Week 1 - Summary Notes

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Note: The content presented here is my understanding and interpretation of the video lectures and could not necessarily be flawless

W1L2_Micro & Macro Economics: The role of data

Summary:

1) What is an economic activity?
   - Any activity that drives the economy is called an economic activity.
   - There are 5 real-time economic activities that take place simultaneously in an Economy, 1. Consumption 2. Production 3. Exchange 4. Distribution 5. Investment.

2) Who are the 3 groups of agents in the Economy?
   a. Producers - firms & enterprises
   b. Consumers - households
   c. Government - which is both a consumer and a producer

3) What is the exchange and distribution type of economic activity ?
   - In simplistic terms, one can imagine exchange as a resource and one such resource is money.
   - Firms and enterprises sell goods and services to consumers via exchange (of money/resource)
   - This distribution of the exchange has implications on investment and production, in other words every exchange has an underlying distribution of resources

4) How are these 5 economic activities interrelated?
   - When consumers consume, producers produce and resources are exchanged among them and this distribution of the exchange determines the investment and in turn determines the production capacity.

5) How do these economic activities get affected by each other?
   - One of these economic activities, if affected, could eventually affect all of them.
   - For example during the times of 'Covid' Consumption (of goods and services) got blocked that led to Exchange (flow of money) getting blocked which in turn led to Production getting affected severely.

6) What is Micro Economics and Macro Economics discussed in the lecture?

- Economic activities at the level of Individuals, households and firms comes under micro economics and at the level of state, nation, global, industrial, sectorial, usually in aggregated terms comes under macro economics.

7) What is the role of data analysis at the micro and the macro level

- Micro level: At firm level there are many important parameters such as resource allocation, energy consumption, labour productivity, etc and every firm has data corresponding to these critical parameters. A data analyst would analyze this data and provide useful insights to make important decisions leading to efficient resource allocation, optimal energy consumption, effective labour productivity, etc.
- Macro level: Data analysis for example can be done on national level data to understand behavioral nature of the various activities such as consumption trends etc and data analysis on such data can bring interesting behavioral insights. National sample survey is one such source of annual survey on consumption data released by Central Statistics Office (CSO)

W1L3_Production, consumption and exchange

Summary:

1) What is production and value addition during the production process?

- Production is a process of converting raw materials into usable goods.- The usability or usefulness of the good obtained has certain value to it- Hence production adds this value during its process from raw material to useful good

2) What is the notion of utility ?

- Utility is implicit to a commodity
- Any commodity without utility value will have no takers

3) How does a producer determine what to produce and how much to produce?

- For producers, several important data such as price data, real time data, continuous flow of data, resources data are important
- These kinds of data lead to analyzing the data, get useful insights to answer important questions like what products to produce in coming years? Should we produce high value low cost products? or a low value high cost product?

4) How is the price the coordinating mechanism?

- Price in economics acts as a mechanism of coordinating decisions such as buying and selling, it also plays the role of determination mechanism on both value and decisions.

5) What is consumption and satisfaction during consumption ?

- Consumption is consuming a good or service
- There would not be production, if there was no consumption
- The basic unit of consumption is a consumer
- A consumer consumes a good or service and derives satisfaction upon consumption
- A producer always tries to maximize this satisfaction by using the consumer consumption data and gauging the consumer behavioral patterns.

6) What is consumption theory?

- A consumer has limited means(income) while their wants could be unlimited
- Consumption theory is formulation or generalization of standard relationships that explain how consumers tend to behave. Eg: As price increases, demand decreases.

W1L4_Consumption baskets

Summary:

1) What are the consumption and consumption baskets?

- For example , household consumption over a day could be consumption of vegetables, electricity, water, data, etc. If we can categorize all the consumption to a day or week or month we call them as consumption baskets. Examples of consumption baskets at household level are transportation, ration, electricity, rent, and etc.

- At household level 'monthly consumption basket' provides useful information in accessing the demand. For a given income bracket of several thousands of households, these monthly consumption baskets give us patterns on consumption and therefore provide even much better insight into gauging the customer behaviour and demand

2) What are examples of different types of households and their consumption patterns

- Income of a household forms the upper limit on spending and is also termed as household budget. In the lecture 3 examples are presented of households of 15k income(9:07) 30k income(10:50) and 50k income(13:30)

W1L5_Survey data

Summary:

1) What is sampling, stratified sampling, and sample size?

- Sampling is a technique of selecting individual members or a subset of the population to make statistical inferences from them.
- Stratified sampling is a method where your sampling is modeled based on different strata such as income, region , occupation etc.
- Sampling data and sample size should be representative of the entire population.

2) What are the 2 kinds of biases from consumption survey data?

- 1.Bias due to timing of the survey: It is quintessential to do the survey all across the country at the same time of the date to avoid this kind of bias.
- 2. Recall Bias: it is bias that arises during a survey when the participant has to recall his consumption history for a week or month.

3) Why do we need high frequency consumption data ?

- Data pertaining to a certain list of commodities that are consumed in higher frequency (recurring) are termed as high frequency consumption data.
- After 1991, major economic reforms, India has seen an increase in choice of goods and services, and this led to unpredictability in consumption data on the goods and services. To address this, GOI came up with high frequency consumption data pertaining to it.

4) Which trends in consumer expenditure over the years are shown in the lecture?

- Composition of consumer expenditure 1993-1994: 7:50
- Composition of consumer expenditure 1993-2011: 8:21
- Break-up of rural and urban expenditure 2011-2012: 12:28
- Relationship between income and poverty: 14:00

W1L6_Utility and prices: An introduction

Summary:

1) What is the notion of utility and its effect on consumers' choice?

- Utility is often seen in terms of utility value of good or service to be purchased
- Consumer generally is aware or tries to gauge the utility value of a potential good or service looking to be consumed
- Utility is subjective, the utility value may differ from one individual to another. Eg: A certain individual may have a high utility value to watch the movie on the first day and is willing to pay a premium price and a certain other individual may have lesser utility value for the same.
- Utility drives consumer's choice: every household has an income, which acts as the upper limit. The household has to operate within this budget constraint. So the household purchasing is determined by the various consumer choices he has at hand and what utility value those choices provide and which of those to exercise based on priority of the household.

2) How does price act as the rationing device?

- Imagine a good whose value is free, so being that way (free) the consumption could more likely be unlimited and therefore over time it's value diminishes.
- In order to avoid this 'price' plays an important role; every good and service has a price.
- Price usually serves as a rationalizing device whereby their use is kept down to the available supply.

W1L7_Other sources of survey data

Summary:

1) What is/are the limitations of large scale national sample surveys?

- Large scale sample surveys from official sources have a limitation that the data availability is not in regular intervals

2) What are CMIE consumer pyramid household surveys and what are its advantages?

- It is A product by the Centre for Monitoring Indian Economy Pvt. Ltd.
- They conducts waves of surveys on Indian households
- Current wave as of sep-dec 2021 is 26th surveyed on 236,000 people

Advantages:

- This is a continuous type of survey (periodic waves)
- It has good coverage (currently: 236,000)
- The data obtained by the survey is of type 'longitudinal'

3) What is an example of longitudinal data?
- Survey conducted on a household 3 times a year and have been conducting for the past several years. The data obtained on such households over the time is called longitudinal data.
- Such information will help determine the economic mobility of the household such as consumption, consumption basket diversification, incomes, which goods became inferior over time, etc.

4) What are the different types of data discussed in the lecture?
- 1. Time series data: It is data collected at different points in time. These data points typically consist of successive measurements made from the same source over a time interval and are used to track change over time. Eg: GDP
- 2. Cross-sectional data: It provides a snapshot of data at a certain instance or point of time. Eg: NSS data
- 3. Panel data: It is a type of data which is pooled from both time series and cross sectional data.

5) What is the importance of market research obtained from surveys by consulting firms
- From a firm standpoint, specific surveys act both as market intelligence and forecasting
- Surveys act as inputs for strategic decision making for firms.
- Firms can look at the trends of today and be able to plan to position themselves 5 or 10 years from today to meet the demands by calibrating their supplies.
- Surveys are a source for demand information and can help in understanding where certain strata are headed to and taking cues from these firms can position themselves to succeed in the future.
- Visualization of data using different types of charts such as bar graphs, stacked bar charts, scatter plots, pie charts, and etc are very important in today's day and age and have become a critical part in aiding market research and decision making.

Resources mentioned in lecture:
1. https://consumerpyramidsdx.cmie.com/
2. https://image-src.bcg.com/Images/BCG-Ten-Trends-That-Are-Altering-Consumer-Behavior-in-India-Oct-2019_tcm9-231429.pdf

Week 2 - Summary Notes:

W2L1_Utility: Cardinal vs. Ordinal, Indifference curves:

Summary:

Q) Why is consumer behavior important?

- Consumer behaviour involves consumption decisions that determine the overall demand.
- There are 2 approaches to this 1. Cardinal approach 2. Ordinal approach
- Cardinal approach is a quantitative approach where we associate numerical value
- Ordinal approach is a qualitative approach where the preferences are listed non-numerically.

Q) What is utility and what is its measurement unit?

- Utility is the level of satisfaction derived from consumption of a good or service. The unit of measurement of utility is 'util'

Q) What is the cardinal utility theory with an example?

- It is a cardinal approach of utility where, we assign numeric value to commodities
- eg: A person derives 100 utils from drinking cup of coffee
- Notation:
- Let's assume there are 2 commodities X and Y that are consumed. Also U_x and U_y represent utility value derived from consumption of 2 commodities X and Y given by:
- $U_x = f(X)$ and $U_y = f(Y)$
- P_x and P_y represent the prices of commodities X and Y.

Q) What is the ordinal utility theory?

- It is a ordinal approach of utility where, we assign ranking of preferences

Q) What is total utility and marginal utility ?

- Total Utility(TU): The overall satisfaction derived from consumption of a commodity
- Marginal Utility(MU): It is the additional satisfaction that an individual derives from consumption of additional units of goods or service.
- $MU = \Delta TU / \Delta Q$
  = Change in Total Utility / Change in Quantity

Quantity (Q)	Total Utility TU	Marginal Utility MU
1	30	30
2	55	25
3	75	20
4	90	15
5	98	8
6	98	0
7	88	-10
8	63	-25

Source

Q) What is the law of diminishing marginal utility ?

- As more and more quantities of a commodity are consumed, this results in smaller and smaller additions to utility as shown in above image.
- When the TU is maximum MU is 0
- When the TU is decreasing MU is -ve

Q) What is the relationship between TU and MU

- TU increases with increase in Q (quantity) upto certain point of time
- TU decreases with further increase in Q after that
- When TU is increasing MU > 0
- When TU is maximum MU = 0
- When TU is decreasing MU < 0

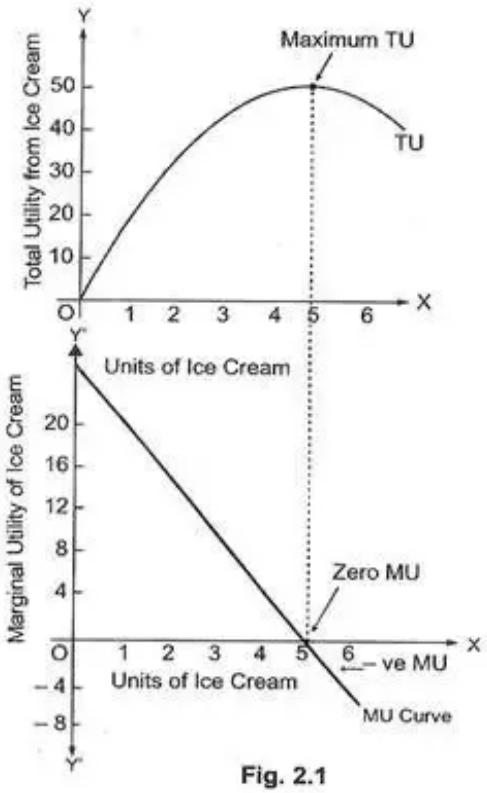

Fig. 2.1

Source

Q) What are the limitations/constraints consumers face regarding consumption of a good or service?

- In reality, consumers face 2 types of constraints 1. Limited income at hand 2. Price of good or service
- Consumer tries to maximize his utility based on these 2: income and prices of commodities.

Q) What is Consumer Equilibrium?

Q) What is the Ordinal Approach of Utility?

- Utility is qualitative in nature rather than quantitative, and a list of preferences can be provided based on ranking of the utilities.

Q) What is an indifference curve?

- Indifference curve(IC) is a representation that gives a combination of commodities that provides the same level of satisfaction for the consumer. It comes down to prices of commodities, so price is a very important determiner..

- Eg: 1idly and 2vada give the same level of satisfaction as 1vada and 2 idly, if this is plotted into a curve is called indifference curve.
- Higher IC => higher level of satisfaction
- Lower IC => lower level of satisfaction
- In the image below IC_1 represent current indifference curve of a household, IC_{-1} represents lower IC (combinations that offer lower level of satisfaction) and IC_2 represents higher IC
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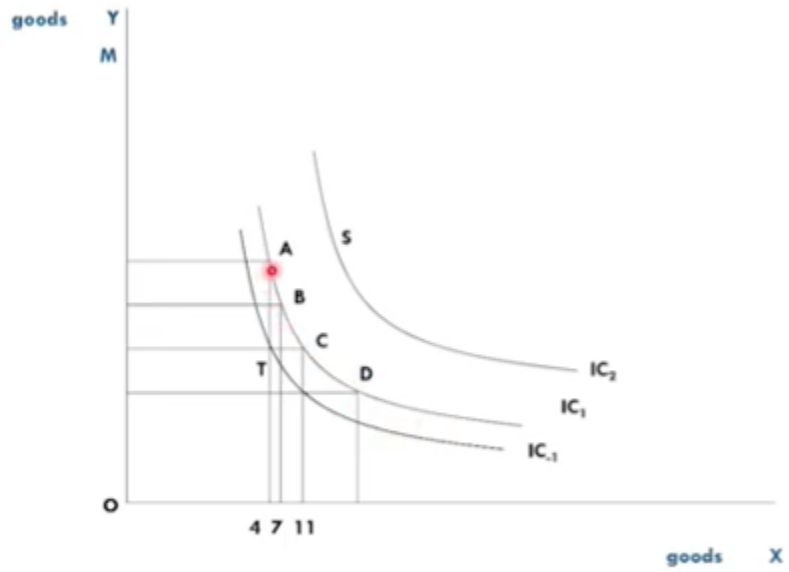


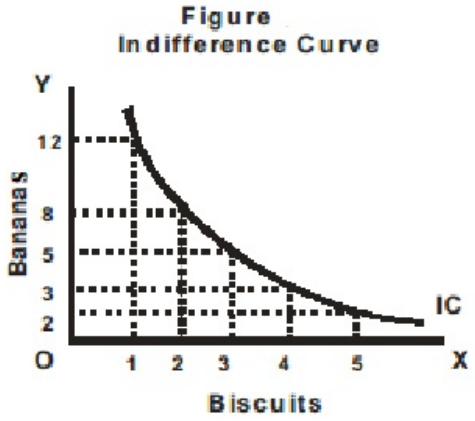


Table Indifference Schedule

Combination (Good X)	Biscuits (Good Y)	Bananas
A	1	12
B	2	8
C	3	5
D	4	3
E	5	2

Source

Q) What are important properties of indifference curves?

- The IC curve is a downward sloping curve which means as one quantity increases other quantities in its combination will decrease.
- IC curves do not intersect, as each of the IC curves stand different bundles of satisfaction
- Farther from the origin IC curve, greater the satisfaction and a rational human always aims to go towards high IC.

W2L2_Demand and supply curves

Summary:

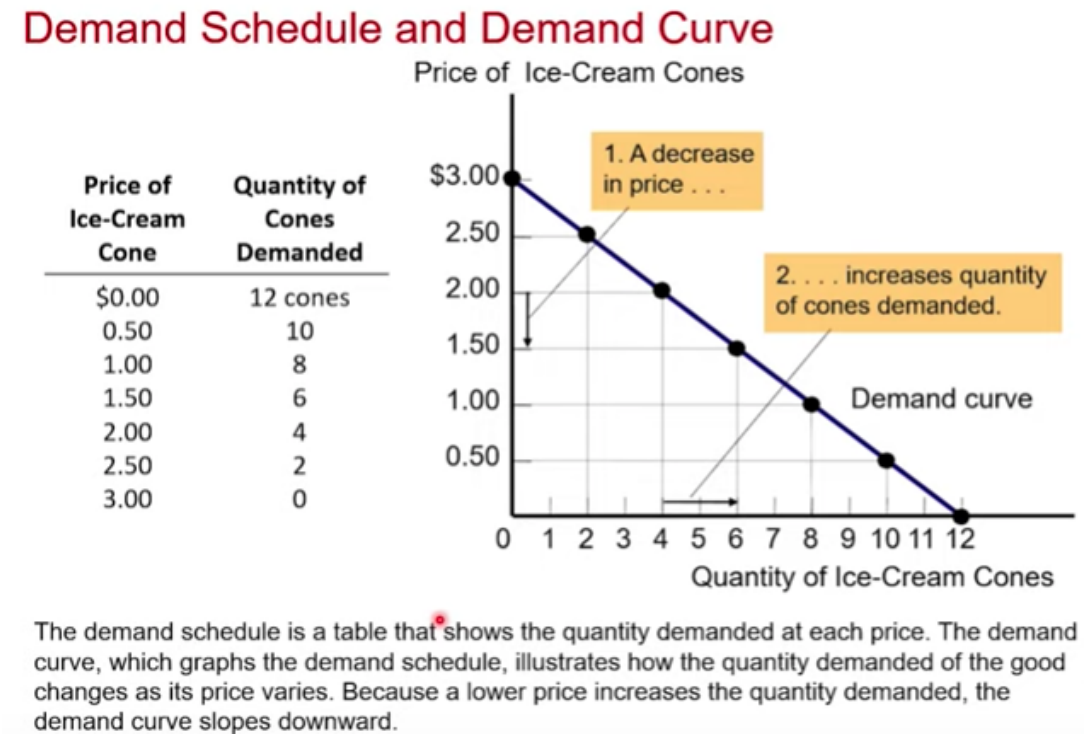
Q) What is a market?

- A market is a group of buyer and sellers of a particular good or service
- Buyers: These are a group of people who determine the demand for a product
- Sellers: These are a group of people who determine the supply of a good or service

Q) What is a demand, law of demand, demand curve and market demand curve?

- Demand is the outcome when an individual or a group of people is willing and able to purchase certain good(s) or service(s).

- Law of demand states that when price of a commodity increases, its demand decreases and when price decreases its demand for that increases(when all other things are equal in a market)
- Demand curve (5:30) is a graphical representation of demand in terms of price and quantity
- Market demand curve (6:40) is sum of demand curves of all individuals together

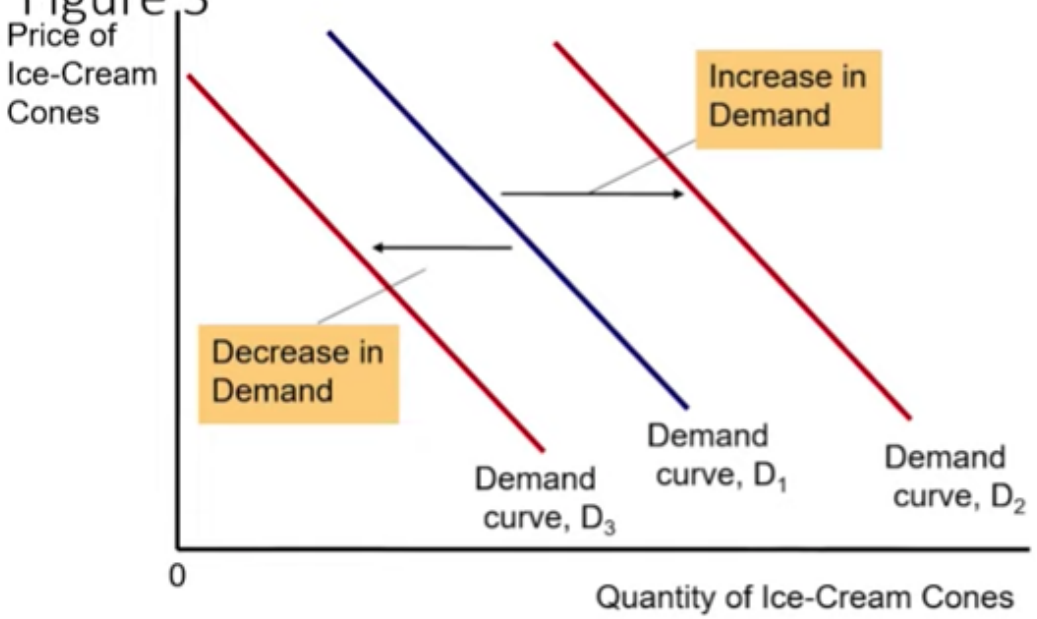


Q) What is the left shift and right shift of the demand curve?

- The demand curve (8:20) could shift to the left (decrease in demand) or to the right (increase in demand) depending on decrease or increase in the quantity demanded at every price.
- Eg: Let's say, during summers, consumers are willing to consume more quantities of ice cream at a price of $7. This means that there is an increase in demand and the demand curve shifts to the right.
- Let's say, during winters, consumers are willing to consume less quantity of ice cream at a price of $7. This means that there is a decrease in demand and the demand curve shifts to the left.

Shifts in the Demand Curve

Figure 3



Any change that raises the quantity that buyers wish to purchase at any given price shifts the demand curve to the right. Any change that lowers the quantity that buyers wish to purchase at any given price shifts the demand curve to the left.

Q) What are the variables that affect the demand curve?

- There are 5 factors (9:57) that affect the demand curve, they are a. Income(10:51) b. Price of related goods(11:30) c. Tastes(13:07) d. Expectations about the future (13:20) e. Number of buyers

Variable	A Change in This Variable . . .
Price of the good itself	Represents a movement along the demand curve
Income	Shifts the demand curve
Prices of related goods	Shifts the demand curve
Tastes	Shifts the demand curve
Expectations	Shifts the demand curve
Number of buyers	Shifts the demand curve

Q) What is the relationship between demand and expectations about the future?

- If the incomes of individuals increase in future years this will lead to increase in demand and vice versa
- If the price of a commodity increases in the future, individuals will purchase more now and thereby increase the demand for it and vice versa.

Q) What are normal and inferior goods with examples?

- Good whose demand increases with increase in income levels of individuals
- Examples of normal goods are: branded clothing, sports bike, dishwasher and etc
- Goods whose demand decreases with increase in income levels of individuals
- Examples of inferior goods: bus travel, bicycle, supermarket own brands and etc

Q) What are substitutes and complements with examples?

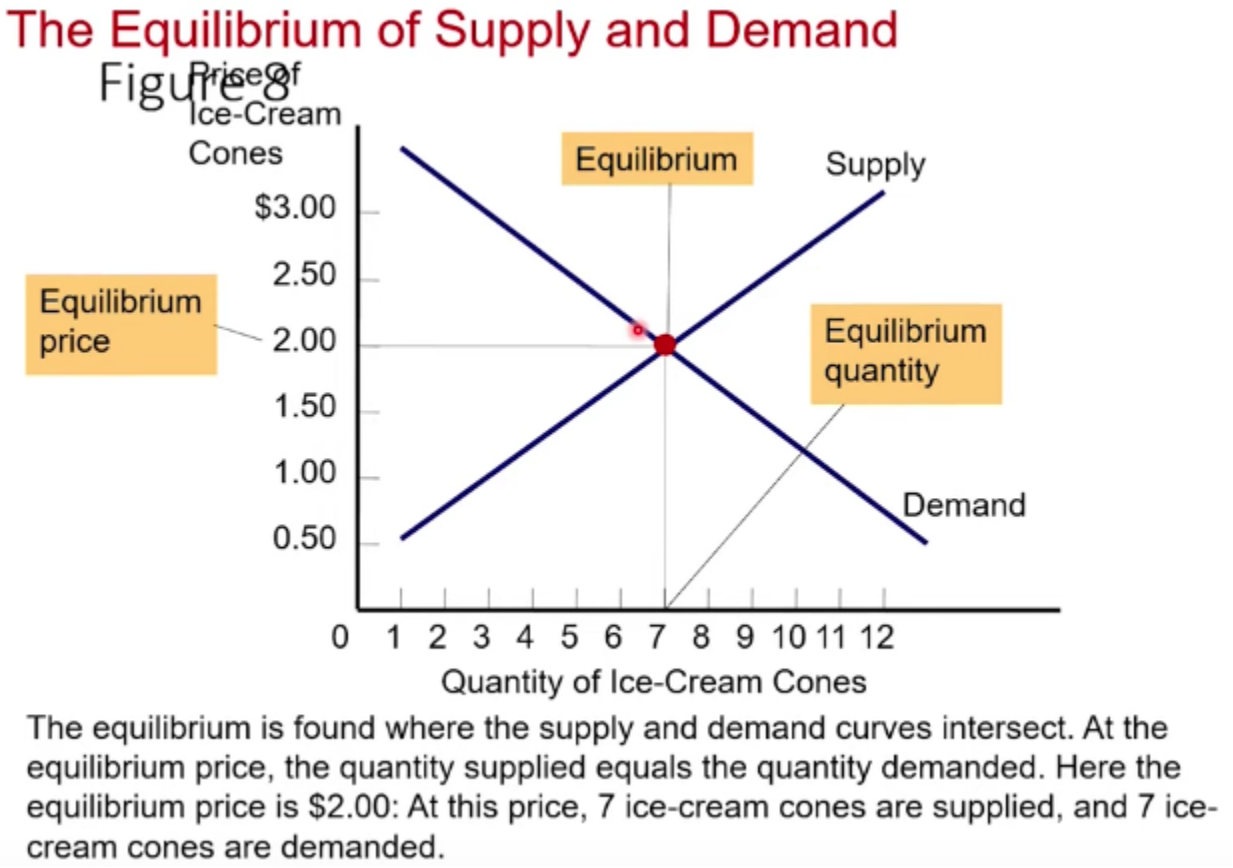
- Substitutes and complements always refer to a pair of goods
- If an increase in demand of one good leads in decrease in demand of other, we term such pair of goods as substitutes
- Examples of substitutes: (soap , body wash), (train tickets , plane tickets), (gel pen , ball pen), (LPG, induction stove)
- If an increase in demand of one good leads to increase in demand of other, we term such pair of goods as complements
- Examples of complements: (pencil , eraser), (tennis racquet , tennis ball), (cereal , milk), (electricity , electronic devices)

Q) What is Market equilibrium(15:10)?

- It is important for demand and supply to take place in a harmonious way in market setting
- If there is no harmony between demand and supply, it may lead to shortages or excess
- Market equilibrium is a situation in which supply and demand are said to be in balance
- In other words, a market equilibrium is a situation in which for a give price level the quantity demanded and quantity supplied are equal
- Also, it is observed that at equilibrium both the demand curve and supply curve intersect with each other

Q) What is Equilibrium price(16:06) and quantity?

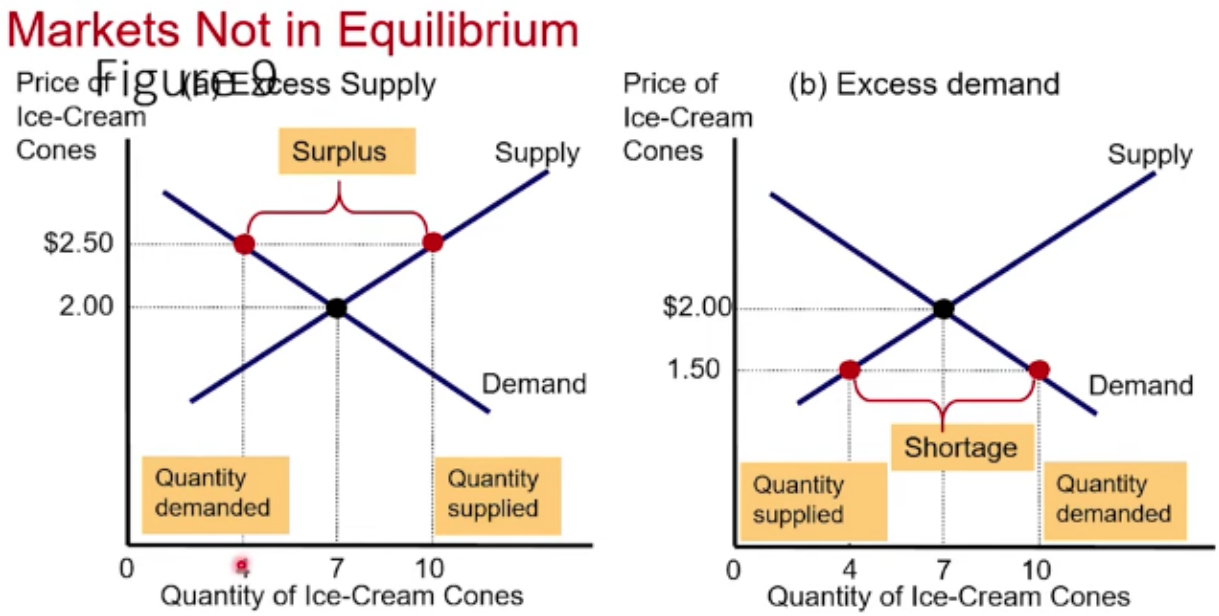
- In a situation of equilibrium, the quantity demanded is called as equilibrium quantity and price at which quantity demanded is equal to the quantity supplied is called as equilibrium price or market clearing price



The equilibrium is found where the supply and demand curves intersect. At the equilibrium price, the quantity supplied equals the quantity demanded. Here the equilibrium price is $2.00: At this price, 7 ice-cream cones are supplied, and 7 ice-cream cones are demanded.

Q) What are surplus and shortage bottlenecks (17:50)?

- Surplus is a situation in which the quantity supplied is more than the quantity demanded (excess supply). This situation usually leads to downward pressure on the price i.e, there is pressure on decreasing the price of the commodity to balance the supply and demand (to reach equilibrium). So, as the price is decreased to reach the equilibrium (seen as the movement along the demand curve) and a new market clearing price is established.
- Shortage is a situation in which the quantity supplied is less than the quantity demanded (excess demand). This situation usually result in an upward pressure on price i.e, there is a pressure to increase the price of the commodity to reach a new market clearing price



Q) What is the Law of Supply and Demand ? (19:20)

- The price of any good adjusts to balance the quantity supplied and quantity demanded for that particular good
- In most of the markets, shortages and surpluses are temporary

W2L3_Changes in demand and elasticity

Q) What is the elasticity of demand?

- Demand depends on certain factors and varies based on the variation of those factors
- Elasticity helps in understanding the variation in demand
- Elasticity is broadly classified into price elasticity(of demand and supply), income elasticity, and cross-price elasticity

Q) What is the price elasticity of demand ?

- With a change in the price of a good, how much a quantity demanded responds to
- Price elasticity of demand = abs(%change in Quantity Demanded / %change in Price)
- Example: If I increase prices by 10%, how much % does the demand change ? is the meaning of the price elasticity of demand.

Q) What is elastic demand and inelastic demand with examples?

- Elastic demand is a demand when quantity demanded responds substantially to change in price
- Example: Chocolate: if chocolate prices were increased, individuals would stop buying chocolate and buy other alternatives like cookies, etc.
- Inelastic demand is a demand when quantity demanded responds meagerly to change in price
- Example: In general necessities and prescriptive medicines are inelastic. Another example could be tobacco and alcohol products. Irrespective of increase in price of tobacco, its consumption is unaffected.

Q) What are the determinants of the price elasticity of demand?

- Availability of close substitutes, necessities and luxuries are some of the determinants of the price elasticity of demand.

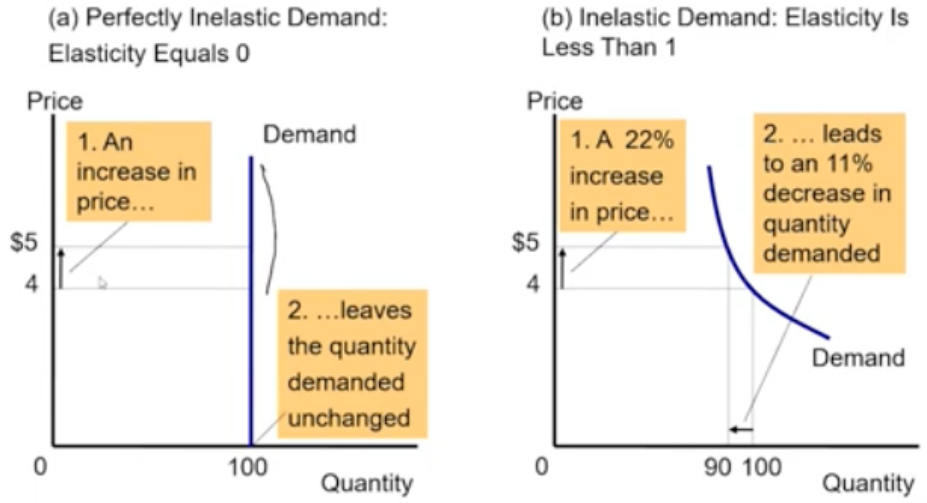
Q) Goods with close substitutes are more elastic in demand, explain?

- Let's say pepsi and coca cola are close substitutes with the same price and pepsi decided to increase its price by 10%.
- Individuals will stop buying pepsi and luckily they have a close substitute of pepsi which is coca cola and they tend to buy it more
- Therefore the close substitutes pepsi and coca cola are elastic in nature, i.e, with change in price of one results in change in quantity demanded on its close substitute, it being substantial.
-

Q) What are different types of demand curves?

- Let PEOD represent : price elasticity of demand
- Elastic Demand: PEOD > 1
- Inelastic Demand: PEOD < 1
- Unit Elasticity:PEOD = 1
- Perfect Elastic Demand: PEOD = Infinity (horizontal curve) (small change in price may result in people not buying at all)
- Perfect Inelastic Demand: PEOD = 0 (vertical curve)

The Price Elasticity of Demand (a, b)



The price elasticity of demand determines whether the demand curve is steep or flat.
Note that all percentage changes are calculated using the midpoint method.

The Price Elasticity of Demand (c)

The price elasticity of demand determines whether the demand curve is steep or flat.
Note that all percentage changes are calculated using the midpoint method.

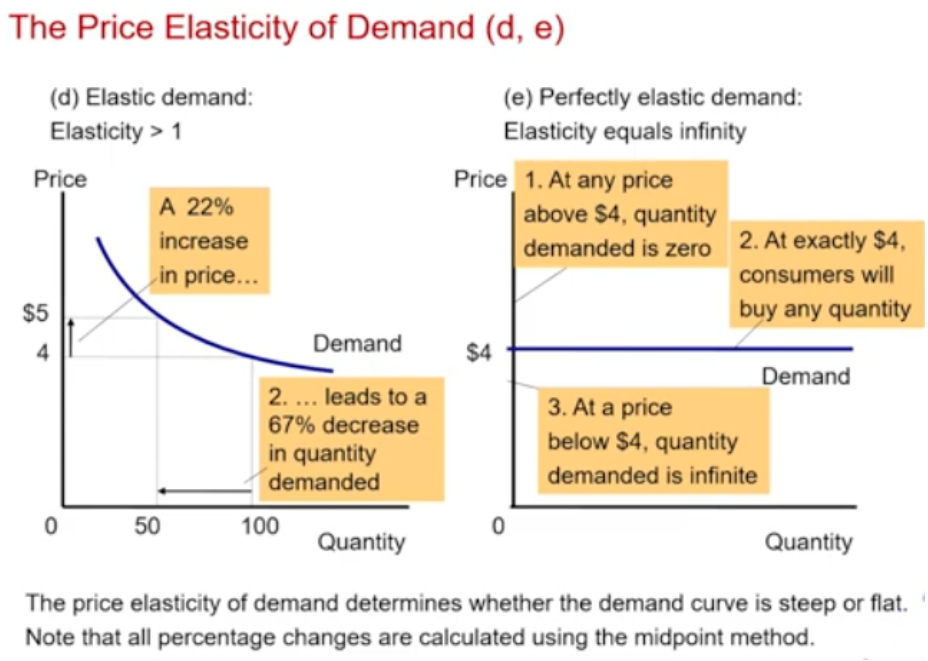


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Fig. 2.11 Types of Price Elasticity of Demand

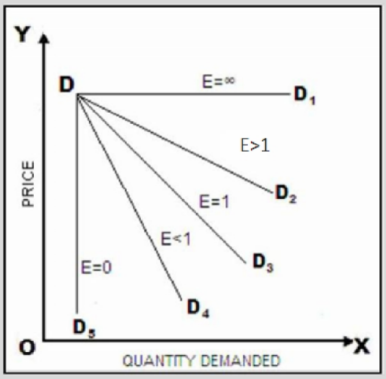


Fig 2.11 shows various demand curves, where X-axis shows quantity demanded and Y-axis shows prices.

Different types of price elasticities discussed above are shown in the diagram.

DD_1 – Perfectly Elastic Demand

DD_2 – Elastic Demand

DD_3 – Unitary Elastic Demand

DD_4 – Inelastic Demand

DD_5 – Perfectly Inelastic Demand

Q) What is income elasticity of demand(IEOD)?

- How much is the quantity demanded by the consumer responds to with change in income of the consumer
- Income elasticity of demand = (%change in Quantity Demanded / %change in Income)
- Unlike PEOD, IEOD can be positive or negative
- IEOD > 0 for normal goods and IEOD <0 for inferior goods.
- For necessities, we observe smaller income elasticities
- For luxuries, we observe larger income elasticities

Q) What is cross-price elasticity of demand?

- When price of one good is changed, how much does the quantity demanded of the second good is changed is the essence of cross-price elasticity of demand
- Cross-price elasticity of demand = (%change in Quantity Demanded of first good / %change in Quantity Demanded of second good)
- Based on cross-price elasticity of demand, goods can be classified into 2: a. Substitutes and b. Complements
- Substitutes are goods with 'positive cross-price elasticity of demand'
- Complements are goods with 'negative cross-price elasticity of demand'

Q) What is elasticity of supply?

- The elasticity of supply is parallel to the elasticity of demand.
- We classify goods in terms of elasticity of supply. Certain goods have very high elasticity in supply, that is, quantity supplied responds substantially to changes in price.
- When there is inelastic supply, quantity supplied actually responds only slightly to changes in price
- These are all determined in terms of the time period that we have in mind, because sometimes when you have a longer time horizon, you can be a little more elastic in supplying. If it is a shorter time horizon elasticity of supply is constrained by the time period or time horizon that we are talking about.

Q) What is the formula for the price elasticity of supply?

- It is the percentage change in quantity supplied divided by the percentage change in price
- Price elasticity of supply is always positive because the supply curve is an upward sloping curve.
- We have varieties of supply curves, unit elastic, elastic, inelastic, exactly like in the context of a demand curve.

Q) What is elastic supply, inelastic supply and what are the determinants of the price elasticity of supply?

- Elastic supply: Quantity supplied responds substantially to change in price
- Inelastic supply: Quantity supplied responds meagerly to change in price
- Determinants of price elasticity of supply: Time period

Q) What are different types of Supply curves?

- Let PEOS represent : price elasticity of supply
- Elastic Supply: PEOS > 1
- Inelastic Supply: PEOS < 1
- Unit Elasticity:PEOS = 1

Q) What is the income effect with example?

- Income effect is the change in consumer real purchasing power brought about by change in the price of commodity
- Example: A consumer income is 15k per month, if meat is part of his consumption basket and the prices of the meat has decreased then it would imply that the income of that consumer has increased and is more than 15k

Q) What is the substitution effect with an example?

- Substitution effect is an incentive to increase the consumption of the good whose price falls and its substitute now becomes more expensive.
- Example: You are a consumer of pepsi over coca cola, but you see pepsi reduced their prices. So, the coca cola you are consuming is expensive now. You switch to consuming pepsi via substitution effect.

W2L4_Production cost

Summary:

Q) Who are the 2 broad agents of the Market?

- 1. Person (consumer) who demands via consumption 2. Person (producer) who supplies via production

Q) What is the objective of a consumer and a producer?

- Objective of a consumer: To Maximize Utility
- Objective of a producer(firm): To Maximize Profits

Q) Which is one the most important variables that affects the cost of production?

- The important factor that affect 'Supply' is 'Cost of Production'

Q) How is understanding of cost a prerequisite to understanding supply decisions?

- Once we have an idea of the cost of producing a commodity, based on the cost of production, several supply decisions can be arrived at like this. what goods to produce b. how much goods to produce c. to which segment to pitch the product to, etc.

Q) What is Historical Cost and Replacement Cost?

- Historical Cost: Actual cost, when purchasing an asset
- eg1: In 2021, purchasing land at a cost which is a historical cost.
- eg2: Cost of machinery while setting up the plant.
- Replacement Cost: The price that is needed to replace a certain asset based on the current market price, let's say Rs. 1 Cr
- eg: The cost of machinery today replacing the outdated one(which was purchased and put at time of setting up of the plant) at current market price let's say 2 Cr

Q) What is the idea of 'depreciation reserve' ?

- A firm bought machinery for a cost of 5 Cr, after 15 years the exact machinery needs to be replaced by a new one. But the cost of the same machinery today 15 years later is 15 Cr. To compensate this a firm starts a depreciation reserve, which accommodates a certain specific amount into this reserve, let's say 1 Cr per year and after 15 years, new machinery is bought from this reserve without any additional burden on the firm.

Q) What is a Fixed and Variable Cost ?

- Fixed Cost: All the costs that are incurred that are unaffected by the company's production output or sales.
- eg: interest to be paid to bank is independent of firm's sales being up or down
- eg: rent to be paid is independent on firm's sales
- Variable Cost: All the costs that are associated with the firm that increase or decrease with respect to the production volume/output. Those costs which increase with increase in production volume and decrease with decrease in production volume.
- eg: Cost of trolley autos increases with increase in production volume

Q) What is a Real Cost and Prime Cost?

- Real Cost: It accounts for physical quantities of various non-monetary factors that are in materialistic terms eg: cost of number of nails, cost of cubic per feet and etc
- Prime Cost: It is the direct cost incurred in terms of material and labour involved in the production excluding fixed cost. Prime costs help determine the selling cost of a commodity to earn profit.

W2L5_Cost curves

Summary:

Q) What are the inferences on the pizza factory example discussed in the lecture?

- A pizza factory was bought which had both 'machinery' and 'shed' = 'initial investment' = € 30 = fixed cost
- Production capacity of the pizza factory is 200 pizzas per hour
- 1 worker is hired(at cost of € 10) who produces 50 pizzas per hour with MP of labour = 50 and
-

Number of workers	Output (quantity of pizzas produced per hour)	Marginal product of labour	Cost of factory	Cost of workers	Total cost of inputs (cost of factory + cost of workers)
0	0	50	€30	€0	€30
1	50	40	30	10	40
2	90	30	30	20	50
3	120	20	30	30	60
4	140	10	30	40	70
5	150		30	50	80

Q) What is the importance of relation between marginal and average cost curves?

- The amount of output/quantity of output is determined by the producer.
- It is of utmost importance for the producer to decide the range of this output in terms of cost efficiency in terms of quantity output.
- This can be identified as region around the point of intersection of the Marginal Curve and The Total Cost Curve
- This forms important decision for a firm

Q) What is a reasonable expansion path of a firm?

- Start with a small factory as the demand increases, firm moves to medium factory and next with increase in demand again moves to large factory.

Q) What are economies of scale?

- It is a part of the 'Long Run Total Average Cost Curve'
- As and when your production (output volume) increase, the average total cost(ATC) keeps falling
- Reasons for this could be many: bulk purchases(cost advantages), technological innovation, and etc.

- This is the region when eg: 10 units are produced at cost of 1 unit of ATC

Q) What are the constant returns of scale?
- This is the region of 'Long Run ATC' for 1 unit of production 1 unit of ATC is incurred.
- It is a one-one relation
- Most firms operate in this region

Q) What is diseconomies of scale?
- It is a part of the 'Long Run Total Average Cost Curve'
- As output volume of production is increased, with respect to this; the ATC increase is by a factor of more than that of the production.
- Eg: 2% increase in output will result in 6% increase in total costs

W2L6_Make vs. Buy

Summary:
Q) What is a make or buy decision for a firm?
- This is a situation for the firm when it has to decide whether to buy from other source (outsource) and sell (avoids investing in capital) or make it on its own via investing in additional capital that is incurred to do so.
- Sunk cost also is one of the important factor in make or buy decision for a firm

Q) What is an example of Sunk Cost?
- A firm entering into an agreement with a marketing agency and need to pay the fee upfront is termed as sunk cost. Here during the course, let's say you do-not yield any results from this and thereby the cost of the fee is sunk (in metaphorical sense)

Q) Can you give an example of the outcome of a make or buy decision?
- For example 'Bata' decided it is better to outsource its operations of footwear making to several local firms than to produce it on its own. One such model could be it gives specifications of the models to be produced along with the quantity and Bata brands the foot wear with its logo and sells to the customers.So for Bata buy was the decision over make.

Q) What is the notion of a firm having control over price and quantity?
- A firm has control of a. price to fix on the commodity b. quantity to produce c. both a and b.

- In a monopoly market, a firm can control both price and quantity
- In a competitive markets, only quantity can be controlled

W2L7_Production decisions

Summary:

Q) What are 2 main factors concerning production decisions?

- Production decisions are intertwined with price and quantity. Pricing is a function of cost and quantity produced.

Q) What is a production function?

- It gives you the maximum level of output to be produced based on the various inputs.
- The production function gives relationship between inputs used in the production and the maximum output production with given period of time and with given period of technology
- Q = f(x1, x2, ….xn) where x1, x2, …..xn are inputs used in the production. Q is the maximum level of output.

Q) What are some general inputs for a typical industry?

- KLEM: capital, labour energy and material

Q) What is a short-term production function?

- Consider a simple production function with 2 inputs: capital and labour Q = f(X,Y); Q: output, X: labour, Y: capital
- A function which provides the maximum output produced for given inputs such that AT LEAST ONE of the production inputs remains unchanged
- Usually for a short-term production function, capital remains unchanged
- Short-term production function is useful in understanding short-term production goal for the firm

Q) What is a long-run production function?

- Consider a simple production function with 2 inputs: capital and labour Q = f(X,Y); Q: output, X: labour, Y: capital
- A function which provides the maximum output produced for given inputs such that at firm is free to vary ALL the production inputs

Q) What are various terms relating to short-run analysis?

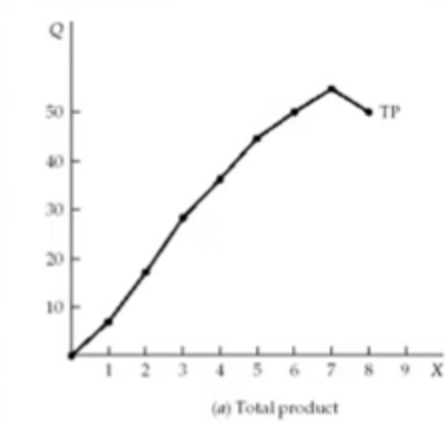
- Marginal product, average product and total product are the three terms important to short-run analysis
- Marginal product(MP) = $\Delta Q / \Delta X$
- Average product(AP_x) = Q / X

Q) What do you understand by marginal product (MP) and average product (AP)?

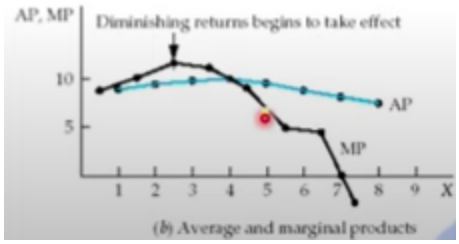
- MP gives you the estimate of change of production output resulting from unit change in a variable output
- For example, let's say a organic farming company wants to hire a manager, MP gives you how much additional production is achieved from this additional hire
- MP helps in production decision making as stated in above example, should I hire an additional person or not
- AP, for example gives you on and average what is total quantity of cement produced by 1 person applicable to a cement manufacturing firm

Q) With its cost and production data at hand how does a firm decide how much to produce and when/where to stop hiring?

- For a firm it is utmost important to locate the level of its production, this can be done with the help of production data (MP, TP, AP)



(a) Total product

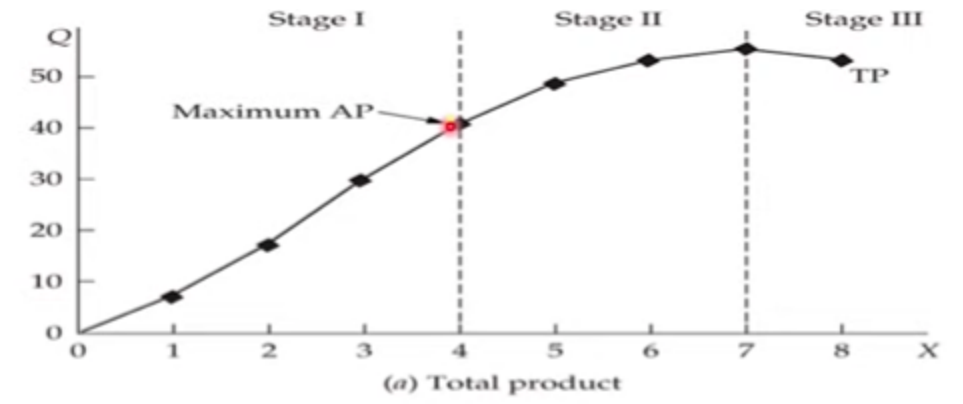


(b) Average and marginal products

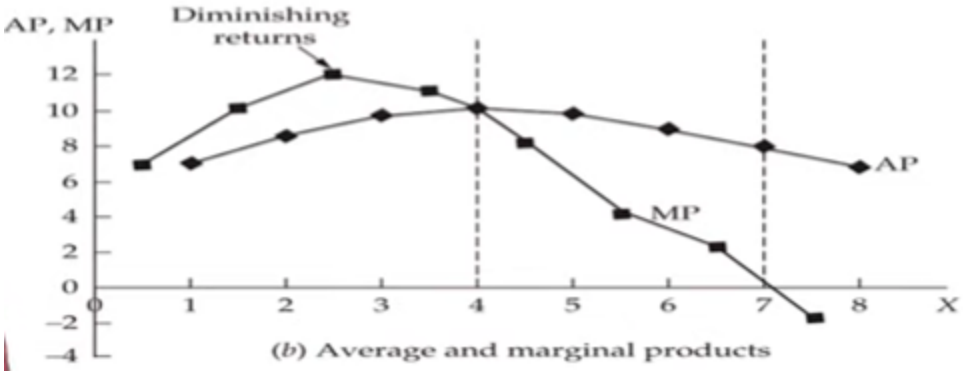
- MP > AP then AP is rising
- MP < AP then AP is falling
- MP = AP then AP is MAXIMIZED (i.e, stop hiring after this)
- For the production data firm get to decide when to stop hiring
- With above production data along with cost data, firm can decide the level of output to be produced

Q) What are the three stages of short-run production analysis?

- Three stages are: Stage1: MP = AP, Stage2: MP = 0, Stage3: beyond MP = 0 as shown in the image below



(a) Total product



(b) Average and marginal products

- Firms prefer to operate in either Stage I or Stage II and if firms enter Stage III, they have to make certain decisions to get back into Stage I or Stage II

Q) For a long run production function, what is IRTS, CRTS, DRTS ?

- Insights on IRTS, CRTS, DRTS helps in one important production decision to start a new plant in new location (expansion) or keep increasing production of the current plant

Q) What is Cobb-Doglous production function?

- It is a 2 input exponential production function of capital and labour
- $Q = aL^bK^c$
- If b + c >1 IRTS
- If b + c =1 CRTS
- If b + c >1 DRTS

Q) Explain capacity planning with an example?

- Capacity planning is a very important and useful factor for capital intensive firms.
- Capital intensive firms are those whose major costs for running the business are from investments in machinery, equipments and other capital related investments

- Example: A cement plant, which is a capital intensive firm operating at 30% of its production capacity is considered as a futile exercise. After investing heavily in capital and working at such low production capacity will lead to huge losses. It can be concluded that the capacity planning for the firm was not done right
- A good capacity planning needs reasonable and approximate forecast of demand
- A good capacity planning needs effective, transparent communication between production and sales & marketing channels of the firm

Q) What is total revenue, average revenue and marginal revenue ?

- Total Revenue: Total Quantity Produced X Price per Quantity
- Average Revenue: Total Revenue / Total Quantity Produced
- Marginal Revenue: Change in total revenue / Change in total quantity (what is the revenue generated from additional quantity produced)
- Below, in the image; a firm which is from a competitive market (price almost never varies), different revenues are listed

Quantity	Price	Total revenue	Average revenue	Marginal revenue
(*Q*)	(*P*)	($TR = P \times Q$)	($AR = TR/Q$)	($MR = \Delta TR/\Delta Q$)
1 litre	€6	€6	€6	
2	6	12	6	€6
3	6	18	6	6
4	6	24	6	6
5	6	30	6	6
6	6	36	6	6
7	6	42	6	6
8	6	48	6	6

Quantity	Total revenue	Total cost	Profit	Marginal revenue	Marginal cost	Change in profit
(*Q*)	(*TR*)	(*TC*)	(*TR* – *TC*)	(*MR* = Δ*TR*/Δ*Q*)	(*MC* = Δ*TC*/Δ*Q*)	(*MR* – *MC*)
0 litres	€0	€3	–€3			
				€6	€2	€4
1	6	5	1	6	3	3
2	12	8	4	6	4	2
3	18	12	6	6	5	1
4	24	17	7	6	6	0
5	30	23	7	6	7	–1
6	36	30	6	6	8	–2
7	42	38	4	6	9	–3
8	48	47	1			

Week 3 - Summary Notes

Q) How pricing is an important strategic variable for fulfilling a firm's strategic value?

- Pricing of a product depends on the market (monopoly, competitive, etc)
- In general ‘price’ cannot be changed much in an competitive markets like FMCG, etc
- Pricing also depends on its product category
- Pricing depends on the long run vision of the firm on that product eg: to maximize sales or to maximize profits, or to capture market share etc.

Q) State some of the pricing strategy objectives:

- In general products have a life cycle of their own, for example: A newly launched product might have a slow start to enter the market and then it gets diffused and faces the competition, then comes the maturity stage for the product when it hits the max volumes and after that comes the declining phase of the product life cycle
- At each stage/phase of product life cycle, different pricing strategies are needed and some of them are listed below:
- 1. Long run profits 2. Short run profits (hit and run) 3. Increase sales volume (greater market share) 4. Company growth (higher profits) 5. Match competitors price 6. Create interest and excitement about the product 7. Discourage competitors from cutting the price (predatory pricing) 8. Social, ethical and ideological objectives 9. Discourage new entrants

Q) What are the factors that affect pricing?

- Consumer's primary goals with respect to the product affects pricing of a product
- Having or not having a Unique Selling Point (USP) for the product vs. competition
- Bundling low-value and high-value products or services (eg: sedan features in a hatchback car)
- Geographical segmentation of market (city -district - income groups) also plays an important factor in pricing. Different regions in the same country may have varied prices sometimes

W3L2_Types of pricing strategies

Q) What are different types of pricing strategies discussed in the video lecture?

- Market skimming, Value pricing, Loss leader pricing, Psychological pricing, Going rate pricing, Tender pricing, Price discrimination, Penetration pricing, Cost plus pricing, Contribution pricing, Target pricing, Marginal cost pricing, Absorption cost pricing, Destroyer pricing
-

Q) What is Market Skimming?

- This type of pricing strategy depends, if one has complete information on customer demand (willingness and ability to buy)
- Low volume - High Price products
- Limited edition bikes, playstation, New launched iPhone and etc
- Suitable only for short term or until market competition is established.
-

Q) What is Value Pricing?

- Based on the surveys, feedback of the customers on a firm's products they categorize them into different categories like status products, premium products, exclusive products and accordingly price the products
- Value pricing for a firm largely depends on the insights about via consumer perception of their products
-

Q) What is loss leader pricing?

- Selling goods and services at reduced cost, to encourage large volume sales for a certain period of time
- Festival sales, supermarket special sales, free mobile for phone contract(USA)

Q) What is psychological pricing?

- Setting a price according to what consumers think the price to be
- Eg: $9.99 instead of $10.99

Q) What is going rate pricing?

- Constantly monitor rival's pricing
- Match the price or cut the price below the competitors price
- Increase the price when needed based on competitor's price

Q) What is tender pricing?

- This is Low cost but high value delivery model
- Typically government tenders
- Many contracts are given via tenders
- Reputation (past track record) is important
- Entry barriers are high (tender placing requirements such as annual turnover of minimum 10cr and etc)

Q) What is a price discrimination, peak-load pricing and cross-price subsidization?

- Same product or service are sold to different people at different prices is called price discrimination
- Example: Airline tickets
- This strategy is possible where there is no resale of the product is not possible
- Peak load pricing is a variant of price discrimination (metro prices at peak hours vs. non-peak hours)
- Cross-price subsidization: For example, there are 2 customers customer#1 does not have the ability to pay more for a service - you subsidize the price and customer#2 has ability to pay more - you charge more to recover from subsidizing the price for customer#1, electricity is another example, classes in train travel

Q) What is penetration pricing?

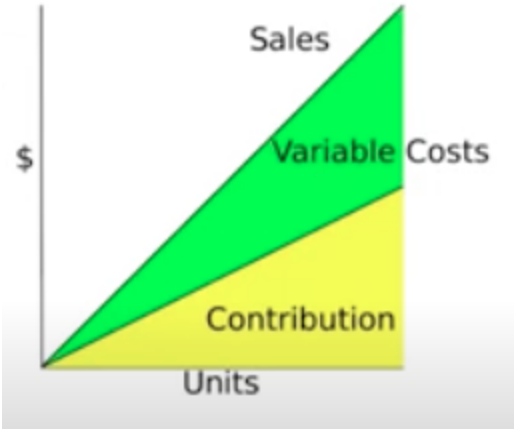
- Pricing set to penetrate the market
- Eg: Jio Fiber
- Initially price is very very low and focus on high volume sales
- Suitable for newly launched product
- Commonly a long term strategy

Q) What is cost plus pricing?

- Cost-plus pricing is a pricing model used to maximize the rates of return for the companies
- Cost price(CP) + Mark-Up(MU) = Selling Price
- Cost price = FC + VC (FC: fixed costs. VC: variable cost)

Q) What is contribution pricing?

- Contribution = selling price - variable cost (direct costs)
- Contribution = CP + MU - VC => (FC + VC) + MU - VC => FC + MU (Fixed cost + Mark-up = contribution)



Q) What is target pricing?

- I want this much of profits
- To reach those profits, vary the mark-ups
- Markup = profit /cost X 100
- When demand is low, you reduce the mark-up
- When the demand is high, you increase the mark-up

Q) What is marginal cost pricing, full cost pricing and absorption cost pricing?

- Marginal cost pricing MC = Δ Total Cost / Δ Output = $80 / 2 = $40
- Marginal cost is the cost of producing one extra unit or one fewer unit
- Full cost pricing is an attempt at pricing the commodity to cover both fixed and the variable costs
- Absorption cost pricing is an attempt to price the commodity to cover variable costs and some of the fixed costs
- In certain markets where the sunk cost is high, one uses absorption cost pricing.

Q) What is destroyer pricing?

- To destroy the post entry of new entrant
- Undercut the pricing to destroy the competition and force to exit
- Anti-competitive and illegal

W3L3_Analysis of firm performance - Key ratios

Q) Why do firms do financial analysis ?

- Financial analysis of the firm helps in finding its own strengths and weaknesses
- Financial analysis helps in monitoring the key indicators of the firm
- Financial analysis helps in comparison between different firms (competitive analysis)
- Financial Analysis helps in understanding a firm's past, present and future financial conditions

Q) What are financial statements and different types of financial statements?

- Financial statements are written records that convey the business activities and the financial performance of a company.
- Balance sheet (annual financial record) (provides performance of company) , income statement (sources of income) (sales, interests, etc), cash flow statement (provides for liquidity position), statement on retained earnings

Q) What is a ratio analysis and objectives

- Ratio analysis helps firms to evaluate performance, do structural analysis, provide useful insights and relationship between various business activities and performance
- Objectives of ratio analysis are to study efficiency of operations, study risk of operations, compare performance with the past performance, compare performance with other firms, evaluate current performance and etc

Q) What are limitations of ratio analysis

- Accounting practices may differ from one firm to another
- Seasonality affects ratio analysis, eg: one quarter saw huge increase in performance (via. ratios) because of more festivals in that quarter which is not the right indicative. In such cases along with that quarter you could compare it with Annual performance to make sense of it.

Q) What is a quick ratio?

- Quick ratio = (current assets - stock inventory) / liabilities
- 1:1 is an ideal ratio to have

- 3:1 is a healthy ratio, and would mean that there exists lot current assets compared to liabilities
- 0.5:1 is an unhealthy ratio, this would put lot of pressure on the firm

Q) What is the current ratio?
- Current ratio = current assets / current liabilities
- Too high or too low current ratio could be problematic
- Too high would mean that there are too many current assets and mostly tied up with unproductive assets
- Too low would mean the risk of not able to pay your way
- Ideal ratio is 1.5:1
- 5:1 ratio would mean Rs 5/- in assets is available to cover every Rs1/- of liabilities
- 0.75:1 ratio would mean 75p in assets is available to cover every Rs1/- of liabilities

Q) What is earnings per share?
- Earnings per share = profit after tax / number of shares
- This gives a signal or indication for potential investors
- For investors this ratio helps in their decision making to invest in a particular firm/stock or not

Q) What is earnings per share ratio?
- earnings per share ratio = profit after tax / number of shares

Q) What is the price earnings ratio?
- Price earnings ratio = market price / earnings per share
- Higher the better

Q) What is Earnings before interest, taxes, and amortization (EBITDA) ratio?
- It measure the operational performance of the company
- EBITDA ratio = enterprise value / EBITDA
- Higher the better for the company

Q) What is the dividend ratio?
- It gives an indication of the return on investment to the share price
- Dividend ratio = (ordinary share dividend/market price)*100

Q) What is a gearing ratio?
- Gearing ratio =(long term loans/capital employed) * 100

- This ratio provides for an idea on how much capital is employed from the long term loans taken

Q) What is Gross Profit, Net Profit and Gross Profit Margin and Net profit Margin?

- Gross profit = total revenue - variable cost
- Net profit = total revenue - (variable cost + fixed cost)
- Gross profit margin = (gross profit/total revenue)*100
- Net profit margin = (net profit/total revenue)*100

Q) What is the return on capital employed(ROCE)?

- Capital employed tells you how much has been put to use in an investment.
- ROCE = (profit/capital employed)*100
- ROCE = 25% would mean 1Re of capital employed generates 25% profit for the firm
- Can partly be indicator for a firm's efficiency in capital utilization

Q) What is an asset turnover ratio?

- Assets turnover ratio = sales turnover / assets employed
- It gives an indication of how many assets employed would generate profit

Q) What is a stock turnover ratio?

- Stock piling up is a big problem in stock intensive industries such as textile, cement etc
- Stock turnover ratio = cost of goods sold / stocks expressed as times per year
- Low stock turnover ratio would mean poor customer satisfaction of the goods and people may not be interested in the goods
- This ratio indicates the rate at which company stocks are turned over

Q) What are debtor days?

- Debtor days = (debtor/sales turnover)*365
- How long it takes for the business to recover its debts
- Shorter the debtor days, better for the firm

Q) What are some of the key insights into analysis of 4 firms discussed in the video lecture?

- Ultra tech cement:
- It is a capital intensive industry
- It is a low profit margin industry (PAT(profit after tax) margin of 9.1% FY 2020)
- Covid impact quarters: Q4 2020 to Q1 2021

- Ultra tech, during the above said covid quarters has seen huge drop in ‘revenue’ but their ‘PAT’(profit after tax) has not seen any loss or not seen huge drop relatively. It can be concluded that the ultra tech mitigated the fall by managing their variable costs well.
- Equity investors are the investors who purchase shares of a company with the expectation that they'll rise in value in the form of capital gains, and/or generate capital dividends.
- Debt investors are the ones who lend money to a firm or project sponsor with the expectation that the borrower will pay back the investment with interest.
- Capital employed tells you how much has been put to use in an investment.
- ROCE is an important metric on capital employed
- It has low ROCE ratio industry (8.8% for FY 2020)
- Example: ROCE around 10% is NOT OK for an equity investor (his general expectation is 15%) and ROCE around 10% is OK for a debt investor
- It was observed that the company has high debt to equity ratio, and it uses cash majorly to retire debt (repay debt)
- FY 2020 current ratio = 1.21 (above 1)
- Debtor days is the number of days it takes for the business to recover its debts
- In the case of ultra tech, it is number of days it takes for it to collect the debt invoiced to their customers
- Debtor days = 19 days FY 2020 and over the years ultra tech has been successful in bringing down the debtor days. This led to an increase in operating cash as observed and they are using this extra cash to pay off their debt (loans)

Week 4 - Summary Notes

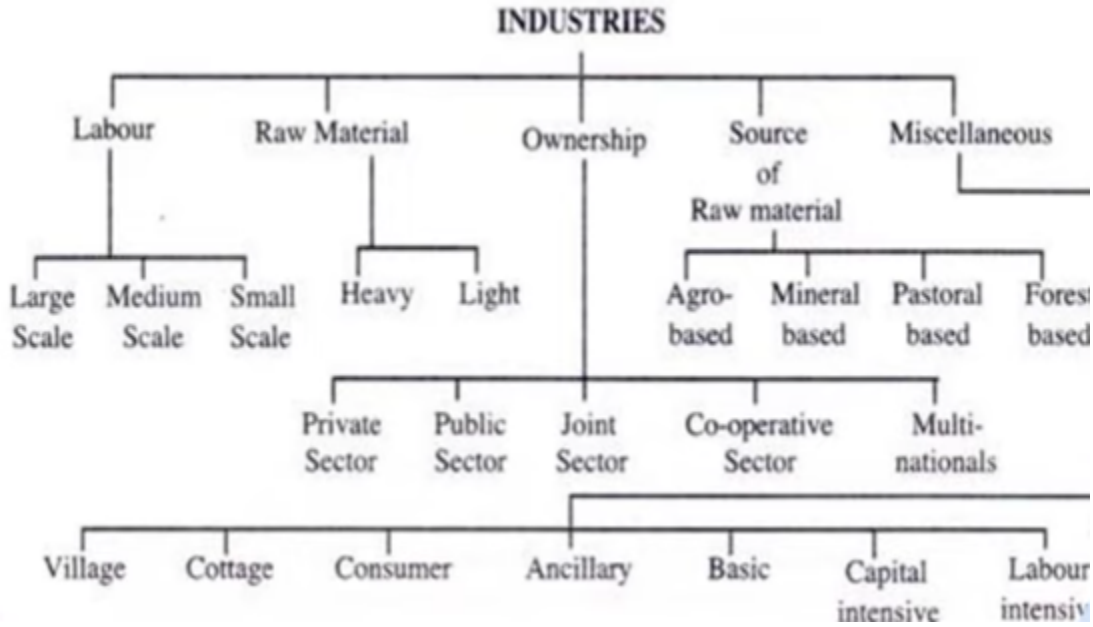
W4L1_Industry definition

Q) What is an industry?

- Industry is collection of firms which are based on related business activities
- Eg: Cement Industry: Ultra Tech, ACC, Maha, etc
- Industry wise analysis provides for broad economic insights and projections that enable for future investment decisions

Q) What are various methods of classification of industries?

- Following is the broad classification of industries:



Q) What is a Multinational Company(MNC)?

- Any company with >10% equity and with operations in more than 1 country is called an MNC

Q) What is ‘missing middle’?

- This phenomenon ‘missing middle’ is unique to India, usually found in the manufacturing industry.
- Compared to small sector and large sector industries, medium sector industries are very very less, eg: manufacturing industry
- We call this missing medium sector industries phenomenon as ‘missing middle’

Q) What are the National Industrial Classification (NIC) codes for the industry?

- NIC is a standard on industrial data comparable across countries
- The NIC classification is based on the final product produced
- Codes are digit based on the different sectors
- The last revision on NIC codes were done in 2008

W4L2_Data used for classification - NIC, IIP and PMI

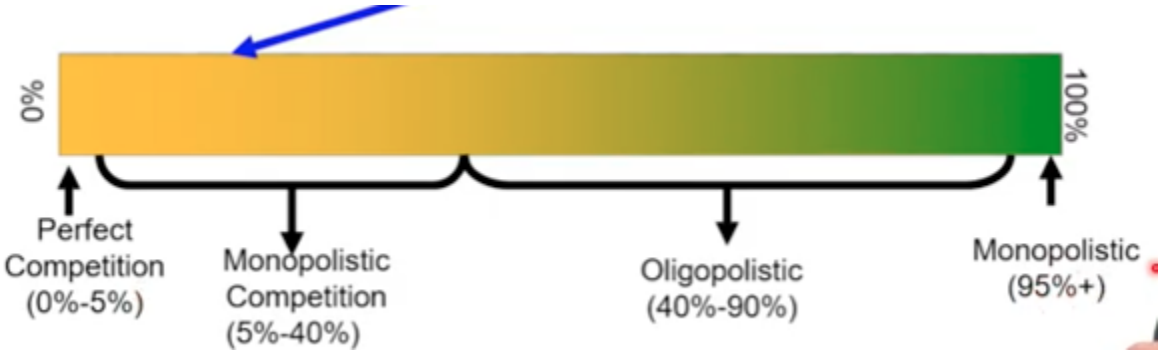
Q) What are the various sources for Industrial data?

- Annual Survey of Industries (ASI) is an annual survey of industries data released by GOI
- It has become infrequent data as the last survey was done in 2018
- This data is conducted by chief inspector of factories (CIF) at factory level
- Index of industrial production (IIP), a quantity index in terms of physical production is a monthly data on industries released in CSO website under GOI
- The purchasing manager's index (PMI) provides for the broad sentiment of the industry by providing monthly reports indicating current and near future conditions

W4L3_Industry market structure and Concentration indices

Q) What is a concentration ratio?

- Concentration ratio is a % metric, which examines the industry's concentration by share of output (sales/value added/other metric) controlled by the largest FOUR firms in the industry.
- In general it is 4, it could be 3, 5 etc
- Below is the Concentration ratio interpretation spectrum:



Q) What are the characteristics of different markets?

- Based on the concentration ratio, markets are classified into perfect competition, monopolistic competition, oligopolistic, monopolistic
- Some common examples seen are telecommunication, cement industry is a oligopoly market
- DBS Diamonds is a monopolistic
- Papad industry, retail bakery is close to perfect competition or monopolistic competition
- Generally, fragmented markets (highly competitive) are easy entry but difficult to survive and concentrated markets (oligopoly) are tough to enter but if one could manage that it is easy to survive
- CMIE publishes film level data, but it is a paid service
- Below are the characteristics for different markets:

Characteristic	Perfect Competition	Monopolistic Competition	Oligopoly	Pure Monopoly
Number of firms	Many	Large number	Few	One
Relationship with industry	Each firm is an insignificant part of industry	Each firm is a small share of industry	Large firms that dominate the industry	Monopoly is the Industry
Pricing power	None (Firms are price takers)	Limited	Control, with mutual interdependence	Monopolist is a price maker
Product characteristic	Standard or Homogenous	Differentiated (typically by heavy advertising)	Either Homogenous (steel) or Differentiated (Autos)	Product has no substitutes
Barriers to entry	Virtually none	Relatively easy	Relatively hard	Substantial (often insurmountable) barriers to entry
Demand curve	Perfectly Elastic (Horizontal)	Highly Elastic	"Kinked"	Downward sloping

Q) What is the Herfindahl index ?

- Concentration ratio looks into only top 4 largest firms in the industry; to overcome that we use Herfindahl index.
- Step1: Determine the % output produced by each of the largest four firms
- Step2: Square each of those shares
- Step3: Add all the squared numbers
- Step4: Interpret it from the Herfindahl index spectrum
- Following images shows how flawed concentration ratio can be and how does herfindahl spectrum looks:

Hypothetical Example: Herfindahl Index

Herfindahl Index

The Concentration Ratio would look the same for these two industries, but the Herfindahl Index really shows differences in market concentration

The Dog Food Industry

Firm	Sales in 2006	Percent of Output as Measured by Sales	Share of Output Squared
Joe's Dog Food	$1,000,000,000	34.0	1,157
Jim's Kibbles	$750,000,000	25.5	651
Sue's Biscuit House	$650,000,000	22.1	489
IHOD (Internation House of Dogfood)	$320,000,000	10.9	118
All Other Firms	$220,000,000	7.5	na
Total	$2,940,000,000	100.0	na
Herindahl Index	na	na	2,415

Notice that the top four industries each comprise about 92% of the industry…

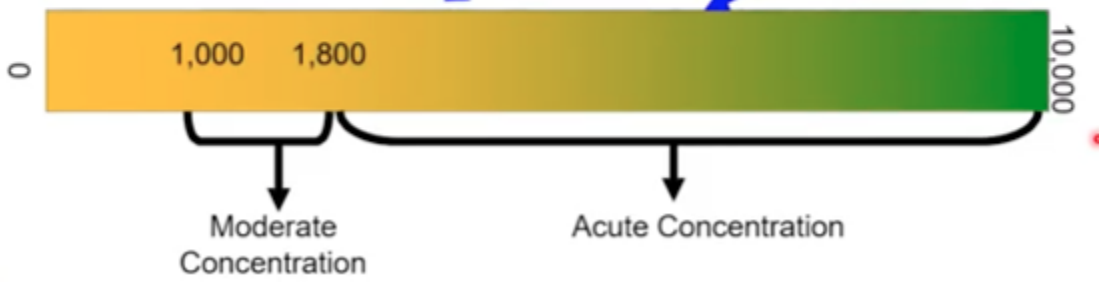
But for cat food, the largest is really dominant

The Cat Food Industry

Firm	Sales in 2006	Percent of Output as Measured by Sales	Share of Output Squared
Joe's Cat Food	$1,000,000	79.2	6,279
Jim's Catbles	$75,000	5.9	35
Sue's Meow House	$65,000	5.2	27
IHOC (Internation House of Catfood)	$32,000	2.5	6
All Other Firms	$90,000	7.1	na
Total	$1,262,000	100.0	na
Herindahl Index	na	na	6,347

With a Herfindahl Index of 2,415, the hypothetical Dog Food Industry is somewhat concentrated.

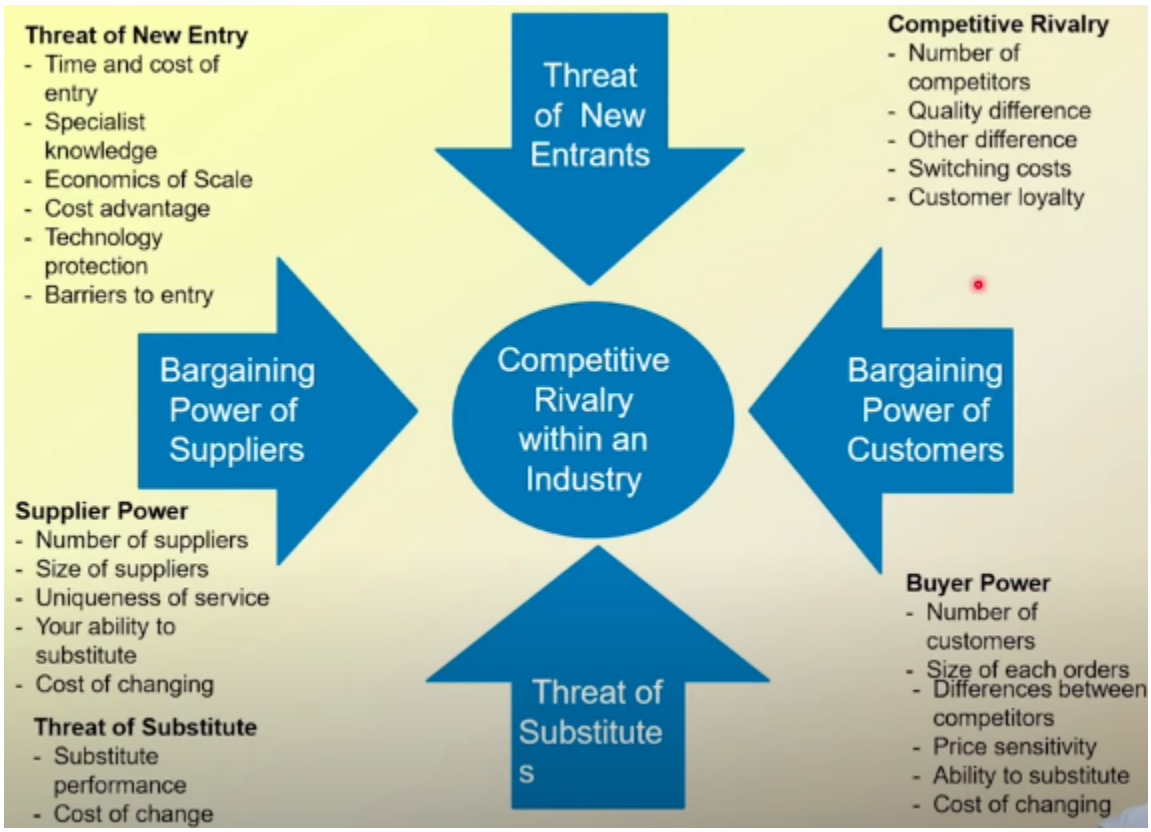
With a Herfindahl Index of 6,347, the hypothetical Cat Food Industry is more heavily concentrated.



W4_L4_Competitive positioning in an industry - Porter's five forces

Q) What are Porter's five forces?

- Porter's five forces are part of competitive analysis
- Competitive analysis is very important and help in determining USP's, strategies and processes which will put edge of one company over the other
- An example of porter's five forces for a sporting industry in USA: Link
- Following is the overview of the porter's five forces:



Q) What are the limitations of Porter's five forces ?

- Porter's five forces does not take into account IT/digitalization, globalization, instability in economy, changes in customer expectations, environmental changes, organization reinvention

Q) What are some common sources for researching data?

- CARE ratings
- Company Filings
- ICICI Direct Research
- UN comtrade
- Wazir analysis
- Televisory's Analysis
- Niti Ayog
- Goldman Sachs Global
- Gartner