Ziang Li
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Princeton, NJ 08540
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December 1, 2019

Dear Professors,

I am writing to apply for the Behavioral Macroeconomics Research Bootcamp for Graduate Students at the NBER. As requested, I attached my academic CV with Ph.D. courses I have taken and a two-page essay detailing my motivations.

I am currently a second-year graduate student in the Department of Economics of Princeton University, specializing in macroeconomics and finance. Before the Ph.D. program, I spent two years at Columbia University as a pre-doc working on various projects on behavioral economics.

My recommendation letter writer is Professor Michael Woodford of Columbia University.

The concept and program of the bootcamp are very appealing to me. I believe my research experience in both macroeconomics and behavioral economics make me a suitable candidate. You can find more details about my academic background and current research in the attached materials.

Thank you for your time and consideration. I look forward to hearing your decisions.

Sincerely,

Ziang Li

Ziang Li

Ph.D. Candidate in Economics, Princeton University

Department of Economics, Princeton University
Julis Romo Rabinowitz Building, Princeton, NJ 08544
✉: ziang.li@princeton.edu ☎: (929) 462-4107

Education

Princeton University *2018 - present*
Ph.D. in Economics

Renmin University of China *2013 - 2017*
B.A. in Economics & B.S. in Mathematics (with distinction)

Coursework at Ph.D. Level

First-year Ph.D.: Microeconomic Theory I, II Macroeconomic Theory I, II Econometric Theory I, II

Second-year Ph.D.: Advanced Macroeconomics I, II Behavioral Economics Asset Pricing Corporate Finance Financial Modeling Financial and Monetary Economics Topics in Empirical Macro-Finance

Mathematics.: Mathematics for Economists (Math Camp) Probability Theory Stochastic Calculus PDE Methods for Financial Mathematics

Fields

Macroeconomics, Finance, Behavioral Economics

Working Papers

Cognitive Imprecision and Small-Stakes Risk Aversion, (with Mel W. Khaw and Michael Woodford). NBER Working Paper no.24978, August 2018. Revised January 2019. Previously circulated under the title "Risk Aversion as a Perceptual Bias". R&R, *Review of Economic Studies*

Work in Progress

Cognitive Imprecision and Intertemporal Decision Making, (with Mel W. Khaw and Michael Woodford).

The Fourfold Pattern of Risk Attitudes: A Bayesian Interpretation, (with Mel W. Khaw and Michael Woodford).

Publications

Temporal Discounting and Search Habits: Evidence for a Task-dependent Relationship, (with Mel W. Khaw and Michael Woodford). *Frontiers in Psychology*, 2018.

Seminar & Conference Presentations

2019 Princeton (Directed Research Seminar)

2018 Sloan-Nomis Summer School on Cognitive Foundations of Economic Behavior

2017 Columbia, Annual Meeting for the Society for Neuroeconomics (Toronto)

2015 Waseda University

Research Experience

Research Assistant for Prof. Markus K. Brunnermeier, Princeton University *Summer 2019*

Research Associate, Institute for Social and Economic Research and Policy (ISERP), Columbia University *2017 - 2018*

Research Assistant for Prof. Michael Woodford, Columbia University *2016 - 2017*

Date: Sep 2019

Awards & Scholarships

Robert W. Ballantine Graduate Scholarship, Princeton University	*2018*
Scholarship for Academic Excellence, Renmin University of China	*2016*
National Scholarship, Ministry of Education of China	*2015*
First Prize, China Undergraduate Mathematical Modeling Contest (Beijing Division)	*2015*
Samsung Scholarship, Renmin University of China	*2014*

Additional Information

Languages:	Chinese (native), English (proficient)
Computer Skills:	MATLAB, Julia, Stata, LaTeX, MS Office

Date: Sep 2019

Research Summary

Ziang Li

Advancing our knowledge of economic behaviors and their macroeconomic implications has long been my career aspiration. Towards this end, I have conducted research in both behavioral economics and macroeconomics. Along this path, I intend to combine my experience in both fields and further study how behavioral deviations impact the economy at the aggregate level.

My current behavioral research focuses on theoretical and empirical studies of decision making and information processing. In a series of projects with Professor Woodford at Columbia University, we studied how cognitive imprecision affects risk preference and intertemporal choice. In our NBER working paper "*Cognitive Imprecision and Small-Stakes Risk Aversion*" (R&R at *Review of Economic Studies*), we show how imprecision in numerical cognition leads to risk aversion even when bets are small. Our ongoing work will feature in two papers on prospect theory and intertemporal choice. In one project, we interpret prospect theory as resulting from efficient Bayesian inference subject to the noisy perception of information. We proposed a rational inattention model where agents are expected utility maximizers but subject to certain fuzziness in converting perceived information into economic valuations. Specifically, we assume a log compression in the perception of magnitudes and probabilities, which is well established in the cognitive literature and reflects the fact that similar states are difficult to discriminate between. Using a dataset collected from our laboratory experiment, we show that our model accounts for subjects' risk attitudes and choice stochasticity better than the classic random utility and prospect theory models. In a similar vein, we initiated another project on intertemporal choice. Subject to cognitive imperfection, exponential discounters allocate more attention to sooner payoffs, resulting in as-if hyperbolic discounting behavior. Using a similar Bayesian model, we simultaneously account for the discounting patterns observed in the lab and the varying precision in choice across different options and lengths of delay.

In the meantime, another part of my current research lies in macroeconomics and finance. In a project with Sebastian Merkel at Princeton, we study the transmission of monetary policy through households' portfolio decisions. We build a heterogeneous-agent New Keynesian (HANK) model where households split their investments between a safe asset (e.g., government bond) and a risky asset (e.g., capital). By affecting the return on the safe/nominal asset, monetary policy changes the portfolio choice problem of households and poses additional trade-off for policy-makers. In another (very preliminary) project, I study the impact of heterogeneous and sticky beliefs on market granularity and macroeconomic volatilities.

In the future, I wish to pursue further in the intersection of macroeconomics and behavioral economics. In particular, I am interested how macroeconomic expectations are formed. With the recent availability of survey and household data, I intend to study realistically how people update their beliefs and quantify the difference from the rational expectation models.

Moreover, I would like to explore how bounded rationality interacts with financial frictions.

Given my research interests and academic background, I believe that the bootcamp is well suited for me. My interests and experiences in both behavioral economics and macroeconomics match the theme and faculty members of the workshop in specific and meaningful ways. First of all, my experience with interdisciplinary research enables me to integrate knowledge from different fields better, and my familiarity with both disciplines makes it easier to identify new research questions. Moreover, the workshop features an active group of faculty members. I believe it will be an excellent opportunity to get exposed to cutting-edge research in this emerging field. Importantly, there are many exciting works from the faculty members that I find close to my interests. Attending the workshop will give me the capability to integrate them into my future research. My academic background and interests complement the resources and mentorship offered by the bootcamp, and therefore, it would be ideal for me to attend.

COLUMBIA UNIVERSITY
IN THE CITY OF NEW YORK
ECONOMICS

New York, NY 10027
December 8, 2019

Selection Committee
Behavioral Macroeconomics Bootcamp
National Bureau of Economic Research
Cambridge, Massachusetts

Dear colleagues,

I am writing to recommend Ziang Li, a second-year PhD student in Economics at Princeton University, who would like to attend the Behavioral Macroeconomics Bootcamp in March 2020.

I got to know Ziang while he was an undergraduate student at Renmin University (Beijing), who spent a year as a visiting student at Columbia. I was so impressed by him then that I offered him a position as a research assistant at Columbia for a year between college and his PhD studies (the only time that I have ever hired someone without a PhD to be a full-time RA). During that time I worked with him closely, and he became a co-author on several papers. One of these has already been published in a psychology journal; another has been issued as an NBER Working Paper (in fact, four successive versions of the paper have been issued under two different titles; the latest version has recently been re-submitted to the *Review of Economic Studies*); and three others are still in preparation (one of which represents new work since he has enrolled at Princeton).

The work that Ziang did with me was in behavioral economics; he helped me to develop and test computational models of decision making on the basis of imperfect mental representations of the decision problem. The paper that is under review at *REStud* models choices between simple gambles in a laboratory experiment; it proposes a unified interpretation of both choice biases of the kind modeled by prospect theory and the random trial-to-trial variation in choices, and seeks to provide a deeper foundation for prospect-theory-like biases by showing that they are properties of an optimal decision rule when decisions must be based on imperfect mental representations. The work still in progress includes not only further developments of the model of risk-taking, but also an examination of the extent to which a similar model can explain laboratory choices involving intertemporal tradeoffs, as proposed in a recent working paper of Xavier Gabaix and David Laibson.

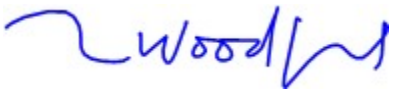
Since starting graduate school at Princeton, Ziang has had most of his time engaged by the usual PhD coursework, but he continues to be interested in behavioral economics, and continues to work with me on models of imprecise perception. At the same time, he is also beginning to explore new interests in macroeconomics and financial economics. It is too soon to say what the topic of his dissertation research will be, though he is interested in exploring potential consequences of behavioral biases for macroeconomic and financial dynamics. His strong mathematical and computational abilities, as well as a stronger background in theoretical behavioral economics than most students who work in the areas of macroeconomics or finance

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have, position him well to be able to study the implications of imperfect cognition for the relatively complex issues studied in macro and finance.

Ziang is an extremely promising student, but still at a stage in his development where attending this workshop could have a transformative effect on the path of his future research. I recommend him wholeheartedly for participation in the NBER Behavioral Macroeconomics Bootcamp.

Sincerely,



Michael Woodford
John Bates Clark Professor
of Political Economy
Columbia University