Annual Short Course in Global Trade Analysis
"Introduction to Applied General Equilibrium Analysis in a Multi-Region Framework"

Background

The short course consists of two parts. The online phase is an eight-week sequence where students get in-depth training about the microeconomic underpinnings of applied general equilibrium (AGE) models. The online course allows for self-paced learning on a modular basis. Each weekly module requires an end of week submission that triggers feedback from the instruction team. The onsite course is a mix of lecture and lab sessions designed to develop the economic intuition required to perform high-level policy analysis using the GTAP Model and Data Base. These activities culminate in a major application undertaken by small groups and presented on the final day of the course.

Objectives

- introduce participants to a standardized framework (GTAP Model, version 7) for conducting global policy analysis in an applied general equilibrium setting

- provide participants with hands-on training with software that has been tailored to instruction in economic analysis with minimal software manipulation overhead

- deliver participants an opportunity to interact with economists working on global trade and resource use issues and provide the perfect entry point to the international network of AGE modelers and policy analysts using GTAP data and models

Course Structure

Part I: Online Modules - Part I is an eight-week online program to refresh and reinforce microeconomic foundations of AGE analysis. Each weekly module culminates in a deliverable submitted to the course instruction team. Course participants receive individualized feedback on each of their submissions. By working through this material in advance of the onsite course, participants will become intimately familiar with not only the theory behind AGE models, but also the notation conventions that are specific to GTAP data and models. Additionally, the online course is designed to improve student facility with the course software so that lab sessions in the onsite portion of the course can focus efficiently on the economic analysis of global policy problems. The modules covered during the online portion of the course follow:

1. **Getting Started:** This module motivates the use of Applied General Equilibrium Analysis. We introduce the GTAP Model in a simple, one-region setting, as well as some of the basic notations used in the model.

    - Topics Covered:
        - Overview of the GTAP Framework
        - Introduction to Accounting Relationships

- o Detailed Listing and Derivation of Accounting Equations
- o Introduction to Price Linkages
- o Detailed Listing and Derivation of Price Linkages
- o Tax/Subsidy Conventions

2. **Overview of the GTAP Framework:** This module documents the notations used in the one-region model, as well as the basic marginal relationships between quantity, price and macroeconomic variables.

    - Topics Covered:
        - o Overview of the GTAP Framework
        - o Introduction to Accounting Relationships
        - o Detailed Listing and Derivation of Accounting Equations
        - o Introduction to Price Linkages
        - o Detailed Listing and Derivation of Price Linkages
        - o Tax/Subsidy Conventions
        - o OneGTAP Tutorial - Part II: What comes out?

3. **Producer Behavior:** This module presents in more details the manner in which the firm combines individual inputs to produce its output. We will review the major assumptions behind producer behavior in the OneGTAP CGE model, with the underlying behavioral equations and parameters.

    - Topics Covered:
        - o Introduction to Producer Behavior
        - o Restrictions on the Producer Function
        - o Notes on Restrictions on the Production Function
        - o The Nested CES Production Function
        - o The Nested CES Case
        - o A Specific Production Function
        - o Conditional Producer Response to a Change in Input Price
        - o Linearization of the CES and Analysis of Technical Change
        - o Introduction to AnalyseGE

4. **Household Behavior:** This module introduces household behavior, government behavior and savings in the One-Region Model. Don't miss the illustrative simulation; we prepared a hands-on introduction to AnalyseGE. This movie will show you how to use AnalyseGE to further decompose OneGTAP's results.

    - Topics Covered:
        - o Final Demand in the One-Region Model
        - o General Restrictions on Consumer Demand
        - o Treatment of Government and Savings Demands
        - o CDE Expenditure Function
        - o Household Response to a Price Change
        - o Notes on Final Demand in the Presence of Non-homothetic, Weak Separability
        - o Understanding Complementarity in the CDE Demand System
        - o CDE Expenditure Function: Weak, Non-homothetic Separability

5. **Supply Response:** This module introduces the relationships between technology, factor mobility, and firm supply response. This will allow us to further decompose sectoral supply response.

- Topics Covered:
  - Overview of Supply Response in the One-Region Model
  - Notes on Supply Response
  - Supply Response to a Change in Producer Prices

6. **Market Equilibrium:** In this module we put together the determinants of industry input demands and output supplies, and we introduce the concept of an equilibrium elasticity. This concept offers a useful means of combining knowledge of individual agents' behavior to make inferences about market relationships.

- Topics Covered:
  - Market Demand
  - Equilibrium Demand Elasticities and Incidence of a Subsidy
  - Links between AGE Analysis and Input-Output Analysis
  - Partial vs. General Equilibrium Closures
  - Market Demand Response to a Price Change
  - Social Accounting Matrices (SAMs)
  - Macro-Accounting in a SAM

7. **Welfare Decomposition:** To introduce Equivalent Variation (EV) as a welfare indicator and learn how we can decompose welfare changes into its constituent parts.

- Topics Covered:
  - Equivalent Variation as a Measure of Welfare Changes
  - Welfare Decomposition
  - Welfare Change due to an Output Tax

8. **GTAP Data Base:** The purpose of this topic is to give you some background on the development of the GTAP Data Base.

- Topics Covered:
  - Data Base Overview
  - Trade Data
  - Other Macro Data

Part II: Onsite intensive training - Part II is an intensive, onsite short course consisting of lectures, lab assignments, and informal discussions designed to introduce participants to the basic features of the updated, GTAP Model (version 7) and GTAP Data Base. These activities culminate in a major application based on an extension of the GTAP Model. This second phase of the course consists of small group work on student experiments that extend published GTAP findings in some dimension. Two instructors per small group serve as resources guiding replication and extensions developed by students. This capstone experience is designed to prepare students for designing, conducting, and analyzing their own simulations as they continue working with GTAP after the course. The daily content overview follows:

DAY 1
- Welcome and Course Motivation
- Overview of the GTAP Framework
- Accounting Relationships and Market Clearing Conditions
- Hands-On Computing

- Price Linkages and Taxes in the Multi-Region Model
- GTAP Data Base I

DAY 2
- Behavioral Equations for Production
- Trade, Armington, and Transportation
- Standard GTAP Closures
- Interpretation of Model Results I
- Global Bank
- Final Demand
- GE Mechanisms and the Real Exchange Rate

DAY 3
- Alternative Closures
- GTAP Data Base II
- Interpretation of Model Results II
- Decomposing Welfare Changes in GTAP
- Introduction to Group Projects

DAY 4
- Group Project Meetings

DAY 5
- Group Project: Replicating the Application, Planning, Implementing, and Analyzing the Extension

DAY 6
- Group Project: Analysis Wrap-up, Presentation Development and Delivery
- Wrap-up Discussions and Final Course Evaluation

Contact
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