Hyunjae Lee
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February 10, 2026

Dear NBER Innovation Research Boot Camp Selection Committee,

I am writing to apply to the NBER Innovation Research Boot Camp 2026. I am a fourth-year Ph.D. student in Economics at the University of North Carolina at Chapel Hill, where I specialize in macroeconomics and the economics of innovation.

My research lies at the intersection of innovation, firm dynamics, and economic growth. As I transition from my current working paper, *"Growth with Endogenous Industry Dynamics,"* to a new project on risky innovation and technology waves, the Boot Camp offers a timely opportunity to engage with foundational ideas and frontier questions in the field and to receive feedback from participating faculty and peers.

As requested, my application materials, including my CV, a list of completed Ph.D. coursework, and a one-page research essay, are enclosed. My primary advisor, Professor Can Tian, will provide a letter of recommendation in support of my application.

Recommendation Letter Writer:
Professor Can Tian
University of North Carolina at Chapel Hill
Email: tiancan@email.unc.edu | tiancan.econ@gmail.com

Thank you for your time and consideration. I would be grateful for the opportunity to participate in July 2026.

Sincerely,
Hyunjae Lee

HYUNJAE LEE

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EDUCATION

University of North Carolina at Chapel Hill *Sep. 2022 –*
Ph.D. in Economics (Advisor: Can Tian)

Seoul National University *Mar. 2019 – Aug. 2021*
M.A. in Economics (Advisor: Yongsung Chang)

Yonsei University *Mar. 2011 – Aug. 2015*
B.A. in Business Administration, minor in Economics

RESEARCH INTEREST

Macroeconomics, Innovation, Firm and Industry Dynamics, Economic Growth

RESEARCH

Working Paper

"Growth with Endogenous Industry Dynamics." 2026.
I develop a Schumpeterian growth model in which industries are endogenously created, follow life-cycles, and exit. Entrants choose between entering existing industries or paying a sunk cost to create new ones, which determines industry turnover and the composition of growth. In a quantitative version calibrated to U.S. data (1982–2011), equilibrium features insufficient industry renewal; subsidies targeted to variety creation generate larger growth and welfare gains than traditional incumbent R&D subsidies.

Pre-Doctoral Publication

"Returns to Tenure and Labor Market Mobility in Korea." *Journal of Economic Theory and Econometrics*, Vol. 32, No. 4, Dec. 2021, 42–64.

PRESENTATIONS

- 2025: 12th I-85 Macroeconomics Workshop, 20th Economics Graduate Student Conference (WUSTL), Tiago Pires Graduate Student Conference (UNC)

AWARDS AND SCHOLARSHIPS

Robert Gallman Graduate Scholarship, *Department of Economics, UNC* *May 2024*
University Fellowship, *Department of Economics, UNC* *2022 - 2027*
Brain Korea 21 Plus Scholarship, *National Research Foundation of Korea* *2019 - 2022*
Business MVP Award for *Futures and Options, Yonsei University* *Aug. 2015*

RESEARCH AND TEACHING EXPERIENCES

Teaching Assistant

Intermediate Macroeconomics (UNC, undergraduate) Instructor: Ying Chao	*Spring 2026*
Advanced Macroeconomic Theory I (UNC, graduate) Instructor: Can Tian	*Fall 2025*
Financial Economics (UNC, undergraduate) Instructor: Chris Roark	*Fall 2024*
Advanced Macroeconomic Theory II (UNC, graduate) Instructor: Stanislav Rabinovich	*Spring 2024*
Advanced Macroeconomic Theory I (UNC, graduate) Instructor: Lutz Hendricks	*Fall 2023*
Macroeconomic Theory (SNU, undergraduate) Instructor: Yongsung Chang	*Fall 2021*
Advanced Macroeconomics (SNU, graduate) Instructor: Yena Park	*Fall 2020*

Research Assistant

Structured labor research project for Yunzhi Hu, UNC	*Sep. 2025 –*
Theoretical and experimental projects for Dmitry Shapiro, SNU	*Sep. 2019 – Mar. 2021*

SKILLS

Programming: Julia, MATLAB, R, Stata, Python

Languages: English (fluent), Korean (native), Japanese

MILITARY SERVICE

Republic of Korea Air Force Financial Officer, First Lieutenant *Sep. 2015 – Nov. 2018*

Ph.D. Coursework

Hyunjae Lee — University of North Carolina at Chapel Hill

Ph.D. Core Courses

- ECON 700: Quantitative Techniques — *Instructor:* Fei Li
- ECON 701: Analytical Methods — *Instructor:* Jaden Yang Chen
- ECON 710: Advanced Microeconomic Theory I — *Instructor:* Fei Li
- ECON 720: Advanced Macroeconomic Theory I — *Instructor:* Lutz Hendricks
- ECON 770: Econometric Theory — *Instructor:* Jonathan Hill
- ECON 711: Advanced Microeconomic Theory II — *Instructor:* Peter Norman
- ECON 721: Advanced Macroeconomic Theory II — *Instructor:* Stan Rabinovich
- ECON 771: Econometrics — *Instructor:* Andrii Babii

Field Courses

- ECON 890: Firm Dynamics and Production Networks — *Instructor:* Can Tian
- ECON 846: Theoretical Industrial Organization — *Instructor:* Gary Biglaiser
- ECON 847: Empirical Industrial Organization I — *Instructor:* Brian McManus
- ECON 848: Empirical Industrial Organization II — *Instructor:* Jonathan Williams
- ECON 876: Advanced Empirical Finance — *Instructor:* Eric Ghysels
- ECON 883: Search Theory — *Instructor:* Peter Norman
- ECON 882 (Duke): Economic Growth — *Instructor:* Pietro F. Peretto
- ECON 881 (Duke): Heterogeneity & Macro — *Instructor:* David Berger
- ECON 882 (Duke): Topics in Production Networks — *Instructor:* Federico Huneeus
- ECON 882 (Duke): Firm Heterogeneity and Macro — *Instructor:* Matthias Kehrig

Audited Courses

- ECON 890: Search and Experimentation (Current (Spring 2026)) — *Instructor:* Fei Li
- ECON 890: Macro Labor — *Instructor:* William Jungerman

Research Essay — NBER Innovation Research Boot Camp 2026

Hyunjae Lee (UNC–Chapel Hill)

I am a macroeconomist working at the intersection of innovation, firm dynamics, and economic growth. My research studies how firms' innovation choices shape competition and industry evolution, and how the resulting aggregate outcomes feed back into firms' incentives to innovate. To study these forces, I develop tractable, microfounded models of innovation that generate rich sectoral and aggregate dynamics. My goal is to connect micro-level innovation incentives to macro-level patterns, including long-run growth and technology waves, with sharp, policy-relevant implications.

Current project. My current working paper, *"Growth with Endogenous Industry Dynamics,"* investigates the microfoundations of aggregate productivity growth through the lens of the "mushroom" view of economic progress: growth is driven by a rotating set of high-performing industries that sprout, flourish, and fade rather than by uniform improvements across the economy.[1] I develop a Schumpeterian framework that links innovation incentives to endogenous industry dynamics, where a continuum of industries is endogenously created, evolves through a life cycle, and eventually exits.

The central margin is an entrant's choice between innovating within an existing industry or paying a sunk cost to engage in market-creating innovation by founding a new industry. This industry-creation margin governs how innovative effort is allocated between within-industry innovation and variety creation, shaping the composition of growth and the economy's rate of renewal. The model implies a new set of externalities operating through the industry-creation margin that distort innovation incentives. Using quantitative methods, I show that an economy calibrated to U.S. data exhibits inefficiently low industry creation, and that innovation policy targeted at variety creation can deliver larger gains in growth and welfare than traditional subsidies focused on incumbent R&D.

Next project (preliminary). My next project studies risky innovation and technology waves. Motivated by evidence that U.S. patenting intensity rose after the late 1990s while multiple measures of average patent quality declined, with the shift driven by smaller firms and concentrated in a few emerging technology areas, I explore the hypothesis that declining profitability in mature markets shifts innovative effort toward riskier frontiers. This reallocation may generate "congested frontiers," where preemption incentives and uncertainty tilt innovation toward frequent, lower-impact outcomes rather than breakthrough search. This project aims to characterize how innovation choices over timing, direction, and risk jointly shape technology-wave dynamics and the pace of aggregate growth.

Why the Boot Camp. The NBER Innovation Research Boot Camp is a timely opportunity for me to transition from my first working paper to this new agenda. I am eager to engage with foundational ideas and frontier work in innovation economics and to receive feedback from participating faculty and peers as I sharpen the framing and positioning of my research.

[1] Harberger, Arnold C. 1998. "A vision of the growth process." *The American Economic Review*, 88(1): 1–32.

THE UNIVERSITY of NORTH CAROLINA at CHAPEL HILL

Can Tian
Associate Professor, Department of Economics
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Chapel Hill, NC 27599-3305, USA
919-966-2383
tiancan@email.unc.edu

February 10, 2026

Dear Colleagues,

I am writing to enthusiastically recommend **Hyunjae Lee** for the *NBER Innovation Research Boot Camp*. Hyunjae is currently a fourth year econ PhD student at UNC Chapel Hill. He has been my advisee since his second year here and is the **strongest macroeconomics student** I have worked with in my seven years at UNC. He would be highly competitive at any top program such as Penn econ, where I was trained.

Hyunjae has two solo-authored research projects. The first one is his field paper (roughly a third year paper), in which he develops an endogenous growth model with firms entering and innovating in heterogeneous industries, featuring *endogenous industry dynamics*. The link between industry lifecycles, firm innovation incentives, and aggregate growth is natural and has novel policy implications, but remains unexplored in the literature. His second project on risky and directed innovation and waves of technology advancement is in an early stage, but it is even more ambitious in terms of technical sophistication. Few students at this stage would take on problems of such difficulty.

The boot camp is perfectly timed for Hyunjae. He has a working paper and is launching his next project precisely when exposure to frontier work and leading scholars would be most valuable. The Research Triangle has limited researchers working on innovation and growth, and Hyunjae would benefit enormously from engaging with the boot camp faculty and cohort. This short letter does not do him justice. **I recommend him without any reservation.**

Sincerely,



Can Tian
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