December 9, 2019

National Bureau of Economic Research

To Whom It May Concern,

I am writing to apply for the Behavioral Macroeconomics Research Boot Camp. I am currently in my third year and am in my candidacy in the Economics PhD program at the University of Arkansas. I completed my Master of Arts in Economics in May 2019 and am projected to complete my PhD in May of 2022. I am also a Doctoral Academy Fellow and a Senior Graduate Assistant at the University of Arkansas

My research interests are behavioral and experimental macroeconomics, as well as macroeconomic theory in general. I currently employ empirical and experimental methods to understand which types of people fail to solve the lifecycle problem (consumption smoothing) and why. I have conducted an empirical study that evaluates market completeness by income group using Panel Study of Income Dynamics (PSID) data. In this study I conduct a test of market completeness in the spirit of Mace (1991) and Cochrane (1991) but I divide my sample into four income quartiles. I find that in the face of idiosyncratic income shocks, like spending months unemployed or missing work due to prolonged illness, it is only the first income quartile that is unable to smooth their consumption. I am using this empirical work as motivation for understanding why people in the first income quartile are unable to smooth their consumption in a current working paper with Don Koh[1]. In this paper, we evaluate the consumption smoothing behavior of low-income households disaggregated by socioeconomic factors. We are able to develop detailed consumption profiles by household and describe consumption behavior as the result of an unemployment shock. In addition, I am currently in the process of running an experiment that tests whether pairs are better at solving the lifecycle problem than individuals with Ryan Rholes[2].

I would be a good candidate for the Behavioral Macroeconomics Research Boot Camp. The knowledge I gain during the boot camp can help me achieve my future research goals. My plan for future research is to reconcile empirical results that suggest market incompleteness with findings from the lab that highlight subjects' inability to solve the lifecycle problem. In this way, I can answer whether market incompleteness, i.e. there are still people who cannot smooth their consumption when they receive an idiosyncratic income shock, is the result of institutions, behavior, or simply just financial constraints.

Logan Miller

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Letter of recommendation writer: Don Koh

[1] University of Arkansas
[2] Fifth-year PhD student at Texas A&M University

Logan J. Miller

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Education

Ph.D. Economics, University of Arkansas, In Progress

M.A. Economics, University of Arkansas, 2019

B.S. International Business, University of Arkansas, 2013

Research Fields

Behavioral Macroeconomics, Experimental Macroeconomics, Macroeconomic Theory

Working Papers

1. **Logan Miller** "Market Completeness by Income Groups"
   An empirical analysis of different income groups' ability to smooth consumption in response to idiosyncratic income shocks. I analyzed income groups at the quartile level for the years 1999-2017 using Panel Study of Income Dynamics data. I run cross-sectional regressions using a feasible GLS model and show that in the face of idiosyncratic income shocks, like spending months unemployed or missing work due to prolonged illness, it is only the first income quartile that is unable to smooth their consumption.

2. **Logan Miller** and Ryan Rholes "Joint Consumption Smoothing in the Lab"
   This paper studies the relative ability of individuals and pairs to solve a finite lifecycle problem in the lab. Our main results are based on a 2x1 between-subjects design where subjects in both treatments must smooth a stochastic income process by borrowing and saving. We find that pairs outperform individuals relative to both the unconditionally- and the conditionally-optimal consumption paths. We also introduce a variation of the individual treatment that we call the "ledger" treatment. Individuals in this treatment have the option to record the logic of their decisions on screen before committing to an action. Individuals in this treatment do not perform any better than individuals without the ledger, which indicates that pairs outperform individuals due to the exchange of ideas and not because they are forced to articulate their ideas before committing to an action. We introduce a novel approach for comparing pair and individual behavior and use this to quantify performance differences. We randomly form synthetic pairs whose per-period consumption decision is the average of each of individual's corresponding consumption decision. We then quantify by how much we can positively handicap decisions of synthetic pairs before real pairs no longer outperform synthetic pairs. On average, we can positively handicap synthetic pairs by about 30% before we see no difference between synthetic and real pairs using a 10% significance level. We use the same method to quantify how pairs and individuals improve with experience. We can positively handicap synthetic pairs by approximately 32% over the first ten periods of play but by approximately 48.5% in the last ten periods of play. This suggests that pairs may learn more efficiently than individuals. Finally, we document differences in individual and pair consumption heuristics that can help explain this performance gap. Both pairs and individuals primarily make consumption decisions based on a constant marginal propensity to consume (MPC). However, pairs use a relatively higher MPC on average, which leads to fewer and less-severe consumption binges relative to individuals. Further, we find less heterogeneity in pair consumption heuristics relative to individual consumption heuristics.

Work in Progress

3. Don Koh and **Logan Miller** "Consumption Smoothing Behavior of Low-Income Households"

Fellowships, Scholarships, Grants, and Awards

Doctoral Academy Fellow, University of Arkansas, 2017 to present

Ziegler Fund Grant - $3,100

Workshops and Professional Development

12th BESLab Experimental Economics Summer School in Macroeconomics

25th Graduate Student Workshop in Experimental Economics at Chapman University (upcoming)

Professional Experience

University of Arkansas - Fayetteville, AR

Graduate Assistant, 2017 - Present

Buzz Digital & Design- Fayetteville, AR

Co-Founder and Chief Executive Officer, 2015 - 2017

Advantage Sales and Marketing, Bayer DRT- Bentonville, AR

Retail Sales Associate, 2014-2015

Teaching Experience

University of Arkansas - Instructor

Principles of Macroeconomics (ECON 2013), Fall 2019

Basic Economics (ECON 2143), Fall 2018, Spring 2019

Basic Economics (ECON 2143 - Supplemental Instructor), Spring 2018

University of Arkansas - Teaching Assistant

Macroeconomic Theory (ECON 3133), Fall 2018, Spring 2019

Forecastiing (ECON 4753), Fall 2017, Spring 2018. Spring 2019

Introduction to Econometrics (ECON 4743), Fall 2017, Spring 2018

Coursework

Fall 2017

Macroeconomic Theory I

Microeconomic Theory I

Econometrics I

Spring 2018

Macroeconomic Theory II

Microeconomic Theory II

Econometrics II

Fall 2018

Industrial Organization I

International Development I

Experimental Economics

Spring 2019

Industrial Organization II

International Development II

Econometrics III

Programming and Coding

Programming Languages: Stata, MatLab, LaTeX, Z-tree

Languages

English - *Native*

Spanish - *Limited Conversational Proficency*

Updated: December 2019

I am a third year PhD candidate at the University of Arkansas. I focus on behavioral macroeconomics using empirical and experimental methods. My research explores how people approach dynamic optimization. I am particularly interested in the behavioral biases that lead to inefficient solutions to these dynamic optimization problems and how this relates to policy that could improve suboptimal consumption choices.

I started this line of research by conducting an empirical study that evaluates market completeness by income group using Panel Study of Income Dynamics (PSID) data. In this study I conduct a test of market completeness in the spirit of Mace (1991) and Cochrane (1991) but I divide my sample into four income quartiles. I find that in the face of idiosyncratic income shocks, like spending months unemployed or missing work due to prolonged illness, it is only the first income quartile that is unable to smooth their consumption. Smoothed consumption here refers to the consumption growth rate from year-to-year not being statistically significantly different than zero. I further test consumption smoothing for this first income quartile in relation to internal (socioeconomic) and external (government assistance) factors. These results suggest that reason the lowest income quartile cannot smooth their consumption, unlike the three other quartiles, is not due to institutional limitations, but to behavioral biases. I use this finding to motivate two other papers.

In one, joint work with Ryan Rholes[1], I run an experiment that tests whether pairs are better at solving the lifecycle problem than individuals with. This can be viewed as a single-parent versus a two-parent household. Many learning-to-optimize experiments test whether households can solve the lifecycle optimization problem. A ubiquitous feature of these experiments is that they use individual subjects acting as households. This may yield an unfair test of macroeconomic theory that, sometimes implicitly and sometimes explicitly, focuses on the decisions of a household and not an individual. Since most households have more than one decision maker and since it is well-known that pairs often conform more closely to economic rationality than individuals, it might be that testing the ability of pairs to solve the lifecycle consumption problem provides a better test of economic theory.

In the other, joint work with Don Koh[2], we evaluate the consumption smoothing behavior of low-income households disaggregated by socioeconomic factors. We are able to develop detailed consumption profiles by household and describe consumption behavior as the result of an unemployment shock. We are also able to show methods employed by households to smooth their consumption after receiving an unemployment shock.

My plan for future research is to reconcile empirical results that suggest market incompleteness with findings from the lab that highlight subjects' inability to solve the lifecycle problem. In this way, I can answer whether market incompleteness, i.e. there are still people who cannot smooth their consumption when they receive an idiosyncratic income shock, is the result of institutions, behavior, or simply just financial constraints. In light of my current and future research direction I believe I would be a good fit for the research boot camp.

[1] Fifth-year PhD student at Texas A&M University
[2] University of Arkansas

I am applying for this research boot camp because it can provide me with several benefits. The first is the learning opportunities the research boot camp will provide. I have had a graduate Macroeconomic series and a graduate behavioral series that was taught in the context of Industrial Organization. It will be helpful to learn the two subjects synthesized into one course and would greatly benefit my development. I will also benefit from having new teachers that will expose me to new material, methods, and styles of teaching. This will glean the immediate benefit of learning new material that I can incorporate into my research. However, it will also pay dividends later when I begin to teach this material myself. Finally, learning new material oftentimes leads to new research ideas. The exposure to new material allows students to see holes and extensions in current research that the researcher can be too close to the material to see.

The second benefit I would gain from attending is growing my network. As the only person working in behavioral macroeconomics at the University of Arkansas, I am highly isolated and opportunities like this are very important to me. I am extremely interested in the field of behavioral macroeconomics. While my University has good faculty that are extremely supportive of my research endeavors and interests, there are no faculty members doing research in behavioral macroeconomics. If I attend, I will get to meet 24 other economists interested in the same field as me and in a similar stage of their career. In addition, I will get to meet some established researchers that are leaders in the field. This will allow me to get a better understanding of the state of research in the field and how I can meaningfully contribute. It will also afford me the chance to ask questions to the experts in the field that I cannot currently get answers to at my University. Finally, meeting new scholars can lead to the generation of new research ideas and constructive critiques from new faces can improve research in an important way.

UNIVERSITY OF ARKANSAS

Sam M. Walton College of Business
Department of Economics

December 9, 2019

National Bureau of Economic Research
1050 Massachusetts Ave.
Cambridge, MA

Dear NBER Research Boot Camp Committee,

It is my great pleasure to write this letter in support of Logan Miller's application to the NBER Behavioral Macroeconomics Research Boot Camp in 2020.

I have been supervising Logan's research on the sources of consumption insurance in the U.S. markets for three years. His motivation for this research is to explore the types of insurance that the U.S. households by income class rely on to insure against idiosyncratic income shocks. For instance, higher income classes may have access to financial assets/securities from the U.S. financial markets, while lower income classes may have limited access to those securities but instead may rely on alternative means, such as family composition and labor supply, informal transfers from relatives or neighbors, or government benefits. The primary objective of his research is to explicitly identify the sources of consumption insurance in the U.S. economy.

He tackles this research question through three approaches: empirical, theoretical, and experimental. On the empirical side, the full insurance model for each income class and each consumption item is tested (as in Mace, 1991 and Cochrane, 1991) using the recent Panel Study of Income Dynamics (PSID) data. Beginning in 1999, PSID started collecting several categories of consumption expenditures for each household biannually, while the pre-1999 data collected information on food and housing expenditures only. Even though the recent information allows him to examine consumption responses by items, the biannual sampling after 1997 may reduce the size of an overall response to income shocks. Therefore, he verifies how much of the response is mitigated by biannual sampling by comparing to the annual response of food expenditure to the same type of income shocks using pre-1997 data. His primary finding is that the full insurance hypothesis is rejected for the lowest quartile income group, while the hypothesis cannot be rejected for higher income groups. Despite its common use of PSID data for the test of full insurance, the empirical contribution of his research is to demonstrate the full insurance hypothesis by the heterogeneity of household characteristics and by the categories of consumption items.

On the theory side, a complete market model with solvency constraints (Alvarez & Jermann, 2000) is more theoretically consistent with the empirical finding as oppose to an alternative standard incomplete market model with self-insurance (e.g., Aiyagari-Huggett-Bewley model)

because households in the higher income classes have access to full insurance to smooth out their consumption in response to income shocks. Nevertheless, endogenous solvency constraints in the model are not enough to explain the consumption response of the lower income classes to adverse income shocks because the solvency constraints prevent low-income households from defaulting and reverting to autarchy. To match the size of insurance for low-income households, he imposes more stringent solvency constraints. The theoretical contribution of his research is to quantitatively measure the size of insurance generated by the model and demonstrate how stringent the endogenous solvency constraints should be for the lowest income class in the model.

Finally, on the experimental side, he studies the relative ability of individuals and pairs to solve a finite lifecycle problem in the lab. Through a lab experiment, he tests an empirical evidence that married couples' consumption is less responsive to idiosyncratic income shocks than a single household. He uses a between-subjects design where subjects in both treatments smooth a stochastic income process by borrowing and saving. In this experiment, to compare pair and individual behaviors, he randomly forms synthetic pairs whose per-period consumption decision is the average of each of individual's corresponding consumption decision. He then quantifies by how much we can positively handicap decisions of synthetic pairs before real pairs no longer outperform synthetic pairs. He also uses the same method to quantify how pairs and individuals improve with experience. Through this lab experiment, he finds that pairs outperform individuals relative to both the unconditionally- and the conditionally-optimal consumption paths.

His ambition to tackle his research question from three diversified channels is highly promising. It is for this reason that I wholeheartedly recommend Logan to participate the NBER Behavioral Macroeconomics Research Boot Camp. If you have any further questions, please do not hesitate to contact me.

Sincerely,



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