UNIVERSITY OF CALIFORNIA, IRVINE

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9th December 2019

Behavioral Macroeconomics Research Boot Camp
NBER
1050 Massachusetts Avenue
Cambridge MA 02138-5398

L. Carolina Acuña Armenta
Department of Economics
3151 Social Sciences Plaza
Irvine, CA 92697

Dear Members of the Review Panel,

I am writing to apply for the Behavioral Macroeconomics Research Boot Camp organized by organized by Professor Yuriy Gorodnichenko. I am a third year Economics PhD student at the University of California Irvine. Since the last academic year, I have been working with Professor Fabio Milani, from whom I would be receiving the letter of recommendation for the workshop. My research interests focused on macroeconomics, particularly expectations, learning and survey forecasts.

Before attending graduate school, I worked at the Mexican central bank and the Federal Economic Competition Commission where I developed economic analysis and forecasts. In addition to gaining empirical and theoretical skills, both employments gave me the opportunity to learn at first hand the relevance of economic research into policy implementation. Plus, I learned to be a team player; how every idea and small task are fundamental to completing the final goal.

During my studies I received multiple fellowships which allowed me to study abroad and I experienced a plethora of cultures, teaching methods, and mindsets which have contribute to the way I approach my research. I learned that it is not only the academic studies that gave knowledge and skills, but I also benefited greatly from belonging in a multicultural and interdisciplinary environment.

Thus, I am enthusiastic about attending the NBER workshop and gain the exposure to current research on behavioral macroeconomics. Furthermore, I am eager to benefit as well as to contribute to the exchange of research ideas. The opportunity to attend this boot camp with such a respected group of researchers would be an invaluable experience.

I thank you for taking the time to consider my application and I look forward to hearing from you soon.

Warm regards,



L. Carolina Acuña Armenta
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L. CAROLINA ACUÑA ARMENTA

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EDUCATION

University of California, Irvine *2017 - present*
PhD in Economics - Third year student

University of Warwick, England *2009 - 2010*
MSc in Economics

Université Toulouse 1: Sciences Sociales, France *2006 - 2008*
Licence en Sciences Économiques parcours en Économetrie

Universidad Autónoma de Baja California, México *2004 - 2008*
Licenciatura en Economía
Summa cum laude

PHD COURSES

Macroeconomics

- *Macroeconomic theory I*, teached by Professor Guillaume Rocheteau.
- *Macroeconomic theory II*, teached by Professor William Branch and Professor Eric Swanson.
- *Macroeconomic theory III*, teached by Professor Professor Eric Swanson and Professor Fabio Milani.
- *Monetary economics I*, teached by Professor William Branch.
- *Monetary economics II*, teached by Professor Eric Swanson.
- *Independent study I*, with Professor Fabio Milani.
- *Independent study II*, with Professor Fabio Milani.
- *Independent study III*, with Professor Fabio Milani.
- *Advanced macroeconomics II*, teached by Professor Guillaume Rocheteau.

Mathematics and Econometrics

- *Probability & Statistics*, teached by Professor Dale Poirier.
- *Math for economists*, teached by Professor Igor Kopylov.
- *Statistics & Econometrics I*, teached by Professor Dale Poirier.
- *Statistics & Econometrics II*, teached by Professor Ying-Ying Lee.
- *Statistics & Econometrics III*, teached by Professor Ivan Jeliazkov.
- *Statistical methods I*, teached by Professor Hal Stern at the Department of Statistics.
- *Independent study*, with Professor Ivan Jeliazkov.
- *Big data*, teached by Professor Matthew Harding.

Microeconomics

- *Microeconomic theory I*, teached by Professor Stergios Skaperdas.
- *Microeconomic theory II*, teached by Professor Jean Paul Carvalho.
- *Microeconomic theory III*, teached by Professor Igor Kopylov.

ACADEMIC AWARDS

UC MEXUS-CONACYT Doctoral Fellowship

· September 2017 - June 2022

Santander Abbey Latin America Masters Scholarship

· 2009

PETAL Scholarship (Programa de Economía Toulouse-América Latina)

· August 2006 - June 2008

NOTE: PETAL is a bilateral program between the governments of México and France in which Mexican students in economics participated in an academic exchange for 2 years in the Université Toulouse 1 and, if succesfull, they are awarded Bachelor's degrees in Economics from both countries.

RECENT EXPERIENCE

Federal Economic Competition Commission April 2015 - September 2016
Mergers and acquisitions Director *Mexico City, Mexico*

· Economic analysis of mergers and acquisitions for the decision-making of the Plenum of the Commission.

Banco de México October 2012 - March 2015
Researcher *Mexico City, Mexico*

· Analysis and forecasts of the demand of money for the used by the General Directors and the Board of Governors in the planning process of the currency production.

SOFTWARE KNOWLEDGE

· MATLAB, R, Stata, Oxmetrics

LANGUAGES

· Spanish: First language
· English: Fluently spoken, read and written
· French: Read and written

HOBBIES

· Reading, cooking, photography

Behavioral Macroeconomics Research Boot Camp

L. Carolina Acuña Armenta

University of California, Irvine

Attending the Behavioral Macroeconomics Research Boot Camp would be a great opportunity. Firstly, it would allow me to be exposed to state-of-the-art literature about behavioral macroeconomics. Additionally, it would give me the opportunity to interact with researchers, professors, and students with similar academic interests than mine. In the end, the boot camp would be an enrichment process, not only because of the novel skills and ideas I would acquire, but because my research can be nourished through the exchange of ideas.

My research interests lie in expectations, learning and survey forecasts. I find extremely relevant the mechanisms by which expectations are formed, their impact on decision-making and interaction with policy. So far, my current research has focused on inflation and monetary policy expectations on an adaptive learning framework. I studied how central bank transparency, via information limitations, impacts agents' expectations' formation. As Bernanke (2007) point out *"a fuller understanding of the public's learning rules would improve the central bank's capacity to assess its own credibility, to evaluate the implications of its policy decisions and communication strategy, and perhaps to forecast inflation"*.

Many papers have addressed this topic,[1] proposing that central bank transparency affects the available information about the monetary policy rule that the economic agents have at their disposal. Nevertheless, my work contrasts with past literature as it does not focus on the stability of the rational expectations' equilibrium, but on the empirical role of adaptive learning within a transparent central bank environment.

[1] Some examples are Berardi and Duffy (2007), Eusepi (2005), Orphanides and Williams (2007), and Eusepi and Preston (2010).

On my second-year paper, I use Bayesian methods to estimate a baseline New Keynesian model to assess the impact of central bank transparency on the evolution of agents' beliefs while exploiting survey-based data on expectations to accurately extract the evolution of agents' beliefs. The empirical analysis focus on the Mexican experience, since numerous measures of central bank transparency had been implemented during the last decades, in addition to the adoption of an inflation targeting framework in 2001. Plus, the central bank has been able to successfully reduce and stabilize inflation during the past two decades, after experiencing chronic high inflation.

The results show that agents exhibit a fast learning speed and a declining perceived inflation persistence. The implied learning mechanism is able to closely match the empirical inflation expectations from the Survey on Expectations of Private Sector Specialists published by the Mexican central bank. Moreover, while contrasting different specifications, the model with the highest degree of transparency outperforms all others. In sum, the transparency adopted by the Mexican central bank impacted the evolution of agents' beliefs and expectations formation. It promoted a better guidance for the formation of expectations, as suggested by Orphanides and Williams (2007). Nonetheless, it did not necessarily ease a better understanding of monetary policy.

In the future, I will continue working on topics related to expectations formation and their aggregate implications on the economy. Some examples of research ideas I would like to pursue are listed next:

Exchange rate expectations. Being from a border town, I have noticed that most people exhibit a recurrent pessimism about the exchange rate of their home currency to the U.S. dollar. This sentiment could be correlated with past devaluations which influenced their expectations about its value. Thus, in line with Malmendier and Nagel (2016), an interesting question to address would be how do agents form their exchange rate expectations?

Non-linear inflation expectations. The mechanism used by individuals to form their expectations can differ depending on the economic environment they are facing. For instance, economic agents can expect distinct inflationary processes depending on the magnitude of the deviation of current inflation with respect to the inflation target. Assessing these differences on expectations and their effect on the macroeconomy may lead to compelling lessons.

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December 8, 2019

Dear Selection Committee,

It's a pleasure to write this letter in support of **Carolina Acuna Armenta**'s application to participate in the Behavioral Macroeconomics Boot Camp. I can recommend her highly.

I've known Carolina for three years now. I've met her as a student in my first-year Macroeconomic Theory course, in which she did extremely well. I'm now serving as Carolina's main dissertation advisor, with Bill Branch and Ivan Jeliazkov also serving in the dissertation committee. I see Carolina regularly, both to discuss her research and also since she's a participant in a weekly reading group in macroeconomics that we have been organizing for the past two years.

Carolina is interested in studying deviations from rational expectations and their implications for monetary policy and macroeconomic dynamics. Both in current and future research, she aims to exploit the information contained in survey forecasts to better understand the formation of expectations. Her research interests span both closed and open-economy macro. Her main focus is typically empirical, but based on microfounded structural models. She is particularly knowledgeable and skilled in Bayesian econometrics.

Carolina has one completed paper (at UCI, we require students to write a second-year paper by the Fall of the students' third year), titled "Central bank transparency under adaptive learning". In the paper, she studies the impact of central bank transparency and communication on private sector's beliefs about inflation and monetary policy, in a model with adaptive learning. In her first paper, she has decided to focus on the Mexican experience. The conventional assumption of rational expectations typically imposes strong informational requirements on economic agents: the level of knowledge that is required by the public may be unrealistic for a developed economy as the US, but it would be even more so for economies that have been subject to large degrees of structural instability, as in the case of Mexico over the last thirty years. Carolina estimates her model allowing for private-sector learning and using survey forecasts as additional observables (obtained from the Bank of Mexico's Survey on Expectations of Private Sector Specialist).

The central bank may suffer from imperfect credibility and limited transparency in its policy decisions, which may improve over the sample. Private-sector agents try to learn about the monetary policy rule that is implemented, and about the properties of inflation (for example, whether they fully believe that inflation will quickly revert back to the target or not, in response to shocks). In this way, private-sector participants are learning whether to trust the central bank before and after the transition to inflation targeting.

The paper's results show that economic agents in Mexico have been more responsive to their forecast errors than their US counterparts: the estimated constant gain coefficients are larger. Their perceptions about the persistence of inflation have fallen over time, and particularly after the adoption of inflation targeting. Finally, Carolina compares estimated versions of the model under different assumptions about transparency. The model that imposes the highest degree of transparency achieves the best fit of the data, suggesting that the Bank of Mexico did a good job in making monetary policy predictable.

Carolina is pursuing different ideas for future papers that could become part of her dissertation, all with a strong focus on expectations and sharing a common behavioral flavor. In one of these ideas, Carolina uses the results in Malmendier and Nagel (2016) as a starting point to study the formation of exchange rate expectations, and their aggregate consequences. In another, she plans to study nonlinearities related to the formation of macroeconomic expectations and their aggregate implications.

Carolina is a very talented student, who has the potential to write a strong dissertation in behavioral macroeconomics. She will benefit immensely from attending the program and being exposed to different models and approaches in the area. As a third-year student, she is actively working on her research, but she hasn't settled on a more ambitious research topic that can become the main focus of her future job market paper. The workshop will help her seeing up close how the best research looks like and provide her with inspiration for future ideas.

Therefore, I strongly recommend that you accept Carolina's application for participation in the Boot Camp.

Best regards,



Fabio Milani
Professor of Economics
University of California, Irvine