George Hu

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Recommendation Letter Writer: Marc Melitz

Dear Profs. Bryan, Ganguli, and Myers,

After learning of the opportunity through the NBER website, I am eagerly applying to participate in the NBER's 2023 Summer Innovation Research Bootcamp. Currently a second year PhD student in economics at Harvard, I have completed coursework not only in innovation economics but also in related fields such as entrepreneurship and Industrial Organization over the past two years. Given my background, I believe that the Innovation Research Bootcamp will enable me to both solidify my understanding of the innovation economics literature's frontier and begin developing my research agenda in the field.

As requested, I have included a CV, a comprehensive list of my PhD Coursework, and a one-page summary of (i) my ongoing research and (ii) my rationale for applying to this Bootcamp in the subsequent pages. These documents should provide more complete information on my academic background, ongoing research projects, and motivations for applying.

Finally, I would like to thank you for offering this opportunity and for considering my application. I would be happy to address any follow-up questions or requests that you may have about my application, and I look forward to hearing back from you if the occasion allows.

Sincerely,

George Hu

PhD Candidate in Economics

Harvard University

George Hu

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Graduate Studies:

Ph.D. Candidate in Economics, Harvard University, 2021-Present
Fields: International Trade, Industrial Organization

J.D. Candidate, Harvard Law School, Expected Matriculation in Fall 2023

Undergraduate Studies:

A.B., *summa cum laude* in Economics, Harvard University, 2020
Secondary Field in Mathematical Sciences, Language Citation in Latin

Working Papers:

"Failing Just Fine: Assessing Careers of Venture Capital-backed Entrepreneurs Via a Non-Wage Measure," with Natee Amornsiripanitch, Paul Gompers, Will Levinson, and Vladimir Mukharlyamov. June 2022. NBER Working Paper w30179.
Press: NBER Featured Working Paper (September 6, 2022), Harvard Business School Working Knowledge.

This paper proposes a non-pecuniary measure of career achievement, *Seniority*. Based on a database of over 5 million resumes, this metric exploits the variation in job titles and how long they take to attain. When non-monetary factors influence career choice, inference benefits from the use of non-wage measures, such as seniority. We apply it to study labor market outcomes of VC-backed entrepreneurs. Would-be founders experience accelerated career trajectories prior to founding, significantly outperforming graduates of same-tier colleges with similar first jobs. After exiting their start-ups, they obtain jobs about three years more senior than their right-before-founding peers. Even failed founders land jobs with higher seniority than those attained by their peers in the meantime.

"Getting Schooled: The Role of Universities in Attracting Immigrant Entrepreneurs," with Natee Amornsiripanitch, Paul Gompers, and Kaushik Vasudevan. May 2021. NBER Working Paper w28773. Conditionally Accepted, *Research Policy*.
Press: Harvard Law School Forum on Corporate Governance, Cato Institute Research Briefs in Economic Policy, Los Angeles Times, Brookings Hutchins Roundup, Minneapolis Federal Reserve.

This paper analyzes how US universities contribute to the quantity and quality of VC-backed immigrant entrepreneurship in the US. Using a novel data set that identifies immigration status and education history for the near-universe of VC-backed founders in the US, we document several interrelated facts. First, immigrants contribute disproportionately to US VC-backed entrepreneurship, accounting for approximately 20% of VC-backed companies. More than 75% of these immigrant entrepreneurs obtained post-secondary education in the US, which suggests that higher education represents a primary entry channel for foreign entrepreneurial talent into the country. Given these facts, we assess how universities shape both the geographic distribution and the quality of immigrant entrepreneurship. Close to 40% of US-educated immigrants start a company in the state of their alma mater, suggesting that place of education substantially impacts immigrant entrepreneurs' start-up location choice. Regarding firm quality, immigrant founders are also more likely to found financially successful and scientifically innovative start-ups than their US-born counterparts. Altogether, the results suggest that foreign students educated in US universities substantially contribute to local and national VC-backed entrepreneurship, thereby identifying higher education's global scope as a potential tool to attract entrepreneurial talent and encourage entrepreneurial growth.

"US Patents and Global Performance: Analyzing the Impact of Local Patent Protection on Firms' International Operations," Undergraduate Senior Thesis. May 2020. Harvard Kennedy School M-RCBG Associate Working Paper no. 141.

This paper examines how US patent protection affects the global scale and cross-country distribution of firms' operations. After presenting a simple theoretical model, I exploit exogenous variation in patent examiner leniency to estimate the impact of US patent protection on firms' aggregate sales in both the US and various foreign countries. In addition, to consider how US patents affect firms' production location decisions, I estimate the impact of firm-level US patent protection on US and foreign subsidiary sales. Lastly, I evaluate how institutional factors contribute to cross-country heterogeneity in the relationship between US patents and foreign subsidiary sales. I find that US patent protection increases firms' US sales at the aggregate and subsidiary levels. Furthermore, US patent protection increases firms' aggregate sales in foreign countries. Nonetheless, the impact of US patent protection on foreign subsidiaries' sales depends upon country-specific levels of intellectual property rights (IPR) protection, property rights, judicial independence, and political transparency. Altogether, these findings suggest that US patent protection not only grants substantial domestic market power to innovative firms, but also may incentivize them to expand their foreign operations.

Other Writing:

"Labor Market Reform, Productivity, and Exports: An Analysis using Germany's Hartz Reforms," June 2020. *Harvard Economics Review* (Undergraduate Journal).

I examine the impact of Germany's Hartz reforms on country and industry level trade outcomes, particularly trade balances. Linking product-level bilateral trade data with industry-level data on wages and productivity, we conduct two related analyses examining the impact of the Hartz Labor Market Reforms on German economic trade outcomes. First, on the country level, the paper finds that the Hartz reforms on average boosted German bilateral exports, net exports, and net exports as a percentage of GDP with its trading partners. Second, on the industry level, sectors with higher levels of labor productivity boosted by the reforms also appeared to exhibit higher levels of bilateral gross and net exports.

"Trumping Up Trade? The Impact of Chinese Imports on Student Political Views," with Klaus Ashorn, Claire Shi, and Alex Wu. 3rd Prize paper in 2019 Undergraduate Econometrics Game hosted by UChicago Department of Economics.

We study the causal effect of exposure to Chinese import competition on the political preferences of incoming U.S. college students from 1990 to 2000. We find that exposure to Chinese import competition pushes conservative students further to the right on social issues but not economic issues. These results add nuance to the existing literature, which focuses primarily on economic outcomes among working adults. Our identification strategy borrows from an instrumental variable approach introduced by Autor et al. (2013). We build upon this approach by linking Autor et al.'s data to UCLA survey data from 1.2 million college students across the United States to construct population and commuting zone-level metrics.

Awards and Fellowships:

Spring 2022	NSF Graduate Research Fellowship
Spring 2021	Harvard GSAS Presidential Scholarship
Spring 2020	John H. Williams Prize (Best Undergraduate Record in Harvard Economics Department)
Spring 2020	Thomas Temple Hoopes Prize (Outstanding Undergraduate Senior Thesis)
Spring 2020	John T. Dunlop Prize Honorable Mention (Best Undergraduate Thesis in Business and Government)
Fall 2019	Phi Beta Kappa (Senior 48)
Spring 2019	3rd Prize in Oeconomica Econometrics Game, University of Chicago Department of Economics
Summer 2018	Summer Fellowship, HBS Program for Research in Markets and Organizations
Fall 2017	Detur Book Prize (Outstanding Freshman Academic Achievement)
2017, 2019	John Harvard Scholarship (two-time recipient)

Research and Professional Experience:

Summer 2022	Research Assistant for Prof. Marc Melitz, Harvard University Department of Economics Project: Rules of Origin and the NAFTA/USMCA Laffer Curve
2021	Analyst, Cornerstone Research, Boston MA Office

2020-2021 Research Assistant for Prof. Paul Gompers, Harvard Business School
Summer 2019 Summer Analyst, Cornerstone Research, Boston MA Office
2018-2019 Research Assistant for Prof. Kyle Myers, Harvard Business School
Project: Innovation Races and Racecars: Analyzing the Interplay of Competition, Innovation, and Regulation in Formula 1 Racing
Spring 2018 Research Assistant for Dr. Thomas Chevalier, Harvard University Center for European Studies
Project: Bringing Rokkan Back In: Analyzing the French Political Economy in a Comparative Perspective
Summer 2017 Medieval Latin Research Intern, Dumbarton Oaks Medieval Library and Collection

Teaching and Mentoring Experience:

2022-Present Peer Mentor, Harvard University Graduate Economics Association Peer Support Network
2022-Present Peer Mentor, Harvard-MIT Economics Application Assistance and Mentorship Program
2021-Present Non-Resident Tutor at Lowell House, Harvard College
2021 Alumni Mentor, Harvard Undergraduates for Inclusion in Economics
Fall 2020 Teaching Assistant, Intermediate Macroeconomics, Harvard University, Dr. Thomas Baranga
2019-2020 Teaching Fellow, Introduction to Econometrics, Harvard University, Dr. Gregory Bruich
2017-2018 Course Assistant, Principles of Economics, Harvard University, Prof. Greg Mankiw

Editorial Activities:

2019-2020 Harvard Economics Review, Associate Editor
Summer 2018 Harvard Undergraduate Summer Research Village Abstract Book, Editorial Committee
2017-2019 Harvard International Review, Associate Editor, Writing and Copyediting Divisions

Technical:

Stata, R, SQL, Latex, Microsoft Excel (Proficient); MATLAB, Python, C, ArcGIS (Basic).

Languages:

English (Native); French, Latin (Proficient); German, Ancient Greek (Basic).

Hobbies:

Premier League Soccer, Hiking, Skiing, Classical Music, History, Historical Fiction.

PhD Course List

All Courses Taken at Harvard University Unless Otherwise Noted

Spring 2023 (Current) Semester:

Economics 2060: Contract Theory

Economics 2535: Advanced Topics in International Trade

Economics 2611: Industrial Organization II

Economics 2326: Political Economy and Development

Fall 2022 Semester:

Economics of Ideas, Science, and Innovation (Institute for Progress Online 6-Week Course)

Economics 2530A: International Trade

Economics 2610: Industrial Organization I

Economics 2000: Introduction to Quantitative Economics

Spring 2022 Semester:

Economics 2010B: Economic Theory (Microeconomics)

Economics 2010D: Economic Theory (Macroeconomics)

Economics 2140: Econometric Methods

Economics 2730: Theoretical and Empirical Perspectives on Entrepreneurship

Fall 2021 Semester:

Economics 2010A: Economic Theory (Microeconomics)

Economics 2010C: Economic Theory (Macroeconomics)

Economics 2120: Principles of Econometrics

Earlier Semesters:

Economics 2115: Econometric Methods for Applied Research II (Spring 2019)

Economics 2110: Econometric Methods for Applied Research I (Fall 2018)

At the NBER's 2023 Summer Innovation Research Bootcamp, I aim to enrich my academic background in innovation economics, incubate new research ideas, and connect with other early-career researchers within the innovation economics community. Having previously completed the Institute for Progress's Online PhD Course on the Economics of Science, Ideas, and Innovation, I seek to receive additional exposure to innovation economics' research frontier this July. Furthermore, as I transition towards conducting independent research full-time, the Bootcamp would provide an invaluable opportunity for me to build working relationships with both early career and more senior researchers in the field.

My current body of research has involved multiple innovation-adjacent topics. First, my two NBER working papers consider Venture Capital (VC)-backed entrepreneurs. VC-backed entrepreneurship is per se a closely related topic to innovation economics; moreover, both works contribute insights and tools more directly applicable to innovation economics. To elaborate, when comparing immigrant vs. native-led VC-backed startups, Amornsiripanitch et al 2021 examines startups' innovative nature and output via patent data. In turn, Amornsiripanitch et al 2022 uses resume data to construct a generalizable non-wage measure of career advancement that enables a more robust comparison of job desirability across sectors with drastically different wage structures (e.g., finance vs. academia). The paper primarily applies the measure to evaluate entrepreneurial careers. However, as academic research careers may not be the most monetarily lucrative, the measure may also prove valuable when analyzing the trajectories of scientific careers, vis-à-vis traditional wage measures.

The topics and data from these projects will inform and facilitate my future research endeavors. For example, ongoing early-stage work seeks to investigate the general equilibrium impacts of the H-1B visa program and its legal intricacies. By using the aforementioned resume data to measure both within-firm occupational composition and across-firm hirings/separations, the work's proposed analyses would estimate disaggregated occupation-level changes that result from H-1B lottery outcomes and impute counterfactual changes to productivity, employment, and innovative output that would result from adjusting the design of the H-1B lottery itself. In my view, such analyses would extend the literature on high-skilled immigration and the supply of scientists and inform an important debate on the design of H-1B and broader innovation policy.

Another segment of my future research agenda will reside at the intersection of international trade and intellectual property (IP). Having investigated US patent protection's impact on the global scope of firm operations in independent undergraduate research, I more broadly aim to examine how global IP concordance affects (i) firms' innovation incentives, (ii) multinationals' production location decisions, and (iii) the aggregate rate and direction of patented innovation in upcoming years. Prior literature has largely focused on the IP-innovation relationship within specific countries, industries, or technologies. In contrast, I plan to leverage the 1995 TRIPS Agreement as a source of (i) IP protection strengthening within countries and (ii) IP concordance across countries. This strategy should allow for a broader understanding of how IP regulation might alter both the aggregate amount and the direction of innovation. In the policy realm, this proposed analysis may inform the design of bilateral or regional trade agreements during an era where relocation of IP-intensive production, R&D subsidization, and geopolitically motivated trade policy becomes increasingly prevalent.

The Innovation Research Bootcamp will accelerate and inform my research agenda by deepening my academic background in innovation economics and connecting me with innovation researchers. For example, attending lectures by Pierre Azoulay, Ina Ganguli, John Van Reenen, and Heidi Williams will likely prove especially helpful as I consider pursuing research that touches upon entrepreneurship, the supply of innovators, global R&D activity, and IP. In addition, connecting with other early-career researchers in innovation economics would facilitate my efforts to solicit additional feedback on the previously described early-stage ideas and identify potential future collaborators within the field. In all, I am confident that the Bootcamp will facilitate my transition from coursework to independent research, and I also believe that it will materially affect the specific details and broader composition of my longer-term research agenda.

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January 27, 2023

Recommendation for George Hu – NBER Innovation Research Boot Camp 2023

I am writing to enthusiastically recommend George Hu for the NBER Innovation Research Boot Camp 2023. I have been in close contact with George for many years now, starting in his junior year at Harvard when I taught him in a small junior-research tutorial course. I subsequently advised his senior economics thesis the following year; and most recently George has been working for me as a research assistant. George wrote the strongest thesis that I have advised or read/graded in the past 20 years. This would be a strong research paper for a second/third year PhD student working on their dissertation in our program (in fact, a majority of our PhD students do not write papers at this level until their second or third papers later in their dissertation writing stage). This outstanding work was recognized both by the interdisplinary Social Sciences Honors Committee with a Thomas Temple Hoopes Prize (for oustanding thesis) as well as by the Economics Department with the John H. Williams Prize awarded to a Summa Cum Laude ecnomics graduate "with the best overall record". (That prize also reflects George's stellar record in his classwork: his overall GPA is 3.97/4.00, earned on a tough set of courses.)

George's thesis investigates the impact of US patent protection on firms' incentives to invest and produce both in the US and abroad. The thesis provides a decomposition of those effects on both the location of sales as well as the location of subsidiaries throughout the world. George finds that US patent protection induces an increase in global sales for US firms, as well as an increase in sales for all firms (including foreign firms) selling into the US market. US patent protection also induces an expansion in subsidiaries both in the US as well as in other foreign markets. But this expansion in foreign markets is more nuanced as characteristics of those markets (most notably policies related to the protection of intellectual property) play an important role in shaping that response. For some countries with low levels of protection, US patent protection induces firms to reduce the scale of their subsidiaries in those locations (presumably substituting with export sales to consumers in those locations). The results are convincing and represent an important contribution to the understanding of the role played by US patent protection on the investment and production decisions of multinational firms.

More recently, George has been working as a research assistant on one of my research projects on the global automotive industry. The quality of his work has been superb, at the same level as some of my very best research assistants who have gone on to produce outstanding dissertations and are now distinguished scholars at top research institutions. George has also displayed impressive maturity in his work on this project: Once a problem is formulated, he requires almost no additional direction and develops his own approaches and methods.

I hope that I have been able to convince you that George is an exceptionally gifted aspiring research scholar. Beyond that research creativity and his academic credentials, George is also an excellent communicator with strong teamwork skills. I witnessed this first-hand in the seminar course George took with me. He gave an excellent in-class presentation of his research project; but he was also able to provide insightful and constructive comments to his classmates' research projects. In my experience, I have found that providing this kind of valuable feedback on other students' research represents a much higher bar than assimilating one own's research. I recommend him in the highest possible terms without any reservations.

Sincerely,

