APPLICATION TO THE NBER ENTREPRENEURSHIP RESEARCH BOOT CAMP 2023

Dear Dr. Bloom, Dr. Hochberg, Dr. Lerner, Dr. Robinson, Dr. Schoar, and Dr. Stern:

Please consider my application to the NBER Entrepreneurship Research Boot Camp 2023. In addition to this application packet, you should receive a letter of recommendation from my PhD main advisor Dr. Ginger Zhe Jin (University of Maryland).

Sincerely,

Mario Leccese

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Mario Leccese

Ph.D. Candidate, Dept. of Economics, University of Maryland

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Research Interests

Industrial Organization, Antitrust and Regulation, Innovation, Entrepreneurship, Economics of Information

Education

Ph.D. | *Economics* — Expected 2024
University of Maryland

M.A. | *Economics* — 2020
University of Maryland

M.Sc. | *Economic and Social Sciences* — 2017
Bocconi University

B.Sc.| *Economic and Social Sciences* — 2015
Bocconi University

Publications

How Do Top Acquirers Compare in Technology Mergers? New Evidence from an S&P Taxonomy (with Ginger Zhe Jin and Liad Wagman). **International Journal of Industrial Organization**, forthcoming.

Working Papers

M&A and Innovation: A New Classification of Patents (with Zhaoqi Cheng, Ginger Zhe Jin, Dokyun Lee and Liad Wagman). 2023. Submitted to AEA P&P.

Asymmetric Taxation, Pass-through and Market Competition: Evidence from Taxis and Ride-sharing. 2022. SSRN working paper #3824453 (Peer-reviewed extended abstract published in the Proceedings of the 2022 ACM Conference on Economics and Computation)

Do Minorities Pay More for Congestion Taxes? Evidence from a Tax on Ride-sharing. 2022. SSRN working paper #4021595

M&A and Technological Expansion (with Ginger Zhe Jin and Liad Wagman). 2022. SSRN working paper #4009215. *Revise and resubmit* at the Journal of Economics & Management Strategy.

Should We Expect Uncertain Synergies To Be Passed Through to Consumers? (with Andrew Sweeting and Xuezhen Tao). 2022. CEPR discussion paper #17059

Bargaining, Forward-Looking Buyers and Dynamic Price Competition (with Shanglyu Deng, Shen Hui, Calvin Jia and Andrew Sweeting). 2022.

Work in Progress

Venture Capital, Common Ownership and Venture Success.

Disclosure of Bad News: An Experiment (with Agata Farina).

Conferences and Presentations

NFI-NBIM-Oxford Conference on Common Ownership, Governance and IO (2023, scheduled)

NBER Conference on Megafirms and the Post-COVID Economy (2022)

23rd ACM Conference on Economics & Computation (2022)

Urban Economics Association North American Meeting (2022)

JEMS Conference on The Business Revolution of Digital Transformation at USC (2022)

GMU Law&Economics Center Research Roundtable on The Data-Competition Interface (2022)

ICCCDS (2022)

IIOC 19th Annual Conference (2021)

MACCI Annual Conference (2021)

NBER Digitization Tutorial (2021)

Applied Micro Seminar University of Maryland (2020, 2021, 2022)

Honors and Awards

Washington Center for Equitable Growth Grant — 2022
Doctoral Grant ($15,000)

University of Maryland Faculty-Student Research Award (with Ginger Zhe Jin) — 2022
Research Grant ($10,000)

Jacob K. Goldhaber Travel Grant — 2022
University of Maryland

Best Third Year Paper Award — 2021
Department of Economics, University of Maryland

University of Maryland Graduate School Summer Research Fellowship — 2021
Stipend to support research activities ($5,000)

University of Maryland BSOS Dean's Research Initiative — 2020, 2021
Research Grants ($1,500 and $3,248, respectively)

Graduate Research Assistantship — 2021-2023
Department of Economics, University of Maryland

Graduate Teaching Assistantship — 2019-2021
Department of Economics, University of Maryland

First-year Graduate Fellowship — 2018-2019
Department of Economics, University of Maryland

IGIER Visiting Student Initiative, *Mentor:* Michele Polo — 2015-2016
Selective Program within Bocconi University M.Sc. to enhance students' research skills

Teaching

Intermediate Microeconomics — Summer 2020, Winter 2021
University of Maryland — Instructor

Behavioral Economics — Spring 2021
University of Maryland — TA

Intermediate Microeconomics — Spring 2020, Fall 2020
University of Maryland — TA

Principles of Microeconomics — Fall 2019
University of Maryland — TA

EXPERIENCE

Research Assistant for Ginger Zhe Jin — 2022-2023
University of Maryland

Research Assistant for Andrew Sweeting — 2021-2022
University of Maryland

Research Assistant for Marco Ottaviani — 2017
Bocconi University

Research Assistant at LEAR — Spring 2018
Economic Consulting

PROFESSIONAL SERVICE

Referee for: *RAND Journal of Economics*, *Metroeconomica*

Young Economist Representative of the Transportation and Energy Committee — 2022-2023
American Bar Association

Economics Ambassador — 2021-2022
American Bar Association

SKILLS&LANGUAGES

Languages: English (Fluent), Italian (Native), Spanish (B1)
Programming: MATLAB, R, Mathematica, Stata, oTree, Latex

LIST OF COMPLETED PHD COURSES

(Not currently taking any course)

Course Name	Grade	Instructor(s)	Academic Period
Micro Analysis I	A	Emel Filiz-Ozbay/Larry Ausubel	Fall 2018
Macro Analysis I	A	John Shea/Allan Drazen	Fall 2018
Econometrics I	A	John Chao	Fall 2018
Micro Analysis II	A-	Erkut Ozbay/Daniel Vincent	Spring 2019
Macro Analysis II	A-	Boragan Arouba/John Haltiwanger	Spring 2019
Econometrics II	A+	Guido Kuersteiner/Ingmar Prucha	Spring 2019
Computational Economics	A+	Andrew Sweeting	Fall 2019
Experimental Economics	A+	Erkut Ozbay	Fall 2019
Advanced Micro I	A+	Daniel Vincent	Fall 2019
Behavioral Economics	A+	Emel Filiz-Ozbay	Spring 2020
Advanced Micro II	A	Larry Ausubel	Spring 2020
Empirical IO	A-	Chenyu Yang	Spring 2020

RESEARCH DESCRIPTION

Over the past four years, I have developed a body of research at the intersection of industrial organization, finance and entrepreneurship which studies what drives or hinders firms to develop new technologies, focusing on the role of financial intermediaries, the interaction between the innovation strategies of established incumbents and young startups, and their effects on market competition. Since technological innovation is a primary determinant of economic growth, these fascinating topics are subject to a huge amount of policy debate and can serve as a base for my future research agenda.

Entrepreneurship plays a crucial role in this setting. In fact, the extent to which entrepreneurs are able to develop original projects and ideas is related to the behavior of other actors active in the technology space. First, it is well documented how, in the past few decades, financial intermediaries—and in particular venture capitalists—played a major role in the increase in the number of entrepreneurs creating and leading to success technology startups. Second, the past few decades have also been characterized by an increase in entrepreneurs' favor towards successfully exiting via incumbent buyout (rather than exclusively via IPO). Since successful technology startups can disrupt product markets and affect competition, incumbent buyout of startups has gained particular attention in antitrust. Hence, understanding how the behavior of key actors, such as large technology incumbents and financial intermediaries, interacts with that of entrepreneurs—e.g., by changing the number of new startups founded or successfully exiting in a certain business areas—is a first-order question in entrepreneurship.

My job market paper studies—both theoretically and empirically—the effect of venture capitalist's common ownership of competing technology ventures on these ventures' outcomes. Antitrust agencies are generally concerned that investment funds that have a significant share in competing firms may soften the competition between these firms for their own profits. Most academic studies on this topic focus on common ownership in established firms, such as major airlines or well-known banks, but very little attention is paid to common ownership of the same investor in competing startups. Arguably, the effects of common ownership of startups by venture capitalists could have even more profound anticompetitive impact than that of established companies by institutional investors because it affects the pipeline of new innovations and therefore define competition in future markets. Moreover, differently from institutional investors, venture capitalists investing in startups tend to have substantial control rights and actively participate in firm's strategic decisions.

I develop an analytical framework in which I analyze the determinants and the consequences in terms of portfolio ventures valuation of venture capitalists' investment strategy when faced with the opportunity to invest in competing projects. After providing capital to entrepreneurs, a venture capitalist (VC) can affect portfolio ventures managerial strategy by determining their investment in product R&D. This reduces the intensity of product market competition between ventures, and hence the return of each project. Alternatively, the VC can shut down one of the ventures. I show that VCs investing in two competing ventures (common owners) invest more in product R&D than one selecting only one of the two (separate owners) because the former internalize the product market externality across portfolio ventures. This leads commonly owned ventures to have higher valuations, on average. I test the predictions of the model through an analysis of investment data from Crunchbase between 2009 and 2017. I examine the effect of investment in competitors on ventures' money and rounds raised after the investment stage, and on the probability of having an IPO, being acquired, or shutdown. Guided by the theoretical framework, I use an instrumental variable approach to address ventures' selection into a common VC's portfolio, and preliminary results suggest that—consistently with the prediction of the model—sharing a VC with a competitor leads ventures to raise more additional funds and rounds, without any effect on the shutdown probability. This suggests that VCs tend to internalize product market externalities across competing portfolio ventures and exert

effort to reduce the degree of competition between them, rather than shutting down one of the two. This strategy benefits portfolio ventures by improving their outcomes.

In addition, I worked on two projects studying technological M&As with Ginger Zhe Jin and Liad Wagman. In the first one, we shed some light on the recent antitrust debates about the M&A activity of technology firms, primarily large tech platforms such as Alphabet/Google, Amazon, Apple, Facebook/Meta and Microsoft (or GAFAM). Since comparisons of GAFAM with other top acquirers have been difficult, in part due to a lack of a structured way to uniformly and narrowly classify the industries and business verticals of acquired firms, we fill in this gap in order to assess if there are unique features to GAFAM's acquisitions that may merit regulatory attention. Particularly, we focus on concerns regarding market dominance of certain industry categories by way of acquisitions, and other theories of competitive harm such as "kill zones." Overall, we find that, although GAFAM completed more tech acquisitions per firm than other groups of top acquirers, targeting younger and more consumer-facing firms on average, these technology acquisitions did not shield GAFAM from competition, at least not from other GAFAM members or other firms that acquire in the same categories.

In the other project, we examine how public firms acquire tech companies to expand technologically. We show that only a small fraction of these firms (13%) engages in tech M&A but such acquisitions are widespread across sectors of the economy. Moreover, larger and older firms are more likely to acquire tech companies and transactions in each M&A-active tech category tend to be led by acquirers from a specific sector, to varying extents over time. Finally, the majority of target companies fall outside the acquirer's core area of business and firms are, in part, driven to acquire because they face increased competition in their core areas.

Currently, we are working on a new project which focuses on the effect of incumbents' acquisitions on the creation of new startups. In effect, policymakers are increasingly concerned that incumbent acquisitions of small or young firms may slow down rather than speed up innovation. Thus, motivated by the significant pace and scope with which big tech incumbents acquire tech startups, we investigate whether incumbent acquisitions of tech startups should be encouraged or not. On the one hand, encouraging these M&A deals may motivate more subsequent startup-driven innovations. On the other hand, antitrust agencies may want to discourage—or even ban—them because incumbents may use such acquisitions to buy out potential competitors, preempt future entry, and ultimately harm market competition. Answering this question is essential for many ongoing antitrust debates on how to regulate large technology platforms such as GAFAM.

A well-recognized challenged in this setting is identifying which firms are related in the fast-changing space of technological innovation. Thus, in a paper submitted to AEA P&P, joint with Zhaoqi Cheng, Ginger Zhe Jin, Dokyun Lee and Liad Wagman, we proposes a new, data-driven method to classify patent data into tech-business zones on a probabilistic basis, using patent assignee information. After combining M&A data from S&P Global Market Intelligence with PatentsView data from the US Patent and Trademark Office, we discuss how the zone classification can aid merger reviews and other lines of research.

Thus, given my interest on entrepreneurship, I strongly believe that attending the Entrepreneurship Research Boot Camp would significantly improve my research by helping me developing new ideas and providing me with the correct toolkit to do research in this area.

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February 14, 2023

Dear ERBC Admission Committee:

I am writing to enthusiastically recommend **Mario Leccese** for the 2023 NBER Entrepreneurship Research Boot Camp (ERBC). I first knew Mario when he reached out to me for research advising in April 2020, although I was on leave at a non-academic position at that time. Since I returned in June 2020, he and I have worked closely on a number of research projects related to venture investment, startup acquisitions, and technological innovation. His own dissertation focuses on common ownership in venture investment. This important but under-studied topic is crucial for the creation, survival, development, and exit of startup ventures. Based on my 22-year experience in PhD advising, I believe Mario is a brilliant student and has a great potential to grow into a world-class researcher in the intersection of economics, finance and entrepreneurship. The intensive workshop activities of ERBC will help him continue the remarkable progress in dissertation and research.

As of today, Mario is a fifth-year PhD student in industrial organization, a field of economics that focuses on firm behavior and market competition. When he reached out to me in April 2020, he already had an 80%-completed paper evaluating Chicago's new tax on ridesharing. He came up with the paper all by himself during the second year of his graduate class. After incorporating comments from me and other faculty members, he has presented the paper at the 2021 Annual MaCCI Annual Conference and the 2022 ACM Conference on Economics and Computation (EC'22). The paper is currently under revision for *Management Science*.

Since Fall 2020, Mario has been working with me and Professor Liad Wagman (Illinois Institute of Technology) on a number of research papers that aim to understand venture investment, startup acquisition, and market competition. He is a full-blown coauthor from the very beginning. So far, we have completed four research papers: (1) the first paper describes how top acquirers differ in the acquisition of tech startups from 2010-2020 and has been published in the *International Journal of Industrial Organization*; (2) the second paper documents what type of public firms are more likely to acquire tech startups and is under revision for the *Journal of Economics & Management Strategy*; (3) a third paper aims to identify the effect of startup acquisition on the creation, survival, and funding of nearby ventures, it was presented in the 2022 Annual Competition and Regulation Summer School and Conference (CRESSE) and will be ready for peer review soon; and (4) the fourth paper develops a new method to classify US patents and compare incumbents and tech startups in patentable innovation, it is scheduled to publish in the *American Economic Association Papers & Proceedings* in May 2023. Mario plays an essential role in all these papers. Besides data analysis and paper writing, he presented the first paper in the 2022 NBER meeting on mega firms last April and was instrumental for us to get funded by the Washington Center for Equitable Growth in 2022.

All these papers are closely related to entrepreneurship, not only because venture funding is crucial for tech startups, but also because merger and acquisition (M&A) is one for the few channels that enable the founding entrepreneurs to successfully exit. In addition, recent antitrust debates on the role of "big tech" in market competition, especially their acquisition of tech startups, have the potential to reshape

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the financial and economic environment of tech startups. This background generates a strong link between antitrust economics and entrepreneurship.

Even more related to entrepreneurship is Mario's solo dissertation work on common ownership of venture investment. In particular, Mario studies the role of such common ownership in the competition between startups. Common ownership is a hotly debated topic– some found competing companies that are commonly owned by institutional investors tend to charge higher price and compete less aggressively, as compared to companies without such common ownership; but others have questioned the findings. This debate has made antitrust authorities consider whether they need to limit, ban, or incorporate common ownership in merger reviews. However, one shortcoming of this fast-growing literature is its focus on publicly traded companies. While most public companies are large and mature, common ownership is prevalent in the early development of many private companies. Arguably, being able to invest in different and potentially competing ventures can promote investment and innovation, which is beneficial for both the founding entrepreneurs and the society. Meanwhile, common ownership of startups can also distort future competition between startups, through investor influence on venture development. Documenting these tradeoffs is essential to understand the role of common ownership in entrepreneurship and market competition, especially in innovative and dynamic industries.

Mario has made remarkable progress in this exciting research: on the theory side, he has developed a sophisticated theory that endogenizes investor choice of common ownership. When an investor decides to invest in two competing startups, Mario allows the common owner to strategically change the product differentiation between the two, or pick a winner and shut down the other. In comparison, an investor that only invests in one startup have different incentives in differentiation and cannot "pick-the-winner." His theory generates testable predictions as to how common ownership may concentrate on a selected group of startups and affect their business value. On the empirical side, Mario has analyzed Crunchbase data on venture deals in tech startups, identified the effect of common ownership on ventures' funding prospects and exit outcomes, and used instrumental variables to address the selection of ventures under common ownership.

As the chair of his dissertation committee, I expect Mario to have a polished draft from this work by September 2022 and ready for the job market at the end of 2022. ERBC is a wonderful opportunity for him to get immersed in the most up-to-date research in entrepreneurship. Given his unique focus on the intersection of entrepreneurship, finance and antitrust economics, I am confident that he will make a valuable contribution to the workshop. Thank you for considering him. Should you have any question, please do not hesitate to contact me at jin@econ.umd.edu.

Best regards,



Ginger Zhe Jin
Professor of Economics