NBER Entrepreneurship Research Boot Camp 2022 Application

Name: Bianca (Huan) He
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Recommendation letter writer: Professor Amir Sufi

Completed PhD courses:

Micro: Price Theory I, II, III
Macro: Theory of Income I, II, III
Metrics: Empirical Analysis I, III; Statistical Inference I, II, III
Field courses: Corporate Finance Theory, Empirical Corporate Finance, Asset Pricing I
Industrial Organization I

Bianca (Huan) He

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Education

2020 – Present	University of Chicago, Booth School of Business Ph.D. Coursework in Finance
2014 – 2018	Cornell University B.A., Economics and Statistics, minor in Business *magna cum laude*

Professional Experience

2018 – 2020	Fama-Miller Center for Research in Finance, Chicago Booth *Assisted Professor Yueran Ma, Lubos Pastor, Amir Sufi, Michael Weber with research*
Summer 2017	NERA Economic Consulting *Antitrust team*
Summer 2016	Guotai Junan Securities *M&A Intern*
2015 - 2016	Cornell Institute for China Economic Research *Research Assistant*

Selected Awards & Honors

2021	CRSP Summer Paper Award
2020 – Present	Booth Doctoral Fellowship, Chicago Booth
2016	Hatfield Undergraduate Research Fellowship

Working Papers (Draft available upon request)

"Lost Innovation"

Selected Work in Progress

"Private Equity" (with Paul Gompers and Steve Kaplan)
"Chinese Real Estate" (with Charles Nathanson and Eric Zwick)

Other Skills

Programming Languages:	R, Python, SQL, Matlab
Software:	LaTex, Stata, SAS, Lyx
Hobbies:	Tennis, Skiing, Sailing, Gardening
Foreign Languages:	Native speaker in Chinese, basic Japanese

Application Statement

I am a second-year Ph.D. student in Finance at the University of Chicago Booth School of Business. Prior to the Ph.D. program, I worked as a research assistant at the Fama-Miller Center for Research in Finance at Chicago Booth. My research interests are empirical corporate finance and broadly related to innovation and entrepreneurship. This interest developed in the first year of my Ph.D. study. Currently, I have two ongoing projects that are related to innovation and entrepreneurship.

The first such project is joint work with Steve Kaplan and Paul Gompers. We investigate the relationship between human capital and investment outcomes in private equity. Early work suggests that the entrepreneurial background of managing directors is important.

The other project studies the impact of recessions on newly developed technologies. I compare the citations of patents issued during recessions and those issued during normal times. Patents issued during recessions are cited less year-by-year and over the lifetime of the patent. In particular, I find that innovations patented during recessions are left under-utilized by the parent company and by other industry players. In this way, the industry may forget technologies. Recessions can have a long-term impact on technological progress through the loss of innovation. More broadly, this project speaks to the idea of recessions affecting long-run growth for the economy as a whole. I shed light on the production side of the economy.

I look at the economic conditions at the beginning of a patent's lifetime and categorize the issuance date into recessions and non-recessions. To address endogeneity concerns, I exploit the unpredictability of the business cycle and the rules governing patent issuance. After patent applications are filed, a patent examiner from USPTO typically an expert in the field examines the filing to make sure the innovation qualifies for patenting and cites all relevant previous works. It typically takes one to five years from the filing date for a patent to be granted (or rejected). The average time between filing and receiving the First Office Action is around 24 months. According to the rules with USPTO, USPTO only communicates with one party either the attorney or the inventor in the patent approval process. One should expect the inventors in our sample to hear from their patent attorneys and prepare documents accordingly. It is unlikely that the filers or the filer companies have control in deciding the patent issuance date to be in the recessions or not. The

patent issuance date depends on many factors that are outside of the control of the filers, not to say recessions hit by surprise.

I find patent issued during recessions is associated with about a 17% decrease in patent citations over its lifetime. Moreover, for each period after the patent issuance, the patents issued during recessions consistently receive fewer citations when compared with those that are not. Overall, evidence suggests knowledge produced during the recessions is more likely to be "forgotten" and spurs less follow-on innovative work. This phenomenon is similar to the labor cohort evidence that students graduating into recession consistently have worse labor market outcomes compared to peers who do not.

I investigate several plausible mechanisms. Interestingly, firm financial constraints during recessions are not major drivers of the decrease. I also investigate the potential channel for intensified firm exits and M&A activities during recessions that impact the patent citations. With a subsample I found patents with issuance dates that happen to fall within recessions continuously receive fewer citations in each period after issuance. The point estimates in implies that a patent issued during recessions receives around 0.031 less. However, for firm exits (or M&A) after patent issuance, we see an increase in subsequent citations. Firm exits or M&A after patent issuance is correlated with 0.034 more citations per period. One such mechanism is after the firm exits (or M&A) the acquirer of the IP better propagates the research agenda. Another potential mechanism is the liquidators choose to let the patents lapse and spur follow-up work. I am currently working on unveiling the long-term impact of the technological loss.

My research in innovation and entrepreneurship is the impetus for my application to the NBER Entrepreneurship Research Boot Camp. The Boot Camp has a team of leading scholars in entrepreneurial finance. I am excited to study the literature as well as listen to them discuss some of the work in entrepreneurship finance. My school does not offer an entrepreneurial finance field class at the Ph.D. level, and thus participating in the Boot Camp is a great way to gain a more structured introduction to the field. Moreover, I am excited to meet other young scholars who share a similar research interest with me. I believe the Boot Camp will be a truly rewarding experience.

Amir Sufi
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RE: Bianca (Huan) He

I am writing in strong support of Bianca's application to be admitted into the NBER Entrepreneurship Research Boot Camp for 2022. I know Bianca well. She worked for me in a research assistance capacity in 2019, and she is a second year PhD student at Booth this year, currently taking my PhD course. I also advised her first year summer paper.

Bianca was a stellar research assistant, which is one reason she was admitted into the Chicago Booth PhD program. She worked on many projects for me, and always excelled.

In terms of her own research, Bianca wrote a first year paper exploring how the citations of patents issued during recessions compare to those issued during normal times. Identification was achieved by exploiting the delay that comes between the filing and issuance of the patent. Therefore, at the time of filing, it is usually the case that the probability of a subsequent recession is unknown. The core finding is that patents issued during recessions experience a lower citation rate, even many years later. Bianca is trying to link cyclical issues to longer term growth, which I find to be a fascinating topic. It as a solid first year summer paper, and I think there is future potential. I understand that she is also working with Steve Kaplan and Paul Gompers on a project.

I think highly of Bianca. She is creative, diligent, and intelligent. I think she would be a great addition to the boot camp. I am confident she will be able to produce an outstanding thesis during her time at Booth.

Sincerely,

Amir Sufi