management systems in the US and Japan to suggest improvements for China.
- Utilized a Risk Metric model to calculate the Value at Risk (VaR) of pension funds after their entry into the A-share market, and applied the Monte Carlo Simulation Method for robustness testing of the conclusions.
- Published research paper in JUFE Working Paper Series and received the Outstanding College-Level Academic Project Award

CONFERENCE PRESENTATIONS

- 2024 Southern Economics Association (SEA) 94th Annual Meeting
- George Washington University Macroeconomics Lunch Seminar
- Seminar on Big Data and Causal Inference
- IMI Forum at Renmin University of China (RUC)

TEACHING & INTERNSHIP

CCIR Summer Course, Cambridge Centre for International Research **Summer 2024**
Teaching Assistant *Washington D.C., US*

- Collaborated with Dr. Corneliu Bolbocean to design a comprehensive syllabus, reading list, and teaching plan, ensuring the course was both engaging and educational.
- Led personalized one-on-one supervision and group writing sessions, providing tailored feedback to support students in developing their research projects and academic papers.
- Successfully enhanced student engagement and understanding, resulting in an average improvement of 20% in final project scores and positive feedback from students on the depth of their learning and support received throughout the course.

ECON 8305/8306 Macroeconomics (PhD Level), GWU **Spring and Fall 2023**
Teaching Assistant *Washington D.C., US*

- Led four 90-minute classes each week, independently delivering complex macroeconomic models and dynamic programming skills to First-year PhD-level students, fostering an interactive and engaging learning environment
- Provided instruction on quantitative modeling techniques and facilitated hands-on applications using MATLAB (Dynare), enabling students to simulate and analyze macroeconomic models.
- Offered 3 hours of office hours and academic support per week, coworking with *Prof. Roberto Samaniego* and *Prof. Chao Wei*, addressing student inquiries and facilitating a deeper understanding of advanced macroeconomic theories.

ECON 1011 Principle of Microeconomics, GWU **Summer 2022**
Instructor *Washington D.C., US*

- Delivered lectures independently, four days per week over the summer session, with 90-minute classes each day, effectively managing course content and student engagement.
- Created the syllabus, prepared learning materials, and conducted exams, ensuring a comprehensive and structured learning experience.
- Achieved a 100% student satisfaction rate, with students highlighting the clarity and engagement of lectures, as well as the effectiveness of the learning materials and support provided throughout the session.

CBDCs Analysis Group, Shenwan Hongyuan Securities **Summer 2019**
Equity Research Intern *Beijing, China*

- Assisted in gathering, analyzing, and synthesizing data on industry trends, competitive dynamics, and financial performance to support valuation models and forecasts.
- Collaborated with team members to produce timely research reports, enhancing my understanding of equity research processes and developing analytical skills in a professional finance environment.
- Authored an industry research report *The Rise of Electronic Currencies (CBDCs): Market Dynamics and Future Outlook*, published on the IMI Forum.

EXTRACURRICULAR

Laboratory of Computational Social Science, Tsinghua University **Fall 2023**
Student Participant *Beijing, China*

- Participated in the "Seminar on Big Data and Causal Inference" as part of the Tsinghua University Interdisciplinary Research Capacity Enhancement Program. Under the guidance of Professor Qingguo Meng, focused on advanced methods in big data analysis and causal inference techniques.

Financial Investment Association, JUFE **2016 – 2018**
Office Director *Jiangxi, China*

- Oversaw daily operations of the association's office, ensuring efficient coordination across departments and seamless execution of administrative tasks.

- Organized and facilitated finance-related events and workshops, fostering engagement and professional development opportunities for members.
- Collaborated with external partners to build relationships and create networking opportunities, enhancing the association's visibility in the finance community.

CERTIFICATIONS

- JPMorgan Chase & Co.'s Quantitative Research
- CMA Piano Performance Certification (Level 10)

HONORS & AWARDS

2021-2026 Graduate Merit Fellowship, John Whitefield Kendrick Graduate Fellowship **(College-Wide Award)**
2022,2023,2024 John Whitefield Kendrick Graduate Fellowship in Economics **(College-Wide Award)**
2020 International Exchange Student Scholarship(**(College-Wide Award))**
2017 the 8th Blue Bridge Cup National Software and Information Technology Professional Talent Competition Software Entrepreneurship Team National Selection, **(Country-Wide Award, 3rd Prize)**
2016 the 2nd National University Internet Finance Application Innovation Competition, **(Country-Wide Award, 3rd Prize)**

OTHERS

Programming Skills: MATLAB (Dynare), Python(numpy, pandas, scipy, matplotlib), R(fGarch, quantmod, stats, ggplot2), Stata, Excel VBA, Eviews, OxMetric, C, SAS, PowerPoint, LaTex

Other Skills: Piano, Guitar, Photograph, Chinese Calligraphy

Languages: Mandarin (native), English (advanced)

Bypassing Barriers: Capital Controls, Liquidity Risk, and Carry Trades in the Commodity Futures Market

Geyue Sun

1 Introduction

Carry trade has long been a profitable strategy in global financial markets, yet its dynamics in the commodity futures market remain underexplored, particularly in the context of capital controls (Boonman, 2023). While traditional carry trades operate within foreign exchange markets, commodity futures present an alternative vehicle for bypassing capital control restrictions. This study investigates how liquidity risk in commodity markets influences carry trade profitability and how capital control interventions amplify these effects. Beyond its implications for macroeconomic policy, this research contributes to the broader discussion on entrepreneurial finance by examining how firms, particularly commodity-trading enterprises, respond to capital market frictions. The ability of firms to engage in commodity carry trade strategies reflects a form of financial adaptation, where businesses seek to optimize liquidity management and mitigate regulatory constraints. By studying these dynamics, my work provides insights into how financial innovations shape entrepreneurial activity and market development.

This study seeks to answer several key questions. **First, how does liquidity risk in the commodity futures market impact carry trade returns?** Firms engaging in commodity carry trade rely on liquidity conditions in futures markets to optimize financial strategies. It is hypothesized that heightened liquidity risk significantly reduces carry trade profitability, with preliminary country-level panel estimates suggesting a negative impact of approximately -0.226. **Second, do capital controls exacerbate the negative impact of liquidity risk on carry trade returns?** The hypothesis suggests that the adverse effects of liquidity risk on carry trade returns are magnified under stringent capital controls. **Third, How could the risk from commodity market spillover to the Financial Market?And how it impact the stability of the global financial market?**

2 Methodology and Future Contributions

This study develops a **firm-level structural model** to analyze how commodity-trading firms adjust their carry trade strategies in response to liquidity risk and capital controls, capturing their hedging, capital allocation, and market participation decisions under financial constraints. Then, we employ a **Staggered-Difference-in-Differences (Staggered-DID) model** to analyze how market participants adjust their carry trade strategies in response to capital control policies. By leveraging high-frequency data, the analysis aims to capture the dynamic interactions between liquidity risk, capital controls, and carry trade returns in commodity futures markets. A key innovation of this study is the use of **Large Language Models (LLMs)** to systematically extract and classify regional capital control policies from a vast set of commodity contracts. This machine learning-driven approach enhances the precision of tracking capital market restrictions and their spillover effects on global financial flows.

This study examines the intersection of **commodity markets, capital controls, and entrepreneurial finance**, focusing on how firms use **commodity futures to bypass capital restrictions** and manage liquidity risk. By integrating **high-frequency data**, it quantifies the impact of capital controls on firm-level carry trade profitability and financial stability. A key contribution is the development of a **quantitative model for firm decision-making in commodity carry trade**, offering insights into how financial frictions influence business strategies and global market spillovers.

3 Reason to Attend

Participating in the **NBER Entrepreneurship Research Boot Camp** will be an invaluable opportunity to deepen my understanding of **structural modeling techniques** in entrepreneurial finance and engage in discussions with leading scholars and peers to refine my approach. I am particularly interested in **collaborating with researchers** who work on firm-level financial constraints, investment behavior, and regulatory impacts, as these align closely with my research on commodity carry trade and capital controls. Additionally, I aim to enhance my knowledge of **firm-level data collection and processing**, learning best practices for handling high-frequency financial data while also contributing to discussions on the application of **Generative AI (Gen-AI) in data extraction and classification**. By exchanging insights on advanced modeling and data methodologies, I hope to integrate new perspectives into my research and contribute to the broader discourse on financial frictions, policy interventions, and firm adaptation in global markets.

THE GEORGE WASHINGTON UNIVERSITY
WASHINGTON, DC

Department of Economics

Letter of Reference for Geyue Sun

This letter of recommendation is for Geyue Sun who is applying for the 2025 NBER Entrepreneurship Research Boot Camp. Geyue is a student in the Ph.D. in economics at the George Washington Universith, which I have known for the past three years. My letter is a show of strong support for Geyue's admission into the camp.

I first met Geyue when she was assigned to me as a research assistant for the Summer 2022. At the time I was working on a project on Equity Demand Shocks and Firm Financing in different capital markets that is about to be out as a working paper. She was very helpful with a thorough literature review we needed at the time in the area of corporate finance. After that, she started helping with processing a database I got access to, Morningstar Direct. I asked her to develop a code to download entire portfolios of mutual funds and ETFs at the security and time level. This was not an easy task to do as there was also a daily limit on the amount of data she could download, and it required to be very organized since the data to download was very large. On her own she worked through it and was able to produce an automatic code that each day downloaded the data, organize it, and keep track of when the daily data limit was hit. She always found a way around different issues we had downloading this data. During the Fall semester 2023 she took my Ph.D. course on Empirical International Finance. The course involves working through papers covering different aspects of international financial markets with frictions. She excelled at the course, always asking the right questions, and always completing in notable form the different tasks through the semester. Most importantly, the final task was on producing a research paper proposal of 2 pages together with an in-class presentation. Her proposed topic was on Carry Trade and Liquidity Risk using an event study from the Nickel Crisis in Commodity Futures Market. Through it she demonstrated a good ability to think about potential research projects. Among 16 students in the class, Geyue was in the top 5% in terms of ability, intuition, and thinking about potential research projects.

On a final note, Geyue is an extremely hard-working and thoughtful student. In the past three years, where I have gotten to interact more with her, I have observed how she has grown and in my view, she will become a very solid researcher in the area of international macroeconomics and finance. She is very dedicated and wants to fully understand empirical regularities that can be thought through theoretical models to better understand the real world. Within this, I could notice that she has an extremely good economic intuition when looking at different data patterns. Additionally, I observe her constantly learning from other researchers and quickly picking up new tools to do economic research. At the same time, she is also very knowledgeable in "state of the art" econometric techniques to try to overcome identification challenges. Geyue was also a teaching assistant for a good number of different courses in economics at GWU getting very good teaching reviews in the process. Finally, and on a personal note, in my three years knowing Geyue, she has always been a collegial Ph.D. student and is an extremely kind colleague. Overall, I fully support Geyue for her participation in the 2025 NBER Entrepreneurship Research Boot Camp.

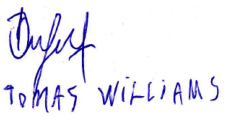
Sincerely,

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