CHAPTER FOUR

MONOPOLISTIC COMPETITION

Introduction to MCM

Definition- MCM is a market structure with many buyers and sellers in which product differentiation exists

- In PCM there are elements of both monopoly and perfect competition.

Assumptions of Monopolistic Competition

1. There are large number of sellers and buyers in the group
2. The products of the sellers are differentiated, but they are close substitutes of one another.
3. There is free entry and exit of firms in the group.
4. The goal of the firm is profit maximization.
5. The prices of factors and technology are given.
6. The firm is knew its demand and cost curves with certainty.
7. The long run consists of a number of identical short run periods, which are assumed to be independent of one another

7.1. Product Differentiation, Demand & Cost

Product differentiation is any feature of a product of sellers that makes buyers to prefer one product or sellers to that of another.

- It leads to different consumer's preference and it is the **basis** for establishing a **downward sloping demand curve**.
- Chamberlin suggested that the demand for a product is determined by the price, the style of the product, the services associated with it and the selling activities of the firm.
- Chamberlin introduced two additional policy variables in the theory of the firm: ***the product* itself** and ***selling costs***.

Hence, the demand curve shifts if:

1. The style, services, or the selling strategy of the firm changes,
2. Competitors change their price, output, services or selling policies of a product;
3. Tastes, incomes, prices or selling policies of products from other industries change.

cont…

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Product differentiation is intended to distinguish the product of one producer from that of other producer in the 'industry' (group).

- It leaves firms under monopolistic competition with some degree of monopoly power. Because of this the firm is not a price – taker.

Product Differentiation cont…

Product differentiation can be ***real*** or ***fancied*** (artificial)

Real differentiation: exists when the inherent characteristics of the products have slight differences (in quality, durability), in the specification of products (terms of credit, transportation, guarantee, location of the firm), which determine the convenience with which a product is accessible to the consumer.

Example: chemical differences existing in shampoos or conditioners.

Fancied differentiation is established by advertising or differences in packaging or in design (color or shape) or simply by brand name.

Product Differentiation cont…

Product differentiation creates **brand loyalty** and gives rise to a **negatively sloped demand curve**.

- The importance of product differentiation are;
  1. It gives some advantage in the **determination of price** for its product to a firm in MCM.
  2. **Consumers do have special preferences** for the products of a specific seller and within limits will pay a higher price to satisfy those preferences. The reason why not a firm looses or attracts all consumers when price increases or decreases, respectively and consumers are willing to pay a **higher price** for a product of a specific firm is due to **brand loyalty**.

Product Differentiation, Demand & Cost cont…

COST FUNCTIONS OF THE FIRM

- Cost structure of a firm under MCM is similar to that of any other firm (perfectly competitive and monopoly firm).
- The AVC, MC, ATC are all U- shaped implying that there rcis only single level of output which can be optimally produced.
- Additionally there is cost of advertising and selling activities which will shift the demand and make the demand less elastic.
- Total cost = Production cost + Selling cost.
- Like any other costs the average selling cost is U-shaped. That means there are economies and diseconomies of selling cost as output increases.
- The U shaped average selling cost, added to U shaped average production cost, yields a u shaped ATC curve.

4.2 PRODUCT GROUP & INDUSTRY

Product group: includes products which are '**closely related**' .

An **operational definition** of the 'product group' is the **demand** of each single product be **highly elastic** and it shifts appreciably when the price of other products in the group changes.

- ✓ Here products should be close substitutes both technologically and economically

Technological substitutes are products which can technically cover the same want.

Motor cars are all used for transportation,

All powder soaps are used for washing purpose.

Economic substitutes are products which cover same want and have similar prices.

Product Group & Industry Cont…

Chamberlin's definition

PRODUCT GROUP: It refers to a group of sellers in an industry, supplying **different brand of commodities or services**, but are **very much (closely) related**.

- ✓ Consumers are unable to differentiate them based on some state of quality, such as shape, test, color etc.

Example: Automobile industry cars with brand name Fiat and Lada, Corolla DX and Toyota DX

INDUSTRY: refers to broader classification and hence consists of several product groups.

- ✓ If all firms in a MCM produce very close products as the brewery industry or supply very close service as the banking and insurance industry in Ethiopia all the firms in can be regarded as product group and industry.
- ✓ Thus, product group is a sub set of industry.

4.4 Equilibrium of Firms

Short run Equilibrium of Firms

It is calculated by equating MR with the MC curve.

Numerical Example

- Assume a firm engaging in selling its product and promotional activities in monopolistic competition face short run demand and cost functions as $Q_d=20-0.5P$ and $TC= 4Q^2-8Q+15$, respectively. Having this information

  a. Determine the optimal level of output and price in the short run.

  b. Calculate the economic profit (loss) the firm will obtain (incur).

  c. Show the economic profit (loss) of the firm.

Equilibrium of Firms Cont…

Solution

Given; Q=20-O.5P and TC= $4Q^2$-8Q+15

a. Q=20-0.5P, Q-20=-0.5P, P=40-2Q ,

TR=PQ= (40-2Q)Q =40Q-$2Q^2$ ⇒ MR=∂TR /∂ Q =40-4Q

TC=$4Q^2$-8Q+15 ⇒ MC= ∂TR /∂ Q=8Q-8

At equilibrium MR=MC⇒ 40-4Q=8Q-8 ⇒Q* =4

P*=40-2Q**4**=40-2(4)=40-8=32

b. π=TR-TC = (40Q-$2Q^2$) – ($4Q^2$-8Q+15)

= (40(4)-2$(4)^2$) - (4$(4)^2$-8(4)+15)

= (160-64) – (64-32+15) or 81

=128 – 47

=81

Long Run Equilibrium

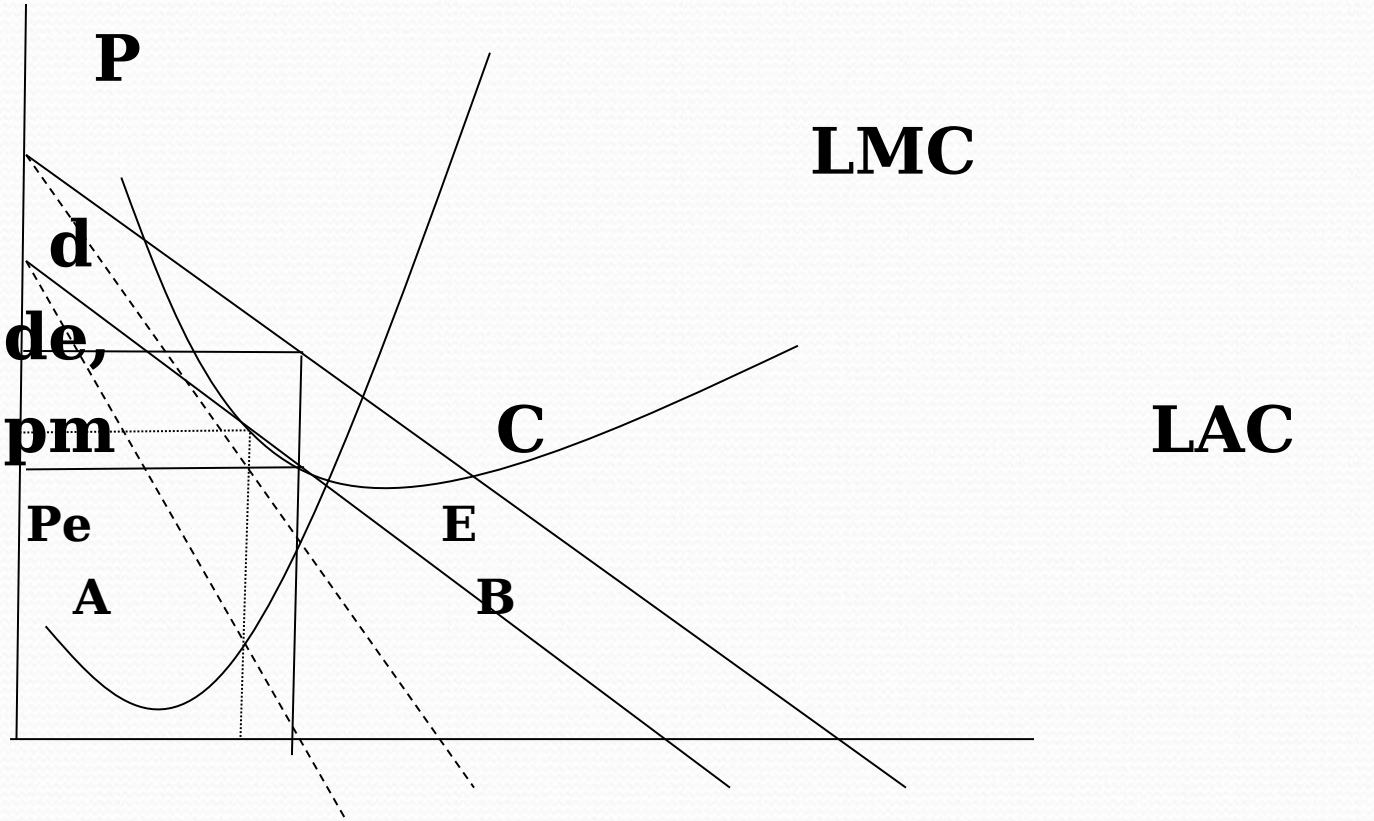
- In order to be able to analyze the equilibrium of the firm and of the industry on the same diagram **Chamberlin made two 'heroic assumption'**,

1. firms have identical costs, and
2. consumers' preferences are evenly distributed among the different products.

- That is, although the products are differentiated, all firms have identical demand and cost curves.
- Under these assumptions the **price in the market will be unique**.
- Chamberlin develops **three models of equilibrium**.

Cont...

Model 1: Equilibrium with Entry of new firms



Long Run Equilibrium cont…

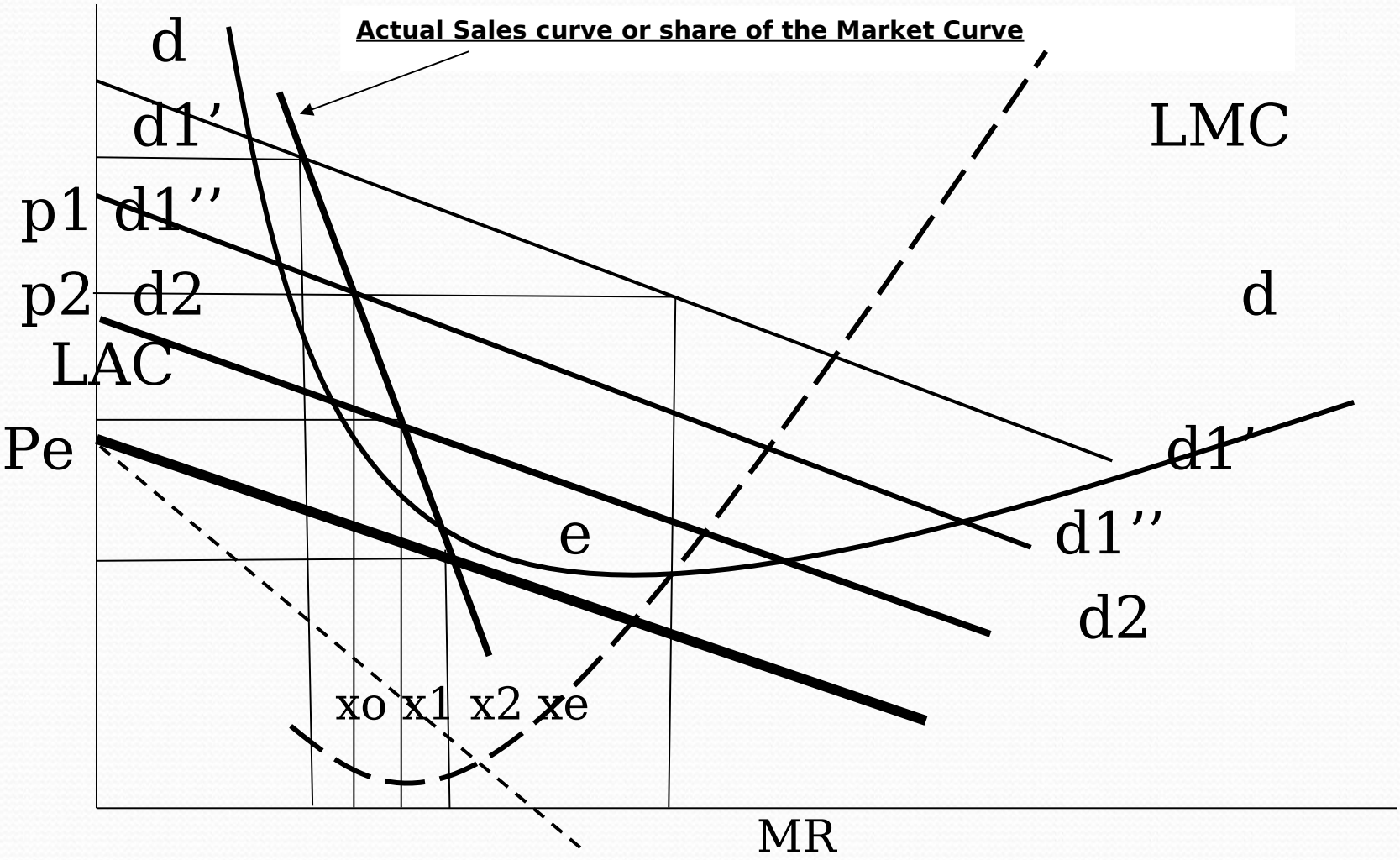
- The firm is in short run equilibrium atC where MC = MR attains abnormal profit, area of PmCBA.
- The excess profit attracts firms to come in to the market which results downward shift of the demand curve dd', since the market is shared by a larger number of sellers.
- The process will continue until the dd curve is tangent to the AC curve at its equilibrium. i.e. until the abnormal profit is eliminated and excess profit is wiped out.
- In the final equilibrium of the firm, the price will be P_e and the ultimate demand curve will be dd^{I}E.
- In the long run the equilibrium occurs at P=LAC, at this point there will be neither entry nor exit, and the equilibrium is stable.

Long Run Equilibrium cont…

Model 2: Equilibrium with price competition

- In this model, the number of firms in the industry is assumed to be compatible with long run equilibrium, so that neither entry nor exit will take place.
- But the ruling price in the short run is assumed to be higher than the equilibrium price.
- The analysis of this case is done by the introduction of a second demand curve, labeled DD, which shows the actual sales of the firm at each price after accounting for the adjustments of the prices of other firms in the group.
- DD' is sometimes called actual sales curve or share of the market curve. It is a locus of points of shifting dd curves as competitors change their price.

Long Run Equilibrium cont…



Long Run Equilibrium cont...

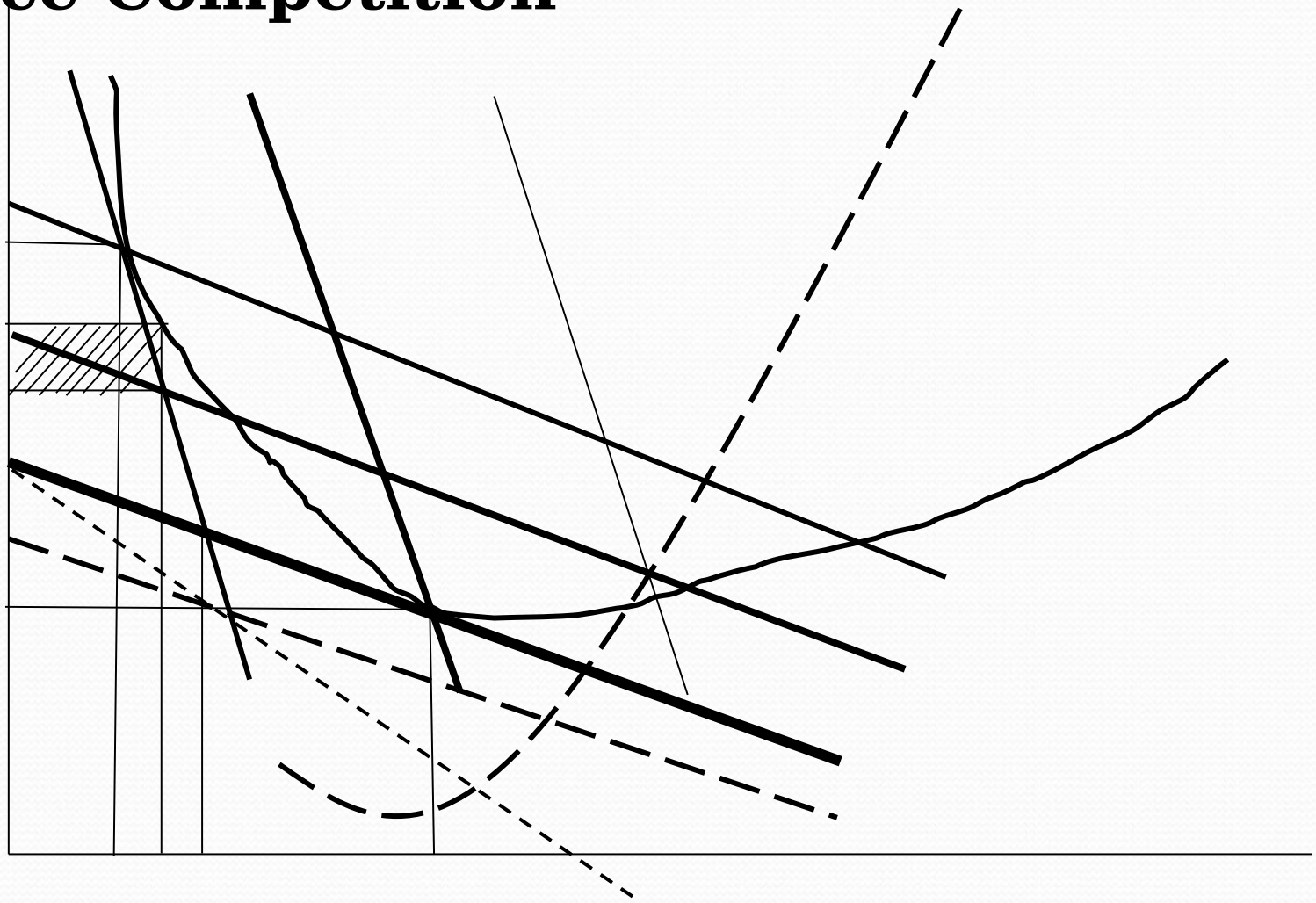
- All firms acting independently reduce their price simultaneously to P_1. As a result, the dd curve shifts downward and the firm instead of selling expected quantity sales actual quantity X_1 (whish is less than the expected quantity)on the shifted dd curve dd' along the share curve DD'.
- According to Chamberlin, the firm does not learn from pas experience and may further reduce price expecting that the others will not react. Thus the firm lowers its price again in an attempt to reach equilibrium, but instead of the expected sales Xo the firm achieves actual sales of X_2, because all other firms act identically, though independently.

Long Run Equilibrium cont…

- The process stops when the dd’ curve has shifted so far to the left as to be tangent to the LAC curve.
- Equilibrium is determined by the tangency of dd’ and the LAC.
- At the point of tangency the DD curve cuts the dd curve.
- Obviously it will pay no one firm to cut the price beyond that point, because its costs of producing the larger output would exceed the price at which this output could be sold in the market.

Long Run Equilibrium cont…

Model 3: Equilibrium through Entry & Price Competition



Long Run Equilibrium cont…

- Chamberlin suggests that in the real world adjustment towards long run equilibrium takes place through both entry/exit and price competition.
- Price adjustments are shown along the dd' curve (the flater demand curves) while entry/exit cause shifts in the DD' curve (the stipper demand).
- Equilibrium is stable if the dd' curve is tangent to the AC curve and expected sales are equal to actual sales, i..e, DD' curve cuts dd' curve at the point of tangency of dd' & LAC.
- Equilibrium is then stable with normal profits earned by all firms and no entry or exit taking place.

1.3 Excess Capacity and Welfare Loss

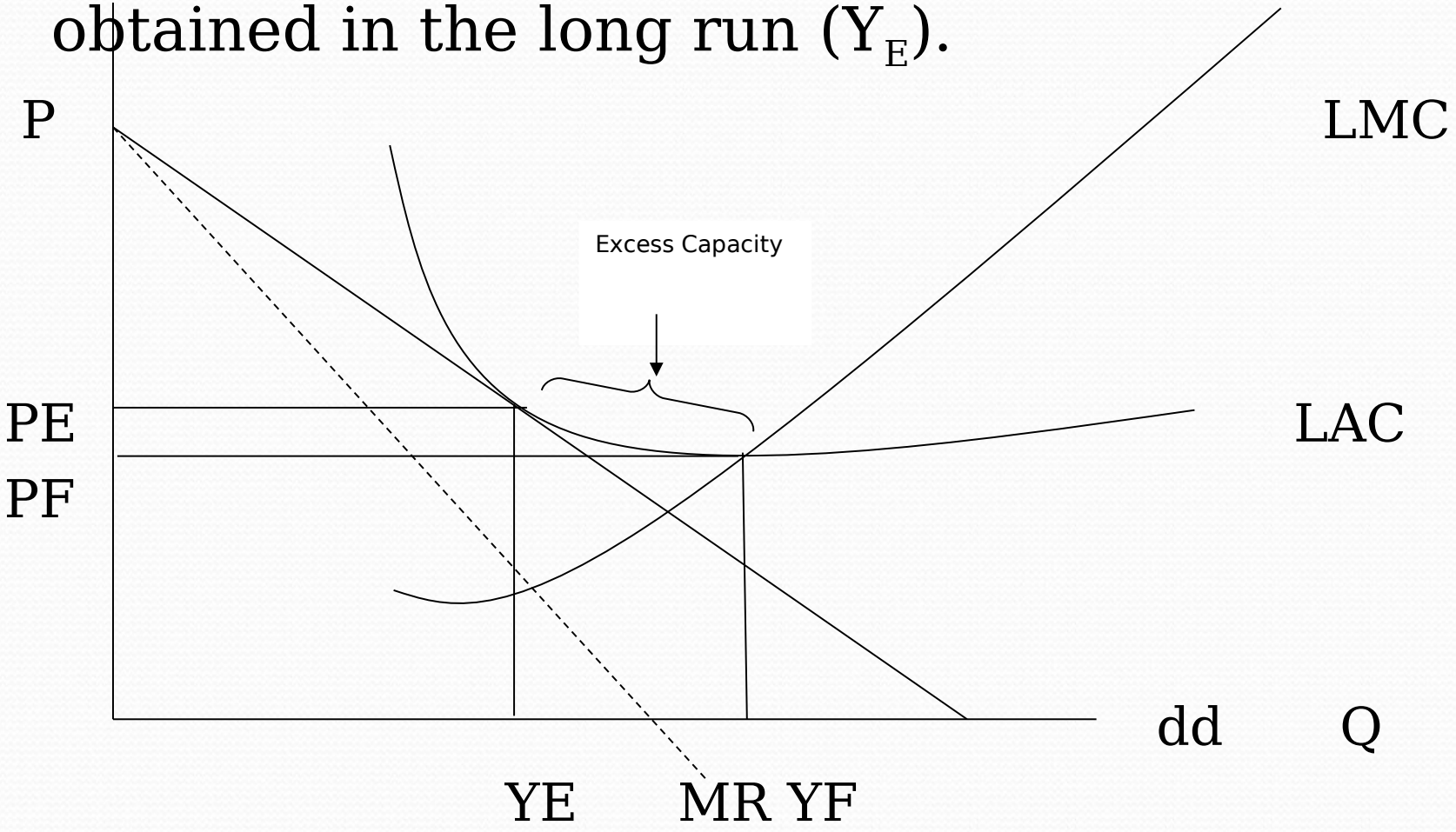
- Under PCM firm MC = MR = LAC = P = AC at the min of LAC and resources are efficiently allocated.
- On the other hand, under MCM MC = MR and P = AC, but P > MC (because P > MR).
- As a result price will be higher and output will be lower in MCM as compared to the PCM.
- In MCM firms produces less than the optimal (at a higher cost) because of:

1. The tangency of the LAC and demand occurs at the falling point of the LAC.
2. Firms incur selling cost which is not presented in PCM.

- **Therefore, firms in MCM have an excess capacity**

Excess Capacity & Welfare Loss Cont...

- Excess capacity measured by the difference b/n the ideal output (Y_F) corresponding to the minimum LAC curve and output actually obtained in the long run (Y_E).



Excess Capacity & Welfare Loss Cont…

- Chamberlin argues that the excess capacity and misallocation of resources is valid only if one assumes that demand curve of each individual firm is horizontal.
- If demand is downward sloping and firms enter into active price competition and entry is free in the industry, Y_F cannot be considered as a socially optimal output.
- Consumers desire a variety of products and it reflects the desire of consumers to pay higher price for differentiated product.
- Therefore, the difference b/n the actual output Y_E and the minimum cost output Y_F is not a measure of excess capacity but rather a measure of the "**social cost of producing and offering the consumers a greater variety of output.**"

REVIEW QUESTIONS

1. A firm operating in MCM is faced by the following demand and cost functions i.e. $P = 350 - Q$ and

   $TC = 355Q - 2Q^2 + 0.05Q^3$ then

   a. Calculate the profit maximizing level of output and

   price

   b. What is the economic profit earned by the firm when

   the output is 10 units?

Review Questions Cont…

Solution:

a. Given; $P = 350 – Q$ and $TC = 355Q – 2Q^2 + 0.05Q^3$

$TR=PQ=(350-Q)Q=350Q-Q^2 \Rightarrow MR=350-2Q$

$TC = 355Q – 2Q^2 + 0.05Q^3 \Rightarrow MC=355-4Q+0.15Q^2$

At equilibrium, $MR=MC$, $350-2Q=355-4Q-0.15Q^2$

$\Rightarrow -0.15Q^2 +2Q+5=0 \Rightarrow Q=10$ & $P=350-10=340$

b. Economic profits are TR – TC

at Q is 10 profits are

$(340 \times 10) – (355 \times 10 – 2 \times 10^2 + 0.05 \times 10^3) = 0.$

Review Questions Cont…

2. A firm in a monopolistic competition faces the following total revenue function: TR = 500 + 50A – A^2 and cost of advertizing is 4 Birr where A = units of advertising, then

a. What is the optimal budget for advertising?

b. If you get quantity discounts for purchase of advertising and the MCA = 60 – 3A, What is the profit maximizing number of advertisements?

Review Questions Cont…

a. Revenue function

TR = 500 + 50A – A^2 ∴ MRA = 50 – 2A and MCA = 4

The optimum level of advertising is ⇒50–2A = 4

⇒A = 23

The Optimal budget for advertising = (23 x 4) = 92.

b. If you get quantity discounts

MCA = 60 – 3A

At profit maximizing advertising MRA = MCA

⇒ 50 – 2A = 60 – 3A ⇒ A = 10

- The profit maximizing advertisings are 10 units.