Multisector DSGE models based on Input-Output tables: Applications with Dynare and Matlab

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Summary of the Training Session:

The impact of any significant economic policy change is the net effect of various forces operating in different directions. One of the main challenges for policymakers is to assess the relative strength of each of these components. As economists, we have several tools at our disposal to perform these assessments. Dynamic Stochastic General Equilibrium (DSGE) models are the primary tool to carry out such evaluations in an open and transparent way. Moreover, understanding these models' design is crucial as they are used in major economic institutions for policy decision-making.

In this one-day introductory course, divided into four sections, we will explore both the real business cycle DSGE model and a multisectoral open economy DSGE model. This advanced model incorporates rigid prices and heterogeneous production sectors. Unlike conventional approaches, this model relaxes the standard symmetry assumption, allowing idiosyncratic sector dynamics in response to various policy shocks.

Outline:

First Session *Development of the real business cycle DSGE model and solution methods.*

Second Session *Introduction to Dynare and solution of the cycle model in Dynare with practical applications.*

Third Session *Explanation and development of the multisectoral open economy DSGE model.*

Fourth Session *Practical exercises based on the sectorial model using ECLAC's multiregional input-output matrix to calibrate the model and analyze different scenarios.*

Prerequisites:

1. *Basic Knowledge: Participants should have a basic understanding of macroeconomics concepts such as national income, gross domestic product (GDP), inflation, unemployment, savings, and investments. Familiarity with the concepts of Dynamic Stochastic General Equilibrium (DSGE) models would be beneficial.*
2. *Software Requirements: Participants must bring a computer with MATLAB installed. It is crucial to ensure that MATLAB is correctly installed and functioning on your computer.*

3. **Dynare Installation:** *Participants should download and install the latest version of Dynare. After installation, the Dynare folder will contain several sub-directories, including 'matlab', 'mex', and 'doc'. Detailed installation instructions can be found on the Dynare website.*
4. **Preparation:** *It is recommended that participants familiarize themselves with the basic functions and commands of MATLAB and Dynare before the course.*

Suggested References:

1. *Macroeconomics:*
   - *"Macroeconomics" by N. Gregory Mankiw: This book provides a comprehensive introduction to macroeconomic concepts.*
   - *"Advanced Macroeconomics" by David Romer: This book offers more advanced insights into macroeconomic theory and policy.*
2. *Dynamic Stochastic General Equilibrium (DSGE) Models:*
   - *"Recursive Macroeconomic Theory" by Lars Ljungqvist and Thomas J. Sargent: This book provides an introduction to DSGE models and their applications.*
   - *"Introduction to Dynamic Macroeconomic General Equilibrium Models" by José Luis Torres Chacon: This book offers a more in-depth look at DSGE models, with plenty of practical examples.*
3. *MATLAB and Dynare:*
   - *MATLAB Fundamentals. This course provides a basic introduction to using MATLAB. https://matlabacademy.mathworks.com/es/details/matlab-fundamentals/mlbe*
   - *"User Guide on Dynare" (available on the Dynare website): This guide offers practical instructions for installing and using Dynare. https://www.dynare.org/*
4. *Multisectoral Models:*
   - *"Input-Output Analysis: Foundations and Extensions" by Ronald E. Miller and Peter D. Blair: This book provides an introduction to input-output models, a key component of the multisectoral model we will be using in the course.*