

INTER - FIRM RELATIONSHIP IN THE CONTEXT OF ANCILLARIZATION : A CASE STUDY OF BHILAI STEEL PLANT

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I hereby affirm that the research for this dissertation titled '**Inter-firm Relationship In the Context of Ancillarization : Case study of Bhilai Steel Plant**', being submitted to Jawaharlal Nehru University for the award of the Degree of Master of Philosophy in Applied Economics, was carried out entirely by me at the Center for Development Studies, Thiruvananthapuram.

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Certified that this dissertation is the bona fide work of Madhuri.S , and has not been considered for the award of any other degree by any other university.

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Chapter I

INTRODUCTION

1.1 *The Problem*

The co-existence of large and small firms has been a persistent feature of the modern industrial economy. The empirical literature (Sandesara, 1966; Little et. al., 1987) has focused primarily on the question of scale and structure of firms, wherein the links between firm size, efficiency, capital intensity and innovation have been established. The inferences drawn on the relative superiority of small over large firms, however, remain inconclusive. With the recent developments in the theory of industrial organization, the focus has shifted from size *per se* to the *relationship* between firms.

Unlike the earlier theories (Friedman, 1977; Holmes, 1986) that have explained inter-firm relationships in terms of technology and bargaining strength, these relationships are now being explained in terms of organizational responses to reduction in production and transaction costs. Following Coase's (1937) fundamental insight, a firm primarily comes to exist because there are certain activities that are cheaper to organize internally than procuring from the market.¹ Extending from Coase, Williamson's view can be stated as, "... more generally, the objective is not to economize on transaction costs but to economize in both transaction and neoclassical production cost respects. Whether transaction cost economies are realized at the expense of scale or scope, thus needs

¹ In other words, the firm as a network of contractual arrangements, supersedes the price mechanism, because there are certain costs of using the price mechanism which are, (a) the cost of discovering prices and (b) the costs of negotiating and concluding contracts

to be realized" (Williamson, 1985: p.61). Thus, transaction cost becomes central to the analysis of inter-firm relationships in addition to production cost².

While the earlier explanations follow the traditional theory of firm, as a production function translating a vector of inputs into outputs, the recent theory explains interfirm relations as based on contractual efficiency and views firms as heterogeneous units with varied organizational responses. In other words, organizational forms spanning between the extremes of complete vertical integration and complete dependence on the market, such as subcontracting, franchising and joint ownership are known to exist.

In a non-interventionist regime, the interfirm relationships are primarily oriented to reducing production and transaction costs. However, in an economy, where government plays an important role by intervening in the production process, the relationships are greatly influenced by policy. Subcontracting in Indian industry was encouraged beginning from 1970 when the government undertook an active policy of ancillarization, especially in public sector enterprises³ with the objectives ^{of} import substitution, promotion of entrepreneurship, and long term replacement of plant and machinery in large firms.⁴ The specific role of ancillarization was recognized by the Industrial Policy Statement of 1977 as well as 1980 to promote inter-firm interdependence and technology diffusion.⁵

² This is discussed in Chapter II.

³ See Appendix I.1 for evidence on growth of subcontracting.

⁴ See Appendix IV in Chapter IV for details.

⁵ This was broadly conceived as a means to promote small scale industries, (Sandesara, 1992 and Inone, 1992).

Various studies⁶ on subcontracting in Indian industry have emphasized the unequal power relation between large and small firms that allows the former to squeeze orders, delay payments and pass on inventory costs which shift the burden of adjustment to the ancillary units. These studies had shown that, the ancillaries, in turn, had to resort to sweat labour relations as a cost reduction mechanism. Since adequate cover was not provided to these units the policy of ancillarization was criticized as being one-sided dependent relation.

A major limitation of these studies, however, is that they do not explain the persistence of small firms despite the unequal and asymmetric nature of inter-firm relationships. Another line of development in literature known as flexible specialisation⁷ has stressed the independent and dynamic role of small firms in industrial development. In this context, a different notion of efficiency emerges, which is collective efficiency amongst small firms through cluster formation⁸. Industrial clusters follow two strategies of industrialisation namely, the 'high road' and the 'low road' strategy. While the former is based on technological innovation and collective efficiency, the latter is based on sweat labour relations. As revealed by the studies⁹ of Cawthorne (1989) and Knorringa (1995) the Indian experience follows the low road strategy.

⁶ For example, Nagaraj (1989), Mukherjee (1986), Bose (1987), and Padhi (undated).

⁷ Flexible specialisation entails manufacture of varied products with multipurpose equipment and multi skilled workers in contrast to mass production of standardised products made by narrowly skilled workers and single purpose machines.

⁸ Collective efficiency is the economies of agglomerations arising when a network of suppliers develops, that provides materials, tools, new machinery, secondhand machinery, spare parts, repair services and so on.

⁹ These studies relate to garment and footwear industries respectively.

However, none of the available studies have addressed the important issue of contractual and non-contractual factors¹⁰ in the inter-firm relationship, given the overall framework set by government policy. A study of such nature would unravel the dynamic interaction between firms guided by market and government policy in sustaining their relationship. The present study analyses the case of a public sector enterprise, namely, Bhilai Steel Plant (BSP) where the government has consciously followed the policy of ancillarization. While evaluating the policy of ancillarization, the nature and type of industry have to be kept in view. In this context, case studies provide a useful scope for a comparative evaluation.

1.2 *Objectives of the study:*

The specific objectives of the present study are:

- a. to study the contractual and non-contractual relationship between the Bhilai Steel Plant and its small scale supplier units. Given the constraints set by policy, the non-contractual factors are studied with special reference to the "efficiency" of contracts;
- b. to examine whether ancillarization, as an organizational response to cost reduction, is based on the economic rationale of Bhilai Steel Plant or is guided more by the social objectives set by policy; and,

¹⁰ For definitions, see Chapter III.

- c. to evaluate the policy of ancillarization, with regard to development of entrepreneurship and learning by doing, in terms of the response of ancillary units and its impact on their relationship.

In addition, it is attempted to compare and contrast the ancillarization process of the present study with the case study of yet another public sector unit, that is, Hindustan Machine Tools Ltd. (HMT)¹¹.

1.3 Sources of Data and Methodology:

The study draws upon both published and unpublished sources of data. The latter consisted of a field survey carried out for the purpose in the Bhilai region. This was done using two schedules. Schedule one targeted the parent firm, in this case the Bhilai Steel Plant (BSP), wherein interviews were conducted at the management and shop-floor level to understand the factors influencing make-buy decisions, the purchase policy, and relationship with ancillaries. The data collected include number of ancillary units, ancillary orders, nature of price variation, employment in ancillary units, technical details and project reports available with the BSP.

The second schedule canvassed among a sample of 30 ancillaries. The details of sample frame are given in Table I.1. It can be seen that the sample was so drawn as to give representation to different categories of ancillaries in the population. The quantitative information collected relates to such items as capital investment, employment and levels of supplies to the BSP and the market. Keeping in view of the nature of present

¹¹ Nagaraj (1989).

Investigation, detailed qualitative data on the nature of contracts, types of items supplied, purchase policy of BSP and so on have been collected.

In addition to the sample of 30 ancillary units, data on the order flow and employment figures were also collected from BSP and District Industry Centre (DIC) for 25 units. Additional data concerning guidelines for ancillarization, implementation of policy and so on was collected from the office of Additional Director, DIC at Durg. Published sources consulted include the general literature, case studies in India and abroad, and Reports of Steel Authority of India Ltd. (SAIL).

Table 1.1: Number of ancillary units in the population and sample

Type of units	Population			Total	Sample	
	Total	Estate	Outside		Estate	Outside
1. Mechanical based	70	62	8	17	15	2
2. Electrical based	10	4	6	3	2	1
3. Others*	78	33	45	10	5	5
Total	158	99	59	30	22	8

Note: * Others include broadly two types of units: a. those supplying consumer-based items like shoes, helmets, stationary, furniture, timber products, chemical and rubber based items, b. those supplying items based on by-products of steel plant, like fly ash, refractory bricks and those specifically developed for the Plant during its expansion stage.

1.4 Chapterization Scheme

The study is organized into five chapters including introduction. Chapter II outlines the conceptual issues and theoretical framework. Chapter III studies the contractual relationship between BSP and its small scale supplier units. The plant structure,

production process, and nature of transaction are studied. Chapter IV studies the rationale of ancillarisation, wherein the make-buy decision, comparative cost considerations, and relative merits and demerits of vertical integration are studied. Chapter V evaluates the response of ancillary units with respect to the facilities provided by the government policy to achieve the objectives of ancillary policy, one of them being entrepreneurship development. The specific results of the study are compared with those of a case study of HMT Ltd. The Chapter VI summarises the study and discusses major policy implications.

Appendix I.1

Table I.A.1

Growth of Ancillarization and Subcontracting in Public Sector Undertakings

	No of PSUs reporting	No. of SSI/ANCs. SSI ANC.	Total	Value of purchases from SSI/ANCs (Rs. in lakhs)	Purchases as % of PSU production
1974/75	-	N A	432	293	N A
1975/76	-	N A	479	364	N A
1976/77	-	N A	508	438	N A
1977/78	-	N A	550	806	N A
1978/79	73	4267	805	5072	0.50
1979/80	80	3841	888	4729	0.51
1980/81	80	4340	984	5324	0.57
1981/82	102	7143	1078	8221	0.66
1982/83	113	12861	1176	14037	0.70
1983/84	132	13492	1412	14904	0.72
1984/85	151	13391	1648	15039	0.69
1985/86	153	14473	1693	16166	0.76

Note: Information on the number of small scale units supplying to PSUs not available.

PSU=Public Sector Undertakings; SSI =Small Scale units; and,
ANC=Ancillary units, NA=Not Available.

Source: Nagaraj (1984) for the period between 1974-75 to 1976-77
Handbook of Statistics 1985-86, DCSSI for 1977-78 onwards

Chapter II

CONCEPTUAL ISSUES AND ANALYTICAL FRAMEWORK

2.1 Introduction

This chapter clarifies certain concepts discussed in the literature on inter-firm relationships between large and small firms and outlines the analytical framework for the present study. It consists of four sections. Section 2.2 discusses the concept of subcontracting from the standpoint of earlier literature and seeks to clarify the differences between a supplier and a subcontractor in the context of the present study. Section 2.3 outlines the analytical framework of the present study and section 2.4 concludes the chapter with a discussion on vertical quasi integration, which is the object of the present study.

2.2 A Conceptual clarification

As a prelude to the framework, it is intended to clarify the meaning of inter-firm relationship as implied in the present study. The study focuses on the buyer-supplier aspect of inter-firm relationships, wherein the buyer is a large firm and supplier is a small firm. Earlier approaches have explained this relationship in terms of subcontracting, distinguishing a subcontractor from a supplier. The term subcontracting in economic literature is used mainly with regard to the supply of components to an end product industry.¹ A process industry, such as the case of the present study, farms out the

¹ As an illustration, consider a manufacturing firm, say, a motor industry. The work it farms out directly to a second firm represents 'contracting out' work and the work offloaded by the second to a third firm is 'subcontracting out' work. But the work done by the second firm is 'subcontracting out' work in so far as the first firm does not sell end product unit by unit but sells in large blocks on contract to big customers (Friedman, 1977). Hence, the term subcontract is basically used in connection with the manufacture of end product.

production of spare parts of 'equipment' to be used in the production process which do not enter the end product directly. In this case, the manufacturing units supplying spare parts and components are suppliers and not subcontractors. The legal definition² of subcontracting takes account of only labour contracts, defining all other forms of subcontracting as suppliers, where the large firm temporarily employs labour inside the firm to perform certain work.

These definitions do not serve the analytical purpose of the present study which regards both supplier and subcontractor as the same. The study intends to analyze inter-firm relationship in the sense of buyer-supplier relationship between a large and a small firm. In particular, it examines the relationship between the sub-category of ancillaries within the suppliers and the parent firm. The category of suppliers, in this study, includes all the small firms that supply something or the other to the parent firm.

2.3 Analytical Framework

The concept of governance structures is central to the analysis of the present study. Governance structure is defined in terms of a set of agents, or firms as in the present case, and a set of rules.

² A purely legal definition of contracting is given by the Indian Contract Labour (Regulation and Abolition) Act 1970, which excludes from its ambit 'mere supply of goods or articles of manufacture to such establishments. The definition of contractor indicates that the contractor should undertake to produce a given result for the establishment. It means that the work which is undertaken in relation to the establishment should be exclusively for the establishment concerned. However, in case of ancillary units they are supplying only 50 per cent of their goods and services to the parent units and the remainder is made available to the local market, hence they are not producing a given result for the establishment. Hence, they are independent suppliers and not contractors' (GOI, Office of DCSSI, 1979).

In the developed countries, studies³ have shown that different institutional arrangements or governance structures between firms, spanning between the extremities of market at one end and vertical integration on the other, arise as an organizational need to minimize production and transaction costs. That is, in between the two polarities of market and vertical integration⁴, there exists a wide array of governance structures such as subcontracting, franchising or joint ownership.

The governance structure depends upon the cost and nature of transaction. The cost of transaction, in turn, depends on three factors, namely, bounded rationality, opportunism, and asset specificity (Williamson, 1985). Bounded rationality is based on incomplete knowledge and informational asymmetry. Incomplete knowledge implies that all possible states of the world and cause-effect relationships cannot be identified and, hence, the probabilities cannot be calculated based on previous occurrence. Informational asymmetry/complexity arises because individuals have inevitable limits on their abilities to process or use information available to them due to difficulties in understanding and manipulating data involved in any but trivial situations. Thus, according to Simon (1957:xxiv) economic actors are 'intendedly rational, but only limitedly so. Opportunism refers to 'self interest-seeking with guile' (Williamson 1985: p.47). Asset specific investment refers to the degree to which durable human or physical assets are locked into a particular trading relationship, and hence the extent to which they have value in

³ Joskow (1985).

⁴ See Appendix II.1 for a diagrammatic exposition of vertical integration according to transaction cost theory.

alternative activities. A high level of asset specificity implies the existence of a bilateral monopoly. As asset specificity results in a locked-in relation, this aspect assumes significance in the present context.

Asset specificity is of four types. They are,

a) physical asset specific investment, which entails one or both parties to the transaction making investment in equipment that involves design features specific to the transaction.

It assumes that special purpose equipment is needed to produce the component in question. Alternative buyers for such an asset are few.

b) dedicated asset specific investment where, general investment that would not take place but for the prospect of selling a significant amount of product to a particular customer.

c) location specific investment in which, the buyer and seller are in a cheek-by-jowl relationship reflecting decision to minimize inventory and transportation costs. For example, the location of a specialized plant in a unique proximate relation to a downstream processing stage to which it supplies input.

d) human capital specific investment, arising as a result of learning by doing and transfer of skills particular to a relationship..

It is important to distinguish between *ex ante* and *ex post* competition with reference to asset specificity. Initially, there may be enough suppliers for an item. In the process of transacting with the buyer, the supplier may acquire specific skills in a 'learning by doing' fashion, transforming the situation into a bilateral relation.⁵ Other factors which

⁵This applies to a section of ancillaries in the case study, which acquired skills overtime to develop items specific to the requirement of the parent unit. This point is taken up again in the Chapter V.

Influence the nature of transaction are frequency and uncertainty of transaction. Frequency or recurring transaction, also assumes significance in the context of the present study. Thus, a high degree of asset specificity along with a recurring nature of transaction requires a governance structure based on a long term contractual relationship to sustain the bilateral relation and vice-versa.⁶

2.4 Vertical Quasi-Integration: a phenomenon in the case study

The intermediary forms of organization in between market and vertical integration have been termed as vertical quasi integration⁷. Vertical quasi-integration is a situation that exists when some firms gain the advantages of vertical integration without assuming the risk or rigidity of ownership. Incorporating benefits into the transaction cost analysis of the firm, Dietrich (1994) argues that evolution of this form of economic institution may involve factors other than just transaction cost minimization. In what follows, the study explains how this form of governance structure arises as an outcome of government policies to reap certain organizational benefits, in the specific context of the parent and ancillary unit .

As already defined, governance structure consists of a set of agents and a set of rules. In the present study, the set of agents are the firms consisting of the parent and ancillary units and the set of rules are those contained in the policy statements of the government. The agent's response depends on the policy objective which determine whether the firms

⁶ See Appendix II.3 for a classification of governance structures depending on the nature of transaction.

⁷ This term is attributed to Blois (1972). See Appendix II.2 for a diagrammatic exposition of vertical quasi integration based on organizational benefits (Dietrich,1994).

minimize production and transaction costs.

This is evident, for example, if one looks at the contractual terms between the public sector units (PSU) and the government before and after 1988, when the concept of the Memorandum of Understanding⁸ was introduced in an attempt to bring a proper balance between accountability and autonomy. The emphasis was on achieving the negotiated and agreed objectives without bureaucratic interference. Before the introduction of MOU, the public sector enterprises were not oriented to profit maximization or considerations of cost minimization. After the introduction of MOU, with more autonomy to the PSU's the emphasis has shifted on profit maximization rather than concerns of social objectives.⁹ Thus, in the changed scenario, the parent firm has an incentive to reduce not only production but transaction costs as well.

The responses to policy changes emanating from the MOU could be well understood from the following statement :

"Market orientation is the cornerstone of SAIL's corporate strategy. The key to the coordination between marketing and production begins with sound investment planning and project formulation. Competitive edge in the

⁸ The concept was introduced following the recommendations of the Arjun Sen Gupta Committee Report (1988). The basic driving force for new institutional arrangement for the current 'MOU exercise' is drawn from two major criticisms levelled against the MOU exercise in the past. First, it was argued by many Public sector chief executives that the MOU was a contract between "unequals". They claimed that how could one party to the contract be also the judge of that contract, referring to the past practice of the onus of evaluating PSU performance against the commitments made in MOU's lying with the administrative ministries. Another major concern related to the imbalance in technical expertise available between the government and the PSUs.

⁹ No mention of an ancillary policy can be found in the new MOU that applies to SAIL. Further, since 1985 onwards, the official monitoring of ancillary policy has been stopped by Bureau of Public Enterprises.

market can be gained only through cost effective and timely project implementation. The MOU signed between the government and SAIL increases the financial powers of the SAIL's Board to sanction projects and it also commits that government approvals on investment proposals will be granted within the specified time. This should considerably speed up the project approval process.¹⁰

Thus the policy statements and the respective agents' (i.e., BSP personnel and ancillary owners) responses give rise to a particular form of vertical quasi integration which is the focus of the present study. In a non-interventionist regime, government policies play negligible role in influencing organizational responses by firms. However, in an interventionist regime, the government itself may influence the governance structure or economic institutions on motivations of achieving certain organizational benefits like entrepreneurship development and learning by doing. However, whether the organizational benefits are achieved depends on the agents who respond in different ways to a policy. The present study makes a comparative evaluation of the actual outcome of the interactions with the ideal governance structure implicit in the policy statements by examining the responses of the firms.

¹⁰ BSP (1987) in Management Trainees (technical)-induction training program, Vol. I.

Appendix II.1

A diagrammatic exposition of vertical integration:

Transaction cost minimization can be depicted using the following diagrams (Dietrich, 1994), where the control costs incurred by the partial (for human inputs) or complete internalization of one particular activity are described as C_f rather than C_m or C'_f involving long-run advantages that can only be exploited by intra-firm control over resource allocation. In short, the tangents to the three curves indicate transaction cost savings for firm rather than the market organization. (Fig 3A)

The transaction cost curve is derived from the short-run (the overall stock of managerial resources being given) relationship between management input per unit time and output (defined in terms of two joint products: responsibilities and prices), for any one contracting activity. Thus, greater management effort produces a more detailed specification and policing of responsibilities and/or more advantageous prices (higher/lower for outputs/inputs). (Fig 1A)

This relationship is transformed into the associated transaction costs, which reflect the resource cost of extra management inputs (or the opportunity cost of management) into any one activity. Thus, transaction costs reflect increasing opportunity cost function of management. The diagram shows that, when more advantageous prices result from negotiation, or responsibilities taken, that is, contracting output goes up, transaction costs also rise. (Fig 2A)

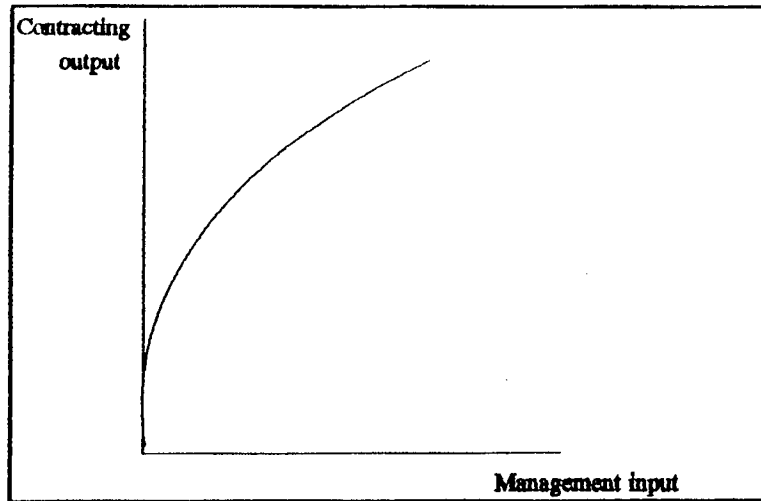


Figure 1A Short-run contracting

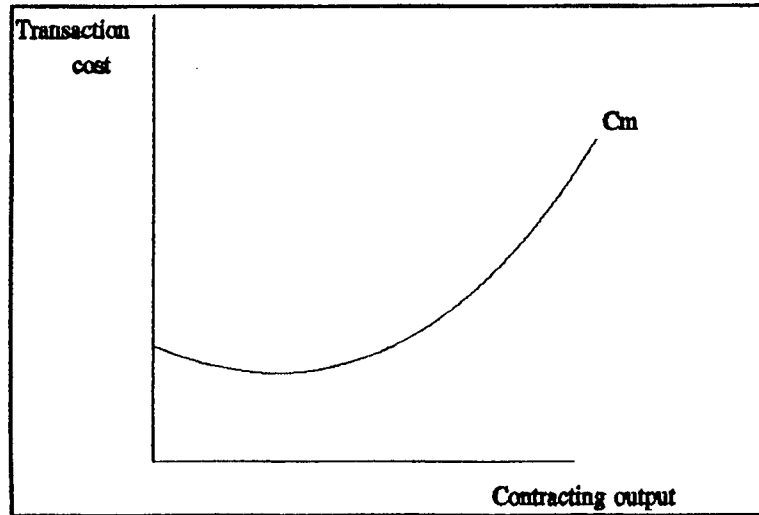


Figure 2A Transaction cost curve

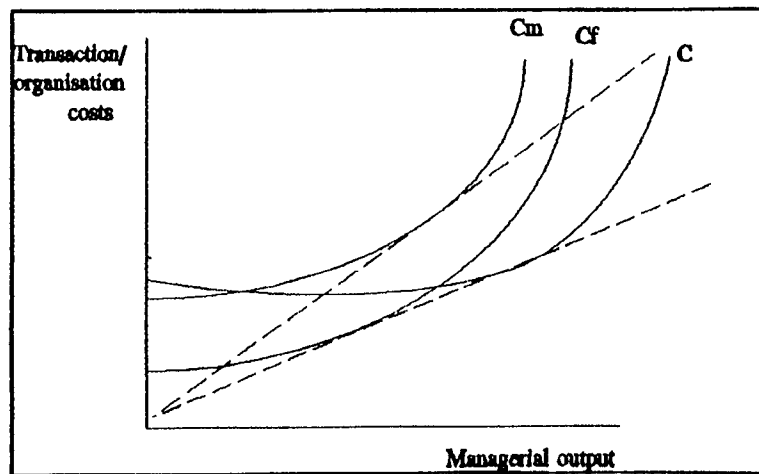


Figure 3A The fundamental theorem of transaction cost economics

Appendix II.2

Mc Nell gives a three way classification of governance structures depending on the nature of transaction, as shown in the table below.

Table II.A.2
Classification of Governance structures

		INVESTMENT CHARACTERISTICS		
		Non-specific	Mixed	Idiosyncratic
Occasional	Market Governance		\	/
			Trilateral Governance	
Recurrent	Market Governance		Bilateral Governance	Unified Governance

Source: Willlamson (1985)

The two transactions for which trilateral governance is required are occasional transactions of the mixed and highly idiosyncratic kind. These involve a high degree of asset specificity, the opportunity cost of which is very low in alternative uses. Market cannot be resorted to in such cases, and besides, the set up costs of such transaction specific governance structure cannot be realized. Therefore the need for an intermediate institutional form, which is third party assistance or trilateral governance. For transactions of such nature which are recurrent in nature and also involve asset specific (idiosyncratic) investments, the recourse is either unified governance (in-house production or internalizing the transaction) or bilateral governance in case of transactions with mixed investment characteristics. It is for the transactions with investments of the mixed and idiosyncratic type that the costs of market governance are high and are substituted by long-term contractual arrangements.

Appendix II.3

A diagrammatic exposition of Vertical quasi integration:

In the diagram given below, Intra-firm organization is infeasible ($C_f > B_f$), perhaps because of highly specialized skills needed to produce an input. If the input is bought-in increased benefits will result ($B_m > B_f$) but transaction costs are excessive, perhaps because of small numbers trading and information asymmetries, therefore a market is also infeasible ($C_m > B_m$). But long term relationships and the development of trust between trading partners, that is quasi-integration, will shift C_m down towards C_f therefore rendering economic organization feasible.

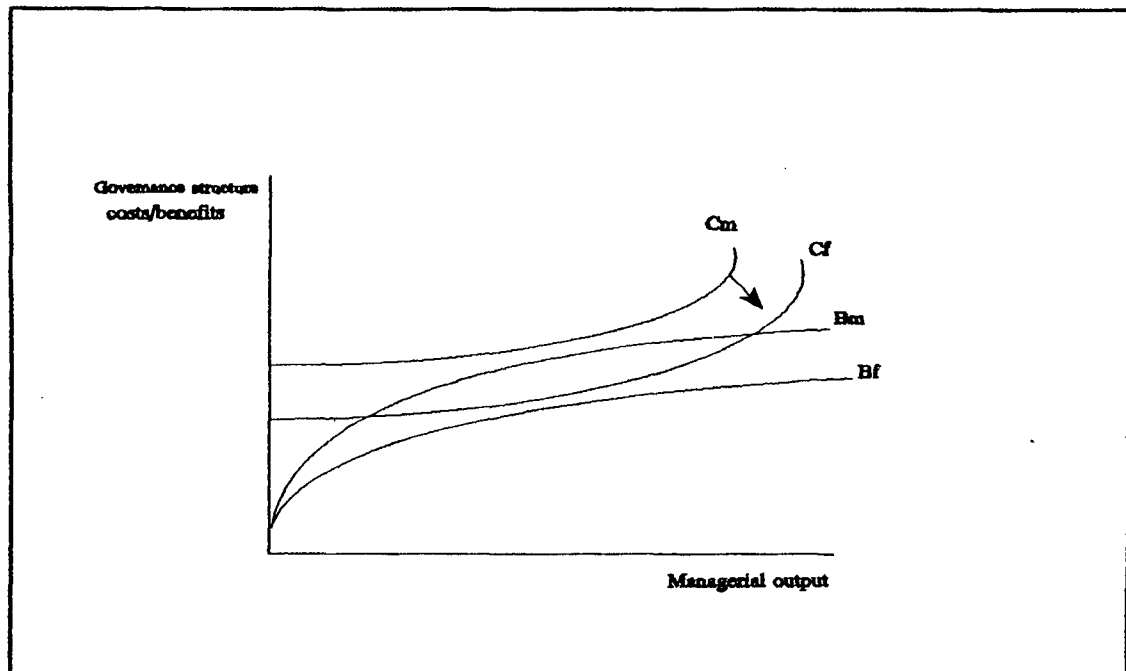


Figure 4A Quasi-integration

Chapter III

CONTRACTUAL RELATIONSHIP BETWEEN BSP AND ITS SUPPLIERS

3.1 Introduction

In light of the analytical framework developed in Chapter Two, the present chapter examines the relationship between the buyer and supplier firms. In the present study, the Bhilai Steel Plant (BSP) is the buyer and the local small scale units are the suppliers. The underlying objective here is to understand whether the contractual terms are consistent with the nature of transaction. As the suppliers include the ancillary units too, the chapter discusses the contractual relationship of BSP with its suppliers in general.

The chapter is organised into three sections. In Section 3.2, the plant structure and production process is outlined. This provides a background to understand how production process of BSP gives rise to different transactions which is discussed in Section 3.3. Contracts forge the relationship between the buyer and seller to effect the transactions. The terms of contract of BSP and their specific features are discussed in Section 3.4.

3.2 Plant structure and production process:

3.2.1 Plant structure:

Bhilai Steel Plant (BSP), the biggest of the integrated iron and steel plants in the public sector, was commissioned in 1955 in collaboration with the erstwhile USSR, with a capacity of one million ton of Ingot steel per year. It was later taken under the fold of Steel Authority of India Limited (SAIL) which was set up in 1973 to manage the five public

sector steel units. The BSP gradually expanded its capacity to 2.5mt and to the present level of 4mt per year. The details of plant structure are given in Table III.1.

Table III.1: Plant Structure and Annual capacity

DEPARTMENT	PRODUCTS	ANN.CAP. 1000T
COKE OVENS	+25MM COKE	3303
SINTER PLANT1	SUPER FLUXED SINTER	2040
SINTER PLANT2	DO	3137
BLAST FURNACES	HOT METAL & SALEABLE PIG IRON	4080+630
STEELMELT.SHOP1	INGOT STEEL	2500
STEELMELT.SHOP2	LIQUID STEEL	1500
CONT.CAST.PLANT	SLABS&BLOOMS	1180+245
BLOOMING MILL	BLOOMS	2149
BILLET MILL	BILLETS	1501
RAIL&STRUCT.MILL	RAILS & HEAVY STRUCTURALS	750
MERCHANT MILL	MERCHANT PRODUCTS.	500
WIRE ROD MILL	WIRE RODS	400
PLATE MILL	PLATES	950
TOTAL SALEABLE		3153

Source: Operational Statistics of BSP, 1995-96

The BSP adopted the technology of the conventional route of steel making by the open hearth process, ingot moulding and rolling in mills of established repute. The expansion to 2.5 million ton(mt) was effected through mere addition of units. As steel is a capital intensive industry, it was not considered practical to effect a changeover to a new technology once an investment had been made. The 4mt expansion, based on product

diversification, went in for modernization having a new stream, comprising basic oxygen furnace steel making and continuous casting. The new units along with the plate mill now incorporate the latest technologies. Apart from meeting the internal demand of the country for various categories of steel, BSP is also exporting its products (rails) to Sudan, Malaysia, Japan and South Korea. Data on the exports, sales, profits are given in the Appendix III.1.

3.2.2 Production process

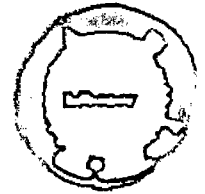
Steel, unlike electronics or an automobiles industry, is a process industry where ingot steel is produced at the final stage. Inputs form production equipment unlike production items as in the case of electronics or automobiles industry where the item supplied by the supplier is a part of the end product. The BSP is an integrated steel plant where the process of steel making involves different stages with the end product of one stage becoming the vital starting point of next stage.

In the cycle of steel making, the first stage consists of coke ovens to produce coke from coal, utilize the same coke along with iron ore in the blast furnace to produce hot metal which is fed into the steel melting shop to produce ingot steel. This is fed into the blooming mills to produce blooms, billets and slabs, and other merchant products. This is a well-knit process and disruption at any stage would reflect on the final output, and therefore, maintenance becomes crucial. The productivity and profitability, thus, depends on maintenance whose prime components are labour costs and spares and stores. The maintenance cost by virtue of purchase of stores and spares is presented in Table III.2.

Table III.2: Percent of income spent on stores and spares 1990-97

1990	1991	1992	1993	1994	1995	1996	1997
16.6	16.8	16.9	15	14	12.9	11.7	11.3

Source: Annual accounts of BSP- 1990-97



As seen in Table III.2, there is a continuous decline in the percent of income spent on stores and spares from 16.6 per cent to 11.3 per cent.

The BSP in general requires products which fall into 3 categories. They are:

- i) *Production oriented goods* which are items directly used as part of the process to assist steel making and consumed accordingly. These include raw materials such as manganese ore, ferro alloys and others. They are not procured from the local small scale suppliers.
- ii) *Maintenance oriented goods* which are spare parts required for the maintenance of equipments; and
- iii) *Consumables* which are items used mainly by the production as well as maintenance personnel to effectively carry out day-to-day operations and fulfil preventive maintenance schedules. The unit prices of these items are small, but in terms of consumption their value is high.

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It is items under category (ii) and (iii) which are procured from local small scale and ancillary units. How the demand for these items give rise to different kinds of transactions, is discussed in the following section.

3.3 Nature of Transaction

This section gives a brief description of the kinds of suppliers depending on the item supplied to BSP. The nature of transaction in each category are also studied.

There are three kinds of items supplied, namely, mechanical, electrical, and others:

a) *Mechanical* nature includes small nuts and bolts, wire ropes, valves, and other critical spare parts and equipments which enter the production process directly. Units which supply mechanical spare parts are all located around Bhilai and Durg, and are basically equipped with machining, casting and fabrication facilities. The spare parts supplied require either of the three operations.

Transaction in such cases is of recurrent as well as non-recurrent in nature with non-specific investment. It may also be of recurrent nature with certain degree of asset specific investment acquired overtime through learning by doing.

b) *Electrical and electronic* - electrical includes items like insulating material, carbon brushes, batteries, printed circuit board, transformer, etc; Electronic spares require assembly operations and more of skill than the other spare parts.

Transactions of this nature are recurrent and require non-specific investment, excepting the case of electronic items which are custom-made.

c) *Other* items include chemical based items like paints, plastics; leather goods such as hand gloves and safety shoes, rain coats, brushes of all types and allied timber products.

This category also includes units specifically developed for the plant during its expansion stage and units based on the by-product utilisation of the plant. Such units are set up

as ancillaries to the plant. Though the value of these items in alternative use is low, the cost of investing in these units is not very high.

Here too, the transaction is either of a recurring or non-recurring nature with minimal investment in assets specific to the transaction.

Broadly, the transactions can be divided into three categories:

- a) recurring with non-specific investment,
- b) recurring with some degree of specific investment, and
- c) non-recurring with non-specific investment.

One would expect the contractual terms for category (b) to differ from those of (a) and (c), incorporating future contingencies for the continuance of the relationship involving some degree of asset specificity. However, the terms are similar for all categories. This inconsistency is dealt with in Chapter V.

The plant's contractual terms are primarily based on the recurring aspect of the transaction. What follows is a brief description of the contractual and non-contractual practices followed by BSP, highlighting the nature of relationship between the firm and its suppliers.

3.4 Contractual Terms

3.4.1 Guiding Principles

Contractual terms depend on the number of future contingencies that may arise as a result of the nature of transaction. The contractual terms on the part of BSP is guided by three considerations, They are:

1. *Inventory management*, that is, keeping inventory at the minimum and at the same time ensuring an uninterrupted flow of materials and services. In brief, to reduce the inventory carrying cost.
2. *Reducing the purchase cost* by lessening the procedure of purchase.
3. *Minimizing the adverse price variations* from competitive trends.
4. *Other considerations* include the customized nature and criticality of the items in the production process for which corresponding clauses regarding specification, late delivery, and default could be laid down.

The benefits of such contracts follows from these considerations. Firstly, the organization works with minimum inventory level, at the same time assuring a high service level. Secondly, it is possible to get lower prices of materials by negotiations, by developing competition and by developing new sources of suppliers. Thirdly, quality can be assured through inspection, as per the specification of the user. Materials are bought on the basis of their performance and on the basis of sample suitability.

3.4.2 Kinds of contracts

In practice, there are three types of contracts, namely, purchase (rate) contracts, job contracts with Central Planning Department, and repair and reclamation job contracts. The contracts depends upon the nature of transaction. Items of proprietary nature have a long term contracts with duration of 5 years. For all other items which are required frequently, that is repetitive nature, the BSP enters into similar contract with both its

ancillaries and other suppliers, the terms being in accordance with the policy of SAIL. For these items, 2 year rate contracts are entered into where the rate is fixed and there is a price escalation clause. These are more than 2000 items of repetitive nature which are offloaded to the local suppliers and it was observed in the field survey that most of contracts entered into are purchase contracts. To understand the contractual relationships, it is, therefore, attempted to study the terms and features of purchase contract.

3.4.2.1 Purchase contract

A purchase contract is a corporate technique designed to assist the buyer and seller to improve re-ordering of repetitive use material or service with an absolute minimum of administrative expense and with the maintenance of adequate business contract. When the undertakings are not in a position to work out the demands accurately and where the items are required repetitively, it may be advisable to place rate contracts which can cover a period of 1-2 years or more if necessary. A fairly detailed contract can serve as a communication device within a large corporation since it integrates all the departments and heads including the materials managers, ancillary cell division, inspection department, finance and stores section and so on. These contracts are also beneficial in the sense that they reduce the lead time involved in placing and finalizing an order each time. Because of the repetitive nature of the items, all orders can be placed for 2 years without going through the whole process of purchasing. Items of non-repetitive nature are ordered as and when the requirement arises for which short term contracts of 6-8 months are entered into and these do not have price escalation clause.

The purchase contracts of BSP are characterised by the following features.¹

The *scope of the contract and specifications* are laid down. Specification problems are not uncommon in the present case study because of lack of technical qualification of most of the suppliers who accept orders without a proper understanding of the specification of the materials required. Sometimes, even the indenter in the parent firm sends incomplete list of drawings.

The *duration of contract* is specified. In this context of fixing the duration of the contract, the ancillary policy plays an important role. As per the guidelines of ancillary policy, the parent unit should have a suitable contract with ancillary units to cover the developmental phase of the units and, not exceeding three years. Although in most cases, the transaction does not require specific investment, but the assurance of a ready market creates expectation formation and, hence, makes many of the ancillaries undertake some degree of asset-specific investment², which require to be taken care of in the purchase policy of the parent unit.

The *price remains firm* till the completion of deliveries. The price escalation clause is present for some items of repetitive nature, prices being reviewed after every five years. For the non-repetitive items, the price escalation clause does not exist. The contract further specifies the discount structure, excise, and sales tax and the packaging and forwarding charges.

¹ This discussion is based on the terms and conditions as spelt out at the back of purchase orders .

² See, Section V.3 of Chapter V for specific cases.

A *clause for the effect of contingencies* is incorporated. This clause reads as follows: 'the buyer shall not be liable for failure to accept delivery of goods under this order in case such failure is due to causes beyond the control of the buyer, including but not limited to the acts of God, force majeure, fire, floods, accidents, riots, lockout, strike, slow down, labour stoppage of any kind or act of the government.'

Though, cases of non-acceptance of materials on part of BSP is very rare, a frequent practice is that of deferring the purchase of material to be procured when the requirement arises next as a means of inventory management. There are further delays in picking up the material from the ancillaries by 2-3 months minimum due to delays in inspection. This increases the cost of inventory holding for the supplier units which is normally the value of order plus the rate of interest on the working capital blocked as a result. A lot of delay also occurs due to the administrative procedure involved in issuing a purchase order.

The *contract has a late delivery clause* where penalty is imposed for late delivery which goes upto a maximum 5 per cent of the order. In cases of specification problems, it is generally waived.³ The genuine reasons for the late delivery on part of ancillaries include raw material shortages, power failure, problem of absenteeism of casual labour, causing labour shortages and improper management and scheduling of jobs in case of mechanical units. Although, the ancillaries have a special status of serving as extensions to the shops in the steel plant, they are treated at par with other suppliers where there

³ According to the information given by the President of Ancillary Association in the course of the field survey, the aggregate amount withdrawn from all ancillaries as penalty for late delivery is around Rs 70 lakhs.

Is no interference in the labour and day to day management problems. In case there are labour disputes in any unit, the plant stops sending any enquiry for sending quotations.

The contract *provisions also plan for the effect of defective performance* as given by the risk purchase clause, wherein BSP can cancel its orders from a supplier if it is unsatisfied. It also empowers BSP to resort to another supplier with the condition that any extra cost has to be borne by the unit supplying initially. However, this clause is used only in cases of emergency and not used against defective performances as such.

A clause for *legal sanction exists*, wherein the jurisdiction of specific courts is also mentioned.

In addition to these formal contractual terms, there are certain practices informally followed by the BSP in order to minimise the cost arising from the future contingencies. These are termed as non-contractual terms. One such important practice is that of risk spreading. In the case of the steel plant, the cost of breakdown or any loss due to delayed availability of spares is difficult to specify because the processing cost of steel is very high. One ton of steel leaked is much costlier than the spare part. Most important is the cost incurred due to shut down and waiting time caused due to delays from the side of the ancillaries. Further, improper specification on part of the indenter and inferior quality of spare parts which do not serve for long also contribute to the loss. To minimise such loss, the BSP resorts to minimum 2 suppliers for an item. The plant also tries to deal with firms of good reputation and develops quality by maintaining report cards on suppliers. In the case of job work, it takes a security in the form of bank guarantee. When default occurs in case of manufactured items, the supplier can take it

back for repair only after providing a bank guarantee for the amount it has been paid. Generally, the creation of exchanges is far more contractual than the adjustment of such relationship and the settlement of disputes, specially with regard to the small unit suppliers who yield to the bargaining strength of the large unit.

In the present case, the implementation of certain contractual terms like Late Delivey clause, Risk purchase clause, and so on depend on other non-contractual aspects of the relationship between the supplier and buyer firms. Since the contractual terms are inadequate, non-contractual factors play a significant role in reducing the transaction costs. This suggests, that although, one can only minimize on transaction costs, given that all future contingencies cannot be incorporated in the formal contract, the combination of formal and informal terms might together result in an efficient resource allocation. However, the above analysis suggests that in the present case, in the absence of a reciprocal contract and prevalence of mistrust, methods of transaction cost minimization on part of ancillaries⁴ might result in an inefficiency.

Summing up:

This chapter described the production process, the nature of transaction, and contractual terms of transaction between the BSP and its supplier units. It was found that most of the transactions are of a recurring nature and involving non-specific investments. Hence one would expect the relation to be governed by spot market purchases or short term contracts as is the case with the procedure of rate contracts. However, since the terms of the contract are similar for all transactions with both the suppliers and ancillary units, the contractual terms cannot be linked to the implicit rationale for ancillarisation. This issue is taken up in the next chapter.

⁴ See chapter V for detail analysis of ancillary units.

Appendix III

Table: III.A.1 Data on Sales, Profits, Exports of BSP Rs. in Crores

Year	Total Sales Includes IPT*	Net Profits	Exports
1979-80	472.00	39.53	5.86
1980-81	527.65	17.84	3.48
1981-82	727.12	66.09	0.00
1982-83	772.46	19.95	0.00
1983-84	846.26	-2.83	2.28
1984-85	1091.48	49.27	33.75
1985-86	1304.00	64.38	0.00
1986-87	1339.07	38.67	9.07
1987-88	1515.12	-30.27	17.77
1988-89	2103.53	66.52	61.43
1989-90	2433.97	72.22	105.00
1990-91	2762.97	104.03	109.50
1991-92	3377.82	206.31	122.52
1992-93	3443.04	172.84	190.73
1993-94	4099.66	367.78	415.59
1994-95	4789.32	639.47	415.79
1995-96	5171.38	819.37	320.54
1996-97	N.A.	683.97	N.A.

*IPT = Inter Plant Transfers. Source: Financial Yearbook, 1995-96, BSP.

Chapter IV

RATIONALE FOR ANCILLARIZATION

4.1 Introduction

In the earlier chapter, the contractual relationship of BSP with its supplier units was studied. with reference to non-contractual factors in the relationship. It was found that ancillaries also face similar terms as other suppliers irrespective of the asset specificity of the transaction. Hence, contractual terms are not consistent with the nature of transaction, especially with respect to ancillary units. The present chapter tries to explain this inconsistency by examining the rationale of ancillarization.

Section 4.2 examines the make-buy decision of plant in general and its requirement arising from market and captive in-house facility. Section 4.3 discusses import

These include the production and transaction costs where the latter includes both the quantifiable and non-quantifiable aspects of transaction costs. Section 4.5 discusses the relative merits and demerits of vertical integration.

4.2 Make-buy decision¹

There are two issues to be clearly distinguished when one talks about make-buy decisions in the present context. One involves the farming out of items that can be

¹ This section is based on the interviews conducted and secondary data collected from BSP at the management (ancillary and purchase department) and shop floor level. The shop floor selected was steel melting shop, as it is the stage requiring the maximum number of spare parts and components.

produced in-house. Here, the farming out decision is based on relative merits and demerits of vertical integration and alternative cost comparisons, which provide rationale for ancillarization. Second is the purchase of items, the cost of producing in-house of which is very high. Here whatever the costs of market procurement, they are going to be lesser than in-house production. That is, while the former includes items which are within the in-house capacity, the latter are not and hence have to be procured from outside. However, ancillaries exist for both the items within and without in-house capacity. In what follows, the make-buy decision involving these items is studied.

The requirement of spare parts and assemblies is met from the following three sources:

1. Captive shops;
2. Purchase from indigenous sources;
3. Imports.

The main sources out of the three are the captive resources which have been provided in each of the steel plants. Captive resources include Foundries, Machine shops, Forge shops, Fabrication shops and electrical repair shops. These central engineering shops undertake manufacture of new spares, repair of old spares, equipment and generate necessary assemblies for replacement. So far, a two-tier system has been operating in the plants for meeting these requirements, which includes a repair shop provided to each major shop apart from the central engineering shops².

² In addition to the above, the need has been felt for establishing manufacturing facilities for complete equipment and major revamping of equipment at SAIL level. Efforts are on the way to establish such a shop called 'Growth shop' at Bhilai and manufacturing facilities also being developed at Kulti. This will enable SAIL to have in-house facilities for manufacture of complete equipment and also undertake intensive renovation work for the equipment which is already two decades old. With these facilities, the need for procurement of equipment from indigenous sources as well as imports will

These well equipped mechanical and engineering shops manufacture approximately 90 percent³ of the total requirements of the spare parts and changeables in terms of tonnage. The major function of these shops is during the time of capital repairs, done once an year, for the whole steel plant, planning for which starts six months in advance. The type of equipments in the engineering shops ranges from the simplest to the sophisticated ones imported from abroad. The range of items according to their weight and shape determines the economical ones to be produced inside. Basically, there are three kinds of items bought out⁴:

- (1) Specialized items like compressors, motors and hydraulic equipment not made in-house.
- (2) Items of imported origin and of proprietary nature.
- (3) Items within capacity which have been divided into repetitive and non-repetitive category depending on the requirement of the plant. There are other items, which do not have in-house facility and are procured from outside.

The study is concerned with the make-buy decision involving the third category of items, which are the ones offloaded to ancillaries. The following section discusses the motivation of setting up ancillaries and the factors influencing the make-buy decision with respect to the ancillaries.

substantially shrink. It will also provide facility to experiment and adopt to new technologies faster. (Management Trainees' technical induction programme, SAIL - BSP⁴, 1988).

³ BSP (1979), Report on the assessment of capacities and facilities available with local SSI.

⁴ Based on discussions with BSP personnel at the shop floor level.

4.3 Rationale of Ancillaries

The motivation to set up ancillary units followed from the objective of government policy⁵ to promote regional development around Bhilai with a view to foster inter firm linkages on one hand, and import substitution on the other. However, the decision to farm out items to ancillaries depended on (a) In-house capacity (b) purchase cost. This is taken up in the following sub-sections.

4.3.1 Import substitution

Since the plant was built according to Soviet technology, as per the turnkey contract, during the initial stage of expansion, supply of spare parts was from USSR, imposing a foreign exchange constraint. Hence the need for developing indigenous capability was felt. Initially, the major source of supply of machinery, equipment, essential stores and spares was from the USSR⁶. Indian supplies constituted only 8.8 percent of the total, which is indicative of the lack of indigenous manufacturing ability in the mid-fifties and hence the need for massive imports amounting to a foreign exchange component of Rs 97.98 crores.

⁵ See Appendix IV.1 for a more detailed and critical analysis of the policy of ancillarization.

⁶ This was covered under the main Contract No.430 dated 2nd April, 1958 for one lakh tonnes running into 146 numbers, upto 3rd April 1962 for 19,315 tons, thus totalling to 119,315 tons (Srinivasan, 1984).

For the expansion into 2.5mt stage⁷, taking into account the indigenous availability of equipment and materials, a contract (no.7300) was entered with the USSR in February 1962, for the supply of equipment, materials and spares from USSR, to the value of 54.2 crores. As a result of the policy of government to maximize indigenous content, local and indian manufacturers came up to meet the needs of the industry. Correspondingly, the indigenous component increased considerably from 9 percent in the one mt stage to 23.3 per cent (equipments), 42.3 per cent (structures), 44.2 per cent (refractory).The reduction in foreign exchange can be inferred from Table IV.1 over the three stages.

Table IV.1 Reduction in Foreign Exchange Component of Spares

(Rs. in crores)

Stage of expansion (Million tons) (1)	Base date (2)	Total cost of spares (3)	Foreign exchange (4)	(4) as % of (3) (5)
1.0 MT	June 1963	202	98	49
2.5 MT	June 1973	154	55	34
4.0 MT	December, 1981	1600	180	11

Source: Srinivasan (1984)

4.3.2 Cost reductions through inventory management

Another rationale for ancillarization arises due to inventory management. Inventory management⁸ has come to occupy an important place in industrial organization. The

⁷ The Government of India, in making advance preparations for III Five Year Plan, had entered into agreements with the USSR for a Soviet credit of 150 million roubles for entering into separate agreements for specific third plan projects. Accordingly, an additional agreement was signed during February 1960 by the Steel Ministry with Russia for expansion of Bhilai steel works upto 2.5 mt (Srinivasan, 1984).

⁸ *The Economic Order Quantity* (Camp's formula, 1922).
One of the most effective techniques for the determination of quantity is called economic

emphasis has shifted from the "Just-in-case" (JIC) systems of organization to the "Just-in-time" (JIT) methods of organization. In case of the steel plant, the reliance on the ancillaries is also meant to reflect the JIT concept, in some sense, though the principle doesn't apply fully as it is a process industry. Further, during capital repairs, huge maintenance is required by the engineering shops and excess orders are placed on these shops. These excess jobs are off loaded to the ancillaries depending on their capability. The engineering shops basically cater to the most urgent and critical jobs and the minor and repetitive ones are offloaded to the ancillaries. The ancillaries also serve to minimize the production variance of engineering shops, such that they concentrate on the crucial jobs and breakdowns. Job contracts are placed on such ancillaries undertaking machining jobs and serving as extensions to the engineering shops inside the plant.

order quantity. The basic objective is to economize on the total cost of purchases. There are many factors to be taken into consideration - unit cost of the item in various lot sizes, the average inventory resulting from purchases in different quantities, the number of orders issued, cost of negotiating and issuing a purchase order and cost of carrying materials in inventory.

The economic order quantity is the quantity at which the cost of procuring the annual requirement of an item and the inventory carrying cost are equal. The Q is chosen such that the total ordering costs are minimized. The formula used is;

$$Q = \sqrt{2AP/UC}$$

where A is annual consumption, P is procurement cost per order, C is inventory carrying cost as percentage, U is unit price, and Q is quantity per order. Total costs comprise inventory costs which is given by

Average inventory * inventory cost per item, or $(1/2Q)/U$; and,

ordering cost which is given by

Number of orders p.a. * order cost, or $(A/Q * P)$.

Therefore, total costs are,

$$C(t) = (A/Q)*P + (1/2Q)/U$$

Differentiating total costs with respect to Q gives

$$dC/dQ = -AP/Q^2 + (1/2)U, \text{ or } Q = \sqrt{2AP/U}$$

Looking at the Inventory analysis, one can make out a declining trend in inventory holding over the years. The variable (Opening balance/issues) of indigenous spare parts and general stores items, shows a fluctuating, though declining trend over the years 1975-1996. However this does not reflect an increase in reliance on ancillary spare parts and ancillary stores items alone as it comprises inventory of indigenous purchases as a whole including purchases of proprietary items, from other than local suppliers. Since a segregated value of items bought from ancillary and other suppliers is not available for each category viz. spares, stores, refractories, we can not say for sure whether ancillaries have contributed towards inventory control. However, if we compare the movements of the total order flow to ancillaries and the inventory control variables, they seem to be moving in the opposite directions showing an inverse relation, that is, inventory holding decreases as order flow to ancillaries increases⁹.

⁹ See Appendix IV.2 for the regression results.

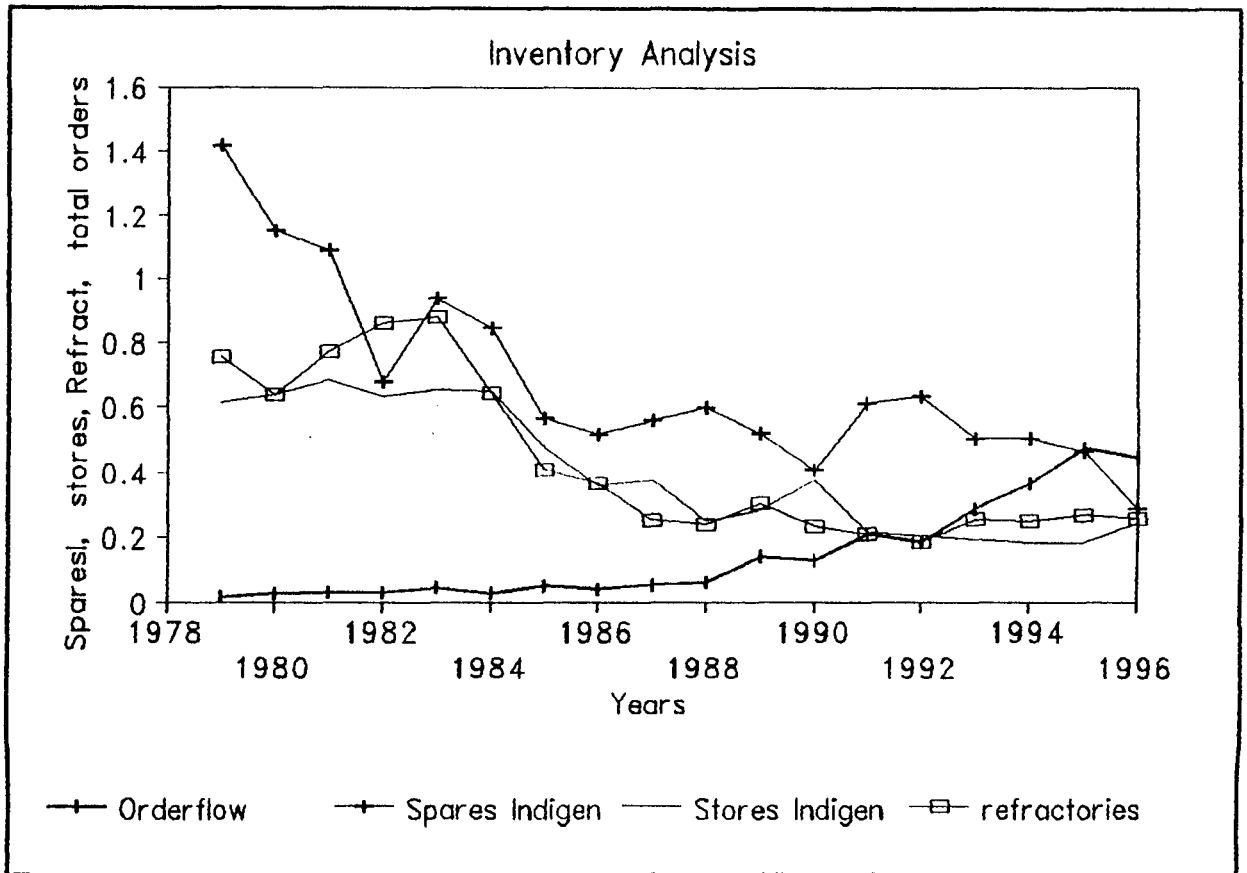


Figure 5: *Inventory Analysis*

To find out how much the ancillaries help in inventory control, we can look at the percentage share of ancillary orders in total purchases of indigenous spare parts, stores and refractories. Total purchases include proprietary items bought from suppliers outside the local region as well as the items bought from local SSI's and ancillary units. In the four years, 1993-94 to 1996-97, the share of ancillary orders in the total purchases from indigenous sources has increased from 9.1 per cent to 10.9 per cent and 13.7 per cent and then declined in 1996-97 to 8.7 per cent. Though the role of ancillaries in inventory control is growing, still it is marginal given that their share is only around 10 per cent in the total purchases.

4.3.3 Other Cost Savings

There are other cost savings achieved by relying on small scale and ancillary units, for items which do not have in-house facility. This includes the cost involved in the tendering process¹⁰. Firstly, for items which are required regularly, the cost of retendering is avoided and the order is placed with the same ancillary if it agrees on the past terms and conditions. Secondly, there is saving of interest on investment on purchase. This is because payment to the ancillary units is done only after 2-4 weeks of effective delivery of the material whereas, to outside suppliers, the plant pays in advance since their supply documents are routed through bank and are retired by the plant much before the material reaches the plant. In such case the investment on purchases is blocked for a month. Thus the difference in purchasing cost for the plant between the ancillary and outside suppliers in terms of investment above is one month and two weeks and on an average the interest burden on such a case is 2.25 per cent (taking interest @18 per cent per annum, which works out as 0.15 for a month). Further there is cost saving achieved due to the difference in the central and state sales tax, saving in cost of freight, packaging and forwarding and cost of collection of materials from transport godown, etc.

Indirect profitability areas

Besides these, there are indirect profitability areas not possible to quantify which include free and prompt after sale service, technical help at site from the ancillary units,

¹⁰ There are 3 types of tenders, namely, open tender; limited tender, and single tender. Open tender system for inviting bids is followed when there is need for developing competition for that spare part and whose value exceeds one crore. For such items, pre-qualifying bids are called and the process involves more time. Further, there is always the risk of unknown suppliers. This process involves more cost and followed for few items. Single tender system is followed when the suppliers are known and procuring involves less time. A list of approved vendors is there from whom to procure items. For items which have to be necessarily bought out, there are many cost savings achieved through ancillarization.

minimization of down time of equipment by timely supply of spares , thus arranging back-up to maximize production. An underlining factor which enables the Plant to take advantage of these factors is the emphasis on maintaining good relations with its vendors, where the ancillaries are treated as an extension of the Plant's workshops. This enables them to depend on the ancillaries during any time of breakdown or emergency at the cost of disrupting the work schedule of the ancillaries.

4.4 Comparative Cost Considerations

Fixed costs of In-house facility

A dilemma faced in setting up ancillaries was that the Plant has its own in-house engineering facilities to meet approximately 90 per cent of its requirements of its spare parts. The scope for specialization in the production of spares is limited in a process industry such as steel unlike an end-product industry like electronics. Thus, the decision to farm out manufacture of certain spare parts and components is a flexible one, depending not just on alternative cost comparisons, but also the relative merits and demerits of vertical integration and budget for purchases¹¹. Discussions held with the BSP personnel revealed that the cost of in-house production is lower than the cost of purchase, if only variable costs are considered. Table IV.2 shows the difference in production cost and purchase cost of certain critical repetitive items, which is lower for in-house production compared to purchase.

¹¹ During 1997, the manufacture of a number of ferrous and non-ferrous items of repetitive nature were diverted in-house because of a cash crunch faced by BSP.

However, the estimates provided by the costing section prove otherwise, once fixed costs are also included. This is because, *once the fixed costs are included in the cost of producing in-house, the total cost of producing in-house is higher than purchase because the average cost of production is high.* That is, the maintenance cost of the machine may be too high compared to the value of the item produced like nuts and bolts. Hence, purchasing from ancillaries and local suppliers is preferable as they have lower overheads.

Table IV.2: Comparison of costs of In-house vs. Purchase. (in Rupees)

S.No.	Item	M/C Hours	Material cost	Operating cost	In-house Total Cost	Purchase Total Cost
1.	Grate Bar	Foundry	121	56	177	342
2.	Door Frame	SSS	13104	3295	16399	41330
3.	Beams	Foundry	18781	40572	59352	160000
4.	Mudgun Nozzle	6.29	928	1694	2622	2700
5.	Paw for metal ladle	216.94+6.33	20275	136009	156284	245000
6.	Half coupling	4.31+0.9 +12.56	1681	7849	9530	6960

Source: Costing and Accounts Department, Bhilai Steel Plant.

However, if we consider the magnitude of purchase cost and the organizational set up involved in dealing with so many suppliers, in other words, the elements of transaction cost involved in the exchange relationship, the argument again shifts in favour of in-house production. This is illustrated by the purchase procedure described below.

4.4.1 Transaction Cost

The requirement of spare parts and changeables is divided into two categories. The first category are spare parts of repetitive nature, whose requirement is worked out by the Materials Planning Department in consultation with the various departments for placement of orders for a period of two years at a time. These items have been

successfully developed by the ancillaries and local industries for the Plant. The second category are items of non-repetitive in nature whose orders are placed by the different departments as and when required.

Purchase indent of the requirement in the prescribed form with all relevant details such as specification of material, set of drawings, quantity required, delivery schedule and approximate purchase value is then floated by the indenting department. This is sent to Materials Planning Department for clearance after which, quotations are invited by the purchase department and comparative statement prepared.

The statement is then sent back to the indenter for purchase recommendation. If it is accepted then, normally the lowest quoted price is accepted and purchase order is placed. After the material arrives, inspection is done by the inspection department under the controller of purchase and stores and if the material is as specified in the A/T, it is accepted and taken charge of for issue to the indenter on demand. The whole procedure¹² is a tedious one and may take a long time, thus raising the cost of procuring from outside as the lead time increases.

The Purchasing cost is the cost involved by the purchase department in making purchase. For example, each time a purchase order is placed, there are set-up or administrative costs involved in inviting quotations, scrutinising them, costs of inspection and receiving the material. The cost component has a fixed and a variable component. *Fixed costs* comprise, salaries and wages of purchase personnel and ancillary cell, depreciation of furniture (new and old), apportionment of central computer cost and

¹² See Appendix IV.3 for a flow chart representing the purchase procedure.

depreciation related to that which can be solely attributed to purchase department, apportionment of rental and electricity value of Ispat Bhavan, attributable to the purchase department.

Variable costs comprise expenditure on consumables viz., maintenance cost of computer, stationary, telephone calls (STD and Local), postage charges depending on how many orders, enquiries and amendments have been issued, faxes and telegrams and finally the inspection costs. Approximately the cost of placing one order (A/T) comes to about Rs 5800. These costs rise as the lead time involved between raising an indent and placing the purchase order too rises.

The magnitude of work and cost involved in the administrative work that includes identifying suppliers, sending quotations, issuing purchase orders to various suppliers, cost of retendering if the item is not supplied , etc., is quite a lot and, might shift the decision in favour of in-house production.

Other *non quantifiable costs* include the cost of a separate ancillary cell and administrative procedure and cost of inferior quality. This is discussed below.

Cost of low quality of ancillaries¹³ : The units take advantage of the captive demand by delaying delivery, forming cartels and raising prices, and using inferior quality of material. Taking advantage of the fact that Payment from BSP is guaranteed and the threat of penalty on late delivery can be mitigated through lobbying, the ancillaries supplying mechanical spares take up a number of orders from private parties also and supply them at an earlier date than BSP. These factors are compounded by the prevalence of mistrust between the plant and the ancillaries who hold back information and do not maintain proper records on a number of aspects like their investment in plant and machinery, subsidiary units, availability of extra facilities to do specialized jobs, their annual turnover, employment on temporary and permanent basis, and so on.

To remove any kind of bias arising from the side of the purchase officer in the selection of vendors and so on, the organizational hierarchy is so structured such that every officer can approve only upto a certain value of the order depending on his rank and seniority.

Having analysed the role of transaction costs, the chapter next studies the relative merits of vertical integration¹⁴, which play an important role in the make-buy decision. In the

¹³ The process of developing vendors is a continuous one and the ancillary cell assesses the performance of the units continuously and prepares *report cards* with certain yardsticks like delivery schedule, addition and upgradation of facilities in the unit, ability to take up and develop new items/tasks according to the plant's specification, price competitiveness and quality. If the performance of the unit is not satisfactory and the unit is found to engage in unfair means to secure orders and unhealthy competition, it is blacklisted and orders are stopped from not only the plant but also its sister concerns.

¹⁴ The decision to farm out is based on the relative merits and demerits of vertical integration. The benefits a firm might obtain through vertical integration, generally constitute, decreased marketing expenses, stability of operations, better control over product distribution and additional profit margin. The disadvantages constitute disparities in productive capacities at various stages of production, public opinion, governmental

course of discussions at the management level, benefits due to vertical integration were given an important role in the decision to produce in-house. The main reason cited was, better utilisation of resources.

4.5 Relative merits and demerits of in-house production

There are various advantages of in-house production that lead to reduction in transaction costs. These include: quality control, cheaper cost of the spare part in the sense that one can concentrate more on the functional rather than the aesthetic value of the spare part as it is not going to be marketed, better utilization of men and machines considering that a public sector is overmanned and the expenses on overheads, labour and capital serves as fixed cost which will be spread over a number of spare parts manufactured in-house. Further, there is more of standardization and precision due to sophisticated machines, unlike in an ancillary unit where precision of job depends more on the skill of labour.

In fact, disparities in production capacities due to in-house production do not arise generally because the jobs are so scheduled as to utilize the full capacity and even if disparity arises, it is compensated by the flexibility to be able to meet urgent needs by stopping less urgent ones and meeting the more urgent ones. The maintenance function of engineering shops is both centralized and decentralized in the sense that each shop has its own repair shop besides getting help from engineering shops.

pressure, lack of specialization, inflexibility of operations, lack of direct competitive pressure on the cost of intermediate products, extension of management team and so on (Blois, 1972).

Thus there are a lot of advantages of in-house production which arise due to engineering shops primarily built to serve 90 per cent of the plant's needs. Considering the advantages of in-house production, it could be true in some cases that the purchase cost is higher than the average cost of producing an item in-house, and farming out would only increase the transaction costs of dealing with so many suppliers. This suggests an implicit rationale for ancillarization that is, benefits perceived by the government policy against which the costs of purchase have been traded off.

Broadly speaking, the manufacture of spare parts and components is farmed out on four considerations:

- i) It is uneconomical to manufacture small items like nuts and bolts on the sophisticated machines of engineering shops. The ancillaries work with simpler machines with lower maintenance cost resulting in lower average costs. They also have lower overheads and labour costs.
- ii) It serves to enable the engineering shops to concentrate on the more sophisticated jobs and breakdowns.
- iii) There are numerous items falling under the category of general stores like safety helmets, shoes, raincoats, polythene bags, rubber items, and so on, for which the cost of in-house production would be too high.

iv) It is mandatory to off load repetitive items¹⁵ to ensure regularity of orders to ancillaries. The duration of the contract is also supposed to be such as to cover the developmental phase of the ancillary. Besides the repetitive jobs, even the non-repetitive ones are off loaded as and when the requirement arises. However, there is a thin line between the two categories as certain items may enter the second category when their requirement decreases overtime. Hence, the list of repetitive items is flexible and prepared afresh after every two years.

The first argument is based on production cost minimization, while the second is based on merits and demerits of vertical integration. The third and fourth constitute a paradox. The third factor does not explain ancillarization, as its purpose is served as well by suppliers. It is fourth factor which provides a hint to the implicit rationale of ancillarization.

Summing up:

From the above analysis, it appears that a pure transaction cost argument would not be helpful in explaining the decision to farm out the manufacture of certain spare parts and components that can be manufactured in house also. Organizational and institutional factors, that is, the role played by government policy is also a very important factor because ancillarization was not purely based on organizational need of the firm, but dictated by government policy. It points out to an implicit rationale of ancillarization

¹⁵ Though it is mandatory for the steel plant to farm out items of repetitive nature, it is the non-repetitive items that comprise more than 50 per cent of the total order the ancillary unit gets. Since the quantum of repetitive items tendered out is fluctuating and there is also no guarantee that the ancillary unit gets the order again in the next cycle too, as it may go to another unit once it is retendered, the ancillary units maintain a higher proportion of non-repetitive items in their total order, both in number and value.

which is the government policy that influences the governance structure between firms to achieve certain goals such as entrepreneurship development and learning by doing. In the following chapter, response by the ancillary units to these policies is examined.

Appendix IV.1

One of the strategies of industrialization in a developing country like India has been the promotion of small scale industries. According to the Abid Hussain Committee report (1997), 'employment generation is the main objective of the policy, institutional and legal framework governing small industry in labour-surplus India, so as to spread the benefits of growth to the maximum number of people.' The specific role of the SSI's was recognized by the industrial policy statement of 1948 which stated that cottage and small scale industries are particularly suited for better utilization of local resources and achievement of local self-sufficiency in certain essential goods.

Broadly, the objectives of promoting SSI units contain seven principal aspects:

- 1) Increasing employment as the capital requirement per job created is lower than in large firms;
- 2) The potential to achieve a better distribution of personal incomes as the profits generated by small units are more widely distributed;
- 3) Being easier to disperse spatially, small units can also serve to achieve regional income equity;
- 4) Promotion of small scale firms broadens the scope for the development of new entrepreneurs and in turn broadens the industrialization process;
- 5) ensures maximum utilization of local raw materials and contributes to the achievement of local self-sufficiency in consumer goods, thereby reducing pressure on the transportation system;
- 6) small units help to mobilize local capital resources which would otherwise remain untapped, and;

7) restricting the rate of growth of urbanization by creating employment opportunities in dispersed rural and semi urban locations and absorbing the labour force in such small enterprises.

The foundation of SSI policy was laid in the second five year plan. Subsequently, a number of incentives and concessions were given for the development of SSI units. However, there was no clear distinction between the policy objectives of promotion of employment, encouragement of entrepreneurship and protection on basis of size per se. There is often a confusion between the objective of promotion of employment and encouragement of entrepreneurs, with the latter being taken for granted. The objective of promotion of employment, on the assumption of better utilization of factor proportions, may not hold for certain group of SSI units, as has been shown by various studies¹⁶. In such cases, the encouragement of entrepreneurs is a more valid objective of their development and any measure to evaluate the success of policy measures should be done on this basis, rather than based on the assumption that SSI's are more labour intensive.

In consonance with the policy objectives, the 1977 policy statement expanded the list of items reserved for SSI's from 180 to 504 and later to 807. A tiny sector was brought in with investment in plant and machinery upto Rs.1 lakh and suited in towns and villages with population less than 50000. The District industry centres were established as the nodal agency for the sector. Lastly, arrangements were made for marketing assistance such as product standardization, quality control, etc.

The 1980 policy statement recognized the importance of ancillary industry and accelerated the development of rural and backward areas. Investment limits were raised for the SSI sector as a whole to Rs 20 lakhs and for the tiny sector, to Rs 2 lakh and for the ancillary the limit was set at Rs 35 lakhs, which was subsequently raised to Rs 45 lakhs in the 1985 policy statement, taking account of inflation. An ancillary unit was

¹⁶ See Dhar and Lyndal(1961); Sandesara (1966); Little, et. al. (1987).

defined (1980 policy statement) as an undertaking having investment in plant and machinery not exceeding 25 lacks (now 75 lacks) and engaged in :

- a) The manufacture of parts, components, sub-assemblies, tooling or intermediaries,
- b) The rendering of services and supplying or rendering 50% of their production or total services as the case may be to other units for production of other articles.

In the late 1960's, the need for ancillarization was felt due to the presence of large scale idle capacity in the small scale engineering industries and a growing trend towards specialization in the large industries. As early as 1975, when the investment limit for ancillaries was set at 15 lakhs, the public sector undertakings were encouraged to take up ancillarization to serve as stimuli to private sector with the following objectives:

1. Import substitution

2. Employment generation

3. Long term procurement of machinery and plant replacement of PSU's with a view towards modernization, giving due considerations to factors like residual service life, capacity, efficiency and obsolescence.

In some cases it would have been necessary that some major sacrifices (like apparently satisfactory residual life, considerable difference in the purchase price of new equipment and second hand value of existing one) would have to be made of the advantages of early replacement of standard general purpose machine tools and small manufacturing machinery by installing more efficient and modern equipment in the interest of minimization of replacement cost. These factors could be mitigated if a dependable ready market for these replaceable items of equipment could be economically established in close proximity to the manufacturing plants, which is served by ancillarization.

It is a common phenomenon with all big industries that they need the support of small and medium industries for the supply of their various inputs, semi-finished products, consumables, stores and spares etc. In the initial stages, however the satellite industries had to suffer because of their dependence upon the consumer market which is of a widely fluctuating nature. It was in this background that the idea of ancillary industries

around the bigger industries was conceived of with a view to promote a relationship of inter-dependence which would be to the mutual advantage of both.

Appendix IV.2

Regression Results

X1 = Ratio of Opening balance/Issues of mechanical spares

X2 = Ratio of Opening balance/Issues of Stores Items

X3 = Ratio of Opening balance/Issues of Refractory items

Y = Orderflow to ancillaries.

$Y = 0.42 - 0.10 X1 - 1.06 X2 + 0.50 X3$

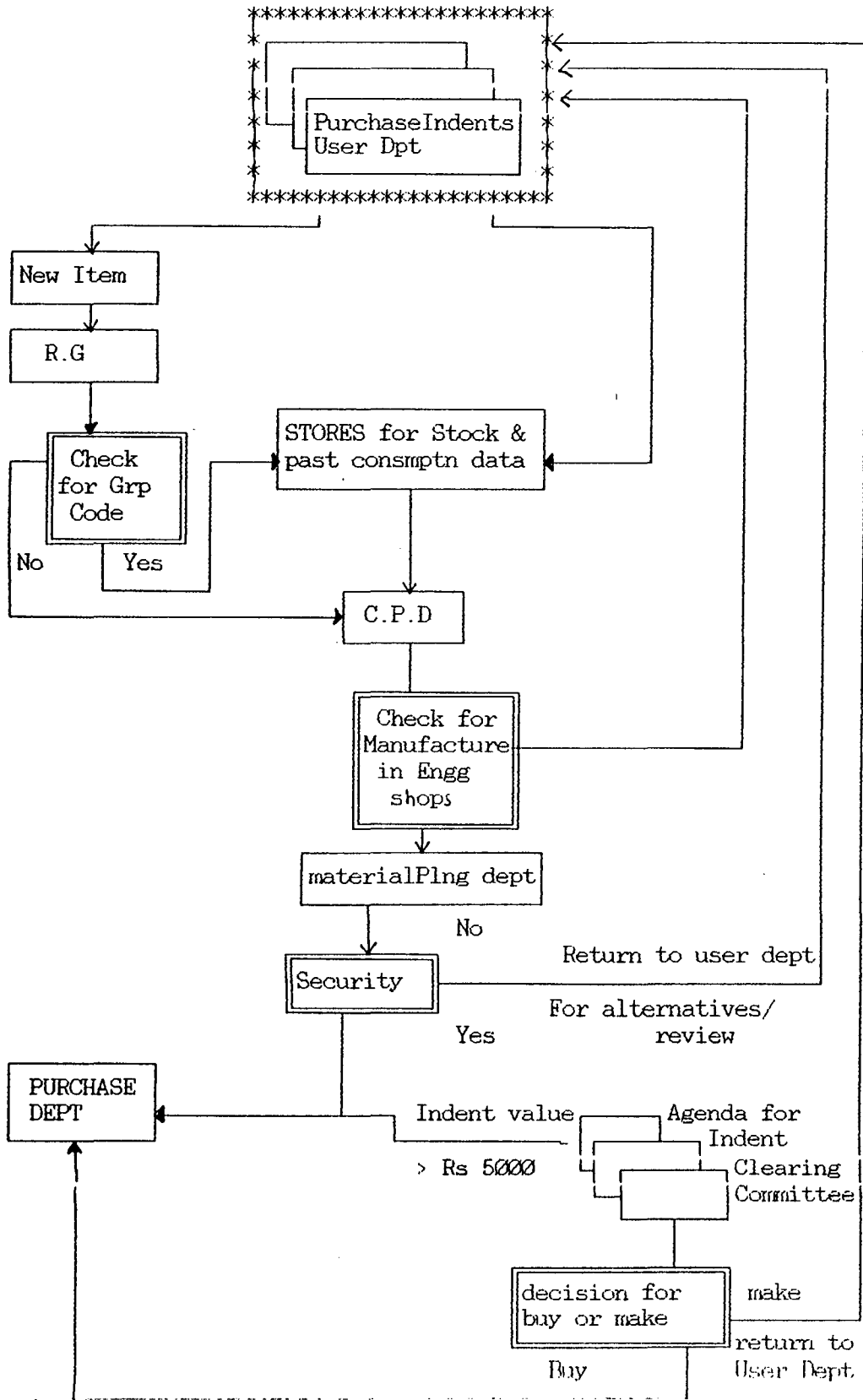
(0.064) (0.13) (0.33) (0.26)

R SQR = 0.65, Adj.R SQR = 0.57.

In the four variable regression model, the second variable is significant at all levels of significance and third variable is significant at 1% level for a one tail test .

Chart IV.A.3

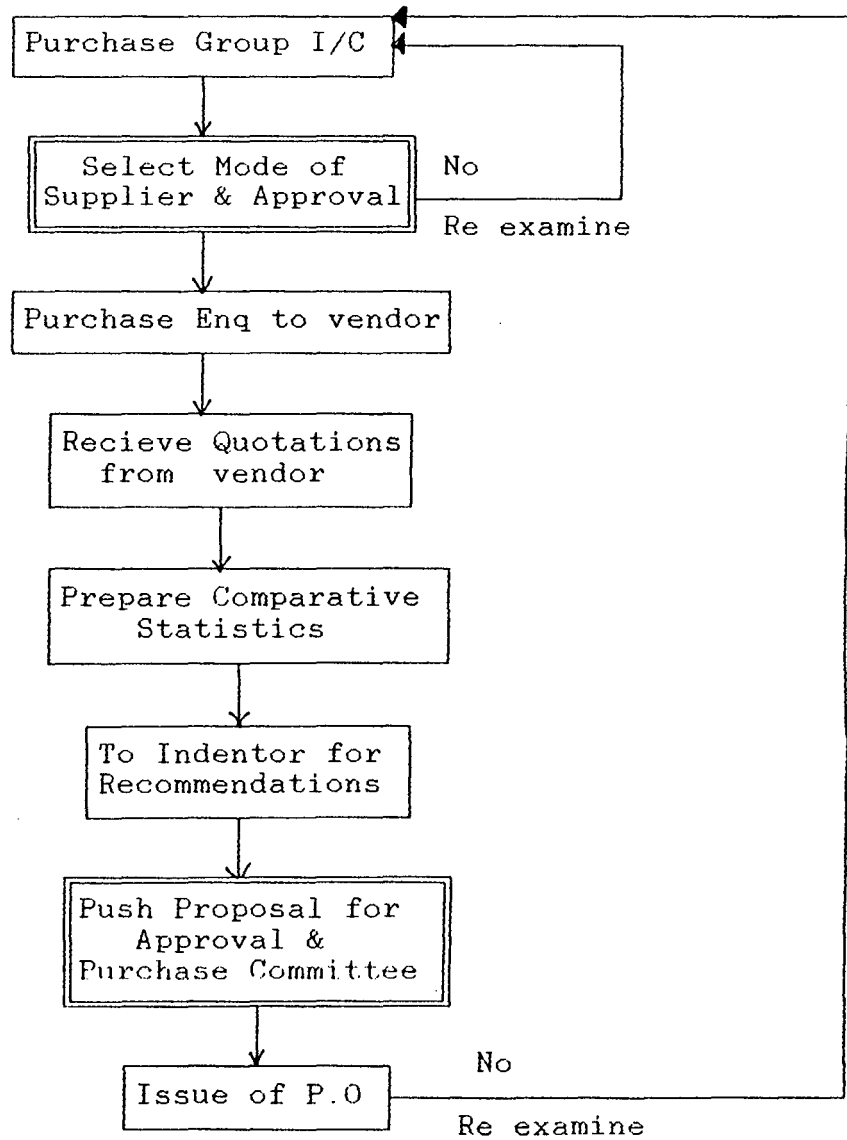
A. MATERIALS PLANNING FLOW CHART:



Notes :
 R.G : Rationalization G
 C.P.D : Central Planning

chart IV.A.3

B. PURCHASE ACTIVITY FLOW CHART



Chapter V

RESPONSE OF ANCILLARY UNITS

5.1 Introduction

Having examined the rationale of ancillarization as implicit in the government policy to promote small scale units, this chapter analyses the response of the ancillary units to the government policy objectives. These objectives are formulated by the government to influence the large-small firm relationship such that certain organizational benefits like entrepreneurship development are achieved. In the process, certain incentives are provided by the government, such as provision of facilities to ancillary units. It is attempted in this chapter to unravel the response of the ancillaries to such incentives, which in turn determines the final outcome of the governance structure.

Section 5.1 critically examines the facilities provided by the BSP as per the guidelines of Bureau of Public Enterprises (BPE). Section 5.2 analyses the response of the ancillary units in terms of their investment in specific assets and their recourse to different means of securing orders. Section 5.3 brings out the final outcomes of these responses and the factors that have constrained the achievement of entrepreneurship development. Comparison with the case study of HMT is attempted to draw generalization.

5.2 Facilities to the ancillary units

The social objective of ancillarization was to encourage small units through inter-firm interdependence, by anchoring them to a large unit, in this case the public sector unit. In consonance with the objectives of the government policy to promote entrepreneurship and regional development, a number of incentives and concessions were introduced including the

provision of facilities to the ancillary units¹. This section critically examines the role of facilities given by BSP (dictated by the guidelines of Bureau of Public Enterprises) to the ancillaries to achieve entrepreneurship development. Some of these facilities include, issue of scarce raw materials, reservation of certain category of items to be off loaded exclusively to ancillaries ensuring captive demand, price preference, and free testing and technical facilities. This is based on the survey of thirty ancillary units to the BSP.

i) Issue of raw material

The policy of scarce raw material allocation has not resulted in removing supply shortages, with the present system often being abused with the ancillaries merely acting as trading enterprises, reselling the material at prevailing prices. There is no effective method to curb this opportunistic behaviour on part of ancillaries other than stopping the allocation of such material.

ii) Reservation of items

The policy of reserving items of repetitive nature for ancillaries has resulted in expectation formation by giving rise to a number of new small scale units trying to get the ancillary status. As the Table V.1 shows, next to Durgapur, Bhilai has the maximum number of small scale units including ancillaries in December 1986. At present (1997), there are 317 vendors to the BSP which includes 162 ancillaries and 155 other small scale units.

¹ See Appendix V.1 for a list of facilities to be provided by the parent firm and the government.

Table V.1: Ancillary and SSI units in steel plants under SAIL

Steel Plant	No. of ancillary and SSI units	
	December 1979	December 1986
Rourkela	150	224
Bokaro	106	147
Bhilai	171	345
Durgapur	88	540
IISCO, Burnpur	68	110
ASP, Durgapur	49	90

Source: Seminar on ancillary development, BSP(1988)

The ancillarization programme was started by BSP in 1979 when 31 existing units were declared ancillaries. The number of ancillaries has gone upto 158 as on August 1997. The growth in number of ancillaries took place between 1979-1987, as that was the period of commencement of the policy² and reached its maximum in 1994 after which there is a fall as a number of non-functional units were weeded out.

iii) Price preference

In the above context it is important to mention the policy of price preference issued by BPE guidelines. BSP's policy is not in consonance with the BPE guidelines as regards price preference. The main reason for not adhering to this is that the ancillary units are developed in the vicinity of Bhilai and therefore they are already getting benefit in transportation cost. In addition the new units are getting various concessions from the state/central government units and therefore it was felt that the rates from ancillaries should be competitive and lower than outside suppliers.

² The figures were collected from the BSP.

In the absence of any laid down formula for pricing of ancillary products, disputes arise over the price fixation. The cost-plus profit³ method is the most common and an issue of dispute which occurs in most cases. Another method which is generally adopted is to take the lowest tendered rate as a basis for ancillary price fixation. This practice, however conflicts with the policy of reserving certain items for ancillaries. While the reservation policy has resulted in growth_λⁱⁿ units more than the optimal number due to expectation formation, the practice of lowest tender has generated a cut-throat competition amongst them, resorting to undercutting of prices.

iv) Prompt payment

Another facility that the ancillaries are supposed to get is that of prompt release of payment within 20 days after the receipt and acceptance at stores. Although the survey shows mixed response regarding this facility, the issue of prompt payment is of great importance for the small units. When asked about the advantages and disadvantages of contract with BSP, most of the ancillaries factored out security of payment as the important benefit as compared to private parties. The disadvantages were, low rate, sometimes delay in payment by at least 3-4 months, due to administrative procedures. Delay in payments is a common problem experienced by SSI's all over India and specially faced by ancillary units faced with one buyer.

Various studies⁴ have been done on the problem of delayed payments to SSI units and in cognizance of these difficulties, the Kalyanasundaram Report confirmed the need and

³ The profit margin of ancillaries is higher on items which are critical and customized. Being more customized, they are also rejection prone. Quantity ordered on the ancillaries can be adjusted depending on requirement of the plant and a margin of plus or minus 20 per cent is maintained.

⁴ See NCAER, 1990. "National Analysis of the promotion and structure of Small Scale Industries, NCAER, New Delhi.

feasibility of starting factoring services in India⁵. The State Bank of India, together with the SIDBI, have recently launched SBI factors. Not only will this improve the efficiency of open account trading practices, and hence assist in overcoming liquidity problems in the SSI sector, it will encourage a more efficient credit performance reporting system which will benefit all those engaged in buying and selling of goods. Other banks are looking to the possibility of launching such services in other regions of the country.

v) Technical and managerial aid

As regards the facility of technical guidance, testing facilities, managerial aid, and so on, during the course of interview with thirty units, twenty-two of them denied as having got any facility, while some of them agreed to having got the facility of allocation of scarce raw material, which was later stopped. Eight of them agreed to getting technical aid and advise, testing facility and raw materials. Incidentally, these included the more technically qualified and successful ancillary owners.

This suggests that technically qualified are more aware and get more benefits out of the relationship and also that the initiative to learn and develop rests on both sides, including

⁵ While it found that existing law (section 13.0 of the Transfer of Property Act, 1882) covers debts that are actionable claims, the existing law has no express rules with regard to priorities between successive assignments of the same debt and that there was no law restricting the introduction of a stipulation in the contract of Sale of Goods and Services that prevents the creditor assigning the debt to someone else. In this later case, a "powerful" buyer may be able to insist on such a stipulation and effectively deny the seller the advantages of such an inclusion. This possibility does not occur in the U.S.A. or Europe as the Uniform Commercial Code prohibits such inclusion. Another issue is regarding the levy of States' stamp duty on value of transferred assets, including assigned debts, which imposes constraint on the establishment of factoring services, given the narrow margin within which they operate.

active participation of small firms in seminars and workshops conducted by the parent firm. However, in most cases the ancillaries denied as having getting any special benefits. Some of them expressed the view that the technical advice offered by the government departments is limited and of no use. This substantiates the general perception that the relevance of technical advice offered by promotional agencies is limited by their staff's lack of technical expertise and experience⁶.

A critical examination of these facilities has shown that most of these are ineffective and have not achieved cooperation between the ancillaries and parent firm.

The above conclusion is substantiated by the findings of other studies which have shown that the policy measures undertaken to assist the new and existing entrepreneurs to set up small scale units and acquire skills over time, are not effective due to a variety of reasons. Primary of these, is the inadequate coverage and intensity of such programs. According to a survey conducted of 200 firms in Andhra Pradesh on the coverage and intensity of Industrial extension services (IES) by the government, there exists a large variation in both awareness and usage of IES, shown by the Table V.2.

⁶ See Little, et al, 1987.

Table V.2: User Perception Of IES (as % of Total Respondents)

Assistance available in obtaining	Awareness	Use
Total Respondents (Nos)	195	180
1. Basic infrastructure	96	68
2. Plant and equipment	85	62
3. Raw material	64	42
4. Tooling centre facilities	19	3
5. Prototype development facilities	9	1
6. Quality testing centres	23	3
7. Entrepreneurship training	15	4
8. Technical training	26	3
9. Vocational training	4	-
10. Assistance in marketing	11	2
11. Assistance in procuring govt. orders	8	4

Source: World Bank Consultancy Group (1991), A Study on SSI in Andhra Pradesh, Hyderabad .

Secondly, easy access to basic infrastructural facilities at concessional rates has facilitated and induced a number of small scale units which continue to remain non-viable. In general, the efficiency of firms located within industrial estates are found to be lower than those located outside the estates: Numerous studies indicate that the rates of return of firms located within the estates are on an average, much lower than those located outside (Bandopadhyaya, 1969; Sandesara, 1988; Dhar and Lyndall, 1958). Availability of inputs at concessional rates (financial assistance and raw material) has also at times made it more lucrative for firms to remain within the estates and to take on trading activities, that is, to resell inputs outside at a profit margin than to go into actual production.

5.3 Response of the Ancillaries

This section describes the response of ancillaries to sustain a long term relationship by way of investing in certain capacity and skills; in other words asset specific investment, due to the assurance of a captive demand. However, this is not possible due to the following factors : paucity of work, specification changes with every fresh order, technological innovations and

requirements of new facilities by the parent firm and consequent change in the design and production, and finally, the sophisticated nature of items where the ancillaries haven't come upto the expectations.⁷ Hence, as a response to the irregular orderflow, the ancillaries adopt various means of securing orders, which is brought out by examining the factors influencing the orderflow (dealt with in Section 5.3.2).

5.3.1 *Various types of Investments*

This section examines the response of the ancillary units to the provision of facilities, with regard to the nature of investment undertaken by the units and its effect on the relationship. For the purpose of the study, the sample units are divided into three categories on the basis of nature of items supplied. They are a) mechanical, b) electrical, and c) others.

a) Mechanical units

These ancillaries are situated in the industrial estates adjacent to the plant and are equipped with Casting, fabrication and machining facilities. The production of a spare part requires any or either of the three operations of casting, fabrication and machining. Thus, the ancillaries achieve economies of scope by catering to different types of requirement.

The mechanical units can be broadly divided into 3 categories :

- i) those which supply to other large firms and take up mostly purchase contracts with the BSP, supplying items of both repetitive and non-repetitive in nature, but more of the latter. These are quite well off ones and have grown considerably, their reliance on BSP being minimal

⁷ Government of India (1989)

- ii) those units which supply mostly to BSP and take up both job and purchase contracts: In the case of some of these units, asset specific investment in the form of development of specific skills according to BSP's requirements, has taken place, that is, learning by doing. This has proved costly as the parent unit switches to other suppliers for better quality. This is reflected in the letter of the additional director of industries, Durg, dated 7-5-89, to director SISI, Indore. It is clearly mentioned, that inspite of a particular item being supplied by the local firms/ancillaries, for the past 20 years, the parent unit has switched on to an outside supplier on the ground that the life of the item supplied by the outsider is 10 times more than that of the locally supplied item and hence no order can be given. The director has suggested that such a switchover is detrimental to these units, which have developed the process based on the requirements and specification of the parent unit and hence should be given sufficient time to switchover to another technique, till which time they should be given part of the orders.
- iii) those relying entirely on the Steel plant and take up only job contracts/purchase contracts. The third category undertaking only job contracts, is located adjacent to the steel plant and whose market is limited as they undertake only machining jobs around the region of steel plant. That is, their investment in plant and machinery is location specific. Securing orders in this category depends a lot on the relations with BSP personnel. There exists a trade off between the cost of adding in more facilities and specializing on one hand and the cost of rent seeking on the other, with most of them

opting for the latter. Due to low order flow, they resort to 'voice mechanism'⁸, rather than the exit option.

b) Electrical spare parts

These too, are basically jobbing units. Manufacture of electrical spare parts, however requires more skill and less of investment than the former. Unlike the mechanical units, there is no glut in the market yet and not much competition too. Besides supplying to BSP and other large units, the units undertake other activities too. In the category of electrical spare parts, one of the units is a manufacturing agent as well as stockist agent of components of other manufacturers. One interesting case is that of a unit declared as ancillary for steel furniture. After the initial placement of orders, as the orders declined, it started supplying mechanical spare parts, utilizing the facilities of other units. Although it has been registered as a furniture supplier, even orders of mechanical spare parts are placed on it, because of its political clout.

c) Others

This category can be divided into two groups. The first category consists of units supplying miscellaneous items like rubber items, chemical based items, timber, stationary, consumer based like raincoats, safety helmets, shoes, furniture, cotton waste, etc. Most of these units supply consumer-based items and are having a market outside the local region.

⁸ The neoclassical view of how resources get allocated is based on the workings of the price mechanism which provides incentives or disincentives based on the assumption that there are no costs involved in quitting. From the behavioral standpoint, the actual communication between the actors is important, that is what is known as the 'voice mechanism' (Hirschman, 1970). Rather than terminating contractual arrangements, which will involve costs and risks in drawing up new contracts with unknown third party, it is in the interest of both parties to discuss their problems or 'voice' their opinion.

The other group consists of two categories:

- i) units specifically developed for the Plant's requirements during the 4MT expansion stage and supply items like; lancing pipes, lolly-pop sampler, thermo-couple tips, and so on and. When the requirements from such units ceases, orders on some other item is placed. Though the item is tailor made according to the plant's requirements and value in alternative use is low, the cost of investing in such units is not very high. For instance, the lolly pop sampler requires mainly assembling of certain parts which are procured from outside by the ancillary. The Plant develops two or three suppliers for each such item and places orders on both.

- ii) units based on bye-product utilization of plant and are not easily procurable from outside sources and require the supplier to be located nearby. Steel plant is a continuous process plant which often generates products and waste products which can be fruitfully processed in the small scale sector. For example, amongst the bye product emerging from the steel plant is slag from open hearth furnaces and L.D. convertors. While Slag from blast furnaces can be used directly for the manufacture of cement, the slag from Open hearth furnaces cannot be used directly so and is usually dumped as waste or used, for other purposes such as road building. However, if crushed to the requisite size, this slag can also be used as a soil conditioner for acidic soil. Yet this process has been exploited only to a limited extent and requires the involvement of steel plant, relevant national laboratories, departments of agriculture, financial institutions for provision of venture capital and the District Industry Centre. Other examples are, fly ash from thermal power plants which can be used for making bricks, and coal dust for mines from which pellets can be made and used as fuel. Many bye products are being utilized in such manner, for example,

coke ovens wastes from steel plants are being used by the small units near the plant for the manufacture of chemicals (Nag, 1988).

These units invest in a specific quantity according to the plant's requirements spelt out in the beginning. However, such investment is based on the expectation formation resulting from a captive demand assured by ancillary policy. The nature and consequences of such investment on the ancillaries is discussed below.

Some of the units supplying items like safety helmets, shoes and plastics like nylon plastic pipes and polythene tube for refractories, undertake to supply a certain quantity (dedicated asset specific investment) according to the plant's requirements spelt out initially during the setting up of the unit. However, there is no commitment on part of the plant that it will buy from the same unit. It is subject to the units' fulfilling the quality requirements and safety standards, based on which, the plant guarantees an offtake of 50 per cent of unit's order on a "long-term" basis.⁹ One of the ancillaries which supplies safety helmets undertook investment to supply 10000 helmets per annum to the Plant. However, the specification of the plant changed soon after and the unit was required to obtain safety certificate as per the safety standards. However, the unit was unable to meet the change in specification and

⁹ It is clearly laid down by the District Industry Centre, " As per the government policy, any unit under SSI can be declared an ancillary by the PSU if minimum 50% of the capacity utilization is required by the PSU on a long term basis, provided, the PSU is satisfied about the capabilities of the SSI. BSP declares the ancillaries if BSP can assure 50 % of the capacity utilization of the SSI or 50% of BSP requirements or orders upto 7.5 lakhs, whichever is lower provided the unit is capable and located in the vicinity of Bhilai." This leaves no ambiguity in specifying that there is no binding relation between the Plant and its ancillaries and that in the short run, they have to rely on other customers.

accordingly, couldn't get the safety certificate. Hence its orders ceased and the unit was declared sick.

Another case is that of a manufacturer of plastic products like polythene tubes and plastic pipes, tailor made according to BSP's requirements. The main problems it faced was the high cost of investing in R&D for low value items, which are tailor made for BSP. Further, it has to compete with the traders who often quote the lowest tender. Unable to meet its profit margin, the unit started incurring recurrent losses and was declared a sick unit. The two instances cited above emphasize the need for a more secure contractual relation between the buyer and seller firms and also institutions which would assist these small units in achieving the requirements of the parent firm, through timely supply of technical advise and credit facilities.

In the absence of an assured market, most of the ancillaries undertake other trading activities. For example, one unit which is declared ancillary for supplying drain cleaning rods, is a trader in paddy husk and agent for selling oil. Another unit supplying helmets is a trader in shoes. There are two units set up exclusively for supply of a spare part tailor made for BSP. These units are assembling units, which procure the component parts, assemble them under a roof and supply it. The value of order for such units hardly exceeds five lacks per year. Since, the units would have to close down, once the requirement of the item ceases, these units survive by trading in other items and undertaking business in other activities unrelated to steel plant. This leads one to question the concept of an ancillary.

According to the ancillary policy, only manufacturing units and not traders are eligible for ancillary status. But in the case of BSP, the realities are not so. The fact that the manufacturing units have to compete with trading units inhibits the genuine units from

developing a long-term relationship with the parent firm. Few of the mechanical units which had invested in developing import substitutable items for the plant, saving a lot of foreign exchange in the process, were reluctant to do again due to BSP's indifferent attitude towards traders and manufacturing / jobbing units.

5.3.2 Means of securing orders and factors affecting orderflow¹⁰

The value of orders shows a fluctuating trend, though it has increased over the years. There has been a twenty-fold increase in the nominal value of placed on ancillaries between 1979-1996; from Rs. 1.47 crores in 1979-80 to Rs 29.02 crores in 1993-94 and Rs 36.81 crores in 1994-95 to Rs. 45.02 crores in 1996-97. During the 1990's, there has been a slight change in the composition of orders with the share of repetitive items declining and that of non-repetitive items (which are high-value items) increasing¹¹. It shows the shift in BSP's policy from purchases to in-house production due to several factors. During 1997 a number of ferrous and non-ferrous items of repetitive nature have been diverted in-house because of a cash crunch. As mentioned earlier, the presence of in-house production facilities has made dependent the order flow to ancillaries on a number of factors like budget provision and the decisions of the central planning department and materials planning department .

¹⁰ The flow of orders to some of the ancillaries can be classified as given; during May to October, their orders are full, then for 2 months they have a slack period and from December to April when the plant is running at full swing, they practically have no job. Most of the ancillaries are now facing a slack in demand because of the cash crunch in BSP and diversion of a number of ferrous and non-ferrous items to engineering shops to arrest the cash outflow and to utilize better the excessive manpower. However this doesn't mean that there was excess capacity in the machines which is being utilized now, but it involved more of production rescheduling, by stopping the production of certain items and utilizing the capacity so created.

¹¹ Data on this aspect were obtained from Materials Management Information service, BSP.

This section will try and find if there is any relation between the size and average order flow of the units. Based on the proportion of output of ancillaries that goes to the BSP and the market, which is available for 55 units the units can be divided into two 3 categories : a) those supplying greater than 50 per cent of their output to the customers other than BSP and which can be said to be more market oriented and, b) those supplying greater or equal to 50 per cent of output to the BSP and which can be said to be BSP-dependent units.

The Table V.3 is derived from the scatter diagram showing the distribution of (BSP and Non-BSP dependent) units according to the quantum of orders they get from BSP. It can be seen that 14 out of 55 units supply greater than 50 per cent of output to customers other than BSP, that is outside market, while 41 primarily rely on BSP for getting orders. Majority of the units getting lowest order value are those, which primarily supply to BSP and these constitute nearly 90 per cent of the group (36/41).

Table V.3 Dependence of units based on orderflow

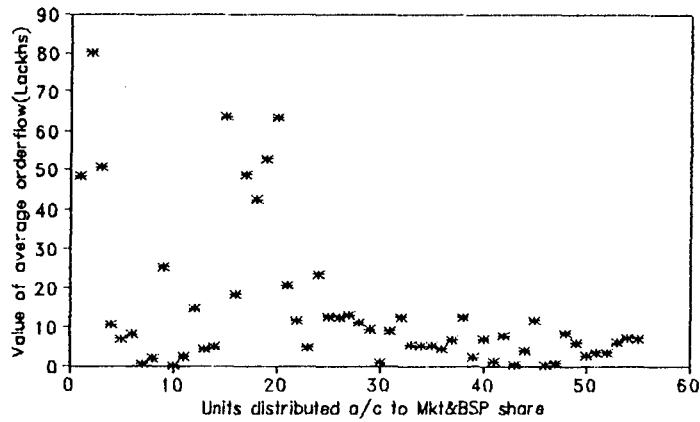
Average Order Value (in Lakhs)	Not dependent	Dependent	Total
< 25	10	36	46
25 - 50	1	2	3
> 50	3	3	6
Total	14	41	55

Note: When the units are categorized according to the proportion of output that goes to BSP and market, it is assumed that the categorization does not change over the 6 year period from 1991-97.

Dependent = Units supplying > or = 50% of their O/P to BSP.
Not Dependent.= Units supplying > 50% to the Market.

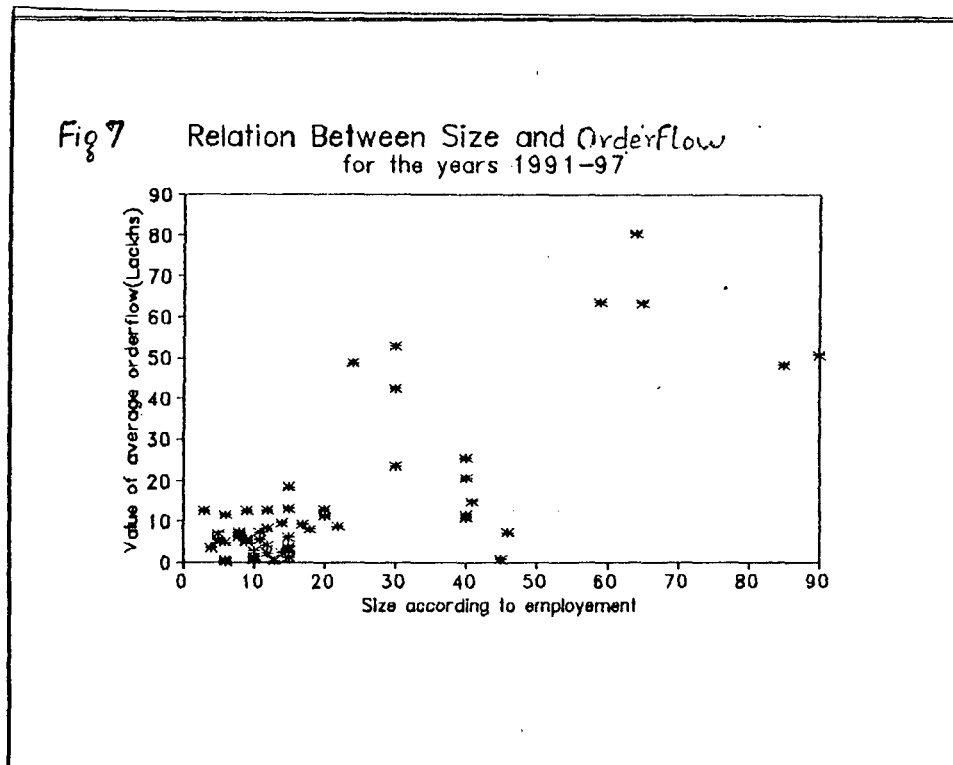
Source: Field survey

Fig 6 Distribution of units: Mkt Vs.BSP
for the years 1991-97



It is natural that those relying on market may get lesser orders from BSP (as the very fact that they get lesser orders may have made them market oriented) and those getting higher orders from BSP are also more dependent on the plant (as they are the regular suppliers). The former category includes mostly, units supplying miscellaneous consumer-based items, those which are not jobbing units basically. The latter category includes basically the machining and electrical units or the jobbing units. Therefore, it is the other category, that is, a) Those primarily relying on the market as well as getting high quantum of orders and, b) those relying on BSP, yet getting a low quantum of orders; that form the outliers and compel one to probe further the factors influencing the order flow.

Since units getting high order values are equally represented by both groups of units, there may be other factors like size of the unit in explaining the high quantum of orders to these units. However, this does not mean that units which are big in size do not get low order value.



The scatter plot between the size¹² of unit and the average quantum of orders the units got over the period 1991-97, shows a positive relation between the size and order value, that is, as the size increases, the order value also increases. This could further be understood from Table V.4.

Table V.4 Distribution of units based on size and order flow

Average Order Value (lakhs)	Big	Medium	Small	Total
< 25	8	22	16	46
25 - 50	3	-	-	3
> 50	6	-	-	6
Total	17	22	16	55

Note: Big = units employing >20 labourers
 Medium = units employing 10-20 labourers
 Small = units employing <10 labourers

Source : Field survey

¹² See Appendix V.2g for an explanation on taking employment as proxy for the size of unit.

Two inferences could be drawn based on Table V.4. They are:

1. Firstly, firms which are big in size and market oriented or competitive get higher value of orders. It may be due to the fact that bigger units possess better facilities and are more reliable in performance. However, there are factors other than competition in enabling these big units to secure orders, one of them being the presence of ex-employees of the steel plant in these ancillaries and informal relations.

Much of the competition goes on between the medium and small units. As table V.4 shows, both the medium and small units get orders less than 25 lacks on an average and 30/36 of these are primarily dependent on the BSP. These units are established since the beginning of ancillarization. There are two groups¹³ amongst the units- the old one\$ consisting of units established in the late 1970's, that is, the initial set of units declared ancillaries. Second group consists of new units established around mid 1980's and later. The presidentship of ancillary association is taken up alternatively by each of these groups. Though there is absence of collective action amongst the ancillaries, it was also seen that a sub-section of ancillaries resorted to cartel formation. The cut-throat competition and lack of unity amongst the units is compounded by their diversity, as voiced by one of the ancillary owners according to whom, an important factor contributing towards HMT's successful ancillarization is the fact that all the ancillary owners belong to the same state and have been able to organize themselves in a unified manner.

¹³ See Appendix V.2A for age of ancillary units.

2. Secondly, the small units getting less value of orders are not able to compete maybe because of factors like irregularity of orders and investment constraints which impede their growth¹⁴.

The analysis shows that, there is no policy of distributing the orders on the basis of any criteria like, value of order, capability of unit according to its size, hence the small units have to compete on an unequal footing with the medium and large units. This has created a trade off between cost of becoming competitive and cost of rent seeking. Since the cost of achieving competence by investing more is higher given the scarcity of resources, the other means of securing orders is through activities that involve rent-seeking. This ad-hocism in distribution of orders causes considerable delay and loss to the plant also in terms of quality. The lack of organizing and distributing orders to the ancillaries may considerably raise the transaction cost of the parent unit, but considering the magnitude of overall purchasing activity, it may be insignificant. Secondly, the cost of organizing purchases from ancillaries, may be costly, specially when it is not possible to identify, who will benefit from it. Infact, the preference or attitude is one towards maintaining `status quo¹⁵', so long as there is peace and

¹⁴ When the units don't get orders from the plant they rely on the private medium enterprises which give out work on their terms which are less preferred by the small units as their payment is not prompt and guaranteed and their is no inspection prior to the delivery of the material which may cause disputes later.

¹⁵ Fernandez and Rodrik (1991) have shown that there is a bias towards the status quo (and hence against the efficiency enhancing reforms) whenever (some of) the individual gainers and losers from reform cannot be identified before hand. There is a non-neutrality in the way that the gains and losses from the reform are distributed within the society: the gainers from the status quo are taken to be politically strong and the losers to be politically weak. There are reforms which, once adopted, will receive adequate political support but would have failed to carry the day ex ante. Moreover, the role of uncertainty in determining the outcomes is not symmetric, since reforms that are initially rejected will continue to be so in the future while reforms that are

no labour disputes or unionism of any kind. Hence the firm uses other means to overcome these costs, for example, through a policy of 'divide and rule', by favouring certain units against the others.

The pricing of items and the price escalation clause¹⁶ as followed by the BSP have generated inefficiency amongst the units. For items of repetitive nature¹⁷, there exists a price escalation clause for the machine hour rate which is worked out scientifically by the authorities depending on the three different types (light, medium and heavy lathe machines) of machines taking into account the yearly return on machine tools (production cost that is, yearly expenditure on running machines plus overheads plus interest on capital plus return on machine tool) divided by the available machine hours. The ancillaries also have their

initially accepted may find themselves reversed over time. Thus there exists what may be called 'Path dependency' and preference towards a status quo as it cannot be identified before hand which entrepreneurs are going to be benefitted and which are going to be the losers.

¹⁶ For items governed by purchase contract, the escalation formula worked out by the ancillaries is given below:

$$P = P_0 (0.10 + 0.55 S/S_0 + 0.25 W/W_0 + 0.10 C/C_0),$$

where,

S = Increased price of steel,

W = Increased labour wages,

C = Increased price of consumables;

C₀ = Price of consumables before 1-4-93, 0.10 = Fixed element profit that is 10 per cent;

S₀ = Price before 1-4-93;

W₀ = Labour wages before 1-4-93 and,

P = increased price.

¹⁷ Payment for certain items of critical nature is based on performance and generally these items are not off loaded 50 per cent to the ancillaries but gradually on basis of performance and reputation. For example, the Oxygen lance used in the steel melting shop through which oxygen is forced into the liquid metal in the furnace so that the impurities form oxide and float out, is a critical part entering the production process directly. The payment of such an item depends on the number of heats it stands which is normally 20. If it is more or less than that, payment is increased or decreased.

escalation formula which is generally not accepted. The escalation is not given strictly as mentioned in the contract and is generally given once in 5 years after much demand.

The ad-hocism prevalent in pricing and the policy of accepting the lowest tender^(L1) has resulted in cut-throat competition amongst the units as well as between the local units and outsiders¹⁸. Further, instead of making the units efficient, due to a lack of transparency in tendering process, the competition to quote the lowest rate has resulted in the inefficient units undercutting the efficient ones by compensating on quality. The Table V.5 shows the price trend in some important repetitive items, for some items prices have actually declined.

Table V.5: Price trends amongst ancillaries

(in Rupees)

Item	1992	1993	1994	1995	1996	1997
1.	-	1768	2033	2033	2599	2700
2.	-	11262	11262	12339	14114	14114
3.	302	195	195	225	225	225
		299*	194*			
4.	1410	1038	1038	1199	1199	1199
	1395*	1395*				
5.	3080	1600	1600	1840	1335	1335
		3080*	1840*			
6.	--	11810	13582	13582	13300	13300
7.	--	10387	10387	11945	11970	12440
			11899*	12660*		

Note: * indicates price quoted by other parties

Source : Materials Management Information Service (MMIS), BSP.

¹⁸ However, in the case of HMT, the costing department works out the purchase price and value of purchase orders using current raw material and index of wages. Ancillaries are price takers and if prices are unacceptable, ancillaries are required to provide justification which is settled across the table. Pricing is according to HMT's standard costing or market price as the case may be.

It is important to refer to the letter of additional director of industries Durg, to the Director, SISI Indore, regarding the policy of L1 and its effect on the ancillaries. It has been stated that "... the PSU's are arriving at the price of the item not on the basis of worked out price but on the system of inviting quotations/tenders in which not only the ancillaries but also other SSI units, local and outside parties are also participating. This policy is infusing cut-throat competition amongst the SSI units and in certain circumstances, the ancillaries are compelled to accept very low prices... the management has to abide by the lowest quotation in view of the audit and unable to assist the units. If suitable provision is made in the guidelines stated, the SSI units will not be put to distress, provided the PSU's are made to follow the same." (Office of DCSSI, 1989).

To conclude this section, the study has shown that majority of the units are dependent on BSP and small in size and some of them are sick units getting orders less than 5 lacks. The factors influencing orderflow are, size of the unit, technical capability and better facilities, which enables them to be more competitive. Further, the lack of an organized approach to pricing and distribution of orders has generated cut throat competition on one hand and cartel formation on the other. Source of competition arises from, compensation on quality and undercutting. A major factor determining the orderflow to big units is the presence of ex-employees and informal relations. The small and medium units secure orders through factors like groupism, lobbying and rent seeking .

Amongst other factors affecting the order flow are, the changed industrial scenario with redefined goals and the profit oriented approach of PSU's. The industrial recession in early nineties due to which there has been a slackening of investment and project expansion in this sector have also slowed the pace of industrial activity.

5.4. Entrepreneurship Development

The above analysis has shown the varied responses of the ancillaries to the government policies of assuring captive demand which is not sustained by a regular orderflow. Hence the ancillaries use various means to sustain the relationship, like lobbying and rent seeking. This section analyses the final outcome of the governance structure as determined by the response of ancillary units by examining whether the organizational benefit, namely entrepreneurship development was attained and the factors responsible for it.

5.4.1 Background of entrepreneurs

An interesting typology of businesspersons has been proposed in Smith (1967). He distinguishes two polar types, craft entrepreneurs and opportunist entrepreneurs. The former have a narrow, mainly technical education and low social awareness and involvement. They are bad at delegation, hire on a personal basis, and have limited horizons in the realm of finance and marketing. They have no long-range plans which might involve a change in the character of the business. Opportunist entrepreneurs are just the opposite. They build more adaptable firms, and success stories concern such entrepreneurs and their firms¹⁹.

Most of the ancillaries around Bhilai are businessmen who are not having any technical training and have grown up with experience, basically starting as small time traders and contractors. Bhilai is replete with examples of entrepreneurs who were attracted from their business interests in Delhi and Rajasthan by the growth potential of the steel plant, settled down at Bhilai since 2 generations, and later became ancillary suppliers. In the total sample out of 30, only 10 are having technical qualification (engineering, MBA and diploma in ITI) (see Table V.6) and 17 are non-locals, that is, from other states, mainly Rajasthan, U.P, Punjab, Delhi and Maharashtra. This makes the objective of promotion of regional

¹⁹ Little, et al, 1987.

entrepreneurs ambiguous as almost none of the sample ancillary owners are strictly, natives of Madhya Pradesh, but migrated from other states in search of livelihood and settled down since two or three generations.

Table V.6: Educational Qualification of Ancillary Owners

Educational qualification	No. of units
Upto 10 (Matric)	8
Diploma (ITI)	4
Graduates:	13
Engineering	2
B. Sc / BA	11
Post-graduates	5
MBA	4
M. Sc	1
Total	30

Source: Field survey

5.4.2 Selection of Entrepreneurs

There are two gates to the ancillarization procedure. Gate one consists of, establishing new units. This involves conducting of techno-economic surveys by a committee constituting of members of plant, SISI, DIC for new areas of ancillarization; advertisement by the DIC, Bhopal and finally calling the applicants for interview. The units so selected are called proposed ancillary units and given time from one year to three years to set up their unit, progress being reviewed periodically. They are given trial order after commencement and accorded the status of regular ancillary after one year.

Gate two consists of according ancillary status to existing units who are on rolls as regular manufacturers/vendors and have established in good rating to become ancillaries. These units

are inspected by a team authorized by Plant level committee (PLC) constituting of plant officers, Joint Director and Assistant Director, SISI. The recommendations of the committee are put upto next meeting for ratification and the ancillaries are awarded ancillary status to one year probation, after completion of which, they are regularized. Unlike the case of BSP, where the ancillarization process was more procedural, HMT kept government officials out of the selection process and thus had greater control in shaping the scheme. HMT selected only qualified persons with merit and 50 per cent of the units were allotted to skilled workers and engineers. It assigned items to be manufactured by each ancillary, prepared project reports and supplied necessary machinery. Care was taken to build interdependency among them to economize on fixed costs. Since machine tool industry was in infancy and the scheme was first of its kinds, HMT is said to have offered considerable material and technical and managerial help to ancillaries, which were assured of market on attractive terms. Ancillaries were encouraged to form a cooperative to facilitate procurement of scarce raw material like steel and commonly used consumable items.

As most of the ancillary owners were first generation entrepreneurs, it took them considerable learning time, however, they were prepared for the effort due to high profit margins. Due to technical diffusion, they earned reputation for quality work and could secure orders from other customers like Bharat earth movers, L&T and Kirloskars, after facing initial difficulty caused by recession. Some of the ancillaries developed mainly to produce specialized accessories found it difficult to diversify, others successfully absorbed technology, as a result of which there was a rapid growth of small number of workshops around the HMT plant.

5.4.3 Nature of Industry

BSP is a processing plant, which has ancillaries supplying spare parts which are not directly related to the end product, steel. Since the steel plants all over India are set up with

collaborations of different countries, the requirement of spare parts and equipments is also different, in other words customized, such that no single market for spares exists for steel industry as a whole. Keeping this in view, ancillaries were developed dealing with mainly machining, fabrication and casting facilities. During the initial stages of expansion, they played a major role in indigenisation and became self-sufficient in designing, based on BSP's tender specifications, process technology, detailed engineering, manufacturing, supply and erection of number of turnkey contracts. The beginner small scale firms were able to achieve learning by doing and grew over time into private medium and large scale units.

However, later on, with the assurance of captive demand, there seems to be an expectation formation resulting in the growth of a number of ancillaries and small scale units. The term 'Ancillary' serves as a brand name most of the time, apart from the facilities it gets from the parent firm, and establishes a unit as a quality supplier. Although the ancillaries have a higher status than the local vendors, the nature of items is such that there exist many alternative suppliers for the items. Hence, there is not much incentive for developing ancillaries, on part of the parent unit and has inhibited the development and learning process of local entrepreneurs.

HMT Ltd., a central government undertaking was incorporated in 1953 under the companies act in Bangalore to manufacture machine tools. It had technical collaboration with Orlikon machine tool works, Burhle and co., Zurich. In 1958, this financial collaboration was terminated and the shares transferred to government of India. HMT unlike BSP, is an 'end-product' industry, which undertakes, mostly component and assembly subcontracting²⁰, the subcontractors being related to the end-product directly.

²⁰ This typology was adopted from Nagaraj(1989).

Initially in the 1950's Bangalore did not have a base in metal working industry and was faced with a choice between putting up relatively more vertical integrated plant or relying on imports for components and sub assemblies. Realizing the advantage of division of labour and specialization in machine tools, HMT encouraged in 1958 3 SSIs, promoted by its employees. The success prompted it to set up its own industrial estate in 1960, with the National small industries corporation financing 95% of the ancillaries. Unlike most other industrial estates, sponsored by government promotional agencies, HMT opted to rent, rather than sell ancillary sheds. The entrepreneurs had to renew lease annually by signing contract which gave HMT more control on the ancillaries.

In the case of HMT, initially the relationship seems to have worked well as HMT was facing a seller's market and probably willing to share its profits with the ancillaries. After the mid-60's with the onset of industrial recession, the ancillaries were forced to rely on other customers. Further, as the metal industry base widened in Bangalore and more and more private producers came up taking advantage of the liberalized regime in the 70's, HMT underwent a change in product-mix, rendering some of the ancillaries obsolete.

Further, with a change in the market structure of standardized components and increasing number of competitive small scale units coming up, the reliance on ancillaries declined considerably. This is shown by the ancillary orders in money terms, which declined from 9 per cent of the value of output to 3 per cent of the value of output of the Bangalore HMT plant between 1967-68 to 1981-82. Although competition forced the parent firm to shift protection from the ancillaries, given that it had invested in its own estate, there was considerable scope in maintaining the relationship.

Summing up:

This chapter examined the implicit rationale of ancillarization as determined by government policy. The response of ancillaries to the facilities provided by the government and its effect

on the relationship in turn was studied. It was found that while the facilities to ancillaries generated expectation formation, it was not fulfilled by the purchase policy. In the course of the relationship, with the assurance of captive demand, the ancillaries have invested in some specific assets. However, in the absence of a regular order flow most of them undertake other trading activities or become sick units. Since the cost of exiting from the relationship is high, they resort to other means like lobbying and so on to secure orders. This suggests that some inefficiency might result in resource allocation.

Further, the analysis of the background and selection procedure of entrepreneurs reveals that most of the entrepreneurs started as traders and are from a non-technical background. The procedure of selecting entrepreneurs is also very bureaucratic involving authorities of both the parent firm and state government. This is unlike the case of HMT, which took considerable care in the selection and development of entrepreneurship enabling learning by doing. It also examined the price fixation and areas of dispute between the ancillaries and the parent firm. It is concluded that though the lack of a suitable and organized approach to distribute orders to ancillaries may considerably raise the transaction cost of the parent firm, due to an absence of any link between capability of unit and work farmed out, losses due to poor quality, costs of bargaining and retendering the order and so on, the cost may be less than the savings achieved by organizing, given the share of ancillaries in the overall purchasing activity. Hence, the firm uses other means to overcome these costs through informal relations favouring one unit against the other or, in other words, divide and rule. This is unlike HMT where the pricing and distribution of orders is more systematic.

The analysis brought that the mismatch between the response of the ancillary units of BSP and the intended objectives of ancillarization policy. This was mainly due to lack of long term commitment on the part of the BSP. It also suggested that a processing industry, such as

steel, could promote small scale industries in general, rather than ancillary units because of its inability to sustain a long term relationship crucial for ancillarization.

Appendix V.1

BSP offers the following facilities to the ancillaries:

- a) Purchase preference: The tender enquiry is invariably being called from the ancillary units for the item for which the SSI unit is declared ancillary. In case, the lowest for Bhilai (landed cost basis) rates are quoted from any other party, other than the ancillary, the ancillary unit can match their rates and order for 50% of the tendered quantity is being placed on the ancillary unit.
- b) Items of repetitive nature which is around 2000 are reserved for ancillary units.
- c) The CPD rate contracts are only off loaded to the ancillary units.
- d) Benefits of price escalation on repetitive items are extended to them as per B.P.E. guidelines.
- e) The inspection of the materials is carried out at the premises of the ancillary unit only.
- f) Against BSP orders, essentiality certificate is being issued for the raw materials (SAIL's products) to ancillary units.
- g) Earnest money/security deposits is not being charged from the ancillary units and tender documents are given free of cost to these industries.
- h) The ancillary units can enjoy free testing facilities, technical guidance, against BSP orders.
- i) Against any contract release of 100% payment within 20 days after receipt and acceptance at the stores.
- j) MP consultancy Organization assists the SSI's in preparation of project report.
- k) The allotment of land on priority to Ancillaries in Industrial area is given by District Industry centre/Audhyogik Vikas Nigam.
- l) Madhya Pradesh Financial Corporation /Bank extends loan upto 70% of the total Project cost for establishing the ancillary units.

m) New Ancillaries are exempted from payment of MPST(state sales tax) for the initial period of 3-7 years depending upon the area of location.

n) The Laghu Udyog Nigam assists them in getting the raw material at an economical price.

Guidelines on deancillarization:

a) Repeated failure in tendering against enquiries.

b) Failure to establish the unit within the stipulated time period including the extension granted by the company.

c) Units not engaged in manufacturing of items for which the Ancillary status is accorded.

d) Objectional conduct by way of threats/manhandling/foul speaking with company's officials and/or engaging in slander/propaganda against the company officials.

e) Failing to give material account within a reasonable period of 3 months from the date of completion of job.

f) Adverse report from the Vigilance department of BSP.

Appendix V..2

A. Age of the units surveyed: The units can be divided into 3 groups:

a) Those established before 1970's or during the 1960's: There were 31 units established prior to 1970 and existing before ancillarization started. The sample includes only 3 of this group.

b) Those established during the inception of ancillarization (1979-85) : there were about 70 new units which were accorded the status of ancillaries between 1979-85. The sample includes 12 of these units.

c) Those established during 1985 and later: During 1985 to 1997, the total number of ancillaries increased to 168 which included about 68 new units. These units belong to the

category of new units, established after the initial set of ancillaries. The sample includes 15 units of this group.

- B** . Size of the units surveyed: As can be seen from Table V.A.1, the distribution of units differs when different proxies for size, that is, employment and capital investment are taken. If employment is taken as the proxy for size, one finds units almost equal representation for all the three groups: small, medium and big. Whereas, if capital investment is taken as proxy, then more units fall in medium and small criteria. That is, the capital investment criteria would overstate medium and small. Secondly, capital investment figures are not accurate as they are not revised upwards. Some units have given the appreciated value, while others have given only initial investment. They are also not comparable as some units gave comprehensive figure including land, building and machinery, while others gave figures only for building and machinery. Hence, employment figures are considered as better proxy for size. Further, since employment and order flow data was available for 25 extra units apart from the sample units, analysis of order flow and size was done using these figures, rather than the investment figures.

Table V.A.1: Employment and capital investment in ancillaries

Size - Labour (no.) Capital (Rs. in lakh)	Number of units - Labour	Number of units - Capital
Less than 10	10	11
10 - 20	9	15
More than 20	11	4
Total	30	30

Note: The size is defined according to the number of labour employed and the capital invested.

Source: Field survey

Chapter VI

SUMMARY AND CONCLUSION

In concluding this study, the major findings of our analysis may be summarized and some inferences having a bearing on both theory and policy on inter-firm relationship may be discussed. There are also pointers to the aspects of future research.

The study has made an empirical analysis of the buyer-supplier (large-small firm) relationship, in the light of the industrial organization theory which offers great scope to analyse the interfirm relationships and to explore the dynamics between market, government, and economic agents (firms) in a micro-analytical framework. While the earlier studies have studied this relationship as subcontracting, determined by the technology and market share of firms, the present study addresses it in terms of buyer and supplier relationship determined by contractual efficiency.

The study suggests the rationale for analyzing the issue in the context of a different paradigm, that is, transaction cost theory. The analytical framework used takes into account the role of the ancillarization policy of government, in influencing the governance structure, to reap certain organizational benefits like entrepreneurship development. However, whether the desired results are achieved or not depends on the responses of the firms, which determine the final outcome of the governance structure as different from the 'ideal' governance structure as perceived by the government. This is brought out by examining the contractual relationship and the responses of the firms which, in turn, is influenced by the incentives provided by the policy to achieve the intended objectives.

The study has analyzed the contractual relationship between the BSP and its supplier firms, and argued that the contractual terms are not consistent with the nature of transaction for the ancillary units, which are a sub-section of suppliers. This inconsistency was addressed by examining the economic rationale of ancillarization in the case of Bhilai Steel Plant. Although import substitution and inventory management play an important role, the alternative cost comparisons shift the argument in favour of in-house production due to the merits associated with in-house production and the existence of transaction costs.

The decision to make or buy is primarily explained in terms of reducing production costs and transaction costs of the firm. The main components of production costs are labour costs. Transaction costs include the costs of writing, implementing and enforcing contractual terms and conditions, and costs associated with breach of contract. It also includes costs that are not quantifiable, such as losses due to inferior quality, uncompetitive price, and others. It was, hence, argued that the rationale of ancillarization policy is implicit in the objectives of organizational policy, which is to promote entrepreneurship development and learning by doing. However, whether these objectives are realized depends on the firms' responses.

It was found that the incentives provided by the government, in the form of facilities to the ancillary units, are conflicting in themselves and have resulted in an expectation formation in general. This has in turn resulted in the growth of a number of new small scale and ancillary units competing between themselves for securing orders. In the process various types of asset specific investment are undertaken by the units to sustain the relationship.

However, in the absence of a regular orderflow, as ensured by the policy of reservation of repetitive items and lack of a systematic approach to distribution of orders, these units have responded by resorting to various other means to secure orders like political intervention, lobbying, rent seeking and use of yellow journalism.

Further, the tendering process has generated a cut-throat competition amongst the units, resulting in undercutting on price as well as quality. According to BSP, however, the cost saving of a systematic policy towards its suppliers is insignificant given the magnitude of the share of ancillaries in the overall purchasing activity.

It was found in the course of the study that the orderflow is not dependent on the capability of the units and that even the trading units compete with the manufacturing units. This is conflicting with the policy of ancillarization wherein only genuine manufacturers and not traders are supposed to be given the status of ancillaries. The study argued that by maintaining a neutral attitude between the trading and genuine manufacturing ancillary units, BSP has created an inherent bias against the manufacturing units, making it as a disincentive for the units to maintain a long term relationship with the BSP.

As a result, the intended benefits of entrepreneurship development and learning by doing are also not attained. One of the important factors in enabling the attainment of these objectives is the nature of industry, which determines the type of transaction that would sustain a long term relationship. This was brought out by a comparison of the results of the present study with that of the case study of another public sector unit, that is, HMT.

Large industries functioning through assembly of components provide consistent opportunities for the establishment of ancillary units. Since HMT is an end-product industry, with the spare part/component entering the production process directly, it had more incentive to ensure that its ancillaries were technically trained and quality conscious and assist the units for the same. Ancillarization was more a market driven response of HMT to enable it to diversify and specialize in high value added machines.

Industries like Steel plant are continuous processing plants to which ancillary units can at best supply spare parts and components comprising a comparatively small portion of total purchases, where requirements are also uncertain. In case of BSP, the role of government policy plays an important part and being a process industry, its needs might have been well served by promoting Small scale suppliers, instead of ancillaries (excepting the category of units specifically serving BSP), as the nature of transaction does not require a long term relation between the two firms. The bye products generated by such industries can be successfully processed by the small scale unit. The raising of such auxiliary units requires a determined effort to ensure both production and marketing of the finished product produced by the auxiliary units, as many of these products based on bye products are not commercially viable. But the active involvement of parent unit in the development of such small units is doubtful unless they supply the finished product back to the parent unit.

The study argues that entrepreneurship development as an organizational benefit can be made consistent with efficiency by other means. That is, the nature of industry makes it less costly in terms of transaction costs for developing the ancillary relationship. Hence, the ex post behaviour as laid down in the contractual terms is consistent with ex ante behaviour. Although BSP is a process industry, it does not imply that the intended objectives of government policy cannot be attained. On the contrary, the study has shown that it would be achieved in a better way, by emulating the approach of HMT towards selection of entrepreneurs and more commitment in developing the relationship. Further, it has a considerable scope for encouraging entrepreneurship and other policy objectives by promoting small scale units as opposed to ancillaries.

Policy Implications and Future Directions:

Small scale industry in India has always been accorded priority status, and a number of incentives and concessions given in order to promote a more wider and decentralized industrial structure. The evidence on the success of these policy measures is mixed. The policy measures to encourage small scale industry are undertaken aggregating the small units, without discrimination amongst various categories even within the same activity. Such measures often conflict and turn out to be self defeating. As a result, large number of facilities provided by the government are either under-utilized or misused, which shows that there is a mismatch between the policy measures undertaken and the actual need as perceived by the entrepreneurs. Hence, a disaggregated study of various categories of small scale units, such as the present one, is needed. This is because, the policy measures for small units involve welfare implications. That is, a set of measures, while benefitting a category of units might discriminate against another category.

Further, there is a need for institutions and insurance mechanisms to revive the existing units that are sick and which require technical and managerial aid. The study suggests that in order to ensure a long term cooperative relationship between the small and big firms, so that transfer of skills takes place over time, the nature of industry and the characteristics of the transaction need to be studied.

The study highlights the shift in the policy approach of treating the responses of economic agents to policy, as given and passive. It is being increasingly realised that the outcome of intended policy objective depends on the response of the agents on whom it is targeted. Hence, if there is a mismatch between the objectives and the response, the benefits perceived by policy will not materialise.

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ANNEXURE 1.1

Schedule I: SUBCONTRACTING AND ANCILLARIES--CASE STUDY OF BHILAI STEEL PLANT.

- I.1 Advantages of manufacturing in-house vis-a-vis procuring from outside:
- 1.Certainty of supply management
 - 2.Quality control
 - 3.Better inventory
 - 4.Additional profit margin
- I.2 Disadvantages:
1. Disparities between productive capacities at various stages of production
 2. Inflexibility of operations
 3. Higher overheads
 4. Others
- I.3 What is the purchase cost of stores and spares as a percentage of income from total sales?
- I.4 What factors influence the orderflow to the ancillaries:
- 1.Increase in sales
 - 2.Higher profits
 3. Better inventory management
 4. others
- I.5 What is the percentage of items supplied by the ancillaries which are:
- 1.Standardized-Repetitive (%) Non-repetitive (%)
 - 2.Customized-Repetitive (%) Non-repetitive(%)
- I.6 How do you meet your requirement if the supplier fails to deliver and what are the costs involved for:
- 1.Standardized Material
 2. Customized Material
- I.7 What is the cost incurred due to:
1. Shut down and waiting time caused by delays
 2. Inferior quality (requiring rigorous inspection)
 3. Improper specification with respect to availability of raw material, size, formulation, etc.

BLOCK II

- II.1 What is the percentage of orders on ancillaries based on:
- 1.Open tender
 - 2.Limited tender
 - 3.Single tender
 - 4.Proprietary
- II.2 What are the costs involved in tendering process?
- II.3 Bids vs. Negotiations-For what kind of items former procedure is followed and for what items the latter method is followed?

- II.4 Is the acceptance of tender strictly on L1 basis? In an year, what is the percentage of orders on L1 basis(approx).
- II.5 If L1 is not accepted, what are the reasons for it? What is the weightage given to different criteria while accepting a tender?
1. Lowest bid 2.Reputation 3.Ancillary status 4.Others
- II.6 To what extent do factors other than contractual terms help in binding/enforcing supplier relation and protection against future contingencies like default in supply, etc.?

1.Reputation 2.Business ethics/norms 3.Personal relationship 4.Report cards
5.Testing of products supplied
6. Others
- II.7 Do you ensure orders to ancillaries every year or you don't bother if there is no requirement? What is the percentage of cases where orders are given for considerations other than the capacity of the ancillary, requirement of the plant?

BLOCK III

- III.1 Does the specification of material/product, limit the buyer's choice to a single make?
- III.2 Do you inform the supplier regarding the specific use for which his product is intended, how it is to be applied and the performance expected?
- III.3 Do suppliers submit alternative proposals? If yes, is the bid accepted or reopened for competition?
- III.4 Do some ancillaries have brand names or serve such purpose thereby minimizing the need to inspect? Do you develop competition here?
- III.5 For sub-standard deliveries, do you-
1. Outright reject 2. Return for replacement 3. Technical or engineering adjustment
4. Price adjustment.
- III.6 Percentage of cases where the material shortage has led to urgent procurement and the terms of such procurement:

BLOCK IV

- IV.1 What problems do you face from the ancillaries and what suggestions do you purpose to overcome them, viz.,late delivery, poor quality, pricing, etc.
- IV.2 Given a captive demand from the B.S.P., how strong is the competitive pressure on the ancillaries to make them efficient?

IV.3 Which units do you thin are more efficient and why?

1. Those relying solely on B.S.P.

2. Those catering to other customers

Does polly/treatment differ for these two categories?

IV.4 How is adjustment/settlements of disputes done? What is the compensation given?

IV.5 Do labour disputes or poor labour relations in the ancillary units affect you? What steps do you take to prevent it?

ANNEXURE 1.2

SCHEDULE II :SUBCONTRACTING AND ANCILLARIES- CASE STUDY OF BHILAI STEEL PLANT.

Field survey by S.Madhuri for the Dissertation under the M.Phil Programme in Applied Economics of the Jawaharlal Nehru university at Centre For Development Studies, Trivandrum.

BLOCK 1 Identification

I.1 Name of the unit

I.2 Location 1.Estate 2.Outside

I.3 Address

I.4 Form of Organisation 1.Proprietorship 2.Partnership
3.Cooperative 4.Private Ltd. 5.Public Ltd.

I.5 Ownership Details

Name	Age	Caste	Education	Place of origin	Reason for Migration	Period of stay

I.6 How did you enter this industry?
1.Experience as an employee 2.Through relatives, friends 3.Other factors

I.7 Nature of registration

I.8 Date of establishment

I.9 Source of acquisition of machinery 1.Indigenous 2.Imports

I.10 Date of starting actual operation

I.11 Whether ancillary from the beginning? 1.Yes 2.No

I.12 Any subsidiary unit 1.Yes Name 2.NO

I.13 Technical or managerial experience of the owner
1. Nil 2. less than 3 yrs 3. 3-5 yrs 4. 6-10 yrs 5. 10 and above

BLOCK II- Production Details

II.1 Type of machinery and capacity

II.2 What was the rate of production last year?

II.3 What was the percentage of capacity utilisation?

II.4 What was the quantity and value of sales?

II.5 Production cost

1.Capital invested Fixed Rs()

Items Initial Addition Total

Land

Building

machines

Total

2.Working Capital Rs()

Raw material

Wages

Power

Rent

Transport

Administration cost

Others

II.6 Terms of acquiring land/ready shed

1.Ownership Investment Rs()

2.Hire purchase Annual instalment Rs()

3.On lease Lease period() Rent()

II.7 How is the output price fixed?

II.8 What is the profit margin? Are there any fluctuations? What are the influencing factors?

BLOCK III- Employment

III.1 Employment status and wages

	Temporary
Engineers	
Technicians	
Skilled	
Unskilled	
Others	

III.2 How is labour recruitment done?

III.3 Do you prefer to recruit from 1.local 2.migrants 3.same caste

III.4 Is there reskilling/training of labour if design changes? If yes, does the parent unit assist?

III.5 Is there any increase in wages after training?

III.6 Is there supervision on working conditions by the parent unit?

III.7 Has there been strike/labour dispute in your unit? If so, does the parent unit interfere?

BLOCK IV Capital requirement and problems

IV.1 Initial sources of capital

- 1.Inheritance 2.Personal savings 3.Loans from relatives
4.Loan from money lender 5.Loan from bank 6.Others

IV.2 How do you meet working capital requirement?

- 1.Advance from buyer 2.Bank 3.Others

IV.3 To what extent bank has been useful in meeting your requirements?

IV.4 Operational problems:

Is the unit working at full capacity? If no, reasons for excess capacity.

- 1.Lack of demand 2.Lack of power 3.Lack of finance 4.Lack of skilled labour
5.Lack of raw materials 5.Others

IV.5 Difficulty in selling products: Yes No

- 1.Competition with local industries 2.Competition with outside industries
3.Absence of market data 4.Transport bottleneck 5.High cost of production

IV.6 What do you think is the source of competitiveness of others?

- 1.Cheap labour 2.Flexibility in working condition 3.Proximity to the market
4.Better machines 5.Others

IV.7 Does unfair competition exist? If so, do you think any organisation of units or entrepreneurs will be better for you?

BLOCK V Contractual relation

- V.1 How long have you been supplying to BSP/getting orders continuously?
- V.2 Items supplied to BSP:
1.Repetitive 2.Non-repetitive 3.Both 1&2 4.others
- V.3 What is the proportion of repetitive vs non-repetitive.Does it vary every year?
- V.4 Do you take machining Jobs also? 1.Yes 2.NO
- V.5 Type of contract entered and why?
1.Purchase 2.CPD 3.Both 1&2
- V.6 Orders in the past 6 years from BSP:
1997 1996 1995 1994 1993 1992 1991
- V.7 Who are your other customers?
Orders for past 6 years:
1997 1996 1995 1994 1993 1992 1991
- V.8 Items supplied to others and type of contract entered:
- V.9 Working period: 1.Seasonal 2.Perennial
- V.10 What are the low demand and high demand months?
- V.11 Is the no. of orders increasing or fluctuating each year?
What factors influence this fluctuation in demand?
- V.12 Nature of changes in output prices:

1997 1996 1995 1994 1993 1992 1991

What factors influence this fluctuation?
- V.13 Do you get any price escalation? If yes, what factors do you consider for price escalation?
- V.14 Do you get any advance/credit?

V.15 Quantity adjustments:

1.% of cases in an year where normal schedule of supply disrupted due to an emergency by BSP:

2.Percentage of inventory carrying cost due to material deferred by BSP:
Inspite of extra costs, why do you continue? What steps do you take to prevent this cost?

3.What is the flexibility in delivery schedule-are there serious consequences if you delay repeatedly?

What are the reasons for late delivery?

4.Percentage of late delivery in total order:

How is the price change during extension period accounted for?

V.16 How do you meet the order flow during
1.Slack period 2.Peak/emergency period

Do you hire/lay off labour, etc.?

V.17 Has there been risk purchase with you any time and what are the costs?

V.18 Quality improvement- steps taken to improve quality? 1.Training
2.Any other investment

V.19 What steps do you take to get repeat orders?What are the influencing factors?

BLOCK VI Advantages/Disadvantages

VI.1 Why do you think BSP subcontracts?

VI.2 Advantages of BSP contract compared to others:

VI.3 Disadvantages compared to others:

VI.4 Facilities got by govt. and BSP:

1. Technical aid/advice 2. Marketing aid/advice 3. Managerial aid/advice 4. credit and finance

5. essential raw material 6. warehouse and storage facilities 7. Transport facility

7.Testing facility 8.others

VI.5 What further help do you envisage?