**Chapter Three**

**Market Concentration**

**3.1 Introduction**

Market concentration or, more specially, the degree of sellers’ concentration in the market, is an important element of the market structure which plays a dominant role in determining the behaviors of a firm in the market. Here you may ask what the concept of market concentration is, what the measurements of market concentration are and what the impacts of market concentration on the economy are. Further you could ask what the theoretical deductions on market concentration are. All your above question will be addressed in this unit. This unit has five sections.

This unit has five sections which focuses on the above questions and give detailed information with regard to concept of market concentration, measurements of market concentration, study about market concentration and monopoly market, impact of market concentration on price, growth of a firm, technological change and other aspects of market and lastly some theoretical deductions of market concentration.

**3.2 Objectives**

At the end of this unit the learner will be able to:

* Explain the concepts of market concentration
* Identify the common measurements of market concentration
* Discuss about market concentration and monopoly power in the economy.
* Explain the effect of market concentration on different activities of the firm
* Discuss some the theoretical deduction of market concentration

**3.3** Concepts of Market concentration

Market concentration means the situation when an industry or market is controlled by a small number of leading producers that are exclusively or at least very largely engaged in that industry. Two variables that are of relevance in determining such situation are

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* The number of the firms in industry, and
* Their relative size distribution

In the context of industrial sector, the implications of market concentration are far wider than whatever we find in the theory of the firm .It will be our attempt in this chapter to focus on such implications in the framework of ‘market structure – conduct performance’ link or any subset of this . For example, concentration in the ownership of the industry, concentration of decision –making power and concentration of the firms in a particular location or region, etc, all being elements of market concentration, may have considerable impact on the market performance of the firms such as profitability, price –cost margin, growth, technological progress and content.

These links are to be understood properly, because all of them are very much relevant from the point of view of decision – making and regulation of industries.

3.4 Measurement of Market concentration

In order to test empirically the behavioral hypotheses about the firms and industries, we need a measurement of market concentration. Various quantitative indexes have been suggested for this purpose which we are going to summarize in this section. Some of them are used to measure the monopoly power of the firms and some for market concentration. These two terms i.e. monopoly power and market concentration, are closely interrelated and can not be separated from each other in the measurement process. The degree of market concentration would vary with the monopoly power in a particular industry, or we may also say that existing firms acquire monopoly power if market is concentrated. The indexes that we are going to discuss here would therefore be indicating to us almost similar things with a minor difference.

The measure must yield an unambiguous ranking of industries by concentration. Consider **Fig 3.1** where the figure shows concentration curves, that is, the graphs represent cumulative number of firms from largest to smallest and cumulative percentages of market supply are shown by I1, I2, and I3 for three industries separately. I1 is above I2 and I3 every where. It means the industry which is represented by I1 is more concentrated than

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the other two. However, there is ambiguity in the ranking of the second and third industries represented by I2 and I3 respectively.

Market supply cumulative %

I1

I2

I3

Cumulative No of firm ( Largest to smallest)

0 4 8 12

**Figure 3.1 Hypothetical cumulative number of firms (Largest to smallest concentration curves)**

Note the following conditions

* The concentration measure should be a function of the combined market share of the firms rather than of the absolute size of the market or industry.
* If the number of firms increases then concentration should decrease. However, if the new entrant is large enough, then concentration may go up
* If there is transfer of sales from a small firm to a large one in the market, then 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

 The following are the common measurements of market concentration.

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I) The Concentration Ratio

The most popular and perhaps simplest index for measurement of market concentration or monopoly power is the use of the concentration ratio, that is , the share of the market or industry held by some of the largest firms. The market share of such firms may be taken either in production or sales or employment or any magnitude of the market. In symbolic form the concentration ratio is written as

**……………………………. (3.1)**

Where Pi= market share of ith firm in descending order.

 m= number of firms considered

The normal practice is to take 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 is the greater the monopoly power or market concentration existing in the industry.

There are some limitations of this index.

* It does not take the entire concentration curve (as shown in Fig. 3.1) in to account; it rather indicates market concentration at a point of the curve. The ranking of industries depends on the point chosen. If the point is changed there may be changes in the ranking of the industries also. This is the situation shown in Fig.3.1 for I2and I3 curves. On the basis of the 4 –firm concentration ratio, industry 3 (I3­) is more concentrated than industry 2, but on the basis of the 12-firm concentration ratio the ranking is reversed. For the 8-firms both are equally concentrated. There is, thus, some ambiguity as to which point is to be chosen.
* Further, the concentration ratio depends to a great extent on how the market is defined. A broad market would lend to reduce the computed concentration ratio whereas a narrow one would usually have the opposite effect. This means in the standard industrial classification the concentration ratios will be lower for the two – digit major industry group than the ratios for the three – digit industries in the same group. The data for the finer classification of the industries may not be available;

hence it may be difficult to have precise idea of market concentration using the aggregate data. Moreover, it may not be comparable with other industries' or countries' data

* The ratios do not reflect the presence of or absence of potential entry of firms; they being based upon national figures.
* Do not say any thing about the regional market power,
* They do not describe the entire number and size distribution of firms, only a part of that is considered by them.
* They do not say anything about the monopoly power of the individual firms in the market and ignore the role of imports in the domestic market.
* The ratios may give conflicting picture of the concentration with the use of different variables for size of the firms.

In spite of the limitations, the ratios are widely used in industrial economics’. They are simple to compute, readily available for the manufacturing sectors, and capable of measuring market concentration with a finer classification of the industries. They are consistent with the economic theory, as we know, that, other things being equal, monopolistic practices are likely to be in operation to a greater extent where a small number of the leading firms account for the bulk of any industry’s output than where the industry’s output is eventually distributed among the firms.

Example

*We have eight firms in Edible Oil market. The information given in the table below will show us the market share of each firm. Now using the information below, compute the concentration ratio of the higher four firms.*

|  |  |  |
| --- | --- | --- |
| *S.N* | *Name of a firm*  | *Market share in percentage*  |
| *1* | *Firm 1* | *25* |
| *2* | *Firm 2* | *1* |
| *3* | *Firm 3* | *4* |
| *4* | *Firm 4* | *20* |
| *5* | *Firm 5* | *3* |
| *6* | *Firm 6* | *2* |
| *7* | *Firm 7* | *15* |
| *8* | *Firm 8* | *30* |

*Now the first thing we do is to identify the four largest firms based on their market share. We will put then in descending order as you can see in the table below.*

|  |  |  |
| --- | --- | --- |
| *S.N* | *Name of a firm*  | *Market share in percentage*  |
| *1* | *Firm 8* | *30* |
| *2* | *Firm 1* | *25* |
| *3* | *Firm 4* | *20* |
| *4* | *Firm 7* | *15* |
|  *Total*  | *90* |

*Now using the formula given for concentration ratio, we can get the monopoly power of these four firms. The value of the concentration ratio is 0.9 or in other word the four firms took 90 percent of the total market.*

II) The Hirschman – Herfindahl Index

It is the sum of the squares of the relative sizes (i.e. market shares) of the firms in the market, where the relative sizes are expressed as proportions of the total size of the market. Symbolically,

 

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 share itself. The larger the firm, more will be its

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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 1/n, that is

 

H decrease as n increases. The index is simple to calculate. It takes account of all the firms and their relative sizes. It is therefore popular in use and consistent with the theory of oligopoly because of its similarity to measures of monopoly power.

Example

*We have six firms in a given computer market. The following table shows the market share of the firm.*

|  |  |  |  |
| --- | --- | --- | --- |
| *S.N* | *Name of a firm*  | *Market share in percentage*  | *Square of market share*  |
| *1* | *Firm 1* | *20* | *0.04* |
| *2* | *Firm 2* | *15* | *0.0225* |
| *3* | *Firm 3* | *10* | *0.01* |
| *4* | *Firm 4* | *15* | *0.0225* |
| *5* | *Firm 5* | *25* | *0.0625* |
| *6* | *Firm 6* | *15* | *0.0225* |
|  *Total*  | *0.018* |

*Using the formula above, first you can compute the square of each market share of a given firm. After that just take the summation of the square of each market shares. It will give you the value of the Hirschman – Herfindahl index. That is 0.018 the value indicates that monopoly power of the firms is very low.*

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**III) The Rosenbluth Index**

 The index is 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. It is computed as,



Where n = number of firms, Pi = market share of ith firm. This index has the apparent properties as the H index but it is rarely used in practice.

Example

*We have six firms in a given VCD market. The following table shows the market share of the firms.*

|  |  |  |  |
| --- | --- | --- | --- |
| *S.N* | *Name of a firm*  | *Market share in percentage*  | *Number of firms times*  *market share of each g firms*  |
| *1* | *Firm X* | *20* | *1.20* |
| *2* | *Firm Y* | *15* | *.90* |
| *3* | *Firm Z* | *10* | *.60* |
| *4* | *Firm A* | *15* | *.90* |
| *5* | *Firm B* | *25* | *1.50* |
| *6* | *Firm C* | *15* | *.90* |
|  *Total*  | *6.00* |

*Now using the formula of Rosenbluth index given above we can get the following result.*



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IV) The Entropy Index

 

It uses the formula where E is defined as Entropy Coefficient, Pi is the market share of ith firm and n the number of firm. 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. If there are n firms, all equal in size, then,

 

Both, increased equality of market shares and in the number of firms increase the entropy coefficient but the latter factor plays a diminishing role because of the use of logarithms which implies that addition of an extra firm, when number is already large enough, becomes less significant from the point of view of market concentration.

To take in to account the number of firms as a determinant of the entropy coefficient one may use the relative measure of the entropy, i.e., the entropy coefficient E divided by the maximum value of the coefficient.

 

This expression indicates the actual degree of dispersion of market share to the maximum dispersion possible for a given number of firms.

The entropy coefficient 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 on the basis of sizes, regions, products and the classification of industry etc.

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**Example**

*We have six firms in a given Mobile market. The following table shows the market share the firms.*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| S.N | Name of a firm  | Market share In Percentage (Pi) | 1/Pi | Log 1/Pi | P1(log 1/Pi) |
| 1 | Firm 1 | 2 | 5 | 0.7 | 0.14 |
| 2 | Firm 2 | 15 | 7 | 0.8 | 0.12 |
| 3 | Firm 3 | 10 | 10 | 1 | 0.1 |
| 4 | Firm 4 | 15 | 7 | 0.8 | 0.12 |
| 5 | Firm 5 | 25 | 4 | 0.6 | 0.15 |
| 6 | Firm 6 | 15 | 7 | 0.8 | 0.12 |
| Total |  |  | 0.75 |

As indicated in the above table the Entropy index is 0.75 which indicates the level of uncertainty is very high or the monopoly power of the firm is very less.

V) The Linda Index

This index is used in the statistical work of the European Economic Community. To compute the Linda index, first a ratio is constructed as

 

Where Ai= Total market share of the fire i top firms among the K large firms ; Ak = Total market share of the k firms, k firms, k may be any number of firms between 2 to n.

Q is the ratio between the average market shares of the first top i firms and the average market share of the remaining k – i firms.

The Linda index of concentration then can be expressed as,

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That is, the index is 1/k times the average of Q for k-i firms. This gives us a measure of inequality between the values of the variable included in a sub – sample of k units and thus gives proper weights to the market shares of the k largest firms. The index is claimed to be useful to identify the boundary between the oligopolistic and other firms in the market. This can be done by computing the index where size of the sub –samples is k =2 , then for k=3, k=4 , and so on until a minimum value is produced ( that is the index for k +1 is greater than for k firms). This point defines the oligopolistic boundary in the market.

**Example**

 *We have ten firms in cloth market. The market share of top 3 firms among ten large firm is 50 percent. The total market shares of the ten firms are 80 percent. Now using the above information we can compute the Linda Index. First we will compute the value of Qi. Qi is the ratio between the average market shares of the first top i firms and the average market share of the remaining k – i firms.*



*This gives us a measure of inequality between the values of the variable included in a sub-sample of k units and thus gives proper weighs to the market shares of the k largest firms.*

**VI) The Horvath Index**

This is what Horvath calls as a ‘Comprehensive Concentration Index (CCL) in the sense that it takes into account the share of the largest firm in the market in a discrete manner and of the other firms’ market shares in a weighted form conforming with other summary measures of the concentration ( a summary index is one which takes all firms in account while measuring the concentration ), the formula Hovath suggested is,

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The upper limit for the CCI is unity when there is only one firm, and the lowest limit is  provided for n = 2, i.e for duopoly, CCI comes out to be equal to 0.875. Pi is the discrete part of the concentration and remaining portion of the formula is the summary part.

**Example**

*We have Edible Oil market in a particular area. The numbers of firms are four that are supplying the Edible Oil product in the market. Firm B took the highest share of the market (60 percent of the market supply). The remaining firm A (20 percen ), Firm C (15 percent ) and firm D (15 percent ). Now compute comprehensive concentration index (CCI.*

 *Using the formula above we can compute the Horvath index ( comprehensive concentration index’(CCI) as follow.*



*As you can see from the above computation the comprehensive concentration index is 0.736.*

**VII) The Lerner Index**

There are some other indexes which are mainly use to measure monopoly power of a firm but some of them can be applied to the market as a whole with little modification or by simply reinterpreting the variable concerned. The Lerner index is the best known of them. It is expressed as,

 

We know, under perfect competition price will be equal to marginal cost. If there is a difference between the two, such that price >marginal cost, this is because of market imperfection or what we call as the monopoly power of the firm. Greater the deviation between price and marginal cost, higher the monopoly power of a firm. The steps to derive

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the index are straight forward. Writing the expression for marginal revenue (MR) for a monopoly firm we get .

 

Ep= price elasticity of demand, and for profit maximization we have the familiar condition,

 MR = MC

from these two equations we the Lerner index as,

 

That is, the index is inverse of the price elasticity of demand. Remember,

 

**VIII) The Rothschild Index**

Note that the slope of demand curve plays a vital role in measuring the monopoly power of a firm. In the Lerener index the elasticity of demand takes care of this, but a more exhaustive measure depending on this has been suggested by Rothshild. According to him the degree of monopoly power exercised by a firm might be measured by a ratio of the slopes’ of the demand curves faced by a firm under the situation of monopolistic competition One of the two demand curve is known as anticipated demand curve and the other as ‘ proportional demand curve or simply’ market share curve.’ In **Fig.3.4** dd’ is the anticipated demand curve that a firm expects to face when all other firms in the market keep their price and outputs constant. On the other hand DD’ is the demand curve faced by the firm when all other firms are making similar moves as the firm. dd’ will be more elastic than DD’ curve. The firm is in short run equilibrium say at point E. At this point the ratio of the slopes these two demand curves gives us a measurement of monopoly power of the firm. This ratio is given as,

 

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 Price

 E 

 0

 Quantity

**Figure 3.4 Measurement of monopoly power by Rothschild index**

The ratio will be zero when the anticipated demand curve is horizontal, that is the firm is under perfect competition. For a monopoly firm it will be equal to 1 as the two demand curve coincide in this case. Greater the ratio between these two limits, higher will be the monopoly power of the firm

This index presumes that the two demand curves are known to the firm or at least can be estimated precisely. It may, in fact, be difficult to estimate these curves, Further, only price is being used here as a relevant variable to change the demand expectation of the firm. But, there are other variables like income, other prices tastes, etc., which have been ignored. The supply and cost conditions are assumed to be insignificant factors in determining the monopoly power of a firm. Considering all such limitations the index is rarely used in actual practice.

**IX) 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’ i.e.



Where eii= own elasticity of demand eji and = cross elasticity of demand.

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An increase in the ratio means lesser number of firms in the market and a decrease means higher number. Obviously there is a link between number of firms and the cross elasticity of demand here; In the context of measuring the monopoly power, sometimes only cross elasticity is used as an index. This is because under pure monopoly the cross – elasticity will be zero. Greater the number of firms and products, higher will be the cross elasticity. Papandreou used this index extensively in his work. There is difficulty with this index as cross elasticity may be zero for monopoly and its antithesis, perfect competition since, no single perfect competitor is able to influence the over all market quantity. In practice there are numerous difficulties n estimating the cross elasticities so they are rarely used. They only provide theoretical insight for understanding the problem rather than measuring that.

**Example**

*The product own elasticity of demand of a commodity was 0.15 and cross demand elasticity of the product was 0.60. The number of the firm in this year was ten. Compute the elasticity index*

*This indicates the ratio is very high or the number of firms is very less.*

**X) The Profit Ratio**

 This was suggested by Baim. According to him, when a firm persistently earns excess profit for a long period of time, then it should be attributed to its monopoly power. Monopoly power and profit rate are assumed to be linked positively. The profit rate is defined as “that rate which used in discounting the future rents of the enterprise, equates their capital value to the cost of those assets which would be held by the firm if it produced its present output in competitive equilibrium.” This rate of profit is then compared with the normal rate of profit to assess the monopoly power of the firm. There

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is sonic operational significance of this index but is not always true that profits accrue because of monopoly power.

A firm without any such thing may manage its business well and earn profits for a long time. Moreover, estimation of the conceived profit rate is itself very much complicated. What assets, at which price, original or current cost, net profit or gross profit service life of the assets, etc are some issues related to such estimation. The profit rate index for monopoly power is, thus, a weak proposition. It is unsatisfactory as well as unreliable.

**The Dispersion measures**

1. **Coefficient of Variation**

 Is simple one and expressed as:-



Where is the average market share of the firms.

 standard deviation of the market shares

 Pi=share of ith firm (in proportion),

 n = number of the firms.

The coefficient varies between 0 and . Greater the coefficient of variation, more will be inequality in distribution of the market shares and hence more concentration. The Herfindahl index which we have discussed earlier is also a measure of the dispersion which can be shown equal to .

**II) The Lorenze Curve**

The Lorenz curve shows the variation in cumulative percentage distribution of market share (using sales or output or assets or employment, etc. as a variable for this) with cumulative percentage distribution of firms from smallest to largest in the market as

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shown in **Fig 3.2**. If firms are cumulated from largest to smallest, then the curve would look like the concentration curve shown in **Fig.3.1.**

If the firms are equal in size the Lorenz curve would then be a straight line as shown by the 00’diagonal. If there is inequality in the distribution of the market share the Lorenz curve would then bend away as shown in the figure below.

Market share % Cumulative by sales

 0

 100

 80

 60

 40

 20

 0

Line of perfect Equality

% of Firms cumulative Form Smallest

Lorenz curve

 20 40 60 80 100

**Figure 3.2 The Loren curve for dispersion of the firms and their market shares**

**Note**: If the firms are cumulative from the largest, the origin of the graph would be at 0 point diagonal towards the X- axis. A coefficient which we may call the ‘Lorenz coefficient’ or the ‘ Gini coefficient’ as it is commonly known, by dividing the area bounded between the Lorenz curve and the diagonal line 00’ by the area of the triangle under the diagonal .

The coefficient varies between 0 to 1 as the degree of inequality in the distribution increase, thus, it is used as an index to measure the concentration. To find the dotted

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areas, one may find the area of the triangle first, and then the area under the L curve either using graphical approximation or through the use of integral calculus. The difference of these two areas gives the dotted area. One can then find the Lorenz or Gini coefficient as defined above.

Limitations:-

* Sufficient and accurate data about the market share of every firm in the market may not be available.
* Two entirely different Lorenz curves may give the same Gini coefficient. The number of the firms is not relevant to influence the result. Say, if there are two firms with 50% market share each or 1000 firms with 0.001% share each in the market, the result would be the same. The coefficient in fact does not represent the unique distribution. the

Advantage:-

* It takes into account all firms in the industry unlike the concentration ratios which suffer from this limitation.
1. **Utton Index**

Utton’s index is, is used for measuring the product diversification by a firm. It has however straight forward application to measure the market concentration by interpreting the products as firms. Consider the following concentration curve where cumulative proportionate market shares of the firms are plotted on the Y-axis and the number of firms from largest to smallest on the X-axis. ‘A’ shows the area above the concentration curve bounded by the Y-axis and the horizontal line at full market share (1.0) level. Utton suggested double of the area A as a measurement of concentration. that is,



Where Pi = market share of the ith firm. ‘W’ can be interpreted as a ‘number equivalent’ of market concentration; It varies between 1 for a monopoly case and n for the firms of

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equal size. This is a simple index which can be followed easily for empirical uses. It is almost similar to the Lorenz curve.

1.0

 A

0 0

No of firms in descending order or size

Concen. Curve

**Figure 3.3 Measuring concentrations by the Utton’s method**

**3.5 Market Concentration: Some Theoretical Deductions**

Market concentration is a feature of the imperfect competition where one or few firms dominate the entire industry. To understand the mechanism by which market concentration determines the economic behavior of such firms with that of others in the industry, we have to use some theoretical models or deductions.

Here let us concentrate on simpler approaches to show the relevance of the number of firms and their relative size distribution for the economic behavior (conduct and performance) of the firms.

Let us assume that there are few large firms a long with many smaller firms selling a homogeneous product at a uniform single price. The large firms will have interdependence among themselves. This is certainly a situation of market concentration affecting the firms. It can be made explicitly known with the help of the following mathematical derivation.

 



 

The revenue function for ith firm is given by,

 

Differentiate with respect to gi, the marginal revenue for the ith firm will be as,

 

Where since an increase in one unit of output by ith firm means one unit increase in the total market supply. Equation (3.20) can be rewritten as,

 

Where q/Q is the market share of the ith firm. We have assumed uniform price for the industry which changes if output of any big firm changes. Let us define the market quantity elasticity of demand (eQ) as the percentage change in market price with a marginal percent change in the market quantity supplied that is,

 

Substituting (3.22) in (3.21),we get

 

This equation shows that marginal revenue for the ith firm depends on product price, market share in output for the firm and quantity – elasticity of price. If the firms are of uneven sizes then the average marginal revenue for the firm in the industry be written as,

 

Market shares of the firms are being taken as weights to compute the average marginal revenue (MR). Making the substitution for MR from equation (3.23) and simplify, we get

Or 

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Where is the Herfindahi index of concentration. This equation says that average marginal revenue depends on product price (P), concentration index (H) and the elasticity coefficient (eQ).

Marginal revenue will be positive when eQ is less than one which is the situation where price elasticity is grater than one i.e. The deviation of marginal revenue from the price is a direct consequence of the monopoly power prevailing in the market due to market concentration.

**3.6 Concentration and the Market performance of a firm**

There are many behavioral hypotheses about concentration and market performance which we would like to discuss in brief in this section. As we read in microeconomics, a firm with substantial monopoly power will tend to charge high price, produce and sell less output, make high rates of profit, grow faster than others, capable of doing anything it wants in connection with its business such as research and development, advertisement and so on. Let us presume that concentration is an appropriate measure of such power, we are then in apposition to verify the various propositions of the economic theory which reflect the relationships between concentration and market performance of the firm. This will naturally be based on empirical evidences available so far but no attempt will be made to make an exhaustive survey of this here. Only few selected studies will be referred in connection with the individual hypotheses.

**3.6.1 Concentration and profits**

A firm derives market power or monopoly power in the situation of concentration. Such market power, via market conducts activities or directly leads to an increase in the profitability of the firm. It is frequently assumed that persistency of high rate of profits over a long period is the consequence of high of intra industry concentration. J. S. Bain was the first to make an empirical study of this proposition, who found it valid for the

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U.S industries. The relation ship was found so strong that Bain was to argue for the pr rate as an index to measure the concentration. Since then there has been a flood of studies on the relationship which by and large supported this but some of them were, of course, very critical also.

There are some difficulties in establishing correct relationship between the two variables (concentration and profitability) as both of them are subject to ambiguities of measurement. Which index of measurement is to be used for concentration? There are so many of them. If one measure is selected it may have strong correlation with profitability, but if another is taken, it may have a weak relationship. Further, measurement of profit rates is also not free from bias .This is generally based on accounting data which ignores certain opportunity cost elements related to own funds or own labor of the entrepreneurs in the business.

Some arbitrary valuations are placed for such elements which may induct bias in the relationship. What denominator is to be used to compute profit rate is also not clear sales or assets or production or something like that. Researchers make their own choices for such rates, with out giving the proper rationale of that. In spite of such difficulties we should not discard the relationship between concentration and profitability. It is a positive one which is consistent with the theoretical logic, though very precise estimation of which is yet to come.

**3.6.2 Concentration and Price – cost Margins**

Price – cost margin is another way to define profitability. This is a short – term view of profitability based on current sales and cost figures. Say, the average price – cost margin is just a ratio of these two magnitudes. Empirical studies particularly those conducted by Collin and Preston supported the positive relationship between concentration and the price – cost margin.

They found it as an insignificant predictor of price –cost margins when other relevant indicators of market structure like product differentiation, rate of technological change,

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etc ., were also considered side by side. We may not agree with their findings simply because when all such determinants were taken together along with concentration, multicollinearity might have distorted their relationship making concentration insignificant. For its significance, there is a strong theoretical base which cannot be demolished because of statistical inadequacies of measurement.

**3.6.3 Concentration and Growth of the Firm**

There are two different streams of thoughts to explain the causal relationship between the two variables. According to one view, a firm with market power, as a consequence of concentration, may prefer to maintain is high rate of profit by restricting the output and charging high price. If it grows, it has to sacrifice some profit margin, and lower price which may not be in its interest. Moreover, there will be all kinds of restrictions imposed by the government to stop further growth of such firm.

Furthermore, static diseconomies of scale and numerous dynamic factors and bottlenecks all adversely affect the ability of such firm to grow. Thus, we expect that the higher the monopoly power of the firm the lesser may be its growth. The few firms in the concentrated industry may be dominating enough to restrict the growth of the other firms and to stop the entry of new ones because of the various barriers to entry at their disposal. There are some empirical studies where the inverse relationship between initial market, concentration and subsequent market growth has been verified.

The second view about the concentration and growth of the firm and the market is a positive one. In order to maximize the long –term profit, firms may like to grow over time even under market concentration. They may prefer to create excess capacity to meet the future growing demand and to discourage new entry in the market. They may have some short – term sacrifice of profit in order to stimulate long – term benefits. So, we find a case for the positive relationship between initial market concentration and growth of the firms. There are empirical evidence for such proposition also.

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**3.6.4 Concentration and Technological change**

It is true that the few firms who enjoy monopoly power in a concentrated industry will be large enough. They will be having stability, financial resources and ability to initiate the processes of research and development and gain the benefits from them. Dasgupta and Stiglitz, in their recent papers clearly showed the situation when market concentration and innovative activities are positively correlated.

There is no conclusive empirical evidence to prove such proposition. In fact studies conducted by Williamson have shown quite opposite results. It may not be the concentration but the other attributes of market structure like size of firm, product differentiation possibilities etc., which may be having collinearly with concentration and thus causing a spurious positive correlation between concentration and technological change.

**3.6.5 Concentration and other Aspects of Market performance**

We may briefly mention some other aspects of market performance which may be having some association with market concentration. Stability in the business, which may be judged either by persistent profit rates or sales volume or market share, is one of them. Greater the market power of a firm, the more we expect its stability. The uncertainties faced by the firm may be smaller. Further, if there is high concentration in the market the existing few large firms may maintain their size ranking in order to keep the leadership with them. If the size ranking of the firms, which is defined as ‘turnover’, is changing, this implies that the competitive forces are in action in the market. Lack of such change, that is, of ‘turnover’, means a lack of competition and possible tacit or alright collusion between competitors and hence a perpetuation of the market concentration which ensures stability for the few oiligoplist firms.

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**Summary**

 Market concentration or, more specially, the degree of sellers’ concentration in the market, is an important element of the market structure which pays a dominant role in determining the behavior of a firm in the market. The number of the firms in industry, and their relative size distribution are the two variables that are of relevance in determining market concentration. Concentration in the ownership of the industry, concentration of decision – making power and concentration of the firms in a particular location or region, etc., all being elements of market concentration, may have considerable impact on the market performance of the firms such as profitably, price –cost margin, growth, technological progress and content.

There are a number of measurements of index for concentration or monopoly power. these are the concentration ratio, the Hirschman – Herfindahl Index , Rosenbluth Index, Linda index, Horvath index, dispersion Measures, Lerenr Index, Rothschild Index, Elasticity Index and Profit Ratio. Out of all these measurements the Herfindahl index, the concentration ratios and the Lerner index are comparatively better than the other indexes for practical application.