CHAPTER ONE

INTRODUCTION

1.1 What is industrial economics about?

- IE is a distinctive branch of economics that deals with economic problems of firms and industries, and their relationship with society.

- Economic problems arise due to scarcity

- Microeconomics studies the producer's behavior in relation to scarcity of resources.

- Some economists regard IE as an elaboration of and development from microeconomics.

- IE is best defined as "the application of micro economic theory to the analysis of firms, markets and industries".

- Stigler (1968) argued that IE does not exist as a separate discipline.
  - just simply a differentiated microeconomics.
- The distinction is mainly that IE focuses on empirical works and its implications for policy.
- Viewing IE as a development of microeconomics is indeed quite understandable.
  - Concerned with the economic aspects of firms and industries

Differences:

- Microeconomics: formal, deductive & abstract discipline
- IE: less formal and more inductive in nature

- Microeconomics assumes profit maximization as the goal of the firm (passive approach)

- IE does not believe in single goal of profit maximization.
  - concentrates on the constraints which impede the achievement of the goals and tries to remove them (active discipline)
- Microeconomics is abstract, hence, does not go into operational details of production, distribution and other aspects of the firms and industries. It provides theoretical basis to IE
- IE also takes care of public policy implications

Why IE?

- Industrial Economics is the study of firms, industries and markets.

- It looks at firms of all sizes and considers a whole range of industries

❖We study IE because we want to know:

- The levels at which capacity, output and prices are set
- The extent that products are differentiated
- how much firms invest in R&D
- how and why firms advertise

- A state regulates industries
  - Nationalization
  - privatization
  - anti-trust policies

- How this affect the performance of firms is a crucial aspect in IE

- IE is also known as:
  - economics of industries
  - industry and trade
  - industrial organization and policy
  - Commerce
  - business economics

- "Industrial organization" is commonly viewed as synonymous with IE

- Carlson (1989) made distinction
  - Industrial organization focuses on the structure of industries at a particular point of time.
  - Industrial dynamics is primarily concerned with the evolution of industry as a process in time
  - IE encompasses both industrial organization and industrial dynamics.

- Industrial dynamics comprises 4 main themes
  - The nature of economic activity in the firm
  - Degree of interdependence among firms
  - Role of technological change and institutional framework
  - The role of economic policy

- IE is predominantly an empirical discipline having micro and macro aspects.

- 2 broad elements:
- **Descriptive element**: is concerned with information content of the subject

✓ it deals with the information about the competitors, natural resources and factors of production and government rules and regulations related to the concerned industry.

- **Analytical element:** is concerned with business policy and decision-making content

✓ It deals with topics such as market analysis, pricing, choice of techniques, location of plant, investment planning, hiring and firing of labor, financial decisions, product diversification

- The two elements are interdependent.

1.2. Approaches to industrial economics

Structure-conduct-performance (SCP)

- The central questions addressed by industrial economics are
  - *is there market power and if so, how do you measure it?*
  - *How do firms acquire and maintain market power?*
  - *What are the implications of market power?*
  - *What is the role of public policy as regards market power?*

- Idea is whether sufficient market power exists

- **Market Structure:** Refers to the organizational characteristics of buyers and sellers in a particular market.

- It shows the pattern buyers and sellers are linked together.

- Bain's 4 main features of market structure:
  - The degree of seller concentration
  - The degree of buyer concentration
  - The degree of product differentiation
  - The condition of entry to the market

- **Market Conduct:** It is the patterns of behavior firms follow in adopting or adjusting to the market in meeting goals.

- the pattern of behavior followed by firms in the industry when adapting to a particular market situation.

- It includes
    - price decisions
    - types of products and quantities
    - product design
    - quality standards
    - advertisement

- **Market Performance**: it is the end result of activities made by firms in pursuit of goals.

- **Examples**:
  - High profitability
  - high firm growth rate
  - increase in sales
  - increase in capital turnover

- Indicators of good market performance:
  - Efficiency in resources allocation
  - Technical or operational efficiency
  - Profit rates
  - Output levels
  - Technologically progressive producers

1.2.2. The Chicago school of thought

- At the University of Chicago in 1940s.

  - free markets best allocate resources
  - Need for minimal government intervention

- two distinct components of the School.

A) **scientific**: Economics is not an abstract subject

  - The empirical worth of a theory
  - It is an "engine for analysis”

B) **policy:** Clear emphasis on free markets

- strongly opposed government intervention.

- The school can be said to reject Keynesianism in favor of neoclassical price theory and monetarism.

- Proponents of this school elevate economic liberalism and free markets above all else.

1.2.3. Institutional economics

- Focuses on the importance of nonmarket factors in influencing economic behavior
  - sociological factors
  - history
  - institutional development
- Huge emphasis on evolutionary process and institutions in shaping economic behavior.

- Institutional economics views markets as result of complex institutional interactions

- Interlinked with
  - Law and economics
  - Behavioral economics

- An attempt was made to integrate institutionalism into more recent developments in mainstream economics, under the title new institutional economics.

- But "institution" is so central for all social sciences
    - It means all things to all people
    - The meaning of nothing

CHAPTER TWO

THEORY OF THE FIRM

2.1 The Neoclassical theory of the firm

- The theory treats the firm as a producing unit.
- However, the firm is now seen as a more complex organization where control and ownership are distinct and as a nexus of different activities.
- focuses on decision makers in which maximization rationality is possible.
  - we mean individuals have all relevant information to any decision, which they are able to utilize effectively so as to maximize profit/utility.
- Hence, decisions are made with perfect information.

Cont.

- If an entrepreneur in a competitive industry anticipated all relevant events and if he is able to adjust his plans, no disequilibrium could arise [Stigler]

- Hence, the neoclassical theory sees the price system as the only device identified as a mechanism of coordinating different activities.
- Administration coordination is disregarded.

Cont.

- The theory assumes zero transaction cost
- It also implies that institutional arrangements play minor role in the economic process
- Firms are passive entities: they cannot make a difference in their economic performance.

2.2 Modern Theories of the Firm

2.2.1 Managerial theory of the firm

- focuses on relationship between owners and managers and the possible deviations of objectives

- complex nature of modern corporate firms
    - separation of ownership and control
    - divergence in objective between parties

- diminishing influence of shareholders in decision making process
- 2 different models

A) Baumol's Model

- Assumes that sale/revenue maximization is the primary objective of the firm.

- Why ?
  - Sales performance reflects the performance in market power and market share.
  - Sales data are easily accessible
  - Financial markets, retailers and distributors are more responsive to a firm with rising sales.

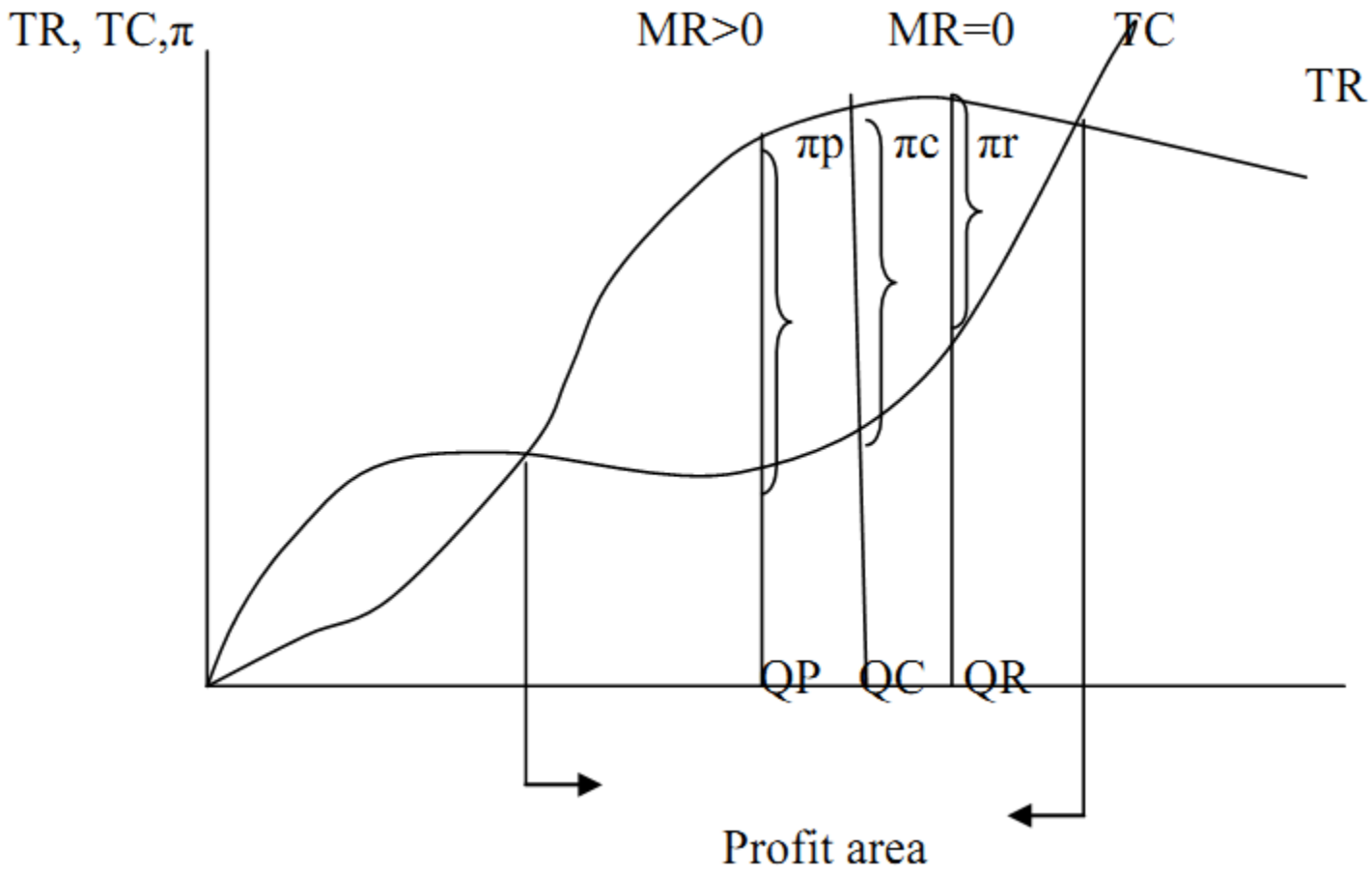
Cont.

- Baumol argues that even if there is divergence of objectives, the objectives are reconcilable

- How this could happen?

- It assumes that the firm maximizes sales revenue subject to a maximum profit constraint

Cont.



Cont.

- QP= output produced by a profit maximizing firm;
- QR=output produced by revenue maximizing firm.
- QC=output produced by the revenue maximizing firm when constrained by a minimum profit.

- **Sacrificed profit:** $\pi p - \pi c$

- Such profits are given up by the firm in order to increase sales revenue.

B) The Marris Model

- Hypothesized that managerial control would lead to growth as an objective.

- Like Baumol, he assumed that managers act to maximize their utilities rather than profit.

- In contrast to Baumol, this would be achieved through growth rather than sales.

Cont.

- The model has two sides: supply growth and demand growth.

- *supply growth*: maximum growth in supply that can be generated from each profit rate given the management's attitude towards growth.
- *demand growth*: maximum profit rate associated with each growth in demand.

Cont.

- In the demand growth, growth determines profits. But in the supply growth, profit determines growth.
- When the supply growth and demand growth relationships are satisfied, there would be unique state of growth and profit equilibrium.
- This occurs at a point of balance between the two sides

2.2.2 The Principal-agent theory

- examines a situation in which there are two main actors:
  - a principal (asset owner)
  - an agent (decision maker)

- According to Williamson, agency theory focuses on the design and improvement of contracts between the two parties.

Cont.

- Agency theory has the following assumptions.

  - There is separation between ownership and control.
  - Firms are active entities in their economic activities

  - Information asymmetry
  - Moral Hazard, shrinking and hidden action problem
  - Unbounded rationality

Tackling moral hazard

- Equating the salaries of managers with their marginal product (W=VMP=P.MP)
- Incentives that make agents to act in line with the interest of principals

- Monitoring the performance of individual managers.
- Hostile takeovers
- Best solution - The principal to be his own agent

2.2.3 The Transaction Cost Theory

- Developed by Coase and Williamson.
- Aims at the minimization of transaction costs as the basis for the existence of firms.
- Transaction costs are costs of running the economic system.

Cont.

- Such costs include two elements:
  - Costs of acquiring information
  - Costs involved in undertaking transactions

- Examples of transaction costs:
  - costs of obtaining information on good and/or service
  - costs of knowing current DD and SS levels
  - costs of selecting and screening buyers and sellers

2.3. The Growth of the Firm

- Growth is one of the performance indicators of a firm.

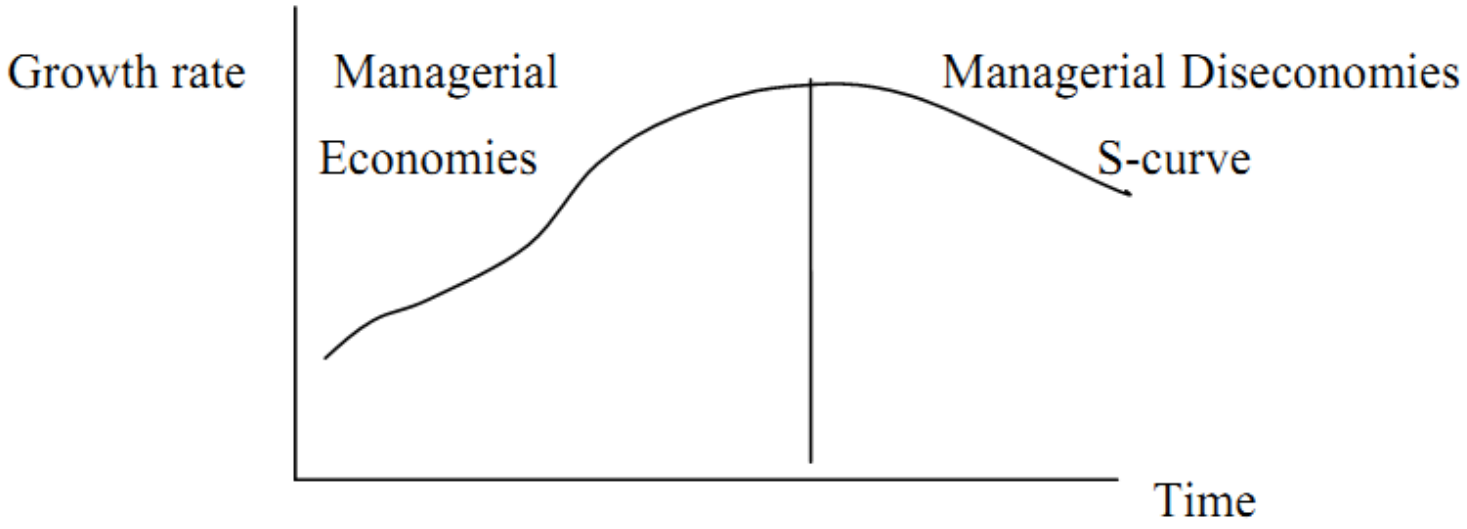
- Why firms need growth?
  - Just simply as a goal
  - Growth is a natural process
  - External pressures
    - Increment in demand
    - Dynamism of competition

2.3.1 The Life-Cycle Theory

- proposed that firms experience a natural evolutionary trend of growth

- Birth $\rightarrow$childhood $\rightarrow$ maturity$\rightarrow$ old age $\rightarrow$ death

through the sigmoid curve



Cont.

- Young firms allow management economies.
  - ease for handling and transmitting information,
  - High communication, and timely decisions

- Older firms face managerial diseconomies:
  - poor communication
  - managerial hierarchy
  - delayed information

2.3.2 Downie's Theory

- concerned with the analysis of the dispersion in efficiency and rate of technical progress among firms in a given industry.

- Some firms have greater efficiency than the industry average and some lower than this.

- Efficiency variation is attributed to the variation in their technical progress.

Cont.

- Firms having access to technologically superior process and/or products are taken to be more efficient than firms which don't have such facility.

- Technological superiority can be obtained from patented innovations, accumulated skill or experience

Cont.

❖2 means of growth:

Capacity of production:

- To expand their capacity, firms need finance

- Efficient firms are assumed to be profitable

- Capacity expansion is positively related with profit rate

Cont.

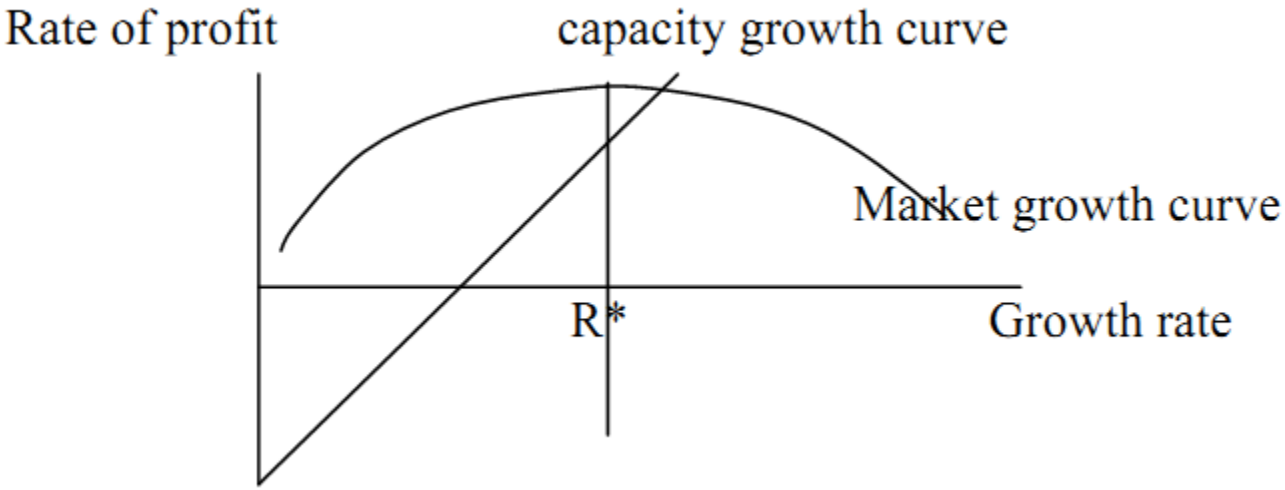
Market expansion:

- Efficient firms with better technology may make price reduction and hence attract new customers.

- But this would be feasible only up to certain point (as long as it is operating in the elastic zone of its demand curve)
- Going beyond leads to a reduction in the rate of profit.

- So, an inverse relationship between market expansion and profit after some point. These two opposite trends set the upper limit of the rate of growth of the firm.

Cont.


Rate of profit
capacity growth curve
Market growth curve
R*
Growth rate

Cont.

- *R^* is the optimum situation for the rate of growth of the firm where the capacity and the market growth curves intersect.*

- *An efficient firm will be able to sustain a higher growth rate than an inefficient firm because of its higher rate of profit initially and ability to expand its capacity.*

Cont.

- **Limitations**
  - diversification is not considered as a way to remove the market restraint on growth of the firm
  - managerial restraint which plays very important role in limiting the size of a firm is not considered
  - Its focus in innovation was inadequate.

2.3.2 Penrose's Theory

- There is no formal equilibrium growth model for the firm

- Goal of the firm is to increase total long run profit.

Cont.

- To achieve this objective, the firm continues to make investment as long as it gets positive return from it.

- It takes the advantage of productive opportunities for expansion

- Penrose considers the firm as a pool of productive resources organized within an administrative framework.

Firms' restraints?

Internal constraints:

- Managerial
- Financial

External constraints:

- competition
- patents and other forms of restrictions
- Input scarcity

- Penrose argued that the external factors and the financial constraints can be easily handled if the management is strong.

2.3.3 Marris Theory

- Applicable to a corporate firms owned by shareholders and controlled by managers.

- Shareholders aimed to maximizing return on investment.

- Managers aspire to maximize their own interests
- All such things are postulated to be positively correlated to the growth of the firm.

Cont.

- The return on shareholders' investment is realized in the form of dividends and capital gains throughout the life of the firm.

- the value of the firm is determined through the present value of dividends and capital gains

Cont.

- Marris specified maximization of the rate of growth as the overall objective of the firm subject to a stock market valuation constraint.

- If profitability or market value of the firm's shares decline, the job or importance of the managers will be adversely affected.

Cont.

The steady state growth condition:

- All characteristics of the firm (assets, employment, sales, profits, etc) grow at the same constant exponential rate over time.

- Its implication is that both supply and demand sides of the firm grow over time at same rate.

Cont.

Demand function growth:

- Firms grow better with bright product demand, not otherwise
- If product demand is at its saturation point, then the firm will be stagnant.
- This demands diversification
- $\mathbf{g_d = f_1(d)}$**……(1),** g_d *is growth in demand and* ***d*** *is diversification rate*

Cont.

Supply function growth:

- refers to an increase in assets of the firm.
- A firm can raise finance through
  - Retained earnings
  - Borrowings
  - Issuance of new equity shares

Cont.

- Assuming that the new investment is financed by retained earnings, we get;
- **$I=r\pi$, I** is the new investment, **r** is the retention ratio, and **π** is the profit rate.

- **$g_s = I/K = r.\pi/K = rp$**, **g_s** =growth in supply

  K =capital stock and

  P = rate of return on capital (**π/k**)

Cont.

- The capacity of raising funds from external sources, lenders and equity buyers, depends on its long run return on capital.

- The higher the expected rate of return on capital, the higher the possibility of fund rising from external sources will be.

Cont.

- With this assumption, we can specify the growth of supply function as $\mathbf{g_s = \alpha p}$
- α is the amount of new investment financed per unit of profit earned.

- There is some maximum upper limit for α determined by the managers of the firm after taking the riskiness of different modes of financing in to account.

- Hence, we can write the growth of supply function as: $\mathbf{g_s = \alpha p;\ \alpha <= \alpha^*}$**……(2)**

Cont.

The cost of expansion function:

- It is the rate of successful diversification that determines the growth of demand of the firm.

- The rate of diversification depends on cost of expansion (if cost of expansion grows fast, profit rate on capital is likely to decline)

- That is why Marris specified relationship between rate of diversification and rate of return on capital as

$$\mathbf{d=f_2\,(1/P)\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(3a)}$$

Cont.

- By definition: **$P=\pi/k=(\pi/Q)(Q/k)=m/v$**
  - π/Q is profit margin (m)
  - K/Q is capital output ratio, v=Q/K
  - Q is value of output

- Substituting m/v in equation (3a), we get

$d=f_2\,(v/m)$……(3b)

- **Hence,** rate of diversification is directly related to capital output ratio but inversely to profit margin.

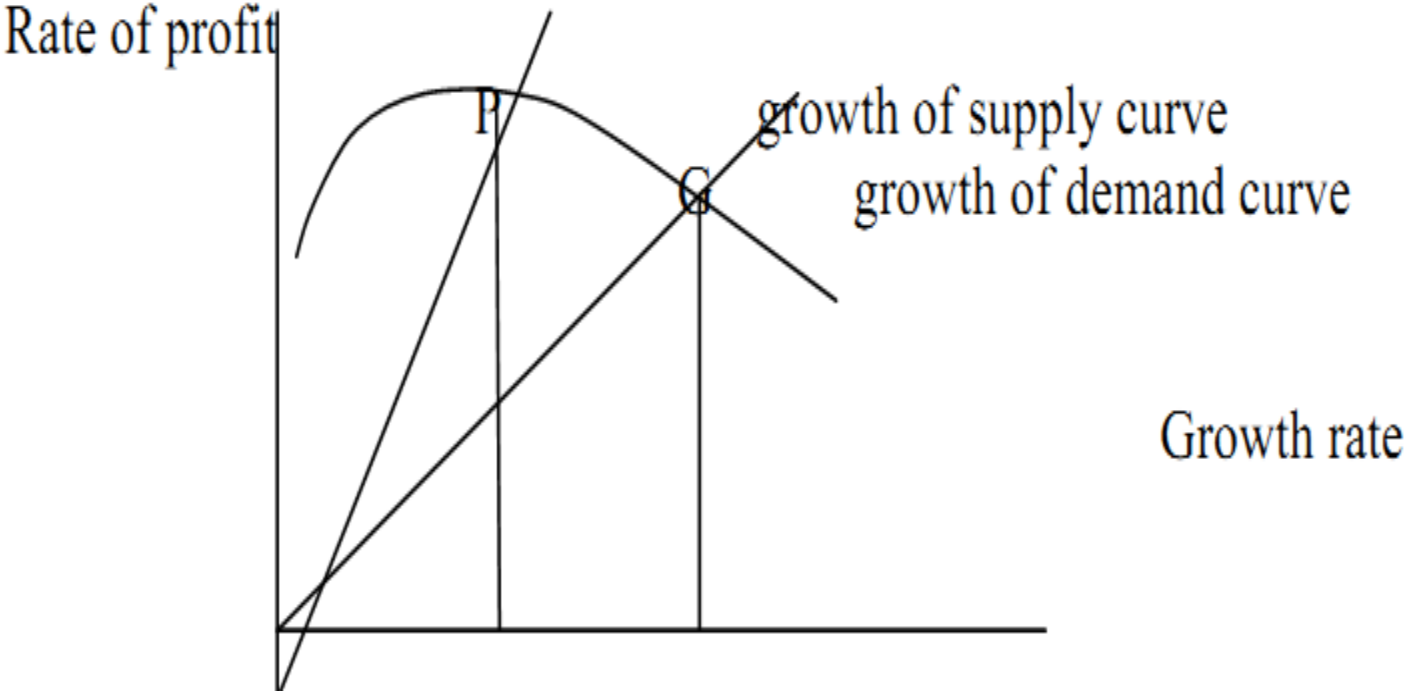
Justifications for the inverse relationship between diversification and rate of return on capital

- Successful diversification demands higher expenditure (advertisement, sales promotion, R&D)

- Diversification needs a new management skill and services

Cont.

The graphical representation of the Marris model is given below.



Cont.

- point G reflects maximum attainable growth rates for the firm.

- If the firm pursues the goal of profit maximization, then point P is the level of maximum attainable profit.

CHAPTER 3

MARKET CONCENTRATION

3.1 Nature of concentration

- Market concentration indicates the situation when an industry/market is controlled by a small number of leading producers.
- Called the degree of seller's concentration.

- Determinants:
  - The number of firms
  - Their relative size distribution.

- Market concentration affects market performance of the firms say profitability

- Understanding the link is hence invaluable.

3.2. Theory of concentration

- Market concentration is a feature of imperfect competition - dominated by few firms.

- To understand the mechanism, we have to use some theoretical models or deductions.

- Assume that there are few large firms along with many smaller firms selling a homogenous product at a uniform single price.

- Larger firms have interdependence among themselves (hence, variation in firm's P or SS has significant effect on SS, P and R of all other firms in the industry.

This can be shown mathematically as follows: Let the total market supply for the product is Q, the market demand function is:

$$P = f(Q) = f(q1 + q2 + \cdots + qi + \cdots + qn) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 1.$$

Where: P is price of the product, qi is output of the i^{th} firm.

i=1,2,3,…,n, $\sum qi=Q$

The revenue function for the i^{th} firm is given by:

$$Ri = P.qi \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 2.$$

Differentiating equation 2 with respect to qi, the marginal revenue of the i^{th} firm will be:

$$\frac{\partial Ri}{\partial qi} = P.\frac{\partial qi}{\partial qi} + qi.\frac{\partial P}{\partial qi}.$$

$$\frac{\partial Ri}{\partial qi} = P + qi.\frac{\partial P}{\partial Q}.\frac{\partial Q}{\partial qi} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 3.$$

Where: $\frac{\partial Q}{\partial qi}$=1, since an increase in one unit of output by the i^{th} firm means one unit increase in the total supply. Equation 3 can be rewritten as:

$$\frac{\partial Ri}{\partial qi} = P\left(1 + \frac{qi}{Q}.\frac{Q}{P}.\frac{\partial P}{\partial Q}\right) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 4.$$

Where: qi/Q is the market share of the i^{th} firm and $\frac{Q}{P}.\frac{\partial P}{\partial Q}$ is the measure of the quantity elasticity of price (inverse of the price elasticity of demand) denoted by eq. thus,

$$\frac{\partial Ri}{\partial qi} = P\left(1+\frac{qi}{Q}.eq\right), \quad i = 1,2,\dots,n \ \dots\dots\dots\dots\dots\dots\dots\dots 5.$$

This equation shows that marginal revenue for the i^{th} firm depends on product price, market share of the firm and elasticity of price. If the firms are of uneven size, then the average marginal revenue for the firm in the industry is written as:

$$MR = \frac{q1}{Q}.MR1 + \frac{q2}{Q}.MR2 + \cdots + \frac{qn}{Q}.MRn \ \dots\dots\dots\dots\dots\dots 6.$$

Here, market shares of the firms are taken as weights to compute the average margina revenue. Substituting the definitions of MR1, MR2, ..., MRn, from equation 5, we get:

$$MR = P[1 + \sum(\frac{qi}{Q})^2 . eq] \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 7.$$

$$MR = P(1 + H.eq) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 8.$$

Where: $H = \sum(\frac{qi}{Q})^2$ is the Herfindahl index of concentration.

- Equ. 8 says that AMR depends on P, H, and eq.
  - If all n firms are of equal size, then H=1/n (MR will be almost equal to price as in perfect competition)
  - If there is only one firm, then H=1 (the monopoly extreme of the market structure)
  - Between these extremes of H, we get the various degrees of market concentration and MR varies directly with H.

Sources of market concentration

I. Barriers to Entry

A) Absolute cost advantages:

- Control of superior production techniques
- Exclusive ownership of superior deposits of resources

- Inability of entrant firms to acquire desired inputs
- Less favorable access of entrant firms to liquid funds for investment

B) Product differentiation advantage:

- Patent control of superior product designs
- Accumulated preferences of buyers for existing firms' products and their reputation

- Ownership or contractual control of favorable distributive channels
- Advertisement, marketing strategies, R & D and other conditions favorable to existing firms

C) Scale economy barriers:

- The economies of scale accrue to the existing firms due to efficiency

- The pecuniary benefits to the existing firms

II. Barriers to exit

- Sunk costs
- compensation to employees,
- long term contractual obligations, and
- social pressure of employment maintenance

3.3 Measures of market concentration and monopoly power

- We need some general conditions which should be satisfied

- helpful in screening the indexes while marking the final choice for empirical work.

- The conditions are:

- The measure must yield an unambiguous ranking of industries by concentration.
- The concentration measure should be a function of the combined market share of the firms (not absolute size of the market or industry)
- If the number of firms increases, then concentration should decrease.

- If there is transfer of sales from a small firm to a large one, concentration increases.

- Proportionate decrease in the market share of all firms reduces the concentration by the same proportion.

- Merger activities increase the degree of concentration.

- Several measures are suggested
  - All are equally good or bad.
  - Let us review them briefly

A. The Concentration Ratio

- most popular

- simplest index

- share of the market or industry held by some of the largest firms.

$$C = \sum_{i=1}^{m} pi,\ m = 4,8,10,12,,,...,20,..$$

Where; Pi = market share of i^{th} firm in descending order.

- The normal practice is to take the four-firm *(m* = 4) concentration ratio but if the total number of firms operating in the market is large enough, then one has to compute the 8-firm or even 20-firm concentration ratio to assess the situation.

- The higher the concentration ratio, the greater the monopoly power or market concentration existing in the industry will be.

Limitations

- It doesn’t take the entire concentration curve into account.
- The concentration ratio depends on how the market is defined.
- It may not be comparable with other industries or countries data.

- It doesn’t reflect the presence or absence of potential entry of firms to the industry.
- It doesn’t show the entire number and size distribution of firms.

Advantages of concentration ratio

- Widely used in industrial economics
- Simple to compute
- Readily available for the manufacturing sector
- Consistent with the economic theory

B. The Hirschman-Herfindahl Index

- It is the sum of the squares of the relative sizes (market shares) of the firms in the market

- relative sizes are expressed as proportions of the total size of the market.

Symbolically, $$\text{Herfindahl Index } (H) = \sum_{i=1}^{n} (pi)^2$$

Where; Pi = qi/Q, qi is output of ith firm and Q is total output of all the firms in the market, and n is the total number of firms in the market.

- takes account all firms in the market

- The larger the firm, more will be its weight in the index.

The maximum value for the index is one where only one firm occupies the whole market. This is the case of a monopoly. The index will have minimum value when the *n* firms in the market hold an identical share. This will be equal to l/n, that is

$$(H) = \sum_{i=1}^{n} \left(\frac{1}{n}\right)^2 = \frac{1}{n}$$

H decreases as *n* increases. The index is simple to calculate and it is popular in use and consistent with the theory of oligopoly because of its similarity to measure monopoly power.

C. The Rosenbluth Index

- based on the rank of each firm in the market and its market share.

- It gives more weight to the number of the firm and importance of small firm.

$$R = \frac{1}{[(2\sum_{i=1}^{n} i * p_i) - 1]};$$

$$1/n \leq R \leq 1$$

Where;

n = number of firms,

Pi = market share of i^{th} firm.

This index has the apparent properties as the H index but it is rarely used in practice.

D. The Entropy Index

- suggested quite recently
- It uses the formula

$$E = \sum_{i=1}^{n} pi \log \frac{1}{p_i}$$

$$0 \leq E \leq \log n$$

Where E is defined as 'Entropy Coefficient', Pi is the market share of ith firm and n the number of firms.

This coefficient in fact measures the degree of market uncertainty faced by a firm in relation to a given customer. This will be the situation when number of firms is large enough, i.e. market is not concentrated. For a monopoly firm (n = 1), the entropy coefficient takes the value of zero which means no uncertainty and maximum concentration. Thus, we find opposite (inverse) relationship between the entropy coefficient E and the degree of market concentration.

- It is a useful measure of market concentration in the sense that the population of the firms for which the entropy coefficient is to be computed can be decomposed or disaggregated into several groups (say across sizes, regions, products)

E. The Horvath Index

- *'comprehensive concentration index*' (CCI)

- This is so because it takes into account the share of the largest firm in the market in a discrete manner and of the other firm's market shares in a weighted form

$$CCI = p_i \sum_{j=2}^{n} p_j^{\,2}[1 + (1 - p_j)],$$

$j = 2, 3 \ldots n$

The upper limit for the CCI is unity when there is only one firm, and the lowest limit is $(3n^2 - 3n + 1)/n^3$ provided $n \neq 2$. For $n = 2$, i.e. for duopoly, CCI comes out to be equal to 0.875. P_I is the discrete part of the concentration and remaining portion of the formula is the summary part. The index is not popular in use as it does not provide either theoretical or computational advantages over the other indexes discussed so far.

F. The Learner Index

$$I = \frac{P - MC}{P}$$

Where;P = Price, MC = Marginal Cost

G.The Elasticity Index

- The ratio of *'own elasticity of demand and cross-elasticity of demand*' for a firm could be used as a measure of monopoly power or market concentration in terms of *'number-equivalent'*

$$\text{ie; } e_{ji} = -\frac{e_{ii}}{n-1} \quad \text{or} \quad n-1 = -\frac{e_{ii}}{e_{ji}}$$

Where; e_{ii} = own elasticity of demand and eji = cross elasticity of demand

An increase in the ratio means lesser number of firms in the market and a decrease means higher number. Under pure monopoly, the cross elasticity will be zero. The greater the number of firms and products, the higher will be the cross elasticity.

CHAPTER 4

INDUSTRIAL LOCATION ANALYSIS

- Industrial location is key for firm performance.
- 3 decisions to be considered
  - scale of operation
  - technique to be adopted
  - location of the factory

- The conventional theory of the firm takes care of the 1st two decisions, but it ignores the 3rd one.

- Industrial location or location analysis is a separate branch of economics bordering with Geography.

- Given the spatial distribution of the inputs and outputs markets, decisions about the place where the factory should be located is a must.

- Hence, consider factors:
  1. Technical
     - Economic and infrastructural
     - Other factors

4.1 Determinants of Industrial Location

A)Technical factors:

- Availability of land
- Nature and quality of raw materials
- Geographic situation of the factory site
- Energy resources
- Availability of water
- Climate

B) Economic and infrastructural factors:

- Local markets
- Situation in relation to export markets
- Costs of land and buildings
- Salaries and wages in relation to skills
- Taxes and subsidies

C)Other factors:

- Government policies towards location of new plants
- personal factors

Example: locating factory at your birth place

- Industrial location based on such personal factors will entirely be a matter of chance or which is as called historical accident.

4.2 Approaches to industrial Location Analysis

- Geographers + Economists
  - Geographers adopted intuitive conceptual base and case studies approach
  - Economists followed a more formal, abstract or deductive approach
- Some operational models are made based on the integration of these approaches

A) Geographical contributions

A) Central Place Theory:

- first systematic geographical theory of location.
- Is developed by Walter Christaller
- Demonstrated graphically the spatial arrangement between hinterlands and central places
- Empirical testing is doubtful unlike its valuable

B) Renner's Theory:

- 4 categories of industry : extractive, reproductive, facilitative, and fabricative

- To undertake anyone of these, six ingredients are required
  - *raw material*
  - *market*
  - *labor and management*
  - *power*
  - *capital*
  - *transportation*

The industry will be close to:

- ***Raw Materials:*** uses perishable raw substances,
- ***Market:*** processing adds fragility, perishability, weight, or
- ***Labor:*** wages are a large item in the total cost.
- ***Power:*** where the mechanical energy requirement is too high

- 3 types of industrial symbiosis is

(a) Disjunctive symbiosis

- Different industries having no economic or technical connections among themselves are located together.

(b) Conjunctive symbiosis

- Different industries with inter-connections are located together

(c) Coindustrialization

- Renner's approach is quite realistic as it tries to bring together the major determinants

- **Limitations**:
  - Failure to deeply analyze the effects of spatial cost variation and industrial symbiosis

C) **Rawstron's Principles:**

- Developed his theory of industrial location in terms of 3 restrictions
  - physical restriction
  - economic restriction
  - technical restriction

- The physical restriction : raw materials mainly natural resources are to be produced or obtained at the proposed site for the plant.

- The economic restriction embodies the concept of spatial margins to profitability. The cost of production varies from place to place resulting in a spatial variation in profitability for a firm.

B) **Economic theories of industrial location**

- ***Weber's Theory***
- ***Tord Plander's theory of Market Area***
- ***Losch's Theory of Central Place***

a) Weber's Theory: To construct a general theory of location applied to all industries at all times.

- Followed Launhardt's principle of industrial location based on minimum transport cost.

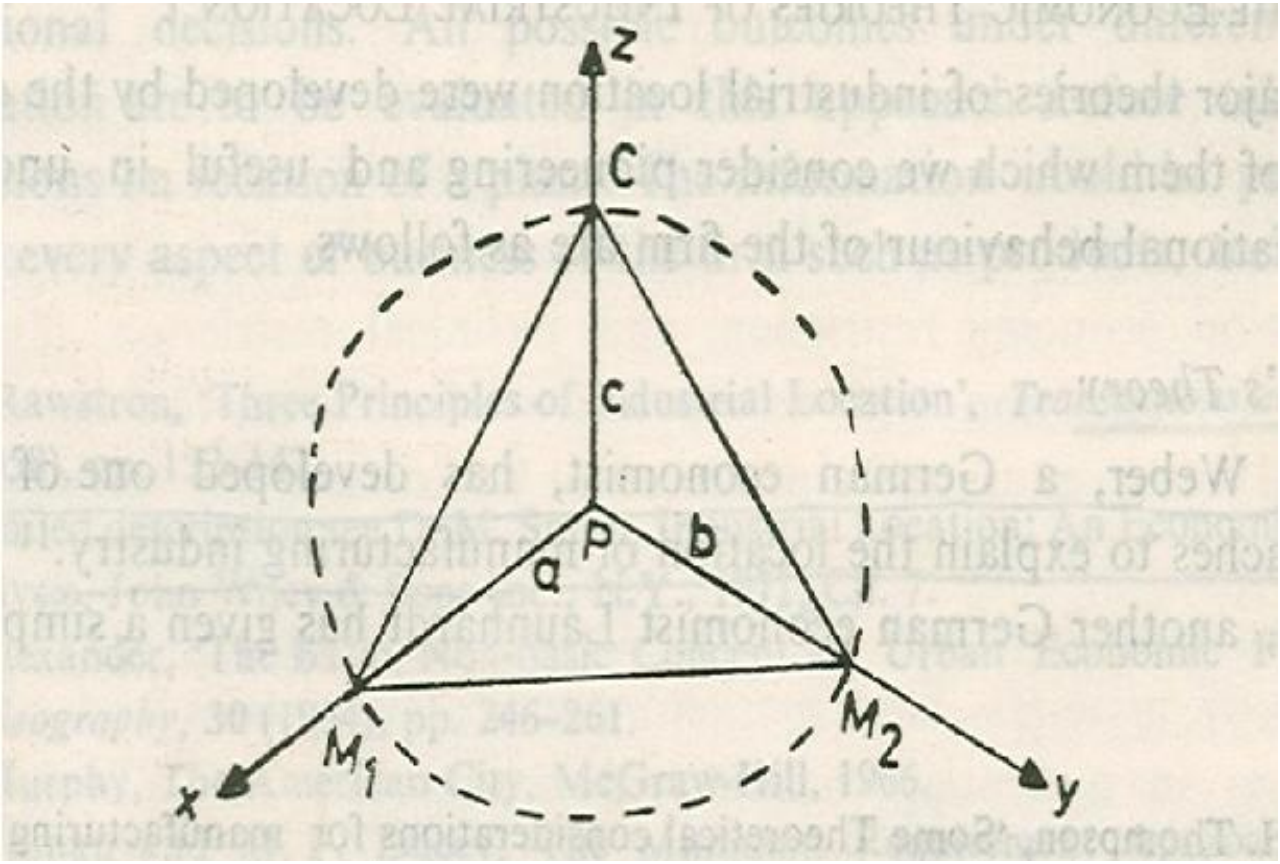
- ***Assumptions:***

  - *Locations of raw materials are fixed*
  - *Situation and size of consuming centers are given*
  - *several fixed labour supply centers*
  - *Institutional factors like taxation, interest, insurance, etc., are insignificant locational factors*
  - *Economic culture and political system are uniform across locations*
  - *Perfect competition*

- Analysis begins with the proposition that a manufacturing unit tends to locate at the place where cost of transportation is minimum.

- He used the locational triangle of Launhardt to find the place of minimum transport cost.

- Assumed a simple spatial situation with one consumption center(C) and two fixed supply


z
C
c
P
a
b
M_1
M_2
x
y

- the least cost point will be located within the triangle CM1M2 (say P).
- Let x and y be the requirements of materials M1 and M2 and let a, b and c be distances between P and M1, M2, and C points respectively.
- The total ton-miles of transport per unit output would then be ax + by + c. This is to be minimized in order to find the position of point P, i.e. the location of production.

- An industry may be material-oriented or market-oriented from location point of view.
- *The material index (M I) is defined as:*

MI= Weight of localized material / Weight of finished product

Industries displaying a high material index i.e., MI > 1 are material oriented and industries displaying a material index less than one are market oriented.

- assumption of a uniform transportation rate was relaxed by Weber
- Let t1, t2 and t3 be the transportation rates per ton-mile for material M1, M2 and finished product respectively,
- Total transport cost/ton of finished product: t1ax + t2by + t3c
- The location of P can be determined by minimizing this cost

- An industry will choose a cheap labour site if the labour cost saving is greater than the increment in transport cost at this site above the minimum possible transport cost.

- He used isodapanes to explain the effect of labor cost on the least-transport-cost location of a plant.

- ***An isodapane is the locus of the points having equal additional transport cost around the least-transport cost location.***

- Let P1= least-transport-cost location

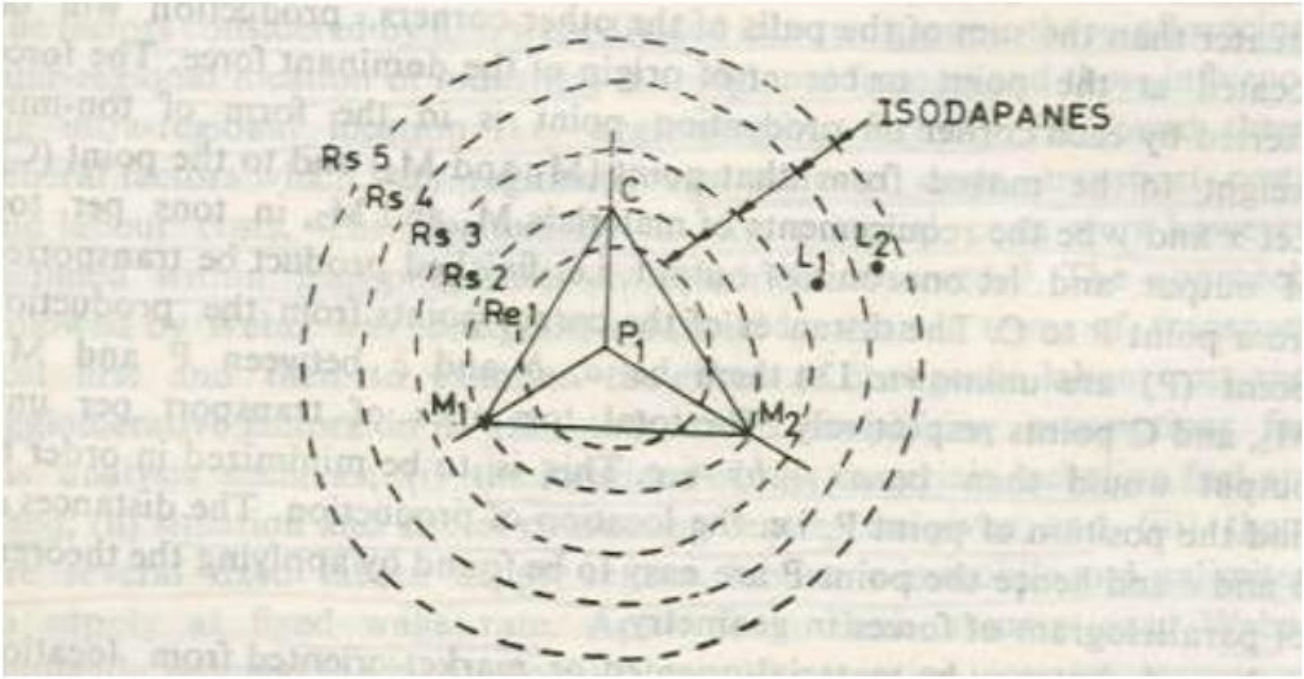


Fig 4.2 Isodapanes and equilibrium location with cheap source of labour

- Let us presume that there will be a saving of labour cost by Br 4 if plant is located at L1 instead of at P1.

- The isodapanes around P1 are drawn for incremental transport cost of Br1, Br2, Bir3, Bir4 and Bir5. Point L1 lies with the isodapane of Br4.

- It implies that it is economical to shift the location from P1 to L1.

- If labor source making a saving of Br4 in cost of production lie outside the isodapane of Br4 (say L2), it would mean a loss in shifting the location from the least-transport-cost location P1 to the labour centre L2.

b) Market area theory of tord palander:

- *2 different but interrelated questions.*

  - *Where will production take place? [given the price and location of materials]*

  - *How does price affect the extent of the area in which a particular producer can sell his goods?[given the place of production, competitive conditions, factory costs, and transportation rates]*

- To demonstrate how the market boundary between firms can be determined, Palander took a simple case of two firms making the same product and selling that in a linear market (fig 4.3)

- The firms are located at two different places, A and B, which are on a horizontal line which defines the market area of the firms.

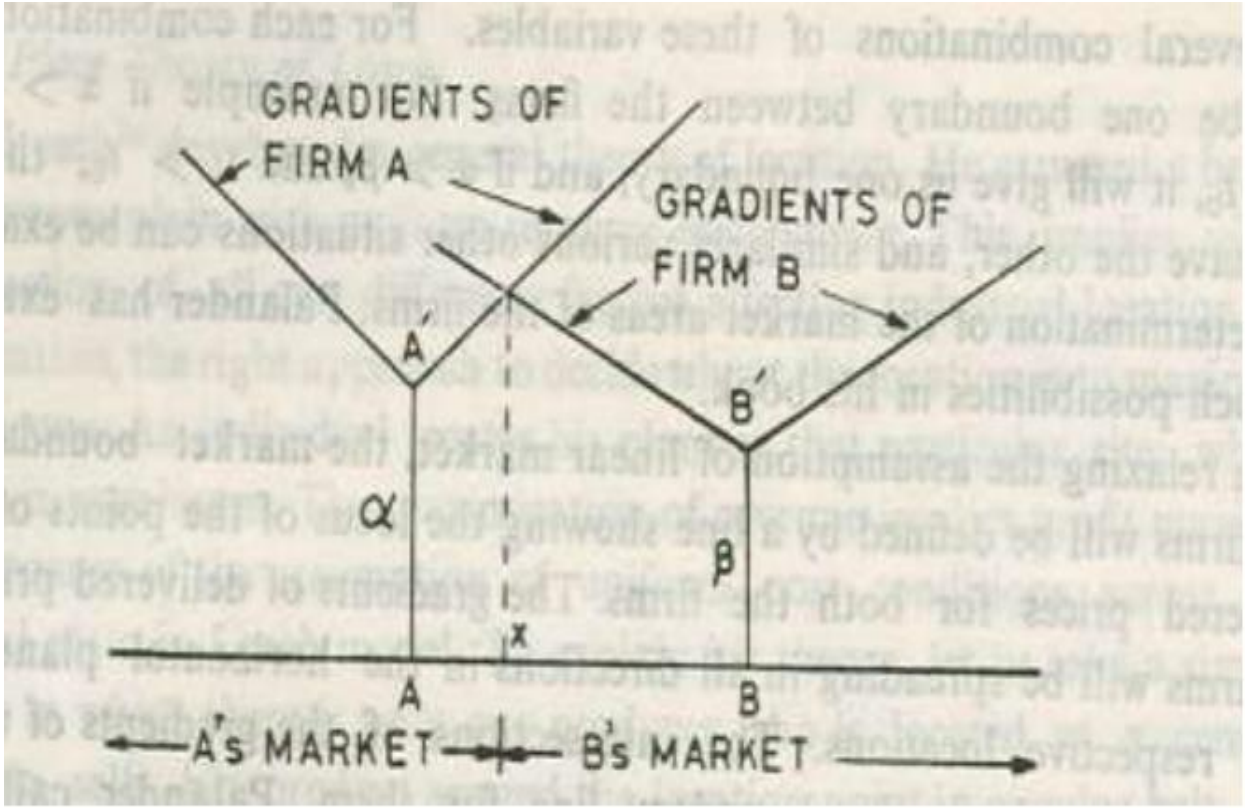


Fig 4.3 Determination of market boundary for two firms in a linear market

- Let the prices charged by the firms at their locations be α and β respectively and are shown by the vertical distance AA' for firm A and BB' for firm B.

- The consumers who are situated away from the location points of the firms will be paying higher prices for the product of the firms.

- Addition in price will be the transportation cost

- Let t_a and t_b be the average transport costs for the product per unit distance for the two firms respectively.

- The price for the product at a point other than location would be $\alpha + ta*da$ for firm A and $\beta + tb*db$ for firm B

- Transport cost is a function of distance for each firm.

- The gradients of total price paid by the consumer for the product are shown by the lines forming cones at points A' and B' for the two firms (**Fig. 4.3)**

- The gradients are linear because of fixed transport rates for the product over distance.

- Just above point X, the gradient lines of firm A and firm B intersect implying that consumers pay same price for the product of the firms.

- The point X defines the boundary between the market areas of the two firms.

- Algebraically, at point X we have:

$$\alpha + ta\,(AX) = \beta + tb\,(BX)$$

But since ***AX + XB =AB, we have***

$$\alpha + ta\,(AX) = \beta + tb\,(AB-AX)$$ Or

Example

]. AB

Let α = Birr.100, β = Birr. 90, ta = ta = Birr. 2 and AB = 100 km.

So, AX = [(90 – 100) / (2+ 2)] + [2/ (2+2)] [100]

= -2.50 + 50

= 48.5 km.

c) Central Place Theory of Losch:

- Advocated by Losch based on a broad homogeneous plain with uniform resource endowment.
- This rejects all cost difference factors affecting industrial location.
- The right approach to decide about the location is to maximize total revenue. ***An***

- R-maximization implies profit maximization because of the assumption of uniform cost conditions across the locational plain in Losch model.

- Consider a simple situation in which there is only one producer, located at a central place.

- He sells his product around the location point in circular belt
- Demand for the product falls with distance.
- Maximum extent of the market area for the producer is given by the distance when demand falls to zero.

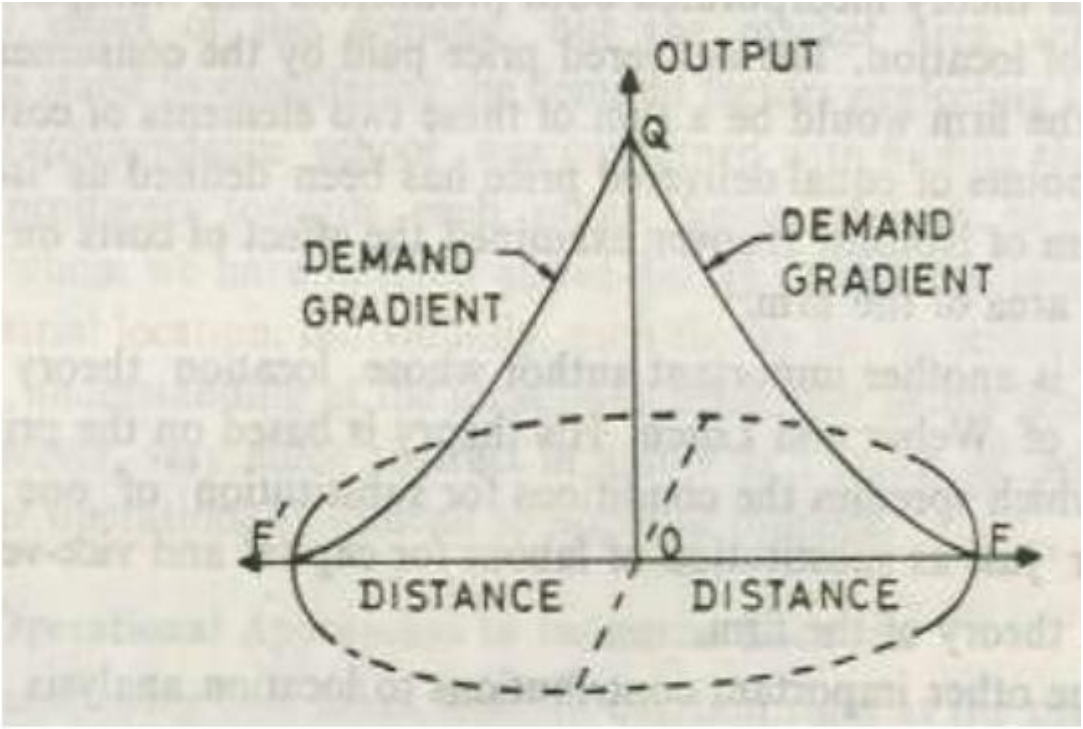


Fig. 4.4.Market area of firm (Losch Model)

- OF as radius defines the market area for the producer. O is the location of the producer at which OQ is the demand for his product.

- The producer being only one in the market makes profits. This attracts other competitors in the industry. The entry of new producers gradually reduces the market area of the existing firms.

- Losch's theory is a general spatial equilibrium theory, and it is not giving any thing about the factors which determine location of firms.

- The rejection of cost differences as locational factors is a major weakness of Losch's theory.

Chapter Five
Analysis of Firm Structure

(Reading Assignment)

CHAPTER SIX

DIVERSIFICATION, INTEGRATION AND MERGER

6.1 Definitions

A. Diversification

- ***producing a totally different product which is not a substitute for the existing products in the market***

- It is "the spreading of business operations over dissimilar economic activities".

– Penrose : a firm is said to diversify, whenever, without entirely abandoning its old lines of product, it embarks upon the production of new products

- When a firm makes significant changes in its ‘operation areas‘ (technological base, market areas and productive activities)

- 4 different possibilities:
  - additional products
  - new market areas
  - products with new technological bases
  - New (product + technological bases + market)

B. Vertical Integration

- It is the set of operations by a firm in two or more industries representing successive stages in the flow of materials or products
- Integration among the intermediate products

C. Merger

- Amalgamation or integration of two or more firms.
- ‘Acquisition' and 'takeover’
- Occurs when a firm acquires assets(stocks) in part (full) of other firm to get operational control over them.

Situations of merger

(1) H***orizontal integration or merger:***

- Products are viewed by buyers as identical
- products have high cross elasticity of DD and SS

(2) ***Vertical integration or merger:***

- There is a successive functional link between their products
- That is output of a firm is input of another firm
- integration between a producing and a marketing firm for the same commodity

(3) ***Conglomerate integration or merger***:

- Firms are producing altogether different products
- not substitutes for each other
- zero cross elasticity of SS and DD

6.2. Motives for Diversification, Vertical Integration and Merger

I. Diversification

1. ***Lateral Diversification*:** When a firm produces different goods which diverge from the same process or source

   - they are used as materials for the same process or market.

- Reasons for Lateral diversification:
  - When production of one commodity necessarily involves production of another
  - When *market demand* for the existing products is *declining or stagnant*
  - Better utilization of existing facilities
    - managerial talents
    - R&D activities

2. **Conglomerate Diversification:** unrelated products .

- all motives of lateral diversification will also be motives of conglomerate diversification.
- In brief it:
  - Provides more options for risk taking for profits
  - Maintains the process of growth
  - Gives pecuniary gains to the firm
  - Provides better utilization of some facilities
  - Causes an increase in the barriers to entry , etc.

3. ***Vertical Diversification***: It involves diversification into process of manufacturing or distribution which precedes or succeeds those in which the firm is already engaged.

- It can be either:
  - **Backward integration:** A firm starts manufacturing products previously purchased from others in order to use them in making its original product line.
  - **Forward integration:** A firm moves nearer to the

- Motives for Vertical diversification :
  - Better security to the firm
  - enhancement of *efficiency*
  - *saving by eliminating* 'the middle man' and its unnecessary profit margin

4. ***Diagonal Diversification or Integration*: :** It consists of the provision within same organization of supplementary goods and services required for the several main processes of production.

- Motives are more or less the same as for lateral and vertical diversification. Among them the major one will be:
  - Mopping up of excess capacity
  - Reduction of the risks.

- *Summary of motives: all types of diversification*
  - Profitability motive : fuller utilization of resources/capacities
  - Stability motive: reduction of risks and uncertainties
  - Growth motive: expansion of productive capacities
  - Market power motive : increase in barriers to entry as a result of diversification.

II. Vertical Integration

- The motives for vertical integration have already been discussed above under vertical diversification.

III. Merger

- Motives of merger and diversification are similar.

❖General motives:

- Increase in profitability
- Efficiency motives
- Market Power motives
- *Growth motives:* Combined firm after merger will command more assets, more sales and more market power.

6.3. Implication for Public Policies

- Diversification +integration - market strategies which affect the competitive environment of an industry and economy as a whole.

- an increase in the competitive climate in the industry by diversification.

- Firms and their products compete for scarce resources and markets

- Does such competition involve all or few firms?
  - Competition is commonly between large firms.

- Diversification motive: *growth* and *market power* without being charged for monopolizing in the market.

- Public policy implication of diversification:

  - no welfare state will allow concentrating market for a commodity in the hands of few firms.

- Public policy goals
  - Diffusion of economic power
  - Efficient allocation of resources
  - Economic freedom

- All mergers and diversification policies are to be evaluated in the light of such social goals.

- If any conflict, they are to be checked and controlled effectively through Antitrust or Monopoly and Restrictive Trade Practices Commissions

- Set of rules or guidelines

CHAPTER SEVEN

ADVERTISEMENT

7.1 Information and advertisement

- *Advertising*: mass paid communication aimed to
  - impart information
  - develop attitudes
  - induce action
- *Forms:*
  - media advertisements
  - direct mail
  - leaflets
  - sponsorship
- *Advertising content:*
  - Simply display the name of the product
  - Compare the product with rivals
  - Provide detailed information about its attribute

- A firm might promote sales
  - by employing more sales representatives
  - by altering the product's packaging
  - by widening wholesale and retail margins
- Advertising can be either a substitution or a complement to, other forms of promotional activity. Economic analysis of advertising effects is complex
- That is, it is difficult to separate from other similar tasks

7.2 Why advertising?

- 3 generic objectives of advertisements
  - communicate information about a particular product, service, or brand
  - persuade people to buy the product
  - Keep the organization in the public eye (called institutional advertising)

- Specific objectives:
  - increases in sales
  - market share
  - Awareness
  - Organizational image improvement

- Examples of the ideas that advertising tries to communicate
  - *product details*,
  - *benefits* and
  - *brand information*.

7.3 Debates on advertising

- Just a important feature of modern life.
  - advertising messages (TV, magazines, radio, internet, or simply walk down the street)
    - Huge expenditures
- What economists say about advertising?

Two views exist

- **Traditional view:**
  - It persuades people to buy a firm's product (to increase market power)
  - It distorts consumer's choice, but uses resources which could have been used elsewhere.
  - It manipulates consumer tastes (brings new desires)

- By increasing product differentiation and encouraging brand loyalty, advertising may make consumers less price sensitive [moving the market from perfect competition to imperfect competition]

- economically wasteful, damages welfare by distorting consumers' preferences, thus creating monopoly power

- Heavy spending on advertising may also

Question for the traditional view

- **Informative View:** broader view of competition
- advertising
  - provides consumers with information
  - reduces search costs
  - Enables for better informed choices.

- Advertising is economically valuable (it increases the flow of information and reduces asymmetric information)

- This intensifies competition

- So, 2main divergent views: persuasive and informative view

A. ‘Advertising as persuasion' view

- Advertising brings benefits to the firm in the form of increased sales

- The traditional view supports that advertising works by persuasion, and results in increases in both market power and prices.

- It is assumed that advertising distorts consumers' preferences.
- Makes consumers to make wrong choices, selecting advertised goods
- It has the effect of reducing the cross elasticity of demand between the advertised product and its close substitutes

- To overcome brand loyalty, an entrant must either advertise more heavily or offer substantial price discounts.

- Consumers are reluctant to try new products of unknown quality

- Existing firms will be able to exercise their market power once the threat of new entry has been reduced. This will result in higher prices for consumers and higher profits for producers.

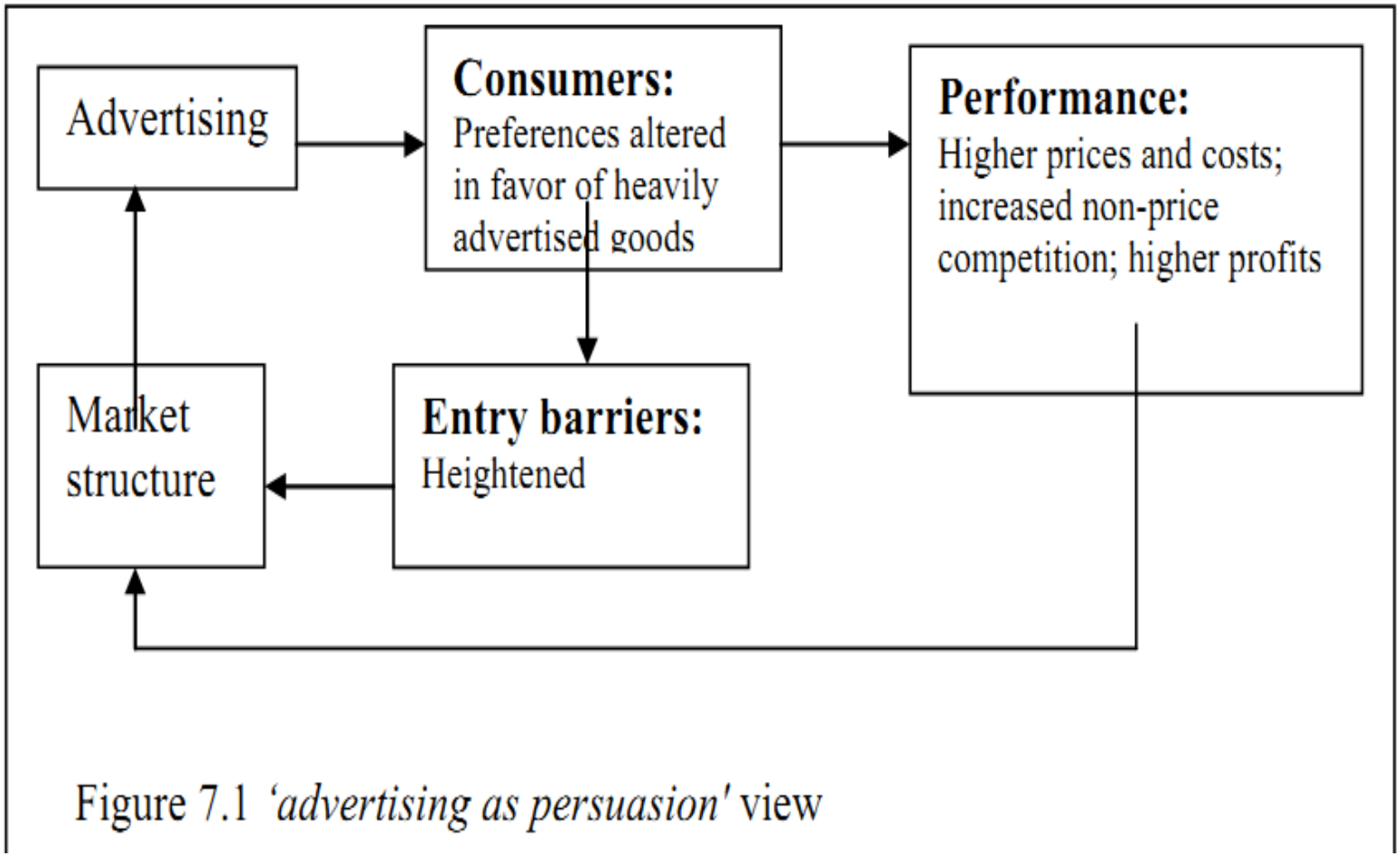


Figure 7.1 *'advertising as persuasion'* view

B. ‘Advertising as information' view

- Stresses the role of advertising in providing information.
- As in the 1st view, advertising influences consumers behavior. But it is not regarded as having adverse consequences for consumers' welfare.
- consumers need to be fully aware of all possible alternatives.

- Advertising can make consumers more responsive to price changes and price differentials, increasing their concern to buy the 'right' alternative

- Advertised products are generally of high quality

- Advertising is not used by established firms to deter entry

- But it facilitates entry, since it is an important means through which entrants provide price and quality information to consumers.

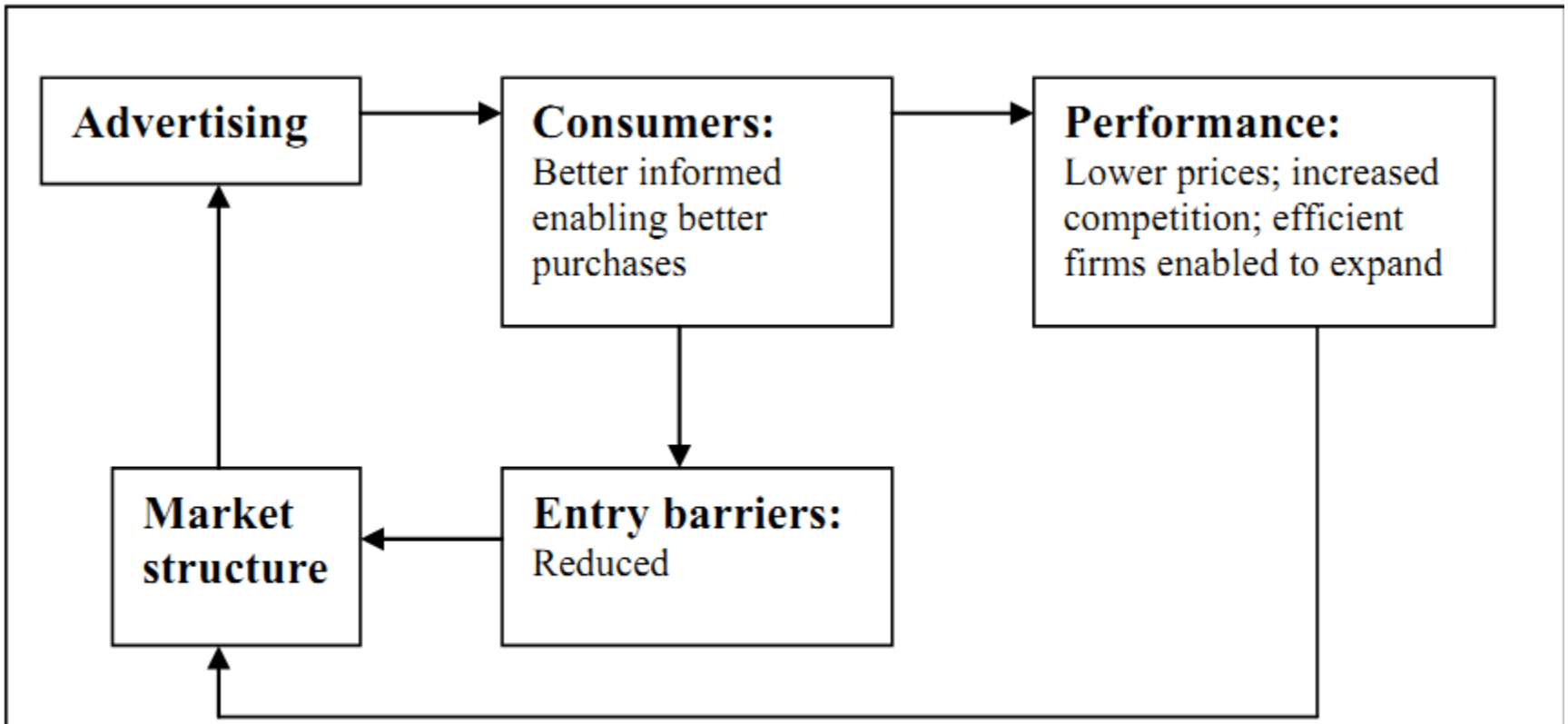


Figure 7.2 'The advertising as information' view

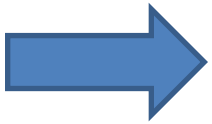
CHAPTER EIGHT

TECHNOLOGICAL PROGRESS

8.1 Stages of technological change

1st-Invention:

- By individuals or corporate bodies (research institutes, universities)

- Inputs  outputs

- Called output of the research industry
- Aimed to solve social problems /extra profits

2nd-*innovation*:

- It is a logical extension of invention.
- Once invention is made, its fruits are made available to the society through innovation.

- *Could be process-innovation* and *product-innovation*

3rd-*Diffusion:*

- It is the imitation of innovation, and the innovation, initiated by an innovator, spreads in the market.

- From social point of view, diffusion or spread of the innovation is desirable but not from an individual firm's view

- It is an instrument for enhancing competitive power in the market.

- Elements - technological change includes
    - New products
    - New methods of production
    - New markets
    - New forms of industrial organization

8.2 Invention, innovation, and diffusion

- Innovation consists of a set of interrelated terms.

- The first is the concept of *invention* - the creation of a new technology.

- ‘Technology‘ means any tool or technique, product or process, physical equipment or method of doing or making, by which human capability is extended.

- The process of adopting an invention in a practical use is called innovation.

- It is the implementation of a new or significantly improved idea, good, service, process or practice that is intended to be useful.

- *product-innovation:* If a firm introduces a new product with or without displacement of the old ones
- *process- innovation:* If a new method is initiated to produce existing products
- *market-innovation:* When a firm makes changes in its marketing strategy

- Schumpeter identifies five types of innovation:

1)***introduction of a new good:*** Consumers are not yet familiar/new quality of a good.

2)***introduction of a new method of production:*** exists in a new way of handling a commodity commercially.

3) O***penning of a new market:*** a market into which the particular branch of manufacture of the country in question has not previously entered

4) C***onquest of a new source of inputs***: irrespective of whether this source already exists or whether it has first to be created.

5)C***arrying out of the new organization:***

- Reorganization of methods of operation

- Another useful concept related to the innovation process is 'imitation‘
- It is just a situation when an innovation is copied by others.

- we also call it **'diffusion of the innovation'**.

- The 3 terms (invention, innovation and diffusion) are the successive stages of the process of innovation or technological change.

- Diffusion is not possible without innovation, which in turn is impossible without invention.

CHAPTER NINE

INDUSTRIAL POLICY

- Industrial policy indicates the political actions designed to affect either the general mechanisms of production and resource allocation

or

- the actual allocation of resources among sectors of production by means other than general monetary and fiscal policies which are designed to influence various macro-economic aggregates (Lindbeck)

9.1. Government intervention

- Intervention in industry is justified if it results in a net increase in economic welfare.

- As long as those who gain could, in principle, compensate those who lose, welfare is enhanced (Pareto improvement criterion).

- 5 circumstances: markets produce not optimal output:
  - Monopoly
  - Public goods
  - Externalities
  - CPRs
  - Differences in private & social time preferences.

- Markets failure is a prerequisite for corrective policy measures.
- The need for industry policy depends on uncertainty, imperfect information and transaction costs.
- The government may find it difficult to identify cases of market failure.

- To evaluate policy impact, intervention results need to be identified.

- This requires knowledge of the state of the world (in the absence of intervention)

- The success of a policy can be judged qualitatively.

Different approaches to intervention:

- Government involvement is a matter of judgment

- Desirable features - industrial policy
  - Capability to perform well under transaction costs
  - The opportunity cost burden of the policy must not exceed any perceived, potential benefits

- 4 distinct approaches to industry policy:

A) **L*aissez-faire approach:***

- Information flows are perfect
- Market is a better judge of desirable actions than government agencies.

- Policies should aim on strengthening and promoting a competitive environment

B) S***upportive approach:***

- Believes in the superiority of market forces,
- Considers imperfect information & transaction costs.
- Argue for intervention (enforcement of PRs, encourage education and entrepreneurship)

- External constraints may force the adoption of less desirable, or 'second-best', policies.

C) A***ctive approach:***

- Wider, direct government involvement
- Selected industries would typically be given financial support to promote restructuring and be protected from external competition by tariff and non-tariff barriers.
- Measures would again be taken to promote competition domestically.

D)***Planning approach:***

- More extreme version of the active approach.

  -Enhancing welfare via centralized planning.

- Intervention is more comprehensive than active approach.

9.2 Review of focuses of the Ethiopian Industrial Policy

- Various constraints including:
  - Limited foreign currency earning capability
  - Obsolescence of machinery and equipments
  - Low level of local technological development
  - Lack of technological information
  - Lack of skilled labor
  - Low demand for Industrial goods

Specific objectives of industrial policy in Ethiopia

- Create complete structural linkage between manufacturing and agricultural sector
- Create an internally balanced manufacturing sector
- Enhance productivity and efficiency of firms
- Develop dynamic comparative advantage of industries

Selection of industries for promotion

- Industries producing modern technical inputs to agriculture
- Industries producing intermediate and capital goods
- Import cost reducing and export promoting industries
- Efficient and innovative firms
- Strategic industries

Promotional measures

- Identify the specific problems
- Product market
- Input market
- Capital market
- Technology market
- Skill market
- FDI

Incentive instruments

- Taxes (direct and indirect)
- Finance
- Foreign exchange priority
- Priority in infrastructure provision
- Import duty exemption or reduction
- Subsidies
- Free or favorable provision of land
- Reduced electricity charges
- Reduced domestic air cargo charges

CLASS END

THANK YOU!