Modeling International Trade

Short Course on CGE Modeling, United Nations ESCAP

John Gilbert

Professor
Department of Economics and Finance
Jon M. Huntsman School of Business
Utah State University
jgilbert@usu.edu

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Introduction

- We have now constructed the two main building blocks of a CGE model, a basic demand block and a production block (in a couple of flavors).
- Our next step is to bring the two together and thereby form a basic model of international trade.
- We'll start with a small country model, and then consider extensions to the large country case.

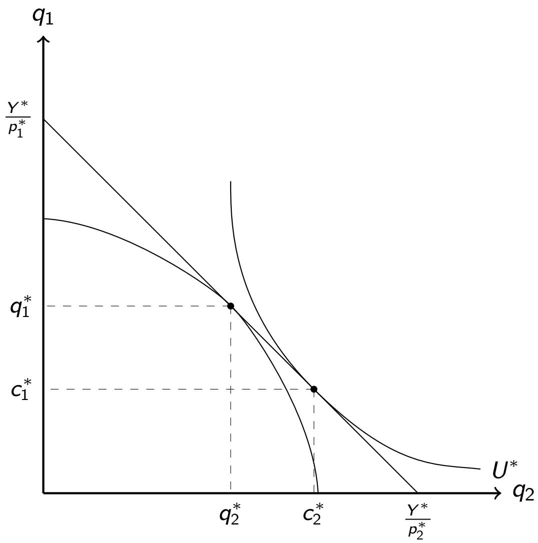
Session Outline

1. Building a model of a small open economy
2. Building a model of a large open economy

Small Economy

- A small economy is defined as one for which the world prices are fixed.
- We already have the pieces we need to build a model of a small economy engaging in free trade.
- To do so, we use one of our models of production to model the supply side.
- The solution to the problem is the maximum value of income (GDP) at world prices.
- Given we can then solve the representative consumer's problem to characterize demand.
- International trade is the difference between the production and consumption bundles.

Geometric Interpretation



GAMS Program

1. Start with one of the models of production.
2. Add in the variables and parameters associated with consumption (`ALPHA`, `BETA(I)`, `C(I)` and `U`).
3. Replace income (`Y`) with `GDP` at all occurrences.
4. Define a new variable `X(I)` (and corresponding initial value) to hold the trade flows. This should not be bounded.
5. Add a new equation to the model to determine the trade flows as `X(I)=E=Q(I)-C(I)`.
6. Set up the model and solve statements.

Exercises

- Holding prices constant, what happens to net exports of each good as you increase the stock of capital in the economy? What if you increase the stock of labor?
- What is the numéraire here?
- How does the economy respond to a terms-of-trade shock?
- In this model we did not include a trade balance equation. Can you use the model results to show that trade balance is in fact implied by the other equations in the system?

Large Economy

- A large economy is defined as one that is able to influence world prices.
- In other words, a large country model endogenizes world relative prices.
- This can be accomplished by adding a demand/supply curve for exports/imports.