Cover Letter

Name: Nannan Peng

Position: PhD student (4th year),
Department of Economics,
Rutgers University

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Recommender: Prof. Rosemary Kaiser,
Department of Economics,
Rutgers University

Completed PhD courses (no courses in progress):

Mathematic Method for Microeconomics
Microeconomic Theory I
Macroeconomic Theory I
Advanced Economic Statistics

Microeconomic Theory II
Macroeconomic Theory II
Econometrics I

Applied Econometrics Microeconomics
Economics of Labor Market
Industrial Organization II
Seminar in Macroeconomics I

Public Finance I
Seminar in Macroeconomics II
Seminar in Econometrics

Advanced Topics in Macroeconomics
Seminar in Economic History

My research agenda revolves around understanding how firms make innovation decisions and adopt (or adapt) new technologies, as well as the impacts of these decisions on growth and distribution.

In one ongoing project, I build a macro model to quantify the effects of defensive innovation. This study is motivated by the divergence between (slow growth of) labor productivity and (increased) R&D investment since the early 2000s in the US. I define defensive innovation as R&D investment that results in little or no innovative outcomes, and whose main purpose is to slow down competitors' innovation and protect market share (e.g., patent thickets and evergreening, and killer acquisitions). Though empirical studies have documented these defensive innovations in various industries, their macro effects are largely unknown.

In this study, I document two empirical facts that support the defensive innovation story and connect it to growth and distribution. First, in the early 2000s, the wage premium of innovation workers increased compared to production workers. This increase is mainly due to a decrease in production workers' wage levels, while the wage level of innovation workers is relatively stable. Second, around the same time, firms started filing more "internal" patents—those with high self-citation shares—which is consistent with increased defensive innovation. I find that these patents are often less innovative, and they are associated with lower innovation activity and weaker outcomes for firms' competitors. These two facts support the defensive innovation story and provide an explanation for the observed aggregate trends: when firms shift toward defensive innovation in the early 2000s, it slows down the growth rate of labor productivity and hence has a negative impact on the wages of production workers, while innovation workers' marginal productivity is not affected. Based on these facts, my model quantifies the contribution of defensive innovation to the slow growth of labor productivity over the last two decades. Meanwhile, I am also exploring different causes of firms' shift in innovation strategies.

Another project I am working on is building a novel database by collecting job postings from newspapers in the US during 1880–2000. Using modern AI tools, I extract information such as characteristics and skill requirements for job applicants in each job posting. I also extract firm names, technology mentions, and wages, with the goal of building a firm-year panel that summarizes what types of jobs firms posted and how job requirements changed. Among various uses of this database, one of my research goals is to understand how general-purpose and office-related technologies (e.g., typewriters and computers) diffused across firms over time. A related question is what type of workers benefit from these technologies and how technology adoption changes skill demands and wages. I believe this database can help study these questions.

My intention of participating in the camp is twofold. First, I hope to systematically study the economics of innovation and explore frontier research questions. Though I have a great interest in this field, I have not had the chance to be systematically exposed to it. Second, with the opportunity provided by this camp, I hope to meet with different scholars and get feedback on my research projects.

Nannan Peng

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Education

Ph.D. Economics, Rutgers University, 2022-

Ph.D. (course work) Computational and Data Sciences, Chapman University, 2020-2022

M.S. Behavioral and Computational Economics, Chapman University, 2018-2020

M.S. Finance, Sichuan University, 2015-2018

B.E. Materials Science, Anhui University of Science & Technology, 2011-2015

Research Interest

Macroeconomic Theory and Labor Economics

Research Paper in Progress

Defensive Innovation, Labor Productivity and Wage Structure (JMP)

The Impact of Technological Change on Contents of Work and Wage Inequality (Best Second Year Paper Award)

Job Postings from Newspapers in the United States: 1880 - 2000

Research and Teaching Experience

Rutgers University

12/2022 - 06/2023	Research Assistant for Prof. Jacob Bastian at Department of Economics
09/2024 - 11/2024	Research Assistant for Prof. Rosemary Kaiser at Department of Economics
02/2025 - 07/2025	Research Assistant for Prof. Roger Klein at Department of Economics
07/2025 - 08/2025	Instructor for Introduction to Microeconomics at Department of Economics

Chapman University

2018 - 2022	Research Assistant for Prof. Stephen Rassenti at Economic Science Institute

Awards

2025 Sidney I. Simon Prize for Outstanding Second Year Research Paper

2024 Sidney Brown Prize in Economics for Outstanding Performance in Graduate Study

2023 Rie Ashizawa Memorial Award for Outstanding Performance on the Qualifying Examinations

2018 - 2020 Research Fellowship for M.S. at Economic Science Institute, Chapman University

Skills

Coding: Python, R, Stata, C++, LaTex

Languages: Chinese (Native), English (Fluent)

February 11, 2026

Dear Selection Committee,

I am writing to enthusiastically recommend Nannan Peng for the NBER Innovation Camp. I am Nannan's primary advisor, and have found that Nannan is an exceptionally motivated and highly capable Ph.D. student. He is working in macroeconomics, with research focusing on technological change, innovation, productivity, and wage inequality. He is widely regarded as the most advanced and driven student in his cohort, and he has already made great progress on his dissertation, particularly on his job market paper examining defensive innovation, productivity, and wage structure.

Nannan's job market paper studies an observation in recent data: the coexistence of rising R&D investment and innovation-related wage premia with the slowdown in labor productivity growth. Using firm-level evidence and a structural framework, he proposes a novel mechanism in which firms increasingly engage in "defensive" innovation investments designed to protect market share and deter entry rather than raise productivity. This mechanism provides an explanation for both the slowdown in productivity growth and the widening wage premium for innovation workers. The paper makes a meaningful contribution to the literature on innovation and productivity by distinguishing between productive and defensive forms of innovation and analyzing their aggregate implications. Nannan has developed this project independently and has shown excellent judgment in identifying an important research question, collecting empirical evidence, and developing a framework to study it.

Nannan's research agenda more broadly is closely aligned with the themes of the NBER Innovation Camp, including work on new measures of innovation based on the creation of new work using job postings and firm-level data, as well as research on technological change and the evolution of wage inequality. Nannan also stands out for his collaboration, friendliness, and willingness to help other students.

I recommend Nannan very strongly for the NBER Innovation Camp. Among students at a similar stage, he is the most advanced and driven researcher. I am confident that he would benefit greatly from the feedback and interaction the program provides, and that he would also be an active and constructive participant. Please feel free to reach me with any questions at r.kaiser@rutgers.edu.

Sincerely,
Rosemary Kaiser
Assistant Professor
Rutgers University