Department of Economics,
University of Minnesota
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Recommender: Manuel Amador
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March 20, 2023

Dear Selection Committee,

I am writing to express my interest in attending the second NBER Graduate Student Workshop on Heterogeneous-Agent Macroeconomics. I am currently a third-year Ph.D. student in Economics at the University of Minnesota. My fields of interest are international macroeconomics, sovereign default, and monetary policy, with a special focus on heterogeneity.

Prior to the Ph.D. I worked at the Macroeconomics Modeling Department of the Central Bank of Colombia for over three years, where I discovered my interest in monetary policy questions. There I participated in different projects that consisted of keeping the theoretical framework of the economic models up to date with the latest findings in the literature. These models are used to produce forecasts and advise the Board of Directors in its monetary policy decisions. This experience inspired me to investigate in my Master's thesis, at Universidad de Los Andes, whether monetary policy should be designed in a way that takes into account the possibility to prevent financial crises. To answer this question I built a small open economy model with nominal rigidities and endogenous financial crises. The model replicates the stylized facts around a crisis event, and I found that monetary policy could reduce the probability of a crisis at a cost of generating higher volatility in consumption. The final document was printed in 2019 in the Working Papers series of the Economics Department and was awarded the "Juan Luis Londoño" prize as the best Master's thesis written among all the graduates of the year.

After my time at the Central Bank, I joined the Research Department at the Inter-American Development Bank in Washington, D.C. There I conducted research on the implications of firm heterogeneity in macroeconomics. In "Domestic barriers to entry and external vulnerability in emerging economies" (with Victoria Nuguer and Alan Finkelstein-Shapiro, R&R at the *Journal of Economic Dynamics and Control*) we show that in response to adverse shocks to the US banking system, emerging economies with low firm-creation costs exhibit smaller contractions and earlier recoveries in cross-border bank flows, domestic bank credit, and GDP compared to those with high firm-creation costs. A two-country model with banking frictions, cross-border bank flows, and endogenous firm entry can successfully capture this evidence. Our findings suggest that greater domestic credit-market deepening via lower barriers to firm entry in emerging economies need not be associated with greater macro and financial volatility.

During my Ph.D. I have served as a teaching assistant for Principles of Microeconomics and Principles of Macroeconomics. These experiences have prepared me to teach courses on a range of topics in economics. My commitment to teaching has resulted in a portfolio of outstanding evaluations from students, as I was recently awarded the *Distinguished Teaching Assistant award*. Recently, I started studying the distributional effects of macroprudential policies, the transmission channel of the US interest rate to emerging markets through the interaction between monetary policy and default risk, and together with Cristina Arellano, we evaluate the role of official lending and debt-acceleration clauses during default episodes.

I am particularly drawn to the workshop's emphasis on computational methods on heterogeneous-agent models, as they would equip me with the state-of-the-art tools to efficiently solve the models of my third-year projects. Last year I worked directly with the *Sequence-Space Jacobian* toolkit, as I was the research

assistant for the paper "Micro risks and Pareto improving policies" by Mark Aguiar, Manuel Amador and Cristina Arellano. In this project, I recalibrate the Krusell-Smith model and retrieved some Jacobians from the solution to evaluate the feasibility of Pareto-improving fiscal policies. I am eager to expand my knowledge on these solution methods, and I believe that this workshop will provide an excellent opportunity for me to do so.

As part of my application, I include my CV and the statement of motivation.

Thank you for your consideration. I look forward to the opportunity to contribute to and learn from the workshop.

Sincerely,

Leonardo Barreto
Ph.D. student
Department of Economics
University of Minnesota

LEONARDO BARRETO

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EDUCATION

Ph.D. in Economics (in progress) *2020 - Present*
University of Minnesota, Twin Cities, Minneapolis, MN, USA

M.A. in Economics *2020 - 2023*
University of Minnesota, Twin Cities, Minneapolis, MN, USA

M.A. in Economics *2014 - 2017*
Universidad de Los Andes, Bogotá, Colombia

B.A. in Economics, *cum laude* *2010 - 2014*
Universidad de Los Andes, Bogotá, Colombia

PROFESSIONAL EXPERIENCE

Research Analyst, Research Department *2022 - Present*
Federal Reserve Bank of Minneapolis, Minneapolis, MN, USA

Consultant, Department of Research and Chief Economist *Summer 2022*
Inter-American Development Bank, Washington, D.C., USA

Consultant, EAP Chief Economist Unit *Summer 2022*
World Bank, Washington, D.C., USA

Research Fellow, Department of Research and Chief Economist *2018 - 2020*
Inter-American Development Bank, Washington, D.C., USA

Economist, Macroeconomic Modeling Department *2014 - 2018*
Central Bank of Colombia, Bogotá, Colombia

TEACHING EXPERIENCE

Teaching Assistant at University of Minnesota, Twin Cities
Principles of Macroeconomics (B.A.) *2021-2022*
Principles of Microeconomics (B.A.) *2020-2021*

Teaching Assistant at Universidad de Los Andes
Advanced Macroeconomics (M.A. / Ph.D.) *2016 - 2017*
Macroeconomics II (B.A.) *2016*
Macroeconomics and International Finance (B.A.) *2014 - 2015*
Fiscal Theory and Policy (B.A.) *2013*

Teaching Assistant at Universidad del Rosario
Monetary Theory and Policy (B.A.) *2015 - 2016*

FELLOWSHIPS AND AWARDS

Distinguished Teaching Assistant, University of Minnesota, Twin Cities *2022*
Based on the teaching performance in Principles of Macroeconomics

Juan Luis Londoño Prize, Universidad de Los Andes *2018*
Best M.A. thesis of the year at the Department of Economics

***Cum Laude* B.A. Graduation, Universidad de Los Andes** *2014*
Top 3% of the historical GPA distribution at the Department of Economics
Ranked second out of 117 graduates

Academic Excellence Scholarship, Universidad de Los Andes *2012*
Highest GPA of the previous semester at the Department of Economics
5 on the 5-Point System

"Quiero Estudiar" Scholarship, Universidad de Los Andes *2010 - 2014*
Top 1% of the score distribution in the high school standardized exam

RESEARCH

Official sovereign debt (with Cristina Arellano), in progress

Domestic barriers to entry and external vulnerability in emerging economies (with Victoria Nuguer and Alan Finkelstein-Shapiro), Revise and Resubmit, Journal of Economic Dynamics and Control, 2023

Nonconventional monetary policy in a regime-switching model with endogenous financial crises. Documentos CEDE 016382, Universidad de los Andes. 2018.

ADDITIONAL INFORMATION

Languages English (fluent), Spanish (native)
Software LaTeX, Stata, MATLAB, Julia, Python, Fortran

MACROECONOMICS PH.D. COURSES

- Macroeconomic Theory, first year Ph.D. sequence
- Heterogeneous Agents Models, with Mariacristina De Nardi
- Monetary Economics, with Cristina Arellano and Marco Bassetto
- Computational Economics, with Ellen McGrattan and Anmol Bhandari
- International Macroeconomics, with Manuel Amador
- Empirical Methods for Dynamic Economies, with Fatih Guvenen
- Labor Economics, with Loukas Karabarbounis and Fatih Guvenen
- Public Economics, with Jonathan Heathcote and V.V. Chari
- International Trade and Payments Theory, with Timothy Kehoe

Cristina Arellano
Monetary Advisor
Research Department
Federal Reserve Bank of Minneapolis
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Manuel Amador
Curtis L. Carlson Professor of Economics
Department of Economics
University of Minnesota, Twin Cities
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Timothy J. Kehoe
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Paulina Restrepo
Senior Economist
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March 20, 2023

Dear Selection Committee,

The motivation for attending the second NBER Graduate Student Workshop on Heterogeneous-Agent Macroeconomics comes from two different sources: (i) my research interests on heterogeneous-agents macroeconomics, monetary policy, sovereign debt, and computational methods; and (ii) my previous research assistant experience working for Mark Aguiar, Manuel Amador, and Cristina Arellano with the *Sequence-Space Jacobian* toolkit.

During the third year of the Ph.D., I began to conduct research on two different projects. The first project studies the distributional effects of macroprudential policies in a model with households' heterogeneity and financial crises. The literature has focused on how such policies influence the transmission mechanism driving a financial crisis, assuming a representative agent framework. This approach abstracts from the interaction between inequality, macroeconomic policy, and aggregate risk. The second project analyzes the transmission channel of the US interest rate to emerging markets business cycles through the interaction between monetary policy and default risk. To do so, I am working on solving a New-Keynesian-Default model with foreign interest rate shocks. I plan to use the discrete-choice method with extreme-value taste shocks that is common in the default literature and is included in the syllabus of the workshop.

Additionally, last year I had the opportunity to be the research assistant for the paper "Micro risks and Pareto improving policies" by Mark Aguiar, Manuel Amador, and Cristina Arellano. This paper studies fiscal policies that induce Pareto improvements in the class of incomplete markets models of Bewley-Huggett-Aiyagari when the interest rate on government debt is below the growth rate. Here I worked directly with the *Sequence-Space Jacobian* toolkit. My work here consisted of calibrating the Krusell-Smith model to match a negative interest rate in steady-state and retrieving the Jacobians to calculate a present discounted value of savings elasticities. Such a value indicates whether a Pareto improvement is feasible or not. While working on this paper, I developed a keen interest in understanding the solution method in the background and how to apply it to my research.

Thank you for considering my application. I am excited about the opportunity to participate in this workshop and look forward to hearing from you soon.

Sincerely,

Leonardo Barreto
Ph.D. student
Department of Economics
University of Minnesota