Cover Letter

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Recommendation: Prof. Thomas Chemmanur

March 27

NBER Entrepreneurship Working Group

To Whom It May Concern:

I wish to apply for the NBER Entrepreneurship Working Group Meeting. I became aware of this program through Professor Thomas Chemmanur who has encouraged me to apply for this program. I am a third year PhD student in the finance department of the Boston College, and I am highly interested in working in the field of entrepreneurial finance. Currently, I am working with Professor Chemmanur on a research project in entrepreneurial finance. In our paper, we analyze the role of trademarks in the financing, valuation, and performance of start-up firms. We find that the number of trademarks held by an entrepreneurial firm is associated with a greater VC investment amount spread over a smaller number of financing rounds; a greater probability of successful exit; higher IPO and secondary market valuations; greater institutional investor IPO participation; smaller post-IPO equity market information asymmetry; and better post-IPO operating performance. We use an instrumental variable analysis (using trademark application examiner's leniency as the instrument) to show that the above results are causal. Professor Chemmanur is giving me a recommendation for this application.

After working extensively in an entrepreneurial finance project, I am now familiar with some prominent research papers and databases in the field. I am also exploring a couple of research ideas in the entrepreneurial finance field, which I have briefly mentioned in my essay and will like to discuss these ideas with the faculties at the boot camp. I am highly motivated to pursue a career in academic research, and I believe that the field of entrepreneurial finance has a lot of potential for significant research work.

I will appreciate an opportunity to attend the entrepreneurship boot camp so that I may interact with the professors in the boot camp seminars, discuss and further develop my research ideas. I expect that this boot camp is going to be a great learning experience for me and may help me achieve my research goals. I have enclosed my resume and an essay expressing my interest along with this letter.

Sincerely,

Harshit Rajaiya

Curriculum Vitae

Harshit Rajaiya

Carroll School of Management
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Chestnut Hill, MA 02467

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EDUCATION

Carroll School of Management, Boston College

Ph.D. in finance, 2015-2020 (expected)

Indian Institute of Management (IIM) Calcutta

Post Graduate Diploma in Management, 2013

Indian Institute of Technology (IIT) Kharagpur

Bachelor of Technology, 2011

RESEARCH INTEREST

Entrepreneurial Finance, Corporate Finance, Innovation

WORKING PAPER

"Trademarks in Entrepreneurial Finance: Empirical Evidence from Venture Capital Investments in Private Firms and Venture-Backed IPOs", with Thomas J. Chemmanur, Xuan Tian, and Qianqian Yu

We analyze the role of trademarks in the financing, valuation, and performance of start-up firms, for the first time in the literature. We conjecture that trademarks may play two economically important roles in entrepreneurial finance: first, granting start-up firms some monopoly power in the product market (a "protective" role) leading them to perform better in the future; and second, signaling better future financial performance and higher intrinsic value to private and public equity investors such as venture capitalists (VCs) and those in the IPO market (an "informational" role). We develop testable hypotheses regarding the relation between the number of trademarks held by a firm and various aspects of VC investment in it; its probability of successful exit; its IPO and secondary market valuation; institutional investor participation in its IPO; its post-IPO operating performance; and its post-IPO information asymmetry. We test these hypotheses using a large and unique dataset of trademarks held by VC-backed firms and data on VC investment in these firms, on their exit decisions, and on the IPO characteristics (of those firms going public). We find that the number of trademarks held by an entrepreneurial firm is associated with a greater VC investment amount spread over a smaller number of financing rounds; a greater probability of successful exit; higher IPO and secondary market valuations; greater institutional investor IPO participation; smaller post-IPO equity market information asymmetry; and better post-IPO

operating performance. We establish using an instrumental variable analysis (using trademark application examiner leniency as the instrument) that the above results are causal.

SELECTED AWARDS AND HONORS

AFA Doctoral Student Travel Grant, 2017

Doctoral Student Scholarship, Boston College

Conference Travel Grant, Finance Department, Boston College, 2018

99.9 percentile in the Common Admission Test (CAT) India, 2010

State rank of 6 in the Regional Mathematics Olympiad (India), 2007

CONFERENCE DISCUSSION

Financial Management Association (FMA) 2017 , Boston

TEACHING ASSISTANTSHIP

Advanced Corporate Finance (MBA/MSF)

PHD COURSES (COMPLETED)

Microeconomics Theory –I, Statistics, Microeconomics Theory – II, Econometric Methods, PhD seminar in Capital Markets, Doctoral Seminar in Corporate finance, PhD seminar in Empirical Asset pricing, PhD seminar in Empirical Corporate Finance, Applied Econometrics, PhD seminar in Advanced Asset Pricing, PhD seminar in dissertation topics in Corporate Finance, PhD seminar in Empirical topics in Accounting

PROFESSIONAL EXPERIENCE

PricewaterhouseCoopers India**,** 2013-2015

REFERENCES

Thomas J. Chemmanur

Professor of Finance

Boston College

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Essay

I am a third year PhD student in the School of Management at the Boston College. I have completed my course requirements, and I am actively working on some research projects. I am fascinated by the entrepreneurial finance literature. In particular, I find the research on financing of startups and private firms very interesting. For example, Bernstein, Korteweg, and Laws (2017) conduct a random field experiment of AngelList and show that average investors respond strongly to information on the founding team but not to information on the leading investors in a firm. Robinson and Robb (2014) use data from the Kauffman Firm Survey and show that most of the firms in their initial years of operation rely extensively on external debt as opposed to funding from friends and families. Venture capital (VC) financing is another interesting strand of the entrepreneurial finance literature. For example, Chemmanur, Krishnan, and Nandy (2011) use Longitudinal Research Database (LRD) to show that VC-backed firms have greater growth in efficiency after VC investments as opposed to non VC-backed firms. They also provide evidence that VC backing increase the probability of successful exit (IPO or acquisition). Ozmel, Robinson, and Stuart (2009) study the trade-offs that biotech start-ups face when they choose between raising firm-level capital from VCs or project-level capital from strategic alliance partners and show that both types of private capital make IPO more likely. However, VC investments make acquisition as alternative to IPO more likely. These are just few examples of papers that have piqued by interest in entrepreneurial finance.

Currently, I am working on a research project in entrepreneurial finance with Prof. Thomas Chemmanur. In our paper, we analyze the role of trademarks in the financing, valuation, and performance of start-up firms. We conjecture that trademarks may play two economically important roles in entrepreneurial finance. First, trademarks grant start-up firms some monopoly power in the product market (a "protective" role) leading them to perform better in the future. Second, trademarks signal better future financial performance and higher intrinsic value to private and public equity investors such as venture capitalists (VCs) and those in the IPO market (an "informational" role). We find that the number of trademarks held by an entrepreneurial firm is associated with a greater VC investment amount spread over a smaller number of financing rounds; a greater probability of successful exit; higher IPO and secondary market valuations; greater institutional investor IPO participation; smaller post-IPO equity market information asymmetry; and better post-IPO operating performance. We use an instrumental variable analysis (using trademark application examiner's leniency as the instrument) to show that the above results are causal. To summarize, we are tracking VC-backed firms from the point of first round of VC investment to an eventual exit. Further, we look at some IPO and post-IPO characteristics of these VC-backed firms that went public.

My research work has helped me familiarize myself with not only the theoretical but also the empirical side of entrepreneurial finance research. I have used the VentureXpert, SDC Thomson One, NBER patent database, CompuStat, and CRSP extensively for various works. In addition, I am well versed with the use of research tools like Stata, R, Python, etc. I am also exploring a couple of research ideas in entrepreneurial finance. One question, which I think could be potentially interesting, is to compare (empirically) the impact of bank financing versus VC

investment. Using a theoretical model, Ueda (2004) argues that a stronger protection of intellectual property encourages entrepreneurs to finance through VCs. It will be interesting to analyze (empirically) the question of selection vs. value addition (by both banks and VCs) in this context. Another potentially interesting question is to study the cross-section of states in US and explain the differences in entrepreneurship activity, e.g., can these differences be explained by government policies (taxes, subsidies, etc.), educational institutions, and labor force differences?

I am highly motivated to pursue a career in academic research, and I believe that the field of entrepreneurial finance has a lot of potential for significant research work. The opportunity to attend the NBER Entrepreneurship boot camp may be very helpful towards achieving my research goals. If given the opportunity to attend the boot camp, I will interact with the various professors conducting the workshop to discuss some of my research ideas in detail and get their valuable feedback.

References

Bernstein, S., Korteweg, A., & Laws, K. (2017). Attracting Early-Stage Investors: Evidence from a Randomized Field Experiment. *The Journal of Finance*, *72*(2), 509-538.

Chemmanur, T. J., Krishnan, K., & Nandy, D. K. (2011). How does venture capital financing improve efficiency in private firms? A look beneath the surface. *The Review of Financial Studies*, *24*(12), 4037-4090.

Ozmel, U., Robinson, D. T., & Stuart, T. E. (2013). Strategic alliances, venture capital, and exit decisions in early stage high-tech firms. *Journal of Financial Economics*, *107*(3), 655-670.

Robb, A. M., & Robinson, D. T. (2014). The capital structure decisions of new firms. *The Review of Financial Studies*, *27*(1), 153-179.

Ueda, M. (2004). Banks versus venture capital: Project evaluation, screening, and expropriation. *The Journal of Finance*, *59*(2), 601-621.

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Brett Maranjian
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March 25, 2018

Dear Brett:

I am writing to recommend one of our doctoral students, Harshit Rajaiya, for the NBER Entrepreneurship Boot Camp this summer. I am the chair of Harshit's Ph. D. dissertation committee (i.e., his main Ph.D. dissertation advisor or supervisor). Harshit is currently in his third year in the Boston College Ph.D. program in Finance, and is working on his main dissertation (solo-authored) paper.

I have co-authored one paper with Harshit (joint with Qianqian Yu of Lehigh University and Xuan Tian of Tsinghua University PBC School of Finance) titled, **"Trademarks in Entrepreneurial Finance: Empirical Evidence from Venture Capital Investments in Private Firms and Venture-backed IPOs."**

In this paper, we analyze the role of trademarks in the financing, valuation, and performance of start-up firms, for the first time in the literature. We conjecture that trademarks may play two economically important roles in entrepreneurial finance: first, granting start-up firms some monopoly power in the product market (a "protective" role) leading them to perform better in the future; and second, signaling better future financial performance and higher intrinsic value to private and public equity investors such as venture capitalists (VCs) and those in the IPO market (an "informational" role). We develop testable hypotheses regarding the relationship between the number of trademarks held by a firm and various aspects of VC investment in it; its probability of successful exit; its IPO and secondary market valuation; institutional investor participation in its IPO; its post-IPO information asymmetry; and its post-IPO operating performance. We test these hypotheses using a large and unique dataset of trademarks held by private firms and data on VC investment in these firms, on their exit decisions, and on the IPO

characteristics (of those firms going public). We find that the number of trademarks held by an entrepreneurial firm is associated with a greater VC investment amount spread over a smaller number of financing rounds; a greater probability of successful exit; higher IPO and secondary market valuations; greater institutional investor IPO participation; smaller post-IPO equity market information asymmetry; and better post-IPO operating performance. We establish using a propensity score matching analysis and an instrumental variable analysis (using trademark application examiner leniency as the instrument) that the above results are causal.

Harshit is now working on his main dissertation paper, which is in its early stages. This paper is also in the area of entrepreneurial finance (broadly defined). Harshit also has a paper in the area of corporate innovation.

Having worked closely with him, I can say that Harshit 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 his various research projects to a successful fruition. He took two of my Ph.D. classes in Corporate Finance, and did exceptionally well in both classes. In the finance Ph. D. comprehensive exam, he did very well, and was awarded a "High Pass." He has made excellent progress as an academic scholar in our Ph.D. program. He also has done several presentations of some of his other academic research in various classes and seminars at Boston College and at conferences outside, and I have found them also to be of very high quality. Harshit is expected to be in the job market in slightly more than a year's time (at the beginning of his fifth year in the doctoral program).

In summary, I would say that Harshit is an ideal candidate to benefit from the NBER Entrepreneurship Boot Camp Program, since he is a very smart researcher working in an area which is of tremendous interest to entrepreneurs, venture capitalists, and angels. I therefore feel comfortable in recommending him strongly for NBER Entrepreneurship Boot Camp. If you have any questions about Harshit, please feel free to call (Phone: 617 552 3980) or e-mail me (chemmanu@bc.edu).



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