Leonardo Ortega
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March 27, 2020

NBER Entrepreneurship Working Group
Entrepreneurship Research Boot Camp 2020
Admission Committee

Dear NBER Entrepreneurship Working Group,

I am writing to express my interest in participating in the 13th Entrepreneurship Research Boot Camp (ERBC). I am completing my third year as a PhD Student in the Strategy and Innovation department at Scheller College of Business, Georgia Institute of Technology. My current advisor, Professor Pian Shu (pian.shu@scheller.gatech.edu), will provide you with my letter of recommendation.

During my current studies at Georgia Tech, I have been fortunate enough to be exposed to the Entrepreneurship literature in several ways. I attended the Entrepreneurship Seminar, a class taught by Prof. Peter Thompson, where we reviewed the recent theoretical and empirical literature on entrepreneurship. Also, I have been exposed to current research projects in this area by assisting our internal guest speaker seminar series and by participating in the Annual Roundtable for Engineering Entrepreneurship Research (REER) Conference.

My current research interests focus on understanding new ways in which firms innovate in markets characterized by a strong intellectual property right system and the presence of disruptive technologies such as digital technologies. This broad area of research is in line with current developments in the entrepreneurship literature. This is why I believe the Entrepreneurship Research Boot Camp 2020 will allow me to have a deeper understanding of the leading research topics in the area of entrepreneurship and innovation, which I am certain will be important for my future research agenda in this area.

Thank you for your time and consideration.

Sincerely yours,

Leonardo Ortega

Leonardo Ortega

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EDUCATION

Georgia Institute of Technology
Ph.D. in Strategy and Innovation
Main Courses:
Strategy & Innovation Seminar, Entrepreneurship Seminar,
Economics of Innovation Seminar,
Technology, Organization, and Strategy Seminar

Atlanta, GA
2017 - present

University of Pittsburgh
Master in Economics
Main Courses:
Advanced Microeconomic Theory I & II
Advanced Macroeconomic Theory I & II
Econometrics I & II

Pittsburgh, PA
2012 - 2014

Universidad Central de Venezuela
Bachelor of Arts in Economics

Caracas, Venezuela
2002 - 2007

RESEARCH INTEREST

Economics of Innovation, Entrepreneurship, Intellectual Property Strategy

WORK IN PROGRESS

"Import Competition and the Demand for External Technologies", joint with Pian Shu

"A new measurement of product innovation: lessons from the pharmaceutical industry", joint with Annamaria Conti and Elie Sung

PROFESSIONAL EXPERIENCE

Inter-American Development Bank (IDB)
Research Fellow, Competitiveness, Technology, and Innovation Division

Washington, DC
Dec 2014 - Jul 2017

United Nations Environment Program (UNEP)
Economic Research Consultant

Caracas, Venezuela
Jul 2014 - Nov 2014

OTHER INFORMATION

Languages: Spanish (native), English (fluent)

Programming: Stata, R, Python, LaTeX

ACADEMIC REFERENCES

Pian Shu
Assistant Professor
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Scheller College of Business
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Annamaria Conti
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Strategy, Globalization, and Society
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Entrepreneurship Research Boot Camp 2020

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The way firms innovate has evolved in the last 30 years. The time has passed for the traditional model where large firms integrate all phases of innovation (i.e. research, development, commercialization). The evolution in the way firms innovate is mainly due to the strengthening of intellectual property rights (IPRs) and the emergence of disrupting digital technologies. Strong IPRs allow firms to trade technologies in a market setting. Digital technologies significantly reduce the costs of acquiring and store information. These changes are creating new opportunities to innovate, particularly for young firms: from firms that recombine technologies developed by other firms with their developments, to firms that take advantage of digital technologies to scale up projects that before were only possible for large firms. My research interests focus on understanding how firms innovate and what are the new challenges they face when innovating in this new environment. This is why, I believe, the Entrepreneurship Research Boot Camp 2020 will be an opportunity to be exposed to the most recent developments in the area of entrepreneurship and innovation.

My current research agenda consists of three work-in-progress papers. In my first paper, a joint project with Pian Shu, we examine how import competition from China affects the demand for external technologies of domestic firms in the U.S. Previous studies have shown that the rise of import competition from China has led to a decline in patenting and R&D spending of large public U.S. firms (Autor et al., 2017; Pierce & Schott, 2018; Bloom et al., 2016). These findings, however, only paint a partial picture of the innovation response of firms, since firms could be shifting from innovating in-house to purchasing external technologies in response to increased competition. Using newly matched data on patent reassignments and M&A activities, this paper investigates the impact of Chinese import competition on U.S. firms' acquisition of external technologies. Preliminary findings suggest that the decline of in-house innovation is not compensated by increased transactions on the market for technology.

My second project, a joint work with Annamaria Conti and Elie Sung, focuses on generating a new proxy for product innovation based on patent and trademark records. Current measurements of product innovation have several limitations either because they only cover a subsample of firms (i.e. innovation surveys) or because they are based on product counts in certain economic sectors (see Jaravel, 2018). We propose a new measurement of product innovation that covers all firms with patents and trademark records. The measurement consists of identifying patents (a proxy for innovation) that are associated with new products based on the text similarity with trademark records (a proxy for new products). Future projects will use this proxy to understand the dynamics of product innovation and the heterogeneities across firms and economic sectors.

My third project will focus on investigating an unexplored innovation strategy that could potentially reduce the uncertainty in the innovation process. Innovation is usually thought of as a trial-and-error process that aims to solve a particular problem. Other times innovation occurs as a fortuity event (i.e. discovery). In both cases, the innovation process has a substantial component of risk and uncertainty. Can firms follow a different strategy to reduce this uncertainty? A backward induction process could be the answer to this question. Firms could use their experience in the market and their stock of knowledge to predict possible technology paths that will dominate their market in the near future. Once the firm determines these potential scenarios, it could use backward induction to develop technologies needed to reach that point. Since this is a dynamic process, the evolution of technologies -within the firm and in the market- will validate the prediction. This dynamic validation could serve as a way to reduce the uncertainty of the innovation process. Firms like Apple have followed a similar approach with very successful outcomes, such as the iPhone.

Letter of Recommendation for **Leo Ortega**

Application to NBER Entrepreneurship Research Boot Camp

To Whom It May Concern:

I'm writing this letter in support of my student, Leo Ortega, who is currently a third-year PhD candidate in the Strategy & Innovation program at Georgia Tech. Leo is a hard-working student with strong empirical skills, a great understanding of the trade and innovation literature, and a variety of interests in entrepreneurship and innovation topics. I believe the opportunity to participate in the Boot Camp will be hugely beneficial for his scholarly development, and, in turn, he would be a valuable addition to the program.

I started working with Leo in 2018, when I hired him as a research assistant on my joint project with Claudia Steinwender from MIT Sloan. We wanted to survey the existing empirical evidence on the impact of trade liberation on firm innovation, and we tasked Leo with the responsibility of doing a first scan of the literature. Leo helped us download, categorize, and summarize over 150 papers on the topic. While he initially needed some guidance from me and Claudia, he quickly grasped how to synthesize the key results of a paper. His assistance was crucial in helping us digest the vast literature with a short timeline. The resulting work was published in the 2018 volume of the NBER Innovation Policy and the Economy.

Our joint project, *"Import Competition and the Demand for External Technologies,"* stemmed out of the earlier collaboration. Given his interest in the *process* of firm innovation (e.g., the choice between in-house R&D versus external technology purchasing), he sharply identified a key missing piece in the current empirical literature on trade and innovation (particularly on the impact of import competition): that very few studies have considered technology purchasing/licensing as an alternative to in-house development. This observation has potentially large implications. For instance, existing evidence on the negative impact of import competition on domestic innovation (e.g., my own work with coauthors) may not represent an overall decline in innovation, but simply a *shift* in firm innovation strategy. To investigate this alternative possibility, Leo carefully undertook two pieces of significant data collection efforts, one on patent reassignments and the

other on firm M&A activities. He made tremendous progress on the initial analysis and was fully responsible for the first draft of the paper (as his second-year paper). This work was accepted at the 2020 Duke-UNC Innovation & Entrepreneurship Conference.

In summary, I believe Leo will be a terrific match with the Boot Camp. I have very much enjoyed working with him and have been impressed by his work ethics, empirical skills, and maturity as a researcher. Please don't hesitate to contact me if you have any questions about his application.

Best,



Pian Shu
Assistant Professor, Strategy & Innovation
Scheller College of Business, Georgia Tech