1 Introduction to Economic Analysis

1.1 Scarcity

Scarce: Quantity of resources lower than demand, hence insufficient to satisfv needs and wants
Resources: CELL (Capital - physical and human capital, Entrepreneurship, Land, Labour)

What is Economics?: study of choice under scarcity
- How people decide how much to work, what to buy, how much to save, how to invest, etc. given budget and costs
- How firms decide how much to produce, how many workers to hire, etc. given available budget and costs
- How society decides how to allocate its resources among national defense, health care, education, scientific research, social safety nets, etc.

Opportunity cost of any choice: whatever must be given up when we make that choice

$$\begin{aligned}\text{Opp. cost} &= \text{explicit costs} + \text{implicit costs} \\ &= \text{what you get when you give up the good}\end{aligned}$$

- Explicit cost: monetary sacrifice
- Implicit cost: non-monetary e.g. time
- **[IMPT]** when the alternatives to a choice are mutually exclusive, the implicit cost of the choice is the value of the next best alternative
  - can try listing all the possible alternatives; if it's infinite then usually opp cost is monetary value

1.2 Five core principles

1. **Scarcity implies trade-offs**
   - We have unlimited wants and limited resources
   - Hence having more of one good thing usually means having less of another.
2. **Bargaining strength comes through scarcity**
   - Scarce resources command high prices
3. **Compare costs and benefits**
   - An action should be taken if, and only if, the benefit is at least as great as the cost.
4. **People respond to changes in costs and benefits**
   - The likelihood of taking an action rises as the benefit rises, and falls as the cost rises.
5. **Focus on your comparative advantage**
   - Everyone gains when each individual (or each country) concentrates on the activities in which her opportunity cost is lowest.

1.3 Types of economics

Microeconomics: derived from *Mikros* or *small*
- The study of how households and firms make decisions and how they interact in markets

Microeconomics: derived from *Makros* or *large*
- The study of economy-wide phenomena e.g. inflation, unemployment, and econ growth

Positive Economics: *describe* the world as it is
- Addresses "What is?" question using tools of economics, without any value judgment
- Positive **statements**: can be confirmed or refuted by examining evidence
- Positive **disagreements**: due to differences in scientific judgments

Normative Economics: *prescribe* how the world should be
- Addresses "What should be?" question which require value judgment
- Every normative analysis is based on underlying positive analysis
- Normative **statements**: cannot be confirmed or refuted
- Normative **disagreements**: due to differences in values

1.4 Production Possibility Frontier (PPF)

Model: A simplification of a more complicated reality
- *Simplifying* assumptions: do not affect important conclusions
- *Critical* assumptions: affect important conclusions

Definition: A graph that shows all combinations of two goods that can be produced given the available resources and technology
- Points on the PPF: possible and efficient
- Points under the PPF: possible but not efficient
- Points above the PPF: not possible

Movements:
- **Moving along** a PPF
  - Involves shifting resources from the production of one good to the production of the other good
  - Because resources are limited and hence sacrifice has to be made
  - **Slope** of PPF = **Opportunity cost** of good x in terms of good y
- **Shifting** of PPF
  - Due to additional resources or improvement in technology
  - The economy can produce more of good x or good y or any combination in between

Shapes of PPF
- Straight line: opp. cost is constant
- Concave: the opp. cost of a good rises as the economy produces more of the good
  - When different resources are suited for different uses
  - Different resources have different opp. costs of producing one good in terms of the other good (e.g. different workers have different skills)
  - Explanation:
    - Initially, most workers including those who are better at producing good B are producing good A $\rightarrow$ to get more good B, we can shift workers who are more efficient in producing B from the production of A to B $\rightarrow$ hence we don't need to give up so many of good A
    - However, producing more of good B would require shifting workers who are more effi-

cient in A than B → hence there would be a huge drop in output of A → higher opp. cost

1.5 Gains from Trade

Absolute advantage: the ability to produce a good using fewer inputs than another producer

- Producer A can produce the same amount of good x with fewer inputs as compared to producer B
- **[IMPT]** Two countries can gain from trade when each specializes in the good it produces at lowest cost

Comparative advantage: the ability to produce good at a lower opportunity cost than another producer

- Producer A can produce the same amount of good x by giving up fewer of good y as compared to producer B
- **[IMPT]** Absolute advantage is not necessary for comparative advantage
- Gains from trade arise from comparative advantage (differences in opp. costs)
- When each country specializes in the good in which it has a comparative advantage,
  - total production in all countries is higher,
  - the world's economic pie is bigger,
  - and all countries can gain from trade.

Note that there are different possibilities for CA/AA

- AA possibilities
  - A has AA in both goods
  - A has AA in good X but B has AA in good Y
  - Neither has AA in either good
- CA possibilities
  - A has CA in both goods
  - A has CA in good X but B has CA in good Y
  - Neither has CA in either good

1.6 Supply and Demand

Why? How supply and demand determine prices in a market economy which has the function of allocating the economy's scarce resources

Market Economy : allocates resources through the decentralized decisions of households and firms as they interact in markets for goods and services

Market : a group of buyers and sellers of a particular good and service

Perfectly Competitive Market : Identical goods and services, Numerous buyers and sellers, no one can affect market price (price taker)

1.6.1 Demand

Q^D: the amount of the good that buyers are willing and able to purchase

- Q^D in the market is the sum of the Q^D by all buyers at each price

Law of Demand: As the P of good ⇑, the Q^D ⇓
Demand Schedule: a table that shows the relationship between P and Q^D of a good
Demand Curve: Shows how P affects Q^D, ceteris paribus (other things kept equal)

Non-price determinants of DD

- Number of buyers
- Y (Income)/type of good (*normal/inferior*); are they positively/negatively related to income?
- P of related goods (substitutes/complement?); **[IMPT]** will cause a shift in DD curve, not Q^D
- Tastes and preferences
- Expectations (of future P or Y)

1.6.2 Supply

Q^S: the amount of the good that sellers are willing and able to sell

- Q^S in the market is the sum of the Q^S by all sellers at each price

Law of Supply: As the P of good ⇑, the Q^S ⇑
Supply Schedule: a table that shows the relationship between P and Q^S of a good
Supply Curve: Shows how P affects Q^S, ceteris paribus (other things kept equal)

Non-price determinants of SS

- Number of sellers
- Input prices
  a ⇓ in input prices will ⇑ π at each output P, so firms increase Q^S at each P
- Technology
- Weather/Natural factors
- Expectations (of future events/P)
- Expectations (of future P or Y)

1.6.3 DD and SS

Equilibrium: a state in which opposing forces are balanced so that one is not greater than the other.

- Eq. P: the price that equates Q^D with Q^S
- Eq. Q: Q^S and Q^D at the eq. P

Surplus/excess supply: $Q^S - Q_D$ when $Q^S > Q^D$
Shortage/excess demand: $Q^D - Q^S$ when $Q^D > Q^S$

One important question to ask: will DD change more than SS when both curves shift?

1.7 Elasticity

1.7.1 PED

PED measures how much Q^D responds to a change in P

$$
\begin{aligned}
PED &= \frac{\%\Delta Q^D}{\%\Delta P} \\
&= \frac{\frac{Q_2^D - Q_1^D}{\frac{Q_2^D + Q_1^D}{2}} \cdot 100\%}{\frac{P_2 - P_1}{\frac{P_2 + P_1}{2}} \cdot 100\%} \\
&= \frac{Q_2^D - Q_1^D}{Q_2^D + Q_1^D} \Big/ \frac{P_2 - P_1}{P_2 + P_1} \text{ (using midpoint)}
\end{aligned}
$$

Types of DD curves:

- Perfectly inelastic ($PED = 0$)

- Inelastic ($PED < 1$)
- Unit elastic ($PED = 1$)
- Elastic ($PED > 1$)
- Perfectly elastic ($PED = \infty$)

Factors that affect PED:
- How **broadly** or **narrowly** the good is defined
  number of substitutes?? e.g. fruits vs apple
- Is the good a **necessity** or **luxury**?
  e.g. water vs orange juice
- The extent to which **close substitutes** are available
  e.g. breakfast cereal vs rabies vaccine
- How **expensive/cheap** the good is
  Proportion of income?? e.g. Nike vs nonbranded flip-flops
- **Time horizon**
  in the SR, when P changes, there's not much we can do (PED is close to 0)
  in the LR, more substitutes are available hence PED$\Uparrow$

How does PED affect R?
- Elastic $\Rightarrow \%\Delta Q^D > \%\Delta P$
  - If $P \Downarrow$, $R_{total} \Uparrow$ as the $\Uparrow R$ from $\Uparrow Q$ dominates $\Downarrow R$ from $\Downarrow P$
  - If $P \Uparrow$, $R_{total} \Downarrow$ as the $\Downarrow R$ from $\Downarrow Q$ dominates $\Uparrow R$ from $\Uparrow P$
- Inelastic $\Rightarrow \%\Delta Q^D < \%\Delta P$
  - If $P \Downarrow$, $R_{total} \Downarrow$ as the $\Downarrow R$ from $\Downarrow P$ dominates $\Uparrow R$ from $\Uparrow Q$
  - If $P \Uparrow$, $R_{total} \Uparrow$ as the $\Uparrow R$ from $\Uparrow P$ dominates $\Downarrow R$ from $\Downarrow Q$
    e.g. Pharmacies increase the price of insulin by 10%

1.7.2 CED

CED measures how much Q^D responds to a change in the price of another good

$$CED = \frac{\%\Delta Q_1^D}{\%\Delta P_2}$$

- Substitutes $\Rightarrow$ CED > 0
- Complements $\Rightarrow$ CED < 0

1.7.3 YED

YED measures how much Q^D responds to a change in the Y

$$YED = \frac{\%\Delta Q^D}{\%\Delta Y}$$

- Normal goods $\Rightarrow$ YED > 0
- Inferior goods $\Rightarrow$ YED < 0

1.7.4 PES

PES measures how Q^S responds to a change in P

$$PES = \frac{\%\Delta Q^S}{\%\Delta P}$$

Factors that affect PES:
- How **easily** sellers can change the quantity they produce
  The more easily, the greater the PES and vice versa
- **Time horizon**
  In the SR, PES is low. In the LR, PES is high because firms build new factories and new firms enter the market

[IMPT] If DD shift, consider PES

1.8 The Efficiency of Markets

Welfare economics: how the allocation of resources affects *economic well-being*
- *how much* of each good and service is produced
- *which producers* produce them
- *which consumers* consume them

Willingness to Pay (WTP): *maximum amount* the buyer will pay for that good
- measures how much the buyer values the good
- Buyer will buy the good if $WTP \geq P$

$$WTP_{\text{market}} = \sum WTP_{\text{buyer}}$$

- **Marginal buyer**: the buyer who would leave the market if P were any higher
  [IMPT] height of DD curve is the WTP of the marginal buyer
- **Consumer Surplus (CS)**: the amount a buyer is willing to pay - the amount he actually pays

$$CS = WTP - P$$

  (area below DD but above P from 0 to Q)
- If $P \uparrow$, CS will fall
  - $\downarrow CS$ due to less buyers and they leave market
  - $\downarrow CS$ due to remaining buyers paying higher P

Cost/Willingness to Sell (WTS): value of everything a seller must give up to produce a good (opportunity cost) = input costs + value of the seller's time
- Seller will produce only if $P \geq C$
- **Marginal seller**: the seller who would leave if the P were any lower
  [IMPT] the height of the SS curve is the WTS of the marginal seller
- **Producer Surplus (PS)**: the amount the seler receives for a good - his cost

$$PS = P - Cost$$

  (area above SS but below P from 0 to Q)
- If $P \downarrow$, PS will fall
  - $\downarrow PS$ due to less sellers and they leave market
  - $\downarrow PS$ due to remaining sellers receiving less

1.8.1 Efficiency

$$\begin{aligned}\text{Total Surplus} &= \text{Value to Buyers} - \text{Cost to Sellers} \\ &= CS - PS\end{aligned}$$

*CS = buyers' gains from participating in the market
*PS = sellers' gains from participating in the market
*Total Surplus = total gains from trade (a measure of *society's well-being*)

- An allocation of resources is efficient if Total Surplus is maximized
  - goods are consumed by buyers who value them most highly
  - goods are produced by sellers with the lowest cost

(Harford Chapter 3): A set of interconnected **perfectly competitive markets** results in:
1. Companies making things the right way (↓Costs)
2. Companies making the right things (no externalities)
3. Things being made in the right proportions (no under/over allocation)
4. Things going to the right people (those with the highest valuation get to consume the goods)

the Invisible Hand
- Interaction between buyers and sellers determine P
- Each P reflects sellers' costs and buyers' valuation of the good
- Self-interested sellers and buyers use P to guide and make decisions which will allocate resources

First Fundamental Theorem of Welfare Economics, Assume that:
1. **Markets** and **market prices** exist for all goods
2. All buyers and sellers are **competitive price takers**
3. Each person's utility depends only on his own consumption

then any market equilibrium is efficient