INTRODUCTION

Fundamentals of economics and welfare economics

Resources, scarcity and economics

- Economics can be defined as the study of **how society allocates <u>scarce</u> resources**
- An economic time scale is a time interval for which planning, and management are meaningful (the classification may turn out to be tricky)
- A market economy is where goods and services are all allocated on the basis of prices
- Prices determine how much is demanded and supplied
- **All resources are <u>scarse</u>**: natural resources (oil, trees, land, water, …), human resources (labour), capital resources (machines, factories)

Resources, scarcity and economics

The economic problems are therefore essentially two

THE SCARISTY (SHORTAGE) OF RESOURCES

THE MULTIPLICITY OF NEEDS TO BE SATISFIED

INDIVIDUALS AND SOCIETY ARE FACED WITH CHOOSING FROM A LIMITED SET OF POSSIBILITIES

Resources, scarcity and economics

ECONOMICS

MICROECONOMICS

«Political Economy»

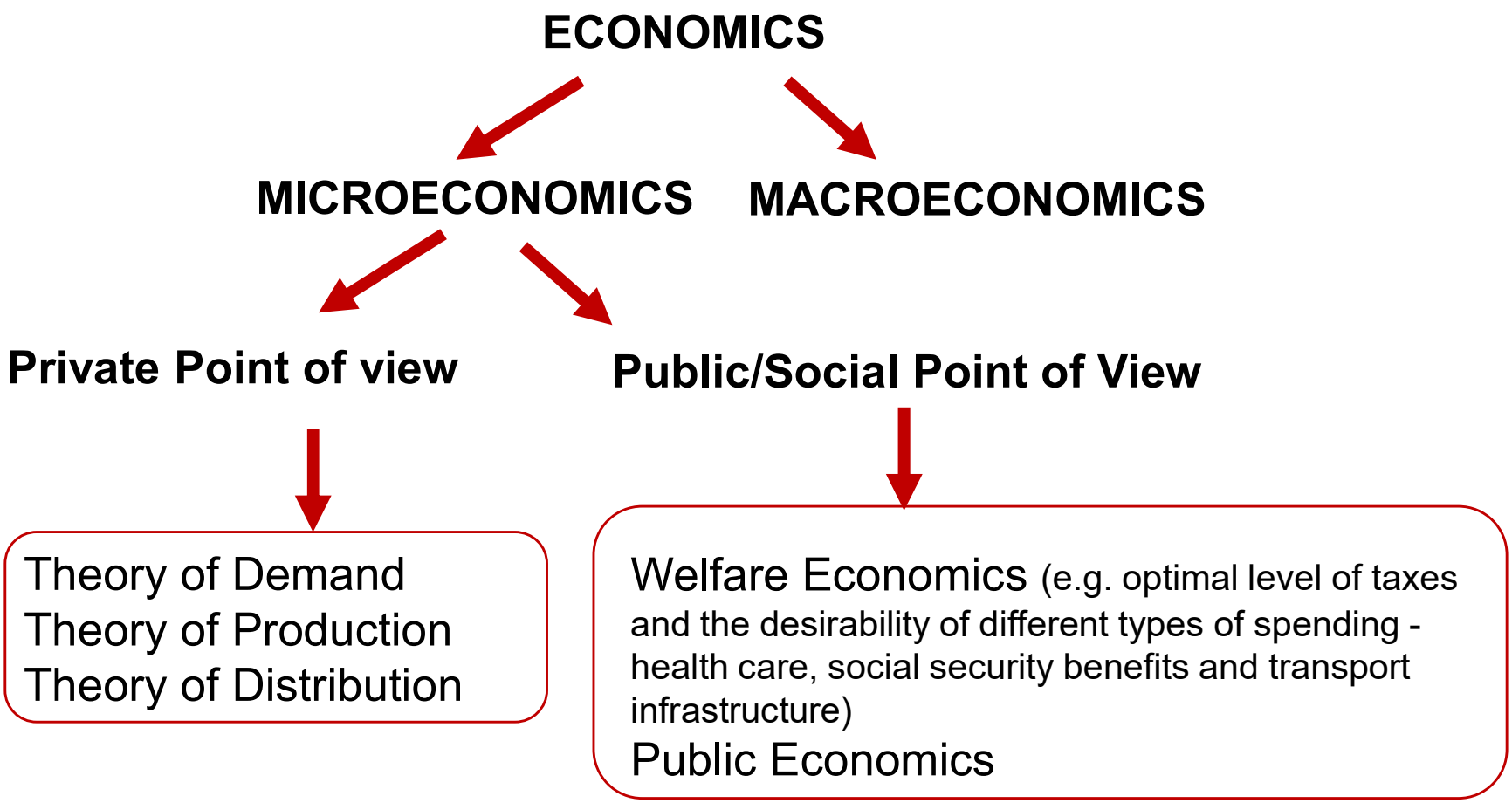
It deals with the economic behavior of individual economic units and varaiables, how supply (production) and demand (consumption) interact, or with problems related to individual sectors of economic activity.

MACROECONOMICS

«Economic Policy»

It deals with the functioning of the aggregate economic system (inflation, GDP, unemployment, economic cycles, tax revenue, state budget, money demand, exchange rates)

Resources, scarcity and economics



Resources, scarcity and economics

Resources are not enough to satisfy all the desires of all people

People and society must make choices among a limited set of possibilities

The choice to have more than one thing necessarily means having less of other things

In centrally planned economies these decisions were made by central planners

Resources, scarcity and economics

Because of sarcity any society has to answer three questions:

- **What** is to be produced?
- **How** it is to be produced?
- **Who** gets the outputs?

} In order to maximie PROFITS

Price and distribution policy

The way these three questions are answered is referred to as the ***allocation of the resources***, i.e. how society's resources are divided up :

- among the various outputs
- among the different organizations that produce these outputs
- among the members of the society

OPPORTUNITY COST

- the value of the most highly valued foregone alternative
- i.e. what you give up by having it
- when more of commodity X is produced resources are used up
- these resources could have been used to produce alternative commodities

Resources, scarcity and economics

Scarce resources can be allocated in three specific ways:

1. ***market economy :***
    - A mode of organization where resource allocation is determined by independent decisions and actions of individual consumers and producers
    - No central coordination/direction
2. ***centrally planned economy:***
    - A mode of organization where decisions on resource allocation are made by government bureaux
2. ***mixed economy***

Market systems and economic models

- Model: a simplified description of some aspects of the economy, often containing equations and graphs
- key words: diagrams, statistics and data, models

Models

We use models for both positive and normative analysis

- positive analysis: statements of cause and effect
- normative analysis: statements that embody value judgements

The demand and supply model

In a market economy coordination is accomplished in a decentralized way through prices

How do prices guide the behavior of both producers and consumers?

Definition of demand:

Determinants of demand

1. Price – "the law of demand"
2. Income – normal and inferior goods
3. Prices of related goods-substitutes and complements
4. Tastes
5. (Others)

- The demand schedule/curve - the relationship between the market price and the quantity demanded
- The demand curve is, ceteris paribus, downward sloping

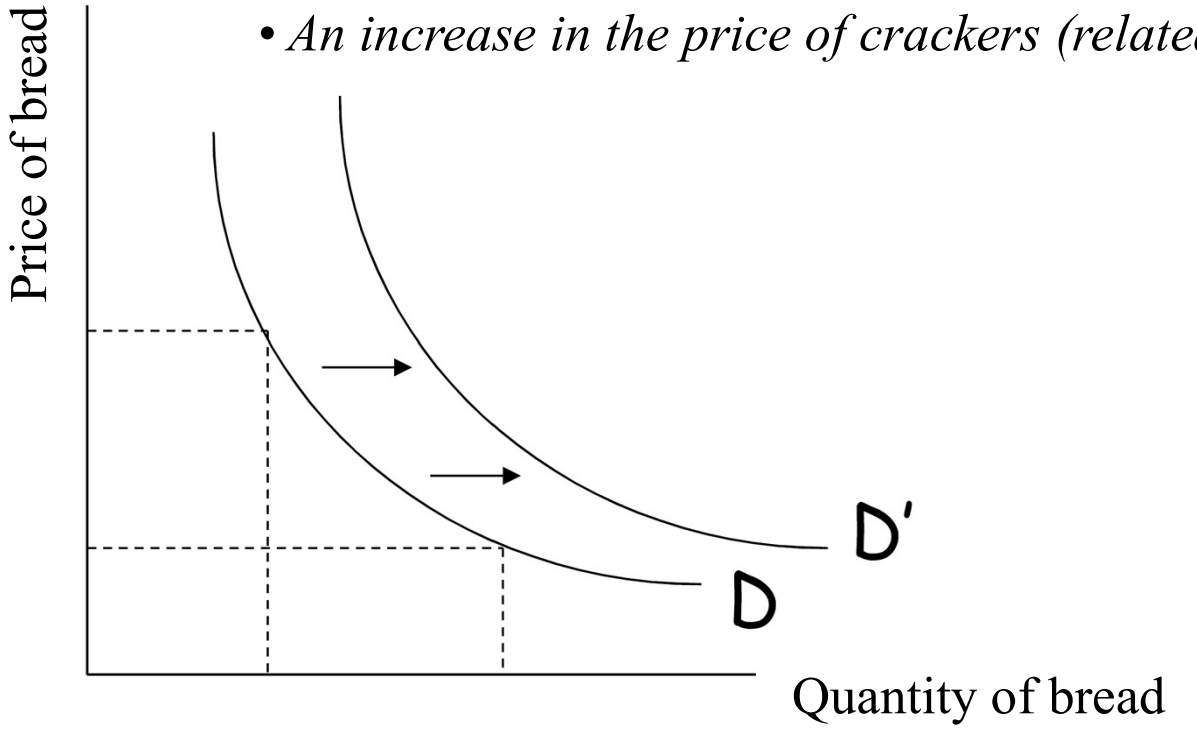
Demand

Shifts in the demand curve

- Changes in income
- Changes in the price of related goods

NORMAL GOOD
(opposite direction for inferior goods)

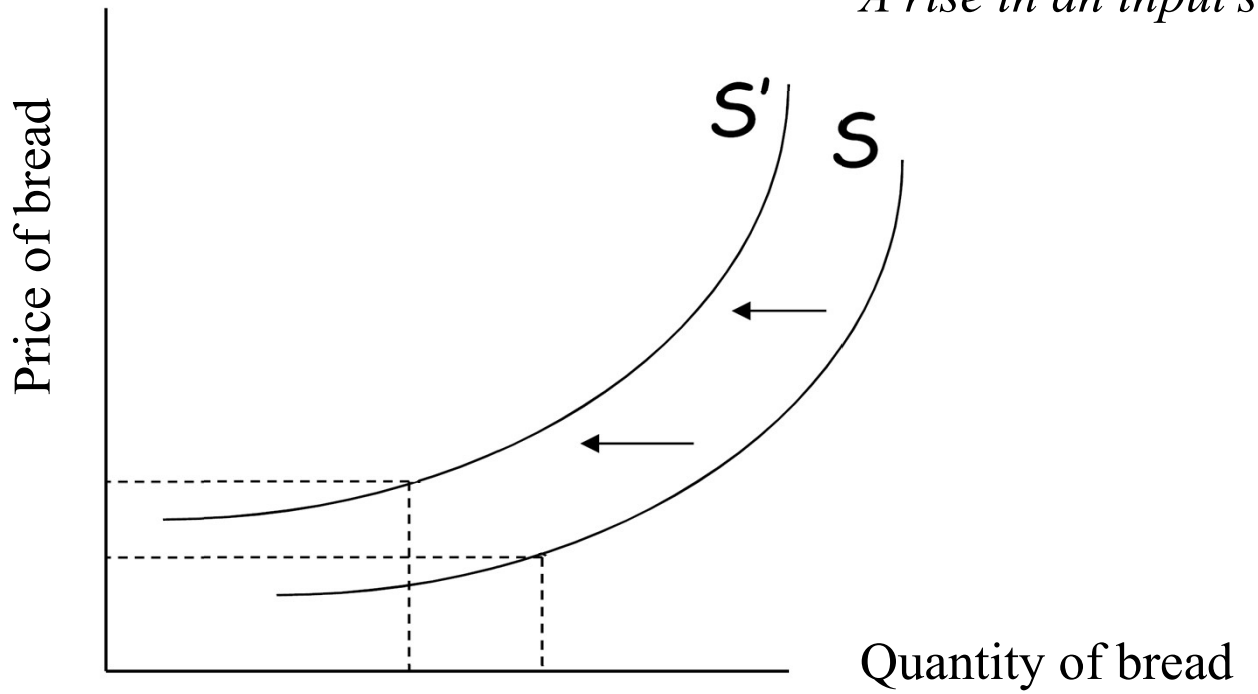
- *An increase in income*
- *An increase in the price of crackers (related goods)*



Supply

- The supply schedule/curve – the relationship between the market price and the quantity supplied, ceteris paribus
- The supply curve is upward sloping
- Shifts in the supply curve
- A change in an input's price

A rise in an input's price



The roles of prices

The role of prices in the marketplace:

- Prices convey information: prices are signals to ensure consistency in the decisions of households and firms
- Prices ration scarce resources: everyone who is willing to pay the equilibrium price gets the good, and everyone who is not, does not
- Prices determine incomes: households' money income depends on the prices of the inputs that they supply

• Consumer choice

- 'You can't always get what you want'
- Why not?
- People's **desires are unlimited**, whereas their **resources are finite** – **SCARCITY**
- So, consumers have to make choices

Consumer choice

- What is the problem facing a typical consumer?
- His/her ***resources are limited*** relative to his/her desires
- So, how does a consumer make sensible decisions in the presence of such **scarcity**?
- To answer this question involves 3 steps:
    1. *Consumer's preferences - know what the consumer 'wants'*
    2. *Know what the consumer 'can' do given his/her limited income and the prices he/she faces*
    3. *Combining the consumer's preferences with his/her budget constraints*
- Theory of Choice – how an individual makes a decision, given his/her articular tastes

Assumption

Assumption 1 - completeness:

given two commodity bundles $a=(x_1,y_1)$ and $b=(x_2,y_2)$ the consumer can tell us which one he/she prefers ($a \succ b$) or whether he/she is indifferent between them ($a \sim b$)

Assumption 2- transitivity:

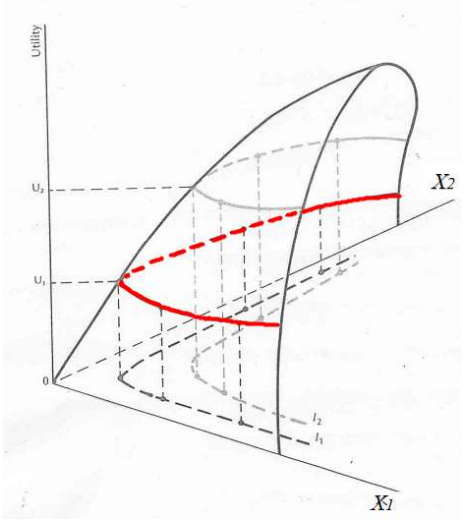
if $a \succ b$ and $b \succ c$ then $a \succ c$

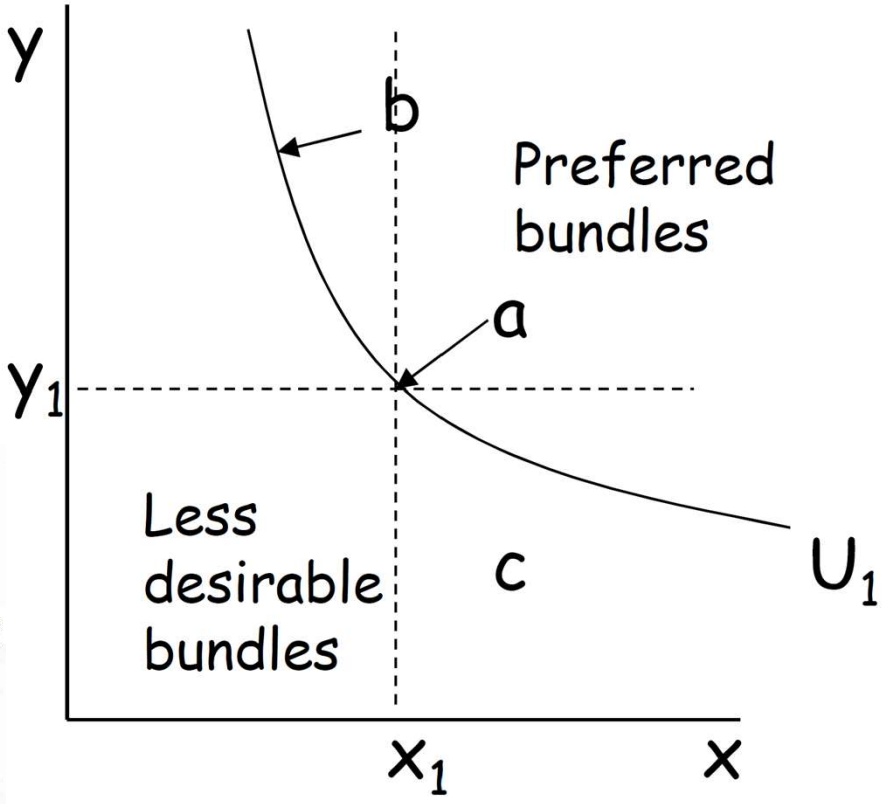
Assumption 3- non satiation:

a bundle with more of either commodity is always preferred to a bundle with less (the pig principles, i.e. if some is good, more is better)

Indifference curves

- An indifference curve is the set of all bundles among which a consumer is indifferent
- U1 shows all bundles among which the consumer is indifferent
- Hence U1 is referred to as an indifference curve
- The slope of an indifference curve shows the rate at which the consumer is willing to trade one good for another



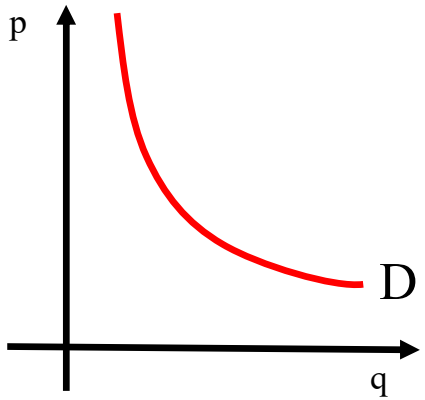


Resources, scarcity and economics

DEMAND

There are three factors that influence the decisions of a single individual or family on the consumption of a particular good:

- The tastes
- The income
- The price of goods on the market and the price associated with them

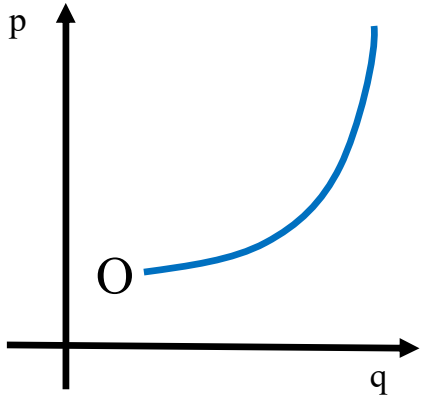


The DEMAND CURVE indicates the relationship between the market price of a good and the quantity demanded of that good.

SUPPLY

There are three factors that influence companies' decisions on the supply of a specific good:

- The selling price
- The price of inputs
- Technology (production system)



The SUPPLY CURVE indicates the relationship between the market price of a good and the quantity of a good that producers are willing to offer.

Consumer equilibrium

- The indifference map tells us what a consumer ‘wants’ to do
- The budget constraint I shows us what a consumer ‘can’ do

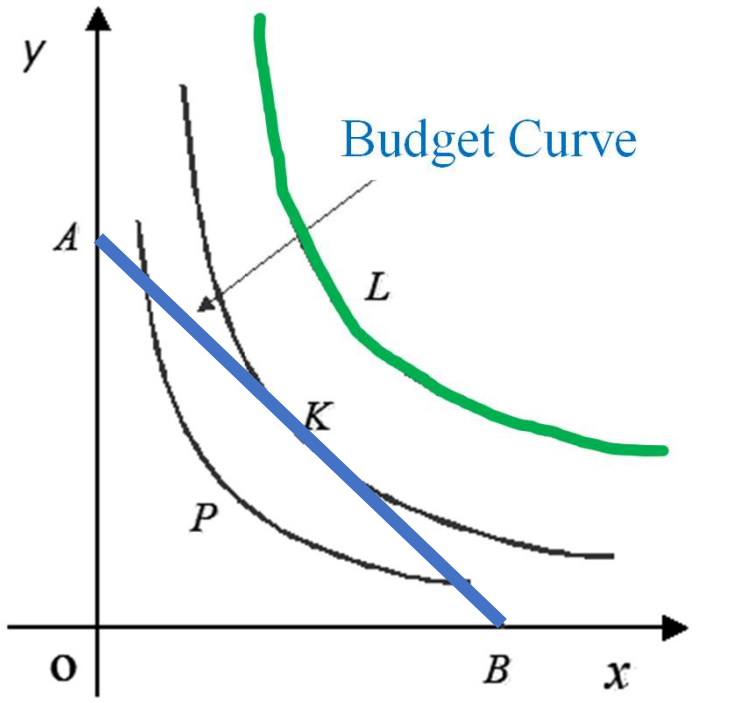
$$\bar{I}=\bar{p}_x X+\bar{p}_y Y$$

- To find out what the consumer actually does, the two step must be put together

Budget Curve $y = -\frac{\bar{p}_x}{\bar{p}_y} x + \frac{\bar{I}}{\bar{p}_y}$

MSR

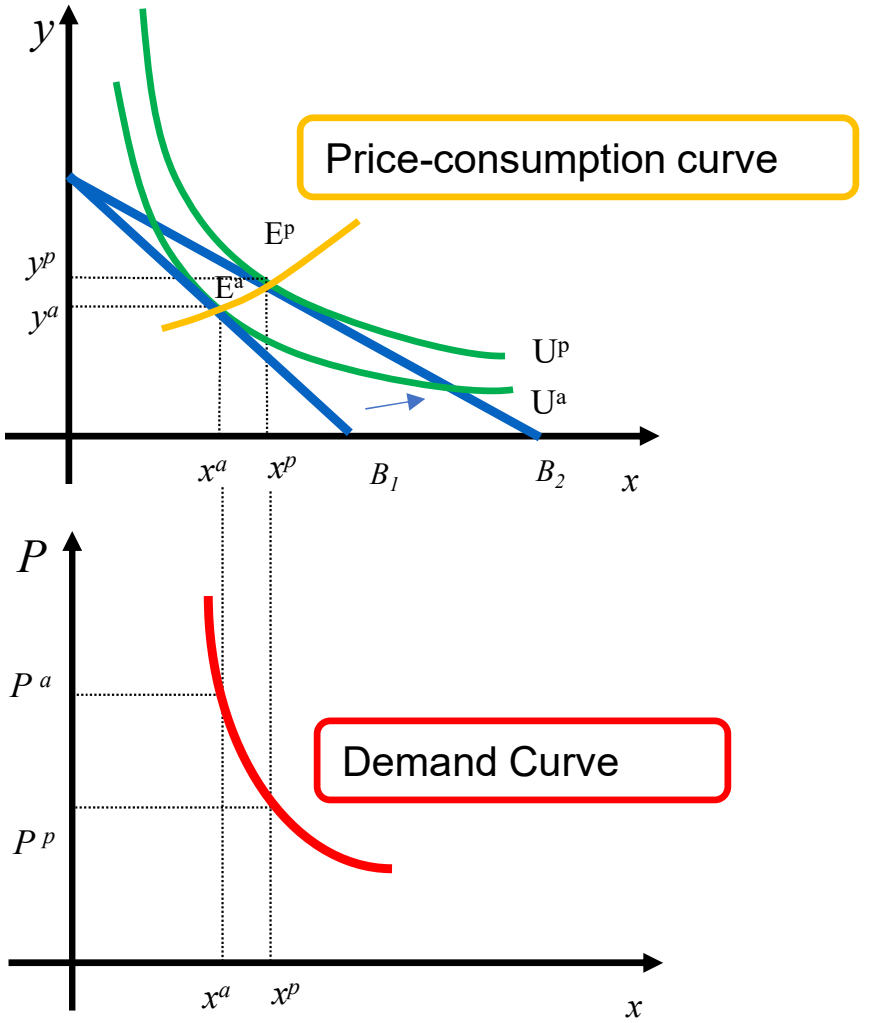
Indifference (or Utility) curves



Demand Curve

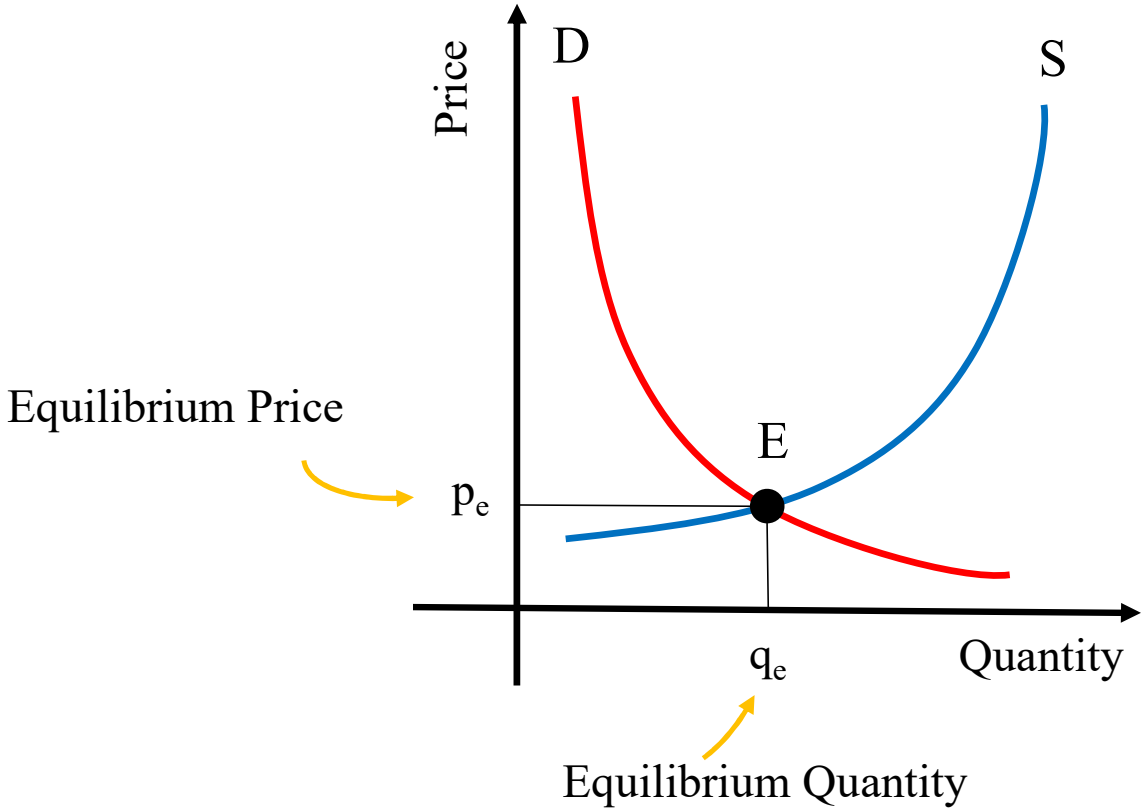
$$D = f(p_x, \overline{I, p_y, T}) = f(p_x)$$

The demand curve, given the same income, tastes and price of other goods, expresses the trend in the quantity demanded as a function of the price of the good.



Resources, scarcity and economics

EQUILIBRIUM is represented by the meeting point between supply and demand, i.e. the point at which the quantity supplied is equal to the quantity requested at a given price.



Resources, scarcity and economics

Fundamentals of economics relevance to this class

- Resource Allocation
- Cost-Benefit Analysis
- Economic Impact of Hazards
- Social Return and Vulnerability

Application in Real-World Scenarios

Imagine a government deciding between investing in flood defenses or funding emergency relief. By applying economic principles and welfare economics, decision-makers can:

- **Evaluate the trade-offs** between prevention (e.g., building levees) and response (e.g., funding post-disaster relief).
- Use **cost-benefit analysis** to identify which option provides the most value to society.
- Consider the **distributional impacts (called EXTERNALITIES)**: Will certain communities or economic sectors benefit more from one option? Will others be left at higher risk or suffer greater losses?

This kind of economic analysis is essential for ensuring that risk management strategies are not only effective but also efficient (just and equitable).

Resources, scarcity and economics

Key ECONOMIC Concepts in Risk Management

- Market Failure
- Externalities
- Public Goods
- Welfare Economics

Importance of Economics and Project Valuation in Water-Related Hazards

Water-related hazards create unique economic challenges, from disruptions to agriculture and industry to increased costs for infrastructure repair and healthcare. Effective management of these hazards must take into account the economic implications at both the macro and micro levels. For example:

•**Floods** may destroy homes, businesses, and infrastructure, leading to costly recovery efforts and long-term economic disruptions.

•**Droughts** may reduce agricultural output, leading to food shortages, higher prices, and economic hardship for farming communities.

Economic analysis helps us understand the short-term and long-term impacts of these hazards, allowing for better planning, risk mitigation, and recovery efforts. By incorporating welfare economics, we ensure that decisions prioritize the well-being of all, including vulnerable populations who may be less able to recover from the economic shocks caused by water-related disasters.

REFERENCES

- Morgan W., Katz M. L. , Rosen H. S. (2009): “Microeconomics”, McGraw-Hill
- Pearce D., Atkinson G., Mourato S. (2006): “ Cost-Benefit Analysis and the Environment”, OECD, Paris
- Pearce D.W., Turner R.K. (1990): “Economics of Natural Resources and the Environment”, Harvester Wheatsheaf, London