

Consumer Behavior Theories

Module 2

Select Terminologies of Economics

- **Scarcity:**
 - Scarce of resources and **unlimited wants**.
 - Scarcity of resources and **alternative uses**.
- **Short-run and long run**
 - Based on the possibility of changing production (factor) inputs.
 - Labour and Capital : Long-run
 - Labour : Short-run → fixed capital

- **Stock and flow variables**

Stock variables: A quantity of a variable at a point in time.

- Eg: Number of books in a library at a particular time.
- Number of persons employed in a country.
- Total money supply at a point of time.
- Population etc.

- Flow variables: A quantity of a variable that are measurable over a period of time.

- Eg: Depreciation.
- Capital formation/investment.

- It is performed for convenience .

- Equilibrium and disequilibrium

Equilibrium:

“a situation in which opposite economic forces are in balance and there is no tendency to deviate from this position”

eg: demand and supply analysis

Disequilibrium

“this is a situation in which two opposite economic forces are not balance”

it is a routine matter of any economy.

- Partial equilibrium and general equilibrium analysis
- Partial equilibrium analysis:
 - It is a method of analysis of a part of an economy.
 - Assumption: Other things remain unaffected (*ceteris paribus*).
 - Eg: Theory of demand.
- General equilibrium analysis:
 - Analysis of economic system as a whole.
 - Comprehensive and realistic view.
 - Study the interrelationships and interdependence of many variables.

- Static and dynamic analysis

Static → (meaning “Still”)

- An economic analysis which is conducted under **static conditions**.
- Not a real one. **Theoretical** model.
- The variables included in the models have no past or future (i.e., **no time dimension**).
- Comparative statics (two equilibrium).
- Stock is static in nature.

Dynamic → (meaning “casing to change”)

- An economic analysis which is conducted under changing conditions.
- More realistic one.
- Analysis of changing the economy from one equilibrium to another.
- Flow is dynamic in nature.

Economic models

- An economic model is **a simplified description of reality**, designed to yield hypotheses about economic behavior that can be tested.

The End

Consumer behaviour theories

- Consumers utilise different goods and services, and aims to attain a higher level of satisfaction.
- In economics, there are two approaches to study the consumer's utility.
 - 1- Cardinal utility approach (neo classical model)
 - 2- Ordinal utility approach.

Cardinal utility approach

- Proposed by **Alfred Marshall**, and is known as the **neoclassical theory of consumer demand**.
- The theory assumes that **utility** can be **measured** and therefore can be expressed in **quantitative** numbers.
- The utility is expressed using a hypothetical unit of measurement is called “**utils**”.
 - Eg: Utility from a cup of tea =10 > Utility from a cup of coffee =8

An illustration

→ Derivation of TU and MU



APPLE HAS THE POWER TO
SATISFY A WANT. APPLE HAS
UTILITY

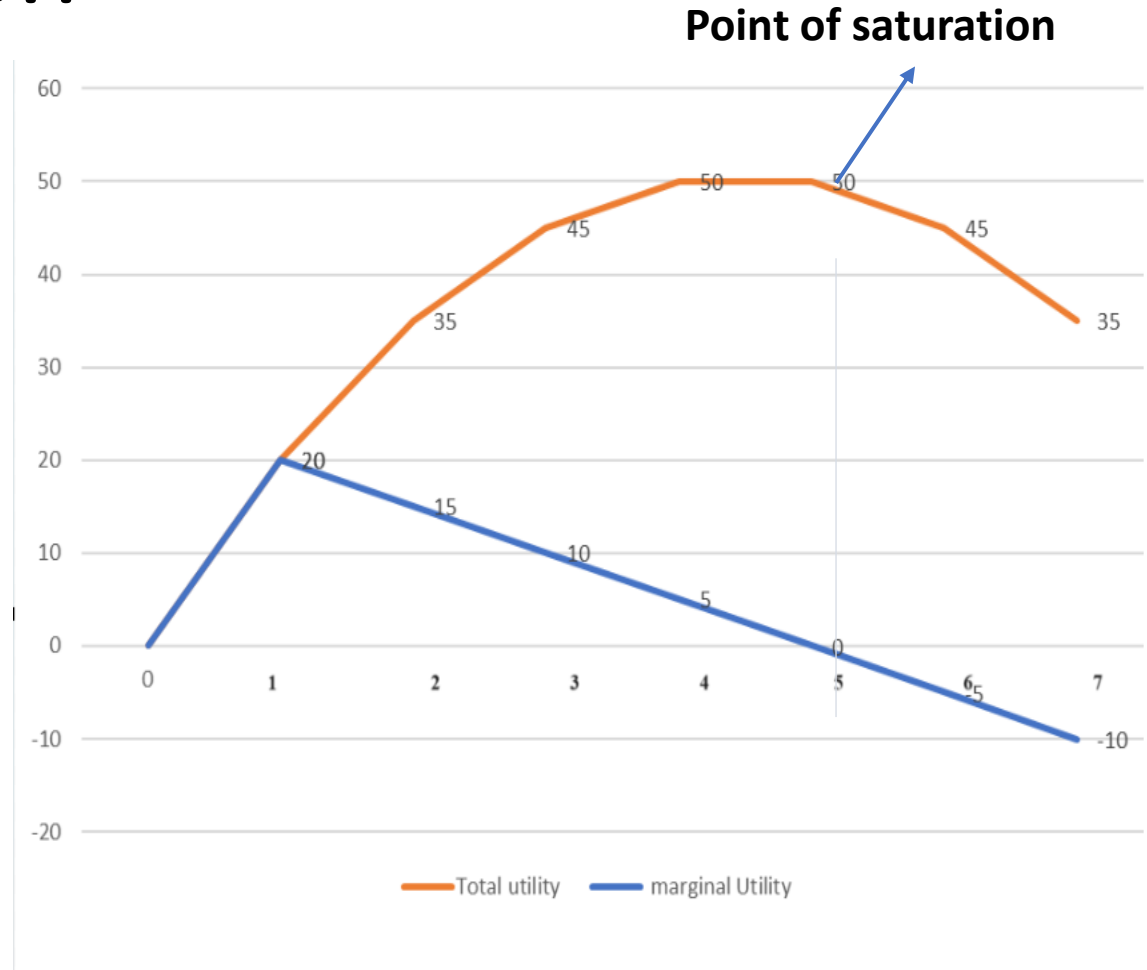
Assumptions

- Utility is based on cardinal concept – utility can be measured and additive in nature.
- Utility is measurable in terms of money.
- The marginal utility of money is assumed to be constant.
- Consumers are rational.
- Consumers have full knowledge of the choices of commodities available [price, quantity of product etc.].
- Since consumers are rational, their choice will be certain.
- There are no perfect substitutes.

Note: These assumptions are common for LDMU, Consumers surplus, and law of demand.

A numerical illustration

Units of good	Total utility	marginal Utility
0	0	0
1	20	20
2	35	15
3	45	10
4	50	5
5	50	0
6	45	-5
7	35	-10



Relationship between TU and MU....?

The law of diminishing marginal utility

- Herman Heinrich Gossen – formulated the concept: Known as Gossen's first law.

....as consumers consume more of a good, the amount of satisfaction gained by each additional unit of that good declines.

Limitations of the theory

- The law assumes that all the units of commodity has homogeneous character.
- No change in tastes of consumers.
- Continuity of consumption.
- Suitable size of units [drinking water in glass or spoon?].
- Constant prices (of substitutes).
- Indivisible goods (utility of durables - house).
- Rational consumers are considered (counter example: addictive consumption behaviour).
- Ordinary goods [contesting evidence: diamond, rare items like old coins].
- Marginal utility of money is constant [MU of money – rich may spend more on luxuries whereas poor may spend more on non-luxuries].

Application

- Product innovation.
- It explains the value theory of money – water diamond paradox – increase in supply may reduce price due to decline in utility.

What we know?



I AM HUNGRY. I WANT
FOOD. THIS APPLE CAN
SATISFY MY WANT

APPLE HAS THE POWER TO
SATISFY A WANT. APPLE HAS
UTILITY

→ Derivation of TU and MU

→ **Gossen's first law**

→ **Limitation of the theory?**

The proportionality rule

- It is regarded as the Gossen's second law.
- Also known as "the law of equi-marginal utility"
- "If a person has a thing which he can put to several uses, he will distribute it among these uses in such a way that it has the same marginal utility in all." - Alfred Marshall

An illustration



**How much
for each
good/service?**



Continue...

- Since consumers have unlimited wants with limited income (resources), they will allocate their income on various purchases such a way that maximise the utility.
- To allocate the income on different purchases the consumers compare marginal utility of each purchase.
- If MU from commodity A is higher than the MU from commodity B, the consumer will prefer commodity A.
- Effectively, consumers will compare the MU of each good in proportion to its price.
- If a given amount of income spend on a good gives less marginal utility, the consumer will withdraw from it and will substitute another good which MU is in proportion to its price → **Proportionality rule.**

Continue... Second and third law

- Algebraically,

$$MU_A/P_A = MU_B/P_B = MU_m$$

MU= Marginal Utility

MU_m= Marginal Utility of money

P = Price

A and B are two commodities

The above equation can be restated as follow:

$$MU_A/MU_B = P_A/P_B = MU_m$$

Third law→

$$P_A Q_A + P_B Q_B = I$$

Numerical illustration

Price of Pizza= \$20, Price of Pepsi = \$10, Income/budget = \$ 100

No. of units	TU (Pizza)	MU (Pizza)	MU(Pizza)/P(Pizza)	TU (Pepsi)	MU (Pepsi)	MU(Pepsi)/P(Pepsi)
1	200			110		
2	500	300	15	260	150	15
3	700	200	10	390	130	13
4	800	100	5	490	100	10
5	870	70	3.5	570	80	8
6	920	50	2.5	630	60	6
7	950	30	1.5	670	40	4

- Gossen's third law → the consumer should spend entire income on the purchase of the commodities.

Summary

- The consumer equalises the marginal utility of each good weighted by its price.
- Consumer equalises the ratio of MU with the ratio of the prices for all commodities.
- MU of all commodities are equalised when all consumers income is spend on consumption.

Limitations

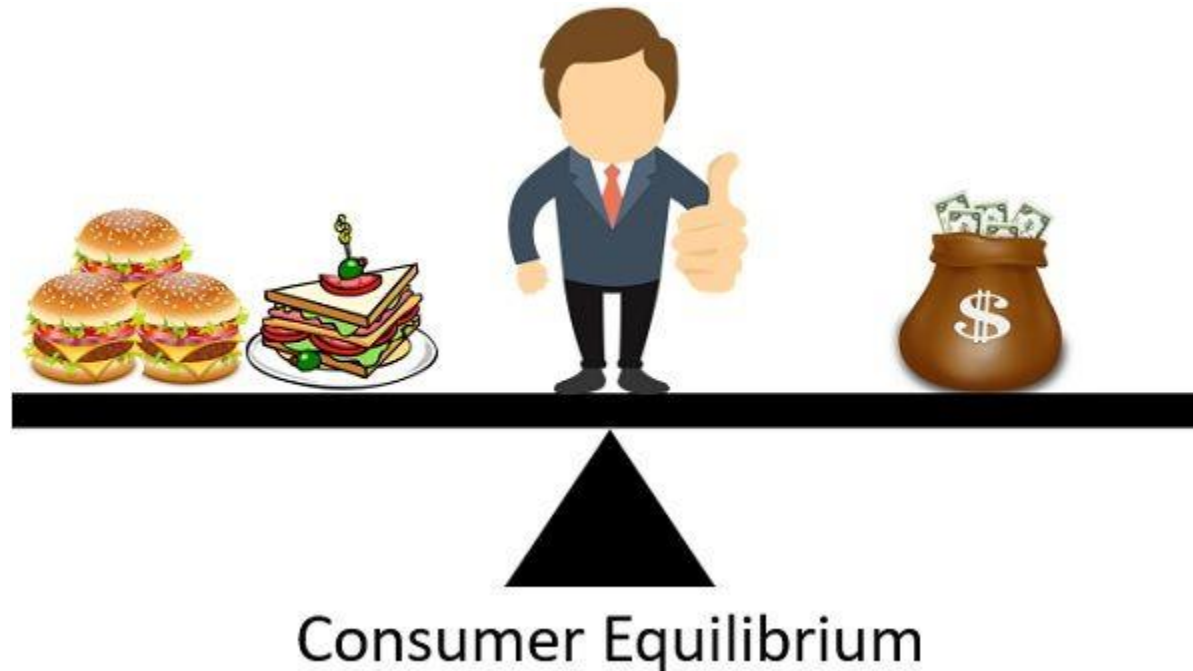
- Imperfect knowledge.
- Goods are indivisible.
- Consumer choices may be uncertain, and even risky.
- Consumers are not perfectly rational (role of advertisements).
- Utility is not measurable.

Utility analysis- Ordinal Approach

[indifference curve analysis]

What we know

- Utility can be measured in numbers –
- $MU \text{ of money} = MU \text{ from consumption}$



Background – ordinal utility approach

- The theory was first introduced by F.Y. Edgeworth and then modified by Vilfredo Pareto.
- The theory was refined J.R Hicks and Allen.
- The theory assumes that **utility can not be measured** in absolute terms, but **can be ranked or ordered**. Therefore, it is called **ordinal utility approach**.
- The theory explain how a consumer behave based on their preferences for different combinations of good and services. An indifference curve is drawn from the indifference schedule of the consumer which shows different combinations of commodities.

Assumptions

1. Rationality:

- The consumer is assumed to be rational he aims at the maximization of his utility given income and market prices.

2. There are two goods [Good A and Good B].

3. The consumers have perfect knowledge about the prices of the goods.

Continue...

4. The prices of the goods are given.

5. The consumer's tastes, habits and income remains same throughout the analysis.

6. Consumers may prefer more of Good A over Good B OR more of Good B over Good A.

7. An **indifference curve** is negatively inclined sloping downward.

Continue...

8. An indifference curve is convex to the origin.

9. An indifference curve is smooth and continuous, which means the two goods are highly **divisible** and the level of satisfaction also change in a continuous manner.

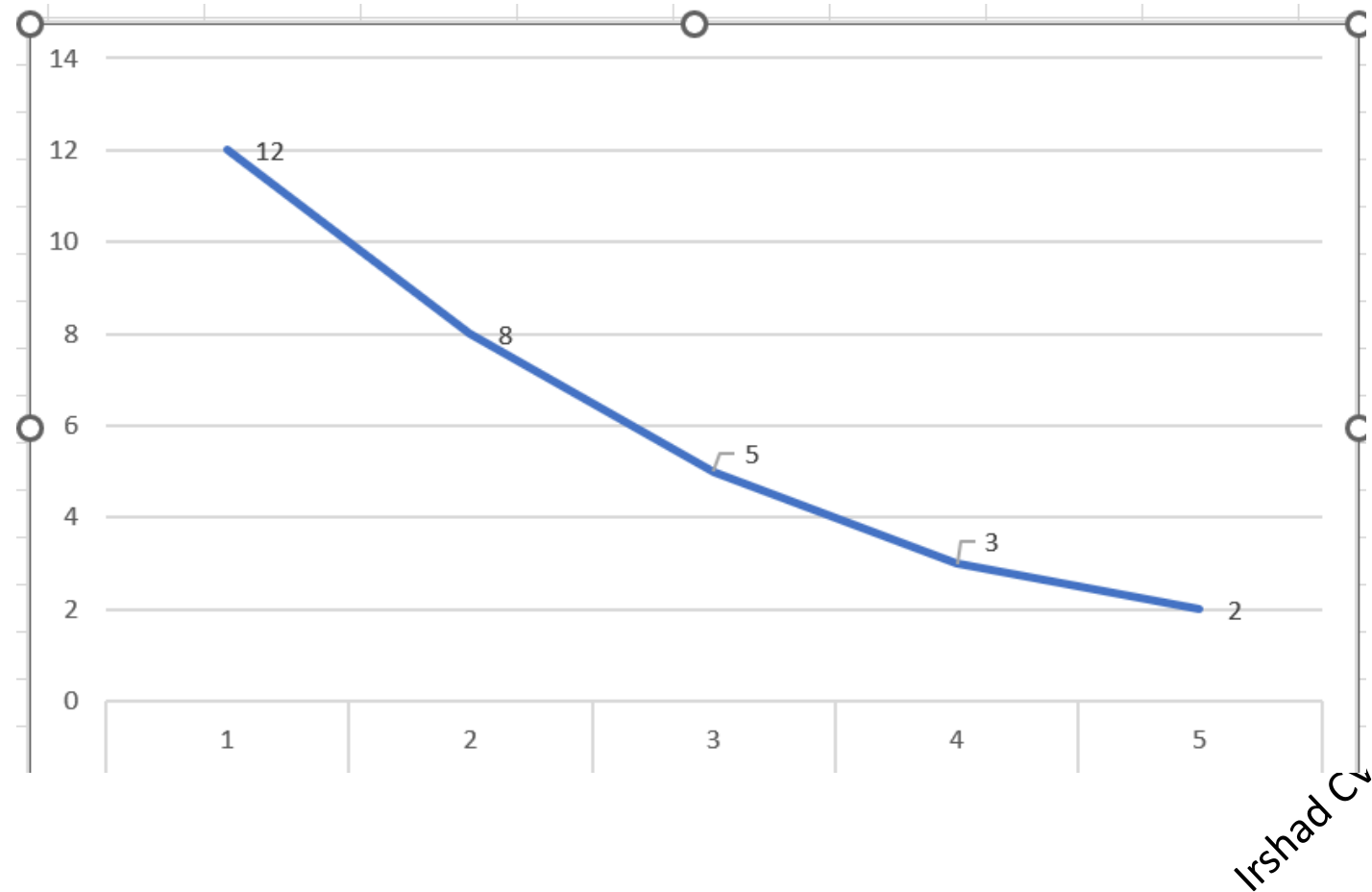
10. The consumers arrange goods and services based on their preference and indifference for the goods.

11. **Transitivity** (consistency of choices): - $A > B, B > C \rightarrow A > C$

12. **The consumer is in a position to order all possible combinations** of two goods.

Indifference schedule and indifference curve

Combination	Good A [x axis]	Good B [y axis]
A	1	12
B	2	8
C	3	5
D	4	3
E	5	2



Indifference curve map

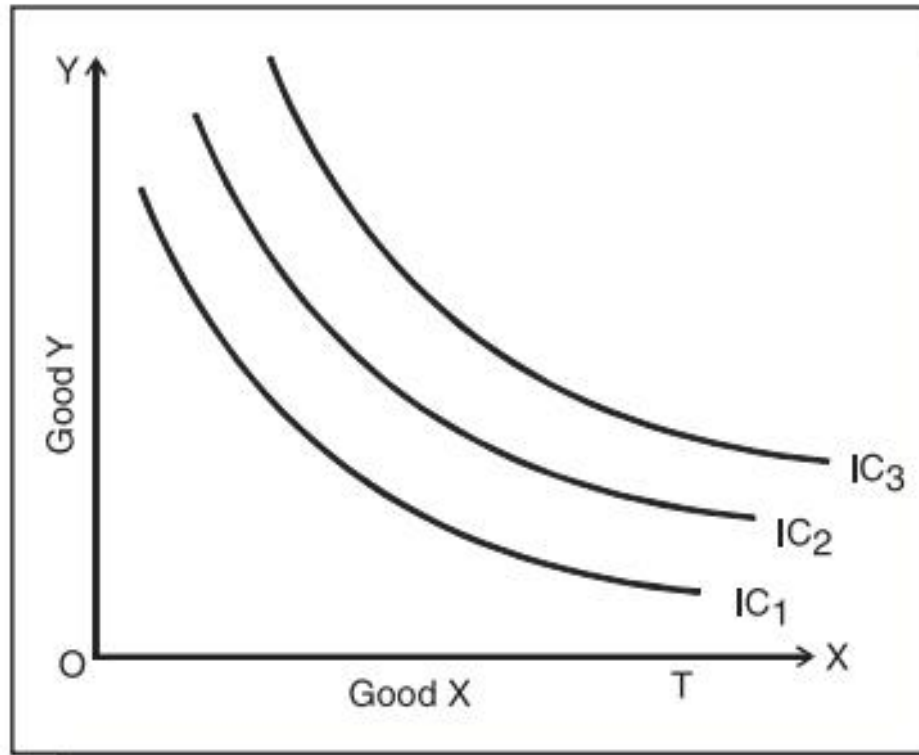


Fig. 2 : Indifference Map

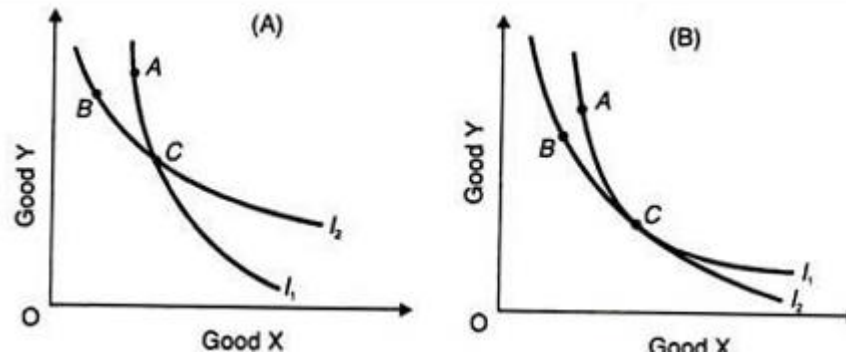
A higher indifference curve gives a higher Level of satisfaction for the consumer.

$$IC_3 > IC_2 > IC_1$$

Properties of indifference curve

- 1- A higher IC represents a higher level of satisfaction.
- 2- There can be many ICs for a consumer.
- 3- Slope of IC is negative, from left to right. As consumer wants to get more of good A, good B should be substituted.
- 4- ICs cannot touch or intersect each other ?

What is the problem?



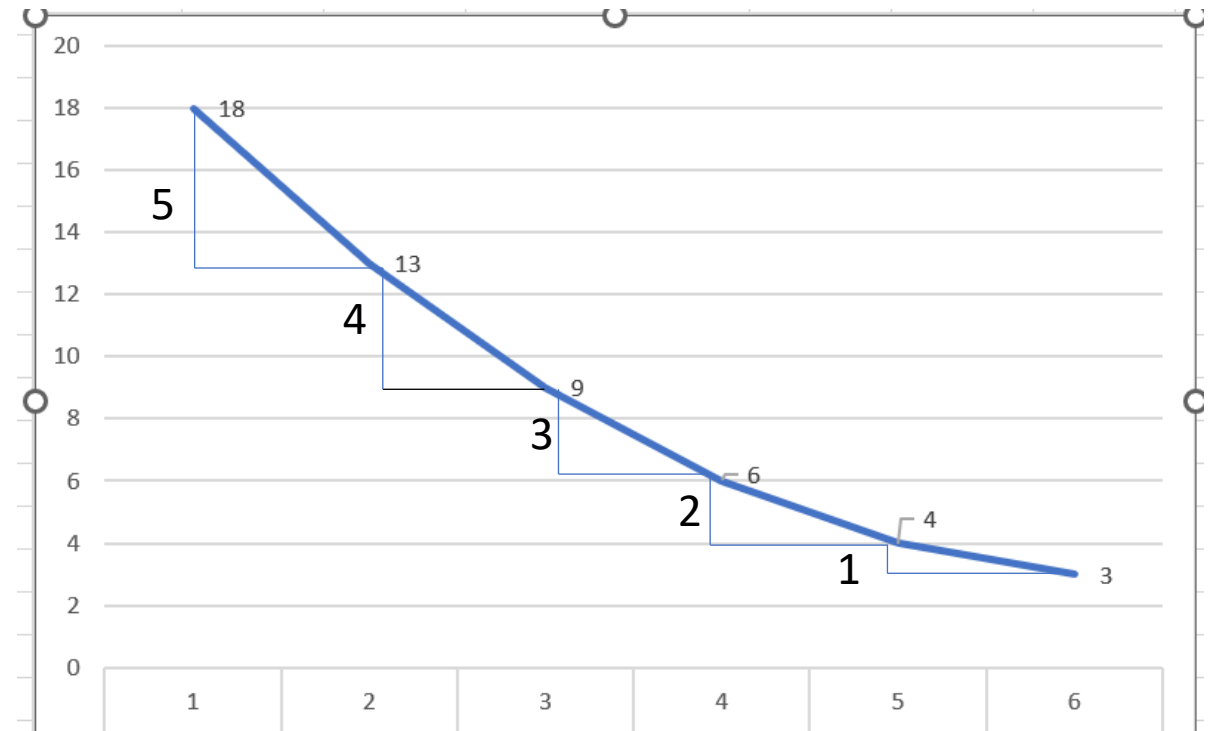
Continue...

5. An indifference curve cannot touch either axis. [it violates the assumption that consumers consume both the commodities].
6. An indifference curve is convex to the origin. It implies that marginal rate of substitution (**MRS**) diminishes. **Meaning?**
7. Indifference curves are not necessarily parallel to each other. [Two indifference curves can have different slopes].

Marginal Rate of Substitution (MRS)

- It shows the exchange between units of two commodities which are equally preferred.

Combina tion	Good A	Good B	MRS _{AB}
A	1	18	-
B	2	13	5:1
C	3	9	4:1
D	4	6	3:1
E	5	4	2:1
F	6	3	1:1



Why diminishing MRS???

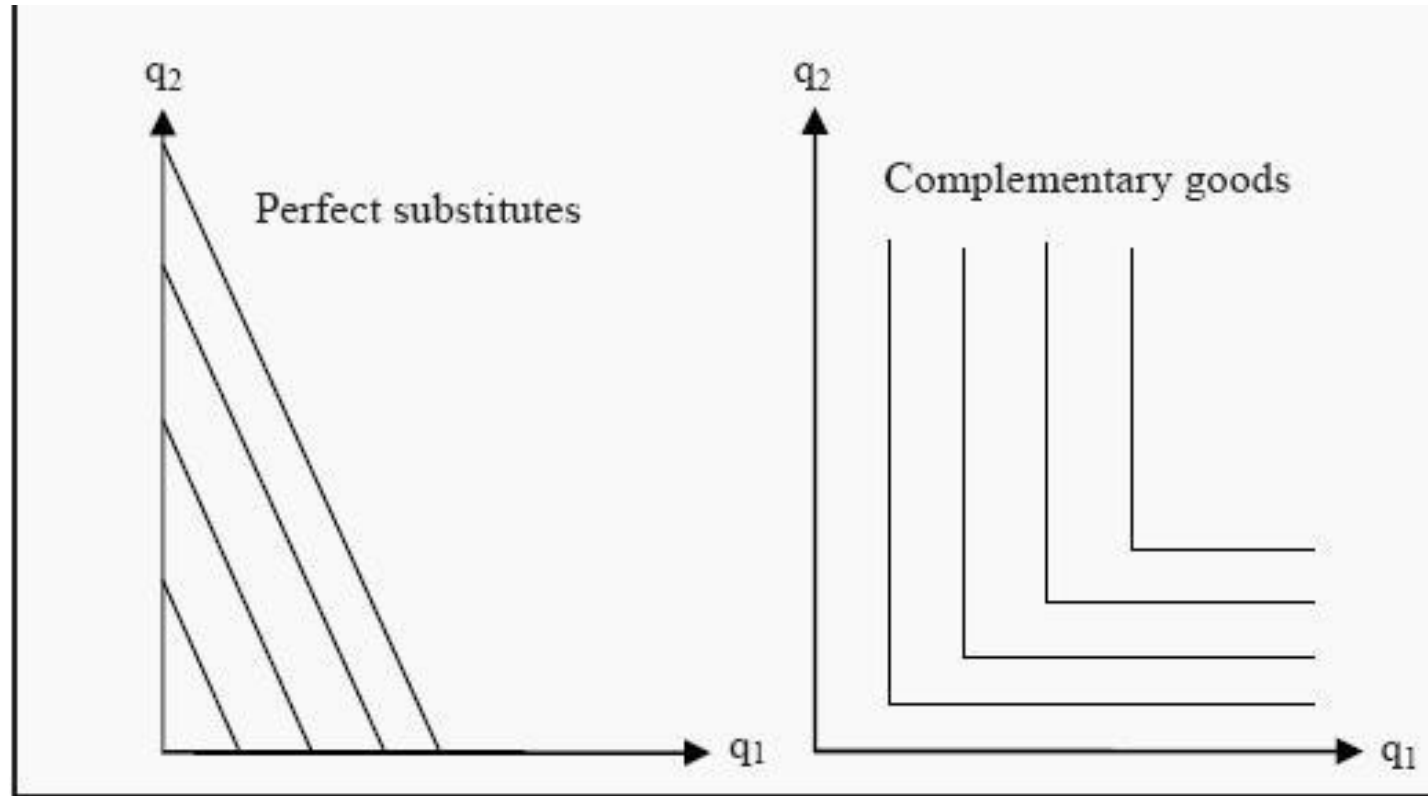
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- Mathematically,
- $MRS_{AB} = dB/dA$

Application:- Why more quantities are offered at lower price when consumer purchase higher quantities ?

IC Approach is superior to cardinal utility approach. IC analysis is free from the psychological measurement of utility – more realistic one.

Exceptions



What will be the value of MRS in these cases?

Price – Income or Budget Line

- What we know?
 - We presented consumer's preferences and its presentation using indifference curve analysis.
- In reality, these **preferences and consumption levels** are determined by consumer's **income** and the **prices** of the commodities.
- A budget line is considered for that matter.
- Meaning:

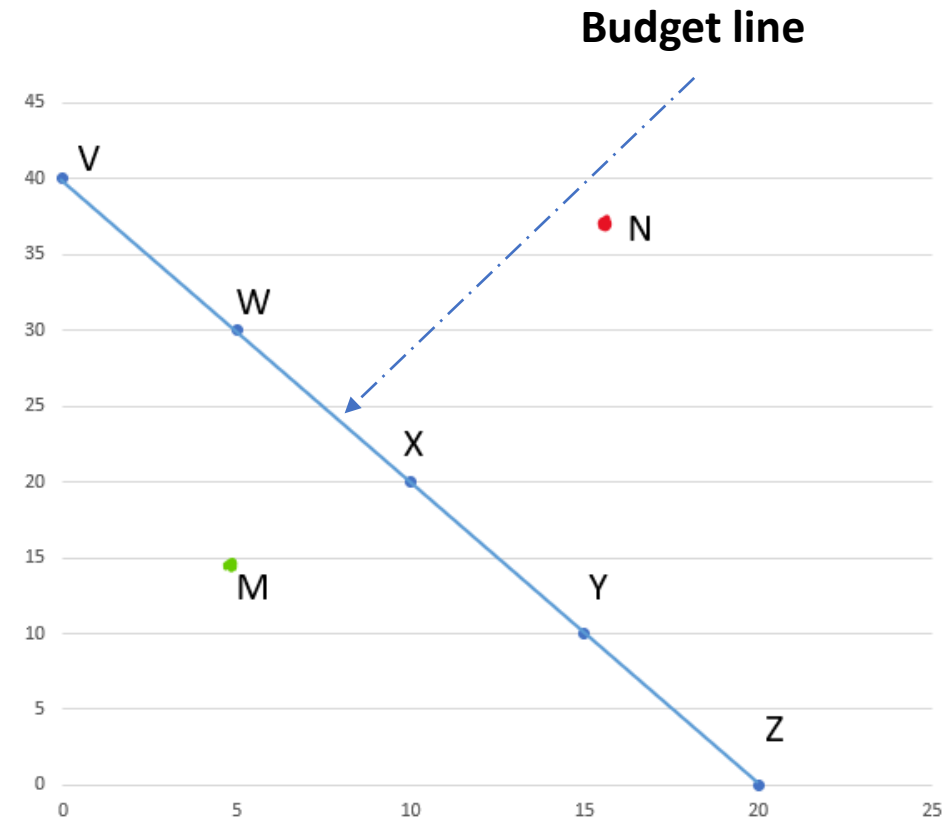
“The budget line shows all the different combinations of two commodities that a consumer can purchase given his or her income and the prices of the two commodities”

Illustration

- Price of X = \$ 2, Price of Y = \$ 1
- Income(I) = \$ 40

Combina tion	Good X [x axis]	Good Y [y axis]
V	0	40
W	5	30
X	10	20
Y	15	10
Z	20	0

I/P_B



I/P_A

Budget line equation

$$M = P_x Q_x + P_y Q_y$$

M=Money income of the consumer;

P_x = Price of good-X;

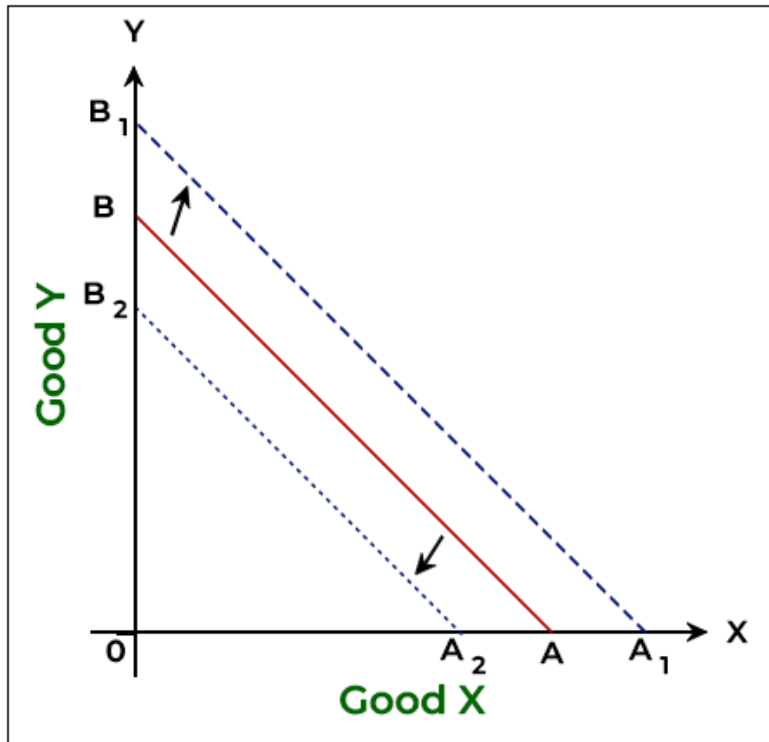
P_y =Price of good-Y

Q_x = Quantity of good -X;

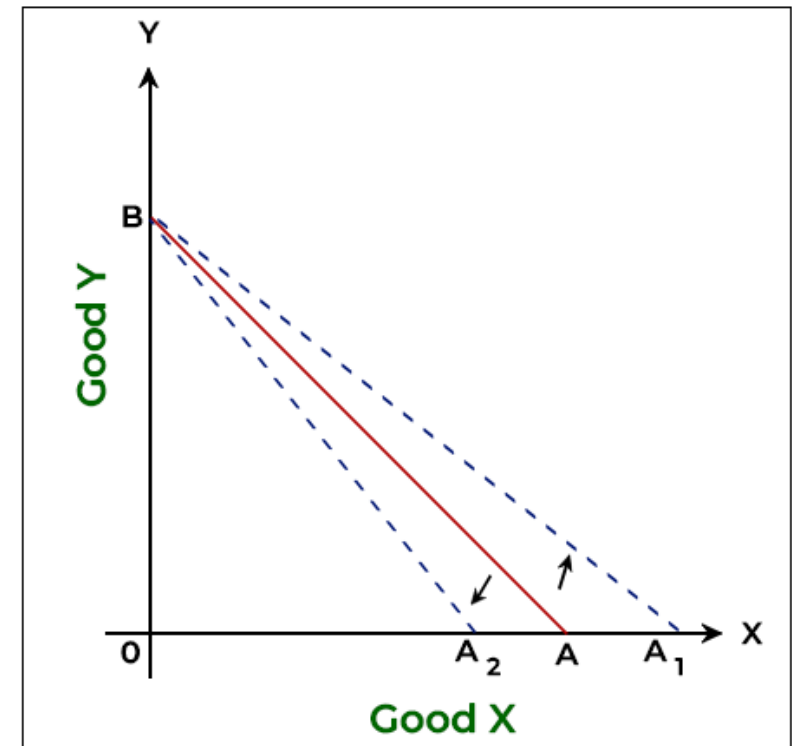
Q_y = Quantity of good-Y

Changes in budget line [shifts in budget line and rotation of budget line]

Shifts in budget line
(Due to change income)



rotation of budget line
(Due to change price)



Consumer's equilibrium

- A consumer can attain his equilibrium when he or she can maximise the utility from the two commodities given the price and income constraints.

“the consumer is in equilibrium when he maximises his utility, given his income and market prices”

- Anna Koutsayiannis

Assumptions

- 1- The consumer's indifference map for the two goods X and Y is based on the taste of preferences for them which does not change at all in this analysis.
- 2- Consumer's money income is given and constant.
- 3- Prices of two goods are given and constant.
- 4- The goods A and B are homogenous and divisible.
- 5- The taste and preferences of the consumer is constant throughout the analysis.
- 6- There is perfect competition in the market.
- 7- The consumer is rational and thus maximises his satisfaction from the purchase of two goods.

Continue...

- The consumer attain equilibrium under the following three conditions:

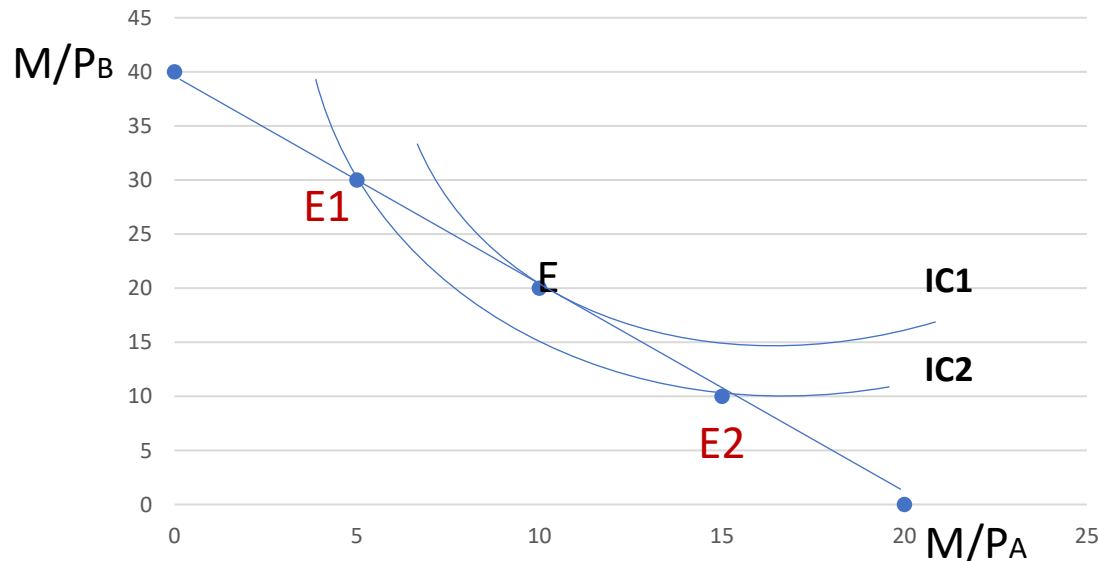
1- The budget line should be tangent to the indifference curve.

at equilibrium, the consumer satisfies the **budget line equation**.

$$M = P_x Q_x + P_y Q_y$$

Based on the previous illustration,

$$\$40 = \$2 * Q_x \text{ AND } \$1 * Q_y$$



At point E ???

What about point E₁ and E₂???

Continue

2- At the equilibrium the slope of the indifference curve and the budget line should be the same.

Slope of budget line?

$$= M/P_Y / M/P_X$$

$$= (M/P_Y) * (P_X/M)$$

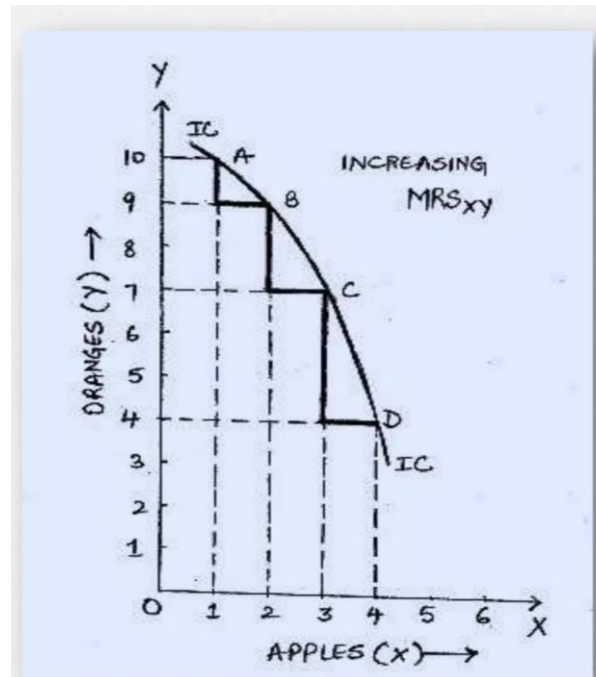
$$= P_X / P_Y \quad [\text{Price ratio}]$$

Slope of IC (MRS_{xy}) = Slope of Budget line

Continue

3- indifference curve should be convex to the origin.

Otherwise, it will violate the law of diminishing marginal rate of substitution.



Demand Analysis

- Market ?
 - Market a group of buyers and sellers of a particular good or service
- Market and competition:
 - competitive market a market in which there are many buyers and many sellers so that each has a negligible impact on the market price
- Types of market.....

Demand

- Meaning: quantity demanded the amount of a good that buyers are **willing** and **able** to purchase
- A case: Imagine you have decided to purchase a laptop. What are the possible factors that can potentially determinant your of demand ?

Determinants of Demand

1- Price (P): There is an inverse relationship between price and demand.

2- Price of other commodities (Pr):

a- Substitutes (two commodities that can satisfy similar wants)

eg: tea and coffee.

When price of tea increases → demand for coffee will increase
[positive relation between price and quantity].

b- complementary (the demand for two commodities that are linked)

eg: car and petrol

When price of car increase → demand for petrol will decrease
[negative relation between price and quantity]

Continue...

3- Income (Y):

In general, income of the consumer and demand for a commodity are positively related [not always].

4- Tastes and preferences (T):

Changes in tastes and preferences will influence demand

new fashion can increase demand for new products.

Continue...

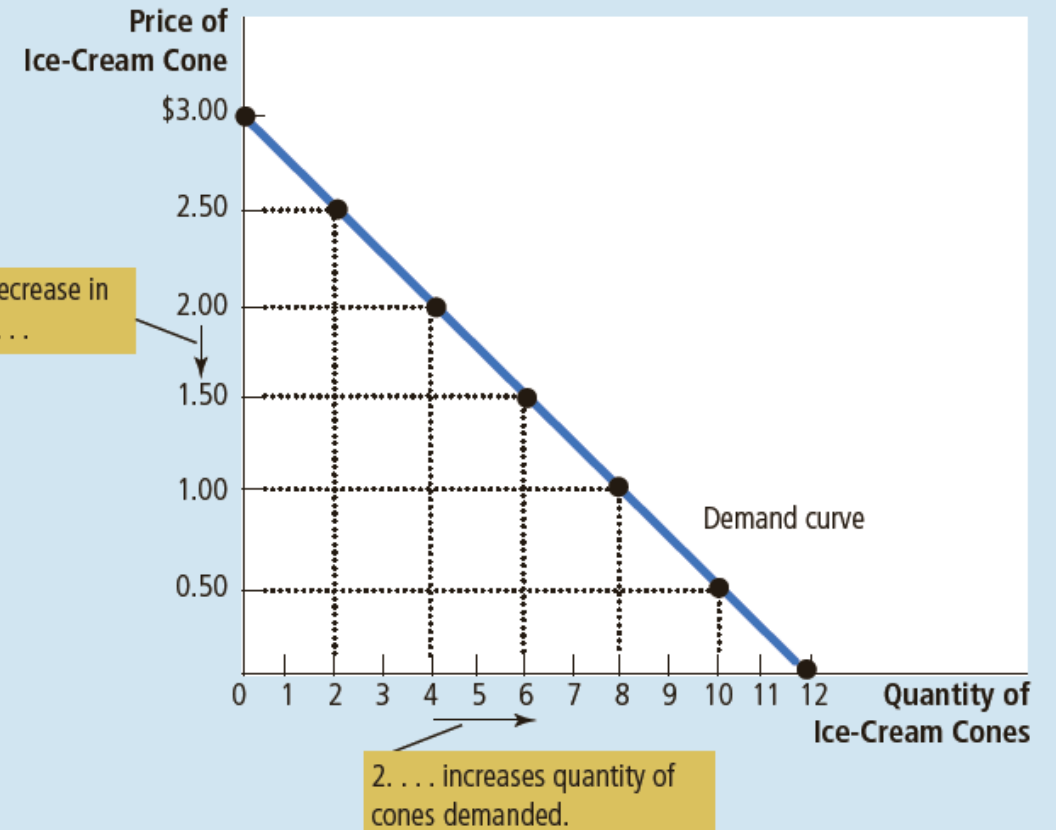
- In Marshallian analysis, we consider the quantity of commodity demanded at given prices with an assumption that other factors remains constant [*ceteris paribus*].

$$D = f (P, P_r, Y, T)$$

- Assuming that all the determinants other than price is constant, we may say that demand is a function of price.
“the demand for an individual commodity is the quantities of commodities demanded at different prices of that commodity keeping other determinants as constant”

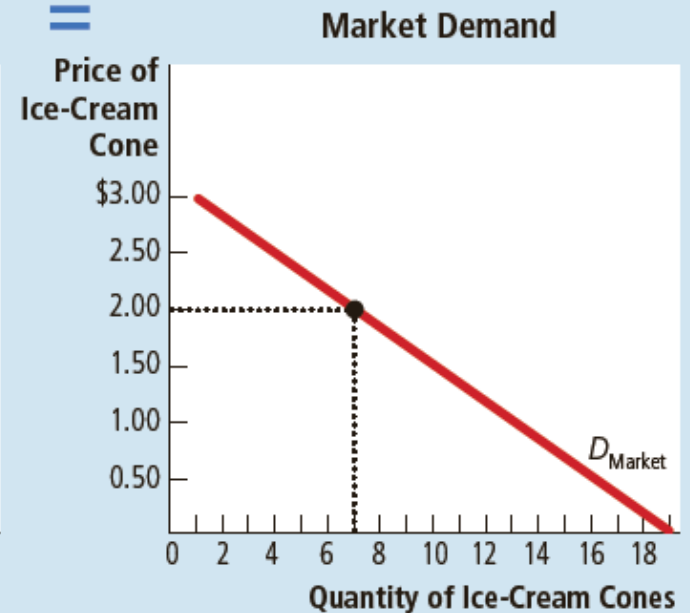
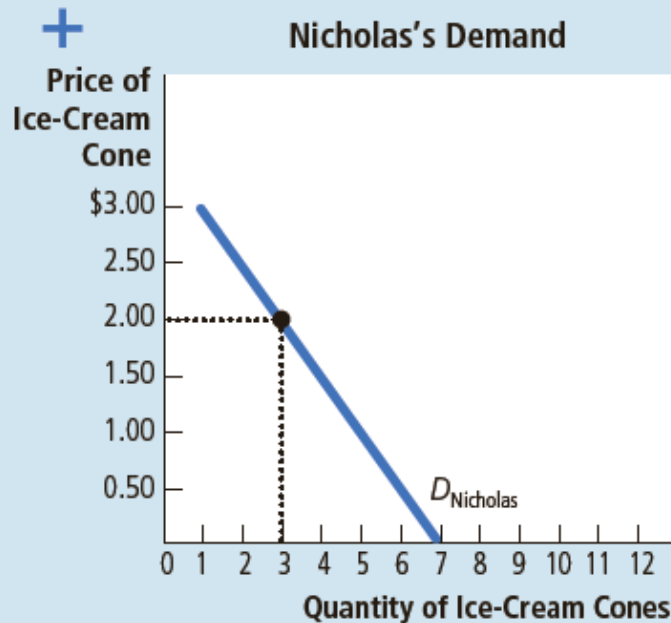
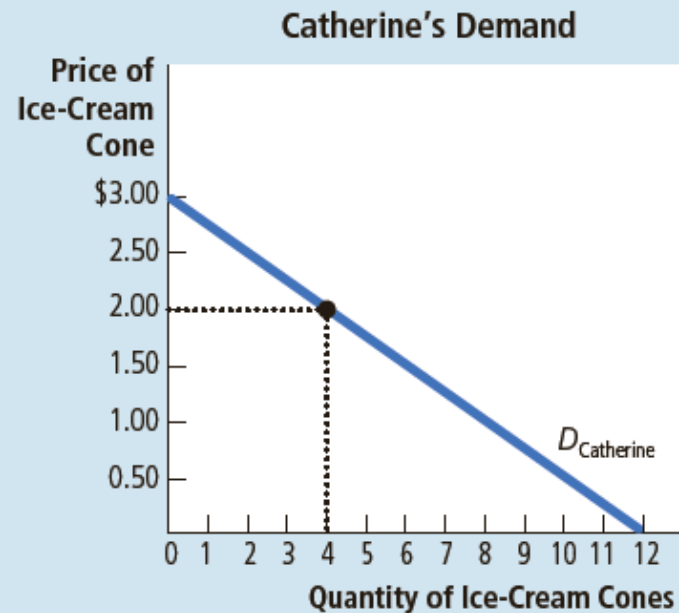
Individual demand schedule and demand curve

Price of Ice-Cream Cone	Quantity of Cones Demanded
\$0.00	12 cones
0.50	10
1.00	8
1.50	6
2.00	4
2.50	2
3.00	0



Market demand schedule and curve

Price of Ice-Cream Cone	Catherine			Nicholas			Market
\$0.00	12	+	7	=			19 cones
0.50	10			6			16
1.00	8			5			13
1.50	6			4			10
2.00	4			3			7
2.50	2			2			4
3.00	0			1			1



Definitions

- **Law of demand:**

“**law of demand** the claim that, other things being equal, the quantity demanded of a good falls when the price of the good rises”

- **Demand schedule:**

“**demand schedule** a table that shows the relationship between the price of a good and the quantity demanded”

- **Demand Curve:**

“**demand curve** a graph of the relationship between the price of a good and the quantity demanded”

Continue...

- **Market demand:**

“The quantity demanded in a market is the sum of the quantities demanded by all the buyers at each price. Thus, the **market demand** curve is found by adding horizontally the individual demand curves”

Demand Analysis: Movement and shifts in demand [changes in demand]

Demand function →

$$D = f(P, P_r, Y, T)$$

There are two types of changes in demand

- 1- Increase or decrease in demand [due to changes in factors other than price]
- 2- Extension or contraction in demand [due to changes in price].

A case:



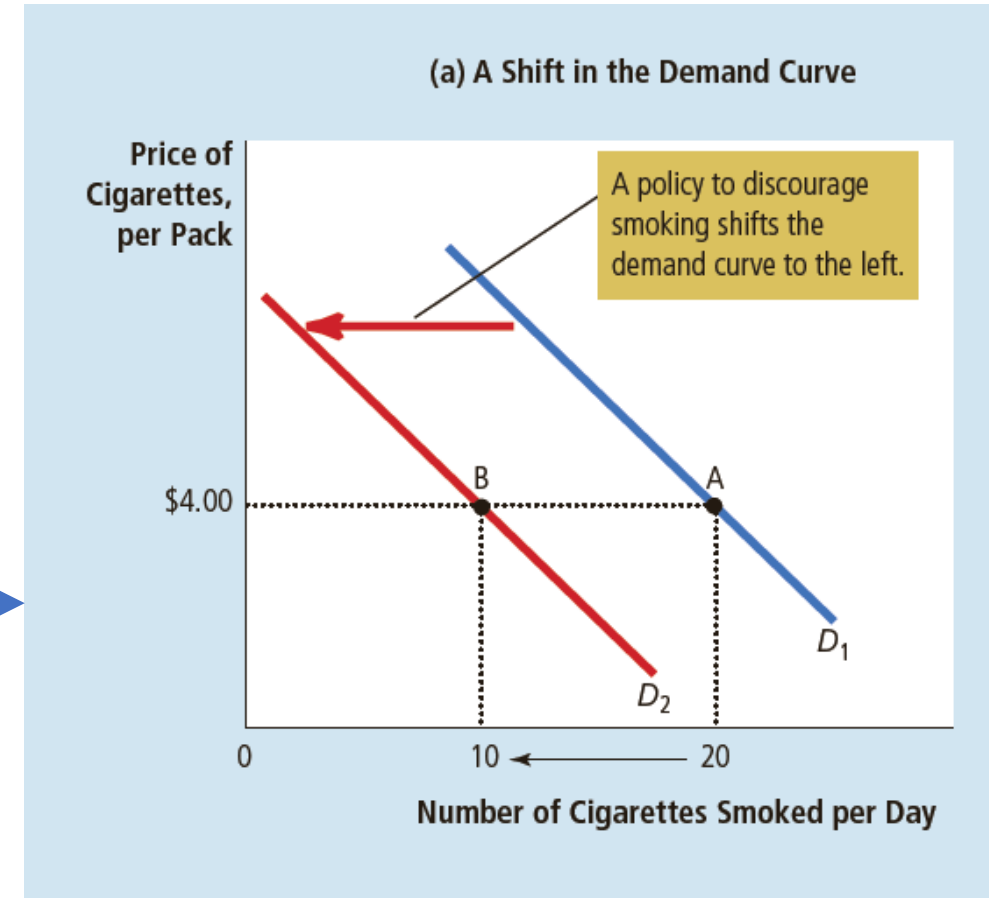
What is the best way to stop this?

Is it possible by

**Increasing price?
other public policy measures?**

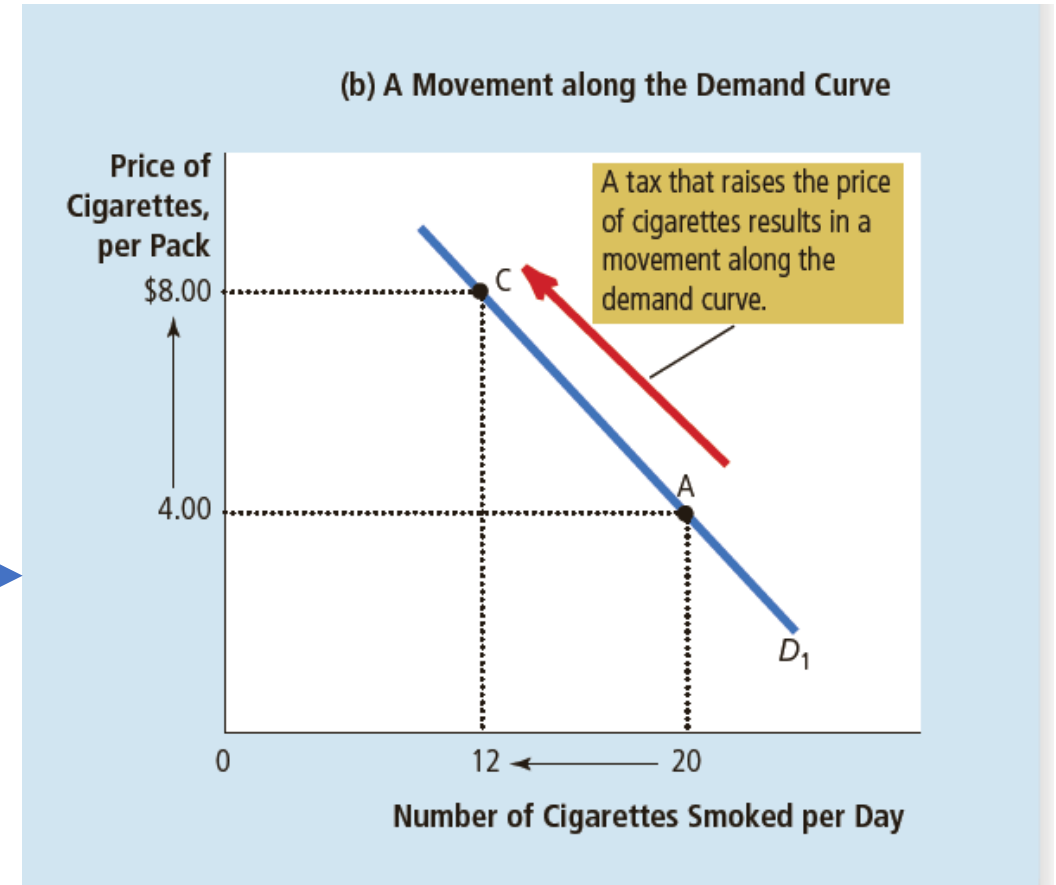
Increase or decrease in demand [shifts in demand]

Policy intervention



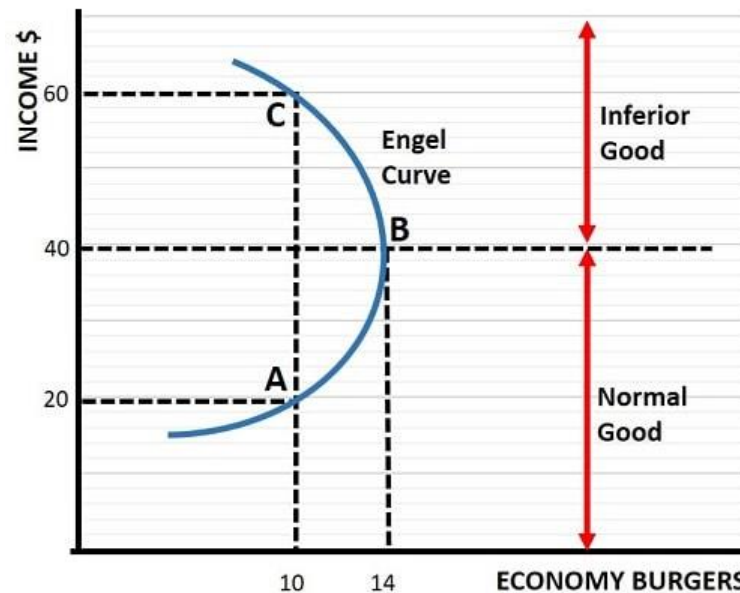
Extension or contraction in demand

High tax on cigarettes → Higher price



Income demand

- Here we consider, $D = f(Y)$
- The income and demand relationship is usually direct. Therefore the slope of income demand curve is positive.



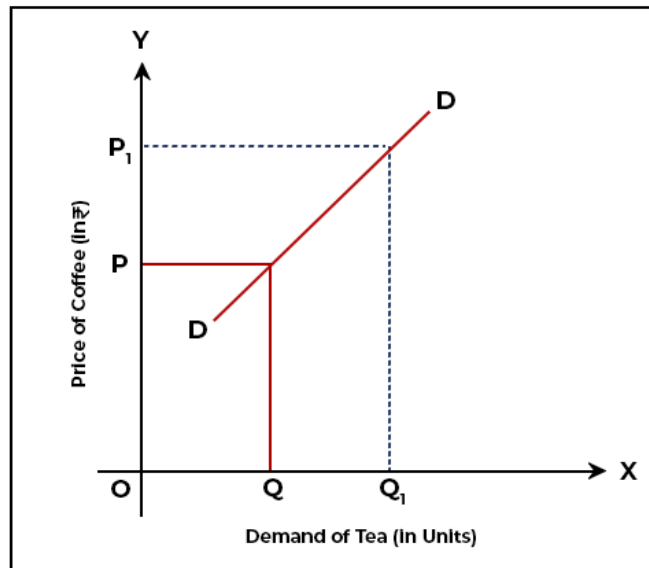
**Eg: Canned food,
intercity bus service**

Cross demand [Demand for related goods]

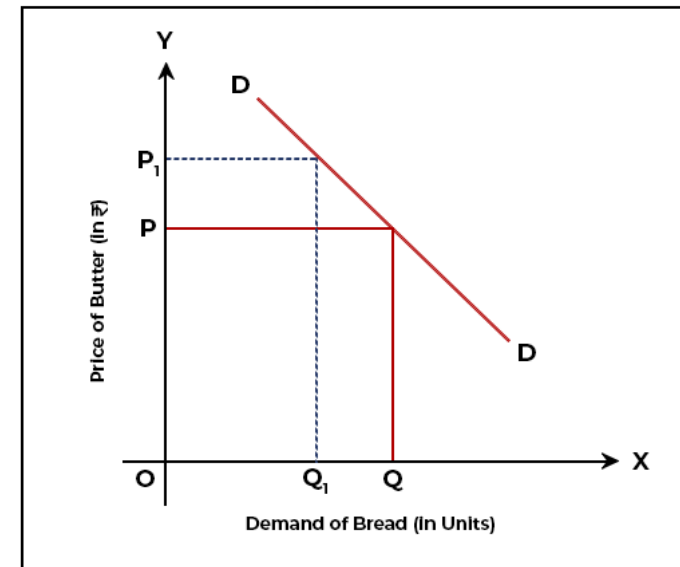
- Two types of related goods.
 - 1- Substitutes
 - 2- Complementary goods.

- Positive

Substitute Goods



Complementary Goods



- Negative

Why demand curve slopes downward

- The law of diminishing marginal utility.
- Price effect [existing + new customers].
- Substitution effect [discussed above].
- Real income effect [purchasing power].
- Effect of social group [middle income and lower middle income groups in the society, sensitive to price changes].
- Alternative uses for a commodity.

Exceptions to the law of demand

- War [practice of hoarding, accumulation of stocks of necessities].
- Depression [both demand and price will be lower].
- Giffen paradox [consumed out of necessity].
 - Classical example: During a famine in Ireland, people consumed inferior goods [in calorie intake] despite higher prices. Compared to other commodities these inferior commodities were preferred due to the shortage of income.
- Demonstration effect: Conspicuous consumption [Eg: Luxury cars, expensive jewellery, branded products].
- Ignorance effect: eg: Ayurvedic products – deceptive packing, label etc.
- Speculation: consumers behaves irrationally [violation of basic assumption of demand theory].

Demand Forecasting

Accurate demand forecasting is essential for a **firm** to enable it to **produce** the - required quantities at the right time and to arrange well in advance for the various **factors of production**. Forecasting helps the firm to assess the probable demand for its products and plan its production accordingly.

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Asus aims to top the Indian laptop market by 2024 with high-end gaming laptops

[Gaming](#)

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Continue...

- Demand forecasting is a technique of estimating the probable demand of a commodity in the future using important available information (**data**).
- In a competitive market [with few/many sellers] demand forecasting is crucial to make better decision.
- Demand forecasting can be based on short run or long run.

Why demand forecasting is important

- To take accurate decision on important regular activities of a firm including production, sales, HR recruitment, capital accumulation.
- A good forecasting is appropriate for a smooth functioning of a business entity.
- It helps to prepare appropriate budget.
- Evaluation of the functioning of a firm [e.g. Growth of a firm].
- CASES:
 - Launching of a product.
 - Upgradation of a service or a good.

Demand forecasting and errors

- Forecasting errors = Difference between forecasted demand and actual demand.
- There are different models which decision makers can prefer to perform based on suitability.
- Regression analysis is considered as a powerful Econometric tool in model building.
- Steps:
 - What we want to know/model? – start with a **hypothetical** question [advertisement expenditure and demand]
 - Data? [data types]
 - Estimation - forecasting - available software
 - Accuracy of the model
 - Testing the hypothetical statement

Law of Supply

- Meaning: The **quantities** of a commodity or service which a seller is **willing** and **able** to offer at different prices during a given period of time.
- The law of supply:
“At a higher price, the producer will be ready to supply more quantity of a commodity”

Factors affecting law of supply

1- Price of the commodity:

There is a positive relationship between price and quantity of supply.

2- Prices of other commodities:

In case of substitutes?

3- Prices of factors of production:

Price of factors of production (wage, profit, rent and interest) can determine the cost of production – also affect price of the commodity.

Continue...

4- Goals of producers [expectations]

Sales maximisation Vs profit maximisation

Eg: iphone Vs android

5- State of technology

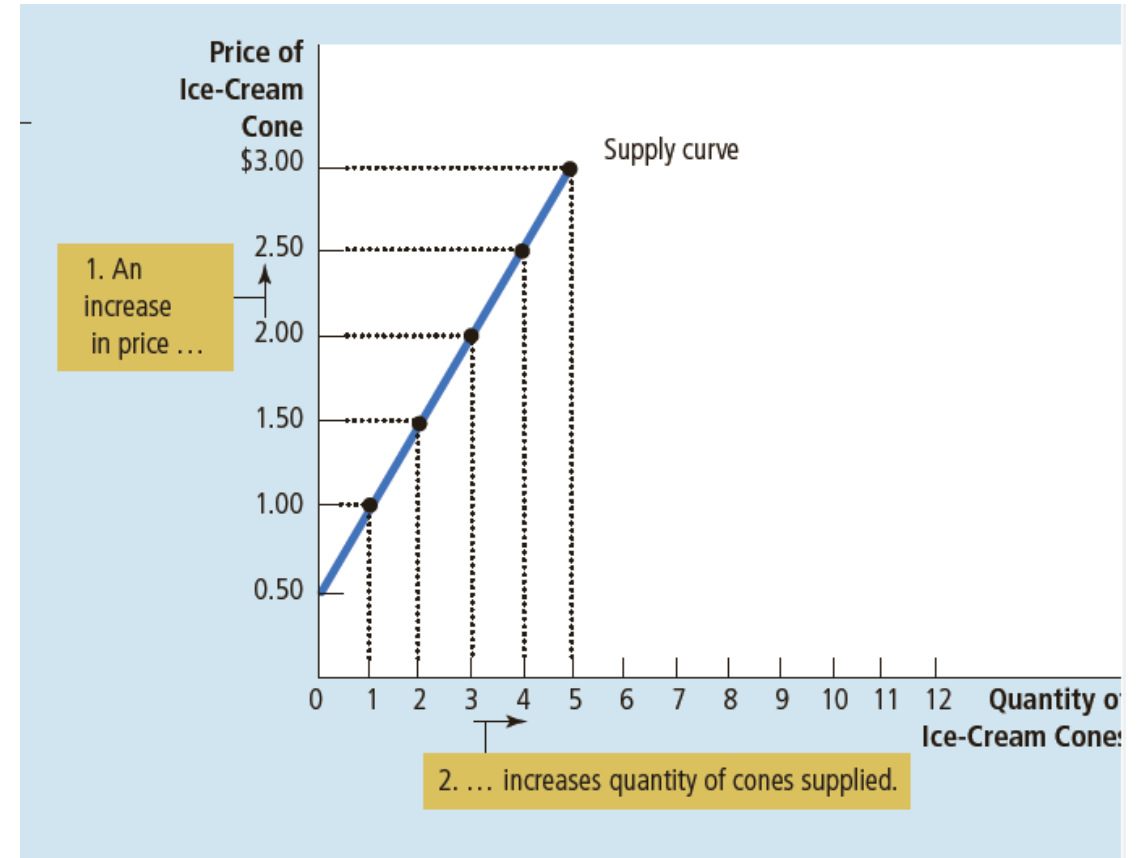
Improved technology can increase supply.

6- Number of sellers

Higher number of sellers → increase the supply.

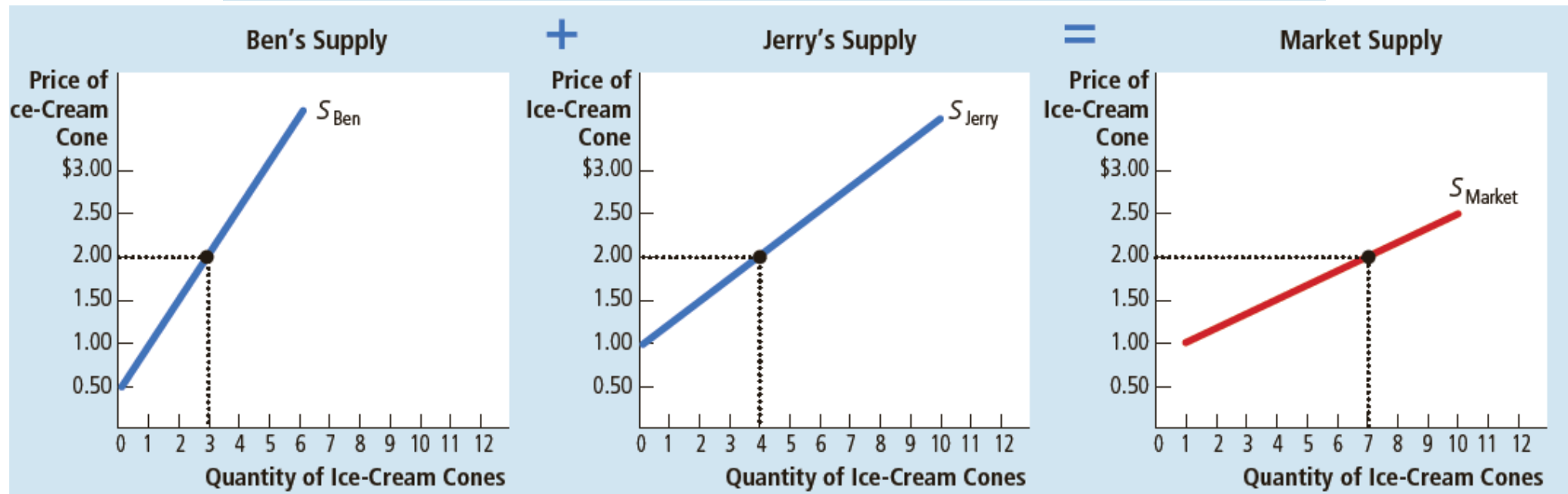
Supply schedule and supply curve

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\$0.00	0 cones
0.50	0
1.00	1
1.50	2
2.00	3
2.50	4
3.00	5

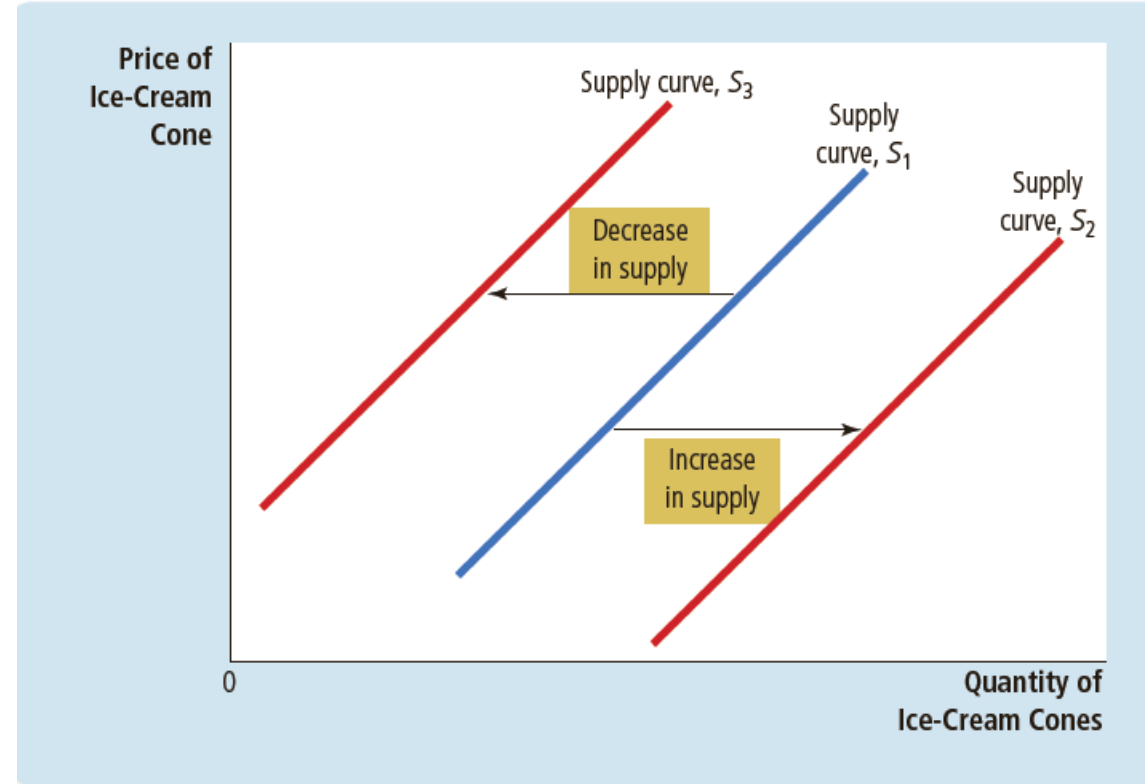
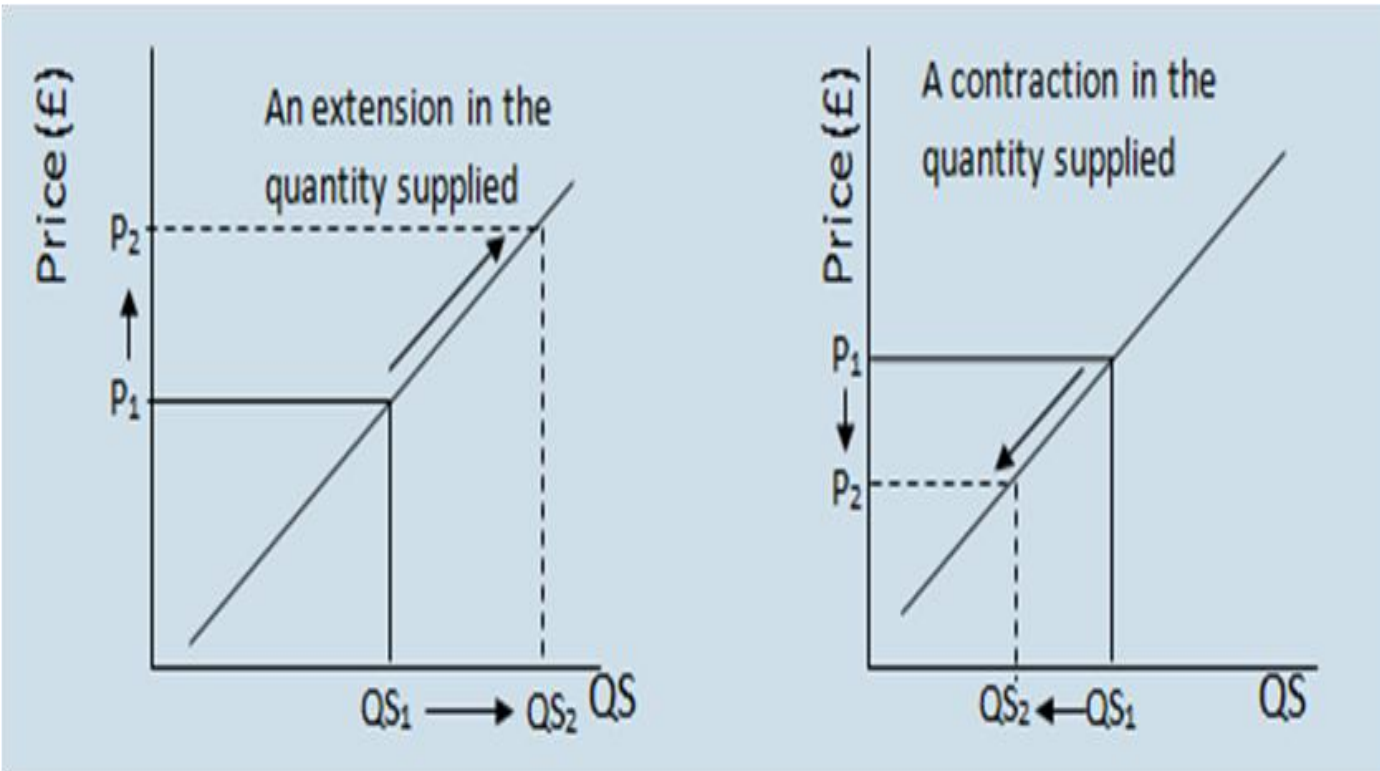


Market supply [supply schedule and supply curve]

Price of Ice-Cream Cone	Ben		Jerry		Market
\$0.00	0	+	0	=	0 cones
0.50	0		0		0
1.00	1		0		1
1.50	2		2		4
2.00	3		4		7
2.50	4		6		10
3.00	5		8		13



Changes in Supply



Why shifts in supply:

- 1- Input prices.
- 2- Technology.
- 3- Expectations.
- 4- Number of sellers.

Summary:

- **Supply schedule:** a table that shows the relationship between the price of a good and the quantity supplied.
- **Supply curve** a graph of the relationship between the price of a good and the quantity supplied.
- The quantity supplied in a market is the sum of the quantities supplied by all the sellers at each price. Thus, the **market supply** curve is found by adding horizontally the individual supply curves

Summary – changes in supply

TABLE 2

Variables That Influence Sellers

This table lists the variables that affect how much of any good producers choose to sell. Notice the special role that the price of the good plays: A change in the good's price represents a movement along the supply curve, whereas a change in one of the other variables shifts the supply curve.

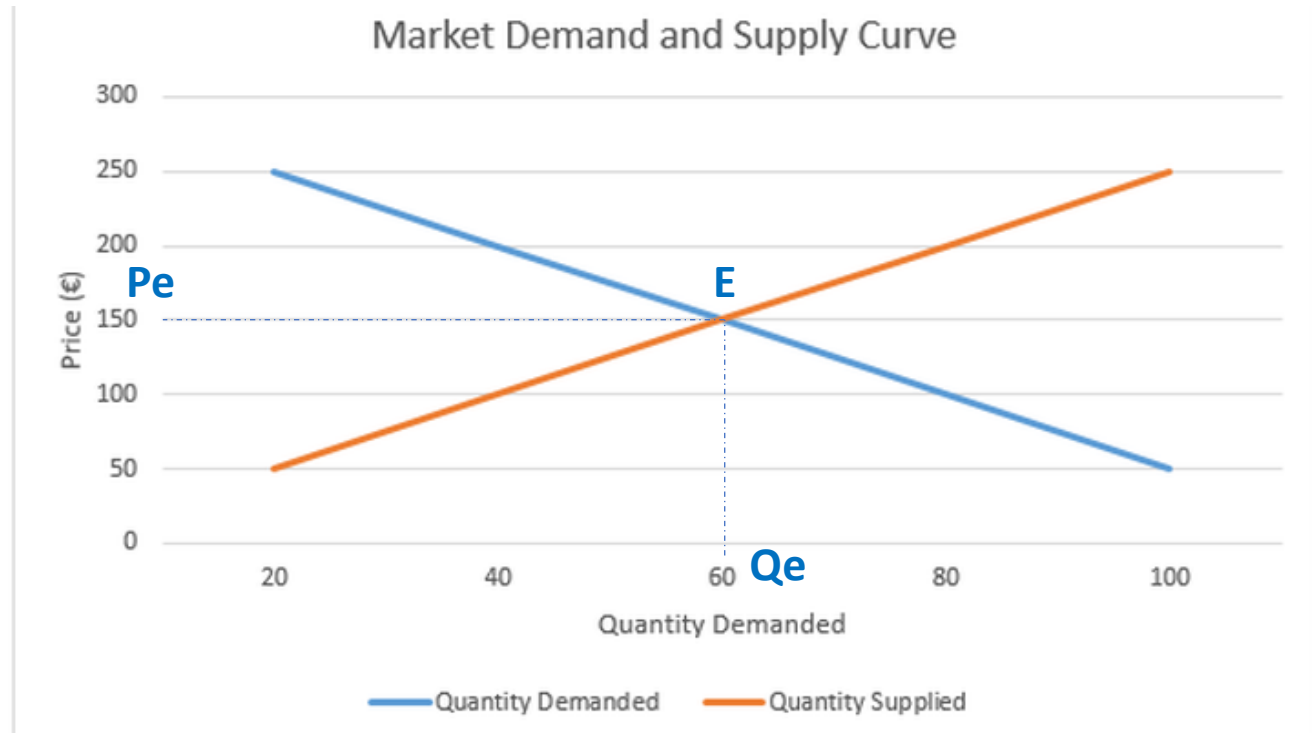
Variable	A Change in This Variable . . .
Price of the good itself	Represents a movement along the supply curve
Input prices	Shifts the supply curve
Technology	Shifts the supply curve
Expectations	Shifts the supply curve
Number of sellers	Shifts the supply curve

Market equilibrium

- **Equilibrium** a situation in which the market price has reached the level at which quantity supplied equals quantity demanded.
- At equilibrium market is efficient, whereas at disequilibrium, market will be inefficient (**market failure**, which is a case of excess supply or excess demand).
- **Excess Supply** a situation in which quantity supplied is greater than quantity demanded.
- **Excess demand is** a situation in which quantity demanded is greater than quantity supplied

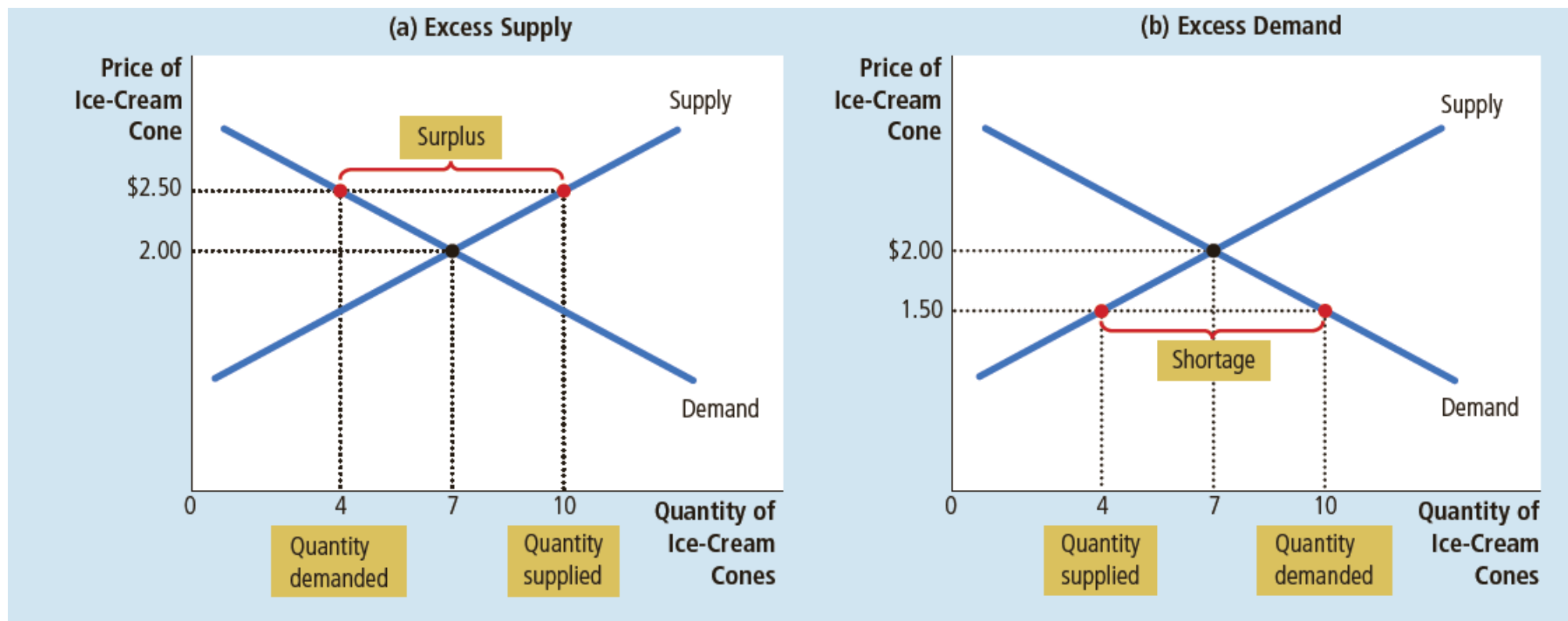
An illustration

Price	Quantity demanded	Quantity supplied
50	20	100
100	40	80
150	60	60
200	80	40
250	100	20



Market is in equilibrium at E, market price is determined at P_e , and market equilibrium quantity is determined at Q_e

The cases of market inefficiency [disequilibrium]



Further analysis [not required as per syllabus]
Changes in demand or supply
Changes in demand and supply

[class based numerical examples are not presented here, if any]

The End