February 14, 2023

Xuelai Li
349 ACE Extension, Exhibition Road
London SW7 2AZ
United Kingdom

National Bureau of Economic Research
1050 Massachusetts Avenue
Cambridge, MA 02138
United States

Dear Admissions Panel,

I am writing to express my interest in the Entrepreneurship Research Boot Camp hosted by the NBER. As a third-year PhD student at Imperial College Business School under the advisory of Professor Ramana Nanda, I believe that this boot camp would provide me with a valuable opportunity to advance my research in the field of entrepreneurship.

My area of research lies in the intersection of Entrepreneurship, Strategy, and Finance, with a particular interest in entrepreneurial decision-making. I aim to shed light on how startups can effectively acquire and generate information to reduce uncertainty and make quality decisions during the critical early years of their development. This is particularly relevant in the context of early-stage technology startups, where the outcomes of these decisions significantly impact their trajectory and future success, including fundraising and firm performance.

While I am currently registered under the Department of Management and Entrepreneurship, I hold a Bachelor's degree in Economics with a major in Finance. I completed PhD-level advanced microeconomics and econometrics, and I am familiar with the methodologies of identification. My interdisciplinary background enables me to approach the study of entrepreneurship from a diverse range of perspectives and to conduct research that appeals to a broad audience.

Applying for the NBER Entrepreneurship Research Boot Camp is my top priority this year, as the speakers in recent years have included many of the scholars whose work I admire most. I am eager to immerse myself in cutting-edge research topics in the economics of entrepreneurship and entrepreneurial finance and to further develop my understanding of these fields.

Enclosed please find my curriculum vitae and research statement. Professor Ramana Nanda will provide a recommendation letter. Please do not hesitate to contact me if any additional information is needed. Thank you for considering my application. I look forward to hearing from you.

Sincerely,
Xuelai Li

XUELAI LI

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EDUCATION

Imperial College Business School *Sep. 2020 - Jun. 2025 (expected)*
PhD candidate, Department of Management and Entrepreneurship
Supervisor: Ramana Nanda
Courses: Applied Microeconometrics, Information Economics, Corporate Finance, Entrepreneurship, Innovation Management, Strategic Management, Judgment and Decision Making

Peking University *Sep. 2016 - Jun. 2020*
Bachelor of Economics in Finance, Guanghua School of Management
GPA: 3.8/4.0 (top 5%)
Courses: Advanced Microeconomics (PhD level), Machine Learning (Graduate level)

RESEARCH INTERESTS

Technology Entrepreneurship, Entrepreneurial Strategy

RESEARCH EXPERIENCE

Undergraduate Visiting Research Student at Stanford University Stanford, CA
Entrepreneurship and Strategy *Jul. 2019 - Aug. 2019*

- Hosted by Prof. Chuck Eesley in Department of Management Science and Engineering
- Conducted research into entrepreneurs' fundraising strategies within the blockchain sector.

AWARDS

- Graduate Teaching Assistant Scholarship, Imperial College London, 2020-2025
- Shouren Chen Scholarship, Peking University, 2019
- China National Scholarship, Peking University, 2018
- Fung Scholarship, The University of Hong Kong, 2018
- Merit Student, Peking University, 2018
- Founder Group Scholarship, Peking University, 2017
- Award for Academic Excellence, Peking University, 2017

TEACHING

- Entrepreneurial Strategy, Imperial College London, 2022 Spring
- Natural Language Processing Seminar, Peking University, 2018 Fall

MISCELLANEOUS

- Coding: Python, R, MATLAB, C, Stata, LaTeX, SAS, Javascript, HTML
- Languages: Chinese (native), English (fluent)

Research Statement

Xuelai Li

February 14, 2023

My research aims to gain insights into the decision-making under uncertainty, particularly in the context of early-stage technology startups. To accomplish this, I employ modern identification strategies and advanced machine learning techniques.

1 Ongoing research

Uncertainty arises from a lack of information and thus it is essential to understand what information to acquire and what information to generate. My ongoing research spans two domains: information generation and its antecedents. In both streams, my work ultimately seeks to address how to learn more effectively under uncertainty.

(1) Optimal information generation

Information may not exist when firms are engaging in entrepreneurial activities. Therefore, experimentation is required to generate information that can solve uncertainty and produce validated learning (Kerr, Nanda, and Rhodes-Kropf 2014). My work studies how firms can more effectively design experiments that generate the most information value about product-market fit.

There are two key factors that influence the value of information: the timing of the information generated and the content of the information. Startups can test their ideas at various stages, such as the product definition stage, beta product development stage, or product launch stage. The earlier a startup receives feedback from the market, the easier it is to make changes to the product. However, early feedback may also lead to a product that caters to the preferences of early adopters. In addition, the content of the information signals market interest. With limited resources and time, a startup must weigh the trade-off between the breadth and strength of the information generated; by either engaging broadly by investigating multiple verticals before choosing to focus one, or engaging deeply by conducting interviews with multiple customers within one vertical.

I am currently working on a structural model, and plan to calibrate it with the data from a large accelerator.

(2) The antecedents of information generation

Entrepreneurs make choices on generating or acquiring information under uncertainty based on their attributions of uncertainty. Information generation involves running experiments to gather market feedback then adapting to that feedback throughout the product development process (i.e., *ex post*

learning). Information acquisition involves analyzing the internal and external environment prior to seeking market feedback (i.e., *ex ante* learning). Since early-stage ventures are resource-constrained (Gans, Stern, and Wu 2019), they cannot put substantial effort on both information generation and acquisition simultaneously. This raises the question: when do entrepreneurs choose different learning strategies?

Using natural language processing techniques, I have measured the perceived uncertainty of entrepreneurs from textual data and found that the perception of epistemic uncertainty leads to information acquisition, while the perception of aleatory uncertainty leads to information generation. To further prove the causation of my findings, I am currently conducting experiments.

2 Future research

My future work intends to shed light on the product development and financing strategies for early-stage hardware startups. The adoption of Amazon's Web Services has facilitated the experimentation of software startups and made them more attractive to VCs (Ewens, Nanda, and Rhodes-Kropf 2018). VCs traditionally have preferred software startups as they have better scalability and lower cost of minimum viable products. In the software-dominated technology era, hardware startups require more capital upfront and are less favorable by VCs (Howell 2017; Lerner and Nanda 2020).

Based on data from the UK, I have found that the post-money valuation of software startups has a greater rate of increase in their early years, while the post-money valuation of hardware startups experiences its greatest rate of increase only after several years have passed. This may be due to the higher cost of experimentation for hardware startups.

My research will seek to answer the question of what are the most effective product development and financing strategies for hardware startups that require substantial upfront investments.

3 The reason for wanting to attend the boot camp

My research interest originated from the literature on the economics and finance of entrepreneurship, especially the research on technology entrepreneurship and entrepreneurial finance. The desire to understand how to better facilitate technology entrepreneurship and improve the performance of startups motivated me to join PhD program and conduct research in this area.

This Entrepreneurship Research Boot Camp invites the top scholars in this area each summer. I am eager to immerse myself in cutting-edge research topics in the economics of entrepreneurship and entrepreneurial finance, and further develop my understanding. I have several specific research ideas on experimentation and learning under uncertainty, and I look forward to discussing these ideas with top scholars. I would cherish and utilize to the fullest this opportunity to be able to further develop my way of conducting high-quality research.

References

Ewens, M., R. Nanda, and M. Rhodes-Kropf (2018). "Cost of experimentation and the evolution of venture capital". *Journal of Financial Economics* 128.3, pp. 422–442.

Gans, J. S., S. Stern, and J. Wu (2019). "Foundations of entrepreneurial strategy". *Strategic Management Journal* 40.5, pp. 736–756.

Howell, S. T. (2017). "Financing innovation: Evidence from R&D grants". *American Economic Review* 107.4.

Kerr, W. R., R. Nanda, and M. Rhodes-Kropf (2014). "Entrepreneurship as experimentation". *Journal of Economic Perspectives* 28.3, pp. 25–48.

Lerner, J. and R. Nanda (2020). "Venture capital's role in financing innovation: What we know and how much we still need to learn". *Journal of Economic Perspectives* 34.3.