NBER Innovation Research Boot Camp

January 26, 2024

Dear Committee Members,

I am pleased to attach my application for the NBER Innovation Research Boot Camp. You will find below a CV with my contact information, an overview of graduate studies to date and a description of my interests and current research projects. I will gladly provide any other supporting materials upon request.

The letter of recommendation will be provided by Pr. **Shane Greenstein**.

You can contact me at my email jboudou@hbs.edu

Thank you for your consideration, and I look forward to hearing from you.

Sincerely,

Justine Boudou

JUSTINE BOUDOU

Harvard Business School
jboudou@hbs.edu

EDUCATION

Harvard Business School, Boston (USA) — 2020 to date
Ph.D. Student in Business Administration
Field: Technology & Operations Management (Innovation track)

HEC Paris, Jouy-en-Josas (France) — 2016 – 2019
MiM (Master in Management)

Delft University of Technology, Delft (The Netherlands) — 2017 – 2018
M.S. Management of Technology
(Exchange program during the last year of Master of the ENPC)

Ecole Nationale des Ponts et Chaussées, Paris (France) — 2014 – 2018
M.S. Engineering (specialization Economics & Finance)

WORK EXPERIENCE

Philips, Amsterdam (The Netherlands) — 2019 – 2020
Mergers & Acquisitions Analyst

Pierre Fabre, Paris (France) — 2016 (Summer)
Research Intern, Finance and Strategy department

Polytechnic University of Catalonia, Barcelona (Spain) — 2015 (Summer)
Research Intern, Environmental Engineering and Microbiology Group (GEMMA)

RESEARCH

Are firms stealing talents? The sorting of scientists between Industry and Academia and consequences for Science? *(JMP - in progress)*

Innovation Under Resource Constraints: A Study of Supercomputing in Scientific Research *(w/ John McKeon, in progress)*

Bringing Science to Market: Academic Startups' Knowledge Foundations and Performance *(w/ Maria Roche – in progress)*

AWARDS

Best Master Thesis Award (HEC Paris) — 2019

NBER Digitization Tutorial — Spring 2023

GRADUATE COURSEWORK

All coursework is completed and is at Harvard, except specified otherwise.

Economics

1. Microeconomic Theory I (Rahul Deb)
2. Microeconomic Theory II (Chris Avery and Dennis Yao)
3. Industrial Organization I (Ariel Pakes)
4. Labor Economics and Labor Market Institutions (Amanda Pallais)
5. Empirical Research in Labor and Public Economics (Winnie van Dijk)

Innovation

1. Economics of Ideas and Innovation (Pierre Azoulay and Scott Stern - MIT)
2. Empirical studies of Innovation and Digitization (Shane Greenstein)
3. Economics of Ideas, Science and Innovation Online Course (Pierre Azoulay, Matt Clancy, Ina Ganguli, Ben Jones and Heidi Williams, organized by the Institute for Progress)

Methods

1. Econometric Methods for Applied Research I (Gregory Bruich)
2. Econometric Methods for Applied Research II (Will Dobbie)
3. Causal Inference in Management Research (Tim Simcoe - BU)
4. Machine Learning and Big Data Analytics (Soroush Saghafian)
5. Machine Learning (David Parkes and Finale Doshi-Velez)

Technology Management

1. Empirical Technology & Operations Management (Antonio Moreno)

ESSAY

For this essay, I choose to briefly present two projects I am currently working on as part of my dissertation plan. They both focus on the economics of science and study two major inputs of the knowledge production function: labor and computing resources.

Project #1: While the supply of scientists and its consequences for innovation has been widely studied, the allocation of scientists across sectors has received less attention. Because individuals are heterogeneous in skills and some occupations have greater potential of generating significant spillovers than others, the matching between jobs and individuals is of critical importance. In this paper, I study the allocation of Ph.D. at graduation across the academic and the private sector and its consequences for firms, universities and the economy. While the share of students joining the private sector has substantially increased in the last decade, the consequences of this sorting remain unclear. Are firms recruiting the individuals who would be particularly productive in the private sector? Are they diverting those who would have been prolific academic researchers? Using a newly-created dataset covering more than 40 cohorts of Ph.D. graduates with information about their earnings and their publication output, I first estimate the causal impact of joining the private sector vs Academia on earnings and publication output. Using an instrumental variable design, I show that scientists who start their career in the private sector generate 62% less publications and earn 59% more, compared to scientists who start their career in a university. Using Marginal Treatment Effects, I show that there is substantial heterogeneity across individuals. I then use these publication-wage reduced-form estimates in a simple model of social returns that allows me to shed light on the extent of misallocation across sectors.

Project #2: Another project of mine studies an increasingly important input for the production function of science: high performance computing resources. When key inputs are constrained, both firms and government agencies face a key trade-off when deciding whether to provide additional resources to a given set of projects or spread them out across a wider range of projects. In this paper, I study specifically the scarce input of computing power and ask: what is the effect of getting additional high computing hours on the quantity and quality of projects that researchers pursue? At its core, this question is related to the impact of getting additional resources on the rate and direction of innovation. Do researchers write more papers, but with a lower quality? Do they improve on their existing projects? Do they work on topics that depart from their existing lines of work? This paper overcomes endogeneity challenges by using a new setting and a new dataset that allows me to get exogenous variation in the quantity of computing resources that each researcher receives and to make causal claims about the intensive margin of non-fungible computing resource allocation.

With my dissertation being directly related to the economics of science and innovation, this tutorial is a unique opportunity for me to benefit from experts in the field and make progress on my work. Importantly, it would also allow me to hear and benefit from other students and initiate fruitful collaborations as I move closer to graduation.

Thanks a lot for your consideration,

Sincerely,
Justine Boudou

Harvard Business School

Shane M. Greenstein
he/him/his
Martin Marshall Professor of Business Administration, Technology and Operations Management

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Justine Boudou

January 30, 2024

I heartily recommend Ms. Justine Boudou for the NBER Innovation Book Camp. Ms. Boudou is completing her fourth year of graduate training at the Harvard Business School as part of the Technology and Operations and Management unit. At this stage, she is firmly committed to pursuing a research agenda in the science of science and the commercialization of science. She certainly will be among your top applicants this year.

I first met Ms. Boudou when she took my empirical studies of innovation course in Spring 2022. We have since begun an extensive conversation about two of her projects. I am on her committee with Maria Roche and Kyle Myers, who is the chair.

One project examines how the labor markets for technical talent have operated and evolved over many years. It involves analysis of the most extensive data set ever collected on new PhD sorting between industry and academic employment. The data is exceedingly rich, particularly about how the academic/entrepreneurial employment and career path market has changed across different scientific fields.

The second project examines the NSF's allocation of frontier computing to different projects, taking advantage of the fixed capacity of the facilities, which necessitates granting access to fewer resources than requested. It estimates the impact of those policies on the productivity of the researchers.

In addition, Ms. Boudou works closely with Kyle Myers and Maria Roche. These collaborations are consistent with her broad innovation and entrepreneurial economics research agenda, focusing on the science/commercialization boundary.

Ms. Boudou also has all the traits you desire in a participant. She makes thoughtful and creative remarks in discussions. She listens well and speaks clearly. She asks probing

Harvard Business School

Shane M. Greenstein
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Martin Marshall Professor of Business Administration, Technology and Operations Management

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analytical questions. She is also determined and enthusiastic about studying innovation economics. You cannot help but notice the enthusiasm and passion. It is infectious.

I cannot say enough wonderful things about Ms. Boudou. She is great to have around and will be a terrific participant in your boot camp.

Sincerely,

