CHAPTER TWO

RESEARCH METHODOLOGY AND CONCEPTUAL FRAMEWORK
RESEARCH METHODS

The research method used for the study is neither purely deductive nor purely inductive. It is an integrated one. This is so because to begin with, the study sets up certain hypotheses about the characteristics of diversifying firms and also of the industries generally entered into by the diversified firms. These are also statistically examined in detail. Based on empirical investigation the study then attempts to explain whether the nature, extent, pattern and trends in the diversification movement in the manufacturing sector of Indian economy can be attributed to certain assignable causes.

It has been explained in the preceding chapter that in a given framework of public regulation of economic affairs, the firms are not only free to invest in lines other than those in which they are currently engaged, but there are some definite reasons why they should wish to do so. These fall into the following three categories:

1) Those connected with the growth of firms;

ii) Those connected with the competitive position of firms; and
iii) Those connected with the stability of firms.

In the light of these reasons, which in practice are inextricably inter-wined as often the same act of diversification can be explained with reference to any one of these reasons or to a combination of all three, the probable characteristics of diversifying firms and those of industries can be stated as follows:-

**Characteristics of Diversifying Firms**

1. The large firms, as compared to small firms of an industry, have a low marginal cost of raising capital because of their inequality of access to knowledge of profit opportunities, capacity to undertake and utilise technical research, and employing 'loss leader' tactics. Therefore, the large firms, in order to utilise the easy-got-capital, are more multi-product firms. In other words there is a correlation between size of firms, ability to engage in long-range basic research and feasible range of product line.

2. For a large number of reasons considered in the preceding chapter, firms want to grow in size and since diversification itself is a form of growth, the firms which

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1"The investment below a certain level is not conducive to productivity in research — it would only lead to scratching the surface or tinkering with research, rather than produce serious results." S. Hussain Zaheer, A. Rehman and N. Sen — "Investment in Scientific and Technological Research During the Fourth Five Year Plan", p. 5.
diversify their productive base, *ceteris paribus*, are more likely to grow fast on an average than those whose output remains homogeneous. Thus high growth rate is a feature of diversified firms.

3. There is a growing tendency to consider firms as living organisms and a diversified growth of their dimensions like all biological growth (with crucial stages as formation, segregation, differentiation and growth), comes with age. Hence, there is more likelihood that older firms are more prone to adopt diversification strategies than young firms.

4. Firms that find themselves with an unsatisfactory profit and cost record, would seek to reduce the costs or expand sales or both. In the process they are more likely to diversify their activities by searching for new products or markets. In the promotion of diversification programme, the direction of diversification will to a large extent be determined by the existing and potential resources of a firm because, "a firm must consider not only the rate of return it might expect on its new investment but also whether or not its resources are likely to be sufficient for the

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2".... Perhaps the firm's chief difference from the human organism is that a corporate form of organisation made possible an indefinite life span... whereas the life span of a human being is finite"—Ralph S. Alexander, S. Cross and Ross M. Cunningham 'Appraisal of Company Strengths and Weaknesses' in Industrial Marketing (1961), pp. 132-136.
maintenance of the rate of investment that will be required to keep up with competitor's innovations and expansion in its existing field as well as in the new one.\(^3\) On the contrary, the firms having both a satisfactory profit record and a satisfactory cost history (as compared with their rival concerns in a given industry) would not like to search for new products and also opportunities.

**Characteristics of Diversifying Industries**

1. The growth commodity industries\(^4\) which have some strong cost-reduction incentives and economies of scale, and industries which enjoy state patronage (in the form of various tax rebates holidays and exemptions; subsidies and protection; availability of credit finance and guarantees including the assurances that the government will avoid getting into the way) generally obtain outside finance more cheaply, and therefore the marginal efficiency of their investment schedules is always at a higher level. This, therefore, implies that such industries attract more entries. Similarly, firms in slowly growing industries usually do not need outside funds and internal funds in such industries almost always have a lower imputed cost than outside funds. There is some inducement, therefore, for the firms in such industries.

\(^3\)E.T. Penrose, op.cit,(1959), p. 136.

\(^4\)Industries for which real or potential effective demand increases rapidly.
industries to move into more rapidly growing sectors wherein the marginal efficiency of capital is higher than the marginal cost of capital.

2. If the firms seek to grow more rapidly than the rate at which their primary industry is growing, they will be more active in diversifying into the fast growing areas. And if in their primary industry, the degree of concentration is high, that is, the perceptible control over the market is vested in a few entrepreneurs, the keenness for diversification is further sharpened. This is because in the face of high market imperfections it is not feasible for the firms to expand their activities rapidly within the spheres of their primary industry. Thus highly concentrated industries produce a higher proportion of migrants than the industries characterised by competitive market structure.

But this generally does not hold good for the large firms which have a perceptible control in the concentrated industries. On the contrary, the situation is reversed. Large firms rather than medium or small firms of competitive industries are more induced to migrate into new industries particularly to the ones which have a higher degree of seller concentration. Most of the industries for which the intensity of competition is low are those which are characterised by large capital investments and significant economies of scale, the parameters which set barriers to new entry for most of the medium and small firms rather than for large firms.
3. The stability motive of the firms pushes the process of market invasion by them more towards those industries where the technical limits to the number of products to which plant capacity can be adapted and the physical limits to the market which can be reached are very wide. Since technology is basically concerned with developing new products and new uses of existing products, the technically progressive industries with intensive research offer many sustainable product lines. Hence, there is more likelihood that diversification moves are more towards such industries. Again, industries which are characterised by rapidly changing technologies, are likely to grow fast and therefore, entry into such industries also meets the firm's objective for growth.

4. Where the firms are faced with a choice among activities equally attractive from the technology and growth points of view, they usually undertake such activities whose production base lies closer to the technology of their primary activity. This is obvious because in such situations the prior experience of firms and their existing capacities such as plant, raw materials and personnel give them an advantage over their rival firms entering into the proposed ventures through other sectors of the economy.

5. In industries having large number of consecutive stages of production such that each stage can be considered as an independent activity for a specialised firm, and where
the demand for the final product is relatively stable or is increasing, firms of intermediary stages for the sales of final products would find it more advantageous to diversify by integrating forward to compete with the non-integrated specialised firms of their initial intermediary stage.

Similarly, in such industries if the firms of intermediary stages find that they are using monopolistically produced raw materials or components, in order to improve their bargaining power, they may find it desirable to diversify by integrating backward. By this process they may not only reduce the risk of fluctuations in the supply prices of their purchases but may also ensure the required quality and regularity of the supplies and components.

Thus industries having investments at several levels of production develop multiple-product lines. Here "The motivation is seldom the desire to expand the product line. But the technical requirements for an efficient size of plant at one level are frequently out of balance with the company's own needs at other levels .... Not only scale economies but secular shifts and technology and cyclical shifts in product-mix put the organisation out of balance."5

6. Industries characterised either by composite

5Joel Dean, op. cit., p. 117.
supply\textsuperscript{6} or composite demand\textsuperscript{7} or both, are generally more diversified because their business units (in order to freeze competitors for having a stable demand schedule) consider full-line-supply and exclusive dealer-arrangements to be a rational policy. Therefore, they are always inclined to diversify their activities.

7. Industries suffering from uncertainties (caused) either by changes in prices or techniques of production or yields of inputs i.e., technical coefficients of a production function or institutional relations etc.,) increase the cost of management decision-process\textsuperscript{8} and carrying of cash inventories. The optimum size of

\begin{figure}[h]
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\includegraphics[width=\textwidth]{figure_IV.png}
\caption{Figure IV}
\end{figure}

\textsuperscript{6}Composite supply - Goods for which alternative sources of supply exist, that is the supply is composed of the sum total of supplies from the various sources.

\textsuperscript{7}Composite demand - Goods which can be put to more than one use, that is the total demand is composed of the demand for all the uses taken together.

\textsuperscript{8}"Under a high degree of uncertainty firms are
production in such industries, therefore, is squeezed because in such situations the long-run average cost curve of the firm after briskly kissing its minimum at low level of output, begins to rise rapidly in a north east direction (See Figure IV). Thus from the viewpoint of corporate goals, firms for diversification programmes do not seek entry into such industries. Instead these industries prompt their firms to spread production over a number of products. The higher the extent of uncertainty and instability in an industry, the lower is its attraction power for entry by the firms operating in stable industries and greater are possibilities for the former to provide diversification outlets.

8. Industries sensitive to cyclical fluctuations also promote diversification. They do so because the firms of such industries, in order to reduce fluctuations in their turnover and income, would wish to join new industries which have either products with steady demand or whose cyclical periodicities are negatively related with those of the former. In such industries, a proliferation of activities is considered worthwhile even if there are no other ancillary advantages and the prospective average returns in the new

unlikely to have accurate forecasts of their sales, and executives require a relatively large amounts of information .... Routine extrapolation from previous experience cannot be depended on to provide the correct responses to forecast"—David Schwartzman, "Uncertainty and the Size of the Firm". Economica, (1963), p. 287.
lines are no longer higher than those in the old.9

9. Similar is the case with an industry for which either the demand or output or both are subject to seasonal variations. The firms of such industry, prompted by fuller utilisation of their resources and capacities, prefer to produce products with a different seasonal pattern to average out the random fluctuations in their demand or output.

10. As a corollary to the above hypotheses, though firms seek diversification, they do not diversify randomly all the time. There are some definite favourable and unfavourable periods for diversification.

If in an industry the need to strengthen competition is the least for the firms (because the demand is very high relative to capital stock) diversification moves by large

9 Some economists (Joel Dean and Winfield Smith) argue that "There is no real reason why a firm in an existing industry, operating it what might be defined as the optimum size should diversify into another industry where the rate of growth is normal." But as most of the firms are risk averters they know that without reducing the chance of income variation and bankruptcy to bare minimum, they cannot comfortably stay in business to maximize their long-run payoff. Thus, they would be willing to accept a reduction in expected value of average profits if by doing so they can increase the chance of their earnings to fluctuate over a narrow range.

firms during depressions\textsuperscript{10} may be more advantageous by acquiring the small and unviable units operating in vicious circles of limited credit resources and market outlets. Where, however, the need to strengthen competitive position is strong and the marginal cost of raising capital is high, many firms would be unwilling to borrow in order to move into new lines even though they are confident of making a good long-run payoff from such investments. This is because they feel that it always takes time to develop engineering and managerial techniques and market position for new ventures.

Thus, as a result, firms may postpone investment in new lines until they can be financed from internal resources or from funds raised at very low rates of interest. Consequently when the urge to strengthen competition is strong, a greater amount of diversification investment occurs after a period during which the income of the firm has been growing at a very rapid rate as also in years of high prosperity.

**Sampling Design**

In view of the empirical verification of the foregoing hypotheses and an estimation of the nature, extent,

\textsuperscript{10}"... it was found that mergers responded positively and with high consistency to the business cycle ... compared to the reference cycle, the time sequence of peaks suggests that mergers reach their zenith first, followed by contracts for plant, orders for equipment, and finally by stock prices." Ralph L. Nelson, "Business Cycle Factors in the Choice between Internal and External Growth", The Corporate Merger (Edited. William W. Alberts & Joel E. Segall), op.cit., pp. 52-66.
pattern, and trends in the diversification movement, one has to look at the structure and number of business activities maintained by the Indian business firms.

There is a virtual absence\textsuperscript{11} of official data on the subject. The study is, therefore, based on a sample of 100 apparently gifted corporate units which have pulled themselves up to the top rank of their industries. It is hoped that their counterparts would benefit from the experiences of these firms which with varying degrees of robustness have successfully survived the knocks of the business game.

While selecting the sample of 100 companies, attention is focussed on manufacturing firms for three reasons. First, this is the one area where comparatively comprehensive information at the company level is available in sufficient detail to permit an appraisal. Second, manufacturing has been recognised as that sector of economy which most clearly reflects in its organisation the impact of large scale production on the competitive system. Third, the manufacturing industry is the pace-setter in economic growth, mainly because it is the sector in which the rate of input of technology is highest. Fourth, the vitality of the economy depends, to a considerable extent, on the

\textsuperscript{11}No government department publishes or maintains product records or information on the product structures of the Indian business enterprises including the corporate sector.
investment activities in the manufacturing industry. Again, within the manufacturing industry the study deals with the fields of private enterprise. The reasons for selecting this sector are more than one. The most important of these are: (a) The manufacturing industry in India has been developed by the private sector as till recently the economic activities of the public sector were confined to the provision of essential services and public utilities like railway transport, post-telegraph services, communication and irrigation. (b) The public sector undertakings in the manufacturing industry are highly specialized concerns as these have been instituted to manufacture those products which have either been completely banned from the private sector or the expansion of capacity of the existing private units is discouraged.

The sample selected for the study is basically what Deming calls a 'judgement sample', while the size of the sample is determined arbitrarily, with a view to having

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12The sample was originally obtained from Kothari's Economic Guide and Investor's Year Book, 1965. Later on the selection was slightly modified in view of the publication entitled "Information Broadsheet about the First Hundred and Twenty-eight Companies at work in India (1963-64)" published in July, 1965 by the Research and Statistics Division of the Company Law Board, Government of India, and finally the sample became a group of one hundred largest (in terms of net tangible assets) public joint stock manufacturing companies taken from the list of 838 non-government companies (other than banking and insurance) having assets of Rs. 1 crore or more as on 31st March, 1964, as published in Appendix E of the 'Report of the Monopolies Inquiry Commission, 1965.'
adequate representation of the manufacturing universe, the companies selected (as listed in Appendix II) are drawn from eleven major manufacturing industrial groups (2-digits) by adopting the concept and definition of industry as developed by the authors of Standard Industrial Classification in India — an organisation which also collects official industrial statistics of the country. Since the selected companies are highly diversified (as they are engaged in two or more principal lines of business), the single industrial classification of companies is based on their initial manufacturing interest for which necessary industrial classification codes are given against their names in the Alphabetical List of the Joint Stock Companies, 1959 published by the Company Law Board, Government of India.13

Again for each selected industrial group, the number of sample companies was also decided on the basis of their economic importance, degree of heterogeneity and level of seller concentration of the industries.

Further, since the companies differ in origin, circumstances and processes of development, their selection has leaned toward the largest companies whose growth histories and data are available at least from 1948 onwards (except in

13 In the case of five companies, however, the industrial classification codes as given against their names in this publication have not been adopted, as later on it was found that the initial manufacturing interest of these companies were different from the ones as recorded in the publication.
case of two companies incorporated in 1949) when for the first time, after independence, the industrial policy of the Indian National Government was clearly enunciated.

In the process of selection, some of the 2-digit industries, such as manufacture of rubber products, manufacture of products of petroleum and coal, furniture, and fixtures have been completely omitted, because the number of companies with these industries as their primary activities are less than four in the lists from which the sample companies have been selected. This 'cut' has been used because a small number of companies do not adequately represent the behaviour of the industry group to which they belong.

Table 1 shows that for most of the industrial groups, the companies in our sample account for a substantial proportion of the paid-up capital of all the companies classifiable under these industries.

**Source of Data**

As the present study deals with the impact of market structure, technological changes, degree of uncertainty or cyclical fluctuations of the manufacturing industries on the pattern of diversification, necessary empirical material has

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14 Industrywise data on total assets are not available as the same are not compiled by the custodians of official statistics in the country.
been collected from a large number of sources. Primary data have been collected through a mail survey (i.e., mailing a questionnaire to the selected companies) and by personal visits; whereas the secondary data have been culled from the Annual Reports and Chairmen's Speeches of the Companies, Kothari's Economic Guide and Investor's Year Books, Government publications such as Annual Abstracts of Statistics, Annual Survey of Industries, Monthly Bulletins of the Reserve Bank of India and certain ad hoc reports like the Report of the Monopolies Inquiry Commission, 1965, Industrial Planning and Licensing Policy Report (R.K. Hazari) 1967, Estimates Committee Report on Industrial Licensing (1967-68).

**Primary** - The primary source of collection of data has been undertaken to obtain the particulars regarding the year of starting commercial activities, nature of manufacturing and non-manufacturing activities commenced and abandoned, distribution of labour or turnover, location of works, particulars of subsidiary companies, and details of mergers and acquisitions from the sample companies. A questionnaire which sought information on these points was mailed to the Chairman/Managing Directors/Secretaries of these companies.

The degree of response to the questionnaire has not been unsatisfactory. Of the 100 sample companies, 75 cooperated for the purpose of the study and 11 companies did not acknowledge receipt of the questionnaire despite three reminders to each. Among the 89 companies which had the
courtesy to acknowledge receipt, 14 refused\textsuperscript{15} to disclose the particulars and also did not supply the copies of their annual reports for the last five years. A high degree of non-response and reluctant attitude was observed from the companies in industries like basic metals, metal products and transport equipment. Managements of some of the most eminently successful companies, however, appreciated the study.\textsuperscript{16} These companies in addition to mailing back the reply for the questionnaire, most ungrudgingly sent additional literature such as special brochures issued from time to time.

In a few cases a personal visit was also made to company headquarters to discuss with the management of the companies, without any formal questionnaire, subjects like structure, organization and products of the company, its history and growth; nature of investment and more particularly

\textsuperscript{15}Samples of reply — (i) "... the reason why we do not reply to such letters is that we are always flooded with similar enquiries not only from Government Departments but also from the Commercial Organizations and from individuals all over the country". (ii) Of late it appears to us that a large number of universities are taking interest in undertaking studies in various aspects of industries, and in consequence quite large number of Lecturers are addressing communications to us for compiling statistics to assist them in their studies. You will appreciate that it is difficult for a manufacturing company to undertake preparation of so much statistical data for various organisations, in addition to the work we have already to do for certain departments of the Government."

\textsuperscript{16}A sample of reply — "We appreciate your research work on Diversification in Indian Manufacturing Industry and hope this would be of use to the Indian Industries".
the factors which prompted the company to take up product complexes by diversifying its production base; problems and incentives to growth and its long term outlook.

The company financial data used in the study have, however, been extracted from the published accounts of the sample companies for the last five years.\(^{17}\) Copies of the annual accounts for the period 1959-60 to 1963-64\(^ {18}\) were also collected from the companies along with the questionnaire. Companies which did not or could not supply their annual reports were examined in the Directorate of Research and Statistics, Company Law Board, Government of India, New Delhi, which maintains copies of annual accounts (from 1956 onwards) of the corporate units.

**Secondary** - For identifying the market structure, magnitude of uncertainty, levels of technological sensitiveness

\(^{17}\) Though according to the original plan of the study, the period for estimating the growth rates and other financial functions was to be a decade but since majority of the companies declined to provide the copies of their annual accounts for such a long span of time on the ground that 'spare copies not available', the period of investigation has been slashed to five years. This curtailment in the planned period of investigation does not deter the main objective of the study because even a five year period is adequate to have a fairly complete and representative picture about the trend in the data.

\(^{18}\) The number of companies closing their annual accounts in each quarter are shown below:

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<thead>
<tr>
<th>Quarter</th>
<th>Number</th>
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<tbody>
<tr>
<td>January to March</td>
<td>39</td>
</tr>
<tr>
<td>April to June</td>
<td>15</td>
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<tr>
<td>July to September</td>
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<td>October to December</td>
<td>33</td>
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<tr>
<td><strong>Total</strong></td>
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of industries, and estimating their growth, concentration ratio, cyclical fluctuations, changes in scale of production, and profitability, much reliance is placed upon the secondary sources of data.

As most of these problems are to deal with historical data, the efficiency of various estimates obviously largely depends upon the richness of the statistical series with regard to their coverage of subjects and sectors, and also upon the statistical imagination of the country, which keeps the concepts and definitions (around which the statistical figures revolve) comparable over time.

It has already been stated that the statistical system of India does not provide a long series of variables of interests to this type of study. The empirical material used in this study, although the best which could be brought together in the time available, is therefore, not ideal for the purposes and hence there are some instances where data have been tortured so that they yield appropriate answers to the concepts.

**DIVERSIFICATION Vs DIFFERENTIATION**

As one turns to dwell upon various dimensions of the study, it becomes imperative at the very outset to define the concept of diversification in some measurable units and to state how far it differs from the term differentiation.\(^\text{19}\)

\(^{19}\)Diversification includes increase in the variety
The term diversification, in common parlance, implies a business policy or management philosophy of operating the firm so that its business and profits come from a number of sources, usually from diverse products which are new to the firm but may or may not be new to the economy.

Since a product is conceived by the matching of a technique of production (i.e., technology) and an end source of want satisfaction (i.e., market) it has two principal dimensions and a change in one or both of the dimensions by the firm gives a status of newness to its products. Further, as product newness can be created either by having a moderate change, or by having a substantial change in one or both of the dimensions, new products are often classified as improved products, new uses, new markets for old products, related new products, unrelated new products, and innovations, depending upon the nature and the degree of change in the dimensions. This entire range of newness or heterogeneity is a blend of product differentiation and diversification.

Product differentiation, a market strategy of monopolistic or imperfect competition, normally implies producing significantly different brands and grades or different sizes and specifications of the good in question, increasing the
the degree of spatial dispersion of markets, and creating psycho-illusions in the minds of consumers for the similar products of any other firm. It differs from diversification as the latter connotes more than performance of a variety of productive activities within a firm, in the sense that these activities are not related either in a technological or marketing sense. In this context Penrose has rightly remarked that "Diversification that involves a departure from the firm's existing areas may be of the three kinds: (i) The entry into new markets with new products using the same production base; (ii) expansion in the same market with new products based in a different areas of technology; and (iii) entry into new markets with new products based in a different areas of technology."20

Johnson and Jones have given the following classification of new products as caused by changes in technology and market.21

20 E. T. Penrose. op. cit., p. 110.


22 Similar growth vectors in diversification have been set up by H. Igor Ansoff. Corporate Strategy, op. cit., pp. 128-132.
The investment strategies as given in blocks (4) to (9) indicate diversification moves of a company; whereas the product missions as given in the other blocks of the chart imply product differentiation policies. Thus the chart discloses that diversification begins where differentiation ends.

Since diversification stands for that particular investment policy which calls for a substantial departure from the present technology and market structure, the question arises about the adaptation of a criterion which may guide us in the identification of a change in market structure and in technology.

In economic theory, market structures are normally
distinguished on the basis of the degree of competition or extent of substitutability of products. Two products are said to be distinct, heterogeneous, independent or belonging to different markets if there is less competition or substitutability between them. Now as the degree of competition or substitutability between any two products is measured in terms of cross elasticity\(^23\) of demand for one product with reference to the other product, this measure of elasticity can be used to examine the degree of diversification. A higher value of this measure means that the commodities are close substitutes; whereas a zero value implies that the products are independent of each other in the market, and hence they are diversified.

Unfortunately this criterion is not empirically observable as the relevant data on which cross elasticities are estimated are seldom available. Even if the data are avoidable, one does not know how to judge what value of the degree of heterogeneity of the product is to be called either as differentiation or diversification. This difficulty arises mainly from the fact that between the extreme values\(^24\)

\(^{23}\)The cross elasticity of demand for commodity 'A' with reference to commodity 'B' is defined as the percentage change in the quantity of 'A' demanded which would result from one per cent change in the price of 'B', all other factors being held constant.

\(^{24}\)Values vary between plus infinity to minus infinity.
on a given scale of cross elasticity of demand, there is a complex range of markets, and on this scale it is a gradient and not a cliff which determines the heterogeneity of the products and separates one market from the other. Therefore, the use of this criterion for study of diversification involves arbitration. The other difficulty with this measure is that competitive relations among products are not fixed as these change over time with alteration of production techniques, consumer tastes, and the general level of business activity.

The second way to identify diversification moves of a firm is to examine whether it has crossed its primary industrial boundaries and productive activities or not. This lands us to a new set of problems of identification of industry or understanding the contour lines which separate one industry from the other.

Although there are a good number of definitions of an industry which emphasize the demand side of the product, and according to such definitions an industry represents a group of close competitors producing close substitute commodities, yet it is the supply side of the economic picture,

25"The definition of any one industry is very blurred. We talk of such-and-such an industry and such-and-such another industry, but in actual fact logical boundaries between the two will be extremely uncertain, as Census takers know to their cost." P.S. Florence, The Logic of British and American Industry. London: Routledge and Kegan Paul, (1953), p. 22.
that is, homogeneity of physical or technological structure of the production operations which gives us maximum affinity to define a homogeneous or non-diversified line of activity in the manufacturing field. For example, tin cans and glass containers are close substitute commodities, but are defined in two different industries because of the difference in the supply characteristics such as raw material, process of manufacture and type of machinery used.

Thus ideally one can adopt the mobility of productive resources or to be more precise, the elasticity of technical substitution as a criterion for demarcating various industrial boundaries. Where the resources can be shifted rapidly and with ease from one set of products to another, there is a greater elasticity of technical substitution and under the situation products may be deemed to fall in a common industry from the standpoint of the supplier, though they may or may not be distinctly separate as seen by the buyer.

According to this definition two products are said to belong to the same industry if they are commonly produced in substantial amounts by essentially the same equipment, technical process, raw material, and personnel. This is so because the most common circumstances under which the productive capacity in terms of equipment, technology and personnel can be more rapidly diverted from one use to another are those involving products which are close substitutes and are associated with high degrees of cross elasticities of demand.
It is this fact of technical substitutability to consider products of different sizes and specifications which constitutes product differentiation or a single market class. Thus the criterion of elasticity of technical substitution not only considers the supply aspect of the product but also takes into account the demand or market aspects of the product.

Here again, as in the case of the first criterion, unfortunately one encounters the paucity of relevant data to estimate either the elasticity of technical substitution or the degree of mobility among the productive resources between any two products under consideration. The other difficulty with this criterion as a measure of diversification is that sometimes as a result of a single manufacturing process two or more joint products are made, and though these products compete for the same technical processes and production capacities, they may not be close substitutes and may relate to different markets.

Since the supply characteristics of a commodity are more frequently observable than the demand characteristics, the conventional classification of industries as drawn up by the Statistical Commission (1943) of the United Nations for the purpose of facilitating the compilation of data seems to have its origin in similarity of supply or input factors. Therefore, in publications like Indexes to the International Standard Industrial Classification of all Economic Activities, and the Standard Industrial and Occupational Classification
in India, the authors' emphasis on the technical rather than the market structure of production is a reflection of the elasticity of the technical substitution criterion.

The definition of industry adopted in this study for measuring the degree of diversification is very close to the one used in SIOC.\textsuperscript{26}

The SIOC contains 9 divisions, 55 major groups, 284 groups and 753 sub-groups of economic activities, and the manufacture universe of this classification is divided into 19 major groups (designated by 2-digit codes) and sub-divided into about 133 industry groups (3-digit codes) which are further divided into some 392 industries\textsuperscript{27} (4-digit codes).

Since diversification is viewed as encompassing within the single company of two or more activities each of which constitutes the sole activity of more specialised companies, diversification is a very widespread phenomenon. But how widespread it is, of course, depends upon how finely one divides the activities or industries. An examination of the nature of the product at the major group level reveals a range of 19 major manufacturing industrial groups, but if

\textsuperscript{26} Standard Industrial and Occupational Classification, Government of India, Department of Statistics, Central Statistical Organisation, New Delhi, 1962.

\textsuperscript{27} The publication under reference contains 366, 4-digit manufacturing industries. An addition of 26, 4-digit manufacturing industries has been made to the existing list as these could not be properly classified under the given number of industries.
one considers identification of the product, again in the manufacturing sector, at the industrial group level one has 133 mutually exclusive categories in any of which a product can be classified. Similarly, if one views the manufactured product at the industries level, there are 392 classes.

For this study, however, most of information about the product structure of a set of companies is collected direct from the companies, but in a few cases it is also gathered from Kothari's Economic Guide and Investment Encyclopaedia, Investor's Year Book, Monopolies Commission Report, and advertisements appearing in the press. A use of 4-digit level of classification for product data is adopted because it gives a standard and stable basis to count the number of industries in which a particular enterprise is engaged. It also provides a uniform and unambiguous way to control the effect of variations in the details in which various companies reported data or the secondary sources recorded the data. Thus on the basis of codification of product information, the sample companies are classified into separate industries and wherever the products of a company fall under more than one, 4-digit code of the Standard Industrial and Occupational Classification, the company is said to be a diversified one.

Measures of Diversification

For understanding the quantitative differences of
industrial diversities or heterogeneity of markets served by a firm so as to distinguish more or less diversified enterprises, several measures can be developed, and the choice among these measures would largely depend upon the availability of data and the problems one chooses to examine.

Michael Gort has developed eight measures of diversification which are:

\[
\begin{align*}
D_1 &= 1 - \frac{Pr}{Mr - Ir} \\
D_2 &= 1 - \frac{Pr + Sr}{Mr - Ir} \\
D_3 &= N_1 \left(1 - \frac{Pr}{Mr - Ir}\right) \\
D_4 &= 1 - \frac{Ge}{Ve - Ae} \\
D_5 &= N_2 \left(1 - \frac{Ge}{Ve - Ae}\right) \\
D_6 &= 1 - \frac{Pe}{Me} \\
D_7 &= 1 - \frac{Le}{Ve} \\
D_8 &= N_3
\end{align*}
\]

Pr = primary 4-digit pay rolls; Mr = total manufacturing pay rolls; Ir = manufacturing pay rolls associated with integration; Sr = manufacturing pay rolls in the second largest 4-digit industry; N_1 = number of 4-digit manufacturing industries, excluding those which account for less than 1 per cent of manufacturing employment and those classified as integration; N_2 = the total number of 2-digit industries; Ge = employment in the primary 2-digit industries; Ae = employment in 2-digit activities associated primarily with integration; Ve = total company employment; Re = primary 4-digit industry employment; Me = total company employment in manufacturing; Le = primary industry employment at the modified 3-digit level of detail; and N_3 = number of 3-digit industries. Michael Gort, *Diversification and Integration in American Industry*. Princeton: University Press, (1962), pp. 23-24.
If the purpose of the study, as with us, is to throw light on the extent to which an enterprise is likely to enter activities unrelated to its primary operations in response, for example, to high earnings or growth prospects in other industries, a simple identification and count of the number of industries in which the enterprise produces goods and services would be appropriate.

But as most of the manufacturing enterprises, carry for their own use, a large number of auxiliary activities, such as "force account construction; power generation; warehousing and storage; repair and maintenance of own facilities and equipment; testing, research and development work; buying operations, shipping and delivery operations; and garage operation", counting of industries to measure the degree of diversification for such a company becomes a delusion as in such cases a simple count of auxiliary activities gives undue weight to a wide dispersion of activities accounting for a small proportion of the firm's total operations. This bias in the total number of industrial activities of a company has been removed by the counting out of the auxiliary activities of the company.

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There is another difficulty with this measure. That is, it reveals the same magnitude of diversification for two companies if they are operating in the same number of industries irrespective of the fact whether their productive capacities and resources are evenly distributed over the industrial activities or largely concentrated in one of the industries. For interfirm comparisons about the magnitude of diversification, counting of industrial activities would give erroneous results because to say that two firms are equally diversified as their income flows from the same number of sources, sounds incorrect. This limitation is illustrated by a simple example. Suppose two firms are operating in common five industries and one has evenly divided its productive resources over these trades; whereas the other firm has a high degree of specialisation in one industry, say, 80 per cent of its productive resources are concentrated in this industry and the remaining 20 per cent of the resources are employed in the remaining four industries. Now any comparison, for the purposes of diversification of a firm with 80% capacity concentrated in one industry, with another firm having 20 per cent capacity in the same industry, does not seem to be sound.

Conscious of this limitation of the proposed measure of diversification, the sample companies were requested to specify along with their activities the proportion of labour employed, capital used and value of turnover for the
activities reported, because such information product-wise is not published by the companies in their annual reports. Strangely enough, only five companies disclosed the data, and others who, though reacting favourably to the other items of enquiry, expressed their inability to split up productwise strength of their employees/assets/turnover. These companies, while not disclosing the data, suggested that such a type of data with an enterprise were always likely to vary from time to time (sometimes even in a short period) due to several variable factors, a few among them even beyond the control of the enterprise. Consequently, the Central Statistical Organization, the official collector of industrial statistics, was approached with a list of the factory establishments of the sample companies for the supply of relevant data. But, this official organ also expressed its inability to release the necessary information in view of secrecy involved under the Collection of Statistics Act, 1953. Therefore, with no other recourse, the number of products or the activities maintained by the sample companies has been taken as the only measure of production diversification.

The Concept of Enterprise

But while enumerating the activities of a company, which, so far as legal theory is concerned, has always been recognised as a body corporate with a separate personality of its own, the concept of enterprise is taken in the
operational sense. Therefore, the sample companies are taken along with their subsidiaries in which the holding sample companies have either complete or effectively predominant control over the businesses of the former through their absolute majority voting power. However, the activities of those subsidiaries which are incorporated and operate outside the country are not taken into account as such activities do not form part of the Indian manufacturing scene.

Again, in the Indian corporate sector, the companies, like the business enterprises of any free or semi-controlled economy, have inter-corporate trade investments. The study does not take into account the nature of activities accruing to the companies from their inter-corporate trading investments because in such cases the companies do not have an absolute majority ownership, management, and control. There may be instances where a sample company, without having an absolute majority ownership of the equity capital, may have the highest share of ownership in the equity capital of the other companies and thereby may have an effective control and

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30 In the sample of 100 companies, 31 are holding companies and have 74 subsidiary companies.

31 An absolute majority voting power is held by a holding company when it holds more than half in nominal value of the equity share capital of a subsidiary company.
management over the activities of such companies in which its trading investments are injected. But since the identification of such control over the business of other enterprises by an investing company is more a matter of qualitative judgement and a time consuming pursuit, it is all the more necessary to ignore the nature of such activities which, as stated earlier, accrue to the sample companies only by virtue of their inter-corporate trading investment injections to the corporate sector.