# ECO401 – INTRODUCTION TO ECONOMICS

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Lesson 1

# INTRODUCTION TO ECONOMICS

(Economics is a science of wealth) by adam smith

## WHAT IS ECONOMICS?

Economics is not a natural science, i.e. it is not concerned with studying the physical world like chemistry, biology. Social sciences are connected with the study of people in society. It is not possible to conduct laboratory experiments, nor is it possible to fully unravel the process of human decision-making.

"Economics is the study of how we the people engage ourselves in production, distribution and consumption of goods and services in a society."

The term economics came from the Greek for oikos (house) and nomos (custom or law), hence "rules of the household.

Another definition is: "The science which studies human behavior as a relationship between ends and scarce means which have alternative uses."

Definition by lionel robbins

## BRANCHES OF ECONOMICS

**Normative economics:** its give only advice how to do..

Normative economics is the branch of economics that incorporates value judgments about what the economy should be like or what particular policy actions should be recommended to achieve a desirable goal. Normative economics looks at the desirability of certain aspects of the economy. It underlies expressions of support for particular economic policies. Normative economics is known as statements of opinion which cannot be proved or disproved, and suggests what should be done to solve economic problems, i-e unemployment should be reduced. Normative economics discusses "what ought to be".

**Examples:**

**1-**A normative economic theory not only describes how money-supply growth affects inflation, but it also provides instructions that what policy should be followed.

**2-** A normative economic theory not only describes how interest rate affects inflation but it also provides guidance that what policy should be followed.

Normative economics deals with desired economy
Positive economics deals with observed economy

**Positive economics:**

Positive economics, by contrast, is the analysis of facts and behavior in an economy or "the way things are." Positive statements can be proved or disproved, and which concern how an economy works, i-e unemployment is increasing in our economy. Positive economics is sometimes defined as the economics of "what is"

**Examples:**

**1-** A positive economic theory might describe how money-supply growth affects inflation, but it does not provide any instruction on what policy should be followed.

**2-** A positive economic theory might describe how interest rate affects inflation but it does not provide any guidance on whether what policy should be followed.

**We** the people: includes firms, households and the government.

**Goods** are the things which are produced to be sold.

**Services** involve doing something for the customers but not producing goods.

## FACTORS OF PRODUCTION

Resources are also called input or factors of production

Factors of production are inputs into the production process. They are the resources needed to produce goods and services. The factors of production are:

- **Land** includes the land used for agriculture or industrial purposes as well as natural resources taken from above or below the soil.
- **Capital** consists of durable producer goods (machines, plants etc.) that are in turn used for production of other goods.
- **Labor** consists of the manpower used in the process of production.
- **Entrepreneurship** includes the managerial abilities that a person brings to the organization. Entrepreneurs can be owners or managers of firms.

**Scarcity** does not mean that a good is rare; scarcity exists because economic resources are unable to supply all the goods demanded. It is a pervasive condition of human existence that exists because society has unlimited wants and needs, but limited resources used for their satisfaction. In other words, while we all want a bunch of stuff, we can't have everything that we want.

**Rationing** is a process by which we limit the supply or amount of some economic factor which is scarcely available. It is the distribution or allocation of a limited commodity, usually accomplished based on a standard or criterion. The two primary methods of rationing are markets and governments. Rationing is needed due to the scarcity problem. Because wants and needs are unlimited, but resources are limited, available commodities must be rationed out to competing uses.

## ECONOMIC SYSTEMS

There are different types of economic systems prevailing in the world.

**Dictatorship:**

Dictatorship is a system in which economic decisions are taken by the dictator which may be an individual or a group of selected people.

**Command or planned economy:**

A command or planned economy is a mode of economic organization in which the key economic functions – for whom, what, how to produce are principally determined by government directive. In a planned economy, a planning committee usually government or some group determines the economy's output of goods and services. They decide about the optimal mix of resources in the economy. They also decide how the factor of production needs to be employed to get optimal mix.

**Free market/capitalist economy:**

A free market/capitalist economy is a system in which the questions about what to produce, how to produce and for whom to produce are decided primarily by the demand and supply interactions in the market. In this economy what to produce is thereby determined by the market price of each good and service in relation to the cost of producing each good and service.

In a free economy the only goods and services produced are those whose price in the market is at least equal to the producer's cost of producing output. When a price greater than the cost of producing that good or service prevails, producers are induced to increase the production. If the product's price falls below the cost of production, producers reduce supply.

**Islamic economic system:**

This system is based on Islamic values and Islamic rules i-e zakat, ushr, etc. Islam forbids both the taking and giving of interest. Modern economists, too, have slowly begun to realize the futility of interest. The Islamic economic principles if strictly followed would eliminate the possibility of accumulation of wealth in the hands of a few and would ensure the greater circulation of money as well as a wider distribution of wealth. Broadly speaking these principles are (1) Zakat or compulsory alms giving (2) The Islamic law of inheritance which splits the property of an individual into a number of shares given to his relations (3) The forbiddance of interest which checks accumulation of wealth and this strikes at the root of capitalism.

**Pakistan case: A mixed economy**

In Pakistan, there is mixed economic system. Resources are governed by both government and individuals. Some resources are in the hand of government and some are in the hand of public. Optimal mix of resources is decided by the price mechanism i-e by the market forces of demand and supply. Pakistan economy thus consists of the characteristics of both planned economy and free market economy. People are free to make their decisions. They can make their properties. Government controls the Defence.

goods and services sometimes called commodities

## CIRCULAR FLOW OF GOODS & INCOME

There are two sectors in the circular flow of goods & services. One is household sector and the other is the business sector which includes firms. Households demands goods & services, Firms supply goods & services. An exchange takes place in an economy. In monetary economy, firms exchange goods & services for money. Firms' demands factors of production and households supply factors of production. Firms pay the payment in terms of wages, rent, etc. This is circular flow of goods. On the other hand,

household gives money to firms to purchase the goods & services from firms, and firms' gives money to households in return for factors of production.

**DISTINCTION BETWEEN MICRO & MACRO ECONOMICS**

**Micro Economics:**

The branch of economics that studies the parts of the economy, especially such topics as markets, prices, industries, demand, and supply. It can be thought of as the study of the economic trees, as compared to macroeconomics, which is study of the entire economic forest. Microeconomics is a branch of economics that studies how individuals, households, and firms make decisions to allocate limited resources typically in markets where goods or services are being bought and sold. It also examines how these decisions and behaviors affect the supply and demand for goods and services, which determines prices, and how prices, in turn, determine the supply and demand of goods and services.

**Macro Economics:**

The branch of economics that studies the entire economy, especially such topics as aggregate production, unemployment, inflation, and business cycles. It can be thought of as the study of the economic forest, as compared to microeconomics, which is study of the economic trees. Macroeconomics, involves the "sum total of economic activity, dealing with the issues of growth, inflation, and unemployment and with national economic policies relating to these issues" and the effects of government actions (e.g., changing taxation levels) on them.

All material things,which are used by human beings to satisfy their wants called goods.

Those actions of individuals, which can satisfy others wants called services.

Lesson 02

## INTRODUCTION TO ECONOMICS (CONTINUED)

### COST & BENEFIT ANALYSIS

**Rational choice** is the choice based on pure reason and without succumbing to one's emotions or whims. Consumers can decide about the rational decision by using cost and benefit analysis. Rational choice is a general theory of human behavior that assumes individuals try to make the most efficient decisions possible in an environment of scarce resources. By "efficient" it is meant that humans are "utility maximizers" - for any given choice a person seeks the most benefit relative to costs. Consumers can make about the rational decision by using cost and benefit analysis. Consumers want to maximize their level of satisfaction relative to their cost. Rational choice is also the optimal choice.

**Optimum** means producing the best possible results (also optimal).

**Equity in economics** means a situation in which every thing is treated fairly or equally, i.e. according to its due share. So if the lives of all individuals are deemed to have equal value, equity would demand that all of them have equal financial net worth.

**Nepotism** means doing unfair favors for near ones when in power.

**Rational choice** is the choice based on pure reason and without succumbing to one's emotions or whims.

**Barter trade** is a non-monetary system of trade in which "goods" not money is exchanged. This was the system used in the world before the advent of coins and currency.

### HOW CONSUMER DECIDES ABOUT OPTIMAL CHOICE

The consumers decide about the optimal choice by using the cost and benefit analysis which maximizes the benefit relative to the cost.

**Example:**

| | Benefit (Salary) | Cost (Transportation) | Net Benefit = Benefit – Cost |
|---|---|---|---|
| **Job A (Lahore)** | 15,000 | 1,000 | 14,000 |
| **Job B (Gujranwala)** | 20,000 | 7,000 | 13,000 |

Since net benefit of job A is greater so the rational choice is job A which is in Lahore.

### HOW PRODUCERS DECIDE ABOUT OPTIMAL CHOICE

Assume that a firm which is thinking to open a new production line of car manufacturing. Rational decision involves the cost and benefit of that car's production.

**Costs** will be additional labor employed, additional raw material and additional parts & components that have to be bought.

**Benefits** will be additional revenue that the firm will get by selling the additional number of cars.

It will be profitable to invest if revenue is greater than the cost.

### OPPORTUNITY COST

The opportunity cost of a particular choice is the satisfaction that would have been derived from the next best alternative foregone; in other words, it is what must be given up or sacrificed in making a certain choice or decision.

**Example:**

Let's take the decision to buy the book or not, if you will not buy the book then you will be involved in many other activities. In the following table, opportunity Cost of buying the book and not giving charity = 20 SU, which is the benefit derived from giving charity. You will buy the book if the benefit from other alternatives is less than the benefit derived from buying of book.

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| | Cost | Benefit Derived in Satisfaction Unit |
|---|---|---|
| **Book** | 200 | 10 |
| **Clothes** | 200 | 5 |
| **Charity** | 200 | 20 |

**MARGINAL COST AND MARGINAL BENEFIT**

**Marginal cost** is the increment to total costs of producing an additional unit of some good or service. There are other broader definitions as well.

**Marginal benefit** is the increment to total benefit derived from consuming an additional unit of good or service. There are other broader definitions as well.

**PRODUCTION POSSIBILITY FRONTIER (PPF)**

Production possibility frontier (PPF) is the curve which joins all the points showing the maximum amount of goods and services which the country can produce in a given time with limited resources, given a specific state of technology. A production possibilities frontier represents the boundary or frontier of the economy's production capabilities. That's why it's termed a production possibilities frontier (or PPF). As a frontier, it is the maximum production possible given existing (fixed) resources and technology.

**Table: Choice & Opportunity cost revisited: The law of increasing opportunity cost**

| | Rice (Bags) | Cotton (Bushels) | Opportunity Cost of Additional Unit |
|---|---|---|---|
| **A** | 0 | 10 | |
| **B** | 1 | 9 | 1 |
| **C** | 2 | 7 | 2 |
| **D** | 3 | 4 | 3 |
| **E** | 4 | 0 | 4 |

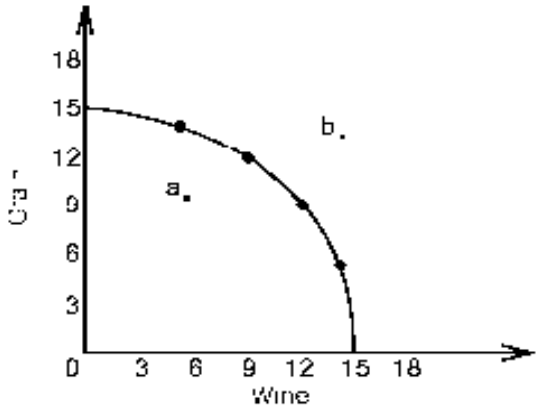
This table represents the alternative combinations of rice and cotton for a hypothetical economy which is producing only 2 goods. At point A only cotton is produced, rice is not produced. In order to produce one unit of rice, we have to give up one unit of cotton (10-9=1). So the opportunity cost is 1 at point B. further in order to produce next unit of rice, we have to give up 2 units of cotton (9-7=2). So the opportunity cost of next additional unit is 2 and so on. This table shows that opportunity cost is increasing with each additional unit. It means we have to give up higher and higher units of cotton in order to produce each additional unit of rice. This is the principle of increasing opportunity cost. If opportunity cost decreases with each additional unit produced, then it is the principle of decreasing opportunity cost. And if opportunity cost remains constant with each extra unit produced, it is the principle of constant opportunity cost.

The law of increasing opportunity cost is what gives the curve its distinctive convex shape. Points on the PPF show the efficient utilization of resources. Points inside the PPF show inefficient use of resources. Points outside the PPF show that some of the resources are unemployed or not utilized. PPF curve shifts upward due to technological advancements. If there is improvement in technology to produce the output, then total output will increase and PPF will shift outward.

**OPPORTUNITY COST & PRODUCTION POSSIBILITIES**

The production possibilities analysis, which is the alternative combinations of two goods that an economy can produce with given resources and technology, can be used to illustrate opportunity cost--the highest valued alternative foregone in the pursuit of an activity. The PPF showed in the video lecture slide shows the principle of increasing opportunity cost.

**PPF AND ITS RELATIONSHIP WITH MACROECONOMICS**




In the graph of PPF, Points within the PPF are inefficient and it is the rare possibility in the real world. Inefficient means that it may not be using its available resources. May be some workers are unemployed creating the macro economic problem of unemployment or may be capital is not using properly. Points outside the PPF are unattainable since the PPF defines the maximum output produced at the given time period so there is no possibility to produce output outside the PPF. Here in PPF, we are not concerned with the combinations of goods which is a micro economic issue rather we are concerned with the overall output produced which is a macroeconomic issue.

**Economic growth** is an increase in the total output of a country over time. It is the long-run expansion of the economy's ability to produce output. When GDP of a country is increasing it means that country is growing economically. Economic growth is made possible by increasing the quantity or quality of the economy's resources (labor, capital, land, and entrepreneurship).

## EXERCISES

**Could production and consumption take place without money? If you think they could, give examples.**

Yes. People could produce things for their own consumption. For example, people could grow vegetables in their garden or allotment; they could do their own painting and decorating. Alternatively people could engage in barter: they could produce things and then swap them for goods that other people had produced.

**Must goods be at least temporarily unattainable to be scarce?**

Goods need not be unattainable to be scarce. Because people's incomes are limited, they can not have everything they want from shops, even though the shops are stocked full. If all items in shops were free, the shelves would soon be emptied!

**If we would all like more money, why does the government not print a lot more? Could it not thereby solve the problem of scarcity 'at a stroke'?**

The problem of scarcity is one of a lack of production. Simply printing more money without producing more goods and services will merely lead to inflation. To the extent that firms cannot meet the extra demand (i.e. the extra consumer expenditure) by extra production, they will respond by putting up their prices. Without extra production, consumers will be unable to buy any more than previously.

**Which of the following are macroeconomic issues, which are microeconomic ones and which could be either depending on the context?**

**a) Inflation.**
**b) Low wages in certain service industries.**
**c) The rate of exchange between the dollar and the rupee.**
**d) Why the price of cabbages fluctuates more than that of cars.**
**e) The rate of economic growth this year compared with last year.**
**f)The decline of traditional manufacturing industries.**

a) Macro. It refers to a general rise in prices across the whole economy.
b) Micro. It refers to specific industries
c) Either. In a world context, it is a micro issue, since it refers to the price of one currency in terms of one other. In a national context it is more of a macro issue, since it refers to the exchange rate at which all Pakistanis goods are traded internationally. (This is certainly a less clear–cut division that in (a) and (b) above.)
d) Micro. It refers to specific products.
e) Macro. It refers to the general growth in output of the economy as a whole.
f) Micro (macro in certain contexts). It is micro because it refers to specific industries. It could, however, also help to explain the macroeconomic phenomena of high unemployment or balance of payments problems.

**Assume that you are looking for a job and are offered two. One is more unpleasant to do, but pays more. How would you make a rational choice between the two jobs?**

You should weigh up whether the extra pay (benefit) from the better paid job is worth the extra hardship (cost) involved in doing it.

**How would the principle of weighing up marginal costs and benefits apply to a worker deciding how much overtime to work in a given week?**

The worker would consider whether the extra pay (the marginal benefit) is worth the extra effort and loss of leisure (the marginal cost).

**Would it ever be desirable to have total equality in an economy?**

The objective of total equality may be regarded as desirable in itself by many people. There are two problems with this objective, however. The first is in defining equality. If there were total equality of incomes then households with dependants would have a lower income per head than households where everyone was working. In other words, equality of incomes would not mean equality in terms of standards of living.

If on the other hand, equality were to be defined in terms of standards of living, then should the different needs of different people be taken into account? Should people with special health or other needs have a higher income? Also, if equality were to be defined in terms of standards of living, many people would regard it as unfair that people should receive different incomes (according to the nature of their household) for doing the same amount of work.

The second major problem concerns incentives. If all jobs were to be paid the same (or people were to be paid according to the composition of their household), irrespective of people's efforts or skills, then what would be the incentive to train or to work harder?

**If there are several other things you could have done, is the opportunity cost the sum of all of them?**

No. It is the sacrifice involved in the next best alternative.

**What is the opportunity cost of spending an evening revising for an economics exam? What would you need to know in order to make a sensible decision about what to do that evening?**

The next best alternative might be revising for another exam, or it might be taking time off to relax or to go out. To make a sensible decision, you need to consider these alternatives and whether they are better or worse for you than studying for the economics exam. One major problem here is the lack of information. You do not know just how much the extra study will improve your performance in the exam, because you do not know in advance just how much you will learn and you do not know what is going to be on the exam paper. Similarly you do not know this information for studying for other exams.

**Make a list of the benefits of higher education.**

The benefits to the individual include: increased future earnings; the direct benefits of being more educated; the pleasure of the social contacts at university or college.

**Is the opportunity cost to the individual of attending higher education different from the opportunity costs to society as a whole?**

Yes. The opportunity cost to society as a whole would include the costs of providing tuition (staffing costs, materials, capital costs, etc.), which could be greater than any fees the student may have to pay. On the other hand, the benefits to society would include benefits beyond those received by the individual. For example, they would include the extra profits employers would make by employing the individual with those qualifications.

**There is a saying in economics, 'There is no such thing as a free lunch'. What does this mean?**

That there is always (or virtually always) an opportunity cost of anything we consume. Even if we do not incur the cost ourselves (the 'lunch' is free to us), someone will incur the cost (e.g. the institution providing the lunch).

**Are any other (desirable) goods or services truly abundant?**

Very few! Possibly various social interactions between people, but even here, the time to enjoy them is not abundant.

**Under what circumstances would the production possibility curve be (a) a straight line; (b) bowed in toward the origin? Are these circumstances ever likely?**

a) When there are constant opportunity costs. This will occur when resources are equally suited to producing either good. This might possibly occur in our highly simplified world of just two goods. In the real world it is unlikely.
b) When there are decreasing opportunity costs. This will occur when increased specialization in one good allows the country to become more efficient in its production. It gains 'economies of scale' sufficient to offset having to use less suitable resources.

**Will economic growth necessarily involve a parallel outward shift of the production possibility curve?**

No. Technical progress, the discovery of raw materials, improved education and training, etc., may favour one good rather than the other. In such cases the gap between the old and new curves would be widest where they meet the axis of the good whose potential output had grown more.

**Which of the following are positive statements, which are normative statements and which could be either depending on the context?**

**a) Cutting the higher rates of income tax will redistribute incomes from the poor to the rich.**

**b) It is wrong that inflation should be reduced if this means that there will be higher unemployment.**
**c) It is wrong to state that putting up interest rates will reduce inflation.**
**d) The government should raise interest rates in order to prevent the exchange rate falling.**
**e) Current government policies should reduce unemployment.**

a) Positive. This is merely a statement about what would happen.
b) Normative. The statement is making the value judgment that reducing inflation is a less desirable goal than the avoidance of higher unemployment.
c) Positive. Here the word 'wrong' means 'incorrect' not 'morally wrong'. The statement is making a claim that can be tested by looking at the facts. Do higher interest rates reduce inflation, or don't they?
d) Both. The positive element is the claim that higher interest rates prevent the exchange rate falling. This can be tested by an appeal to the facts. The normative element is the value judgment that the government ought to prevent the exchange rate falling.
e) Either. It depends what is meant. If the statement means that current government policies are likely to reduce unemployment, the statement is positive. If, however, it means that the government ought to direct its policies towards reducing unemployment, the statement is normative.

Lesson 03

## Demand, Supply & Equilibrium Analysis

### GOODS MARKET AND FACTORS MARKET

**Goods/product/commodity markets:**

Markets used to exchange final good or service. Product markets exchange consumer goods purchased by the household sector, capital investment goods purchased by the business sector, and goods purchased by government and foreign sectors. A product market, however, does NOT include the exchange of raw materials, scarce resources, factors of production, or any type of intermediate goods. The total value of goods exchanged in product markets each year is measured by gross domestic product. The demand side of product markets includes consumption expenditures, investment expenditures, government purchases, and net exports. The supply side of product markets is production of the business sector.

**Factors markets:**

Markets used to exchange the services of a factor of production: labor, capital, land, and entrepreneurship. Factor markets, also termed resource markets, exchange the services of factors, NOT the factors themselves. For example, the labor services of workers are exchanged through factor markets NOT the actual workers. Buying and selling the actual workers are not only slavery (which is illegal) it's also the type of exchange that would take place through product markets, not factor markets. More realistically, capital and land are two resources and are legally exchanged through product markets. The services of these resources, however, are exchanged through factor markets. The value of the services exchanged through factor markets each year is measured as national income.

**Assumption** is a belief or feeling that something is true or that something will happen, although there is no proof. Economists make frequent use of assumptions in putting forward their theories.

**Perfect competition** refers to a situation in which no firm or consumer is big enough to affect the market price.

### DEMAND ANALYSIS

**Shortage:**

A shortage is a situation in which demand exceeds supply, i.e. producers are unable to meet market demand for the product. Shortages cause prices to raise prompting producers to produce more and consumers to demand less.

**Surplus:**

A surplus is a situation of excess supply, in which market demand falls short of the quantity supplied; i.e. the producers are unable to sell all the produced goods in the market. Surpluses cause prices to fall prompting producers to supply less and consumers to demand more.

**Price Mechanism:**

The price mechanism is a signaling and rationing device which prompts consumers and producers to adjust their demand and supply, respectively, in response to a shortage or surplus. Shortages cause prices to rise, prompting producers to produce more and consumers to demand less. Surpluses cause prices to fall prompting producers to supply less and consumers to demand more. In either case, the price mechanism attempts to clear the shortage or surplus in the market.

**Normal goods** are goods whose quantity demanded goes up as consumer income increases.

**Inferior goods** are goods whose quantity demanded goes down as consumer income increases.

**Giffen goods** are the sub category of inferior good. It is a rare type of good seldom seen in the real world, in which a change in price causes quantity demanded to change in the same direction (in violation of the law of demand). In other words, an increase in the price of Giffen good results in an increase in the quantity demanded. The existence of a Giffen good requires the existence of special circumstances. First, the good must be an inferior good. Second, the income effect is greater than the substitution effect. A Giffen good is most likely to result when the good is a significant share of the consumer's budget. Margarine is a Giffen good as compared to butter.

**Substitution effect:**

It is one of two reasons for law of demand and the negative slope of the market demand curve. The substitution effect occurs because a change in the price of a good makes it relatively higher or lower

than the prices of other goods that might act as substitutes. A higher price means that a good is more expensive relative to other goods, while a lower price means it's less expensive.
Or more simply we can say that if price of any good increases, people reduce its consumption and substitute any other good whose price is not increased. This is substitution effect.

**Income effect:**

It is also one of two reasons for the law of demand and the negative slope of the market demand curve. The income effect results because a change in price gives buyers more real income, or the purchasing power of the income, even though money or nominal income remains the same. This causes changes in the quantity demanded of the good.
Or more simply we can say that when price of any good increases, consumer's real income falls and its purchasing power also decreases. This is income effect.

**Price effect:**

Price effect is the addition of income and substitution effect.
Price effect = Income effect + Substitution effect
**Substitutes** are goods that compete with one another or can be substituted for one another, like butter and margarine.
**Compliments** are goods that go hand in hand with each another. Examples are left shoe and right shoe, or bread and butter
Cash crops are the crops which are not used as food but as a raw material in factories e.g. cotton.

**DEMAND**

Demand is the quantity of a good that buyers wish to purchase at each conceivable price.

**Law of demand:**

The law of demand states that holding all other factors constant, if the price of a certain commodity rises, its quantity demanded will go down, and vice-versa. Other factors are income, population, tastes, prices of all other goods etc.

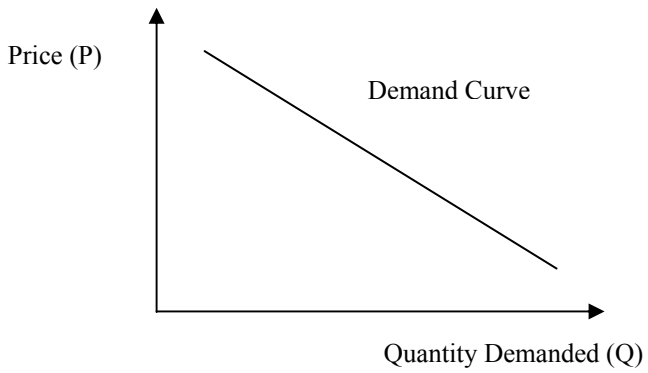
**Demand schedule:**

A demand schedule is a table (sometimes also referred to as a graph) which shows various combinations of quantity demanded and price.

| Price | Quantity demanded (Individual) | Quantity demanded (Market) |
|---|---|---|
| 5 | 3.5 | 3500 |
| 4 | 4.5 | 4500 |
| 3 | 6.0 | 6000 |
| 2 | 8.0 | 8000 |
| 1 | 11.0 | 11000 |

**Demand curve:**

A demand curve is a graph that obtains when price (one of the determinants of demand) is plotted against quantity demanded.




**Demand function:**

A demand function is an equational representation of demand as a function of its many determinants.

Qd = f ( Pg , T , Psi … Psn , Pci … Pcm , Y , B , Pge t+1 )
Where,
Pg = Price of the good, T = Tastes, Psi … Psn = Prices of substitute goods, Pci … Pcm = Prices of complimentary goods, Y = Income, B = Income Distribution, Pge t+1 = Future prices
Equation of demand function is **Qd= a – b P**

**Shifts in the demand curve:**

Shifts in the demand curve plotted in P-Qd space are caused by changes in any determinant of demand other than the price of the good itself. Movements along the curve correspond to the changes in the variable on the vertical axis.

**FACTORS SHIFTING DEMAND CURVE:**

| Factors Changing Demand | Effect on Demand | Direction of Shift in Demand Curve | Effect on Equilibrium Price | Effect on Equilibrium Quantity |
|---|---|---|---|---|
| Increase in income (normal good) | Increase | Rightward | Increase | Increase |
| Decrease in income(normal good) | Decrease | Leftward | Decrease | Decrease |
| Increase in income (inferior good) | Decrease | Leftward | Decrease | Decrease |
| Decrease in income(inferior good) | Increase | Rightward | Increase | Increase |
| Increase in price of Substitute | Increase | Rightward | Increase | Increase |
| Decrease in price of substitute | Decrease | Leftward | Decrease | Decrease |
| Increase in price of complement | Decrease | Leftward | Decrease | Decrease |
| Decrease in price of complement | Increase | Rightward | Increase | Increase |
| Increase in taste and preference for good | Increase | Rightward | Increase | Increase |
| Decrease in taste and preference for good | Decrease | Leftward | Decrease | Decrease |
| Increase in number of consumers | Increase | Rightward | Increase | Increase |
| Decrease in number of consumers | Decrease | Leftward | Decrease | Decrease |

**MARKET DEMAND CURVE**

Market demand curve is a graphic representation of a market demand which shows the quantities of a commodity that consumers are willing and able to purchase during a period of time at various alternative prices, while holding constant everything else that effects demand. The market demand curve for a commodity is negatively sloped, indicating that more of a commodity is purchased at a lower price.

Lesson 04

## DEMAND, SUPPLY & EQUILIBRIUM ANALYSIS (CONTINUED)

### SUPPLY

Supply is the quantity of a good that sellers wish to sell at each conceivable price.

**Law of supply:**

The law of supply states that the quantity supplied will go up as the price goes up and vice versa. As output increases, cost will also increase. Higher prices means more profit so firms will produce more of that product whose price has increased. New producers will also emerge in the market. And total supply will also increase.

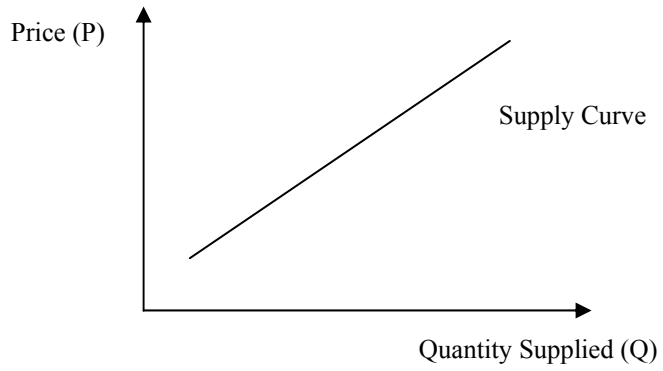
**Supply schedule:**

A supply schedule is a table (sometimes also referred to as a graph) which shows various combinations of quantity supplied and price.

| Price | Quantity supplied (Individual) | Quantity supplied (Market) |
|---|---|---|
| 5 | 75 | 7500 |
| 4 | 70 | 7000 |
| 3 | 60 | 6000 |
| 2 | 40 | 4000 |
| 1 | 10 | 1000 |

**Supply curve:**

A supply schedule is a table which shows various combinations of quantity supplied and price. Graphical illustration of this table gives us the supply curve.




**Supply function:**

A supply function is an equational representation of supply as a function of all its determinants.

Quantity Supplied = *f* (Price)

QS = f ( Pg , Cg , a1 … an , j1 … jm , R , A , Pge t+1 )

Where,

Quantity Supplied = Qs, Price of the goods = Pg, Profitability of alternative goods = a1…..an, Profitability of the goods jointly supplied = j1….jm, Nature and Other Random Shocks = R, Aims of Producers = A, Expected Price of good = Pge at some future time = t+1

A supply equation is **QS = c + d P**

### PROBLEMS OF IDENTIFICATION OR DETERMINANTS OF SUPPLY

Problems of identification arise when we can not determine that the change in the equilibrium quantities is either caused by a change in demand or by changes in both demand and supply.

Determinants of supply are:

- Costs of production
- Profitability of alternative products (substitutes in supply)
- Profitability of goods in joint supply

# ECO401 – INTRODUCTION TO ECONOMICS

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Lesson 04

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**Law of supply:**

The law of supply states that the quantity supplied will go up as the price goes up and vice versa. As output increases, cost will also increase. Higher prices means more profit so firms will produce more of that product whose price has increased. New producers will also emerge in the market. And total supply will also increase.

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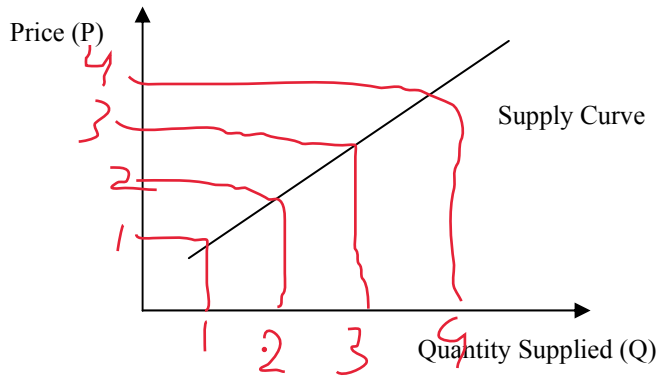


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QS = f ( Pg , Cg , a1 … an , j1 … jm , R , A , Pge t+1 )

Where,

Quantity Supplied = Qs, Price of the goods = Pg, Profitability of alternative goods = a1…..an, Profitability of the goods jointly supplied = j1….jm, Nature and Other Random Shocks = R, Aims of Producers = A, Expected Price of good = Pge at some future time = t+1

A supply equation is **QS = c + d P**

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Problems of identification arise when we can not determine that the change in the equilibrium quantities is either caused by a change in demand or by changes in both demand and supply.

Determinants of supply are:

- Costs of production
- Profitability of alternative products (substitutes in supply)
- Profitability of goods in joint supply

- Nature and other random shocks
- Aims of producers
- Expectations of producers

**Determinants in the context of supply of butter:**

- ~~A reduction in the cost of producing butter.~~
- ~~A reduction in the profitability of producing cream or cheese.~~
- ~~An increase in the profitability of skimmed milk.~~
- ~~If weather conditions are favorable, grass yields and hence milk yields are likely to be high.~~
- ~~If butter producers expect the price to rise in near future, they may decide to release less to the market now.~~

**FACTORS SHIFTING SUPPLY CURVE**

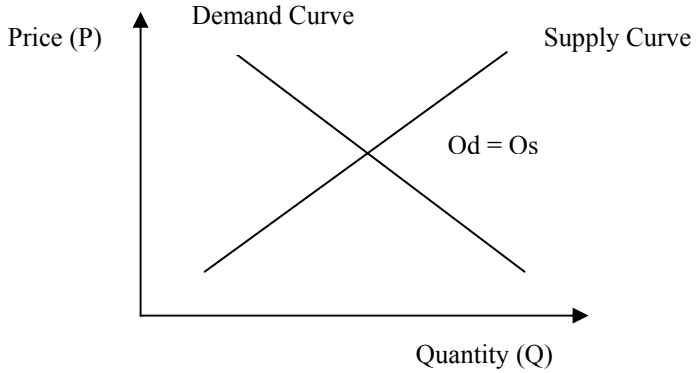
| Factors Changing Supply | Effect on Supply | Direction of Shift in Supply Curve | Effect on Equilibrium Price | Effect on Equilibrium Quantity |
|---|---|---|---|---|
| Increase in resource price | Decrease | Leftward | Increase | Decrease |
| Decrease in resource price | Increase | Rightward | Decrease | Increase |
| Improved technology | Increase | Rightward | Decrease | Increase |
| Decline in technology | Decrease | Leftward | Increase | Decrease |
| Expect a price increase | Decrease | Leftward | Increase | Decrease |
| Expect a price decrease | Increase | Rightward | Decrease | Increase |
| Increase in number of suppliers | Increase | Rightward | Decrease | Increase |
| Decrease in number of suppliers | Decrease | Leftward | Increase | Decrease |

**EQUILIBRIUM**

Equilibrium is a state in which there are no shortages and surpluses; in other words the quantity demanded is equal to the quantity supplied.

Equilibrium price is the price prevailing at the point of intersection of the demand and supply curves; in other words, it is the price at which the quantity demanded is equal to the quantity supplied.

Equilibrium quantity is the quantity that clears the market; in other words, it is it is the quantity at which the quantity demand is equal to the quantity supplied.




**ALGEBRAIC REPRESENTATION OF EQUILIBRIUM**

If we have following demand and supply function

**Qd = 100 – 10 P**

**Qs = 40 + 20 P**

In equilibrium,

$$\mathbf{Qd = Qs}$$

Therefore,

$$100 - 10P = 40 + 20P$$
$$20P + 10P = 100 - 40$$
$$30P = 60$$
$$P = 60/30$$
$$\mathbf{P = 2}$$

Putting the value of price in any of demand and supply equation,

$$Q = 100 – 10x2 \text{ (or } 40 + 20x2)$$
$$Q = 100 – 20$$
$$\mathbf{Q = 80}$$

The equilibrium price is 2 and the equilibrium quantity is 80

Lesson 05

## DEMAND, SUPPLY & EQUILIBRIUM ANALYSIS (CONTINUED)

**EQUILIBRIUM CAN SHIFT IF**

- Demand Curve Shifts.
- Supply Curve Shifts.
- Both Shift.

This gives rise to eight possibilities. These eight possibilities can be summarized as following:

| | | |
|---|---|---|
| D → , S ~, | P↑ | Q↑ |
| D ~ , S → , | P↓ | Q↑ |
| D → , S → , | P ? | Q↑ |
| D ← , S ~ , | P↓ | Q↓ |
| D ~ , S ← , | P↑ | Q↓ |
| D → , S ← , | P↑ | Q ? |
| D ← , S → , | P↓ | Q ? |
| D ← , S ← , | P ? | Q↓ |

The symbol "**→**" or "**↑**" shows increase and the symbol "**←**" **and** "**↓**" shows a decrease while the symbol "**~**" shows that the particular thing remains same.

**NOTE:** (Graphical illustration of all these possibilities is given in the video lecture)

**Points to note in these 8 possibilities:**

1. Whenever the demand curve shifts the new equilibrium is obtained by moving along the supply curve.
2. Whenever supply curve shifts, the new equilibrium is obtained by moving along the demand curve.
3. Whenever both demand and supply curves shifts, we will move first on the demand curve and then along the supply curve.

**THE MARKET FOR BUTTER**

**Question:** What will happen to the equilibrium price and quantity of butter in each of the following cases?

**a.** A rise in the price of the margarine. D → , S ←
**b.** A rise in the demand for milk. S →; D ← ( if milk is a substitute )
**c.** A rise in the price of bread. D ←
**d.** A rise in the demand of bread. D →
**e.** An expected rise in the price of butter in near future. S ← D →
**f.** A Tax on butter production. S ←
**g.** An invention of a new, but expensive, process of removing all cholesterol from butter , plus the passing of law which states that all producers must use this process. D → S ←

**GOVERNMENT'S ROLE IN PRICE-DETERMINATION & EQUILIBRIUM ANALYSIS**

Identification problem is the problem of how to identify demand & supply curve. This problem arises when both price and quantity.

Government can impact on equilibrium by two fundamental ways. The government may intervene in the market and mandate a maximum price (price ceiling) or minimum price (price floor) for a good or service.

**PRICE CEILING:**

A price ceiling is the maximum price limit that the government sets to ensure that prices don't rise above that limit (medicines for e.g.).

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Lesson 05

## DEMAND, SUPPLY & EQUILIBRIUM ANALYSIS (CONTINUED)

Fall in price expends demand contracts supply
Rise in price contracts demand and expends supply

### EQUILIBRIUM CAN SHIFT IF

- Demand Curve Shifts.
- Supply Curve Shifts.
- Both Shift.

This gives rise to eight possibilities. These eight possibilities can be summarized as following:

Supply has direct relation with price

Demand has inverse relation with price

| | | |
|---|---|---|
| D → , S ~, | P↑ | Q↑ |
| D ~ , S → , | P↓ | Q↑ |
| D → , S → , | P ? | Q↑ |
| D ← , S ~ , | P↓ | Q↓ |
| D ~ , S ← , | P↑ | Q↓ |
| D → , S ← , | P↑ | Q ? |
| D ← , S → , | P↓ | Q ? |
| D ← , S ← , | P ? | Q↓ |

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- ~~**d.** A rise in the demand of bread. D →~~
- ~~**e.** An expected rise in the price of butter in near future. S ← D →~~
- ~~**f.** A Tax on butter production. S ←~~
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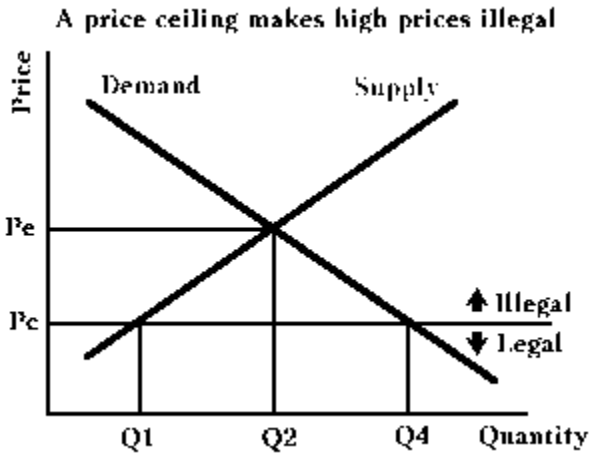
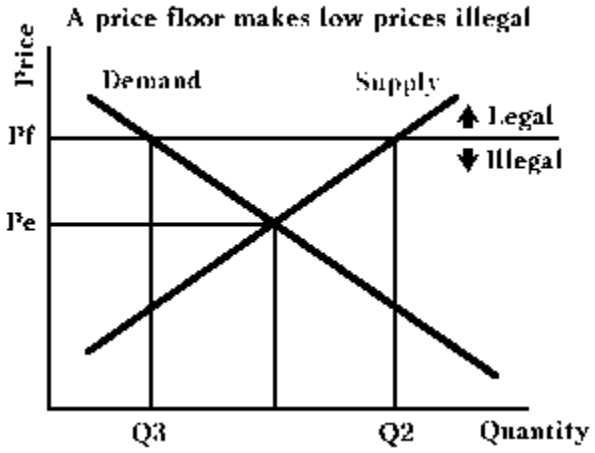



If a price ceiling is placed below the market-clearing price, as Pc, the market-clearing or equilibrium price of Pe becomes illegal. At the ceiling price, buyers want to buy more than sellers will make available. In the graph, buyers would like to buy amount Q4 at price Pc, but sellers will sell only Q1. Because they cannot buy as much as they would like at the legal price, buyers will be out of equilibrium. The normal adjustment that this disequilibrium would set into motion in a free market, an increase in price, is illegal; and buyers or sellers or both will be penalized if transactions take place above Pc. Buyers are faced with the problem that they want to buy more than is available. This is a rationing problem.

**PRICE FLOOR:**

A price floor is the minimum price that a Government sets to support a desired commodity or service in a society (wages for e.g.).




Price ceilings are not the only sort of price controls governments have imposed. There have also been many laws that establish minimum prices, or price floors. The graph illustrates a price floor with price Pf. At this price, buyers are in equilibrium, but sellers are not. They would like to sell quantity Q2, but buyers are only willing to take Q3. To prevent the adjustment process from causing price to fall, government may buy the surplus, If it does not buy the surplus, government must penalize either buyers or sellers or both who transact below the price floor, or else price will fall. Because there is no one else to absorb the surplus, sellers will.

**RATIONING & SUPPLY SHOCKS (ALTERATION OF EQUILIBRIUM PRICE BY THE GOVT)**

There are two ways for this:

1. **Through Tax :**

Tax (to be paid by the producer) will increase the Supply Price, Supply Curve shifts left ward, Price increases & quantity decreases.

2. **Through Subsidy :**

Subsidy (given to the producer) will decrease the Supply Price, Supply Curve shifts rightward, Price decreases & quantity increases.

**SOCIAL COST**

Social cost is the cost of an economic decision, whether private or public, borne by the society as a whole.

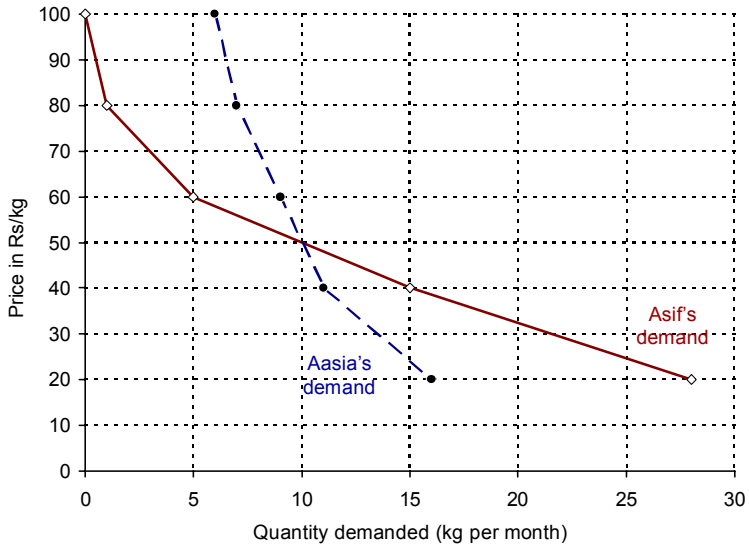
**MARGINAL SOCIAL COST**

Marginal social cost is the change in social costs caused by a unit change in output.

## EXERCISES

**Asif and Aasia's "monthly" demand schedules for potatoes are given. Roughly draw these demand schedules on the same graph. Assume that there are 200 consumers in the market. Of these, 100 have schedules like Asif's and 100 have schedules like Aasia's. Complete the Total market demand ("monthly") column in the table below?**

| Price (pence per kg) | Asif (Qd in kg) | Aasia (Qd in kg) | Total market demand (kg) |
|---|---|---|---|
| 20 | 28 | 16 | 4400 |
| 40 | 15 | 11 | 2600 |
| 60 | 5 | 9 | 1400 |
| 80 | 1 | 7 | 800 |
| 100 | 0 | 6 | 600 |




**Assuming that demand does not change from month to month, how would you plot the annual market demand for potatoes?**

The amount demanded would be 12 times higher at each price. If the scale of the horizontal axis were unaltered, the curve would shift way out to the right. A simple way of showing the new curve, therefore, would be to compress the scale of the horizontal axis. (If each of the numbers on the axis were multiplied by 12, the curve would remain in physically the same position.)

**At what price is their demand the same?**

The two curves cross at a price of Rs50 per kg and at a demand of 10 kg per month.

**What explanations could there be for the quite different shapes of their two demand curves?**

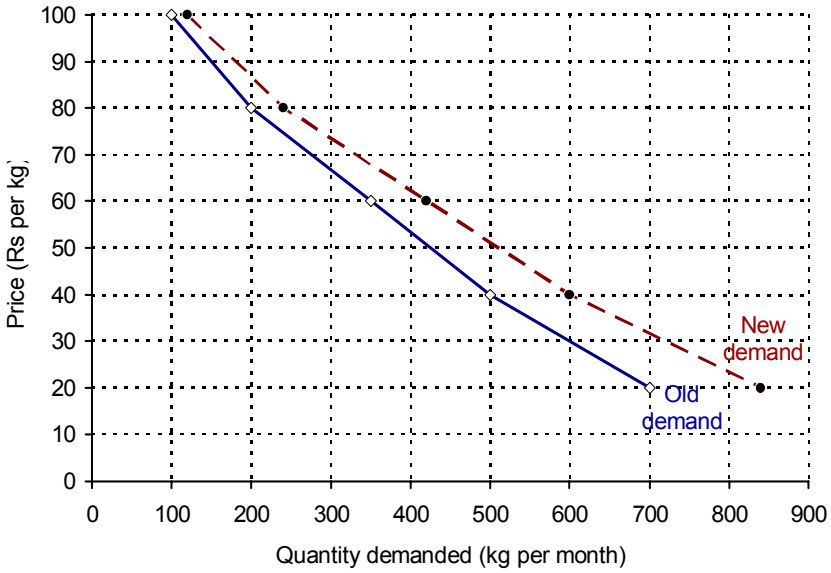
One explanation could be that Asif is quite happy to eat rice, pasta or bread instead of potatoes. Thus when the price of potatoes goes up she switches to these other foods, and switches to potatoes when the price of potatoes comes down. Aasia, by contrast, may not see these other foods as close substitutes and thus her demand for potatoes will be less price sensitive.

**Do all these the determinants of demand affect both an individual's demand and the market demand for a product?**

All except the distribution of income in the economy.

**You are given a market demand curve for apples. Assume that the price of apples increases by 20 per cent at each price – due, say, to substantial increases in the prices of other substitute fruits. Plot the new demand curve for apples. Is the new curve parallel to the old one?**

See below. As you can see, the curves are not parallel. A constant percentage increase in quantity demanded gives a bigger and bigger absolute increase as quantity increases.




**The price of lamb meat rises and yet it is observed that the sales of lamb meat increase. Does this mean that the demand curve for lamb meat is upward sloping? Explain.**

No not necessarily. For example, the price of substitutes such as beef or chicken may have risen by a larger amount. In such cases the demand curve for lamb meat will have shifted to the right. Thus although a rise in the price of lamb meat will cause a movement up along this new demand curve, more lamb meat will nevertheless be demanded because lamb meat is now relatively cheaper than the alternatives.

**A demand function is given by $Q_d = 10000 – 200P$. Draw this in P-$Q_d$ space. What is it about the demand function equation that makes the demand curve in P- $Q_d$ space (a) downward sloping; (b) a straight line?**

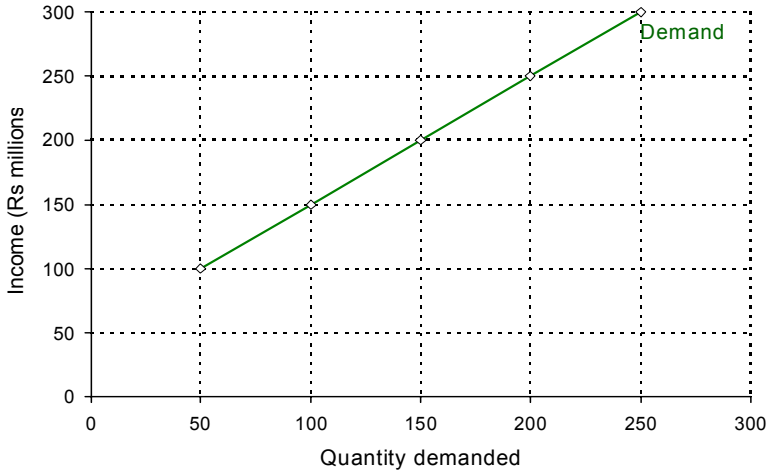
a) The fact is that the 200P term has a negative sign attached to it. This means that as P rises, $Q_d$ falls.
b) The fact is that there is no P to a power term. The demand curve thus has a constant slope of –1/200.

**A demand function is given by $Q_d = a + bY$, where Y is total income. If the term "a" has a value of –50 000 and the term "b" a value of 0.001, construct a demand schedule with respect to Y. Do this for incomes between Rs100 million and Rs300 million at Rs50 million intervals.**

| Y (in Rs millions) | $Q_d$ (in 000s) |
|---|---|
| 100 | 50 |
| 150 | 100 |
| 200 | 150 |
| 250 | 200 |
| 300 | 250 |

**Now use this schedule to plot a demand curve with respect to income. Comment on its shape.**

The curve will be an upward-sloping straight line, crossing the horizontal axis at –50 000. It would rise by 100 000 units for each Rs100 million rise in income.




Market demand (with respect to income)

**What are the reasons which cause the market supply of potatoes to fall?**

Examples include:

- The cost of producing potatoes rises.
- The profitability of alternative crops (e.g. carrots) rises.
- A poor potato harvest.
- Farmers expect the price of potatoes to rise (short-run supply falls).

**For what reasons might the supply of leather rise?**

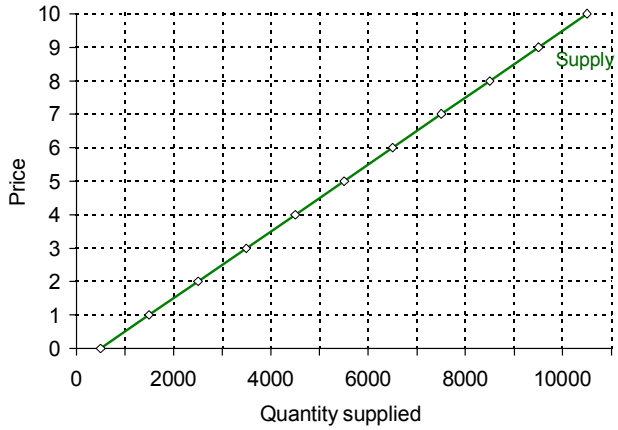
Examples include:

- The cost of producing leather falls.
- The profitability of producing mutton and chicken decreases.
- The price of beef rises (goods in joint supply).
- A long-running industrial dispute involving leather workers is resolved.
- Producers expect the price of leather to fall (short-run supply increases).

**This question is concerned with the supply of gas for home and office heating in winters. In each case consider whether there is a movement along the supply curve (and in which direction) or a shift in it (left or right). (a) New gas fields start up in production. (b) The demand for home heating rises. (c) The price of electric heating falls. (d) The demand for CNG for cars (produced in joint supply) rises. (e) New technology decreases the costs of gas production.**

(a) Shift right. (b) Movement up along (as a result of a rise in price). (c) Movement down along (as a result of a fall in price resulting from a fall in demand as people switch to electric heating). (d) Shift right (more of a good in joint supply is produced). (e) Shift right.

**A supply function is given as $Q_s = c + dP$, where "c" is 500 and "d" is 1000. Draw the schedule (table) and graph for equation for prices from Rs1 to Rs10. What is it in the equation that determines the slope of the supply 'curve'?**




| P (in Rs) | $Q_s$ (units) |
|---|---|
| 1 | 1500 |
| 2 | 2500 |
| 3 | 3500 |
| 4 | 4500 |
| 5 | 5500 |
| 6 | 6500 |
| 7 | 7500 |
| 8 | 8500 |
| 9 | 9500 |
| 10 | 10500 |

The graph is an upward sloping straight line crossing the horizontal axis at 500 units. The slope is given by the value of the d term: i.e. the slope is 1/1000 (for every Re1 increase in price, quantity supplied increases by 1000 units).

**Explain the process by which the price of houses would rise if there were a shortage.**

People with houses to sell would ask a higher price than previous sellers of similar houses (probably with the advice of an estate agent). Potential purchasers would be prepared to pay a higher price than previously in order to obtain the type of house they wanted.

**With a typical upward sloping market supply curve and downward sloping market demand curve, what would happen to equilibrium price and quantity if the demand curve shifted to the left?**

Both price and quantity will fall. You should be able to label two demand curves (e.g. D1 and D2), two equilibrium points (e.g. e1 and e2) corresponding prices $P_{e2}$ and $P_{e1}$ ($P_{e2} < P_{e1}$), and quantities $Q_{e2}$ and $Q_{e1}$ ($Q_{e2} > Q_{e1}$).

**What will happen to the equilibrium price and quantity of butter in each of the following cases? You should state whether demand or supply (or both) have shifted and in which direction. (In each case assume ceteris paribus.)**

**(a) A rise in the price of margarine; (b) A rise in the demand for yoghurt; (c) A rise in the price of bread; (d) A rise in the demand for bread; (e) An expected rise in the price of butter in the near future; (f) A tax on butter production; (g) The invention of a new, but expensive, process for**

**removing all cholesterol from butter plus the passing of a law which states that all butter producers must use this process.**

a) Price rises, quantity rises (demand shifts to the right: butter and margarine are substitutes).
b) Price falls, quantity rises (supply shifts to the right: butter and yoghurt are in joint supply).
c) Price falls, quantity falls (demand shifts to the left: bread and butter are complementary goods).
d) Price rises, quantity rises (demand shifts to the right: bread and butter are complementary goods).
e) Price rises, quantity rises or falls depending on relative sizes of the shifts in demand and supply (demand shifts to the right as people buy now before the price rises; supply shifts to the left as producers hold back stocks until the price does rise).
f) Price rises, quantity falls (supply shifts to the left).
g) Price rises, quantity rises or falls depending on the relative size of the shifts in demand and supply (demand shifts to the right as more health-conscious people start buying butter; supply shifts to the left as a result of the increased cost of production).

**Are there any factors on the supply side that influence house prices?**

Yes. Although they are usually less important than demand-side factors, they are, nevertheless important in determining changes in house prices. The two most important are the expectations of the construction industry. If house building firms (contractors) are confident that demand will continue to rise, and with it house prices, they are likely to start building more houses. The resulting increase in the supply of houses (after the time taken to build them) will help to dampen the rise in prices.

The other major supply-side factor is the expectations of house owners. If people think that prices will rise in the near future and are thinking of selling their house, they are likely to delay selling and wait until prices have risen. This (temporary) reduction in supply will help to push up prices even further.

**Draw a supply and demand diagram with the price of labour (the wage rate) on the vertical axis and the quantity of labour (the number of workers) on the horizontal axis. What will happen to employment if the government raises wages from the equilibrium to some minimum wage above the equilibrium?**

Firms' demand for labour will shrink at the new higher wage rate. The supply of workers will rise as more workers would be willing to work (and work more hours) at the higher wage rate. There will thus be unemployment (a surplus of workers) at the minimum wage set.

**All economies have black markets in goods; whether this poses a serious problem is another matter. What would be the effect on black-market prices of a rise in the official price?**

Other things being equal, there would probably be a fall in the black-market price. A rise in the official price would cause an increase in the quantity supplied and a reduction in the quantity demanded and hence less of a shortage. There would therefore be less demand for black-market products.

**Will a system of low official prices plus a black market be more equitable or less equitable than a system of free markets?**

More equitable if the supplies at official prices were distributed fairly (e.g. by some form of rationing). If, however, supplies were allocated on a first-come, first-served basis, then on official markets there would still be inequity between those who are lucky enough or queue long enough to get the product and those who do not get it. Also, the rich will still be able to get the product on the black market!

**Think of some examples where the price of a good or service is kept below the equilibrium (e.g. rent controls). In each case consider the advantages and disadvantages of the policy.**

Two examples are:

- Rent controls.

  **Advantages:** makes cheap housing available to those who would otherwise have difficulty in affording reasonable accommodation. Disadvantages: causes a reduction in the supply of private rented accommodation; causes demand to exceed supply and thus some people will be unable to find accommodation.

- Tickets for a concert.

**Advantages:** allows the price to be advertised in advance and guarantees a full house; makes seats available to those who could not afford the free-market price. Disadvantages: causes queuing or seats are being only available to those booking well in advance.

**Primary and secondary schooling is free in state schools in most countries. If parents are given a choice of schools for their children, there will be a shortage of places at popular schools. What methods could be used for dealing with this shortage? What are their relative merits?**

Some form of rationing (selection) will have to be applied. This could be done on the basis of ability. If the objective is to have schools that cater for the full range of abilities, then this objective will not be met. If the objective is to recruit the most able children, then selection by ability is consistent with this goal. An alternative is to select by geographical location, with the students living nearer to the school being given preference over those living further away. This is the system used by most state schools. It could well disadvantage children with particular needs, however, for whom the school would be particularly suitable. Other methods include the 'sibling' rule, whereby children who have older brothers or sisters already at the school are given preference. This, however, could lead to children living nearer the school being deprived of a place.

**Under what circumstances would making a product illegal (a) cause a fall in its price; (b) cause the quantity sold to fall to zero.**

a) Where the shift in demand was greater than the shift in supply (perhaps because of very 'law abiding' consumers, or where consumers faced harsher penalties than suppliers.
b) Where the penalties were very harsh and the law was strictly enforced, and/or where people were very law abiding.

**Can you think of any examples where prices and wages do not adjust very rapidly to a shortage or surplus? For what reasons might they not do so?**

- Many prices set by companies are adjusted relatively infrequently: it would be administratively too costly to change them every time there was a change in demand. For example a mail order company, where all the items in its catalogue have a printed price, would find it costly to adjust prices very frequently, since that would involve printing a new catalogue, or at least a new price list.
- Many wages are set annually by a process of collective bargaining. They are not adjusted in the interim.

**Why do the prices of fresh vegetables fall when they are in season? Could an individual farmer prevent the price falling?**

Because supply is at a high level. The increased supply creates a surplus which pushes down the price. Individual farmers could not prevent the price falling. If they continued to charge the higher price, consumers would simply buy from those farmers charging the lower price.

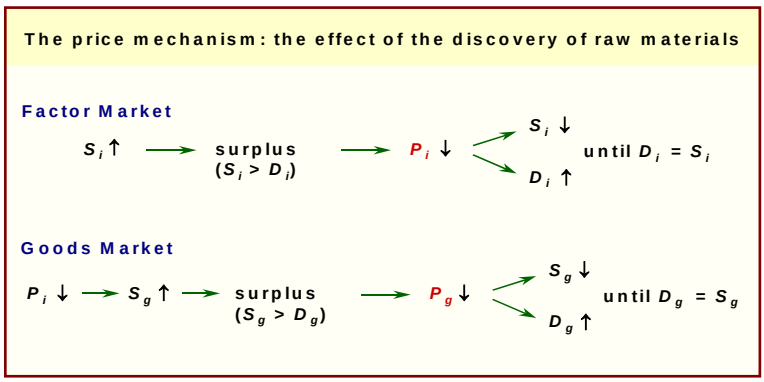
**If you were the owner of a clothes shop, how would you set about deciding what prices to charge for each garment at the end of season sale?**

You would try to reduce the price of each item as little as was necessary to get rid of the remaining stock. The problem for shop owners is that they do not have enough information about consumer demand to make precise calculations here. Many shops try a fairly cautious approach first, and then, if that is not enough to sell all the stock, they make further 'end of sale' reductions later.

**The number of owners of CD players has grown rapidly and hence the demand for CDs has also grown rapidly. Yet the prices of CDs have fallen. How could this come about?**

- The costs of manufacturing CDs may have fallen with improvements in technology and mass-production economies.
- Competition from increased numbers of manufacturers may have increased supply of CDs and driven prices down.
- The advent of copying tracks from the internet reduces the demand for CDs. This change in demand has further compounded the fall in price.

**Explain in words what is happening in the following diagram.**




The new discovery of raw material i means an increase in the supply i. This causes a surplus (excess supply) in the market for i, causing the price of i to fall until the same is removed (lower Pi causes demand to increase and supply to fall). The reduction in Pi also reduces the cost of producing good g (we can assume good g uses the factor i intensively), causing the supply of good g to increase beyond demand. The surplus in the market for good g drives the price of g down until the excess is cleared. The diagram illustrates interdependence between goods and factor markets.

**Can different factor markets be interdependent also? Give examples.**

Yes. A rise in the price of one factor (e.g. oil) will encourage producers to switch to alternatives (e.g. coal). This will create a shortage of coal and drive up its price. This will encourage increased production of coal. Similarly an increase in the population (and consequently size of the labour force) of a country will depress the price of labour (wages). This will cause producers to shift to more labour intensive production and reduce production methods which are capital (or machine) intensive. As a result the demand for capital will fall reducing its rental price.

Lesson 06

# ELASTICITIES

## IMPORTANCE OF ELASTICITY IN OUR TODAY'S LIFE

There is much more importance of the concept of elasticity in our life.

- The firm which uses advertising to change prices uses the concept of elasticity of demand of its product.
- Mostly firms set the prices of their product by viewing at the elasticity of demand of their product.
- The government collects revenues by imposing taxes. The good tax imposed by the government on the products is one for which either demand is inelastic or the supply is inelastic.
- So if the government wants to put tax burden on the consumers then it will choose the product to tax with low price elasticity of demand.
- And if government wants to panelize the producers then it must choose the product with low price elasticity of supply.

## ELASTICITY

Elasticity is a term widely used in economics to denote the "responsiveness of one variable to changes in another." In proper words, it is the relative response of one variable to changes in another variable. The phrase "relative response" is best interpreted as the percentage change.

## TYPES OF ELASTICITY

There are four major types of elasticity:

- Price Elasticity of Demand
- Price Elasticity of Supply
- Income Elasticity of Demand
- Cross-Price Elasticity of Demand

**Price Elasticity of Demand:**

Price elasticity of demand is the percentage change in quantity demanded with respect to the percentage change in price.

Price elasticity of demand can be illustrated by the following formula:

$$PЄ_d = \frac{\text{Percentage change in Quantity Demanded}}{\text{Percentage change in Price}}$$

Where Є = Epsilon; universal notation for elasticity.

If, for example, a 20% increase in the price of a product causes a 10% fall in the Quantity demanded, the price elasticity of demand will be:

$$PЄ_d = \frac{-10\%}{20\%} = -0.5$$

**Price Elasticity of Supply:**

Price elasticity of supply is the percentage change in quantity supplied with respect to the percentage change in price.

Price elasticity of supply can be illustrated by the following formula:

$$PЄs = \frac{\text{Percentage change in Quantity Supplied}}{\text{Percentage change in Price}}$$

If a 15% rise in the price of a product causes a 15% rise in the quantity supplied, the price elasticity of supply will be:

$$PЄs = \frac{15\ \%}{15\ \%} = 1$$

# ECO401 – INTRODUCTION TO ECONOMICS

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Lesson 05

## DEMAND, SUPPLY & EQUILIBRIUM ANALYSIS (CONTINUED)

Fall in price expends demand contracts supply
Rise in price contracts demand and expends supply

### EQUILIBRIUM CAN SHIFT IF

- Demand Curve Shifts.
- Supply Curve Shifts.
- Both Shift.

This gives rise to eight possibilities. These eight possibilities can be summarized as following:

Supply has direct relation with price

Demand has inverse relation with price

| | | |
|---|---|---|
| D → , S ~, | P↑ | Q↑ |
| D ~ , S → , | P↓ | Q↑ |
| D → , S → , | P ? | Q↑ |
| D ← , S ~ , | P↓ | Q↓ |
| D ~ , S ← , | P↑ | Q↓ |
| D → , S ← , | P↑ | Q ? |
| D ← , S → , | P↓ | Q ? |
| D ← , S ← , | P ? | Q↓ |

The symbol "**→**" or "**↑**" shows increase and the symbol "**←**" **and** "**↓**" shows a decrease while the symbol "**~**" shows that the particular thing remains same.

**NOTE:** (Graphical illustration of all these possibilities is given in the video lecture)

**Points to note in these 8 possibilities:**

1. Whenever the demand curve shifts the new equilibrium is obtained by moving along the supply curve.
2. Whenever supply curve shifts, the new equilibrium is obtained by moving along the demand curve.
3. Whenever both demand and supply curves shifts, we will move first on the demand curve and then along the supply curve.

### THE MARKET FOR BUTTER

~~**Question:** What will happen to the equilibrium price and quantity of butter in each of the following cases?~~

- ~~**a.** A rise in the price of the margarine.~~ ~~D → , S ←~~
- ~~**b.** A rise in the demand for milk. S →; D ← ( if milk is a substitute )~~
- ~~**c.** A rise in the price of bread. D ←~~
- ~~**d.** A rise in the demand of bread. D →~~
- ~~**e.** An expected rise in the price of butter in near future. S ← D →~~
- ~~**f.** A Tax on butter production. S ←~~
- ~~**g.** An invention of a new, but expensive, process of removing all cholesterol from butter , plus the passing of law which states that all producers must use this process. D → S ←~~

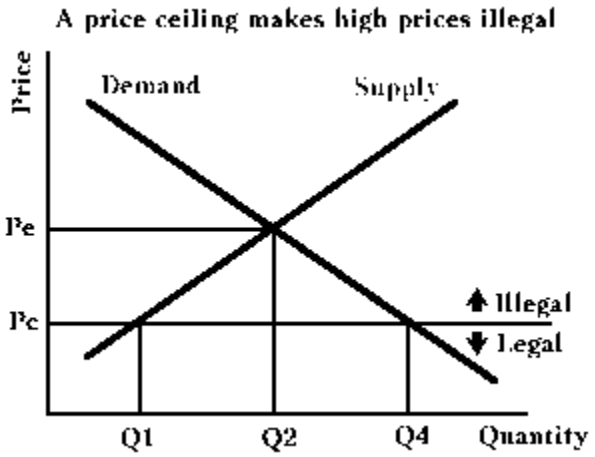
### GOVERNMENT'S ROLE IN PRICE-DETERMINATION & EQUILIBRIUM ANALYSIS

Identification problem is the problem of how to identify demand & supply curve. This problem arises when both price and quantity.

Government can impact on equilibrium by two fundamental ways. The government may intervene in the market and mandate a maximum price (price ceiling) or minimum price (price floor) for a good or service.

### PRICE CEILING:

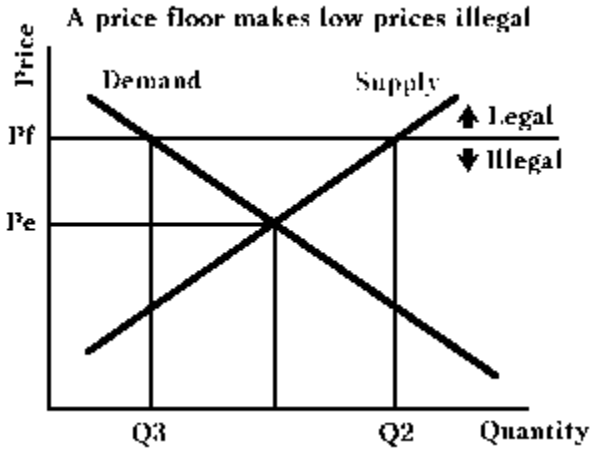
A price ceiling is the maximum price limit that the government sets to ensure that prices don't rise above that limit (medicines for e.g.).




If a price ceiling is placed below the market-clearing price, as Pc, the market-clearing or equilibrium price of Pe becomes illegal. At the ceiling price, buyers want to buy more than sellers will make available. In the graph, buyers would like to buy amount Q4 at price Pc, but sellers will sell only Q1. Because they cannot buy as much as they would like at the legal price, buyers will be out of equilibrium. The normal adjustment that this disequilibrium would set into motion in a free market, an increase in price, is illegal; and buyers or sellers or both will be penalized if transactions take place above Pc. Buyers are faced with the problem that they want to buy more than is available. This is a rationing problem.

**PRICE FLOOR:**

A price floor is the minimum price that a Government sets to support a desired commodity or service in a society (wages for e.g.).




Price ceilings are not the only sort of price controls governments have imposed. There have also been many laws that establish minimum prices, or price floors. The graph illustrates a price floor with price Pf. At this price, buyers are in equilibrium, but sellers are not. They would like to sell quantity Q2, but buyers are only willing to take Q3. To prevent the adjustment process from causing price to fall, government may buy the surplus, If it does not buy the surplus, government must penalize either buyers or sellers or both who transact below the price floor, or else price will fall. Because there is no one else to absorb the surplus, sellers will.

**RATIONING & SUPPLY SHOCKS (ALTERATION OF EQUILIBRIUM PRICE BY THE GOVT)**

There are two ways for this:

1. **Through Tax :**

Tax (to be paid by the producer) will increase the Supply Price, Supply Curve shifts left ward, Price increases & quantity decreases.

2. **Through Subsidy :**

Subsidy (given to the producer) will decrease the Supply Price, Supply Curve shifts rightward, Price decreases & quantity increases.

**SOCIAL COST**

Social cost is the cost of an economic decision, whether private or public, borne by the society as a whole.

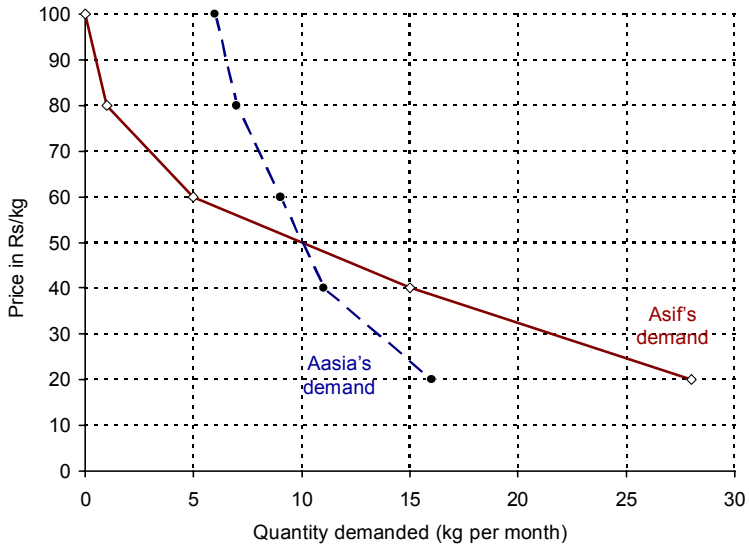
**MARGINAL SOCIAL COST**

Marginal social cost is the change in social costs caused by a unit change in output.

## EXERCISES

**Asif and Aasia's "monthly" demand schedules for potatoes are given. Roughly draw these demand schedules on the same graph. Assume that there are 200 consumers in the market. Of these, 100 have schedules like Asif's and 100 have schedules like Aasia's. Complete the Total market demand ("monthly") column in the table below?**

| Price (pence per kg) | Asif (Qd in kg) | Aasia (Qd in kg) | Total market demand (kg) |
|---|---|---|---|
| 20 | 28 | 16 | 4400 |
| 40 | 15 | 11 | 2600 |
| 60 | 5 | 9 | 1400 |
| 80 | 1 | 7 | 800 |
| 100 | 0 | 6 | 600 |




**Assuming that demand does not change from month to month, how would you plot the annual market demand for potatoes?**

The amount demanded would be 12 times higher at each price. If the scale of the horizontal axis were unaltered, the curve would shift way out to the right. A simple way of showing the new curve, therefore, would be to compress the scale of the horizontal axis. (If each of the numbers on the axis were multiplied by 12, the curve would remain in physically the same position.)

**At what price is their demand the same?**

The two curves cross at a price of Rs50 per kg and at a demand of 10 kg per month.

**What explanations could there be for the quite different shapes of their two demand curves?**

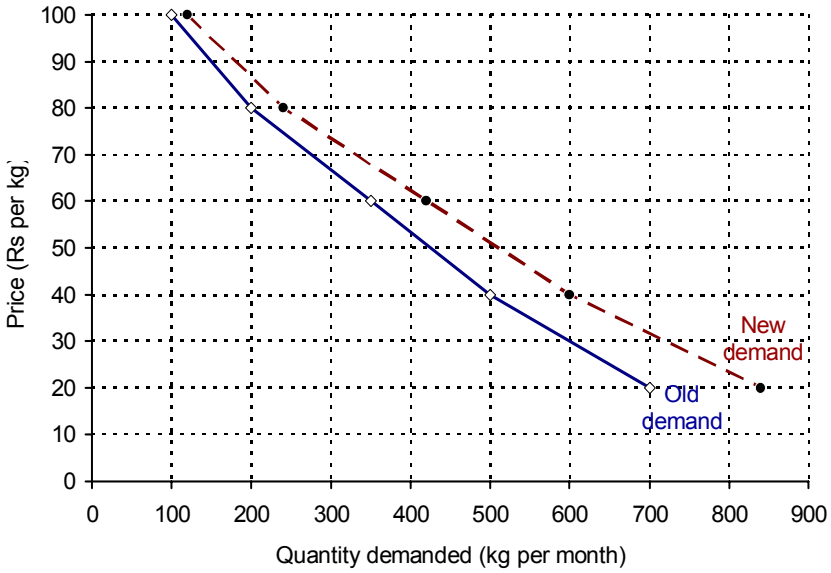
One explanation could be that Asif is quite happy to eat rice, pasta or bread instead of potatoes. Thus when the price of potatoes goes up she switches to these other foods, and switches to potatoes when the price of potatoes comes down. Aasia, by contrast, may not see these other foods as close substitutes and thus her demand for potatoes will be less price sensitive.

**Do all these the determinants of demand affect both an individual's demand and the market demand for a product?**

All except the distribution of income in the economy.

**You are given a market demand curve for apples. Assume that the price of apples increases by 20 per cent at each price – due, say, to substantial increases in the prices of other substitute fruits. Plot the new demand curve for apples. Is the new curve parallel to the old one?**

See below. As you can see, the curves are not parallel. A constant percentage increase in quantity demanded gives a bigger and bigger absolute increase as quantity increases.




**The price of lamb meat rises and yet it is observed that the sales of lamb meat increase. Does this mean that the demand curve for lamb meat is upward sloping? Explain.**

No not necessarily. For example, the price of substitutes such as beef or chicken may have risen by a larger amount. In such cases the demand curve for lamb meat will have shifted to the right. Thus although a rise in the price of lamb meat will cause a movement up along this new demand curve, more lamb meat will nevertheless be demanded because lamb meat is now relatively cheaper than the alternatives.

**A demand function is given by $Q_d = 10000 – 200P$. Draw this in P-$Q_d$ space. What is it about the demand function equation that makes the demand curve in P- $Q_d$ space (a) downward sloping; (b) a straight line?**

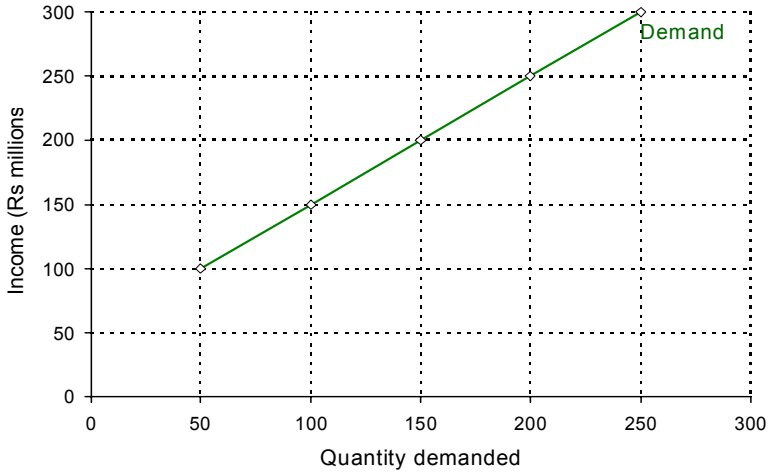
a) The fact is that the 200P term has a negative sign attached to it. This means that as P rises, $Q_d$ falls.
b) The fact is that there is no P to a power term. The demand curve thus has a constant slope of –1/200.

**A demand function is given by $Q_d = a + bY$, where Y is total income. If the term "a" has a value of –50 000 and the term "b" a value of 0.001, construct a demand schedule with respect to Y. Do this for incomes between Rs100 million and Rs300 million at Rs50 million intervals.**

| Y (in Rs millions) | $Q_d$ (in 000s) |
|---|---|
| 100 | 50 |
| 150 | 100 |
| 200 | 150 |
| 250 | 200 |
| 300 | 250 |

**Now use this schedule to plot a demand curve with respect to income. Comment on its shape.**

The curve will be an upward-sloping straight line, crossing the horizontal axis at –50 000. It would rise by 100 000 units for each Rs100 million rise in income.




Market demand (with respect to income)

**What are the reasons which cause the market supply of potatoes to fall?**

Examples include:

- The cost of producing potatoes rises.
- The profitability of alternative crops (e.g. carrots) rises.
- A poor potato harvest.
- Farmers expect the price of potatoes to rise (short-run supply falls).

**For what reasons might the supply of leather rise?**

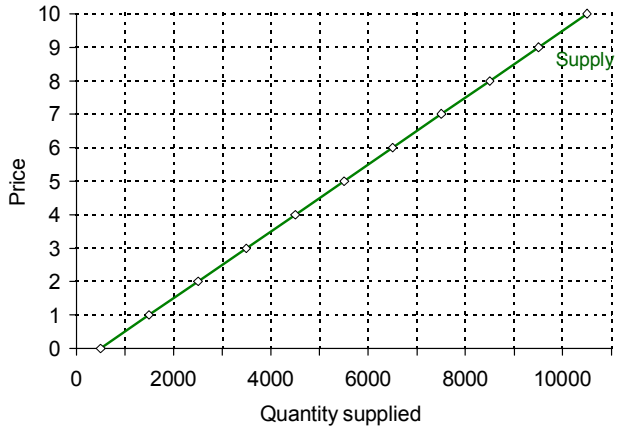
Examples include:

- The cost of producing leather falls.
- The profitability of producing mutton and chicken decreases.
- The price of beef rises (goods in joint supply).
- A long-running industrial dispute involving leather workers is resolved.
- Producers expect the price of leather to fall (short-run supply increases).

**This question is concerned with the supply of gas for home and office heating in winters. In each case consider whether there is a movement along the supply curve (and in which direction) or a shift in it (left or right). (a) New gas fields start up in production. (b) The demand for home heating rises. (c) The price of electric heating falls. (d) The demand for CNG for cars (produced in joint supply) rises. (e) New technology decreases the costs of gas production.**

(a) Shift right. (b) Movement up along (as a result of a rise in price). (c) Movement down along (as a result of a fall in price resulting from a fall in demand as people switch to electric heating). (d) Shift right (more of a good in joint supply is produced). (e) Shift right.

**A supply function is given as $Q_s = c + dP$, where "c" is 500 and "d" is 1000. Draw the schedule (table) and graph for equation for prices from Rs1 to Rs10. What is it in the equation that determines the slope of the supply 'curve'?**




| P (in Rs) | $Q_s$ (units) |
|---|---|
| 1 | 1500 |
| 2 | 2500 |
| 3 | 3500 |
| 4 | 4500 |
| 5 | 5500 |
| 6 | 6500 |
| 7 | 7500 |
| 8 | 8500 |
| 9 | 9500 |
| 10 | 10500 |

The graph is an upward sloping straight line crossing the horizontal axis at 500 units. The slope is given by the value of the d term: i.e. the slope is 1/1000 (for every Re1 increase in price, quantity supplied increases by 1000 units).

**Explain the process by which the price of houses would rise if there were a shortage.**

People with houses to sell would ask a higher price than previous sellers of similar houses (probably with the advice of an estate agent). Potential purchasers would be prepared to pay a higher price than previously in order to obtain the type of house they wanted.

**With a typical upward sloping market supply curve and downward sloping market demand curve, what would happen to equilibrium price and quantity if the demand curve shifted to the left?**

Both price and quantity will fall. You should be able to label two demand curves (e.g. D1 and D2), two equilibrium points (e.g. e1 and e2) corresponding prices $P_{e2}$ and $P_{e1}$ ($P_{e2} < P_{e1}$), and quantities $Q_{e2}$ and $Q_{e1}$ ($Q_{e2} > Q_{e1}$).

**What will happen to the equilibrium price and quantity of butter in each of the following cases? You should state whether demand or supply (or both) have shifted and in which direction. (In each case assume ceteris paribus.)**

**(a) A rise in the price of margarine; (b) A rise in the demand for yoghurt; (c) A rise in the price of bread; (d) A rise in the demand for bread; (e) An expected rise in the price of butter in the near future; (f) A tax on butter production; (g) The invention of a new, but expensive, process for**

**removing all cholesterol from butter plus the passing of a law which states that all butter producers must use this process.**

a) Price rises, quantity rises (demand shifts to the right: butter and margarine are substitutes).
b) Price falls, quantity rises (supply shifts to the right: butter and yoghurt are in joint supply).
c) Price falls, quantity falls (demand shifts to the left: bread and butter are complementary goods).
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Yes. Although they are usually less important than demand-side factors, they are, nevertheless important in determining changes in house prices. The two most important are the expectations of the construction industry. If house building firms (contractors) are confident that demand will continue to rise, and with it house prices, they are likely to start building more houses. The resulting increase in the supply of houses (after the time taken to build them) will help to dampen the rise in prices.

The other major supply-side factor is the expectations of house owners. If people think that prices will rise in the near future and are thinking of selling their house, they are likely to delay selling and wait until prices have risen. This (temporary) reduction in supply will help to push up prices even further.

**Draw a supply and demand diagram with the price of labour (the wage rate) on the vertical axis and the quantity of labour (the number of workers) on the horizontal axis. What will happen to employment if the government raises wages from the equilibrium to some minimum wage above the equilibrium?**

Firms' demand for labour will shrink at the new higher wage rate. The supply of workers will rise as more workers would be willing to work (and work more hours) at the higher wage rate. There will thus be unemployment (a surplus of workers) at the minimum wage set.

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Other things being equal, there would probably be a fall in the black-market price. A rise in the official price would cause an increase in the quantity supplied and a reduction in the quantity demanded and hence less of a shortage. There would therefore be less demand for black-market products.

**Will a system of low official prices plus a black market be more equitable or less equitable than a system of free markets?**

More equitable if the supplies at official prices were distributed fairly (e.g. by some form of rationing). If, however, supplies were allocated on a first-come, first-served basis, then on official markets there would still be inequity between those who are lucky enough or queue long enough to get the product and those who do not get it. Also, the rich will still be able to get the product on the black market!

**Think of some examples where the price of a good or service is kept below the equilibrium (e.g. rent controls). In each case consider the advantages and disadvantages of the policy.**

Two examples are:

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  **Advantages:** makes cheap housing available to those who would otherwise have difficulty in affording reasonable accommodation. Disadvantages: causes a reduction in the supply of private rented accommodation; causes demand to exceed supply and thus some people will be unable to find accommodation.

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**Advantages:** allows the price to be advertised in advance and guarantees a full house; makes seats available to those who could not afford the free-market price. Disadvantages: causes queuing or seats are being only available to those booking well in advance.

**Primary and secondary schooling is free in state schools in most countries. If parents are given a choice of schools for their children, there will be a shortage of places at popular schools. What methods could be used for dealing with this shortage? What are their relative merits?**

Some form of rationing (selection) will have to be applied. This could be done on the basis of ability. If the objective is to have schools that cater for the full range of abilities, then this objective will not be met. If the objective is to recruit the most able children, then selection by ability is consistent with this goal. An alternative is to select by geographical location, with the students living nearer to the school being given preference over those living further away. This is the system used by most state schools. It could well disadvantage children with particular needs, however, for whom the school would be particularly suitable. Other methods include the 'sibling' rule, whereby children who have older brothers or sisters already at the school are given preference. This, however, could lead to children living nearer the school being deprived of a place.

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b) Where the penalties were very harsh and the law was strictly enforced, and/or where people were very law abiding.

**Can you think of any examples where prices and wages do not adjust very rapidly to a shortage or surplus? For what reasons might they not do so?**

- Many prices set by companies are adjusted relatively infrequently: it would be administratively too costly to change them every time there was a change in demand. For example a mail order company, where all the items in its catalogue have a printed price, would find it costly to adjust prices very frequently, since that would involve printing a new catalogue, or at least a new price list.
- Many wages are set annually by a process of collective bargaining. They are not adjusted in the interim.

**Why do the prices of fresh vegetables fall when they are in season? Could an individual farmer prevent the price falling?**

Because supply is at a high level. The increased supply creates a surplus which pushes down the price. Individual farmers could not prevent the price falling. If they continued to charge the higher price, consumers would simply buy from those farmers charging the lower price.

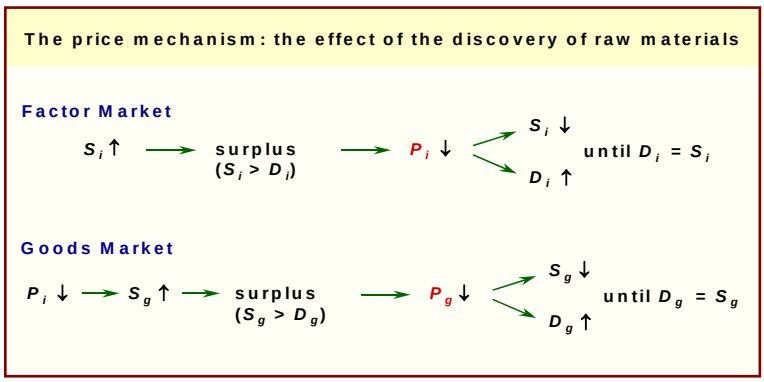
**If you were the owner of a clothes shop, how would you set about deciding what prices to charge for each garment at the end of season sale?**

You would try to reduce the price of each item as little as was necessary to get rid of the remaining stock. The problem for shop owners is that they do not have enough information about consumer demand to make precise calculations here. Many shops try a fairly cautious approach first, and then, if that is not enough to sell all the stock, they make further 'end of sale' reductions later.

**The number of owners of CD players has grown rapidly and hence the demand for CDs has also grown rapidly. Yet the prices of CDs have fallen. How could this come about?**

- The costs of manufacturing CDs may have fallen with improvements in technology and mass-production economies.
- Competition from increased numbers of manufacturers may have increased supply of CDs and driven prices down.
- The advent of copying tracks from the internet reduces the demand for CDs. This change in demand has further compounded the fall in price.

**Explain in words what is happening in the following diagram.**




The new discovery of raw material i means an increase in the supply i. This causes a surplus (excess supply) in the market for i, causing the price of i to fall until the same is removed (lower Pi causes demand to increase and supply to fall). The reduction in Pi also reduces the cost of producing good g (we can assume good g uses the factor i intensively), causing the supply of good g to increase beyond demand. The surplus in the market for good g drives the price of g down until the excess is cleared. The diagram illustrates interdependence between goods and factor markets.

**Can different factor markets be interdependent also? Give examples.**

Yes. A rise in the price of one factor (e.g. oil) will encourage producers to switch to alternatives (e.g. coal). This will create a shortage of coal and drive up its price. This will encourage increased production of coal. Similarly an increase in the population (and consequently size of the labour force) of a country will depress the price of labour (wages). This will cause producers to shift to more labour intensive production and reduce production methods which are capital (or machine) intensive. As a result the demand for capital will fall reducing its rental price.

Lesson 06

# ELASTICITIES

## IMPORTANCE OF ELASTICITY IN OUR TODAY'S LIFE

There is much more importance of the concept of elasticity in our life.

- The firm which uses advertising to change prices uses the concept of elasticity of demand of its product.
- Mostly firms set the prices of their product by viewing at the elasticity of demand of their product.
- The government collects revenues by imposing taxes. The good tax imposed by the government on the products is one for which either demand is inelastic or the supply is inelastic.
- So if the government wants to put tax burden on the consumers then it will choose the product to tax with low price elasticity of demand.
- And if government wants to panelize the producers then it must choose the product with low price elasticity of supply.

## ELASTICITY

Elasticity is a term widely used in economics to denote the "responsiveness of one variable to changes in another." In proper words, it is the relative response of one variable to changes in another variable. The phrase "relative response" is best interpreted as the percentage change.

## TYPES OF ELASTICITY

There are four major types of elasticity:

- Price Elasticity of Demand
- Price Elasticity of Supply
- Income Elasticity of Demand
- Cross-Price Elasticity of Demand

### Price Elasticity of Demand:

Price elasticity of demand is the percentage change in quantity demanded with respect to the percentage change in price.

Price elasticity of demand can be illustrated by the following formula:

$$PЄ_d = \frac{\text{Percentage change in Quantity Demanded}}{\text{Percentage change in Price}}$$

Where Є = Epsilon; universal notation for elasticity.

If, for example, a 20% increase in the price of a product causes a 10% fall in the Quantity demanded, the price elasticity of demand will be:

$$PЄ_d = \frac{-10\%}{20\%} = -0.5$$

### Price Elasticity of Supply:

Price elasticity of supply is the percentage change in quantity supplied with respect to the percentage change in price.

Price elasticity of supply can be illustrated by the following formula:

$$PЄs = \frac{\text{Percentage change in Quantity Supplied}}{\text{Percentage change in Price}}$$

If a 15% rise in the price of a product causes a 15% rise in the quantity supplied, the price elasticity of supply will be:

$$PЄs = \frac{15\ \%}{15\ \%} = 1$$

**Income Elasticity of Demand:**

Income elasticity of demand is the percentage change in quantity demanded with respect to the percentage change in income of the consumer.

Income elasticity of demand can be illustrated by the following formula:

$$\text{YЄd} = \frac{\text{Percentage change in Quantity Demanded}}{\text{Percentage change in Income}}$$

If a 2% rise in the consumer's incomes causes an 8% rise in product's demand, then the income elasticity of demand for the product will be:

$$\text{YЄd} = \frac{8\%}{2\%} = 4$$

**Cross-Price Elasticity of Demand:**

Cross price elasticity of demand is the percentage change in quantity demanded of a specific good, with respect to the percentage change in the price of another related good.

$$\text{PbЄda} = \frac{\text{Percentage change in Demand for good a}}{\text{Percentage change in Price of good b}}$$

If, for example, the demand for butter rose by 2% when the price of margarine rose by 8%, then the cross price elasticity of demand of butter with respect to the price of margarine will be.

$$\text{PbЄda} = \frac{2\%}{8\%} = 0.25$$

If, on the other hand, the price of bread (a compliment) rose, the demand for butter would fall. If a 4% rise in the price of bread led to a 3% fall in the demand for butter, the cross-price elasticity of demand for butter with respect to bread would be:

$$\text{PbЄda} = -\frac{3\%}{4\%} = -0.75$$

**WHY WE USE PERCENTAGE CHANGE RATHER THAN ABSOLUTE CHANGE IN ELASTICITY?**

1. By using percentage changes and proportions we can avoid the problem of comparison in two different quantitative variables i-e Qd is measured in units and Price is measured in rupees. So by calculating percentages we can avoid the problem of unit conversion into rupees.
2. It helps us avoid that of what size of units to be changed i-e A jump from Rs.2 to Rs.4 could be described as a 100% increase or as an increase of Rs.2. but by using percentages we can avoid this problem because both gives the same answer.
3. It also helps how to define big or small changes. By looking at Rs.2 or Rs.4, we can't say that it is a big change or a small change. But if we translate it in the form of percentages then it becomes 100% which is a big change.

**ELASTIC AND INELASTIC DEMAND**

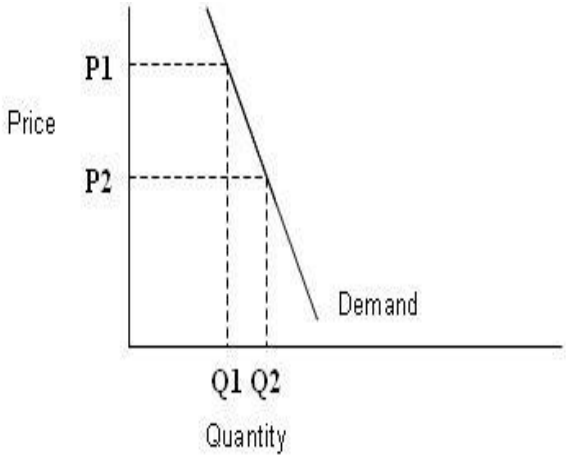
Slope and elasticity of demand have an inverse relationship. When slope is high elasticity of demand is low and vice versa.

When the slope of a demand curve is infinity, elasticity is zero (perfectly inelastic demand); and when the slope of a demand curve is zero, elasticity is infinite (perfectly elastic demand).

Unit elasticity means that a 1% change in price will result in an exact 1% change in quantity demanded. Thus elasticity will be equal to one. A unit elastic demand curve plots as a rectangular hyperbola. Note that a straight line demand curve cannot have unit elasticity as the value of elasticity changes along the straight line demand curve.

Elastic demand curve


Inelastic demand curve




**TOTAL REVENUE AND ELASTICITY**

Total revenue (TR) = Price x Quantity (P x Q)

**Elastic demand** means when price of any product increases, its demand decreases more than the increase in price. As price increases total revenue decreases in case of elastic demand.

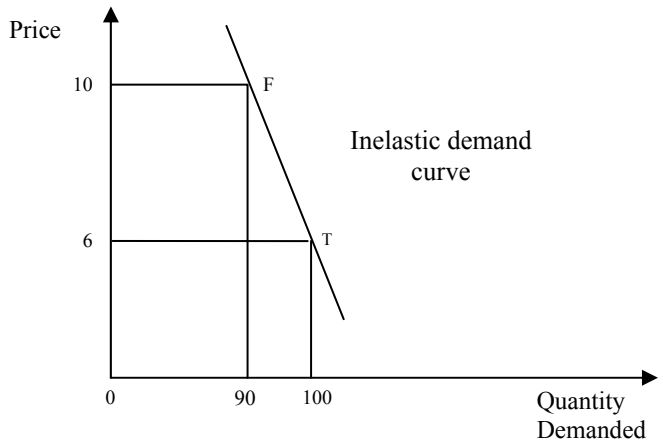
**Inelastic demand** of any product means that if price of that product increases there is very small effect on its quantity demanded. As price increases, total revenue also increases in case of inelastic demand.

**For example,** flour is the basic necessity of life for all people. Its demand is inelastic. As the price of flour increases, its quantity demanded does not decrease much because people have to use flour in all situations whether its price is high or low.

**EXAMPLE OF 2 FIRMS**

**Firm 1: (Inelastic demand curve)**

For inelastic demand curve, firm increases its prices but quantity demanded does not change as much. Increase in price is greater while the decrease in quantity is smaller. So firm will earn more revenues by increasing prices. So TR increases as the price increases.




Є = percentage change in Qd
Percentage change in P

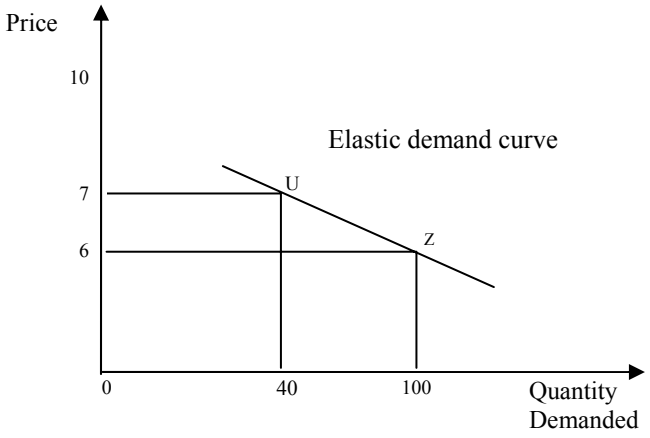
$= \frac{90 - 100}{100} \div \frac{10 - 6}{6}$

$= -0.15$

In the above figure, Elasticity for firm 1 is equal to -0.15; it is less than 1 (ignoring minus sign) which shows that the demand curve is inelastic.

**Firm 2: (Elastic demand curve)**

For elastic demand curve, firm does not increase its prices. Because as prices increases, quantity demanded decreases much larger. Decrease in quantity demanded is greater than the increase in prices. So firm will earn less revenue. So TR decreases as price increases.




Є = percentage change in Qd
Percentage change in P

$= \frac{40 - 100}{100} \div \frac{7 - 6}{6}$

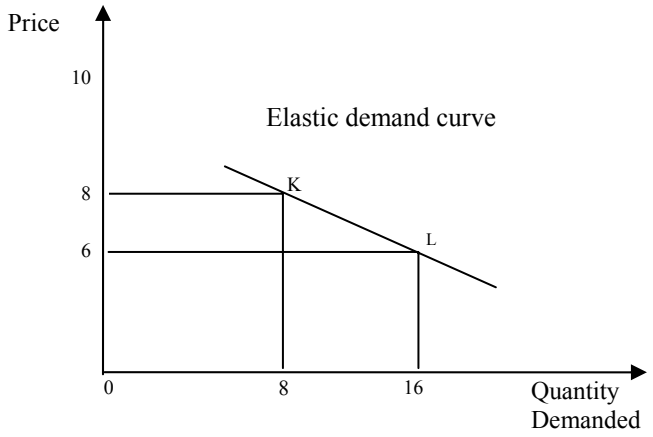
$= -3.6$

In the above figure elasticity for firm 2 is -3.6; it is greater than 1 (ignoring minus sign) which shows that the demand curve is elastic.

**ELASTICITY BETWEEN TWO POINTS**

Elasticity can also be calculated between two points.

**Figure:**




In this figure, elasticity from point K to L is -4.

$$Є_{KL} = \frac{\text{percentage change in Qd}}{\text{Percentage change in P}}$$

$$= \frac{\frac{16-8}{8}}{\frac{6-8}{8}}$$

$$= -4$$

Since absolute value is greater than 1 so it is elastic.
Similarly we can also calculate for inelastic demand curve.

**Arc Elasticity**

Arc elasticity measures the "average" elasticity between two points on the demand curve. The formula is simply (change in quantity/change in price)*(average price/average quantity).

To measure arc elasticity we take average values for Q and P respectively.

**Point Elasticity**

Point elasticity is used when the change in price is very small, i.e. the two points between which elasticity is being measured essentially collapse on each other. Differential calculus is used to calculate the instantaneous rate of change of quantity with respect to changes in price (dQ/dP) and then this is multiplied by P/Q, where P and Q are the price and quantity obtaining at the point of interest. The formula for point elasticity can be illustrated as:

$$Є = \frac{\Delta Q}{\Delta P} \times \frac{P}{Q}$$

Or this formula can also be written as:

$$Є = \frac{dQ}{dP} \times \frac{P}{Q}$$

Where d = infinitely small change in price.
If elasticity = zero then demand curve will be vertical.
If elasticity is infinity then the demand curve will be horizontal.

**POINT ELASTICITY FOR QUADRATIC DEMAND FUNCTION**

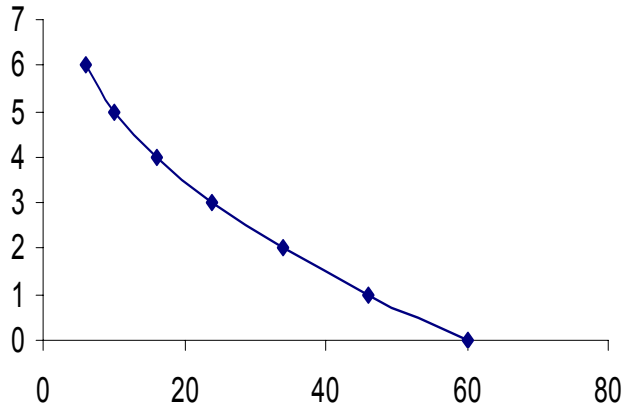
The quadratic demand function is

**$Qd = 60 - 15P + P^2$**

Assume different values of price e-g from 0 to 10. Put these values in this equation and find out the quantity demand. Here we take price from 0 to 3.

| **P** | **60** | **-15P** | **$P^2$** | **$Qd = 60 – 15P + P^2$** |
|---|---|---|---|---|
| 0 | 60 | 0 | 0 | 60 |
| 1 | 60 | -15 | 1 | 46 |
| 2 | 60 | -30 | 4 | 34 |
| 3 | 60 | -45 | 9 | 24 |

Then draw a figure, plot prices on vertical axis and quantity on horizontal axis. The resulting curve will be downward sloping curve.




To find the point elasticity of demand from this quadratic equation, differentiate it with respect to price,

$$Qd = 60 – 15P + P^2$$

$$dQ/dP = -15 + 2P$$

IF P=3 then

$$dQ/dP = -15 + 2(3)$$
$$= -15 + 6$$
$$= -9$$

And

$$Qd = 60- 15(3) + (3)^2$$
$$= 24$$

The formula of elasticity = (dQ / dP) (P/Q)
= -9 (3/24)
= -1.125

Its absolute value (ignoring minus sign) is greater than one so it is point elastic.

Lesson 07

## ELASTICITIES (CONTINUED)

**INELASTIC DEMAND 0< Є < 1**

- Price rises:
  As P increases, Q decreases
  Percentage change in P > percentage change in Q
  Now TR = P x Q TR will also increase
- Price falls:
  As P decreases, Q increases
  Percentage change in P > percentage change in Q
  Now TR = P x Q TR will also decrease

**ELASTIC DEMAND Є > 1**

- Price rises:
  As P increases, Q decreases
  Percentage change in P < percentage change in Q
  Now TR = P x Q TR will also decrease
- Price falls:
  As P decreases, Q increases
  Percentage change in P < percentage change in Q
  Now TR = P x Q TR will also increase

**UNIT ELASTIC DEMAND Є = 1**

- Price rises:
  As P increases, Q decreases
  Percentage change in P = percentage change in Q.
  Now TR = P x Q TR will remain unchanged.
- Price falls:
  As P decreases, Q increases
  Percentage change in P = percentage change in Q.
  Now TR = P x Q TR will remain unchanged.

**TABLE OF UNITARY ELASTICITY**

| P | Q | TR |
|---|---|---|
| 2.5 | 400 | 1,000 |
| 5 | 200 | 1,000 |
| 10 | 100 | 1,000 |
| 20 | 50 | 1,000 |
| 40 | 25 | 1,000 |

The curve of unitary elastic demand will be a hyperbola.

**DETERMINANTS OF PRICE ELASTICITY OF DEMAND**

**1. Number of close substitutes within the market** - The more (and closer) substitutes available in the market the more elastic demand will be in response to a change in price. In this case, the substitution effect will be quite strong.

**2. Percentage of income spent on a good** - It may be the case that the smaller the proportion of income spent taken up with purchasing the good or service the more inelastic demand will be.

**3. Time period under consideration** - Demand tends to be more elastic in the long run rather than in the short run. For example, after the two world oil price shocks of the 1970s - the "response" to higher oil prices was modest in the immediate period after price increases, but as time passed, people found ways to consume less petroleum and other oil products. This included measures to get better mileage

from their cars; higher spending on insulation in homes and car pooling for commuters. The demand for oil became more elastic in the long-run.

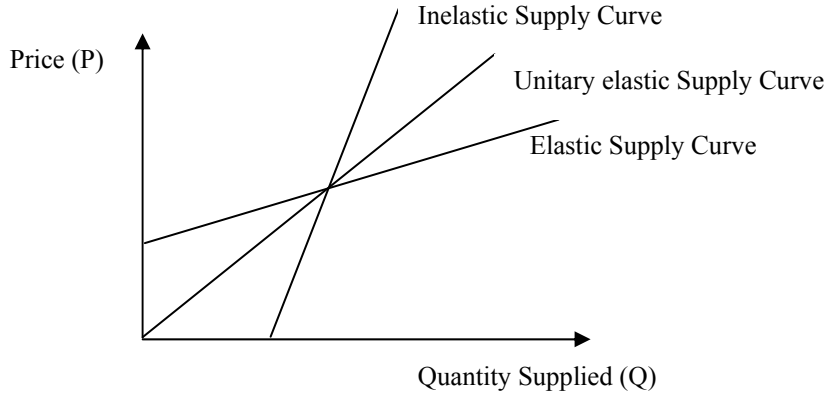
**EFFECTS OF ADVERTISING ON DEMAND CURVE**

Advertising aims to:

- Change the slope of the demand curve – make it more inelastic. This is done by generating brand loyalty;
- Shift the demand curve to the right by tempting the people's want for that specific product.

**PRICE ELASTICITY OF SUPPLY**

The relative response of a change in quantity supplied to a relative change in price. More specifically the price elasticity of supply can be defined as the percentage change in quantity supplied due to a percentage change in supply price.




- Calculating elasticities between two points at the same curve involves arc elasticity method.
- While calculating elasticity at a certain point involves point elasticity method.

**DETERMINANTS OF PRICE ELASTICITY OF SUPPLY**

- If costs increases, lower will be the supply. Lower the costs the more will be the supply.
- Amount of time given to quantity respond to a price increase or decrease. There may be immediate time period, short term and long term time period.

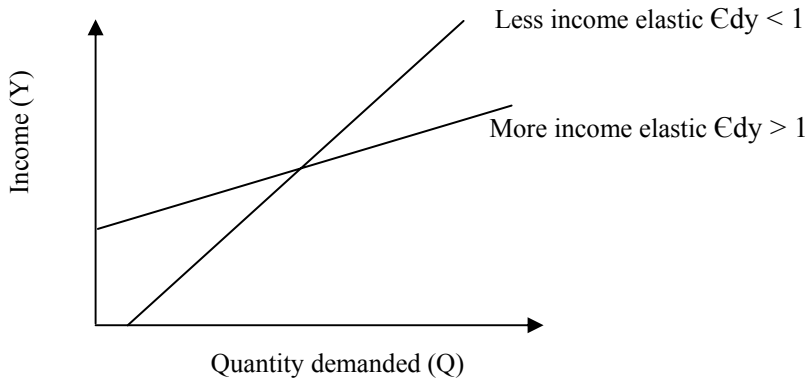
Lesson 08

## ELASTICITIES (CONTINUED)

### INCOME ELASTICITY OF DEMAND

The relative response of a change in demand to a relative change in income. More specifically the income elasticity of demand can be defined as the percentage change in demand due to a percentage change in buyers' income. The income elasticity of demand quantitatively identifies the theoretical relationship between income and demand.

$$Єdy = \frac{\Delta \mathbf{Q}}{Q} \div \frac{\Delta Y}{Y}$$




If the sign of income elasticity of demand is positive, the good is normal and if sign is negative, the good is inferior.

**Table:**

| Income (Rs) | Quantity Demanded (units) |
|---|---|
| 10000 | 100 |
| 12000 | 105 |

$$YЄd = \frac{\Delta Q}{Q} \div \frac{\Delta Y}{Y}$$
$$= \frac{5}{100} \div \frac{2000}{10000}$$
$$= 0.25$$

The Good is normal (the sign is positive). But its demand is income inelastic o< | Є | < 1.

### DETERMINANTS OF INCOME ELASTICITY OF DEMAND

The determinants of income elasticity of demand are:

- Degree of necessity of good.
- The rate at which the desire for good is satisfied as consumption increases
- The level of income of consumer.

**Short Run and Long Run**

Short run is a period in which not all factors can adjust fully and therefore adjustment to shocks can only be partial.

Long run is a period over which all factors can be changed and full adjustment to shocks can take place.

# ECO401 – INTRODUCTION TO ECONOMICS

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Lesson 08

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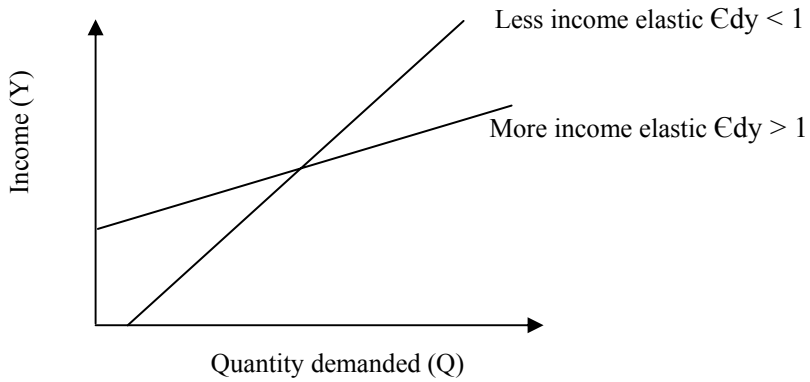


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Short run is a period in which not all factors can adjust fully and therefore adjustment to shocks can only be partial.

Long run is a period over which all factors can be changed and full adjustment to shocks can take place.

LONG RUN:
Long run is a period in which all factors may be varied and in which firm may enter or leave the class

SHORT RUN:
Short run is a period over which one or more factors of production is fixed in supply.

**MINISTRY OF AGRICULTURE REPORT**

| Food Stuff | YЄd |
|---|---|
| Milk | -0.40 |
| Eggs | -0.41 |
| Mutton | -0.21 |
| Bread | -0.25 |
| Butter | -0.04 |
| MargarIne | -0.44 |
| Sugar | -0.54 |
| Fresh Potatoes | -0.48 |
| Tea | -0.56 |
| Cheese | 0.19 |
| Beef | 0.08 |
| Cakes&Buiscuits | 0.02 |
| Fresh Green Vegetables | 0.13 |
| Fresh Fruit | 0.48 |
| Fresh Juices | 0.94 |
| Coffee | 0.23 |
| ElasticIty For All Food | -0.01 |

## CROSS-PRICE ELASTICITY OF DEMAND

Cross price elasticity of demand is the percentage change in quantity demanded of a specific good, with respect to the percentage change in the price of another related good.

$$PbЄda = \frac{\Delta Qa}{Q\,a} \div \frac{\Delta Pb}{Pb}$$

**Table**

| Demand for A | Price of B |
|---|---|
| 100 | 10 |
| 140 | 12 |

$$PbЄda = \frac{\Delta Qa}{Q\,a} \div \frac{\Delta Pb}{Pb}$$

$$= \frac{40}{100} \div \frac{2}{10}$$

$$= 2$$

Goods are substitutes (sign is positive). Demand is cross price elastic $|\epsilon| > 1$.

## DETERMINANTS OF CROSS PRICE ELASTICITY OF DEMAND

- **Time period**
  The longer the time period, the more will be the elasticity,
- **Tastes and preferences**
  Taste and preferences can change.

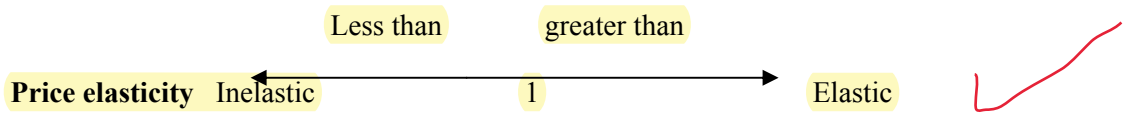
## INCIDENCE OF TAXATION

A tax results in a vertical shift of the supply curve as it increases the cost of producing the taxed product.

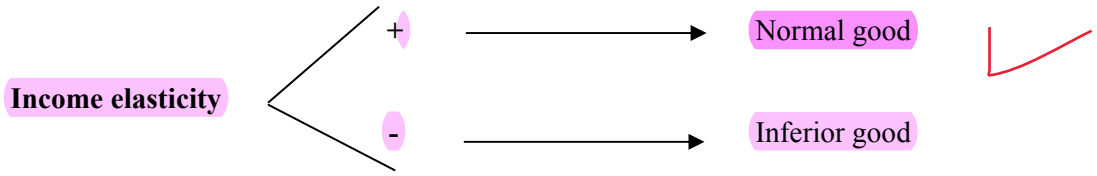
The incidence of taxation relates to how much of the tax's burden is being borne by consumers and producers. The more inelastic the demand, the more of the tax's burden will fall on consumers. The more inelastic the supply, the more of the tax's burden will fall on producers.
Terms of trade means the 'real' terms at which a nation sells its exports and buys its import.
OPEC: Organization of Petroleum Exporting Countries.

**THREE CORE RULES OF ELASTICTY**

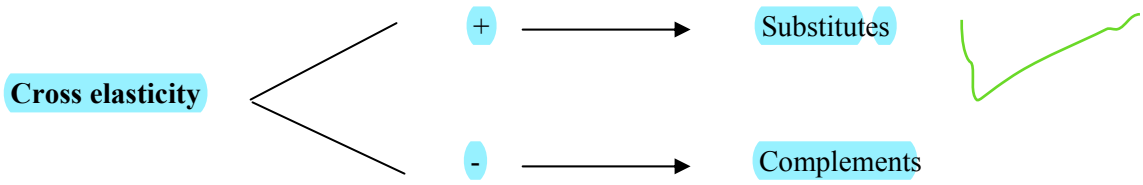
**RULE # 01**




**RULE # 02**




**RULE # 03**



## EXERCISES

**Why will the price elasticity of demand for a particular brand of a product (e.g. Shell) be greater than that for the product in general (e.g. petrol)? Is this difference the result of a difference in the size of the income effect or the substitution effect?**

The price elasticity of demand for a particular brand is more elastic than that for a product in general because people can switch to an alternative brand if the price of one brand goes up. No such switching will take place if the price of the product in general (i.e. all brands) goes up. Thus the difference in elasticity is the result of a difference in the size of the substitution effect.

**Will a general item of expenditure like food (or clothing) have a price-elastic or inelastic demand? Discuss in the context of income and substitution effects.**

The income effect will be relatively large (making demand relatively elastic). The substitution effect will be relatively small (making demand relatively inelastic). The actual elasticity will depend on the relative size of these two effects.

**Demand for oil might be relatively elastic over the longer term, and yet it could still be observed that over time people consume more oil (or only very slightly less) despite rising oil prices. How can this apparent contradiction be explained?**

Because, there has been a rightward shift in the demand curve for oil. This is likely to be the result of rising incomes. Car ownership and use increase as incomes increase. Also tastes may have changed so that people want to drive more. There may also have been a decline in substitute modes of transport such as rail transport and buses. Finally, people may travel longer distances to work as a result of a general move to the suburbs.

**Assume that demand for a product is inelastic. Will consumer expenditure go on increasing as price rises? Would there be any limit?**

So long as demand remains inelastic with respect to price, then consumer expenditure will go on rising as price rises. However, if the price is raised high enough, demand always will become elastic.

**Can you think of any examples of goods which have a totally inelastic demand (a) at all prices; (b) over a particular price range?**

a) No goods fit into this category, otherwise price could rise to infinity with no fall in demand – but people do not have infinite incomes!
b) Over very small price ranges, the demand for goods with no close substitutes, oil, water (where it is scarce) may be totally inelastic.

**What will the demand curve corresponding to the following table look like?**

**If the curve had an elasticity of –1 throughout its length, what would be the quantity demanded (a) at a price of £1; (b) at a price of 10p; (c) if the good were free?**

| *P (£)* | *Q* | *Total Expenditure (£)* |
|---|---|---|
| 2.5 | 400 | 1000 |
| 5 | 200 | 1000 |
| 10 | 100 | 1000 |
| 20 | 50 | 1000 |
| 40 | 25 | 1000 |

The curve will be a 'rectangular hyperbola': it will be a smooth curve, concave to the origin which never crosses either axis ($Q_d = 1000/P$).

a. 1000 units.
b. 10 000 units.
c. There would be infinite demand!

**Referring to the following table, use the mid-point (arc) formula to calculate the price elasticity of demand between (a) P = 6 and P = 4; (b) P = 4 and P = 2. What do you conclude about the elasticity**

**of a straight-line demand curve as you move down it?**

| **Price** | **Quantity Demanded** |
|---|---|
| **6** | **20** |
| **5** | **25** |
| **4** | **30** |
| **3** | **35** |
| **2** | **40** |

Using the formula: (ΔQ/mid Q) ÷ (ΔP/mid P) gives the following answers:

(a) $10/25 \div -2/5$
$= 10/25 \times 5/-2$
$= 50/-50$
$= -1$ (which is unit elastic)

(b) $10/35 \div -2/3$
$= 10/35 \times 3/-2$
$= 30/-70$
$= -0.43$ (which is inelastic)

The elasticity decreases as you move down a straight-line demand curve.

**Given $Qd = 60 - 15P + P^2$, calculate the (point) price elasticity of demand at a price of:**

a. **5**
b. **2**
c. **0.**

Given that:
$Qd = 60 - 15P + P^2$
Then,
$dQ/dP = -15 + 2P$.
Thus using the formula, $P\varepsilon_d = dQ/dP \times P/Q$, the elasticity at the each of the above price points
Equals:

(a) $(-15 + (2 \times 5)) \times (5/ (60 - (15 \times 5) + 5^2))$
$= -5 \times 5/10 =$ **–2.5**

(b) $(-15 + (2 \times 2)) \times (2/ (60 - (15 \times 2) + 2^2))$
$= -11 \times 2/34 =$ **–0.65**

(c) $(-15 + (2 \times 0)) \times (0/ (60 - (15 \times 0) + 0^2))$
$= -15 \times 0/60 =$ **0**

**As you move down a straight-line demand curve, what happens to elasticity? Why?**
It decreases. P/Q gets less and less, but dQ/dP remains constant.

**Given the following supply schedule:**

| ***P*** | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|
| **Q** | 0 | 10 | 20 | 30 | 40 |

a. **Draw the supply curve.**
b. **Using the arc method calculate price elasticity of supply:**
   i. **Between P = 2 and P = 4;**
   ii. **Between P = 8 and P = 10**
c. **Using the point method calculate price elasticity of supply at P = 6.**
d. **Does the elasticity of the supply curve increase or decrease as P and Q increase? Why?**
e. **What would be the answer to (d) if the supply curve had been a straight line but intersecting the horizontal axis to the right of the origin?**

**a.** The supply curve will be an upward sloping straight line crossing the vertical axis where P = 2.
**b.** Using the formula ΔQ/average Q ÷ ΔP/average P, gives:
$10/5 \div 2/3 =$ **3**
$10/35 \div 2/9 =$ **1.29**

**c.** Using the formula dQ/dP × P/Q, and given that dQ/dP = 5 (= 10/2), gives:
5 × 6/20= **1.5**

**d.** The elasticity of supply decreases as P and Q increase. It starts at infinity where the supply curve crosses the vertical axis (Q = 0 and thus P/Q =∞).

**e.** No. At the point where it crossed the horizontal axis, the elasticity of supply would be zero (P = 0 and thus P/Q = 0). Thereafter, as P and Q increased, so would the elasticity of supply.

**Which are likely to have the highest cross elasticity of demand: two brands of tea, or tea and coffee?**

Two brands of tea, because they are closer substitutes than tea and coffee.

**Supply tends to be more elastic in the long run than in the short run. Assume that a tax is imposed on a good that was previously untaxed. How will the incidence of this tax change as time passes? How will the incidence be affected if demand too becomes more elastic over time?**

As supply becomes more elastic, so output will fall and hence tax revenue will fall. At the same time price will tend to rise and hence the incidence will shift from the producer to the consumer.

As demand becomes more elastic, so this too will lead to a fall in sales. This, however, will have the opposite effect on the incidence of the tax: the burden will tend to shift from the consumer to the producer.

**If raising the tax rate on cigarettes raise more revenue and reduce smoking, are there any conflict between the health and revenue objectives of the government?**

There may still be a dilemma in terms of the amount by which the tax rate should be raised. To raise the maximum amount of revenue may require only a relatively modest increase in the tax rate. To obtain a large reduction in smoking, however, may require a very large increase in the tax rate. Ultimately, if the tax rate were to be so high as to stop people smoking altogether, there would be no tax revenue at all for the government!

**You are a government minister; what arguments might you put forward in favour of maximising the revenue from cigarette taxation?**

That it is better than putting the taxes on more socially desirable activities. That there is the beneficial spin-off from reducing a harmful activity. (You would conveniently ignore the option of putting up taxes beyond the point that maximizes revenue and thus cutting down even more on smoking.)

**You are a doctor; why might you suggest that smoking should be severely restricted? What methods would you advocate?**

That the medical arguments concerning damage to health should take precedence over questions of raising revenue. You would probably advocate using whatever method was most effective in reducing smoking. This would probably include a series of measures from large increases in taxes, to banning advertising, to education campaigns against smoking. You might even go so far as to advocate making smoking tobacco illegal. The problem here, of course, would be in policing the law.

**Why is the supply curve for food often drawn as a vertical straight line?**

It is because; the supply of food is virtually fixed in the short run. Once a crop is grown and harvested, then it is of a fixed amount. (In practice, the timing of releasing crops on to the market can vary, given that many crops can be stored. This does allow some variation of supply with price.)

**The income elasticity of demand for potatoes is negative (an 'inferior' good). What is the implication of this for potato producers?**

Potato producers would expect to earn less as time goes past, given that national income rises over time. Thus if the incomes of individual potato producers are to be protected, production should be reduced (with some potato dairy farmers switching to other foodstuffs or away from food production altogether).

Lesson 09

## CONSUMER BEHAVIOR: CONSUMPTION SIDE ANALYSIS

### SCARCITY AND RATIONAL CHOICE

Although scarcity, as defined in Lectures 1-2 was of a different nature, the most common form of scarcity is the scarcity of income, i.e., the money resources are limited and consumers are faced with the decision on how to spend those scarce resources on different goods and services.

Rational choice consists in evaluating the costs and benefits of different decisions and then choosing the decision that gives the highest benefit relative to cost.

While taking decisions, economics stress the importance of weighing the marginal costs against marginal benefits rather than total costs and benefits.

**Ignorance and Irrationality:**

There is a difference between "ignorance" and "irrationality." A person operating under uncertainty and thus at least partial ignorance can still make rational decisions by taking into account all the information she has at her disposal. Rationality is an ex-ante concept. Economists do not judge rational behavior on the basis of actual outcomes, rather on the basis of choices made.

### CARDINAL VS. ORDINAL APPROACH

There are two approaches to analyzing consumer behavior;

- Marginal utility analysis (Cardinal approach)
- Indifference curve approach (Ordinal approach)

### MARGINAL UTILITY ANALYSIS OR CARDINAL APPROACH

Marginal utility approach involves cardinal measurement of utility, i.e., you assign exact values or you measure utility in exact units, while the indifference curve approach is an ordinal approach, i.e., you rank possibilities or outcomes in an order of preferences, without assigning them exact utility values.

**Utility** is the usefulness, benefit or satisfaction derived from the consumption of goods and services.

**Total utility (TU)** is the entire satisfaction one derives from consuming a good or service.

**Marginal utility (MU)** is the additional utility derived from the consumption of one or more unit of the good.

### THE LAW OF DIMINISHING MARGINAL UTILITY

The law of diminishing marginal utility states that as you consume more and more of a particular good, the satisfaction or utility that you derive from each additional unit falls.

**Example:**

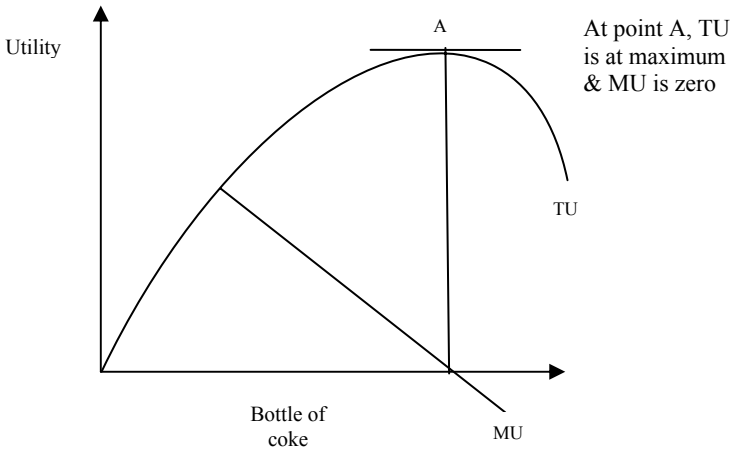
| Bottle of coke | TU | MU |
|---|---|---|
| 0 | 0 | ------- |
| 1 | 7 | 7-0=7 |
| 2 | 11 | 11-7=4 |
| 3 | 13 | 2 |
| 4 | 14 | 1 |
| 5 | 14 | 0 |
| 6 | 13 | -1 |

As we consume more & more bottles of cokes, total utility increases & marginal utility remains positive till units 4, after that total utility starts decreasing & marginal utility becomes negative. Total utility is maximum at unit 5 & marginal utility is zero at this point.

**Total & Marginal utility curves:**

The marginal utility curve slopes downwards in a MU-Q graph showing the principle of diminishing marginal utility. The MU curve is exactly equal to the demand curve.

The total utility curve starts at the origin and reaches the peak when marginal utility is zero. Marginal utility can be derived from total utility. It is the slope of the lines joining two adjacent points on the TU curve.




**Marginal utility functions can also be derived using calculus:**
$TU = 60Q - 4Q^2$
This is quadratic utility function. To find out marginal utility, we take derivative of TU function:
$MU = dTU/ dQ = 60-8Q$
For calculating MU, we take different values of Q.

**DECIDING ON THE OPTIMAL LEVEL OF CONSUMPTION**
**Consumer Surplus:**
Consumer surplus is the difference between willingness to pay and what the consumer actually has to pay: i.e. CS= MU-P. Total consumer surplus is the area between the MU curve and the horizontal market price line. Thus as price increases, consumer surplus shrinks, and vice versa.
The optimal point of consumption is that point where consumer surplus becomes zero. If marginal utility is greater than price, consumption will increase causing MU to fall until it equals price, and vice versa.
There are 3 points regarding marginal utility and price:
**1-** Consumer will consume additional units of the commodity until marginal utility becomes equal to the price (MU = P)
**2-** If MU > P then consumer will increase consumption, increasing consumption causes MU to fall and MU will become equal to the P.
**3-** If MU < P then consumer will decrease consumption, decreasing consumption causes MU to rise and MU will become equal to the P.

**THE EQUI-MARGINAL PRINCIPLE**
In the case of more than two goods, optimum consumption point can be arrived at by using the equi-marginal principle. This states that a person will derive a maximum level of TU from consuming a particular bundle of goods when the utility derived from the last dollar spent on each good is the same:

$$\frac{MUa}{Pa} = \frac{MUb}{Pb} = \frac{MUc}{P_C} \ldots\ldots\ldots\ldots$$

Lesson 10

## CONSUMER BEHAVIOR: CONSUMPTION SIDE ANALYSIS (CONTINUED)

### SUPPLY SIDE AND DEMAND SIDE VIEWS ON THE VALUE OF GOOD

According to the supply side view on the value of a good, the value of a good was determined by the labor content that had gone into producing good, either directly or indirectly.

According to the demand side view on the value of a good, the value of a good was determined by its marginal utility. This helped solve the diamond-water paradox, i.e. why diamonds have such a high price while water (much more essential for life) sells so cheaply.

### SUPPLY SIDE AND DEMAND SIDE: DIAMOND WATER PARADOX

Economists like recordo and Karl Marx focused on the supply side of the economics. In their opinion any good produced, its value is equal to the labor content used in its production. For example, if workers are working 8 hours a day to produce bicycles then their time multiplied is the value of that bicycle. This is labor content. On the other hand, economists like Adam smith focused on the demand side of the economics.

They face a paradox of diamond and water. They found that water and diamond are very different in value. Water is extremely used thing while diamonds are not much used. The price of diamond is very high while the price of water is very low. Since water is used widely so it's marginal utility is very low. And diamonds are used very rarely so its marginal utility is very high.

On supply side, water is abundant so has low value and diamond is scarce so has very high value.

The "law" of diminishing marginal utility is said to explain the "paradox of water and diamonds", most commonly associated with Adam Smith. Human beings cannot even survive without water, whereas diamonds were in Smith's day mere ornamentation or engraving bits. Yet water had a very small price, and diamonds a very large price, by any normal measure. Marginalists explained that it is the marginal usefulness of any given quantity that matters, rather than the usefulness of a class or of a totality. For most people, water was sufficiently abundant that the loss or gain of a gallon would withdraw or add only some very minor use if any; whereas diamonds were in much more restricted supply, so that the lost or gained use were much greater.

That is not to say that the price of any good or service is simply a function of the marginal utility that it has for any one individual nor for some typical individual. Rather, individuals are willing to trade based upon the respective marginal utilities of the goods that they have or desire (with these marginal utilities being distinct for each potential trader), and prices thus develop constrained by these marginal utilities. The "law" is not about geology or cosmology, so does not tell us such things as why diamonds are naturally less abundant on the earth than is water, but helps us to understand how relative abundance affects the value imputed to a given diamond and the price of diamonds in a market.

### UNCERTAINTY IN THE CONSUMPTION DECISION ANALYSIS

**Uncertainty** is the possibility that any number of things could happen in the future. In other words, the future is not known.

The problem of uncertainty is integral to consumption decisions especially in the matter of purchasing durable goods. Uncertainty means assigning probabilities to the outcomes.

A consumer's response to uncertainty depends upon her attitude to risk: whether she is:

- **a.** Risk averse
- **b.** Risk-loving
- **c.** Risk neutral

### RISK

Risk means to take a chance after the probabilities have been assigned. Risk is the possibility of gain or loss. Risk the calculated probability of different events happening, is usually contrasted with uncertainty the possibility that any number of things could happen. For example, uncertainty is the possibility that you could win or lose $100 on the flip of a coin. You don't know which will happen, it could go either way. Risk, in contrast, is the 50 percent chance of winning $100 and the 50 percent chance of losing

$100 on the flip of the coin. You know that your probability of winning or losing is 50 percent because the coin has a 50 percent chance of coming up either heads or tails.

**The odds ratio (OR)** is the ratio of the probability of success to the probability of failure. It can be equal to 1, less than 1 or greater than 1. If it is equal to 1 we call it fair odds, if less then 1 unfavorable odds, and if greater 1 then favorable odds.

**A risk neutral person** is one who buys a good when OR > 1. He is indifferent when OR = 1 and will not buy when OR < 1.

**A risk averse person** will not buy if OR < 1. He will also not buy if OR = 1. He might also not decide to buy if OR > 1.

**A risk loving person** will buy if OR > 1 or = 1, but he might also buy when OR is < 1.

The degree of risk aversion increases as your income level falls, due to diminishing marginal utility of income.

Risk aversion is a common feature of rational utility maximizing behavior by the average consumer.

**Example:**

If chances of winning = 50%

Chances of losing = 50%

You toss a coin, if head comes, you are given Rs. 100 & if tail comes, you have to pay Rs. 100. Will you play this game or not?

The answer is if you are a risk averse person then you will not play this game because you consider much the loss of Rs. 100 than the gain of Rs. 100. On the other hand, if you are risk loving person then you will play this game.

**The total utility curve** for a risk neutral person will be a straight line while it will be convex for risk averse person. The greater the convexity (curvature) the more risk averse the person will be.

**RISK HEDGING** can be used to reduce the extent to which concerns about uncertainty affect our daily lives.

**Example: Insurance companies** operate under the principle of law of large numbers. An insurance company collects the premium from the people. They also diversify the risk.

In the presence of asymmetric information, an insurance company has to contend with the problems of **adverse selection** (people who want to buy insurance are also the most risky customers; an ex-ante problem) and **moral hazard** (once a person is insured his behavior might become more rash; an ex-post problem).

Lesson 11

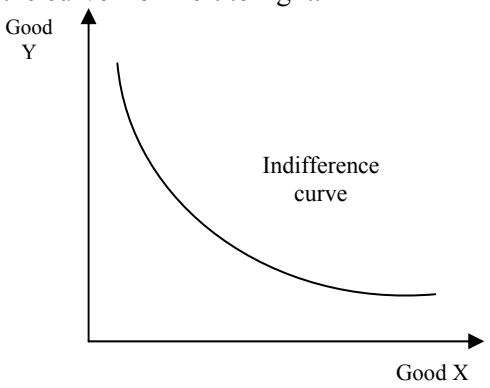
## CONSUMER BEHAVIOR: CONSUMPTION SIDE ANALYSIS (CONTINUED)

### THE INDIFFERENCE CURVE APPROACH OR ORDINAL APPROACH

This ordinal approach to utility consists in asking the question as to whether the consumer prefers one combination or bundle of goods to another combination or bundle of goods. Ordinal approaches do not require a "measurement" of the utility a person gains, rather, only a ranking of the various bundles in order of preference.

**An indifference curve** is a line which charts out all the different points on which the consumer is indifferent with respect to the utility he derives (in other words it is a combination of all equi-utility points). It is drawn in goods space, i.e. a good Y on the vertical axis and a good X on the horizontal axis.

Indifference curves are bowed in towards the origin. In other words its slope decreases (in absolute terms) as we move down along the curve from left to right.



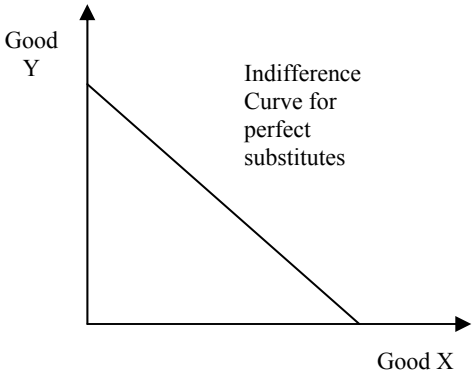

### MARGINAL RATE OF SUBSTITUTION

The average slope of the indifference curve between any two points is given by the change in the quantity of good Y divided by change in the quantity of good X. This is called the marginal rate of substitution (MRS). **MRS** states how much unit of a good you have to give up in order get an additional unit of another good.

A **diminishing** marginal rate of substitution (MRS) is related to the principle of diminishing marginal utility. MRS is equal to the ratio of the marginal utility of X to the marginal utility of Y.

$$\frac{dY}{dX} = \frac{MU_X}{MU_Y} = MRS$$

The indifference curve for **perfect substitutes** is a straight line, while it is L-shaped for **perfect compliments**.

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Lesson 11

## CONSUMER BEHAVIOR: CONSUMPTION SIDE ANALYSIS (CONTINUED)

### THE INDIFFERENCE CURVE APPROACH OR ORDINAL APPROACH

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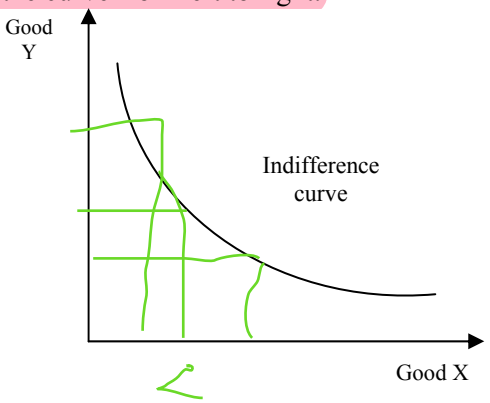


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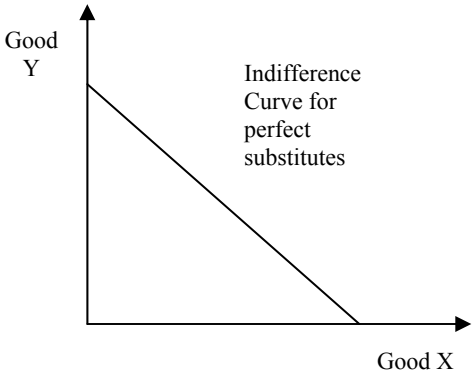


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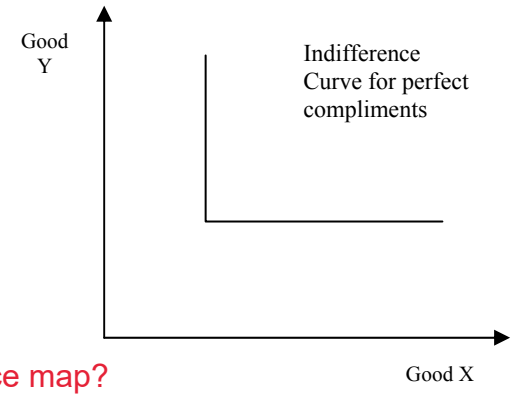
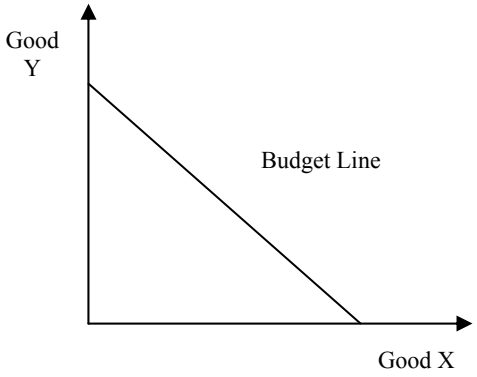



S/Q:Define the term indifference map?

**An indifference map** shows a number of indifference curves corresponding to different levels of utility. A higher indifference curve corresponds to a higher level of utility. Indifference curves never intersect.

**The Budget Line and Indifference curves:**

The budget line shows various combinations of 2 goods X & Y that can be purchased. Its slope –Px/PY is called input price ratio.




**EQUATION OF THE BUDGET LINE**

Budget line in terms of Y = a + bX

$kX + lY = M$

$lY = -kX + M$

$Y = -\frac{k}{l}X + \frac{M}{l}$

Where,

M = total amount of money

k & l = Prices of two goods

$\frac{M}{l}$ = intercept

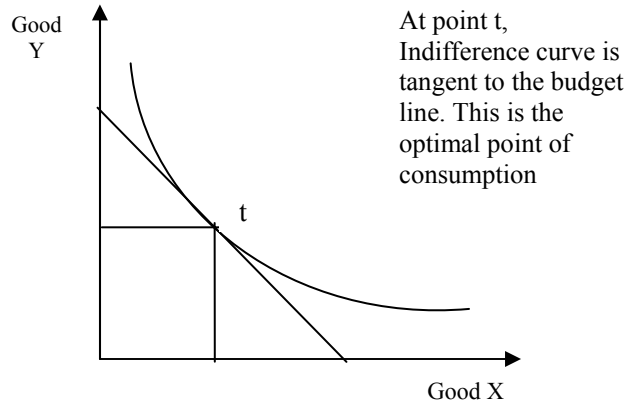
$-\frac{K}{l} = \frac{Px}{Py}$ = slope

The budget line can shift due to changes in total budget and the relative price ratio –Px/PY. If money income rises, the budget line will shift outwards (parallel to the initial budget line). If the relative price ratio changes, the slope of the budget line changes.

Lesson 12

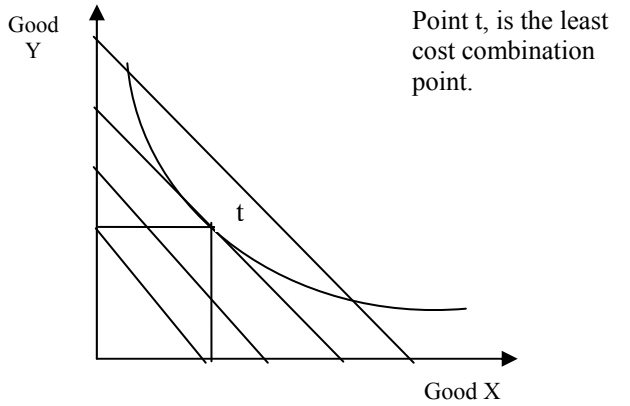
## CONSUMER BEHAVIOR: CONSUMPTION SIDE ANALYSIS (CONTINUED)

**THE OPTIMUM CONSUMPTION POINT FOR THE CONSUMER** is where the budget line is tangent to the highest possible indifference curve. At such a point, the slopes of the indifference curve and the budget line are equal. In other words: MRS = Px/Py = $\Delta Y/\Delta X$ = MUx/MUy.
Just as we can use indifference analysis to show the combination of goods that maximizes utility for a given budget, so too we can show the least-cost combination of goods that yields a given level of utility.




At point t, Indifference curve is tangent to the budget line. This is the optimal point of consumption

**LEAST COST COMBINATION** can be derived also from the indifference curve & budget line.




Point t, is the least cost combination point.

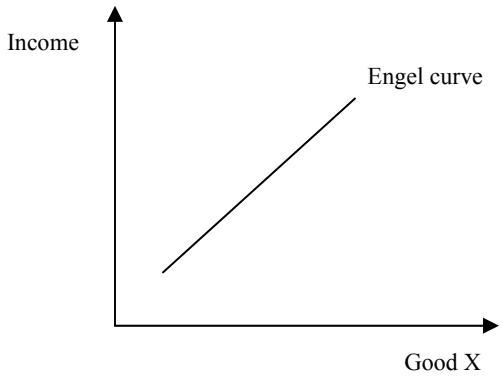
This figure shows how consumer minimizes his cost.

**Normal Goods and Giffen Good**

A normal good is one whose consumption increases when income increases, while inferior good is one whose consumption decreases with increase in income.
A Giffen good is a sub-category of inferior goods; its consumption increases when it's price increases. This is because of its very strong income effect.
Both normal and inferior goods have downward sloping demand curves.

**THE INCOME CONSUMPTION CURVE (ICC)**

The income consumption curve (ICC) can be used to derive the Engel Curve, which shows the relationship between income and quantity demanded.




Engel curve shows the positive relationship between income & quantity demanded of normal good. As income increases, quantity demanded for normal goods also increases.

**PRICE CONSUMPTION CURVE (PCC)**

The price consumption curve (PCC) traces out the optimal choice of consumption at different prices. The PCC can be used to derive the demand curve, which shows the relationship between price & quantity demanded.

**When the price of one good change, two things happen**:

- One the purchasing power of consumer changes i.e., the budget line shifts (leads to income effect).
- Secondly, the slope of budget line changes due to a change in the relative price ratio (leads to substitution effect).

**The substitution effect** of a price rise is always negative, while the **income effect** of a price rise on the consumption of a normal good is negative. **The income effect** for an inferior good is positive. The income effect of a Giffen good is so positive that it offsets the negative substitution effect, therefore.

**LIMITATION OF INDIFFERENCE APPROACH**

The indifference curves approach has the following limitations:

**a.** Indifference curve analysis is only possible for 2 or at best for 3 goods.
**b.** It is almost impossible to practically derive indifference curves.
**c.** The consumer may not always behave rationally.
**d.** The consumer may not always realize the level of utility (ex-post) from consumption, that she originally expected (ex-ante).
**e.** Indifference curve analysis can not help when one of the goods (X or Y) is a durable good.

## EXERCISES

**Do you ever purchase things irrationally? If so, what are they and why is your behaviour irrational?**

A good example is things you purchase impulsively, when in fact you do have time to reflect on whether you really want them. It is not a question of ignorance but a lack of care. Your behavior is irrational because the marginal benefit of a bit of extra care would exceed the marginal effort involved.

**Imagine that you are going out for the evening with a group of friends. How would you decide where to go? Would this decision-making process be described as 'rational' behavior?**

You would probably discuss it and try to reach a consensus view. The benefits to you (and to other group members) would probably be maximized in this way. Whether these benefits would be seen as purely 'selfish' on the part of the members of the group, or whether people have more genuinely unselfish approach, will depend on the individuals involved.

**If you buy something in the shop on the corner when you know that the same item could have been bought more cheaply two miles up the road from the wholesale market, is your behavior irrational? Explain.**

Not necessarily. If you could not have anticipated wanting the item and if it would cost you time, effort, and maybe money (e.g. petrol) to go to the wholesale market, then your behavior is rational. Your behavior a few days previously would have be irrational, however, if, when making out your weekly shopping list for the wholesale market, a moment's thought could have saved you having to make the subsequent trip to the shop on the corner.

**Are there any goods or services where consumers do not experience diminishing marginal utility?**

Virtually none, if the time period is short enough. If, however, we are referring to a long time period, such as a year, then initially as more of an item is consumed people may start 'getting more of a taste for it' and thus experience increasing marginal utility. But even with such items, eventually, as consumption increases, diminishing marginal utility will be experienced.

**If Ammaar were to consume more and more crisps, would his total utility ever (a) fall to zero; (b) become negative? Explain.**

Yes, both. If he went on eating more and more, eventually he would feel more dissatisfied than if he had never eaten any in the first place. He might actually be physically sick!

**Complete this table to the level of consumption at which total utility (TU) is at a maximum, given the utility function TU = Q + 60Q – 4Q2.**

| *Q* | *60Q* | $-4Q^2$ | = | *TU* |
|---|---|---|---|---|
| 1 | 60 | –4 | = | 56 |
| 2 | 120 | –16 | = | 104 |
| 3 | 180 | –36 | = | 144 |
| 4 | 240 | –64 | = | 176 |
| 5 | 300 | –100 | = | 200 |
| 6 | 360 | –144 | = | 216 |
| 7 | 420 | –196 | = | 224 |
| 8 | 480 | –256 | = | 224 |

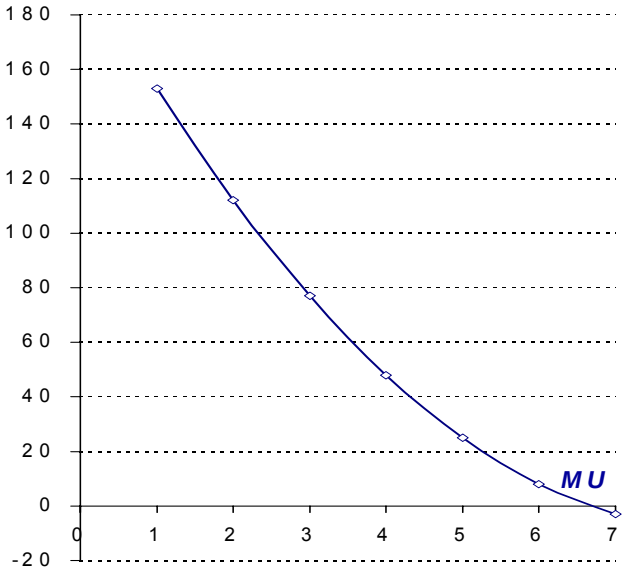
**Derive the MU function from the following TU function:**

$$\mathbf{TU = 200Q – 25Q^2 + Q^3}$$

From this MU function, draw up a table (like the one above) up to the level of Q where MU becomes negative. Graph these figures.

$$MU = dTU/dQ = 200 – 50Q + 3Q^2$$

| **Q** | *200* | *–50Q* | + | $3Q^2$ | = | **MU** |
|---|---|---|---|---|---|---|
| 1 | 200 | –50 | + | 3 | = | 153 |
| 2 | 200 | –100 | + | 12 | = | 112 |
| 3 | 200 | –150 | + | 27 | = | 77 |
| 4 | 200 | –200 | + | 48 | = | 48 |
| 5 | 200 | –250 | + | 75 | = | 25 |
| 6 | 200 | –300 | + | 108 | = | 8 |
| 7 | 200 | –350 | + | 147 | = | –3 |




**If a good were free, why would total consumer surplus equal total utility? What would be the level of marginal utility?**

Because there would be no expenditure. At the point of maximum consumer surplus, marginal utility would be equal to zero, since if P = 0, and MU = P, then MU = 0.

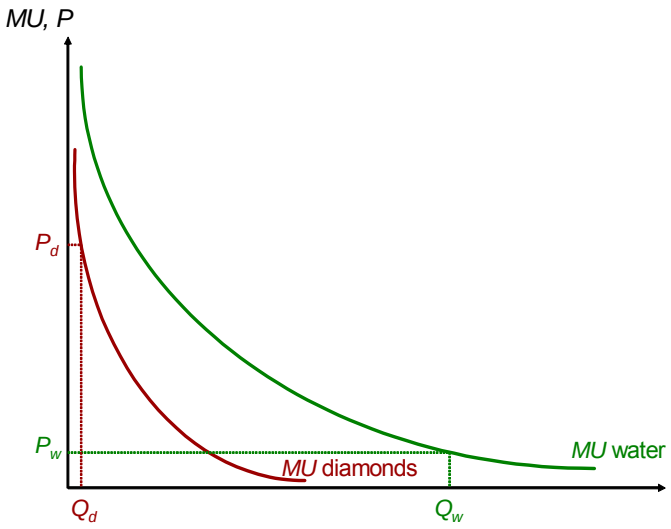
**Why do we get less consumer surplus from goods where our demand is relatively elastic?**

Because we would not be prepared to pay such a high price for them. If price went up, we would more readily switch to alternative products.

**How would marginal utility and market demand be affected by a rise in the price of a complementary good?**

Marginal utility and market demand would fall (shift to the left). The rise in the price of the complement would cause less of it to be consumed. This would therefore reduce the marginal utility of the other good. For example, if the price of lettuce goes up and as a result we consume less lettuce, the marginal utility of mayonnaise will fall.

**The diagram illustrates a person's MU curves of water and diamonds. Assume that diamonds are more expensive than water. Show how the MU of diamonds will be greater than the MU of water. Show also how the TU of diamonds will be less than the TU of water.**




**Define 'risk' and 'uncertainty'.**
Risk: when an outcome may or may not occur, but its probability of occurring is known.
Uncertainty: when an outcome may or may not occur and its probability of occurring is not known.
**Give some examples of gambling (or risk taking in general) where the odds are (a) unfavorable; (b) fair; (c) favorable.**

a. Betting on the horses; firms launching a new product in a market that is already virtually saturated and where the firm does not bother to advertise.
b. Gambling on a private game of cards which is a game of pure chance; deciding which of two alternative brands to buy when they both cost the same and you have no idea which you will like the best.
c. The buying and selling of shares on the stock exchange by dealers who are skilled in predicting share price movements; not taking an umbrella when the forecast is that it will not rain (weather forecasts are right more often than they are wrong!); an employer taking on a new manager who has excellent references from previous employers.

(Note that in the cases of (a) and (c) the actual odds may not be known, only that they are unfavorable or favorable.)
**Which game would you be more willing to play, a 60:40 chance of gaining or losing Rs10 000, or a 40:60 chance of gaining or losing Re1? Explain why.**
Most people would probably prefer the 40:60 chance of gaining or losing Re1. The reason is that, given the diminishing marginal utility of income, the benefit of gaining Rs10 000 may be considerably less than the costs of losing Rs10 000, and this may be more than enough to deter people, despite the fact that the chances of winning are 60:40.
**Do you think that this provides a moral argument for redistributing income from the rich to the poor? Does it prove that income should be so redistributed?**
Arguments like this are frequently used to justify redistributing income and form part of people's moral code. Most people would argue that the rich ought to pay more in taxes than the poor and that the poor ought to receive more state benefits than the rich. The argument is frequently expressed in terms of a pound being worth more to a poor person than a rich person. It does not prove that income should be so redistributed, however, unless you argue (a) that the government ought to increase total utility in society and (b) that it is possible to compare the utility gained by poor people with that lost by rich people – something that is virtually impossible to do.
**What details does an insurance company require to know before it will insure a person to drive a car?**
Age; sex; occupation; accident record; number of years that a license has been held; traffic law violations and convictions; model and value of the car; age of the car; details of other drivers of the car.

**How will the following reduce moral hazard?**

a. A no-claims bonus.
b. The driver having to pay the first so many rupees of any claim (called "excess").
c. Offering lower premiums to those less likely to claim (e.g. if a house has a burglar alarm, it is less likely to be burgled and therefore the insurance premiums for its contents – TV, VCR, etc. can be reduced by the insurance company).

In the case of (a) and (b) people will be more careful as they would incur a financial loss if the event they were insured against occurred (loss of no-claims bonus; paying the first so much of the claim). In the case of (c) it distinguishes people more accurately according to risk. It encourages people to move into the category of those less likely to claim (but it does not make people more careful within a category: e.g. those with burglar alarms may be less inclined to turn them on if they are well insured!).

**If people are generally risk averse, why do so many people around the world take part in national lotteries?**

Because the cost of taking part is so little, that they do not regard it as a sacrifice. They also are likely to take a 'hopeful' view (i.e. not based on the true odds) on their chances of winning. What is more, the act of taking part itself gives pleasure. Thus the behaviour can still be classed as 'rational': i.e. one where the perceived marginal benefit of the gamble exceeds the marginal cost.

**Why are insurance companies unwilling to provide insurance against losses arising from war or 'civil disorder'?**

Because the risks are not independent. If family A has its house bombed, it is more likely that family B will too.

**Name some other events where it would be impossible to obtain insurance.**

Against losses on the stock market; against crop losses resulting from drought.

**Although indifference curves will normally be bowed in toward the origin, on odd occasions they might not be. What would indifference curves look like in each of the following cases?**

**a. X and Y are left shoes and right shoes.**
**b. X and Y are two brands of the same product, and the consumer cannot tell them apart.**
**c. X is a good but Y is a 'bad' – like household refuse.**

a. L-shaped. An additional left shoe will give no extra utility without an additional right shoe to go with it!
b. Straight lines. The consumer is prepared to go on giving up one unit of one brand provided that it is replaced by one unit of the other brand.
c. Upward sloping. If consumers are to be persuaded to put up with more of the 'bad', they must have more of the good to compensate.

**What will happen to the budget line if the consumer's income doubles and the price of both X and Y double?**

It will not move. Exactly the same quantities can be purchased as before. Money income has risen, but real income has remained the same.

**The income–consumption curve is often drawn as positively sloped at low levels of income. Why?**

Because for those on a low level of income the good is not yet in the category of an inferior good. Take the case of inexpensive margarine. Those on very low incomes may economise on their use of it (along with all other products), but as they earn a little more, so they can afford to spread it a little thicker or use it more frequently (the income–consumption curve is positive). Only when their income rises more substantially do they substitute better quality margarines or butter.

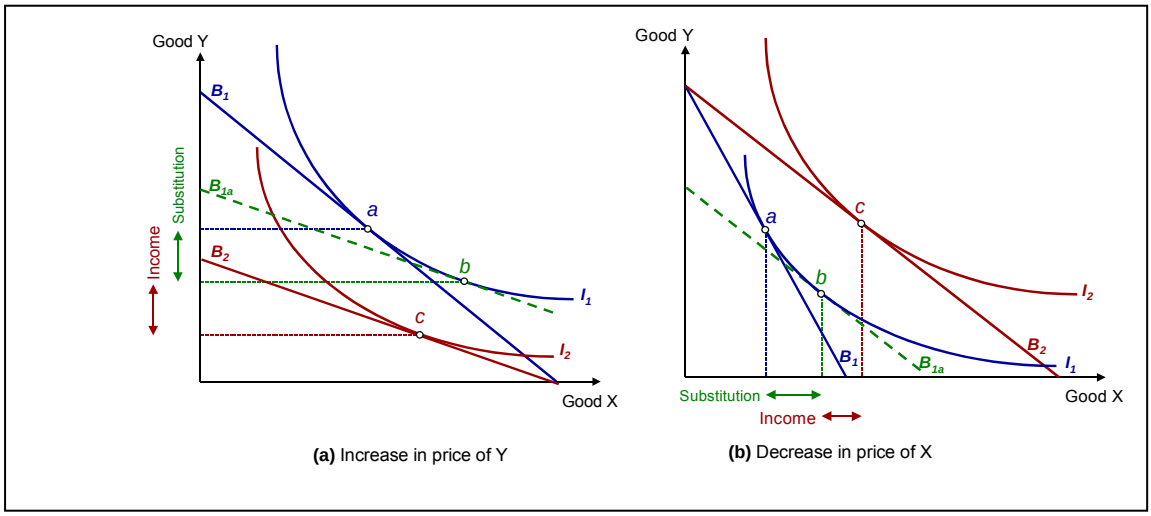
**Illustrate on an indifference diagram the effects of the following: A ceteris paribus (a) rise in the price of good Y (b) fall in the price of good X.**

a. The budget line will pivot inwards from B1 to B2.
b. The budget line would pivot outward on the point where the budget line crosses the vertical axis. It is likely that the new tangency point with an indifference curve will represent an increase in the consumption of both goods. The diagram above can be used to illustrate this. Assume the budget line pivots outwards from B1 to B2. The optimum consumption point will move from point a to c.

**Illustrate the income and substitution effects in the above question.**

See the diagram above. In each case the substitution effect is shown by a movement from point a to point b and the substitution effect is shown by a movement from point b to point c.

**Are there any Giffen goods that you consume? If not, could you conceive of any circumstances in which one or more items of your expenditure would become Giffen goods?**




It is unlikely that any of the goods you consume are Giffen goods. One possible exception may be goods where you have a specific budget for two or more items, where one item is much cheaper: e.g. fruit bought from a greengrocer (or rehri waala on the street). If, say, apples are initially much cheaper than bananas, you may be able to afford some of each. Then you find that apples have gone up in price, but are still cheaper than bananas. What do you do? By continuing to buy some of each fruit you may feel that you are not eating enough pieces of fruit to keep you healthy and so you substitute apples for bananas, thereby purchasing more apples than before (but probably less pieces of fruit than originally).

Lesson 13

## PRODUCER BEHAVIOR: PRODUCTION SIDE ANALYSIS

### FIRM

A firm is any organized form of production, in which someone or collections of individuals are involved in the production of goods and services. An organization that combines resources for the production and supply of goods and services. The firm is used by entrepreneurs to bring together otherwise unproductive resources. The key role played by a firm is the production of output using the economy's scarce resources. Firm's are the means through which society transforms less satisfying resources into more satisfying goods and services. If firms did not do this deed, then something else would. And we would probably call those something else's firms.

A firm faced with three basic questions:

a. What should it produce?
b. How should it produce it and
c. How much profit/net benefit will the firm make?

### TRADITIONAL THEORY OF THE FIRM

The traditional theory of the firm says that the firm's basic goal is to maximize profits. Profit is the difference between the total revenue & total cost.

$$\pi = TR - TC$$

TR should be greater than the TC in order to maximize the profit. Some economists say that firm do not want to maximize profit rather it wants to maximize its sales growth, its product likeliness etc. some theories says that firms basic objective is to drive its competitor out of the market. All these are rival theories. However, the traditional theory says that firm's objective is to maximize the profit.

**Types of firms:**

A firm can be sole proprietorship (one-person ownership), partnership (a limited number of owners) or a limited company (a large number of changing shareholders).

### ENTREPRENEURSHIP

Entrepreneurship refers to the management skills, or the personal initiative used to combine resources in productive ways. It involves taking risks. It is the managerial function that combines land, labor, and capital in a cost-effective way and uncovers new opportunities to earn profit; includes willingness to take the risks associated with a business venture.

### PRODUCTION FUNCTION

A mathematical relation between the production of a good or service and the inputs used. A production function is usually expressed in this general form: Q = f(L, K), where Q = quantity of production output, L = quantity of labor input, and K = quantity of capital input. A production function is simply the relationship between inputs & outputs.

Mathematically it can be written as:

$$Q = f(K, L, N, E, T, P\ldots)$$

Where,

Q = Output = Total product produced
K = Capital
L = Labor
N = Natural resources
E = Entrepreneurship
T = Technology
P = Power

### COBB DOUGLAS PRODUCTION FUNCTION

In economics, the Cobb-Douglas functional form of production functions is widely used to represent the relationship of an output to inputs. It was proposed by Knut Wicksell, and tested against statistical evidence by Paul Douglas and Charles Cobb in 1928.

Cobb Douglas production function can be represented by the following equation,

Lesson 13

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Cobb Douglas production function can be represented by the following equation,

$$Q = A K^{\alpha} L^{1-\alpha}$$

**Where:**
Q = output
L = labor input
K = capital input
A, α and 1 – α are constants determined by technology.

**Short run:**
In terms of the macroeconomic analysis of the aggregate market, a period of time in which some prices, especially wages, are rigid, inflexible, or otherwise in the process of adjusting. Short-run wage and price rigidity prevents some markets, especially resources markets and most notably labor markets, from achieving equilibrium. In terms of the microeconomic analysis of production and supply, a period of time in which at least one input in the production process is variable and one is fixed. In the microeconomic analysis, the short run is primarily used to analyze production decisions for a firm.

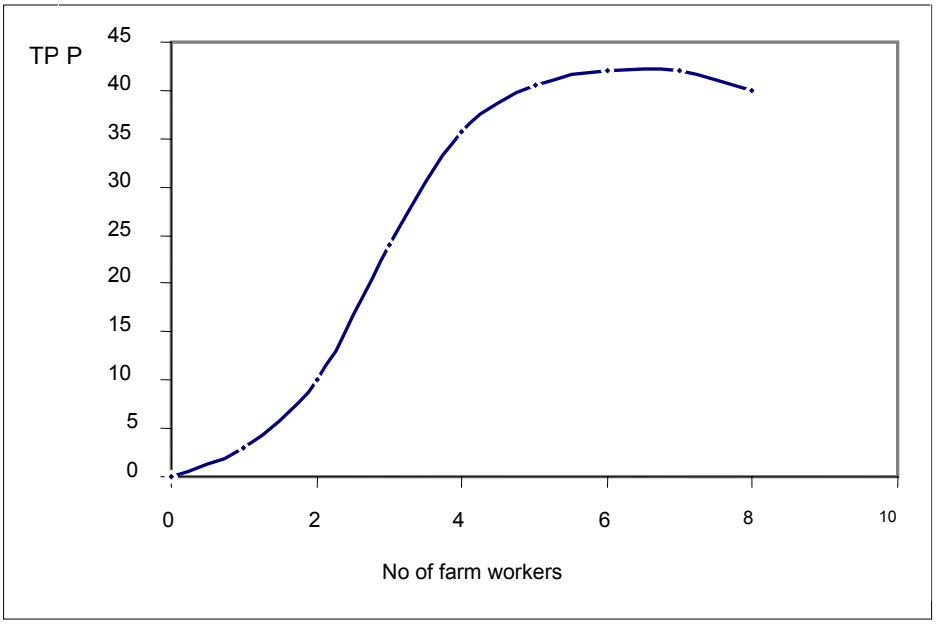
**Long run:**
In terms of the macroeconomic analysis of the aggregate market, a period of time in which all prices, especially wages, are flexible, and have achieved their equilibrium levels. In terms of the microeconomic analysis of production and supply, a period of time in which all inputs in the production process is variable.
The actual length of the short run and long run can vary considerably from industry to industry.

## THE LAW OF DIMINISHING MARGINAL RETURNS

The law of diminishing marginal returns states that as you increase the quantity of a variable factor together with a fixed factor, the returns (in terms of output) become less and less. Thus if we are using labor in the production of wheat given a fixed amount of land, after a certain point the increase in the output of wheat will become less and less until it starts reducing the total output of wheat.

| **Wheat production per year from a particular farm** | |
|---|---|
| **Quantity of variable factor: number of workers employed ( Lb )** | **Total physical product: output of wheat in tones per year ( TPP)** |
| 0 | 0 |
| 1 | 3 |
| 2 | 10 |
| 3 | 24 |
| 4 | 36 |
| 5 | 40 |
| 6 | 42 |
| 7 | 42 |
| 8 | 40 |

**Graphical illustration**




**The total physical product (TPP)** of a factor (F) is the latter's total contribution to output measured in units of output produced.

**Average physical product (APP)** is TPP per unit of the variable factor. APP can be represented by the following formula,

$$APP = TPPF/QF$$

**Marginal physical product (MPP)** is the addition to TPP brought by employing an extra unit of the variable factor. More generally,

$$MPPF = \Delta TPPF/\Delta QF$$

**RELATIONSHIP BETWEEN APP AND MPP**

- If the marginal physical product equals the average physical product, the average physical product will not change.
- If the marginal physical product is above the average physical product, the average physical product will rise.
- If the marginal physical product is below the average physical product, the average physical product will fall.

Lesson 14

## PRODUCER BEHAVIOR: PRODUCTION SIDE ANALYSIS (CONTINUED)

### THERE ARE TWO THEORIES OF PRODUCTION

1. **Short run productivity theory** or the law of diminishing marginal returns. This theory states that as we increase the amount of a variable factor with the fixed factor, initially the output will increase but afterwards there will come a point when each extra unit of the variable factor produces less extra output than the previous unit. In this theory, we take one factor as fixed therefore; it applies only in the short run.
2. **Long run productivity theory or returns to scale theory.** In long run, all factors are variable. This theory includes constant, increasing & decreasing returns to scale.

If population is increasing and output remains constant, then diminishing returns set in and therefore average per capita production/consumption can be expected to fall ceteris paribus.

A firm confronted with three more decisions;

a. Scale of production,
b. Location, size of industry
c. Optimum combination of inputs

### THE SCALE OF PRODUCTION

**Returns to scale** refers to a technical property of production that examines changes in output subsequent to a proportional change in all inputs (where all inputs increase by a constant). If output increases by that same proportional change then there are constant returns to scale (CRTS), sometimes referred to simply as returns to scale.

The scale of production (returns to scale) can be increasing, decreasing or constant. Increasing (decreasing) returns to scale arise when a 1% increase in the amount of all the factors employed causes a >1% (<1%) increase in output. Constant returns arise when a 1% increase in all the factors causes a 1% increase in output.

**Returns to scale and returns to factor** are two different concepts, the latter related to the short-term, the former to the long-term.

Increasing returns to scale or (economies of scale) arise if, as firms become bigger and bigger, their costs per unit of output fall. This could be because of larger more efficient plants, financial economies, more efficient specialized labour, bulk discounts on purchases etc.

### THE LOCATION, SIZE OF DECISION

The location decision depends upon both the location of raw material suppliers and the location of the market. The nature of the product, transportation costs, availability of suitable land for production, stable power supply and good communications network, availability of qualified and skilled workers, level of wages, the cost of local services and availability of banking and financial facilities are among some other important factors. The size of an industry can lead to external economies and diseconomies of scale.

**Economies of scale:**

The increase in efficiency of production as the number of goods being produced increases. Typically, a company that achieves economies of scale lowers the average cost per unit through increased production since fixed costs are shared over an increased number of goods.

There are two types of economies of scale:

**External economies** - the cost per unit depends on the size of the industry, not the firm.

**Internal economies** - the cost per unit depends on size of the individual firm.

### EXTERNAL ECONOMIES AND DISECONOMIES OF SCALE

External economies are benefits accruing to any one firm due to actions or the presence of other firms. For example, advertising by a rival industry, setting up of credit information bureaus by banks.

An example of external diseconomies of scale arising is when, as an industry grows larger, a shortage of specific raw materials or skilled labor occurs, adversely affecting the costs and prospects of all firms in the industry.

**Diseconomies of scale**

Diseconomies of scale are the forces that cause larger firms to produce goods and services at increased per-unit costs. They are less well known than what economists have long understood as "economies of scale", the forces which enable larger firms to produce goods and services at reduced per-unit costs.

**THE OPTIMUM COMBINATION OF FACTORS**

The optimum combination of factors will obtain at the point where the marginal physical product of the last dollar spent on all inputs is equal, i.e.:

$$\frac{MPP_K}{P_K} = \frac{MPP_L}{P_L}$$

If $\frac{MPP_K}{P_K} \neq \frac{MPPL}{P_L}$

It would be possible to reduce cost per unit of output by using a different combination of labor and capital

If $\frac{MPP_L}{P_L} > \frac{MPP_K}{P_K}$

More labor should be used relative to capital, since the firm is getting a greater physical return for its money from using extra workers than it is getting from using extra capital. However as more and more labor is used, diminishing returns to labor set in. Thus MPPL will fall. Likewise, as less capital is used, MPPK will rise. Until

$$\frac{MPP_K}{P_K} = \frac{MPP_L}{P_L}$$

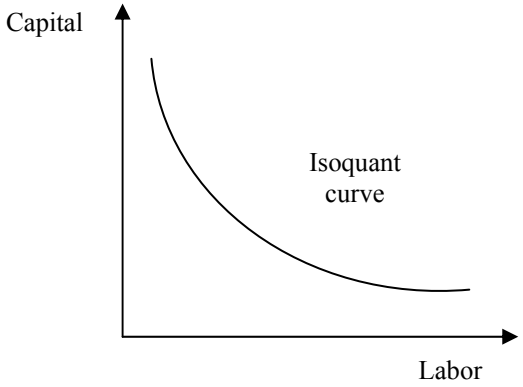
(Technical or productive Efficiency point)

Lesson 15

## PRODUCER BEHAVIOR: PRODUCTION SIDE ANALYSIS (CONTINUED)

### ISOQUANT

An isoquant represents different combinations of factors of production that a firm can employ to produce the same level of output. Isoquant can be used to illustrate the concepts of returns to scale and returns to factor.




**Isoquant Map:**

Like an indifference map, an isoquant map consists of parallel isoquants that do not intersect. The higher the output level the further to the right an isoquant will be.

### MARGINAL RATE OF TECHNICAL SUBSTITUTION (MRTS)

The slope of an isoquant is called marginal rate of technical substitution (MRTS). It is analogous to the term marginal rate of substitution (MRS) in consumer analysis. MRTS is the amount of one factor, e.g. capital, that can be replaced by a one unit increase in the other factor e.g. labor, if output is to be held constant.

The principle of diminishing MRTS is related to the law of diminishing returns. As one moves down along an isoquant drawn in K-L space, increasing amounts of labor are used relative to capital. Now, given diminishing returns, the MPP of labor will fall relative to the MPP of capital.

$$\textbf{MRTS} = \frac{\Delta \textbf{K}}{\Delta \textbf{L}}$$

$$\Delta K . MPPK = \Delta L . MPPL$$

Rearranging

$$\frac{\Delta K}{\Delta L} = \frac{MPPL}{MPPK}$$

$$\text{Also MRTS} = \frac{\Delta K}{\Delta L} = \text{MRTS}$$

$$MRTS = \frac{MPPL}{MPPK}$$

**Isoquant can be used to illustrate the concepts of returns to scale and returns to factor.**

a. Constant returns to scale: equally spaced isoquants;
b. Increasing returns to scale: isoquants become closer and closer to each other;
c. Decreasing returns to scale: isoquants become further and further apart from each other.
d. Diminishing returns to factors can be illustrated by keeping one of the inputs constant (say capital). Here if there are constant returns to scale, ever-increasing increments of labor will be required to produce equal increments to output.

Lesson 15

## PRODUCER BEHAVIOR: PRODUCTION SIDE ANALYSIS (CONTINUED)

### ISOQUANT

S/Q:DEFINE ISOQUANT?

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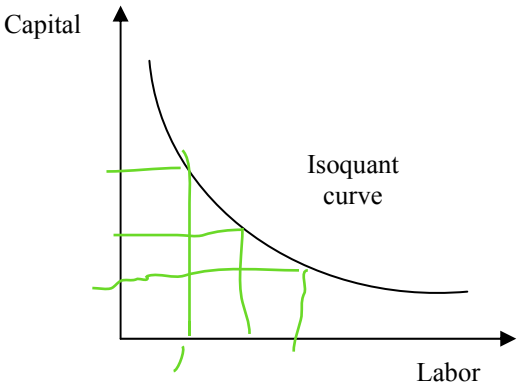
quiz

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quiz

$$\textbf{MRTS} = \frac{\Delta K}{\Delta L} = \frac{MPPL}{MPPK}$$

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quiz

quiz

S/Q:Define isocost?

**ISOCOST OR BUDGET LINE**

The concept of isocost is similar to the budget line developed in indifference curve analysis. It is a line, which captures all the different combinations of inputs that the firm can afford to hire.

a. If price of both inputs increases, the isocost line shifts inwards.
b. If price of one input increases, it pivots out.
c. The slope of isocost is PL/PK.

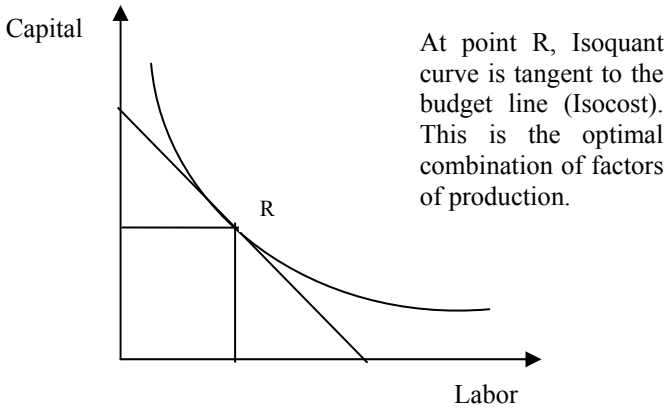
**The isoquant-isocost combination can help answer:**

a. What is the least cost way of producing a particular level of output?
b. What the highest level of output the firm can produce given a certain budget.

**OPTIMAL COMBINATION OF FACTORS**

In either case, the optimal factor combination obtains at the point of tangency between the relevant iso-cost and isoquant. At this point

$$MRTS = \frac{MPPL}{MPPK} = \frac{PL}{PK}$$




At point R, Isoquant curve is tangent to the budget line (Isocost). This is the optimal combination of factors of production.

**SUNK COST**

In economics and in business decision-making, sunk costs are costs that have already been incurred and which cannot be recovered to any significant degree. Sunk costs are sometimes contrasted with variable costs, which are the costs that will change due to the proposed course of action. In microeconomic theory, only variable costs are relevant to a decision. Economics proposes that a rational actor does not let sunk costs influence one's decisions, because doing so would not be assessing a decision exclusively on its own merits. It is important to note that the decision-maker may make rational decisions according to their own incentives; these incentives may dictate different decisions than would be dictated by efficiency or profitability, and this is considered an incentive problem and distinct from a sunk cost problem.

Lesson 16

## PRODUCER BEHAVIOR: COST ANALYSIS

Economists argue that sunk cost should not be included in a rational person's decision-making process while opportunity cost should be included.

### VARIABLE COST (VC)

Costs, which vary with the level of activity (or output), are called variable costs. Variable cost is a cost of labor, material or overhead that changes according to the change in the volume of production units. Combined with fixed costs, variable costs make up the total cost of production. While the total variable cost changes with increased production, the total fixed cost stays the same.

### Fixed Cost (FC)

Costs, which do not vary with the level of activity or output, are called fixed costs. In long run, there are no fixed costs. Fixed cost does not vary depending on production or sales levels, such as rent, property tax, insurance, or interest expense.

### Total Cost (TC)

Total cost (TC) is the sum of all fixed and variable costs. It plot as a vertical summation of the horizontal line total fixed cost (TFC) curve and the upward sloping total variable cost (TVC) curve.

$$TC = FC + VC$$

### Average Cost or Average total cost (AC or ATC)

Total cost per unit of output, found by dividing total cost by the quantity of output. Average total cost, usually abbreviated ATC, can be found in two ways. Because average total cost is total cost per unit of output, it can be found by dividing total cost by the quantity of output. Alternatively, because total cost is the sum of total variable cost and total fixed cost, average total cost can be derived by summing average variable cost and average fixed cost. Average cost (AC) is the vertical summation of the AFC & AVC. Average variable cost plus average fixed cost equals average total cost.

$$\mathbf{AVC + AFC = ATC \text{ or } AC}$$

### Average variable cost (AVC)

AVC is an economics term to describe the total cost a firm can vary (labor, etc.) divided by the total units of output.

$$\mathbf{AVC = TVC/Q}$$

### Average fixed cost (AFC)

AFC is total; fixed cost divided by the total units of output.

$$\mathbf{AFC = TFC/Q}$$

**AC = AFC + AVC**, where average fixed cost (AFC) is a downward sloping line as you are dividing a fixed number by an increasing number of output units. By contrast, average variable cost (AVC) first falls as output increases and then rises.

Study of AC is necessary for firms to be able to set the price or (average revenue) at which they will sell. Also they will be interested in knowing how AC is broken down into AFC & AVC.

### MARGINAL COST (MC)

The change in total cost (or total variable cost) resulting from a change in the quantity of output produced by a firm in the short run. Marginal cost indicates how much total cost changes for a given change in the quantity of output. Because changes in total cost are matched by changes in total variable cost in the short run (remember total fixed cost is fixed), marginal cost is the change in either total cost or total variable cost. Marginal cost, usually abbreviated MC, is found by dividing the change in total cost (or total variable cost) by the change in output.

Marginal cost is the addition to TC caused by a unit increase in output. More generally:

$$\mathbf{MC = \Delta TC/\Delta Q}$$

The secret of the shape of the MC curve lies in the law of diminishing marginal returns. The relationship between MC and AC is a reflection of the relationship between MPP & APP. That is: both MC and AC fall in the beginning, then MC starts to rise, cutting AC from below at the latter's turning point (minima).

# ECO401 – INTRODUCTION TO ECONOMICS

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Lesson 16

## PRODUCER BEHAVIOR: COST ANALYSIS

Economists argue that sunk cost should not be included in a rational person's decision-making process while opportunity cost should be included.

**VARIABLE COST (VC)** S/Q:Define variable cost?

Costs, which vary with the level of activity (or output), are called variable costs. Variable cost is a cost of labor, material or overhead that changes according to the change in the volume of production units. Combined with fixed costs, variable costs make up the total cost of production. While the total variable cost changes with increased production, the total fixed cost stays the same.

**Fixed Cost (FC)** s//Q:Define fixed cost?

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Total cost (TC) is the sum of all fixed and variable costs. It plot as a vertical summation of the horizontal line total fixed cost (TFC) curve and the upward sloping total variable cost (TVC) curve.

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$$\mathbf{AVC + AFC = ATC \text{ or } AC}$$

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AVC is an economics term to describe the total cost a firm can vary (labor, etc.) divided by the total units of output.

$$\mathbf{AVC = TVC/Q}$$

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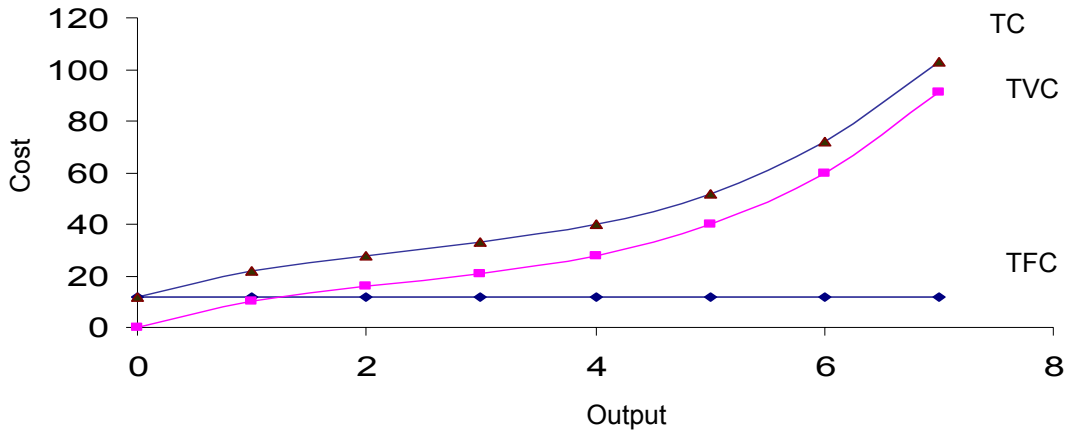
Marginal cost is the addition to TC caused by a unit increase in output. More generally:

$$\mathbf{MC = \Delta TC/\Delta Q}$$

The secret of the shape of the MC curve lies in the law of diminishing marginal returns. The relationship between MC and AC is a reflection of the relationship between MPP & APP. That is: both MC and AC fall in the beginning, then MC starts to rise, cutting AC from below at the latter's turning point (minima).

In the long run, the law of diminishing marginal returns does not apply to the extent that it does in short run.

| TC = TVC + TFC | | | |
|---|---|---|---|
| **Output ( Q )** | **TFC** | **TVC** | **TC** |
| 0 | 12 | 0 | 12 |
| 1 | 12 | 10 | 22 |
| 2 | 12 | 16 | 28 |
| 3 | 12 | 21 | 33 |
| 4 | 12 | 28 | 40 |
| 5 | 12 | 40 | 52 |
| 6 | 12 | 60 | 72 |
| 7 | 12 | 91 | 103 |




**RELATIONSHIP BETWEEN AC AND AVC**

Initially, AC falls more rapidly than AVC because AC is a summation of AFC & AVC and since both are falling the effect of two falling curves is greater than the effect of one falling curve. After the turning point in AVC, both AC and AVC rise but the gap between them narrows because of same reasoning as given above.

There is an **inverse** relationship between costs and productivity, i.e. as productivity rises, costs fall and vice versa.

The equivalent of constant, increasing and decreasing returns to scale in terms of costs are economies of scale, diseconomies of scale and constant costs (or constant returns to scale).

i. In the case of economies of scale, long run total cost (LRTC) is an upward sloping curve but with falling slope. Note that the slope can never become zero or negative, though.
ii. In diseconomies of scale, LRTC is an upward sloping curve with an increasing slope.
iii. In constant costs, LRTC is a positively sloped straight line.

**THE LONG-RUN AVERAGE COST CURVE (LRAC)** L/Q:Describe the three aspects of LRAC

The long-run average cost (LRAC) curve for a typical firm is U shaped.

i. As a firm expands, it initially experiences economies of scale (due to productive efficiency, better utilization of resources etc.); in other words, it faces a downward sloping LRAC curve.
ii. After the scale of operation is increased further, however, the firm achieve constant costs i.e., LRAC become flat.
iii. If the firm further increases its scale of operation, diseconomies of scale set in (due to problems with managing a very large organization etc.) and the LRAC assumes a positive slope.

S/Q:What are the assumptoins made while deriving LRAC curve?

**The following assumptions are made while deriving LRAC curves:**

Price of factors are constant, technology is fixed, firms choose that combination of factors at which the MPP of the last dollar spent on each input is equal.

**Long-run marginal cost (LRMC):**

In case a firm is enjoying economies of scale, each incremental unit will cost less than the preceding one i.e., LRMC will be falling. The opposite will be true for diseconomies of scale. In case of constant costs, each incremental unit will cost the same, i.e., the LRMC will be constant.

**Relation between SRAC and LRAC curves:**

The LRAC curve for a firm is actually derived from its SRAC curves. The exact shape of the LRAC is a wave connecting the least cost parts of the SRAC curves. In practice however, LRAC is shown as a smooth U-shaped curve drawn tangent to the SRAC. This is also called an envelope curve.

S/Q:Define envelpoe curve?

Lesson 17

## REVENUE & PROFIT MAXIMIZATION ANALYSIS

### REVENUES

Revenues are the sale proceeds that accrue to a firm when it sells the goods it produces; in other words, they are the cash inflows that the firm received by way of selling its products.

**Total Revenue (TR), Average Revenue (AR) and Marginal Revenue (MR):**

Total revenue (TR), average revenue (AR) and marginal revenue (MR) concepts apply in the same way as they did to TC, AC and MC.

i. **TR = P x Q.**
ii. **AR = TR/Q;** AR is usually equal to price unless the firm is engaged in price discrimination.
iii. **MR = ΔTR/ΔQ.**

### PRICE-TAKING FIRM

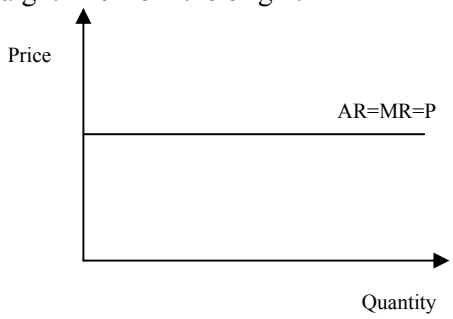
A firm that does not have the ability to influence market price is a price-taker. In perfect competition, the firm is price taker. There are large number of buyers and sellers and firm can not influence on the market price. Price is set by the forces of demand and supply.

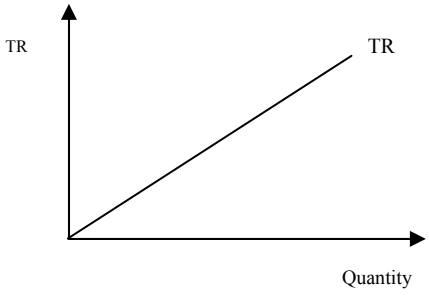
### PRICE-MAKING FIRM

A firm that influences the market price by how much it produces can be called a price-maker or price-setter. In Monopoly, firm is price maker. A monopoly or a firm within monopolistic competition has the power to influence the price it charges as the good it produces does not have perfect substitutes. A monopoly is a price maker as it holds a large amount of power over the price it charges.

### DERIVING A FIRM'S AR & MR CURVES FOR PRICE TAKING FIRM

For a price taker, **AR=MR=P**. In this case, the demand (or AR) curve the firm faces is a horizontal line. TR for a price-taking firm is a straight line from the origin.



Lesson 17

## REVENUE & PROFIT MAXIMIZATION ANALYSIS

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what do you know about revenue?

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L/Q:Write a note on prcie-taking firm?

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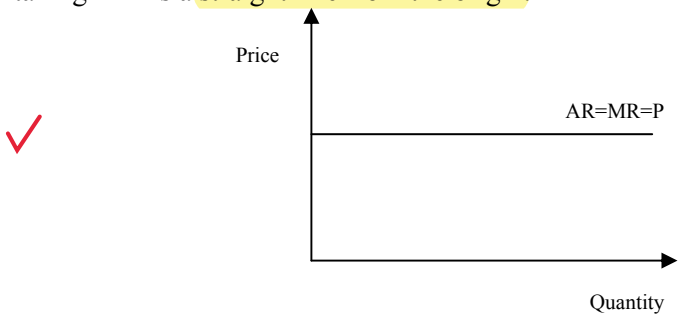
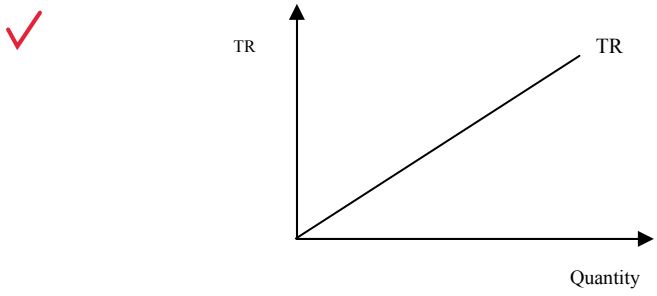
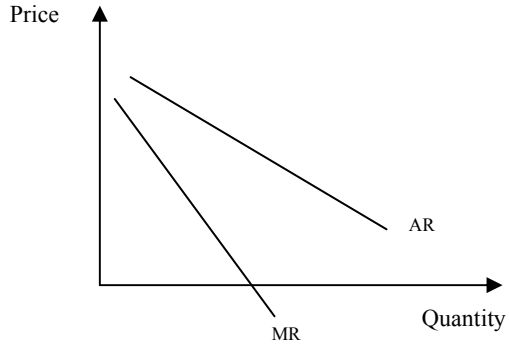


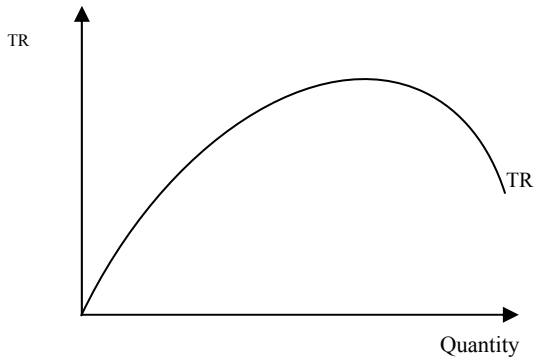



**DERIVING A FIRM'S AR & MR CURVES FOR PRICE MAKING FIRM**

| Q (ships) | P = AR Rs. Crores | TR= P×Q Rs. Crores | MR |
|---|---|---|---|
| 1 | 8 | 8 | |
| 2 | 7 | 14 | 6 |
| 3 | 6 | 18 | 4 |
| 4 | 5 | 20 | 2 |
| 5 | 4 | 20 | 0 |
| 6 | 3 | 18 | -2 |
| 7 | 2 | 14 | -4 |

A price maker faces a downward sloping demand (or AR) curve i.e., it cannot sell more without reducing price. But this means lowering the price for all units, not just the extra units it hopes to sell. The demand faced by a price maker is elastic, when MR is positive and therefore TR increases due to a decrease in price. Demand is inelastic when MR is negative, and therefore TR falls due to a decrease in price.




**PROFIT MAXIMIZATION**

Firms are interested in profit maximization. Profit is the difference between total revenue & total cost. Higher the difference, higher is the level of profit. Economists say that when firms earn zero accounting profits, they actually earn normal economic profits because TC already includes the normal profits that owners of the firms need for themselves to stay in the business. Positive profits are, for this reason, called supernormal profits as they are over and above what the owners normally require as a return for their entrepreneurship.

$$\text{Profit} = TR - TC$$

**APPROACHES OF PROFIT MAXIMIZATION**

Profit maximization can be studied using the TR-TC approach and the MR-MC approach.

✓ **i.** In the TR-TC approach, it is assumed that firm is price maker and firm is operating in short run. Total profit is the vertical distance between TR and TC.

✓ **ii.** In the MR-MC approach, two steps are followed to identify maximum profit. First: the profit-maximizing output is identified – this is the point where MR cuts MC. Second: the size of maximum profit is calculated using AC and AR curves.

**Assumptions:**

1. Demand curve is downward sloping
2. Firm is operating in the short run

**TR & TC APPROACH**

According to this approach, profit is maximized at that point where the difference between total revenue & total cost is maximum. In this table, profit is maximized at quantity of 3, where profit is at its maximum of 4.

| Q(units) | TR | TC | T π |
|---|---|---|---|
| 0 | 0 | 6 | -6 |
| 1 | 8 | 10 | -2 |
| 2 | 14 | 12 | 2 |
| **3** | **18** | **14** | **4** |
| 4 | 20 | 18 | 2 |
| 5 | 20 | 25 | -5 |
| 6 | 18 | 36 | -18 |
| 7 | 14 | 56 | -42 |

**MR & MC APPROACH**

According to this approach, profit is maximized at the point where MC=MR. In this table, profit is maximized at quantity of 4 where MR=MC=2

| Q | P=AR | TR | MR | TC | AC | MC | T π | A π |
|---|---|---|---|---|---|---|---|---|
| 0 | 9 | 0 | ----- | 6 | ---- | ---- | -6 | ---- |
| 1 | 8 | 8 | 8 | 10 | 10 | 4 | -2 | -2 |
| 2 | 7 | 14 | 6 | 12 | 6 | 2 | 2 | 1 |
| 3 | 6 | 18 | 4 | 14 | 4 2/3 | 2 | 4 | 1 1/3 |
| **4** | **5** | **20** | **2** | **18** | **4 1/2** | **4** | **2** | **1/2** |
| 5 | 4 | 20 | 0 | 25 | 5 | 7 | -5 | -1 |
| 6 | 3 | 18 | -2 | 36 | ? | 11 | -18 | -3 |
| 7 | 2 | 14 | -4 | 56 | 8 | 20 | -42 | -6 |

If MR & AR remain same over the long run, then the profit maximizing output will be obtained where MR intersects LRMC.

If AC is always above AR, then firms will never be able to make a profit. In this case, the point where MR=MC, represents the loss-minimizing point.

When MC and MR intersect at two points, not one, then Firms should produce at that point of intersection of MR and MC beyond which, MC exceeds MR.

If a firm's AR is below its AVC, it will shut down since it is not covering any part of its fixed costs.

**Note:** Graphical illustration of these two approaches is discussed in detail in the video lectures.

## EXERCISES

**How will the length of the short run for a shipping company depend on the state of the shipbuilding industry?**

If the shipbuilding industry is in recession, the short run (and the long run) may be shorter. It will take less time to acquire a new ship if there is no waiting list, or if there are already ships available to purchase (with perhaps only minimal modifications necessary).

**Up to roughly how long is the short run in the following cases?**

**(a) A mobile ice-cream firm. (b) A small grocery. (c) Electricity power generation.**

a) 2-3 days: the time necessary to acquire new bicycles, equipment and workers.
b) Several weeks: the time taken to acquire additional premises.
c) 3-5 years: the time taken to plan and build a new power station.

**How would you advise the naanwaala (bread-maker) next door as to whether he should (a) employ an extra assistant on a Sunday (which is a high demand day); (b) extend his shop, thereby allowing more customers to be served on a Sunday?**

a) If maximizing profit is the sole aim, then he should employ an additional assistant if the extra revenue from the extra customers that the assistant can serve is greater than the costs of employing the assistant.
b) Only if the extra revenue from the extra customers will more than cover the costs of the extension plus the extra staffing.

**Given that there is a fixed supply of land in the world, what implications can you draw from about the effects of an increase in world population for food output per head?**

Other things being equal, diminishing returns would cause food output per head to decline (a declining MPP and APP of labour). This, however, would be offset (partly, completely or more than completely) by improvements in agricultural technology and by increased amounts of capital devoted to agriculture: this would have the effect of shifting the APP curve upwards.

**The following are some costs incurred by a shoe manufacturer. Decide whether each one is a fixed cost or a variable cost or has some element of both.**

**(a) The cost of leather. (b) The fee paid to an advertising agency. (c) Wear and tear on machinery. (d) Business rates on the factory. (e) Electricity for heating and lighting. (f) Electricity for running the machines. (g) Basic minimum wages agreed with the union. (h) Overtime pay. (i) Depreciation of machines as a result purely of their age (irrespective of their condition).**

(a) Variable. (b) Fixed (unless the fee negotiated depends on the success of the campaign). (c) Variable (the more that is produced, the more the wear and tear). (d) Fixed. (e) Fixed if the factory will be heated and lit to the same extent irrespective of output, but variable if the amount of heating and lighting depends on the amount of the factory in operation, which in turn depends on output. (f) Variable. (g) Variable (although the basic wage is fixed per worker, the cost will still be variable because the total cost will increase with output if the number of workers is increased). (h) Variable. (i) Fixed (because it does not depend on output).

**Assume that a firm has 5 identical machines, each operating independently. Assume that with all 5 machines operating normally, 100 units of output are produced each day. Below what level of output will AVC and MC rise?**

20 units. Below this level, the one remaining machine left in operation will begin to operate at a level below its optimum. (Note that with 5 machines producing 100 units of output, minimum AVC could be achieved at 100, 80, 60, 40 and 20 units of output, but between these levels some machines may be working at less than their optimum and some at more than their optimum. Thus if the optimum level for a machine is critical, then the AVC curve may look 'wavy' rather than a smooth line.

**Why is the minimum point of the AVC curve (y) at a lower level of output than the minimum point of the AC curve (z)?**

Because between points y and z marginal cost is above AVC (and thus AVC must be past the minimum point) but below AC (and thus AC cannot yet have reached the minimum point). Even though AVC is rising beyond point y, the fall in AFC initially more than offsets the rise in AVC and thus AC still falls.

**What economies of scale is a large department store likely to experience?**

Specialized staff for each department (saving on training costs and providing a more efficient service for customers); being able to reallocate space as demand shifts from one product to another and thereby reducing the overall amount of space required; full use of large delivery lorries which would be able to carry a range of different products; bulk purchasing discounts; reduced administrative overheads as a proportion of total costs.

**Why are firms likely to experience economies of scale up to a certain size and then diseconomies of scale after some point beyond that?**

Because economies of scale, given that most arise from increasing returns to scale, will be fully realized after a certain level of output, whereas diseconomies of scale, given that they largely arise from the managerial problems of running large organizations, are only likely to set in beyond a certain level of output.

**How is the opening up of trade and investment between, say eastern and western Europe, likely to affect the location of industries within Europe that have (a) substantial economies of scale; (b) little or no economies of scale?**

a) Given that production will take place in only one or two plants, new plants will tend to be located near to the centre of the new enlarged European market.
b) Plants will still tend to be scattered round Europe, given that the customers are scattered.

These effects will be the result of attempts to minimize transport costs and thus will be more significant the higher are transport costs per kilometer.

**Name some industries where external economies of scale are gained. What are the specific external economies in each case?**

Two examples are:

- Financial services: pool of qualified and experienced labour, access to specialist software, one firm providing specialist services to another.
- Various parts of the engineering industry: pool of qualified and experienced labour, access to specialist suppliers, possible joint research, specialized banking services.

**Would you expect external economies to be associated with the concentration of an industry in a particular region?**

Yes. There may be a common transport and communications infrastructure that can be used; there is likely to be a pool of trained and experienced labour in the area; joint demand may be high enough to allow economies of scale to be experienced in the supply of some locally extracted raw material.

**If factor X costs twice as much as factor Y (Px/Py = 2), what can be said about the relationship between the MPPs of the two factors if the optimum combination of factors is used?**

MPPx/MPPy = 2. The reason is that if MPPx/Px = MPPy/Py, then, by rearranging the terms of the equation, MPPx/MPPy must equal Px/Py (= 2).

**Could isoquants ever cross?**

Not for a given state of technology, otherwise it would mean that at one side of the intersection the higher output isoquant would be 'south-west' of the lower output isoquant. This would mean that a higher output could be achieved by using less of both factors of production!

**Could they ever slope upward to the right?**

Yes. It would mean that one of the two factors had a negative marginal productivity that was greater than the positive marginal productivity of the other: i.e. that MPPa/MPPb (or MPPb/MPPa) was negative (a negative marginal rate of factor substitution).

This situation will occur when so much is used of one factor that diminishing returns have become so great as to produce substantial negative marginal productivity: isoquants will bend back on themselves beyond the points where they become vertical or horizontal. The firm, however, will not produce along this portion of an isoquant, because the price ratio (Pa/Pb) will (virtually) never be negative.

**What will happen to an isocost if the prices of both factors rise by the same percentage?**

It will shift inwards parallel to the old isocost.

**Why do the prices of cattle and sheep prices fall so drastically "on", or just "after" the first day of Eid-ul-Azha?**

The supply curve for cattle and sheep is fixed in the short-run, i.e. a vertical supply curve, therefore price will be determined by demand. Since demand for "cattle for sacrifice" falls drastically after or on the first day of Eid-ul-Azha, the price has to come down drastically as well for the market to clear.

**Explain the shape of the LRMC curve for a firm with a typical U-shaped LRAC curve.**

At first economies of scale cause the LRMC to fall. Then because of (marginal) diseconomies of scale, additional units of production begin to cost more to produce than previous units: the LRMC begins to slope upwards. But the LRAC is still falling because the LRMC is below it pulling it down. It is not until the LRMC crosses the LRAC that the firm will experience a rising LRAC and hence average diseconomies of scale.

**Will the "envelope curve" be tangential to the bottom of each of the short-run average cost curves? Explain why it should or should not be.**

No. At the tangency points the two curves must have the same slope. Thus the slope at the tangency point is not zero (the slope at the turning point or minima of the SRAC curves).

**What would the isoquant map look like if there were (a) continuously increasing returns to scale; (b) continuously decreasing returns to scale?**

a) The isoquants would get progressively closer and closer together.
b) The isoquants would get progressively further and further apart.

**What can we say about the slope of the TR and TC curves at the maximum profit point? What does this tell us about marginal revenue and marginal cost?**

The slopes are the same. But given that the slope of the total curve gives the respective marginal, this means that marginal revenue will be equal to marginal cost.

**Fill in the missing figures in the table below.**

| *Q* | *P = AR* | *TR* | *MR* | *TC* | *AC* | *MC* | *Tπ* | *Aπ* |
|---|---|---|---|---|---|---|---|---|
| 0 | 9 | | | 6 | | | | |
| | | | | | | | | |
| 1 | 8 | | | 10 | | | | |
| | | | | | | | | |
| 2 | 7 | | | 12 | | | | |
| | | | | | | | | |
| 3 | 6 | | | 14 | | | | |
| | | | | | | | | |
| 4 | 5 | | | 18 | | | | |
| | | | | | | | | |
| 5 | 4 | | | 25 | | | | |
| | | | | | | | | |
| 6 | 3 | | | 36 | | | | |
| | | | | | | | | |
| 7 | 2 | | | 56 | | | | |

| *Q* | *P = AR* | *TR* | *MR* | *TC* | *AC* | *MC* | *Tπ* | *Aπ* |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| 0 | 9 | 0 | | 6 | – | | –6 | – |
| | | | 8 | | | 4 | | |
| 1 | 8 | 8 | | 10 | 10 | | –2 | –2 |
| | | | 6 | | | 2 | | |
| 2 | 7 | 14 | | 12 | 6 | | 2 | 1 |
| | | | 4 | | | 2 | | |
| 3 | 6 | 18 | | 14 | 4.3 | | 4 | 1.3 |
| | | | 2 | | | 4 | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 4 | 5 | 20 | | 18 | 4.5 | | 2 | 0.5 |
| | | | 0 | | | 6 | | |
| 5 | 4 | 20 | | 25 | 5 | | –5 | –1 |
| | | | –2 | | | 9 | | |
| 6 | 3 | 18 | | 36 | 6 | | –18 | –3 |
| | | | –4 | | | 16 | | |
| 7 | 2 | 14 | | 56 | 8 | | –42 | –6 |

**Why should the figures for MR and MC be entered in the spaces between the lines?**

Because marginal revenue (or cost) is the extra revenue (or cost) from moving from one quantity to another.

**You are given the following information for a firm.**

| ***Q*** | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|---|
| ***P*** | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 |
| ***TC*** | 2 | 6 | 9 | 12 | 16 | 21 | 28 | 38 |

Construct a detailed table like the one you constructed in the earlier question with TR, AC, MR, TC, AC, MC, TΠ and AΠ. Use your table to draw "two" diagrams (one with the marginal revenue and cost curves, and one with the total (or average) revenue and cost curves) and use them to show the "profit-maximizing output" and the "level of maximum profit", respectively. Confirm your findings by reference to the table you construct.

| ***Q*** | ***P = AR*** | ***TR*** | ***MR*** | ***TC*** | ***AC*** | ***MC*** | ***Tπ*** | ***Aπ*** |
|---|---|---|---|---|---|---|---|---|
| 0 | 12 | 0 | | 2 | – | | –2 | – |
| | | | 11 | | | 4 | | |
| 1 | 11 | 11 | | 6 | 6 | | 5 | 5 |
| | | | 9 | | | 3 | | |
| 2 | 10 | 20 | | 9 | 4.5 | | 11 | 5.5 |
| | | | 7 | | | 3 | | |
| 3 | 9 | 27 | | 12 | 4 | | 15 | 5 |
| | | | 5 | | | 4 | | |
| 4 | 8 | 32 | | 16 | 4 | | 16 | 4 |
| | | | 3 | | | 5 | | |
| 5 | 7 | 35 | | 21 | 4.2 | | 14 | 2.8 |
| | | | 1 | | | 7 | | |
| 6 | 6 | 36 | | 28 | 4.7 | | 8 | 1.3 |
| | | | –1 | | | 10 | | |
| 7 | 5 | 35 | | 38 | 5.4 | | –3 | –0.4 |

The curves will be a similar shape to those discussed in the lecture, and included in the slides handout. The peak of the TΠ curve will be at Q = 4. This will be the output where MR and MC intersect.

**Will the size of normal 'profit' vary with the general state of the economy?**

Yes. Normal profit is the rate of profit that can be earned elsewhere (in industries involving similar level of risk). When the economy is booming, profits will normally be higher than when the economy is in recession. Thus the 'normal' profit that must be earned in any one industry must be higher to prevent capital being attracted to other industries.

**Given the following equations:**

$$\mathbf{TR = 72Q - 2Q^2;\ TC = 10 + 12Q + 4Q^2}$$

**Calculate the maximum profit output and the amount of profit at that output using both methods.**

(a) $T\Pi = 72Q - 2Q^2 - 10 - 12Q - 4Q$

$= -10 + 60Q - 6Q^2$ (1)

$\therefore d\Pi/dQ = 60 - 12Q$

Setting this equal to zero gives:

$60 - 12Q = 0$

$\therefore 12Q = 60$

$\therefore$ **Q = 5**

(b) $MR = dTR/dQ = 72 - 4Q$

$MC = dTC/dQ = 12 + 8Q$

Setting MR equal to MC gives:

$72 - 4Q = 12 + 8Q$

$\therefore 12Q = 60$

$\therefore$ **Q = 5**

To find the level of maximum profit, we must substitute Q = 5 into equation (1). This gives:

$\Pi = -10 + (60 \times 5) - (6 \times 5^2)$

$= -10 + 300 - 150$

**= Rs. 140**

Lesson 18

## PROFIT MAXIMIZATION ANALYSIS (CONTINUED) & MARKET STRUCTURES

### PROFIT MAXIMIZATION USING CALCULUS

If total revenue (TR) and total cost equation are given as follows:

$$\mathbf{TR = 48q - q^2}$$

$$\mathbf{TC = 12 + 16q + 3Q^2}$$

| Q | TR | TC | Tπ = TR –TC |
|---|---|---|---|
| 0 | 0 | 12 | -12 |
| 1 | 47 | 31 | 16 |
| 2 | 92 | 56 | 36 |
| 3 | 135 | 87 | 48 |
| 4 | 176 | 124 | 52 |
| 5 | 215 | 167 | 48 |
| 6 | 252 | 216 | 36 |
| 7 | 287 | 271 | 16 |

Profit is maximized at the point where:

$$\mathbf{MC = MR}$$

MC function can be found by taking derivative of total cost function. i.e.:

$$MC = d\,TC / dQ$$

$$MC = 16 + 6Q$$

MR function can be found by taking derivative of total revenue (TR) function i.e.:

$$MR = d\,TR / dQ$$

$$= 48 - 2Q$$

As profit is maximized at the point where MR = MC, so by equating values of MC and MR function, we get,

$$\mathbf{MR = MC}$$

$$16 + 6Q = 48 - 2Q$$

$$6Q + 2Q = 48 - 16$$

$$8Q = 32$$

$$\underline{\mathbf{Q = 4}}$$

The equation for total profit is,

$$\mathbf{T\pi = TR - TC}$$

$$= 48Q - Q^2 - (12 + 16Q + 3Q^2)$$

$$= 48Q - Q^2 - 12 - 16Q - 3Q^2$$

$$= -4Q^2 + 32Q - 12$$

Putting Q = 4, we get,

$$T\pi = -4(4)^2 + 32(4) - 12$$

$$= -64 + 128 - 12$$

$$\underline{\mathbf{T\pi = 52}}$$

So profit is maximized where output is 4 and the maximum profit is 52.

**We can also calculate AR from this information:**

$$\mathbf{TR = 48Q - Q2}$$

$$AR = TR/Q = 48Q/Q - Q2/Q$$

$$= 48 - Q$$

$$= 48 - 4$$

$$\underline{\mathbf{AR = 44}}$$

**Slope of MR curve is twice as the slope of AR curve:**

Slope of AR is obtained by differentiating AR function with respect to Q.

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$$= 48 - Q$$

$$= 48 - 4$$

$$\underline{\mathbf{AR = 44}}$$

**Slope of MR curve is twice as the slope of AR curve:**

Slope of AR is obtained by differentiating AR function with respect to Q.

**Slope of AR = dAR / dQ**
= d/dQ (48-Q)
= -1

Slope of MR is obtained by differentiating MR function with respect to Q.

**Slope of MR = dMR / dQ**
= d/dQ (48-2Q)
= -2

**MARKET STRUCTURES**

Economists have identified four broad market structures:

- Perfect competition
- Monopoly
- Monopolistic competition
- Oligopoly

very very very important table

| Type of market | Number of firms | Freedom of entry | Nature of product | Examples | Implication for demand curve of firm |
|---|---|---|---|---|---|
| Perfect competition | Very many | Unrestricted | Homogenous (undifferentiated) | Grains (wheat) or vegetables | Horizontal; firm is a price taker |
| Monopolistic competition | Many / Several | Unrestricted | Differentiated | Plumbers, restaurants | Downward sloping but relatively elastic; firm has some control over prices. |
| Oligopoly or Cartel | Few | Restricted | 1. Undifferentiated or 2. Differentiated | Cement, cars, electrical appliance, oil. | Downward sloping relatively inelastic but depends on reactions of rivals to a price change |
| Monopoly | One | Restricted or completely blocked | Unique | WAPDA, or KESC | Downward sloping more inelastic than oligopoly; firm has considerable control over price |

Market structure refers to how an industry (broadly called market) that a firm is operating in is structured or organized.

**The key ingredients of any market structure are:**

- Number of firms in the market/industry
- Extent of barriers to entry
- Nature of product
- Degree of control over price

**Knowledge about market structure can help answer four questions:**

ii. How much profit a firm will make (normal or supernormal)
iii. How much quantity it will produce at its profit-maximization point (i.e. whether it will be a large level of output or a small one relative to the market)
iv. Whether or not a higher level of output would increase the cost or productive efficiency of the firm or allocative efficiency for society (see the summary on monopoly for details)
v. Are the prices set too high, too low, or just right?

**PERFECT COMPETITION**

The main assumptions of perfect competition are:

i. Large number of buyers and sellers, therefore firms price-takers.
ii. No barriers to entry (also implies free mobility of factors of production).
iii. Identical/homogeneous products
iv. Perfect information/knowledge

The word **perfect** in perfect competition is not used in its normative sense. Rather it means that competition in the industry is of an extreme nature. It is used as a benchmark with which to compare other types of market structures.

Perfect competition can be thought of as an **extreme form of capitalism**, i.e. all the firms are fully subject to the market forces of demand and supply.
**Concentration ratio** is used to assess the level of competition in an industry. It is simply the percentage of total industry output that is produced by the five largest firms in the industry.

**PROFIT MAXIMIZATION UNDER PERFECT COMPETITION IN THE SHORT RUN**
The short run is the period where at least one factor of production is fixed. In perfect competition, it also means that no new firms can enter the market. Equilibrium analysis can help us answer questions about the market-clearing price and quantity; where the profits are maximized and how much are these profits; how individual firms make their short run supply decisions and how these translate into the long-run industry supply curve.
In the short run, a perfectly competitive firm can settle at equilibrium where it is making super normal profits, normal profits, loss, or where it decides to shut down.
In the short run, the firm's supply curve is identical to the positive part of MC. The short run industry supply curve is simply the horizontal summation of the supply curves of individual firms.

**The demand (or AR) curve** for the industry is downward sloping but for any individual perfectly competitive firm, is horizontal. Thus, the firm can sell as much at the given market price. For this reason, the AR and MR curves align under perfect competition.

Lesson 19

## MARKET STRUCTURES (CONTINUED)

### PROFIT MAXIMIZATION UNDER PERFECT COMPETITION IN THE LONG RUN

In the long run, all the factors of production are variable. In the long run, any firm can enter or leave the industry. If there are supernormal profits in the short run, more firms will be attracted to the market and the increase in supply will push prices down to eliminate supernormal profit possibilities in the long run. By contrast, if firms are making losses in the short run, they will leave the industry in the long run causing supply to fall, prices to rise and normal profitability to be restored. In the long run, therefore, perfectly competitive firms can only earn normal profits.

### ALLOCATIVE EFFICIENCY AND PRODUCTIVE EFFICIENCY

Public interest is concerned with both allocative efficiency and productive efficiency.

a. **Allocative efficiency:** The optimal point of production for any individual firm is where MR=MC. The optimal point of production for any society is where price is equal to marginal cost. This is called the point of maximum allocative efficiency and is achieved in perfect competition (because MR=MC, and MR=AR=P for a perfectly competitive price taking firm, therefore P=MC).
b. **Productive efficiency:** This is attained when firms produce at the bottom of their AC curves, that is, goods are produced in the most cost efficient manner. Perfectly competitive firms also achieve this in the long run because they produce at P=MC and this intersection point also happens to be the point of tangency with the lowest part of the AC curve. Thus P= AC minimum.

### MONOPOLY

Monopoly defines the other pole or extreme of the market structure spectrum. Usually refers to a situation where there is a single producer in the market. However, it actually depends upon how narrowly you define the industry.

### MONOPOLY POWER

Economists are often interested in how much monopoly power any firm (not necessarily a monopoly) has. Here monopoly stands for the extent to which the firm can raise prices without driving away all it customers. In other words, monopoly power and price elasticity of demand are inversely related.

Firms whose customers are more have more monopoly power. A monopolistic firm faces inelastic demand of the product & its demand curve is negatively sloped. While in perfect competition, demand curve has infinitely elasticity.

### PROFIT MAXIMIZATION UNDER MONOPOLY

In monopoly, firm earns profit when MC=MR and MC curve cuts the MR curve from below. MC curve is not the supply curve of the firm as it was in the perfect competition. This is also the major difference between monopoly & perfect competition.

i. The profit maximizing or best level of output is given where MR=MC. Price is then read off the demand curve which is downward sloping. Note however, the difference with perfect competition, where the firm's demand curve was horizontal and not downward sloping like the industry. In a monopoly, however, the firm "is" the industry and therefore faces the same demand curve as the industry (a downward sloping one).
ii. Depending upon the level of AC at the point where MR=MC, the monopolist might be earn supernormal profits, breaking even or minimizing short run losses.
iii. Price is greater than MR in equilibrium. Therefore, price is not equal to MC. As such, therefore, the supply curve for the firm is not the rising part of the MC curve.

A monopolist can make supernormal profits even in long run because there is no easy entry for other firms as in the case of perfect competition. Therefore, a monopolist can maintain high price even in the long run.

S/Q:Why a monopolist can make supernormal profit in long run

### HOW CAN A MONOPOLIST RETAIN ITS MONOPOLY?

**i.** These can be due to "natural" reasons or "active policies" pursued by the monopolist.
**ii.** Large initial fixed costs may be involved, which makes it prohibitive for others to enter.

Lesson 19

## MARKET STRUCTURES (CONTINUED)

### PROFIT MAXIMIZATION UNDER PERFECT COMPETITION IN THE LONG RUN

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S/Q:Why a firm can only earn normal profit in perfecr competition?

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S/Q:Why a monopolist can make supernormal profit in long run?

### HOW CAN A MONOPOLIST RETAIN ITS MONOPOLY?

**i.** These can be due to "natural" reasons or "active policies" pursued by the monopolist.
**ii.** Large initial fixed costs may be involved, which makes it prohibitive for others to enter.

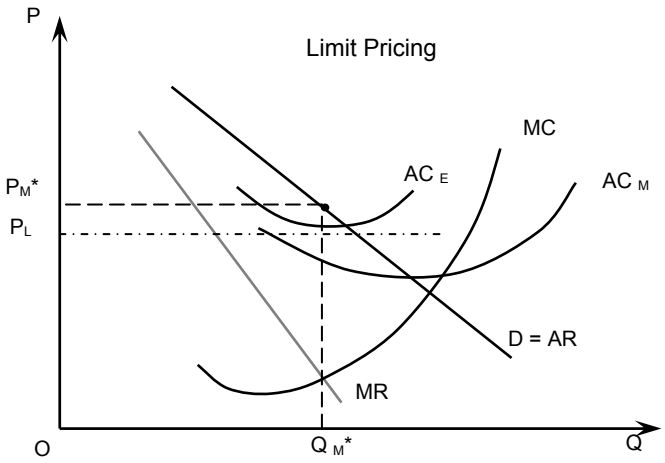
**iii.** Natural monopoly experiences economies of scale as its operation becomes bigger and bigger and therefore it is cost-effective for only one single firm producing for the entire economy, rather than two or more firms.
**iv.** Product differentiation or brand loyalty.
**v.** Active pricing strategies (limit pricing: charging a price below a potential entrant's AC to drive him out or discourage him from entering).
**vi.** The "threat of takeover" by the monopolist sometimes prevents other firms from entering.
**vii.** The monopolist controls the supply of key factors of production.
**viii.** The monopolist produces a product, which no one else can imitate, i.e. is protected by patents or copyrights.

Lesson 20

## MARKET STRUCTURES (CONTINUED)

### LIMIT PRICING

If a firm is already established in the market, it got gradually the business tricks of how to run the business. A new entrant firm in the market has to face high costs. A monopolist firm knows about this fact very well that his costs are lower than the new entrant firm so he can take advantage of this situation.



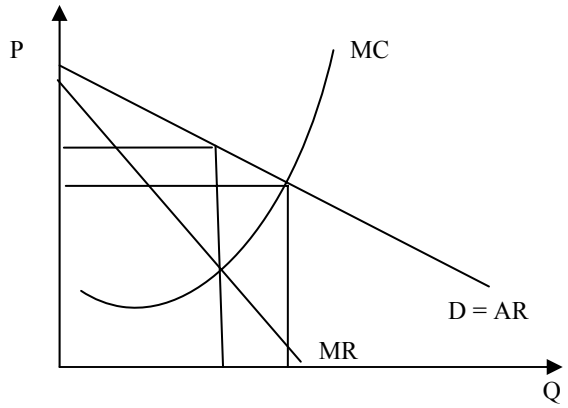

In this figure,
**$AC_E$ =** Average cost curve for new entrant firm
**$AC_M$ =** Average cost curve for monopolist firm
New entrant firm should charge the same or lower price than the monopolist other wise people will not purchase from new entrant firm. Now if monopolist wants to maximize his profits he would produce the output where MC=MR at $Q_M$*. At this output level, monopolist will charge the price of $P_M$*. This is the price that monopolist should charge if he wants to maximize his profits. But in order to ensure that the new entrant will not enter the market, he can charge the price lower than $P_M$*.

### MONOPOLIES AND THE PUBLIC INTEREST

**Disadvantages of monopolies:**

i. Monopolists produce lower quantities at higher prices compared to perfectly competitive firms. This is because monopolists do not produce where P=MC (the point of allocative efficiency) nor at P= AC minimum (the point of cost efficiency).
ii. Monopolists earn supernormal profits compared to perfectly competitive firms
iii. Most of the "surplus" (producer + consumer surplus) accrues to monopolists.
iv. Monopolists do not pay sufficient attention to increasing efficiency in their production processes.

**Equilibrium of the industry under perfect competition and monopoly: with the same MC**

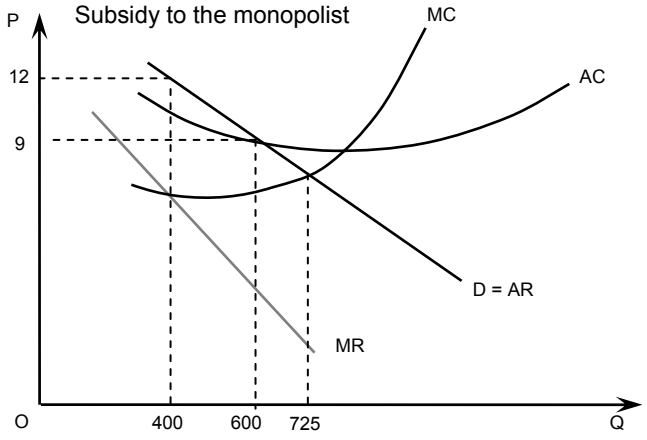



**Advantages of monopolies:**

i. Natural Monopolies are beneficial and efficient for society.
ii. Supernormal or monopoly profits can be invested in R&D, development of new innovative products and to sustain a price war when breaking into new foreign markets.

**GOVERNMENT REGULATION**

The government can regulate monopolies to ensure that they set a price where the AR curve intersects the MC curve. This will ensure allocative efficiency. It might not be possible to ensure that productive efficiency is attained as well because it is not necessary for the AR curve to intersect MC at the AC minimum. Also, in setting AR (or P) = MC, the economist might make a loss in which case the government would have to provide a subsidy. If the monopolist makes a profit then a tax is warranted. Due to difficulties with implementing subsidies, governments sometimes regulate monopolies at the point where the AR curve intersects the AC curve. This often takes the monopolist reasonably close to the allocative and productive efficiency points without necessitating a tax or a subsidy.



Lesson 21

## MARKET STRUCTURES (CONTINUED)

**PRICE DISCRIMINATION** (PD) happens when a producer charges different prices for the same product to different customers. A seller with a degree of monopoly power has the ability to price discriminate. This means being able to charge a different price to different customers.

### TYPES OF PRICE DISCRIMINATION

PD can be of three types:

i. 1st degree PD
ii. 2nd degree PD
iii. 3rd degree PD

### 1ST DEGREE PD

In this type, everyone charged according to what he can pay. Seller can charge the highest price of any product from customers. First-degree price discrimination occurs when identical goods are sold at different prices to each individual consumer. Obviously, the seller is not always going to be able to identify who is willing to pay more for certain items, but when he or she can, his profit increases.

**For example,** this type of price discrimination can be observed in the sale of both new and used cars. People will pay different prices for cars with identical features, and the salesperson must attempt to estimate the maximum price at which the car can be sold. This type of price discrimination often includes a bargaining aspect, where the consumer attempts to negotiate a lower price.

### 2ND DEGREE PD

In this type, different prices charged to customers who purchase different quantities.

**Examples** of this can often be found in the hotel and airline industries where spare rooms and seats are sold on a last minute standby basis. In these types of industry, the fixed costs of production are high. At the same time the marginal or variable costs are small and predictable. If there are unsold airline tickets or hotel rooms, it is often in the businesses best interest to offload any spare capacity at a discount prices, always providing that the cheaper price that adds to revenue at least covers the marginal cost of each unit.

In retail stores, second-degree price discrimination also exists. A reduced price may be offered if you buy two t-shirts instead of just one. This form helps to get rid of merchandise and generate more revenue for a company.

### 3RD DEGREE PD

In this type, seller charge different prices to different customers in different markets.

**For example,** exporters may charge a higher price in overseas markets if demand is estimated to be more inelastic than it is in home markets. In Pakistan, there is food chain like Mc Donald's, pizza hut, KFC etc. They sell their products at different prices in different countries. Moreover, senior citizens are considered a group, and are often offered discounts at movie theaters, for transportation, in restaurants, and even in retail stores where seniors may have a "senior day" each week that allows them to take a discount on merchandise. "Students" are another segmented group that may be offered lower prices. Both seniors and students have a higher elasticity of demand and can generally afford to pay less than the average worker.

**Consequences of PD:**

PD can allow firms making losses to make profits, firms to increase their supernormal profits if make supernormal profits; allow goods to be produced that would otherwise not be produced.

### PRE-REQUISITES / CONDITIONS OF PRICE DISCRIMINATION

i. That markets should be independent (it should not be possible for the different customers to arbitrage the price differences in the market).
ii. Firms should have the flexibility to price discriminate (i.e. should have some control over prices, so perfect competition ruled out).
iii. Price elasticity of demand for different customers should be different.

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### 2ND DEGREE PD

In this type, different prices charged to customers who purchase different quantities.

**Examples** of this can often be found in the hotel and airline industries where spare rooms and seats are sold on a last minute standby basis. In these types of industry, the fixed costs of production are high. At the same time the marginal or variable costs are small and predictable. If there are unsold airline tickets or hotel rooms, it is often in the businesses best interest to offload any spare capacity at a discount prices, always providing that the cheaper price that adds to revenue at least covers the marginal cost of each unit.

In retail stores, second-degree price discrimination also exists. A reduced price may be offered if you buy two t-shirts instead of just one. This form helps to get rid of merchandise and generate more revenue for a company.

### 3RD DEGREE PD

In this type, seller charge different prices to different customers in different markets.

**For example,** exporters may charge a higher price in overseas markets if demand is estimated to be more inelastic than it is in home markets. In Pakistan, there is food chain like Mc Donald's, pizza hut, KFC etc. They sell their products at different prices in different countries. Moreover, senior citizens are considered a group, and are often offered discounts at movie theaters, for transportation, in restaurants, and even in retail stores where seniors may have a "senior day" each week that allows them to take a discount on merchandise. "Students" are another segmented group that may be offered lower prices. Both seniors and students have a higher elasticity of demand and can generally afford to pay less than the average worker.

**Consequences of PD:**

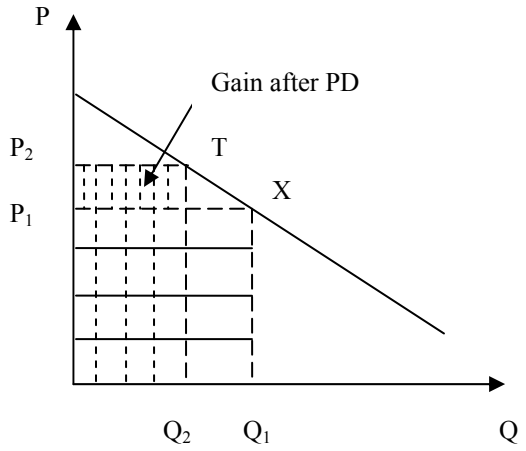
PD can allow firms making losses to make profits, firms to increase their supernormal profits if make supernormal profits; allow goods to be produced that would otherwise not be produced.

### PRE-REQUISITES / CONDITIONS OF PRICE DISCRIMINATION

i. That markets should be independent (it should not be possible for the different customers to arbitrage the price differences in the market).
ii. Firms should have the flexibility to price discriminate (i.e. should have some control over prices, so perfect competition ruled out).
iii. Price elasticity of demand for different customers should be different.

**BENEFITS OF PRICE DISCRIMINATION**

Price discrimination can be both, **beneficial or harmful** for public interest depending on a number of factors (equity or fairness concerns, the production of goods otherwise not produced, the use to which price-discriminating firms put their supernormal profits to, etc.).




**MONOPOLISTIC COMPETITION**

Monopolistic competition is also characterized by a large number of buyers and sellers and absence of entry barriers. In these two respects it is like perfect competition. Firms are price-takers but not in the extreme sense of perfect competition. Products are differentiated and in this respect, it is different from perfect competition.

Thus the characteristics of a monopolistically competitive market are almost the same as in perfect competition, with the exception of heterogeneous products, and that monopolistic competition involves a great deal of non-price competition (based on subtle product differentiation). A firm making profits in the short run will break even in the long run because demand will decrease and average total cost will increase. This means in the long run, a monopolistically competitive firm will make zero economic profit. This gives the company a certain amount of influence over the market; because of brand loyalty, it can raise its prices without losing all of its customers. This means that an individual firm's demand curve is downward sloping, in contrast to perfect competition, which has a perfectly elastic demand schedule.

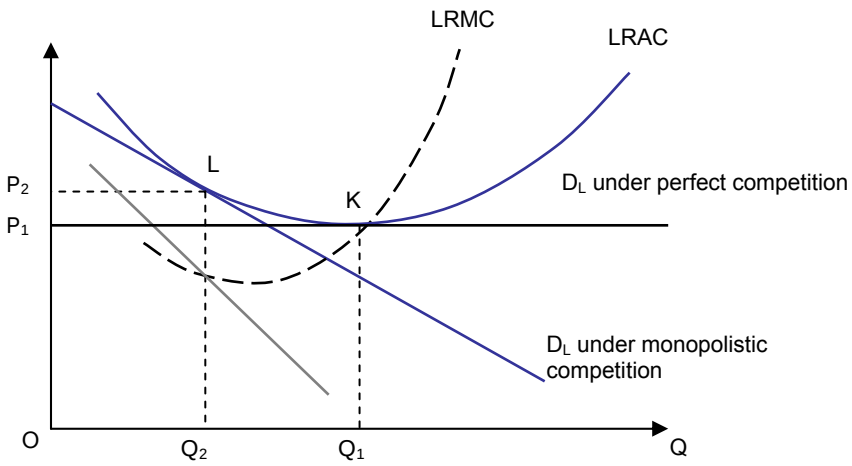
**SHORT RUN AND LONG RUN UNDER MONOPOLISTIC COMPETITION:**

In the short run, super normal profits are possible, but, in long run only normal profits can be earned. Equilibrium obtains where the AR curve becomes tangent to the AC curve. Public interest depends upon the position of AC at the point of tangency. If the AR curve is steep then the point of tangency will produce an output that will be well to the left of right the point where P= MC or P=AC $_{\text{minimum}}$.

Since products are differentiated, there is room and rationale for advertising and product promotion.

Monopolistic competition & public interest



Lesson 22

## MARKET STRUCTURES (CONTINUED)

### OLIGOPOLY

Similar to monopoly in the sense that there are a small number of firms (about 2-20) in the market and, as such, barriers to entry exist. It is similar to perfect competition in the sense that firms compete with each other, often feverishly, which may result in prices very similar to those that would obtain under perfect competition. It is similar to monopolistic competition since there is a possibility of having differentiated products.

### DIFFERENCE OF OLIGOPOLY WITH OTHER MARKET STRUCTURES

An oligopoly is a market form in which a market or industry is dominated by a small number of sellers (oligopolists). The word is derived from the Greek for few sellers.

- Because there are few participants in this type of market, each oligopolist is aware of the actions of the others. The decisions of one firm influence, and are influenced by the decisions of other firms. Strategic planning by oligopolists always involves taking into account the likely responses of the other market participants. This causes oligopolistic markets and industries to be at the highest risk for collusion.
- It is not possible to identify any single equilibrium in oligopoly. Theory of firm is not clearly discussed & established as the theory of firm in the other three market structures. Reason for that is the firms are interdependent.

### COLLUSION

Collusion occurs when two or more firms decide to cooperate with each other in the setting of prices and/or quantities. Firms collude in order to maximize the profits of the industry as a whole by behaving like a single firm. In doing so, they try to increase their individual profits. In the study of economics and market competition, collusion takes place within an industry when rival companies cooperate for their mutual benefit. Collusion most often takes place within the market form of oligopoly, where the decision of a few firms to collude can significantly impact the market as a whole. Cartels are a special case of explicit collusion. Collusion which is not overt, on the other hand, is known as tacit collusion.

At one time, all the firms sit together and combine their decisions in order to maximize profits & behave like monopoly. But at the same time, since all these firms have separate identity, they have the desire also to maximize their own individual profits as well. They might behave like single firm but they can also try to maximize their individual profits. This opposing situation creates tension. This tension can lead to collusion to break down.

### TWO POSSIBLE SCENARIOS OF OLIGOPOLY

This tension between collusion & competition give rise to two possible scenarios that the oligopolist firms can have:

1. Collusive oligopoly
2. Non-collusive oligopoly

### 1- COLLUSIVE OLIGOPOLY (CARTEL)

A collusive oligopoly (or cartel) can be formed by deciding upon market shares, advertising expenses, prices to be charged (identical or different) or production quotas, such as OPEC, are collusive oligopolies. A firm can collude in many different ways. For example, they can collude on the market share in total profits. Collusion can also be done in terms of how much advertising expenditures each firm would have to put. They can also set the prices and quotas. If firms are not of equal size, then quotas can be allocated according to the MC of each firm. Cost of the cartel firm is minimized if the MC of each of the firm is equal. But the problem with this quota system is that firms which have higher MC will get lower quotas and the firms which have lower MC will get higher quotas.

**Cartel**

A cartel is a formal (explicit) agreement among firms. Cartels usually occur in an oligopolistic industry, where there are a small number of sellers and usually involve homogeneous products.

Lesson 22

# MARKET STRUCTURES (CONTINUED)

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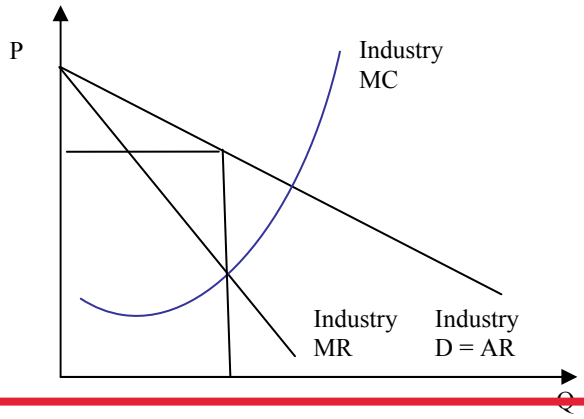
### Cartel

A cartel is a formal (explicit) agreement among firms. Cartels usually occur in an oligopolistic industry, where there are a small number of sellers and usually involve homogeneous products.

S/Q: Define cartel?

A cartel is most likely to survive when the number of firms is small, there is openness among firms regarding their production processes; the product is homogeneous; there is a large firm which acts as price leader; industry is stable; government's strictness in implementing anti-trust (or anti-collusion) laws. Govt regulations are helpless against internationally operational cartels or when collusion is tacit (or hidden) not explicit.

Profit maximizing cartel




S/Q:What is non-collusive oligopoly?

**2- NON- COLLUSIVE OLIGOPOLY**

If different firms in the oligopolistic structures do not cooperate with each other is known as non collusive oligopoly. In this case, collusion breaks down because the incentive to cheat is very high. This can arise, for instance, in a situation where there is a lure of very high profits so that individual firms cheat on their quota and try to increase output and profits. But this causes everyone else to do the same and therefore supply soars and prices tumble producing in effect a non-collusive oligopoly.

The incentive to collude becomes strong for members of a non-collusive oligopoly when firms are not making good profits. Thus oligopolies usually oscillate between collusive and non-collusive equilibria.

**COLLUSION & GAME THEORY**

**The Prisoner's Dilemma Situation**

Consider about the two prisoners who have committed a crime together. Both have been arrested by the police and kept in separate cells. They have been interrogated separately about their crime. The dilemma is this if both confess to a crime they each have to face the punishment of 5 years in jail. If they do not confess then police has no evidence to keep them and police will let them go free. Their punishment will be very minor or might be zero in this case.

If one testifies for the prosecution against the other and the other remains silent, the betrayer goes free and the silent accomplice receives the full 10-year sentence. If both remain silent, both prisoners are sentenced to only six months in jail for a minor charge. If each betrays the other, each receives a five-year sentence. Each prisoner must make the choice of whether to betray the other or to remain silent. However, neither prisoner knows for sure what choice the other prisoner will make. So this dilemma poses the question: How should the prisoners act?

The dilemma arises when one assumes that both prisoners only care about minimizing their own jail terms. Each prisoner has two and only two options: either to co-operate with his accomplice and stay quiet, or to defect from their implied pact and betray his accomplice in return for a lighter sentence. The outcome of each choice depends on the choice of the accomplice, but each prisoner must choose without knowing what his accomplice has chosen.

In deciding what to do in strategic situations, it is normally important to predict what others will do. This is not the case here. If one prisoner knew the other prisoner would stay silent, his best move is to betray as he then walk free instead of receiving the minor sentence. If he knew the other prisoner would betray, his best move is still to betray, as he receive a lesser sentence than by silence. Betraying is a dominant strategy. The other prisoner reasons similarly, and therefore also chooses to betray. Yet by

both defecting they get a lower payoff than they would get by staying silent. So rational, self-interested play results in each prisoner being worse off than if they had stayed silent.

A prisoner's dilemma situation for oligopolistic firms arises when 2 or more firms by attempting independently to choose the best strategy anticipation of whatever the others are likely to do, all end up in a worse position than if they had cooperated in the first place.

**Payoff of a matrix for firm X& Y**
**(profit in Rs: at different prices)**

| | | X's price | |
|---|---|---|---|
| | | **Rs.2** | **Rs.1.80** |
| **Y's price** | **Rs.2** | **A.** 10m each | **B.** 5m for Y<br>12m for X |
| | **Rs.1.80** | **C.** 12m for Y<br>5m for X | **D.** 8m each |

**There are four points to be noted in this table:**

- If both X & Y firms charge same price of Rs.2 then they get same profit of Rs.10 million as shown by option A.
- If both firm independently thought about reducing the price to Rs.1.8 then they have to take into account the decision of other firm. They have to think about what their rival will do? Their rival can do two things either to lower the price or kept the same price level. Now if X kept his price at Rs.2 the worst thing for X would be that its rival Y cuts its price to Rs.1.8. X's profit will now fall to Rs.5 million and Y's profit will increase to Rs.12 million due to lower price. This is shown in option C.
- If however, X cuts its price to Rs.1.8 the worst outcome still would be Y to cut its price too to Rs.1.8. but this time X's profit will only fall to Rs.8 million and Y's profit will also fall to Rs.8 million. This is shown in option D.
- However if X think optimistically and cuts its price to Rs.1.8 with his optimistic assumption that Y will leave with its price at Rs.2. if X is right in his assumption then he will earn the maximum profit of Rs.12 million and Y will earn Rs.5 million. This option is shown in option B.

L/Q:What is meant by maximin strategy?

**Maximin strategy**

Maximin strategy is a cautious (pessimistic) approach in which firms try to maximize the worst payoff they can make. It is the policy of adopting the safer side. It means the firm is trying to maximize the minimum profit that it will make.

**Maximax strategy**

A Maximax strategy involves choosing the strategy which maximizes the maximum payoff (optimistic). This policy arises from the optimistic approach that your rival will react most favorable to you. It means firm is going for the maximum possible profit.

L/Q:What is meant by maximax?

**Dominant strategy game:**

Both these strategies leads towards the same strategy that is cutting down of price to Rs.1.8. this type of game is called the dominant strategy game. Given that both X & Y are tempted to lower price, they both end up tempting the lower profit i-e Rs.8 million each. If they collude and charge the same price, they will get profit of Rs.10 million each. Thus collusion rather than price war would be beneficial for both.

## EXERCISES

**Give two examples of markets which fall into each of the following g categories.**
Perfect competition: grains; foreign exchange.
Monopolistic competition: taxis; van hire, restaurants.
Oligopoly: (homogeneous) white sugar; (differentiated) soap; banks.
Monopoly: WAPDA (electricity transmission); local bus company on specific routes.
**Would you expect general building contractors and restaurant owners to have the same degree of control over price?**
Other things being equal, restaurant owners are likely to produce a more differentiated product/service than general builders (as opposed to specialist builders), and are thus likely to face a less elastic demand. This gives them more control over price. Note, however, that the control over price depends on the degree of competition a firm faces. If, therefore, there were only a few builders in a given town, but many restaurants, the above arguments may not hold.
**It is sometimes claimed that the market for the stocks/ shares of a company is perfectly competitive, or nearly so. Go through the four main perfect competition assumptions you have been taught about (large no. of price taking firms, no entry barriers, homogenous product, and perfect information) and see if they apply to HUBCO shares.**

- **a.** Most aspects of the four assumptions of perfect competition apply.
- **b.** There is a very large number of shareholders (although there are some large institutional shareholders.)
- **c.** People are free to buy HUBCO shares (though, in reality, this depends on how liquid, i.e. accessible/available for sale the HUBCO shares are).
- **d.** All HUBCO shares are the same.
- **e.** Buyers and sellers know the current HUBCO share price, but they have imperfect knowledge of future share prices.

**Is the market for gold perfectly competitive?**
It is almost similar to the market for HUBCO shares. There are many buyers and sellers of gold, who are thus price takers, but who have imperfect knowledge of future gold prices. Also, countries with large gold stocks (e.g. the USA) could influence the price by large-scale selling (or buying). [Note also that the 'price' would have to refer to a weighted average of the price in all major currencies to take account of exchange rate fluctuations.]
**What are the advantages and disadvantages of using a 5-firm "concentration ratio" rather than a 10-firm, 3-firm or even a 1-firm ratio?**
The fewer the number of firms used in the ratio, the more useful it is for seeing just how powerful the largest firms are. The problem with only including one or two firms in the ratio, however, is that it will not pick up the significance of the medium-to-large firms. For example, if we look at the 3-firm ratio for two industries, and if in both cases the three largest firms have a 50 per cent market share, but in one industry the next largest three firms have 45 per cent of the market (a highly concentrated industry), but in the other industry the next three largest firms have only 5 per cent of the market (an industry with many competing firms), the 3-firm ratio will not pick up this difference. Clearly, this problem is more acute when using a 2-firm or a 1-firm ratio.
The more the firms used in the ratio, the more useful it is for seeing whether the industry is moderately competitive or very competitive. It will not, however, show whether the industry is dominated by just one or two firms. For example, the 10-firm ratio for two industries may be 90 per cent. But if in one case there are 10 firms of roughly equal size, all with a market share of approximately 9 per cent, then this will be a much more competitive industry than the other one, if that other one is dominated by one large firm which has an 85 per cent market share.
A more complete picture would be given of an industry if more than one ratio were used: perhaps a 1-firm, a 2-firm, a 5-firm and a 10-firm ratio.
**Why do economists treat normal profit as a cost of production?**
Because it is part of the opportunity cost of production. It is the profit sacrificed by not using the capital in some alternative use.

**What determines (a) the level and (b) the rate of normal profit for a particular firm?**
It is easier to answer this in the reverse order.

**a.** The level of normal profit depends on the total amount of capital employed.
**b.** The rate of normal profit is the rate of profit on capital that could be earned by the owner in some alternative industry (involving the same level of risks).

**Will the industry supply be zero when the price of a firm A falls below P1 , where P1 < AVC for the firm?**
Once the price dips below a firm's AVC curve, it will stop production. But only if "all" firms have the same AVC curve will the "entire industry" stop production. If some firms have a lower AVC curve than firm A, then industry supply will not be zero at P1.

**Why is perfect competition so rare?**

- Information on revenue and costs, especially future revenue and costs, is imperfect.
- Producers usually produce differentiated products.
- There are frequently barriers to entry for new firms.

**Why does the market for fresh vegetables approximate to perfect competition, whereas that for aircraft does not?**
There are limited economies of scale in the production of fresh vegetables and therefore there are many producers. There are such substantial economies of scale in aircraft production, however, that the market is only large enough for a very limited number of producers, each of which, therefore, will have considerable market power.

**What advantages might a large established retailer have over a new e-commerce rival to suggest that the new e-commerce business will face difficulties establishing a market for internet shopping?**

- Customers are familiar with the retailer's products and services and may trust their quality.
- Consumers may prefer to be able to ask advice from a sales assistant, something they can't do when buying over the internet.
- The retailer may have sufficient market strength to match any lower prices offered by the e-commerce firm.
- The retailer may have sufficient market strength to force down prices from its suppliers.
- Consumers may prefer to see and/or touch the products on display to assess their quality.
- Consumers may prefer the 'retail experience' of going shopping.

**As an illustration of the difficulty in identifying monopolies, try to decide which of the following are monopolies: Pakistan Telecommunications Corporation Limited PTCL); your local morning newspaper; the village post office; ice cream seller inside the cinema hall; food sold in a university cafeteria; the board game 'Monopoly'.**
In some cases there is more obvious competition than in others. For example, with the growth of mobile phones supplying phone services too, PTCL has lost some of its monopoly status for a section of the population. In other cases, such as ice creams in the cinema, village post offices and university cafeterias, there is likely to be a local monopoly. In all cases, the closeness of substitutes will very much depend on consumers' perceptions.

**A monopoly would be expected to face an inelastic demand. And yet, if it produces where MR = MC, MR must be positive, demand must therefore be elastic. Therefore the monopolist must face an elastic demand! Can you solve this puzzle?**
Demand is elastic at the point where MR = MC. The reason is that MC must be positive and therefore MR must also be positive. But if MR is positive, demand must be elastic. Nevertheless, at any given price a monopoly will face a less elastic demand curve than a firm producing the same good under monopolistic competition or oligopoly. This enables it to raise price further before demand becomes elastic (and before the point is reached where MR = MC).

**If the shares in a monopoly (such as a water supply company in a European country) were very widely distributed among the population, would the shareholders necessarily want the firm to use its monopoly power to make larger profits?**
If the water company raised its charges and thereby made a larger profit, shareholders would gain from larger dividends, but as consumers of water would lose from having to pay the higher charges. Except in the case of shareholders with only a few water shares, however, the gain is likely to outweigh the loss. Nevertheless, with shares very widely distributed, the average net gain would be only very small, and the

wider the distribution, the more shareholders there would be who would suffer a net loss from the higher charges.

**In what respects might the behaviour of Microsoft, increasingly becoming a monopoly in the software and operating systems market, be deemed to be: (a) against the public interest; (b) in the public interest?**

**a)** Prices are likely to be higher, given the lack of competition; there may be less product development, because potential competitors fear Microsoft's power to block their entry to the market, or drive them from it if they do succeed in entering; less choice for consumers.

**b)** By developing products that are in general use round the world, it is more convenient for businesses and their employees, who do not have to learn different sets of programmes or have problems with incompatibility of programmes and operating systems; monopoly profits can lead to high levels of investment and product development, which can help to reduce prices over the longer term.

**In which of the following industries are exit costs likely to be low: (a) steel production; (b) market gardening; (c) nuclear power generation; (d) specialist financial advisory services; (e) production of a new medicine. Are these exit costs dependent on how narrowly the industry is defined?**

**a)** High. The plant cannot be used for other purposes.

**b)** Relatively low. The industry is not very capital intensive, and the various tools and equipment could be sold or transferred to producing other crops.

**c)** Very high. The plant cannot be used for other purposes and decommissioning costs are very high.

**d)** Low. The capital costs are low and offices can be sold.

**e)** Low to moderate. It is likely that a pharmaceutical company can relatively easily switch to producing alternative drugs. Substantial exit costs are only likely to arise if the company is committed to a long-term research and development programme or if equipment is not transferable to producing alternative drugs.

**Give some other examples of monopolistic competition.**

Examples include: taxis, car hire, hotels and restaurants, insurance agents, estate agents, office equipment suppliers, antique dealers, computer systems.

**Why may a food shop charge higher prices than wholesale markets (or supermarkets) for 'essential items' and yet very similar prices for "delicacy" items?**

Because the demand for such essential items from a local food shop is likely to be less price-elastic than the demand for the delicacy items: if people run out of basic items, they will want to obtain them straight away from the nearest shop rather than waiting until they visit the supermarket. Also the supermarkets may obtain bulk discount from their suppliers on basic items, but not on delicacy items, where the sales turnover is much lower.

**Which of these two items is a PSO or Shell petrol station more likely to sell at a discount: (a) petrol; (b) sweets? Why?**

Petrol. The reason is that demand is more price elastic. People will be tempted to buy now, rather than waiting, if they see a reasonable discount. In the case of sweets, these are often an impulse buy and the price is very low anyway relative to the amount already spent on petrol. A penny or two price reductions will probably make very little difference to sales.

**In monopolistic competition, why does the LRMC curve cross the MRL curve directly below the tangency point of the LRAC and ARL curves?**

One way of answering the question is to note that long-run profits are maximized where long-run MR equals long-run MC (let's call it QL). But at QL, long-run AR equals long-run AC, whilst at any other output long-run AR is below long-run AC. Thus profits must be maximized at QL.

**Assuming that supernormal profits can be made in the short run in a monopolistically competitive industry; will there be any difference in the long-run and short-run elasticity of demand? Explain.**

Yes. The entry of new firms, attracted by the supernormal profits, will make the long-run demand for the firm more elastic: there are now more alternatives for consumers to choose from.

**Why would you expect additional advertising dollars spent by a firm to cause smaller and smaller increases in sales? In other words why should advertising suffer from "diminishing returns"?**

Because fewer and fewer additional people will see each extra advertisement (i.e. many of the people will have seen the adverts already and thus there will be little additional effect on their demand).

**Which would you rather have: five restaurants to choose from, each with very different menus and each having spare tables so that you could always guarantee getting one; or just two restaurants, charging a bit less but with less choice and where you have to book quite a long time in advance?**
Many people would choose the first, but clearly it is a question of personal preference.
**How will advertising affect a cartel's MC and AR curves? How will this affect the profit-maximizing output?**
If advertising increases total cartel sales, the cartel's AR curve will shift to the right and possibly become less elastic. The MC curve will only shift if the advertising varies with output. Given that the amount that member firms will advertise might not be known and, even if it were, the exact effects of any amount of advertising on AR are impossible to identify and compute, it would become difficult for the cartel to identify the profit-maximizing price with any degree of precision.
**You have been taught about the conditions that facilitate the formation of a cartel? Which of these conditions were to found in the oil market in (a) the early 1970s; (b) the mid-1980s; (c) 2000?**

- There are relatively few oil producing countries (but more in the 1980s than in the 1970s).
- The OPEC members meet openly to discuss pricing and quotas (in all three periods)
- Production methods are relatively similar, although costs vary according to the accessibility of the oil.
- The (final) product is very similar and there is an international price for each type of crude.
- Saudi Arabia is the dominant member of OPEC: its dominance over the world market, however, waned from the mid-1980s as non-OPEC production increased and there was a world glut of oil. With a growing world economy in the late 1990s, Saudi Arabia's influence grew again.
- Entry barriers, however, have "not" been significant. This has allowed several non-OPEC members (e.g. Mexico, Norway and the UK) to break into the market.
- The market is relatively stable in the short run (given the price and income inelasticity of demand). There has been a problem, however, of a decline in demand over the longer term.
- Governments round the world have been relatively powerless to curb OPEC's collusion, although from time to time (e.g. during the Gulf War) the USA has released oil from its huge stock piles to prevent excessive price increases.

**Could OPEC have done anything to prevent the long-term decline in real oil prices since 1981?**
Very little, given that the supply of substitutes (both oil and non-oil) for OPEC oil has increased substantially. Perhaps, with hindsight, if OPEC had not raised prices so much in 1973/74 and 1979 there would have been less incentive to develop substitutes and to break the power of the cartel.
**Many oil analysts are predicting a rapid decline in world oil output in 10 to 20 years as world reserves are depleted. What effect is this likely to have on OPEC's behaviour?**
The fall in output will drive up prices. Provided that OPEC can prevent its members from pumping oil more rapidly to take advantage of the rising price, OPEC's power could increase. It could demonstrate to its members the rising trend in oil prices and attempt to persuade them of the benefit of reducing production even further. It could 'sell' this policy to the world as one of being prudent with dwindling oil stocks.
**In which of the following industries is collusion likely to occur: bricks, margarine, cement, crisps, washing powder, blank audio or video cassettes, and carpets?**
In all cases collusion is quite likely: check out the factors favouring collusion discussed in the lecture and also above. In some cases it is more likely than others: for example, in the case of cement, where there is little product differentiation and a limited number of producers, collusion is more likely than in the case of carpets, where there is much more product differentiation.
**Assume that there are two major oil companies operating filling stations in an area. The first promises to match the other's prices. The other promises that it will always sell at Re.1 per liter cheaper than the first. Describe the likely sequence of events in this 'game' and the likely eventual outcome. Could the promise of the second company be seen as credible (i.e. you will believe)?**
Prices would be driven down, and hence profits reduced, until one of the companies could no longer stick to its promise – either the first accepting that its price will be Re. 1 above the second, or the second accepting the same price as the first. Alternatively both companies simultaneously may decide to abandon their policy and collude to raise prices. This may involve a secret meeting between them, or simply 'letting it be known' that they would be willing to raise prices, providing that the other company did the same.

The promise of the second company could be seen as credible if it had lower costs or greater financial backing than the first company. In such circumstances, the first company may be forced to give up its policy first. If they have similar costs and financial strength, then the threat is not credible.

**Consider a train company which charges different prices for first and standard class, for traveling on different days in the week or different times in the day etc. Are these examples of price discrimination?**

Price discrimination occurs when the same product or service (with the same marginal cost) is sold at different prices to different customers. Thus, strictly speaking, charging a different price for first and standard class, for travel on different times of day, or on different days of the week, or at different times of the year are not the purest examples of price discrimination, since (a) the service is different and (b) the marginal cost is not the same. On the other hand, charging a different price for children, students, old people, people traveling on single rather than return tickets etc. are examples of price discrimination since they allow travel on the same seat on the same train to different classes of people.

**Are these various forms of price discrimination in the traveler's interest?**

If the lower-price fares are making travel possible for people who could otherwise not afford it, then clearly they are benefiting. For the people paying the higher-priced fares, then there are advantages and disadvantages. Clearly, they will not like paying more than they would in the absence of price discrimination, but given that at peak times some lines are operating to full capacity, the higher price may be necessary to prevent queuing or grossly overcrowded trains (though note, as explained in the answer to the last question, charging higher prices at peak times to everyone is strictly speaking not a form of price discrimination).

**If, over time, consumers are encouraged to switch their use of dial-up internet connections to off-peak periods, what will happen to peak and off-peak prices?**

The difference between the prices will narrow.

**To what extent is peak-load pricing (i.e. charging the highest price for a product/service when the loan of demand for it is highest; e.g. charging a high rate for dial-up internet connection in the day rather than after midnight) in the interests of consumers?**

It may help to keep the average price down, if it spreads the use of fixed factors (like bandwidth or telephone lines) more evenly. It may also help to ease congestion (e.g. on trains) at peak times for those who have no alternative but to use the service at that time. Peak users may prefer a higher priced journey to a more congested journey or having to queue, and possibly running the risk of not getting the service (e.g. not getting on the train or bus because it is full).

**Is total consumption likely to be higher or lower with a system of peak and off-peak prices as opposed to a uniform price at all times?**

Higher, since some people would only be prepared to buy the product at off-peak prices.

**Which type of price discrimination do cinemas pursue when they charge different prices for adults and children? First, second or third degree? Would it be possible for the cinema to pursue either of the other two types?**

It is third-degree price discrimination. It groups cinema goers into two types: adults and children.

It could not practice first-degree discrimination: it would not be possible to negotiate a separate ticket price with each customer! It could possibly practice a form of second-degree price discrimination, however, if it gave tokens to people each time they purchased a ticket and then sold tickets at reduced prices to people with tokens.

**If all cinema seats could be sold to adults in the evenings at the end of the week, but only a few on Mondays and Tuesdays, what price discrimination policy would you recommend to the cinema in order for it to maximize its weekly revenue?**

Offer reduced-price tickets to children in the evenings as well as in the afternoon for the first part of the week, but not for the end of the week.

**Would the cinema make more profit if it could charge adults a different price in the afternoon and the evenings?**

Possibly. The danger for the cinema, however, is that adults who would have gone to the cinema anyway may now choose to go in the afternoon, thereby losing the cinema revenue. Ideally the cinema would like to discriminate in such a way as to encourage people to go in the afternoon at a reduced price who would

not have gone at all (whether in the afternoon or the evening), like old people for e.g., if they had to pay the higher price.

**Why is the Prisoners' Dilemma game discussed in the lecture a dominant strategy 'game'?**

Because, whatever assumption is made about the other's behavior, each prisoner is likely to confess.

**How would each prisoner's strategy change if there were five prisoners (who committed the joint crime) and not two, and if all five all of them had been caught?**

The more people there were involved in the crime, the greater would be the likelihood of one of them confessing and therefore the greater the temptation for any individual prisoner to confess.

**Can you think of any other non-economic examples of the prisoners' dilemma?**

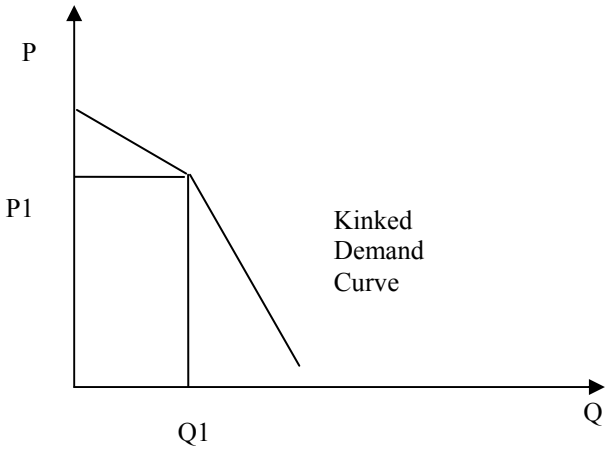
Children in a class agreeing not to do homework, but parents keeping them apart after school so that they can persuade their children to do their homework, telling them, 'The other children will also be doing theirs and you will not want to show up by doing badly compared with them.' What should the children do? Do their homework in the fear that everybody else would do the homework (the equivalent of "confessing" in the fear of the other prisoners confessing) or not do the homework hoping that the others won't do it as well (the equivalent of "not confessing" in the hope that the others won't do it either).

Lesson 23

## MARKET STRUCTURES (CONTINUED) & WELFARE ECONOMICS

### PRICE STABILITY IN NON-COLLUSIVE OLIGOPOLIES: KINKED DEMAND CURVE

A kinked demand curve explains the "stickiness" of the prices in oligopolistic markets. The theory of kinked demand curve rests on the two assumptions that if one firm raises prices, no one else will raise their prices and so the firm will face declining revenues (elastic demand). However if one firm lowered its price, everyone else would lower their prices as well and everyone's revenues, including the first firm's revenues would fall (inelastic demand).




A demand curve with two distinct segments which have different elasticities that joins to form a corner or kink. The primary use of the kinked-demand curve is to explain price rigidity in oligopoly. The two segments are:

**(1)** A relatively more elastic segment for price increases

**(2)** A relatively less elastic segment for price decreases

The relative elasticities of these two segments are based on the interdependent decision-making of oligopolistic firms.

**Non Price Competition:**

Non price competition means competition amongst the firms based on factors other than price, e.g. advertising expenditures.

**Oligopoly & public interests:**

In oligopoly, firms are able to earn super normal profits. This is also the feature of monopoly. But this is not the feature of perfect competition & monopolistic competition. Firms can use their profits in cost minimization techniques.

### WELFARE ECONOMICS

It is a branch of economics dealing with normative issues (i.e., what should be). Welfare economics is a branch of economics that uses microeconomic techniques to simultaneously determine allocative efficiency within an economy and the income distribution associated with it. It analyzes social welfare in terms of economic activities of the individuals that comprise the theoretical society considered.

### THE MARGINAL PRIVATE COST OF ADVERTISING

The marginal private cost of advertising is the cost of every additional TV commercial or newspaper advertisement that a firm has to bear. However, this does not include the nuisance cost that such advertisements sometimes cause to viewers of television or readers of newspapers. If firms incorporated these costs into their calculations, they would do less advertising. Concerns such as these fall into the realm of welfare economics.

# ECO401 – INTRODUCTION TO ECONOMICS

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