NEW YORK UNIVERSITY

MANAV RAJ
Ph.D. Student in Strategy
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March 26, 2020

Dear NBER Entrepreneurship Research Working Group,

I am pleased to submit a proposal to be considered for the 2020 NBER Entrepreneurship Research Boot Camp (ERBC). My name is Manav Raj, and I am a third year doctoral student in NYU Stern's Management & Organizations Department. In addition to this cover letter, I am including an up-to-date version of my curriculum vitae and a two page essay outlining my current and future research interests. Separately, my advisor, Professor Robert Seamans, will be submitting a letter of recommendation for my application to Brett Maranjian.

I am including relevant contact information below. Thank you for your time and consideration. Please let me know if there is any additional information that I can provide.

Sincerely,

Manav Raj
Doctoral Student, NYU Stern
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512-923-2945

Manav Raj

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March 2020

EDUCATION

New York University, Leonard Stern School of Business, New York City, NY
Ph.D., Management and Organizations (Specialization: Strategy)
Expected graduation: May 2022

Dartmouth College, Hanover, NH
A.B., *Cum Laude*, Economics Major with a Minor in Public Policy, 2015

RESEARCH INTERESTS

- Effects of novel innovation on competition, market conditions, and incumbent firms
- Effects of institutions and non-market forces on innovation and entrepreneurship.

PUBLICATIONS

Felten, E., **M. Raj**, & R. Seamans (2019) The Effect of Artificial Intelligence on Human Labor: An Ability-Based Approach. *Academy of Management Proceedings*.

Raj, M. & R. Seamans (2019) Primer on Artificial Intelligence and Robotics. *Journal of Organizational Design.*

Raj, M. & R. Seamans. Automation (2019) In *Oxford Bibliographies in Management*, eds. Ricky Griffin, Oxford University Press: New York.

Raj, M. & R. Seamans (2019) AI, Labor, Productivity, and the Need for Firm-Level Data. In *The Economics of Artificial Intelligence: An Agenda*, eds. Ajay Agrawal, Joshua S. Gans and Avi Goldfarb, University of Chicago Press: Chicago.

Felten, E., **M. Raj**, & R. Seamans (2018) A Method to Link Advances in Artificial Intelligence to Occupational Abilities. *American Economic Association Papers & Proceedings*, 108: 1-4.

WORKING PAPERS

Raj, M. A House Divided: Legislative Competition, State Incentives, and Young Firm Survival in the United States.

- *Revise & Resubmit* at *Strategic Management Journal*.

Felten, E., **M. Raj**, & R. Seamans. The Occupational Impact of Artificial Intelligence: Labor, Skills, and Inequality.

Hegde, D. & **M. Raj**. Does Gender Affect Work? Evidence from U.S. Patent Examination.

Raj, M. & J. Eggers. Under Pressure: CEOs' Short-Term Responses to Employment Threat.

- Strategic Management Society, Annual Conference 2019, Best Paper Award Honorable Mention.

Hegde, D., A. Ljungqvist, & **M. Raj**. Quick and Dirty Patents.

M. Raj. Friends in High Places: Indirect Network Effects and Competition on Platform Markets.

WORK IN PROGRESS

Eklund, J., J. Eggers, & **M. Raj**. Managerial Cognition and Responses to Technological Change.

Bondi, T., G. Johnson, **M. Raj**, & O. Reshef. When Delivery Comes to Town.

HONORS & AWARDS

Strategic Research Foundation, Dissertation Research Grant ($10,000), 2019

NYU Stern Center for Global Economy and Business, PhD Grant ($2,500), 2019

CONFERENCE PRESENTATIONS

Raj, M. & J. Eggers. Under Pressure: CEOs' Short-Term Responses to Employment Threat.

- Strategic Management Science Annual Conference, October 2019

Felten, E., **M. Raj**, & R. Seamans. The Occupational Impact of Artificial Intelligence: Labor, Skills, and Inequality.

- Academy of Management Annual Conference, August 2019.
- Temple University Conference on Artificial Intelligence, Machine Learning, and Business Analytics, December 2019.

Raj, M. A House Divided: Legislative Competition, State Incentives, and Young Firm Survival in the United States.

- East Coast Doctoral Consortium, April 2019
- Strategic Management Science Annual Conference, October 2019.

Hegde, D., A. Ljungqvist, & **M. Raj**. Quick and Dirty Patents.

- National Science Foundation Future of IP Conference, February 2020.

SYMPOSIA, CONSORTIUMS, AND WORKSHOPS

Doctoral Student Workshop at the Strategic Management Science Annual Conference in Minneapolis, October 2019.

Doctoral Student Workshop at the West Coast Research Symposium at Stanford University, September 2019.

REVIEWING EXPERIENCE

Organization Science (*Ad Hoc Reviewer)* 2018 to present

MEMBERSHIPS AND AFFILIATIONS

Academy of Management 2018 to present

Strategic Management Society 2018 to present

Institute for Operations Research and the Management Sciences (INFORMS) 2018 to present

PRIOR WORK EXPERIENCE

Cornerstone Research Fall 2015 – Spring 2017
Analyst, Consulting Group

Dimensional Fund Advisors Summer 2014
Associate (Intern), Financial Advisors Services Group

J.P. Morgan Chase & Co. Winter 2014
Consultant (Intern), Consumer Bank & Credit Card Division

United States Treasury Summer 2012
Analyst (Intern), Office of Small Business, Community Development, and Housing Policy

CURRENT AND COMPLETED COURSEWORK

Microeconomics, Econometrics I, Behavioral Research Methods, Advanced Research in Organizational Behavior, Organization Theory, Strategy, Panel Data Analysis (Econometrics II), Advanced Strategy Doctoral Seminar in Corporate Governance, Strategy I (Innovation Economics), Sociology of Culture, Advanced Empirical Methods for Identification, Columbia Consortium in Strategy, Digital Economics, Advanced Strategy Doctoral Seminar in Innovation, Professional Seminar (six semesters), Research Practica (five semesters), Research Design and Development.

Manav Raj, NYU Stern School of Business: NBER Entrepreneurship Research Boot Camp

Research Interests and Previous Work

I am interested in the effects of factors outside of firms' traditional boundaries that may affect firm strategy and outcomes. Within this broad domain, my research has examined two sets of factors: 1) the role of institutions and non-market factors in inhibiting or encouraging innovation and entrepreneurship and 2) the effect of novel innovation on competition and market conditions. For the purpose of NBER ERBC, I will focus on describing my entrepreneurship-related work.

I have multiple projects that explore various aspects of this issue. In a paper coauthored with Professors Deepak Hegde and Alexander Ljungqvist, we investigate the trade-offs between patent scope and examination timing for startup patent applicants. Using an identification strategy that relies on individual variation in examiner's lenience with respect to patent scope and examination time, we find that timing has large and meaningful effects on growth for the focal startup as well as spillovers for others in the industry, while the effects of patent scope are negligible. In a separate line of work, in a sole-authored paper, I examine the role of the political environment on entrepreneurial outcomes. Specifically, I study the effect specifically state-level legislative competition in the United States on the institutional environment and young firm mortality. I find that higher levels of legislative competition induce policy-makers to seek favor from established interests by increasing the use of business incentives, leading to an increase in young firm mortality. This project received an *R&R* from the *Strategic Management Journal* and is currently being prepared for resubmission.

Future Work and Dissertation Research

My dissertation research will examine how the emergence of digital platforms in an industry affects incumbents and entrants. I propose to study the performance, strategic, and competitive implications of digital platforms on firms.

In the first chapter of my dissertation, I examine the competitive dynamics between complementors (i.e., firms that sell or offer goods or services on a platform) on platform marketplaces. In traditional markets, entry of additional firms is associated with an increase in competitive pressure and an erosion of profits, however, in platform markets, an increased number of complementor firms may have a positive effect as it increases the attractiveness of the platform. Using data on the music streaming industry, I plan to extend the existing literature by identifying how these two competing effects manifest and how competitor expansion or entry to an artist's competitors affects the focal artist's performance. In the second chapter of my dissertation, I study how the entry of a cooperative digital platform affects the entry, exit, and performance of firms within an industry. Using the restaurant and food delivery industry as my empirical setting, I will present evidence that the entry of such platforms alters the value of firms' resource

portfolios and increases environmental munificence, enabling greater entrepreneurial activity but also leading to greater firm exit. Finally, in the last chapter of my dissertation, I hope to study how digitization affects the downstream reuse of products in future innovation. Again using the music industry as a setting, I plan to study how digitization of music affects its reuse and influence on future content. Particularly, I will identify how the removal of digital rights management technologies affects the future re-use of music via sampling. In doing so, I hope to provide evidence that increased digitization of creative content leads to greater use and influence of the content in the future.

It is my belief that this line of research has a variety of meaningful implications for entrepreneurial outcomes, particularly in platform settings. Digital markets and platform intermediaries are increasingly common and alter the nature of competition across firms. Start-ups and innovators that participate in such markets face a unique set of opportunities and constraints, and it is my hope that my work will allow us to better understand how platforms and digital markets affect competition across firms, innovation, and entrepreneurial entry and success.

Interest in the NBER ERBC

As my current and future research interests suggest, I have had a sustained interest in understanding the causes and consequences of entrepreneurship. I hope that as I continue to advance in my career and grow as a scholar, I can become an expert in this area and have a well-rounded understanding of both foundational and cutting-edge literature and methods used in this space. I have sought opportunities to pursue my entrepreneurship-related interests through my time in the PhD program at NYU. In addition to my research and coursework (featuring courses on innovation, entrepreneurship, strategy, and empirical identification), I work with Professor Deepak Hegde at NYU's Endless Frontier Labs, a start-up incubator for scalable, science and deep technology startups at NYU, providing me practical and real-world exposure to start-ups and the entrepreneurial funding process. However, I continue to seek out other opportunities to grow as a student and a scholar in this area.

The NBER ERBC seems to be a great opportunity to continue my growth in this area by meeting distinguished and respected scholars, learning about cutting-edge work in the field, and receiving feedback on my own research and ideas. The boot camp is highly recommended to me from two of my co-authors and advisors, Professors Deepak Hegde and Rob Seamans. Professor Hegde noted that he attended the inaugural session of this research boot camp when he was a doctoral student and felt that it was extremely beneficial to him as an entrepreneurship scholar. He noted that since the time he attended, the camp has grown in relevance and access to others in the field producing cutting-edge entrepreneurship research. I would greatly appreciate the opportunity to meet and learn from the many high-quality scholars affiliated with the NBER ERBC and feel that it would help me develop as a producer and consumer of entrepreneurial research.

NEW YORK UNIVERSITY
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ROBERT SEAMANS
ASSOCIATE PROFESSOR

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Dear Prof. Robinson:

I am pleased to recommend Mr. Manav Raj for the NBER Entrepreneurship Research Boot Camp. Manav is currently in his third year of doctoral studies here at NYU Stern's Department of Management and Organizations. His research interests lie at the nexus of strategy, technology, and entrepreneurship, and he is shaping up to be a very promising student who has thus far excelled in every facet of the PhD program. He would greatly benefit from the Boot Camp (I say this as an alum of the Boot Camp).

Manav has worked with me on several projects relating to artificial intelligence (AI) and automation, which has led to publications in several outlets including: *Journal of Organizational Design*, *AEA Papers & Proceedings*, and *Oxford Annotated Bibliographies*. All these publications are related in some form to an ambitious project that we've been working on to develop a methodology that links advances in AI to occupational abilities. Using this methodology, we find that occupations that have the most exposure to AI have experienced an increase in wages. This effect is primarily driven by occupations that have higher software skills requirements. We believe our findings provide some evidence that AI and human labor are complementary in many cases. Manav is also working on projects with other faculty, including a couple of innovation-oriented papers with Deepak Hegde and Alexander Ljundqvist.

Manav is now turning his attention to his dissertation research. He has identified what I believe to be an exciting set of research papers broadly on the topic of "digital platforms." In one of these papers, Manav plans to investigate how digital platform entrants in downstream parts of the supply chain affect (non-digital) incumbents higher up in the supply chain. He plans to do this by studying how the entry of food delivery platforms, such as Grubhub, Doordash and UberEats, affects restaurants. There are many pieces to this paper that I like, but I want to highlight two.

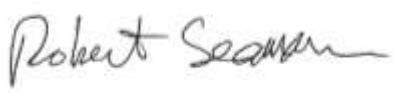
First, much of the literature on platforms takes a "competitive strategy" approach. In a supply chain setting, however, there is also room for cooperative strategy. Entry by digital food delivery platforms likely creates additional value (i.e., the entry increases the "size of the pie"); it is now easier for eaters to

purchase meals without leaving their home (i.e. to do take-out or to do sit-down at the restaurant). However, it is not clear how this additional value is divided up. Surely the new platforms get some of the value, otherwise they wouldn't enter. But the effects on incumbent restaurants may be heterogeneous depending on their bargaining power vis-à-vis the platforms. I believe this setting is theoretically rich, and will allow Manav to contribute to the literature.

Second, the staggered timing of entry of digital food delivery platforms across cities, as well as differences across cities in the number of food delivery platforms, provide quasi-exogenous sources of variation that Manav will be able to use for econometric identification. Some of this variation will come from cities that already have Uber or not, or that have bike lanes or not, or that have really well developed Internet infrastructure or not. There is lots of prior literature on all these factors that Manav will be able to draw from. In other words, while I believe the setting is theoretically rich, it also has features that should help Manav assess his theoretical predictions.

I hope that this recommendation letter highlights to you how promising Manav is. He would benefit greatly from the Boot Camp, and is eager to take part. Thank you again for considering his application. If you have any further questions, please don't hesitate to contact me via phone or email.

Sincerely,



Robert Seamans
Associate Professor
NYU Stern Management Department