Questions:

• Under what circumstances do we expect markets to perform well?

• Under what circumstances do we expect markets to fail to produce desirable results?

• When is it desirable to allocate and redistribute resources through the government rather than the market?

A: Use the theory of welfare economics to address these questions.

1 What is Welfare Economics?

Welfare Economics:

• is the branch of economic theory concerned with the social desirability of alternative economic states.

• judges these alternatives using the notions of efficiency and equity
2 Outline of Chapter

Overview of Welfare Economics

1. Pure Exchange Economy
   Edgeworth box, Pareto Efficiency

2. Production Economy
   Production possibilities frontier and Pareto efficiency

3. First Fundamental Theorem of Welfare Economics

4. Fairness (equity) and the Second Fundamental Theorem
   Social Welfare Function

5. Sources of Market Failure
   market power
   nonexistence of markets
   asymmetric information
   externalities
   public goods
3 Pure Exchange Economy

Assume:

1. 2 goods, fig leaves (F) and apples (A)
2. 2 individuals, Adam and Eve
3. total amount of Apples and Fig Leaves, given and fixed

Edgeworth Box:

• shows all feasible allocations of apples and fig leaves divided between Adam and Eve
• shows preferences (indifference curves) of Adam and Eve
• identifies Pareto efficient allocations

Definitions

• Pareto improvement: a reallocation of resources that makes at least one person better off without making anyone else worse off.

• Pareto efficient allocation: an allocation in which it is not possible to make someone better off without making someone else worse off.

An allocation in which no further Pareto improvements are possible.

\[ MRS^A_{af} = MRS^E_{af} \]

• contract curve: the set of all Pareto Efficient allocations
4 Production Economy

Technology: production possibility set, i.e., the set of all possible combinations of Apples and Fig Leaves that are feasible given resources.

\[ |\text{slope}| = \text{marginal rate of transformation (MRT)} \quad (1) \]
\[ = |\Delta \text{Fig leaves}/\Delta \text{Apples}| \]
\[ = MC_a/MC_f \]

Remark:
MRT increasing as you move down the production possibility frontier

Pareto Efficiency with production and consumption:

\[ MRT = MRS^A = MRS^E \]
5 First Fundamental Theorem of WE

Assume:

1. all producers and consumers act as perfect competitors
2. a market exists for each good

then the FFTWE states that a Pareto Efficient Allocation of resources will result.

5.1 Intuitive ‘proof’

under competition, consumers optimize:

\[ MRS^A_{af} = \frac{P_a}{P_f} \]  \hspace{1cm} (2)
\[ MRS^E_{af} = \frac{P_a}{P_f} \]

since they face same prices:

\[ \rightarrow MRS^A_{af} = MRS^E_{af} \]
\[ \rightarrow \text{Pareto efficient} \]

under competition, Producers maximize profits:

\[ MC_a = P_a \]  \hspace{1cm} (3)
\[ MC_f = P_f \]
\[ \rightarrow MC_a/MC_f = \frac{P_a}{P_f} \]
\[ \rightarrow MRT_{af} = \frac{P_a}{P_f} \]

since consumers and producers face same \( P_a/P_f \):

\[ \rightarrow MRT_{af} = MRS^A_{af} = MRS^E_{af} \]
\[ \rightarrow \text{Pareto efficient} \]
Q: Role of Government if FFTWE holds?

Minimal:

- protect property rights
- law and order
- judicial system
- national defense

But what about equity/fairness?
6 Fairness and the Second Fundamental Theorem

Efficiency vs Equity: Edgeworth box: perfect competition efficient but not necessary equitable

utility possibilities curve (derived from contract curve)

**social welfare function**: a statement of how society’s well-being relates to the well-being of its members

\[ W = f(U_1, U_2, \ldots, U_N), \text{ utilitarian SWF} \]  \hspace{1cm} (4)

\[ W = \alpha_1 U_1 + \alpha_2 U_2 + \ldots \alpha_N U_N, \text{ additive utilitarian SWF} \]

\[ W = U_1 + U_2 + \ldots U_N, \text{ egalitarian, additive utilitarian SWF} \]

Social Indifference curves

Maximize SWF s.t. utility possibilities frontier

identifies efficient and equitable allocations
6.1 Second Fundamental Theorem

SFTWE states that society can attain any Pareto efficient allocation of resources by making a suitable assignment of initial endowments and then letting people freely trade.

Implies that efficiency and equity can be addressed separately...deal with equity through redistribution, and let the market lead to a Pareto efficient allocation.

7 When is the market likely to fail to reach an efficient outcome?

Sources of Market Failure (i.e., when will $MRS \neq MRT$)

- market power
  
  $P > MC \rightarrow MRT \neq MRS$

- nonexistence of markets

  **asymmetric information**
  
  eg: no market for poverty insurance

  **externalities**: situation in which one person’s behavior affects the welfare of others in a way that is outside of existing market
  
  divergence between private and social marginal cost
  
  $\rightarrow MRT \neq MRS$

  **public goods**: commodities that are nonrival in consumption
  
  eg: lighthouse
  
  problem: free rider
  
  $\rightarrow MRT \neq MRS$
Implications for role of government?
Potential additional role—correcting market failure.