Gunhee Cho

gxc5369@psu.edu 582.203.8603 State College PA, USA

February 9, 2026
Professors Kevin Bryan, Ina Ganguli, and Kyle Myers and Members of the Reviewing Panel
National Bureau of Economic Research
1050 Massachusetts Avenue
Cambridge, MA 02138

Dear Professors and Members of the Reviewing Panel,

I am writing to express my enthusiasm for applying to the 5th NBER Innovation Research Boot Camp. I am a Ph.D. candidate at Pennsylvania State University, specializing in the intersection of innovation and economic growth. My research addresses the subject by combining structural growth models with rigorous micro-evidence, and it aims to understand how economic factors such as policies and market frictions shape the innovative landscape of firms and aggregate growth.

Specifically, my third-year paper investigates how R&D policies can paradoxically stifle growth when they are misallocated. Using a general equilibrium model disciplined by comprehensive project-level data from Korea, I document that policies aimed at expanding the ”base” of R&D performers induce entry of less innovative firms. This crowds out more productive research by inflating input costs of R&D, leading to a significant loss in the economic growth rate. Counterfactual analyses reveal that an intervention to increase the supply of research labor in the input market is substantially more effective and efficient as a policy tool to promote innovation.

Building on my interest in how firm-level innovation interacts with the markets for R&D input, my ongoing thesis explores how job-to-job mobility of inventors in the labor market impacts private innovation and growth. While existing literature often emphasizes the spillover benefits of inventor mobility, I integrate human capital accumulation and destruction on the job into an endogenous growth framework to highlight a potential anti-growth channel: the destruction of non-transferable, firm-specific human capital by separations. My model formalizes how this mechanism impedes innovation and allows me to quantify its growth implications. The research is currently on the stage of empirical validation and estimation of the model using matched inventor-firm data from Germany.

I strongly believe the NBER Innovation Research Boot Camp is the ideal environment to refine my research agenda. Given my academic focus on the mechanisms of innovation and the approaches I take to bridge macro-modeling with micro-level evidence, I am eager to learn from the distinguished scholars leading the field. I look forward to the opportunity to discuss my work and gain insights that will elevate my research to the frontier.

Thank you for your time and consideration.

Sincerely,

Gunhee Cho

PS. My advisor, Professor James R. Tybout, will provide the recommendation letter for me.

GUNHEE CHO

Date of Birth: 1994.04.22 ◇ Citizenship: Korea, Republic of
Tel: +1 582-203-8603 ◇ E-mail: gxc5369@psu.edu

EDUCATION

Pennsylvania State University *2022 - Present*
Ph.D. candidate in Economics (Advisor: Prof. James R. Tybout)

Seoul National University *2020 - 2022*
M.A. in Economics (Advisor: Prof. Chul-In Lee)

Seoul National University *2013 - 2020*
B.A. in Economics (Minor: Statistics)
Summa Cum Laude

· Mandatory Military Service: 2014.10. - 2016.07. (Republic of Korea Army, ROKA)

FIELDS OF INTEREST

Firm Innovation, R&D, Growth Theory, Development Economics, Labor Economics

WORKS IN PROGRESS

Growth Implications of Inventor Mobility (Ongoing thesis)

· This paper investigates a potential anti-growth force of the job market mobility of knowledge workers. Integrating structures for on-the-job accumulation of human capital and its imperfect portability with an endogenous growth model, I formalize a new theory that frequent job-to-job movements of inventors can negatively impact innovation and thus the economic growth by destroying the firm-specific human capital of the innovation workers. A structural model for quantification of this mechanism is constructed to provide a more complete picture of how inventor mobility affects the aggregate economy. I also present an empirical design to validate and estimate the model based on administrative data from Germany.

Economic Consequences of Misguided R&D Subsidies in Korea

· The economic outcomes of a strand of South Korea's R&D policy during the 2010s are analyzed in this paper. The main finding is that misallocation of R&D subsidies decelerates aggregate innovation and growth. This is mainly driven by excessive research participation of low-ability firms that received subsidy, which increases the price of input for firm innovation. A model that incorporates this framework is empirically supported and estimated using a comprehensive project-level data. The counterfactual analysis based on the estimated model reveals that increasing supply of R&D labor is a more efficient and effective way to promote innovation and growth.

· This paper is nominated for the Wallace Prize for Best Third-Year Paper by the department of economics of the Pennsylvania State University.

PUBLICATIONS

Cho, G., Y.Yun, and H.-Y. Jung(2019): "Arbitrage opportunities induced from differences in relative price of assets between exchanges", *Journal of the Korean Data & Information Science Society*, 30(1): 45-56. (written in Korean)
We study arbitrage opportunities induced by different relative prices of cryptocurrencies between exchanges. We find that the volatility in relative prices significantly limits arbitraging, and that investors tend not to take the actual currency value into account when exploiting the arbitrage opportunities.

Based on our empirical findings, we suggest that regulations on cryptocurrency transactions should come after a serious valuation of the asset and an analysis of the behaviors of market participants.

AWARDS & HONOR

Wallace Prize for Best 3rd Year Paper (Nominee), Pennsylvania State University, Department of Economics *2025*

Will Mason Memorial Prize, Pennsylvania State University, Department of Economics *2023*

· Highest Ph.D. 1st year GPA

Best Paper in Labor Economics, The Korea Economic Daily Research Paper Competition *2019*

· Title: Effects of unemployment insurance on re-employment probabilities of the unemployed - based on a competing risks model

Honorable Mention (Top 8), MBN Economics Research Paper Competition *2018*

· Title: Arbitrage opportunities induced from differences in relative price of assets between exchanges

SCHOLARSHIP & GRANTS

Lecture & Research Scholarship, Seoul National University *2021*
Ministry of Education Brain Korea 21+ Research Fellowship *2020 - Spring 2021*

RESEARCH EXPERIENCE

Research Assistant for Prof. Chul-In Lee *Mar. 2020 - Mar. 2021*

· Project title: Consideration on Korea's dropping birth rate
· This research aims to explain Korea's plummeting birth rate in relation to socio-cultural factors including expectations on future economy, social norm, political situation and social conflicts.
· Collected data from World Value Survey and reviewed related literature.

TEACHING EXPERIENCE

Teaching Assistant of Prof. Kai-jie Wu and Prof. Maria Jose Carreras

· Course: *Advanced Macroeconomic Theory* (PhD core) *Current*

Teaching Assistant of Prof. Chul-In Lee

· Course: *Macroeconomics* (Undergraduate core) *Fall 2021*
· Course: *Studies in Labor Economics* (Graduate) *Fall 2021*
· Course: *Government Revenues/Taxation* (Undergraduate) *Spring 2021*

Teaching Assistant of Prof. Jungmin Lee

· Course: *Principles of Economics 1* (Undergraduate core) *Fall 2020*

ADDITIONAL INFORMATION

Languages Korean (native), English (fluent), Mandarin(fluent)
Computer skills R, MATLAB, Python, C

Graduate Advising Transcript

Name: **Gunhee Cho**
Student ID: **952216167**

Print Date: 2026-02-03
Campus ID: GXC5369
Requestor: Gunhee Cho

Beginning of Graduate Record

FA 2022

Program: Liberal Arts
Plan: Economics (PHD) Major

Course		Description	Attempted	Earned	Grade	Points
ECON	500	Math Econ	3.000	3.000	A	12.000
Instructor:		Ran Shorrer				
ECON	501	Econometrics	3.000	3.000	A	12.000
Instructor:		Coenraad Pinkse				
ECON	502	Micro Anal	3.000	3.000	A	12.000
Instructor:		Vijay Krishna				
ECON	503	Macro Anal	3.000	3.000	A	12.000
Instructor:		Qi LI Ruilin Zhou				

			Attempted	Earned	GPA Units	Points
Term GPA	4.000	Term Totals	12.000	12.000	12.000	48.000
Transfer Term GPA		Transfer Totals	0.000	0.000	0.000	0.000
Combined GPA	4.000	Comb Totals	12.000	12.000	12.000	48.000
Cum GPA	4.000	Cum Totals	12.000	12.000	12.000	48.000
Transfer Cum GPA		Transfer Totals	0.000	0.000	0.000	0.000
Combined Cum GPA	4.000	Comb Totals	12.000	12.000	12.000	48.000

SP 2023

Program: Liberal Arts
Plan: Economics (PHD) Major

Course		Description	Attempted	Earned	Grade	Points
ECON	510	Econometrics I	3.000	3.000	A	12.000
Instructor:		Patrik Guggenberger				
ECON	521	Adv Microec Thry	3.000	3.000	A	12.000
Instructor:		Kalyan Chatterjee				
ECON	522	Adv Macroec Theory	3.000	3.000	A	12.000
Instructor:		Ruilin Zhou Ross Doppelt				

			Attempted	Earned	GPA Units	Points
Term GPA	4.000	Term Totals	9.000	9.000	9.000	36.000
Transfer Term GPA		Transfer Totals	0.000	0.000	0.000	0.000
Combined GPA	4.000	Comb Totals	9.000	9.000	9.000	36.000
Cum GPA	4.000	Cum Totals	21.000	21.000	21.000	84.000
Transfer Cum GPA		Transfer Totals	0.000	0.000	0.000	0.000
Combined Cum GPA	4.000	Comb Totals	21.000	21.000	21.000	84.000

FA 2023

Program: Liberal Arts
Plan: Economics (PHD) Major

Graduate Advising Transcript

Name: **Gunhee Cho**
Student ID: **952216167**

Course		Description	Attempted	Earned	Grade	Points
ECON	512A	Empirical Mthds I	1.000	1.000	A	4.000
Instructor:		Ewout Verriest Bradley Setzler				
ECON	543	Industrial Orgn	3.000	3.000	A	12.000
Instructor:		Paul Grieco				
ECON	589	Sem Economet Thry	3.000	3.000	A-	11.010
Instructor:		Andres Aradillas-Lopez				
ECON	597	Special Topics	3.000	3.000	A	12.000
Course Topic:		Labor Economics				
Instructor:		Ewout Verriest Bradley Setzler				

			Attempted	Earned	GPA Units	Points
Term GPA	3.900	Term Totals	10.000	10.000	10.000	39.010
Transfer Term GPA		Transfer Totals	0.000	0.000	0.000	0.000
Combined GPA	3.900	Comb Totals	10.000	10.000	10.000	39.010
Cum GPA	3.970	Cum Totals	31.000	31.000	31.000	123.010
Transfer Cum GPA		Transfer Totals	0.000	0.000	0.000	0.000
Combined Cum GPA	3.970	Comb Totals	31.000	31.000	31.000	123.010

SP 2024

Program: Liberal Arts
Plan: Economics (PHD) Major

Course		Description	Attempted	Earned	Grade	Points
ECON	512B	Empirical Mthds II	2.000	2.000	A	8.000
Instructor:		Ewout Verriest Bradley Setzler				
ECON	543	Industrial Orgn	3.000	3.000	A	12.000
Instructor:		Conor Ryan				
ECON	570	Development Econ	3.000	3.000	A	12.000
Instructor:		James Tybout				
ECON	589	Sem Economet Thry	3.000	3.000	A	12.000
Instructor:		Keisuke Hirano				

			Attempted	Earned	GPA Units	Points
Term GPA	4.000	Term Totals	11.000	11.000	11.000	44.000
Transfer Term GPA		Transfer Totals	0.000	0.000	0.000	0.000
Combined GPA	4.000	Comb Totals	11.000	11.000	11.000	44.000
Cum GPA	3.980	Cum Totals	42.000	42.000	42.000	167.010
Transfer Cum GPA		Transfer Totals	0.000	0.000	0.000	0.000
Combined Cum GPA	3.980	Comb Totals	42.000	42.000	42.000	167.010

FA 2024

Program: Liberal Arts
Plan: Economics (PHD) Major

Course		Description	Attempted	Earned	Grade	Points
ECON	555	Knowledge Transfer Methods	3.000	3.000	A	12.000
Instructor:		Marc Henry				
ECON	600	Thesis Research	9.000	9.000	R	0.000
Instructor:		James Tybout				

Graduate Advising Transcript

Name: **Gunhee Cho**
Student ID: **952216167**

			Attempted	Earned	GPA Units	Points
Term GPA	4.000	Term Totals	12.000	12.000	3.000	12.000
Transfer Term GPA		Transfer Totals	0.000	0.000	0.000	0.000
Combined GPA	4.000	Comb Totals	12.000	12.000	3.000	12.000
Cum GPA	3.980	Cum Totals	54.000	54.000	45.000	179.010
Transfer Cum GPA		Transfer Totals	0.000	0.000	0.000	0.000
Combined Cum GPA	3.980	Comb Totals	54.000	54.000	45.000	179.010

SP 2025

Program: Liberal Arts
Plan: Economics (PHD) Major

Course		Description	Attempted	Earned	Grade	Points
ECON	600	Thesis Research	9.000	9.000	R	0.000

Instructor: James Tybout

			Attempted	Earned	GPA Units	Points
Term GPA	0.000	Term Totals	9.000	9.000	0.000	0.000
Transfer Term GPA		Transfer Totals	0.000	0.000	0.000	0.000
Combined GPA	0.000	Comb Totals	9.000	9.000	0.000	0.000
Cum GPA	3.980	Cum Totals	63.000	63.000	45.000	179.010
Transfer Cum GPA		Transfer Totals	0.000	0.000	0.000	0.000
Combined Cum GPA	3.980	Comb Totals	63.000	63.000	45.000	179.010

SU 2025

Program: Liberal Arts
Plan: Economics (PHD) Major

Course		Description	Attempted	Earned	Grade	Points
ECON	600	Thesis Research	1.000	1.000	R	0.000

Instructor: James Tybout

			Attempted	Earned	GPA Units	Points
Term GPA	0.000	Term Totals	1.000	1.000	0.000	0.000
Transfer Term GPA		Transfer Totals	0.000	0.000	0.000	0.000
Combined GPA	0.000	Comb Totals	1.000	1.000	0.000	0.000
Cum GPA	3.980	Cum Totals	64.000	64.000	45.000	179.010
Transfer Cum GPA		Transfer Totals	0.000	0.000	0.000	0.000
Combined Cum GPA	3.980	Comb Totals	64.000	64.000	45.000	179.010

FA 2025

Program: Liberal Arts
Plan: Economics (PHD) Major

Course		Description	Attempted	Earned	Grade	Points
ECON	601	Ph D Dis Full-Time	0.000	0.000	R	0.000

Instructor: James Tybout

			Attempted	Earned	GPA Units	Points
Term GPA	0.000	Term Totals	0.000	0.000	0.000	0.000
Transfer Term GPA		Transfer Totals	0.000	0.000	0.000	0.000
Combined GPA	0.000	Comb Totals	0.000	0.000	0.000	0.000

Graduate Advising Transcript

Name: **Gunhee Cho**
Student ID: **952216167**

Cum GPA	3.980	Cum Totals	64.000	64.000	45.000	179.010
Transfer Cum GPA		Transfer Totals	0.000	0.000	0.000	0.000
Combined Cum GPA	3.980	Comb Totals	64.000	64.000	45.000	179.010

SP 2026

Program: Liberal Arts
Plan: Economics (PHD) Major

Course		Description	Attempted	Earned	Grade	Points
ECON	601	Ph D Dis Full-Time	0.000	0.000		0.000
Instructor:		James Tybout				

			Attempted	Earned	GPA Units	Points
Term GPA	0.000	Term Totals	0.000	0.000	0.000	0.000
Transfer Term GPA		Transfer Totals	0.000	0.000	0.000	0.000
Combined GPA	0.000	Comb Totals	0.000	0.000	0.000	0.000
Cum GPA	3.980	Cum Totals	64.000	64.000	45.000	179.010
Transfer Cum GPA		Transfer Totals	0.000	0.000	0.000	0.000
Combined Cum GPA	3.980	Comb Totals	64.000	64.000	45.000	179.010

Graduate Career Totals

Cum GPA:	3.980	Cum Totals	64.000	64.000	45.000	179.010
Transfer Cum GPA		Transfer Totals	0.000	0.000	0.000	0.000
Combined Cum GPA	3.980	Comb Totals	64.000	64.000	45.000	179.010

Non-Course Milestones

Program: Liberal Arts
SARI Requirements for Research Degree
Status: Not Completed

SARI Requirements for Research Degree
Status: Completed
Date Completed: 2022-08-08

Doctoral Qualifying Examination
Status: Completed
Date Completed: 2023-05-12

Doctoral Comprehensive Examination
Status: Completed
Date Completed: 2025-08-04

External Degrees

Seoul National University
Bachelor of Economics 2020-02-01

End of Graduate Advising Transcript

Research synopsis

My research agenda broadly explores how innovation interplays with market environments, with a particular focus on their implications for aggregate economic growth. Within this broader theme, my current thesis investigates how job-to-job mobility in the market of inventors shapes firm-level innovation and the economic growth. Complementing existing literature which emphasizes the role of reallocation and knowledge spillover, I highlight the countervailing force of frequent job-to-job mobility among inventors that destroys non-transferrable, firm-specific human capital, such as research network and tacit knowledge. To quantify the growth implications of this mechanism, I construct a model that integrates endogenous growth, job flows of inventors in a frictional labor market, and accumulation and destruction of human capital. The model, after disciplined by micro-evidence from administrative data of German inventors, would shed light on the tradeoff in inventor mobility between flexible labor markets and retention of firm-specific resources for innovation.

A key strand of my future research extends this insight on the interaction between innovation and labor market to the organizational implications of inventor mobility. I hypothesize that the risk of hired researchers leaving for new employers fundamentally alters how firms organize their R&D teams and select projects. Firms facing high mobility risks may refrain from forming a large and complex organizational structure to minimize the disruptions in research processes or information leakage caused by separations. In turn, this could influence the type and radical nature of innovation the firm produces, if organizational size and complexity determine the feasible scope of research projects for a firm. Based on this intuition, I plan to investigate how variations in labor market fluidity across industries and countries explain heterogeneity in R&D organization and outcomes. This line of inquiry will further bridge labor economics with the context of macro-growth to explain diverging growth patterns and R&D specialization across economies.

Motivation to apply

There are three reasons I take the NBER Innovation Research Bootcamp as a critical milestone for advancing my research agenda. First, I aim to expand the boundaries of my research by learning how leading scholars address the interfaces between innovation and other emerging domains, such as the markets for education, market power in product markets, and artificial intelligence. As I plan to incorporate broader economic factors into my growth models, understanding the current frontier in these adjacent fields is essential. Second, I seek to refine my methodological toolkit, particularly in combining structural modeling with micro-foundations. The boot camp's lecturers are renowned for their rigorous approach to micro-founding and estimating complex economic models. Learning their techniques for connecting theory and data will be invaluable for improving my analytical ability as an economist. Finally, I am eager to receive critical feedback on my ongoing work. By presenting my work to experts who specialize in innovation, I would be able to collect the targeted advice needed to elevate my paper's contribution and robustness. Moreover, I hope they could also share their insights on how I may further extend my current framework into new dimensions.

PENNSTATE

Department of Economics

The Pennsylvania State University
613 Kern Graduate Building
University Park, PA 16802-3306

814-865-1456
Fax: 814-865-0013

February 9, 2026

To whom it may concern:

This letter is to highly recommend Gunhee Cho for this year's Innnovation Research Boot Camp. I know Gunhee because he was a student in my doctoral course on economic development (econ 570), and more recently, I have served as his primary advisor for his third-year paper and his dissertation. On the basis of these interactions with him, I can offer the following observations. First, he is well-positioned to learn a great deal from the Camp. His interests lie squarely in innovation and human capital. And while his course work in IO, development and econometrics has given him some exposure to the literature in these areas, a deep dive with leaders in the field would be invaluable to him. Second, as you can see from his transcript, he is an excellent student. His straight-A record reflects both an exceptional work ethic and an analytical, innovative mind. Finally, he is very engaged and interactive. I am quite confident he would make valuable contributions to group discussions, should he be invited to attend.

Gunhee's thesis (in progress) examines the relationship between worker turnover and patterns of innovative activity. But unlike most contributions to this literature, he recognizes that when scientists and engineers change employers, they disrupt the innovative process at the firms they leave behind. More precisely, there is a firm-specific component to workers' accumulated human capital. So as they acquire tenure with their existing employers, they become increasingly valuable to them, not just in terms of their productivity, but also in terms of their interactions with in-house researchers and innovators. And when they are bid away by other firms, a complete accounting of the effects of this reallocation should recognize the negative impact of this disruption. To develop this idea, Gunhee has run a battery of reduced-form IV regressions that link voluntary worker separations to reductions in innovative activity at the source firm in the following year, especially among firms that rely relatively heavily on innovative synergy between R&D and worker knowledge. (These results are based on the Korean Human Capital Corporate Panel, which tracks firms in sectors where human resource management is important.) Encouraged by these findings, he is now in the process of developing an endogenous growth model in which heterogeneous firms match with workers who, through experience, accumulate non-portable human capital that facilitates their employers' innovative efforts. I am quite enthusiastic about this project, and I think it has the potential to make a significant contribution.

In sum, the Innovation Research Boot Camp seems tailor-made to benefit Gunhee at this stage in his career, and should he be accepted, I believe he would bring an interesting perspective to the class discussions. I very much hope you will be able to include him.

Sincerely,

James R. Tybout

James Tybout
Professor of Economics