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Lecture 1

Trade-off: The opportunity you chose in the present that caused an *opportunity cost*. Trade-offs can be a matter of choice or compulsion.

Opportunity-cost: what was given up for the trade-off.

Example: For POE(trade-off), FOM(opportunity-cost) was given up.

Resources: Things around us used for production and distribution to make our trade-off work.(finite)

Scarcity: The gap between *want-list*(infinite) and *need-list*(finite). Limitation of resources.*(Q3)*

Need-list: Essentials, necessities.
Want-list: Not essential, enhancements.
Key difference:

Need-list	Want-list
Necessity	Desire
Priority	Flexible
Absence leads to major impacts	Absence causes minor impacts.

Economics is the allocation of scarce resources amongst the alternative ends to meet the unlimited wants*(Q1)*

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*(Q2)***What an economist does:**
- Decision-making
- Manage scarcity
- Get the best from what is available
- Rationalize a decision as long as it doesn't barricade anything
- Know about *purchasing power*, needs, wants and *choices.*

Purchasing-power: the ability to buy.
Choices: decisions made when faced with trade-offs.

Market: A platform where buyers and sellers make choices(*rational* or *irrational*) based on incentives.

Rational Choices: maximize utility and profit.
Irrational Choices: Decisions that do not align with economic theories of rationality. This could be due to emotional factors, biases, lack of information, or other influences that lead to making choices that do not maximize their utility or profit.

Example(Chat-gpt):

Rational Decisions: A buyer might compare different smartphone models and choose one that offers the best combination of features, performance, and price within their budget. Similarly, a seller might price a smartphone competitively to attract more buyers and increase market share, while optimizing production costs.
Irrational Decisions: A buyer might choose a more expensive smartphone based on brand loyalty or the desire for the latest model, even if it exceeds their budget or offers marginal improvements over a less expensive option. A seller might set a higher price for a smartphone to exploit a temporary trend, even if it risks alienating price-sensitive customers.

Incentive: Agreement between buyer and seller termed as price.(Sir)/ benefits or costs of an action that influences people's decisions and behavior.(gpb.org)

Incentives are important to economics for two reasons: how people respond to them and how they are created and used.

How does it all fit together?(chatgpt)
- In a well-functioning market, buyers and sellers interact through their decisions, which are influenced by rational and irrational factors. Choices are made based on available options and incentives, which in turn affect supply and demand.
- Rational decisions aim to maximize benefit or profit, while irrational decisions might deviate from these goals due to various influences.
- Incentives play a crucial role in shaping these decisions, guiding how buyers and sellers respond to changes in prices, availability, and market conditions.

Overall, the market is a dynamic system where the interplay between buyers and sellers, guided by their decisions and incentives, determines the allocation of resources and the flow of goods and services.

Positive Economics: About facts and figures, reality.(it is)

- Objective: understand how the economy functions by analyzing data and observing relationships between economic variables without making judgments about what ought to be.

Normative Economics: Emphasizing on problems and solutions.(should be/ must be)
Objective: suggest ways to improve economic outcomes based on normative judgments about fairness, equity, and what is desirable for society.

Positive(problems reported) + Normative(problem remedies/policy) === Policy economics

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Resources:
- **Land**(natural, it's there to be utilized):
- **Labor**(physical and mental)
- **Capital**(Not money but the equipment, infrastructure, industry and compensated people)(Land + Labor)
- **Enterprise/entrepreneur**(Risk takers, creative heads, innovators, not necessarily with money but with ideas)

Key Terms

trade-off	opportunity	resources	opportunity-cost	scarcity
need-list	want-list	choices	incentives	rational
irrational	purchasing-power	buyers	sellers	positive eco
normative eco	Policy eco	finite	infinite	land
labor	capital	enterprise	entrepreneur	

Questions

Q1) What is economics?
Q2) What does an economist do?
Q3) What are the challenges of economics?
Q4) Is progress rational?

Lecture 2

Building on the Q1 from lecture 1:

- Economics is about the allocation of scarce resources amongst the alternative ends to meet the unlimited wants.(*scarcity based*)
- Economics is the study of how humans consume and industries produce and how well both connect.(*consumption/production based*)
- Economics is the study of humans in different environments.(*environment based*)
- Economics is the study of how to create the best environment with the resources around us.(*environment/resource based*)
- Economics is the study of how to put things around us to the best use.(*resource based*)

Scarcity-Based: Focuses on resource allocation due to limited availability.
Consumption/Production-Based: Looks at how consumption and production processes are managed and interconnected.
Environment-Based: Considers economic behavior within and impact on different environments.
Environment/Resource-Based: Aims at creating optimal environments through effective resource management.
Resource-Based: Concentrates on the efficient use of resources to achieve economic objectives.

Resources : land, labor, capital and entrepreneur(form ideas that add *value*).

Value added = Output - Input

Policy: Framework, statement, structure. A policy should continue or else there is chaos.

- Fiscal: framed by the government support/spending, taxes and investment. Formed by the parliament, the government and the social and economic conditions.

    Objectives: economic growth, stability and equity.

    Example(Chatgpt):

    Scenario: *During a recession, the government decides to implement an expansionary fiscal policy.*

➢ ***Increase in Government Spending***: *The government invests in large infrastructure projects (e.g., building highways, bridges) to create jobs and stimulate economic activity.*
➢ ***Tax Reductions***: *The government lowers income tax rates to increase disposable income for consumers and encourage spending.*
➢ ***Increased Investment***: *The government invests in educational programs and research to foster long-term economic growth.*

Formation process:

➢ ***Parliament***: *Reviews and approves the budget, including the increased spending and tax cuts proposed by the government.*
➢ ***Government***: *Develops the budget proposal based on current economic conditions and policy objectives.*
➢ ***Social and Economic Conditions***: *The policy responds to high unemployment and low consumer spending, aiming to boost economic activity and job creation.*

Further Reading: [Fiscal Policy](#)

● Monetary: Framework formed by the central bank, state bank, reserve bank. Framework dependent on money supply and *interest rate*. Flow of borrowing and spending.
Interest Rate: cost of borrowing

Money supply = Currency(cash in hand(paper or plastic)) + Deposits(cash in bank)

➢ The more the deposit, the more the money supply.(direct proportionality)

Money Supply ↓ ↓ Deposits
Money Supply ↑ ↑ Deposits

➢ If the interest rate is high, money supply is low, because borrowing is low (inverse proportionality).
➢ In theory if there is more money supply, there is more production and so more employment(good economic state).
Further Reading: [Monetary vs Fiscal](#)

● Foreign: Policies about maintaining relations with other countries. (bilateral and trilateral)

Examples:
➢ Pakistan to India: (rival)disturbed relations.
➢ Pakistan to China:(ally)policies relating to partnerships.
➢ Pakistan to USA:(indebted to)policies relating to loans.(Umbrella of USA)
➢ Pakistan to EU:(target market)policies relating to exports.

SAARC(South Asian Association for Regional Cooperation):[About SAARC](#)
Further reading: [EU foreign role in SAARC](#)

Scientific Models:
1. Set hypothesis(assumptions based on observation)
2. Create an isolated environment(so that only independent and dependent variables are affected).
3. Experiment
4. Record results
5. Evaluate

Economic Models: Simplified versions of the reality to explain the complex situations.

Types:

Demand Model: Dependent on the price. (inversely proportional)
Demand: Desire and willingness to buy goods and services at different prices.

<div align="center">

Price ↑ ↓ Demand
Price ↓ ↑ Demand

</div>

Price defines buyers behavior.

Supply Model: Dependent on price. (directly proportional)
Supply: desire and willingness to produce the goods at different prices.

<div align="center">

Price ↓ ↓ Supply
Price ↑ ↑ Supply

</div>

Price defines seller behavior.

Special remarks from the lecture: good economics puts resources and choices to best use.

Fallacies: misleading statement(sometimes true, sometimes false).

Indifference: neither agree, nor disagree.

Fallacy of Composition: Appears to be true for one person may not be true for all.

Other Fallacies: Punctuality fallacy, Healthcare Fallacy, Divine Fallacy.

Key Terms

Value added	Output	Input	Fiscal policy	Monetary policy
Foreign policy	Currency	Deposit	Interest Rate	SAARC
Demand	Supply	Fallacy	Economic Model	

Lecture 3

Rationality: Means logic/ it also means a systemic framework to achieve one objective as long as it doesn't harm others/ utility maximization, profit maximization in a logical way.(Rational Choices)

Example(Chatgpt):
Scenario: *A manufacturing company is experiencing declining profit margins due to rising production costs.*

Rational Approach:

- **Objective:** *The company aims to maximize its profit by reducing production costs without compromising product quality.*
- **Systematic Framework:**
    1. **Analyze Costs:** *The company conducts a detailed analysis of its cost structure to identify areas where expenses can be reduced.*
    2. **Implement Changes:** *Based on the analysis, the company decides to invest in more efficient machinery and renegotiate supplier contracts to lower the cost of raw materials.*
    3. **Monitor and Adjust:** *The company monitors the impact of these changes on both production efficiency and product quality. Adjustments are made as needed to ensure that cost reductions are achieved without negatively affecting the product.*

Outcome: *By applying rational decision-making, the company effectively reduces its production costs, leading to higher profit margins while maintaining the quality of its products.*

Creating a monopoly is considered as rational for the firm holding the monopoly as:
1. It maximizes profits.
2. It benefits the firm via economies of sales.
3. It gives market control and stability

For firms/ businesses: it is rational to make profits.
For individuals: maximize satisfaction.(person, household)

Utility: Happiness,usefulness, satisfaction/ the ability of a good or service to fulfill a person's wants or needs. It is intrinsic(can not be measured)

Types: Total and marginal.

Basic Questions:

Questions

Q1) What to produce?
Dependant on essentials/luxuries, needs/wants

Q2)How to produce?
Dependent on resources,factors of production

Q3)When to produce?
Dependent on timeframe (events/festivities/season)

Q4)For whom to produce?
Dependant on market segments(dependent on location, income bracket, affordability)

Microeconomics: study of individuals and firms, maximizing utility and profit in a confined framework.
- Demand and supply
- Utility analysis
- Profit competitors
- Monopoly

Profit = Revenue - Cost

Macroeconomics: study of the entire economy.

1. GDP,GNP
2. Unemployment
3. Inflation
4. Exchange rate
5. Banking
6. Macroeconomics models

GDP: Gross Domestic Product, Total production of goods and resources in a fixed period of time in a fixed period of time in the borders of a country.

Time period = Fiscal year - Financial year

Fiscal year: starts and ends with budget.
Financial year: a normal year(12 months).

GNP: Gross National Product, Production within the borders and outside the borders of the country.

2

Unemployment:
1. Involuntary: Lack of jobs and opportunities.
2. Voluntary: Chosen.

3

Inflation: Increasing prices.
1. Good: Production rise, opportunity rise + price rise
2. Bad: No production, no opportunity + price rise

4

Exchange Rate: Measure of domestic currency in foreign currency.

If the nation's exchange rate is positive, its economy is on the right path, otherwise it isn't.

5

Banking:

Assets	Liability
Reserves	Deposits

Types:
1. 100% reserve banking
2. Fractional banking(Mostly Used)
3. Islamic banking

Circular Income Flow: Closed Economy

- Assumes self-reliance(no import, no export).

$$Y = S + C + T$$
$$Y = C + I + G$$
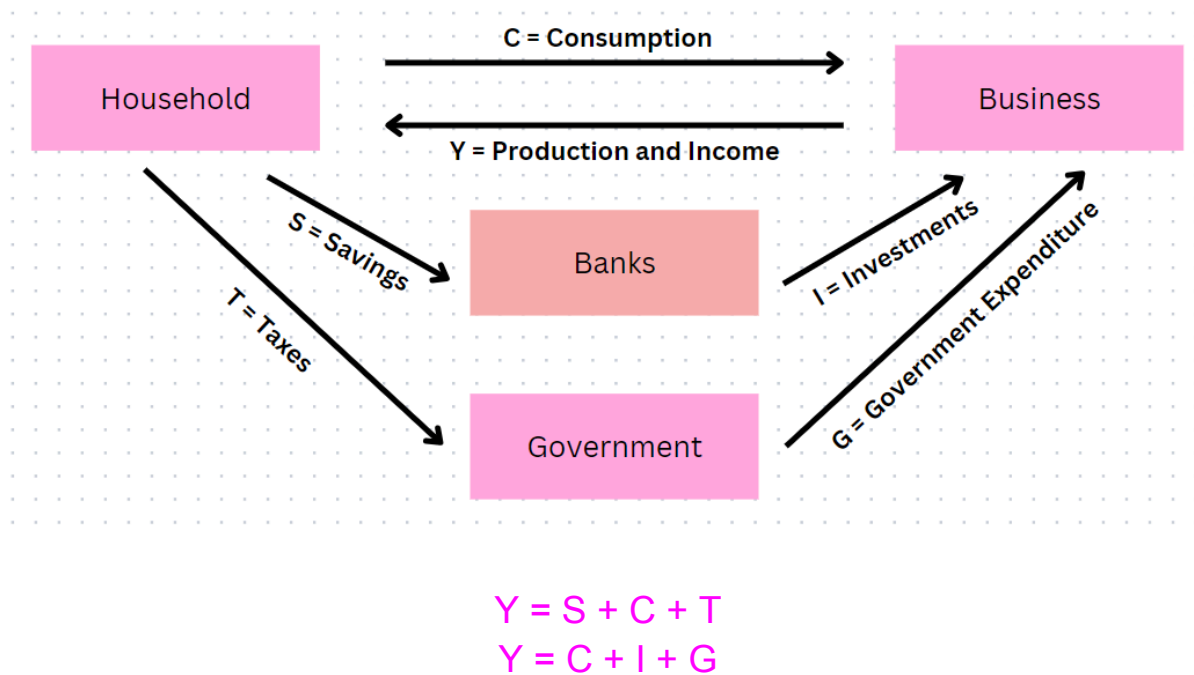
Key Terms

Rationality	Monopoly	Market Segment	Timeframe	Utility
Microeconomics	Revenue	Cost	Macroeconomics	GDP
GNP	Unemployment	Inflation	Exchange Rate	Banking
Assets	Liability	Reserves	Deposits	Savings
Taxes	Income	Consumption	Investment	Self-reliance
Closed Economy	Circular Income Flow	Fiscal Year	Financial Year	

Lecture 4

Consumer Behavior and Utility Maximization:

Assumptions:
1. Rationality: Maximize utility and profit logically.
2. Preferences: To prioritize the order of things and choices/ interest levels.
3. Prices: cost, money paid for exchange and incentive.
4. Budget Constraints:
   - Income
   - Budget line, price line

Let A = good 1, B = good2

Income = (Price of A * Quantity of A) + (Price of B * Quantity of B)

Utility: Happiness,usefulness, satisfaction/ the ability of a…

1. Marginal Utility: Extra utility obtained by a repeated action. For example: rewatching a show.
2. Total Utility

Law of Diminishing Marginal Utility
As the individual consumes more of a good/service his total utility increases but marginal utility decreases

- Repeated action = decreased marginal utility

Utility maximization:
(UTIL) → unit of utility

Tacos Consumed per unit	Total Utility\utils	Marginal Utility\utils
0	0	0
1	10	10

2	18	8
3	24	6
4	28	4
5	30	2
6	30	0
7	28	-2
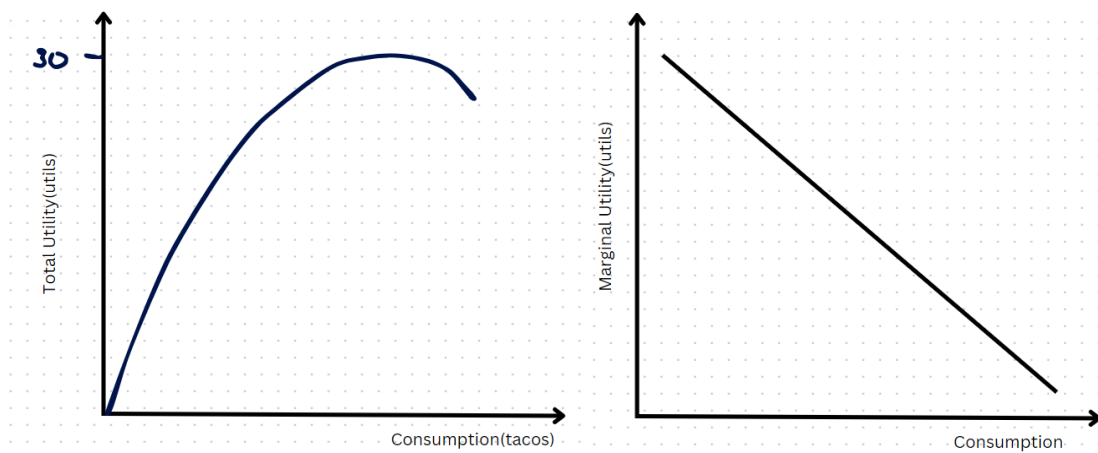
- **The MU curve can be translated to the demand curve.**
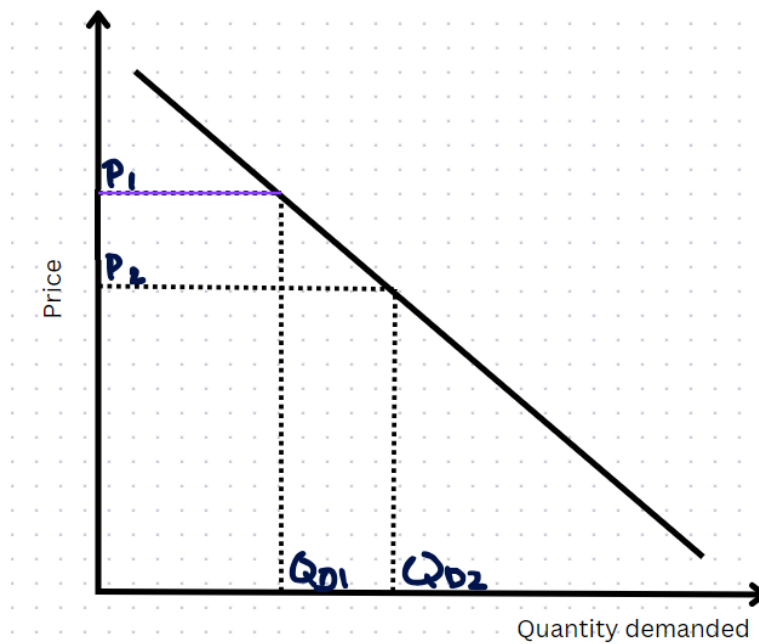
MU ↑   P ↑   TU ↓
When the good is difficult to access

MU ↓   P ↓   TU ↑
When the good is easy to access

However, these are overlooked when:

- Diamond\Water Paradox

- Cash and non-cash gifts

Key Terms

Rationality	Preferences	Budget	Utility	Marginal
Total	utils	Demand	Price	

Lecture 5

Demand: The desire backed by the willingness and ability of the individual to purchase the goods/services at variable prices. [Demand Model](#)

Willingness: decision making, choice.
Ability: talent/income.
Purchase: making the buying decision.
Variable Prices: many prices of a single product, related product, different product.

Demand Curve:
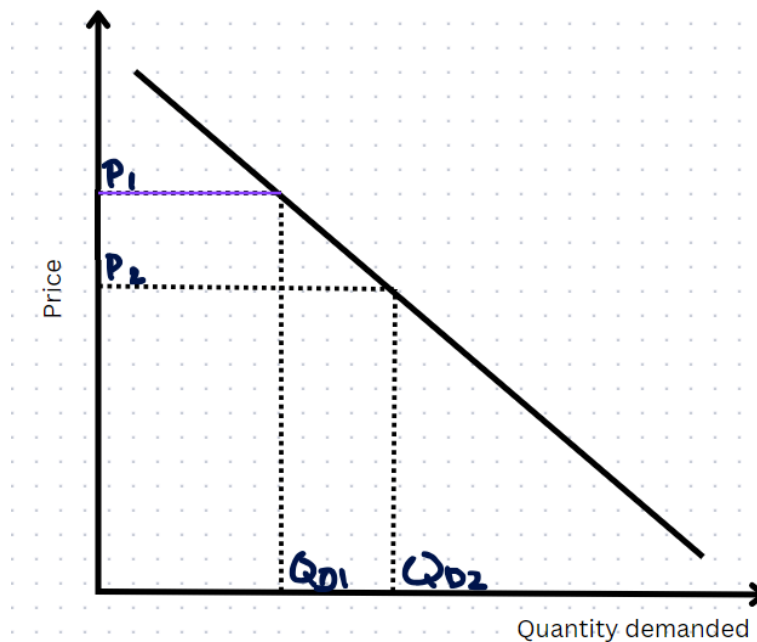
Factors Affecting Demand:
- **Price:**

  Price↑ ↓Quantity Demand (viceversa)
  Harder to purchase

- **Income:**

  Income↑ ↑Demand (viceversa)
  More money to spend

- **Customers:**

  Customer↑ ↑Demand (viceversa)

- **Substitutes:**
Substitutes↑ ↓Demand (viceversa)
There are similar things to buy

- **Complements:** These are goods that go together, like toothbrush and toothpaste. So an increase in the demand of one product increases the demand of the other product as well.
Taking the example of the toothbrush, if the price of the toothbrush increased, then its Qd would decrease and so the Qd of toothpaste would also decrease.

Taking the example of fuel price and cars and public commute. If fuel price increases then car demand decreases and public commute increases.

NB: both products can also be bought separately and so are complete products on their own.

- **Season:** Events and timeframes. Like summer/winter, religious holidays etcetera also affect demand for products.

- **Time:** With time certain products become less desirable, like CDs, so their demand diminishes. Other times the opposite happens.

Qd	Demand
Depends on price.	Depends on income
It is only a point on the curve.	It is the curve.
Change of Qd is along the curve:	Change of Demand shifts the curve:

The left graph shows Price on the y-axis and Quantity Demand on the x-axis with a downward sloping line. Labels: P_1, P_2, Qd_1, Qd_2, and $\Delta Qd = Qd_2 - Qd_1$.

The right graph shows Price on the y-axis and Quantity Demand on the x-axis with two downward sloping parallel lines. Labels: ΔD, D_1, D_2, and $\Delta D = D_2 - D_1$.
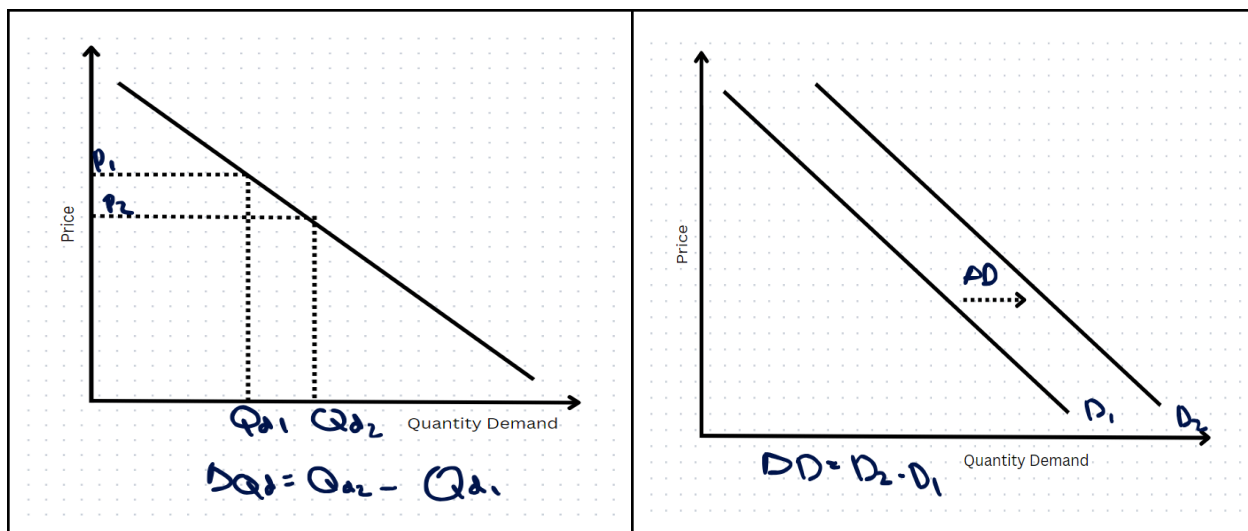
- Demand is the quantity of a good or service that consumers are willing and able to buy at given prices during a period of time. Quantity demanded is the amount of a good or service people will buy at a particular price at a particular time. (source: econedlink)
- Video reference: Demand vs Qd.

Questions

Q1) Assume that the income of an individual increases with the prices of product and services constant. What will be the change on the demand curve?
The curve shifts to the right.

Q2)If the cell phone and sim are complementary to each other, and the price of the sim increases, will the individual purchase new phones or not? Also how will it affect the demand?
The quantity demand of the sim decreases and there is no effect on the demand curve for sim, but the demand curve of phones shift to the left.

Key Terms

Rationality	Preferences	Budget	Utility	Marginal
Total	utils	Demand	Price	

Lecture 6

Supply: It is the desire backed by the willingness and ability of the producer to make the goods and services available at variable prices.

P(Price) directly proportional to Qs(Quantity Supply)

Supply Curve:
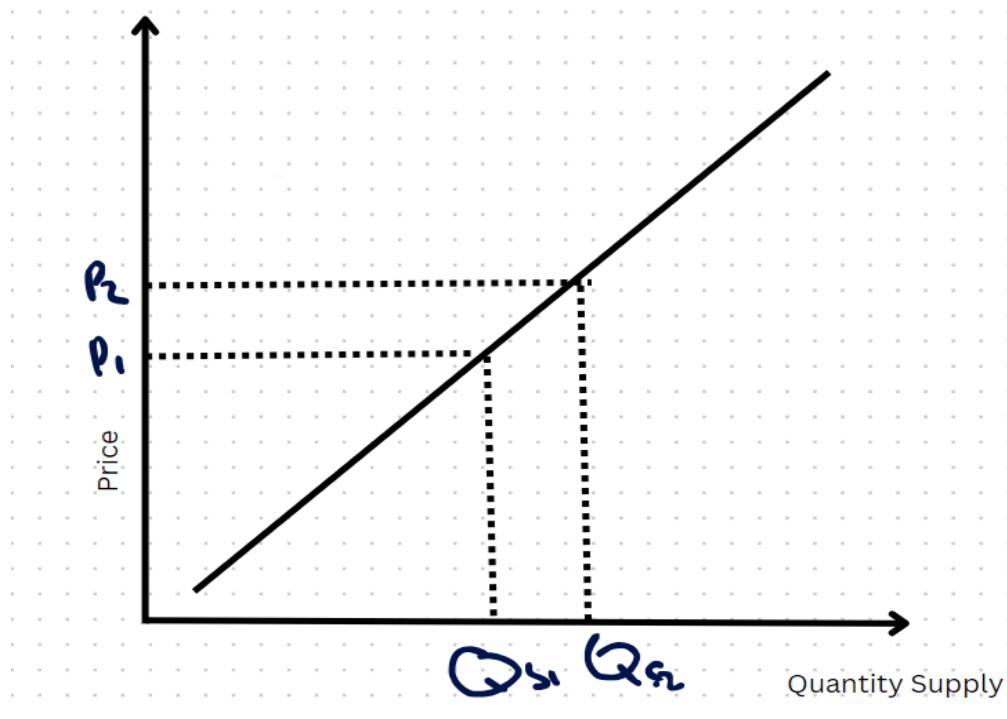
Factors affecting Supply:
- **Price:**

  Price↑ ↑Quantity Supply (viceversa)

- **Cost of Inputs:**

  Cost of Inputs↑ ↓Supply (viceversa)
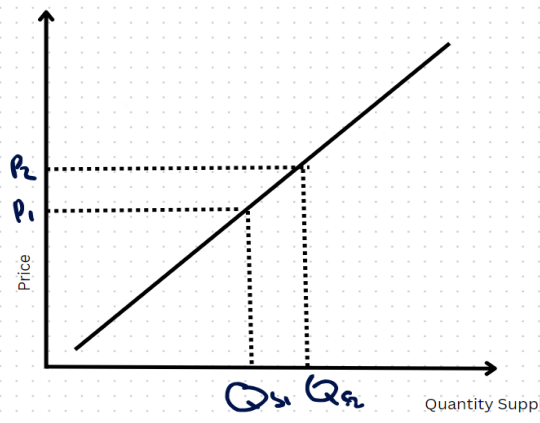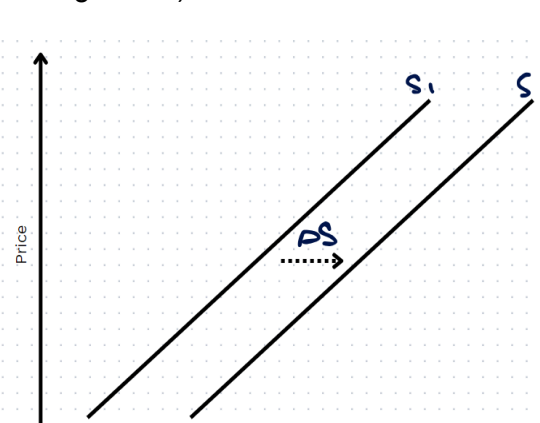
- **Technology:**

  Technology↑ ↑Supply (viceversa)

- **Tax:**

  Tax↑ ↓Supply (viceversa)

- **Season:** Events and timeframes. Like summer/winter, religious holidays etcetera also affect supply for products.

- **Time:** In time supplies learn to : specialize, expand and diversify.

Qs	Supply
Depends on price	Depends on technology
Change of Qs is along the curve:	Change of supply shifts the curve (paradigm shift):

Graph (Qs): Price on vertical axis with P_2 above P_1, Quantity Supply on horizontal axis with Q_{s1} and Q_{s2}.

$$\Delta Qs = Q_{s2} - Q_{s1}$$

Graph (Supply): Price on vertical axis, Quantity Supply on horizontal axis, with curves S_1 and S_2, and shift ΔS.

$$\Delta s = S_2 - S_1$$

- Quantity Supplied is specifically related to changes in the price of the good. It reflects the amount producers are willing and able to sell at a given price.
- Supply refers to the overall relationship between the price of a good and the total quantity of that good available in the market, influenced by factors like input costs, technology, taxes, seasonal conditions, and time.

Both graphs together:
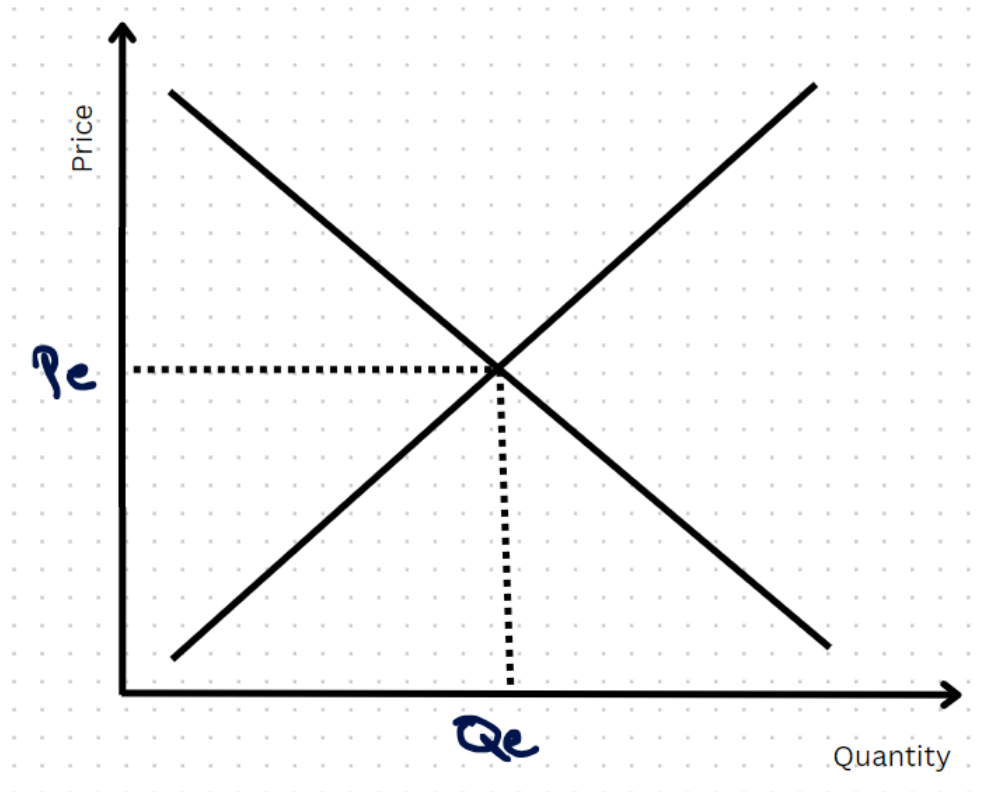
- Pe = Equilibrium Price, Qe = Equilibrium Quantity.
- Balance of demand and supply forces.

Cases:
1)Income↑ and Supply in constant:

Price (y-axis)

D_1 D_2

P_{ef}
P_e

Q_e Q_{ef}

Quantity
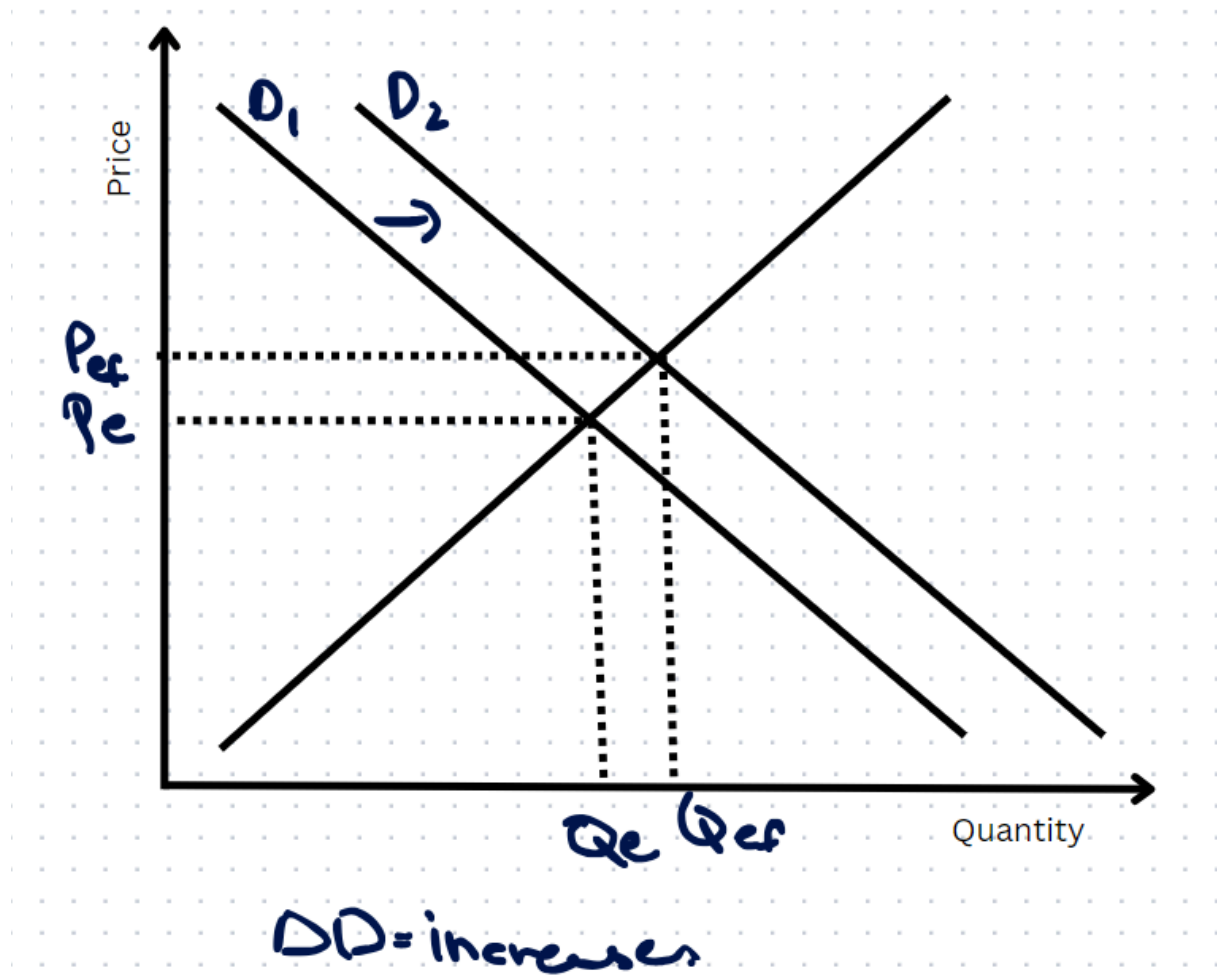
DD = increases

Spending increases as income increases.

2)Taxes↓ and demand is constant:

Price

S_1 S_2

P_e
P_{ef}

Q_e Q_{ef} Quantity
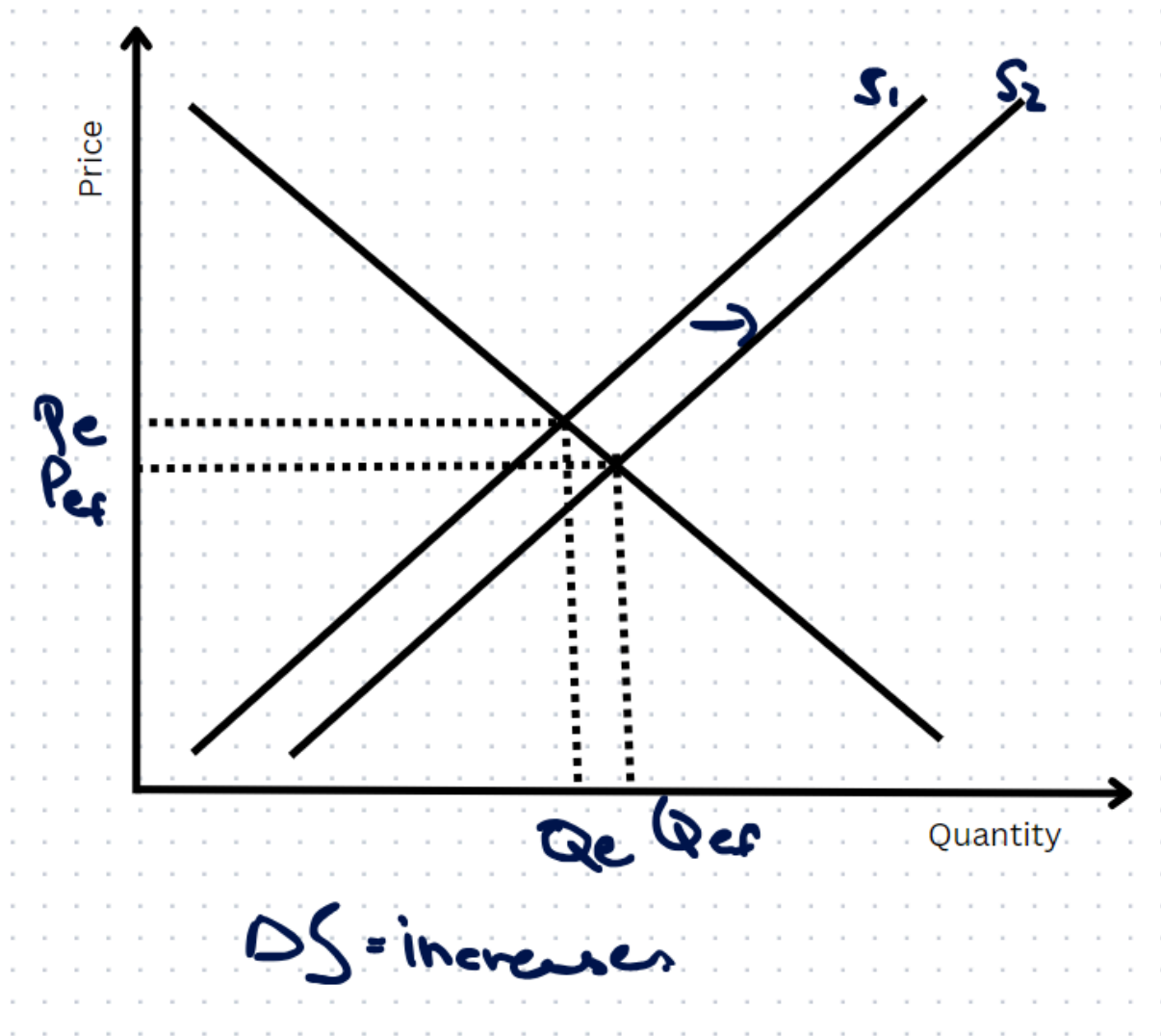
ΔS = increases

3)Technological improvement↑ and Demand is not constant:
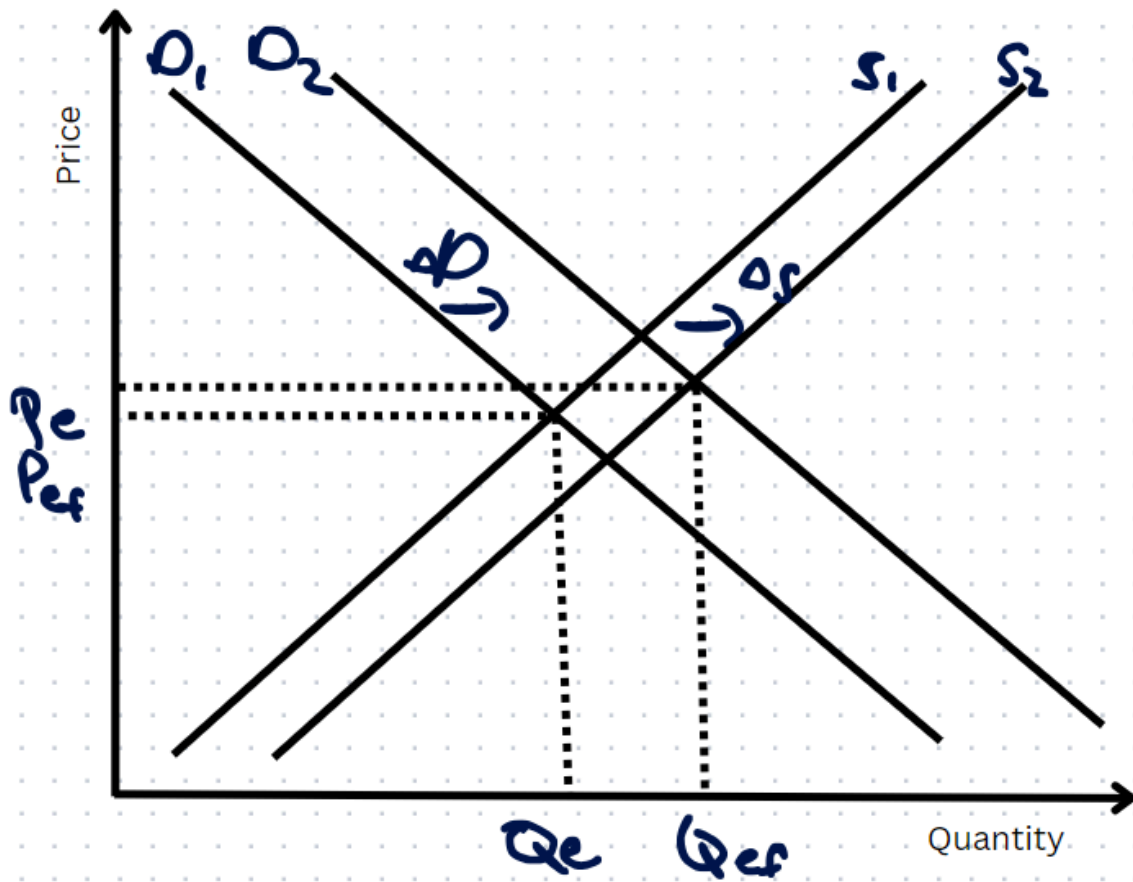
Case Studied: Iphone demand/supply and Ipod demand/supply

The Price Mechanism has three main functions

Rationing Function
- Prices allocate limited supply

Signalling Function
- Prices signal information about a market

Incentive Function
- Prices provide agents with incentives to alter their behaviour
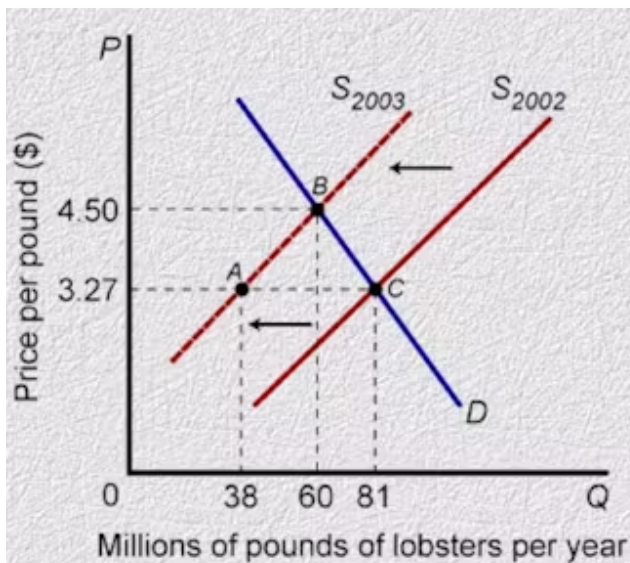
- A decrease in supply creates a shortage at the original price.

- The lower supply is rationed to those who are willing and able to pay the higher price.

Rationing Function: The rationing function of price is the process by which market prices determine the distribution of scarce resources. When a resource is limited, its price tends to increase, thereby rationing its usage to those who can afford it.

Price

Signalling effects

S1 S2 S

P1 — — — e2

e1 e P — — — —

In the long run, the higher price (P1) signals to potential suppliers to enter the market. (Supply shifts to S2)

And consumers leave the market to look for cheaper substitutes. (Demand shifts to D1)

D D1

Q1 Q2 Q Quantity

Copyright: www.economicsonline.co.uk
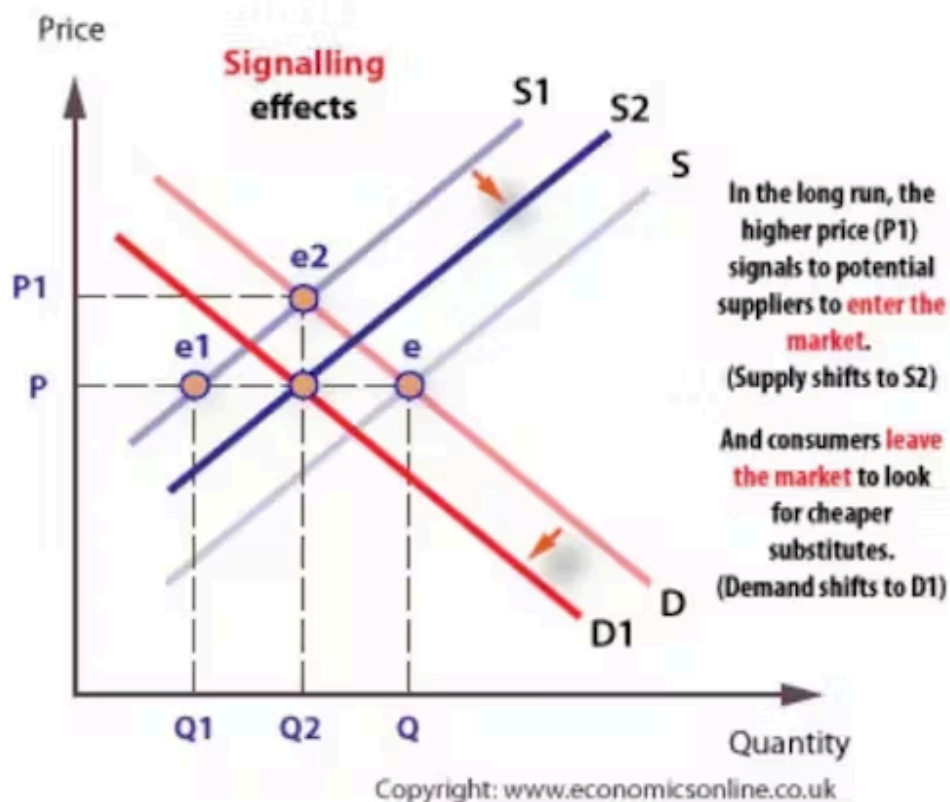
Signaling Function: The signaling function refers to how changes in price provide information to buyers and sellers, influencing their decisions. It's a communication tool in the market that guides the allocation of resources without central coordination.

Case Study: Housing Market
- *Rationing Aspect: In urban centres, high real estate prices can limit access to housing for lower-income groups, illustrating the rationing function of price.*
- *Signalling in Real Estate: Fluctuations in housing prices signal changes in the housing market, influenced by factors like interest rates, economic conditions, and demographic trends.*
- *Incentivising Developers: High demand and rising prices in certain areas can incentivise developers to build more houses or apartments, impacting the supply side of the market.*

Source: https://www.tutorchase.com/

Key Terms

Supply	Preferences	Budget	Utility	Marginal
Total	utils	Demand	Price	

Lecture 7

Equilibrium:
- **Price Floor:** The market conditions in which the government intervenes and sets a minimum price price above the market equilibrium, and sales below the price are prevented.
- **Price Ceiling:** It is the maximum price fixed by the government below the market equilibrium, and sales above this price are prevented.

Case 1: Wheat Floor(Price Floor):
Government wants to support the wheat farmers and sets a price of wheat wheat above the market price, with a promise to purchase the surplus.

Surplus: When the supply is greater than the demand, the leftover is surplus.
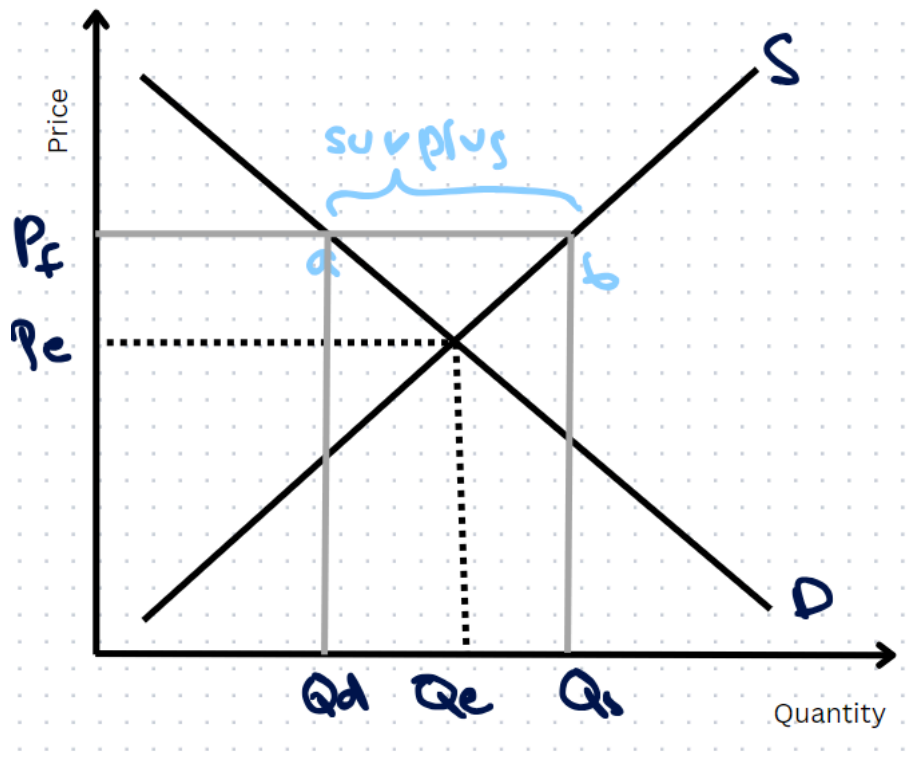
Case 2: Wage Floor(Price Floor)
The government wants to support the working class and sets a minimum wage above the market rate, without any promise to accommodate if workers become unemployed.
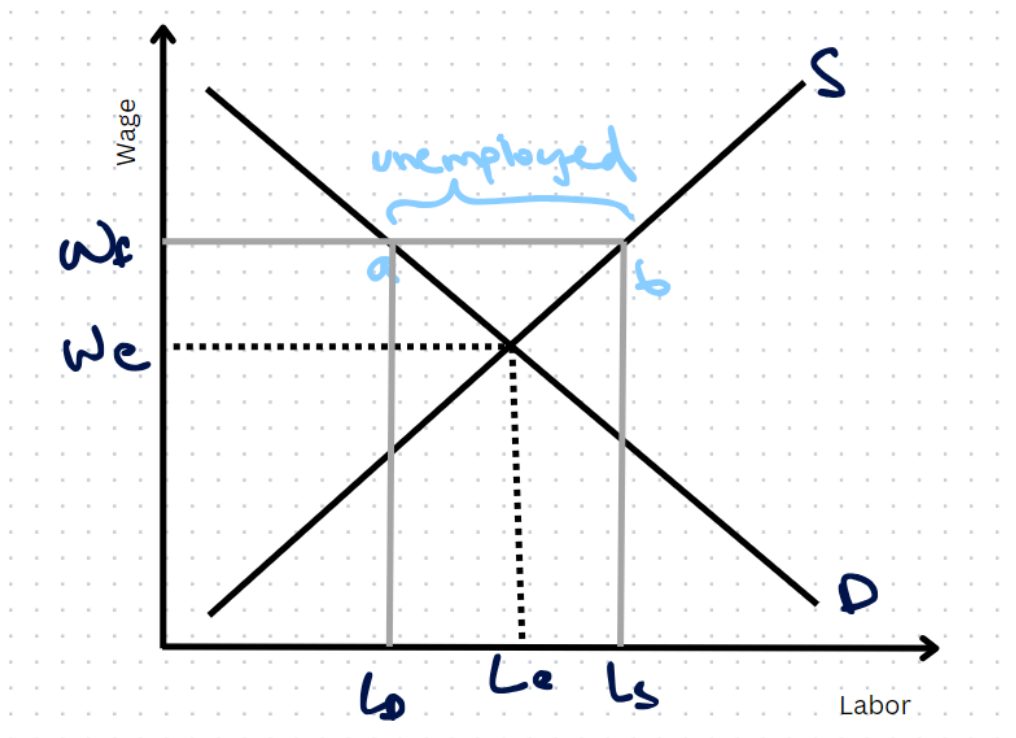
Questions

Q1) Who are the stakeholders?
Employers, working class, government.

Q2) How would the employers respond to the wage floor?
They will not be happy, since (O - Ld) < (O - Le), hence they will decrease the number of employees.

Q3) Would the working class be willing to work on a higher wage?
Yes, since (O - Ls) > (O- Le).

Q4)What would be the overall outcome of the wage floor?
Increased unemployment

Q5)If employees are forced to hire would that have an effect on the prices of goods and services?
If employers are forced to hire the demand curve will shift rightwards and the equilibrium will be at point b. The employers will also increase the price of the goods and services causing **Wage Push Inflation**.

Q6)What are the remedies to deal with unemployment?
- Subsidize taxes for industries
- Create apprenticeship programs
- Expand family profession
- Encourage entrepreneurship
- Provide loans for the working class(eg: Benazir income support)
- Foreign jobs

Wage Push Inflation:
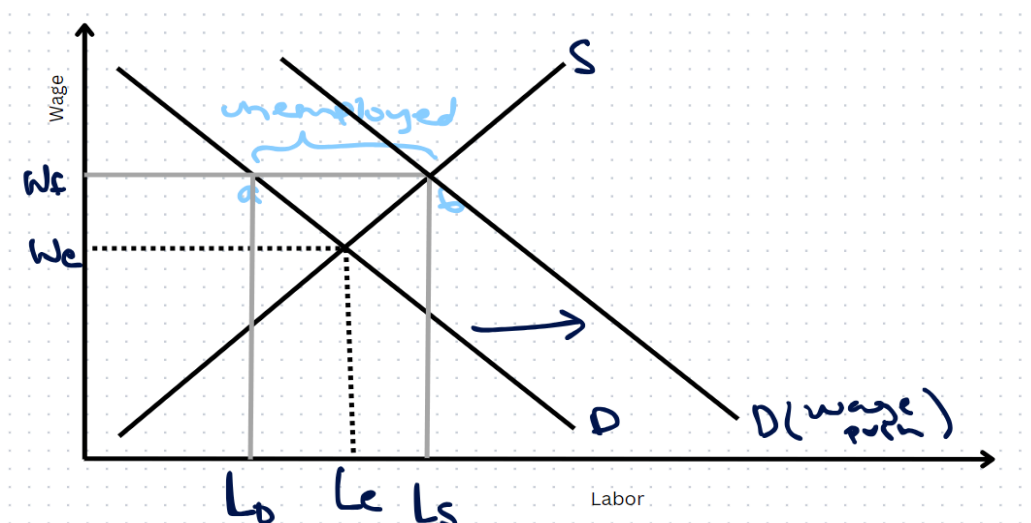
Key Terms

Rationality	Preferences	Budget	Utility	Marginal
Total	utils	Demand	Price	

Lecture 8

Rent Control:
The government wants to facilitate the renters by setting a rent below market price with no compensation.
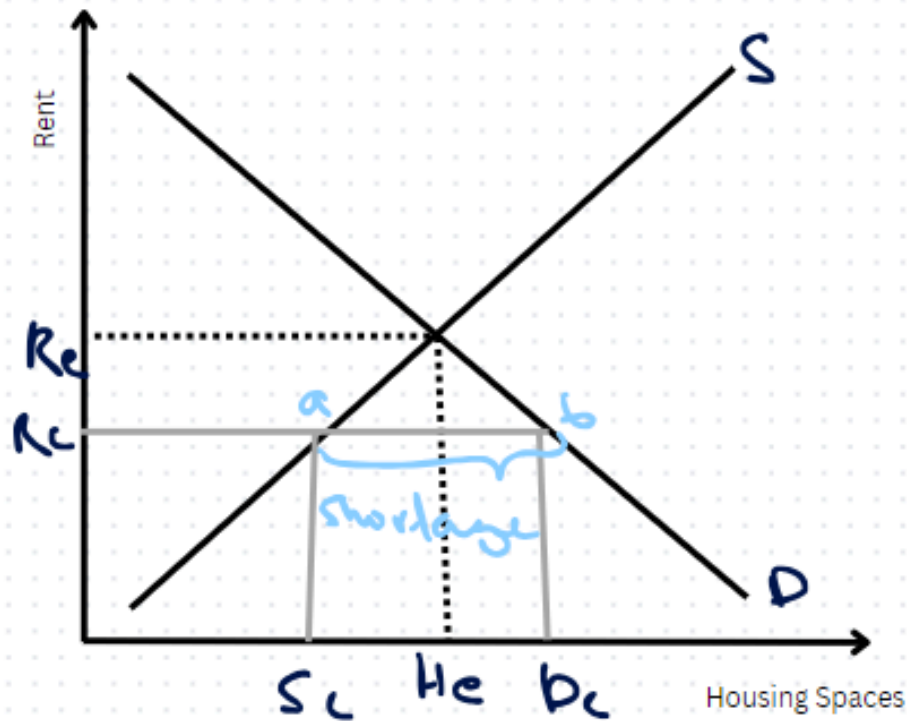
Re = Market Rent

Rc = Ceiling Rent

Sc = Housing Supply
at Rent ceiling

Dc = Housing demand
at Rent ceiling

b - a = shortage

Case: Lifesaving Drugs(Price Ceiling)

Government imposes a price ceiling(price below market price) on the price of the drugs to facilitate the sick.

Price

Pe

Pc

S

shortage

D

Sc   Qe   Dc

Quantity of Drugs
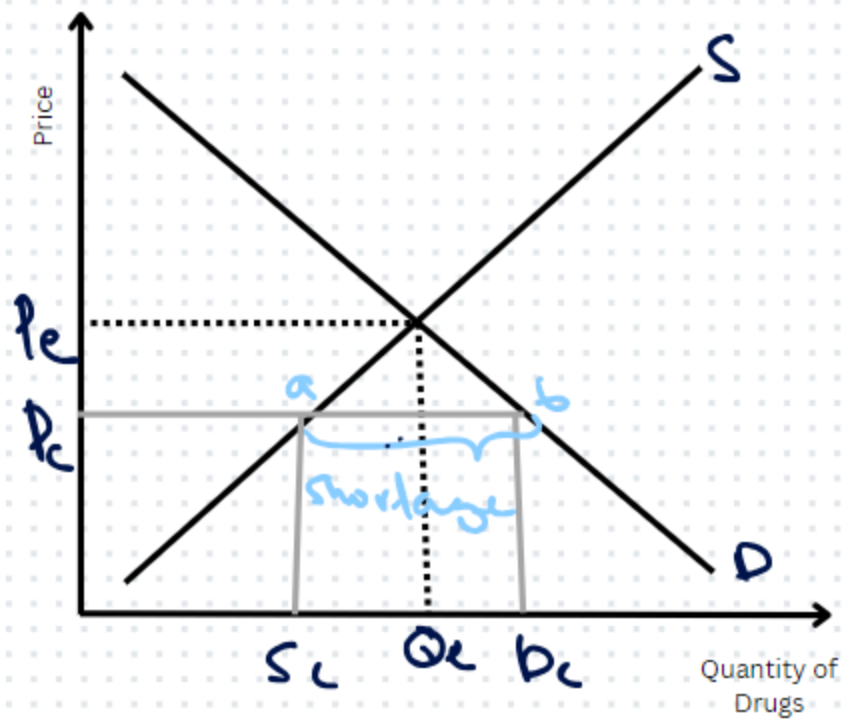
Pe = Market
Pc = Ceiling Price
Sc = Drug Supply at Price ceiling
Dc = Drug Demand at Price ceiling
b − a = shortage

Case: Fuel Price(Price Ceiling):

Accommodation for consumers provided by the government by decreasing the fuel price from the market price.

Pe = Market Price
Pc = Ceiling Price
Sc = Fuel supply at Price ceiling
Dc = Fuel Demand at Price ceiling
b - a = shortage
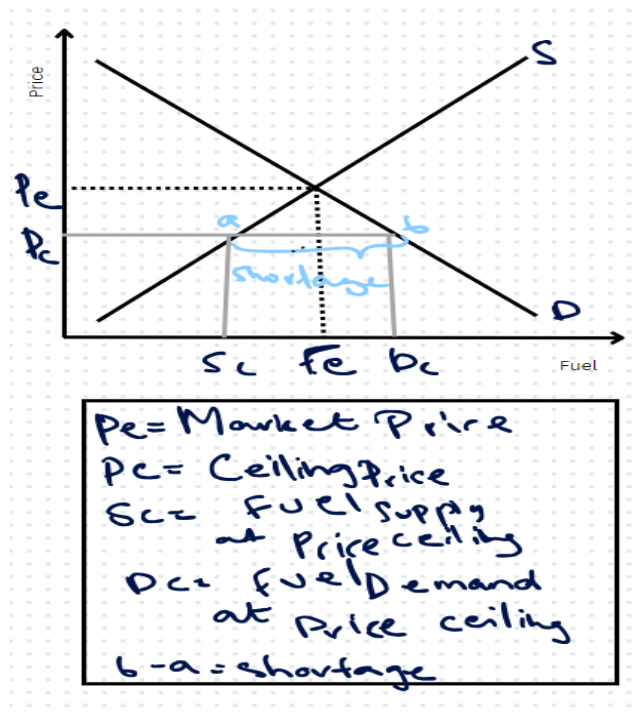
Questions

Q1) Who are the stakeholders?

Q2) What would be the response of the consumers?

Q3) What would be the response of the sellers?

Q4) What will be the effect of the supply?

Q5)What are the remedies?
- Smuggling control
- Find alternative fuel supplies
- Use public transport
- Use fuel cards

Lecture 9

Elasticity: The modified response of the customer due to the price change or any other factor of demand/ measured response to the price change or change in any other factor.

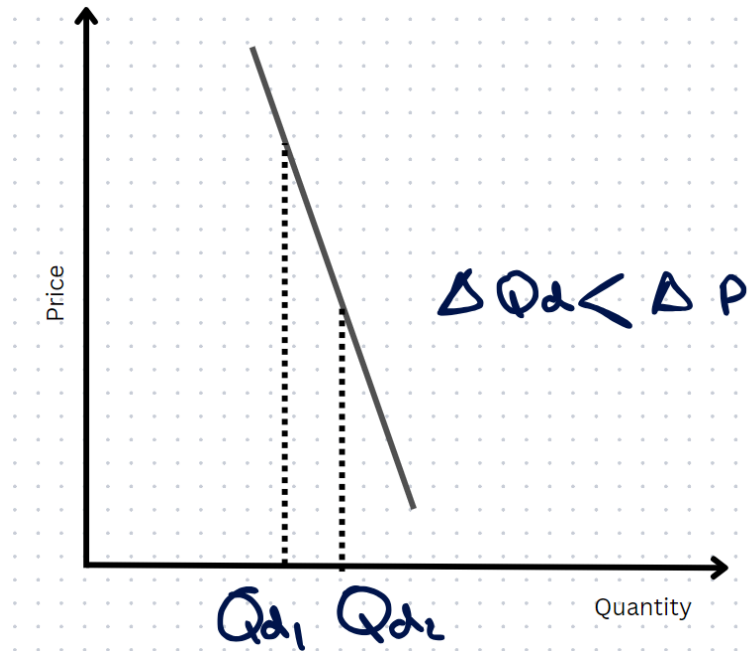$$Ed = \%\Delta Qd \:/\: \%\Delta P \quad \rightarrow \text{could be any other factor of demand}$$

Types of elasticity:
- Perfectly Inelastic: The demand remains constant even though the factor(price) changes.
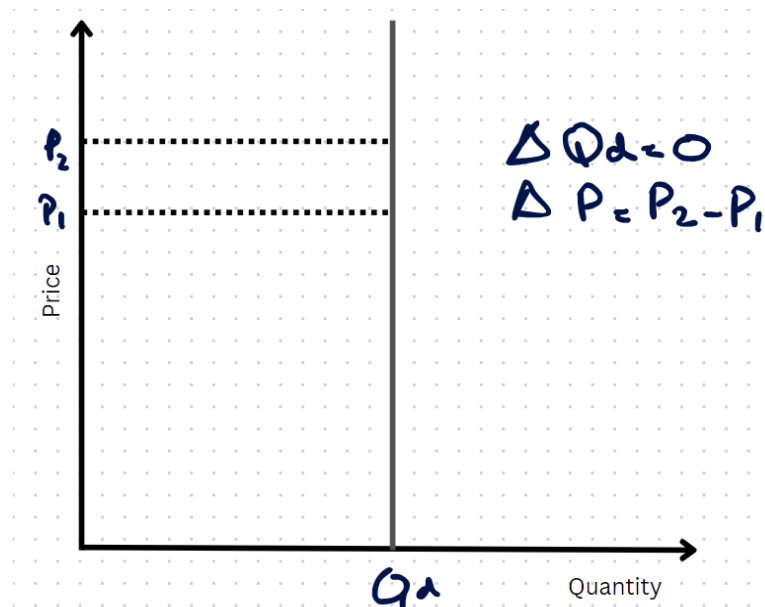
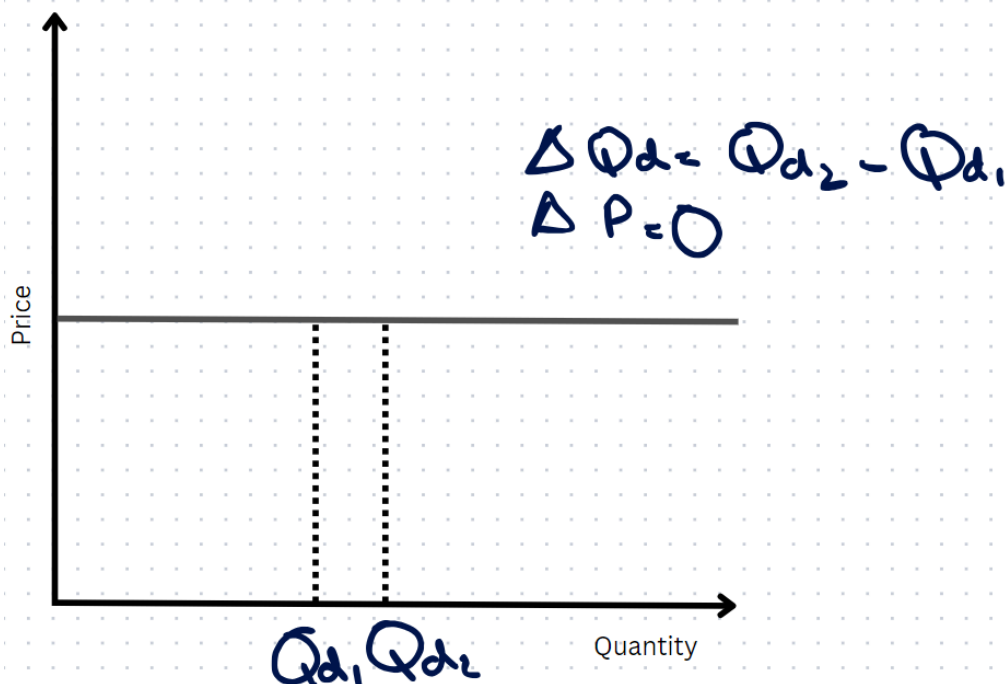$$\Delta Qd = 0$$
$$\Delta P = P_2 - P_1$$

Examples: This is a theoretical model so nothing in practical life follows this elasticity, the closest examples are: healthcare treatments.

- Relatively inelastic:

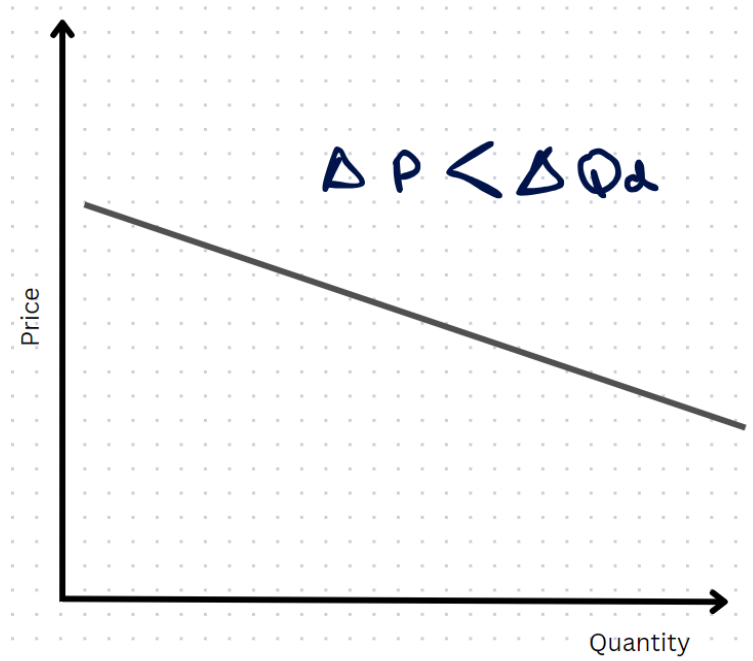$$\Delta Qd < \Delta P$$

Qd_1 Qd_2

Examples: all the necessities.

- Perfectly elastic: The demand changes even though the factor(price) remains constant. If the price changes no one will buy it.

$$\Delta Qd = Qd_2 - Qd_1$$
$$\Delta P = 0$$

$Qd_1 Qd_2$

Examples: This is a theoretical model so nothing in practical life follows this elasticity, the closest examples are: gold, diamond

- Relatively elastic:

$$\Delta P < \Delta Qd$$

Examples: Luxuries.

Video reference: Elasticity of Demand

Types of Ed:
- **Arc Price Elasticity:**

  Earc = ((Q2 - Q1)/((Q2 + Q1)/2)) / ((P2 - P1)/((P2 + P1)/2))

  Used when there are visible changes in the graph

- **Arc Income Elasticity:**

  Earc(Y) = ((Q2 - Q1)/((Q2 + Q1)/2)) / ((Y2 - Y1)/((Y2 + Y1)/2))

  If Earc(Y) > 1, the good is a luxury (demand increases more than income).
  If 0 < Earc(Y) < 1, the good is a necessity (demand increases less than income).
  If Earc(Y) < 0, the good is an inferior good (demand decreases as income increases).

  Used when there are visible changes in the graph

- **Point Elasticity:**
  Let's say Q = 20 - 2p + 0.5Y

  $$Ept(P) = \Delta Q/\Delta P * P/Q = -2 * P/Q$$
  $$Ept(Y) = \Delta Q/\Delta Y * Y/Q = 0.5 * P/Q$$

Used when there are minute changes

- **Cross Price Elasticity:**

  Ecross(A*B) = ((Q2A - Q1A)/((Q2A + Q1A)/2)) / ((P2B - P1B)/((P2B + P1B)/2))

  If Exy > 0, goods X and Y are substitutes (increase in price of Y increases demand for X).
  If Exy < 0, goods X and Y are complements (increase in price of Y decreases demand for X).
  If Exy = 0, goods are unrelated.

  Used for complements and substitutes
  how the demand for good **A** changes in response to the price change of good **B**.

- **Advertising Elasticity:**
  Ed = %ΔQd / %ΔAd expenses

  Advertising has a direct relation with demand.

Ed < 1	Rel inelastic	ΔP > ΔQ
Ed > 1	Rel elastic	ΔQ > ΔP
Ed = 0	Inelastic	ΔQ = 0 ΔP = ∞
Ed = ∞	Elastic	ΔQ = ∞ ΔP = 0
Ed = 1	Unit Elastic	ΔQ = ΔP

Questions from the handout = Q3
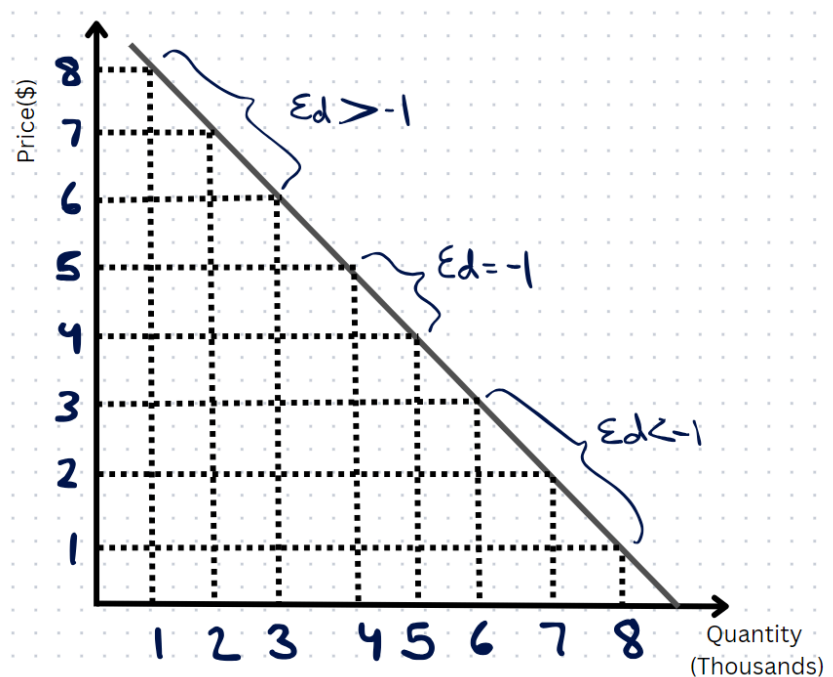
Lecture 10

**Total Revenue and Elasticity Curve:**

Total Revenue = Q * P
Elasticity = %ΔQd / %ΔP<u>Elasticity: The modified response of the customer due to the price…</u>

Elasticity Curve

P x Q	
8000	
14000	TR increases when Ed > -1 (elastic)
18000	
20000	TR becomes constant when Ed = -1(unit elastic)
20000	
12000	
14000	TR decreases when Ed < -1(inelastic)
8000	

Marginal Revenue: First derivative(difference) of TR.
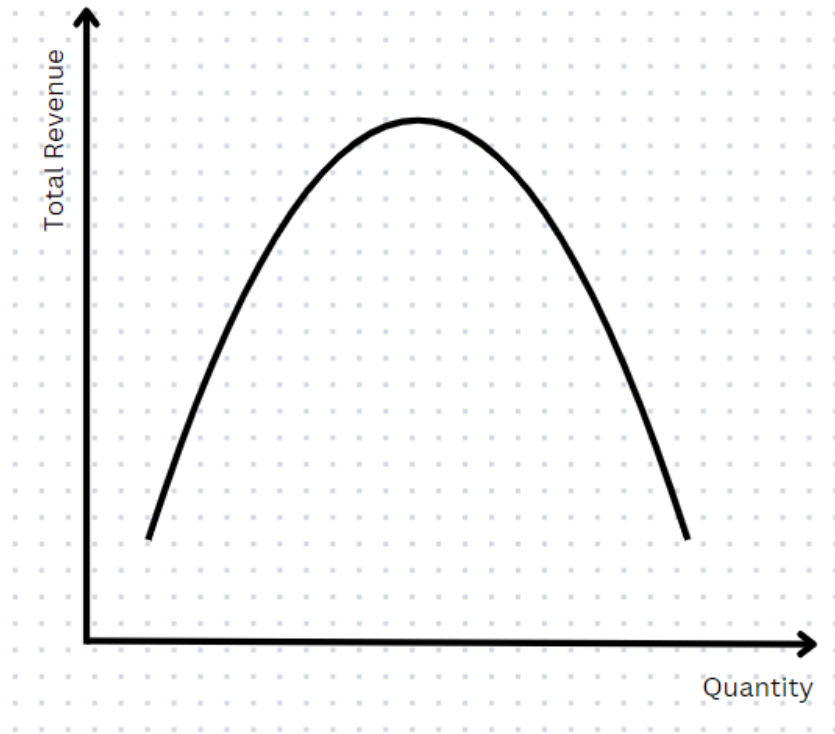
Total Revenue Curve

Questions from Handout: Q17, Q8, Q9, Q10, Q3, Q5, Q11, Q12, Q20, Q19, Q18, Q16.

Lecture 11

Utility Maximization Rule: In order to maximize utility, the customer should allocate his money/income in a manner that the last dollar spent on each good yields equal *utility per dollar(Mu/P)*.

$$M (income)= Pa.A + Pb.B$$

M = $10, Pa =$1, Pb = $2

Unit of Product	Mua	MUa/Pa	Mub	MUb/Pb
1	10	10	24	12
2	8	<u>8</u>	20	10
3	7	7	18	9
4	6	6	16	<u>8</u>
5	5	5	12	6
6	4	4	6	3
7	3	3	4	2

Mua/Pa = Mub/Pb = 8 = 8/1 = 16/2 utills/dollar
Units of A = 2, Units of B = 4
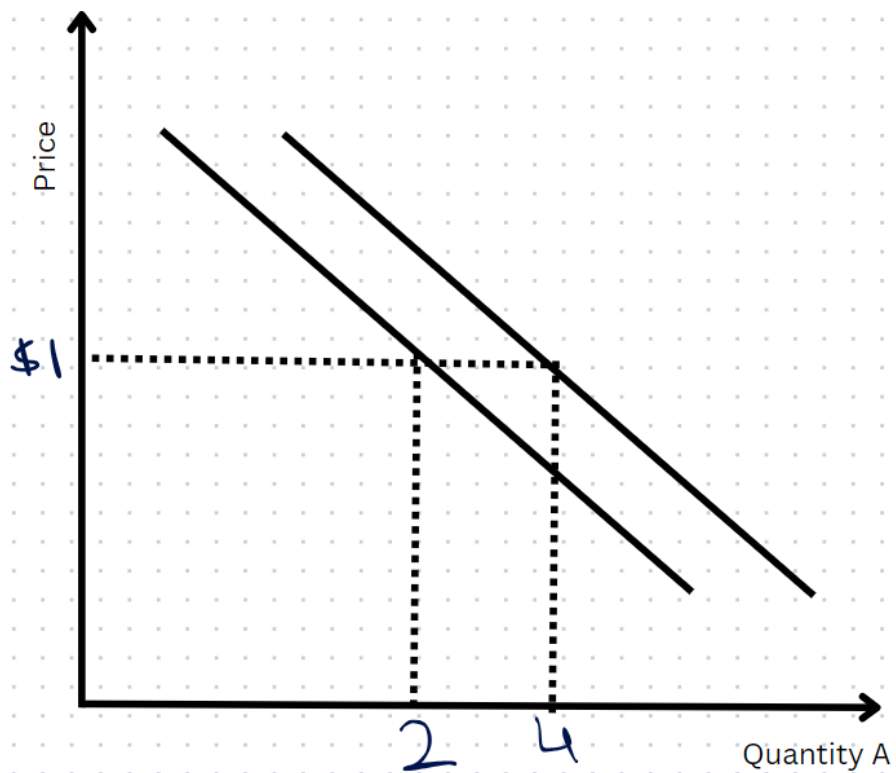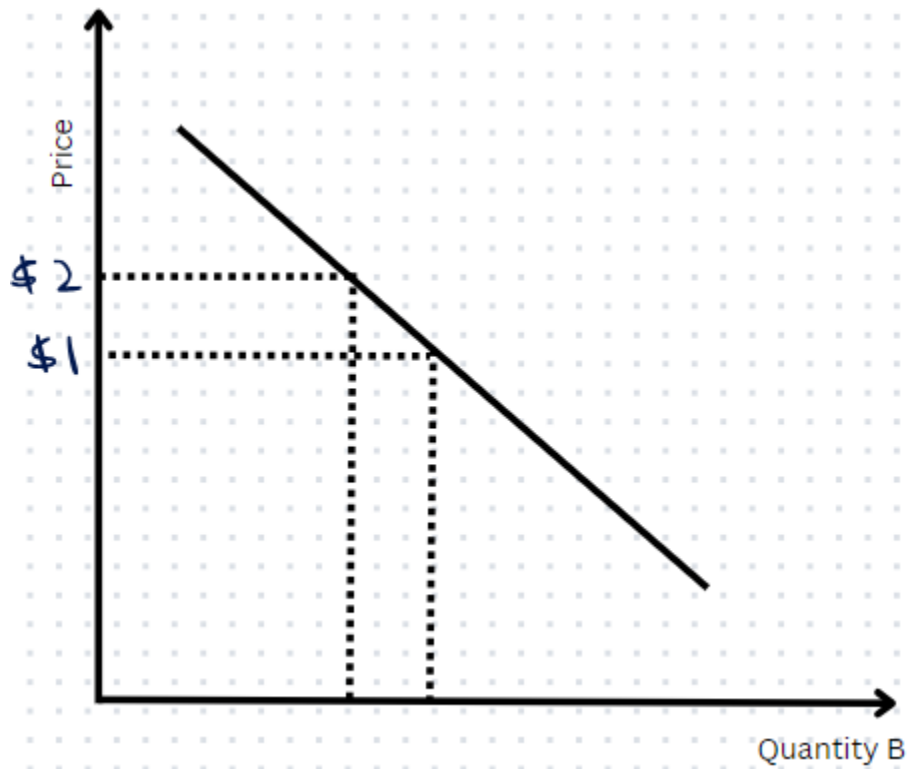**M = $10 = 2*1 + 4*2**

If Pb = $1, all else same

Unit of Product	Mua	MUa/Pa	Mub	MUb/Pb
1	10	10	24	24
2	8	8	20	20
3	7	7	18	18
4	6	<u>6</u>	16	16
5	5	5	12	12
6	4	4	6	<u>6</u>
7	3	3	4	4

Mua/Pa = Mub/Pb = 6 = 6/1 = 6/1
Units of A = 4, Units of B = 4
M = $10 = 4*1 + 6*1

Graphs of Change(Due to ΔPb):

Price

$2

$1

Quantity B

Price

$1

2   4

Quantity A

Pa = $18, Pb = $6, Pc = $4, Pd = $24, M = $106
Can leave a product

Unit of P	Mua	Mua/ Pa	Mub	Mub/ Pb	Muc	Muc/ Pc	Mud	Mud/ Pd	Mvs
1	72	4	24	4	25	15/4	36	3/2	5
2	54	3	15	5/2	12	3	30	5/4	4
3	45	5/2	12	**2**	8	**2**	24	1	3
4	36	**2**	9		7		18		**2**
5	27		7		5		13		1/2
6	18		5		4		7		1/4
7	15		2		3.5		4		1/8
8	12		1		3		2		

No product D bought.

IF THERE IS NO SITUATION WHERE MUa/Pa=MUb/Pb THEN ANSWER: no allocation for this case(money is saved),

Lecture 12

Utility Maximisation Rule:

Q) Mua = z = 10 - x
   Mub = z = 21 - 2y

   x + y = 10
   a) **Compare:**
      10-x = 21-2y
      2y- x = 11
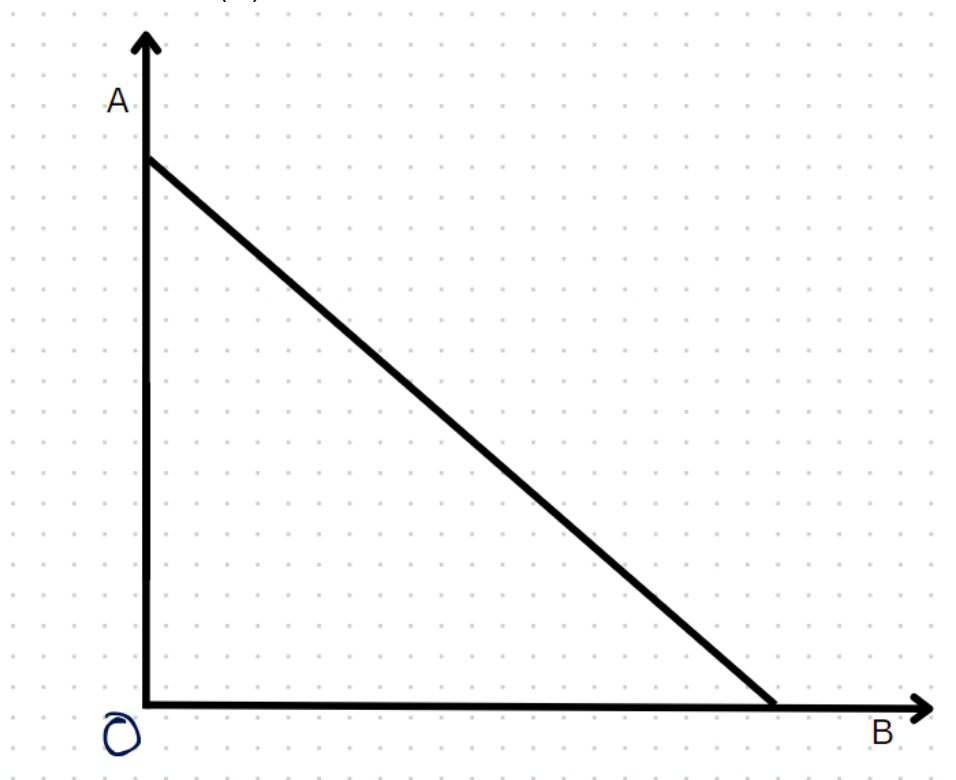   b) **Find z:**
      y = 10-x
      Substitute and solve to find z

Budget Line:
Objective\Cardinal approach to utility.
It is a curve that shows objectively various combinations of two goods which the individual can consume in limited income(M).
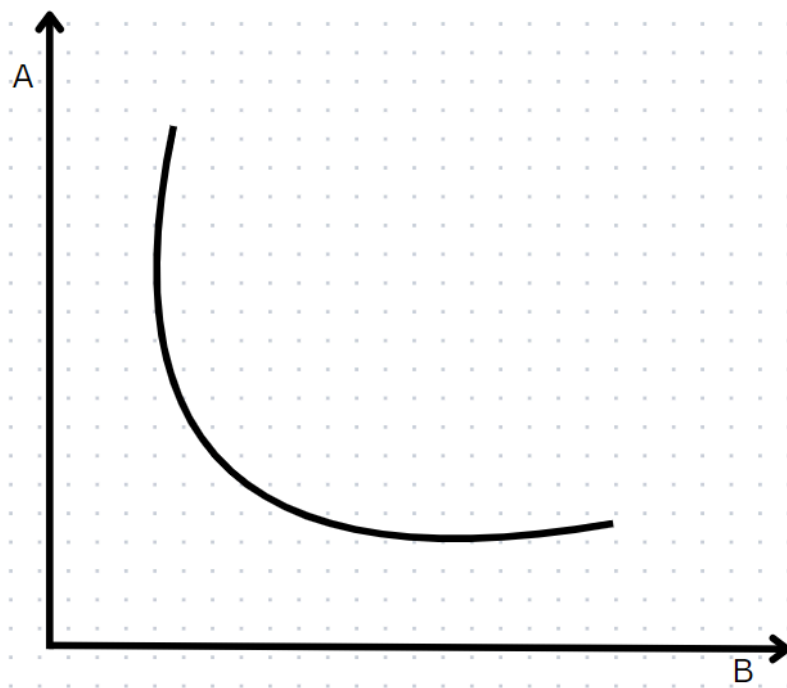

M = $12, Pa = $1.5, Pb = $1
M = Pa(A) + Pb(B)
12 = 1.5(A) + 1(B)

A	B
8	0
6	3
4(Optimal Combination)	6
2	9
0	12

All combination will equate the equation to $ 12.

Indifference Curve Approach:
It is the locus of points which shows various combinations of two goods the individual can consume in limited income, subjectively.


Properties:
- Convex to origin
  Q) Why convex?
  We can increase and decrease(law of diminishing MU), we can't increase and increase and decrease and decrease.(With respect to A and B)

A↑ TU↑ MU↓
B↓ TU↓ MU↑
MRS(Marginal rate of Substitution) = Slope of Budget Line = A/B = *the rate at which a consumer is willing to give up one good in exchange for another good while maintaining the same level of utility. It measures the trade-off between two goods.*
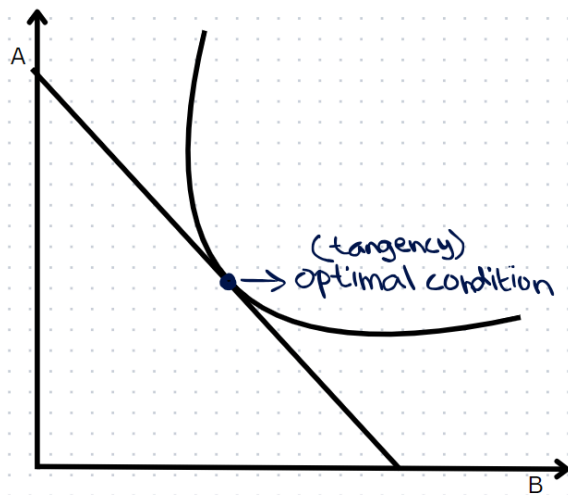

- Indifference map: To compare different curves.
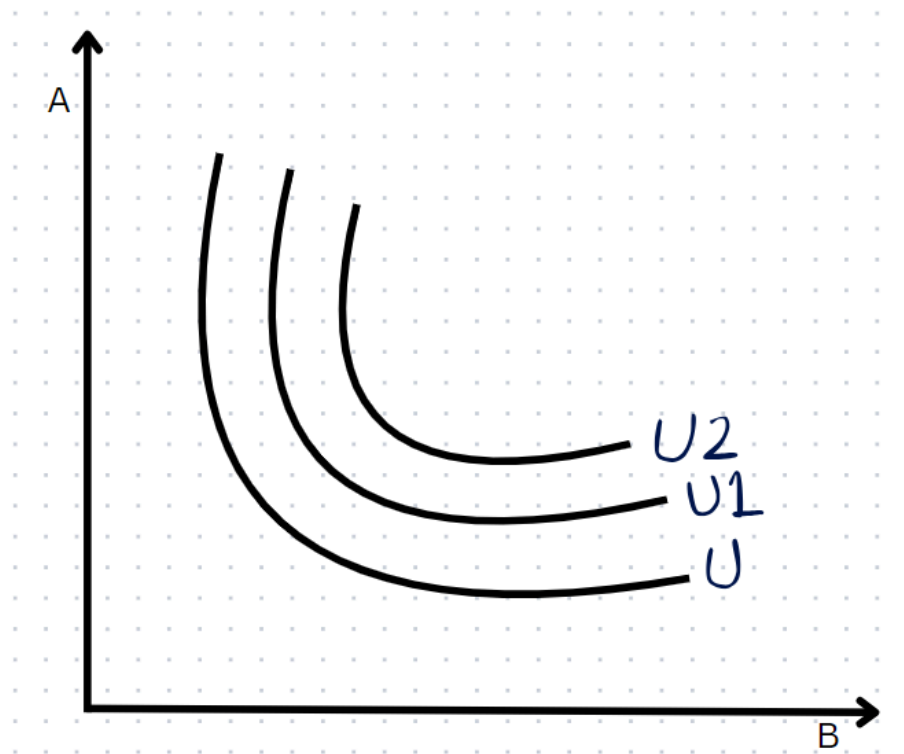
TU is the same throughout 1 curve.
TU decreases with the decrease in difference from O(origin)
Total Utility: U < U1 < U2

- Consumers Equilibrium: MRS
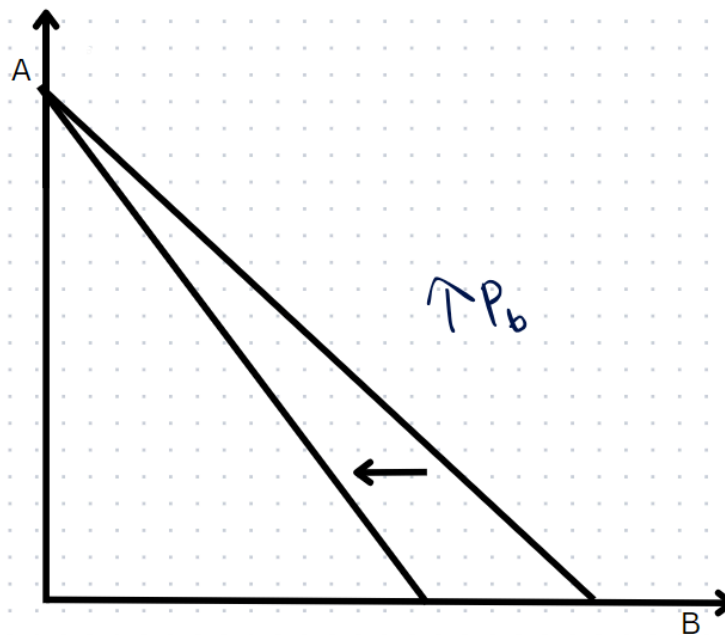
(tangency)
→ optimal condition

The consumer's equilibrium is found at the point where the highest indifference curve is tangent to the budget line. At this point, the slope of the budget line equals the MRS.
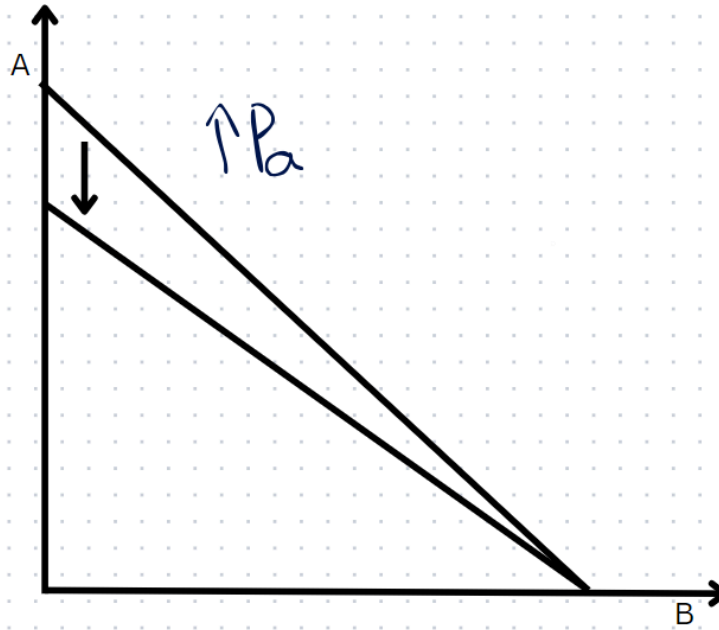
- Negatively sloped.

Properties of Budget Line:
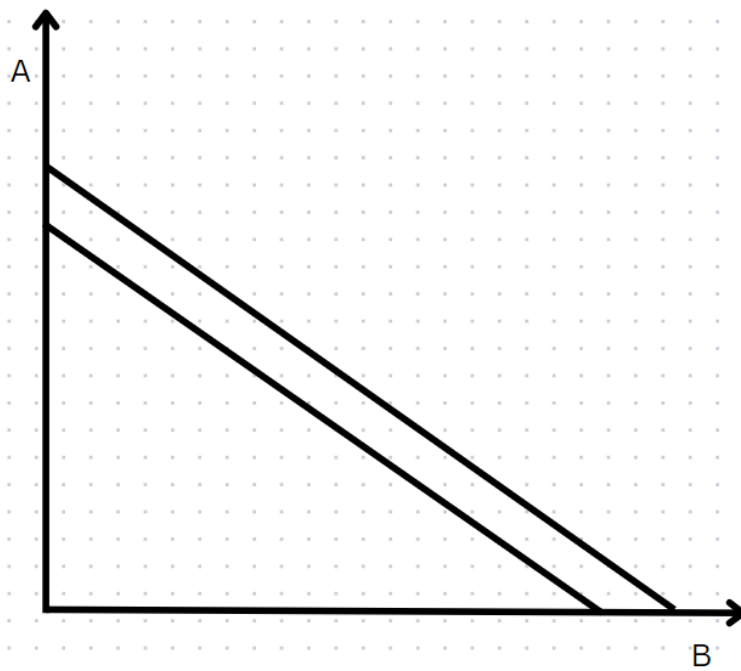1. It can rotate on either axis(due to price change).

$\uparrow P_b$

Price of B increases so quantities of B decreases

↑Pa

Price of A increases so quantities of A decrease

2. It can parallel shift (due to income).

Quantities of A and B increase throughout the curve with increase in income

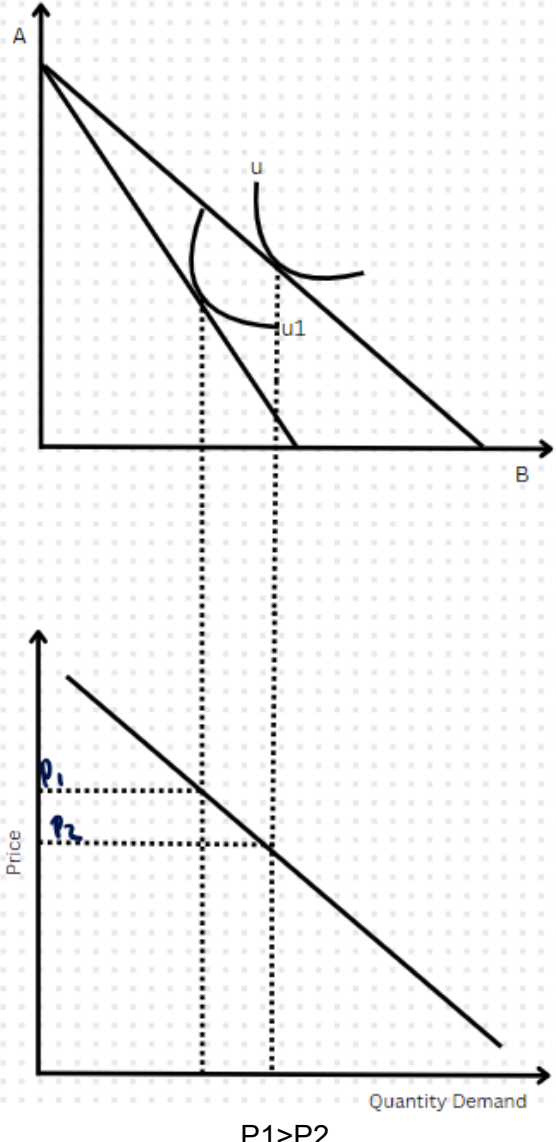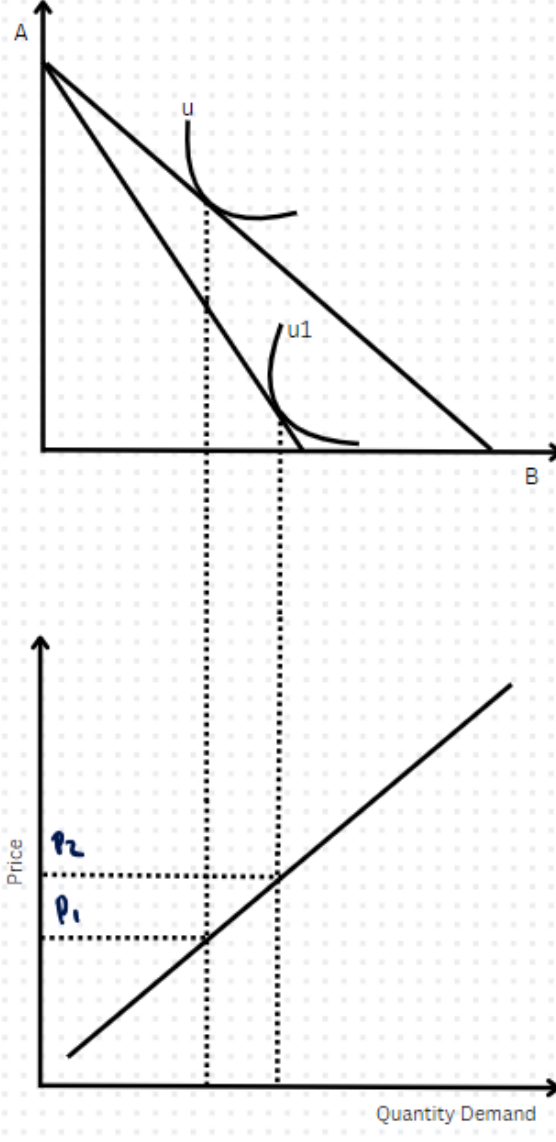Real Income = M(Income)/P(Price) = Income - Inflation

Types of Goods:
- Normal: doesn't violate the law of demand. E.g:
- Giffen: violates the law of demand. E.g:rough paper.

- Superior: goods for which demand rises with increasing income level. E.g: medical goods.
- Inferior: goods for which demand falls with increasing income level. E.g: staple food.

Source: [Superior and Inferior](#)

Lecture 13

Normal Good	Giffen Good
Follows law of demand. $P \propto 1/Qd$	Doesn't follow the law of demand. $P \propto Qd$
Eg: Laptops(Demand decreases as price increases)	Eg:Practice paper to print paper(Demand increases as price increases as quality of product increases)

Normal Good graphs — P1>P2

Giffen Good graphs — P2>P1

Superior goods: goods for which demand rises with increasing income levels.
Inferior goods: those for which demand falls as incomes go up.

Real Income = M/P = Income - Inflation

Cost of Production:
1. **Explicit Cost:** visible, e.g: infrastructure.
2. **Implicit Cost:** invisible, e.g: alternative income.

   Profit = Total Revenue(TR) - Total Cost(TC)
   TR= P*Q
   TC= Implicit + Explicit
3. **Accounting Profit:** TR - Explicit Cost
4. **Economic Profit:** TR - (Explicit Cost + Implicit Cost)
   Accounting Profit > Economic Profit

5. **TC = FC + VC:**
   FC: Fixed Cost, doesn't change with the output.(eg: equipment).
   VC: Variable Cost, may change with the output(eg: labor).
   Question from book

6. **Law of diminishing returns:**
   - **Short run**
   - **Long run**

Assumptions:
- Short run
- Labor is unavailable
- Technology is fixed

Statement: 'As successive units of variable resources are added to fixed resources, total product may increase to a certain point but marginal product will decrease.'

Total Product = Total Output
Marginal Product = $\Delta TP/\Delta L$(Labor/units of resources)
Average Product = TP/L(Labor/units of resources)

Variable Product(L)	Total Product	Marginal Product	Average Product
0	0	0	0
1	10	10	10
2	25	15	12.5
3	45	20	15
4	60	15	15
5	70	10	14
6	75	5	12.5
7	75	0	10.75
8	70	5	8.75
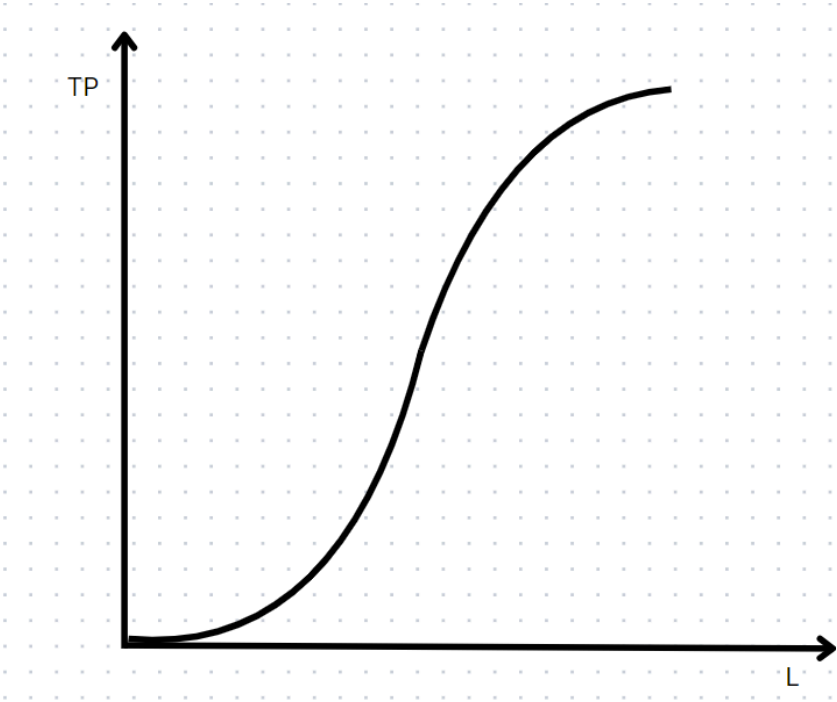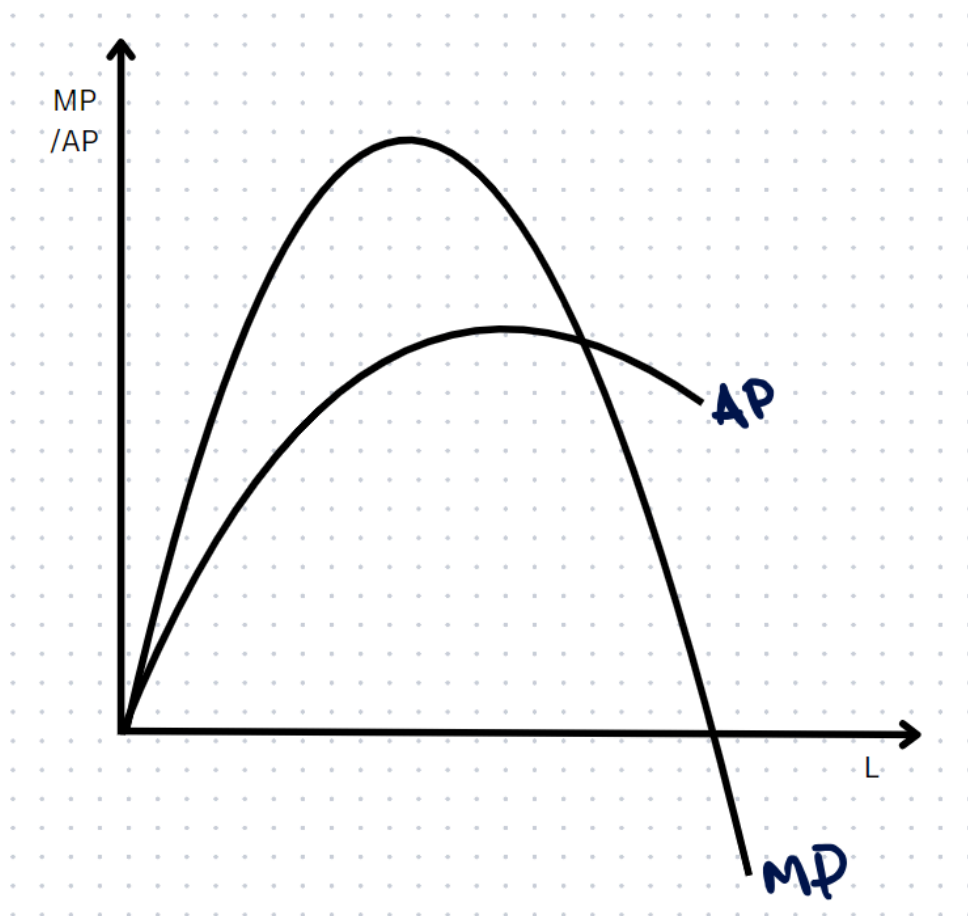
Lecture 14

Cost of Production:

Other derivatives of cost:
TC = TFC + TVC

Marginal cost =

$$\frac{\Delta TC}{\Delta TP}$$

Average Cost =

$$\frac{TC}{TP}$$
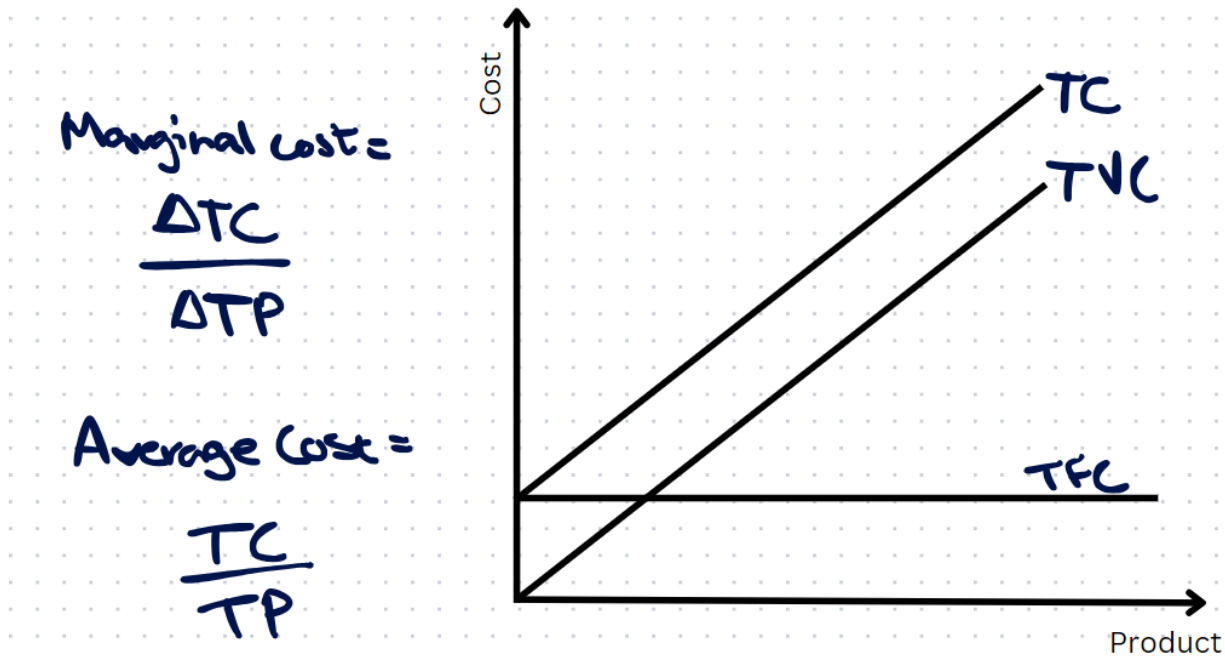
Marginal cost: Additional cost.
Quantity = Labor = Total Product

TP	TFC	TVC	TC	AFC	AVC	ATC	MC
0	100	0	100		0		0
1	100	45	145	100	45		45
2	100	85	185	50	42.5		40
3	100	120	220	33.3	40		35
4	100	150	250	25	37.5		30
5	100	185	285	20	37		35
6	100	225	325	16.667	37.5		40

7	100	270	370	14.29	38.6		45
8	100	325	425	12.5	40.6		55
9	100	390	490	11.1	43.33		65
10	100	465	565	10	46.5		75
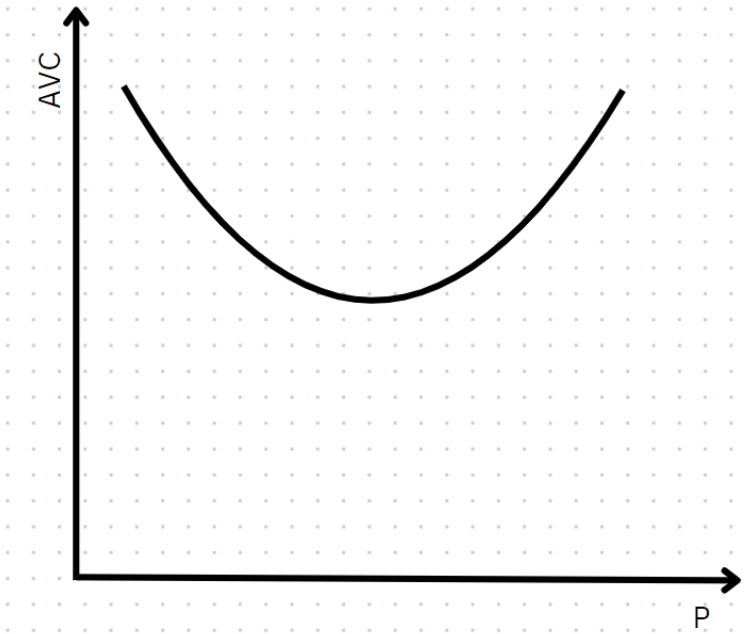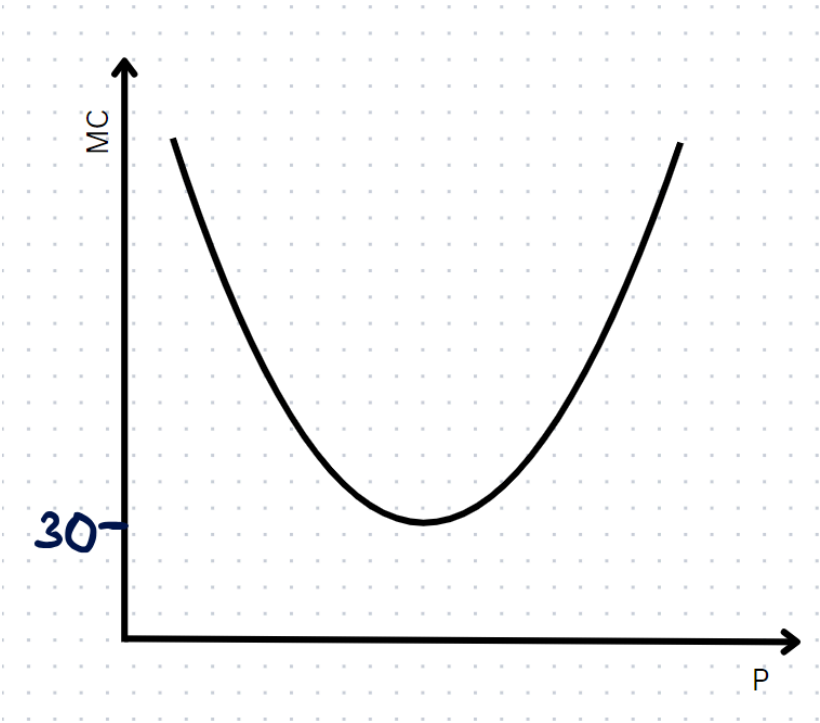
Product Cycle([Product cycle](#)):
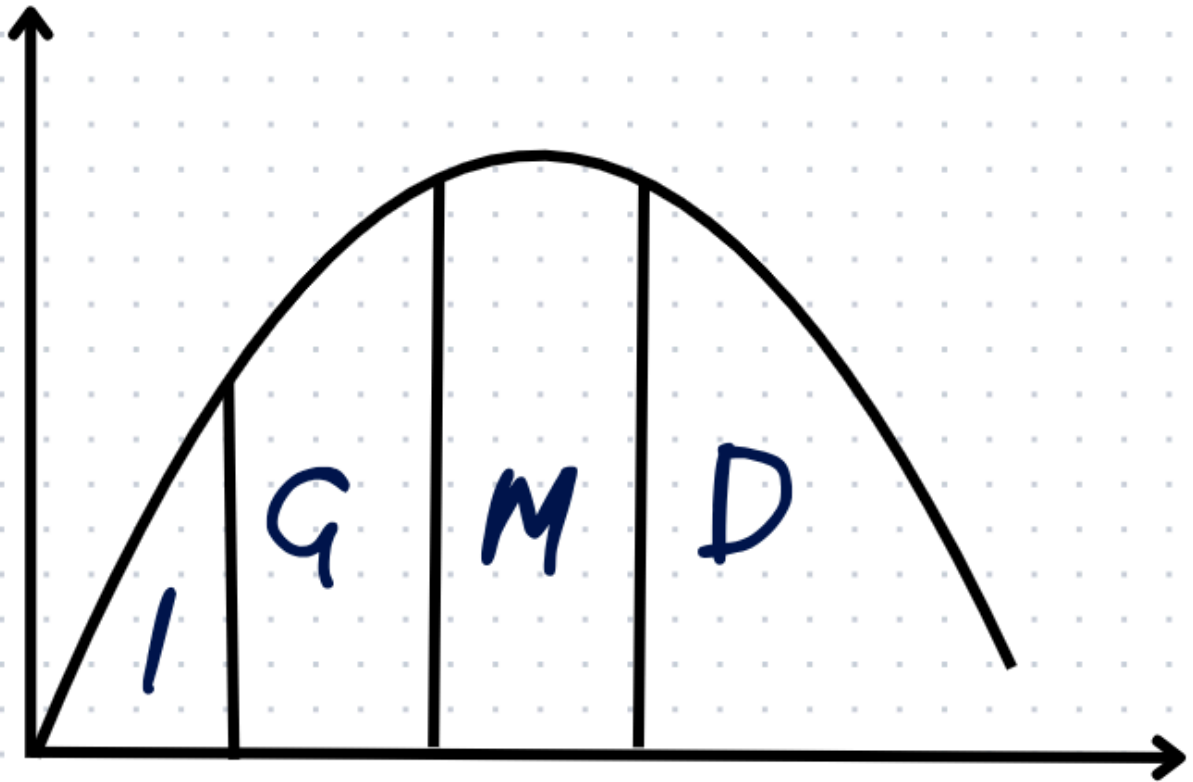
I = initial
G = growing.
M = maturity.
D= decline.

Questions

Q1) Why is the MP curve a mirror image on the MC curve?

Law of diminishing returns, when cost increases product decreases.

Q2) Why is the AVC(Average Variable Cost) U shaped(ChatGPT + Sir Michael)?

The U-shaped Average Variable Cost (AVC) curve reflects the relationship between output levels and variable costs. Let's break down why this occurs:

Initial Decline in AVC

1. **Low Production Levels**: At the start, production is low, leading to inefficiencies. Workers may not be specialized, and resources may not be used optimally.
2. **Economies of Scale**: As production increases, the company benefits from economies of scale. Fixed costs are spread over a larger number of units, and workers become more efficient through specialization and better management practices.
3. **Decreased Variable Costs**: During this phase, the AVC decreases as the company optimizes its production processes, reducing the cost per unit.

Bottom of the U

4. **Optimal Production Level**: The lowest point on the AVC curve represents the optimal level of production. Here, the firm achieves the best combination of efficiency and cost-effectiveness. The costs are minimized at this output level.

Initial Increase in AVC

5. **Diminishing Returns**: After reaching the optimal production level, if the company continues to increase output, it may face diminishing returns. This happens when adding more variable inputs (like labor) results in less proportionate increases in output.
6. **Increased Costs**: As the production scale continues to rise beyond optimal levels, the AVC begins to increase due to factors such as:
   - Overcrowding of resources.
   - Increased complexity in management and production.
   - Potential need for overtime pay or hiring less skilled workers.

Decline Phase

7. **Market Saturation and Decline**: Eventually, as market demand stabilizes or declines, companies may experience a decrease in production efficiency, leading to higher average variable costs as they try to maintain profitability.

Conclusion

The U-shape of the AVC curve captures the initial efficiencies gained through increasing production, followed by inefficiencies that arise as production scales beyond optimal levels. This behavior is a fundamental concept in economics and helps firms understand their cost structures and optimize production levels.

Why is there a decline?
- Competition
- Debt
- Less government support

Lecture 15

Q1) What can shift the cost curves?
- Competition
- Market structure
- Economies of scale
- Increase of Labor
- Increased quantity of inputs
- Inflation
- Technology
- Taxes/subsidies

Q2) What are the explicit and implicit costs of attending the university?

Explicit: Tuition, Security, books, project materials, transport, stationary

Implicit: Degree from IBA, income from freelancing etc.

Q3) Do the resources remain fixed and variable in the long run?
All are variable as there is flexibility in all the inputs.

Q4) Interpret:
- Economies of scale: When the firm becomes efficient, specializes in all covered expertise.
- Economies of scope: Achieved efficiency and produces complementary products as well(diversification). Eg: Habitt pharmaceuticals and furniture.
- Diseconomies of scale: less efficient, cost of stuff increases, Results from over-expansion leading to inefficiencies and higher costs.
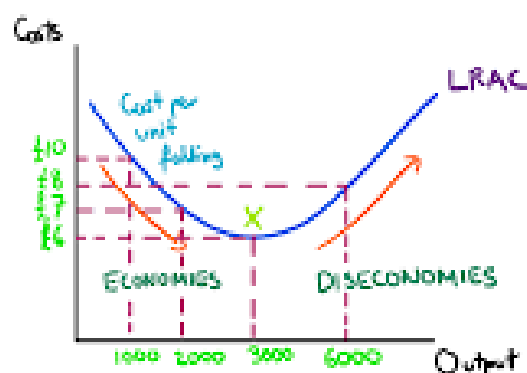
Lecture 16

Pure Competition:
1. **Market model**
2. **Many buyers and sellers**
3. **The demand curve is perfectly elastic**
4. **Product is homogenous(**all firms are producing the same product**)**
5. **Price is uniform**
6. **Demand is perfectly elastic**
7. **Price = MR = AR = D**
8. **Free entrance and exit(**There are no barriers to entry or exit, i.e: taxes, government regulations**)**
9. **The firms are price takers**
10. **There is no government(**if government is there then point 6 and 8 not possible**)**

Applications:
1. Agriculture to the point when the crop is not reaped.
2. Mobile network markets:
   - Call rates
   - SMS
   - Packages

Profit Maximisation Approaches in Short Run of a Purely Competitive Market:
1. Total Revenue and Total Cost approach:
   Conditions:
   - TR > TC(Economic Profit)
   - TR < TC(Loss)
   - TR = TC(Breakeven\Normal Profit)
   - TR = AVC(Indifference: there is loss but it can be recovered)
   - TR < AVC(Firm has to shutdown)
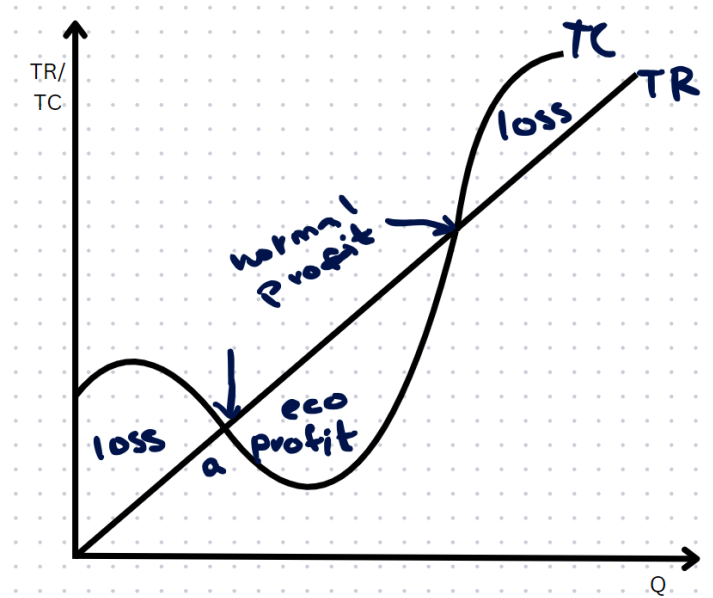
For short run, in a pure competition

2. Marginal Revenue and Marginal Cost approach:

Breakeven:

P

MC

ATC

MR=AR

Oe

$MR = AR = TR/Q = D$

$TR = Q_e \times P = TC$

$TC = ATC \times Q_e$

$TC = ATC \times R$

Loss:

P

MC

ATC

P_1

R_1

loss

c

e_1

MR

O

Qe_1 Qe_2

Q

$loss = TR = TC$

TR = ☐ O R1 e1 Qe1

TC = ☐ O P1 c Qe2

Profit:

$$Profit = TR - TC$$

$$TR = \square O \; P1 \; e1 \; Qe1$$

MR

$$TC = \square O \; R1 \; c \; Qe1$$
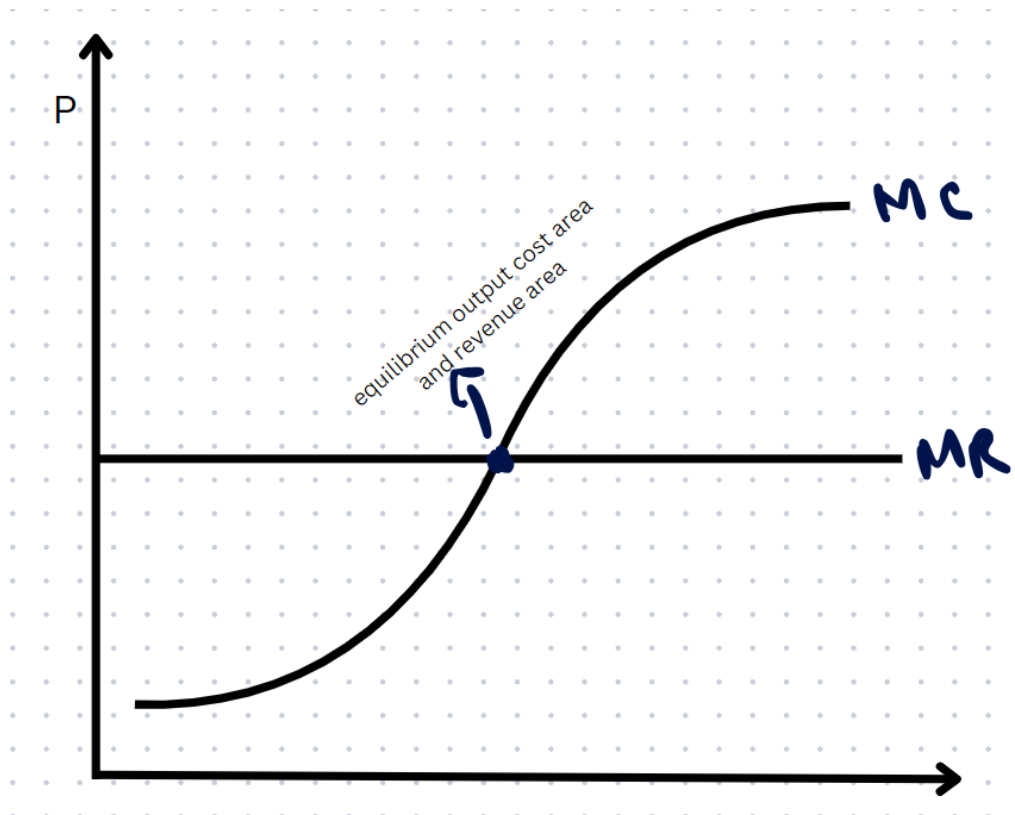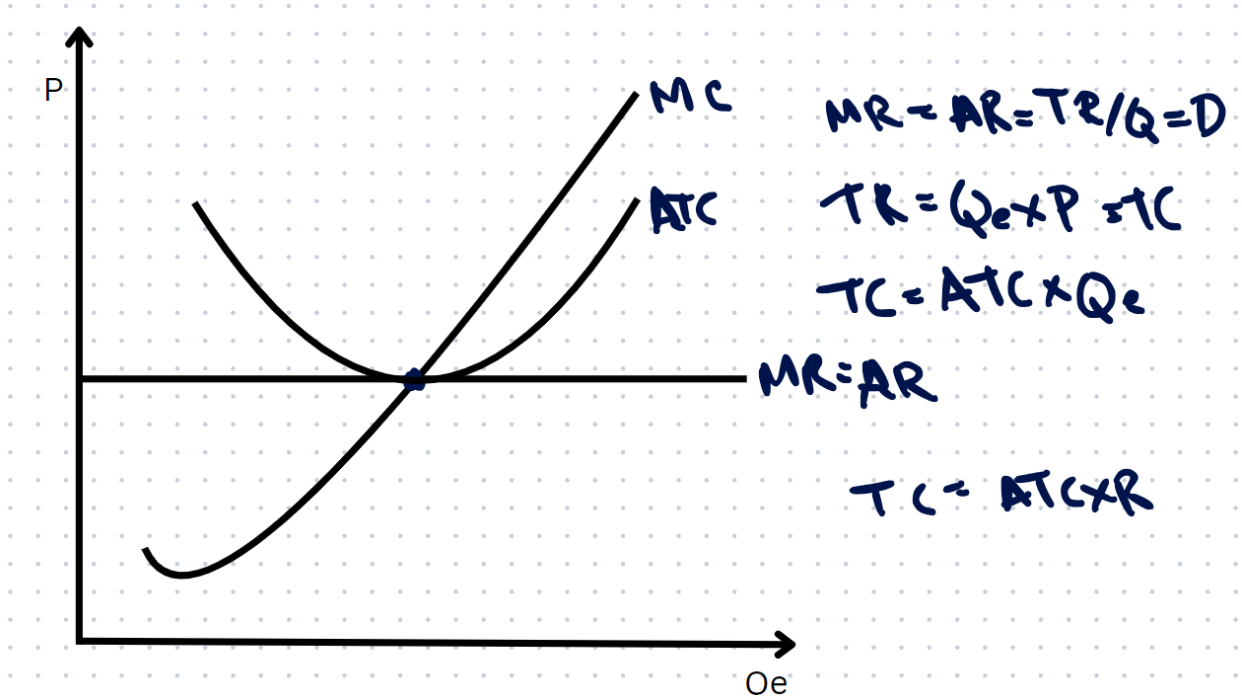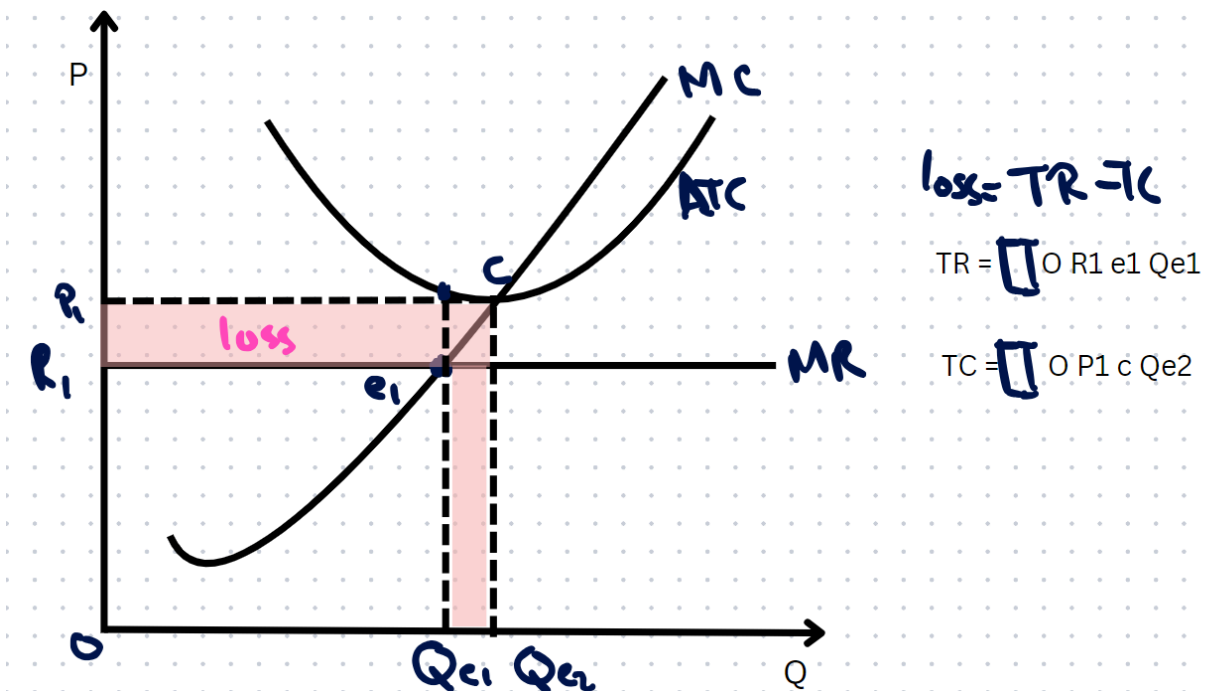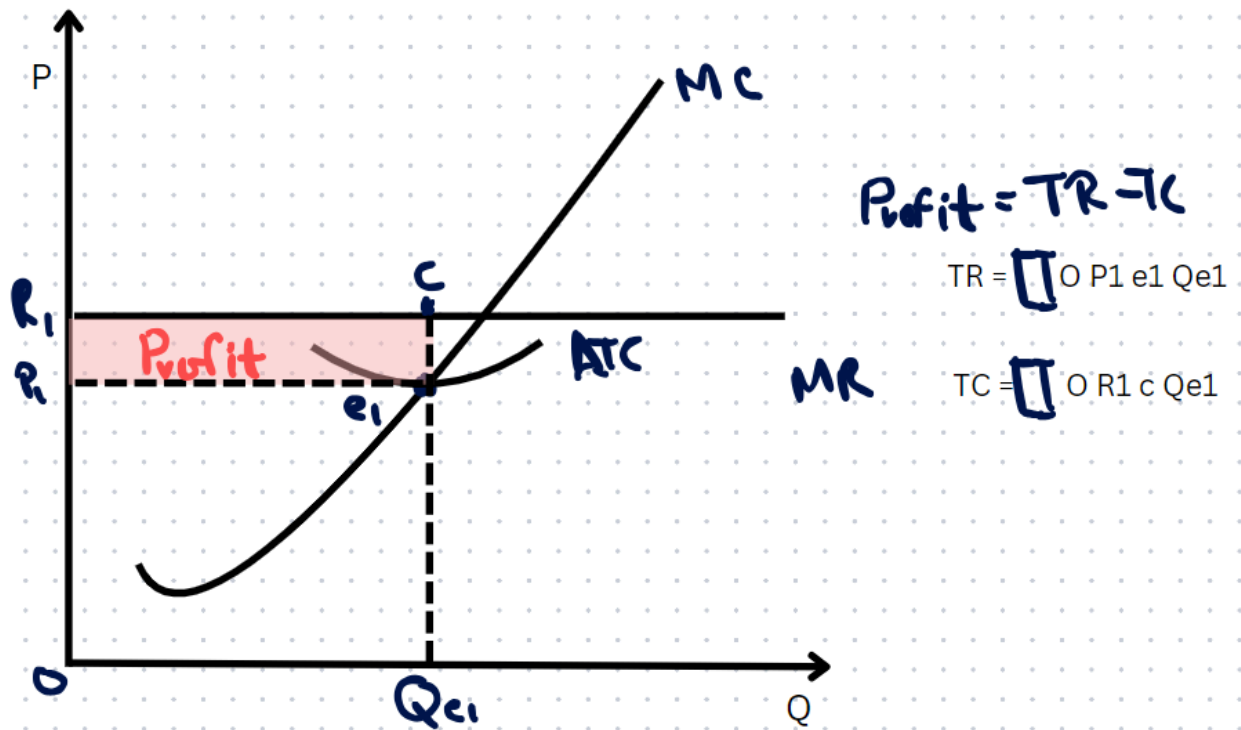
Combined:
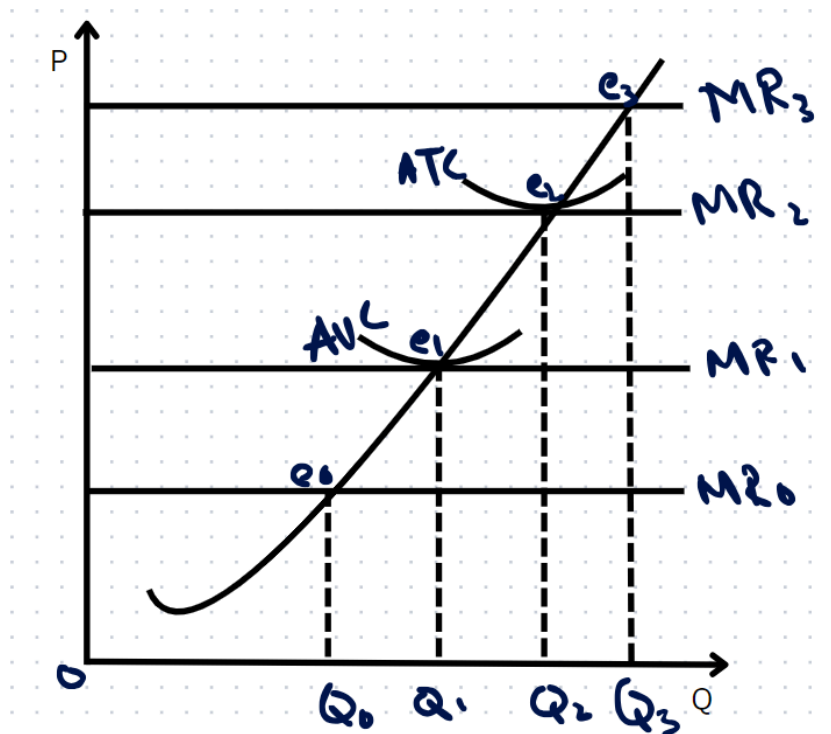
e0 = firm shuts down, e1 = loss, e2 = breakeven, e3 = profit.

- In the long run all purely competitive firms exhibit normal profit(breakeven).

Mid2 review

- Definition of elasticity(theoretical and mathematical).
- Types: elastic, inelastic…..
- Ed>1(rel elastic), Ed< 1(rel inelastic), Ed = 1(unit elastic)
- Types of Ed(elasticity of demand): arc price, arc income….
- Total Revenue and elasticity(graphs and table):
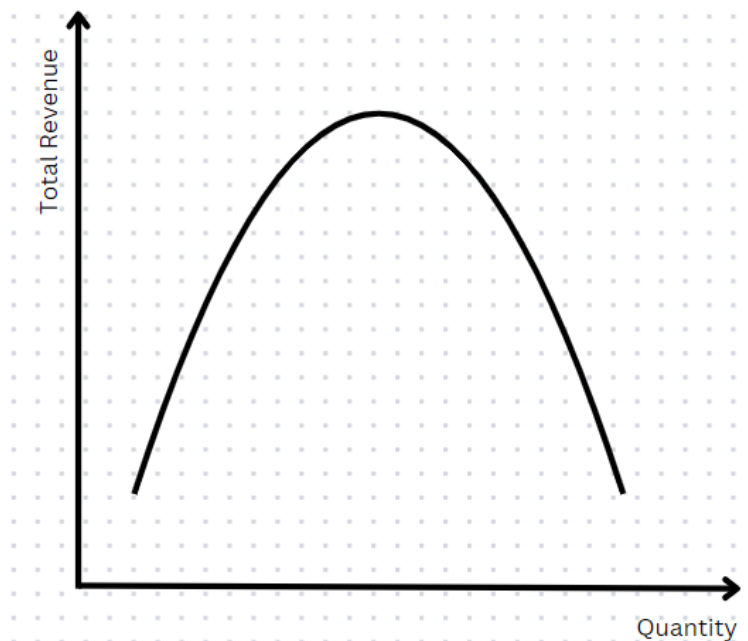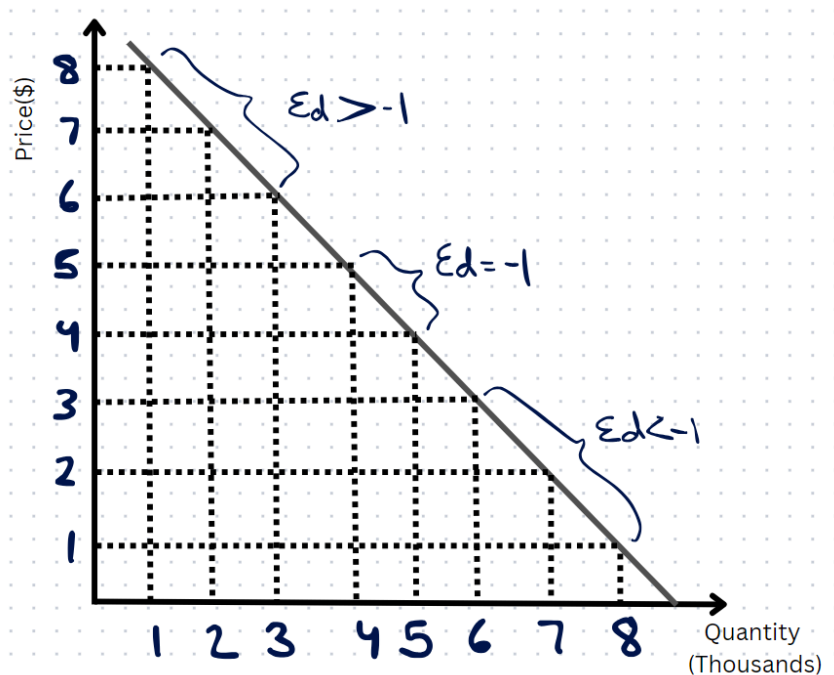
TR curve ascending = Ed > 1, TR curve plateau = Ed = 1, TR curve descending = Ed < 1

- Utility maximization rule,(def and numericals)
- Budget Line: Definition, Graph, Table, Numericals, Properties.
- Indifference Curve: Definition, Graph, Properties.
- Sunk cost = the cost which is irrelevant
  1. RND that is not materialized
  2. Unbought sales
  3. Example: you bought movie tickets but you didn't go see the movie.
  4. Investment without return

<div align="center">Questions</div>

Q1) $P = 2 - 3Q$ FC

$C = \underbrace{0.05 Q^2 + 5Q}_{V \cdot C} + \overbrace{100}$

Determine:

1) TR

$\quad TR = P \cdot Q$

$\quad = (2 - 3Q)(Q)$

$\quad = 2Q - 3Q^2$

2) MR

$\quad \delta TR = 2 - 6Q$

3) AC

$\quad \dfrac{TC}{TP} = \dfrac{0.05Q^2 + 5Q + 100}{2 - 3Q}$

4) FC $= 100$

5) MC

$\quad \delta TC = 0.1Q + 5$

6) Profit

$\quad = TR - TC$

7) VC

$\quad = 0.05 Q^2 + 5Q$

Lecture 17

Pure Monopoly:

- There is a single seller.
- There are barriers to entry and exit, (like taxes and government regulations).
- The monopolist is the price maker.
- P = AR = D.
- A monopolist can practice *price discrimination*.
- There are regulations (taxes, debts, copyrights, patents).
- Legal issues and copyright issues also exist.

-
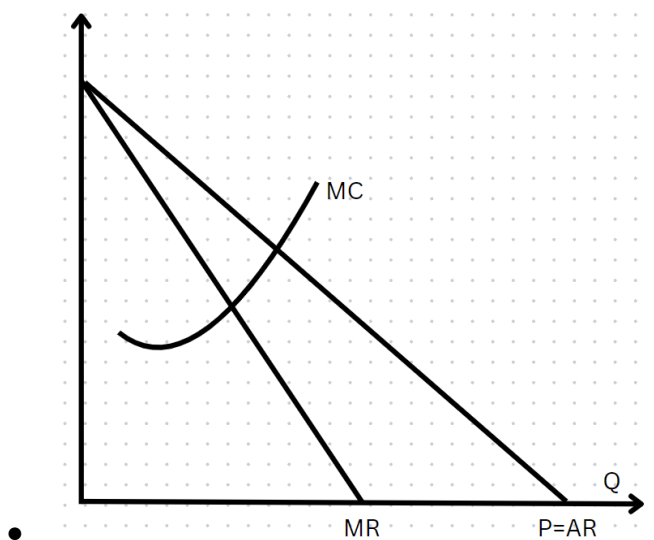
Price Discrimination: Price discrimination refers to a pricing strategy that charges consumers different prices for identical goods or services.(price discrimination) e.g: economy class, business class in railways and airplanes.

Profit Maximisation:

TR > TC	Economic Profit
TR < TC	Loss
TR = TC	Breakeven
TR = AVC	Indifferent(Still a loss but can be dealt with)
TR < AVC	Shutdown

Cost area: under average total cost curve.

Loss:
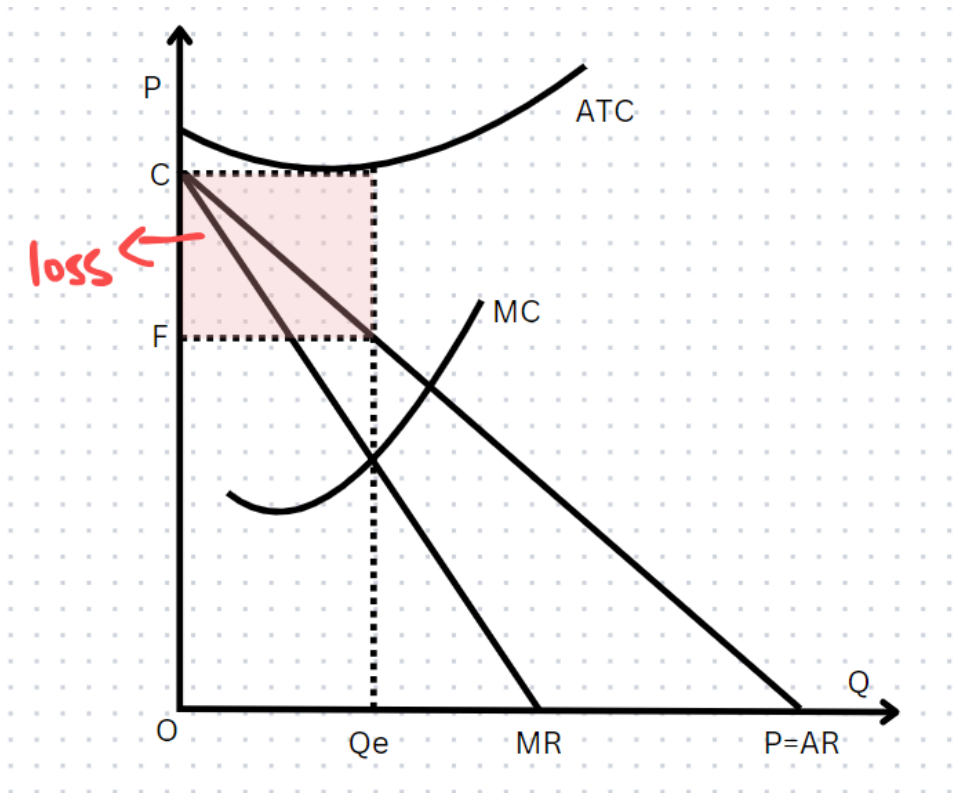
Loss = TR - TC
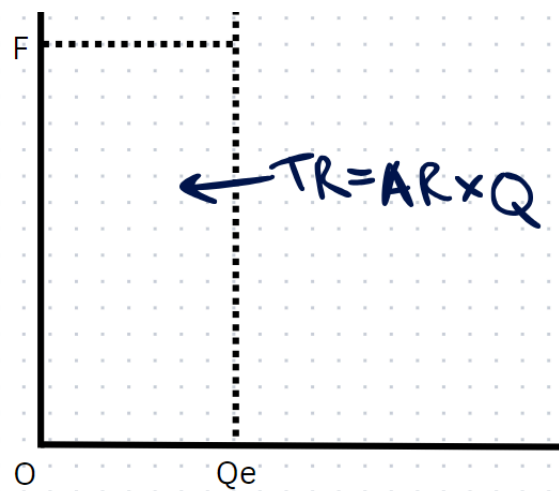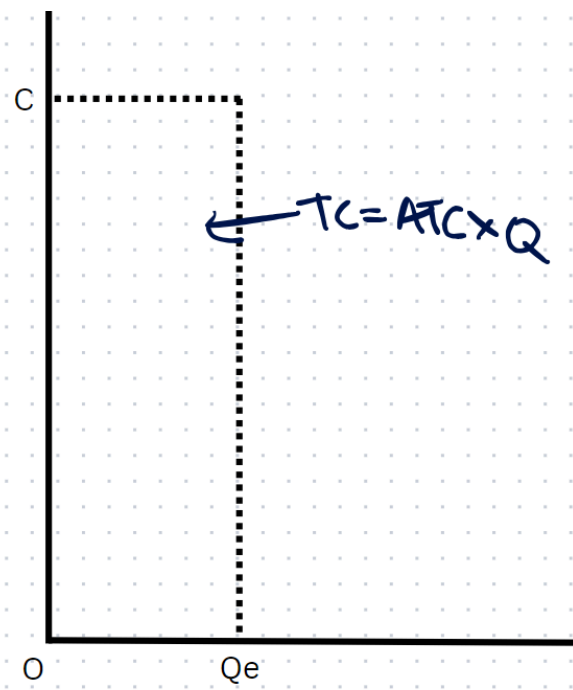
Breakeven:
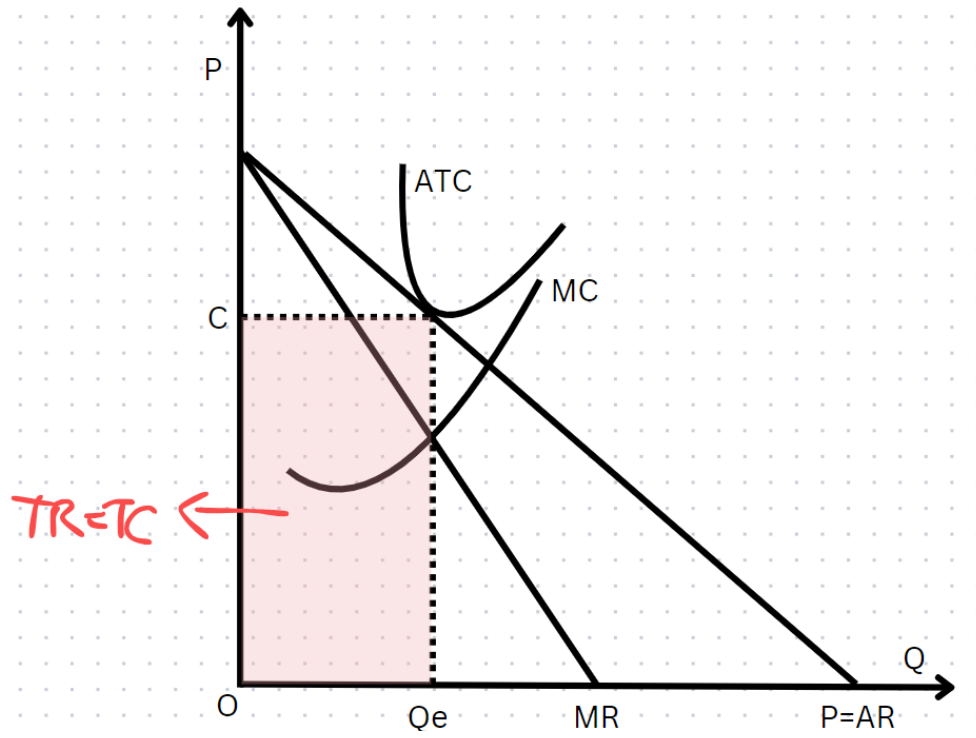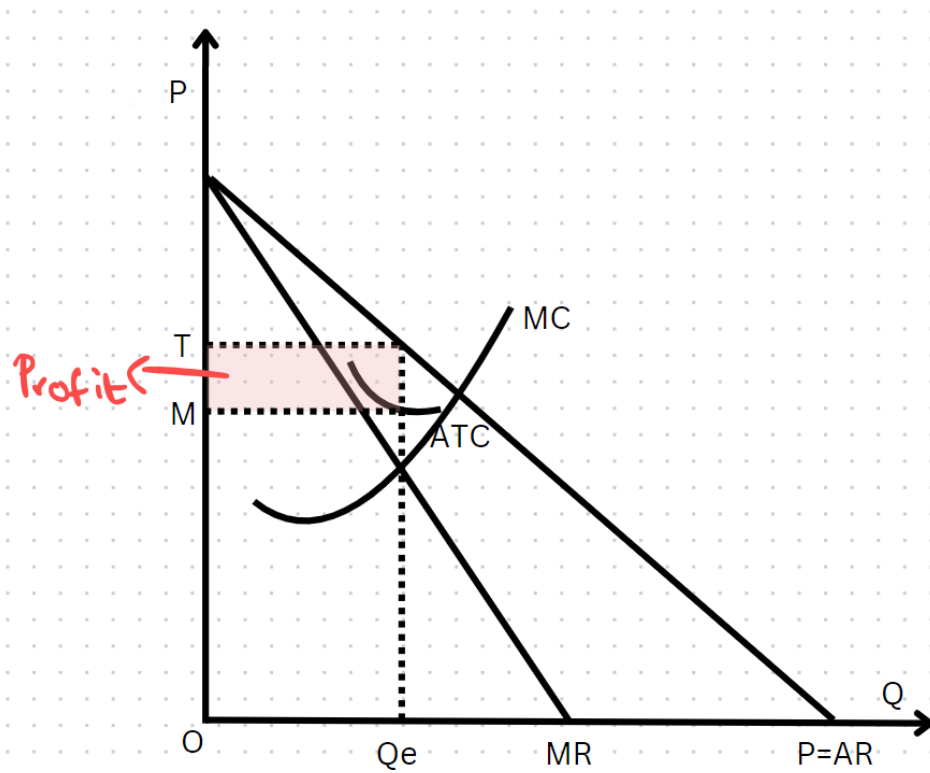
Profit:

Profit = TR- TC
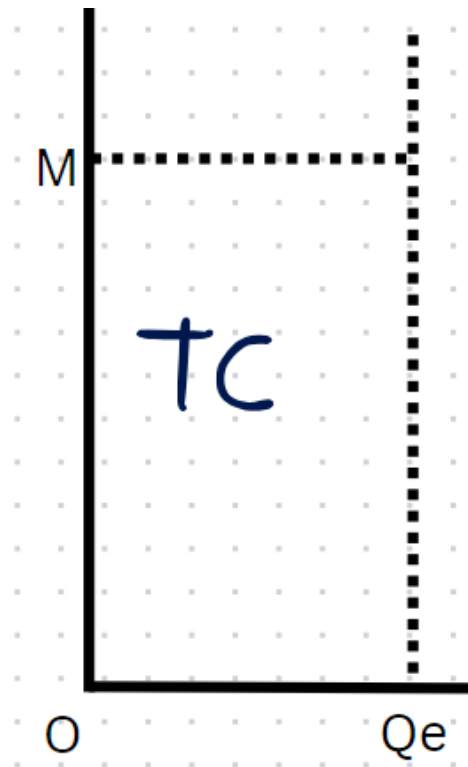
Lecture 18

Macroeconomics Issues:

- **GDP(Gross Domestic Product):** Total product within the borders of a country.
- **GNP(Gross National Product):** Total product within and outside the borders of a country.(production + exports + remittances)
- **Unemployment**
- **Exchange Rate**
- **Balance of payments**

National Income Accounts: Just like any account maintaining the production.(National income accounting is a government bookkeeping system that measures a country's economic activity—offering insight into how an economy is performing.)read more

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Types of GDP:
1. **Nominal GDP(current dollar GDP):** production of goods and services in the current year into prices in the current year. (P*Q)
2. **Real GDP(constant dollar GDP):** production of goods and services in the current year into prices in the base year. (P*Q)

Methods to calculate GDP:
1. **Product method:**
   - Production = income = expenditure
   - Takes into account value added(final output - input)
   - Total goods and services produced in a fixed time period at market value(the final price the buyer pays).

2. **Income method:**
   - Profit (TR - TC)
   - Wages (Income on hourly basis)
   - Salaries (Income per month)
   - Proprietor's income (income of the self employed)
   - Taxes (income for the government / liability for the public)
   - Dividends (what you can earn on stocks and shares)
   - Rate of interest (savings, bonds, desposists, securities)
   - GDP according to income method is sum of all the incomes in a fixed time period.

3. **Expenditure method:**
   Takes into account the ultimate user of the product

$$Y = C + I + G + Nx$$

↳ consumption
investment ↗
↳ government spending
net exports ↙

Consumption function:

→ marginal propensity to consume

$$C = a + bY_D \longrightarrow \text{disposible income}$$

↳ autonomous consumption

In the graph: C (vertical axis), a, ΔC, $\dfrac{\Delta C}{\Delta Y_D} = b$, ΔY_D, Yd (horizontal axis)
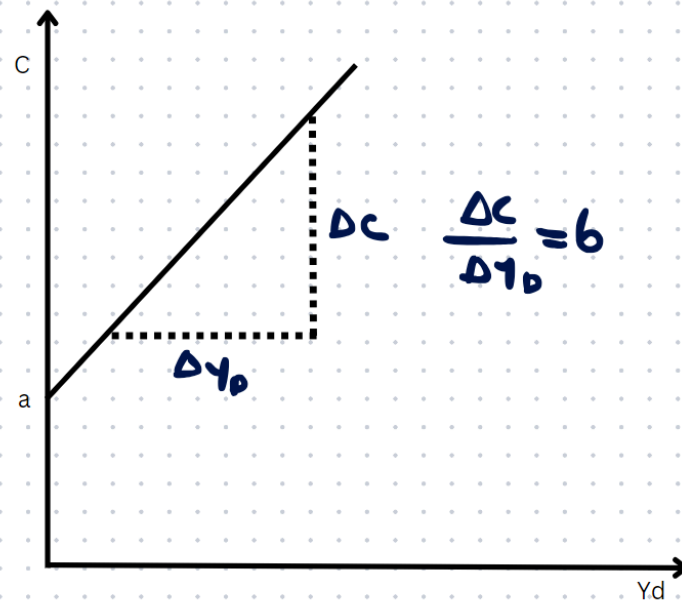
Autonomous consumption: exists even when there are no earnings.
Yd: income - taxes
Investments: residential investments, stocks and bonds, insurance.
Government Spending: bailouts/ stimulus package, public investments, transfers(EOBI(Employee and old age benefits investment), Pensions(for retired government servants), public services).

EOBI are blocked if funds have not been withdrawn for a specific amount of time. Half of the pension is given to the dependents after the death of the individual.

Lecture 19

Consider a hypothetical economy with 2 enterprises:
1. Orange inc
2. Juice inc

	Orange inc transactions		Juice inc transactions
Wages paid to employees ($)	15000		10000
Taxes paid to government ($)	5000		2000
Revenue from sales of oranges ($)	35000	10000 (to public)	
		25000 (to juice inc)	
Oranges purchased ($)			25000
Orange juices sold ($)			40000

Product approach:

Value added = Final output - Input(wages, taxes are liabilities not inputs)

Value added for A = 35000 - 0 = 35000
Value added for B = 40000 - 25000 = 15000

GDP = 35000 + 15000 = $50000

Income approach:

Profits + wages + taxes

1. **Before tax profits(**when tax is neither a liability or income**):**
   Profit for A = 35000 - (15000) = 20000
   Profit for B = 40000 - (10000 + 25000) = 5000

   GDP = 20000 + 5000 + 15000 + 10000 = 50000
2. **After tax profits:**
   Profit for A = 35000 - (15000+5000) = 15000
   Profit for B = 40000 - (10000 + 25000 + 2000) = 3000

GDP = 15000 + 3000 + 15000 + 10000 +5000 + 2000= 50000

Expenditure approach:

= 10000 + 40000 = 50000

If all approaches give the same result, then the data is perfect.

Nominal GDP(current dollar GDP): current year quantities * current year price.
Real GDP(constant dollar GDP): current year quantities * base year price.

Quarterly measure of inflation = N.GDP * 100 / R.GDP

	Base Year		Current Year	
	Quantity	**Price**	**Quantity**	**Price**
Apples	3000	2	4000	3
Oranges	6000	3	14000	2
Bananas	8000	4	32000	5

Nominal GDP(in current year) = (4000 * 3) + (14000 *2) + (32000 *5) = 200000
Nominal GDP(in base year) = (3000 * 2) + (6000 *3) + (8000 *4) = 56000
Real GDP(in current year) = (4000 * 2) + (14000 *3) + (32000 *4) = 178000
Real GDP(in base year) = (3000 * 2) + (6000 *3) + (8000 *4) = 56000

Base year deflator = 1

Current year inflation = 200000* 100 / 178000 = 112.36%

Lecture 20

Parable of the Modern Economy:

Specialization is better than generalization. (less cost/ less time)

Farmer	Rancher
Crops(cost is less) Animals(cost is more)	Crops(cost is less) Animals(cost is more)

Adam Smith's Theory of Absolute Advantage:

Assumptions:
1. Factors of production can be moved across the borders.
2. Labour hours are fixed.
3. There is no government.
4. Each country understands the strengths and weaknesses of each country.

Considering 2 countries: (A,B)

	A	B
X	2	1
Y	1	2

- Country A has absolute advantage with X.
- Country B has absolute advantage with Y.
- Country A has a relative advantage with Y.
- Country B has a relative advantage with X.
- Labor hours are = 2hrs

Speciality Area: X for A, Y for B.

Lesson Learnt: trade specialities.

World Production before trade:
(units of X for A + units of Y for A) + (units of X for B + units of Y for B)) = (2+1) + (1+2) = 6

Let's say country A applies 2 hrs in producing X (hence B applies 2hrs in producing Y):

	A	B
X	2*2 = 4	0
Y	0	2*2 = 4

(4+0) + (0+4) = 8
Specialization is taking place.

Adding terms of trade= 1 : 1

	A	B
X	2*2 = 4 -1 = 3	0 + 1(from A)
Y	0 + 1(from B)	2*2 = 4 -1 = 1+3

World Production after trade:
(3+1) + (1+3) = 8

Gains from trade: 8-6 = 2

Production hrs = 3
Adding terms of trade= 1 : 2

	A	B
X	2*3 = 6 - 1 = 5	0 + 1(from A)
Y	0 + 2(from B)	2*3 = 6 - 2 = 4

World Production after trade:
(5+2) + (1+4) = 12

Gains from trade: 12-9 =3

Lecture 21

Circular Income Flow(previously...):
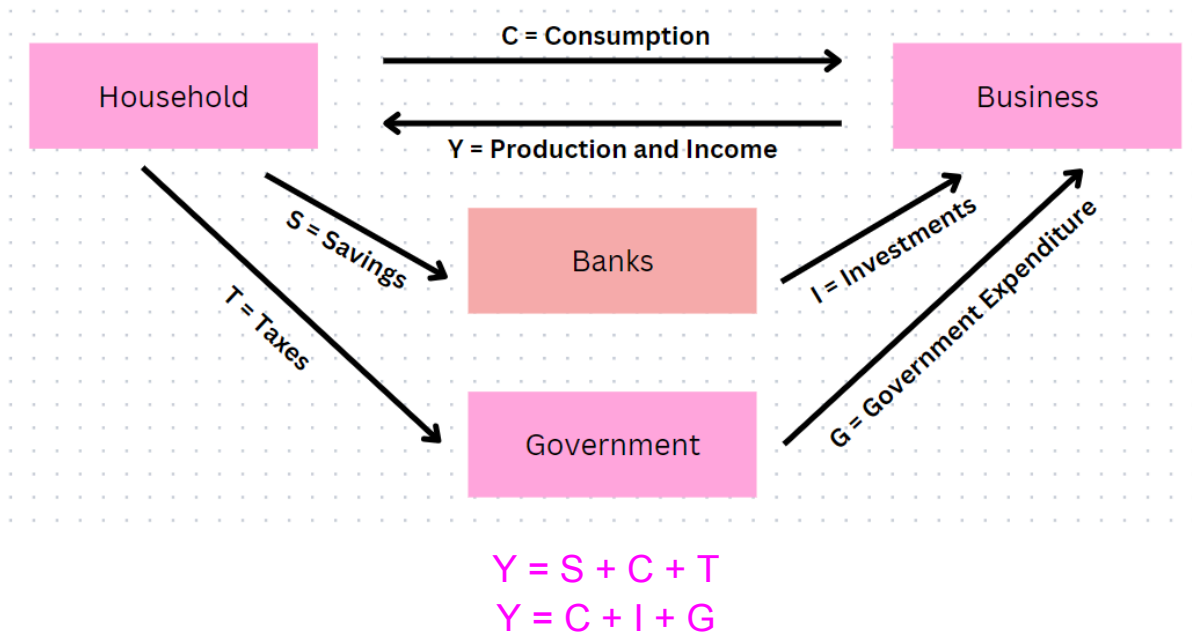
Household	C = Consumption →	Business
	← Y = Production and Income	

S = Savings

T = Taxes

Banks

I = Investments

G = Government Expenditure

Government

$$Y = S + C + T$$
$$Y = C + I + G$$

[Consumption function](#)

→ marginal propensity to consume

$$C = a + bY_D$$

→ disposable income

↳ autonomous consumption

$$DC \quad \frac{\Delta C}{\Delta Y_D} = b$$

$$\Delta Y_D$$
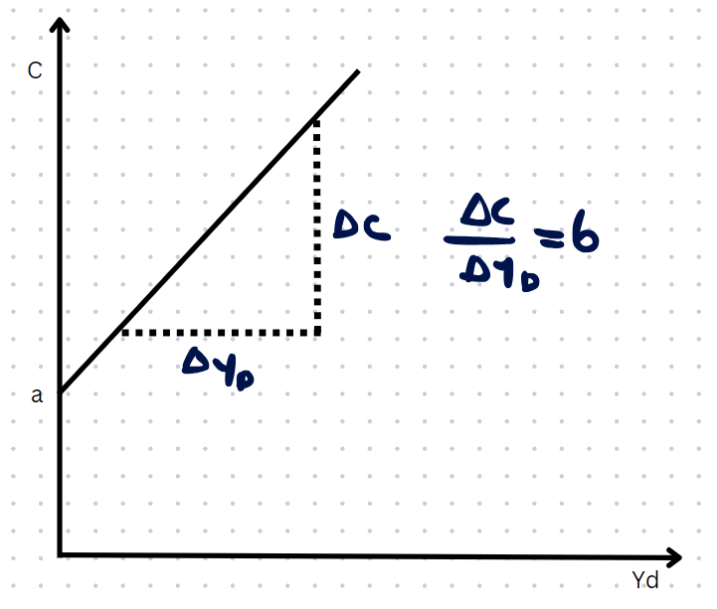
Saving Function:
Y = C + S +T
Y = a + bYd + S + T
Y - T = a + bYd + S
Yd = a + bYd + S
S = -a + Yd - bYd
S = -a + Yd(1-b)

1-b = marginal propensity to save
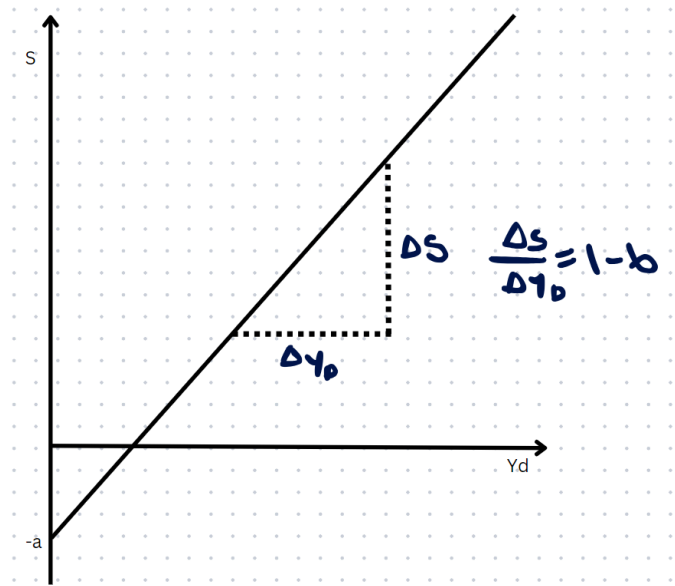
Y = C + I + G
Y = a + bYd + I + G
Y - T = a + b(Y - T) + I + G
Y = a + bY - bT + I + G
Y - Tb = a - bT + I + G
Y(1 - b)=a - bT + I + G
Y = 1/(1-b) * (a - bT + I + G)

Autonomous Expenditure Multiplier = (a - bT + I + G) (as tax in the income of the government)
Multiplier/Injection(I+G) = should be considered an initial investment that brings a propositional change(Ripple effect) in the equilibrium income.

Lecture 22

Multipliers:

1. **Government Spending Multiplier:**
   Y = C + I + G —1
   $Y = C + I + G + \Delta G$

   C = a + bYd
   Y + ΔY = a + bY + bΔY+ I + G + ΔG —2

   Subtract 1 from 2
   $\Delta Y = b\Delta Y + \Delta G$
   $\Delta Y - b\Delta Y = \Delta G$
   $\Delta Y(1-b) = \Delta G$
   $\Delta Y = \Delta G/(1-b)$ —1/(1-b)(**Government Spending Multiplier**)

2. **Investment Multiplier:**
   Y = C + I + G —1
   $Y = C + I + \Delta I + G$

   C = a + bYd
   Y + ΔY = a + bY + bΔY+ I + ΔI + G —2

   Subtract 1 from 2
   $\Delta Y = b\Delta Y + \Delta I$
   $\Delta Y - b\Delta Y = \Delta I$
   $\Delta Y(1-b) = \Delta I$
   $\Delta Y = \Delta I/(1-b)$ —1/(1-b)(**Investment Multiplier**)

3. **Tax Multiplier:**
   Y = C + I + G
   $Y = a + bYd + I + G$
   $Y = a + bY - bT + I + G$ —1

   Y + ΔY = a + bY - bT - bΔT+ I + G —2

   Subtract 1 from 2
   $\Delta Y = b\Delta Y - b\Delta T$
   $\Delta Y - b\Delta Y = - b\Delta T$
   $\Delta Y(1-b) = - b\Delta T$
   $\Delta Y = -b\Delta T/(1-b)$ — -b/(1-b)(**Tax Multiplier**)

Q: b = 0.2, G = 100, I = 200, T = 300

Lecture 23

Money & Banking:

Money = Currency + Coins + Bills + Credit Cards + Debit Cards + Online Payments

Functions:
1. **Medium of Exchange**
2. **Unit of Account**
3. **Store of Value**(Also refers to purchasing power)

Medium of Exchange and Barter System:
Barter: Direct Exchange of Goods and Services
Problem:
- Double Coincidence of wants: In a barter system, for an exchange to happen, **both parties** must have something the other wants at the same time. This is known as a **double coincidence of wants**. In other words, if **Person A** wants to trade a product (e.g., wheat) for something they need (e.g., shoes), **Person B** must not only have shoes but also want the wheat that Person A is offering.(Chat GPT)

Solution: Using money as a medium of exchange

Unit of Account:
- It acts as a yardstick.
- It is a measure.
- It has value.
- Goods can be priced with money.

10 goods; N = 10
N(N-1)/2 = 10(10 -1)/2 = 45

Store of Value: It retains its value over time, allowing people to save it for future use.
Liquidity: How much money can be withdrawn at the current moment.

WWII:
- Soldiers captivated by the Germans in extreme cold.
- Supplies from the Red Cross.
- Soldiers developed their own system of exchange in terms for shirts, shoes, cigarettes & chocolates(Barter of things).
- Later cigarettes became currency.

Nearmonies(Monetary Aggregate):

M1 = Currency + Coins + Demand Deposits

M2 = M1 + Euro Dollars + Traveller's Cheque(Cheque with a monetary value) + Small Time Deposits + Repurchase Agreements + Savings + Mutual Funds
M3 = M2 + Large Time Deposits + Long Term Savings

Demand Deposits: Current Account/ funds held in an account from which withdrawn can be made **on demand**, without any advance notice or penalty.(ChatGPT)
Euro Dollars: Dollar Dominated Deposited Outside US (RFCDs)
Repurchase Agreement: A repurchase agreement is a short-term borrowing arrangement in which one party sells securities (often Treasury Bills, or T-Bills) to another party with the agreement to repurchase them at a later date.
Collateral of T-Bills(Treasury Bills issued by Central Bank): can be redeemed in 3,6 & 12 months. It is security.
Mutual Funds: Refers to a pool of savings deposited in a financial institution that can be invested in profitable ventures by the consent of investors and the profit will be shared among them.
Large Time Deposits: Money deposited for more than 5 years.

ChatGPT explanation:

Nearmonies (Monetary Aggregates):

Monetary aggregates refer to various categories of money supply in an economy. They include different types of assets that are used as money, with varying degrees of liquidity. The most common aggregates are M1, M2, and M3.

M1 - The Narrow Money:

M1 represents the most liquid forms of money, which are easily accessible for transactions. It includes:

- *Currency: This refers to physical money in the form of paper bills and coins.*
- *Coins: These are physical coins issued by the government and used as legal tender.*
- *Demand Deposits: These are funds held in current accounts at banks that can be accessed by the account holder on demand without any restrictions or time delays (e.g., checking accounts).*

M2 - Broader Money Supply:

M2 is a broader measure of money supply than M1, as it includes all of M1 plus additional assets that are less liquid but still relatively easy to convert into cash. M2 includes:

- **M1 (Currency + Coins + Demand Deposits)**: *As described above.*
- **Eurodollars**: *These are U.S. dollar-denominated deposits held in banks outside of the United States. They are not subject to U.S. regulations and offer a way to hold and transfer dollar-denominated assets globally (e.g., in foreign branches of U.S. banks or foreign banks).*
- **Traveller's Cheques**: *These are pre-paid cheques issued by financial institutions, typically used by travelers as a secure form of payment. They can be easily exchanged for cash at banks or financial institutions.*
- **Small Time Deposits**: *These are deposits in banks with a fixed term (typically less than $100,000), where the depositors agree to leave their money for a specified time period in exchange for interest. The money is not immediately available without penalty for early withdrawal.*
- **Repurchase Agreements (Repos)**: *A repurchase agreement is a short-term borrowing arrangement in which one party sells securities (often Treasury Bills, or T-Bills) to another party with the agreement to repurchase them at a later date, usually within a few days to a few months. This is essentially a secured loan where the T-Bills serve as collateral. These agreements are commonly used by banks and financial institutions to manage liquidity.*
- **Savings**: *Savings deposits are accounts where individuals or businesses deposit money for safekeeping and earning interest over time. These are typically less accessible than demand deposits but can still be withdrawn fairly easily.*
- **Mutual Funds**: *A mutual fund pools money from many investors to invest in various assets, such as stocks, bonds, or other securities. Investors own shares in the fund, and any profits (or losses) generated by the fund's investments are shared among the investors. Mutual funds are managed by professional fund managers, who decide how to allocate the pooled money. Investors can buy and sell shares in mutual funds, making them relatively liquid, though not as liquid as cash.*

M3 - The Broadest Measure of Money:

M3 is the broadest measure of money supply, encompassing everything in M2 along with additional forms of money that are even less liquid and typically used by larger institutions or investors. M3 includes:

- **M2 (M1 + Eurodollars + Traveller's Cheques + Small Time Deposits + Repurchase Agreements + Savings + Mutual Funds)**: *As described above.*
- **Large Time Deposits**: *These are deposits with banks for a fixed term, typically over $100,000. These deposits often offer higher interest rates than smaller time deposits but are not as easily accessible.*
- **Long-Term Savings**: *These are long-term deposit accounts or savings instruments, such as certificates of deposit (CDs) or other long-term investment vehicles. They are*

typically locked in for several years, offering higher returns in exchange for the commitment to not access the funds for an extended period.

Lecture 24

Banking and Model of Money Supply:
 Bank:
- Literal definition: to trust.
- Basic Banking:

Assets	Liabilities
Reserves	Demand Deposits(Current Account)

- Liabilities are deposits by the user to be protected by the bank.

100% Reserve Banking:
- Deposit and withdraw.
- Banks charge a small fee.
- Reserves = Demand Deposits.

Fractional Reserve Banking:

Situation A:

Assets	Liabilities
Reserve Requirement(RR) = 10%(fixed by Central Bank) Loans = 90%	Demand Deposits(DD) = 100%

Situation B:

Assets	Liabilities
Reserve Requirement = 9% Loans = 81%	Demand Deposits = 90%

Money Supply(Ms) = 1/RR * DD
For situation A = 100/0.1
For situation B = 90/0.09
- As Ms increases, Liquidity increases.
- Money Multiplier = 1/RR

Q: RR = 60%, DD = 70%

A: Ms = 70/0.6

$$Ms = C + D$$
$$C = \text{Currency}$$
$$D = \text{Deposits}$$
$$B = \text{Monetary Base} = C + R$$

C/D = Currency Deposit Ratio = CR: When CR increases there is more currency in hand and less in deposits and vice versa.

R/D = Reserve Deposit Ratio = RR: When RR increases, Ms decreases.

Equation 1 : $Ms = C + D$
Equation 2: $B = C + R$

Divide 1 by 2:
$Ms/B = (C+D)/(C+R) = ((C + D)/D) / ((C + R)/D)$
$Ms/B = (CR + 1) / (CR + RR)$
$Ms = (CR + 1) / (CR + RR) * B$
$Ms = m * B$
Where, $m = (CR + 1) / (CR + RR)$ (**Extended Money Multiplier**)

Q1: B = 3000, CR = 0.1, RR = 0.4

A: Ms = 6460

Q2: D = 1000, r = 3%

A: Ms = 1000/0.03 = 33333

Price Discrimination:

$$Q = 50 - 0.5\,P$$
$$Q1 = 32 - 0.4\,P1$$
$$Q2 = 18 - 0.18\,P$$
$$Q1 + Q2 = Q$$

$$C = 50 + 40Q$$
$$C = 50 + 40(Q1 + Q2)$$

Required:
1. Q1, Q2
2. P1, P2
3. R1, R2

4. **Total Profit**
5. **e1 , e2**

Q1 = 2, Q2 = 7, P1 = 60, P2 = 110

Lecture 25

Government Regulated Monopoly:

- Government regulates the public utilities, example: electricity, railways, SUI gas reserves and supplies.
- P1 = AR, P2 = MC, P3 = ATC, 3 regulations that the government can apply
- Profit Maximisation Conditions:(assuming for PAK railways)
  MR = MC
  First price = P1 = AR (Government maximises profit)
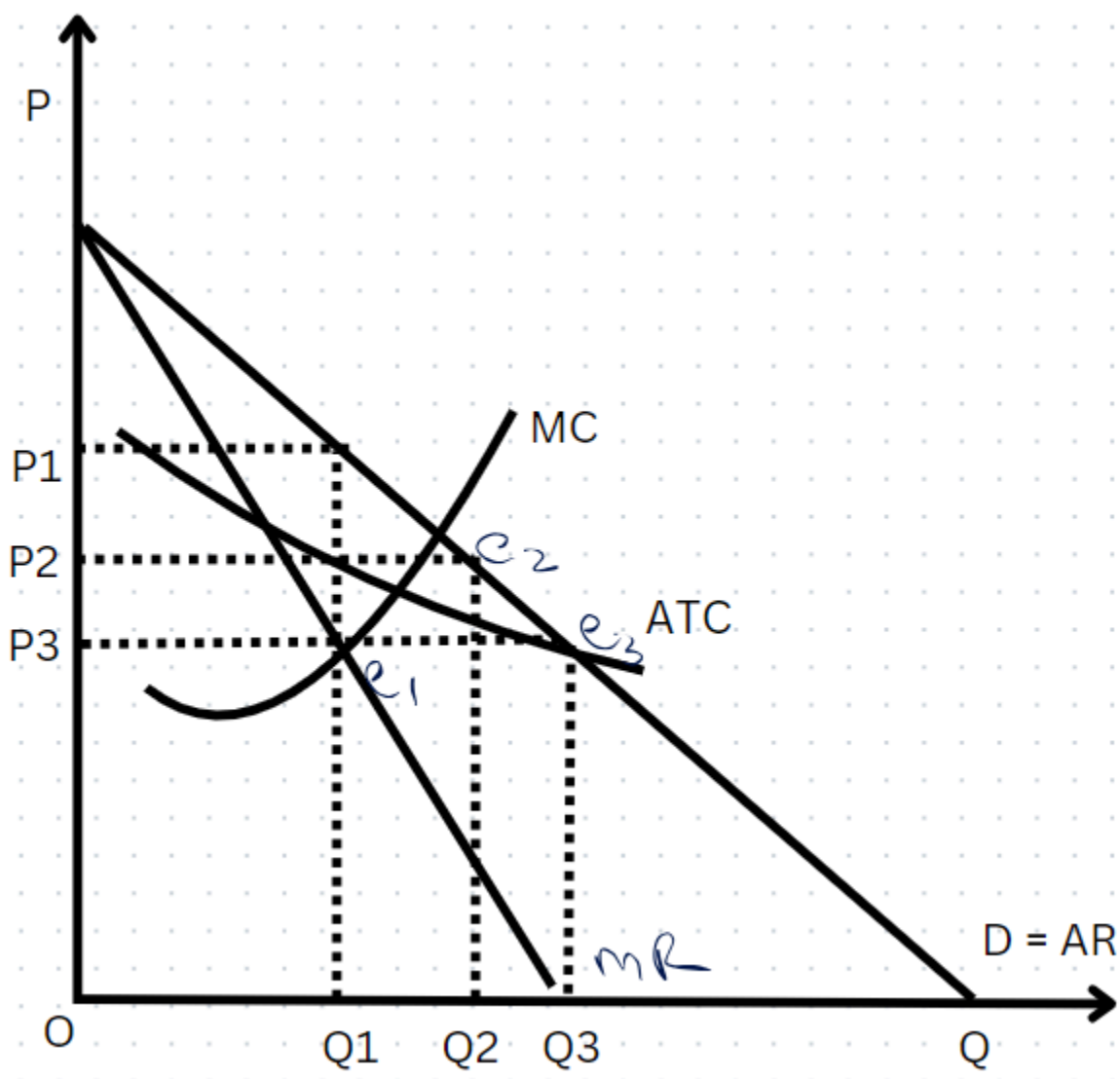
- (O - Q1) = magnitude of travels
- P2 = Me (Special condition on independence day)
  Profits decline

(O - Q2), sales increase
People travel more
- P2 < P1
- P3 = ATC (Govt announces special package, like eid package)
  (O - Q3) = highest magnitude of travel
  TC = TR (Breakeven)

Q: Obtain equilibrium values for Y and C:
Taxes = 0, Y = C + I + G, C = a +bYd

Y- C = I + G
C-bY = a

Ans: Y = (a+ I + G)/ (1-b)
C = a + (a+ I + G)/ (1-b)