Introduction to Dynamic Stochastic General Equilibrium (DSGE) Modeling

Objective of the course

The Introductory Course on Dynamic Stochastic General Equilibrium (DSGE) Modeling is a hands-on training programme designed to equip policymakers, central bank staff, statisticians, researchers, and graduate-level economists with foundational theoretical and practical skills in building, solving, and interpreting DSGE models for macroeconomic and policy analysis. The course introduces participants to the core structure of DSGE models, including households, firms, government, and monetary policy, and demonstrates how these models are used to analyze macroeconomic shocks, fiscal and monetary policy, and long-run economic dynamics. Delivered through a combination of lectures, guided coding sessions, and practical exercises, the course emphasizes applied learning using standard DSGE tools and software. The training is delivered in a structured, module-based format and is suitable for participants with basic knowledge of macroeconomics and quantitative methods. The course is delivered in five modules as follows.

- **Module 1: Foundations of DSGE Modelling and Computational Environment**
    - Overview of modern macroeconomic modeling frameworks
    - Introduction to DSGE models and their empirical applications in macroeconomic policy analysis
    - Role of DSGE models in fiscal and monetary policy formulation
    - Introduction to coding in MATLAB and Dynare software environments
    - Basic programming concepts for DSGE modelling
    - Introduction to inter-temporal optimization and forward-looking expectations
- **Module 2: Real Business Cycle (RBC) DSGE Model**
    - Microeconomic foundations of RBC models
    - Household and firm optimization under perfect competition
    - Firm production, technology, and price setting
    - Technology stocks and business cycle fluctuations
    - Capital accumulation and labour supply decisions
    - Hands-on development of a basic RBC model in Dynare
    - Policy relevance of RBC frameworks
    - Comparisons of RBC and Old Keynesian DSGE model
    - Treatment of expectations in the Old-Keynesian model
- **Module 3: The Baseline New Keynesian DSGE Model**
    - Transition from RBC to New Keynesian frameworks
    - Structure of the Baseline New Keynesian DSGE model
    - Market clearing conditions and equilibrium definition
    - Nominal rigidities and price stickiness (calvo setting)
    - Fiscal and monetary policy rules (Taylor) in New Keynesian models
- **Module 4: Calibration and Model Extensions**
    - Calibration of DSGE models
    - Identification of key structural parameters
    - Steady-state computation

- o Advanced agents: Optimizing and Rule-of-Thumb consumers
    - o Sensitivity analysis and model validation
    - o Introduction to Open Economy DSGE frameworks
    - o Exchange rates, trade linkages, and external sector dynamics
- ■ **Module 5: Policy Simulations, Impulse Response Functions and Reporting**
    - o Fiscal policy modelling (taxation and public expenditure)
    - o Running policy simulations in Dynare
    - o Generating Impulse Response Functions (IRFs)
    - o Scenario analysis for macroeconomic policy evaluation
    - o Interpretation of DSGE simulation results
    - o Welfare and macroeconomic impact analysis
    - o Communicating DSGE results for policy decision-making

Mode of delivery

The course is delivered through an intensive, hands-on approach in which participants systematically build the standard DSGE model, over the duration of the training. The programme is highly sequential, requiring full attendance at all sessions, as each step builds directly on the previous one. Participants work in teams to enhance peer learning and methodological coherence, while each participant is required to have an individual laptop and mouse for practical implementation. By the end of the course, each team presents policy simulation results generated from their model. For the online delivery option, participants are required to submit all assignments within the stipulated timelines to ensure completion within the scheduled period, as extensions may incur additional facilitation costs. To apply for this course, fill in the form below or send an email to apply@macrosolve.net or macrosolveinfo@gmail.com.