Cover Letter for

NBER Entrepreneurship Research Boot Camp 2020

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Name of the Recommendation Letter Writer: Prof. Thomas J. Chemmanur

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Last updated: February 2020

Education

Boston College, Carroll School of Management 2018 – 2023
Ph.D. in Finance (Expected)

University of Cambridge, Faculty of Economics 2016 – 2017
M.Phil. in Finance and Economics

University of Birmingham, Department of Economics 2014 – 2016
B.Sc. in Money, Banking and Finance

Southwestern University of Finance and Economics 2012 – 2014
B.Sc. in Economics

Research Interest

Entrepreneurial Finance, Innovation, Venture Capital, Initial Public Offerings

Publication

1. "Why do firms go public through debt instead of equity?" 2018, with Denys Glushkov, Ajay Khorana, and P. Raghavendra Rau, ***Critical Finance Review***, 7(1), pp. 85–110

Work in Progress

1. Screening or Nurturing: The Role of Corporate Venture Capital in Entrepreneurial Firms' Innovation Success

2. Corporate Venture Capital and Information Diffusion (with Prof. Thomas Chemmanur and Xiang Zheng)

Ph.D. Level Courses

Completed courses:

1. Courses taken at the Boston College Economics Department: Microeconomics Theory I & II, Macroeconomics Theory II, Statistics, Econometric Methods

2. Courses taken at the Boston College Finance Department: Investments, Ph.D. Seminar in Capital Markets, Ph.D. Seminar in Corporate Finance, Ph.D. Seminar in Empirical Asset Pricing, Seminar on Economic Crises

3. Courses taken at other departments: Corporate Finance and Banking (Harvard Business School), Ph.D. Seminar in Empirical Topics in Accounting (Boston College Accounting Department)

Current Courses:

1. Courses taken at the Boston College Finance Department: Ph.D. Seminar in Advanced Topics in Corporate Finance, Ph.D. Seminar in Advanced Asset Pricing

2. Course taken at other departments: Statistical Machine Learning (Boston University Statistical Department)

Research Experiences

Boston College, Carroll School of Management
Research Assistant for Prof. Thomas Chemmanur 2018.09 – Now

University of Cambridge, Judge Business School
Research Assistant for Prof. P. Raghavendra Rau 2017.10 – 2018.06

Teaching Experiences

Teaching Assistant at Boston College, Carroll School of Management
Ph.D. Seminar in Corporate Finance Theory (Ph.D. Level) 2019.01 – 2019.05
Advanced Corporate Finance (Graduate/MBA Level) 2020.01 - Now

Awards, Fellowships and Honors

Doctoral Fellowships, Boston College 2018 – Now

AFA Student Travel Grant, American Finance Association 2020

Research Funding Grant, Boston College 2020

Undergraduate Performance Prize (for academic excellence), University of Birmingham 2015

Academic Excellence Award, Southwestern University of Finance and Economics 2012 – 2014

Professional Services

Ad Hoc Referee: The Pacific-Basin Finance Journal

Other Information

Computer Skills: Stata, R, MATLAB, Eviews, Python, LaTeX, Microsoft Office

Languages: Chinese (Native), English (Fluent)

Essay for NBER Entrepreneurship Research Boot Camp 2020

I would like to start by briefly introducing myself. I am a second-year Ph.D. in Finance candidate at Carroll School of Management of Boston College. I want to do my dissertation research under the supervision of Prof. Thomas Chemmanur, here at Boston College. My immediate research plan is to work in two broad research areas, both related to the area of entrepreneurial finance: Initial Public Offerings (IPOs) and Venture Capital.

Prior to coming to Boston College, I had a master degree at University of Cambridge where I worked on a project with Prof. Raghavendra Rau and other coauthors. This project, eventually published on Critical Finance Review in 2018, is titled "Why Do Firms Go Public Through Debt Instead of Equity?". In this paper, we studied why firms choose to go public through bond issuance as opposed to going public by issuing equity (i.e., Initial Public Offerings, or IPOs), and we showed that the ownership structure and the relative cost of information production are significant in explaining how a firm chooses to go public. We also documented that firms which go public by issuing bonds are on average larger, more likely to be backed by venture capital or private equity firms, and less likely to face information asymmetry than IPO firms. I really enjoyed working on this project because it is broadly related to entrepreneurial finance, to the extent that we analyzed why entrepreneurs running private firms, some of which are backed by venture capital, choose to exit through different ways and what implications this choice of exit has for these firms' future performance. I would like to further in this area of initial public offerings as part of my research at Boston College.

My second area of research interest in entrepreneurial finance is in the area of corporate venture capital (CVC) and their role in encouraging innovation by the entrepreneurial firms they invest in. I am currently working on a project in this area coauthored with Thomas Chemmanur and Xiang Zheng (a fourth-year Ph.D. in Finance candidate at BC, who attended the NBER Entrepreneurial Research Boot Camp last summer). In this project, we are attempting to find the determinants of the innovation success of private entrepreneurial firms backed by CVCs and the implications of the quantity and quality of this innovation for the future success of these entrepreneurial firms. This project gives me the opportunity to utilize the data from the United States Patent and Trademark Office (USPTO) and VenturXpert and to extensively use statistical programs (Stata, SAS, R, and etc.) to analyze this data.

My proposed solo research paper, which may potentially turn out to be my third-year (required) paper at Boston College, is titled "Screening or Nurturing: The Role of Corporate Venture Capital in Entrepreneurial Firms' Innovation Success". This research focuses on the role of CVCs in entrepreneurial firms' innovation output. The central question I want to study is if CVCs have a better ability at monitoring (and adding value to) the innovation attempts of entrepreneurial firms backed by them (i.e., nurturing), or if they just have superior ability at finding innovative firms to invest in (i.e., screening). If it is the former case, what are the possible channels through which CVCs nurture entrepreneurs? If it is the latter case, what facets of CVCs make them better at

identifying more innovative firms compared to independent venture capitalists (IVCs)? These questions, taken together, may be able to shed light on the innovation process of entrepreneurial firms and to provide deeper insights into the interactions between entrepreneurial firms and the venture capitalists backing them.

These questions have been relative under-examined in the literature. Most of the existing literature focusing on the relation between CVC and entrepreneurial firms argue that CVC create values in the entrepreneurial firms in terms of spurring innovation of the latter (Chemmanur, Loutskina, and Tian, 2014) and by providing value-added services (Ivanov and Xie, 2009). Others argue that the establishment of CVC benefits its corporate parent in that the firms with CVC program experience increases in their innovation outputs and higher valuation (Dushnitsky and Lenox, 2005, 2006). Ma (2019), on the other hand, examines the life cycle of CVC parents and analyze why CVC parent firms choose to set up CVC programs and why they eventually terminate them. Few papers have focused on disentangling the possible roles CVC firms can play in helping entrepreneurial firms succeed and the possible channels through which they may be able to do so, and this is the research question I hope to address through my research.

I want to attend the NBER Entrepreneurial Research Boot Camp for three reasons. First, I am highly motivated to pursue a career in academia, and I believe that entrepreneurial finance is a promising field with potentially important topics. The opportunity to attend the NBER Entrepreneurship Research Boot Camp will be very helpful in laying the foundations toward achieving my research goals. Second, by extensively reading the papers in entrepreneurship and attending the lectures led by world-renowned professors, I have the chance to gain new perspectives in entrepreneurship and entrepreneurial finance and come up with more research ideas in this area. Third, by interacting and discussing with professors and Ph.D. students from other institutions, I will have the chance to further perfect my current research. I will also have the opportunity to make friends and socialize with other Ph.D. students, some of whom may turn into my coauthors in the future.

BOSTON COLLEGE

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The Wallace E. Carroll School of Management
Chestnut Hill, MA 02467

Brett Maranjian
National Bureau of Economic Research
1050 Massachusetts Avenue
Cambridge, MA 02138, US

January 30, 2020

Dear Brett:

I am writing to recommend one of our doctoral students, Jingxuan Zhang, for the NBER Entrepreneurship Boot Camp this summer. I am currently advising him on his Ph. D. dissertation. He is in his second year in the Boston College Ph.D. program in Finance, and has started to work on his main dissertation (solo-authored) paper.

Jingxuan has two papers relevant to the area of entrepreneurship and entrepreneurial finance, one on private firms going public by issuing debt rather than equity and another on Corporate Venture Capital (CVC) and innovation. Jingxuan's paper in the area of Initial Public Offerings (coauthored with Denys Glushkov, Ajay Khorana, and Raghavendra Rau) is titled, **"Why do firms go public through debt instead of equity?"**. In this paper, Jingxuan and coauthors study firms that go public through IPOs of Debt Offerings (IPDOs) rather than IPOs of equity, and explore the determinants of that choice. The existing literature suggests that there are three possible determinants of this choice: (1) outsiders' costs of information production about the private firm; (2) the value of private benefits of control of the entrepreneur and other firm insiders; and (3) the value of liquid currency (arising from the firm going public, either by issuing debt or equity).

To test the above theories, Jingxuan and coauthors collect a comprehensive sample of IPDO firms covering a total of 635 IPDO issuers from 1987-2016. They collect financial statement data (as well as issuance, pricing, and credit rating data) on private firms before the IPDO. This data is available because Section 15(d) of the Securities Exchange Act of 1934 mandates that firms issuing public securities of any type file an annual report during the fiscal year within which the public security registration statement became effective, if at the beginning of that year, they had more than 300 security holders on record, and regardless of whether they have publicly traded equity. They then compare this unique sample of IPDO firms with two control samples based on year, industry, and size. The two control samples contain, respectively, (1) firms that

issue public equity via an IPO without having any public debt outstanding, and (2) publicly listed firms that tap the public debt market for the first time (public firm debt offerings, or PFDO, firms).

Controlling for industry, year, and size, they find that there are significant differences between IPDO and IPO firms. IPDO firms typically exhibit superior operating performance, spend less on research and development, have higher ratios of operating cash flows to capital expenditure, and have more private debt than IPO firms. In other words, IPDO firms appear to be more established and to have assets more amenable to financial statement analysis. They are also more likely to be backed by a financial sponsor such as a venture capital or private equity firm, suggesting that ownership structure also matters. However, an industry liquidity index that measures the level of corporate transaction activity indicates that the creation of a liquid currency is not a factor in choosing between an IPDO or IPO. There are also significant differences between IPDO and PFDO firms issuing in the same industry and year. IPDO firms are older and more likely to be sponsor-backed than PFDO firms are and have better operating performance, similar growth opportunities, and lower liquidity. They also face a significantly higher cost of debt (offer yield), more restrictive covenants, and lower credit ratings. This paper has been published in the *Critical Finance Review* in 2018.

Along with Xiang Zheng, another doctoral student in our Ph. D. program (who attended the NBER boot camp last summer), I am also working on another research project in entrepreneurial finance with Jingxuan. While this project is in its early stages yet, we are trying to use a new dataset to study the determinants of innovation by private entrepreneurial firms backed by corporate venture capitalists (CVCs), and the implications of the quantity and quality of this innovation for the future success of these entrepreneurial firms.

Having worked closely with him, I can say that Jingxuan is an extremely bright scholar, who shows every sign of becoming a top-quality researcher in entrepreneurial finance and innovation. I have absolutely no doubt about his ability to bring various research projects to a successful fruition. He took a Ph.D. Corporate Finance Seminar with me and also another Advanced Corporate Finance Course (joint with our MSF students) and did exceptionally well in both classes. In the finance Ph.D. comprehensive exam, he did very well. He also has done several presentations of some of his other academic research in various classes and seminars that I have taught at Boston College, which I also found to be of very high quality. Overall, he has made excellent progress as an academic scholar in our Ph.D. program.

In summary, I would say that Jingxuan could benefit greatly from the NBER Entrepreneurship Boot Camp Program, since he is a very smart researcher working in the area of entrepreneurship and innovation. I therefore feel comfortable in recommending him strongly for the NBER Entrepreneurship Boot Camp. If you have any questions about Jingxuan, please feel free to call (Phone: 617 552 3980) or e-mail me (chemmanu@bc.edu).

Sincerely



Thomas J. Chemmanur
Professor of Finance and Hillenbrand Distinguished Fellow
e-mail: chemmanu@bc.edu