



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 models. Although the online course allows for self-paced learning, students are expected to submit weekly homework assignments which are individually graded. The onsite course mixes daily lectures with 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. Each group is assigned two instructors who are intimately familiar with their project to act as resource persons. Participants leave with the capability of designing, conducting, and analyzing their own policy simulations.

Objectives

- To introduce participants to a standardized framework for conducting global policy analysis in an applied general equilibrium setting
- To provide participants with ample hands-on training with software that has been tailored to global economic analysis
- To give participants the opportunity to interact with economists working on global trade and resource use issues, and become part of an international network

Course Structure

Part I: Web-based Modules - Part I is an eight-week online program structured to strength the microeconomic foundations of applied general equilibrium analysis. Each weekly module culminates in a homework assignment. Homework assignments are individually graded so participants receive individualized feedback on their progress. By working through this material in advance of the onsite course, participants will become intimately familiar with the theory behind applied general equilibrium models, the standard GTAP notation as well as the course software. The eight 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

- Detailed Listing and Derivation of Accounting Equations
 - Introduction to Price Linkages
 - Detailed Listing and Derivation of Price Linkages
 - 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:
 - Overview of the GTAP Framework
 - Introduction to Accounting Relationships
 - Detailed Listing and Derivation of Accounting Equations
 - Introduction to Price Linkages
 - Detailed Listing and Derivation of Price Linkages
 - Tax/Subsidy Conventions
 - 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:
 - Introduction to Producer Behavior
 - Restrictions on the Producer Function
 - Notes on Restrictions on the Production Function
 - The Nested CES Production Function
 - The Nested CES Case
 - A Specific Production Function
 - Conditional Producer Response to a Change in Input Price
 - Linearization of the CES and Analysis of Technical Change
 - 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:
 - Final Demand in the One-Region Model
 - General Restrictions on Consumer Demand
 - Treatment of Government and Savings Demands
 - CDE Expenditure Function
 - Household Response to a Price Change
 - Notes on Final Demand in the Presence of Non-homothetic, Weak Separability
 - Understanding Complementarity in the CDE Demand System
 - 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 a mix of daily lectures, lab assignments, and informal discussions designed to introduce participants to the basic features of the model and data base. These activities culminate in a major application based on one of the many extensions of the GTAP Model undertaken by small groups and presented on the final day of the course. Each group is assigned two instructors who are intimately familiar with their project to act as resource persons. Participants leave with the capability of designing, conducting, and analyzing their own simulations. The daily content overview follows:

DAY 1

- Welcome and Course Motivation
- Overview of the GTAP Framework
- Accounting Relationships and Market Clearing Conditions
- Price Linkages
- GTAP Data Base I: Overview
- Overview of Course Software

DAY 2

- Hands-on Computing and Programming in GEMPACK
- Behavioral Equations for Production
- Trade, Armington, and Transportation
- Standard GTAP Closures
- Global Bank
- Final Demand I: Structure and Calibration
- Model Simulation using RunGTAP

DAY 3

- GTAP Data Base II
- GE Mechanisms and the Real Exchange Rate
- Interpretation of Model Results I: EU/USA Tariff Cut
- Alternative Closures
- Decomposing Welfare Changes in GTAP

DAY 4

- Interpretation of Model Results II: Technical Change
- Allocate to Small Groups for replicating an extending cutting edge applications in the areas of trade and the environment.

DAY 5

- Presentations on Special Topics
- Small groups work on Replication of Application
- The art of writing a good CGE research paper

DAY 6

- Other GTAP Software Tools
- Small groups work on Replication of Application

DAY 7

- Small Group Presentations
- Final Course Evaluation and Wrap-up Discussions

Contact

Please direct all questions on this course to:

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