

EE320 Chapter 1

Introduction

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Logistic Information

- Section 046403
- Instructor: Panit Wattanakoon
- Venue: 304, 11.00am-12.30pm
- Contact: panit@econ.tu.ac.th
- Office hours: 446 by appointment (via email)

Evaluations

■ Evaluations:

- ▶ Quizzes 15 % (6 quizzes, drop the lowest one)
- ▶ Group assignments 10 % (maximum 4 persons)
- ▶ Midterm exam 30%
 - Date: September 29, 2020, 12.00 - 14.00 hrs.
- ▶ Final exam 45%
 - Date: December 14, 2020, 13.30 – 16.30 hrs.

- Lecture handouts/notes will be posted on BE moodle a few days/hours in advance
 - ▶ So check BE moodle regularly!

Other logistic info

- Class starts at 11.10am
- No cell phone, no social media, no FB live
- Questions and comments are always welcome.

Economic model

- We use a model-based framework to study the economy
- What is a model?
 - ▶ Model is an abstract or a simplified form of the problem that we are interested in
 - ▶ Since reality is too complex, we simplify economic phenomena into economic model and try to explain it
 - ▶ Example: GPS has no need to include information on topography, climate, and vegetation, it needs only a part of the earth's surface to guide direction.

Broad analytical questions in economics

Static Equilibrium (Behavioral) Analysis

■ Example:

- ▶ At what price do we trade?: Interaction between consumers and firms
- ▶ Behavior of firms?: Maximize profit, shareholders' dividends, etc
- ▶ Behavior of consumers?: Maximize utility, minimize budget, etc

Comparative Static Equilibrium (Behavioral) analysis

■ Example

- ▶ What happen to the trading price when a pandemic strikes?
- ▶ What happen to firms when government imposes tax?

Dynamic Equilibrium (Behavioral) Analysis

■ Example

- ▶ What is the adjustment process toward the new trading price?
- ▶ How do firms set price over time?

In this semester, we are going to

- Use maths to formalize all these analytical questions.
- Rewrite and Analyze the model concepts discussed in the first year using maths

Why maths in economic model?

Answer: There are at least two (important) reasons

- 1 First, mathematics is more general approach to represent ideas. It is precise and concise. Words are sometimes ambiguous.
- 2 Second, economists need to deal with empirical analysis, i.e. validate the model, and cross-check the model implications with data.
 - ▶ While qualitative predictions are important, many are more interested in quantitative ones.
 - ▶ This fundamentally requires the formulation of a model in its quantitative version; mathematics evidently come into play.
 - ▶ In addition, statistical techniques can be linked to mathematical models, allowing for a more rigorous validation of model against the data.

Math concept in economic model

A math representation to describe economic relationships in a model

- Variable: quantity or amount of some objects whose value can be changed.
 - ▶ Price of goods x : p_x
 - ▶ Quantity demanded of goods x : q_x
- Equation: a description of the relationship of variables
 - ▶ Demand for goods x : $q_x^d = a - bp_x$
- Parameters: a constant in an equation that varies in other equations of the same general form.
 - ▶ (a, b) in $q_x^d = a - bp_x$
- Interactions among equations yield behavioral outcome or equilibrium

Equations and Identities

- Definitional Equation sets up an identity between two alternative expressions that have exactly the same meaning. The symbol $\equiv$ (identical-equality sign) is used between the two expression.
 - ▶ Ex. $\pi \equiv \text{Revenue} - \text{Cost}$
- Behavioral Equation specifies the manner in which a variable behaves in response to changes in other variables.
 - ▶ Ex. $TC = 80 + 20Q$
 - ▶ Ex. $C = a + bY$
- Conditional Equation states a requirement to be satisfied.
 - ▶ Ex. Equilibrium Condition $Q^d = Q^s$
 - ▶ Ex. Break-even Condition $\pi = TR - TC = 0$

Example

Consider the market equilibrium model

$$\text{Equation 1: } Q^d = a - b \cdot P - cY^d$$

$$\text{Equation 2: } Y^d = Y - T$$

$$\text{Equation 3: } Q^s = d + e \cdot P - f \cdot \textit{Temperature}$$

$$\text{Equation 4: } Q^d = Q^s$$

Notations defined as follows:

■ Variables:

- ▶ Q^d = quantity demanded, Q^s = quantity supplied, P = price,
- ▶ Y^d = total disposable income, Y = Gross income, T = Lump-sum tax, $\textit{Temp}$ = temperature

■ Parameters:

- ▶ (a, b, c, d, e, f) coefficients or parameters that are all positive