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**Ph.D. Course of Study**

I am currently a 4th year Ph.D. candidate in Finance at the Olin Business School, Washington University in St. Louis. I began my graduate studies in 2021 and have completed all required coursework, including advanced topics in econometrics, machine learning, and empirical asset pricing. My program has provided me with a robust foundation in economic theory, data science, and quantitative analysis.

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**Research Interests and Current Projects**

My research interests lie at the intersection of digital economics, artificial intelligence, and financial markets, with a particular focus on leveraging advancements in AI to enhance our understanding of systematic risk, asset pricing, and the stochastic discount factor (SDF).

I am currently working on my **job market paper** titled:

**What Causes Market Jump? Interpretable Systematic Risk with Generative AI**

This work focuses on identifying the drivers of large, systematic movements in financial markets using generative AI. Leveraging timestamped high-frequency market data and precise news releases (e.g., Dow Jones Newswire), I employ advanced large language models to analyze the content and timing of news that coincide with market jumps. By incorporating interpretability methods into these models, I aim to identify causal relationships between observable news and market responses. In addition, I construct factors exposed to these interpretable jump risks and examine their pricing performance in asset markets.

Additionally, I am exploring:

1. **Fundamentals of Perpetual Futures (with Asaf Manela, Omri Ross, and Victor von Wachter)**: This project explores the theoretical no-arbitrage price and empirical deviations in perpetual futures, the most widely traded cryptocurrency derivative.
2. **Empirical Asset Pricing with Probability Forecast (with Linying Lv, and Guofu Zhou)**: This research examines the role of probability forecasts in cross-sectional

asset pricing. We provide an information ratio-based interpretation of probability forecasts and assess the incremental value of probability forecasts relative to traditional expected return predictions.

3. **ETFs, Anomalies, and Market Efficiency (with Ilias Filippou, Sophia Zhengzi Li, and Guofu Zhou)**: This study investigates the impact of Exchange-Traded Funds (ETFs) on anomaly profitability. We find whether ETF ownership mitigates market anomalies and improves market efficiency.
4. **Principal Portfolios the Multi-Signal Case (with Ming Yuan and Guofu Zhou)**: Building on the framework of Kelly, Malamud, and Pedersen (2024), this project develops a multi-signal algorithm for constructing principal portfolios.
5. **How Accurate are Survey Forecasts on the Market (with Jiaen Li, Linying Lv, and Guofu Zhou)**: This research evaluates the out-of-sample predictability of market returns using survey forecasts.

My dissertation committee includes:

- **Asaf Manela**
- **Nicolae Garleanu**
- **Andreas Neuhierl**
- **Guofu Zhou**

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**Reason for Application**

I am eager to attend the **NBER Digital Economics and AI Tutorial** to deepen my understanding of the cutting-edge methodologies being applied in digital economics and artificial intelligence. The opportunity to interact with leading researchers and gain insights into emerging topics will greatly benefit my ongoing research and professional development.

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**Thank you for considering my application.**

Sincerely,
**Songrun He**
**Ph.D. Candidate in Finance**
**Washington University in St. Louis**