Xiaoxi (Joyce) Wang
Office 8029
105 St. George Street
Toronto, Ontario, M5S 3E6

February 5, 2025

Review Panel
NBER Innovation Research Boot Camp
National Bureau of Economic Research

Dear Professors Bryan, Ganguli, and Myers,

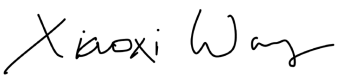
I am writing to express my interest in attending the NBER Innovation Research Boot Camp. I am currently a third-year PhD student in Economic Analysis and Policy at the Rotman School, University of Toronto, with a focus on industrial organization economics and economics of innovation. Having completed over two years of rigorous coursework in economics, I am eager to deepen my understanding of innovation research and engage with fellow scholars in this dynamic field.

For your reference, Professor Matthew Mitchell, who has closely supervised my second-year research, will be submitting a recommendation letter on my behalf.

Thank you for considering my application. I look forward to the opportunity to contribute to and learn from this esteemed program.

Please find enclosed: my CV, research statement, and a list of completed PhD courses.

Sincerely,



Xiaoxi (Joyce) Wang

Xiaoxi (Joyce) Wang

PhD Candidate • Economic Analysis and Policy • Rotman School of Management

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Research Interests

Economics of Innovation, Industrial Organization, Applied Microeconomics

Education

Ph.D. in Business Economics at University of Toronto (Rotman)	Sep. 2022 – Present
Honors M.A. in Public Policy at University of Chicago (Harris)	Sep. 2019 – Dec. 2021
B.Eng. in Bioresource Engineering at McGill University	Sep. 2011 – Jun. 2016

Coursework (Completed)

Methods: Industrial Organizations I&II; Quantitative Macroeconomics
Micro Theory: Advanced Topics in the Theory of Industrial Organization; Advanced Micro Theory
Macro Theory: Topics in Growth and Development; Topics in Macroeconomic Theory

Working Papers

How does Contractual Terms affect Drug Development Success. *[Second Year Paper]*

A small fraction of drug attrition is driven by commercial reasons rather than failures in efficacy or toxicity. In my research, I examine how contract design—specifically, the most negotiated financial term in biopharma contracts, royalties—affects the successful development of a drug. Leveraging the industry practice of drafting contracts based on benchmarks, I construct a novel instrument to address the endogeneity arising from drug quality.

Teaching Experience

Managerial Economics (TA to Prof. William Strange)	Fall 2023, Fall 2024
Math Camp (Harris School of Public Policy)	Summer 2020
Advanced Microeconomics [MPP] (TA to Prof. Steven Durlauf)	Fall 2020

Other Experience

Research Assistant to Professor Richard Hornbeck	Oct. 2020 – Jun. 2022
Research Apprenticeship with Professor Durlauf	Mar. 2021 – Dec. 2021
Science and Technology and Innovation Assistant at Embassy Canada	Apr. 2019 – Jul. 2019
Business Analyst at Humanitas Solutions.	Jan. 2019 – Apr. 2019
Membership Manager at The Canadian Chamber of Commerce in Shanghai	May. 2017 – Dec. 2018
Environment Management Intern at UN Environment Programme	Sep. 2014 – Feb. 2015

Skills

Programming: R, Python, MATLAB, Julia, Stata, MATLAB, Fortran, LaTeX
Languages: English(bilingual proficiency), Chinese(native), French(limited working proficiency)

Research Agenda
NBER Innovation Research Boot Camp 2025

Xiaoxi (Joyce) Wang

February 5, 2025

Innovation drives economic growth, and I have always been interested in its economics — whether through structural change induced by technological advancement, firm dynamics, or the relationship between market structure and innovation. One particular area of interest for me is closely examining the role of the "market for technology" (e.g., patent transactions, licensing, and M&A) in the innovation process. I see this as a rejuvenated area of research, with new methods offering fresh insights.

One aspect I have focused on is licensing in the pharmaceutical industry. Inspired by the commercial factors behind drug attrition and the royalty stacking clause (a contract term that limits the total royalties a company must pay when licensing multiple products), I am interested in understanding how an exogenous shift in the maximum royalty rate in licensing contracts affects drug development success. Since royalties essentially reflect the bargaining power between licensors and licensees, they are inherently endogenous. Leveraging the industry practice where contract parties reference previously signed agreements as benchmarks, I constructed an instrument that captures the industry standard, making it exogenous to the specific quality of an individual contract and the relative bargaining power of the licensor and licensee.

Building on this research, there are several avenues I would like to explore within the market for technology. One is understanding how market frictions between licensors and licensees, as well as their dynamic bargaining power, influence innovation outcomes. One notable market failure is search friction — on one hand, a strong licensor may hold onto its technology, continuously seeking the best possible licensee or attempting to develop the technology internally. On the other hand, this hold-up problem can slow down technology development if the right innovation does not reach the most capable developer. One potential way to measure search friction in the pharmaceutical industry is to use the number of business development managers hired as a proxy for search costs.

Another avenue I would like to pursue is quantifying the role of venture capital in bridging the "valley of death" between basic research and commercialization. If I can measure the network strength of investors — based on the partnerships they form — I aim to directly assess the impact of network strength on the success of technology development.

With these research questions in mind, I am excited about the opportunity to exchange ideas and engage in meaningful discussions at the NBER Innovation Research Boot Camp 2025.

List of Completed PhD Courses

University of Toronto

Winter 2024:

ECO3200H – Advanced Microeconomic Theory I

ECO3901H – Industrial Organization II

RSM3011H – Advanced Topics in the Theory of Industrial Organization

Fall 2023:

ECO2104H – Quantitative Macroeconomics

Eco2120H – Topics in Growth and Development

ECO3300H – International Trade Theory

ECO3900H – Industrial Organization I

Fall 2022 / Winter 2023:

ECO2200H/ECO2201H – Microeconomic Theory I&II

ECO2100H/ECO2101H – Macroeconomic Theory I&II

ECO2400H/ECO2401H – Econometrics I&II

University of Chicago:

Winter 2021

ECON 33530 – Firm Dynamics and Economic Growth

Joseph L. Rotman School of Management
University of Toronto

Rotman

Matthew Mitchell
Professor of Economic Analysis and Policy
Managing Editor, Journal of Industrial Economics

February 6, 2025

To whom it may concern,

I am writing this letter in support of Xiaoxi (Joyce) Wang, who is applying for the the NBER Innovation Research Boot Camp. I have known Joyce since she joined our program two and a half years ago. Joyce is making excellent progress and is a great candidate for the course.

Joyce is interested in understanding markets for technology. She is especially interested in the role that technological complexity plays in these markets. This is relevant because increasing technological complexity may lead to thickets of innovations (for instance thickets of patents) that make trade difficult.

Joyce's familiarity with this data and interest in the topic have already led to an excellent research idea and puts her on track to produce a high-quality dissertation, making the course especially appropriate.

Please feel free to contact me if you have further questions.

Sincerely,



Matthew Mitchell