

Workshop on DSGE Modeling and Climate Risk for Central Banks

CEMLA, Mexico City, March 27 – 31, 2023

Objectives

The Climate Financial Risk Center (CFRC) is organizing its first Workshop on DSGE Modeling and Climate Risk for Central Banks. The workshop aims at enhancing central banks' methodological capacities to assess climate-related risks under scenarios of physical and transition risks, focusing on dynamic stochastic general equilibrium (DSGE) models that can be used to incorporate climate shocks, regulatory innovations, and other related emerging risks into well-established methodological frameworks.

The workshop takes the form of an intensive course in which central bank researchers and analysts with experience in DSGE modeling can learn about state-of-the-art approaches to assess the implications of financial sector dynamics, financial regulations, and climate-related shocks and uncertainty for macroeconomic outcomes. The course is motivated by the widespread use of DSGE modeling in central banking and by recent advances in using this approach to assess welfare trade-offs of climate change policies, to quantify the effects of climate-related shocks and adaptation policies, and to explore long-term effects of climate risk in terms of shifts in the distribution of investment and other macroeconomic outcomes.

The workshop provides a unique space for a small group of experienced central bankers to interact, learn recent advances in DSGE modeling, and to incorporate novel methodological tools in policy analysis. Following up the workshop, participants will work in country teams to prepare short policy notes summarizing how they can incorporate climate-related risks in their quantitative models. These reports will be published in a Special Issue of the Latin American Journal of Central Banking edited by Prof. Dimitrios Tsomocos (Oxford University) and participants will be invited to share their lessons with the community of central banks across Latin America and the Caribbean.

Format

The workshop will take place in half-day morning sessions in person at CEMLA's premises in Mexico City between March 27 and 31, 2023. The CFRC is inviting teams of two participants per central bank, who will get their travel costs (flight in economy class and accommodation) plus a travel allowance covered to facilitate their participation. The workshop is being designed by CEMLA's Financial Stability Directorate in cooperation with Prof. Dimitrios Tsomocos from Oxford University, who will lead the workshop's lessons, guide the country teams, and provide feedback for the term papers to be derived from the workshop. Participants can expect to have an intense interaction with Prof. Tsomocos during the workshop, which will be restricted to a maximum of 12 participants.

Agenda

This workshop aims at working over 5 days in-person with teams of researchers from the central banks of Chile, Colombia, Mexico, Uruguay, Brazil, and Costa Rica. 2 researchers with experience in DSGE modeling per central bank will be invited to participate in the activity. The agenda of the workshop follows the one of an advanced (i.e., Ph.D. level) short course, including an introduction to DSGE modeling, the inclusion of financial sector and financial regulation in these models, and applications with climate risk/scenarios of climate change. The sessions are organized in half-day blocks as follows:

Session 1 – March 27 A primer on equilibrium analysis with financial sector (“recap session”)

- *Securities Markets and Arbitrage*
- *State Pricing and A-D Equilibrium*
- *G.E.I. and Default*

14:00 - 14:30 *Introduction*

14:30 - 15:45 *Session 1*

15:45 - 16:15 *Break*

16:15 - 17:30 *Session 1 (cont'd)*

Session 2 – March 28 DSGE models and the financial sector

- *Liquidity and Default in DSGE*
- *Analysis of Credit Policies during the COVID Pandemic*

10:00 - 11:15 *Session 2*

11:15 - 11:45 *Break*

11:45 - 13:00 *Session 2 (cont'd)*

Session 3 – March 29 Applications with financial regulation

- *Optimal Regulation Under the Presence of Credit and Run Risk*

10:00 - 11:15 *Session 3*

11:15 - 11:45 *Break*

11:45 - 13:00 *Session 3 (cont'd)*

Session 4 – March 30 DSGE applications with climate risk

- *Introduction to Climate Risk*
- *Latin American Experience*

10:00 - 11:15 *Session 4*

11:15 - 11:45 *Break*

11:45 - 13:00 Session 4 (cont'd)

13:00 - 14:30 Lunch

14:30 - 15:45 Session 5. DSGE applications with climate risk

- *A Critical Assessment of Integrated Assessment Models*
- *Distributional Consequences of Climate Change*

Session 5 – March 31 DSGE applications with climate risk (cont'd)

9:00 - 10:15 Session 5 (cont'd)

The organizers will provide in advance a detailed description of the syllabus and material to prepare the sessions in advance. The organizers will contact the nominated participants to make the logistical arrangements ahead of their participation.

Academic materials/references

Session 1 – March 27 A primer on equilibrium analysis with financial sector (“recap session”)

- *Lucas, R. (1978), “Asset Prices in an Exchange Economy”, Econometrica, Vol 46 (6), pp 1429-1445*
- *Tsomocos, D.P. (2003). “Equilibrium Analysis, Banking and Financial Instability,” Journal of Mathematical Economics, 39, Issues 5-6: 619-655.*
- *Espinoza, Goodhart and Tsomocos (2009), “State Prices, Liquidity and Default”, Economic Theory, 39(2)*

Session 2 – March 28 DSGE models and the financial sector

Session 3 – March 29 DSGE applications with financial regulation

- *Kashyap, Tsomocos and Vardoulakis (2020) “Optimal Bank Regulation In the Presence of Credit and Run Risk”, NBER Working Paper 26689.*

Session 4 – March 30 DSGE applications with climate risk

- *Financial stability reports (2022), Central Banks of Chile, Colombia, México, Brasil.*
- *Bernal-Ramírez et al (2022), Impacto macroeconómico del cambio climático en Colombia (ESPE, 102).*

Session 5 – March 31 DSGE applications with climate risk (cont'd)

- *Khemka Aditya, Tsomocos (2023) Financial Regulation and Distributional Consequences of Climate Change, mimeo.*

Requisites

Nominated participants are expected to have experience in DSGE modeling in their central banks. Previous knowledge of DSGE modeling including financial sector dynamics is advisable but not required. Participants are expected to deliver a short policy note (between 10-15 pages long) within the five months following the workshop (by September 1st, 2023), based on a working schedule that will be provided in advance. Participants will be invited to participate in one short call (45 min) to discuss the country teams' advances in their term paper in May, 2023. There is no pre-requisite in terms of academic background; however, participants may benefit from previous knowledge of financial economics, central banking, quantitative modeling, and econometrics.

Contact

The workshop is being coordinated by Dr. Peter Karlström from CEMLA's Financial Stability Directorate / CFRC. For questions, please contact Dr. Karlström at the email pkarlstrom@cemla.org