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SUB - CONTRACTING IN INDIAN MANUFACTURING INDUSTRIES -
ANALYSIS, EVIDENCE AND ISSUES.

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In this study of an aspect of Indian manufacturing industries we are concerned with the following issues : the meaning of sub-contracting (or ancillarisation), its main features, the different forms it takes in different industries, and the economic factors and institutional aspects that influence its growth. The first part of the study discusses these analytical issues. It also includes, as a necessary sequel and link with the second part, a brief survey of the various government policies and their changes which could have considerably influenced the problem under study. Part II contains evidence on the growth of sub-contracting in India. This information has been documented from a number of secondary sources.

Based on this one can discern the broad pattern of changes that has occurred over the last three decades or so. However the available evidence is too inadequate to understand in any ~~any~~ greater detail the extent of ^{their} growth of sub-contracting in different industries/~~and~~ diverse forms and the causes of this growth. Therefore the study concludes by posing a number of questions which need to be answered to arrive at a better understanding of the problem.

PART I

1. Distinguishing features of sub-contracting:

Sub-contracting refers to a type of inter-firm relationship where large firms procure manufactured products, components, parts and sub-assemblies from a number of small firms. In some cases, sub-contracting is associated with 'job-work' where a 'parent' firm provides the necessary

raw materials to the small firms who then return these materials after turning them into the required shapes and sizes, (as per the technical specification), for a predetermined rate. These transactions between firms of differing sizes are not random or occasional business deals but are much more permanent and often a collaborative relationship. In more general terms sub-contracting refers to a specific aspect of the organisation of industrial production where large and small firms, with high degree of specialisation, coexist in an informal cooperation in production and often investment too. In the national context ^{1/} such a cooperation is achieved by the concentration of factories in a small geographic region. This minimizes costs on transportation and information flows.

Sub-contractors (i.e. the small firms which take work on a contract basis) usually undertake manufacturing or receiving orders from their parent firms, which furnish technical specifications. In some cases parent firms provide the necessary technical and financial assistance to enable sub-contractors to execute the order. Usually the items manufactured by sub-contractors are not patented; nor do they produce for the 'market' ~~which~~ which can be purchased 'off-the-shelf'. In this sense sub-contractors are not 'independent' producers, but appendages to their parent firms. To a large extent their survival and growth are circumscribed by the growth process of their parent firm(s), whose

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The discussion is confined to sub-contracting within an economy. International sub-contracting, though similar in many ways is not touched upon in this study.

larger size commands greater economic power. The parent firms usually attempt to systematically develop business relationships with their sub-contractors as an integral element of their own growth process.

It can be illustrated with a few examples. In the metal engineering industry the manufacture of relatively small and simple 'turned' components, fabricated items, castings and forgings can be 'farmed out' to small firms. Similarly large electrical machinery manufacturers could subcontract winding work to small entrepreneurs who have the skilled manpower for this operation. In the electronics industry assembling of components, which is primarily labour intensive can be farmed out.

The sub-contracting discussed above is often confused with the more general form of inter-firm relationships, especially in the case of the automobile industry. Therefore it is necessary to bring out the difference between the two.

In a wide range of engineering industry the final product is an assemblage of a large number of components and sub-assemblies. Manufacturers (some times called assemblers) usually concentrate their efforts on a limited but crucial parts of the final products. The remaining parts are procured from other firms for the final assembly. A considerable proportion of the 'bought out' components can be classified as 'traditionally bought out' these, as a rule, are not produced by the assembler. Moreover these bought out items often require a high level of technology and/or are totally unrelated to the main line of manufacture of the assembler. While some of these specialised, often patented, components can be

readily procured from the market there could be number of others whose production ^{necessitates} a close technical cooperation between the assembler and the producer. The reason could be the high level of technology and the heavy investment involved.

One can cite concrete examples to illustrate the relationships between specialist manufacturers. For a certain range of light commercial vehicles of Mahindra and Mahindra Ltd. the engine is supplied by Simpson and Co., of Madras, ^{2/}. Godrej Boyce Ltd., one of the leading producers of refrigerators in India does not have its own compressor manufacturing facility. Hence it uses Kirlosker Pneumatic Ltd's compressors for its products. ^{Godrej} Boyce's speciality lies in sheet metal work. In the international context, the Boeing corporation of the United states uses Rolls Royce engine for their aircraft.

This type of inter-firm relationship is usually between specialist manufacturers, invariably of equal bargaining strength. Thus conceptually it is not difficult to distinguish this from those described earlier. Sub contracting is usually between firms of different sizes (and hence, of unequal economic power) where the parent firm can exercise considerable control over its sub-contractors. It is not uncommon for them to be 'tied' to their parent firms through technical, financial, input and marketing linkages. These ties could restrict the sub-contractors' freedom to function as independent entrepreneurs. This aspect of domination and control, which is a reflection of their unequal economic status could

^{2/} Simpson has technical collaboration with Perkins Engines of the United States who is one of the leading manufacturers of diesel engines.

be taken to be the crucial distinguishing characteristic of sub-contracting relationships. The apparent cooperation in production, planning and investment decisions, on the one hand, and the underlying unequal bargaining strength, on the other seem to reflect conflict and compromise in the capitalist growth mechanism.

2. Forms of sub-contracting:

The nature of manufacturing technology mainly determines the form of sub-contracting and the extent to which it can develop in any industry. In process industries, for example, its possibility is very limited. Sub-contracting is feasible in industries where the production process is divisible and/or the final product, as described earlier, is constituted by a number of parts and sub-assemblies.

The most commonly observed form of sub-contracting is in metal working industries which we have discussed in the previous section. This we call component sub-contracting. In such industries the parent firm usually concentrates its resources in the development and manufacture of a limited range of technology intensive segments of the final product. However, since the product is sold under their brand name, the parent firms usually undertake marketing and after sales service which assume increasing importance in machinery manufacture.

There could be another type of manufacturing where the input(s) moves through a number of distinct separable activities which need not, for some

technical reason, be carried out continuously and/or in the same premises. In such a case the industry could 'disintegrate' into its constituent activities specialising in individual processes. Alternatively, as a result of a different configuration of influences, another type of sub-contracting could develop where the original firm having an integrated plant could get one or more activities undertaken by sub-contractors and then sell the final product under its own brand name. We define this as activity sub-contracting.

The cotton textile industry in India is probably a good example of this form of sub-contracting. Production of cloth consists of three main activities. Spinning of yarn, weaving it into cloth and finishing (or processing) of the fabric. Since the textile industry in India operates at a low level of technology it is possible for large firms to produce and procure yarn, get it woven in the power loom sector and process it in specialised printing firms.

The nature of sub-contracting in the electronics industry is quite the opposite to what we have observed in the metal engineering industry. Production of components like the chip, capacitor, transistors, ^{TV} picture tubes etc are capital intensive processes requiring high technology. In these industries economics of scale in production could be very substantial and the rate of technological obsolescence could also be very high.

But, on the other hand, assembling of these components to produce the final products is highly labour and skill intensive. Therefore this operation

can be farmed out to small firms. Sub-contracting of this kind, we would call, assembly sub-contracting.

There could be yet another form of this relationship where sub-contractors produce the complete product and the parent firm essentially performs the marketing functions i.e. sell the product under its own brand name. This we define as product sub-contracting. Such an arrangement could be widely prevalent in industries producing consumer goods and durables like electric appliances, metal products and food, clothing and leather products. Such product sub-contracting can be common in a certain range of industrial products as well, like for instance, starters, small motors, transformers etc. in electrical machinery industry.

In some sense the categories outlined above represent the ideal types. One may come across a number of combinations and variants of these basic forms of sub-contracting in different industries. For example, large firms in the metal engineering industry, as we noted earlier, may be farming out production of simpler components. These firms may ^{also} be sub-contracting labour-intensive activities like motor winding where the whole product is taken to the sub-contractor's factory. In some other case, it is possible in Indian industry for a large firm to sell or lease machines to sub-contractors but which continue to remain in the parent firm's premises. The work done on these machines would be counted as ^a 'bought out' component and the workers who operate these machines are employees of the sub-contractor. In such a case the parent firm gets the benefit of production, if any, under one roof, without a corresponding increase in the wage bill and overhead costs.

The distinction we made in the previous section between sub-contracting and the more general type of inter-firm relationship between specialist manufacturers is particularly relevant in the context of component sub-contracting. Though conceptually it is fairly simple to differentiate the two it may not be so in actually analysing concrete situations. One may find a whole spectrum of inter-firm relationships rendering it difficult to empirically identify the sub-contracting relationship. Since the distinction we have made is a qualitative one, any set of objective criteria to identify sub-contracting without taking into account the specificity of the industry, location etc, may prove to be mechanical.

3. Factors influencing the growth of sub-contracting:

The growth of sub-contracting-or lack of it - has a rationale in the capitalist system. However the operation ^{of} purely economic logic is greatly influenced by the role of the state, the institutional framework of industrialisation and its historical antecedents. The level and the pace of industrialisation as well as the way the industrial sector is organised also have a bearing on the growth of sub-contracting. We attempt, in this section, to analyse some of the major factors affecting the growth of sub-contracting in Indian industries ^{3/}

The fundamental basis of sub-contracting relationship in manufacturing industries is the principle of division of labour and specialisation.

^{3/} The discussion here is analytical in nature and no attempt is made to substantiate the arguments. The examples cited are meant to illustrate concepts or arguments and not to be taken as substantial evidence for them.

As small firms have relatively lower labour and overhead costs it may be economical to get certain items manufactured from them. Decisions to produce components and sub-assemblies within the factory or to farm them out - known as 'make or buy' decisions - are based primarily on the relative costs of production within the factory ^{and} outside. However these decisions give due regard to considerations like the reliability of suppliers, their technical competence and the criticalness of the components for the performance of the final product.

In industries where the production process is divisible, economies resulting from specialisation could be substantial. This is particularly true of the machine building industry where a large number of small firms can specialise in a very limited range of manufacture to economise on resources. Since machine building plays a crucial role in industrialisation, productivity increase and relative cheapening of capital goods could have a multiplier effect on the pace of industrial development.^{4/}

The extent of specialisation is, largely determined by the scale of production. When the scale increases it becomes economical for a number of specialised firms to start operating which, in turn, would tend to reduce average costs (Stigler^e, 1951). However, in many cases, it is not the total volume of production alone that is crucial but the batch quantity of production as well. (Alchian, 1959). The extent of farming out would be positively related to batch quantity.

As we mentioned in the beginning the close cooperation between parent firms and sub-contractors is achieved usually by spatial concentration of factories. Firms setting up manufacturing facilities in an industrially developed

^{4/} The role of specialisation in capital goods sector has been brought out forcefully by Rosenberg (1976). Odaka (1980) in some ways, extends this reasoning in the context of labour surplus underdeveloped economies by arguing that sub-contracting enables rapid diffusion of mechanical skills.

can enlist the cooperation of the existing ~~the~~ manufacturers and minimize their capital investment. By the same reasoning facilities located in industrially¹⁰ less developed regions

region would have to invest in much greater range of facilities. The make or buy decisions of firms in backward regions will be affected by the transport costs also. This can be reflected in the size distribution of factories. In any industry average size of factories in a backward region tends to be larger than that in the advanced region. And in any region older plants tend to be of much larger size than the newer ones. (Florence, 1948)

Sub-contracting also offers large firms considerable flexibility to face market fluctuations which is of great significance in day to day business operations. Since the relationship between the parent firm and its sub-contractors is unequal, the former can pass the burden of market fluctuations on to its sub-contractors. This is done by (1) delaying payment of bills, (2) refusing to take delivery of goods and/or ^{postponing inspection of materials. Moreover as} (3) workers in small firms are relatively less well organised, it is much easier to lay them off than the workers in the parent firms. Thus, it is very likely that the real brunt of market fluctuations is to a greater extent, borne by the workers in small firms. (Friedman 1974).

Managements can use sub-contracting as a method of controlling the power of the trade unions. Since the trade unions are organised on the basis of factory firm or industry-wise solidarity, managements can circumvent this challenge by enlisting the cooperation of small entrepreneurs or even working class households. The economic logic of household enterprise seems to be such that it appears to trans~~and~~ ^{and} or negate working class consciousness.^{5/}

Since management systematically develop sub-contractors to reduce direct employment in their factories, they can concede the wage demands of

5/ In an excellent study on Italian industry, Murry (1983) shows how managements have been consciously attempting to circumvent the strength of the trade unions by 'decentralising' the production process.



their own workers and offer them greater autonomy in the work place linked to their productivity levels. Such a strategy keeps the workers in the parent firm and those of their sub-contractors effectively divided.

3.1 Labour market conditions

The arguments outlined so far assume that firms of various sizes operate in an more or less homogenous capital and labour market. The industrialisation of Western Europe and American largely occurred under such conditions.^{6/} Large firms ~~have~~ ^{had} a substantial advantage over smaller ones in the capital market as well as in the marketing of output since the economies of scale could have been considerable. Moreover the predominantly homogenous labour market gave large firms a further advantage (Steindl 1945). These firms found it profitable to have relatively more vertically integrated plants.^{7/} However the large firms derived the benefit of specialisation by multiplant operation. Therefore the role of small firms in the economy ~~declined~~ ^{declined} steadily. [Pratt, 1962]. Consequently sub-contracting as a distinctive feature of the organisation of production could not be discerned.^{8/}

^{6/} Habakkuk's (1962) detailed historical account shows how scarcity of labour was the primary reason for labour saving ^{bring in} technological change in America in the nineteenth century. The recent labour market segmentation literature shows the existence of pockets of cheap labour and the use of racial discrimination. This points to the non-homogenous nature of the labour market. However we are inclined to believe that the qualification does not seriously alter the labour scarcity argument. In spite of these segmentations the labour supply would have been far from being the labour surplus situation faced in densely populated underdeveloped countries of today.

^{7/} There is a considerable variation in plant-size distribution within European economies and the United States also. Pratt (1961)

^{8/} Boston Committee Report (1976) reporting the inadequacy of literature on small enterprises mentions the practice of sub-contracting in engineering industry. Among the earlier studies, excepting Lydell (1958) others make a passing reference to this feature see Collins et al (1954) ~~Lydell~~ (1956)
Bates et al

Sub-contracting seems to acquire a much greater significance under different capital and labour market conditions. As will be discussed below, labour surplus economies with rigidities in labour market and scarcity of capital appear to provide new arguments for its growth, over and above those discussed earlier.

Sub-contracting as we understand it today and to which we attach significance for the economic development of labour surplus economies has historically been very wide spread and has played a crucial role in the Japanese economy. The unique Japanese feature of seniority-based wage payment and life time employment in large firms since the beginning of the present century introduced rigidities in the labour market. One of the methods to overcome this inflexibility has been to cultivate the cooperation of a large number of tiny producers who faced totally different market conditions. These small enterprises while ^{faced with considerable difficulty in raising capital} had access to cheaper labour practically unprotected by labour legislations. Large firms who had much easier access to capital due to their close connections with the commercial banks provided financial assistance and raw materials to small firms in return for an assured supply of manufactured products and components. Such assistance was probably an effective method of 'tying' the tiny entrepreneurs and exercise control over them.^{2/}

^{2/} There are a number of studies ^{which have observed} this feature of the Japanese industrial organisation and its role in economic development. See Watanabe (1983), ~~Sinclair~~ (1964), Odaka (1978), Broadbridge (1966), Hirschmeier and ~~Yu~~ (1981).
Shimokawa Yui

The dense network of sub-contracting relationships is reflected in the size structure of factories. Unlike in West European economies and the United States where larger sized plants predominate, the industry-wise distribution of factories in Japan is quite even across different employment size classes. (Ishikawa, 1968)

The principle of division of labour and specialisation, which is the corner stone of sub-contracting acquires a much deeper meaning in labour surplus dual economies. The availability of very cheap labour, practically unlimited in supply provided substantially larger scope for finer and finer division of labour and farming out of production. The possibility of substitution of labour for capital - or more appropriately, very intensive use of the limited capital by applying greater amounts of labour — forms the basis for the growth of small firms. These firms use their ^{skills} ~~resources~~ intensively and in the ~~process~~ ^{process} acquire more skills to operate simple ^{and} often used and reconditioned, machines. This exerts a downward pressure on costs of production.

If this argument is valid then it follows that the growth of sub-contracting does not depend only or mainly on the labour surplus situation but on the availability of skilled labour as well. Diffusion of technical skills is a complex process which, among other things, is significantly affected by the prevalence of traditional manufacturing skills (like for example, hand weaving and handicrafts), institutional arrangement for ^a importing technical education, and the level and the pace of growth of manufacturing activities.

The growth of the trade union movement protecting the interests of the organised working class, especially in large factories, has taken deep roots in India. The state has enacted a number of laws to protect the interests of labour. Moreover over the last two decades or so the militancy of the

organised workers appears to have grown rapidly. These tendencies could not only affect the division of output between profits and wages, but could also mean a decline in managerial control over the production process.

As a response to this situation, large firms in India, like their counterparts in the developed economies appear to have consciously avoided increasing employment of workers in their factories.^{10/} Sub-contracting can not only reduce the threat from labour but also prove to be extremely economical as the wage differential between large and small firms could be very substantial. Moreover the over head costs in small firms are lower than in large firms which have to incur additional expenditure on better amenities for its employees, marketing and after-sales-service facilities, Research and Development activities etc.

3.2 The Role of Government Policies.

Active state intervention in the programme for planned economic development since the beginning of the fifties has increased the potentiality of growth of sub-contracting relationships in India. The policies affecting small firms can be classified into two: 'Positive' measures to encourage the small scale sector^{11/} and 'protective' measures to restrict the domain of large firms. A large network of institutions has come into existence to implement the state policy ^{for the} small scale sector. Moreover Government policies

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This observation is based on our discussion with a number of managerial personnel in large private sector firms.

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Firms with capital investment up to a certain limit ^{come} ~~are~~ ^{an} under officially defined category of small scale sector. The upper limit is relaxed to a certain extent for the units registered as exclusive ancillary^{ies}. This limit has gone up over the last three decades. We will describe this in detail in the next section.

have attached considerable significance to the development of small scale ancillaries in the machinery manufacturing sector as a means of saving capital investment and promotion of employment.

The most important policy for promotion of small firms is probably the fiscal policy - differential excise duty and exemptions - which is meant to increase their competitive strength. In an industry where the technology used is not very much different among firms of different sizes, other things remaining the same, a lower indirect tax on small firms provides them with a price advantage to that extent. However this advantage may be vitiated by the operations of economies of scale of large firms in purchase of inputs or marketing of output.

There are a number of related policies like supply of scarce raw materials (e.g. steel, coal etc) to small firms on a priority basis and concessional finance which, in principle, are expected to further reduce the disadvantage of small size. Although it is difficult to assess a priori the net effect of these policies on specific industries - which is a matter of empirical verification - one can hazard the proposition that the entry barrier could have been reduced as a result of these policies.

The differential taxation could have had a positive influence on the growth of sub-contracting.^{12/} With the growth of small firms, large firms can purchase items from them instead of producing them in house or purchasing from other large firms. They could also encourage new entrepreneurs to

^{12/} Bharat Bhushan's contribution in Business India dated January 16-29, 1984 clearly supports this proposition.

function as exclusive sub-contractors.

From the point of view of a large firm, purchasing from a number of small firms instead of depending on a single large supplier could not only reduce costs but also offer greater flexibility in production and inventory management. When certain lines of manufacture become well established in a region, where a fair degree of competition among the small firms exists, large firms can cease to perform that production activity in-house ^{and} farm out their entire requirement. To that extent large firms can minimize their capital investment.

An extreme example of this could be one where the tax differential, together with lower labour and overhead costs, have priced large firms out of the market. In such a situation there is a possibility for large firms to get the entire product manufactured by small enterprises and confine themselves to the marketing function alone.^{13/}

The nationalisation of commercial banks in 1969 led to the inclusion of small scale industries in the priority sector of lending. Thus availability of credit for small enterprises improved considerably. Large firms were able to take advantage of this development by cultivating sub-contracting relationship since the small enterprises could now provide them with trade credit. The parent firms can extract longer credit, from their sub-contractors by delaying payment of bills, especially in the times of recession. Hence this could offer them substantial flexibility in their financial management particularly during the regime of high interest rates. Unlike in Japan, there are no laws in India protecting the interest of sub-contractors.

^{13/} Apparently such a situation arose in the dye stuff industry during the Janata regime when the excise duty on small producers was slashed drastically.

The Government's reservation policy is another major step in favour of the small scale sector. The list of reserved items has been steadily expanding over the last two decades or so. The best example of this policy is the ^{freeze} ~~the~~ on loomage in the organised cotton textile industry which was introduced as early as in the fifties. A number of related policy measures have been in force to encourage cloth production in the decentralised sector, especially the handloom sector.^{14/} Similarly the Monopoly and Restrictive Trade ~~Practice~~ ^{Practice} (MRTP) Act, also, in a somewhat different manner, restricts investment and expansion possibilities of large firms in India.

In such a situation large firms may find sub-contracting a convenient way to circumvent the constraints imposed by rules. In the cotton textile industry ^{for example} mills in the organised sector could overcome the freeze on expansion of loomage by getting fabric woven in the powerloom sector. On the one hand powerlooms are not technologically dissimilar to those operated in the organised small sector, on the other hand since wages are probably as low as in handloom sector ^{hence the} profitability in powerloom sector could be quite high. By resorting to sub-contracting large mills in the organised sector may not only be overcoming the freeze on loomage but, as we mentioned earlier, could reduce costs of production as well.^{15/} Similarly firms coming under the purview of the MRTP Act could increase their ~~sales~~ ^{sales} without augmenting their productive capacity by getting the ^{components and} products manufactured on a contract basis.^{16/}

The reservation policy for the small scale sector seems to have opened up the possibility of product sub-contracting in a wide range of consumer

^{14/} The policy on the development of powerloom sector seems to have been ambivalent. However, the available evidence seems to suggest that powerloom sector manages to have concerned all the concessions which are meant for handloom sector. See Jain (1983).

^{15/} For details of this argument see R. Nagaraj, Bombay Textile Strike: The significance of the specificity of the Industry (1982)

^{16/} According to a well known management consultant, quoted in Bharat Bhushan's article in Business India, MRTP Act's restriction on capacity expansion is one of the main reasons for increase sub-contracting in the seventies.

goods and also, to a limited extent, in industrial products. While small firms can manufacture a number of products, and probably at competitive rates too, procurement of raw materials and marketing of output could pose a formidable problem for them. Moreover small firms may not have adequate testing facilities. In the absence of institutional support like cooperatives, small firms may be compelled to manufacture on a contract basis which specialise in marketing. Moreover the large marketing organisations may provide the necessary raw materials and quality control testing facilities.

Apparently large organisations like Bajaj Electricals, Spencer and Co., Gladstone Iyall etc having ^{an} all India marketing network have increasingly resorted to sub-contracting. ^{17/} When biscuit production was included in the list of reserved items for the small scale sector a few years ago, established manufacturers began to get it produced in the small scale sector under their own brand name. ^{18/}

A few years ago, the Government introduced the category of Export Houses as an export promotion measure. To qualify for this status a certain proportion of a ^{firm's} exports has to necessarily consist of the products of ^{the} small scale sector. As with many other measures discussed above this also promotes the linkages between large and small firms. For example, Tata Exports supplies processed leather - manufactured in their modern plant at Dewas (M.P.) - to a number of small leather goods producers who, on a job work basis, turn them into final products. Similarly it is said that a significant proportion of Hindustan Lever's export earnings are on account of products of the small scale sector.

^{17/} It is said that Bajaj Electricals Ltd., one of the leading brand names in consumer durable goods, gets mass of its requirement from about 200 small firms in Bombay and Delhi.

^{18/} According to the Chairman of ^{Brittania} Industries Ltd, as reported in his address to the share holders of the company, 34 per cent of its sales of biscuit were procured from small manufacturers.

The principal analytical issue underlying the discussion in this section can be recapitulated as follows : In a labour surplus dual economy large and small firms face different market conditions. In the market for finance large firms have greater accessibility which provides them the freedom to choose capital intensive technology, with higher labour productivity. This option is usually not available to small firms. But on the other hand, small firms have access to cheaper labour. This ~~argument~~^{asymmetry} makes it possible for small firms to co-exist with large ones, with a lower rate of profit, as long as ^{wage rates do not rise and they operate in} non-competitive markets. But if small firms want to grow the only viable option for them is to get tied to large firms as sub-contractors.^{19/} Though this arrangement could mean a lower profit margin for the small firms it provides an assured market. Various Government policies seem to strengthen the process of inter-linkages between firms of different sizes.

Moreover ^{the} sub-contracting relationship gives ^{own} ~~the~~ opportunity for small firms to acquire technical skills and managerial capabilities. Accumulation of these intangible assets could provide considerable scope for growth of small firms. Thus over a period of time a small firm could graduate from being a sub-contractor to an "Independent" producer manufacturing branded and/or patented products for the market.

3.3. Influence of the specific features of industrialisation in India

The arguments ^{presented} ~~propagated~~ so far outline the possibilities of growth of sub-contracting in India given the condition of surplus labour and the role of the Government policies. However the realisation of this potential could as we will argue below, depend upon a ^{set} ~~number~~ of other factors.

^{19/}

For a detailed mathematical exposition of this argument see
~~Miyazawa~~ (1980)

Miyazawa .

Since the modern industrialisation effort began during the colonial rule, British technology and their organisational methods were replicated in India. Even after independence technical and managerial links with Britain continued to remain very strong. As we noted earlier, the industrial organisation and technology in England evolved under quite different market conditions. Therefore industrial plants there tend to be highly vertically integrated. Since India followed their pattern, factories here tended to be similarly vertically integrated and there existed a reluctance to depend on sub-contracting. Therefore the legacy of industrial development under colonial rule could have had a negative effect on the growth of sub-contracting relationship.

The recession of the mid-sixties and the slower growth which followed has been recognised to have been a very significant development in the experience of post-independence industrialisation. The effect of recession was not uniform across all industries but the engineering industry in particular was very severely affected. In an earlier study we had outlined the specific ways in which the industrial sector was attempting to overcome the crisis of the mid-sixties. (Nagaraj, 1980). It was argued that developing sub-contracting relationship could be a very effective means of cost reduction, ~~and~~ increasing profitability and growth.

However the extent to which firms in an industry are compelled to bring down costs to protect and increase their profitability would considerably depend upon the pressure of competition. Since Indian industries appear to be very cost inefficient (Ghosh, 1982) due to lack of sufficient competition the potentiality of sub-contracting would not have been fully realised.

4. A brief review of Government policies relating to small scale sector^{20/}

Since the beginning of the planning era the promotion of small enterprises in a certain range of modern manufactures and the preservation of traditional industries have been important objectives of development policy. This was guided by the larger concern of generation of employment opportunities, broadening of entrepreneurial base, reduction of economic inequality and spatial dispersion of manufacturing activities. The heavy industrialisation strategy of Mahalanobis also clearly demarcated manufacture of consumer goods and components and sub-assemblies in machinery manufacturing for small scale production. The primary consideration for this was efficiency of production and creation of employment opportunities. The role assigned to sub-contracting in machinery building was primarily in view of its effects on the efficiency in the use of capital resources.

The task of development of the major traditional industries like hand looms, silk, coir etc are assigned to separate statutory boards/commissions. Therefore the small scale sector, as we normally understand it, refers to modern manufactures based on metal, plastics, rubber, petroleum products etc. This category also includes all other industries not covered under these boards/commissions.

By the official definition all enterprises with capital investment less than a certain limit are included under the category of small scale sector. Over the last three decades this limit has been periodically revised upwards - from Rs. 5 lakhs in the early fifties to the current figure of Rs. 20 lakhs.

Since the Government offers a number of concessions to the small scale sector this definition carries considerable significance. No license, approval

^{20/} Information presented in this section is based on the annual reports and other publications of the DCSSI.

or sanction is required to set up a small scale unit. Registration with the small industries department is also not compulsory. However it is needed to obtain other Governmental assistance.

As mentioned in the previous section, this assistance is broadly of two types : "positive" and "restrictive". The positive measures can be either "direct" or "indirect".

The indirect assistance is in the form of physical infrastructural development and a number of ~~common~~ ^{common} facilities. Over the last three decades a large number of industrial estates and related overhead facilities have been developed. A network of Small Industry Service Institutes (SISI) has been established which functions as ^a nuclei for technical assistance, dissemination of information, training, market research etc. Testing facilities have ^{also} been set up in a few cities to help small entrepreneurs upgrade their product quality.

The direct assistance is in the nature of providing entrepreneurs with concessional finance assured supply of raw materials and/or imported machinery. ^{The} National Small Industries ^{Corporation} was set up by the Central Government to provide machinery on hire purchase and assist small firms in marketing their output.

Since the development of small industries is a state subject, each state government has constituted a number of institutions to promote its growth. State financial corporations, in general, provide long term loans and risk capital. State industrial development corporations are meant to supply scarce raw materials. They also normally provide technical and managerial assistance, preparation of project reports, market surveys etc.

As mentioned in the previous section, availability of credit improved significantly for the small scale sector after the ^{leading} commercial banks were

nationalised. While the term lending institutions provide long term finance and risk capital, commercial banks mostly concentrate on short term lending.

Reserving certain products and restricting the entry and expansion of large firms have been important protective policies. During the First Five Year Plan period large established manufacturer were discouraged from producing a number of items including furniture, sports goods etc. During the Second Five Year Plan period 'Common Production Programme' was drawn for up products like bicycles, ~~sewing~~ ^{sewing} machines etc. This was intended to be a method of restricting the expansion of capacities in the large scale sector. The policy of reservation was revived during the sixties and the real thrust came during the second half of the decade. In 1965 about 45 items were included in the reserved list. The number went up to 123 in 1973 and further to over 300 items in 1982. After the MRTP Act was introduced in 1969, it has apparently become more difficult for large firms to expand their production in areas reserved for the small scale sector.

As we mentioned earlier differential taxation is probably the most important protective measure for the small scale sector. In addition to this fiscal subsidies, sales rebate are ^{also} offered to small producers. In some cases ^a special cess is imposed on the products of the large scale sector to promote small industries.

Recognising that sub-contractors in machine building may require capital intensive equipment a higher investment limit has been allowed for them. Currently the limit is Rs. 25 lakhs, ~~Rs.~~ Rs. 5 lakhs more than that permitted for the small scale sector.

Moreover, exclusive ancillaries who register themselves under this category are provided with other concessions as well, like priority allotment of sheds in industrial areas, softer loans and hire purchase terms from NSIC etc.

The Government has given standing instructions to public sector undertakings to identify the items that can be farmed out and ^{to} develop suitable sub-contractors. Some of the leading public sector enterprises like IIT, and ITI have developed ancillary estates close to their factories, helped entrepreneurs purchase suitable capital equipment and supplied orders.

Part II

Some of the evidence presented here consists of broad macro level data while the rest is confined to component sub-contracting since the information available on other forms of the relationship between large and small firms is negligible. Since sub-contracting as a distinct feature of the organisation of industrial production has not received due attention and has been inadequately understood, very little comprehensive and reliable information is available. The official data, as will be discussed below, is seriously unreliable and incomplete. Even the few individual researchers investigating the development of small enterprises in India have not focussed sufficient attention on this problem.

Therefore, as a necessary ground work for further enquiry, we have put together whatever secondary evidence we could collect. We have made use of quantitative data as well as qualitative information. Therefore the picture that emerges is necessarily fragmentary in nature. As far as possible we have commented on the nature and quality of data before putting it to use.

1. Early studies on industrial development

Most of the early studies on industrial development in India did not touch upon the question of sub-contracting. Probably **Koen's** (1959) study was the first serious, though limited, attempt to grapple with the problem. Based

on his visits to a number of factories in Bombay during, 1955-56 he observed that large firms tend to produce most of their requirement within their plants. Hence the level of sub-contracting was very low.

" One of the facts that strikes the observer of Indian manufacturing industry is the small amount of sub-contracting within the present industrial picture.... but in India the larger engineering firms usually produced almost all the parts of a machine within their own factory, importing any other part needed.

△ Rosen, 1959, p.1847 .

On the basis of his study of small firms in Delhi, Dhar (~~1958~~) concluded that "Indian manufacturers preferred integrated plants as they were easily available on imports with or without foreign aid" (Dhar, 1958). James Berna arrived at a similar inference from his study of entrepreneurship in South India. He found that even the smallest metal working unit had their own foundries although these were utilized only for about three months in a year (Berna, 1958).

The Japanese delegation on small scale industries, which visited India in 1959 to recommend policies for small industries had a similar story to tell:

"...the development of ancillary plants leaves much to be desired because big industries in India generally possess facilities that can produce all the goods they require. Moreover the technical standards of big industries for exceeds that of small industries" △ Report of Japanese delegation on Small Scale Industries, 1959, p.807

In 1959, the Engineering Association of India, the then leading association of major engineering firms, conducted a survey of all engineering units employing 20 or more workers with power to obtain a detailed statistical account of the industry. The report said: "the level of sub-contracting is very low and the progress made so far in this direction, barring some notable

exceptions; has been negligible". (Engineering Association of India, 1961, p.19). It further quoted from the Draft outline of the third five year plan to substantiate this claim:

"No significant progress was however, made in developing small scale units as ancillary to large scale units, in bringing about dispersal of industries and in working out common production programme."
 [Engineering Association of India, 1961, p.19]

In the late sixties, surveying the literature on small scale industries in India, Fisher also found that very little was achieved in developing sub-contracting in manufacturing industries.

"Whatever the proper view towards the ancillary as a constraint, it is clear, in practice, that little has been done in the various plans to promote their development. The Third plan takes a strong position but has little to offer; as a constraint suggesting a definite case for small units, the ancillary is not (yet) important in India".
 [Fisher, 1969, p.141]

It is very evident from these remarks that sub-contracting was very little developed till around the early sixties. Now we present evidence for the recent period.

2. Changes in factory concentration : 1950 to 1979:

Change in the size distribution of registered factories - as measured by the average number of workers per factories - shows a very interesting trend which has apparently gone unnoticed. Between 1950 and 1970 the average size of factories has declined in all the major industry groups with the exception of beverages, chemicals and chemical products and electrical machinery. (Table1). Admittedly this is quite an inadequate measure of factory concentration. But Sandesara's (1979) detailed study for the same period using more appropriate statistical techniques also unambiguously indicates a similar trend.

Table 1

Average size of factories - industry -wise,
1950 and 1970

Industry	Number of workers per factory	
	1950	1970
1. Agricultural processes	62	59
2. Food (except beverages)	58	26
3. Beverages	53	73
4. Tobacco	408	147
5. Textiles	598	249
6. Foot wear	140	111
7. Wood and cork (except furniture)	41	17
8. Furnitures and fixtures	63	35
9. Paper and paper products	249	134
10. Printing, publishing and allied industry	54	35
11. Leather and leather products	87	55
12. Rubber and rubber products	288	107
13. Chemical and chemical products	111	114
14. Products of petroleum and coal	280	112
15. Non-metallic minerals	141	83
16. Basic metal industries	167	129
17. Metal products electrical m/c	53	50
18. Machinery (except electrical m/c)	71	62
19. Electrical machinery, Apparatus, appliances	153	158
20. Transport equipment	268	164
21. Miscellaneous industries	184	67
Total	141	73

Source: Statistics of Factors, 1950 and 1970

Table 2

Number of workers per factory industry wise 1971-79

	1971	1972	1973-74	1974-75	1975-76	1976-77	1977-78	1978-79
20-21 Food Products	23	24	42	54	57	58	59	55
22. Beverages, Tobacco and Tobacco products	122	140	85	90	65	44	44	43
23. Cotton textiles	243	256	160	167	108	148	144	147
24. Wool, Silk and Synthetic Fibre Textiles	76	81	56	53	51	48	54	49
25. Jute Textiles	931	933	575	692	1312	1112	1063	969
26. Textile products	57	59	33	36	31	34	34	31
27. Wood and Wood products, Furnitures & Fixtures	16	17	21	19	18	16	16	16
28. Paper and Paper products and Printing, publishing and allied industries	45	49	52	49	46	42	45	41
29. Leather and leather products	85	84	63	56	38	56	54	61
30. Rubber, Plastic, Petroleum and coal products	70	67	49	45	42	35	38	43
31. Chemical and chemical products	110	112	77	73	67	64	61	60
32. Non-metallic mineral products	82	83	63	60	50	46	45	46
33. Basic metal and alloy industries	118	118	85	73	81	72	73	76
34. Metal products	40	40	32	30	25	25	26	24
35. Non-electrical machinery	72	76	51	50	45	42	43	42
36. Electrical mfc, apparatus and appliances	154	159	76	77	75	71	68	67
37. Transport equipment and parts	248	247	192	184	127	114	111	116
38. Other manufacturing industries	48	50	32	32	31	24	26	27

Source: 1. Statistics of Factories, 1971 and 1972

2. Annual Survey of Industries, Summary Results for Factory Sector, Various Issues.

Table - 3Distribution of factories by size of Employment

Year	Percentage of factories to the Total		
	Employing less than 50 workers	Employing 50 or more, but less than 500 workers.	Employing 500 workers and more.
1953	75	22	3
1954	76	21	3
1955	75	22	3
1956	75	22	3
1957	75	22	3
1958	77	20	3
1959	78	19	3
1960	78	19	3
1961	78	19	3
1962	79	18	3
1963	79	18	3
1964	79	18	3
1965	79	18	3
1966	80	17	3
1967	81	17	2
1968	81	16	3
1969	81	16	3
1970	82	16	2
1971	82	16	2
1972	82	15	3

Source: Statistics of Factories, various issues

Table -2 suggests that this trend continued in the seventies as well.*

The three industry groups that registered an increase in average size during 1950-70 also declined in the subsequent decade.

Another indicator of this trend is the proportion of factories employing less than fifty workers. This has gone up from 75 per cent in 1953 to 82 per cent in 1972 (Table-3). Correspondingly the percentage of factories employing 50 to 499 workers has come down from 22 to 15. One is very conscious of the shortcoming of the percentage distribution of factories.

Changes in the employment distribution in different size classes of factories is ^a ~~no~~ more appropriate measure. But, since the extent of underreporting of employment appears very substantial, as has been repeatedly shown by a number of studies, this measure is unlikely to prove to be a better indicator of the change in distribution.

The decline in factory concentration could indicate the growth of sub-contracting. However it may not actually be so. Though it is a necessary condition it is far from being a sufficient one. Increase in capital employed per worker could have had the opposite effect. However in the light of the observed vertically integrated nature of Indian plants in the fifties the steady decline would strongly suggest an increase in sub-contracting and more general forms of inter-firm linkages as well.

But we are aware that the decline in factory concentration does not necessarily mean a similar trend in the firm concentration and growth of inter-firm transactions. It could well be the growth of multiplant operation, and intra-firm trade. No ~~data~~ ^{data} is available to check the validity of

* Since factory statistics data for the seventies was not readily available. Sandesara's statistical exercise could not be extended.

this argument.

However such a proposition would mean, relative to the increase in industrial output a faster growth of output of large firms. And hence an increase in firm and industry level concentration. The available evidence on the concentration of output among large firms and large monopoly houses does not show any increasing trend. Nag's (1982) detailed statistical analysis does not show any clear indication of an increase in the share of top 100 companies in manufacturing output. There is no clear trend in the concentration of output contributed by the top 20 business houses either. (Chandra, 1979). Moreover the share output of firms coming under the purview of MRTP Act has declined over time (CMIE, 1982). Therefore the proposition that the decline in factory concentration could mean growth of multiplant operation and intra-firm transactions is difficult to sustain. Thus one can infer somewhat more safely the growth of inter-firm^{transactions} and vertical disintegration of factories.

3. The official data:

Development commissioner, Small Scale Industries (DCSSI), the apex body of the Central Government for promotion of this sector, regularly publishes data on the number of registered small scale units, capital invested employment and output. This corpus of information has several limitations. The figures on the number of enterprises and capital employed refers only to the units which have registered themselves with the respective State Industrial Development Organisations. As registration is not mandatory for most of the industries, the unregistered units which apparently form a sizable segment are totally left out. Since the upper investment limit for qualifying as a small scale unit has been going up the increase in numbers does not necessarily mean growth of new enterprises and fresh capital investment. Moreover the figure on the number of registered units is a cumulative total over the years which is not adjusted for the enterprises which cease to function. There is no evidence on the mortality

of small firms, which could be considerable in Indian conditions - to correct for this error.

The output estimate is apparently based on one present sample survey. But no details of the sampling procedure and the estimation method is furnished in any of their publications. It appears that these figures are generated mainly for the official use of the department and therefore their reliability is suspect.

Table - 4 Growth of Small Scale Sector in India (in Rs. crores)

	No. of registered working units (000)	Value of Production (in current prices)		Total value of product at 70-71 prices	Percentage increase
		Registered units	Unregistered units		
1972	N.A.	2900	2160	4410.54	
1973	160	3420	3090	5005.24	13.48
1974	216	4930	4270	5707.26	14.03
1975	239	5740	5260	6683.13	17.10
1976	260	6700	5700	7350.32	9.98
1977	287	7570	6430	7750.82	5.88
1978	321	8500	7200	8420.72	8.20

Source: Development Commission, Small Scale Industries, New Delhi

Keeping these limitations in view we examine the trends in the growth of small scale sector in the seventies. (Table - 4) The increase in output, even at the constant prices, appears impressive.

The growth of ^{the} small scale sector need not necessarily imply increasing sub-contracting relationship. In fact the proportion of exclusive ancillaries in the total number of registered small units is almost negligible. In the Reserve Bank of India's sample survey of 1976-77 it was 2 per cent. And in 1979 National Small Industries Corporation's sample survey the proportion was 6 per cent. (Nagaraj 1981, 1983) The official figures on the value



of components purchased from ancillaries by public sector undertakings, though increased considerably-is very small as a proportion of their output. (Table -5) This information is often quoted, in popular literature, to support the view that sub-contracting has failed to grow in Indian industry.

Table - 5

Year	Number of ancillary units	Purchase from ancillaries by public enterprises in Rs. crores	Purchase from ancillaries as of GDP from public sector
1974-75	432	29.31	1.93
1975-76	479	36.36	2.19
1976-77	508	43.84	2.24
1977-78	550	80.51	3.81
1978-79	805	96.44	4.04
1979-80	868	110.92	---

Source: Association of Indian Engineering Industry, (1982).

However such an inference could be inaccurate since the data refers to the value of goods from the exclusive ancillaries units. Since a sizable proportion of small firms undertaking sub-contracting work do not register as exclusive ancillaries the above data is an under estimation. Registration as an exclusive ancillary offers no particular advantage except that the upper limit for investment is relaxed to a certain extent. On the contrary, small firms may consciously avoid acquiring this status and cultivate a larger number of customers to reduce risks and fluctuations. It is possible that parent firms may not welcome this either since they do not want the sub-contractors to get wiped out during business fluctuations.

One could argue that it is in the long term interest of large firms to recognise their self interest in the survival and growth of small enterprises which provide cheaper production facilities.

Table 6

Establishment of sub-contracting exchanges

(i)

Year	Centre
1970	Madras, Bombay
1972	Calcutta
1974-75	Ahmedabad, Jaipur, Bangalore, Hyderabad, New Delhi
1975-76	Ludhiana, Kanpur
1976-77	Palmer, Indore, Trichur, Cuttack
1978-79	Gauhati, Srinagar

Source: Association of Indian Engineering Industry (1982)

(ii)

Performance of sub-contracting exchanges

Year	No. of units registered with sub-contracting exchange	No. of cases of small scale units assisted by the exchange
1975-76	955	4510
1976-77	1331	1561
1977-78	1223	4152
1978-79	1448	5329
1979-80*	624	4209

* Incomplete

Source: Office of the Development Commissioner, Small Scale Industries.

Sub-contracting exchanges as an institutional mechanism of promoting linkage between large and small enterprises were established in the seventies.

The growth in the number of such exchanges and the number of units registered with them can be another indicator of the growth of sub-contracting. However this is a partial measure since it does not reveal the number of firms actually making use of this facility and the magnitude of the transactions involved. While only two sub-contracting exchanges existed in 1970, at Bombay and Madras, the figure went up to 16 in 1979. (Table 6). Correspondingly the number of enterprises registered with these exchanges increased from 955 in 1975-76 to 1448 in 1978-79.

3. Age distribution of small scale units:

This can be another measure of the growth of the small scale sector. But it has a number of limitations. Age distribution cannot account for mortality of enterprises, which could be significant in Indian conditions. To that extent it under estimates the proportion of the older units. Moreover the age distribution does not reveal anything about the growth of value of output which is of greater significance for our purpose.

Data in Table 7 to 9 provides industry-wise temporal distribution for three points of time in the seventies.^{21/} According to Table 7 52 per cent of all the registered small enterprises commenced production between 1966 and 1972. Excepting in a few industry groups in most of them this ratio is over fifty percent.

Data in Table 8 pertains to 169 industries disaggregated at 3 digit National Industrial classification based on a sample survey of small manufacturing enterprises. As the age distribution data is available in percentage terms and not in actual numbers we could not present the information as in the previous table. Table 8 provides distribution of industries

^{21/} The three temporal distributions are based on three different sources with varying coverage and conducted by different agencies. 1972-73 data is based on all India Census of small scale units conducted by DCSSI, 1976-77 data on Reserve Bank of India's sample survey of small enterprises assisted by commercial banks and 1979 data on much more restricted sample survey of enterprises in the plastic and metal engineering industries conducted by National Small Industries Corporation.

according to proportion of total number of firms in each industry commencing production in each period. It shows that during 1951 to 1965 the number of industries in which more than 50 per cent of the units started production was only 22. But the same indicator for the period 1966-76 is 134. In other words, out of 169 industries, in 134 industries more than 50 per cent of the units commenced production between 1966 and 76.

Table 7

Agewise, industry-wise distribution of Units
Based on the census of Small Scale unit 1972-73

Industry	Percentage of units set up				
	1951 and before	1951-55	1956-60	1961-65	1966 and after
1. Food Products	10	5	10	18	57
2. Beverages	16	4	10	19	51
3. Hosiery and garments	12	6	13	17	52
4. Wood products	8	5	13	20	54
5. Paper products and printing	14	6	11	19	50
6. Leather and leather products	21	9	18	19	33
7. Rubber and plastic products	5	3	8	15	69
8. Chemicals	13	6	12	18	51
9. Glass and ceramics	9	4	10	18	59
10. Basic metal industries	9	4	12	21	54
11. Metal products	15	6	13	19	47
12. Machinery	8	4	12	22	54
13. Electrical machinery	5	4	13	22	56
14. Transport equipment	10	6	14	22	48
15. Others	10	6	15	24	45
16. Job work, repairs and service	8	5	11	20	56
All Industries	12	5	12	19	52

Source: Report on Census of Small Scale Industrial Units, Vol I & II
 Government of India, DC, SSI, 1977.

Table -8

Distribution of industries (3 digit ^N SIC) according to proportion of total number of firms in each industry commencing production in each period

Percentage of all firms in each industry commencing production	1951-65	1966-76
0	11	5
1 - 10	26	5
11 - 20	31	1
21 - 30	43	5
31 - 40	22	13
41 - 50	13	17
51 - 60	11	16
61 - 70	4	31
71 - 80	2	27
81 - 90	0	29
91 - 100	6	21
Total number of industries	169	169

Source: R. Nagaraj : Growth and Structure of Small Scale Industries in India : Some Findings . 1981 (unpublished)

Table - 9 Age-wise, industry-wise distribution of the
Sample small enterprises

N .I Code	Industry group	Number of the sample units commencing production during		Total
		1951-65	1966-79	
30	Mfg. of rubber, plastic, petro- leum and coal products	45 (19.31)	187 (80.26)	233
33	Basic metal and alloy indust- ries	68 (33.33)	120 (58.82)	204
34	Mfg of metal products	227 (30.35)	501 (66.98)	748
35	Mfg of machinery and machine tools	117 (34.41)	206 (60.59)	340
36	Mfg of electric equipment and machinery	69 (28.75)	166 (79.17)	240
37	Mfg of transport equipment	62 (40.26)	84 (54.55)	154
Total		588 (30.64)	1264 (65.86)	1919

Source: R. Nagaraj: Some characteristics of Small Scale Industries in
India: Some further results 1983 (unpublished)

Note: The percentages as well as the rows do not add up to totals. This is because the enterprises established before 1951 are excluded, which account for 35 percent of the sample units.

Table 10 Age distribution of factories under ASI

Year	1973-74	1976-77	1978-79
Before 1950	20.4	14.8	13.8
1951-55	7.4	5.3	4.8
1955-60	14.1	9.9	8.2
1961-65	18.7	13.8	12.4
After 1965	32.4	44.4	48.8
Unspecified	7.1	11.8	12.0 [@]

Source: Annual Survey of Industries, Summary ^{Results} ~~Statistics~~ for Factory Sector, Various Issues.



survey conducted in 1979

Table 9 which is based on a very much smaller sample ^{also} indicates a similar trend. About two thirds of the sample units came into existence after 1966. Thus on the basis of the information on age distribution it can be inferred, though not conclusively, that the small scale sector has grown relatively at a faster rate after the mid-sixties.

It would be interesting to compare the age distribution of small scale enterprises with those of the factory sector. Table - 10 presents age distribution of factories covered under ^{the} Annual Survey Industries for the years 1973-74, 1976-77 and 1978-79. A comparison of them with those for small scale sector (as given in Tables 7 to 9) for the corresponding years shows that the proportion of enterprises commencing production after 1966 is much higher in the small scale sector than the factory sector. Thus it suggests that the growth of small scale sector has been relatively faster after the mid sixties than the factory sector. Since a large proportion of small scale sector (these ^{employing} \angle more than 10 worker) are included in the factory sector the above result suggests that the number of small factories is increasing at a faster rate than larger ones.

Our earlier analysis (Nagaraj, 1983) of marketing behaviour of small enterprises based on the National Small Industries Corporation's (NSIC) all India sample survey revealed that a majority of them produced intermediate products and sold directly to bigger units in public and private sectors. Only a small proportion of these units sold their output to distributors and agents. However this exercise was also not quite satisfactory since it does not provide data ^{the} on value of goods sold through different marketing channels.

The detailed examination of four digit product classification of the NSIC data revealed that a large number of small metal engineering firms, which are invariably not registered as ancillary units, undertook work like

machining fabrication etc on contract basis from large firms. This reveals the sub-contracting nature of the relationship between large and small firms.

Although the evidence adduced so far does seem to suggest an increasing trend towards sub-contracting in Indian manufactureries, it does not seem to be sufficient to hazard a generalisation. One way to overcome the problem of lack of aggregated data is to supplement it with micro level studies of specific firms, industries, and regions, to find out if they provide any further insights into the issue.

4. Case-studies:

In an excellent study on vertical inter-firm linkages in the truck manufacturing industry in India, Lal (1980) pointed out that the levels of bought-out components among the two producers - Tata Engineering and Locomotive Company Limited (TELCO) and Ashok Leyland Limited (AL) - is comparable to the levels attained in the developed countries. However between the two producers there is a considerable difference : while AL's bought out components formed 59 percent of the value of the truck, it is 35 percent for TELCO. Like the manufactures in the developed countries, these firms make a strict distinction between 'traditionally made in-house' and 'traditionally bought out' items. The latter is supplied by the auto-ancillary industry. It is in the former that sub-contracting is resorted to for manufacturing relatively simpler components which were earlier made in-house. Over the years components were farmed out to small sub-contractors to take advantage of their lower costs of production. Lal's survey shows that the wages in sub-contractor's firms are about half of those prevailing in AL and TELCO. In addition to the cost consideration, growth in sub-contracting is caused by the policy of the reservation of an increasing large number of items for production in small scale sector. However this is not implemented very strictly.

A study of industrial development of Jamshedpur, (Gupta, 1980) - one of the oldest industrial centres in India where Tata Iron and Steel Co.Ltd., (TISCO), TELCO, and many ^{other engineering firms are located - shows that} over three-fourths of the sample of small firms employing less than 30 workers started in the seventies.* (Table-11) Over 80 per cent of the firms employing less than 10 workers, and over 60 percent of the units employing 11 to 30 workers, manufactured against orders and they did not produce for the market. Most of them sold their output to large units located in Jamshedpur and only a very small proportion of them were dependent on orders from one parent firm.

70 percent of the sample units are engaged in steel manufacturing like casting, forgings, and machine parts; out of these more than half produced parts for the automotive industry. Though Gupta does not state it explicitly, it appears from the study that TELCO is the major buyer from these small units. If this inference is correct, then it is interesting to note that although TELCO has been in existence since 1946, it is only in the seventies that the firm increased its purchase from small scale units.

Table 11: Percentage Distribution of Industrial Establishments at Jamshedpur according to the year of starting operations Medium and small sector only

Year of starting	Size of industrial establishment measured by number of employees						All categories.
	Below	10-29	30-99	100-499	500 and size not above	known	
1939 or before	-	-	-	-	-	-	-
1940 - 47	2.7	2.7	-	-	-	-	1.6
1948 - 55	2.7	2.7	8.3	-	-	-	4.0
1956 - 65	8.1	10.8	16.7	25.0	-	14.3	12.8
1966 - 70	10.8	5.4	8.3	12.5	-	14.3	8.8
1971 or after	75.7	75.7	63.9	62.5	-	42.9	69.6
Data not available	-	2.7	2.8	-	-	23.6	3.2
TOTAL	100.0	100.0	100.0	100.0	-	100.0	100.0
No. of cases analysed	37	37	36	8	-	7	125
Source	Gupta (1980)						

* Unfortunately the study does not mention the procedure for selecting the sample enterprises.

Papola and Mathur's undertook a study of inter-sectoral linkages in the metal engineering industry in Kanpur (NIC 33 to 37), one of the older industrial centres in India. They define small, medium and large firms in terms of the number of workers employed: up to 10 workers, small; 10 to 50 medium 50 and above, large. Unlike other major centres in India, Kanpur does not seem to have a very large metal engineering works employing, say, over 1000 workers. In this study they have only two firms employing more than 500 workers.

Posing the problem within the framework provided by Watanabe, Papola and Mathur find very little technological linkages; though market linkages (sub-contracting) are quite prevalent. It is not difficult to see the reason for poor technological linkages. It is quite likely that the large firms in Papola's sample, with an average size of 60 workers, are technologically backward units which may, in turn, be sub-contractors. Intuitively, one would expect technological diffusion in a situation where the parent firm is rapidly expanding with technological advancement.

However it is interesting to note that even these "large" units ^{in this study -} which in popular parlance would be categorised as small or medium scale firms - also farm out production to get smaller units (employing less than 10 workers, which do not come under the purview of the factories Act). It seems to suggest that there could be not just one, but several layers (or stages) of sub-contractors (sub-contracting) between the final user of the component and its actual producer. The reasons for sub-contracting given in the study are : (i) lack of required machinery, (ii) seasonal excess demand and (iii) avoidance of employing additional workers for fear of attracting the application of more labour regulations.

The temporal distribution of the sample units shows that fewer than 50 per cent of the units were less than 10 years old. The proportion for larger units was 40 percent. These results are not inconsistent with our

earlier analysis of the age distribution of small scale enterprises. However they do indicate that in Kanpur a good proportion of small units have been in existence for a much longer period of time and it is difficult to speak of an acceleration in the recent past.

There is another set of case studies which focuses on the greater exploitability of labour in the small scale units and in the unorganised sector. This fact is very effectively made utilised by large scale enterprises through sub-contracting relationships. In a detailed case study of the ancillarisation programme of a large public sector engineering enterprise,^{22/} it was found that the cost reduction was achieved mainly by exploitation of cheap labour in the small scale units and not through the principle of division of labour and specialisation. ^(NSIC, Undated) The study reveals that the parent firm had provided little assistance to the ancillaries, nor did it make any formal long term commitment regarding pricing, workload, price escalation clause etc. It did not make prompt payment of bills. But it is interesting to note that inspite of such an "unequal" relationship between the parent firm and the small entrepreneurs, the latter's profitability seems to be so high that they relax in "air-conditioned comfort".

Therefore the brunt of the cost reduction in the ancillary units falls directly on the workers since all labour laws are violated. The study provides the following data to show that the wages paid are above the minimum prescribed wages according to the old notification but are lower than the new one. The study also suggests that the entrepreneurs are unlikely to agree to the revised minimum wages unless the trade unions agitate for it.

^{22/} The name of the ~~company~~ company has been withheld.

It also discusses how labour laws are violated.

Employee	Present wage (Rs)	Minimum wage as per old notifi- cation. (Rs)	Minimum wage as per new notification (Rs)
Shaper	250	183	260
Helper	100 - 150	170	250
Learner	125 - 175	125	200
Watchman	100 - 225	170	250

This argument is well summarized by the study in the following words

"It is a sharp contrast to observe the ancillary entrepreneur relaxing in the air-conditioned comfort while evading registration of his factory, to avoid providing his labour with the barest minimum of facilities. The Government policy of encouraging entrepreneurship by subsidizing the benefits given to entrepreneurs is contrary to the declared objective of decentralizing economic power. The ancillary entrepreneurs may be educated unemployed, but the very fact that they own the expensive commodity, education, is generally proof that they belong to the elite. The profits of the ancillaries go to line the pockets of the ancillary entrepreneurs; and thus the cycle of economic power circulating in the hands of a minority continues. In other words, while such policies are followed, poverty will remain inherent to the system." (National Small Industries Corporation, mimeo).

~~■~~ In his study of small industries in Coimbatore, one of the growing industrial centres where a large number of spinning mills and two major textile machinery producers are located, Harris ⁽¹⁹⁸²⁾ found that a large proportion of the engineering units are sub-contractors. Harris says:

"...45 per cent of the registered workshops and 35 per cent of the whole sample are engaged in sub-contracting in which they put their own materials; and that totally just over half of the full sample are engaged in some form of sub-contracting. Nine units (10 per cent) are engaged in one form or another of 'tied' sub-contracting, with a single parent firm,....As many as 37 units (over 40 per cent of the total) are actually engaged in sub-contracting relationship with 'large scale' factory industry." (Harris 1982, p.982).

Table 82

Specialised Activities of Workshops

Registered as SSI	No. of units	Unregistered (Workshops and PCP)	
Sub-Contractors			
Textile mill spares	(2)	Electro-plating	(1)
Sheet metal parts and pressings	(1)	Plastic parts	(1)
Plastic parts	(2)	Sheet metal parts	(2)
Castings	(7)	Machined parts	(2)
Structural metal fabrication	(1)	Aluminium and gun metal casting	(3)
		Castings	(3)
		Glass-fibre tanks	(1)
Tied sub-contractors			
Casting	(1)	Machined parts	(1)
		Sheet-metal parts	(1)
		Textile mill spares (via a trader)	(1)
		Machined parts	(10)
		Patterns	(2)
Job-work	(1)	Machined parts	(6)
Tied job-work		Castings	(2)
Chain assembly		Sheet metal parts	(1)
		Patterns	(1)

Source : Harris (1982)

13
 Table ~~(13)~~ Daily wages of 185 workers in 12 light
 Industrial Enterprises in Bulsar and Pulsar Talu~~ka~~
in 1974

Daily wages (Rs)	No. of workers	Percent	Cumulative percent
Less than 2.00	5	2	3
2.01 - 3.00	45	24	27
3.01 - 4.00	36	19	46
4.01 - 5.00	39	21	68
5.01 - 6.00	26	14	92
6.01 - 7.00	11	6	88
7.01 - 8.00	7	4	92
8.01 - 9.00	3	2	94
More than 9.00	8	4	98
Unknown	5	3	
Total	185	100	100

Source : Street^k ~~Area~~ (1981) p - 665

The product description (Table 12) shows that most of the sub-contractors undertook simple machining operations or manufacture of simple metal or plastic components. One of the interesting findings of this study is that the larger engineering firms in Coimbatore encouraged their skilled workers, especially those employed in the machine shop, to start their own workshops. Parent firms supply sub-contractors with orders and, at times, raw materials also. According to Harris, this is an effective way of reducing labour costs and increasing control over the labour process. However he also says that this may not be true of all the firms. In many cases sub-contracting is encouraged to save on capital expenditure and to utilise the specialised knowledge and skills of the small firms. This is especially true of the foundry industry.

Streefkerk's detailed account of the characteristics of small industries and labour conditions in Bulsar, one of the very rapidly growing industrial towns in Gujarat fairly close to Bombay, shows that the growth of the light industries is closely linked to large scale units.

"A number of industrial firms in Bulsar are closely associated with large industrial concerns. Thus, we might speak of an integration of modern light firms into industrial structure, an integration marked by social and economic sub-ordination with respect to the larger concerns. This association allows these latter firms to supply themselves with relatively cheap parts and to contract out certain phases of the production process." (Streefkerk, 1981, p.666)

The study does not give any further details on the relationship between large and small firms. It's ^{firms} ~~focus~~ is on conditions of labour and labour relations ^{in the area studied.} ~~in the area studied.~~ revealing It is ^{to} ~~to~~ note how the small units consciously avoid registering under the Factories Act and how the bureaucracy works hand

in glove with these entrepreneurs to deny the workers the stipulated minimum wages. Further safety regulations are violated and minimum facilities are ^{not} provided at the workplace.

(Table-13)

The following data shows the wages received by the sample of workers. Further, Sreefkerk, says;

"The wages are low, their working days is often longer than 8 hours, and they receive no paid holiday. They work in small firms having between 5 to 30 workers which are dangerous and unhygienic, with poor lighting, inadequate ventilation and too many machines in too small an area. There is no question of any profit sharing programme or other benefits" (Sreefkerk, 1981, p.663).

In addition to the case studies discussed above of a specific industry or region some data and descriptive accounts of sub-contracting is available for certain public and private sector enterprises. Appendix - 1 provides information for 55 public sector plants for the year 1977-78. It is interesting to note that the captive units (or exclusively ancillaries) of form only a low proportion of the total number of the small units from whom the public sector plants buy their supplies. This supports our earlier argument that the insignificant number of exclusively ancillary units underestimates the levels of subcontracting reached in Indian industry.

The Bombay Chamber of Commerce and Industry collected information on the assistance provided by their members for the growth of the small scale sector. It was presented in a seminar organised by them in 1979. The summary of the results are given in Appendix 2. Though the information is incomplete in many respects and the firms for which the data is available cannot be considered as representative, the data is nevertheless very revealing. Firms belonging to a wide range of industries - metal engineering and chemicals - have developed sub-contractors. But the majority of work done by the small

units consist of machining, fabrication, manufacture of components, plastic moulding, assembling etc. - all of which are apparently labour-intensive involving simple technology. Most of the parent firms offer some kind of technological guidance, though very few of them provide financial assistance. The situation in these units is quite different from what Papola noticed in the metal engineering industries in Kanpur. This data seems to support our view that technological linkages are likely to be strong in a situation where parent firms are large, growing and technologically dynamic units.

We now present data for two tractor manufacturers which gives us insights into the logic of large scale sub-contracting. Escorts Ltd., (Sales Rs. 223.39 crores in 1982) is one of the large, diversified and very rapidly expanding engineering concerns mainly producing tractors, motor cycles, automobile ancillary and a number of items for the railways. It is one of the firms which consciously promoted sub-contractors right from its inception. Escorts News, the house journal states that "During the past 10 years, Escorts' total purchase from ancillary industries has risen from Rs. 10 crores to Rs. 70 crores". In 1981 Escorts had 3010 sub-contractors with the following size distribution.

<u>No. of employees</u>	<u>No. of Units</u>	<u>Proportion of the total</u>
Upto 50	2197	73.0
51 - 100	602	20.0
101 - 500	151	5.0
Over 500	60	2.0
<u>Total</u>	<u>3010</u>	<u>100.0</u>

This data shows that nearly three-fourths of the ancillary units are small ones employing fewer than 50 workers. Though these figures do not tell us

anything about the distribution in terms of the total value of goods supplied, they do nevertheless point to the significance of small sub-contractors. The management very proudly claims this to be evidence of the success of their "Corporate philosophy"²³ ~~4~~.

"Nowhere has Escorts' philosophy of interdependence been more graphically illustrated than its continuous support to ancillary industries during the last 20 years. Over 3000 ancillary industries, making over 500 different components for tractors etc. have been vital factor in Escorts' rapid growth over the past decade". (Escorts News, 1981).

Eicher Goodearth Ltd. is one of the ~~best~~ ^{core} entrants into the tractor industry. Compared to the other firms in the industry the extent of sub-contracting in this firm is apparently ~~high~~ ^{very high}. The proportion of bought-out parts forms about 81 per cent of the value of sales, excluding the excise duty. Even if the contribution of "traditionally bought out" components - which are never manufactured by any tractor producer - is excluded, the supplies from small sub-contractors amount to 30 to 40 per cent of the value of the tractor (FICCI, 1981). The management attributes the lower price for its comparable range of tractors to its efficient ancillary development programme. (Business India, Feb. 2-15, 1981). Eicher Goodearth is now setting up an ancillary estate consisting of 80 units in Kalka. (FICCI, 1980).

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~~4~~ The logic of ancillarisation at Escorts is very neatly summarised in a popular article: "Ancillarisation has been perfect strategy for generating funds for investment: all sales are against cash but the company get 30 days credit from suppliers. Result: most years the company does not need to go to a bank for working capital and in fact has a credit balance. This saves crores in interest charges: money that can be invested for growth. Increase in tractor capacity from 20,000 to 34,000 will be financed entirely through company's own funds". [India Today, July 31, 1982, p. 103].

Conclusions

To, recapitulate, the analytical issues dealt with in this study are (i) to understand the meaning of sub-contracting and its distinction from more general inter-firm relationships, (ii) to outline the various forms of sub-contracting in different types of industries, and (iii) to analyse the logic of sub-contracting especially in the Indian context.

We have attempted to show that although the element/exploitation of cheap labour in sub-contracting undoubtedly exists, it is far from an adequate explanation of the growth of this relationship between large and small firms in Indian industry. Our effort in this study has been to bring out the complex set of factors which influence sub-contracting, like the role of Government policies, the nature of production technology, the level of industrial development and the historical background of modern industrialisation.

Our attempt at documenting the changes in sub-contracting in Indian industry, though lacking in detailed statistical account at the macro level, does suggest a considerable growth. While in the fifties large enterprises believed in manufacturing as many components in-house as possible, the situation has distinctly changed in recent times. Now firms consciously minimise their capital investment by promoting sub-contracting. In addition to taking advantage of specialisation and division of labour, the promotion of sub-contracting is largely guided by two considerations : lower labour ^{and overhead} costs in small firms and restricting in-house employment of workers to minimize the potential threat from organised labour.

The parent firms seem to provide some sort of technical guidance but very little financial assistance. On the contrary sub-contractors extend trade credit to parent firms ranging from 30 to 90 days. Though exclusive auxiliaries are provided with some additional concessions by the Government it appears that

neither the parent firms nor sub-contractors prefer this exclusive status.

The fact that sub-contracting has increased since the mid-sixties suggests that the growth of this relationship could have been in response to the recession of the mid-sixties and the slower growth of manufacturing output in the subsequent period.

Although the evidence marshalled in this study appears substantial in actual fact it lacks in detail. Except in providing a broad view of the changes we know precious little about how sub-contracting is organised and the logic of its growth. Among the case studies only three, namely, Lal (1980), Papola and Mathur (1979) and NSIC (undated) have attempted to understand sub-contracting in any detail. In the remaining studies the issue of relationship between large and small firms is incidental to the main focus of their enquiry. Moreover even the three studies mentioned above examine sub-contracting narrowly in terms of either (i) linkages between the formal and the informal sector or (ii) diffusion of technology or (iii) exploitation of cheap labour.

On the basis of our discussion in part I of this study we find that these investigations have focussed the problem rather narrowly on only a few dimensions. Sub-contracting has to be understood as an integral element of the growth strategy of the firm in the larger context of the organisation of production and industrial change. The role of Government policies, especially in India, could have played a crucial role in promoting sub-contracting.

In the light of the above discussion we think a number of questions have to be answered. First and foremost, we need to have ^a more sound empirical basis to assess the extent of growth of sub-contracting in different industries in different regions. Second, how it is organised and the factors which have promoted or inhibited its growth. More precisely to what extent it is influenced by the specific nature of the product and its market conditions; its

characterisation as public or private sector; the development of infrastructure in a region and Government policies. Thirdly, how sub-contracting leads to diffusion of technical skills, managerial practices and entrepreneurial talents.

We believe these questions can best be answered through a series of case studies of specific firms and/or specific regions which specialise in certain industries. Such studies would necessarily have to collect information from the parent firms and their sub-contractors as well as the workers in the small units who probably form the backbone of this institutional arrangement of production. In a situation where sub-contracting has more than one layer or stages it would be very ^{useful} to 'map out' the sub-contracting relationship through all its stages. Thus in this manner one can trace the ^{relationship between the} actual producer and the user or marketing agency and the logic of this arrangement.

Number of sub-contractors for Public sectorUnits, 1977-78

S1. No.	Name of PSU	Exclusively Ancillary Units	Small Scale
(1)	(2)	(3)	(4)
1.	Bharat Heavy Electricals, Ltd., Hardwar	21	100
2.	Bharat Heavy Electricals Ltd., Jhansi	6	38
3.	Bharat Heavy Electricals Ltd., Trichy	32	175
4.	Bharat Heavy Electricals Ltd., Hyderabad	16	40
5.	Bharat Heavy Electricals Ltd., Bhopal	50	NIL
6.	Bharat Dynamics	-	NIL
7.	Bharat Heavy Plates & Vessels Ltd., Vizeg	2	48
8.	Bharat Aluminium Korba	9	6
9.	Bharat Earth Movers Ltd., Mangalore		
	EM Divn.	NIL	115
	Rail. and Coach Divn	-	-
10.	Bharat Coking Coal Ltd.	-	5
11.	Bharat Electronics Ltd., Bangalore	14	250
12.	Bharat Pump & Compressors Ltd., Naini	-	35
13.	Bokaro Steel Ltd.,	16	58
14.	Electronics Corpn. of India Ltd., Hyderabad	NIL	223
15.	Fertilizer Corpn of India Ltd., Gorakhpur	3	5
16.	Fertilizer Corpn. of India Ltd., Nangal	1	7
17.	Fertilizer Corpn of India Ltd., Sindri	2	4
18.	Fertilizer Corpn, of India Ltd., Durgapur	-	-
19.	Fertilizer Corpn. of India Ltd., Trombay	-	50
20.	Fertilizer Corpn. of India Ltd., Barauni	-	-
21.	Fertilizer Corpn, of India Ltd., Ramagundam	-	-
22.	Goa Shipyard Ltd.	13	-
23.	HMT, Pinjore	-	-
24.	HMT, Bangalore	59	NIL
25.	HMT, Kalamassery	9	8
26.	HMT, Ajmer	1	2
27.	Hindustan Aeronautics Ltd., Koraput	1	1

(1)	(2)	(3)	(4)
28.	Hindustan Aeronautics Ltd., Bangalore	40	113
29.	Hindustan Aeronautics Ltd., Hyderabad	7	115
30.	Hindustan Aeronautics Ltd., Nasik	3	8
31.	Hindustan Steel Ltd., Durgapur	-	-
32.	Hindustan Steel Ltd., Rourkela	16	58
33.	Hindustan Steel Ltd., Bhilai	-	61
34.	Heavy Engineering Corpn., Ranchi	52	-
35.	Hindustan Antibiotics Ltd.	5	-
36.	Hindustan Cables Ltd., Hyderabad	-	-
37.	Hindustan Shipyard Ltd., Vizag	-	67
38.	Hindustan Teleprinters Ltd.	-	60
39.	Instrumentation Ltd., Kota	13	50
40.	Instrumentation Ltd., Palghat	NIL	44
41.	ITI Bangalore	43	-
42.	ITI Naini	33	NIL
43.	IDPL, Rishikesh	24	21
44.	IDPL, Hyderabad	NIL	NIL
45.	Indian Petro Chemical Corpn. Ltd., Baroda	-	116
46.	Manganese Ore	-	2
47.	Mazagon Dock	-	-
48.	Mining & Allied Machinery Corpn.	NIL	163
49.	National Instruments	NIL	90
50.	Nepa Paper Mills	-	2
51.	Madras Refineries	-	87
52.	Praga Tools	-	16
53.	Scooters India Ltd.	29	-
54.	Triveni Structurals Ltd.	-	31
55.	Garden Reach Workshop	-	200

Source: Development Commissioner, Small Scale Industries (1978).

Appendix 2Details of Sub-contracting by selected private
sector units

(Rs. in lakhs)

Sl. No.	Name of the firm	Product manufactured	No. of sub-contractors	Value of components purchased from sub-contractors	Types of goods purchased	Assistance offered	Remarks
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1.	Betliboi and Co. Ltd.	Machine tools	-	50	-	necessary toolings, jigs & fixtures provided	-
2.	Blue Star Ltd.	air conditioning equipment	50	-	Plastic moulded and vacuum formed articles, pressed components, moulding work, electroplating, galvanising etc.	technical and financial assistance	-
3.	Carlin Pvt. Ltd.		15	-	-	technical and financial assistance	-
4.	Caprihans India Ltd.	-	8	-	Control panel and erection of electrical equipment, installation of heavy machinery and fabrication, special casting of nonferrous metals and machining	drawing are supplied for fabrication of components and spare parts.	-
5.	Gabriel India Ltd.	Shock absorbers	40	-	fabrication, machining, manufacture of rubber and plastic components	technical and financial assistance	-
6.	Hercules Hoists Ltd.	-	40	-	manufacture of parts services	-	-
7.	Herdellia chemical Ltd.	Chemicals	-	-	machining and fabrication work	-	-
8.	Indian Card clothing Co. Ltd.	-	-	-	Packing cases and press parts	Supply of raw materials, guaranteed off-take, technical know-how	-

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
9.	International Computer Indian Manufacture Ltd.	Computers peripherals	300	-	Machining jobs, plastic, nylon mouldings, mechanical/electrical assemblies	Supply of tools, jigs & fixtures, inspection equipment, technical assistance of suppliers personnel	
10.	Kirloskar Brothers Ltd.	Engineering goods	155	200	Coremaking, casting, fettling, pattern making, machining, assembly, packing box making, key making, plastic articles, fabrication, machine reconditioning	Project reports, guidance about securing loans, selection of machinery, training of workers, maintenance of records	the firm has established a cooperative of small entrepreneurs and got the 25 acres of land.
11.	Larsen and Toubros.	Engineering goods	1500 but with 600 of them dealings on a regular basis		machining, fabrication, sheet metal press work, forging, casting, moulding, paper cartons, printing, electrical and electronic items, sub-assemblies, assemblies, heat treatment, electroplating		It is the policy of the company not to book more than 35 percent of the ancillary unit.
12.	MICO Ltd.	Spark plugs and fuel injection pumps and other auto ancillaries	260	360	turned parts, metal pressings, plastic components, consumable tools, packing material, jigs and fixtures, components for special purpose machines.	Comprehensive technical assistance, training of personnel, supply of raw materials, tools, gauges etc.	the ancillaries are advised to seek at least one third of the business from other industries.
13.	National Electrical Industries Ltd.		14		Machining, fabrication, rubber products, moulding carbon brush	-	They employ about 200 workers
14.	Philips India Ltd.	Industrial and consumer electronics	561	1100	-	technical expertise, management skills and guidance	The no. of workers supplied by the ancillaries is as many as working within Philips plants. The ancillaries are free to purchase output for other firms also

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
15.	Balliwolf Ltd.	Hand drilling machines	20	-	Machining, repair processing, plating, painting, die, casting, sheet metal and fabrication	Supply of raw materials, advance payment for development of figs and fixtures, and technical assistance	-
16.	Sah and Sanghi Automobiles	Automobile parts	7	-	Pressure die casting, nickel and chrome plating springs and machining of components	-	-
17.	Schwader Schoville and Duncan Ltd.	tyre tube valve	50	-	Components	technical and financial assistance	7 out of 50 units are exclusive ancillaries.
18.	Steelage Industries Ltd.	Steel furniture	32	-	-	-	-

Source: Borbay Chamber of Commerce and Industry (1979).

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