1. Course Introduction

• Title:
  – Public finance
  – Public economics
  – Public-sector economics

• Focus of economic analysis:
  – Resource allocation: \textit{efficiency}
  – Income distribution: \textit{equity}

• \textbf{Govt intervention} due to \textit{market failure}:
  – Government expenditures/spendings
  – Government revenues: taxation
2. Neo-classical Arrow-Debreu Analysis

2.1. Consumer exchange economy: 2 goods \((x, y)\)

- **Edgeworth box**: feasible allocations of fixed total endowment

\[
x_A + x_B = X
\]
\[
y_A + y_B = Y
\]

- Indifference curves (IC): **diminishing MU**
- Bargaining process: based on mutual consent
  - ▶ Contract curve
• MRS (marginal rate of substitution): slope of IC

$$\text{MRS}_{i}^{y,x}$$

▷ How many $x$ are you willing to give up for one more $y$?
▷ How many $x$ is a $y$ worth?

• Market equilibrium:

$$\text{MRS}_{A}^{y,x} = \text{MRS}_{B}^{y,x}$$

• Competitive economy: many consumers, complete info

  – Exchange rates (prices) between goods are fixed
  – All consumers are price takers: no market power
    ▷ Consumers take prices $(P_x, P_y)$ as given/fixed
  – Consumer utility max:

$$\text{MRS}_{i}^{y,x} = \frac{P_y}{P_x}, \forall i$$

– Adjustment process:

  * Buy more $y$ if:

$$\text{MRS}_{i}^{y,x} > \frac{P_y}{P_x}$$

  * Buy more $x$ if:

$$\text{MRS}_{i}^{y,x} < \frac{P_y}{P_x}$$
2.2. Producer Economy

• Convex production technology: increasing MC

• PPF (production possibility frontier):

• MRT (marginal rate of transformation): slope of PPF

\[
\text{MRT}^{y,x}_j = \frac{P_y}{P_x}, \quad \forall j
\]

▷ How many \( x \) do we have to give up for one more \( y \)?

• Firm \( j \): profit maximization

• Production adjustment process:
  
  – Produce more \( y \) if: \( \text{MRT}^{y,x}_j < \frac{P_y}{P_x} \)
  
  – Produce more \( x \) if: \( \text{MRT}^{y,x}_j > \frac{P_y}{P_x} \)
2.3. Complete Market

- Equilibrium: consumer MRS equals producer MRT
  \[ \text{MRS}^{y,x}_i (\forall i) = \frac{P_y}{P_x} = \text{MRT}^{y,x}_j (\forall j) \]

- Overall efficiency

2.4. Fundamental Theorems of Welfare Economics

- 1st Theorem: CE ⇒ PO

- 2nd Theorem: PO ⇒ CE (with proper prices and transfer)
3. Market Failure: Possible Causes

3.1. Non-convex Preferences: MU not Diminishing

\[ x \] is Pareto optimal, but not a competitive equilibrium.\(^1\)

\(^1\)At given price, consumer B wants bundle \( x \), but consumer A prefers \( y \) to \( x \).
3.2. Market imperfection: government Regulation

\(x\) market: competition

\(y\) market: monopoly

\[ P_x = MC_x, \quad P_y > MR_y = MC_y \]

\[ \triangleright \]

\[ MRS_{y,x}^i = \frac{P_y}{P_x} > \frac{MC_y}{MC_x} = MRT_{y,x}^j \]

\[ \triangleright \text{Inefficient, should have more } y \text{ and less } x \square \]

3.3. Public Goods

- Public goods:
  \[ U_A = U_A(x_A, y) \]
  \[ U_B = U_B(x_B, y) \]

- Externality: smoking, driving, littering
  \[ U_i(x_i, s_i, S), \quad S = \sum_j s_j \]

- Altruism:
  \[ U_R(x_R, x_J), \quad U_J(x_J, x_R) \]