QUESTIONS

NUMBER ONE

(a) What is 'Oligopoly'?

(2 marks)

(b) Using a well illustrated diagram, explain why prices are 'sticky' downwards under an oligopolistic market structure

(12 marks)

(c) Using a well-illustrated diagram, show that a monopolist can make losses in the short-run even when MC = MR

(6 marks)

(Total: 20 marks)

NUMBER TWO

(a) What is meant by economies and diseconomies of scale?

(6 marks)

(b) Write explanatory notes on the various types of internal and external economies of scale.

(14 marks)

(**Total: 20 marks)**

NUMBER THREE

(a) Differentiate between economies of scale and returns to scale

(4 marks)

(b) Given a firm's demand function $Q - 90 + 2P = 0$ and its average cost function $AC = Q^2 - 8Q + 57 + 2/Q$, determine the level of output which maximizes profits (NB: only the first order condition is required).

(8 marks)

(c) (i) Explain why a firm in perfect competition may continue in the production of goods which it can only sell at a loss and why it cannot continue doing this indefinitely.

(4 marks)

(ii) Illustrate and explain the short-run supply curve of a firm in perfect competition (4 marks)

(Total: 20 marks)

NUMBER -FOUR

A monopoly firm is faced with the following demand function

$P = 13 – 0.5Q$

The Marginal Cost function for the firm is given by $3 + 4Q$ and the total fixed cost is 4.

Determine:

a) The profit maximizing output. (6 marks)
b) The level of supernormal profit if any. (3 marks)
c) The output level at the break-even point. (2 marks)

A firm operating in a perfectly competitive market has to sell all its output at the price of Sh.10 per unit. Its marginal cost function is given by $Q + 4$ and the total fixed cost is 1.

Determine:

d) The profit maximizing output level. (6 marks)
e) The level of supernormal profit if any. (3 marks)

(Total: 20 marks)

NUMBER -FIVE

a) Explain what is meant by the terms transfer earnings and economic rent of a factor of production. (4 marks)
b) Using well labelled diagrams, illustrate cases when the total factor payments may equal to economic rent, or transfer earnings or shared between the two.(6 marks)
c) i) Briefly explain and illustrate quasi-rent. (4 marks)
ii) Discuss some of the economic implications of a rising trend in the rural-urban migration and offer policy recommendations to reverse it. (6 marks)

(Total: 20 marks)

NUMBER -SIX

The total cost equation in the production of bacon at some hypothetical factory is $C = 1000 + 100Q – 15Q^2 + Q^3$

Where C = Cost measured in shillings, while Q = quantity measured in kilogrammes.

a) Compute the total and average costs at output level of 10 and 11 kilogrammes.(6 marks)
b) What is the Marginal cost of the 12^{th} Kilogramme? (4 marks)
c) Explain the shape and relationship between AC,AVC,MC and AFC curves using relevant diagrams. (10 marks)

(Total: 20 marks)

NUMBER -SEVEN

(a) Assume the following information represents the National Income Model of an 'Utopian' economy.

$$Y = C + I + G$$
$$C = a + b(Y - T)$$
$$T = d + tY$$
$$I = I_O$$
$$G = G_O$$

Where $a > O; O < b < 1$
$d > O; O < t < 1$

T = Taxes
I = Investment
G = Government Expenditure

i) Explain the economic interpretation of the parameters a,b,d and t. (4 marks)
ii) Find the equilibrium values of income, consumption and taxes.(8 marks)

b) Discuss the three approaches used in measuring the national income of a country and show why they give the same estimate. (8 marks)

(Total: 20 marks)

NUMBER-EIGHT

a) Why is it important to estimate National Income of a Country? What difficulties do economists encounter while carrying out such a task particularly in developing countries? (10 marks)

b) The table below represents economic transactions for country XYZ in billions of shillings:

	Total output	Intermediate purchases
Agriculture	30	10
Manufacturing	70	45
Services	55	25

Required:

i) Calculate the Gross National Product of this economy using the value added approach. (3 marks)

ii) If depreciation and indirect taxes equal 8 billion and 7 billion shillings respectively, find the Net Domestic Product both at Market prices and at factor cost. (4 marks)

c) Briefly explain the multiplier and accelerator principles. (3 marks)

(Total: 20 marks)

NUMBER -NINE

a) Define Money and outline its major functions. (8 marks)

b) Explain the various motives of holding money. (6 marks)

c) What are the likely effects of an expansionary monetary policy in an economy. (6 marks)

(Total: 20 marks)

NUMBER ONE

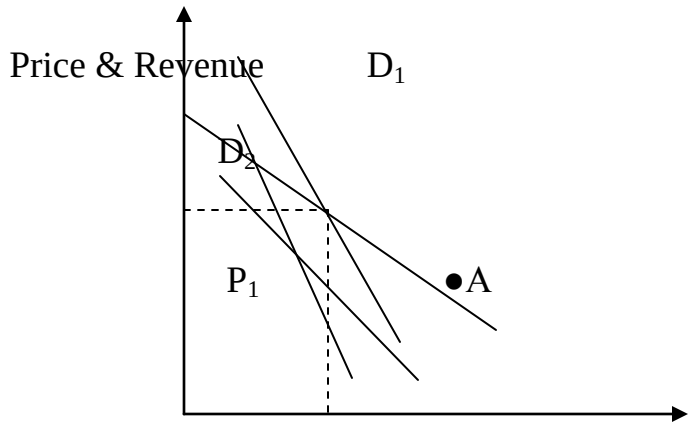
a) Oligopoly refers to a market structure dominated by a few large firms. These few firms account for the whole output of the industry for example banks and newspaper companies. In this market structure, the number of firms is small enough for each seller to take account of the actions of the other sellers in the market, that is, if one firm changes its price or non-price strategies its rivals will react. This is referred to as oligopolistic interdependency. This then means that each oligopolist formulates his policies with an eye to their effect on its rivals.

Some of the factors responsible for oligopoly are:

- In some industries, low production costs cannot be achieved unless a firm is producing an output equal to a substantial portion of the total available market, so consequently the number of firms will tend to be rather small
- There may be economies of scale in sales promotion in certain industries; promoting oligopoly for example effective advertising is often carried out on a large scale and the advertising cost per unit of output decreases with increase in output upto some point
- There may exist barriers to entry into some industries for example, the requirement that a firm build and maintain a large, complicated and expensive plant, or have access to patents or scarce raw materials. Only a few firms may be in a position to obtain all these necessary requirements for entry in the industry.

(b) Why prices are sticky downwards under oligopolistic market structures:

The model for oligopoly that explains why prices are sticky downwards is the kinked demand curve model.



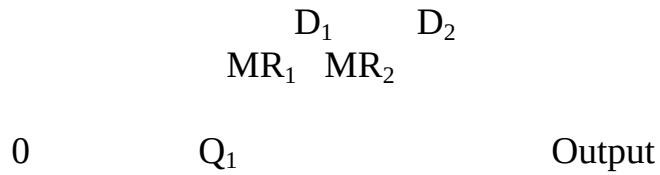


Fig: 21.1: The Kinked demand Curve

Suppose that the oligopolist was selling a quantity of OQ_1 at the price of OP_1. Based on past experience, the oligopolist expects that if he lowers his price, his rivals would also reduce their price in order to maintain their market share. Thus below price OP_1 the oligopolist faces a relatively price inelastic demand curve (AD_1). A proportionate fall in price below OP_1 will lead to a less than proportionate increase in quantity demanded. Also the oligopolist believes that when he increases his price, his rivals will keep their prices constant so as to increase their market share thus above price OP_1 the oligopolist faces a relatively elastic demand curve (AD_2). A proportionate increase in price above OP_1 will lead to a more than proportionate fall in the quantity demanded. The oligopolist thus, has two demand curves $D_1 D_1$ and $D_2 D_2$. . $D_1 D_1$ is the relatively inelastic demand curve when the oligopolist expects his rivals to match his price changes and $D_2 D_2$ when he does not expect his rivals to react.

For a straight line demand curve, marginal revenue curve lies halfway between the demand curve and the Y-axis.

The corresponding marginal revenue curves are MR_1 and MR_2 respectively. The effective demand curve (D_2 AD_1) and the marginal revenue curve facing the oligopolist is illustrated in the diagram below:

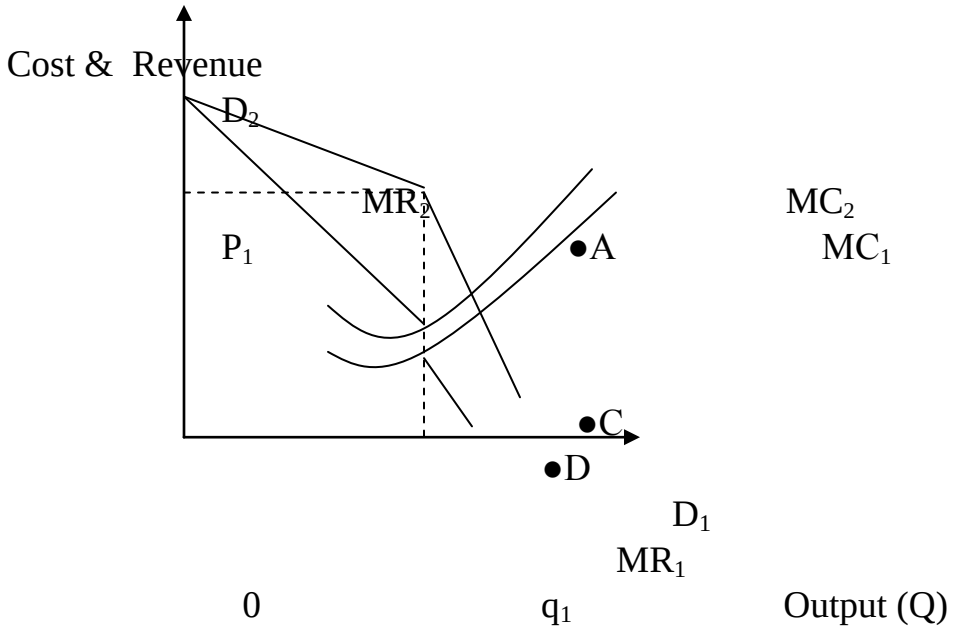


Fig 21.2: To illustrate the effective demand curve and marginal revenue curve in Oligopoly

The effective demand curve is $D_2 AD_1$. It is referred to as a kinked demand curve since it is kinked at point A. The effective marginal revenue curve is given by $D_2 CDMR_1$ with a discontinuity between C and D.

Since the firm is at equilibrium with the output of Oq_1 and price Op_1, marginal cost curve cuts (intersects) the marginal revenue curve somewhere in the area of discontinuity.
Changes in the firm's marginal cost are possible (from MC_1 to MC_2) which will not induce the firm to change its price.
Also possible are the changes in the market demand which shift the demand curve in and out without affecting the height of the kink.
In short, changes in costs and revenue over a certain range will not affect the equilibrium price. The firm can easily reduce the price but it is very hard to increase the price since if it increases, it will lose a big proportion of its market share. The price therefore remains sticky once reduced, that is, all other firms will follow suit and reduce but none will increase the price.

(c) A monopolist making losses:

A monopolist is a single seller in any market. The seller constitutes the industry and there are no close substitutes for the product and there exists barriers to entry in the industry. In the short run, a monopolist can make a loss even when he is producing where MR = MC. This is illustrated below:

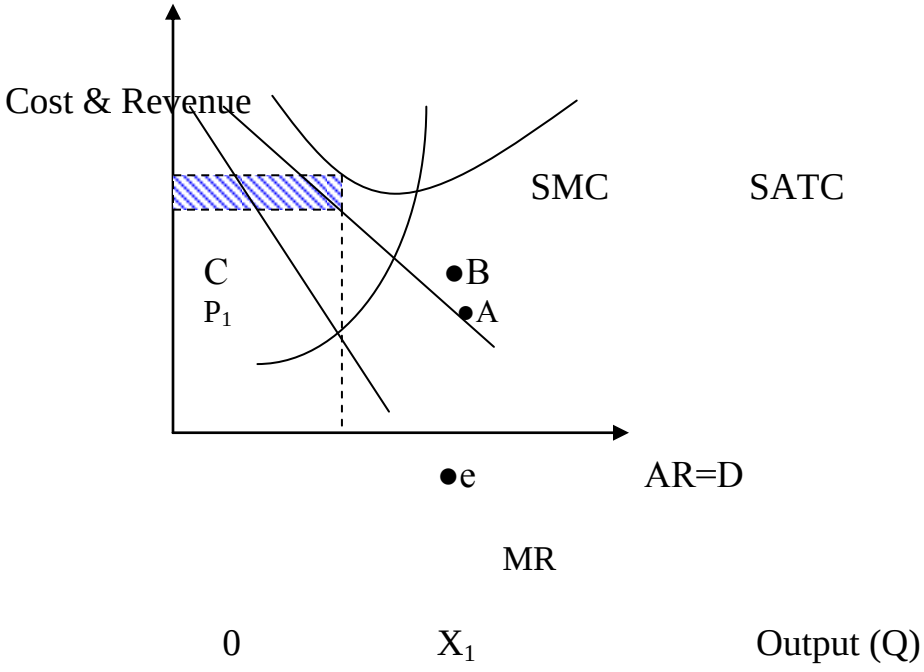
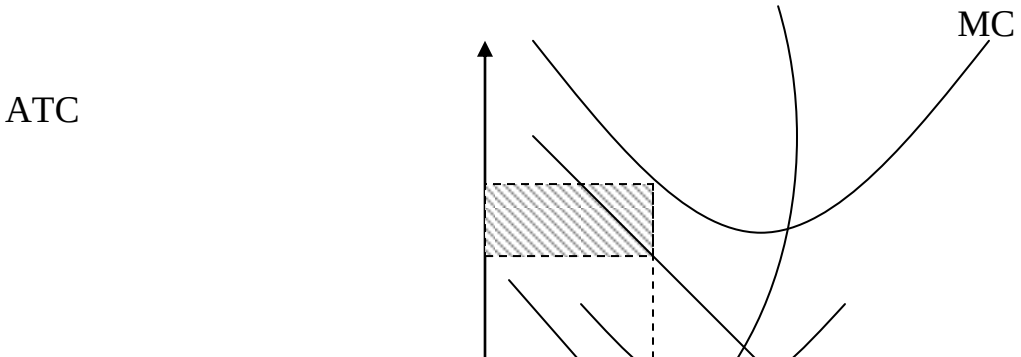


Fig 21.3: Loss – making in monopoly

A monopolist faces a downward sloping demand curve since he is a price maker and quantity setter. The AR curve is the Demand curve. Since the curve (AR) is downward sloping, MR will always be less than price since the firm must reduce the price of all units of output, not just the extra unit in order to sell that extra unit.The monopolist is at equilibrium where MC = MR. This is at the output level of OX_1. . The price charged by the monopolist is OP_1 and the average cost is OC. Since the average cost is greater than the average revenue at equilibrium the firm makes a loss. Total Cost is defined by OX_1 BC while total revenue is the area OX_1 AP_1 . The firm thus makes a loss equal to P_1 ABC, the shaded area.

Whether the monopolist making a loss will continue production depends on whether he covers the average variable cost or not. This is illustrated below:



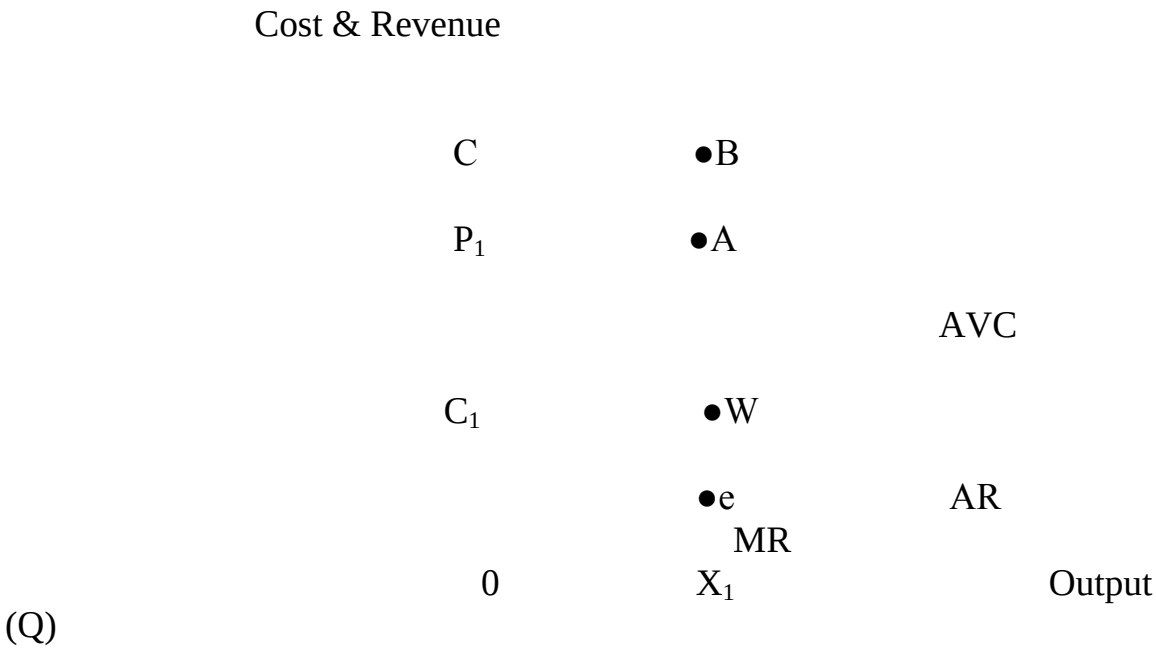
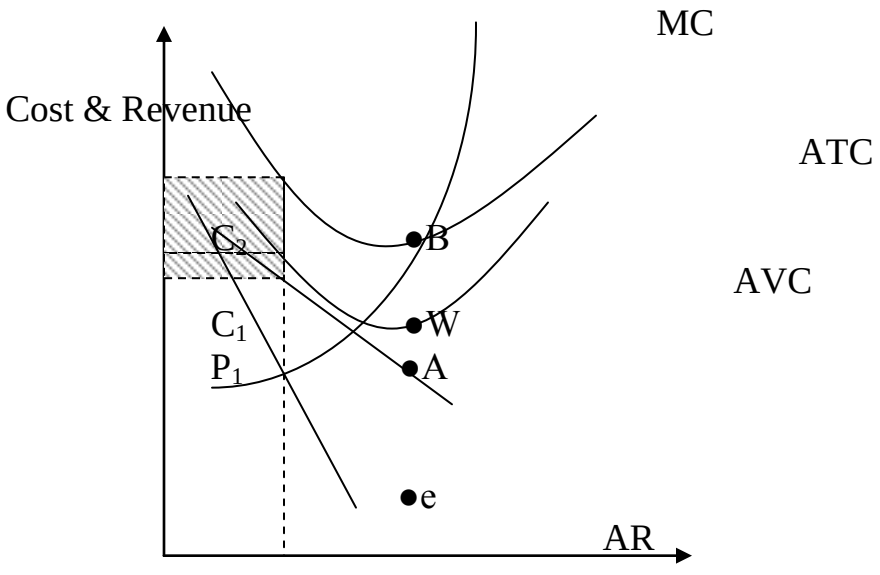


Fig 21.4: A monopolist covering average variable cost

The shaded area is the loss. However, in order to minimize losses, the firm will continue production since AR is greater than average variable cost (AR>AVC). If AR is less than AVC, the firm does not cover its variable cost and will therefore minimize losses by shutting down production.



MR

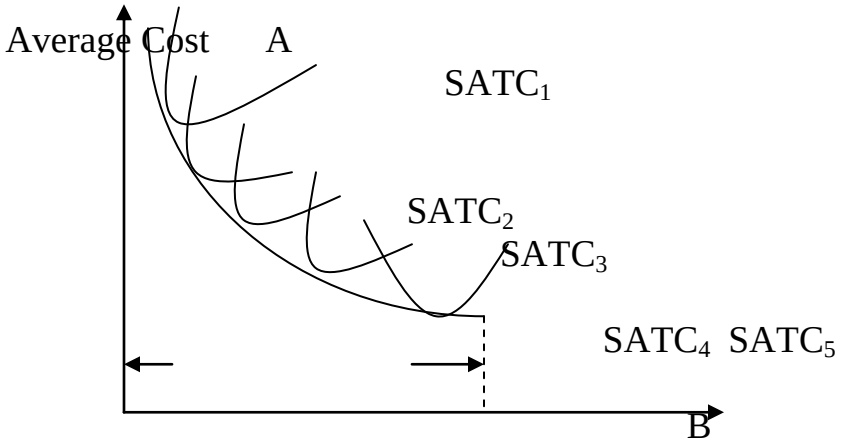
0 X_1 Output (Q)

Fig 21.5: A monopolist not covering average variable cost

AVC is greater than AR so the firm should shut down (cease production).

NUMBER TWO

(a) Economies of scale are those aspects (factors)/benefits which reduce the unit cost of production as a firm expands its scale i.e. one where additional proportionate (proportional) increase in all inputs results in a more than proportionate increase in output. A firm enjoys full economies of scale at the lowest point of its LR average Total Cost Curve (LATC). The diagram below shows a firm experiencing economies of scale.

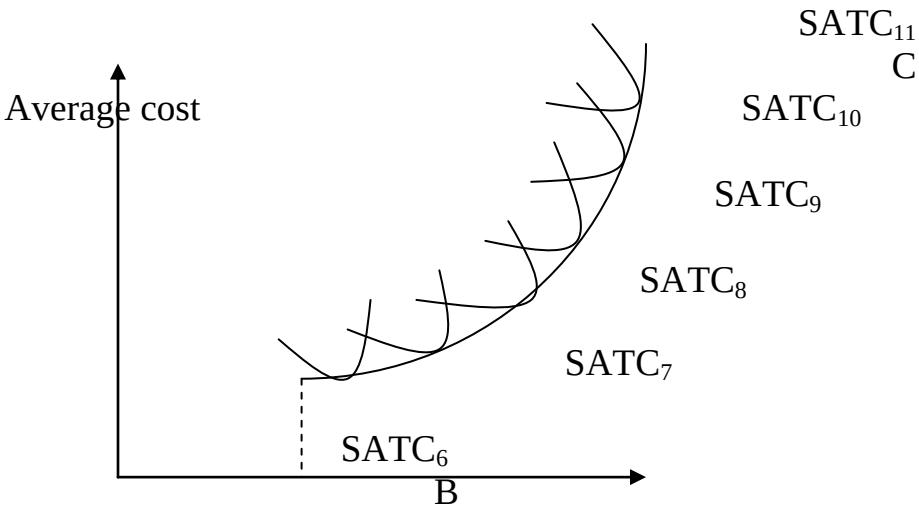


Arc AB shows a section of the long-run Average total cost (LATC) curve where the firm is

experiencing economies of scale.

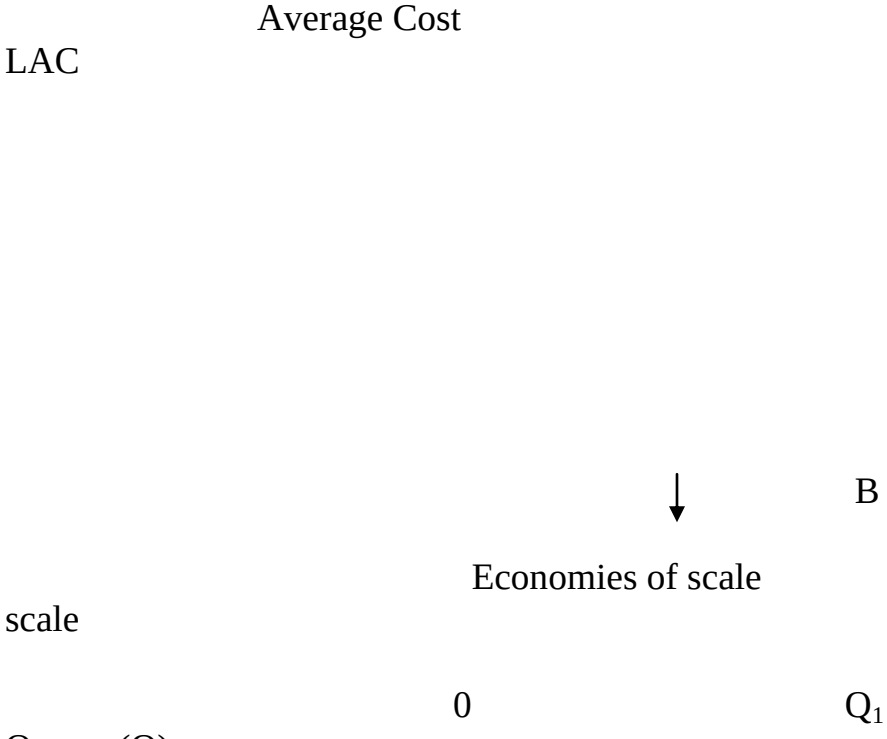
Economies of scale take two forms i.e. internal eg Financial, technical, commercial etc and external such as auxiliary services like banking, insurance; infrastructure, joint research etc.

Diseconomies of scale are those aspects/factors/disadvantages which tend to increase the unit cost of production as the firm expands its scale of the plant. They accrue to a firm experiencing decreasing returns to scale, i.e. one where successive proportional increase in all inputs results in a less than proportional increase in output. Diseconomies of scale begin to set in after full exploitation of the possible economies of scale, such that any increase in output increases unit cost of production as shown below:



Arc BC shows the section of the long-run average total cost curve (LATC) where the firm is experiencing diseconomies of scale.

Examples - Managerial inefficiencies and bureaucracy
- Negative externalities such as pollution etc.



(b) Optimum size of the firm

This is the most efficient size of the firm at which its costs of production per unit of output

will be at a minimum , so that it has no motive either to expand or reduce its scale of production. Thus as a firm expands towards the optimum size it will enjoy Economies of scale, but if it goes beyond the optimum diseconomies will set in.

ECONOMIES OF SCALE

Economies of scale exist when the expansion of a firm or industry allows the product to be produced at a lower unit cost.

1. INTERNAL ECONOMIES OF SCALE

Internal economies of scale are those obtained within the organization as a result of the growth irrespective of what is happening outside. They take the following forms:

a. Technical Economies

i) **Indivisibilities:** These may occur when a large firm is able to take advantage of an industrial process which cannot be reproduced on a small

scale, for example a blast furnace which cannot be reproduced on a small scale while retaining its efficiency.

ii). **Increased Dimension:** These occur when it is possible to increase the size of the firm's equipment and hence realize a higher volume of output without necessarily increasing the costs at the same rate. For example, a matatu and a bus each require one driver and conductor. The output from the bus is much higher than that from the matatu in any given period of time and although the bus driver and conductor will earn more than their matatu counterparts, they will not earn by as many times as the bus output exceeds the matatu output i.e. if the bus output is 3 times the matatu output the bus driver and conductor will not earn 3 times the earnings of their matatu counterparts.

iii) **Economies of Linked Processes:** Technical economies are also sometimes gained by linking processes together eg in the iron and steel industry where iron and steel production is carried out in the same plant, thus saving on both transport and fuel costs.

iv) **Specialization**: Specialisation of labour and machinery can lead to the production of better quality output and higher volume of output.

v) **Research:** A large firm will be in a better financial position to devote funds to research and improvement of its product than a small firm.

b) Marketing Economies

i) **The buying advantage:** A large-scale organization may buy its materials in bulk and therefore get preferential treatment and buy at a discount more easily than a small firm.

ii) **The packaging advantage:** It is easier to pack in bulk than in small quantities and although for a large firm the packaging costs will be higher than for small firms, they will be spread over a large volume of output and the cost per unit will be lower.

iii) **The selling advantage:** A large-scale organization may be able to make fuller use of sales and distribution facilities than a small-scale one. For example, a company with a large transport fleet will probably be able to ensure that they transport mainly full loads, whereas a small business may have to hire transport or dispatch partloads.

c) Organizational:

As a firm becomes larger, the day-to –day organizations can be delegated to office staff, leaving managers free to concentrate on the important tasks.

When a firm is large enough to have a management staff they will be able to specialize in different functions such as accounting, law and market research.

d) Financial Economies:

A large firm will have more assets than a small firm. Hence, it will find it cheaper and easier to
borrow money from financial institutions like commercial banks than a small firm.

e) Risk-bearing Economies

All firms run risks, but risks taken in large numbers become more predictable. In addition to this, if an organization is so large as to be a monopoly, this considerably reduces its commercial risks.

f) Overhead Processes:

For some products, very large overhead costs or processes must be undertaken to develop a product, for example an airliner. Clearly, these costs can only be justified if large numbers of units are subsequently produced.

g) Diversification:

As the firm becomes very large it may be able to safeguard its position by diversifying its products, processes, markets and the location of the production.

2. EXTERNAL ECONOMIES

These are advantages enjoyed by a large size firm when a number of organizations group together in an area irrespective of what is happening within the firm. They include:

a) **Economies of concentration:** When a number of firms in the same industry band together in an area they can derive a great deal of mutual advantage from one another. Advantages might include a pool of skilled workers, a better infrastructure (such as transport, specialized warehousing, banking etc) and the stimulation of improvements. The lack of such external economies is a serious handicap to less developed countries.
b) **Economies of information:** Under this heading, we could consider the setting up of specialist research facilities and the publication of specialist journals.

a) **Economies of disintegration:** This refers to the splitting off or subcontracting of specialist processes. A simple example is to be seen in the high street of most towns where there are specialist photocopying firms.
b)

It should be stressed that what are external economies at one time may be internal at another. To use the last example, small firms may not be able to justify the cost of a sophisticated photocopier but as they expand there may be enough work to allow them to purchase their own machine.

Diseconomies of Scale:

Diseconomies of scale occur when the size of a business becomes so large that, rather than decreasing,
the unit cost of production actually becomes greater. Diseconomies of scale flow from administrative rather than technical problems.

a) Bureaucracy: As an organization becomes larger there is a tendency for it to become more bureaucratic. Decisions can no longer be made quickly at the local levels of management. This may lead to loss of flexibility.
b) Loss of control: Large organizations often find it more difficult to monitor effectively the performance of their workers. Industrial relations can also deteriorate with a large workforce and a management which seems remote and anonymous.

NUMBER THREE

(a) Economies of scale and returns to scale:

Economies of scale are the forces causing a firm's long-run average cost to decrease as its output level and size of the plant are increased; usually thought to be (i) increasing possibilities of division and specialization of labour and (ii) greater possibilities of using more efficient technology, that is, using advanced technological development and/or larger machines.
Returns to scale are the benefits that accrue to a firm from changing the proportions in which factors of production are combined. A rational firm will always seek to maximize profits by minimizing costs: the least-cost factor combination Returns to scale are basically concerned with the physical input and output relationships. If, for example, the input of factors of production were to increase by 100% and output by 150%, increasing returns to scale will be realized. Conversely, if inputs were to be increased by 100% but output

increases by less than 100% then a firm would be experiencing decreasing returns to scale.

Increasing returns to scale should lead to decreasing costs. Confusion frequently arises between economies of scale and returns to scale. Economies of scale reduce the unit cost of production as the scale of production is increased, while returns to scale are largely looked at in terms of the physical input and output relationships in the long-run when all factors of production are variable.

Bulk-buying, for example, may be a cost economy to a business (firm) but it does not involve returns to scale since no change in the input-output relationship is involved.

Generally, returns to scale are the technical aspects of the economies of scale.

(b) Demand function: $Q - 90 + 2P = 0$

NB: Recall that $TR = P.Q$ OR $TR = AR.Q$ in perfect competition where $AR = P$.

$\therefore$ Express P in terms of Q in the demand function as follows:

$Q - 90 + 2P = 0$

$2P = 90 - Q$

$P = 45 - \frac{1}{2} Q$ ----------(i)

TR = P.Q = Q(45 – ½ Q)

TR = 45Q – ½ Q^2 ----------(ii)

MR = $\frac{dTR}{dQ}$ = 45 – Q ---------- (iii)

AC = Q^2 – 8Q + 57 + 2/Q

TC = AC.Q = (Q^2 – 8Q + 57 + 2/Q)Q

Q^3 – 8 Q^2 + 57Q + 2 ----- (iv)

MC = $\frac{dTC}{dQ}$ = 3 Q^2 – 16Q + 57 ----------(v)

Since the first order condition (FOC) provides that profit maximization is at MR = MC level of output, then 45-Q = $3Q^2$ – 16Q + 57

$3Q^2$ – 16Q + 57 – 45 + Q = 0

$3Q^2$ – 15Q + 12 = 0 ---------- (vi) → Q^2 - 5Q + 4 = 0

Q^2 – Q – 4Q + 4 =0

Q(Q-1) –4(Q-1) = 0

(Q – 4) (Q – 1) = 0

Case (i): Q – 4 = 0

Q = 4 units

Case (2): Q – 1 = 0

Q = 1 unit

Factorization method:

$3Q^2 - 12Q - 3Q + 12 = 0$

$3Q(Q - 4) - 3(Q - 4) = 0$

$(3Q-3)(Q-4) = 0$

Therefore two alternatives exist i.e.:

(i) $3Q - 3 = 0$

$3Q = 3$

$Q = (3/3) =$ 1 unit of output

(ii) $Q - 4 = 0$

$Q = (0 + 4) =$ 4 units of output

Formula method:

$3Q^2 - 15Q + 12 = 0$

$3/3Q^2 - 15/3Q + 12/3 = 0/3$

$Q^2 - 5Q + 4 = 0$

$$Q = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$= \frac{-(-5) \pm \sqrt{(-5)^2 - (4)(1)(4)}}{2(1)}$$

$$= \frac{5 \pm \sqrt{25 - 16}}{2}$$

$= \frac{5 \pm \sqrt{9}}{2}$

$= \frac{5 \pm 3}{2}$

Case (1) where 3 is positive:

$$Q = \left(\frac{5 + 3}{2}\right) = \left(\frac{8}{2}\right)$$

$\therefore$ Q = 4 units of output

Case (2) where 3 is negative:

$$Q = \left(\frac{5 - 3}{2}\right) = \left(\frac{2}{2}\right)$$

$\therefore$ Q = 1 units of output

The necessary condition for profit maximization: MC = MR

When MC = MR,

$\frac{d\pi}{dQ} = 0$ where TR – TC = π

$\frac{d\pi}{dQ} = \frac{dTR}{dQ} - \frac{dTC}{dQ} = 0$

$\therefore$The derivative of the profit function with respect to Q should be equal to zero (0) as a necessarycondition.

Proof:

MR = 45 – Q (According to equation (iii))

$MC = 3Q^2 - 16Q + 57$ (Given by equation (v)

We have two levels of output:

Q = 4

Q = 1

At Q = 4:

MR = (45 – 4) = 41

MC = $3(4)^2 – 16(4) + 57$

= 48 – 64 + 57

= (48 + 57) – 64 = 41 $\quad\quad\quad\quad$ $\therefore$ MC = MR = 41 : (FOC)

At Q = 1:

MR = (45 – 1) = 44

MC = $3(1)^2 – 16(1) + 57$

= 3 – 16 + 57

(3 + 57) – 16 = 44 $\quad\quad\quad\quad$ $\therefore$ MC = MR = 44 : (FOC)

From the above computations, both levels of output (Q = 4 & Q = 1) fulfill the necessary condition
for profit maximization. Thus which level of output actually maximizes profit is determined by
performing the second order condition (SOC) which is the sufficient condition for profit
maximization. This is done as follows:

The second derivative is obtained by differentiating the first derivative (i.e. the MR and MC functions
as given in equations (iii) and (v) respectively) with respect to Q or differentiating the profit function with respect to Q.

By differentiating the MR & MC functions with respect to Q, the sufficient condition requires that
the value obtained for MR is less than the value obtained for MC, that is, $R^{11}(Q) < C^{11}(Q)$

Proof:

$R = R^1(Q) = 45 - Q$

$\frac{dMR}{dQ} = R^{11}(Q) = -1$

$MC = C^1(Q) = 3Q^2 - 16Q + 57$

$\frac{dMC}{dQ} = C^{11}(Q) = 6Q - 16$

At $Q = 4$, $C^{11}(Q) = 6(4) - 16 = (24 - 16) = 8$

At $Q = 1$, $C^{11}(Q) = 6(1) - 16 = (6 - 16) = -10$

From the above computations, it is now evidently clear (proved) that

$R^{11}(Q) < C^{11}(Q)$ at $Q = 4$ $\therefore$ profits are maximized at $Q = 4$

Units of output (SOC):

$\frac{d^2 \pi}{d^2 Q} \equiv \pi^{II}(Q) = R^{II}(Q) - C^{1I}(Q)$

< 0 if $R^{1I}(Q) < C^{II}(Q)$

Thus for an output level Q such that $R^1(Q) = C^1(Q)$, the satisfaction of the second order condition
$R^{II}(Q) < C^{II}(Q)$ is sufficient to establish it as a profit – maximizing output. Economically, this
would mean that if the rate of change of MR is less than the rate of change of MC at the output level
where MC = MR, then that output will maximize profit.

(c) (i) A perfectly competitive market is the one where prices of commodities are set by the forces of demand and supply. All the firms in the industry are price takers and the goods produced are homogenous. In this market structure, firms incur average fixed cost and average variable costs. A firm may continue production of goods even though it can sell at a loss if it can cover its average variable costs. By producing more, it will minimize its losses.

This is illustrated below:

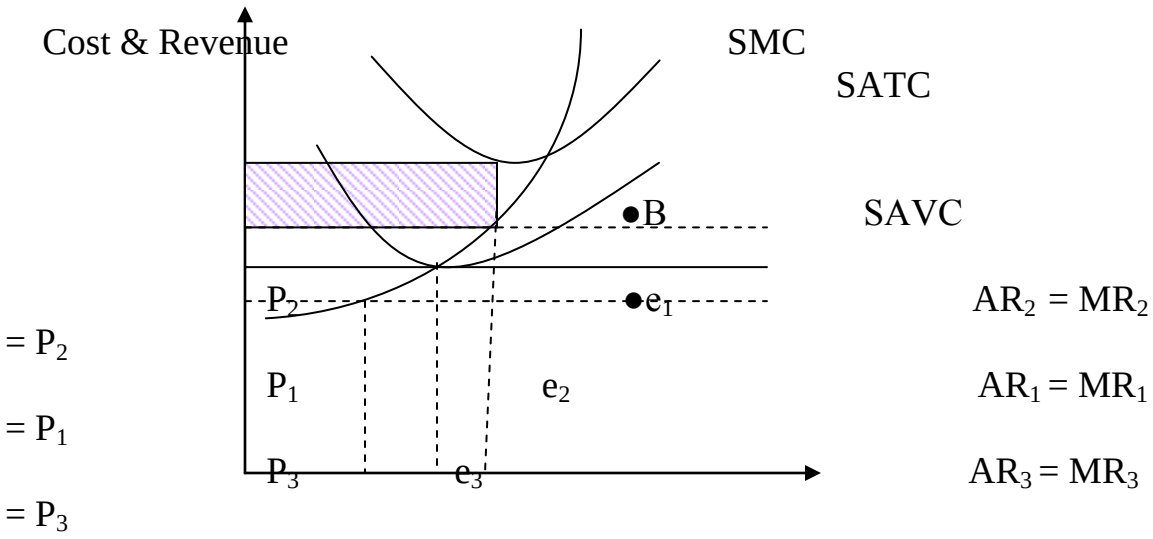


Fig 23:1: A loss making firm is perfect competition covering its average variable costs

A firm in perfect competition will maximize its profit at the point where marginal revenue = marginal cost i.e. MR = MC.

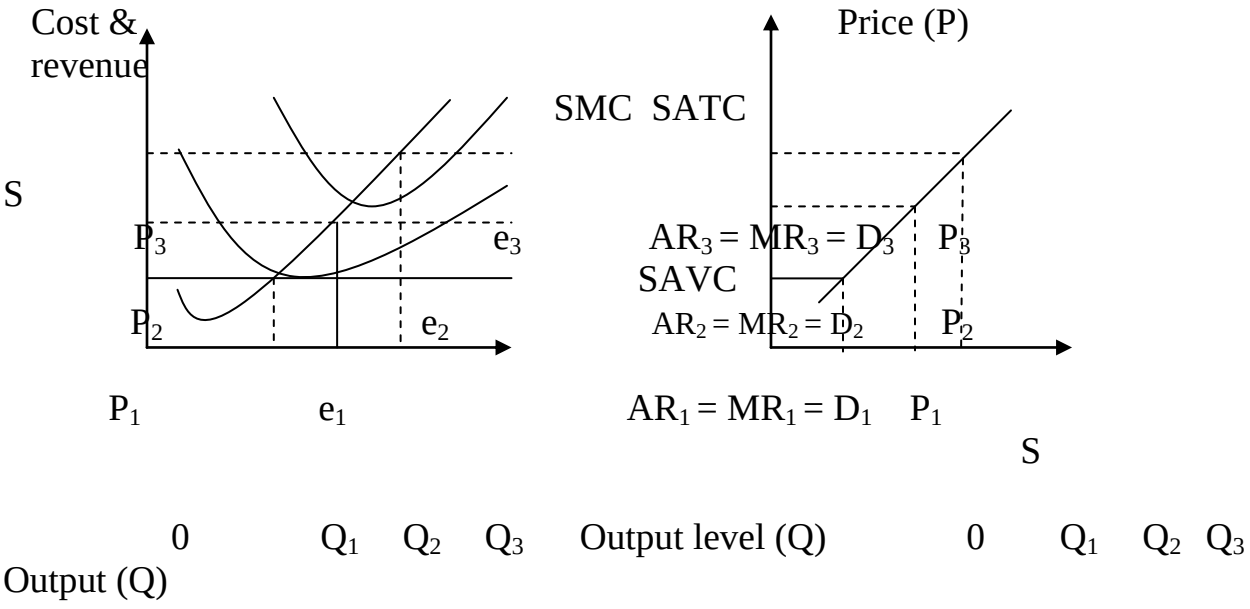
Suppose that the price set by the forces of demand and supply is P_2. The firm's Average revenue = Marginal revenue = P_2 i.e. AR = MR = P_2 . The profit maximizing output will be Q_2 at the position where MC = MR. The firm will be earning a revenue equal to the area of OQ_2 e_1 P_2 but the average cost it incurs will be represented by the area OQ_2 BA which is greater than the revenue it earns; thus it will be making losses represented by the shaded area (P_2 e_1 BA). Although the firm is incurring losses it is able to cover its average variable cost and so it would continue production because by doing so it will be minimizing its losses. Therefore, it will profit the firm to continue operation though incurring losses because by doing so the losses will eventually be completely minimized (relatively minimized).

Assume that the price was to fall from P_2 to P_1 the firm will be at equilibrium at the point where MC = MR. At this point, it is producing an output of OQ_1 . This output will be earning revenue represented by the area OQ_1 e_2 P_1 but at this point it is still making losses because the average total cost is higher. Though incurring losses, the firm is at the point where it is just covering its average variable cost. This point is called the shutdown point because below this price (OP_1) it would benefit the firm to quit production. However, at this point the firm could decide to either close down or continue production because it just covers it coverage variable costs.

Below this price (OP_1), say at price OP_3 , the firm will be at equilibrium at point e_3 producing an output of OQ_3. At this point, the firm its not covering its average variable cost and continuing production will see the firm increasing its losses. So at the point where the firm is not covering its average variable costs it would benefit the firm to quit production. Therefore at some point, though a firm produces while selling at a loss it can not indefinitely continue doing so. This is because when it is not covering its average variable cost (AVC) losses are reduced by ceasing production.

(ii) The short-run is the period where at least one factor of production must be fixed. The supply curve will show that when price increases quantity

supplied increases (ceteris paribus). To explain the short-run supply curve of a firm under perfect competition consider the diagrams below:



To illustrate the short-run supply curve of a firm under perfect competition

In the diagram above, the firm is in equilibrium at the point where MC = MR. Suppose that price is
OP_1 the firm will be at equilibrium at point e_1 where MR_1 = MC producing output OQ_1. If the
price was to increase from OP_1 to OP_2 the demand curve will shift upwards from D_1 to D_2 and the
firm will be at equilibrium where MR_2 = MC producing output OQ_2 (output level increase from
OQ_1 to OQ_2).

If the price would further increase from OP_2 to OP_3 the demand curve will shift further upwards from D_2 to D_3 and the firm will be at equilibrium at point e_3 where MR_3 = MC producing output OQ_3.

Thus as price increases from OP_1 to OP_2 to OP_3 output level increases from OQ_1 to OQ_2 to Q_3.
If price was to fall below OP_1 the firm would close down because it would not be covering its average variable costs and the output would be zero.

Therefore, in the short-run in a perfectly competitive market, a firms short-run supply curve would be the marginal cost curve above the average variable cost curve i.e. from point e_1 upwards as represented by the SS curve.

NUMBER FOUR

$P = 13 - 0.5Q$
$MC = 3 + 4Q$
$TFC = 4$

a) Profit maximizing output:

$p = 13 - 0.5Q$
$TR = P.Q = (13 - 0.5Q)Q$
$TR = 13Q - 0.5Q^2$
$MR = \frac{dTR}{dQ} = 13 - Q$

OR

$AR . Q$
and $P = AR$
therefore $TR = (13 - 0.5Q)Q$
$TR = 13Q - 0.5Q^2$

OR $TR = 13Q - 0.5Q^2$
$AR = 13 - 0.5Q$
Slope of MR = 2 slope of AR
Therefore $MR = 13 - 0.5(2)Q$
$MR = 13 - Q$
 maximized at $MC = MR$: $3 + 4Q = 13 - Q$
$5Q = 10$
$Q = \frac{10}{5} = 2$
$\therefore Q = 2$ units

b) Supernormal profit occurs where

$TR > TC$
$TR = 13Q - 0.5Q^2$ but $Q = 2$
$13(2) - 0.5(2)^2$
$26 - 0.5(4)$
$(26 - 2) = 24$

OR $p = 14 - 0.5Q$ but $Q = 2$
$P = 13 - 0.5(2) = 12$
$TR = P.Q = (12 \times 2) = 24$

Therefore TR = 24

TC = $\int MC$ + K

TC = $\int (MC)\,dQ$ but MC = 3 + 4Q

Therefore TC = $3Q + 2Q^2 + K$ but TFC = 4

$TC = 4 + 3Q + 2Q^2$ but Q = 2

$4 + 3(2) + 2(2)^2 = (4 + 6 + 8) = 18$

Therefore TC = 18

Therefore Supernormal □ = (TR– TC) = (24 – 18) = 6

c) At Break-even point TC = TR

$TR = 13Q - 0.5Q^2$

$TC = 4 + 3Q + 2Q^2$

Thus, $4 + 3Q + 2Q^2 = 13Q - 0.5Q^2$

$2.5Q^2 - 10Q + 4 = 0$

$\Rightarrow 5Q^2 - 20Q + 8 = 0$

$Q = -b \pm \frac{\sqrt{b^2 - 4ac}}{2a}$

a = 2.5 $10 \pm \frac{\sqrt{100 - 40}}{5}$

b = -10

c = 4

$10 \pm \frac{\sqrt{60}}{5}$

$(\frac{10 + 7.75}{5}) = \frac{17.75}{5} = 3.55$ units

OR $(\frac{10 - 7.75}{5}) = (\frac{2.25}{5}) = 0.45$ units

d) In a perfectly competitive market,

P = AR = MR = 10

TR = P.Q = 10Q ; MR = $\frac{dTR}{dQ}$ = 10

MC = Q + 4

Therefore The □ maximizing output level would be at MC = MR

Q + 4 = 10 therefore Q = (10 – 4) = 6 units

e) The level of supernormal profit

□ = TR– TC

TR = P.Q = 10Q = 10 (6) = 60

TC = $\int MC dQ$ but MC = Q + 4

Therefore TC = ½ Q^2 + 4 Q + K

½ $(6)^2$ + 4(6) + 1

½ (36) + 24 + 1

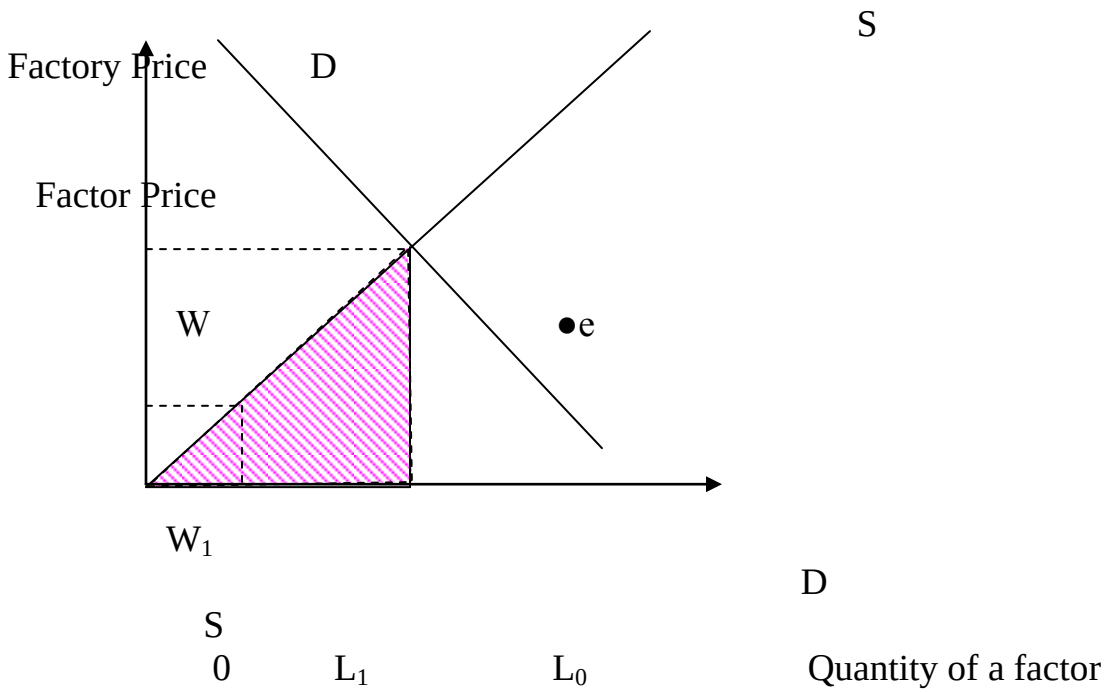
(18 +25) = 43

therefore □ = (60– 43) = 17

NUMBER FIVE

a) Transfer earnings – the payment which is necessary to keep a factor of production in its present use/employment, (hence preventing it from transferring to another use.) Transfer earnings are determined by what a factor of production could have earned in its next best alternative employment – thus it's the opportunity cost of putting or keeping a factor of production in its present use.

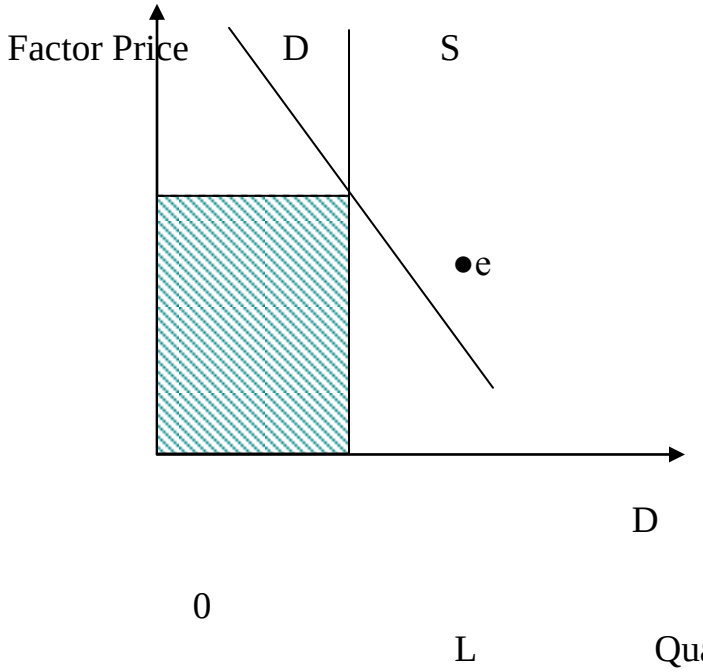
Economic rent is the payment made to a factor of production over and above that which is necessary to keep it in its current use. Take an example of a doctor who is earning Ksh. 40,000 per month in the private sector; if the same doctor would be paid Ksh. 30,000 per month in the public sector and assuming all other working conditions of service are the same, transfer earnings would be Kshs. 30,000 per month, as this is the minimum amount of payment necessary to keep the doctor in the present (private) sector. The doctor is then earning an economic rent of Kshs. 10,000 that is (40,000 – 30,000) per month. If the supply curve of the factor of production is upward sloping, the earnings to the factor will be partly transfer earnings and partly economic rent, as illustrated below:



The supply curve (SS) shows the number of workers willing to work at different wages. Units of labour less than L_0 will be willing to work at lower wage rates that is less than OW. The OL_1 units of labour would have still supplied labour at the wage rate of OW_1. Thus OL_1 units of labour when paid a wage rate of OW receives more than what is necessary to retain the factor in the present employment, that is, the factor earns an economic rent. The same can be said of all other units of labour to the left of OL_0. It is only the L^{th} unit of labour which is being paid its transfer earnings. Thus the area seLo (shaded area) represents transfer earnings while SeW represents economic rent.

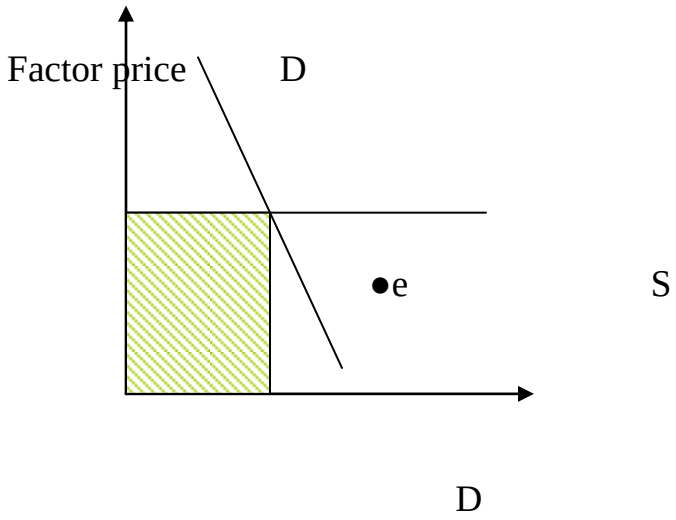
b)

- Case where total factor payments = Economic rent:



DD and S represent the demand and supply curves for labour respectively. The equilibrium (market) wage rate is W and the units of labour employed is OL. If the supply curve of a factor is perfectly inelastic (fixed in supply) the transfer earnings would be zero and all the factor payment would be economic rent (the shade area OleW)

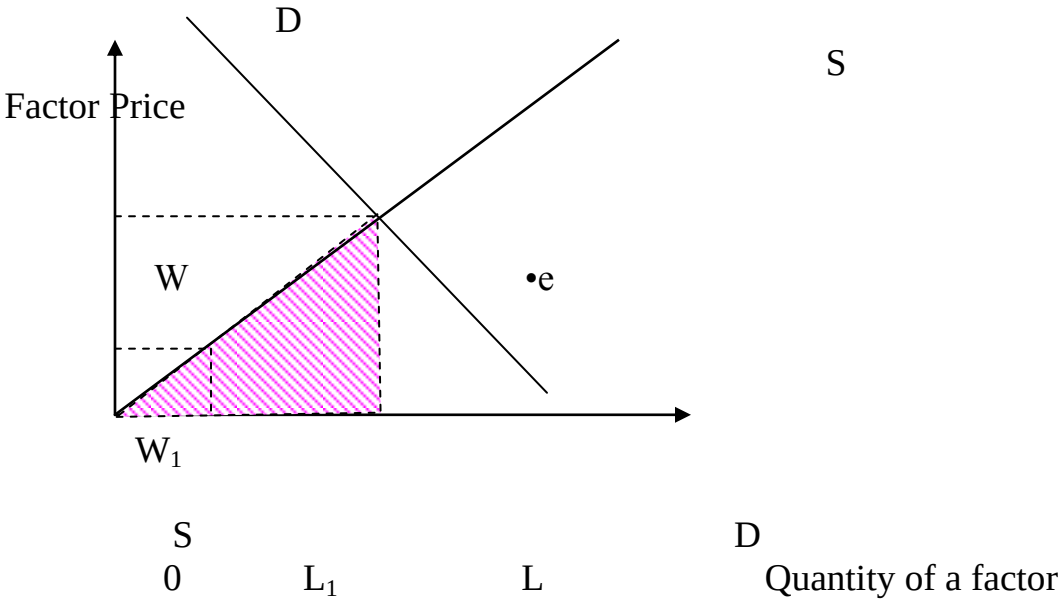
- Case where the total factor payments = transfer earnings:



0 L Quantity of a factor

In the case where the supply of a factor is perfectly elastic the whole earnings to the factor will be transfer earnings. If a price lower than OW is offered, the factor will not be supplied to the firm. Thus, the whole earnings represented by the area OleW represent transfer earnings (pure transfer earnings)

- Case where the total factor payments are shared between transfer earnings and economic rent:



DD and SS represent the demand and supply curves for labour respectively. The equilibrium wage rate is W and the labour force employed is OL units. The area OleW represents the total earnings to the factor. The supply curve (SS) shows the number of workers willing to work at different wage rates. Units of labour less than L will be willing to work at lower wage rates less than OW. OL_1 units of labour would have still supplied labour at the wage rate OW_1. Thus OL_1 units of labour when paid a wage rate of OW receive more than what is necessary to keep the factor in the present employment (that is the factor earns an economic rent). The same can be said of all other units of labour to the left of OL. It is only the L^{th} unit of labour which is paid transfer earnings. Thus the area SeLO (shaded area) represents transfer earnings while SeW represent economic rent, which is a surplus (producer surplus). The steeper the supply curve the more economic rent would be earned.

c) I) Quasi-Rent:

These are factor rewards which are economic rent in the short-run and transfer earnings in the long-run. This is an amount earned by factors of production (other than land) in the short run when its not possible to increase their supply.

May be defined as the payment made to a factor of production in the short run. This is when the supply of the factor of production is less elastic than in the long-run because in the long run it can be transferred to an alternative use.

Increased earnings in an occupation, for example, may lead to people undertaking the necessary training in order to qualify for that occupation, thus reducing earnings in the long-run. Therefore, quasi-rent may be defined as the amount earned only during the period which elapses before supply increases.

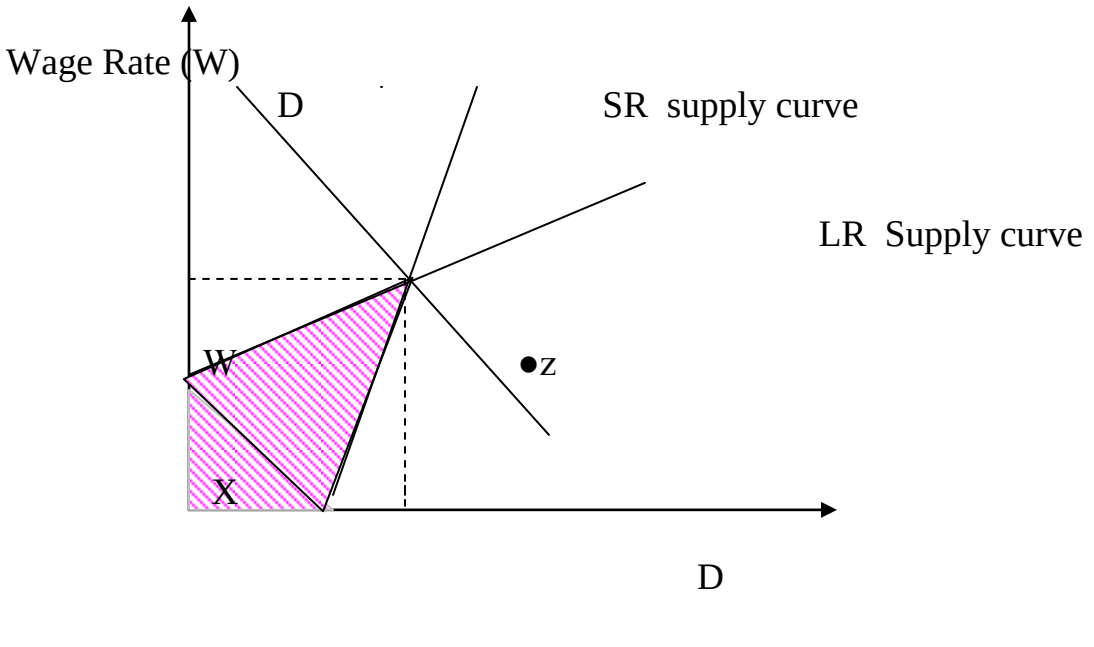


Fig: Quasi-rent

In the figure, the area WXZ is the economic rent for labour. The area YLZ represents the transfer earnings. The equilibrium (market) wage is OW and the number of workers (or hours worked) is OL. The part of labour earnings which is economic rent in the short-run (SR) but transfer earnings in the long-run (LR) is the quasi-rent and is represented by the shaded area OXZY.

ii) Rural-Urban migration refers to the physical movement of people from the rural to urban centers of a country with a view to securing perceived opportunities, especially employment.Nearly all countries experience this movement at varying degrees. Those affected in this movement tend to be mainly the young and educated, especially due to the highly increasing rates of population and unemployment. The migrants perceive high chances of getting jobs in urban centers than in rural areas, and this creates the impetus to migrate. In most countries, urban centers are very distinct from rural areas in terms of industrial location; the concentration of production units in urban areas coupled with the white-collar job orientation arising from the type of education systems, makes the young and educated increase their propensity to migrate in order to get jobs. Rural-urban migration has both positive and negative consequences in the country depending on either the area of origin or destination. A few years ago, rural-urban migration was viewed as a natural process in which surplus

labour was gradually withdrawn from the rural sector to provide needed manpower for the urban industrial growth. The process was deemed socially beneficial since human resources were being shifted from locations where their marginal products were assumed to be zero to places where the marginal products were to be not only positive but also rapidly increasing as a result of fast capital accumulation and technical progress. Further, those involved were assumed to be remitting part of their incomes to their rural relatives which was to work towards increasing the living standards of the rural population.

In contract of this view point, it is now abundantly clear from the experience in developing countries
that the rates of rural-urban migration continue to exceed the rates of urban job creation. It has infact
surpassed the capacity of both industry and urban social services to effectively absorb this labour. Thus,
migration is viewed as the major contributing factor to the ubiquitous phenomenon of urban surplus
labour and a force which continues to exacerbate the already high urban unemployment problems
caused by the growing economic and structural imbalances between urban and rural areas.

Rural-urban migration disproportionately increases the urban job seekers who are young, energetic and educated while heavily depleting the rural country side of valuable human capital necessary for enhanced rural resource utilization. This is infact why most resources in rural areas remain either underutilized or completely unutilized. Consider the large pieces of land which have not been brought to any meaningful

use, yet the government budget is continuously constrained by the increasingly large amount of public consumption expenditure eg. Provision of relief food etc.

Development tends to lag behind in most rural setups not necessarily due to the unproductive nature of the available resources but largely because of the increased unwillingness of the young to probably soil their tender hands; the new concept of psychological neo-colonialism.

With extensive surplus of people in urban centers, dependency ratio increases, housing congestion
results and many other socio-economic problems for whose list is in exhaustibly lengthy. Such evils like bank robbery and other forms of thuggery discourage potential investors and even accelerates capital flights among existing risk-undertakers, let alone the possibility of an extensive damage to the tourist industry (the leading foreign exchange earner for most developing countries like Kenya). Talk of leadership in elective positions (eg. members of parliament) and you find the highly educated (but unemployed or underemployed) young people taking it as yet another source/form of employment. By all means, therefore, the greed for material acquisitions breeds more malpractices (economic or otherwise). Infact, corruption and the general mismanagement rooted in most economies have drawn much international publicity and discontent from multi-lateral donor institutions such as the World Bank and the International Monetary Fund (IMF); the effect becomes either a withdrawal or increased conditionalities for credit, which sometimes cause currency depreciation and inflationary tendencies.

In most countries today, rural urban migration is no longer a desirable phenomenon and governments center around, first and foremost, instituting measures such as:

- Changing job and education systems' orientation – the need for more emphasis on the informal sector and other forms of self-employment ventures; it involves efforts to change the attitudes of people seeking perceived opportunities in urban areas.
- Industrial decentralization – policy frameworks that seek to encourage industrial decentralization to minimize regional resource imbalances.
- More supportive government involvement in the rural resource utilization programmes; include provision of infrustructural facilities, subsidized inputs and relatively well developed and less or uncorruptive output marketing institutions. The government's implementation setups such as the District Focus for Rural Development through the District Development Committees (DDC's) should be strengthened and focused towards living standards enhancing priority areas such as modern agriculture (the ministry of Agriculture and rural Development in Kenya is now working on the Kenya Rural Development strategy (KRDS) called the National Agricultural and Livestock Extension Programme (NALEP)

which is prepared in line with extension policy guidelines and aims at assisting farmers to enhance food production, guarantee food security, increase incomes and improve standards of living. NALEP prescribes alternative extension approaches and cost effective methods of disseminating appropriate technologies to the farming community; any growth in the agricultural sector is therefore expected to create more job opportunities.

- Institutionalizing leadership and community development aspects – strengthening the sense of mutual coexistence and rational social change to avoid such socio-economic and political evils like land clashes and general mistrust between communities, a situation which tends to reduce domestic rural resource mobilization.

NUMBER SIX

$TC = 1000 + 100Q – 15Q^2 + Q^3$

a) Total and average costs at output levels of 10 and 11 kgs:

- Total Costs:

i) Total cost

At Q = 10

$TC = 1000 + 100 (10) – 15(10)^2 + (10)^3$

$TC = 1000 + 1000 – 1500 + 1000$

$TC = 1500$

At Q = 11

$TC = 1000 +100(11) – 15(11)^2 + (11)^3$

$TC = 1000 + 1100 – 1815 + 1331$

$TC = 1616$

ii) Total fixed cost (TFC)

$TC = TFC + TVC$

$TC = 1000 + 100 – 15Q^2 + Q^3$

TFC does not vary with output (same at all levels of output)

So when Q = 0

TC = TFC = 1000

When Q = 10

TFC = 1000

When Q = 11

TFC = 1000

iii) Total variable cost (TVC)

$TC = TFC + TVC$
$TVC = TC - TFC$
$TVC = 1000 + 100Q - 15Q^2 + Q^3 - 1000$
$TVC = 100Q - 15Q^2 + Q^3$

When Q = 10

$TVC = 100(10) - 15(10)^2 + (10)^3$
$TVC = 1000 - 1500 + 1000$

when Q = 11

$TVC = 100(11) - 15(11)^2 + (11)^3$
$TVC = 1100 - 1815 = 1331$
$TVC = 500$ $TVC = 616$

- Average Costs:

i) Average Total Cost (ATC)

Average Total cost is the total cost per unit of output, that is, $\frac{TC}{Q}$

$$ATC = \frac{1000 + 100Q - 15Q^2 + Q^3}{Q}$$

$$ATC = \frac{1000}{Q} + 100 - 15Q + Q^2$$

When Q = 10

$ATC = \frac{1000}{10} + 100 - 15(10) + (10)^2$
$ATC = 100 + 100 - 150 + 100$
$ATC = 150$

when Q = 11

$ATC = \frac{1000}{11} + 100 - 15(11) + (11)^2$
$ATC = 90.9 + 100 - 165 + 121$
$ATC = 146.9$

ii) Average fixed cost (AFC)

Average fixed cost is Total fixed cost per unit of output
Symbolically, $AFC = \frac{TFC}{Q}$
$TFC = 1000$ so $AFC = \frac{1000}{Q}$

When Q is 10

when Q = 11

$$AFC = \frac{1000}{10} = \underline{\underline{100}} \qquad AFC = \frac{1000}{11} = \underline{\underline{90.9}}$$

iii) Average variable cost (AVC)

Average variable cost is total variable cost per unit of output.

$$AVC = \frac{TVC}{Q}$$

$$TVC = 100Q - 15Q^2 + Q^3$$

$$AVC = \frac{100Q - 15Q^2 + Q^3}{Q}$$

$$= 100 - 15Q + Q^2$$

when Q = 10

$AVC = 100 - 15(10) + (10)^2$

$= 100 - 150 + 100$

$AVC = \underline{\underline{50}}$

when Q = 11

$AVC = 100 - 15\,(11) + (11)^2$

$= 100 - 165 + 121$

$AVC = \underline{\underline{56}}$

b) MC of the 12^{th} kilogramme:

Marginal cost (MC) is the change in total cost as a result of a unit change in output, that is,

$$\frac{\Delta TC}{\Delta Q} = \frac{dTC}{dQ}$$

$TC = 1000 + 100Q - 15Q^2 + Q^3$

$MC = 100 - 30Q + 3Q^2$

when Q =12

$MC = 100 - 30(12) + 3(12)^2$

$MC = 100 - 360 + 432$

$MC = \underline{\underline{172}}$

c) Shape and relationship between AC, AVC, MC and AFC curves.

Shape of average total cost curve:

Average total cost is the total cost per unit of output. It is obtained by dividing total cost by the output, that is, $\frac{TC}{Q}$ where Q is the output.

The shape of the ATC curve is a broad U-shape as shown below.

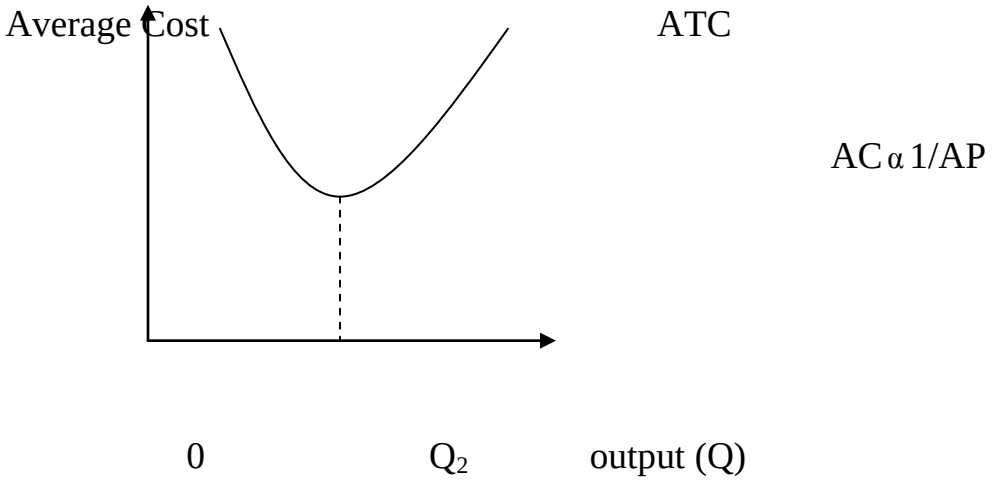


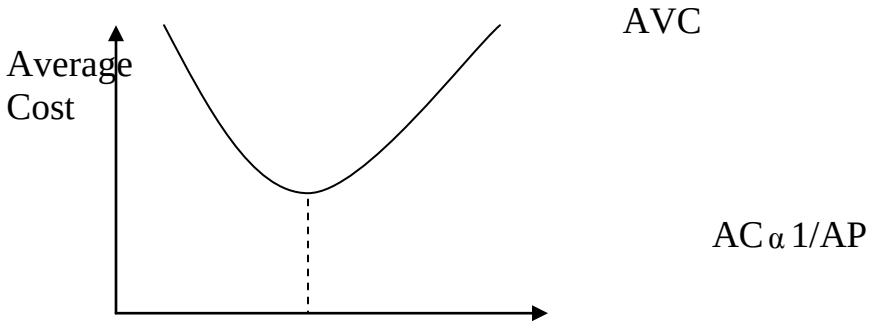
Fig 26.1: To illustrate the ATC Curve

Initially average total cost falls as output is increased upto a point Q_2 beyond which it increases. This behaviour is due to the law of diminishing average returns, that is, as output is increased, there reaches a certain level, where average returns start to diminish. Average total cost falls as Average product increases and Average total costs increase as Average product falls.

Average variable cost curve (AVC):

Average variable cost is the total variable cost per unit of output, that is, $\frac{TVC}{Q}$.

This curve is U shaped because of the law of diminishing average returns.



0 Q_1 Output

Fig 26.2: To illustrate AVC Curve

AVC initially falls as Average product increases upto a certain output level (Q_1) beyond which it increases. (As AVC increase Average product is falling)

Average fixed cost curve:

Average fixed cost is the total fixed cost per unit of output and it is obtained by dividing the total fixed cost by the output, that is, AFC = $\frac{TFC}{Q}$

Average fixed cost has the shape of a rectangular hyperbola. It approaches both axes asymptotically as shown below:

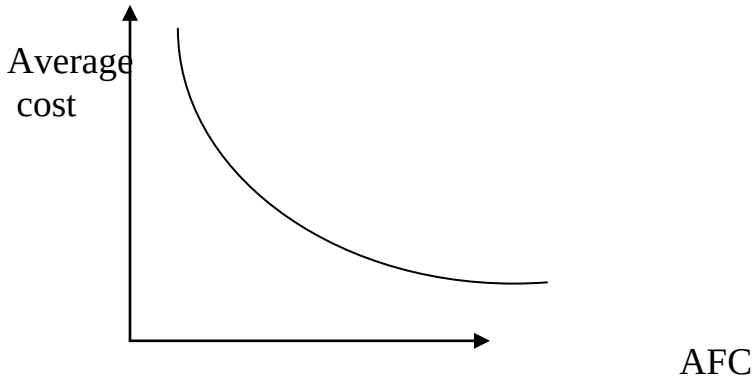


Fig 26.3: To illustrate the AFC curve

Average fixed cost falls as output increases since increasing output means the total fixed cost (constant) borne by each output level diminishes.

Marginal cost curve:

Marginal cost refers to the change in total cost as a result of a unit change in output.

$$MC = \frac{\Delta TC}{\Delta Q} = \frac{dTC}{dQ}$$

The marginal cot curve is U-shaped because of the law of diminishing returns.

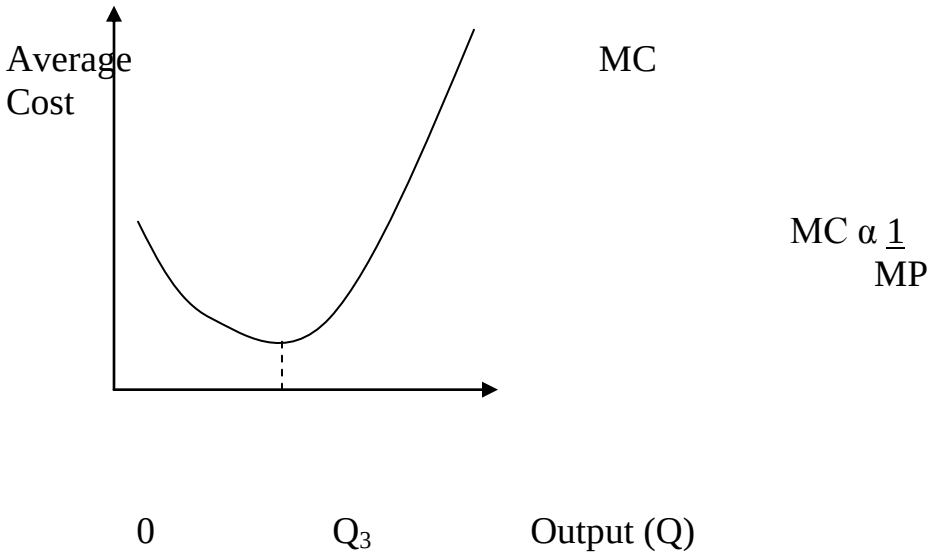


Fig 26.4: To illustrate the MC curve

Initially, marginal cost falls with increase in output as marginal product increases but only upto a certain output level Q_3 beyond which it starts to increase as marginal returns start diminishing.

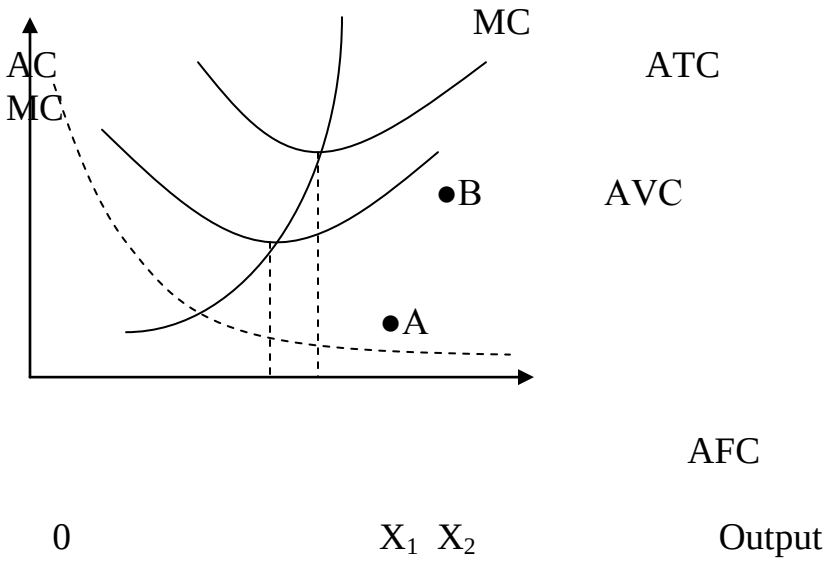


Fig 26.5: To illustrate the relationship between AC,AVC, MC and ATC curves

i) Relationship between AVC and ATC:

$$TC = TFC + TVC$$

$$\frac{TC}{Q} = ATC = \frac{TFC + TVC}{Q}$$

$$\frac{TC}{Q} = ATC = \frac{TFC}{Q} + \frac{TVC}{Q}$$

$$ATC = AFC + AVC$$

Average variable cost forms part of average total cost.
Average variable cost curve reaches its minimum before the average total cost curve, that is, the minimum of the average total cost curve is to the right of the minimum of the average variable cost curve.

The two curves do not start to increase at the same output level. This is because the Average total cost also includes average fixed cost. When AVC reaches its minimum and starts to increase, this increase is more than offset by the full in average fixed cost (AFC falls continuously as output increases) so that Average total cost still falls. However, after OX_2, the rise in Average variable cost more than offsets the fall in average fixed cost so that average total cost increases.

Between the output level of OX_1 and OX_2 the fall in Average fixed cost more than offsets the rise in average variable cost. However, beyond OX_2 the rise in AVC is greater than the fall in AFC.

ii) Relationship between MC and ATC:

The MC curve cuts the ATC curve from below at its minimum point. This relationship is summarized as follows:

- When the slope of ATC is less than zero, ATC will be greater than MC, that is, so long as ATC is falling, it will be greater than MC.
- When the slope of ATC is greater than zero, (ATC increasing) MC will be greater than ATC.
- When the slope of the ATC curve is zero, MC will be equal to ATC. (Point B)

iii) Relationship between MC and AVC:

The MC curve cuts the AVC curve from below at its minimum point. This relationship is summarized as follows:

- When the slope of AVC curve is less than zero (negative), AVC will be greater than MC, that is, so long as AVC is falling MC will be less than AVC.
- When the slope of AVC curve is greater than zero (positive), MC will be greater than AVC, so long as AVC is rising MC will be above it.
- When the slope of AVC curve is zero, MC will be equal to AVC (Point A).

NUMBER SEVEN

$Y = C + I + G$	where	$a > 0; 0 < b < 1$
$C = a + b(Y - T)$		$d > 0; 0 < t < 1$
$T = d + tY$		T = Taxes
$I = I_O$		I = Investment
$G = G_O$		G = Government Expenditure

(a) (i) Economic interpretation of the parameters a, b, d and t:

a: autonomous consumption expenditure, that is, consumption that is independent of consumer's income.

b: marginal propensity to consume (mpc) which refers to the amount of the consumer's extra income devoted to consumption. It's usually a fraction and less than 100%.

d: autonomous tax, that is, the amount that is independent of income paid as tax.

t: marginal propensity to tax, which refers to that portion of extra income paid as tax. It's normally in form of a fraction and, again, less than 100%.

(i) **NB:** The word 'value' in Mathematics refers to a number or quantity represented by a letter: find the value of x. Clearly then, it is not possible to work out values for Y, C and T since the National Income Model (provided) is presented by way of letters but lacking in figures.

Therefore these equilibria can only be approached as follows:

$Y = C + I + G$ $\quad C = a + b(Y - T)$ $\quad T = d + tY$

$Y = a + b(Y - T) + I_O + G_O$ $\quad C = a + b[Y - (d + tY)]$ $\quad T = d + t\left(\frac{a - bd + I_O + G_O}{1 - b(1 - t)}\right)$

$Y = a + b[Y - (d + tY)] + I_O + G_O$ $\quad = a + b(Y - d - tY)$

$a + b(Y - d - tY) + I_O + G_O$ $\quad a + by - bd - btY$

$Y = a + by - bd - btY + I_O + G_O$ $\quad a - bd + by - btY$

$Y - bY + btY = a - bd + I_O + G_O$ $\quad a - bd + Y(b - bt)$

$Y(1 - b + bt) = a - bd + I_O + G_O$ $\quad a - bd + (b - bt)Y$

$Y = \frac{a - bd + I_O + G_O}{1 - b + bt}$ $\quad$ But $Y = \frac{a - bd + I_O + G_O}{1 - b(1 - t)}$

$Y = \frac{a - bd + I_O + G_O}{1 - b(1 - t)}$ $\quad C = a - bd + (b - bt)\left(\frac{a - bd + I_O + G_O}{1 - b(1 - t)}\right)$

(b) Three alternatives to the measurement/estimation of National Income:

- Income
- Expenditure
- Output/product/value added

Income Approach: taken from the perspective of factor incomes i.e. wages/salaries (labour), interest (capital) rent (land) and profit (enterpreneurship) excluding transfer payments. Adjustments would necessarily include the Net factor income from abroad and depreciation.

Expenditure Approach: Looked at in terms of aggregate demand taking the form of the equation

$Y \equiv E = C + I + G + (x - m)$

Where c: consumption – expenditure on consumer goods.

I: Capital formation / accumulation

G: Government expenditure – in terms of what it costs the government to provide goods

and services.

X: Exports – expenditure by foreigners on domestic goods sold abroad.

M: Imports – expenditure on goods and services purchased from abroad.

Again adjustment would include the Net factor income from abroad and depreciation.

Output/value Added Approach: from the stand point of sectoral output (e.g mining, agriculture, fishing, forestry, manufacturing and even the service industry like banking, insurance etc) contribution summed up (put together)

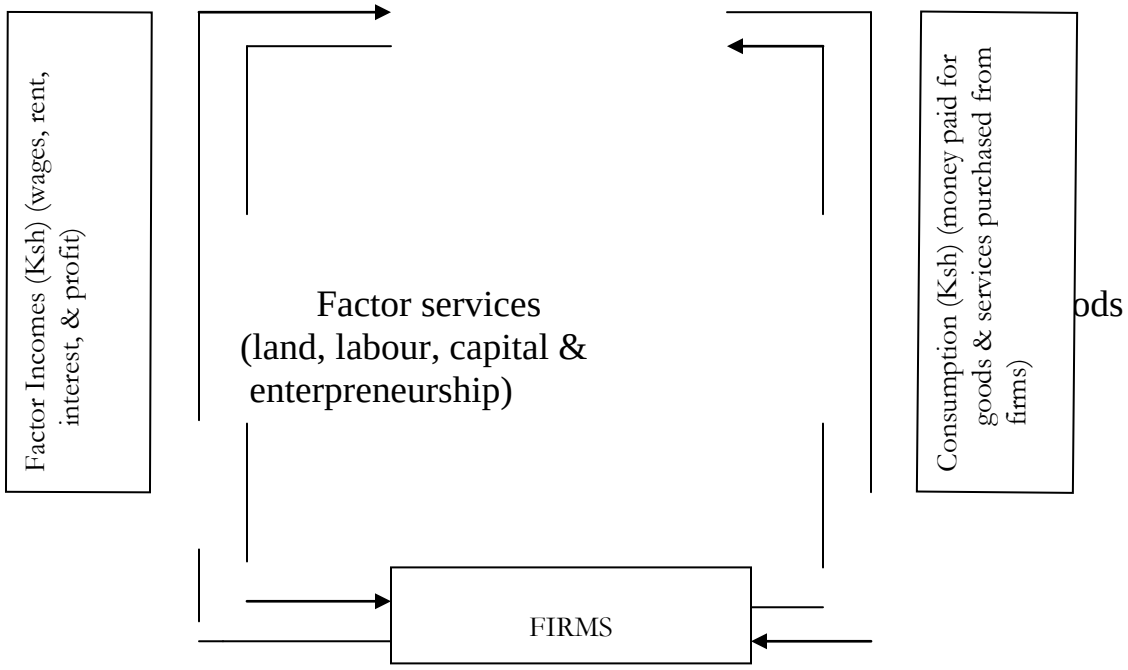
- Also in terms of additional worth (value) to a product in a production process.

Example:

Type of Industry	Value of Output	Cost of Intermediate goods (Ksh)	Value added (factor services) (Ksh)	
Farming	1,000	0	1,000	(Farmer)
Milling	1,300	1000	300	(Miller)
Baking	2,000	1,300	700	(Baker)
Retailing	2,500 (a)	2,000	500	(Shop keeper)
	6,800	4,300	2,500 (b)	

The value added approach is based on the stages of production such that NI = (1,000 + 300 + 700 + 500) = Ksh 2,500 which is the same as the retail price of the product: a = b as shown on the table above.

Expenditure by firms on factors of production (factor services) is an income to households. Similarly, expenditure by households on goods and services (produced by firms) is an income to firms. These two aspects form the basis of the circular flow of income in National Income accounting as shown by the simple model below:



Such that Y ≡ E ≡ O
Where Y: Income
E: Expenditure
O: Output

NUMBER EIGHT

1) Importance of estimation of National Income of a country:
   - Planning and decision making; forecasting etc.
   - Measure of economic performance and Comparison
   - Policy formulation and implementation
   - Property ownership – determination of the size of private foreign direct investment (FDI)

   Problems of measurement of National Income:

   - Incomplete/Inadequate information
   - Double counting
   - Changes in prices
   - The problem of inclusion, in terms of:

     - Subsistence output (income)

- Intermediate goods
- Housing i.e. rent on owner – occupiers
- Public Services provided by the government
- Foreign payments i.e. net income from abroad
- Illegal activities eg. smuggled output
- Revaluation of assets.

NB: Briefly explain each of these problems;

2) i) Computation of GDP using the Value added approach:

Sector	Total Output	Intermediate Purchases	Value Added
Agriculture	30	10	(30 –10) = 20
Manufacturing	70	45	(70 – 45) = 25
Services	55	25	(55 – 25) = 30
Total Value Added: GDP (at factor cost)			75 billion

ii) $NDP_{(MP)}$ = $GDP_{(FC)}$ + Indirect taxes - Depreciation
= (75 + 7 – 8) = (82 – 8) = 74 billion

$NDP_{(FC)}$ = $NDP_{(MP)}$ – Indirect taxes
= (74 – 7) = 67 billion

c) **The Multiplier:**

In his theory Keynes asserted that consumption is a function of income, and so it follows that a change in investment, which we may call ΔI, meaning an increment in I will change Y by more than ΔI,. For while the initial increase in Y, ΔY, will equal to ΔI, this change in Y will itself produce a change in C, which will increase Y still further. The final increase in income thus exceeds the initial increase in investment expenditure which is therefore magnified or "multiplied". This process is called the **multiplier process.**

The Operation of the "Multiplier"

The Multiplier can be defined as the coefficient (or ratio) relating a change in GDP to the change in autonomous expenditure that brought it about. This is

because the Multiplier can be defined as the coefficient (or ratio) relating a change in GDP to the change in autonomous expenditure that brought it about. This is because a change in expenditure, whatever its source, will cause a change in national income that is greater than the initial change in expenditure.

For example, suppose there is an autonomous increase in investment which comes about as a result of decisions by businessmen in the construction industry to increase in investment which comes about as a result of decisions by businessmen in the construction industry to increase the rate of house building by, say, 100 houses each costing £1,000 to build, investment will increase by £100,000. Now this will be paid out as income to workers of all kinds in the building industry, to workers in industries which supply materials to the building industry and others who contribute labour or capital or enterprise to the building of the houses; these people will turn wish to spend these incomes on a wide range consumer
goods and so on. There will thus be a series of further rounds of expenditure, or **Secondary Spending** in addition to the initial **primary spending** which constitutes further increase in GDP.

This is because those people whose incomes are increase by the **primary increase** in autonomous expenditure will, through propensity to consume spend part of their increase in their incomes. Put differently therefore an increase in autonomous expenditure creates a **multiplied effect** on the GDP through the Expenditure – Income – Expenditure cycle.

How and where does the Multiplier Stop

The multiplier concept can erroneously give the impression that an initial increase in autonomous spending would lead to an indefinite increase in GDP. This does not happen because each secondary round of increased expenditure gets progressively smaller, which is explained by the fact that the Marginal Propensity to spend the national income is less than one. This is the ratio which scales down each successive round of expenditure and causes the GDP to converge to a new equilibrium level.

Suppose in our example, an average of three fifths of any increase in income is spent by the people receiving it:

The Marginal Propensity to consumer or save will be 3/5 and 2/5 respectively. Since ΔI, = 100,000, the increase in Y converge at the level 250,000. This is because for any value z between 0 and 1, the series

$$1 + z + z^2 + z^3 + \ldots\ldots\ldots$$

tends to the value $\frac{1}{1-z}$. In our example we have the series (in thousands)

$$100 + 60 + 36 + 21.6 + \ldots\ldots$$

OR

$$100 \{ 1 + (3/5) + (3/5) + (3/5) + \ldots\ldots\}$$

which thus equals:

$$100 = \frac{1}{1 - \frac{3}{5}} = 100 \frac{1}{\frac{2}{5}} = 250$$

This result can be generalized , using our notation, as

$$\Delta I \bullet \frac{1}{1 - \frac{\Delta C}{\Delta Y}} = \Delta I \bullet \frac{1}{\frac{\Delta S}{\Delta Y}} = \Delta Y$$

Dividing by ΔI we obtain

$$\frac{\Delta Y}{\Delta I} = \frac{1}{1 - \frac{\Delta C}{\Delta Y}} = \frac{1}{\frac{\Delta S}{\Delta Y}}$$

The ratio, $\frac{\Delta Y}{\Delta I}$ of the total increase in income to the increase in investment which produce it is known as the MULTIPLIER k. If we write c for $\frac{\Delta C}{\Delta Y}$ and s for $\frac{\Delta S}{\Delta Y}$ we have

$$k = \frac{\Delta Y}{\Delta I} = \frac{1}{1 - c} = \frac{1}{s}$$

$\Delta I \quad 1 - c \quad s$

The multiplier is thus the reciprocal of the MPS (Marginal Propensity to Save).

Relevance Of Multiplier

The Keynesian Model of the Multiplier however is a Short Run Model which puts more emphasis on consumption than on savings. It is not a long run model of growth since savings are the source of investment funds for growth. It is appropriate for mature capitalist economies where there is excess capacity and idle resources, and it is aimed at solving the unemployment problem under those conditions – (i.e. problem of demand deficiency with the level of investment too low, because of lack of business confidence, to absorb the high level of savings at full employment incomes.

It is not a suitable model for a developing economy because:

1. In less developed economies exports rather than investment are the key injections of autonomous spending.
2. The size of the export multiplier itself will be affected by the economies dependence on two or three export commodities.
3. In poor but open economies the savings leakage is likely to be very much smaller , and the import leakage much greater than in developed countries.
4. The difference, and a fundamental one, in less developed countries is in the impact of the multiplier on real output, employment and prices as a result of inelastic supply.

The Accelerator:

Suppose that there is a given ratio between the of output Yt at any time t, and the capital stock required to produce it Kt and that this ratio is equal to α hence:

$$Kt = \alpha\ Yt$$

The coefficient α is the capital – output ratio, $\alpha = K/Y$ and is called the **accelerator co-efficient**. If there is an autonomous increase in investment, ΔI this through the multiplier process will lead to increased employment resulting in overall increase

in income, ΔY. This may lad to further investment called **induced investment** in the production of goods and services. This process is called **acceleration.**

The ratio of induced investment to the increase in income resulting from an initial autonomous increase in investment is called the **accelerator**. Thus if the induced investment is denoted by ΔI^1, and the accelerator by β, then:

$$\frac{\Delta I^1}{\Delta Y} = \beta, \Delta I^1 = \beta \Delta Y$$

Thus another way of looking at the accelerator is as the factor by which the increase income resulting from an initial autonomous increase in investment is multiplied by to get the induced investment.

From the Keynesian model $\Delta Y = \Delta I \bullet 1/S$, we can write

$$\Delta I^1 = \beta \Delta I \bullet 1/S$$

Thus, the higher the multiplier and the higher the accelerator, the high will be the level of induced investment from an initial autonomous increase.

NUMBER NINE

a) Money is defined as anything that is legal and capable of effecting transactions.

Functions of Money:

i) **Medium of exchange:** Money facilitates the exchange of goods and services in the economy. Workers accept money for their wages because they know that money can be exchanged for all the different things they will

need. Use of money as an intermediary in transactions therefore, removes the requirement for double coincidence of wants between transactions. Without money, the world's complicated economic systems which is based on specialization and the division of labour, would be impossible. The use of money enables a person who receives payment for services in money to obtain in exchange for it, the assortment of goods and services from the particular amount of expenditure which will give maximum satisfaction.

ii) **Unit of account:** Money is a means by which the prices of goods and services are quoted and accounts kept. The use of money for accounting purposes makes possible the operation of the price system and automatically providing the basis of keeping accounts, calculating profit and loss, costing etc. It facilitates the evaluation of performance and forward planning. It also allows for the comparison of the relative values of goods and services even without an intention of actually spending (money) on them eg. "window shopping".

iii) **Store of Wealth/value:** The use of money makes it possible to separate the act of sale from the act of purchase. Money is the most convenient way of keeping any form of property which is surplus to immediate use; thus in particular, money is a store of value of which all assets/property can be converted. By refraining from spending a portion of one's current income for some time, it becomes possible to set up a larger sum of money to spend later (of course subject to the time value of money). Less durable or otherwise perishable goods tend to depreciate considerably over time and owners of such goods avoid loss by converting them into money.

iv) **Standard of deferred payment:** Many transactions involve future payment eg. hire purchase, mortgages long term construction works and bank credit facilities. Money thus provides the unit in which given stability in its value, loans are advanced/made and future contracts fixed. Borrowers never want money for its sake, but only for the command it gives over real resources. The use of money again allows a firm to borrow for the payment of wages, purchase of raw materials or generally to offset outstanding debt obligations; with money borrowing and lending becomes much more easier, convenient and satisfying. Its about making commerce and industry possible viable.
Only money, of all possible assets, can be converted into other goods immediately and without cost.

b) Liquidity preference as applied to an individual refers to the desire to hold one's assets as money rather than as income-earning assets. Liquidity preference therefore involves a loss of the income it might otherwise have

earned. There are two schools of thought to explain liquidity preference, namely the Keynesian Theory and Monetarist Theory.

According to Lord John Maynard Keynes, there are three motives of holding money:

The Transaction Motive

A certain amount of money is needed for everyday requirements, the purchase of food and clothing and other ordinary expenses. How much is necessary to hold for these purposes will depend on 3 factors.

- A person's income
- The interval between one pay-day and the next
- Habit

Generally the higher the income the more money will be held. The weekly wage-earner will need to hold less than a person who receives his salary monthly, for in the first case, sufficient amount has to be held to cover expenses for only one week, whereas the other man has to make provision for four weeks.

The Precautionary Motive

People hold money in reserve to cover unanticipated contingencies which might arise in the period or sudden purchase of opportune advantage. The amount held will depend mainly on the **outlook of the individual, how optimistic** he is both as regards events and the **possibility of borrowing at short notice** should the need arise. But, taking the community as a whole, the amount set aside for the precautionary motive is, in normal times, likely to be tied fairly closely to the level of national income.

The Speculative Motive

Another major reason for holding money is in order to speculate on the course of future events. If one thinks prices are now very low and will soon rise, the tendency is to buy now and to put off selling until prices rise. If one thinks prices are high now and will soon fall, the tendency is to sell now and to postpone buying until prices have fallen.

This emphasizes the role of money as a store of wealth. Speculative Balances are wealth held in the form of money rather than interest earning assets because of expectations that the prices of those assets may change.

When households decide how much of their monetary assets they will hold as money rather than s bonds (and other interest earning assets) they are said to be exercising their **Preference for Liquidity.**

In contrast with the above view, monetarists tend to deny the importance of the speculative factor, claiming instead that the main factor is the transaction demand. They argue that the demand for money is interest inelastic and that people hold money largely to finance spending on goods and services. Any increase in the quantity of money can, they agree, produce some changes in interest rates but the main effect is not on investment and output but on prices as people spend their increased money holding mainly on goods and services. The effect of this additional spending is to bid up the price of goods. Monetarist explain this effect by reference to some version of the quantity theory of money summarized in the basic equation MV = PT where M stands for stock of money; V is its velocity of circulation; P is the average price and t is the number of transactions taking place in a given period. Assuming V is relatively constant because the institutional features of an economy change only slowly and that T is fixed at its maximum once a situation of full employment is reached, then it is argued any change in the quantity of money M can only be accommodated by variations in prices.

Modern monetarists following the work of Milton Friedman have refined the quantity theory, pointing out that the demand for money depends on several factors such as total wealth, expected rates of return on wealth, the rate of inflation, the ratio of human to non-human wealth and tastes and preferences.

c) An expansionary monetary policy is to do with an increase in money supply which tends to have the following effects on an economy:

- Inflationary tendencies – an increase in money supply arising from an expansionary monetary policy such as a reduction in the bank rate and therefore an increase in the lending capacity of commercial banks, is likely to cause inflation, particularly where such an increase is inconsistent with the short-run productive capacity.
- Disincentive to investment – a fall in the relative value of a domestic currency discourages investment potential due to:

- An increase in cost of inputs (increase in production costs) which reduces profits
- A fall in purchasing power and effective demand which again reduces profits through the intermediary of a downward pressure on the overall business turnover.

- Increase in cost of capital – an expansionary monetary policy tends to increase the level of interest rates whose extreme effects include the banking crisis manifestations such as the disproportionately large amount of non-performing loans (or even bad debt port folio), statutory management, branch network closures and sometimes liquidation.

➢ However, where the expansionary monetary policy arises during a situation of low economic activity (recession), the tendency would be a fall in interest rates and an increase in equilibrium level of national income. Similarly, a given level of inflation would be necessary for the management of unemployment levels (denoted by the Phillip's curve.)

These two situations are illustrated below:

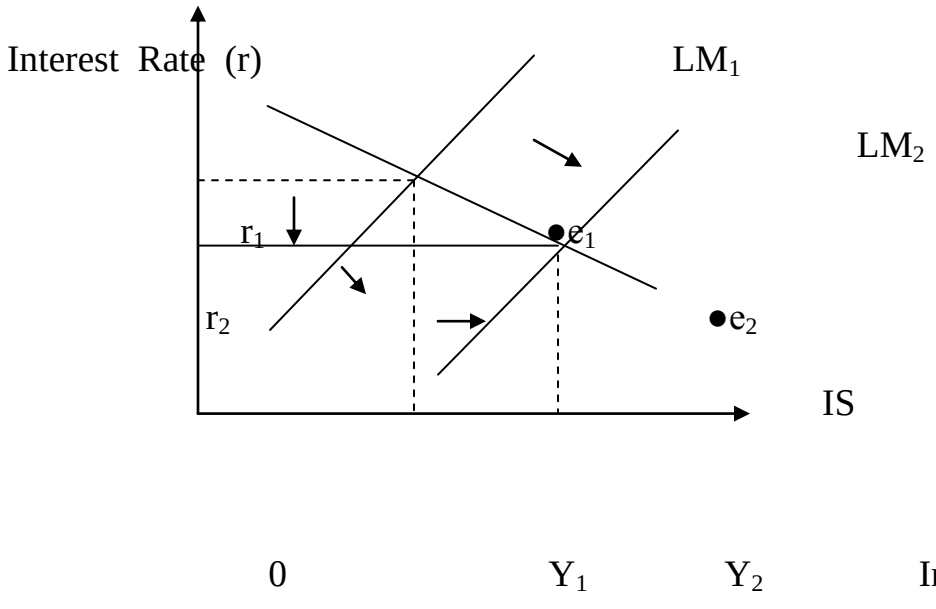


Fig 29.1: Commodity – Money Markets (IS – LM) equilibrium

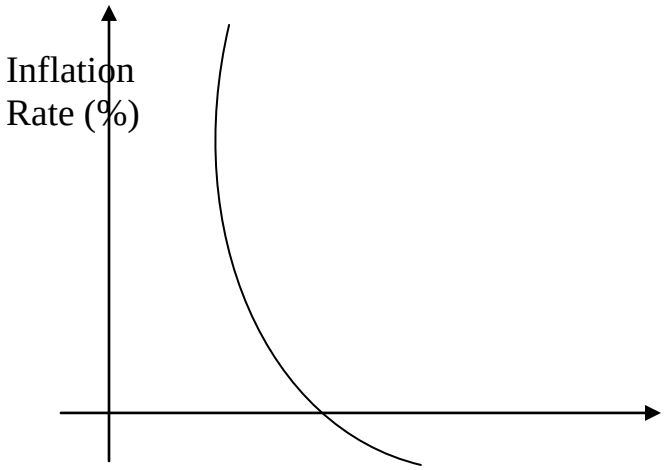


Fig 29.2: The Phillips Curve (PC)