Application to NBER Innovation Research Boot Camp 2026

Michele Liberatore

Contact Information

Name:	Michele
Surname:	Liberatore
Date of Birth:	March 3, 1998
Place of Birth:	Florence, Italy
Age:	27
Gender:	Male
Nationality:	Italian
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Current Position:	Ph.D. Candidate in Economics (since 2024) IMT School for Advanced Studies Lucca Joint program with Università degli Studi di Firenze

Recommendation Letter Writer

Name:	Professor Massimo Riccaboni
Position:	Full Professor of Economics
Institution:	IMT School for Advanced Studies Lucca
Address:	Piazza San Francesco, 19 55100 Lucca, Italy
Relationship:	Ph.D. Advisor

Michele Liberatore

Curriculum Vitae

Ph.D. Candidate in Economics
IMT School for Advanced Studies Lucca, Italy

Education

Ph.D. in Economics 2024 – Present
IMT School for Advanced Studies, Lucca, Italy
Joint program with Università degli Studi di Firenze
Advisor: Prof. Massimo Riccaboni

Master of Science in Economics and Development 2020 – 2022
Georg-August-Universität Göttingen, Germany — Final grade: 1.0/1.0
Double Degree with Università degli Studi di Firenze, Italy

Master Degree in Economics and Development 2020 – 2022
Università degli Studi di Firenze, Italy — Final grade: 110/110
Double Degree with Georg-August-Universität Göttingen, Germany

Bachelor Degree in Economics 2017 – 2020
Università degli Studi di Firenze, Italy — Final grade: 110/110 cum laude

Research Experience

Research and Knowledge Transfer Specialist 2023 – 2024
University of Siena, Italy
Research specialist for Tuscany Health Ecosystem (THE) project

- Market analysis for new inventions and technology transfer to industry
- Patent landscape analysis and prior art searches
- Consultation of major patent databases (Espacenet, Patentscope, The Lens)
- Mapping of researchers and knowledge networks across the innovation ecosystem
- Focus on the life-science sector

Research Fellow 2023 – 2024
University of Florence, Italy
Research areas: Economics of Innovation, Industrial Economics, Political Economy

- Survey design and implementation for analysis of the local manufacturing sector
- Conducted interviews with firms and entrepreneurs
- Created and managed large-scale datasets
- Performed statistical and econometric analysis of firm-level data

University Tutor 2022 – 2023
Georg-August-Universität Göttingen, Germany

- Teaching Assistant for the courses of Advanced Macroeconomics, International Trade & Industrial Economics (Master Level)

Publications and Working Papers

Licensing, Effort, and Selection with a Continuum of Pharma Project Qualities
In progress, 2026
Authors: Liberatore, M., Riccaboni, M.
Submitted for European Economic Association (EEA) conference attendance

Research Interests

Economics of Innovation, Markets for Technology, Pharmaceutical Economics, Industrial Organization, Applied Econometrics, Causal Inference, Machine Learning for Economics

Technical Skills

Advanced: STATA, Python
Intermediate: R, SAP
Basic: MATLAB

Languages

Italian: Native speaker
English: Proficient (C1 level in all competencies)

Ph.D. Coursework

General Courses (Completed)

- **Advanced Microeconomics** (40 hours) - Grade A
  Core microeconomic theory including consumer and producer theory, general equilibrium, game theory, and mechanism design
- **Econometrics I: OLS and Panel Data** (30 hours) - Grade A
  Ordinary least squares, properties of estimators, hypothesis testing, fixed and random effects models
- **Econometrics II: Non-linear Models, GMM and ML Estimators** (20 hours) - Grade A
  Generalized method of moments, maximum likelihood estimation, limited dependent variables, count data models
- **Econometrics III: Causal Methods** (20 hours) - Pass
  Instrumental variables, regression discontinuity design, propensity score matching, difference-in-differences, synthetic control methods, causal machine learning
- **R and Stata for Data Science** (20 hours) - Pass
  Data manipulation, visualization, and statistical analysis in R and Stata
- **Machine Learning for Economic Research** (20 hours) - Grade A
  Supervised and unsupervised learning, regularization methods (LASSO, Ridge, Elastic Net), tree-based methods (Random Forest, XGBoost), cross-validation, Double Debiased Machine Learning, Matrix Completion, Textual Analysis
- **Machine Learning with Python** (30 hours) - Pass
  Implementation of machine learning algorithms, scikit-learn, pandas, data preprocessing and feature engineering

Topic Courses (Completed)

- Economics of Innovation (12 hours)
- Energy Economics (12 hours)
- Health Economics (12 hours)
- Ecological Economics (12 hours)
- Competition and Inequalities (12 hours)
- Satellite Imagery (12 hours)
- Experimental Economics (12 hours)
- Economics of AI (12 hours)

Total Coursework: 250+ hours of doctoral-level training in economics, econometrics, and computational methods

Research Statement

Current Research: Pharmaceutical Innovation and Markets for Technology

My most recent study examines how markets for technology allocate innovative assets and whether they do so efficiently. With my Ph.D. advisor, we focus on the pharmaceutical industry, where biotechnology firms license innovations to large pharmaceutical companies in a setting characterized by frequent, well-documented transactions and clearly defined intellectual property rights (Arora et al., 2001). We develop a theoretical model of pharmaceutical licensing with continuous project quality, asymmetric information, and non-contractible effort. The model identifies conditions under which markets achieve efficient allocation versus "lemons" equilibria (Akerlof, 1970; Pisano, 1997), and shows that selection patterns and efficiency may vary systematically across the risk distribution, with mechanisms that mitigate adverse selection for incremental projects proving less effective for novel, high-risk innovations.

Using product-level data and the Double Machine Learning framework (Chernozhukov et al., 2018) to address high-dimensional confounding, we find strong evidence of positive selection into licensing: licensed products have 3.8–4.3 percentage point higher approval rates than internally developed ones. However, this advantage comes with substantially higher development costs (49–63%) and lower revenues (42–44%). The heterogeneity by predicted success probability (our proxy for project risk) shows that this effect is mainly driven by low-risk incremental projects, for which higher approval rates are offset by lower returns, consistent with competitive equilibrium where firms are indifferent at the margin between alternative product development strategies. However, for high-risk, frontier projects, licensed products retain higher success rates without profitability penalties, suggesting potential market inefficiencies in the pricing and allocation of innovative assets. These findings suggest that if markets for technology systematically undervalue highly novel innovations due to transaction frictions and evaluation challenges, they may distort investment incentives and lead to inefficient allocation of frontier research.

Future Research. Building on this foundation, my research objective is to advance our understanding of how innovation systems allocate resources and generate economic growth. I plan to extend my analysis of pharmaceutical markets for technology by examining how contract structures (royalty rates, milestone payments, upfront transfers) respond to project characteristics and shape innovation outcomes, and by analyzing how the financial sector prices new innovations before their realized market performance.

More broadly, I am interested in questions at the intersection of innovation economics, industrial organization, and policy evaluation. How do knowledge spillovers affect firm innovation strategies and industry dynamics? What are the returns to different types of R&D investments, and how do they vary for different types of innovation? How can policy interventions improve the functioning of innovation systems while accounting for market failures arising from information asymmetries, coordination problems, and appropriability concerns? These questions touch on core themes in innovation economics including firm dynamics (Akcigit and Kerr, 2018), the production of knowledge (Jones, 2009; Bloom et al., 2020), the effects of public R&D investment on private innovation (Azoulay et al., 2019), and the design of innovation policy (Williams, 2013; Budish et al., 2015).

Why This Boot Camp. The NBER Innovation Research Boot Camp represents a unique opportunity to fill a critical gap in my training. In addition to the rigorous foundations in theory and empirics provided by my Ph.D. program, this boot camp would represent a valuable enrichment, offering a wide-ranging perspective on frontier research questions that is difficult to obtain elsewhere.

Beyond the knowledge content, the boot camp will allow me to establish relationships with fellow early-career scholars, receive feedback from leading experts, and become integrated into the network of researchers working on related questions. These connections will be invaluable as I develop my research agenda and navigate early-career challenges.

The international environment and intensive engagement with top scholars represents the formative experience that shapes successful academic careers. I am confident I would be an engaged participant, and I believe this boot camp will be instrumental in my development as a scholar committed to advancing our understanding of innovation systems.

References

Akcigit, U., & Kerr, W. R. (2018). Growth through heterogeneous innovations. *Journal of Political Economy*, 126(4), 1374–1443.

Akerlof, G. A. (1970). The market for "lemons": Quality uncertainty and the market mechanism. *Quarterly Journal of Economics*, 84(3), 488–500.

Arora, A., Fosfuri, A., & Gambardella, A. (2001). Markets for technology and their implications for corporate strategy. *Industrial and Corporate Change*, 10(2), 419–451.

Arora, A., & Gambardella, A. (2010). Ideas for rent: An overview of markets for technology. *Industrial and Corporate Change*, 19(3), 775–803.

Arora, A., Belenzon, S., & Suh, J. (2022). Science and the market for technology. *Management Science*, 68(10), 7176–7201.

Azoulay, P., Graff Zivin, J. S., Li, D., and Sampat, B. N. (2019). Public R&D investments and private-sector patenting: evidence from NIH funding rules. *The Review of economic studies*, 86(1):117–152.

Bloom, N., Jones, C. I., Van Reenen, J., & Webb, M. (2020). Are ideas getting harder to find? *American Economic Review*, 110(4), 1104–1144.

Budish, E., Roin, B. N., & Williams, H. (2015). Do firms underinvest in long-term research? Evidence from cancer clinical trials. *American Economic Review*, 105(7), 2044–2085.

Chernozhukov, V., Chetverikov, D., Demirer, M., Duflo, E., Hansen, C., Newey, W., & Robins, J. (2018). Double/debiased machine learning for treatment and structural parameters. *The Econometrics Journal*, 21(1), C1–C68.

Jones, B. F. (2009). The burden of knowledge and the "death of the renaissance man": Is innovation getting harder? *Review of Economic Studies*, 76(1), 283–317.

Pisano, G. P. (1997). R&D performance, collaborative arrangements, and the market-for-know-how: A test of the "lemons" hypothesis in biotechnology. Working Paper.

Williams, H. L. (2013). Intellectual property rights and innovation: Evidence from the human genome. *Journal of Political Economy*, 121(1), 1–27.

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February 11, 2026

To the Selection Committee
NBER Innovation Research Boot Camp 2026
National Bureau of Economic Research
Cambridge, MA

Re: Recommendation for Michele Liberatore

Dear Selection Committee,

I am writing to recommend Michele Liberatore for the NBER Innovation Research Boot Camp 2026. Michele has been a Ph.D. student under my supervision since 2024, and we are currently working together on a research project based on pharmaceutical innovation and markets for technology.

Our work investigates whether licensing markets efficiently allocate innovative assets or suffer from information problems that lead to adverse selection. Michele took the lead in developing the empirical analysis using comprehensive pharmaceutical data, and our work documents that although licensing markets appear efficient for incremental innovations, they may systematically undervalue highly novel projects. This finding matters because it reveals that competitive equilibrium characterizes licensing markets for incremental innovations but at the same time we detect elements of a 'lemons equilibrium' at the innovation frontier, where the most innovative projects may be undervalued due to fundamental uncertainty and transaction costs.

Michele demonstrates a strong combination of theoretical rigor and empirical precision. He has independently mastered cutting-edge econometric techniques, including Double Machine Learning, and applied them thoughtfully to test specific theoretical predictions. Beyond technical proficiency, he shows good research judgment — he recognized that aggregate patterns masked important heterogeneity, designed the analysis to test for it, and interpreted the results in light of what we know about information asymmetries in technology markets.

The NBER boot camp would be valuable for Michele at this stage. Because innovation economics requires understanding connections across multiple fields (from firm dynamics, to knowledge

production, and to policy design), the boot camp systematic coverage of these topics, combined with exposure to leading researchers and the Summer Institute sessions, would help him position his work within the broader innovation literature and develop a more ambitious research agenda. Michele is a serious researcher who engages deeply with ideas, and I am confident he would make the most of this opportunity while contributing to the program's intellectual community.

I recommend him without reservation.

Sincerely,



Massimo Riccaboni