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N. A.I. Dias
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ORGANISATIONAL STRUCTURE AND THE LOCATIONAL BEHAVIOUR OF
SMALL AND MEDIUM SCALE FIRMS IN METROPOLITAN COLOMBO,
SRI LANKA

A thesis submitted in fulfilment of the
requirements for the award of the
degree of

DOCTOR OF PHILOSOPHY

from

THE UNIVERSITY OF WOLLONGONG

by

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DEPARTMENT OF GEOGRAPHY

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ABSTRACT

Organisational structure and the locational behaviour of small and medium scale firms in Metropolitan Colombo, Sri Lanka

This research focusses on the behaviour of small and medium scale firms in Metropolitan Colombo, Sri Lanka. It argues that the more recent emphasis on organisational structure offers an appropriate conceptual and methodological frame for studying the locational behaviour of small manufacturing firms in Sri Lanka.

In firms in developing countries family ownership, small size, labour intensive technologies and lack of organisation are main characteristics of small and medium scale industries. However, it has been recognised that there exist fundamental structural differences among the firms in this sector in Sri Lanka. Small and medium scale industrial sector consisting of so-called registered and unregistered firms, different structural features reflect differences in size, capital investment, ownership pattern, family participation, raw material utilisation, export orientation and the relationships with government organisations. These structural differences go some considerable way towards explaining the behaviour of small and medium scale manufacturing firms in

Colombo, and the general hypothesis is that the nature of the interactions of small enterprises depend upon their internal organisational structure.

The study focussed on three types of industries (textile, rubber and metal) in identifying the organisational structure of firms and in analysing the relationships between organisational structure and functional linkages, attitudes of entrepreneurs, patterns and degree of locational adjustments and the different responses of small firms to change in government policy. The study uses a sample of 136 firms and data and information were based on a questionnaire survey and extensive fieldwork in Sri Lanka, conducted during the period from January to July, 1984.

Principal components analysis has been used to define the structure of firms and to identify the significant characteristics of industries. The extent to which the organisational structure of firms is reflected in their behaviour was investigated by means of correlation and stepwise multiple regression analyses. The study also recognises the importance of government policies which are important in terms of spatial pattern and structure of small and medium scale industries in Colombo and the way in which industries have perceived these policies and responded to them.

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ABBREVIATIONS

BTT	Business Turnover Tax
CISIR	Ceylon Institute of Scientific and Industrial Research
CMPP	Colombo Master Plan Project
DCS	Department of Census and Statistics
DDC	Divisional Development Council
DFC	Development Finance Corporation
DFCC	Development Finance Credit Corporation
DRS	Duty Rebate Scheme
ECIS	Export Credit Insurance Corporation
EDB	Export Development Board
EEGS	Export Expansion Grant Scheme
EPZ	Export Promotion Zone
FEECS	Foreign Exchange Entitlement Certificate Scheme
FIAC	Foreign Investment Advisory Committee
GCEC	Greater Colombo Economic Commission
GNP	Gross National Product
IDB	Industrial Development Board of Sri Lanka
ILO	International Labour Organisation
IMF	International Monetary Fund
IPZ	Investment Processing Zone
ISIC	International Standard Industrial Classification
NDB	National Development Bank of Sri Lanka
NIBM	National Institute of Business Management
OGLS	Open General License System
SLECIC	Sri Lanka Export Credit Insurance Corporation
UDA	Urban Development Authority
UNCTAD	United Nations Conference on Trade and Development

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CHAPTER 1 : INTRODUCTION

Sri Lanka, like numerous other developing countries, has an overwhelming proportion of its workforce concentrated into its traditional agricultural base. Even the 'enclave' economies established and sustained during its colonial development did little to broaden the manufacturing base and in 1983 only 10.1 percent of the workforce was employed in manufacturing. The contribution of industry to the Gross National Product (GNP) is also relatively small ; 16.9 percent in 1983 (compared to 28.3 percent in agriculture).

During the last three decades however, there has been a shift in industrialisation strategy from import substitution to export orientation. In the early independence period, due to the decline of export earnings and problems with balance of payments, import substitution industrialisation was considered to be crucial in accelerating economic development. Industrialisation with its linkages to other activities and a potential to offer relief from unemployment, low wage levels and to overcome balance of payment difficulties, was seen as the 'primum mobile' of development, the engine of growth (Robinson, 1985).

By mid 1960's the import substitution industrialisation which relied on high levels of protection led to problems in the economy and a new strategy focussed on exports

was adopted. With the change from the socialist government in 1977, export oriented industrialisation has been considered as a critical element in national development and the growth rate of the manufacturing sector has been increasing steadily.

There exist fundamental differences between developing and developed countries in the manufacturing sector including, for example, the internal structure of firms or their size, investments, raw material utilisation, quality of products, plant status and the ownership pattern. Due to the scarcity of financial capital, investments in buildings and equipment may be quite low and technology is likely to be low level and labour intensive. Firms are generally small, very often employing less than 20 persons. Most firms are locally owned, single sited, owner operated industries.

The manufacturing sector consists of both public and private sector industries in which the informal sector comprises a significant part of the private sector manufacturing activities. Entrepreneurs carry out their activities independently with self employed workers forming a part of a family enterprise. Strong personal and kinship relationships result in a high level of family participation in the manufacturing sector.

As Townroe (1979) noted, the characteristics of metropolitan areas and their economies and institutions in developed countries differ from those in the major cities of developing countries. In developing countries, since the agglomeration advantage is stronger in the central cities, locational risk is much lower than in the outside locations. Compared to Western European countries, the dispersed centres are likely to be deficient in desirable external economies and in extensive public infrastructure facilities. Moreover, policies are very often formulated under the guidance provided by the international aid agencies such as the World Bank and the International Monetary Fund (IMF). In developing countries also, government involvement with industries in the form of licensing and controls over imports, imported capital goods and investments are stronger than in most Western developed countries. Government subsidies to industry such as investment subsidies, regional development programmes, rural development programmes, import restrictions and tariffs, are usually of great importance.

These points all raise questions about locational processes in developing countries. Are they similar to those operating in developed countries or do the strong social and cultural relationships imply basic differences? Are differences in the structure of manufacturing organisations translated into differences in locational behaviour? Is the role of the individual entrepreneur similar to that played

by his counterpart in developed countries? Is Government policy and action more pervasive in its effects on manufacturing changes in developing countries?

Research has been carried out in developing countries on industrial location using aggregate data, but not using data on individual firms. Studies by Chaudhuri (1978) in India and Onyemelukwe (1978) in Nigeria provided a starting point for studying behavioural aspects of manufacturing industries. Chaudhuri (1978) examined structural and spatial changes in Indian industry together with constraints on development and measures adopted by government to correct unbalanced industrialisation. In this study he concluded that government intervention has been instrumental in altering the spatial pattern of industry since 1951 by providing subsidies to private sector industries, developing infrastructure facilities, and establishing nationalised industries. Onyemelukwe (1978) studied the patterns of industrial migration, forces influencing these patterns and factors relating to the distance and directional movements in Nigerian industries. He concluded that government influence was a major force in plant migration in Nigeria.

More recent studies have been completed in Latin America (Gwynne, 1982) and Ghana (van Dijk, 1983). Gwynne (1982) used location theory in explaining the patterns of industrial centralisation of large scale manufacturing firms

in big cities of Latin America whilst the behavioural approach was used to demonstrate the attraction of the big city in locational decision making. Using a sample of small entrepreneurs in Upper Volta, van Dijk (1983) analysed the factors influencing the selection of their locations. The study suggested that the entrepreneur, or a family member, as owner of the plant was the most important factor in the choice of actual plant location. Unfortunately, due to inadequate statistical sources and data limitations, these few studies have provided only partial insight into the locational processes of manufacturing industries in developing countries. The influence of organisational structure on the behaviour of firms has been neglected in the literature. There remains, therefore, a gap in our knowledge of the locational processes of manufacturing industry at some scales in developing countries.

This study of Sri Lanka manufacturing industry attempts to bridge this gap by analysing a previously neglected topic - the influence of organisational and behavioural characteristics of manufacturing firms and of their entrepreneurs on industrial location in Sri Lanka. It is argued, too, that the more recent emphasis on organisational structure offers an appropriate conceptual and methodological frame for research into locational behaviour of manufacturing firms in developing countries.

ORGANISATIONAL STRUCTURE : AN APPROPRIATE FRAME FOR THE
ANALYSIS OF LOCATIONAL BEHAVIOUR OF SMALL SCALE
MANUFACTURING IN DEVELOPING COUNTRIES

Traditional studies of industrial location were based on variants of classical economies, whether least cost or revenue maximising (e.g. Weber, 1909; Hotelling, 1929; Palander, 1935; Hoover, 1937, 1948; Losch, 1954; Isard, 1956; Moses, 1958) with the emphasis firmly placed upon the individual plant as the object of study and, more specifically, upon the variables influencing the choice of new sites. This approach is deductive, in that it proceeds from a set of basic propositions about the objectives of those responsible for the location decision, and normative, in that it identifies the optimal outcome for the manufacturer deriving from a clearly specified set of conditions defined by a series of simplifying assumptions.

The underlying assumptions of these approaches such as economic rationality, complete information and a static frame, however, have been widely criticised. Townroe (1971) for example, has noted that they neglect the organisational context of decision making and pay inadequate attention to the limited information upon which locational choice is often based. Dicken (1976; 427) has also pointed out that profit maximisation is not the single or even dominant objective of all business organisations, arguing

that business goals are multidimensional, involving not only profits but also sales volume, prestige and even growth per se. Normative models thus appear to offer little useful guidance, for example, to governments wishing to influence new manufacturing investment in accordance with their regional development objectives. Neither do they achieve their objective of explaining the spatial distribution of manufacturing industry since they are essentially concerned with the "best" or optimal location of a plant at a particular time.

In view of these criticisms, therefore, there has been, since the mid 1960's, a progressive shift away from the determinism of cost minimising and profit maximising principles towards more flexible, "realistic", and holistic frameworks. While a multiplicity of approaches can now be discerned in the corpus of writing on industrial location, the following broad categories can be identified ;

- (a) the behavioural approach ;
- (b) the enterprise approach ;
- (c) the structuralist approach; and
- (d) the business organisations approach.

The Behavioural Approach

The behavioural approach emerged as the result of dissatisfaction with over-generalised, erroneous economic assumptions about the real world which underpinned the

classical and neo-classical approaches. By contrast, behavioural analyses focus directly upon the way in which the variables identified by normative theory are actually perceived and interpreted by those responsible for making location decisions. The notion of the behavioural environment was first introduced by Kirk (1952) and subsequently extensively developed by Pred (1967, 1969), who identified the quantity of information held by a decision maker and the ability to use such information as fundamental parameters of the location-decision making process.

Although subsequently challenged, Pred's work was instrumental in the extension of the behavioural approach into other areas (Dicken, 1971; Townroe, 1972). Dicken (1971; 242) has suggested, even more broadly, that "the ability of decision makers to locate economic activity in space is a function of their geographical location, personality, socio-economic status, and the position of firm". Townroe (1972) has emphasised the importance of the ability of the management in making locational decisions. It is readily apparent, therefore, that this approach is more flexible than the traditional approach, for it considers both explicit spatial behaviour (e.g. opening a new plant) and implicit spatial behaviour (e.g. altering the scale of an existing plant). It also focuses on organisational adaptation to different environments and highlights the importance of risk and uncertainty, internally generated

constraints on growth and performance, information availability, "images" and perceptions of the operational environment, both internal and external to the firm.

By the 1970's however, the limitations of the behavioural approach were also beginning to be highlighted. As Fagan (1985) points out, in the behavioural approach there is difficulty in identifying the underlying processes, principally because of the near absence of a theoretical base. It also poses problems in relation to obtaining representative data, runs the risk of substituting description for explanation, and tends to neglect the role of government, an area which has been heavily emphasised in recent work (see, for example, Keeble, 1976; 1977; Guggin, 1976). It can be concluded, therefore, that in responding to some of the limitations of normative theory the behavioural approach opened up new lines of enquiry. In turn, however, it revealed itself to be seriously flawed.

The Enterprise Approach

The enterprise approach evolved in the 1960's as a consequence of but also as a part of the behavioural approach. It was pioneered by McNee (1958; 1960) and further developed by Krumme (1969a; 1981), Steed (1971), Rees (1972), Watts (1974; 1978; 1982) and Dicken (1976) amongst many. The distinguishing feature of this approach

is a concern with the individual firm and the way its activities are organised over space. In particular, there is a central focus on the interrelationships between firm organisation, development and spatial behaviour in the context of environmental change. The growth and development of individual firms is seen as having various spatial consequences not only because of locational decision making, but also by virtue of linkages with suppliers and customers, acquisition and/or mergers with other firms.

In recent years, proponents of the enterprise approach have paid particular attention to the development and spatial organisation of large multiplant companies (Hamilton, 1978; O'Farrell, 1978; Watts, 1979). In this context three related major themes have emerged.

- (a) the impact of multinational companies on regional development ;
- (b) issues of external control; and,
- (c) corporate restructuring.

Since McNee's pioneering work (McNee, 1958) the enterprise approach has produced a significant shift in emphasis away from a concern, exemplified by normative location theory, with the influence of the spatial organisation of the economic environment upon industrial location and towards an interest in the impact of the activities of

industrial enterprises upon the environment. It provides a central theme for investigation by focussing on the corporation as the main agent of spatial change. Clarke (1984) also argues that the enterprise approach in industrial geography, seen in broad terms, is well placed to elucidate the causes and effects of corporate restructuring through its emphasis on the business organisation itself and with reference to space as a basic element of multinational corporate structure and strategy.

As it stands, however, the enterprise approach, though useful in understanding the growing importance of international production systems embodied in Transnational Corporations does little to explain the emergence of the new international division of labour. Nor has a comprehensive conceptual framework been developed, due to the fact that the internal condition of the firm and related trading relationships have not been spelled out any detail or with any consistency. Thus studies following this approach (for example, Britton, 1976; Le Heron and Schmidt, 1976; Taylor, 1973; 1975; 1978) have never dealt effectively with the internal conditions of the firm. Indeed, there has been very little consistency even in the selection of variables to describe the internal environment, with only employment size having been used generally. Nor has the approach dealt adequately with organisation - environment relationships. Models of corporate spatial growth developed by Taylor (1975)

and Watt (1977), for example, neglect the environment almost completely, thereby isolating the firm from its operating 'environment' and 'context' are largely synonymous. More commonly, however, geographical enterprise studies in the 1970's tended to concentrate particularly upon only certain types of interactions with the environment, for example linkages with customers and suppliers, while disregarding others, such as links with controlling organisations (unions and governments) (Britton, 1976; Le Heron and Schmidt, 1976; McDermott, 1974; Taylor, 1973; 1975; 1978; Taylor and Wood, 1978).

The Structuralist Approach

More recently, emphasis has shifted towards Marxist/structuralist approaches, which appear to offer an integrative framework for the examination of industrial location and its implications. Such a position has been effectively expounded by Massey and Meegan (1979 b), among others. Basic to the structuralist approach is an emphasis upon the process of capital accumulation; the conditions which maintain and extend it; periodically arising difficulties in the process of capital accumulation; and strategies used to overcome them. Interactions between capital, labour and the state are considered to underly relations which shape these processes. A significant question for analysts operating within this paradigm is the way in which the

capitalist system of production and in particular, Trans-national Corporations, use and structure labour to sustain profitability, thereby creating successive divisions of labour and patterns of inequality.

The structuralist approach is now widely regarded as offering a most fruitful conceptual framework for tackling the questions of industrial reorganisation within an increasingly global capitalist system (see for example, Hamilton, 1978). Taylor (1984; 264) too, has noted that the approach has done most to stimulate theoretical thinking in industrial geography by breaking away from a long tradition of description to draw attention to the urgent need to consider the processes shaping industrial economies. Additionally, this approach fills a gap in the literature by attempting to link aggregate economic processes to their implications at the firm level. The approach also provides very powerful insights into the spatial dynamics of industry embodied, for example, in the redistribution of industry away from traditional industrial heartlands to rural peripheries. Marshall (1982 a; 1675) also has argued that the framework provides the 'totality' in industrial analysis by including the macro-economic forces which influence locational change.

Structuralist approaches do not, however, draw on, or provide a single, unified body of theory. Not surprisingly, therefore, their applications to research in human geography

since 1970 have been diverse (Fagan, 1985; 45). Nevertheless, under the broad umbrella of "political economy", they share a common concern with deep - seated processes and structures underlying the surface manifestation which neo classical and behavioural approaches conventionally attempt to explain. Yet, like such approaches, structural studies are also deterministic, in the sense that macro economic forces are deemed to be the ultimate cause of firm behaviour (Marshall, 1982 a), and may also be criticised for underplaying the role of individuals, local communities and other groups in moulding industrial change, by their emphasis upon large firms, especially Transnational Corporations.

From this brief discussion it should be clear that the normative, behavioural and structural approaches are limited in their capacity to develop deeper insights into the behaviour of manufacturing organisations, principally because they fail to conceptualise the business organisation as the principal mechanism creating and altering spatial structures. Only in behavioural studies of information flows has specific, but elementary, consideration been given to the variable character of organisations. But the absence of an adequately comprehensive conceptual framework to guide these studies and inform their choice of variables which effectively describe the internal environment of the enterprise detracts from the contribution they can make to an understanding of the operation of firms in space.

The Business Organisation Approach

The business organisation approach emerged from the more general interest in behavioural geography and as well, as a response to the lack of solid, well articulated, conceptual underpinings for the enterprise approach. It was exemplified by McDermott and Taylor (1982) and operates on the assumption that the individual enterprise is the most tangible and fundamental unit of the economy, the nexus or crucible in which macro - and micro scale processes are played out (Taylor and Thrift, 1983). It attempts to establish principles about the spatial and organisational structure of these enterprises, as well as their behaviour. In this respect, it is much wider than the 'enterprise approach', which has tended to focus largely on firm behaviour for its main concern is with the behaviour and spatial ramifications of corporate activity, that is with the corporation as the main agent of spatial change.

The business organisation approach also recognises that the population of firms is not homogenous but rather segmented; that is, that there are fundamental differences both between and within categories of large and small business organisations (Taylor and Thrift, 1983). At its most basic, this approach emphasises the dualistic nature of business organisation by distinguishing between "large" and "small" firms, where "large" and "small" are defined in terms of

"size", "market share", and "control", and recognising, of course, the unequal nature of the relationships between these two segments. The approach is also particularly concerned to elucidate the spatial organisation of individual firms and to examine the linkages between organisations within and between segments, e.g. subcontracting linkages between large and small business organisations. In brief the notion of segmentation is of fundamental importance to the development of any relatively complete understanding of the spatial behaviour of, and organisation of space by, an organisation. A further distinguishing feature of organisational studies is that they tend to treat macro economic, social and political factors not as broad aggregates but rather through the way in which they impact upon firms, for example, by considering the way in which economic change feeds through the system to affect differentially various types of enterprise.

Although the firm as a decision making unit has been more thoroughly conceptualised in organisation theory than in any of the competing paradigms in industrial geography, even in this framework it cannot be said that either the nature or the behaviour of organisations have been adequately handled. Especially deficient in this regard are analyses of the organisational structure of enterprises and of the relationship between organisations and their operating environment. In analysing organisational structure industrial geographers have adopted a small number of contextual variables such as

operations technology, employment size, plant status and ownership patterns as surrogates for differences in organisational tasks. Since organisational structure is a multi-dimensional concept, however, it cannot effectively be encapsulated in any one single measure. Very often in this approach locational variations in organisational characteristics are ignored and inter-industry differences tend to be neglected.

The Business Organisations Approach : A Basis for Research

In the preceding section several approaches to the geographical study of manufacturing activity have been outlined, however, the identification of a research question emerging as it does from the analyst's perception of the nature of socio-economic and political reality, may well point to one or other of these approaches as being preferable. In a study

seeking to elucidate the role, behaviour and locational dynamics of, and operating constraints upon small firms in a developing economy, structuralist and behavioural approaches might have indeed, have already been employed. Chauduri (1978) and Onyemelukwe (1979), for example, analysed the spatial behaviour of manufacturing industries in India and Nigeria respectively from the structuralist perspective; Gwynne (1982) has used the behavioural approach to demonstrate the attraction of large urban areas in locational decision making; while van Dijk (1983) has used organisational

characteristics to explain actual plant location decision in Upper Volta, as a basis for spatial planning of economic activities.

The organisational approach seems, however, to offer superior opportunities for developing comprehensive and powerful illuminating insights into and understanding of the behaviour, dynamics of and constraints on smaller firms operating in a developing world economy, in this case Sri Lanka. For example, normative, behavioural and structural approaches have all tended to focus mainly on large at the expense of smaller firms. In most developing countries, and certainly in Sri Lanka, however, the location and operation of small and medium scale organisations are fundamental importance. For this reason above, therefore it might be argued that there are substantial grounds for working within the 'business organisation' framework, for only this approach explicitly recognises the importance of the small-medium sector in which neither profit maximising nor cost minimising are likely to be characteristic form of behaviour, and in which locational and other decisions are likely to be very much more affected by such as family ownership, personal factors and kinship relationships.

The choice of the business organisations framework may also be justified by reference to the small and medium scale private owned nature of the industrial concerns selected

for investigation. It is common place to argue that private small industrialists are not mainly aiming at either maximising profit or minimising the cost but would satisfy with a reasonable income. Their location decisions are mainly affected by the type and the nature of enterprise, for example, especially in developing countries strong social and cultural relationships result high family participation in industries and therefore directly influence the location decisions. The business organisational framework allows for a distinction between small and large firms in terms of such characteristics and, as well, for differentials within such classes and therefore, seems to offer a useful framework within which to work.

The organisational structures of manufacturing firms such as the size, ownership pattern, plant status, export orientation, and family participation have considerable locational and operational significance, for structure directly influences the nature and extent of an enterprise's relationships with the external environment (e.g. interactions with suppliers, customers, government and non governmental organisations). In Sri Lanka, more over, there exist fundamental structural differences among the small and medium scale industries in terms of the registered status, number of employees, capital investment, plant status, ownership pattern and type of products, some of which appear to be important in explaining enterprise behaviour. Normative, behavioural and

structural approaches have never dealt adequately with internal conditions of firms and their impact upon the relationships with the external environment; the organisational approach, however, develops this line of investigation quite explicitly and far more comprehensively. It is further the case that small business organisations are generally dependent on external sources for their raw materials, financial requirements, service and infrastructure facilities. Scarcity of financial capital in developing countries necessarily generates a close dependence on government, for example, for incentives and infrastructure facilities such as loans, subsidies, electricity, water and transport services. The financial difficulties commonly faced by small entrepreneurs also often limit their capacity to provide their own business services, for example, maintenance and consultancy in contrast to large firms and, they are obliged therefore to depend on external sources. In similar vein, inter-industry linkages are likely to be vitally important to small entrepreneurs in overcoming marketing difficulties. And again, it is argued, these interactions are better analysed from within the "business organisation" framework and more specifically, from within a framework which is an amalgamation of ideas from the "Structural Contingency" model (Thompson, 1967; Lawrence and Lorsch, 1967; Kast and Rozenzweig, 1974) with linkages and information concepts (McDermott and Taylor, 1982). As a last step before proceeding to consider in detail the objectives of this thesis in greater detail, therefore, it seems necessary to comment briefly on at least the

former and perhaps less familiar of these.

The Structural Contingency Model of Organisations

The structural contingency model comprises three elements : environment, organisational structure and the interactions between organisations and environment. The model of firm: environment interaction was proposed by Petit (1967) and has been elaborated in recent industrial geographical studies by McDermott and Taylor (1982). Figure 1.1 demonstrates the structure of organisation and relationships with the external environment. Figure 1.1 (a) shows the organisation of enterprise as just one of a series of systems arranged in the form of a nested hierarchy. The structural contingency model of organisation proposes that environment and technology are related to the structure of complex organisations and give rise to a range of more or less appropriate organisational forms (Penning, 1975).

The environment has been defined (Kast and Rozenzweig, 1974) as everything outside the organisation, with nine sets of forces operating within the general and societal environment being identified. Several levels of environment may be distinguished - cultural, technological, educational, political, legal, natural resources, demographic, social and economic forces. Due to the operating difficulties of this societal environment and also the difficulty in

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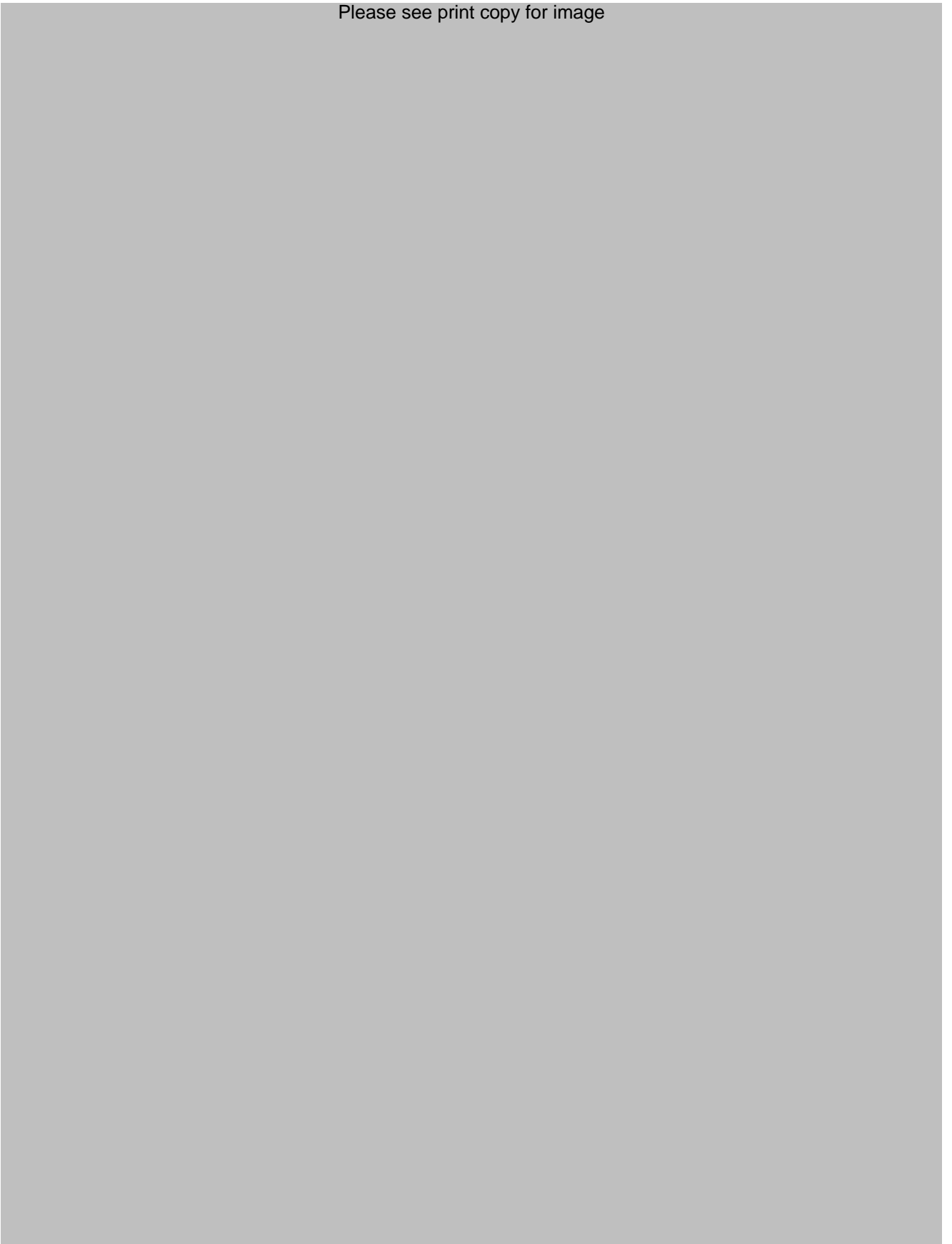


Figure 1.1: Organisation – environment inter-relationships
Source: McDermott and Taylor (1982)

determining the influence of the environment on the structure of organisations, two more precise concepts - domain and task environment - have been elaborated in organisation theory and also in recent industrial geographical studies.

"Domain", identified by Evans (1966), Perrow (1967) and Thompson (1967), is the group of potential contacts with which an organisation may interact, given the activity or range of activities it undertakes. Essentially, the domain represents the potential environment of the organisation. In organisation theory the "task environment" is defined as a set of organisations with which a focal organisation actually establishes exchange relationships (Thompson, 1967). The task environment comprises four main groups :

- i. Customers (users and distributors);
- ii. Suppliers (of material, capital, equipment and workspace);
- iii. Competitors (markets and resources); and
- iv. Regulators (including government and unions).

The domain and task environments of organisations are principal features of the structural contingency model and they provide a realistic means of conceptualising how environment influences the organisation.

Technology is a fundamental dimension of the environment. According to Lawrence and Lorsch (1967),

technology is an exogeneous force which is contained within the societal environment and which influences the firm. Penning's (1975) definition of technology, however, is related to "the internal operations of the organisation, that is, the means that the organisation uses to convert inputs into outputs". This definition implies that technology is an internal force, influencing organisational structure from within, and operating in an outward direction. Due to these different views there have been problems in integrating technology and environment within the contingency framework. The distinction between them has not been made clear in organisation theory and attempts to treat technology as a single force have led to considerable ambiguity and imprecision (McDermott and Taylor, 1982)". Some studies (Woodward, 1965; Perrow, 1967; Zwerman, 1970) have concluded that technology is a primary determinant of the structure of the firm, while others have suggested that it is not a powerful force (Pugh et al., 1968; Hickson, Pugh and Pheysey, 1969); Child and Mansfield, 1972; Blau et al., 1976).

Technology related directly to the production of goods and services which characterise the particular organisation may be called "core" technology. As such it is closely related to the managerial system which co-ordinates operational activities and formulates policies. The managerial system is surrounded by the institutional level of organisations such as sales, marketing, research and

development activities, finance, personnel, transport and distribution activities etc. These are known as boundary spanning structures in organisation theory. The core technology and boundary spanning structures (the office and the administrative function) are the two aspects which comprise the organisational structure.

The structural contingency model recognises that the environment, technology and organisational structure interact one with another. Diagrams b and c in Figure 1.1 illustrate interaction between manufacturing firms and their task environment. In most of the literature, the environment is held to influence the structure and the performance of the business organisations (Jurkovich, 1974; Harrison, 1978). Although there are limitations and shortcomings in the analysis of the organisation environment interactions, the organisational structure in the contingency model is thoroughly conceptualised. By comparison with the theories of the business organisations in organisation theory the geographical literature is limited (McDermott and Taylor, 1982) and consequently only partial in its treatment of corporate structure (Hayter and Watts, 1983).

During the last few years, two distinct themes have emerged in the geographical literature from the study of the structure of business organisations. One theme involves the corporate organisation and spatial structures mainly concerned with large business organisations. The second relates to the

multiplant structures which are a characteristic of corporations. Empirical studies which followed on these two main themes (McDermott, 1976; McDermott and Taylor, 1982, Clarke, 1984) have focussed mainly on the large business organisations, paying less attention to smaller firms. According to Taylor (1984), however, the recent research which followed this approach has never dealt adequately with the competitive and controlling relationships of business organisation's environment. Given this conceptual framework it is now possible to describe the nature of this study in more detail.

THE OBJECTIVES OF THE STUDY

This study has its foundation in questions relating to the organisational structure of manufacturing firms: and more particularly, and importantly, to the organisational structure of small and medium scale manufacturing firms in developing countries and in this case, Sri Lanka. This is because as it has been recognised that there exist fundamental structural differences among the small and medium scale firms in Sri Lanka. These different structural features reflect differences in size, capital investment, ownership pattern, family participation, raw material utilisation, export orientation and the relationships with the government organisations and these structural differences influence the behaviour of manufacturing organisations.

At the most general level the aim of the study is to examine the organisational structure and the locational patterns and processes of small and medium scale manufacturing firms in the Colombo Metropolitan Area.

In the case of small entrepreneurs, the behavioural approach can be considered as the most satisfactory way of explaining the location of firms. Small entrepreneurs strive for a "satisfying" income instead of maximum profit. Lever (1974) points out that a small entrepreneur is likely to be a satisficer rather than a profit maximiser, preferring to be satisfied with a reasonable profit rather than attempting to achieve a maximum profit. Very often such entrepreneurs make sub-optimal decisions with risk and uncertainty involved in their location decisions. In the present study emphasis is placed upon the non economic factors of location, especially the structure and the behaviour of manufacturing firms and the influence of government policy measures. It places much emphasis, too, on the specific organisational structures and strong social and cultural relationships existing in developing countries. In addition, an external force - the impact of government policy measures on manufacturing changes - is recognised as an important element in locational decision making.

More specifically, the objectives of the study are

- i. to analyse empirically the relationship between the structure of manufacturing organisations and their functional linkages;
- ii. to examine the social, cultural and personal relationships influencing the location of industries and the variations of entrepreneurial attitudes in different types of organisations; and
- iii. to examine the relationship between the structure of manufacturing industries and manufacturing changes (locational, size and product) and to evaluate the role of government policy measures in these changes.

The study is concerned only with the small and medium scale industries in the Colombo Metropolitan Area. In Sri Lanka, in terms of employment and output of the manufacturing industries, the small and medium scale sector is becoming increasingly important. In terms of number of industrial units also this sector accounts for more than 90 percent of the total. Small scale industries have also been neglected in the behavioural studies of manufacturing organisations. Hayter and Watts (1983) for example, in

defining the geography of enterprise noted that only the large scale business organisations had been singled out for attention. Recently, however, Storey (1982, 1983) and Harrison and Hart (1983) centered their studies on small firms. In the developing country context small and medium scale industries are of fundamental importance, reflecting the scarcity of financial capital and the characteristics of underdevelopment. The Colombo Metropolitan Area which covers two administrative divisions of Colombo and Gampaha (Figure 1.2), and contains 47 percent of all manufacturing industries was selected for the present study. Of the total manufacturing employment in the country 42 percent are employed in the Colombo Metropolitan Area.

A number of working definitions have been employed by government ministries and organisations to differentiate between industries according to scale. Since 1966, the Ministry of Industries and the Industrial Development Board (IDB) have used a definition which classifies establishments investing less than one million rupees in capital assets (plant and machinery) as small and medium scale industries and less than 0.1 million rupees as small scale establishments.¹

¹ The terms establishment and plant are used interchangeably and refer to any unit engaged in the manufacture of a single product or related products in one location. An establishment may be one of a number owned by a particular firm, but it is classified separately if it has a distinct plant at a specific location.

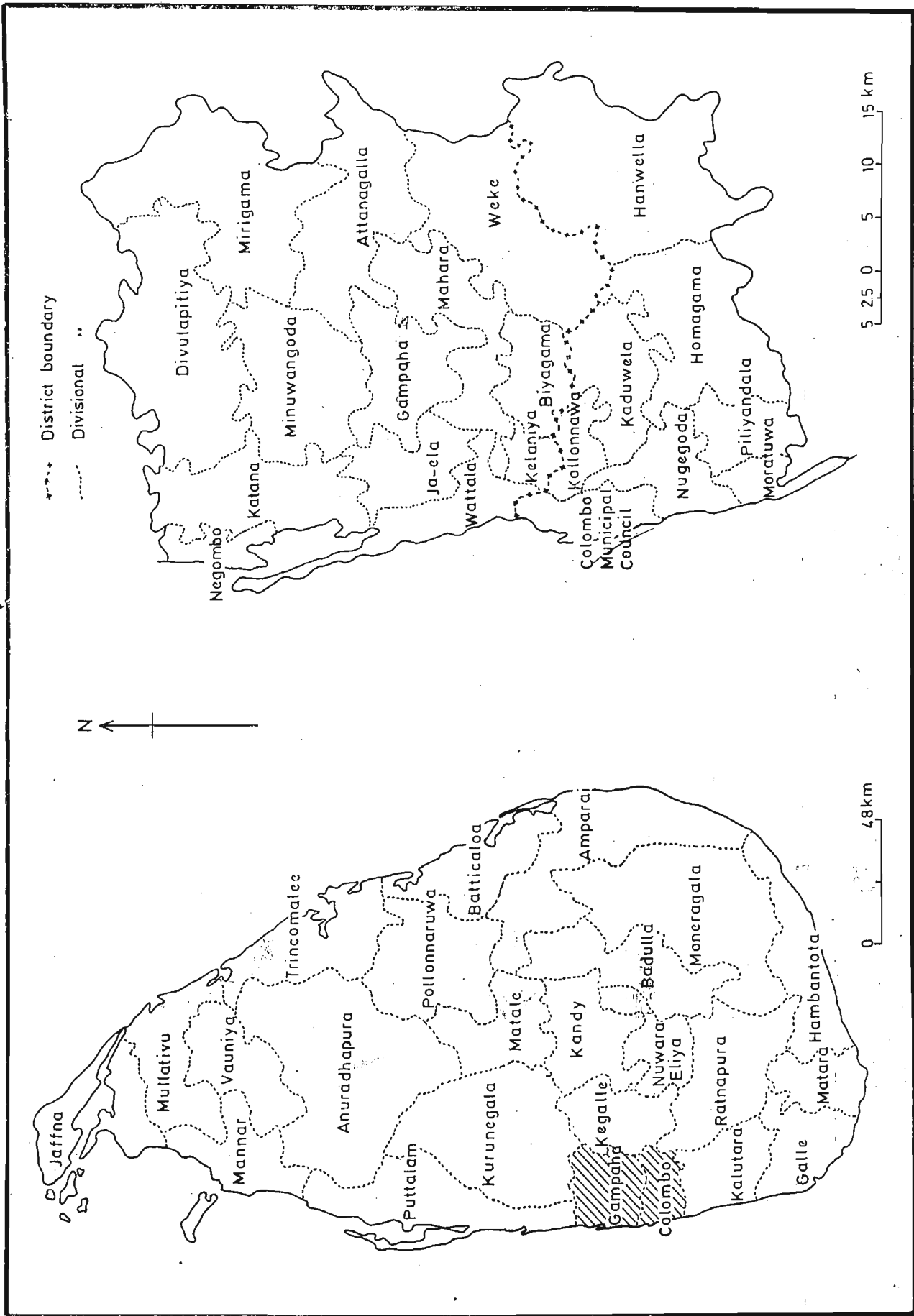


Figure 12: Administrative divisions in Sri Lanka and sub divisions in the study region: Colombo Metropolitan Area (Colombo and Gampaha Districts)

However due to the high inflation rates and the changes in national objectives, this definition cannot be considered as immutable, though it is widely used by many organisations for classification purposes. The same definition was used in the present study. More than 90 percent of firms fall into the category of less than 200 employees, so that, in addition to the definition given by the IDB, the establishments which employ less than 200 employees were considered as small and medium scale industries for the purpose of the present study.

Public sector plants which are controlled wholly or partly by the government have been omitted from the detailed study, since the number of those plants in the selected region is very ~~few~~ and their locational decisions are mainly based on planning objectives such as meeting social, economic and strategic needs of the country. Moreover, there are few organisational differences among these industries.

Three types of industries were selected for the study - textile and wearing apparel, rubber based goods, and fabricated metal products. These three account for 64 percent of the total value of industrial production and in the Colombo Metropolitan Area account for 43 percent of

the total number of establishments. Their locations are not a direct function of orientation to raw materials or market nor can they be explained in terms of weight gain or weight loss as in the classical model. Moreover they have been given high priority in the development programmes of manufacturing activities in recent years.

The small and medium scale sector consists of both registered and unregistered establishments and an explanatory note is in order. Registered establishments are those approved by the Ministry of Industries and Scientific Affairs and Textile Ministry while those not approved by these government organisations fall in the category of unregistered establishments. Approvals for firms are granted on the basis of certain criteria. These include firms which are characterised by

- i. the utilisation of indigenous raw materials,
- ii. export orientation of finished products,
- iii. the creation of employment opportunities,
- iv. location outside the Colombo Municipality limits and
- v. contribution to the formation of an indigenous technological base.

Firms belonging to the registered sector have

some characteristics which differ from those of the unregistered sector and which are likely to influence their behaviour in space. These characteristics are well organised structural features, special relationships with the government and different types of ownership patterns such as owner operated industries, private limited liability companies, and partnerships.

Unregistered establishments are relatively small in size, sometimes employing less than 5 persons and very often forming a part of a family enterprise and controlled by the owner operators. In these establishments investment in buildings and equipment is quite low, the level of technology is low with a high degree of labour intensiveness and management systems are simple with a minimum of control. In the registered sector, however, the dominant role is played by the managers or the shareholders in controlling the enterprise behaviour. Moreover, the government can influence the registered sector by supplying raw materials, market services and incentives. To obtain these facilities and services firms should be organised by maintaining records on input requirements and other business transactions. The registered sector is thus also referred to as the "organised sector". The unregistered establishments carry out their activities independently with self employed workers and are referred to as the "unorganised sector".

This two-sector classification of manufacturing activities is more or less similar to the formal/informal dualism existing in some other developing countries. The notion was first introduced by Keith Hart (1973) in analysing the urban employment in Ghana. In this study he identified seven essential characteristics of the urban informal sector - ease of entry, reliance on indigenous resources, family ownership of enterprises, small scale in operation, labour intensive and adopted technology, skills acquired outside the formal school system and unregulated, and competitive markets.

All these characteristics exist in the unregistered manufacturing sector in Colombo, although, there is some evidence of formal characteristics in the unorganised sector and informal characteristics in the organised sector. To avoid these structural overlaps, the relationship with the government is considered as an important feature in the registered sector, sufficient to enable it to be called the formal sector. It is suggested, therefore, that this two sector classification can be considered as a suitable basis for the study of manufacturing locations of small and medium size firms in Sri Lanka.

SOME WORKING HYPOTHESES

The study, in exploring the organisational structure of small and medium scale manufacturing firms in Colombo Metropolitan Area, examines a number of working hypotheses.

Hypothesis I

'that the functional linkages such as material and service linkages and information flows are highly localised and the pattern of these linkages is determined by the organisational structure of firms, type of industry and the type of counterpart organisations involved (in the case of material linkages, type of raw material supplier and customer, type of employer and the source of capital; in the case of service and information links, the type of linkage)'. .

Onyemelukwe (1974) points out that in a developing country the entrepreneur prefers to make his decisions in an environment in which he feels secure. The entrepreneur is therefore more likely to establish his manufacturing establishment where contacts on both supply and demand sides of his operations are concentrated. The organisational

characteristics of manufacturing plants also have a direct influence on the locational patterns and the theoretical explanations discussed above suggest a relationship between firm structure and external environment.

Hypothesis II

'that entrepreneurial attitudes towards the location of plants in developing countries are influenced by the characteristics of social and cultural environment and that variations of attitudes depend on the internal structure of manufacturing organisations'.

In the limited number of attitudinal studies, primary emphasis has been placed on examining the nature and composition of attitudes and the influence of organisational characteristics. In connection with perception studies, Taylor (1982) has pointed out that this remains a glaringly under-researched area in industrial geography. It is also a purpose of this study to explore some of these phenomena in a developing country like Sri Lanka since, given the strong kinship relationships in developing countries, attitudes are likely to be different from those of developed countries.

Hypothesis III

'that the nature of manufacturing adjustments is significantly influenced by the degree of formality of manufacturing industry; and that these adjustments may be strongly influenced by government policy measures'.

A significant feature of small and medium scale industries in Sri Lanka is the locational adjustment, in the form of expansions and shrinkages (employment, production capacity and addition or loss of products) and industry closures, which has been occurring since the late 1970's. During the last few years, steps have been taken by the government to develop this sector by providing financial and fiscal incentives. It is also well recognised that the organisational structure of manufacturing industries has a direct relationship with manufacturing changes.

STUDY METHODOLOGY

Statistical information for this study was obtained from published comprehensive surveys of industrial production conducted by the Department of Census and Statistics (DCS) (1968, 1978, 1979, 1980) and the Ministry

of Industries and Scientific Affairs (1976, 1980), from industry directories (1980) and from preliminary lists of the industrial census (1983). The coverage of these data has varied from year to year, and has been in a way restricted mainly to those firms which are obliged to send in returns. As unregistered establishments are not covered by some of these surveys there is a limitation of the existing data on unregistered sector. Even the directory of unregistered establishments does not provide recent information as it was based on a survey carried out in 1976. There was also a problem of getting adequate data on manufacturing adjustments and these are discussed in Chapter 7.

Additionally, interviews were held with government officials and a questionnaire survey was conducted of a sample of manufacturing establishments selected from the Colombo Metropolitan Area in order to test the three main hypotheses relating to industrial locational processes. The population of registered establishments was drawn from the preliminary lists of the manufacturing census in 1983. A list of unregistered manufacturing establishments was compiled from a number of sources including the directories published by the Industrial Development Board of Sri Lanka (IDB) in 1980, registers of unapproved industries and also

registers obtained from the preliminary lists of the industrial census 1983. Details of the names, addresses and the type of industry for every manufacturing establishment are available in these sources. This allowed each firm to be stratified by each location and industry type.

A pilot postal survey was undertaken in the study region. On the basis of this, the original questionnaire was modified and the remaining entrepreneurs were interviewed. Interviews took place over the period from January to July 1984 and information was collected for the year ended 31st December 1983. Information on manufacturing changes was based on the six year period between 1978 - 1983.

The questionnaire adopted was divided into four sections (Appendix 1). The first was designed to obtain details on the legal nature of firms, the nature of manufacturing industry, type of products and the status of enterprise. The second part focussed on the factors affecting location and sought information on the sources of raw material and markets, inputs such as labour and capital, and infrastructural facilities. Information on different types of services and contacts was also obtained. The third part of the questionnaire focussed on personal

details of the respondent together with personal attitudes and opinions. The last section was designed to obtain details of manufacturing adjustments.

OUTLINE OF THE THESIS

Chapter 2 is essentially a background chapter. It begins with a description of the development and structural characteristics of the manufacturing sector in Sri Lanka and highlights some essential features of government and private initiatives. Special attention is focussed on the development and locational trends of small and medium scale industries during the last two decades, the switch from import substitution to export oriented industrialisation and the interpretation of the high degree of concentration of the private sector manufacturing establishments. It also describes some aspects of decentralised locations as well as the sample and the sampling framework for the study.

Chapter 3 provides a conceptual framework for the subsequent chapters and outlines the organisational structure of firms in the Colombo Metropolitan Area. Based on organisational attributes, the internal structure of firms in the three selected types of industries is

discussed. The next four chapters deal with the relationships between the organisational structure of firms and the behaviour of these organisations in the Colombo Metropolitan Area. Chapter 4 presents an analysis of functional linkages responsible for the localisation of enterprises in the three types of industries selected for the survey. It deals with the relationship between the raw material, sales, labour and capital input linkage patterns and the organisational structure of manufacturing firms.

Chapter 5 analyses services and communication linkage patterns. Different types of service links such as transport services, plant services, consultancy and financial services are examined in relation to the organisational structures. Communication links such as telephone contacts, postal contacts and face to face contacts are also examined and the relationships between organisational structures are analysed.

Chapter 6 focusses upon the attitudes industrialists possess towards their environment. An attempt is made to analyse the relationships between the structure of manufacturing firms and the perception of decision makers.

In Chapter 7 the types of manufacturing adjustments that have occurred during the period from 1978 to 1983 in Colombo are identified and the factors influencing the frequency of manufacturing adjustments are examined in detail. In addition, the relationships between organisational structure and adjustment type are examined. Chapter 8 describes the policy measures taken by governments since independence and evaluates the impact of these policies on recent manufacturing changes in Sri Lanka; Chapter 9 emphasises the findings of the study and their implications.

CHAPTER 2 : MANUFACTURING IN SRI LANKA :
SOME BACKGROUND COMMENTS

RECENT DEVELOPMENTS IN MANUFACTURING : FROM IMPORT
SUBSTITUTION TO EXPORT-ORIENTED INDUSTRIALISATION

In the late 1950's the Sri Lankan government, like many other governments of developing countries, adopted an import substitution strategy as a basis for economic development. A long term perspective plan, covering a ten year period (1959 - 1968), was formulated and the import substitution strategy was initiated in the plan. The development of industries in a protected market to meet domestic demand was the prime objective, with the possibilities of the long term expansion of manufactured exports - though this was an objective to be achieved as an outcome of import - substitution industrialisation, not as an integral part of the overall industrialisation strategy.

Though the ten year plan gave fairly high priority to industrial development it failed to achieve its targets and hence was abandoned after the first few years. Nevertheless, the development thinking embodied in it provided the major guidelines for policy makers throughout the period up to about the late sixties. With the 1957/58

budget, there emerged a tendency to use tariff policy as a tool for promoting import substitution by imposing protective tariffs on selected industrial products and lowering tariffs on capital equipment and industrial raw materials (Snodgrass, 1966; 216). The acceleration of reserve depletion had reached a critical level by 1960, so that at the end of that year available reserves were sufficient to cover only "three months imports".

In the light of such pressures the ten year long term plan was converted into a three year development action programme - the 1962 short term implementation programme - which, in theory, ran from 1961/62 - 1963/64. The quantitative import restrictions were imposed to curtail imports to a level consistent with the available import capacity. In January 1961, for the first time, a system of import control with individual licensing and allocation of quotas to importers was introduced for several semi-essential consumer items. In 1963, the Foreign Exchange Budget Committee was set up to function as the supreme authority allocating scarce foreign exchange among alternative uses on the basis of national priorities (Kappagoda, 1967). By the end of 1964, the Open General License System (OGLS) of foreign exchange allocation had completely caused to exist, and for all practical purposes Sri Lanka had turned into

what can be called a "closed economy".

The most noteworthy feature of this import control regime was the bias against exports. The existence of a highly protected domestic market implied relatively low profitability of production for the export market. The maintenance of an over-valued exchange rate through import controls further aggravated this situation by eroding rupee earnings of exports and lowering the import cost of import substituting activities (Rasaputram, 1972; 14-15; Dahanayake, 1977; 1-65). The small and medium scale consumer goods industries benefited considerably from the concessions given by the government. Between 1960 and 1963 over 1000 new small and medium scale industries were granted approvals within the private sector compared to approximately 500 industrial establishments during the preceding 15 years. A notable promotional move undertaken in this sphere during this period was the establishment of the Industrial Estates Corporation, which was entrusted with the task of building industrial estates for medium scale industries on which basic facilities such as power, water and transport would be readily available.

During the years between about 1959 and 1963, the initial or "easy phase" of import substitution, the country

witnessed the growth of a large number of consumer goods industries largely based on imported inputs and catering to local demand. In the early stages not only was the quality of products poor, but in many cases production involved only a minimum conversion of imported inputs. Government approvals for setting up new industrial ventures were granted freely without due consideration of the foreign exchange costs involved, particularly in the initial period. During the first phase many of the import substituting industries in the private sector began to concentrate on those very items which were earlier restricted or banned on the grounds of being non essential and luxuries (International Labour Organisation (ILO), 1971). Evidently the early phase of import substitution in industries, particularly in the private sector, 'lacked careful planning and clearly defined priorities' (Development Policies in Ceylon, 1972). In the later years, a stricter and more rationalised approach came to be adopted both in the approval of new private sector industries and in the foreign exchange allocation for raw material imports as the country's foreign exchange situation became increasingly difficult.

By the mid 1960's the import - substitution development strategy had reached a crisis point. Although

the main objective of the import substitution strategy was to lessen the dependence of the growth momentum of the domestic economy on the structurally weak traditional export sector, the newly established industries made the economy more dependent on the traditional export sector. These industries showed an overwhelming reliance on imported machinery and raw materials. The earnings from traditional exports continued to stagnate and the quantity of foreign aid inflow was large enough to fill the gap in import capacity. Because of these difficulties there was a growing recognition by the policy makers that increased emphasis should be placed on export promotion. This recognition led to a number of policy revisions within the existing import-substitution framework to promote exports.

The policy measures taken for the promotion of exports included setting up an Import Duty Rebate Scheme for manufactured exports in December 1964, the introduction of an import entitlement scheme (Bonus Voucher Scheme) for selected minor exports in 1966, the devaluation of rupee in 1967, and the introduction of a dual exchange rate system (Foreign Exchange Entitlement Certificate Scheme, FEECS) with a premium exchange rate for non-traditional exports in 1968. The white paper on Foreign Investments issued in 1966 aimed at attracting foreign investment geared to production

for export. However, between 1965 and 1969 the government placed greater emphasis upon agricultural than industrial development. Expansion of public sector industry was therefore confined to developments which were already underway. Increased development in the private sector was nevertheless facilitated by adequate import allocation of raw materials and machinery. The government encouraged agro-based processing industries, based on export prospects and indigenous technology. In 1966, the Industrial Development Board (IDB) was set up to provide facilities for small and medium scale entrepreneurs.

The policy emphasis on export promotion continued well into the 1970's with the new government that came into power in May 1970. In fact the onset of the oil crisis in 1973 with its attendant balance of payments pressure, and the increasing debt-servicing burden due to continuous reliance on foreign financing since the late 1960's had made export promotion even more urgent in the 1970's than in the 1960's (Hewavitharana, 1975).

The industrial policy of the new government emphasised the provision of maximum support for export-oriented industries (Industrial Policy, 1971). The creation and development of a 'new export sector based on industrial

production' was a key element in the five year plan, 1972 - 1977. This represented an attempt to move away from the import substitution industrialisation of the past. To encourage export oriented industrialisation, a number of steps were taken. The FEEC scheme continued in operation with periodic upward adjustments in the premium rate. In 1971, the Import Duty Rebate Scheme which had until then been virtually inactive due to rigid operational rules, was subjected to a major revision. In the same year, a new import entitlement scheme, the Convertible Rupee Account Scheme (CRA), for exporters of non traditional products was introduced. Apart from these measures there were a number of newly introduced fiscal incentives including an 8 year tax holiday on export profits of approved exporting ventures. The Export Promotion Secretariat was established in 1972 to function as an institute for directing and coordinating export development efforts of the country. Among the other institutional steps taken was the establishment of the State Gem Corporation in 1971.

In 1972, the government issued a white paper on foreign investment in which it recognised the importance of foreign capital participation in export-oriented industrialisation. "Ability to export a greater part of output" was

a major eligibility criterion laid down in the white paper in connection with the approval of new foreign investment projects. Noteworthy features of the foreign investment policy during the period 1970 - 1977 were the interest shown by the government in establishing joint ventures with capital participation by both government corporations and foreign manufacturing firms, and the high degree of export orientation. Although a number of firms started with foreign capital participation, numerous controls operating on the activities of the private sector and the fear of nationalisation prevented maximum participation by foreign investors.

Since 1977, when the present government came into power, a new industrial policy has been implemented. The conviction of the new government was that the existing restrictive trade regime would not provide a lasting solution to Sri Lanka's economic crisis. The solution must therefore be found in an export-led development strategy within the framework of a liberalised trade regime. Linking the economy with the world market system was considered an essential precondition for enhancing economic growth and development. A policy formulated under the guidance provided by the World Bank and International Monetary Fund (IMF), was announced in the budget speech presented in November 1977 and further changes were effected subsequently.

Under this new policy reform, export development was accorded the highest priority in the overall development programme.

The following steps were taken by the government for the development of this export oriented industrialisation; (a) the removal of qualitative import controls, along with a considerable relaxation of control on many types of exchange systems (b) the promotion of export oriented direct foreign investment, including the establishment of the Greater Colombo Economic Commission (GCEC) to organise the Export Promotion Zone (EPZ), and the removal of institutional constraints on capital transfers; (c) revision of fiscal incentives for export production, restricting tax holiday concessions to exporting ventures (by the 1983 budget); (d) the implementation of a specific export development policy package, including import duty rebates and subsidised credit.

To establish a sound institutional background the Export Development Act No.40 was enacted in 1979. The act provided for the establishment of an Export Development Board (EDB). The Board's functions include advising the export development council on export development policies, formulating export development programmes and monitoring

their implementation and coordinating the activities of various government bodies responsible for various aspects of export development.

The post 1977 policy reform has placed a greater emphasis on the role of direct foreign investment in achieving the objective of export oriented industrialisation. The Greater Colombo Economic Commission (GCEC) was set up in 1978, with the main task of establishing and operating Investment Processing Zones (IPZ). The GCEC has been given powers to offer incentives to investors and to provide a suitable and attractive investment atmosphere (GCEC, 1979).

There has been a rapid growth in foreign investment following the policy reform initiated in 1977. During the period 1978 - 1982, 99 FIAC approved projects commenced production. The number of projects operating in the GCEC area had reached 61 by July 1983; of these 57 were in the Katunayake IPZ, which is located only 29 km away from the port of Colombo. For both IPZ investors and FIAC investors, textile and clothing (garments) has been the major industry of attraction. Two major factors which contributed to this pattern were

- i. The imposition of quota restrictions by major consuming countries on garment imports from "traditional developing country producers" generating a potential market for "new comers" and
- ii. the comparative advantage Sri Lanka enjoys in the production of garments in the face of increases in the cost of labour in other major garment producing countries in Asia. Apart from garments, the other areas of production in the IPZ, in the same order of magnitude are non metallic minerals, rubber goods and other labour intensive products such as footwear, toys and electrical appliances.

The Foreign Investment Advisory Committee (FIAC) has been allowed to continue its operation in approving and monitoring foreign investment outside the GCEC areas. Unlike the GCEC, which approves only export oriented projects, FIAC is empowered to approve import - substitution projects on the basis of criteria such as employment generation, net import savings and contribution to domestic technology. However, the potential contribution towards export development is

usually taken as a major criterion. With regard to existing production and export incentives, FIAC approved projects are treated usually as locally owned firms.

Not only were the industries producing for export given tariff concessions and tax incentives but also the small and medium scale industries which were producing for the local market were given some incentives. Industries which commenced during or after 1977 and located outside municipalities were entitled to exemption on tax on profits up to a limit of Rs. 200,000 per annum. Since November 1977 almost all the raw material required for manufacturing industries has been freed from licensed control. Also the imports of machinery for manufacturing industries were exempted from licensed control. Financial incentives were given under the Credit Guarantee Scheme which commenced operation in 1979. During the period from 1979 to 1982 a total of 2088 local investment industrial approvals had been granted compared to 850 approvals during 1970 - 1977.

THE STRUCTURAL CHARACTERISTICS OF SRI LANKAN MANUFACTURING ACTIVITIES

The majority of industries in Sri Lanka are consumer oriented industries with food, beverages and

tobacco sector industries accounting for 20 percent of all industries, and textile, wearing apparels and leather products accounting for 22 percent (Table 2.1). The value of industrial production classified by the type of industry for selected years is shown in Table 2.2. This provides some useful information on the trends in the country's industrial structure.

In terms of value of production the largest industrial group concerns the manufacture of chemicals, coal, rubber and plastic products. The share of this group is 42 percent. The next is the group which includes the manufacture of food, beverages and tobacco which accounts for 25 percent of total investment output. The textile, wearing apparel and leather products group accounts for nearly 18 percent of the industrial output. The manufacture of fabricated metal products is fifth in terms of the value of production as well as in terms of the number of establishments.

Industrial production in Sri Lanka is still dominated by the private sector, which accounts for 75 - 80 percent of the total value of production. This includes a relatively small number of large scale and registered firms and a substantial number of small scale units consisting of

Table 2.1 Percentage of manufacturing establishments
by type of industry

CATEGORY	1952 ¹	1974 ²	1978 ³	1980 ⁴	1980 ⁵
1. Food, beverages and tobacco	1.15	7.69	10.5	10.92	20.32
2. Textile, wearing apparel and leather products	37.89	42.33	34.3	31.61	21.81
3. Wood and wood products	1.02	1.14	0.9	3.57	3.78
4. Paper and paper products	4.86	4.39	4.4	4.88	1.70
5. Chemicals, petroleum, coal, rubber and plastics	17.00	15.46	15.3	20.39	3.38
6. Non metallic mineral products	5.69	4.05	5.2	8.16	21.61
7. Basic metal products	0.01	0.76	0.8	0.01	0.28
8. Fabricated metal products	30.22	22.93	27.4	18.37	13.80
9. Manufactured products not elsewhere specified	1.28	1.35	1.2	1.51	3.32
TOTAL	100	100	100	100	100

Sources:-

1. Census of manufacturing establishments, 1952
Department of Census and Statistics.
2. Report of the field survey of manufacturing industries in Sri Lanka, 1975/76, Ministry of Industries and Scientific Affairs.
- 3,4 Reports of the survey of manufacturing industries 1979 and 1980 by the Department of Census and Statistics
5. Directories of registered and unregistered manufacturing establishments, published by the IDB in 1980.

Table 2.2 The value of industrial production by type of industry in Sri Lanka (in Rs. Millions)

CATEGORY	1952 ¹	1974 ²	1978 ²	1980 ²	1980 ²
1. Food beverages and tobacco	309	1,247	2,609	4,496	6,998
2. Textile, wearing apparel and leather products	121	571	1,008	3,040	5,136
3. Wood and wood products	9	53	124	315	522
4. Paper and paper products	31	137	376	626	901
5. Chemicals, petroleum, coal, rubber and plastics	335	1,353	3,279	12,015	11,888
6. Non metallic mineral products	50	288	592	1,250	1,468
7. Basic metal products	23	130	219	428	302
8. Fabricated metal products	52	349	590	782	1,129
9. Manufactured products not elsewhere specified	2	16	55	58	90
TOTAL	932	4,143	8,851	23,010	28,434

Sources:-

1. Census of manufacturing establishments 1952,
Department of Census and Statistics
2. Reports of the Central Bank of Ceylon.

workshops, cottage industries and handicraft producing units. In the ILO Mission report (1971) it was indicated that in 1968 public sector industries accounted for 17 percent of the total value added in the industrial sector, including

mining and quarrying. Private sector firms employing more than twenty persons contributed 50 percent of the total value added, while private small and medium scale industries accounted for 33 percent of the total. As regards employment the small scale sector has considerable importance since it provides the bulk of employment in the industrial sector - as much as 65 percent of the total. Public sector industry and private sector large scale industry provided nearly one third of the total employment. In employment terms state industry is relatively small, providing less than 10 percent of the total in the industrial sector as a whole.

The distribution of industrial activities among the major industrial groups in the public sector is significantly different from that of the private sector. According to the survey of manufacturing industries done by the Ministry of Industries and Scientific Affairs in 1976, the public sector, which includes the petroleum refinery, has its largest share in the chemical group, with food ranking second and the non metallic mineral industries (including cement and ceramic ware) third. In the private sector the largest branch of industrial activity is the group which includes food processing, tobacco and beverages. The group which ranks second in terms of total value of industrial output in the private sector is that which

includes fabricated products and machinery. The third group is the textile sector (Report on the field survey of manufacturing industries in Sri Lanka, 1975/76, Ministry of Industries and Scientific Affairs). However, the present structure of the private sector manufacturing has changed. Food and textile sectors have emerged as most important in terms of the value of production. In recent years, with the development of Investment Promotion Zones (IPZ), small multinational corporations also have become another element of the corporate nature of manufacturing activity.

As in many other developing countries manufacturing units consist of both well organised firms as well as unorganised small manufacturing establishments. The latter include unregistered small scale textile units, handlooms, brick kilns and carpentry workshops. Of the total number of firms 24 percent belong to the registered sector while 76 percent were unregistered sector. Table 2.3 illustrates the concentrated pattern of registered establishments in the textile, chemical, rubber and plastics and fabricated metal product sectors. A large number of unregistered establishments fall into the categories of food and beverages, textiles and non metallic mineral products.

Table 2.3 Distribution of registered and unregistered establishments by type of industry in Sri Lanka

CATEGORY	REG:	(%)	UNREG:	(%)	TOTAL	(%)
1. Food, beverages and tobacco	5558	11.36	3566	23.18	4124	20.32
2. Textile, wearing apparel and leather products	1591	32.39	2837	18.44	4428	21.81
3. Wood and wood products	92	1.88	676	4.39	768	3.78
4. Paper and paper products	227	4.62	118	0.77	345	1.70
5. Chemicals petroleum, coal, rubber and plastics	1174	23.90	1541	10.01	2715	13.38
6. Non metallic mineral products	204	4.15	4183	27.18	4387	21.61
7. Basic metal products	31	0.63	26	0.17	57	0.28
8. Fabricated metal products	1010	20.56	1792	11.65	2802	13.80
9. Manufactured products not elsewhere specified	26	0.51	648	4.21	674	3.32
TOTAL	4913	100	15387	100	20300	100

Source:-

Compiled from the directories of registered and unregistered manufacturing establishments, published by the Industrial Development Board of Sri Lanka, 1980.

However, data on the value of production of this unregistered sector are not available, as the surveys of private sector manufacturing establishments have mainly concentrated on the registered sector industries. In most of the surveys these widely dispersed small scale unregistered units have been excluded. Census figures and survey data indicate some aspects of the work force employed in these two sectors. According to the survey in 1976 the total number employed in the registered manufacturing sector was 113,000 and the 1971 census data showed that the total work force employed in the industrial sector as 376,198. It can be seen that the total work force employed in the unregistered sector is roughly more than three times that of the registered sector. That is, less than one third of the work force in the manufacturing sector belongs to the registered sector. The data show that the largest number of workers are engaged in the small scale informal production sectors.

In most developing countries it has been always difficult to stipulate limits of output, employment or investment to demarcate the small medium and large scale industrial sectors. Different definitions have been used in different countries based on employment and investment. According to the definition used by the Ministry of

Industries and Scientific Affairs, in Sri Lanka these industrial units whose value of fixed capital assets (plant and machinery) is less than Rs. 100,000 have been classified as small and those between Rs. 100,000 and Rs. 1,000,000 as medium and those exceeding Rs. 1,000,000 as large. The percentage values of industrial products in these sectors by different industrial categories are shown in Table 2.4. In the food, beverages and tobacco sector four large enterprises - the National Milk Board, Sri Lanka State Flour Milling, Sri Lanka Sugar Corporation and Ceylon Tobacco Company contributed a major share of the large scale output. In the chemical products group the major large scale contributor is the petroleum refinery. It is seen from the table that a significant share is contributed by the small and medium scale sector in the other industrial categories.

The available data on the size of the firm based on employment and ownership patterns are limited. They show that the highest proportion of industrial units falls into the category of less than 20 employees. Information from the survey of manufacturing industries in 1980 by the Department of Census and Statistics shows that 35.8 percent of reporting units fall into the category of 0-5 employees, 11.8 percent into the 6-9 category, 15 percent into the 10-19 category, 15.4 percent between 20-49 employees and

Table 2.4 Percentage of output value (ex factory)
by type of industry

CATEGORY	LARGE SCALE	MEDIUM SCALE	SMALL SCALE	TOTAL
1. Food, beverages and tobacco	90.0	5.8	4.2	100
2. Textile, wearing apparel and leather products	55.6	21.0	23.4	100
3. Wood and wood products	8.0	40.0	52.0	100
4. Paper and paper products	20.9	61.3	17.8	100
5. Chemicals, petroleum, coal, rubber and plastics	59.8	30.4	9.8	100
6. Non metallic mineral products	54.2	23.0	22.8	100
7. Basic metal products	41.5	55.0	3.5	100
8. Fabricated metal products	47.2	26.5	26.3	100
9. Manufactured products not elsewhere specified	28.2	60.3	11.5	100

Source:-

Ministry of Industries and Scientific Affairs,
second report on the field survey of manufacturing
industry in Sri Lanka. 1975/76.

14.1 percent of the surveyed firms recorded the number of employees as more than 200. A complete enumeration of the Department of Census and Statistics in 1966 (Survey of Industrial Production, 1966) identified nearly 21,000 production units. Most of these (nearly 95 percent) were small scale units employing less than 10 persons, and 41 percent of small scale industries were single owner operator types. It is also worthwhile to note that nearly 75 percent of the total small scale units were non mechanised.

One of the salient features of Sri Lanka's industrial structure is its continued reliance on imported raw materials, which makes it difficult to sustain the pace of development in the context of an acute foreign exchange shortage. In 1982, of the total value of raw materials used in the organised industrial sector, the foreign raw material component accounted for approximately 78 percent. Table 2.5 indicates that the foreign raw material component is lowest in the food and wood and wood products groups.

The industrial group which includes the manufacture of chemical products is the highest consumer of foreign raw materials, with 92 percent of raw materials being imported. The consumption of imported raw materials in basic metal products and textile sectors is also fairly high compared

Table 2.5 Percentage of all raw materials imported by value

CATEGORY	1977	1978	1979	1980	1981	1982
1. Food, beverages and tobacco	30.0	44.7	47.9	68.8	55.0	18.0
2. Textile, wearing apparel and leather products	63.7	85.7	91.0	83.0	92.9	66.0
3. Wood and wood products	40.9	32.6	29.8	23.8	18.8	29.3
4. Paper and paper products	66.9	61.8	61.1	59.9	63.0	50.0
5. Chemicals, petroleum, coal, rubber and plastics	93.3	93.8	95.0	96.0	96.0	99.0
6. Non metallic mineral products	33.5	73.5	60.4	64.7	36.2	63.2
7. Basic metal products	100.0	100.0	100.0	100.0	100.0	100.0
8. Fabricated metal products	78.9	76.4	78.0	80.0	75.1	44.1
9. Manufactured products not elsewhere specified	47.3	54.7	58.9	72.5	73.6	72.5
TOTAL	65.9	79.0	81.9	89.1	86.5	77.9

Source:-

Central Bank of Ceylon.

to the value of imported raw materials consumption in the other sectors. It is interesting to note that the registered manufacturing sector is largely geared to the use of imported inputs and the pace of industrial development is heavily determined by the availability of imported supplies.

THE LOCATIONAL PATTERNS OF MANUFACTURING ACTIVITY
IN SRI LANKA

The location of private sector manufacturing industries

Private sector manufacturing industries comprise both registered and unregistered establishments. The distribution pattern of these plants shows an overwhelming concentration in the Colombo Metropolitan Area with 43 percent of establishments in the Colombo and Gampaha districts. Registered manufacturing establishments are highly concentrated in the Colombo District, while unregistered small scale units are dispersed over a large number of regions (Figure 2.1). In all, nearly 47 percent of the registered and 20 percent of unregistered establishments are located within the Colombo District. The total manufacturing employment in the Colombo Metropolitan Area has grown steadily during the last few years (1945 - 28.3 percent, 1963 - 30.5 percent, 1971 - 32.7 percent, 1981 - 41.9 percent). The number of registered manufacturing establishments in Kandy, Kurunegala, Matara, Galle, Kalutara and Jaffna are high compared to the other regions. These districts account for 24.4 percent of the total number of manufacturing establishments. However, 69 percent of unregistered establishments are dispersed throughout the country, while the balance is located within the Colombo Metropolitan Area.

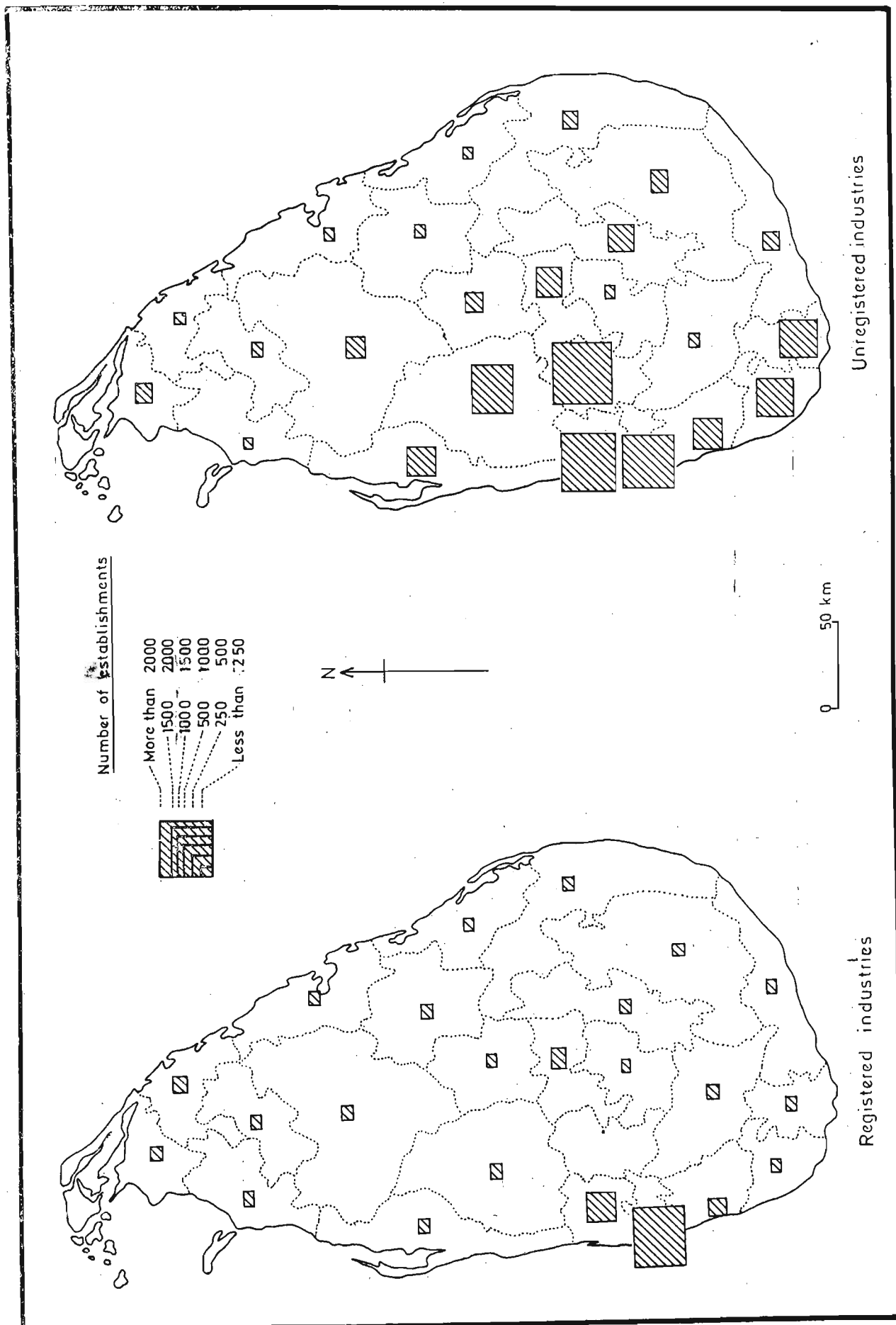


Figure 2.1: Distribution of private manufacturing establishments based on the data compiled from the directories published by the IDB in 1980

Figure 2.1 and the data compiled from the industry directories provide some indication of the spatial pattern of private sector manufacturing industries in terms of the number of establishments. A single criterion has been used in Figure 2.1 to display cartographically the distribution of manufacturing activities. However, a measure of manufacturing, based upon one criterion only is subject to whatever abnormalities that criterion might display and a multiple criterion analysis is preferable. In the light of information available in Sri Lanka, the most useful way of indicating the distribution of plants seems to be the multiple criteria analysis introduced by J.H. Thompson (1955). The concentration is measured using the information from the survey of manufacturing industries in 1976, which covers almost all the registered manufacturing establishments.

Ratings of magnitude are calculated and represented in Figure 2.2 by circles and these are shaded according to intensity ratings which have been divided into six classes¹.

1 Magnitude and intensity ratings:- These measurements depend on the fixed bases which are averages of the conditions found in all districts. i.e. Country's average to compute a district's magnitude rating (a) the number of workers in manufacturing (b) the salaries and wages paid to the factory workers (c) the value added during manufacture in these districts are divided by the respective base. These magnitude rating bases (the country's total divided by 22) for 1976 are (i) number of workers in manufacturing = 3417.5, (ii) salaries and wages paid = Rs. 11586.4 (iii) value added during manufacture = Rs. 27954.5. The quotients derived in this way are multiplied by 100, summed and then averaged to obtain a multiple criteria rating. To calculate intensity

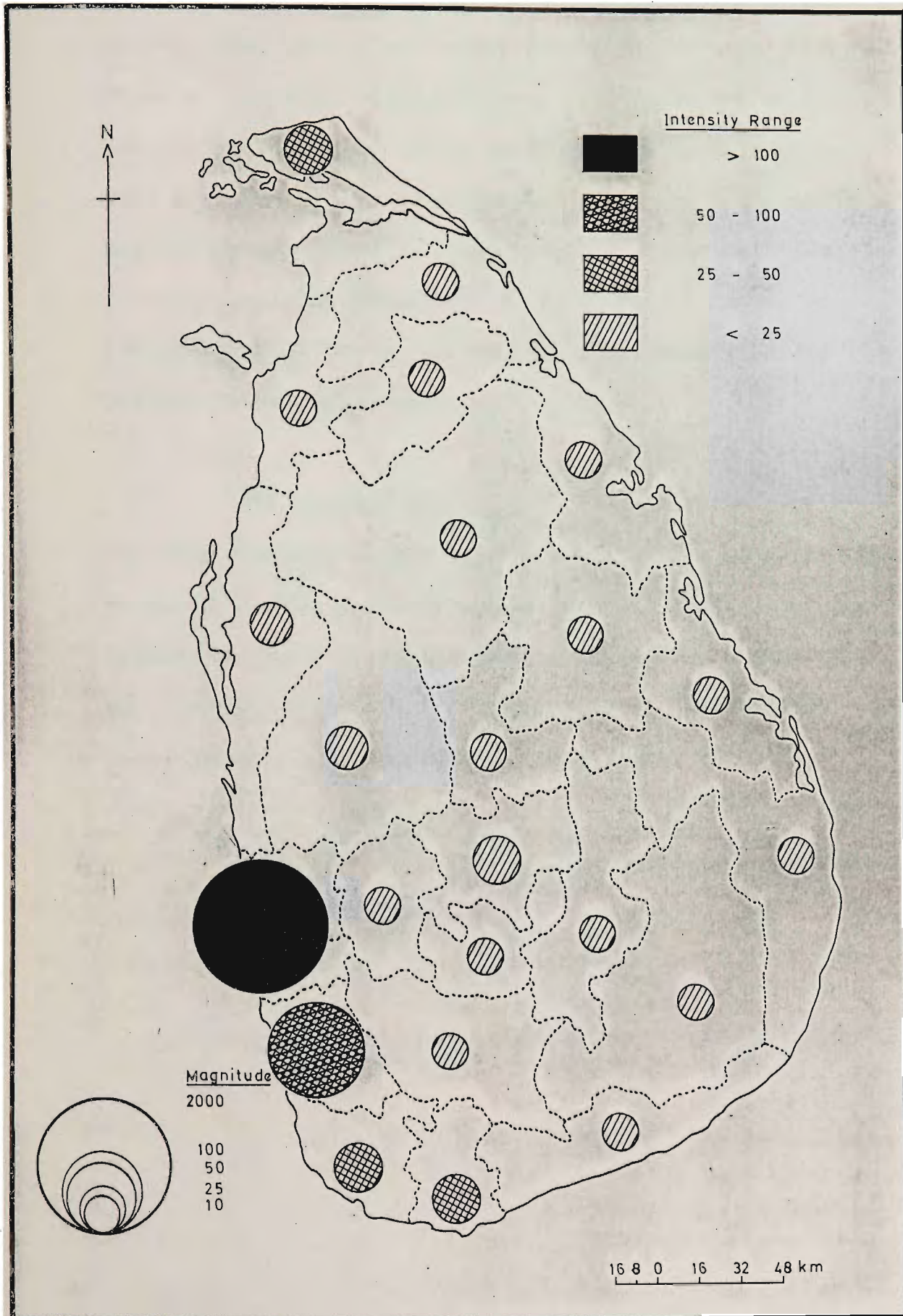


Figure 2.2: Manufacturing magnitude and intensity in the Districts of Sri Lanka

On the one hand Colombo district has a magnitude rating greater than that of any other (in fact more than 20 times those of Kalutara, Kandy, Matara, Kurunegala and Jaffna) and on the other hand there are districts in the eastern part each having an intensity rating less than one tenth of that of Colombo district. The results of the multiple criteria analysis illustrate a higher concentration of industrial activity in the western part, mainly in the Colombo Metropolitan Area.

The accessibility factor plays a vital role in the determination of the concentrated pattern of industries in Colombo. The infrastructural facilities available in Colombo in terms of water, power, road network, transport and communications are by far the best in the island. Since Colombo is served by rail, road, sea, and air

ratings, the following ratios are divided by the respective fixed base ratios: (i) the number of workers in manufacturing to total population, (ii) the number of workers in manufacturing to total labour force, and (iii) the value added by manufacturing to total population. The intensity rating fixed bases (the above ratios for the country as a whole) are (i) data not available (ii) 0.005 (iii) 0.046. The resultant quotients are multiplied by one hundred and summed and averaged to obtain multiple criteria rating of intensity.

transport it has an excellent position in terms of accessibility. Other facilities available in Colombo such as education, health and hospital, recreation and entertainment are all of a high order when compared to the other regions and provide an added impetus for the concentration of industries. Furthermore Colombo is the hub of government activity. The various government ministries, the head offices of all government departments and state corporations are located in and around Colombo. The premier business establishments, banking and financial institutions are also located in Colombo. All these factors positively contribute to the high concentration of industries in Colombo.

The structural pattern reveals a diversification in the Colombo Metropolitan Area. A variety of industries are located here including consumer goods such as textiles, electric bulbs, soap and cosmetics, foot wear, processed foods, tobacco manufacture; intermediate products such as wire, plastics and rubber goods, paint and chemicals, and capital goods such as machine tools and electrical appliances. The indices of diversification, using Gibbs - Martin's formula, show that Colombo, Gampaha, Kalutara and Jaffna districts have higher values than the other districts (Figure 2.3). Furthermore, manufacturing in Colombo and Gampaha

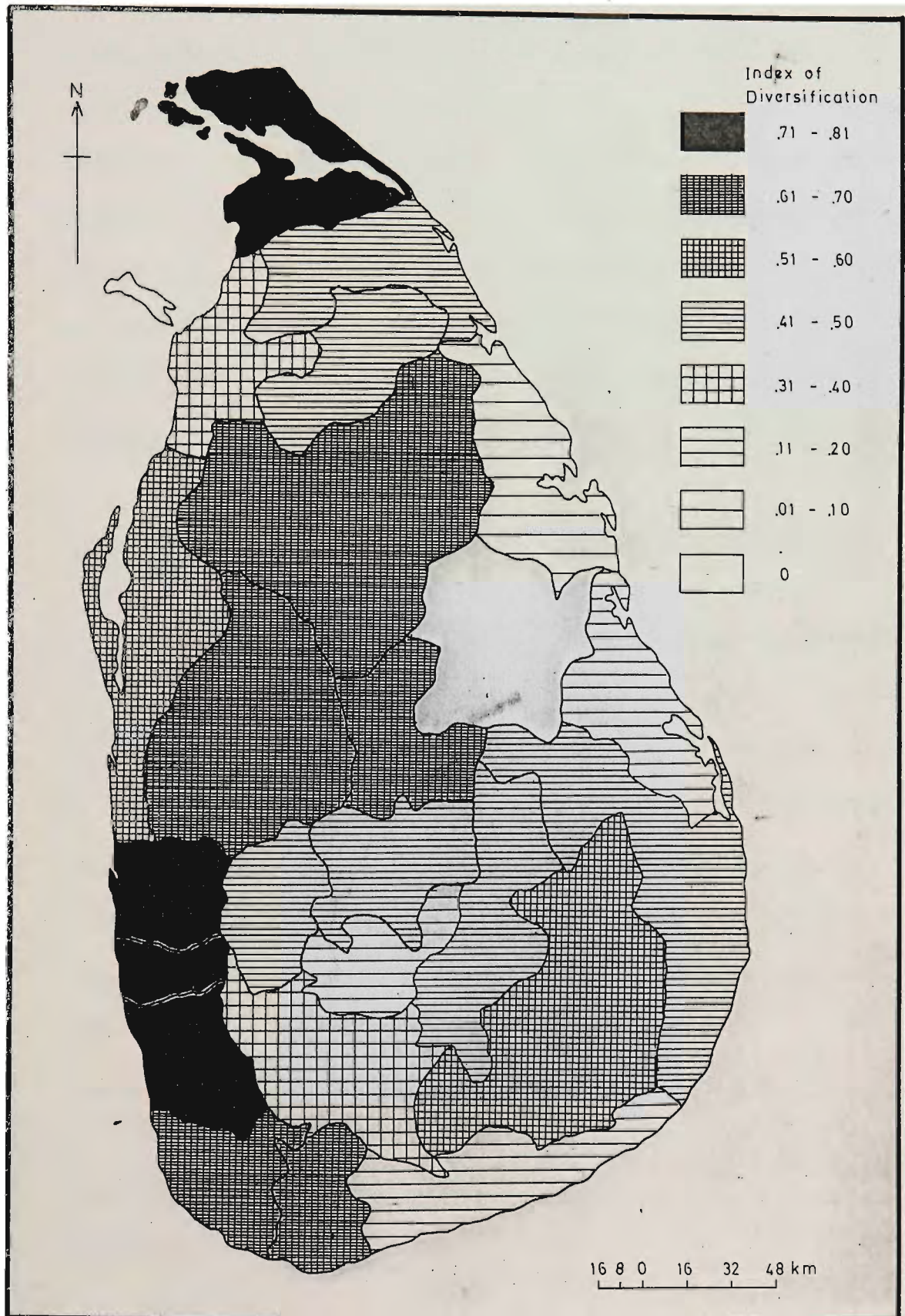


Figure 2.3: Diversification of industries in Sri Lanka

districts is heavily agglomerated around textiles, wearing apparel, leather products and the manufacture of fabricated metal products. According to the survey of 1976, the textile group accounted for 39 percent of the manufacturing employment and the fabricated metal only for 28 percent. However, in Kalutara district of the total employment 41 percent were engaged in the manufacture of chemicals, rubber and plastic products. In Kandy 61 percent were in the manufacture of wood and wood products, while in Jaffna 33 percent were engaged in the manufacture of metal products.

Concentration of industries in Colombo Municipality

The spatial pattern of manufacturing establishments in the Colombo region by administrative divisions is shown in Figure 2.4. The highest concentration is recorded in the Colombo Municipality, accounting for 22 percent of the total establishments in the region, which is 42 percent of the Colombo district. Plants which are largely dependent on imported raw materials preferred locations in the city centre and in the outlying suburbs. A noticeable factor is that even within the Colombo city plants are concentrated into a few municipality wards in the central part of the city such as Fort, Kochchikade South, Panchikawatte and New Bazar. The municipal wards and the distribution of

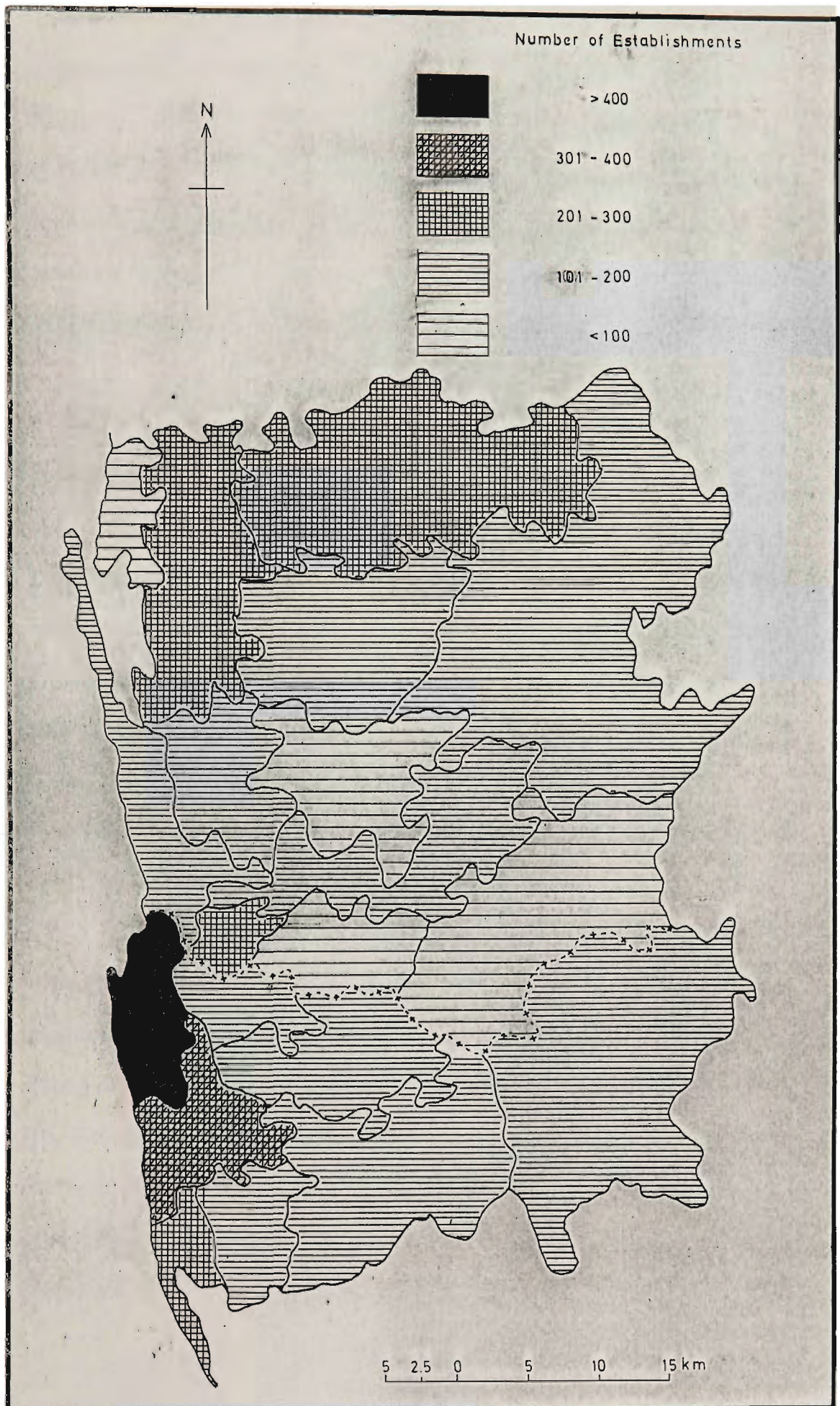


Figure 2.4: Distribution of manufacturing establishments in Colombo and Gampaha Districts

establishments in these wards are shown in the Figures 2.5 and 2.6. The diversified patterns of industries in the central part of the city is illustrated in Figure 2.7. Registered establishments are located within the city centre while the unregistered establishments tend to locate by the sides of main roads and near the markets.

It is important to note, also, that industrial establishments are concentrated in suburban areas such as Ratmalana, Dehiwala, Moratuwa, Maharagama and Homagama. There exists too, a thin sprinkling of industrial establishments in various parts of the suburban outer ring to the north of Colombo as well as to the east. In the suburbs, plants are mainly concentrated along the arterial roads from Colombo to Galle, Negombo, Kandy and Ratnapura. Although the government has taken several steps to relieve the concentration in the city, it is apparent that the manufacturing activities are still clustered in the Colombo municipality area. Figure 2.8 a, b and c illustrate the point distribution patterns of three types of industries. While the textile and leather product plants are clustered in the inner core of the city in the wards of Fort and Kochchikade south, fabricated metal product plants are centered in the central part of the municipality in the Panchikawatte area. Although the clustering pattern in

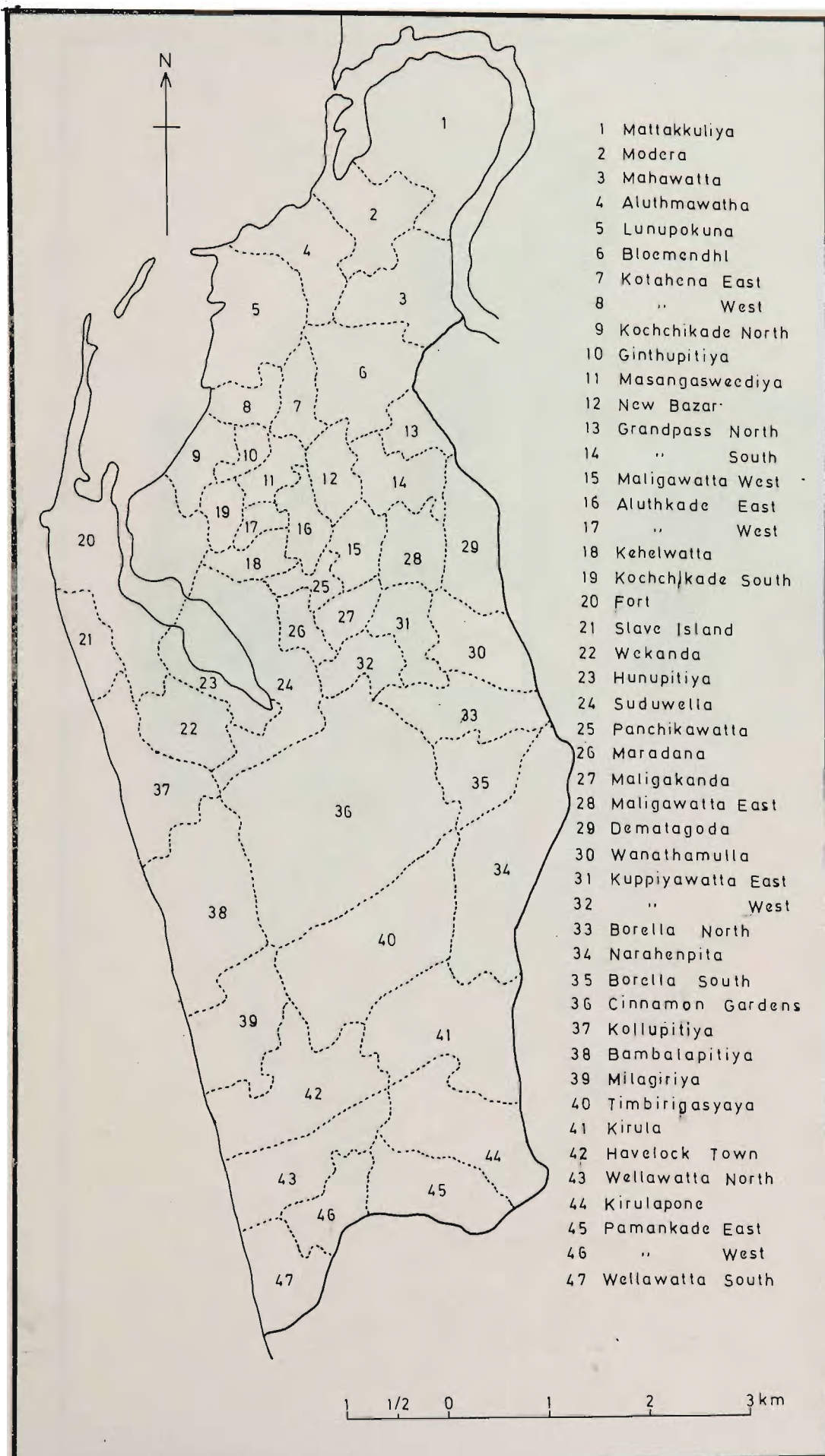


Figure 2.5: Municipal wards in the Colombo city



Figure 2.6: Distribution of manufacturing establishments in Municipal wards

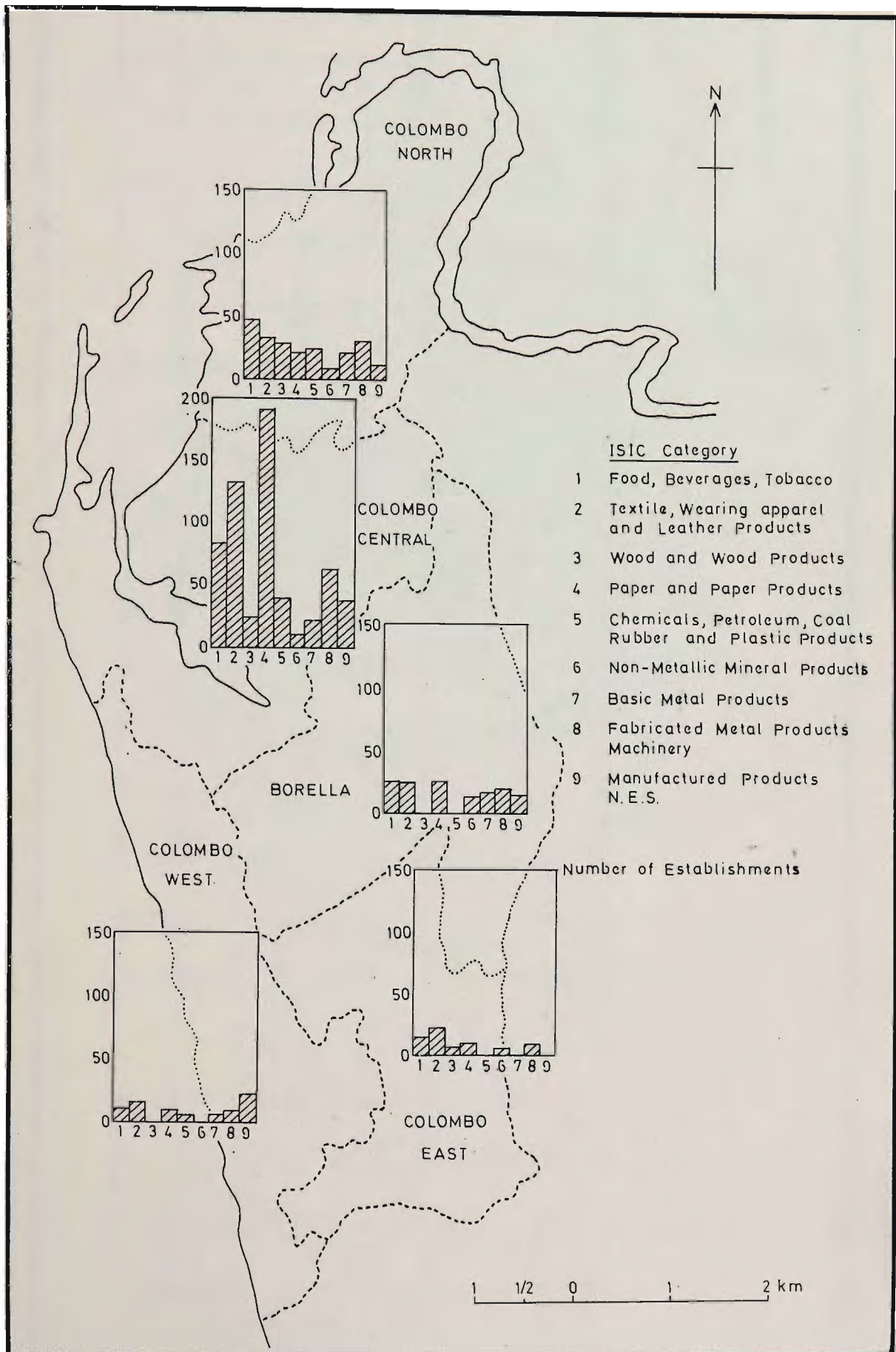


Figure 2.7: Distribution of manufacturing establishments in Electoral Districts by ISIC categories

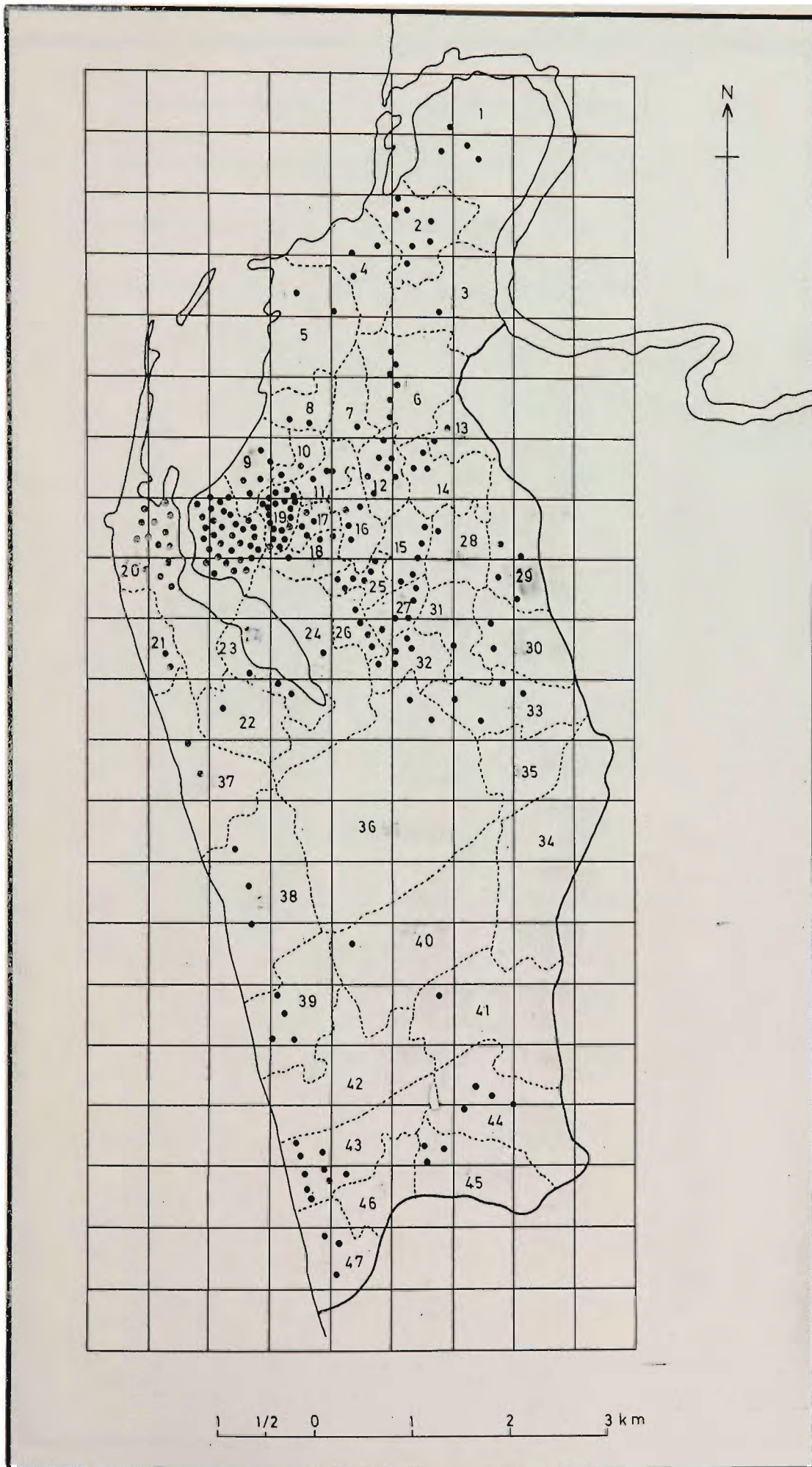


Figure 2.8(a): Distribution pattern of textile, wearing apparel and leather plants

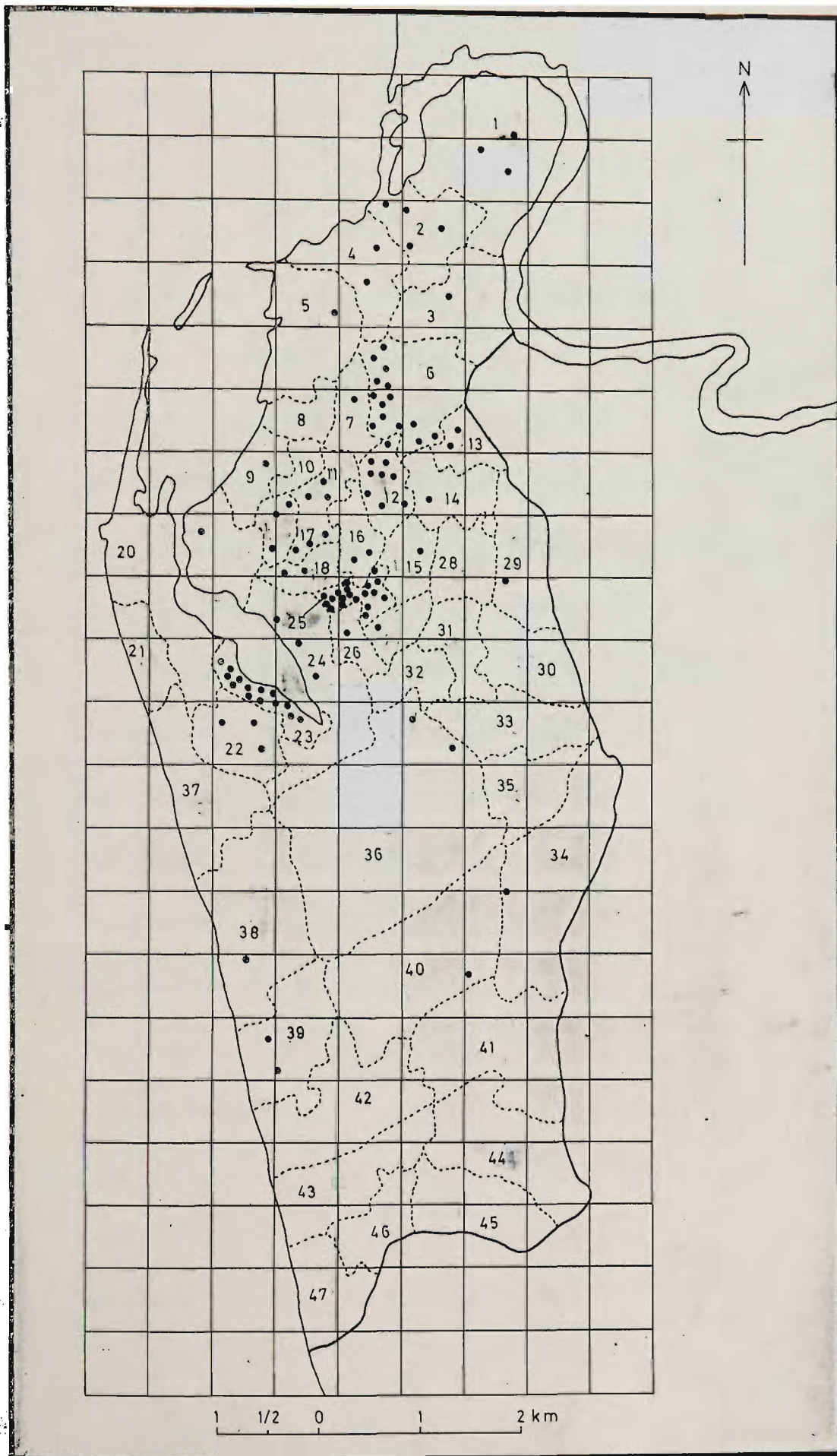


Figure 2.8(b): Distribution pattern of chemical, petroleum rubber and plastic plants

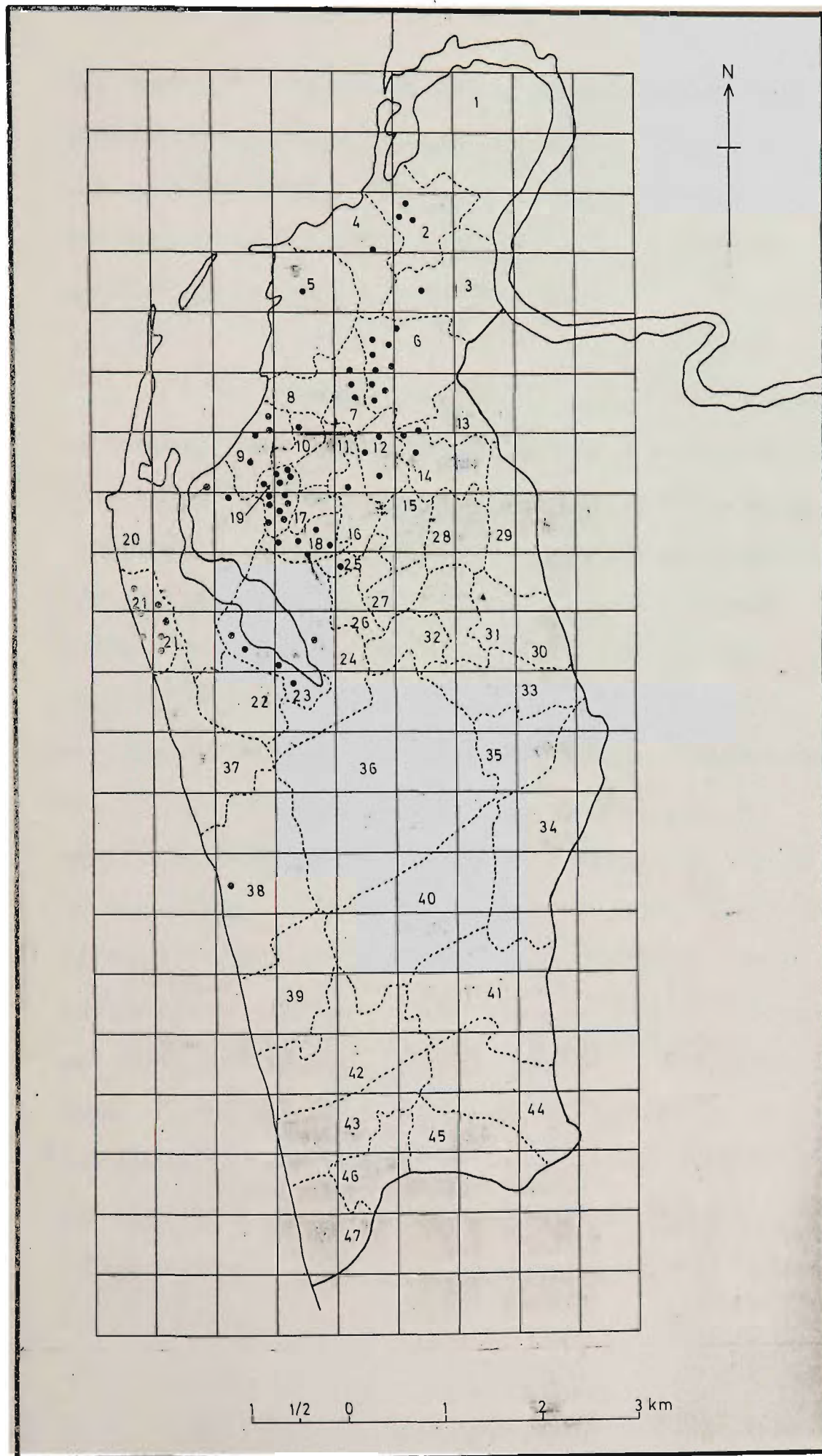


Figure 2.8(c): Distribution pattern of fabricated metal industries

the chemical and petroleum plants is significant, they are not strongly centered into one or two wards as in the other two types. Plants are dispersed throughout the northern part of the Colombo city, while there is none in the southern part of the city.

The clustering pattern in Colombo city reflects as Townroe (1979) suggested the importance of agglomeration economies, "the dominant group of advantages to an industrial enterprise in choosing metropolitan location (in less developed countries) comes under the general heading of agglomeration". Urbanisation economies, including access to common facilities of commerce and banking, to technical advice and servicing, to subcontracting and educational services and to a large pool of adaptable skilled labour are clearly important. Clustering of registered manufacturing establishments may also be due to the closeness to the central administration, face to face contacts with government officers and proximity to financing and banking facilities. The advantages of easy access to a range of services provided by public and private sectors and the existence of diversified services including replacement and repairs has been of considerable importance to entrepreneurs. Entrepreneurs in the city centre also have a much more rapid and favourable access to capital than

those in outer regions. As a rule, all major financial decisions made by the provincial branches are referred to the bank's head office in Colombo city centre for ratification. These urbanisation economies have a powerful role in attracting manufacturing industries into the inner core of the city and the surrounding areas.

Decentralised locations and industrial estates

During the period of early independence the government took steps to locate public sector large scale industries in less developed areas but it did not take any steps to encourage small and medium scale industries to locate in these areas. It was only in the early 1960's that the government started setting up industrial estates as a device for regional dispersal as well as to relieve the congestion in the Colombo Metropolitan Area. As in many other developing countries the other objectives of the industrial estate programme include the creation of employment opportunities in the backward regions, the utilisation of local raw materials and the development of entrepreneurship. The programme was formulated and implemented by the IDB and funds required for the programme were drawn from government allocations. Three major industrial estates were set up, the first at Ekala in 1963, the

second at Pallekele in 1972 and the third at Atchuvvely in 1975. Also two mini estates were set up at Horana and Pannala during the late 1970's and early 1980's respectively (Figure 2.9).

In evaluating the industrial estate programme Vepa (1976) considered it to be a qualified success. He pointed out that the Ekala estate is a successful one, achieving the objectives of relieving the congestion of industrial growth in the Colombo city. It is true that the estate contributed significantly to the development of new entrepreneurship in the Colombo region. During the survey period all 43 units were occupied. The occupancy rates in the two major industrial estates at Pallekele (78 percent) and Atchuvvely (40 percent) are lower. However, high occupancy is not the only criterion for satisfactory performance; more important are the types of units that actually occupy the estate. All the units at Ekala are owned by small and medium scale private entrepreneurs, while at Pallekele small and medium scale units account for only 29 percent, the rest being large units or government agencies. This is the reason Vepa (1976) suggested that the overall performance of the Ekala estate can be said to be satisfactory and has contributed to the development of new entrepreneurship in the Colombo region. The unsatisfactory

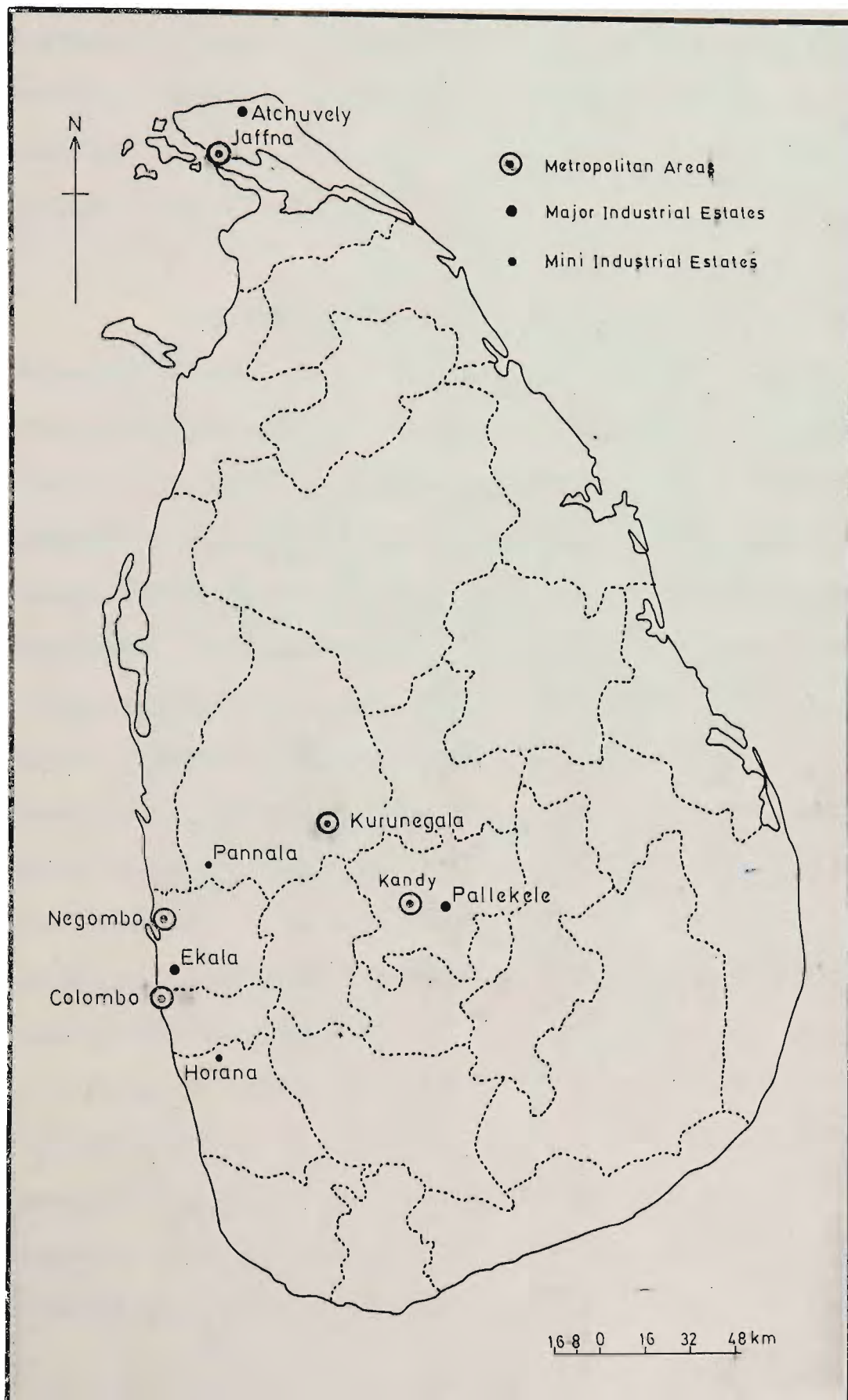


Figure 2.9: Location of Industrial estates in Sri Lanka

performance of the other two estates is largely due to the unfavourable physical locations and to the relatively higher rentals. These locations also have very poor access by road and rail, and the sites seem to have been selected primarily on the availability of land.

The establishment of the industrial estates was expected to create employment opportunities in the backward regions of the country. As Vepa (1976) pointed out, however, there was a high per capita investment and the employment generation was not as large as expected. During the present sample survey there were only about 1300 employees in Ekala and nearly 800 in Pallekele. Another important aspect of these estates is the use of locally available resources. Although there is some evidence that units on the estates have been set up to exploit locally available resources some units are mainly based on imported raw materials. At Ekala while timber for tea chests, hides and skins for leather products, silica sand for sodium silicate, and fruits for canning are obtained locally, some textile and steel products are wholly dependent on imported raw materials. At Pallekele estate the processing of milk and sericulture projects are mainly based on the local raw materials. However, in terms of human resources, there is less indication of the adequate utilisation by the units. For

example the Kandy region is noted for its artisans in brass, copper and silver as well as in batiks, mat weaving and wood carving. These activities are not reflected in the industries at Pallekele estate although this may be due to the fact that a separate artisan estate is located in close vicinity where artisans with traditional skills are provided accommodation (Vepa, 1976).

IDB has provided basic infrastructure facilities required for starting an industry in the recently started mini industrial estates. Except for one industrial unit, all firms located in Horana industrial estate are small firms with less than 20 employees. All industries in Pannala estate have less than 20 employees and there is one firm with 41 employees which comes under the Department of Textiles. Mini industrial estates seem to have contributed significantly to the development of new small and medium scale industries. The ownership pattern and the year of establishment support this argument. However, the mini industrial estate programme cannot be evaluated properly as the estates are still in their early stages of development. The Boosa industrial estate has been closed down. The reason for this closure may be the selection of an unsuitable site, very poorly connected with road and other facilities.

During the 1970's steps were taken by the government to extend industrialisation into rural areas by setting up Divisional Development Councils (DDC) which coordinated the various development activities at the village level. It was expected that under the five year plan formulated in 1971, most of the small scale units (particularly those which were agro-based) would be established under the DDCs. Four types of industries were considered under the programme; (a) industries based on mined raw materials (eg. the manufacture of bricks and tiles from clay and the use of local raw materials for the construction of roads and buildings); (b) industries based on agriculture (eg. coconut, coir, charcoal, rubber and tea processing, the manufacture of jaggery from coconut and distillation of oils); (c) forest based industries; and (d) industries based on timber.

From the inception of the DDC scheme to the end of 1974, 844 industrial projects had been approved. Of these, 398 projects were mineral based industries, 170 were agro based and 266 were wood based. During this period the mineral based light engineering production sector has registered some impressive gains, recording a total production value of Rs. 2.18 million from 60 co-operative

societies in 1974. It is clear from the number of projects approved by the DDC scheme up to the end of 1974 that less emphasis was given to the agro-based sector. Another significant factor was that not all the approved projects were in production (Ministry of Planning, 1974). Under the mineral and chemical industries sector, although 14 projects have been approved, only 3 were in operation. Of the total number of 39 projects approved in the fisheries sector, only 14 were in operation by the end of 1974, giving employment to 340 persons and with a production value of Rs. 1.03 million. Of the 59 animal husbandry projects, only 24 were in operation during the period providing employment for 2129 persons. In the textile sector, there were 42 garment projects, 3 textile printing projects, 2 batik projects, 2 textile weaving projects, 1 weaving material project providing employment to 750 persons (Vepa, 1976).

Although the DDC programme was started to develop backward rural areas, some drawbacks have been noticed in the implementation of the programme. Projects tend to be formulated without much techno-economic consideration and most of the approvals seem to have been granted as a result of political influence. The personnel associated with these projects did not have sufficient experience in industrial

management and this would have definitely affected the quality of products. The arrangements made for the distribution of raw materials and finished products were inadequate, thus limiting the location of new industries in backward regions. Also the incentives proposed by the DDC programme were not sufficiently attractive to encourage firms to locate industries in the rural areas (Vepa, 1976).

Given these general characteristics of manufacturing industries in Sri Lanka it is useful, before examining the notion of organisational structure in more detail, to look at the way in which the sample for this study has been chosen. A brief outline follows.

The sampling frame for the study

According to the industrial census of 1983, and the information obtained from the Ministry of Industries and Scientific Affairs and IDB, there were 1611 registered and 919 unregistered establishments in the study region in the three industrial sectors examined here.

Since it is preferable to stratify the population by means of two or three variables rather than a single one,

Table 2.6 Number of manufacturing firms in the study region
by sector, location and type of industry

Type	Textile	Rubber	Metal	Total
<u>Registered firms</u>				
Colombo Municipality	177	70	130	377
Highly urbanised	150	112	182	444
Semi urbanised	144	194	126	464
Outer region	183	78	65	326
Sub total	654	454	503	1611
<u>Unregistered firms</u>				
Colombo Municipality	125	31	8	164
Highly urbanised	89	64	57	210
Semi urbanised	95	58	25	178
Outer region	144	86	137	367
Sub total	453	239	227	919
Total	1107	693	730	2530

Sources:-

- 1 Preliminary lists of manufacturing census in 1983,
Department of Census and Statistics.
2. Directory of unregistered manufacturing
establishments in Sri Lanka, IDB.
- 3 Register of unapproved industries, IDB.

a stratified proportionate random sample design was adopted. But the choice of variables to stratify the sample was restricted to those for which data existed for the population of firms. It was also important that the sampling framework be adequate for the experimental purposes and therefore variables were selected considering the hypotheses which are to be tested in the thesis. Manufacturing firms were stratified according to three variables.

- i. Structural characteristics
- ii. Location
- iii. Sectoral classification.

A binary structural stratification was employed by distinguishing between registered and unregistered manufacturing firms. Locational stratification was based on the classification used by the Urban Development Authority (UDA) in their master plan (1979) for the Colombo Metropolitan Area. The Colombo Metropolitan region which covers the whole of Colombo and Gampaha districts and a part of Kalutara district has been subdivided into two main sub regions - the central and outer region - by the UDA on the basis of such criteria as the urbanisation process, development needs, infrastructural network development and natural conditions. The former consists of the Colombo urban area and a suburban region which can be considered as a transitional area between the highly urbanised Colombo city and more rural areas of the outer sub-regions. The latter covers mostly the rural locations. The Colombo urban area is again divided into two sections; the Colombo Municipality and adjoining highly urbanised areas. Using this regional classification as a base, firms were selected from the Colombo Municipality, highly urbanised areas, suburban regions and outer sub regions.

The sectoral stratification was achieved by selecting firms from three types of industries; textile and wearing apparel, rubber based industries and fabricated metal products. Firms selected for the sample were proportionate to the number of firms in each of these locational and sectoral groups. This approach produced a good coverage of the total population of firms in each industry for all regions in the Colombo Metropolitan Area and in the two major sectors.

The sample for detailed study comprised 128 registered and 73 unregistered manufacturing firms (a sample of 8 percent) a ratio proportionate to that of the total population of firms in the study region. The size of the sample was determined considering the time available for the field work. Although the sample size may be thought to be small, the sampling error has been reduced by using the stratified proportionate random sample design. Cochran (1963: 89-100) has shown that sample estimates with stratification nearly always result in a smaller variance for the estimated mean or total than is given by a comparable simple random sample. The sample was selected randomly from the lists of manufacturing firms. Due to the constraints imposed by time and resources it was only feasible to select industries from the Administrative sub divisions of Negombo,

Minuwangoda, Mahara, Biyagama, Kaduwela and Homagama in the outer sub-region. Five subdivisions (Diulapitiya, Mirigama, Attanagalle, Weke and Hanwella) which account for 18 percent of firms in Colombo Metropolitan Area were excluded in selecting firms for sample and the selected sample comprised of 88 textile, 55 rubber and 58 metal working firms. On the basis of the locational stratification a sample of 43 establishments was selected from the Colombo Municipality, 52 from the highly urbanised areas, 51 from the semi-urbanised areas and 55 from the outer sub-regions.

Of the 201 firms approached, 136 responded, representing slightly more than 5 percent of the total number of firms in the study area. Initial contacts with entrepreneurs were made by post. In the Colombo Municipality 31 interviews were conducted representing a 72.1 percent response rate. Table 2.7 indicates a fairly constant response rate over the sample. However, the semi urbanised areas produced a lower response rate. Over four regions and three types of industries, 136 interviews conducted from 201 postal contacts represented a 67.6 percent success rate. The highest response rate was achieved with the fabricated metal firms and the lowest rate was achieved with the rubber based firms. Some entrepreneurs did not respond to the

initial postal contacts. It was evident from telephone conversations that some of these, although they are registered, do not have any manufacturing activity but are involved only in buying and selling. These units may have registered as an industry to obtain the fiscal and financial benefits provided by the government to the manufactures. Of the total non respondents about 10 percent were untraceable because they may have either closed down or moved to another location. Although the response rates are lower in the first two sectors compared to the third one, these sectors are not under represented. Low response rates may be because the lists of manufacturing industries include not only manufacturing units but also other business activities.

Using the X^2 statistic it is possible to compare respondents with non respondents in relation to locational and sectoral categories (Table 2.7). From these results it is evident that there is no statistically significant difference between these two groups (respondents and non respondents) both at sectoral level and across the entire sample. As all those X^2 test values are less than $X^2_{0.05}$ (7.814) the null hypothesis is accepted. Respondents and non respondents are not significantly different at the 95 percent level over the whole sample. Although the first

two sectors formed a higher proportion of non respondents, there is no evidence of any statistically significant difference between respondents and non respondents.¹

Table 2.7 Distribution of approached, surveyed and non responded firms by location and type of industry

Type	Textile			Rubber			Metal			Total		
	AP	SU	NR	AP	SU	NR	AP	SU	NR	AP	SU	NR
Colombo MC	24	17	7	8	7	1	11	7	4	43	31	12
Highly urbanised	19	9	10	14	9	5	19	17	2	52	35	17
Semi urbanised	19	10	9	20	11	9	12	8	4	51	29	22
Outer region	26	21	5	13	8	5	16	12	4	55	41	14
Total	88	57	31	55	35	20	58	44	14	201	136	65
χ^2 Test	7.057			7.057			3.388			3.315		

$$\chi^2_{0.05} = 7.814$$

AP = Approached, SU = Surveyed, NR = Non responded

The distribution of respondents by registered and unregistered manufacturing firms can also be compared with non respondents. Although non response rate is higher in the unregistered firms, there is no statistically significant difference between the groups. Table 2.8 shows a considerable similarity between these two sectors across the entire sample.

¹ A two way method is used in calculating the χ^2 test values (Dixon and Massey: 1969). Theoretical frequencies are calculated by using the "marginal" totals.

Table 2.8 Distribution of approached, surveyed and non responded firms by type and sector

Type/Sector	Registered			Unregistered			Total		
	AP	SU	NR	AP	SU	NR	AP	SU	NR
Textile firms	52	36	16	36	21	15	88	57	31
Rubber firms	36	24	12	19	11	8	55	35	20
Metal firms	49	29	11	18	15	3	58	44	14
Total	128	89	39	73	47	26	201	136	65
χ^2 Test	0.274			3.726			2.459		

$$\chi^2_{0.05} = 5.99$$

AP = Approached, SU = Surveyed, NR = Non responded

The surveyed sample is used for analysing the representativeness of the different size categories of these manufacturing firms. According to the survey of manufacturing industries in 1980 (DCS) there were 1987 registered firms. Unregistered firms were excluded from the survey. Although the information gathered from the survey can be considered as a reasonable classification, it is assumed that there will be more unregistered firms with less than 20 employees, when the unregistered firms are included, the distribution of firms across size categories has been compared with the size distribution of these 1980 survey data. The value of chi-square ($\chi^2 = 12.673$) indicates that the size categorisation obtained in the sample is

different from the survey of manufacturing industries in 1980 at 95 percent level (Table 2.9). The difference between the two levels may be due to the inclusion of unregistered firms to the sample survey which has increased the number of firms in the category of less than 20 employees. Therefore, it can be concluded that the sample is not biased to any of these small size categories and also none of these size categories are under-represented in the survey.

Table 2.9 Size distribution of manufacturing firms

Number of employees	1980 survey ¹		1984 sample survey ²	
	No.	(%)	No.	(%)
0 - 5	711	35.8	44	32.4
6 - 19	534	26.8	53	38.9
20 - 49	306	15.4	22	16.2
50 - 74	94	4.7	4	2.9
75 - 149	146	8.4	7	5.2
150 - 199	39	1.0	6	4.4
More than 199	157	7.9	0	0
Total	1987	100	136	100

$$\chi^2 \text{ Test} = 12.673$$

$$\chi^2_{0.05} = 12.5916$$

Sources:-

1. Survey of manufacturing industries, 1980,
Department of Census and Statistics.
2. Sample survey

There are difficulties in evaluating the representativeness of the sample in relation to the ownership pattern, due to the non availability of data and information. Official statistics on ownership do not exist in the surveys done by the DCS, nor was detailed information from the 1983 census available during the fieldwork period. The proportional selection of the registered and unregistered establishments gives a reasonable representation of the ownership pattern, as almost all the unregistered firms belong to owner-operators, while the registered firms are comprised of owner-operators, partnerships and limited liability companies. However, the representativeness of these three categories in the registered firms cannot be easily examined.

Despite these difficulties there are reasonable grounds for accepting the survey data as suitable for the analysis. Sample size, proportionate sampling technique, high response rates, representation of all size categories provide sufficient reasons for accepting the representativeness of the sample.

The following chapters examine the structure of manufacturing organisations from this selected sample and its influence on functional linkages, attitudes and manufacturing changes.

CHAPTER 3 : DEFINING THE ORGANISATIONAL STRUCTURE OF
MANUFACTURING FIRMS IN THE COLOMBO METROPOLITAN AREA:
A FACTOR ANALITIC APPROACH

A number of earlier studies underlined the importance of the organisational structure of firms in relation to locational behaviour (Parsons, 1972; Rees, 1972). Parsons (1972) pointed out that the internal conditions of organisation cannot be wholly controllable with externally applied locational policies, so that internal structure is a critical factor in the development of manufacturing. More recently, and with the significant changes in the corporate structure of firms, it has become apparent that organisational structure may play a fundamental role in functioning and performance of individual organisations and enterprises (McDermott, 1976; McDermott and Taylor, 1982).

In previous studies, "organisational structure" has been defined within the framework of concepts derived from organisation theory. A number of organisational characteristics, including type of product or service produced (Taylor and Wood, 1973), ownership pattern, private/public (Taylor and Wood, 1973; Taylor, 1974; Taylor, 1978b); local/foreign (Britton, 1974, 1976; Schmidt, 1975; Le Heron and Schmidt, 1976; Walker, 1977; Hoare, 1978), management type, owner operator/partnership or

board of directors, (Taylor, 1974, 1977, 1978b), plant status, single plant/multiplant (Burrows and Towns, 1971; Crum and Gudgin, 1977), productivity (Schmidt, 1975; Le Heron and Schmidt, 1976), employment size (Moseley and Townroe, 1973); Le Heron and Schmidt, 1976) and production processes (Taylor and Wood, 1973; Moseley and Townroe, 1973; Taylor, 1978b) have been used in the literature to define the structure of manufacturing organisations.

However, McDermott and Taylor (1982) have argued that none of these studies adequately specifies organisational structure, as they employ crude dichotomised variables depicting gross attributes of organisations. In a study of organisation theory and industrial location, Marshall (1982a) noted that

"with respect to organisational structure industrial geographers with few exceptions (McDermott, 1977) adopted a small number of contextual variables such as operations technology, employment size, and plant status as surrogates for differences in organisational tasks. The only actual measure of structure regularly examined in industrial location is non production employment (Crum and Gudgin, 1977; Marshall, 1979a). Aston studies (Pugh and Hickson, 1976; Pugh and Hinings, 1976; Pugh and Payne, 1977) clearly show that the organisational structure is a multidimensional concept which cannot be encapsulated in one single measure"

and concluded that many geographers have adopted a small number of organisational measures without any regard to the nature of their disciplinary context. He also pointed out, since individual aspects of structure are affected by different variables (Hickson *et al.*, 1969; Child and Mansfield, 1972), that geographers need to be more sophisticated in their analyses of organisational structure.

Other authors (Child, 1973; Blau, 1974) have argued that the ownership of the firm, the spatial dispersion and complexity of the organisation of the company, the dependence of the firm on other enterprises, and the degree of autonomy in decision making in the organisation are important determinants of structure, yet these factors have not been consistently included in industrial locational studies. Since the structure is affected by different characteristics, it is clear from most of these studies that all these variables should be included in an analysis of organisational structure. But although it is possible to conceptualise the notion of organisational structure, it has been rather more difficult to measure it.

Moreover, it is apparent that since manufacturing firms in developing countries operate in a somewhat different context from those in developed countries it is likely that

other variables may need to be taken into account. Thus capital investment, formal/informal dualism, family participation and raw material utilisation are considered in the present study. Many small and medium scale industries in Sri Lanka are locally owned, owner operated, single site establishments, but it has been recognised that there are structural differences among these firms. To date, no attempt has been made to identify the types of manufacturing organisations that exist in developing countries in terms of these structural characteristics.

It is the purpose of this chapter to classify and specify in more detail the organisational features and on the basis of interrelationships between these characteristics to identify the different dimensions of the data as "composite variables".

Further, it follows the studies of McDermott (1977) and McDermott and Taylor (1982), in using principal components analysis to specify the organisational structure of manufacturing firms. The analysis transforms the data to meet the prerequisites of regression analysis. The regression model is based on the premises that the variables utilised approximate normality and that they are independent. The principal components analysis also

eliminates the problem of multicollinearity by extracting from a given set of n variables, m orthogonal dimensions. Moreover, the scores generated during the analysis are normally distributed (Romsa, et al., 1969).

The present analysis differs therefore, from the previous geographical studies in that:

- i. it identifies the organisational structure of small and medium scale firms in a developing country,
- ii. it uses most of the organisational attributes which have been used in more recent, developed world studies as well as others which are important in a developing country context,
- iii. it uses mixed metrics for the analysis (interval scale, ratio scale and dichotomously scaled variables).

The following sections of the chapter examine some aspects of the methodology as well as the results of the principal components analyses.

THE SPECIFICATION OF VARIABLES

Clearly, the identification and selection of an appropriate variable set are fundamental to an adequate definition of organisational structure. In this study selection has been carried out on the basis of three criteria.

First, the variables must be relevant in terms of organisation theory. It was argued in the organisational studies that the complexity of firms in terms of size, production and ownership patterns were important factors in the structure of manufacturing organisations (Child, 1973; Blau, 1974).

Second, it is important to recognise that the manufacturing context is different in developing countries and in developed countries.

Third, the simple availability of data is a pragmatic limitation to theoretical nicety. Table 3.1 lists the variables which were chosen for this study and each is discussed in turn.

Table 3.1 : Variables employed in the analysis of organisational structure.

VARIABLE	DESCRIPTION
X1	Total number of employees in the firm.
X2	Capital investment (plant and machinery).
X3	Ownership patterns (sole proprietorship or not).
X4	Registered firm (Registered with the Government).
X5	Number of family members working in the firm.
X6	Cost of raw materials as a percent of total cost.
X7	Age of the firm.
X8	Administrative ratio (the ratio of managerial and administrative employees to total employment).
X9	Capital intensity of an industry (the ratio of the capital investment to the total number of employees).
X10	Percentage value of foreign raw materials.
X11	Percentage value of exports.
X12	Number of products.

X1 - Total number of employees in the firm

Size of the firm (measured by (X1) and (X2)) was chosen because recent studies highlight the significance

of size on the behaviour of firms (Keeble 1969; Moseley and Townroe 1973; Taylor 1973, 1975, 1978; Lever 1974; Gilmour 1974; Marshall 1982b; Taylor and Thrift 1983).

Studies on locational adjustments have established that relationships do exist between size and manufacturing changes (O'Farrell, 1976; Gudgin, 1978; Healey, 1981). In many studies size is measured by employment; though, Moseley and Townroe (1973) and Le Heron and Schmidt (1976) used turnover and value of output.

Size categorisation seems to be an important structural characteristic in the industrial sector of Sri Lanka, as different size categories exist even among the small and medium scale industries.¹ (see Table 2.9). Moreover, the size distribution of the three types of industries surveyed are fairly similar (Table 3.2)

X2 - Capital investment

In this study capital investment (plant and machinery) was also considered as a measure of size. It was also found that differences exist among the surveyed firms in terms of capital investment, with approximately

1 Survey of manufacturing industries, 1980,
Department of Census and Statistics, Colombo

75 percent of firms having an investment less than Rs. 100,000 (Table 3.3).

X3 - Ownership patterns

Management type and ownership pattern have been widely discussed as factors affecting the behaviour of manufacturing organisations (Taylor and Wood, 1973; Lever, 1974; McDermott, 1974; Hoare, 1978; Marshall, 1982b). In Sri Lanka the same is likely to be so, as different types of ownership patterns; owner operated, private partnerships and limited liability companies exist among the small and medium scale firms.

Among the sampled firms more than 60 percent were found to be in the category of owner operators, while 30 percent were private partnerships and 10 percent were private limited liability companies. X3 was included as a binary variable indicating whether the firm is a "sole Proprietorship" or not.

X4 - Registered firm

There are marked structural differences between registered and unregistered firms in Sri Lanka and this

was considered as a key variable (X4) influencing the locational pattern. It is apparent from a recent study (Industrial Development Board, 1980) that the relationships of firms with government organisations influence the changing pattern of manufacturing activities. The registered firm variable to identify whether the firm is registered with the government organisations or not X4 was included as a binary variable.

Table 3.2 : Size distribution of firms by type of industry

Employment size	Textile		Rubber		Metal		All	
	No	%	No	%	No	%	No	%
0 - 5	20	35.2	9	25.7	15	34.1	44	32.4
6 - 10	10	17.5	3	8.6	7	15.9	20	14.7
11 - 15	8	14.0	8	22.9	9	20.5	25	18.4
16 - 20	1	1.8	3	8.6	4	9.1	8	5.9
21 - 25	4	7.0	5	14.2	3	6.8	12	8.8
26 - 50	4	7.0	4	11.4	2	4.5	10	7.3
51 -200	10	17.5	3	8.6	4	9.1	17	12.5
Total	57	100	35	100	44	100	136	100

Source:-

Sample survey

Table 3.3 : Capital investment of firms by type of industry

		Textile		Rubber		Metal		All	
Capital investment (Rs. 000)		No	%	No	%	No	%	No	%
10 - 20	20	35.1	7	20.0	10	22.7	37	27.2	
21 - 50	18	31.6	13	37.1	7	15.9	38	27.9	
51 - 100	6	10.5	8	22.9	13	29.6	27	19.9	
101 - 200	4	7.0	4	11.4	6	13.6	14	10.3	
201 - 500	3	5.3	0	0.0	4	9.1	7	5.1	
501 - 2000	5	8.7	1	2.9	2	4.6	8	5.9	
2001+	1	1.8	2	5.7	2	4.5	5	3.7	
Total		57	100	35	100	44	100	136	100

Source:-

Sample survey

X5 - Number of family members working in the firm

Again, in many industries family members were found to be employed in the firm, irrespective of its size. Therefore, "family members working in the firm" was also selected as a variable (X5).

X6 - Cost of raw materials

The cost of raw materials (X6) was included as a

variable since a considerable variation of the cost of raw materials was found among the three types of industries.

X7 - Age of the firm

From recent studies it has been revealed that a relationship exists between age of firms and locational processes (Keeble, 1976; Healey, 1981; O'Farrell and O'Loughlin, 1981; O'Farrell, 1985). A positive relationship has also been identified between the number of years in production and backward linkages. The main reason for this type of relationship is that newly established plants pass through a learning process concerning local and domestic sources of supply and will gradually substitute more proximate linkages, provided that these suppliers meet the criteria of the plant concerning price, quality, delivery date, reliability and so on. In addition, however, local and domestic suppliers are likely to become more aware of the input requirements of new firms over a period of time, and may adjust their production processes and output to satisfy the new demand. From this argument it is clear that the behaviour of older firms is likely to be different from that of younger firms. Because all three types of surveyed industries were found to include firms which are more than 10 years old as well as those less than 5 years old age was

included as a variable (X7) in this analysis of organisational structure.

X8 - Administrative ratio

In some recent studies non-production employment has been taken as a significant element of organisational structure (Crum and Gudgin, 1977; Marshall, 1979b). In most owner operated industries there are no administrative employees, the proprietor himself acting as the manager. By contrast partnership firms and companies tend to employ a number of office employees. As a result of this the administrative ratio tends to vary from small sized unorganised to organised medium sized firms, resulting in a clear distinction among the surveyed firms in terms of their employment structure. Thus, the administrative ratio was included as a variable in the analysis (X8).

X9 - Capital intensity

A large number of industries which are small in size tend to be fairly labour intensive. However, during the survey it was difficult to obtain data related to the value of production so that the labour intensity of production could not be calculated. Hence, the capital

intensity of an industry (X9) defined as capital investment per employee, was used as a variable.

X10 - Foreign raw materials

As many industries are heavily dependent on imported raw materials, the value of imports can be considered as an important aspect of the structure of an industry (Table 3.4). The proportionate value of imported raw materials (X10) was used here as a variable.

X11 - Value of exports

Export orientation has been playing an important role in industrialisation strategy during recent years. As shown in Table 3.5, the percentage values of exports are different in the three types of surveyed industries. The degree of export orientation (X11) was therefore, incorporated in the analysis.

X12 - Number of products

Most unregistered small plants tend to produce only a single product, while organised firms tend to produce a few related products. The latter type of firms tend to

Table 3.4 : Foreign raw material utilisation by type of industry

	Textile		Rubber		Metal		All	
%value of foreign rm	No	%	No	%	No	%	No	%
00 - 20	0		24	68.6	6	13.6	30	22.1
21 - 40	2	3.5	8	22.8	12	27.3	22	16.1
41 - 60	14	24.6	3	8.6	8	18.2	25	18.4
61 - 80	24	42.1			12	27.3	36	26.5
81 -100	17	29.8			6	13.6	23	16.9
Total	57	100	35	100	44	100	136	100

Source:-

Sample survey

Table 3.5 : Export share of firms by type of industry

	Textile		Rubber		Metal		All	
%value of exports	No	%	No	%	No	%	No	%
00 - 20	41	71.9	35	100	36	81.8	113	82.4
21 - 40	2	3.5			4	9.1	6	4.4
41 - 60	5	8.8			4	9.1	9	6.6
61 - 80	4	7.0					4	2.9
81 -100	5	8.8					5	3.7
Total	57	100	35	100	44	100	136	100

Source:-

Sample survey

operate on varying production processes and need large quantities and different types of raw materials; therefore the number of products was included in the analysis as a variable (X12).

Variables on the plant status (parent/branch, single/multiplant), which have been considered in several recent studies as organisational variables, were omitted since more than 90 percent of firms were single site establishments. Methodological constraints suggest that variables with very high proportions in one category should be omitted from the analysis. Rummel (1970) also pointed out, 'if dichotomous nominal scales are included, measurements are preferred that do not bunch a proportionately high frequency of cases in one category'.

Of the twelve variables listed in Table 3.1, nine were in interval and ratio measurement scales, and three were dichotomously scaled.

MIXED METRICS IN PRINCIPAL COMPONENTS ANALYSIS : SOME PROBLEMS

For the principal components analysis it is necessary to produce a correlation matrix from the original data matrix. Three types of correlation coefficients were

derived from the original data, as the matrix comprised mixed measurement types.

The Pearson Product Moment correlation coefficient (r) is the one used for the variables measured in interval and ratio scale form. The Pearson coefficient is not suitable for those variables which are measured in binary form. The phi coefficient is the product moment applied to dichotomous data (Carrol, 1961; Cohen and Cohen, 1975). Although the range of phi lies between - 1.00 and 1.00, the phi is restricted if the marginal frequencies are unevenly distributed. The Hamann coefficient is considered (Tinkler, 1971) as a reliable indicator of a relationship within the table when the distribution of marginal frequencies is uneven. The three contingency tables derived from data in the present study indicate that there are no highly uneven marginal frequencies in the distributions. Nor are there any zero occurrences in the cells in these three contingency tables. The phi coefficient, therefore, is used here as a suitable measure for the association between dichotomous variables. Association between dichotomous variables and interval and ratio scale variables were based on the point biserial correlation coefficients (Appendix II).

The correlation coefficient standardises the data

and it enables the comparison not only of data that have different units but also of data on different measurement scales (Rummel, 1970). The correlation matrix constructed from the three types of coefficients formed the input to the principal components analysis, which produced a number of components dimensions of the data as "composite variables". Each composite variable described a portion of the variance in the data.

Initially the analysis was run including the selected three types of industries as variables (using the textile, rubber and metal firms as dichotomously scaled variables). The inverse of the correlation matrix was required to calculate the scores from the extracted components. This procedure was not possible when the types of industries were used as dichotomously scaled variables because the "determinant" measure of the matrix was close to zero. Calculations based on such fine limits can result in significant computational errors and an ill conditioned matrix. Mather (1976) draws an analogy of the ill conditioned matrix with the problem of determining the exact point of intersection of a pair of straight lines: it is easy when the lines are perpendicular, but it is difficult to evaluate precisely as the angle of intersection is reduced. Lines which cross but are close to parallel

correspond to an ill conditioned matrix. To avoid this problem, which was caused by the inter-dependence of these dichotomous variables, industrial types were omitted and three analyses, one for each industrial type, were run. Also to remove redundancy only one indication of ownership, the owner-operator firms as a binary variable, was used in the analysis.

The component scores were computed by using the standardised values of the variables ($f = FZ$, where factor score (f) is a function of factor score coefficient (F) and the standardised values (Z) of variables). As binary variables were included in the analysis, the standardised values were calculated as follows: mean and variance for a dichotomous variable containing a proportion p of 1's and a proportion $(1-p)$ of 0's are $\mu = p$ and $\sigma^2 = p(1-p)$. Z scores of a dichotomy are a function of the proportion in each of the two groups. Therefore Z score corresponding to x variable is $Z = (x-m)/\sigma$ where $m = p$, $\sigma = (np)^{1/2}$ (Dixon et al., 1969). Also it should be noted that, as there is no high frequency in one category (p or q or not so small in selected binary variables) and the sample size is fairly large, the sampling distribution of x is approximately normal. Therefore, the scores which are based on the standardised values of variables are used for further analysis.

THE ORGANISATIONAL STRUCTURE OF MANUFACTURING FIRMS
IN THE COLOMBO METROPOLITAN AREA : THE RESULTS OF
PRINCIPAL COMPONENTS ANALYSIS

GENERAL COMMENTS

Structural characteristics were analysed for all firms in the sample ($n = 136$), as well as for each of the three selected industries (textile, $n = 57$; rubber, $n = 35$; metal, $n = 44$) separately using the variables listed in Table 3.1. The results of these analyses are of considerable interest since they facilitate the comparative analyses of organisational behaviour. There appears to be an argument over whether to rotate or not to rotate components (Davies, 1971; Mather, 1976; Daulty, 1976). Based on the mathematics of the method there is no clear solution for the argument. Since the appearance of the disputation, researchers have continued to rotate components (McDermott, 1977; McDermott and Taylor, 1982). As Davies (1971) noted rotation also simplifies the column matrix and destroys generality in favour of simplifying differences in the data.

Principal components derived from the correlation matrices of organisational variables in each of these analyses were subjected therefore, to a varimax orthogonal rotation procedure, in order to facilitate empirical

interpretation of components. In the initial matrix five components made the greatest contribution to explanation, accounting for 75 percent of the total variance for all sampled firms and 81.9 percent, 82.9 percent and 78.9 percent for textile, rubber and metal firms respectively. The explained variances of the next three components were low and these components were mainly based on one variable from the set of 12 and were treated as unimportant for any generalisations. In rotating components for analyses of rubber and metal firms the conventional procedure of selecting components with eigen values greater than unity was followed, however for the comparative purposes in the analysis of textile firms, two components with eigen values less than unity were included for rotation. The explained variance of these components are low, and were excluded from further analyses.

Loadings exceeding 0.15 for twelve variables on five of the rotated components are presented in Tables 3.6, 3.7, 3.8 and 3.9.¹ The square of each entry of the matrices (square of the component loadings) represents the proportion (percentage) of the total unit variance of each variable which is explained by each component, after allowing for

¹ Eigen values and percentages of variances in the tables correspond to the initial matrices.

the contribution of the other components. The right hand columns of the tables give the sum of squared component loadings, or the "communality" of each variable. The communalities presented in the tables have been adjusted to reflect the explanation due to variables based only on five components. The communality indicates the proportion of the total unit variance explained by all the common factors taken together and is therefore analogous to R^2 in regression analysis.

ORGANISATIONAL STRUCTURE OF ALL FIRMS

Component 1 : Degree of capitalisation

Organisational variables with highest loadings on component 1 are the 'capital investment' and the 'Capital intensity' of production (Table 3.6). The proportion of the total unit variance of the former variable shows that 88 percent of variation in capital investment among firms is explained by component 1 while the contributions of the other components are less than 5 percent. This situation is similar to the latter variable explaining 88 percent of variation (0.94^2) in capital intensity by component 1. The 'total number of employees' loads positively on this component explaining 15 percent of the variance (0.39^2).

Thus firms with a high score on component 1 will have a high level of capital intensity; conversely, firms with low scores are likely to be labour intensive, small firms. The composition of component 1 therefore suggests that it represents the "degree of capitalisation" of firms.

Table 3.6 : Organisational structure; rotated components
for all sampled firms

	Component Loadings (1)					h^2
	(I)	(II)	(III)	(IV)	(V)	
Total employees	0.39	0.20	0.68		-0.39	0.83
Capital investment	0.94		0.18			0.96
Sole proprietorship	-0.19	-0.82	-0.26			0.79
Registered firm		0.43		0.17		0.25
Family members			0.17			0.05
Cost of r/material				0.93		0.88
Age	0.35	0.44	-0.15	-0.57		0.68
Administrative ratio					0.96	0.95
Capital intensity	0.94					0.92
Foreign r/material			0.24			0.09
Export share		0.25	0.84			0.78
No. of products		0.90	0.14			0.84
Eigen value	3.87	1.77	1.59	0.91	0.84	
% of variance	32.3	14.8	13.3	7.6	7.0	

(1) loadings below 0.15 omitted

h^2 = Communality

Table 3.7 : Organisational structure; rotated
components for textile firms

	Component Loadings (1)					h^2
	(I)	(II)	(III)	(IV)	(V)	
Total employees	0.65	0.39		0.41	-0.36	0.88
Capital investment	0.21	0.94				0.94
Sole proprietorship	-0.80		-0.32			0.76
Registered firm	0.28	0.17	0.85			0.86
Family members	0.22			0.93		0.94
Cost of raw materials			-0.16			0.04
Age		0.15				0.96
Administrative ratio					0.96	0.89
Capital intensity		0.93				0.89
Foreign r/material	0.39			0.22		0.26
Export share	0.90	0.18		0.18		0.89
No. of products	0.63	-0.22	0.55			0.75
Eigen Value	4.68	1.85	1.65	0.92	0.69	
% Variance	39.0	15.4	13.8	7.7	5.8	

(1) loading below 0.15 omitted

h^2 = Communality

Table 3.8 : Organisational structure; rotated
components for rubber firms

	Component Loadings (1)					h^2
	(I)	(II)	(III)	(IV)	(V)	
Total employees	0.57		-0.15	0.63	-0.27	0.83
Capital investment	0.95			0.19		0.97
Sole proprietorship	-0.26	-0.81	-0.22			0.79
Registered firm	0.22	0.35	0.84			0.89
Family members					0.95	0.92
Cost of raw materials	0.24		-0.88	-0.16		0.88
Age		0.29				0.11
Administrative ratio				-0.31	-0.19	0.16
Capital intensity	0.92	0.19			-0.18	0.92
Foreign r/material			0.16	0.90	-0.18	0.89
Export share		0.21	0.17			0.11
No. of products		0.93	0.17			0.92
Eigen Value	3.64	2.65	1.54	1.10	1.01	
% Variance	30.4	22.1	12.8	9.2	8.4	

(1) loading below 0.15 omitted

h^2 = Community

Table 3.9 : Organisational structure; rotated components for metal firms

	Component Loadings ⁽¹⁾					h^2
	(I)	(II)	(III)	(IV)	(V)	
Total employees	0.53	0.27	0.25			0.44
Capital investment	0.96					0.95
Sole proprietorship	-0.18	-0.71	-0.44		0.27	0.82
Registered firm		0.19	0.77	0.28	0.29	0.81
Family members	0.15					0.03
Cost of raw materials				0.95		0.94
Age	0.57	0.42	0.20	-0.50		0.81
Administrative ratio						0.05
Capital intensity	0.93					0.90
Foreign raw material	0.22	0.27	0.84			0.84
Export share			0.16		0.95	0.96
No. of products		0.92	0.16			0.90
Eigen Value	4.38	1.87	1.20	1.02	1.01	
% Variance	36.5	15.6	10.0	8.6	8.4	

(1) loadings below 0.15 omitted

h^2 = Communality

Component II : Production complexity

Because component II loads positively on the 'number of products' and negatively on 'sole proprietorship,' it may be characterised as a 'complexity of production' dimension. These two variables explain 81 percent and 67 percent of variances respectively of this second component. Firms with high scores on this component produce a number of related products. 'Firm age' (19 percent of variance), 'registered status' (18 percent), 'export share' (6 percent) and 'total employees' (4 percent) all load positively on this component implying that firms with high scores are fairly old well established registered industries, with large numbers of employees and high export shares. Component II can thus be interpreted as an 'organisation and production complexity' dimension.

Component III : Export orientation

Two variables load positively on component III, namely 'export share' (70 percent of variance) and 'total employees' (46 percent). Firms that score highly on this component will therefore have a high proportion of export and large number of employees. It has a negative loading on the variable sole proprietorship indicating the firms

that produce goods for export market are mainly partnerships and companies. Thus the component can be interpreted as a dimension of 'export orientation'.

Component IV : Younger firms

Component IV loads positively on the variable 'cost of raw materials', while loading negatively on the 'age of firm'. Firms with high scores on this component are recently established industries, with high costs of raw materials. By contrast, firms with a low score on this component have a low 'cost of raw materials' and they are usually more than 10 years old. This agrees with the fact that, when firms get well established after some years of operation, they then tend to use different techniques and processes to reduce the cost of raw materials. The component can be regarded as the "younger firm" dimension.

Component V : Small size firm

This component is positively associated with 'administrative ratios'. As it is closely associated with just a single variable of organisation it could be characterised only by the secondary significance of

other variables. Therefore, its ability to differentiate between firms will be limited. Consequently, it can be omitted from further analysis.

ORGANISATIONAL STRUCTURE OF TEXTILE FIRMS

Component I : Export orientation

A repetition of the analysis for textile firms produces similar results. The first and dominant component extracted is identified as 'export orientation' (Table 3.7), owing to the positive loading of 'export values' (81 percent of variance), the 'number of employees' (42 percent) and the 'number of products' (40 percent). 'Sole proprietorship' again loads negatively on the component; firms with high scores on component I therefore have large proportions of exports and these firms are fairly large in terms of employment and tend to produce more related products. By contrast, firms which have low scores on component I have a small proportion of exports and are small in terms of total employees and produce only a single product. Therefore, the composition of component I suggests that it represents the "export orientation" in the sample of textile firms.

Component II : Degree of capitalisation

This component appears to reflect a 'capitalisation' dimension. Variables loading highly on this component are 'capital investment' (90 percent of variabce) and the 'capital intensity of production'. Numbers of employees also loads quite highly and positively on that component.

Component III : Registered firm status

The loading of 'registered firm status' on this component is very high. 'Number of products' also has a comparatively high positive loading on this component while 'sole proprietorship' status also loads fairly highly but in a negative direction. In terms of these loadings the second component may be taken the "registered firms".

Component IV : Family firm

The variables family members working in the firm' and 'number of employees' have high loadings on this component. This component represents the family participation in manufacturing activities and therefore it is useful to label it as the "family firm" dimension.

Component V : Small size firm

The fifth component has a positive loading on the 'administrative ratio' and a negative loading on the employment. When firms increase in size, they tend to reduce the number of administrative officers relative to the 'total employees' and therefore small firms with single managers have high 'administrative ratios', resulting in a negative correlation between these variables. However, since the component is highly associated with only one variable, it has been omitted from the subsequent analysis.

ORGANISATIONAL STRUCTURE OF RUBBER FIRMS

Component I : Degree of capitalisation

The analysis of rubber firms produces different results from those of textile firms. 'Capital investment' (90 percent of variance), 'capital intensity' (85 percent), and 'number of employees' (32 percent) load positively upon this component, while the variable 'sole proprietorship' loads negatively (Table 3.8). The component relates to the degree of capitalisation and it can be labelled as the "capitalisation" dimension.

Component II : Production complexity

The second component identifies a dimension of "production and organisational complexity" being positively and highly associated with the number of products and negatively associated with 'sole proprietorship'. 'Registered firm status' (13 percent of variance), 'age' (8 percent) and 'export share' (4 percent) also load positively on this component.

Component III : Registered firm status

This component is associated with registered firms with a very high negative loading on raw material costs. Registered firms which maintain frequent relationships with government organisations and direct import facilities tend to reduce the cost of raw materials in comparison to the unregistered establishments. Unregistered establishments usually purchase their materials from retailers and pay a higher price for their purchases.

Component IV : Foreign raw material utilisation

This component reflects the share of foreign raw material utilisation and loads heavily and positively

on it. The 'number of employees' also loads positively on this component.

Component V : Family firm

The component is dominated by the high loading of family participation. The 'number of employees' loads negatively on the component. However, as the component is highly associated with only one variable, it is considered to be not important for further analysis.

ORGANISATIONAL STRUCTURE OF METAL FIRMS

Component I : Degree of capitalisation

In a pattern similar to that of the rubber firms, component I is associated with the 'capital investment' and the 'capital intensity of production'. The variable, 'number of employees', also loads positively on this component (Table 3.9). Metal working firms scoring highly on this component usually have a comparatively high 'capital investment', high 'capital intensity' and large 'number of employees'. The negative loading on the variable 'sole proprietorship' suggests that the firms with high scores are either joint ownerships or private limited liability

companies. Based on this information the component can be registered as the "capitalisation" dimension.

Component II : Production complexity

Again, and similar to the pattern observed for the rubber firms, the number of product variable loads positively on the second component and the 'sole proprietorship' loads negatively. It represents the "complexity of production".

Component III : Registered firm status

The component is associated with the registered firms and the foreign raw material utilisation. Considering the negative loading on 'sole proprietorship' and also positive loadings on the variables 'number of employees' and 'age', it can be represented as the "registered firm" dimension.

Component IV : Younger firm

Cost of raw materials has a highest positive loading on the fourth component and also it is associated with the component, indicating recently established firms

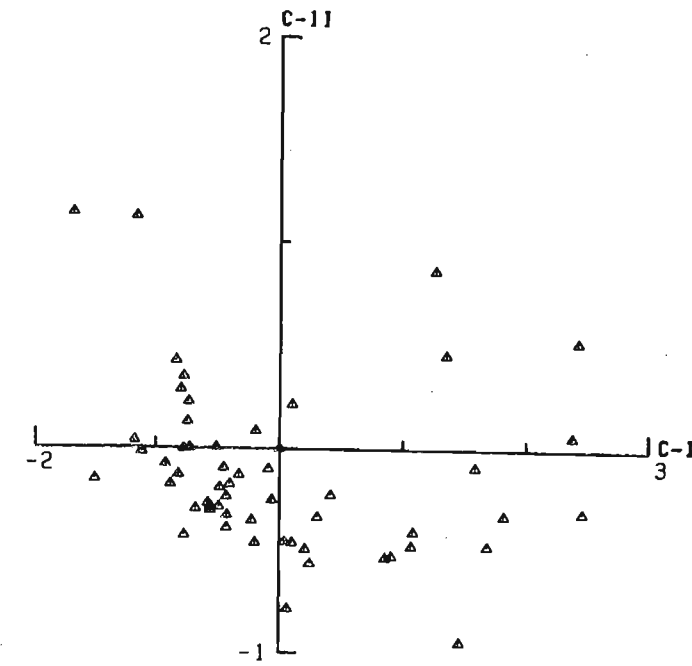
have high costs of raw materials compared to the others. Firms with high scores on this component have high 'cost of raw materials' and are recently established industries. The component may be labelled as the "Younger firm" dimension.

Component V : Export orientation

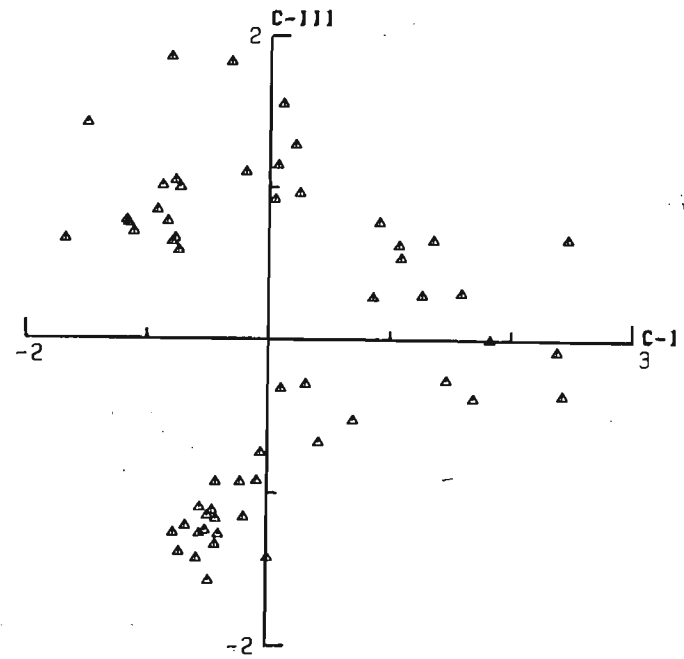
Export share has a high positive loading on the component associating positively on registered firms. It represents the "export orientation" of metal firms.

THE PATTERN OF COMPONENT SCORES

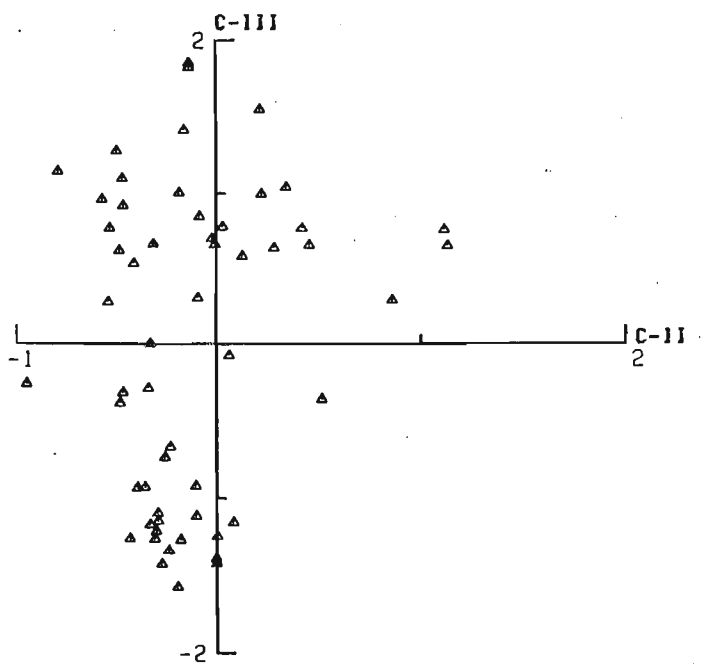
The component score illustrate the structural differences among surveyed manufacturing firms. Pairwise plots of standardised scores on the first three components for textile firms are shown in Figure 3.1. Only 56 scores were plotted on the ordination diagrams. The score of one textile printing firm which has a high 'capital investment' and capital intensity was excluded as it was very high (6.79) and skewed the distribution of other scores. Figure 3.1(a) shows that 37 percent of textile firms score positively on the first component (export orientation), of which 24 percent of firms have high 'capital investment'. The



(a)



(b)



(c)

Figure 3.1: Scores for textile firms on components I and III

diagram also indicates that 25 percent of textile firms with export shares of more than 40 percent score highly on component I and these firms lie on the eastern part of the diagram. The concentrated pattern of scores in the diagram shows that 35 percent of firms have negative scores on both components, suggesting that small textile firms are mainly directed to local markets rather than to the export markets.

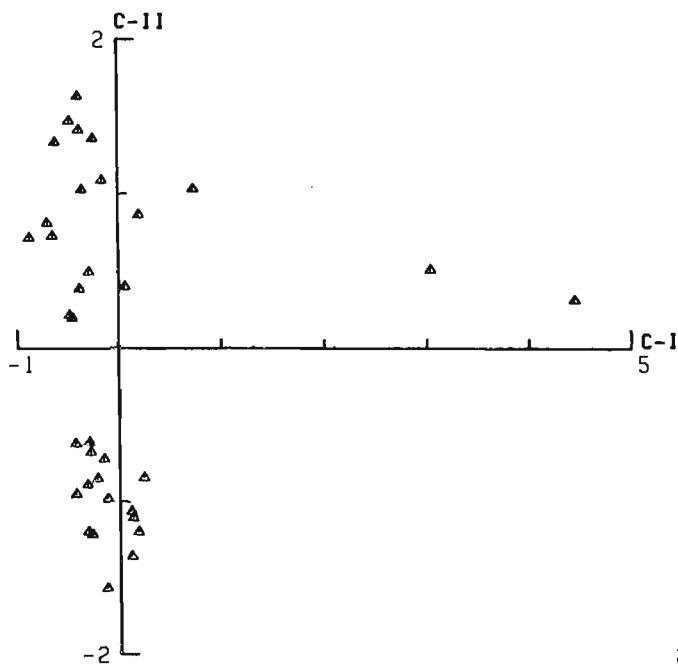
Figure 3.1(b) illustrates the relationship between export orientation and the registered firms in the textile industry. All 14 textile firms which are mainly directed to export markets are registered firms and scores of these firms lie on the north-east quadrant of the ordination diagram. Nineteen textile firms which have negative scores are concentrated on both components I and II. This suggests that only registered firms are directed to export markets while the unregistered firms mainly supply goods to the local market.

Figure 3.1(c) indicates the relationship between capitalisation and registered firms. Of the 13 textile industries with high capital investment, 11 are registered firms. The scattered pattern of the scores on the northern part of the diagram indicates that there are registered

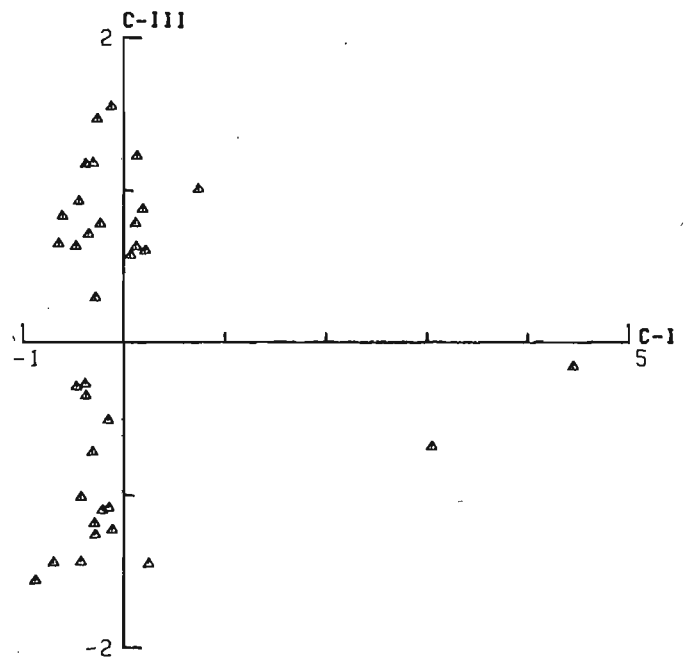
firms with low 'capital investment'. Scores for 20 firms are concentrated on the two components showing a low capital investment in unregistered firms.

Figure 3.2 plots the scores on the three components of the rubber firms. Figure 3.2(a) shows that 19 firms producing more than one product score positively on component II, of which 74 percent of firms are labour intensive, scoring negatively on the first components. This can be seen from the vertical distribution of points parallel to component II. However, two rubber firms have high 'capital investment' and are shown on the eastern corner of the diagram. The concentrated pattern of points on the negative values of components I and II show the scores for the small labour intensive firms producing a single product.

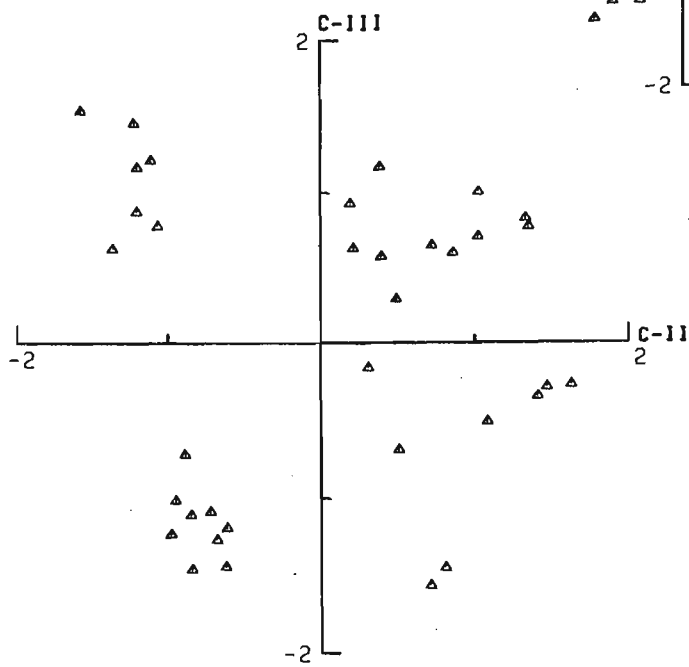
The second diagram (b) of Figure 3.2 illustrates a clear pattern of the degree of capitalisation. The distribution of points parallel to the vertical axis indicates the significance of registered firms in the organisational structure of firms. It is clear from the diagram that all unregistered firms ($n = 11$) have low scores on both the registered firm and capitalisation components. The dispersed pattern of points in Figure 3.2(c)



(a)



(b)



(c)

Figure 3.2: Scores for rubber firms on components I and III

suggest that whether the firm is registered or not has no influence on the 'number of products' produced.

Figure 3.3(a) illustrates the distribution pattern of scores on components I and II in the metal sector. It appears that the degree of capitalisation does not influence the complexity of production (Figure 3.3a). Firms with low scores on capitalisation tend to have high scores on the production complexity component. The vertical distribution of scores parallel to component II indicate that 36 percent of firms produce several products while 43 percent of firms produce only a single product.

Figure 3.3(b) describes the distinction between the registered and non registered firms in the organisational structure. From the diagram it appears that there is no relationship between the degree of capitalisation and the registered firms, as low scores on component I correspond to both high and low scores on component II. The distribution of points in the Figure 3.3(c) is different from the other two and is dispersed throughout the diagram. Both registered and unregistered firms produce several products. The relationships that firms have with the government organisations or their organised nature do not

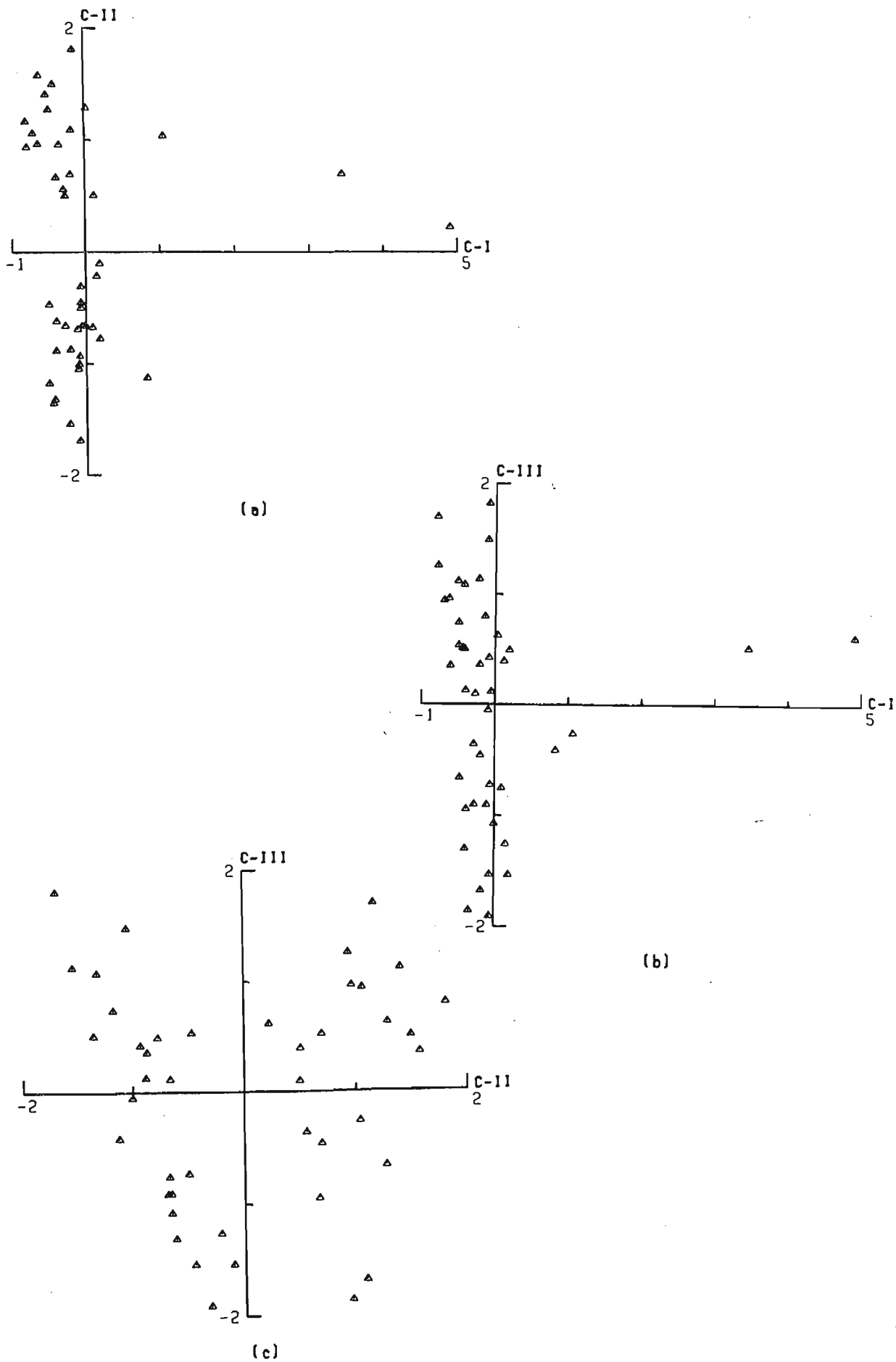


Figure 3.3: Scores for metal firms on components I and III

affect the 'number of products' they produce. The diagram clearly shows 20 metal firms which produce several related products score highly on the second component.

SUMMARY

The results of the analyses show important structural attributes of the small and medium scale manufacturing firms in the Colombo Metropolitan Area. Composite variables shown in Table 3.10 allow comparison of the organisational characteristics in the three types of industries. It is clear from the results that the organisational structure of textile firms is distinct from the other two types of industries. Textile firms are more strongly oriented towards the export rather than the local market, whereas the opposite is the case with rubber and metal firms.

Table 3.10 : Dimensions of the organisational structure
for textile, rubber and metal industries

Component	Textile	Rubber	Metal
1	Export orientation	Capitalisation	Capitalisation
2	Capitalisation	Production complexity	Production complexity
3	Registered firm	Registered firm	Registered firm
4	Family firm	Foreign r/m utilisation	Younger firm
5	Small size firm	Family firm	Export orientation

By contrast the degree of capitalisation emerged as an important characteristic of both rubber and metal firms. This is due to the fact that both capital and labour intensive technologies are important in metal and rubber firms, while labour intensity is a prominent feature of the textile sector. Production complexity is another significant aspect of the organisational structure of rubber and metal firms. A large number of textile firms tend to produce only a single product while rubber and metal firms produce several related products. Rubber firms produce varied products such as spare parts for vehicles and machinery, household goods, products for the furniture industry and toys; metal firms produce agricultural implements, spare parts for machinery and motor vehicles, and household equipment. In contrast, textile firms mainly engage in a single activity, either textile printing, weaving or manufacture of clothing. Clearly, the registered/unregistered dichotomy is a significant feature of all three types of industries.

The distribution of scores on these components demonstrate significant structural differences among the surveyed firms. Export oriented textile firms consist of both large and small establishments. All export oriented

firms fall into the category of registered sector, while unregistered establishments supply the products to local markets. Small rubber manufacturers are single producers and their firms are not registered with government organisations and use mainly labour intensive technologies. Capital intensive metal firms are definitely multiproducers. Registered metal firms consist of both labour intensive and capital intensive industries. These structural differences of the surveyed manufacturing firms, illustrated by component scores, are used in the following chapters in analysing the relationship between organisational structure and behaviour of firms.

CHAPTER 4 : ORGANISATIONAL STRUCTURE AND MATERIAL
LINKAGES : LOCALISATION AS A FUNDAMENTAL PROPERTY
FOR SMALL AND MEDIUM SIZE FIRMS?

The traditional theoretical frameworks of Weber and Losch relied upon quite unrealistic notions of the linkage patterns of firms. Recent macro level studies (Chinitz, 1961; Lever, 1972; Roepke et al., 1974; Hoare, 1975; Todd, 1978; Beyers, 1981) are also related closely to the normative approach and explain location in terms of minimising the costs involved in input-output flows. Taylor and Thrift (1982a) argue that these studies are little more than a complex version of the classical approach, where spatial linkage patterns of manufacturing industries are ignored. McDermott and Taylor (1982) state that in these macro linkage studies, flows within the space economy are measured as aggregate monetary transfers for the inputs and outputs of industrial sectors, with the findings being inappropriate to the task of relating spatial linkage patterns to the organisational structure.

Much research carried out since the late 1960's has been concerned with the separate business contacts of individual firms and industrial establishments (Steed, 1968, 1971; Keeble, 1969, 1976; Moore, 1972, 1973; Taylor and Wood,

1973; McDermott 1974, 1976, 1977; Walker, 1977; O'Farrell and O'Loughlin, 1981; Marshall, 1979b, 1980; Taylor and Thrift, 1983). In these studies attempts have been made to analyse the structural pattern of material linkages in relation to the localisation of industries and numerous generalisations have been made. It has been suggested, for example, that firms are frequently set up in their founder's hometowns, and that linkages tend to be highly localised (Bater and Walker, 1970). Taylor (1973) noted that this pattern was observed mainly to reduce risk and uncertainty. Taylor and Wood (1973) argued that in the West Midland region of the UK, more than 60 percent of the material purchasing links in the iron foundry industry, lock and latch industry and the drop forging industry were locally oriented. In another study of linkage structures in the Oxford region of England, Walker (1977) noted that 50 percent (on average) of the sampled establishments' supplies were met from within the Oxford city and region and 66 percent of the labour force came from the local area.

In analysing the forward linkages of 114 establishments in North West London, Keeble (1969) showed, however, that many agglomerated enterprises possess long distance linkages. In a study of sales linkage patterns of manufacturers in five New Zealand secondary centres,

McDermott (1974) identified a localised pattern of sales linkages. The tendency to localise the linkages was a result of the ability and desire of an organisation, possessing only limited information, to monopolise its adjacent regional market. Extending the findings of this local linkage system, Taylor (1974) in his study of 259 Auckland manufacturing firms concluded that both purchasing and sales links were strongly localised. Lever's (1974) findings of the Scottish plants are fairly consistent with these results in that many plants tended to serve local markets while drawing materials from the outer regions.

These recent studies on linkages have incorporated organisational concepts developed within the management science literature (Taylor, 1975, 1978; McDermott, 1976, 1977; Marshall, 1979b, 1982b; McDermott and Taylor, 1982; O'Farrell and O'Loughlin, 1981; Taylor and Thrift, 1983). Moreover, a number of hypotheses have been tested which suggest that the organisational structure of firms is a major determinant of their linkage patterns.

In a number of studies, an inverse relationship has been identified between firm size and the degree of local/domestic linkages (Keeble, 1969; Moseley and Townroe, 1973; Gilmour, 1974 and Taylor, 1975). Gilmour (1974)

"anticipated that the external economies of scale available in an agglomeration are increasingly used as the size of establishment falls". The bases of this postulate are that small establishments cannot be as self sufficient as large establishments and that, with increasing size, establishments are likely to internalise their linkages. Furthermore with increasing scale of output, the larger firms are likely to extend their external linkages spatially.

Empirical studies have supported this argument. By analysing binary data on local/non local linkage patterns in the West Midlands iron foundry industry, Taylor and Wood (1973) confirmed that small scale producers are more locally linked than large scale manufacturers. They suggested that firms tend to outgrow the need for industrial linkage as they expand in size. Gilmour (1974) also concluded that small establishments have the strongest connections with the local industrial economy, while large establishments (those with over 100 employees) have the weakest linkages with the region in which they are located. McDermott's (1976) findings also suggest that large establishments are associated with more purchases from the outside region.

It has been argued, too, that the operations technology and production systems used tend to influence the

localised pattern of linkages, with firms specialising in mass or continuous flow production with sophisticated technologies, displaying a lower tendency to link with the local economy. Moseley and Townroe (1973) argue that "the non-routine, more specialised and short run industrial processes tend to associate with local linkages". Taylor and Wood (1973) suggest that unsophisticated types of jobbing technology are associated with more locally based linkages. The batch producers of iron castings were also strongly locally linked, while specialist producers of single castings and mass producers were far less locally linked. Marshall (1979) noted the operations technology as a predictor of the extent of linkage. In a study of the Northern Region of England, he concluded that due to the non-routine production requirements of the unit or jobbing technologies, purchasing links were localised. As there is a high degree of uncertainty associated with these non standard purchases, the establishments are more likely to place their orders locally where companies are better known. In contrast firms with mass production technologies and long production processes which require standard components tend to obtain materials from the distant locations as the uncertainty of the transaction is minimal.

Although McDermott (1976) and Marshall (1979b) downgraded the significance of ownership pattern, a number

of empirical studies do suggest a relationship between ownership type, plant status and the pattern of material linkages. Local industrial linkages are dominant among single plant establishments and locally owned industries, while branch plants and externally owned establishments possess more dispersed material linkages. Branch plants and foreign owned plants purchase a lower proportion of inputs from the local area than locally owned and independent plants as they often process inputs supplied by their parent companies. Lever's (1974) study also supported this argument.

The results of Britton's (1976) study of 73 Canadian plants were consistent with the above argument. Two conclusions were drawn. First, that intracompany shipments are associated with long distance linkages, with US owned branches being heavily dependent on these long distance intra-company inputs, and second, that while Canadian and US owned plants in major urban centres (especially Toronto) have significant local linkages, those in peripheral towns more frequently substitute corporate flows for local flows. Stewart (1976) and Hoare (1978) supported the argument that branch plant status influences the long distance linkages in manufacturing industries. Walker (1977) suggested that the branch

establishments in the Oxford region of England imported their supplies from the head offices outside the region, whereas firms which were relatively more tied to the local economy in terms of supplies comprised single establishment firms or establishments whose head office was situated in Oxford. Hoare (1978) concluded that foreign owned establishments are less linked to the regional economy than locally owned firms.

Resource intensive industries whose bulky and perishable inputs are available from the local economy have more locally backward linkages than the technologically sophisticated industries relying heavily upon foreign sources of supply. Research by Keeble (1969) and Moseley and Townroe (1973) suggested that the engineering and metal sector had relatively strong local linkages, partly because of the mechanism of subcontracting. Findings of O'Farrell and O'Loughlin (1981) highlighted the significance of local inputs in the food sector.

Most of the functional linkage studies reviewed above tend to place their primary emphasis on material linkages within a framework of internal structure of organisations and ownership patterns. Moreover, all these empirical studies based on detailed survey data are related

to developed countries such as Britain, Canada and New Zealand.

The question arises, however, as to whether the generalisations established for the linkage patterns of firms in developed countries apply equally to those in the developing countries and, in this context, among small and medium scale firms in Colombo. Intuitively, and given the characteristics of developing countries generally and manufacturing firms particularly, it might be expected that material linkages would be characterised by a very high degree of localisation.

This chapter, therefore, explores the nature of the material linkages of small and medium scale firms in Sri Lanka and more particularly the relationships between the organisational structure of firms, derived in Chapter 3, and their material linkages.

In order to do so, it has been hypothesised that both the "backward linkages" of small and medium scale industries associated with suppliers (linkages from raw material suppliers to entrepreneurs) and the "forward linkages" associated with customers (links from entrepreneurs to customers) will be highly localised. It is further hypothesised that the degree of localisation of linkages is

a function of the organisational structure, type of industry and the type of counterpart organisation involved (type of supplier, customer, employee and source of capital).

The remainder of the chapter falls into two parts. The first part examines the structural patterns of linkages for small and medium scale firms within the Colombo Metropolitan Area. The material linkages with different types of suppliers and the degree of localisation of linkages are analysed in some detail. So, too, are the nature of labour input linkages and the degree of self financing of capital flows. In the second part, the relationships between organisational structure and material linkages are pursued in depth for each of the three types of industrial firms.

THE STRUCTURAL PATTERN OF MATERIAL LINKAGES FOR SMALL AND MEDIUM SCALE FIRMS IN THE COLOMBO METROPOLITAN AREA

In attempting to define the material linkages for firms three characteristics of the linkages are defined:-

- i. the strength or intensity of the linkage,
- ii. the type of counterpart organisation involved and
- iii. the spatial or locational aspects of the linkages.

The data were collected from entrepreneurs using a set of questions on material linkages. At the interviews, entrepreneurs were requested to supply the percentage value of raw materials purchased and finished products supplied within the local area. For each the percentage values of local and non local links were recorded.

Administrative sub-divisions in the Colombo Metropolitan Area (local authority areas) were used in defining the local linkages. At the general level "in municipality" local linkage means the linkages operating within the municipality, "in urban areas" within the urban council area and "in semi urbanised" and "outer regions" within the town council area. In addition to this, when entrepreneurs were unable to identify the boundaries of the local authority areas three levels of distances were used to define the localised pattern of linkages. As the types of local authorities differ in terms of size, in municipal areas a radius of 6 kilometers, in urban areas 4 kilometer and in town locations 2 kilometer radius were used. The sizes of these administrative sub divisions cover approximately the above stated distances (Figure 4.1).

The intensity of the localised material linkages was measured using the value of contact, expressed in

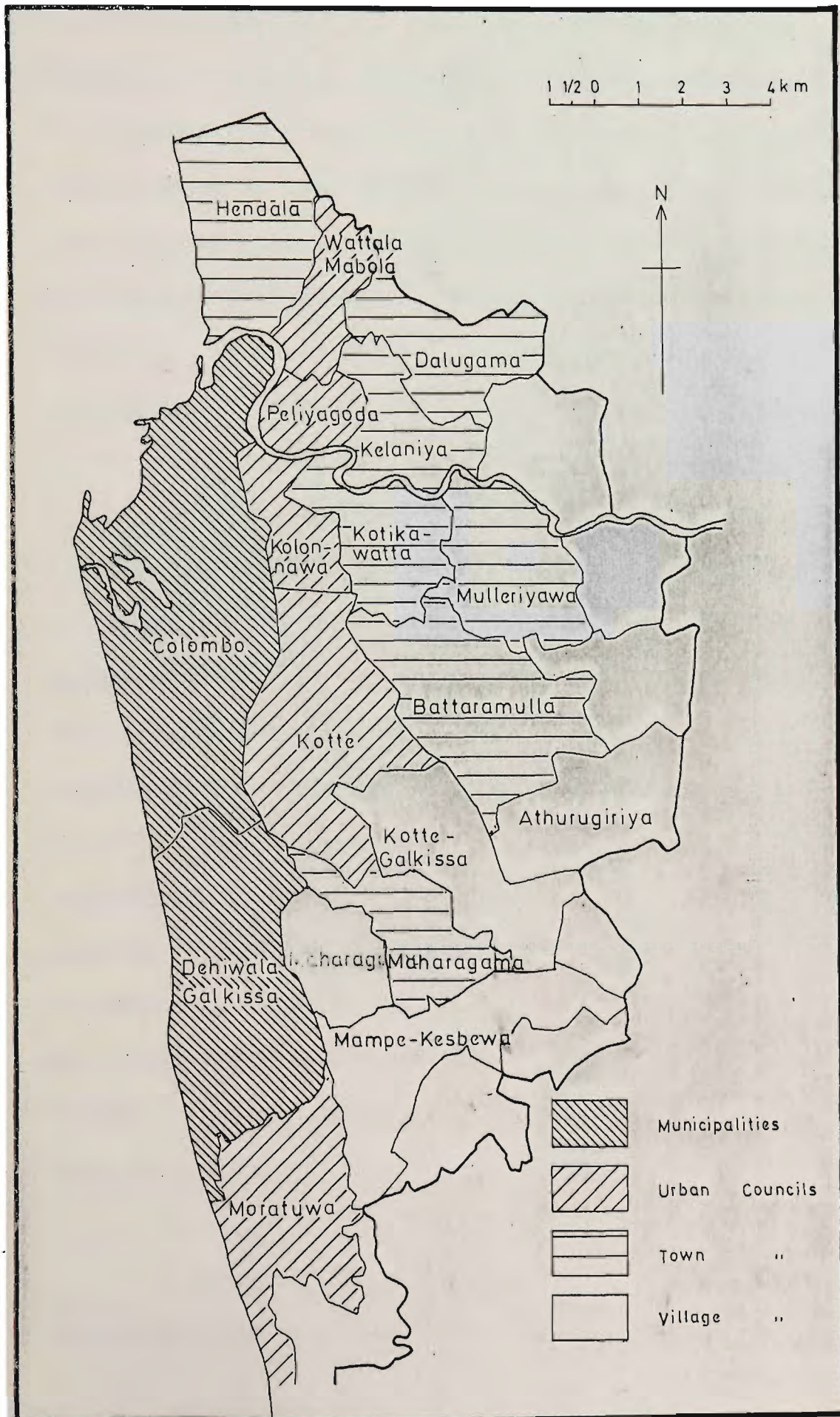


Figure 4.1: Local authorities in the Colombo Urban Area

Rupees. Percentage values of raw material purchases made within the local area by four types of raw material suppliers (retailers, wholesalers, private manufacturers or subcontractors and government industries) and percentage values of sales made within the local area with five types of customers (direct customers, retailers, wholesalers, private manufacturers and government industries) were recorded. The government industry refers not only to a manufacturing industry but also to any service organisation which is controlled wholly or partly by the government. However entrepreneurs were given an opportunity to supply information on the links they maintain with suppliers and customers. From this information it was evident that some textile firms have purchasing links with agents apart from the listed linkages. Therefore, an agent was considered as another raw material supplier to the textile industry. In measuring the labour input linkages, two types of office employees (managerial and administrative) and two types of production employees (skilled and unskilled) were considered separately. In measuring the degree of self financing of the firm, the percentage values of initial and working capital used from their own savings and family savings were recorded.

In Colombo 88 percent of all sampled firms indicated links with local suppliers while 82 percent had

sales links with local customers. The patterns of purchases and sales in the three types of industries were fairly similar. In 89 percent of textile firms, 86 percent of rubber firms and 89 percent of metal firms, supplies were met from within their local areas, while 89 percent of textile firms, 80 percent of rubber firms and 77 percent of metal firms recorded localised sales linkages.

Small entrepreneurs in developing countries are more likely to have well established contacts with local suppliers than with outsiders for a number of reasons. During this present survey entrepreneurs were asked to indicate the significance of factors which influenced the selection of their suppliers. More than 75 percent indicated easy accessibility and proximity to suppliers as very important factors in selecting suppliers. Also nearly 30 percent of entrepreneurs received credit facilities from suppliers, of which more than 90 percent had this facility extended over a period of 30 days. It was apparent, too, that small manufacturers find it easier to obtain credit from suppliers within the local area, since they are likely to be known to each other. Delivered price and delivery reliability were found to be unimportant as many suppliers do not transport their materials to their customers.

The number of firms having different types of purchasing and sales links by type of link (supplier and customer) and type of industry are summarised in Table 4.1. Figures in the table indicate the number of firms having local and non local links and the number of firms which do not have any such links. These data demonstrate the average degree to which the raw material purchasing and sales links are locally oriented with different suppliers and customers. Seventy one percent of firms recorded local purchasing links with wholesalers and 79 percent recorded local links with retailers.

The table also reveals a number of clear distinctions with respect to the linkage structure of the total sample. High levels of local purchasing links with wholesalers and retailers were recorded in the three types of industries. The percentage values of raw materials made within the local area also supported this argument. Forty four percent of surveyed firms obtained more than 40 percent of their raw materials (by value) from wholesalers, while 79 percent obtained more than 20 percent. Thirty five percent of firms purchased more than 40 percent of their raw materials from retailers while 67 percent purchased more than 20 percent.

The three types of industry are dissimilar, however, in respect of purchasing links with subcontractor/private manufacturers and government organisations. Nevertheless, the surveyed firms recorded 61 percent of localised links with private manufacturers and 15 percent with government organisations. The share of raw material purchases from these sources was low with more than 75 percent of firms obtaining less than 20 percent of their purchases from private manufacturers and government organisations.

Purchasing links with local subcontractors/private manufacturers are higher in metal firms than in the other two sectors. This is as expected, since many small metal manufacturers undertake subcontracting work for private manufacturers and they supply the required raw materials. Rubber and metal firms have some links with government organisations, presumably as a result of the raw material supply facility available with the Industrial Development Board and Steel Corporation for small scale rubber manufacturers respectively. The links with agents are only significant in the case of the textile sector and are due to the presence of export oriented firms in this sector.

It is apparent, from Table 4.1, that a large number of firms have highly localised sales linkage.

Table 4.1: The purchasing and sales linkage characteristics of surveyed firms

Industry type	Textile			Rubber			Metal			Total		
Link type	LC	NC	NL	LC	NC	NL	LC	NC	NL	LC	NC	NL
<u>Purchasing links</u>												
Wholesalers	46	4	7	19	6	10	26	5	13	91	15	30
Retailers	48	3	6	29	0	6	30	10	4	107	13	16
Subcontractors/ Private Manu:	34	2	21	10	0	25	39	3	2	83	3	50
Govt. industry	0	0	57	12	4	19	9	4	31	21	8	107
Agents	15	2	40	0	0	35	0	0	44	15	2	119
<u>Sales links</u>												
Customers	50	7	0	27	6	2	29	9	6	106	22	8
Wholesalers	31	4	22	23	0	12	20	4	20	74	8	54
Retailers	45	5	7	28	2	5	29	5	10	102	12	22
Subcontractors/ Private Manu:	36	2	19	10	15	10	34	8	2	80	4	52
Govt. industry	11	13	33	11	0	24	7	6	31	29	6	101

LC = Local, NC = Non Local and NL = No Links

The figures indicate the frequencies of firms having links with different suppliers and customers.

Source:-

Sample survey

patterns with customers, wholesalers and retailers in all three types of industries. This suggests that most small and medium scale firms located in Colombo produce their products for the near by markets where the density of population is high. Sales links with private manufacturers in metal firms are high partly due to the subcontracting

work undertaken by metal firms for the private manufacturers and partly due to the semi finished products produced by metal firms which in turn are inputs to other industries. High sales links with private manufacturers in the textile firms are mainly due to the relationship between textiles and the printing industries.

Labour input links of small and medium scale firms in the Colombo Metropolitan Area also indicate a highly localised pattern (Table 4.2). Owners/Managers of smaller firms usually seek a plant site within their families' action spaces. Early studies (Hunkeler and Wright, 1963; Bater and Walker, 1970; Lee, 1973) suggested that small firms are likely to be located near the residence of the manager/owner who is already familiar with the potential suppliers and customers before he sets up his business. Table 4.2 illustrates the average degree to which the labour input links in the Colombo Metropolitan are locally oriented. As indicated in the table, in 63 percent of surveyed firms entrepreneurs come within the local area. A similar pattern is observed in the three types of industries. Thirty five percent of surveyed firms are located in the same premises as the entrepreneurs themselves, about 50 percent within a distance of 5 kilometers and the other 15 percent within

a distance of 10 kilometers. The fact that almost 85 percent live in the same premises or adjacent neighbourhood also indicates that proximity to the managers' house is important for the entrepreneurs, resulting in a highly localised pattern of managerial employees.

Sixty percent of the textile firms, 69 percent of the rubber firms and 61 percent of the metal firms indicated that their employees come from the local areas. Compared to male employees, the number of skilled female employees engaged in the textile and rubber industries is large and many female employees usually come from the surrounding areas. However, 50 percent of the metal firms indicated that their skilled male employees are mainly from the outer regions, due to the non availability of skilled workers within the local areas.

The significance of self financing in smaller firms has been highlighted in a recent study of the electronic firms in the U.K. (Taylor and Thrift, 1983). Intuitively, entrepreneurs of small industries in developing countries are likely to depend highly on their own finances, because of the difficulties of gaining access to financial capital. Dependence upon self financing, both for initial and for working capital can

Table 4.2 : The structure of local labour input
linkages of surveyed firms

%of employees Type of Employees	0-20	21-40	41-60	61-80	81-100
<u>All sampled firms</u>					
Managerial	15	0	35	1	85
Administrative	92	4	9	2	29
Skilled	30	10	16	15	62
Unskilled	54	0	17	10	54
<u>Textile firms</u>					
Managerial	7	0	15	1	34
Administrative	41	0	3	1	12
Skilled	13	1	8	13	22
Unskilled	13	0	15	7	22
<u>Rubber firms</u>					
Managerial	3	0	8	0	24
Administrative	23	1	4	1	6
Skilled	9	1	3	2	20
Unskilled	18	0	1	3	13
<u>Metal firms</u>					
Managerial	5	0	12	0	27
Administrative	25	3	2	0	32
Skilled	9	8	5	0	22
Unskilled	23	0	2	0	19

The figures indicate the number of firms depended for their employees from local areas.

Source:- Sample survey

be seen in all three types of industries. This is clearly indicated in Table 4.3 which shows that nearly 70 percent of firms indicated that more than 80 percent of their investment in the form of initial and working capital is either from their own savings or from their family savings.

Table 4.3 : Capital investment from individual or family savings in surveyed firms

% of capital investment	0-20	21-40	41-60	61-80	81-100
Type of capital investment					
				<u>All sampled firms</u>	
Initial capital	8	14	22	11	81
Working capital	16	8	24	7	81
				<u>Textile firms</u>	
Initial capital	4	7	11	4	31
Working capital	9	4	13	2	29
				<u>Rubber firms</u>	
Initial capital	2	1	4	4	24
Working capital	3	3	5	2	22
				<u>Metal firms</u>	
Initial capital	2	6	7	3	26
Working capital	4	1	6	3	30

The figures indicate the frequency of firms obtained capital from own savings and families.

Source:- Sample survey

Out of the total number of surveyed firms, 51 percent of textile firms, 31 percent of rubber and 44 percent of metal firms had been successful in obtaining bank loans for their initial capital investment. In a few of these cases the bank supplied only about 20 percent of the capital. It is interesting to note that nearly 70 percent of these firms who were successful in receiving such finances obtained through regional branches. Moreover, 51 percent of textile firms, 37 percent of rubber firms and 32 percent of metal firms were successful in obtaining bank finances for their working capital, mainly as overdrafts. Perhaps surprisingly, only 10 percent of the surveyed firms had been able to utilise the Credit Guarantee Scheme facility introduced by banks in 1979 to assist customers. Many entrepreneurs indicated various difficulties in gaining access to financial assistance through this scheme, largely due to the lack of information and to the difficulties faced in fulfilling the requirements of these institutions.

THE RELATIONSHIPS BETWEEN ORGANISATIONAL STRUCTURE
AND THE SPATIAL PATTERNS OF MATERIAL LINKAGES

To what extent do the spatial patterns of material linkages reflect differences in the organisational

structure of firms? And are there basic differences among firms in different industry groupings?

The questions are explored by means of correlation and stepwise multiple regression analyses. The percentage of purchases and sales made within the local area by individual firms comprise the dependent variables for purchasing and sales linkage analyses. Percentages of employees coming from the local area comprise the dependent variables for the labour input linkages, while percentages of initial and working capital invested from their own savings and family savings comprise the dependent variables for the capital flow analyses.

The main characteristics of organisational structure identified in Chapter 3, are export orientation, capitalisation, registered firm status, production complexity, foreign raw material utilisation, family firm and younger firms. Scores on significant components are taken as independent variables in the analyses.

There are four important objectives in this section:-

- i. to consider the importance of the individual characteristics of firm structure;

- ii. to analyse the relative impact of these individual characteristics;
- iii. to illustrate the combined effect of these organisational structures and
- iv. to analyse the significance of these organisational structures in the three types of industries surveyed.

In this way, it will be possible to provide a more elaborate specification of the significant structural features which influence the material linkage patterns at the level of the individual firm.

In the analysis, simple correlation coefficients show the association between the independent and dependent variables. The R value highlights the significance of the individual variable at the final stage of analysis and describes its strength and direction of relationship. Multiple R^2 values show the variances which are explained at the final stage of the procedure by all variables. The change in R^2 is the percentage of unique variance in the data which is explained by each variable. Partial regression coefficients show the influences of each independent variable upon a dependent variable with the adjustments made for all other independent variables. The relative importance of independent variables can be determined on

the basis of partial regression coefficients, 'B' values.

Draper and Smith (1966), King (1969), Cohen and Cohen (1975) and Ferguson (1977) discussed in detail the procedures for stepwise multiple regression analysis. The process of adding and removing variables to and from individual equations followed a pre-set criterion closely and continued until they had been met. Thus any variable included in equations must have exceeded the F statistic for inclusion, which determined the confidence level based on the number of cases. At subsequent stages, each independent variable was re-examined and removed if it fell below the F value for withdrawal, which was pre-set in the same way. Although the final regression equation represents the "best fit" using the available independent variables, it must be noted that those variables with a lower individual R^2 coefficient were not necessarily less significant, but merely accounted for variance which was as yet unexplained.

Stepwise multiple regression analyses were conducted separately for the three types of industries and for the different types of material linkages:- raw material purchasing, sales, labour input and capital flow. The results of the analyses are set out in the tables and the variables which proved significant are listed and interpreted.

THE RELATIONSHIPS BETWEEN ORGANISATIONAL STRUCTURE AND
RAW MATERIAL PURCHASING LINKAGES.

It has been argued in the literature that organisational structure is a major determinant of raw material linkage patterns. The observed linkage patterns in the Colombo Metropolitan Area appear to be consistent with these studies though the pattern of these relationships tends to vary with the different types of suppliers and the type of industry. The results of the study suggest that the relationship between organisational structure and links with wholesalers and retailers are stronger than the links with private manufacturers or government industries.

(i) Purchasing links with wholesalers

Figure 4.2 indicates the nature of the relationship between the organisational structure and purchasing links with wholesalers in the three types of industries. In the diagrams the variables entered at the first step in the regression analyses are used as the horizontal axes. Figure 4.2a illustrates the positive relationship between capitalisation and wholesale links in the textile firms. Sixteen percent of firms do not have any purchasing links with wholesalers and these firms also score negatively on

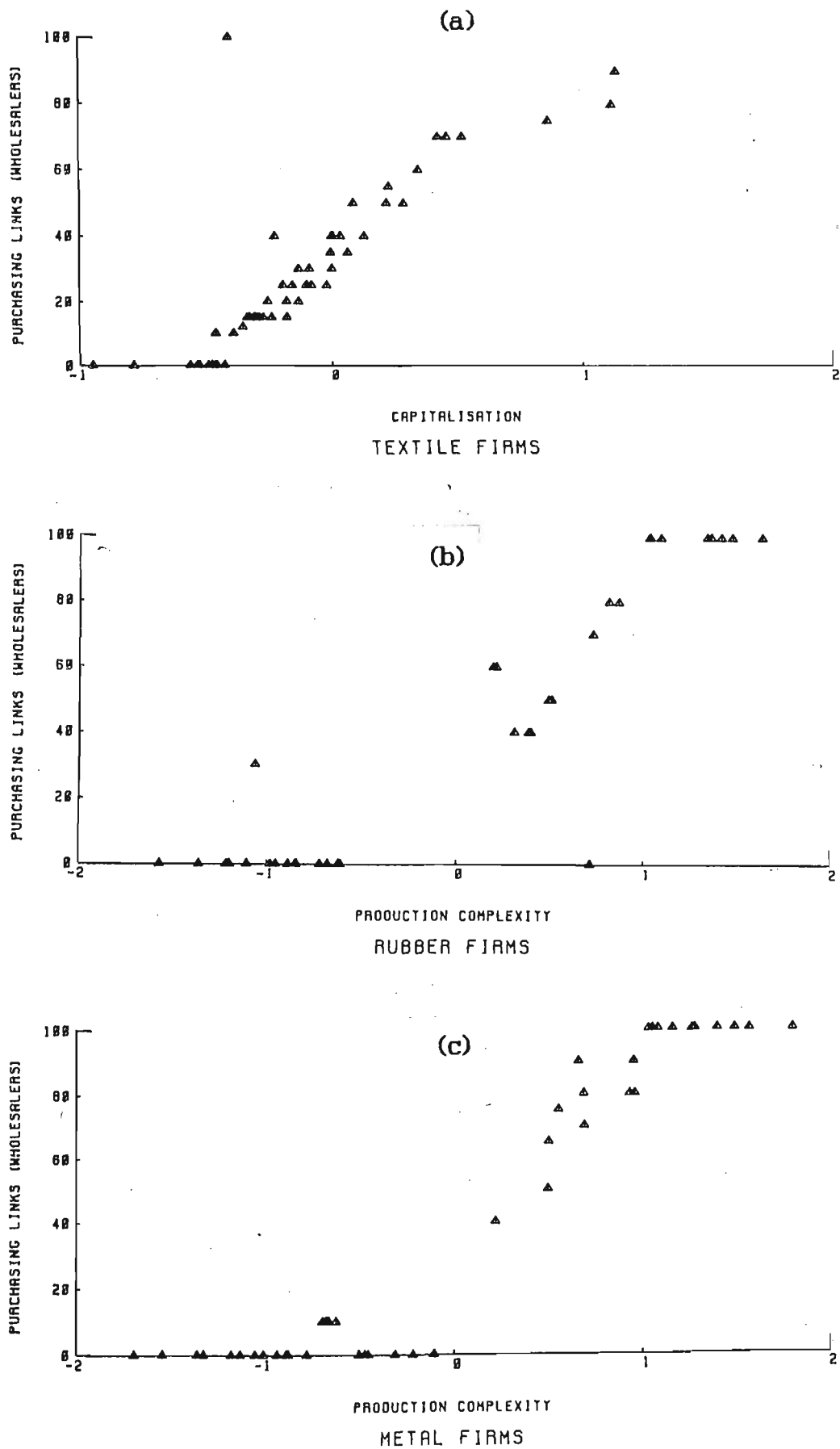


Figure 4.2: Relationship between organisational structure and purchasing

the capitalisation component. This suggests that very small firms do not depend on the wholesalers for their purchases precisely because their requirements are small. Some smaller firms who maintain links with wholesalers purchase less than 40 percent of their raw materials from them. Only three large textile firms obtain more than 75 percent of the value of their raw materials from local wholesalers.

As in the case of textile firms small rubber and metal firms do not depend on the wholesalers for their purchases, 40 percent of rubber and 41 percent of metal firms do not have any relationship with wholesalers and these firms lie on the horizontal axes in the two diagrams. However, in contrast to the textile firm, 23 percent of rubber and metal firms purchased all their requirements from the local wholesalers. The relationship is also somewhat different from the textile firms: production complexity emerged as an important factor in these two types of industries.

(ii) Links with retailers

Figure 4.3, in contrast, underlines the clear negative relationship between the retailers links and the

organisational structure. The variable 'Registered Firm' emerged as the most important variable while in rubber firms 'capitalisation' was found to be the most significant variable. Eighty four percent of textile, 80 percent of rubber and 68 percent of metal firms purchased their raw materials from retailers. However, more textile (26 percent) and metal (23 percent) firms purchased all their raw materials from retailers than the rubber (3 percent) firms. Figures 4.3a and 4.3c illustrate this feature clearly. Firms purchasing more than 40 percent of their raw materials from retailers recorded a negative score on the 'Registered Firm' component, suggesting that unapproved informal type smaller firms, because their requirements are few, tend to buy their raw materials from retailers. Small entrepreneurs indicated financial difficulties as a reason for selecting their suppliers. The low level of relationship in the rubber industry may be due to purchases made by this sector from suppliers located in outer regions.

The results of the regression analyses supported these findings. Five regressions were run separately for different types of suppliers in small sampled firms. The results of the analyses which are significant atleast at 0.05 level, are set out in Table 4.4.

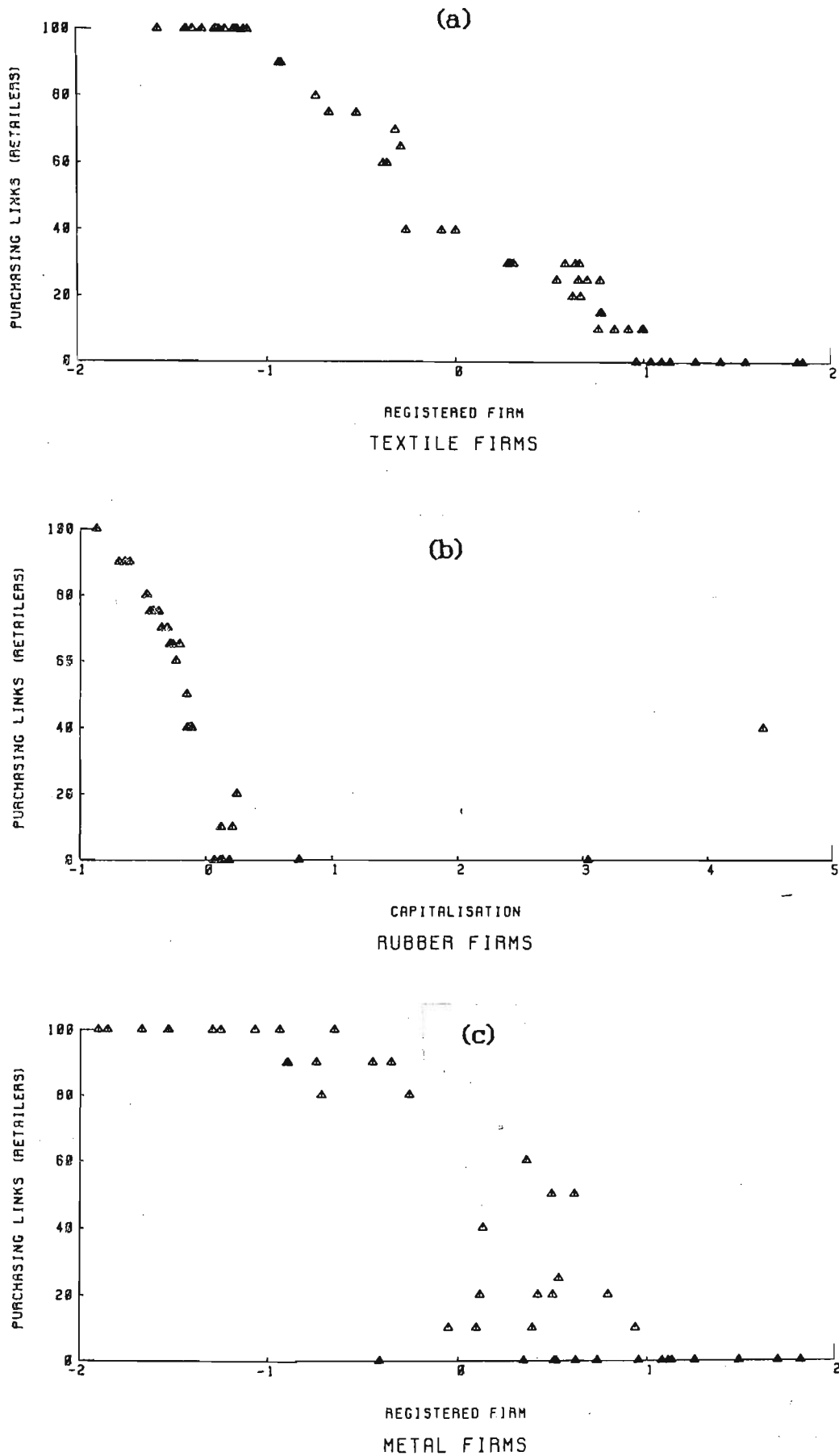


Figure 4.3: Relationship between organisational structure and purchasing links with retailers

The table shows the significance of 'production complexity', 'capitalisation' and 'export orientation' in explaining the purchasing links. Regression analysis, using the link with government industries as the dependent variable and the scores for all sampled firms as independent variables, shows no relationship between organisational structure and this link, explaining only 2 percent of the variance by the organisational structure. The results are also not significant even at the 95 percent level and are excluded from the table. Although the simple correlation coefficients and the explained variations are low between the organisational structure and the link with wholesalers, retailers and private manufacturers (Table 4.4), the results are significant at least at the 95 percent level. Links with wholesalers are positively related to the production complexity while the link with retailers is negatively related to the same variable.

The results suggest that the firms which produce more than one product tend to buy their raw materials from local wholesalers, because their requirements are complex. Conversely, the small single-product manufacturers purchase their materials from retailers as their requirements are simple and small in quantity. The negative relationship with private manufacturers' link suggests that smaller

Table 4.4 : Relationship between local purchasing links and organisational structure in all sampled firms.

Step	variable	simple re;cof;	partial re;cof;	multiple re;cof;	R^2	ΔR^2
<u>Link with wholesalers</u>						
1	Production complexity	0.25	1.92(a)	0.25	0.06	0.06
2	Capitalisation	0.18	1.67(b)	0.31	0.09	0.03
<u>Link with retailers</u>						
1	Production complexity	-0.21	1.79(b)	0.21	0.04	0.04
<u>Link with private manufacturers/subcontractors</u>						
1	Capitalisation	-0.25	-9.26(a)	0.25	0.06	0.06
2	Production complexity	-0.22	-8.23(a)	0.33	0.12	0.05
<u>Link with agents</u>						
1	Export orientation	0.69	19.48(a)	0.69	0.48	0.48
2	Production complexity	0.28	7.95(a)	0.75	0.56	0.08
3	Capitalisation	-0.13	-3.68(b)	0.76	0.58	0.02

(a) significant at 0.01 level

(b) significant at 0.05 level

firms with low capital intensity and with simple production processes tend to maintain links with private manufacturers and subcontractors. The link with agents is strongly

related to the organisational structure explaining 58 percent of variance. The variable, export orientation entered at the first step, suggesting that export oriented firms obtain their imported raw materials through agents.

Regressions were run separately for the three types of industries to facilitate the comparative analyses of relationships between organisational variables and purchasing links. Across all three industries, the statistically significant relationships that emerged are not suprising. The results of the links with wholesalers and retailers are depicted in Table 4.5. Although the links with wholesalers are positive in all three types of industries, simple correlation coefficients and explained variances show that the degree of this relationship is stronger in the rubber and metal working firms. The significance of independent variables is also similar in these two types of industries with 'production complexity' entering at the first step and accounting for 84 percent and 89 percent of variances respectively. In the textile firm however 'capitalisation' emerged as an important variable.

The differences in the degree of relationship and the significance of independent variables in the three

types of industries are as expected. Many textile firms produce a single product (either textile printing, weaving or clothing) and their requirements are simple. The textile printing industry uses dyes and chemicals, the weaving industry uses only cotton and synthetic yarn and the clothing manufacturers use the clothing materials.

In contrast to this, metal firms which produce several products such as agricultural implements, spare parts for machinery, motor vehicles and household equipment need different types and grades of steel. The rubber firms producing goods for the furniture industry use rubber, coir and different chemicals for their production processes. The requirements of these last two industrial sectors are complex so that only wholesalers are capable of supplying the bulk of these demands. Thus the relationships with wholesalers tend to be strong in the metal and rubber sectors.

In contrast to the wholesaler links, a negative relationship can be seen between the link with retailers and organisational structure in all three types of industries (Table 4.5). Strong relationships exist in the textile firms, with organisational structure accounting for almost

Table 4.5 : Relationship between local purchasing links
with wholesalers, retailers and organisational
structure

Step	variable	simple re;cof;	partial re;cof;	multiple R ² re;cof;	R ² ΔR ²	
<hr/>						
					<u>Link with wholesalers</u>	
					<u>Textile firms</u>	
1	Capitalisation	0.64	17.10(a)	0.64	0.41	0.41
					<u>Rubber firms</u>	
1	Production complexity	0.91	38.28(a)	0.91	0.84	0.84
2	Registered firm	0.23	9.56(a)	0.94	0.89	0.05
					<u>Metal firms</u>	
1	Production complexity	0.94	41.49(a)	0.94	0.89	0.89
2	Registered firm	0.13	5.63(b)	0.95	0.91	0.02
					<u>Link with retailers</u>	
					<u>Textile firms</u>	
1	Registered firm	-0.98	-38.40(a)	0.98	0.96	0.96
2	Export orientation	-0.08	-3.09(a)	0.98	0.97	0.01
					<u>Rubber firms</u>	
1	Capitalisation	-0.49	-15.49(a)	0.49	0.24	0.24
2	Production complexity	0.32	10.23(a)	0.58	0.34	0.10
					<u>Metal firms</u>	
1	Registered firm	-0.88	37.59(a)	0.88	0.77	0.77

(a) significant at 0.01 level

(b) significant at 0.05 level

97 percent of the observed variance in the local purchases. On the basis of the simple correlation coefficients (-0.98) the 'registered firm' component entered at the first step, accounted for 96 percent of variance. This could be expected since most non registered firms which produce wearing apparel purchase their raw materials from the closest town or market through retailers. Similarly the negative relationship with the registered firm component in the metal working firms suggest that almost all non registered metal firms depend on retailers for their purchases. Many small metal producers purchase their raw materials from retailers in the Panchikawatte area. In contrast to the other two types of firms, organisational structure and the local retailers links displayed a low level of relationship in the rubber firm, only explaining 24 percent of variance. This is partly due to the fact that some firms purchase their raw materials direct from suppliers in outer regions and partly due to high degree of purchases made from wholesalers.

(iii) Links with private manufacturers/subcontractors

Relationships between organisational structure and the local purchasing links with private manufacturers/

subcontractors are weaker than those with links with wholesalers and retailers (Table 4.6). These results are due to the low levels of purchases from private manufacturers. Inter industry relationships, in the form of providing finished products of one industry as raw materials to another are small among the surveyed firms.

The link with subcontractors in the metal sector is strongly related to the organisational structure compared to the link in the other two sectors, explaining 63 percent of variance by the four organisational components. A negatively associated link with the degree of capitalisation indicates a higher degree of local purchasing links in smaller, labour intensive industries. Most small metal firms located within the Colombo Municipality undertake subcontracting work to private manufacturers in the same area, a fact that explains the existence of a strong relationship between organisational structure and the localised pattern of subcontracting work.

(iv) Links with government industries

The relationship between purchasing links with government industries and organisational structure is

Table 4.6 : Relationship between local purchasing links
with private manufacturers/subcontractors,
government industries and organisational
structure

Step	variable	simple re;cof;	partial re;cof;	multiple re;cof;	R^2	ΔR^2
<u>Link with private manufacturers/subcontractors</u>						
<u>Textile firms</u>						
1	Capitalisation	-0.45	-18.01(a)	0.45	0.20	0.20
<u>Rubber firms</u>						
1	Production complexity	0.39	15.60(b)	0.39	0.15	0.15
<u>Metal firms</u>						
1	Capitalisation	-0.57	-16.34(a)	0.57	0.32	0.32
2	Production complexity	0.37	10.66(a)	0.68	0.46	0.14
3	Registered firm	0.37	10.47(a)	0.77	0.60	0.14
<u>Link with government industries</u>						
<u>Rubber firms</u>						
1	Production complexity	0.53	21.46(a)	0.53	0.28	0.28
<u>Metal firms</u>						
1	Registered firm	0.66	25.79(a)	0.66	0.43	0.43
2	Capitalisation	-0.24	-9.36(b)	0.70	0.49	0.06

(a) significant at 0.01 level

(b) significant at 0.05 level

weaker than the relationships with retailers and wholesalers (Table 4.6). Results of the regression analysis for textile firms suggest that none of the organisational variables is significant. The procedures for obtaining materials from government organisations are complicated and also there are difficulties for small entrepreneurs in fulfilling the necessary documentary requirements. However, 34 percent of variance in the rubber and 51 percent in the metal firms are explained by the four organisational components. Rubber purchases from the Industrial Development Board and steel from the Steel Corporation may have contributed towards these relationships. The link in the metal sector is positively associated with the registered firm component (0.66), suggesting that those industries which purchase steel from the Steel Corporation are mainly registered industries. Steel is normally purchased from the Corporation in large quantities and by cash payment. The unregistered firms are not well organised, their requirements are small and they often receive credit facilities from retailers. For these reasons they rarely obtain their materials from the Steel Corporation.

Results of regression analysis for the textile firms, considering the link with agents as the dependent variable, show a strong positive relationship with export

orientation with a simple correlation coefficient of 0.86 and enter the regression equation at the first step. This suggests, as previously noted, that many export oriented small textile firms obtain their raw materials through agents.

THE RELATIONSHIPS BETWEEN ORGANISATIONAL STRUCTURE AND SALES LINKAGES

Relationships with sales linkages bear similarities to those with purchasing linkages, there being strong relationships between organisational structure and wholesalers and retailers and weak relationships with private manufacturers and government industries. The link with direct customers is strongly related to the organisational structure.

Figure 4.4 demonstrates positive relationships with wholesale links. Figure 4.4a indicates that 46 percent of textile firms do not have any relationship with wholesalers, and of these firms most are unregistered. Forty four percent of textile firms made more than 40 percent of their sales by value with wholesalers but these were registered firms, recording positive values on this component.

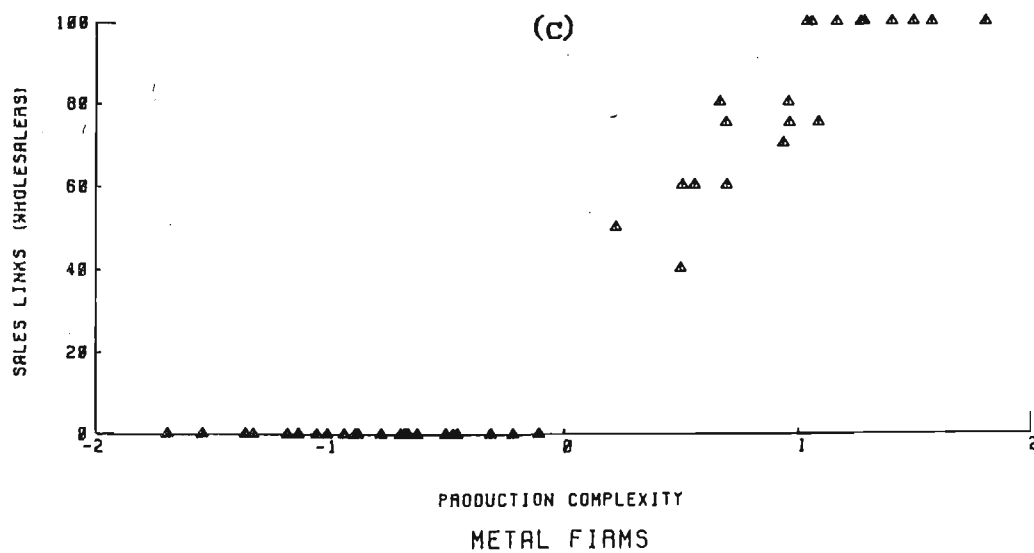
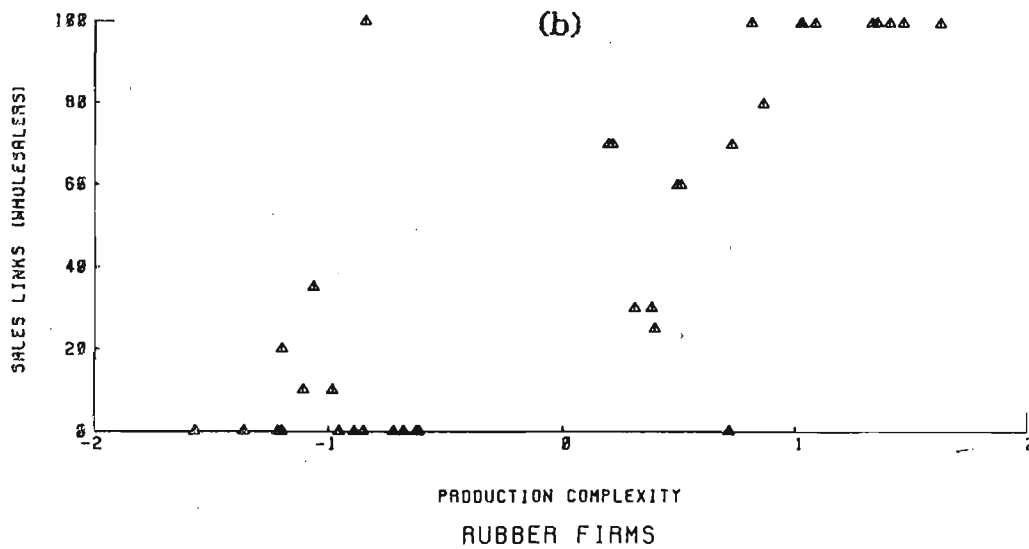
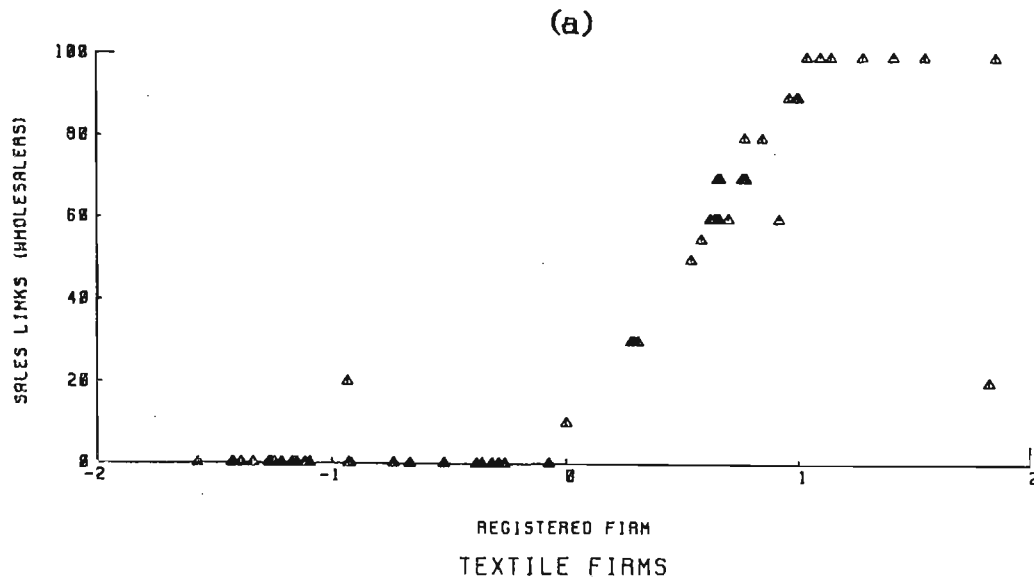


Figure 1. Relationship between organisational structure and sales

A different pattern emerged in the other two types of industries. The relationships with 'production complexity' are shown in Figures 4.4b and 4.4c. Thirty percent of rubber and 21 percent of metal firms sell 10 percent (by value) of their finished products to the local wholesalers. However, 40 percent of rubber firms and 55 percent of metal firms do not have any sales links with wholesalers as these are mainly single product manufacturers which score negatively on the production complexity component and lie on the horizontal axis.

Figure 4.5 demonstrates negative relationships between organisational structure and links with direct customers, suggesting the registered larger firms are less dependent on direct customers than the unregistered, smaller firms. Although negative relationships can be seen in Figures 4.5a and 4.5b, they are not strong as in metal working firms. Eighteen percent of metal firms maintain direct sales links with customers, while in the other two sectors, this type of link is recorded with only about 3 percent of firms sampled.

With respect to the links with retailers (Figure 4.6), a strong relationship exists in metal and textile firms. In rubber firms however the relationship is weaker,

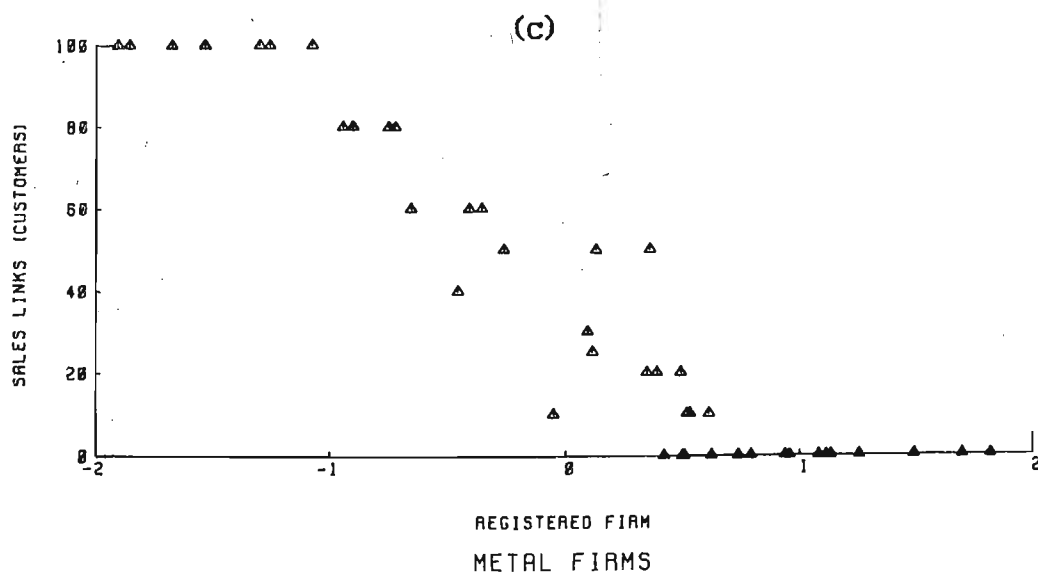
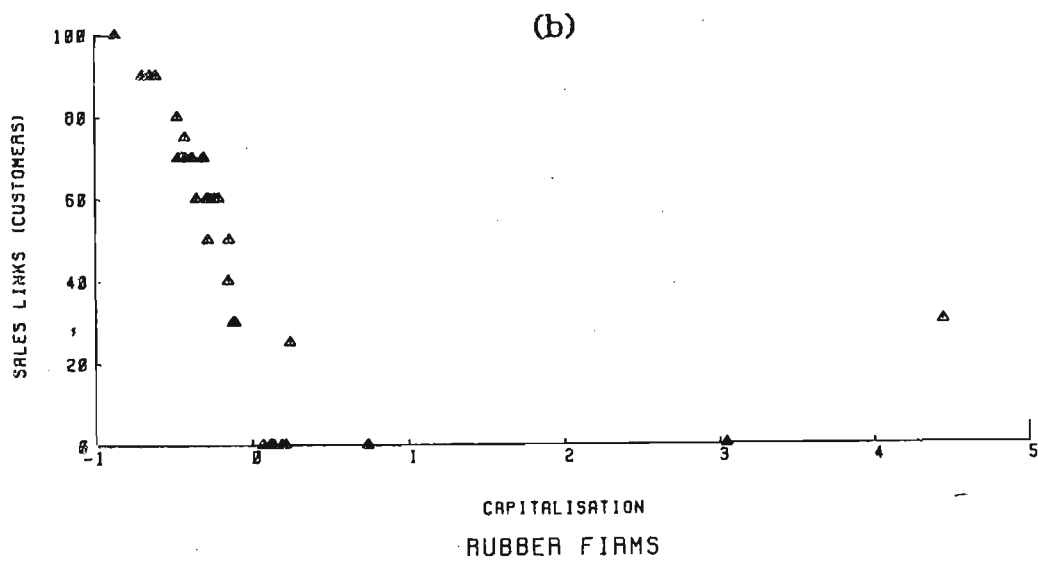
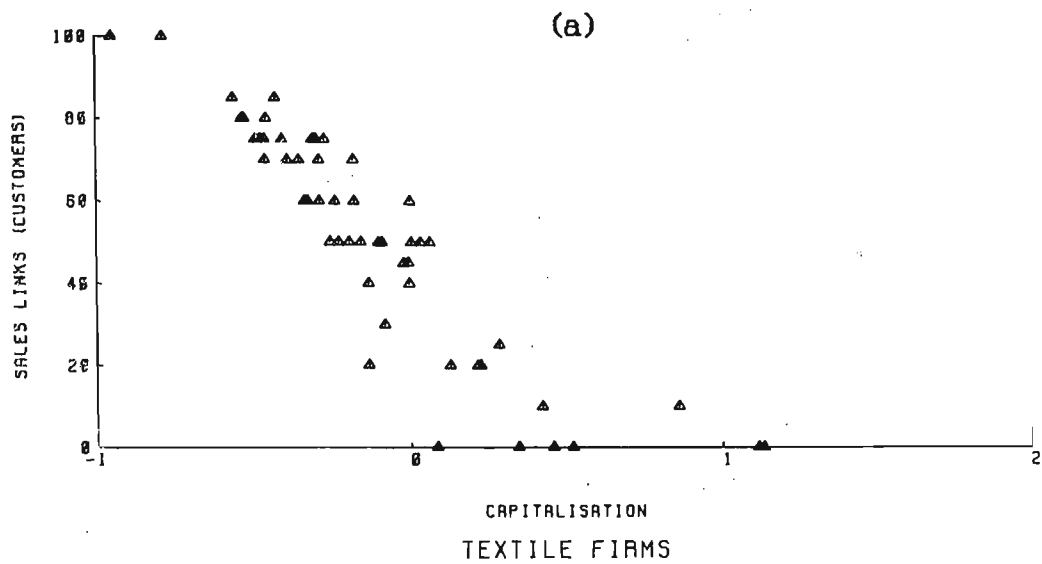


Figure 4.5: Relationship between organisational structure and sales

having negative values for the capitalisation component for more than 80 percent of firms. Twenty percent of textile and 34 percent of metal firms do not have any sales links with retailers and record high values on the registered firm component. Sixteen percent of textile and 20 percent of metal firms have links with local retailers. These firms are unregistered and record negative values on this component.

Regression results also supported the pattern of these relationships. Five regression analyses were conducted for all sampled firms taking the types of suppliers as dependent variables. The significant results are shown in Table 4.7. Sales links with government industries have no significant relationship with organisational structure, hence the results are excluded from the table. Again, as for purchasing links, simple correlation coefficients and explained variances in the other analyses are low, but the results are significant at the 95 percent level. Similar to the relationship between organisational structure and purchasing links, sales links with wholesalers are positively related to 'production complexity' and the links with retailers are negatively related to the same variable. This suggests that the multi product manufacturers send their products to the wholesalers, while single

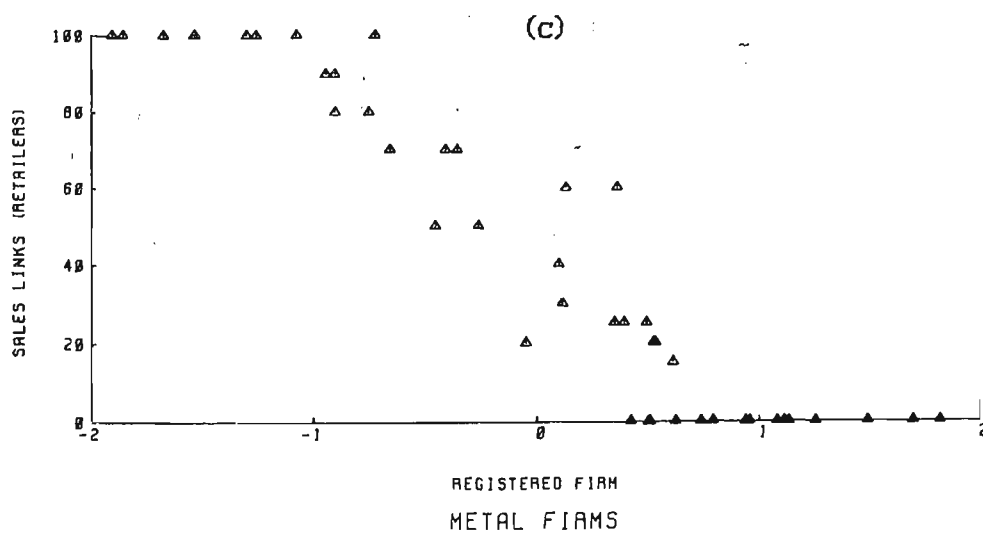
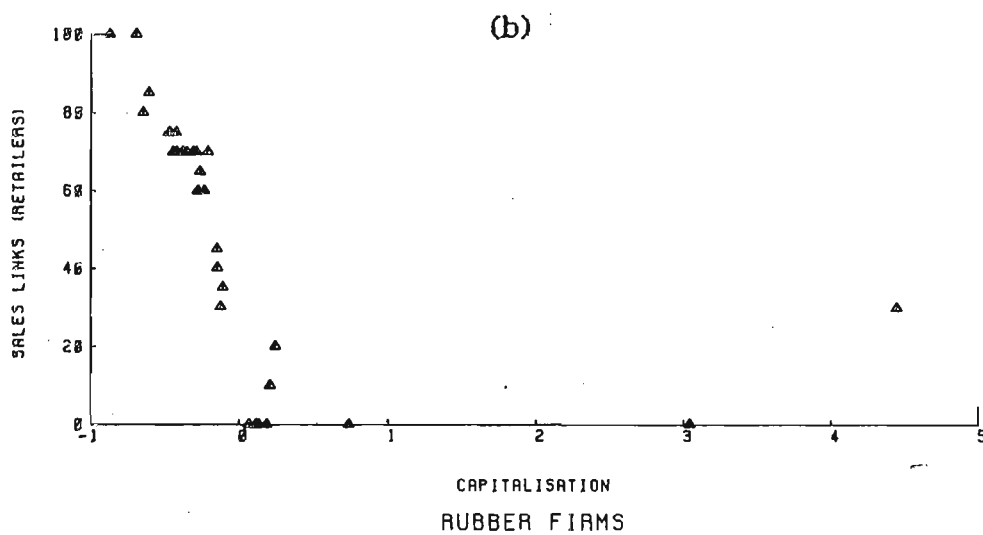
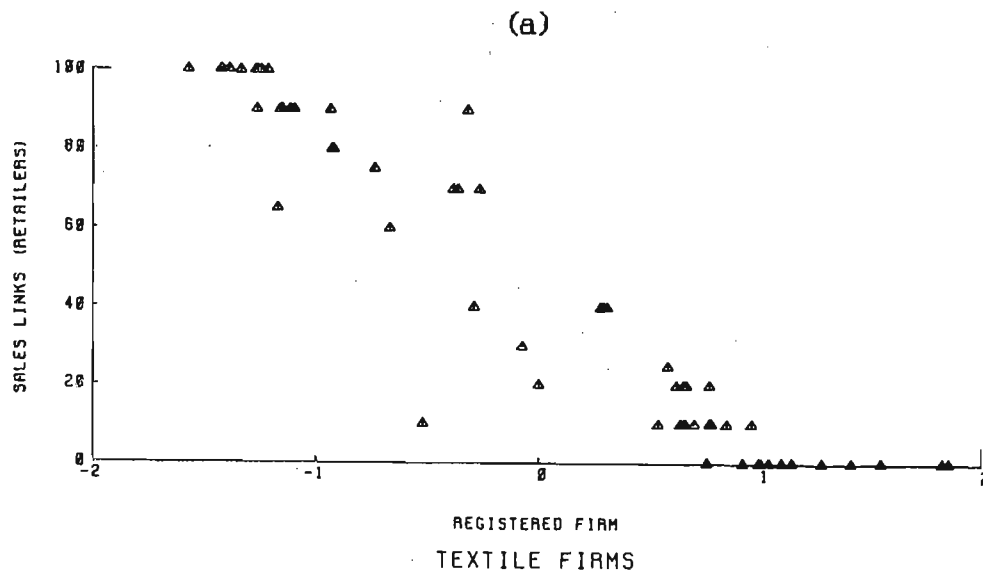


Figure 4.6: Relationship between organisational structure and sales links with retailers

product manufacturers mostly depend on the retailers and direct customers. Many small producers also sell their products directly to the nearby local customers. Links with private manufacturers are also negatively related to the degree of 'capitalisation', suggesting higher links with private manufacturers in smaller, labour intensive firms.

Regression results for the three types of industry may again be used to compare the relationships with different types of customers (Tables 4.8 and 4.9). Strong relationships exist in all three types of industries, with organisational components explaining 83 percent, 68 percent and 93 percent of variances in sales links of textile, rubber and metal working firms respectively. However, the significance of individual variables varies between the three types of industries. Although the 'registered firm' status proved to be a significant determinant in the textile firms, it was not an important factor in the other two sectors. As some registered batik producers have sales links with local wholesalers, a strong relationship exists with this variable. Also multi product manufacturers of rubber and fabricated metal sectors tend to have stronger relationships with wholesalers as they produce a range of finished products.

Table 4.7 : Relationship between sales links and organisational structure in all sampled firms

Step	variable	simple re;cof;	partial re;cof;	multiple re;cof;	R^2	ΔR^2
<u>Link with wholesalers</u>						
1	Production complexity	0.44	18.33(a)	0.44	0.19	0.19
2	Export orientation	-0.29	-11.78(a)	0.53	0.28	0.09
<u>Link with direct customers</u>						
1	Capitalisation	-0.19	6.18(b)	0.19	0.03	0.03
<u>Link with retailers</u>						
1	Production complexity	-0.19	-7.17(b)	0.19	0.03	0.03
<u>Link with private manufacturers/subcontractors</u>						
1	Capitalisation	-0.20	-8.12(b)	0.20	0.04	0.04

(a) significant at 0.01 level

(b) significant at 0.05 level

Relationships with direct customers differ in the three types of industry. The relationships are negative in all cases, but in the textile and rubber firms, they are weaker than in the metal firms. This could be explained by the fact that most metal firms have highly localised links with customers, whereas in the other two sectors such links exist, but there are also important links with the

outer regions. Clothing products in the textile industry and footwear in rubber industry are often sold to the outer regions. Strong negative relationships exist between the organisational structure and retailers links explaining more than 90 percent of variances in the organisational components in textile and rubber firms. However, for rubber firms, explained variance is low due to the lack of highly localised links with retailers.

In contrast to links with wholesalers, retailers and direct customers, sales links with private manufacturers and government industries are not strongly related to the organisational structure (Table 4.9). Some textile firms do not have any sales links with private or government industries, and in the rubber firms links are mostly non localised. Local links with sub contractors and government industries are comparatively high in the metal working firms. Negative relationships with 'capitalisation' and positive relationships with 'registered firms' suggest that smaller, unregistered firms supply their products mostly to the subcontractors, while registered firms tend to have sales links with government industries.

Table 4.8 : Relationship between local sales links with wholesalers, retailers and direct customers and organisational structure

Step	variable	simple re;cof;	partial re;cof;	multiple re;cof;	R ²	ΔR ²
<u>Link with wholesalers</u>						
<u>Textile firms</u>						
1	Registered firm	0.88	34.59(a)	0.88	0.78	0.78
2	Export orientation	-0.22	-8.73(a)	0.91	0.83	0.05
<u>Rubber firms</u>						
1	Production complexity	0.81	34.82(a)	0.81	0.66	0.66
<u>Metal firms</u>						
1	Production complexity	0.94	40.53(a)	0.94	0.89	0.89
2	Registered firm	0.19	8.11(a)	0.96	0.93	0.04
<u>Link with retailers</u>						
<u>Textile firms</u>						
1	Registered firm	-0.94	-37.31(a)	0.94	0.89	0.89
2	Capitalisation	-0.18	-7.24(a)	0.96	0.92	0.03
<u>Rubber firms</u>						
1	Capitalisation	-0.51	-16.24(a)	0.51	0.26	0.26
2	Production complexity	0.31	9.99(b)	0.60	0.36	0.10
3	Registered firm	-0.29	-9.37(b)	0.67	0.44	0.08
<u>Metal firms</u>						
1	Registered firm	-0.94	-37.89(a)	0.94	0.88	0.88
2	Younger firm	-0.12	-4.80(b)	0.94	0.89	0.01
<u>Link with direct customers</u>						
<u>Textile firms</u>						
1	Capitalisation	-0.57	-15.99(a)	0.57	0.33	0.33
<u>Rubber firms</u>						
1	Capitalisation	-0.50	-15.97(a)	0.50	0.25	0.25
2	Production complexity	0.30	9.54(a)	0.58	0.34	0.09
<u>Metal firms</u>						
1	Registered firm	-0.94	-32.27(a)	0.94	0.89	0.89
2	Younger firm	-0.12	-4.94(b)	0.95	0.90	0.01

(a) significant at 0.01 level

(b) significant at 0.05 level

Table 4.9 : Relationship between sales links with
private manufacturers/subcontractors,
government industries and organisational
structure

Step	variable	simple re;cof;	partial re;cof;	multiple re;cof;	R ²	ΔR ²
<u>Link with private manufacturers/subcontractors</u>						
<u>Textile firms</u>						
1	Registered firm	-0.48	-21.47(a)	0.48	0.23	0.23
2	Capitalisation	-0.32	-14.40(a)	0.57	0.33	0.10
<u>Rubber firms</u>						
1	Production complexity	-0.39	16.12(b)	0.39	0.15	0.15
<u>Metal firms</u>						
1	Capitalisation	-0.53	-15.42(a)	0.53	0.28	0.28
1	Production complexity	-0.36	10.52(a)	0.64	0.41	0.13
3	Registered firm	0.34	9.95(a)	0.72	0.52	0.11
<u>Link with government industries</u>						
<u>Textile firms</u>						
1	Registered firm	0.42	15.55(a)	0.43	0.18	0.18
<u>Rubber firms</u>						
2	Production complexity	0.59	23.70(a)	0.59	0.35	0.35
<u>Metal firms</u>						
1	Registered firm	0.51	17.80(a)	0.51	0.26	0.26
2	Younger firm	-0.27	-9.26	0.58	0.33	0.07

(a) significant at 0.01 level

(b) significant at 0.05 level

THE RELATIONSHIPS BETWEEN ORGANISATIONAL STRUCTURE
AND LABOUR INPUT LINKAGES

The results of the labour input analyses show that there is no significant relationship between organisational structure and types of employees. The only significant relationship exists with managerial employees. Even in this case, the simple correlation coefficient (-0.37) and the explained variance (16 percent) are low. In early studies, it has been suggested that small firms are likely to be locally owned and located near the residence of the manager who already knows potential suppliers and customers (Nishioka, 1974; Onyemelukwe, 1974). The results for the three separate industries are consistent with these studies. 'Capitalisation' is negatively related to the managerial employees suggesting highly localised links in smaller firms. Table 4.10 shows that the relationships are significant at the 0.01 level in all three types.

The relationships with unskilled employees are significant only in textile and rubber firms. Many metal firms indicated that they do not employ unskilled employees and this may be the reason for the non significance of the relationship with organisational structure. Labour input of unskilled employees is positively associated with the

Table 4.10 : Relationship between local labour input linkages and organisational structure

Step	variable	simple re;cof;	partial re;cof;	multiple re;cof;	R^2	ΔR^2
<u>Link with Managerial employees</u>						
<u>Textile firms</u>						
1	Capitalisation	-0.54	-19.10(a)	0.54	0.29	0.29
<u>Rubber firms</u>						
1	Capitalisation	-0.72	-23.52(a)	0.72	0.52	0.52
<u>Metal firms</u>						
1	Capitalisation	-0.58	-20.43(a)	-0.58	0.34	0.34
2	Younger firm	-0.39	-13.56(a)	0.70	0.49	0.15
<u>Link with Unskilled employees</u>						
<u>Textile firms</u>						
1	Export orientation	0.55	21.10(a)	0.55	0.30	0.30
2	Registered firm	-0.28	-10.94(a)	0.62	0.38	0.08
<u>Rubber firms</u>						
1	Capitalisation	0.36	17.13(a)	0.36	0.13	0.13

(a) significant at 0.01 level

export orientation in the textile industry and negatively with the registered firms, suggesting that the unregistered firms obtain their unskilled workers from their own families or from the surrounding area, while export oriented industries also depend on local areas for their labour.

THE RELATIONSHIP BETWEEN ORGANISATIONAL STRUCTURE
AND CAPITAL AVAILABILITY

The results of the regression analyses for the total number of sampled firms taking the shares of initial and working capital obtained from own savings and family savings as dependent variables are not statistically significant. Only 8 percent of the variation for initial capital investment is explained by the organisational structure, while in the case of working capital investment the figure is only about 10 percent. The relationship with the degree of self financing is weaker, therefore in the surveyed firms than was expected on the basis of the literature. However, results for the three separate industries show much stronger and significant relationships (Table 4.11). In all three types, self financing is more prevalent among the unregistered and smaller firms, associating negatively with the relevant variables. These results indicate the poor accessibility for finance from banks and other financial institutions of the smaller and unorganised firms. The importance of self financing a smaller firms is in accord with the results of a recent study (Taylor and Thrift, 1983).

Table 4.11 compares the results of the three types of industries surveyed. Stronger relationships are

Table 4.11 : Relationship between capital suppliers
(Family and own savings) and organisational
structure

Step	variable	simple re;cof;	partial re;cof;	multiple re;cof;	R ²	ΔR ²
<u>Initial capital suppliers</u>						
<u>Textile firms</u>						
1	Registered firm	-0.30	-9.07(b)	0.30	0.09	0.09
2	Export orientation	-0.28	-8.51(b)	0.41	0.17	0.08
<u>Rubber firms</u>						
1	Capitalisation	-0.58	-14.93(a)	0.58	0.34	0.34
2	Registered firm	0.33	8.50	0.67	0.45	0.11
<u>Metal firms</u>						
1	Registered firm	-0.50	-14.39(a)	0.50	0.25	0.25
<u>Working capital suppliers</u>						
<u>Textile firms</u>						
1	Registered firm	-0.51	-17.58(a)	0.51	0.26	0.26
<u>Rubber firms</u>						
1	Capitalisation	-0.57	-17.28(a)	0.57	0.33	0.33
<u>Metal firms</u>						
1	Registered firm	-0.52	-15.81(a)	-0.52	0.27	0.27
2	Capitalisation	-0.31	-9.25(b)	0.61	0.37	0.90
3	Production complexity	-0.26	-7.89(b)	0.66	0.43	0.07

(a) significant at 0.01 level

(b) significant at 0.05 level

recorded for the rubber and metal firms, than for the textile firms. This means that the number of firms with bank finances for their initial and working capital is higher in the textile sector than in the other two sectors. The size of the firm or other structural features have not affected the dependence of the capital suppliers. Results of the textile and metal working firms also suggest that the unregistered firms obtain their initial and working capital from their own or family members' savings, while registered firms have easy access to financial assistance from banks or other lending organisation. In rubber firms, 'capitalisation' is negatively associated with the self finances, suggesting that the smaller firms mainly depend on their own and their family savings for both initial and working capital.

SUMMARY

This chapter investigated the types and patterns of purchasing and sales linkages in small and medium scale industries. The links with suppliers and customers in the Colombo Metropolitan Area were highly localised. It highlighted the significance of links with retailers, wholesalers and direct customers while the links with private manufacturers and government industries are few.

Labour input links of small and medium scale industries also showed a highly localised pattern. Entrepreneurs in Colombo highly depended in their own finances.

The effects of firm structure on the firm environmental relationships are also examined in the chapter. The results suggest the significance of the organisational structure in explaining the patterns of material linkages. Few material purchasing and sales links in all three types of industries displayed a strong relationship with the organisational structure. Links with retailers, wholesalers and direct customers displayed a strong relationship with the organisational structure. Comparatively the relationships between links with private manufacturers, government industries and organisational structure are weaker. Labour input and capital flow did not have strong relationships with organisational structure.

However, results demonstrated the implications of the organisational structure for material linkages and emphasised the registered/unregistered dichotomy, capitalisation, and the production complexity as the most important determinant of the degree of these linkage patterns. Although there are differences in the three

types of industries surveyed, the analysis has finally shown that the pattern of functional linkages can be profitably explained within the organisational framework.

CHAPTER 5 : THE RELATIONSHIPS BETWEEN THE ORGANISATIONAL
STRUCTURE OF SMALL AND MEDIUM SCALE MANUFACTURING FIRMS
AND THEIR SERVICE AND COMMUNICATION LINKAGES : A PATTERN
OF EXTERNALISATION

The service linkages of manufacturing firms include a range of non manufacturing activities such as transport and distribution, security, maintenance, research and development and general office services (printing and translating). In the literature, research and development marketing and advertising, computing and data processing, management consultancy, financial services (banking, auditing and insurance) and legal services are considered as the higher order service activities. Lower order service activities include transportation service, plant service (maintenance and repair), other consultancy services (engineering and employment) and office services (typing and book keeping).

Two quite different approaches have been adopted to study the service linkage patterns (Britton, 1974) in the literature. The first attempts to identify the location of the main supplier of services to the establishment; the second focusses on the organisational aspects of firms, measuring the extent to which service requirements are carried out by the different types of establishments.

Few generalisations have emerged from the earlier studies though many have pointed to a highly internalised pattern of service linkages. For Williamson (1978) the internalisation of business services within a company depends largely on the nature of the service activity carried out. Marshall (1982b), too, argued that the differences in the degree of service internalisation reflects the varying business service needs of individual industries. The main factors he suggested were the element of confidentiality associated with the service, the degree of uncertainty associated with the service requirements, the amount of specialist knowledge required to carry out the service, the cost of alternative sources of supply and the availability of the services external to the firm. To preserve commercial advantage, confidential service needs are likely to be met within the company. If the service needs are uncertain or changing, internalisation is also likely to be preferred. However, where highly specialised skills are costly for the manufacturing firms to acquire, outside service suppliers will be used. Finally the amount of service internalisation within manufacturing industry may be increased if the number, range and quality of outside service suppliers do not match the needs of the firms.

Empirical studies in developed countries on large scale firms show that most business service activities are internalised with only some legal and administrative services being externally supplied (Britton, 1974; Marshall, 1979b, 1982b). In a study of three British cities, Marshall (1982b) concluded that more than 50 percent of the service needs of surveyed plants were satisfied by their own organisations.

The localised pattern of the service linkages has also been tested and the literature suggests that the degree of localisation varies with the type of service linkage involved. Research in the Northern region of the United Kingdom, for example, suggests that although local firms operated in national markets for their products, they relied on local specialist suppliers of business services (James et al., 1979b; Marshall, 1979b). McDermott (1977) demonstrated, in an investigation of Scottish sales and marketing managers, that although they maintained a number of long-distance routine contacts, less routine information was obtained from a limited spatial area.

In a study of the East Midlands, Burrows and Towns (1971) found that only lower order activities such as typing and employment services were purchased locally,

while higher order services such as finance, market research and computing were obtained largely from other areas. Britton (1974), using Canadian firms, concluded that there was a strong metropolitan leakage in higher order services to Toronto from firms located outside the capital.

In a small number of recent studies, however, it has been argued that service linkage patterns are a function of organisational structure. Internal structure and employment size were recognised as important factors in determining the pattern of service linkages (Marshall, 1982b). Small establishments, plants with discontinuous production technologies, tend to obtain business services less frequently from their own organisations than large establishments and plants with continuous production technologies. From a case study of three British city regions (Marshall (1982b) concluded that 51 percent of service activities of firms with less than 60 employees were obtained from regions outside their own company locations, while only 31 percent were externalised in firms with more than 300 employees.

Plant status and ownership pattern were considered as important predictors of differences in the linkage

patterns. Independent establishments carried out most business within their own establishments, while subsidiary and branch establishments carried out only a relatively small amount of business within their own establishments. Both subsidiary and branch establishments tended to utilise their own organisations, especially the divisional head office plants, for the provision of business services. Burrows and Town (1971) suggested that as a result branches are more likely to purchase services such as insurance, banking, accounting and legal activities from outside their local area, while parent companies are either internalised or purchase these services locally. Crum and Gudgin (1977) demonstrated that the services are largely concentrated in the manufacturing firms at the head office or purchased from nearby suppliers and imported to branches through headquarters. Marshall (1979b, 1982b) also concluded that head offices and independent plants tend to have localised service linkages, while branch plants and externally owned firms tend to look outside the local area for service suppliers.

Few studies have attempted to analyse the spatial dimensions of information flows of organisations or to explore their implications in terms of organisational structure (Thorngren, 1970; Tornqvist, 1970; Goddard, 1971;

Taylor, 1975; Marshall, 1979b). In these studies two approaches were considered to have some bearing upon the relationship between information flows and organisational structure - the analysis of spatial variations and the availability of information in urban system and urban hierarchies; and organisation-centred studies of the localisation of information flows.

On the basis of these studies it appears that the information flows are strongly localised (Thorngren, 1970, Tornqvist, 1970, Goddard, 1971). In fact, Goddard (1971) showed that 79 percent of all face to face contacts were highly localised. Taylor (1975), using Gysbert's (1974) findings of New Zealand plastic manufacturers in Auckland, concluded that the information flows of firms are more highly localised than their material linkages.

Very few attempts have been made to relate organisational structure to the spatial form of information flows. It has been argued that the employment size operations technology and ownership status are important predictors of communication linkages. Independent plants tend to have more frequent local contacts than externally owned plants. (Northern Region Strategy Team, 1977), Marshall (1979b) suggested that the independent plants

are characterised predominantly by local contact, and information while subsidiaries have comparatively fewer local contacts. More frequent meeting contacts were highlighted in firms with jobbing technologies, while less frequent contacts were recorded in those with mass production technologies. However, as McDermott and Taylor (1982) concluded, none of these analyses attempted to relate spatial variations in information flows to organisational structure, in the manner attempted for material linkages.

To date no attempt has been made to identify the service requirements and the patterns of service and communication linkages of firms in developing countries. Service needs of manufacturing firms in developed countries, given the constraints under which they operate and fundamental differences in economic structure, are likely to be quite different from those of developing countries. Sophisticated production technologies and continuous production processes require higher order services such as computing and data sources, marketing and advertising, research and development and financial and legal services; but discontinuous production processes and lower levels of production technologies are salient characteristics of smaller firms in developing countries. In developing countries, therefore, service requirements tend to be

simpler; and there is a higher degree of uncertainty associated with the service requirements; and financial difficulties of small entrepreneurs often restrict expenditure on services - small and medium scale industrialists for example, often cannot afford the expenses of research and development.

Tornquist (1970) noted that a very large proportion of the external contacts of firms in developed countries are made by telephone and mail; but, as Alonso (1968) pointed out, face to face contacts are more important in developing countries. In most developing countries smaller firms do not have telephone facilities or if they do, frequently find them to be faulty! In these circumstances, and probably due to the cultural emphasis placed on person to person contacts, these face to face contacts are considered to be more effective. Goddard (1971) noted that we have only a scanty knowledge of the contact linkages between different activities in society. Moreover, intuitively, it seems likely that the structural differences of small and medium scale industries influence the pattern and communication linkages.

In an attempt to explore some of these differences, therefore, this chapter focusses on the

nature of the organisational structure of small and medium scale manufacturing firms in Colombo in relation to the pattern of service and communication linkages. It seeks to determine whether or not the high degree of localisation that characterises linkage patterns for firms in developed countries is also apparent for this in Colombo. It explores the degree to which service and communication linkages are internalised in these firms as well as the relationships between organisational structure and the patterns of linkages.

SERVICE LINKAGES FOR SMALL AND MEDIUM SCALE
MANUFACTURING FIRMS IN THE COLOMBO METROPOLITAN AREA

Only the service activities which are considered necessary and important for small and medium scale industries are included in the study. Many small industrialists do not possess their own vehicles, so that transport is considered as an essential service facility. The use of machinery at least for a part of the production process is a salient feature in the selected three types of industries so that maintenance and repair services were considered to be important service activities in the study. Since consultancy services are usually needed for small and medium scale industries to improve technical processes and

methods, to improve productivity and to diversify production activity engineering and management consultancy services were included. Of the office services only the financial (banking, auditing and insurance) and legal services were considered. Most higher order services were excluded as they were found to be relatively unimportant to smaller firms.

As in some previous studies (Britton, 1974; Marshall, 1979b) the questionnaire technique was adopted to measure the service linkages. A number of questions were included to gather information on the internalisation and externalisation of different types of services and in personal interviews entrepreneurs were asked a series of questions about the source from which a service was obtained during the preceding year. In this way, they were able to state whether the service was internalised or externalised. If it was externalised it was further asked whether the service supplier was from the city or town (local) or from outside the local area but within the region. (The same definition used in Chapter 4 for local area was also used here.) Details of the internalised and externalised patterns of transport, plant and consultancy services were recorded. The spatial limits for financial and legal services were also noted.

The supply of transport services

The survey revealed among other things, that in contrast to the experience of firms in developed countries, transport services of the surveyed firms in Colombo are mostly externalised. Eighty five percent of surveyed firms externalised their services: 55 percent obtained the services within their locality while 45 percent used the services outside the locality but within the district. This externalised pattern can be seen both for transport of raw materials and for the distribution of finished products. Eighty five percent of firms used outside transportation for raw material transport and 86 percent used outside transportation for the distribution of output. This pattern is quite easy to understand since only 18 percent of surveyed firms in Colombo had their own vehicles.

There were, however, some remarkable differences in the level of internalisation of transport services between the three types of industries (Table 5.1). Transportation of raw materials is more highly internalised in the textile sector than in the rubber and metal sectors. Twenty six percent of textile firms obtained the services within their own establishments, while for rubber and metal firms the shares were 17 percent and 5 percent respectively.

Of the 24 surveyed firms with their own vehicles, 16 are textile firms and 15 of these firms used the vehicles for their raw material transportation. Also 39 percent of textile firms used public transport services within their own localities.

Available data show that metal and rubber producers tend to prefer private transportation, since the raw materials needed for their industries are comparatively heavy. A survey carried out by the Industrial Development Board of Sri Lanka and the Japan International Cooperation Agency in collaboration with the Technonet Asia (1980), revealed that the main product lines in the metal working industries include the production of agricultural machinery (23.3 percent) and transport equipment and spares (12.6 percent). These types of products require heavy materials such as steel sheets, rods, flats, squares and angles as their raw materials. Major products of the rubber industries include rubberised rollers, engine mounts, oil seals and bushes, power loom accessories and products needed for the furniture industry. These products also tend to use heavy materials such as natural and synthetic rubber and by products of petroleum. Not suprisingly, therefore, 60 percent of rubber and 43 percent of metal firms used private transportation services available within their own

local areas, while 29 percent of rubber firms and 52 percent of metal firms obtained services from outside their local area, but within the district.

It was noted for all three types of industries that the transport services for the distribution of output were highly externalised. A figure of 83 percent was recorded in the textile sector. Such a high figure reflects the close contacts these manufacturers maintained with customers and the direct sales of their products to customers. Moreover, export-oriented firms often have the transport facilities provided externally. In interview, entrepreneurs indicated that exporters prefer to purchase the finished products directly from the establishment. Eighty percent of rubber firms and 95 percent of metal firms externalised their services for the distribution of finished products. Since metal working firms often concentrate on subcontracting, the private manufacturers, who seek their assistance for the manufacture of products, usually provide the transportation for their finished products.

The supply of maintenance services

Empirical studies of firms in developed countries

demonstrate a highly internalised pattern of plant services (maintenance). In a study of Canadian manufacturing plants, Britton (1974) showed that 44 percent of surveyed plants used their own establishment services for machinery maintenance. Marshall (1976b), in a case study of the Northern Region of England, also found a similar pattern for more than 85 percent of surveyed firms. In large establishments the technical expertise and specialised skills are usually available within the organisation; but because the acquisition of specialised skills is expensive small and medium scale firms usually tend to obtain such services from outside sources.

In Colombo, however, 77 percent of surveyed firms obtained their maintenance services from their own establishments and 79 percent supplied their own repair services. This highly internalised pattern of repair services in smaller firms is an unexpected result. In interviews, entrepreneurs indicated the uncertainty of their service needs as a reason for dependence on their own services; but it may be that relatively low-level technology tends towards 'do it yourself' maintenance. Moreover, there is often a considerable amount of experience within plants that rely on a close knit family as its labour supply.

Plant services for the metal and rubber sectors are probably somewhat more demanding than for the textile sector. Metal working included operations such as casting, welding, planing, machining, platework, machine assembly and press work; and rubber firms very often use machinery for their production processes. These two types of industries need more maintenance services than the labour intensive textile industries. Externalised links are recorded for repair services in the rubber and metal sectors (Table 5.1). Of the surveyed rubber firms 29 percent obtained maintenance services externally, while 20 percent of firms had their repair services externalised.

In the metal firms, 30 and 40 percent used external services for maintenances and repairs respectively. This externalisation observed in the two types is mainly due to the services obtained from government organisations such as the Industrial Development Board (IDB) and the Ceylon Institute of Scientific and Industrial Research (CISIR). The basic workshops and technical service facilities of these organisations are located at their head offices and usually they provide technical assistance for repair and maintenance services for small and medium scale industries.

Table 5.1 : Structure of the service linkages by type
of industry

Industry type	Textile				Rubber				Metal				Total			
Link type	IL	TC	NL	NK	IL	TC	NL	NK	IL	TC	NL	NK	IL	TC	NL	NK
<u>Transport services</u>																
Raw material purchasing	15	22	20	0	6	21	10	0	2	19	23	0	23	62	53	0
Disposal of output	10	15	32	0	7	14	14	0	2	23	19	0	19	52	65	0
<u>Plant services</u>																
Main-tenance	48	5	0	4	25	5	5	0	32	3	12	0	105	13	17	4
Repair	50	1	6	6	28	2	5	0	30	5	9	0	108	8	20	6
<u>Consultancy services</u>																
Manage-ment	35	3	6	15	20	2	0	13	30	2	0	12	85	7	6	40
Enginee-ring	10	3	5	44	04	2	6	29	15	0	15	12	29	5	20	85
<u>Financial services</u>																
Banking	0	46	7	4	0	25	5	5	0	29	8	10	0	100	20	19
Auditing	4	6	0	47	4	4	0	27	0	8	0	36	16	10	0	100
Insurance	0	9	2	46	0	11	0	24	0	8	0	36	0	28	2	106
Legal	0	4	2	51	0	4	0	31	0	2	2	40	0	10	4	122

IL - Internalised, TC - Town or City, NL - Non local
and NK - No links.

The figures indicate the frequency of firms having different types of internalised and externalised links.

Source:- Sample survey

The supply of consultancy services

It might be expected that the pattern of consultancy services in the smaller firms would be externalised because of the high costs involved. However, 63 percent of firms used their own management services, while only 21 percent internalised their engineering consultancy services. Thirty percent of entrepreneurs also recorded that there is no need for management services, while 63 percent of firms did not use any engineering services. Nevertheless there is a consistency in the pattern of management consultancy services in all three types of industries (Table 5.1). Non significance of externalised links suggests poor accessibility to these services. During the survey it was apparent that only two fairly large firms consulted management services from the National Institute of Business Management (NIBM). NIBM is a public sector institution which undertakes training and education of workers for active participation in management and provides specialist services in management consultancy, establishing performance standards and improving productivity. Based on the information gathered it was apparent that many small entrepreneurs were not aware of the services provided by this organisation. Some indicated that the costs involved in obtaining these services were excessive

and they would prefer to have these services if they were available at a nominal charge. Although there are some private consultants, very few of them are geared to the requirements of the smaller units.

The patterns of engineering consultancy services shown by the three types of industries were found to be different. For example, engineering services were internalised by 18 percent of textile firms, while in the rubber and metal firms there was an internalised pattern in 11 and 34 percent respectively. Externalised services are more clearly marked among the metal working firms. Entrepreneurs indicated that they do not maintain their own expertise and facilities for quality control and testing; very often they prefer to use the external services. Frequently such services are obtained from The Industrial Development Board (IDB), Ceylon Institute of Scientific and Industrial Research (CISIR), National Engineering Research Centre (NERC) and the Bureau of Ceylon Standards. These are public sector institutions providing consultancy services to private sector enterprises and in doing so undertake design, manufacture of prototype machinery and pilot plants, with the objective of improving the technical processes and methods used in industries. These services are extended to the selection of machinery and equipment, procurement of

raw materials, and to the diversification of products. Available information shows that mainly the small entrepreneurs benefit from the services provided by the IDB. IDB has a separate Extension Services Division to provide the specialised services needed by small and medium scale industrial units. The division has 7 subdivisions dealing with industries producing food, chemicals, fibre and vegetable oil, engineering goods, management development and finance, civil engineering and industrial engineering. Light engineering industries based on engineering technology, and rubber firms frequently using various chemicals are the main beneficiaries of these services from IDB.

Banking services

Although some smaller firms do not have access to the credit facilities provided by the banks, the services obtained from the banks were recorded as important. Table 5.1 indicates that 88 percent of surveyed firms obtained banking services, while 19 percent used auditing and 22 percent of firms used insurance services. Credit to industry is provided by the commercial banks including, for example, People's Bank, Bank of Ceylon, Commercial Bank of Ceylon Ltd., and Hatton National Bank Ltd. In so far as the small scale sector is concerned, the People's

Bank and the Bank of Ceylon are of special interest, as they have special assistance schemes to finance the small and medium entrepreneurs. These two commercial banks also have more diversified facilities, with at least one regional branch in every town within the Colombo Metropolitan Area. Largely because of these diversified facilities, 74 percent of firms were satisfied with their banking needs within the local area. Apart from credit facilities, small entrepreneurs often use the overdraft facilities provided by the banks for customers who maintain personal accounts.

Externalised links are mainly derived from the services obtained from the head offices of commercial banks, which are located at the city centre. Two major commercial banks have separate divisions to assist small and medium scale sector needs. Managers of regional branches are reluctant to depart from the conventional norms of appraisal and security needs for credit applications. Therefore, very often applications from regional areas are directed to head offices for processing. Foreign departments of commercial banks are located at their head offices and they deal with monetary transfers for import of raw materials and export of products. Fifteen percent of firms obtained banking services from outside their local

area, but within the district. This non localised pattern is mainly due to the services obtained by the firms located outside the Colombo Municipal Council area from the bank head offices located within the city of Colombo. As indicated in Table 5.1 very few surveyed firms relied on auditing, insurance and legal services. This is almost certainly due to structural characteristics such as the small workforce, poor organisation and family participation.

COMMUNICATION LINKAGES FOR SMALL AND MEDIUM SCALE
MANUFACTURING FIRMS IN THE COLOMBO METROPOLITAN AREA

Two approaches have been developed in previous studies to measure the communication linkages. The first is mainly based on contact diary data (Thorngren, 1970; Goddard, 1973a; Taylor and Thrift, 1983), while the other uses information from questionnaire surveys (Marshall, 1979b). Contact diaries emphasise quantitative information, rather than qualitative information (Graves, 1972) and usually incorporate all modes of contact, including letters, telephone calls, meetings and memoranda (Burns, 1954). However, Marshall (1979b) noted the disadvantages of diary surveys suggesting their specific nature, and whether or not such periods are generally representative. Nevertheless the information obtained from questionnaire surveys

also has several shortcomings, such as the deviation from more reliable totals obtained from diary surveys of individual contact events (Connel, 1973).

The questionnaire technique was preferred in the present study, due to various shortcomings of the contact diary surveys and the non availability of recorded information for smaller firms. At personal interviews, entrepreneurs mostly supplied the information from memory. A list of potential communication links with three modes of contacts (telephone, face to face and postal), and five types of contactees (raw material suppliers, customers, bank officers, technical advisers and other industrialists) was given to the entrepreneurs and they were asked to indicate the number of contacts they had for the preceding month with the respective contactees. However, there were difficulties in obtaining information on telephone contacts, since the entrepreneurs had very little faith in telephones, indicating that very often their telephones are faulty. In these instances entrepreneurs were requested to indicate the average number of telephone calls made over a period of a working month. For these reasons the data on contacts are considered to be approximate only, though clearly indicative of the actual situation.

Most entrepreneurs in developing countries

consider face to face contact as a more effective means of exchanging information than correspondence via different forms of telecommunication or the post. Survey data indicate the importance of direct personal contacts. The frequency of firms with different types of contacts, by the type of contactee and the type of industry are listed in Table 5.2. Ninety six percent of surveyed firms recorded face to face contacts with raw material suppliers and customers. These contacts are more prevalent among the surveyed firms in comparison to the contacts with bank officers, technical advisers and other industrialists. The importance of face to face contacts with suppliers and customers in all three types of industries is due to the difficulty of obtaining required information through other contacts and the inefficiency and frequent malfunctioning of the telecommunication system. Moreover, nearly 50 percent of smaller firms do not have telephone facilities.

'Supplier' and 'customer' contacts

Most of the face to face contacts (84 percent) are made with the local suppliers and customers. The highly localised patterns of these contacts accord well with the findings of Thorngren (1970) and Goddard (1973). Many small entrepreneurs have frequent contacts with

suppliers since they purchase materials from local suppliers in small quantities. There is little difference in the pattern of contacts among the three types of industries. Ninety six percent of textile firms recorded local contacts with suppliers and customers, while rubber and metal firms recorded 86 and 68 percent respectively. The relatively high figure in the textile sector is due to the fact that small clothing producers obtain the materials from local suppliers and also sell their products to the neighbouring markets. The number of contacts recorded during the preceding month of the survey supported this conclusion. Textile firms recorded a total of 212 face to face contacts ($n=57$, $\bar{x}=3.71$), while rubber and metal firms recorded only 122 ($n=35$, $\bar{x}=3.48$) and 139 ($n=44$, $\bar{x}=3.15$) respectively. Contacts with customers are more remarkable, accounting for 2600, 2165 and 3088 total contacts in textile, rubber and metal sectors respectively.

Contacts with bank officers

Although the number of contacts with bank officers is lower compared to the contacts with suppliers and customers, it is interesting to note that face to face contacts with bank officers are higher than telephone contacts. Textile firms recorded 158 such contacts while

rubber and metal firms recorded only 84 and 69 respectively. Face to face contacts were considered to be the best way to exchange uncomplicated and routine information. Three entrepreneurs indicated that they needed frequent contacts with bank managers while their loan applications were in progress. However, this situation may not have been true in general, since many firms do not have any access to bank finances. Nevertheless it can be concluded that the recorded higher frequencies of these contacts are mainly due to a few firms seeking loan finances.

Contacts with technical advisers

Direct contacts with technical advisers are important for rubber and metal firms. Rubber and metal manufacturers need technical advice in the areas of selection of machinery and equipment, modernisation of production and the improvement of the quality of products. Frequent contacts in these two sectors were an indication of their dependence for technical advice from public institutions. As indicated in Table 5.2 contacts with other industrialists are few.

"Indirect contacts" refer to the exchange of information by telephone or post. In developed countries,

Table 5.2 : Structure of contacts by type of contactee
and the type of industry

Industry type	Textile			Rubber			Metal			Total		
Contactee type	LC	NC	NL	LC	NC	NL	LC	NC	NL	LC	NC	NL
<u>Face to face contacts</u>												
Raw material suppliers	54	6	3	22	15	1	38	3	1	114	24	5
Customers	55	20	2	30	20	2	30	15	2	115	55	6
Bank officers	33	2	24	29	0	6	15	4	25	77	6	55
Technical advisers	5	15	28	8	5	22	20	9	15	33	29	65
Other industrialists	6	9	41	8	0	27	15	11	18	29	20	86
<u>Telephone contacts</u>												
Raw material suppliers	30	8	2	15	5	0	18	8	4	63	21	6
Customers	30	12	2	13	6	2	15	7	7	58	25	11
Bank officers	12	4	16	9	0	6	8	4	10	29	8	32
Technical advisers	17	2	11	7	2	7	8	2	14	32	6	32
Other industrialists	13	0	17	5	2	8	8	0	14	26	2	39
<u>Postal contacts</u>												
Raw material suppliers	24	2	31	13	2	20	22	0	22	59	4	73
Customers	26	4	27	18	5	12	21	4	19	65	13	58
Bank officers	18	2	37	8	4	23	13	2	29	39	8	89
Technical advisers	15	0	42	10	2	23	12	0	32	37	2	97
Other industrialists	3	0	54	1	0	34	14	0	30	18	0	98

LC - Local, NL - Non local, NC - No contacts

The figures indicate the frequency of firms having local
and non local contacts.

Source :- Sample survey

the exchange of information between organisations is more frequent by telephone than in developing countries. Survey data shows that only 56 percent of textile, 43 percent of rubber and 56 percent of metal firms have telephone facilities in their establishments. The number of firms having telephone contacts are fewer than those with face to face contacts (Table 5.2). The significance of telephone contacts is also different for the three types of industries. It is interesting to note that the contacts with local suppliers and customers are more prevalent in the textile sector.

Table 5.2 also presents some notable differences in postal contacts. Of the existing contacts more than 90 percent are localised. In the rubber manufacturing group the highest proportion of postal contacts is with the non local regions. A marked contrast can be found between the metal and the other two type of industries in terms of contacts with other industrialists. This is due to the fact that metal firms undertake subcontracting work and they tend to have more contacts with other industrialists.

ORGANISATIONAL STRUCTURE AND THE PATTERN OF SERVICE LINKAGES

The extent to which the organisational structure of firms was reflected in the service linkage patterns was

examined by means of correlation analysis. Since the service linkages were measured in binary form, the relationship was examined using the point biserial coefficient. If the service was internalised or obtained within the local area, the value was recorded as '1'; if there were non local links or no links the value was recorded as '0'. Scores on significant components derived in Chapter 3 were used as organisational variables.

A limited number of recent empirical studies in developed countries suggest that the internal structure of organisations is a major determinant of the pattern of business services. The results of the present study suggest, however, much weaker relationships with the structure of firms. The correlation coefficients associated with most of the service activities are significant. This is not unexpected in a developing country like Sri Lanka since the service needs of small firms are usually uncertain, and the frequent financial difficulties faced by small entrepreneurs would be reflected in these low values.

The simple correlation coefficients between the internalised pattern of transport services and organisational structure indicate a very low level of relationship (Table 5.3). None of the correlation coefficients

associated with raw material transportation in the surveyed firms is significant. The weaker relationship in all three types of industries is due to the highly externalised pattern of transport services. More than 95 percent of metal manufacturers indicated that because of the need to use heavy vehicles for the transport of steel, they rely on suppliers or external private transport services. In the analysis of the relationship between the organisational structure and the services for raw materials transport a significant coefficient was found to exist only in case of rubber firms (Table 5.3). Also production complexity was positively associated with the raw material transportation. Two large rubber firms with more than 150 employees, producing rubber goods for machinery and vehicles used their own raw material transportation. This internalised pattern was not a feature significant to all surveyed firms, as most smaller single producers depended on outside services. These service linkage patterns between large and small firms resulted in a significant relationship among the rubber firms.

Transport services of finished products are not strongly associated with organisational structure. The organisational variables, registered firm status and production complexity were found to be significantly associated with the distribution of output. Although the direction of the relationship in metal firms is as expected,

the negative association with the registered firms in the textile and rubber sectors is unexpected, since most firms sell their products directly to customers having services externalised.

Table 5.3 : Correlation of transport services (raw material purchasing and distribution of output) with organisational structure.

Organisational structure	R/M purchasing	Distribution output
		<u>Textile firms</u>
Export orientation	0.11	0.21
Capitalisation	0.05	0.05
Registered firm	0.13	-0.25(c)
		<u>Rubber firms</u>
Capitalisation	0.23	0.06
Production complexity	0.35(b)	-0.04
Registered firm	-0.10	-0.37(b)
Foreign R/M utilisation	-0.22	-0.24
		<u>Metal firms</u>
Capitalisation	-0.10	0.14
Production complexity	-0.18	0.33(b)
Registered firm	0.07	0.04
Younger firm	0.00	0.14

(b) significant at 0.05 level

(c) significant at 0.10 level

R/M - Raw material

Plant services, such as maintenance and repair, in small and medium scale industries in Colombo are not strongly related to organisational structure. Simple correlation coefficients tend to indicate the insignificance of organisational structure. None of the variables is significant at the 90 percent level in the analysis of sampled firms so that only the coefficients related to the three types of industries are listed in Table 5.4.

The r values for the three types of industries are not high suggesting weak relationships with organisational structure. This is a result of highly internalised pattern of plant services in the surveyed firms. Previous studies suggest a very low level of relationship between the structure of organisations and maintenance services, Britton (1974) concluded that there was very little difference between the single plant and branches in the way they obtained their services. Marshall (1979b) also pointed out that more than 85 percent of maintenance service activities in all firms, whether it was an independent, subsidiary or branch plant, were internalised.

The significance of internalised services in the Colombo firms accords with the findings of previous studies. Self reliance for these services can be seen both among the

Table 5.4 : Correlation of plant services (maintenance and repair) and consultancy services with organisational structure

Organisational structure	Plant Maintenance	Services Repair	Consultancy Management	services Engineering
<u>Textile firms</u>				
Export orientation	0.17	-0.02	0.01	0.26
Capitalisation	0.05	0.01	0.11	-0.01
Registered firm	0.14	-0.23(c)	-0.02	
<u>Rubber firms</u>				
Capitalisation	0.21	0.14	0.06	0.34(b)
Production complexity	0.07	0.08	-0.15	0.18
Registered firm	0.15	-0.35(b)	0.29	0.13
Foreign R/M utilisation	-0.31(c)	-0.09	-0.53(a)	-0.03
<u>Metal firms</u>				
Capitalisation	0.16	0.18	0.13	0.01
Production complexity	-0.01	0.08	0.11	0.12
Registered firm	-0.02	-0.16	0.08	0.12
Younger firm	-0.34(b)	-0.15	-0.15	-0.14

(a) significant at 0.01 level

(b) significant at 0.05 level

(c) significant at 0.10 level

R/M - Raw material

larger and smaller firms. An entrepreneur of a firm with 186 employees indicated that the quality of the outside service suppliers does not match the needs of his firm, and hence all these services in his establishment are internalised. This may not be the reason for the self reliance on plant services by all large firms. However, a few other large entrepreneurs noted the cost differences involved in obtaining the outside services. Smaller entrepreneurs indicated the uncertainty of their service needs as a reason for the internalisation of services. The highly internalised pattern of plant services resulted in low r values in the textile and rubber firms. Weaker relationships in the metal working firms suggest that the structural differences do not encourage the entrepreneurs to obtain services from external sources, such as public institutions. Consultancy services are also not related to the organisational structure of firms. It is apparent that the registered textile firms are negatively associated with the management consultancy services. Seven of the surveyed textile firms were comparatively large with branches. These branches obtained their services mainly from their head offices, while in the unregistered single site firms services were mainly internalised. Most small firms tend to use their own management services, resulting in a weaker relationship with most of the organisational variables.

Engineering consultancy services are also not significantly affected by the organisational structure, although large and small metal firms use these services fairly frequently. However, organisational structure is not a factor which influences access to the engineering services provided by public institutions.

In contrast to the other services, financial and legal services for firms in Colombo are highly associated with the organisational structure. Correlation coefficients are shown in Table 5.5, the information from which suggests the significance of capitalisation in the financial services. However, banking services do not have a strong relationship compared to auditing and insurance services. Banks have both general and specialised activities, providing not only finance but also advice on general matters. Although the unregistered firms do not have any access to bank loans they still maintain their accounts with the bank. Every entrepreneur maintains at least one account with a commercial bank in his local area. Therefore, the services obtained in almost every firm are localised. This is the reason for the indicated low level of relationship between banking services and the organisational structure.

Table 5.5 : Correlation of financial (banking, auditing and insurance) and legal services with organisational structure

Organisational structure	Banking	Auditing	Insurance	Legal
			<u>Textile firms</u>	
Export orientation	0.04	0.13	0.16	0.37(a)
Capitalisation	-0.23(a)	0.43(a)	0.41(a)	0.00
Registered firm	0.22(c)	0.03	0.25(b)	0.12
			<u>Rubber firms</u>	
Capitalisation	0.13	0.50(a)	0.49(a)	-0.07
Production complexity	-0.07	0.03	-0.12	0.22
Registered firm	0.07	0.08	0.03	0.12
Foreign R/M utilisation	0.01	-0.03	-0.16	0.15
			<u>Metal firms</u>	
Capitalisation	0.18	0.53(a)	0.51(a)	-0.18
Production complexity	-0.09	0.03	0.06	0.23
Registered firm	0.02	0.20	0.28(c)	0.33(b)
Younger firm	-0.08	-0.01	0.02-0.30(b)	

(a) significant at 0.01 level

(b) significant at 0.05 level

(c) significant at 0.10 level

R/M - Raw material

In contrast, the patterns of auditing and insurance services are strongly associated with the organisational structure. Positive relationship with capitalisation suggests the use of auditing and insurance

services in large firms, supplied either from within their establishments or from outside services. Small family owned enterprises rarely obtain such services. The relationship with legal services of the firms in Colombo is in accordance with previous studies. Legal services are more prevalent amongst the registered larger firms, while more than 85 percent of small firms did not obtain any legal service.

ORGANISATIONAL STRUCTURE AND THE PATTERN OF COMMUNICATION LINKAGES

To assess the relationship between communication linkages and organisational structure, a series of regressions was done for all sampled firms and for the three types of industries separately. As the number of contacts were recorded the data was suitable for regression analyses. Frequency of contacts (face to face, telephone and postal) that firms had with five types of contactees - material suppliers, customers, bank officers, technical advisers and other industrialists - were taken as dependent variables for the analyses. The composite variables derived in chapter 3 were used as independent variables. The significant results (at least the 95 percent level) of these analyses are set out in Tables 5.6 - 5.9 and the importance of individual variables is interpreted below.

Marshall (1979b) concluded that the employment size, operations technology and ownership status were meaningful predictors of contact patterns. Figure 5.1 plots the number of face to face contacts the rubber and metal firms in Colombo had with suppliers against the components entered at the first step in each of these regression analyses. A negative relationship can be seen between the contacts with suppliers and the organisational structure of these two industrial sectors. The most noticeable feature is the importance of capitalisation, suggesting that face to face contacts with suppliers are more frequent in smaller firms and less frequent in larger firms.

Regression results supported these findings (Table 5.6) showing the significance of the organisational structure in determining the frequency of contacts. Although the registered firm component entered at the first step in the analysis for textile firms, the explained variance is not high compared to the other two types of firms. Nearly 60 percent of both registered and unregistered textile firms recorded more than two contacts during a period of one month. Except for a few firms, who depended on agents for materials, all other entrepreneurs indicated that, since they usually do not stock

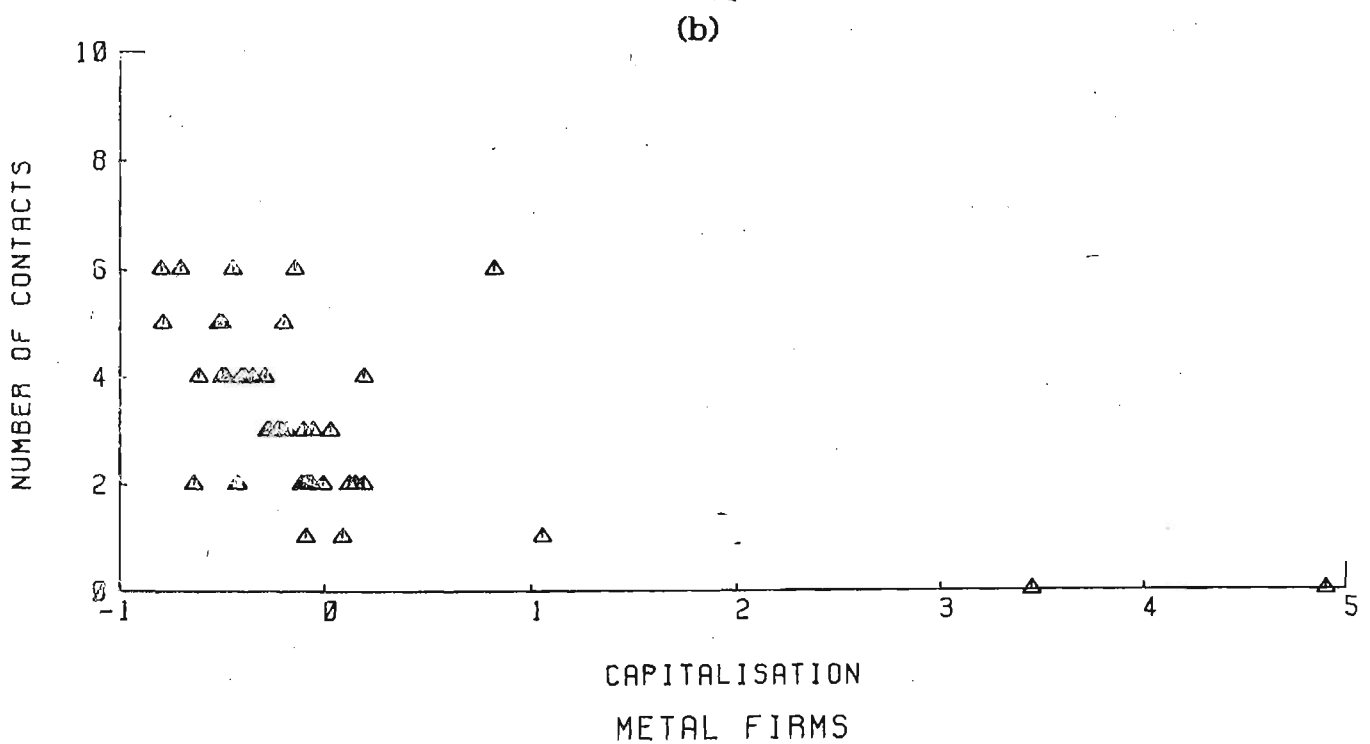
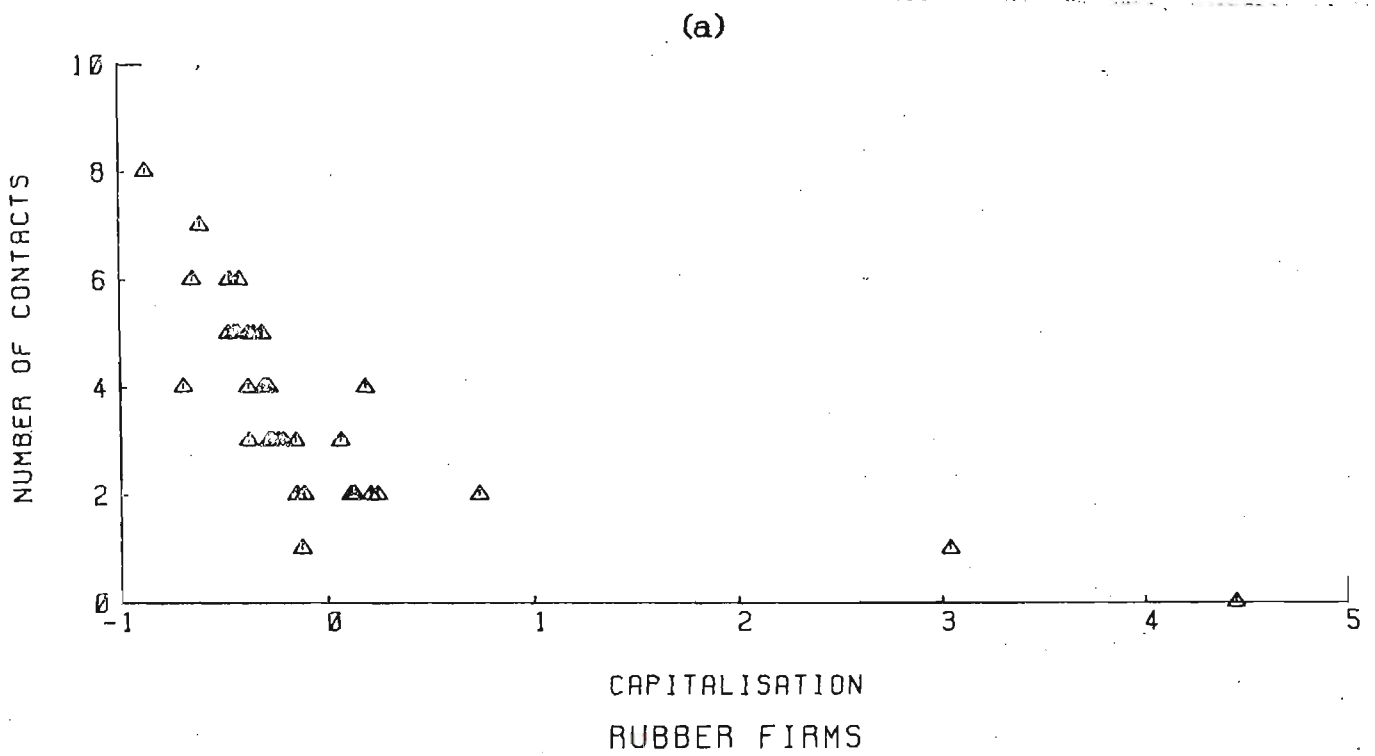


Figure 5.1: Relationship between organisational structure and face to face contacts with suppliers

materials in bulk, they tend to have frequent contacts with material suppliers.

In a case study of the Northern Region of England, Marshall (1979b) concluded that the small size establishments with jobbing technologies had more frequent meeting contacts with customers, while large firms with mass production technologies had less frequent contacts. Regression results of the present study show a positive relationship with the organisational structure (Table 5.7). This is what might be expected for a developing country like Sri Lanka, as most organised medium sized firms supply products direct to customers. The positive relationship with capitalisation and registered firms for textile and rubber firms suggests frequent contacts with customers, in the case of large and well established firms. As the regression model for the metal industries is not significant, it was excluded from the table. Less frequent contacts with customers in both small and medium scale metal working firms is the reason for the non significance of organisational structure.

Findings of a previous study (Marshall, 1979b) suggested more frequent telephone contacts in small firms with jobbing technologies and less frequent contacts in the

large firms with mass production technologies. However, regression results of the present study, considering the telephone contacts with suppliers and customers as dependent variables, are not significant. The simple correlation coefficients and explained variances are low in all three types of firms.

Table 5.6 : Relationship between face to face contacts with raw material suppliers and organisational structure.

Step variable		simple	partial	multiple	R^2	ΔR^2
		re;cof;	re;cof;	re;cof;		
<u>All sampled firms</u>						
1	Capitalisation	-0.21	-0.44(b)	0.21	0.05	0.05
<u>Textile firms</u>						
1	Registered firm	-0.35	-0.87(a)	0.35	0.12	0.12
2	Capitalisation	-0.33	-0.83(a)	0.48	0.23	0.11
<u>Rubber firms</u>						
1	Capitalisation	-0.63	-1.13(a)	0.63	0.39	0.39
2	Production complexity	0.31	0.57(b)	0.70	0.49	0.10
<u>Metal firms</u>						
1	Capitalisation	-0.53	-0.85(a)	0.53	0.28	0.28

(a) significant at 0.01 level

(b) significant at 0.05 level

Table 5.7 : Relationship between face to face contacts
with customers and organisational structure

Step	variable	simple re;cof;	partial re;cof;	multiple re;cof;	R^2	ΔR^2
<u>All sampled firms</u>						
1	Capitalisation	0.19	8.34(b)	0.19	0.04	0.04
<u>Textile firms</u>						
1	Capitalisation	0.35	16.16(a)	0.35	0.12	0.12
<u>Rubber firms</u>						
1	Registered firm	0.43	18.12(a)	0.43	0.19	0.19
2	Capitalisation	0.37	15.72(b)	0.57	0.33	0.14

(a) significant at 0.01 level

(b) significant at 0.05 level

These results are not surprising since for their raw material purchases, most entrepreneurs do not depend on the telephone contacts, but visit the suppliers directly. Also face to face contacts are common to all industries. Due to limited facilities and inefficiency of services, as noted above, frequent telephone contacts with customers are not recorded for most surveyed firms resulting in weak relationships with the organisational structure. In the rubber industry, only the regression models using the telephone contacts with bank officers, technical advisers and other industrialists as independent variables are

significant. The patterns of these relationships are illustrated in Figure 5.2 (only the values corresponding to the firms with telephone facilities are included in the Figure). As shown in Figure 5.2a three large registered rubber firms recorded the highest number of telephone contacts with bank officers.

Figure 5.2b demonstrates the telephone contacts with technical advisers in four registered and three non registered firms. Contacts with other industrialists are related to the capitalisation, suggesting frequent contacts in large firms (Figure 5.2c). This is as expected as most smaller firms have contacts with customers rather than with other industrialists. These relationships are also supported by the results of the regression analyses (Table 5.8). Explained variances are high accounting for 78 percent, 56 percent and 64 percent of variances respectively by the organisational structure (Table 5.8). Registered large firms have more frequent contacts than the smaller firms.

Postal contacts with suppliers, customers are not significantly related to the organisational structure even at 95 percent level. This is because most surveyed firms did not have postal contacts. Although the regression models using postal contacts with bank officers in textile and metal

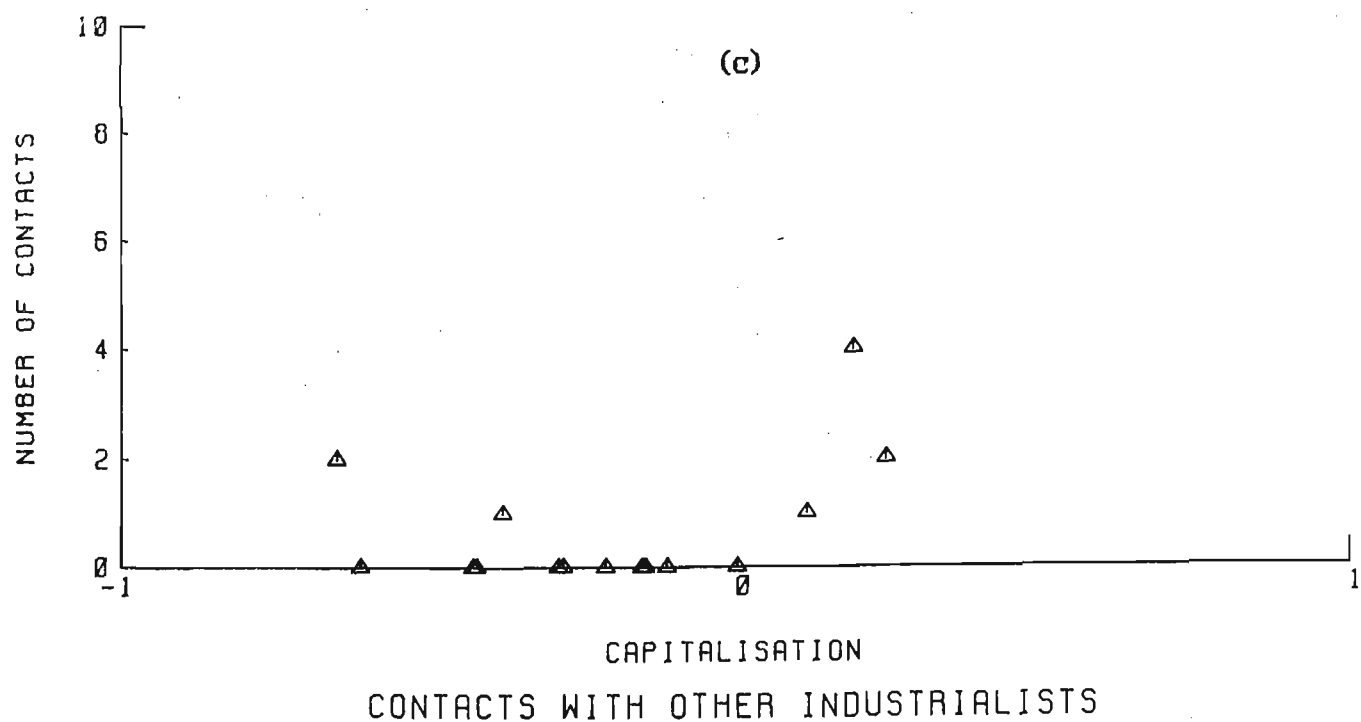
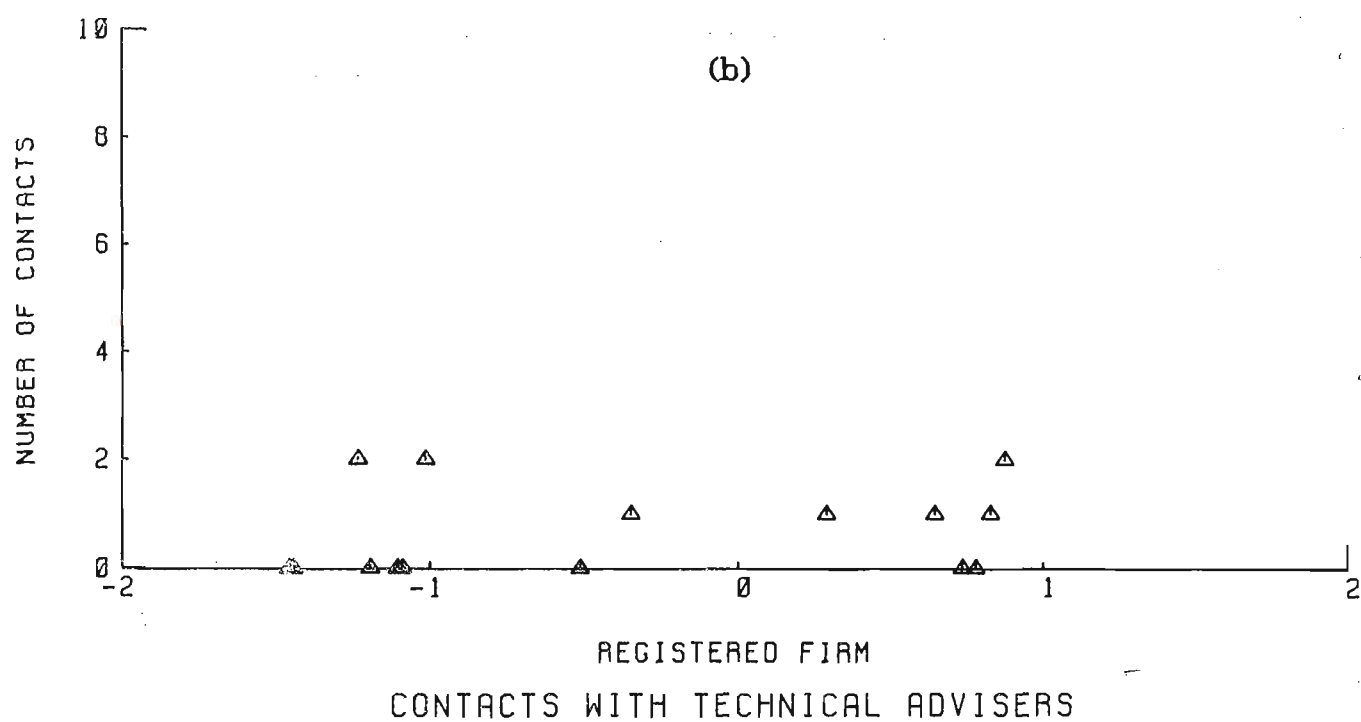
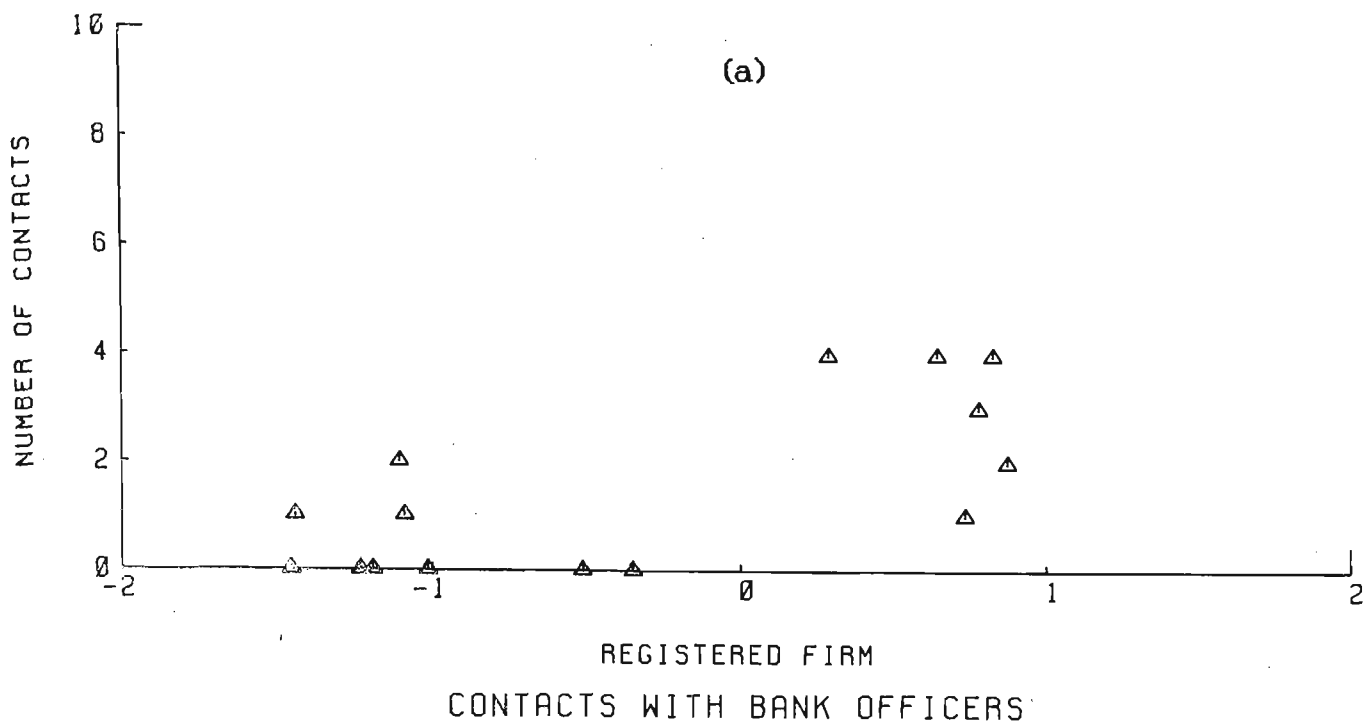


Figure 5.2: Relationship between organisational structure and telephone

Table 5.8 : Relationship between telephone contacts and the organisational structure in the rubber industry

Step variable		simple re;cof;	partial re;cof;	multiple re;cof;	R^2	ΔR^2
<u>Contacts with bank officers</u>						
1	Registered firm	0.81	1.45(a)	0.81	0.66	0.66
2	Foreign R/M utilisation	0.49	0.55(b)	0.88	0.78	0.12
<u>Contacts with technical advisers</u>						
1	Registered firm	0.65	0.49(b)	0.65	0.42	0.42
<u>Contacts with other industrialists</u>						
1	Capitalisation	0.68	2.18(a)	0.68	0.46	0.46

(a) significant at 0.01 level

(b) significant at 0.05 level

firms are significant at 95 percent level, nevertheless the relationships are not strong (Table 5.9). This is due to the small number of recorded postal contacts in most surveyed firms. As younger metal firms seek technical advice they tend to have more frequent postal contacts with them. Compared to the other two industries, inter-industry relationships are higher for metal firms, therefore significant relationships exist with respect to the metal firms.

Table 5.9 : Relationships between postal contacts and organisational structure

Step	variable	simple re;cof;	partial re;cof;	multiple re;cof;	R ²	ΔR ²
<u>Contacts with bank officers</u>						
<u>All sampled firms</u>						
1	Export orientation	0.23	0.38(a)	0.23	0.05	0.05
<u>Textile firms</u>						
1	Export orientation	0.26	0.62(b)	0.26	0.07	0.07
<u>Metal firms</u>						
1	Registered firm	0.38	0.30(b)	0.38	0.14	0.14
<u>Contacts with bank officers</u>						
<u>Textile firms</u>						
1	Registered firm	-0.32	0.17(b)	0.32	0.10	0.10
<u>Metal firms</u>						
1	Younger firm	0.49	0.23(a)	0.49	0.24	0.24
2	Registered firm	0.30	0.14(b)	0.57	0.33	0.09
3	Production complexity	0.28	0.13(b)	0.64	0.40	0.08
<u>Contacts with bank officers</u>						
<u>Metal firms</u>						
1	Capitalisation	0.41	0.59(a)	0.41	0.17	0.17
2	Production complexity	0.31	0.45(a)	0.51	0.26	0.09
3	Registered firm	0.27	0.39(a)	0.58	0.34	0.07

(a) significant at 0.01 level

(b) significant at 0.05 level

SUMMARY

Studies on large firms in developed countries have shown that most of the service activities were internalised while few higher order services were externally supplied. In contrast to this most of the service needs of smaller firms in developing countries are obtained externally. This chapter emphasised the externalised pattern of transport services of small and medium scale manufacturing firms in Colombo. However, the degree of internalisation of plant consultancy services varies between the three types of industries with highly internalised plant and consultancy services in textile and rubber industries and more externalised links in the metal working industries. In developed countries telephone and postal contacts are considered as a means of exchange information between organisation. However, entrepreneurs in Colombo considered direct personal contacts as an effective way of exchanging information.

Previous studies have suggested a relationship between the pattern of service activities, information flows and the organisational structure. Results of this study showed weak relationships between service activities and organisational structure. These can be expected as

most services were externalised in small and medium scale firms in developing countries. Significant relationships emerged only with financial and legal services. Communication links are also not significantly related to the organisational structure. This is because of the significance of direct personal contacts and the non significance of indirect contacts such as telephone and postal contacts in the surveyed small and medium sized firms.

CHAPTER 6 : ENTREPRENEURIAL ATTITUDES AND LOCATIONAL
DECISION-MAKING FOR SMALL AND MEDIUM SCALE FIRMS IN
THE COLOMBO METROPOLITAN AREA

A number of early studies emphasised the importance of managerial attitudes and perception in locational decision making, including those by McNee (1960), Huff (1960), White (1967), Downs (1970) and Dicken (1971) and later, those by Stafford (1974), McDermott and Taylor (1976), Green (1977), Barr and Fairbairn (1978), Taylor (1978b, 1982) and Barr et al., (1980). Neville and Taylor (1980) underlined entrepreneurial perception as an important theme in industrial geography and McDermott and Taylor have argued that "perception defines the very context within which all factors, internal and external to firms, are weighed, and in which decisions are made" (1976; 345).

It is easier, however, to recognise the importance of attitudes and perception than to measure them, though a number of attempts have been made. Picton (1953) has shown the impact of labour on managerial images related to the establishment of branch factories in South Wales by West Midland based firms. The study showed the availability of buildings and labour supply as the most important factors, while transport and other factors occupied a

minor, secondary place. Newby's (1971) findings on the relocation of firms in the South West Region in England also indicated the non significance of economic factors. He emphasised the 'holiday area' item as important but downplayed the significance of economic considerations such as accessibility. Using content analysis (Sunberg and Tyler, 1962) to measure attitudes to locational factors amongst a small sample of businessmen in Appalachian Ohio, Stafford (1974) found personal contacts and labour factors (productivity, wage rates and availability) to be important. Green's study (1977) dealt with managerial perception of government industrial policy in Britain and concluded that the quantity of information on regional economic policy incentives was of particular importance.

McDermott and Taylor (1976) in a study of manufacturing firms in Auckland and five secondary centres in New Zealand suggested the changing pattern of attitudes between different locations. A major difference in managerial perception was revealed between organisations located in Auckland and other secondary centres. A study conducted in Canada (Barr et al., 1980), showed that there was no consistent relationship between the attitudes of the decision makers of firms and the different industrial

categories, though there was a statistically significant effect of different locations on their perception of the behavioural environment. It is also apparent that different factors are important in managerial images at different spatial scales. At the inter-regional scale, market and transport factors seem to be important, while at regional and local scales, service and supply factors and labour factors are found to be important (McDermott and Taylor, 1976).

Recent studies have suggested that the structure of organisations is a determinant of managerial attitudes. Differences in attitudes have been revealed between managers of complexly organised large enterprises and simply organised single plant firms. Taylor and McDermott (1977) suggested that larger and more complexly organised firms possess the most distinctive and polarised attitudes, while smaller and less complexly organised firms have more weakly developed and less extreme opinions. Findings of Neville and Taylor's (1980) study in Singapore also emphasised the organisational structure rather than the product type as a primary determinant of managerial attitudes. Managers of foreign owned, large scale multiplant organisations were more favourably concerned with access to international markets and availability of

land, labour and finance in Singapore, while the entrepreneurs of smaller firms, specially locally owned firms, were more concerned about closeness to their residence.

The published studies of managerial attitudes outlined above tend to place their primary emphasis on the nature and composition of the attitudes that industrialists have towards their economic environments, the spatial dimensions of these attitudes, the influence of organisational characteristics on managerial images and the impact of government policy measures on changes of attitudes. Although some research has been done in developed countries, Taylor (1982) noted that this still remains as an under-researched area in industrial geography. The impact of social and cultural relationships and the nature of the organisational structure of firms as factors influencing the attitudes of entrepreneurs in developing countries require examination and this chapter attempts to make a contribution to this research area. The following questions are addressed -

- i. to what extent do the social and cultural relationships influence the nature of attitudes that industrialists possess towards their environments?

- ii. does entrepreneurial perception vary between different types of industries?
- iii. how does the organisational structure of small and medium size firms in Colombo affect entrepreneurial attitudes?

The chapter follows in three sections. First, an attempt is made to identify the measurement procedures used in previous studies and to describe the scaling method adopted in the present study. Second the nature of attitudes that industrialists possess towards their environment is examined by using the mean attitude scores. The aim of this exercise is to identify whether personal factors dominate the entrepreneurs' attitudes towards their locations. The interindustry differences in attitudes to locational factors are also discussed in this section. Third the relationships between the structure of organisations and attitudes are examined.

MEASUREMENT PROCEDURES : A NOTE ON SCALING METHODS

There is a large amount of psychological literature on attitude measurement (Summers, 1970) and a variety of scaling techniques have been developed, many of which show a high degree of theoretical and mathematical

sophistication. Emphasis has been placed in the techniques upon the identification of structure (Summers, 1970). However, these methods are neither simple nor quick to administer and it was decided that they would not be suitable given

- i. the variation in intellectual capability likely to be found in a random sample of small and medium entrepreneurs, and
- ii. the limited time and the availability of resources for interviewing.

A less sophisticated technique was required which would be simple, and thus easy to comprehend, and quick to administer. In this present study a scaling technique had to be chosen in such a way that it was not only suitable for the measurement of attitudes with regard to industrial locations, but also to sample size, the resources and time available for fieldwork.

Early studies of geographical perception (White, 1967; Gould, 1974; Stafford, 1974) employed ranking methods for measuring attitudes. Some relied mainly upon attitude statements and rating scales. Scaling methods were first used in geographical studies by Downs (1970) in

relation to a study of shopping behaviour though McDermott and Taylor (1976) pointed out that this was no more than specification of the semantic differential method. The semantic differential model (Osgood, et al., 1957) measures attitudes in terms of ratings on bipolar scales defined with contrasting objectives at each end. This scaling technique offers great potential for obtaining quantitative information, and therefore comparable reconstruction of images of objectives (Downs, 1970).

McDermott and Taylor (1976) used a modified semantic differential method. In their study entrepreneurial attitudes towards their behavioural environment were examined using a seven point rating scale. Neville and Taylor (1980) used an almost identical technique with a five point rating scale to investigate the attitudes of entrepreneurs of plastic and electronic industries in Singapore. Again Taylor (1982) employed a similar technique using a five point scale to measure the attitudes of Auckland entrepreneurs. Barr et al ., (1980) adopted a somewhat different technique where rating scales were constructed after the data had been collected by interviews. In this study nine environmental items were explored in relation to 50 specific statements and 7 point rating scales were constructed based on this information. Most

of this research has however, relied upon the use of attitude statements and rating scales. The advantage of this method is its simplicity and the method obviates the general difficulty of having long interviews with entrepreneurs on attitudes. On the basis of this advantage it was decided to present entrepreneurs with an array of statements expressing specific attitudes towards industrial location and to ask them to state how much importance they would give for each statement on a five point scale.

It has been realised that the optimum number of scale categories with intelligent samples is nine, but with less intelligent samples fewer scale units should be used. This was the justification for using a five point scale, as a random sample of entrepreneurs is likely to include a wide variation of intellectual ability. The scale categories used in this study were "not important", "rather unimportant", "occasionally important", "usually important" and "extremely important". Scores of 1 to 5 were allocated to each of the rating scale categories from "not important" to "extremely important". The description given for each point will aid the entrepreneurs to identify clearly the differences between each point. Sixteen locational factors were presented to the entrepreneurs who were requested to state the importance of each factor on a five point scale. These locational factors are listed in Table 6.1.

Some of the factors presented to entrepreneurs were conceptually interrelated so that, for convenience these factors can be grouped into four broad sets describing three aspects of availability access and potential for raw materials and market; availability and cost of land, labour and capital; availability and access to services and utilities and personal factors. This grouping suggests the possibility of duplication of scores, for example, when the availability and cost of an item are closely related. In addition, the relationships among the scales suggest that the statements themselves may be part of the wider statements in the managers' images of location.

ATTITUDES OF ENTREPRENEURS IN THE COLOMBO METROPOLITAN AREA

Previous studies of entrepreneurial attitudes towards locational factors showed the significance of factors such as labour and land. Aggregate attitudes for New Zealand manufacturers (McDermott and Taylor, 1976) demonstrated that land costs and land availability are most important factors for Auckland manufacturers, while labour relations, land availability and residential attraction are particularly favourable considerations for secondary centre manufacturers. In a recent study Taylor (1982) concluded that the quality and stability of the

labour force was of paramount importance. However, these studies are biased towards the large firms in developed countries. Attitudes of small entrepreneurs in Colombo are somewhat different from those revealed in early studies.

Table 6.1 : Locational factors presented to the entrepreneurs in measuring attitudes

1. Access to markets (proximity to wholesale and retail markets).
2. Potential for the local market (including the marketing facilities to other industries and government organisations).
3. Availability of raw materials (availability in the local market).
4. Cost of raw materials.
5. Availability of land.
6. Advantages of land prices and rent.
7. Accessibility to capital (access to financial capital provided by banks).
8. Availability of labour.
9. Cost of labour (relative significance compared to the other locations).
10. Existence of transport facilities (private external).
11. Availability of public utilities (electricity, water and telephone).
12. Access to service (technical and professional services provided by public institutions).
13. Access to local amenities (shopping, housing, schooling and recreational facilities).
14. Closeness to home and family.
15. Personal contacts with others.
16. Personal preference to this area.

Entrepreneurs in Colombo consider the service facilities, utilities and personal factors as most important and access to amenities and cost factors (labour and land) as least important. Mean attitude scores are depicted in Table 6.2 and presented in Figure 6.1. Values for the statements shown in the table and the diagram clearly indicate that the availability and access to services and utilities and personal factors can dominate the entrepreneurial image of the behavioural environment.

The aggregate attitude scores show access to service and utilities as the most important aspect occupying the first place on the scales. Personal factors have become an important aspect and occupy the second place. The significance of personal factors among the entrepreneurs in Colombo is similar to Staffors's (1974) analysis which was based on small entrepreneurs where he concluded that personal factors dominated entrepreneurial images. Factors related to marketing are also important being ranked more than average on the scales.

Service facilities and utilities

Availability and access to service facilities and utilities recorded mean scores occupying the first place

Table 6.2 : Mean attitude scores for entrepreneurs in
the Colombo Metropolitan Area

	1 Textile	II Rubber	III Metal	IV All
Access to market	2.930	2.714	3.591	3.088
Potential for the market	2.580	2.543	3.841	2.988
Availability of raw materials	1.316	3.657	2.932	2.441
Cost of raw materials	1.737	2.229	3.273	2.360
Availability of land	2.105	3.457	3.386	2.868
Land prices and rent	1.895	2.371	2.341	2.162
Accessibility to capital	2.737	3.029	3.295	2.993
Availability of labour	1.545	2.914	3.409	2.623
Cost of labour	1.211	2.200	2.159	1.772
Existence of transport facilities	2.895	2.686	3.945	3.175
Availability of public utilities	2.719	2.343	3.909	3.007
Access to services	2.286	3.686	3.586	3.186
Access to local amenities	1.316	2.029	1.750	1.640
Closeness to home and family	3.263	2.971	3.232	3.155
Personal contacts with others	2.737	2.057	2.977	2.640
Personal preference to the area	3.386	2.543	2.932	3.022

Source:-

Sample survey

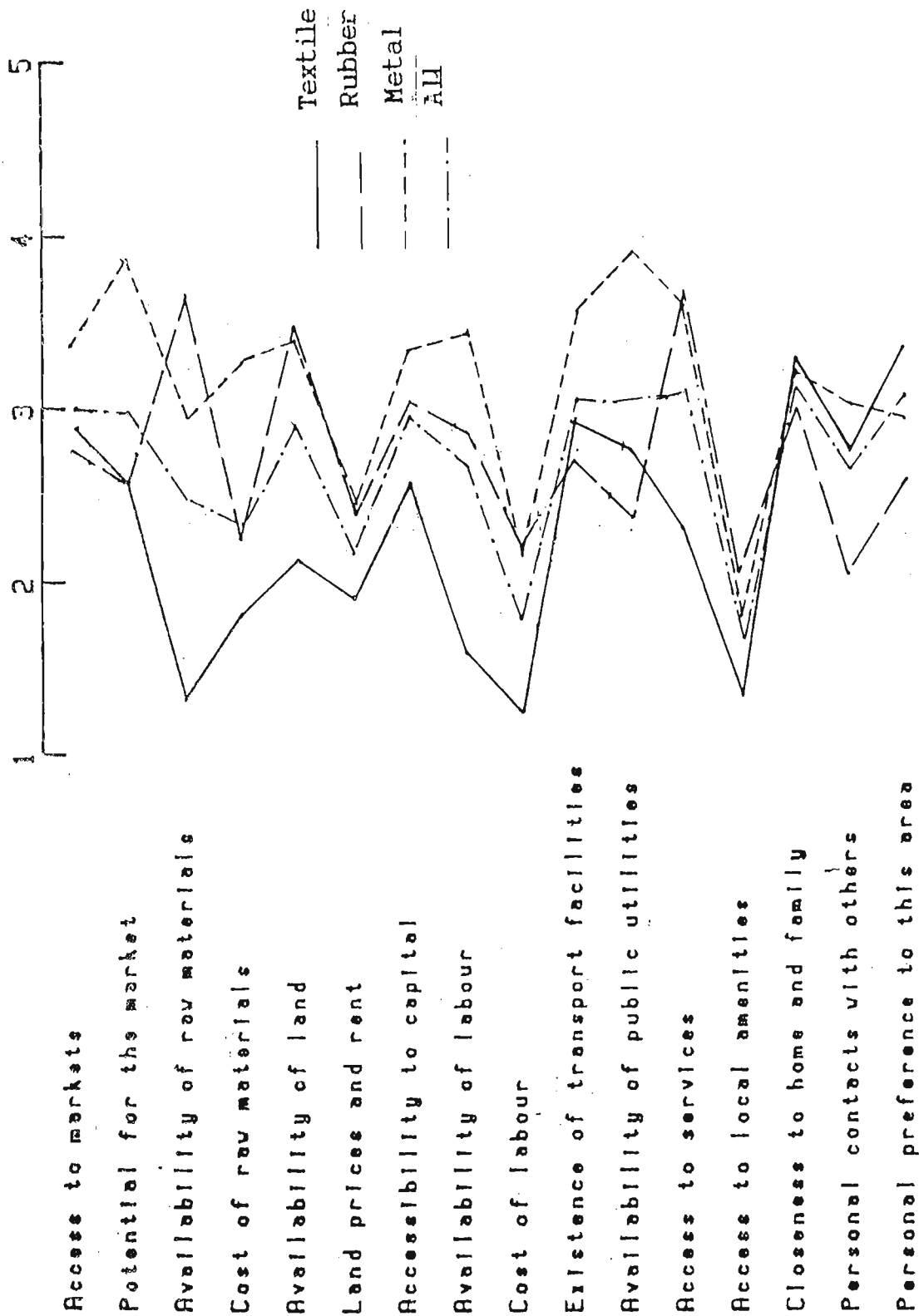


Figure 6.1: Mean attitude scores for entrepreneurs in the Colombo Metropolitan Area

(Table 6.2) on the attitude scale. This situation seems to be true for other developing countries. In a study of Singapore Neville and Taylor (1980) noted that transport facilities are perceived as the most important aspect.

Townroe (1979) pointed out that due to the less developed nature of the transport system and the restricted availability of services the frictional cost of distance will normally be higher in less developed countries. Therefore industries tend to concentrate in the primate cities located near the coasts. These cities act as nodal points of the internal transportation system and also as ports providing important transport links with the outside world. The infrastructure of Colombo city with its port facilities, central railway system and motor transport system has many advantages over the infrastructure of the outer locations. These factors may have influenced the location decisions of entrepreneurs in Colombo. Only a few surveyed firms (18 percent) use their own transport facilities while the majority depend on private or public transport facilities. Raw materials for metal working and rubber based industries are bulky and heavy so these firms need to use readily available private transport facilities. These reasons may have led the entrepreneurs to consider transportation services as significant.

In most developed countries, public utilities and support infrastructure are fairly ubiquitous and their availability tends to be a minor factor in locational choice. However, the limited provision of utilities and services and their concentration into major cities in developing countries act as a major locational factor. Even in the major cities sometimes the facilities are inadequate. Electrical services will be irregular and water supply may be inadequate. Among the public utilities power supply is more important than water supply and other communication facilities. Only rubber and some small textile firms (batiks) need water for their production processes and most of these tend to use their own wells for water supply. Electricity is an essential service for many industries. Even small metal firms usually need 3 phase electricity supply for their production processes and the availability of this service is considered to be more important than other service facilities. Clearly, entrepreneurs considered the availability of these services to be important, recording a mean score of 3.007. Technical and professional services are also an important facility for small industry sector, since this sector does not often possess intrinsic capabilities in this regard. Since most small units are run by a single proprietor who himself may or may not be technically qualified, assisted only by low grade technical staff, it becomes necessary to provide him with expertise

from outside. Access to these services therefore, is considered as important by small entrepreneurs, recording a mean value of 3.186 (Table 6.2).

Personal factors

Personal factors are an important aspect for entrepreneurs in Colombo, occupying the second place. Closeness to home and family recorded an aggregate mean score of 3.155 for all the surveyed firms. Some of the early empirical studies on personal factors have suggested proximity to home as a prominent locational preference feature. Nishioka (1974) pointed out that to avoid adverse effects of unsuccessful locations and also to secure stable profits, small entrepreneurs seek a rational way to locate an industry in his own town. He also stated "a real life decision maker is not only a businessman or an official, but also a husband and a family member. Thus, he may take family welfare as well as profits into account. Therefore, owners of small firms usually seek a plant site within their families' action spaces". The importance of these strong family relationships can be seen in studies of developing countries. Onyemelukwe (1974) suggested in a study of Nigerian manufacturing industries that industrial entrepreneurs establishing the one man proprietorship type of business often seek plant location in their home

community. In a study of the locational behaviour of small entrepreneurs in Upper Volta, van Dijk (1983) also pointed out that the plot being close to the entrepreneurs house is an important factor for the choice of certain locations. Attitudes of entrepreneurs of Colombo are consistent with these previous studies.

Marketing aspects

Marketing problems and financial difficulties led small entrepreneurs to consider the accessibility to markets as important, recording mean attitude scores as more than average. Due to the low purchasing power of the bulk of the population in developing countries, local markets for the finished products are limited for the small scale producers. Also there are marketing problems from which small industry suffers. Vepa (1976) pointed out that the lack of standardisation, poor designing, poor quality, poor purchasing, lack of quality control, poor business contacts effect the small entrepreneurs; thus the access and potential for markets is considered as important for the entrepreneur.

Cost factors : labour and land

Unlike developed countries the cost of labour

seems to be unimportant for manufacturers in Colombo.

As Rasanayagam (1974) pointed out, among the locational factors singled out in the industrial location literature, costs of labour are viewed as being relatively unimportant in the Sri Lankan context. It is assumed that the labour costs incurred are invariable throughout the island. Studies in some developed countries (Keeble, 1968) testify to the importance of labour factors in influencing industrial location decisions. However, in Sri Lanka due to the high unemployment levels and large families there are good grounds for assuming that the variations in labour costs are very small and hence unlikely to influence the locational choice of industries. According to the census of 1981, of the total labour force 17.9 percent was unemployed. Compared to the other regions a high value was recorded for the Colombo Metropolitan Area, reaching 21.5 percent and 26.1 percent for the Colombo and Gampaha districts. Except for casual employees working in the unorganised sector, labour costs for employees, both in the form of earnings and the costs of general welfare facilities are spatially invariant. The registered manufacturing firms decide the minimum daily wage rates based on labour regulations. This applies to both permanent and casual employees. It can therefore be argued that the wage and salary costs of both permanent and casual employees are

more or less spatially invariant in the different types of industries. This may be the reason for the indicated low score (1.772) on the attitude towards the costs of labour.

The cost of land is a major item in the initial expenditure incurred by any manufacturing industry. However, most of the entrepreneurs in Colombo considered the land prices and rent not important. Of the total surveyed firms 74 percent were located on their own land in which case the cost of land becomes a much less significant factor. Moreover, 35 percent of firms used very small sites (below 1000 square metres), while 52 percent used between 1000 - 5000 square metres. Only a few firms (13 percent) have large industrial sites which are more than 5000 square metres. As the land costs incurred by each industry are not available for the surveyed firms, it was difficult to measure the regional variation in land costs. There are differences of average land values within the Colombo city limits and the outer regions, but as most entrepreneurs used their own land, cost of land may not have affected their decision significantly. Access to local amenities such as shopping, housing, schooling and recreational facilities is not an important factor for small entrepreneurs. In a New Zealand study McDermott

and Taylor (1976) noted the significance of residential attraction in the secondary centres. The difference observed in the present study is to be expected as it is concerned with small entrepreneurs.

Inter - industry differences in attitudes to locational factors

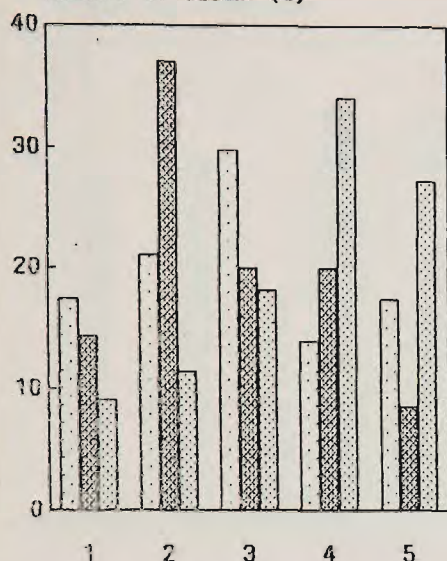
Although, in general, mean attitude scores on some factors are similar in the three types of industries surveyed, a few scales demonstrate some variations between these industries.

- i. The scale referring to access to markets, for example, scores favourably in the textile and metal working firms, accounting for 61.3 percent and 79.6 percent of firms respectively, with more than average scores, while in rubber firms this is less than 50 percent. The first two diagrams of the Figure 6.2 compare the significance of marketing aspects in the three types of industries. The significance of marketing aspects in the textile industry may be due to the direct relationships they need to have with customers.

- ii. Figure 6.2 also clearly distinguishes the scale referring to the availability of land between textile industry and the other two types. In the textile sector more than 75 percent of firms recorded a below average score, while in the other two sectors more than 75 percent recorded an above average score.
- iii. Variation of attitudes can be seen in scores referring to access to services. The position of this statement indicates the significance of technical services for the rubber based (3.69) and fabricated metal (3.59) firms. Compared to these two industries entrepreneurs of textile firms (2.29) do not consider the access to technical services as an important aspect. Smaller textile firms, which are mainly labour intensive do not require any technical services, while the large well organised firms externalised their services.

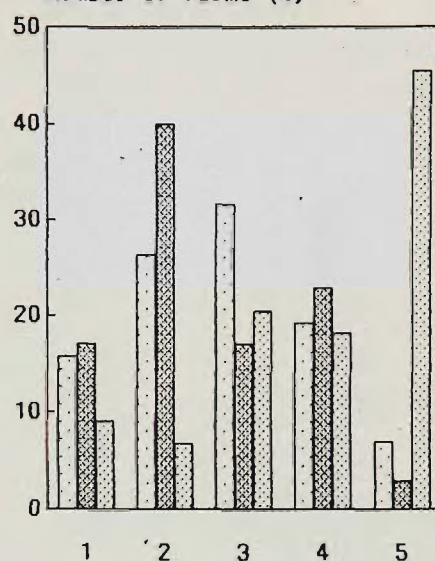
A general consistency of attitudes involving land prices and rent can be seen between the three types of industries. In general, most small manufacturers do not regard the land prices and rent as important since the entrepreneur or a family member is the owner of the plot.

Number of firms (%)



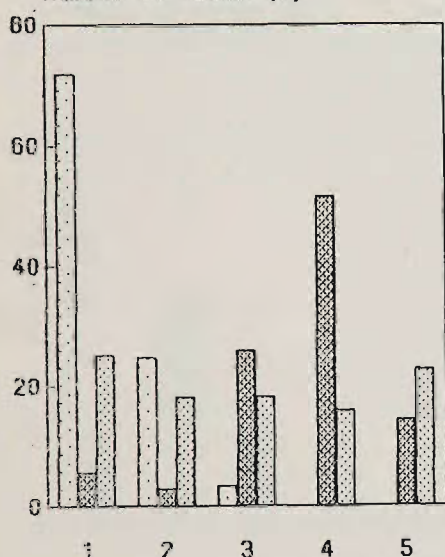
Access to market

Number of firms (%)



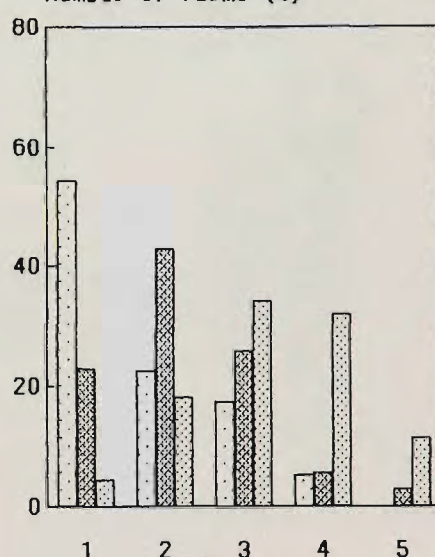
Potential for the market

Number of firms (%)



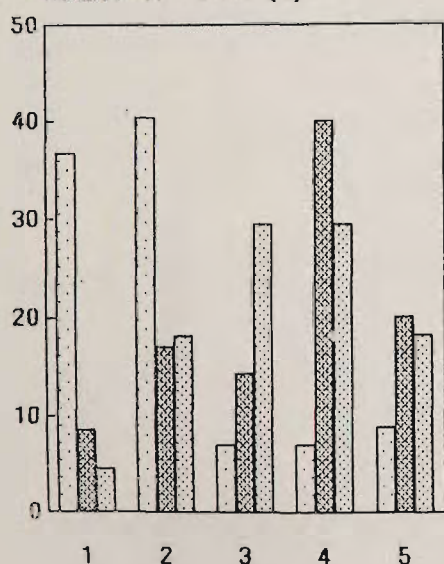
Availability of raw materials

Number of firms (%)



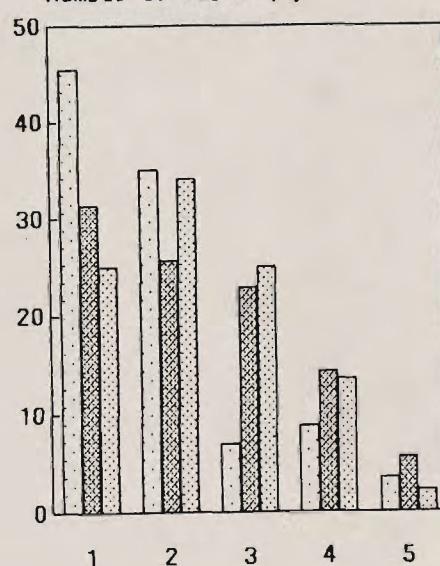
Cost of raw materials

Number of firms (%)

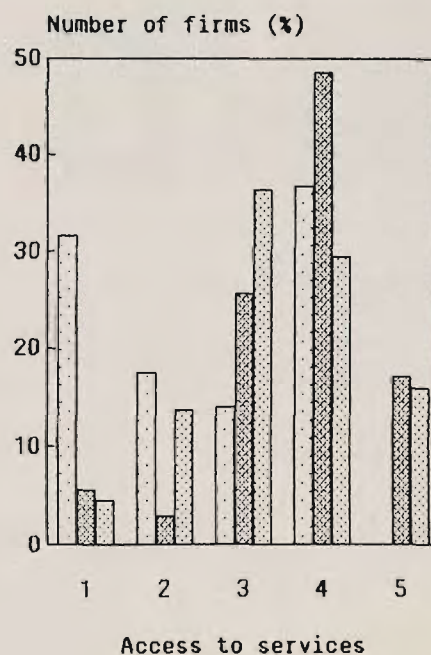
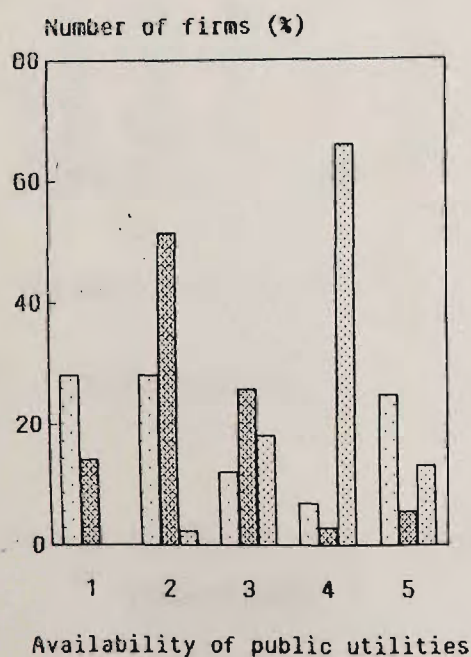
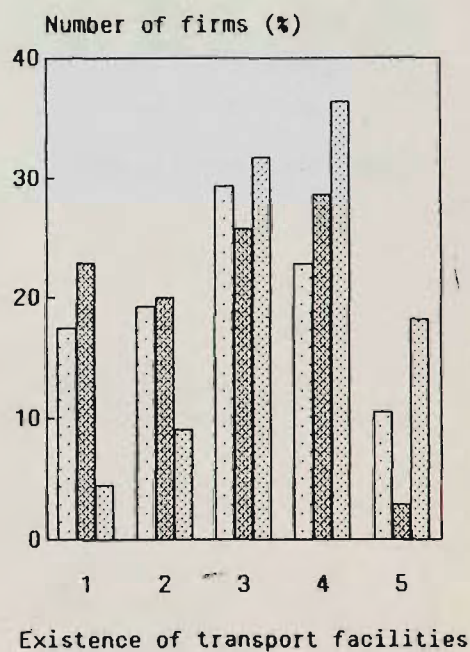
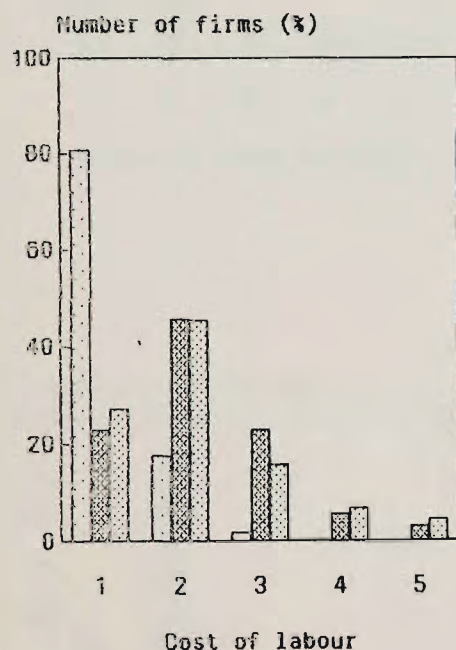
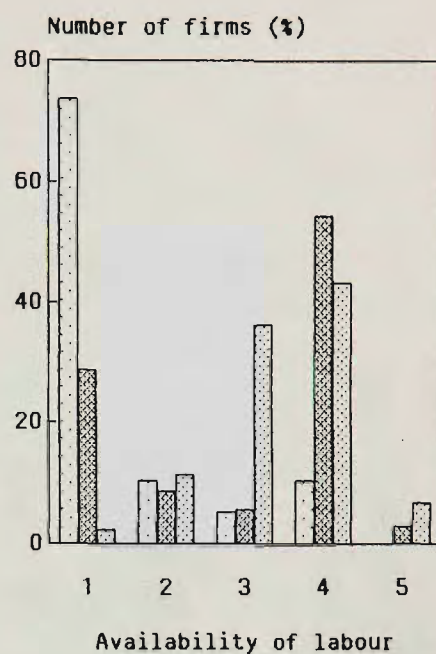
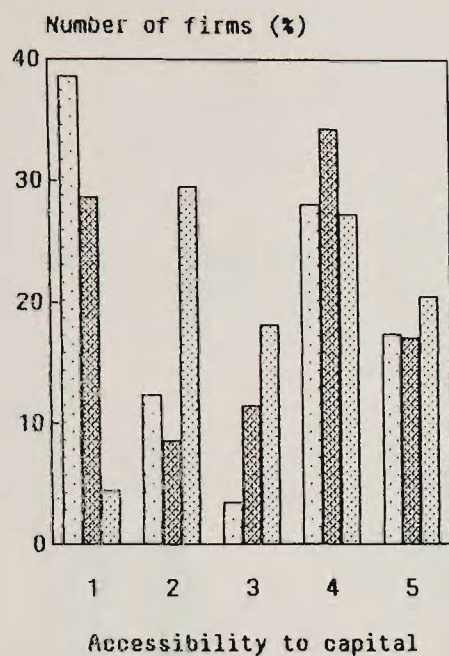


Availability of land

Number of firms (%)



Land prices and rent



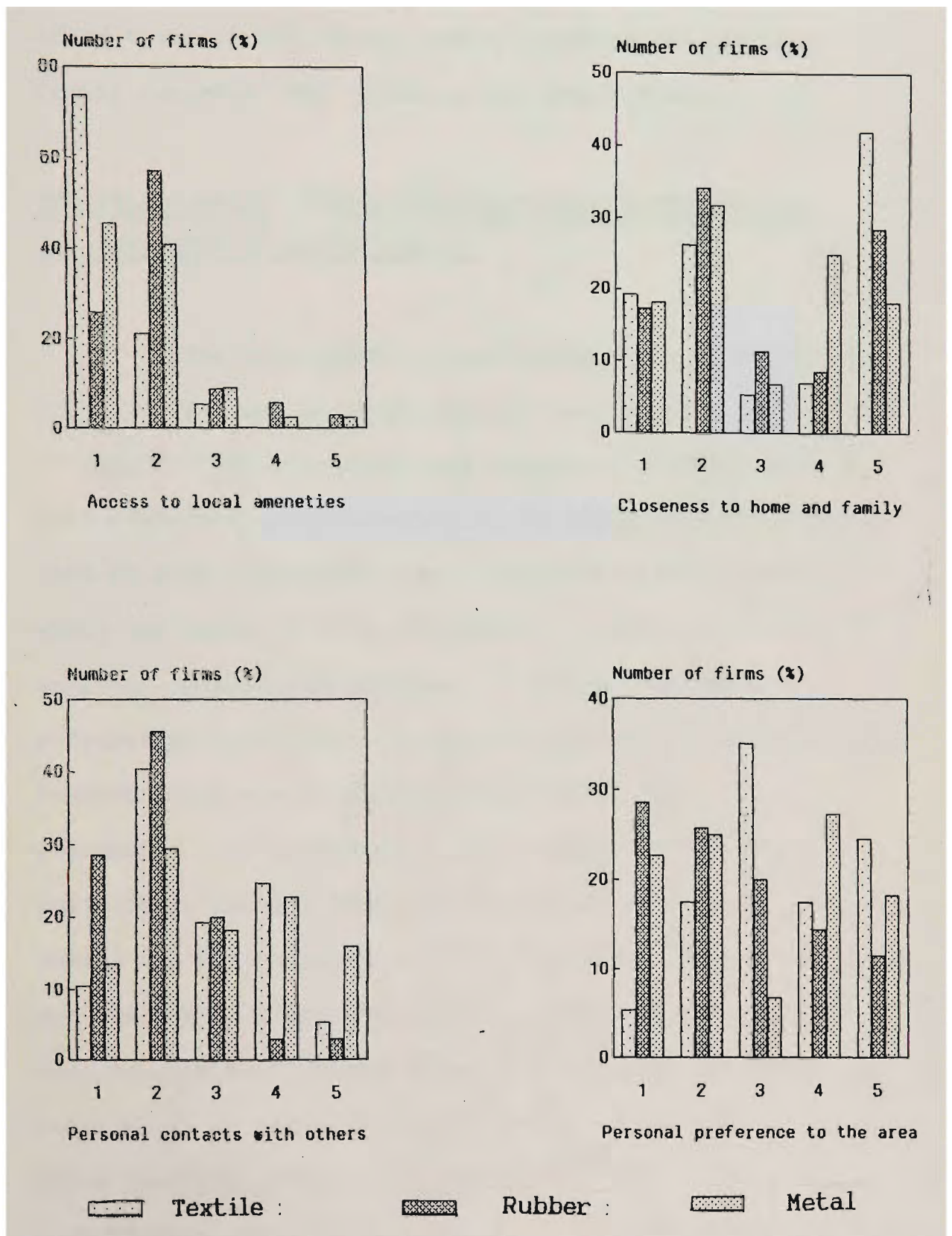


Figure 6.2: Attitude scores for entrepreneurs in the three types of industries

There is a consistency of attitudes towards the access to local amenities rating this as below average in all three types of industries, while closeness to home and family recorded high values in all three types.

THE RELATIONSHIP BETWEEN ORGANISATIONAL STRUCTURE AND THE ATTITUDES OF ENTREPRENEURS

The organisational structure of firms defined in Chapter 3 is used in examining the relationship between the attitudes of entrepreneurs and structure of organisations. This study differs from previous attitudinal studies in that it uses a comprehensive structural classification which was based on a large number of organisational characteristics in small industries. Kendall's tau rank correlation coefficient is used to measure the relationship between structure of organisations and entrepreneur attitudes. It was chosen in preference to Spearman's rho coefficient because Kendall's statistic is better able to handle the large number of variables in the data set which were tied at a given rank. It is important to note that when neither coefficient is close to unity, Kendall's tau coefficient is about 50 percent less than rho in absolute value (Kendall, 1970). Kendall's coefficients and their significance tests facilitate the comparative analyses of

these relationships in the three types of industries surveyed. Across the three industries there are differences in the relationships between the organisational structure of firms and entrepreneurial attitudes.

The organisational structure and service facilities and utilities

Results of the analyses show strong relationships between the structure of manufacturing firms and attitudes in relation to service facilities and public utilities (Table 6.3, 6.4 and 6.5). Existence of transport facilities is negatively related to the capitalisation in all three types of industries suggesting that small, firms consider this as important while large firms view this as unimportant due to the internalisation of their transport services. As shown in the tables the relationship was significant at the 99.9 percent level in the textile firms, while in the rubber and metal firms it was at the 99 percent level. Availability of public utilities such as electricity, gas, water and communication facilities were found to be important for both export oriented large firms and for the smaller firms. Table 6.3 shows a positive relationship with export orientation and a negative relationship with capitalisation in the textile firms.

The negative relationship (-0.59) with capitalisation indicates the significance of public utilities for smaller metal firms. The positive relationship with capitalisation in the rubber based firms is due to the non significance of electricity and gas supply for the smaller labour intensive industries, but for the large organisation communication facilities and power supply seemed to be more important factors.

There is a variability of attitudes between large and small organisations in relation to the access to technical and professional services. These results are in accordance with a previous study (Taylor and McDermott, 1977). The study shows attitudes to professional services vary significantly for all organisational types, suggesting that the managers of older, larger multiplant firms view the professional services unfavourably, while small, younger single plant firms regard these services as satisfactory. As most small rubber and metal manufacturers often obtain technical services from public organisations they consider these services as important. Conversely, the large well organised firms internalised the services and therefore do not treat this factor as important.

Table 6.3 : Relationship between attitudes of
entrepreneurs and organisational
structure of textile firms

	I Export orientation	II Capitalisation	III Registered firm
Access to market	0.29(b)	-0.83(a)	0.00
Potential for the market	0.29(b)	-0.77(a)	0.07
Availability of raw materials	-0.08	0.20	-0.07
Cost of raw materials	0.11	0.04	-0.07
Availability of land	0.19(c)	-0.12	0.02
Land prices and rent	-0.15	0.19(c)	0.05
Accessibility to capital	-0.12	0.04	0.83(a)
Availability of labour	-0.02	-0.54(a)	-0.03
Cost of labour	0.06	0.07	0.13
Existence of transport facilities	0.24(b)	-0.80(a)	0.00
Availability of public utilities	0.87(a)	-0.31(a)	-0.03
Access to services	-0.06	0.09	0.69(a)
Access to local amenities	0.16	-0.15	0.05
Closeness to home and family	0.12	-0.04	-0.84(a)
Personal contacts with others	0.21(b)	-0.10	-0.62(a)
Personal preference to the area	0.21(b)	-0.03	-0.64(a)

(a) significant at 0.001 level

(b) significant at 0.01 level

(c) significant at 0.05 level

Table 6.4 : Relationship between attitudes of entrepreneurs and organisational structure of rubber firms

	I Capitali- sation	II Product. complexity	III Registered firm	IV Foreign raw material utilization
Access to market	-0.52(a)	0.25(c)	0.03	0.18
Potential for the market	-0.49(a)	0.08	0.02	0.22(c)
Availability of raw materials	-0.79(a)	0.23(c)	-0.18	0.25(c)
Cost of raw materials	-0.01	-0.03	-0.07	-0.01
Availability of land	-0.16	-0.16	-0.21(c)	0.10
Land prices and rent	0.12	-0.12	0.19	-0.03
Accessibility to capital	0.11	-0.06	0.88(a)	0.07
Availability of labour	0.08	0.08	-0.02	-0.05
Cost of labour	0.00	-0.01	-0.08	0.24(c)
Existence of transport facilities	-0.33(b)	0.05	-0.06	0.28(b)
Availability of public utilities	0.74(a)	-0.22(c)	0.18	-0.24(c)
Access to services	-0.75(a)	0.25(c)	-0.17	0.20
Access to local amenities	0.31(b)	-0.17	-0.19	-0.02
Closeness to home and family	-0.11	0.06	-0.88(a)	-0.07
Personal contacts with others	0.25(c)	-0.08	-0.29(b)	-0.10
Personal preference to the area	-0.07	0.04	-0.73(a)	-0.16

(a) significant at 0.001 level

(b) significant at 0.01 level

(c) significant at 0.05 level

Table 6.5 : Relationship between attitudes of
entrepreneurs and organisational structure of
metal firms

	I Capitali- sation	II Product. complexity	III Registered firm	IV Younger firm
Access to market	-0.14	-0.06	0.23(c)	0.01
Potential for the market	-0.09	-0.02	0.14	-0.18
Availability of raw materials	0.01	-0.10	-0.05	-0.17
Cost of raw materials	-0.72(a)	0.03	0.14	-0.14
Availability of land	-0.53(a)	0.07	0.02	-0.07
Land prices and rent	-0.14	-0.01	0.07	0.01
Accessibility to capital	-0.19	-0.10	0.74(a)	-0.01
Availability of labour	-0.78(a)	0.10	0.21(c)	-0.04
Cost of labour	0.03	-0.18	0.03	-0.14
Existence of transport facilities	-0.32(b)	-0.08	0.32(b)	0.04
Availability of public utilities	-0.28(b)	0.30(b)	0.27(b)	-0.01
Access to services	-0.59(a)	0.08	0.19(c)	-0.03
Access to local amenities	-0.19(c)	0.03	0.19(c)	0.09
Closeness to home and family	0.25(b)	0.05	-0.87(a)	-0.04
Personal contacts with others	0.22(c)	0.03	-0.62(a)	0.00
Personal preference to the area	0.21(c)	0.01	-0.67(a)	-0.11

(a) significant at 0.001 level

(b) significant at 0.01 level

(c) significant at 0.05 level

The organisational structure and personal factors

Strong relationships can be seen between the attitudes related to personal factors and the organisational structure in all three types. High negative values (-0.84, -0.88, -0.87) demonstrate that the entrepreneurs of the unregistered firms consider the closeness to home and family as important in all three types of industries suggesting the strong family relationships in small surveyed firms. The factor appears to be stronger than the other personal factors such as personal contacts and personal preference. However, the findings of these two factors also present a very clear picture of the relationship with organisational structure by negatively associating with the registered firms. Similarity of these relationships can be seen between the types of industries surveyed, suggesting the types of products do not have any effect on the attitudes towards personal factors.

The organisational structure and inputs

Attitudes in relation to inputs such as raw materials, labour and land are not significantly related to the organisational structure of firms. Weaker relationships are due to the unimportance of factors

such as availability and cost of raw materials and labour in the locational decisions of most surveyed firms. However, availability of raw materials for the small rubber manufacturers and the cost of raw materials for smaller metal manufacturers emerged as important, relating negatively to capitalisation (Tables 6.4 and 6.5). Smaller metal firms which buy materials from retailers in small quantities usually pay a higher cost than the larger firms which purchase the materials in bulk from the wholesalers of the Steel Corporation. Also the few large metal firms who import their materials directly pay a lesser price for their raw materials.

Attitudes towards the cost of labour are not significantly related to the organisational structure, as the labour costs are invariant in the surveyed industries. Nevertheless, the availability of labour is negatively associated with the degree of capitalisation in metal firms. This result is consistent with the Singapore study, in which it was shown that the attitudes towards the labour availability are different in large organisations to those in small organisations, attitudes in the latter being more critical. The negative correlation coefficient in metal firms (-0.77) which is significant at the 99.9 percent level demonstrates the way in which the smaller, less

capital intensive industries view this aspect as very important, while large capital intensive industries consider it as important, but to a lesser degree. This relationship is expected as most small metal firms need more skilled workers than the other two types.

Only in the case of metal firms was a significant relationship observed in relation to the availability of land. Attitudes on land prices and rent are not significantly related to the organisational structure in any of the three types of industries. This is because most entrepreneurs do not view this as an important aspect since they use their own land. The results are similar to those for the analyses for Singapore manufacturers which indicated indifferent attitudes towards the availability and price of land.

Relationships between the structure of manufacturing organisations and the accessibility to capital show a similarity in the three types of industries. Registered manufacturing firms have favourable attitudes while unregistered firms recorded less favourable attitudes. Firms registered with the government have a better access to capital than do the unregistered industries. Tables 6.3, 6.4 and 6.5 show positive relationships with

registered firms and these are significant at the 99.9 percent levels.

The organisational structure and marketing aspects

There is variability in the relationships between the organisational structure of firms and the attitudes related to marketing factors in the types of industries surveyed. The relationship is much stronger in textile firms than the other two types. Smaller less capital intensive textile firms consider the access and potential for the market as more important, while the large industries which do not supply the products direct to customers consider the marketing aspect to be unimportant. High negative correlation with the capitalisation component supports this, the coefficients being -0.83 for access to markets and -0.77 for potential for the markets (Table 6.3).

Attitudes related to marketing factors in rubber firms are also significantly correlated with the degree of capitalisation. This relationship is also as expected because more than 50 percent of rubber firms with less than 20 employees send their finished goods direct to customers, while all the organised large rubber firms have direct relationships with other related industries (Table 6.4).

SUMMARY

Findings of the study suggested that, more than any other locational factors, the availability and access to service facilities and utilities are significant for the locational decision making of small manufacturers in the Colombo Metropolitan Area. In most developed countries these factors seem to be less important for the choice of locations. However, due to the limited facilities and services available in developing countries, availability of public utilities and access to services clearly become more important. Existence of transport facilities, access to services and availability of public utilities dominated the attitudes and concern of entrepreneurs. The study also highlighted the significance of interpersonal relationships in determining the attitudes of entrepreneurs towards their locations. Due to the strong kinship relations small entrepreneurs consider the closeness to home and family as a major locational preference. Although, in general, the attitudes of entrepreneurs showed a consistency among the three types of industries few exceptions on attitudes in relation to some locational factors such as access to markets, availability of land and access to services were observed.

As suggested in previous studies, the structure of manufacturing firms emerged as the major determinant of entrepreneur attitudes. Attitudes related to the service facilities and public utilities are strongly related to the organisational structure. Degree of capitalisation is the main organisational characteristic strongly related to the attitudes of entrepreneurs. Attitudes towards personal factors showed a strong negative relationship with the registered firm status in all three types of industries. Very often, entrepreneurs of unregistered smaller firms seek a location close to their residence while owners of organised firms do not consider this as an important aspect. Weaker relationships exist between the organisational structure and attitudes related to the input factors such as raw materials and labour.

CHAPTER 7 : LOCATIONAL ADJUSTMENTS AND ORGANISATIONAL
STRUCTURE : RECENT CHANGES AMONG SMALL AND MEDIUM
SCALE MANUFACTURING FIRMS IN THE COLOMBO METROPOLITAN
AREA

Although the broad geographical distribution of industries in Sri Lanka hardly changed during the last decade, the number of firms increased and plant sizes, production processes and techniques have been changing rapidly since the late 1970s. The small and medium scale manufacturing sector, in particular, has been given high priority in the development programmes and the present government both the registered and the less formal unregistered type of manufacturing activities have experienced marked changes during the last few years. This chapter focusses on the nature of changes (spatial changes, plant size and product changes) that have occurred more recently in manufacturing firms in Colombo, and on their relationships with the organisational structure of firms. It is useful at the outset, however, to note the way in which questions of locational adjustments have been handled in the literature and the changes in the conceptual framework which have emerged over the last few years.

LOCATIONAL ADJUSTMENTS: SOME PREVIOUS APPROACHES

Over the last two decades, considerable research

has been directed towards documenting the nature of locational adjustments in developed countries. Healey (1983), for example, has argued that manufacturing adjustments include the change of location and the number of plants as well as the change in plant size and production of manufacturing industries over a period of time. Watts (1980) has defined locational adjustments as the "reorganisation where the number of plants of an enterprise remain the same or is reduced, while their capacities, products and linkages are changed. It is clear from these studies that the locational adjustments involve not only the change in location but also the changing pattern of the internal structure, internal production processes and techniques. The process of internal change has spatial consequences since it implies adjustments of the relationships between manufacturing industries and their external environment. Massey (1977) has stressed that "manufacturing is, after all about production, and change of production technology may be having a considerable influence upon industrial location trends through its interrelationships with organisational structure and the external needs of the firms for particular kinds of labour factors and so on".

In the existing literature, it has been pointed

out that the decentralisation process of manufacturing activities in metropolitan areas can be achieved in many ways. These include the physical movement of plants (transfer move) involving their relocation from centre to periphery: the opening of new firms, branches and subsidiary establishments in suburban areas, and the closure of firms (deaths) involving the cessation of production at a plant which is not accompanied by the opening of another plant. In recent geographical studies, the growth and decline of existing establishments, including the change in size (site and employment) and production (addition and loss of products and the change in production capacity) were considered as significant characteristic of manufacturing adjustments. These categories form the basis of what has come to be called the "components of change approach" (Firn and Hughes, 1973; James and Hughes, 1973; Struyk and James, 1975).

In the literature it has been argued that relocation of firms per se is less important than the other processes of change that accompany it (Leone, 1971; James and Hughes, 1973; Wood, 1974; Struyk and James, 1975). Thrift (1979) noted that locational adjustment in the form of plant closure was the most important component of change in inner cities. Empirical studies on British metropolitan

areas also confirm the high level of plant closures as the predominant cause for industrial decentralisation (Firn 1975; Gripaios, 1977a; 1977b; Lloyd and Mason, 1978; Dicken and Lloyd, 1978; Lloyd, 1979; Mason, 1980a,b, 1981). However, in contrast to these studies Cameron (1973), Firn and Hughes (1973), and Bull (1978) concluded that the pattern of plant openings in non central location is more important than the other decentralisation processes. The role of surviving plants in spatial employment change was considered in McDermott's study (1978).

More recently, studies of manufacturing adjustments in developed countries have suggested that the organisational structure of manufacturing firms is a major determinant of the pattern and the degree of manufacturing changes. It has been argued, for example, that plant size influences the relative importance of the various components of change (Dicken and Lloyd, 1978; Cross, 1981; O'Farrell, 1985), and two relationships have been suggested - first, that smaller plants are the most mobile and have a higher propensity to transfer or close, while large plants have the best survival prospects and second, that large plants are more likely to be expanded and have their employment increased than small plants.

A number of factors appear to be important. Small plants have high potential mobility because they have relatively simple requirements for their physical plant and less capital investment to write off when moving. Small firms spend less time searching for the optimum location than larger firms and tend to select the first "minimum requirements" site which they find (Steed, 1972; Cooper, 1975). Also large firms have more flexibility in accommodating expansion because of their ability to purchase land in excess of their needs. Relatively low levels of capital and fewer employees involved in smaller plants influence the higher closure rates. Healey (1981) noted that any economies of scale available are less likely to have been realised in small plants than in large ones. The size of plant may be a factor influencing the probability of its being expanded. In times of growth small plants may be more susceptible to expansion (see, for example, the report of the South East Joint Planning Team, 1971), because any economies of scale to be gained by expansion are generally greater for smaller plants than large ones (Pratten and Dean, 1970).

A number of recent studies have supported these arguments. Mason (1980a,b) found that transfers are common in smaller plants with less than 50 employees. A large

number of studies have established a relationship between size of plants and closures (Luttrell, 1962; Wedervang, 1965; Collins, 1972; James and Hughes, 1973; O'Farrell, 1976; Watts, 1977; Gudgin, 1978; Dicken and Lloyd, 1978; Storey, 1981; Henderson, 1980; Healey, 1981). It has been found that large plants are least likely to go out of business, while small plants are more likely to be closed and transferred. However, Storey (1981) showed a reversal of this trend in that the increase of employment in small establishments is higher than larger plants.

Several authors have sought a relationship between age of plants and types of adjustments. Generally, it is expected that old plants are more likely to be closed or transferred than newly built ones. A negative relationship is identified between age of plants and closures and **relocations** while a positive relationship is shown with expansions. Most newly built plants managed by owner operators have insufficient capital in their early years of operation to purchase a large site or to modernise their processes. However, the "life cycle hypothesis" of plant development suggests that the majority of plants generally survive only a few years after birth and only few plants run ten years or more. In favour of this, Healey (1981, 1982) notes that older plants are more likely to be closed,

transferred or lose their products than newly built plants which are more likely to expand and attract additional products. The older plants are often unsuitable for present day demands as they are not designed for modern production flow techniques. Also older establishments tend to have less space available for expansion, car parking, loading and unloading.

The empirical evidence on relationship between plant age and locational adjustment is conflicting. Sant's (1975) work on closure rates of plants shows that the longer the plant remains in existence the greater is its probability of future survival. According to him closures were relatively uncommon in the initial years, but the probability of closures then increased to a maximum between 5 and 8 years after opening and falling steadily thereafter. Collins (1972) and Gudgin (1978) also supported this statement showing that new plants tend to experience a high mortality rate in their first 5 or 6 years. Similar to these Henderson's (1980) survey results show the proportion of closures occurring in each of the first five years in operation is higher than in any subsequent years. In a study of Ireland O'Farrell (1976) found no relationship between the age of plant and the closure rates. Boswell (1972) has shown a negative relationship between age of

plants and locational adjustments. Healey (1981) argued, that recently opened plants may have a greater potential for adjustments.

It has been suggested in the literature that plant status and ownership pattern greatly influence the manufacturing changes. It is argued that multiplant firms having headquarters located elsewhere are more vulnerable to closure than indigenous local firms (Dicken and Lloyd, 1978; Lloyd and Mason, 1978). The argument here is that plants which are highly dependent on outside management are more likely to be closed than other plants. This is supported by some empirical studies (Luttrell, 1962; Loasby, 1967; Clark, 1976; Healey, 1981). An exception to this is the evidence of Atkins (1973) which suggests that there is no difference in the closure rates of mature branch plants and their parents. Townroe (1975) and Sant (1975) seem to show the reverse to be the case with branch plants frequently having a better survival record even compared to their parent plants.

All the literature reviewed above on the organisational structure of firms and the locational adjustments refers to manufacturing activities in developed countries. No attempt appears to have been made to study

the relationship between the structure of manufacturing organisations and the locational changes in the metropolitan areas of developing countries. The characteristics of metropolitan areas and their economies and institutions in developed countries differ strongly from those in major cities in developing countries.

Moreover because of the scarcity of capital and foreign exchange, managerial and technical skills are significant features in the financial and manpower environment in developing countries. The internal structure of manufacturing firms in the form of ownership pattern, size, investments, raw material utilisation and quality of products are different from those of developed countries. It might be expected that the relationship between the structure of firms and the nature of changes will be different from those of developed countries. In order to explore these relationships within the context of a developing country, this chapter attempts to analyse the relationship between the manufacturing changes and the organisational structure of firms in Colombo. It is hypothesised, therefore, that the extent and the nature of recent changes in the size (workforce and production floor space), capacity and value of production, product additions and losses of manufacturing firms in Colombo are a function

of the organisational structure of firms.

THE DATA BASE OF THE PRESENT STUDY

The data on which the present chapter is based is derived from the industry directories, the census of manufacturing industries and the questionnaire survey (see Chapter 1). However, it should be noted here that there are limitations to the available data on the number of manufacturing establishments.

The latest available directories were published in 1980 and cover all the private sector manufacturing establishments registered with the Ministry of Industries and Scientific Affairs, Ministry of Textile Industries, Ministry of Finance and Planning by the end of 1977. This directory does not contain the establishments engaged in the manufacture of items such as handloom textile, batiks, curios, etc. which are registered with the Department of Small Industries (DSI). This information has to be compiled from the files available at the DSI. As the unregistered establishments carry out their activities independently, it is difficult to obtain the data related to unregistered industries. However, a comprehensive survey on unregistered establishments was carried out by

the IDB in 1976, and this information was published in the directory in 1980. For this survey all establishments processing any raw materials on a commercial basis were considered as industries.

The directory does not include service units such as workshops that undertake only repairwork, bakeries, hotels, wholesale and retail shops, carpentry workshops, gold and silver jewellery shops, tobacco drying centres and other establishments engaged in similar types of activities. With these limitations industry directories provided the data both on registered and unregistered establishments.

However, census data provided only the number of establishments having more than 10 employees. At the time of the survey the details of the establishments with less than 10 employees in 1983 were not readily available and therefore the data had to be compiled from different files obtained from the census department. The number of unregistered manufacturing establishments in Colombo for the year 1983 is therefore, an approximation.

Apart from the recorded data, the information used in this chapter was gathered from the questionnaire survey.

A standard set of questions on the types of locational adjustments and the factors determining those changes was forwarded to the entrepreneurs.

The length of the study period was restricted to six years. With a long study period, industrialists are unable to provide realistic information, as some small entrepreneurs do not have recorded information but supply the information from memory. Again manufacturing changes are more marked since the late 1970s. The pilot survey also indicated that a six year time period was long enough for the firms to have experienced several locational changes. Therefore, a six year time period from the beginning of 1978 to the end of 1983 was chosen.

The chapter falls into two sections. The first identifies the nature of adjustments which have been occurring since 1977 in the Colombo Metropolitan Area. It examines three types of changes, viz, plant number and locational changes, plant size changes (employment and production floor space) and the product changes occurring during this period. The second section analyses the relationship between the organisational structure of firms and the different types of manufacturing adjustments.

THE SPATIAL AND STRUCTURAL ASPECTS OF MANUFACTURING
CHANGES IN THE COLOMBO METROPOLITAN AREA

Spatial changes

Although the government has taken several steps to decentralise economic activity from Colombo city in recent years, it is clear that a large number of manufacturing plants are concentrated in the city (see Chapter 2). According to the available data the number of organised manufacturing establishments in the Colombo Metropolitan Area has decreased from 1252 (Industry Directories, IDB) to 940 (Department of Census and Statistics, 1983), a decrease of 25 percent during the period from 1978 to 1983. Food, beverages and tobacco plants have more or less remained the same; while the number of plants in the textile, wearing apparel, chemical and rubber products sectors and the fabricated metal products in the Colombo municipality have declined by more than 50 percent. However, the information available from the Urban Development Authority (UDA) conflicts with these figures. UDA receive applications for permission to set up industries in the city and approvals have been granted mainly to those small scale firms comprising garments, printing, lathe and carpentry workshops. Considering the

approvals of new establishments, it is not clear whether the reduction in the number of establishments in the city was due to the transfer of firms from the city to the outer regions or as a result of the closure of firms.

It should be noted here that the census data on organised manufacturing firms included only those firms with more than 10 employees; but there exist a considerable number of firms with a smaller number of employees who are registered with government organisations. If these firms are included, the number of organised manufacturing firms in the city in 1983 would definitely be higher than the number indicated above. Reliable data on plant closures in the Colombo Municipality are not available. A sample study done by IDB in 1980 indicated that approximately 5 percent of firms closed down since the introduction of import liberalisation policies in 1977. From the information gathered from the officers of the department it is clear that there has been a reduction in the unorganised manufacturing firms during this period due to closures. During the survey it was also apparent that of the total non respondents nearly 10 percent were untraceable.

The survey results also indicate that the number of firms relocating during this period is very small.

Of the 136 surveyed firms only five firms have transferred their location from the city to the outer regions. The findings of studies of relocation in developed countries suggest that transfer of plants generally occur over short distances (Howard, 1968; Healey, 1981). Kemper (1973) argues that because moving cost increases with distance from the original location, there is greater uncertainty in locating industries in distant locations. The relocation of firms in Colombo occurred in the years 1981 and 1982, and these location changes were to a place within the Colombo Metropolitan Area. The findings of this sample survey supported the argument that generally location changes occur over short distances. Of the five firms relocated, three transferred to locations within 15 kilometers and two were relocated within 18 and 25 kilometers from their original locations.

The theory of decentralisation and the studies on developed countries suggest that significance of economic factors in relocation decisions. In contrast to economic factors in the developed countries, personal factors have been effective for the entrepreneurs in Colombo in changing their original locations. Some entrepreneurs indicated that closeness to home and family and personal relationships with others, as being of major importance in transferring their

locations. Economic factors such as production cost variations or government policy decisions did not effect these locational changes. Although a tax holiday has been introduced by the government for those plants located outside the Colombo Municipality, this has not affected the entrepreneurial decisions. Also none of these plants has moved to locations recommended by the UDA. Only one entrepreneur indicated the lack of space for expansion as a reason for moving to a new location. Site changes are not common among the small and medium scale firms in Colombo.

Information gathered from the survey showed that 96 percent of firms have not changed their sites during this period (Table 7.1). It is clear from some existing literature that manufacturing firms have important ties to other business firms, retail and wholesale customers, their suppliers, sub contractors and service establishments which perform auxiliary functions, machine tool shops, banks, legal and accounting firms. Therefore, besides the costs involved in relocation of plants from the original location personal attachment of owners and managers to a place is an important factor for staying at the original location. During the survey entrepreneurs were asked to identify the factors for staying at the original locations in order of

importance; 58 percent of entrepreneurs rated the personal reasons as being of major importance, while the proximity to customers was rated the second important factor (Table 7.2). From this information it is clear that local business and personal relationships have a tendency to keep entrepreneurs in their original locations.

Table 7.1 : Frequency of manufacturing changes in surveyed firms 1978 - 1984

	Textile No %	Rubber No %	Metal No %	Total No %
Transfer openings	0 0	2 40	3 60	5 100
New openings	12 40	8 27	10 33	30 100
Site extensions	9 53	7 41	1 6	17 100
Employment increase	34 49	15 22	20 29	69 100
Employment decrease	7 28	8 32	10 40	25 100
Volume of production increase	37 48	16 21	24 31	77 100
Volume of production decrease	8 33	9 38	7 29	24 100
Value of production increase	39 48	17 21	25 31	81 100
Value of production decrease	8 33	9 38	7 29	24 100
Production addition	14 50	6 21	8 29	28 100
Production loss	6 38	5 31	5 31	16 100

Source :- Sample survey

More than 95 percent of entrepreneurs do not have any intention of moving to another location. Firms have

lots of advantages in the form of infrastructure facilities in and close to the city of Colombo and therefore are reluctant to move away from the city to outer regions. Townroe (1974; 305) noted, "changing a location is both expensive and time consuming for an industrial company". The information obtained from the UDA highlights the significance of the high cost of shifting industries from their present locations as a major factor for continuing at their original locations. Survey data shows (Table 7.1) that 30 new firms established during this period of which only two were located within the Municipality and 28 were located outside the Municipality but within the metropolitan area. Site extensions occurred only in 13 percent of surveyed firms.

Plant size changes

One of the most striking features emerging from the survey was the high frequency of plant size changes in the form of increases and decreases in employment in the existing plants which occurred during this period. With the exception of firm transfer decisions, the proportion of firms experiencing size changes was higher (Table 7.1). In nearly 51 percent of firms which operated during the study period employment increased, while 18 percent experienced a decrease in employees.

One of the most interesting findings was that plant size increases were more marked in the textile firms than in the other two types. Employment increases were recorded in 49 percent of textile firms while 32 percent of rubber firms and 40 percent of metal firms recorded a decrease in employment. This underlined the important expansion which took place in the textile industry over the period and the relative decrease in the rubber and metal working firms.

Table 7.2 : Reasons given by entrepreneurs (%) for staying at the original locations in order of importance

Locational Factors	Rank Order						
	1	2	3	4	5	6	7
Enough space at present location	12	08	10	15	25	20	10
External and internal economies	00	15	08	12	02	17	46
Easy acquisition of raw materials	02	02	22	20	23	16	15
Proximity to customers	14	32	08	24	12	04	06
Labour advantages	12	16	18	10	16	20	08
Personal reasons	58	14	10	06	07	05	00
Low risk and uncertainty	02	13	24	13	15	18	15

Product changes

The addition of products occurred more frequently than the loss of products - nearly 21 percent of firms added new products while 12 percent of firms reduced the number of products. Changing the products manufactured at a plant can increase the flexibility with which a firm can respond to changing conditions (Healey, 1981). In developed countries the impact of technological change, particularly product innovations, has been influencing the product changes (Thwaites, 1978; Thomas and Le Heron, 1978; Goddard and Thwaites, 1980; Malecki, 1980; Thomas, 1981). In each of the product changes identified in the surveyed firms, the entrepreneur was asked what were the circumstances which led to a change. More than 25 percent of entrepreneurs indicated changing patterns of marketing conditions as a major factor influencing the product changes. An increase in demand for related products was the main factor influencing the decisions for addition of a new product; of the 28 entrepreneurs 90 percent recorded this as a major reason for their expansion. Lack of demand or low profitability were the main reasons given for decisions to abandon any product. Of the 16 entrepreneurs, 62 percent noted lack of demand while 38 percent reported low profitability as the factors for losing the products.

Other reasons for the abandoning of products are the shortage of labour and government policy especially the liberalisation of imports.

MANUFACTURING CHANGES AND THE ORGANISATIONAL STRUCTURE OF FIRMS

The relationships between the structure of organisations and the various types of manufacturing adjustments were tested by means of multiple regression and correlation analyses. Change in location and the number of establishments were omitted from the analysis as these types of adjustments were recorded only in very few sampled firms. In analysing the size and product changes only the 106 firms (textile = 47, rubber = 26 and metal = 33) operating at the beginning of the study period in January 1978 were included. As the information on size changes provided percentage values of employment changes and site extensions step wise multiple regression analysis could be used. These were used as the dependent variables, while the 'composite variables' derived in Chapter 3 were used as independent variables. As the change in volume and value of production was also recorded in percentages the data was suitable for regression analysis. Regressions were run for each industry separately for the size changes as well as for the change in volume and value of production.

However, the technique was not suitable for the analyses of the relationships between the organisational structure and the product addition and losses as the data available was nominal in scale. The point biserial correlation coefficient was used, therefore, to assess the relationship with the product additions and losses. The significant results of the analyses are presented in the tables.

The relationship between plant size changes and organisational structure

Existing literature in developed countries suggested that the large plants had their employment increased more than the smaller plants. The evidence of the present study shows that in developing countries the size, the relationships of firms with the government organisations and their organised nature influence the changing pattern of employment. It is true that most unregistered firms have smaller numbers of employees when compared to the large industries. However, registered firms whether large or small have a better chance of expanding their firms as they have easy access to facilities and services provided by the government and other private organisations. The results of the present study supported this contention. Although the explained

variances by the organisational variables are low¹ in the textile and metal firms, the results suggest a positive relationship between employment changes and the organisational structure (Table 7.3). In both these analyses the registered firm component entered at the first step suggesting an increase in employment in the organised registered manufacturing establishments. These findings are not unexpected. The textile firms have better prospects for expansion even with the imports of foreign textile and clothing since they are mainly directed to export markets. In contrast rubber and metal firms produce goods mainly for the local markets and compete with imported goods. The organised nature of registered firms has, therefore, stronger effect on the expansion of their activities.

Healey (1981) has shown that the employment changes are not related to the plant size. The evidence of the present study supported this, showing that employment change is unrelated to the size of the firm. However, in the rubber firms capitalisation emerged as the most important variable, suggesting that large capital intensive

1 1 The use of component scores in the regression analysis, does reduce the coefficient of determination obtained, R^2 as a result of the composite nature of the independent variables (Romsa, et al., 1969).

firms more frequently have their employment increased. The survey of the industrial Development Board (1980) also shows that employment in approved industries has increased by 7.1 percent since 1977 and in contrast, 16.1 percent decline of employment was recorded in unapproved industries. As very few people, and often family members, are involved in the unregistered organisations they are free to reduce the scale of operation any time they wish. Nor do they appear to be unduly affected by labour regulations.

Table 7.3 : Relationship between employment changes and the organisational structure.

Step	variable	simple re;cof;	partial re;cof;	multiple re;cof;	R^2	ΔR^2
<u>Textile firms</u>						
1	Registered firm	0.30	30.74(b)	0.30	0.09	0.09
<u>Rubber firms</u>						
1	Capitalisa- tion	0.74	106.55(a)	0.74	0.54	0.54
<u>Metal firms</u>						
1	Registered firm	0.32	43.55(b)	0.32	0.10	0.10

(a) significant at 0.01 level

(b) significant at 0.05 level

Studies in developed countries have suggested that large firms have flexibility to expand their sites because of their ability to purchase land in excess of their needs (Healey, 1981). The results of the present study supported these findings (Table 7.4). The analysis of rubber firms suggests a high positive relationship with capitalisation indicating only large capital intensive industries have expanded their sites during the last few years. In the metal firms production complexity emerged as a prominent variable entering at the first step. This suggests firms which produce several products expanded their sites since large spaces were required for their production processes. In the textile firms site extensions were marked only in the well organised registered firms.

Table 7.4 : Relationship between the site changes and the organisational structure

Step	variable	simple re;cof;	partial re;cof;	multiple re;cof;	R^2	ΔR^2
<u>Textile firms</u>						
1	Registered firm	0.46	2.83(a)	0.46	0.21	0.21
<u>Rubber firms</u>						
1	Capitalisation	0.72	3.70(a)	0.72	0.52	0.72
<u>Metal firms</u>						
1	Production complexity	0.37	1.74(b)	0.37	0.14	0.14

(a) significant at 0.01 level

(b) significant at 0.05 level

The relationship between product changes and organisational structure

The results of the analyses in Table 7.5 show that the volume of production is positively related to the organisational structure of firms. In all analyses, the registered firm component entered at the first step suggesting the significance of the registered/unregistered dichotomy in the changing pattern of production. The results are as expected since most policies introduced by the government favourably affected the registered, well organised firms and adversely affected the unregistered firms. The recently introduced export promotion policies and the financial incentive schemes, mainly benefit the organised firms due to the frequent relationships they tend to maintain with the government organisations. The survey results of the IDB also show that there were notable differences between the two types of establishments. During the period from 1977 to 1979, the increase in the value of production in the registered firms was recorded as 20.5 percent, while in the unapproved establishments, value of production has not increased. The present sample survey also shows the value of production in these industries has declined by about 6 percent. No relationship was found between the size of the firm, complexity of production, degree of capitalisation and

Table 7.5 : Relationship between the change of production
(volume and value) and the organisational
structure

Step	variable	simple re-cof;	partial re;cof;	multiple re;cof;	R^2	ΔR^2
<u>Change in the volume of production</u>						
<u>Textile firms</u>						
1	Registered firm	0.55	16.17(a)	0.55	0.30	0.30
<u>Rubber firms</u>						
1	Registered firm	0.49	14.23(b)	0.50	0.25	0.25
<u>Metal firms</u>						
1	Registered firm	0.48	16.23(a)	0.48	0.23	0.23
<u>Change in the value of production</u>						
<u>Textile firms</u>						
1	Registered firm	0.62	22.79(a)	0.62	0.38	0.38
<u>Rubber firms</u>						
1	Registered firm	0.55	19.82(a)	0.55	0.31	0.31
<u>Metal firms</u>						
1	Registered firm	0.45	20.98(b)	0.45	0.21	0.21

(a) significant at 0.01 level

(b) significant at 0.05 level

product changes. This is because more than internal
structure, the organised nature of firms was affected by
the recent policies introduced by the government.

It has been suggested in the literature that large plants will probably attract more additional products than small ones because it is usually easier and cheaper to find space within a large plant rather than in a small plant (Healey, 1981). However, the evidence of the present study does not always support the contention. Product additions were more common in registered firms, as shown by the positive association for textile and metal working firms. On the other hand in all three types of industries, the loss of products was associated with firms which were not registered with the government. There was also evidence that product gains and losses were common in both large and small firms (Table 7.6). The attraction of products to large firms seems to have occurred in the textile and rubber firms, while addition of products recorded in the smaller metal working firms. This is because of the subcontracting work that the smaller metal firms undertake; in such cases the type of product to be manufactured is determined by another organisation.

Product losses were expected to be common among the unregistered industries. They were found to occur in these firms as shown by the negative associations for all three types of industries. Neither the size of the firm nor the degree of capitalisation had any effect on the

product changes in the textile firms. However, product abandonments were common in the smaller rubber firms.

Table 7.6 : Relationship between the product additions, losses and the organisational structure

Component Change	(I)	(II)	(III)	(IV)
<u>Textile firms</u>				
	Export orientation	Capitalisation	Registered firm	
Product addition	-0.10	0.18(c)	0.48(a)	
Product loss	0.16(c)	-0.08	-0.24(b)	
<u>Rubber firms</u>				
	Capitalisation	Production complexity	Registered firm	Foreign r/m utilisation
Product addition	0.22(c)	-0.13	0.00	-0.12
Product loss	-0.32(b)	0.26(c)	-0.40(a)	-0.04
<u>Metal firms</u>				
	Capitalisation	Production complexity	Registered firm	Younger firm
Product addition	-0.22(b)	-0.05	0.36(a)	-0.01
Product loss	-0.02	0.10	-0.21(b)	0.02

(a) significant at 0.001 level

(b) significant at 0.01 level

(c) significant at 0.05 level

SUMMARY

Studies in developed countries have highlighted the plant closures in central locations, plant openings in peripheral locations and the employment changes in surviving plants as more important decentralisation processes than the relocation of plants. The survey in Colombo showed the number of firms relocated were few and most small entrepreneurs prefer to remain at their ~~original~~ locations. Personal reasons have been mainly responsible for these decisions. However, the surveyed firms recorded a high frequency of plant size changes. Employment increases were marked in some firms while some experienced a decrease in employment. The addition of products occurred very frequently in the surveyed firms.

The literature in developed countries suggested the significance of organisational characteristics in determining the manufacturing changes. The results of the study supported this showing a relationship between the organisational structure and manufacturing adjustments. 'Registered firm status' emerged as the most significant organisational variable in determining the plant size changes in most surveyed firms. 'Capitalisation' is the other significantly related variable to the size changes.

'The registered firm status' is strongly related to the change of production (Volume and value) in all three types of industries.

CHAPTER 8 : POLICY AND CHANGE: THE IMPACT OF GOVERNMENT
POLICY ON RECENT MANUFACTURING CHANGES IN SRI LANKA

Chapter 7 explored the question of recent manufacturing changes in the Colombo Metropolitan Area and highlighted the types of important changes and their relationship with the organisational structure of firms. It was apparent in that chapter that although there were few locational changes among the small and medium scale firms, structural and product changes have been marked during recent years. Plant size changes in the form of employment increases and decreases and product changes such as product additions and losses emerged as major manufacturing adjustments occurred in recent years.

This final chapter looks at small and medium scale industry in Sri Lanka in a somewhat wider framework. It recognises the importance of government action in developing countries, particularly in Colombo, in relation to industrial development generally and decentralisation policies particularly. It explores, therefore, not only the general 'bundle' of policies which are important in terms of spatial pattern and structure of small and medium scale industries in the Colombo Metropolitan Area, but also the way in which industries have perceived these policies and responded to them.

In order to examine these aspects of industrial location and locational change, information was obtained from government organisations and the sample survey. Information related to the policy and spatial changes was based on sources obtained from the Urban Development Authority (UDA). A number of questions were included in the questionnaire to obtain information on how entrepreneurs responded to export promotion policies, tax and tariff policies and policies on financial incentives.¹

The chapter has four parts, the first attempts to examine the decentralisation policies introduced by the UDA and the importance of these policies on decentralisation process; the second examines the recently introduced export promotion policies mainly the Import Duty Rebate and Export Expansion Grant Schemes; in the third part the policies on fiscal and tariff concessions are examined, with emphasis on import liberalisation policies, while the fourth section evaluates the financial policies introduced by the government with special emphasis on the recently introduced Credit Guarantee Scheme.

1 Policies on direct foreign investment were excluded as the survey was restricted only to locally owned small and medium scale manufacturing organisations.

POLICIES ON THE DECENTRALISATION OF MANUFACTURING INDUSTRIES

Since independence, policy measures were taken by the government to decentralise manufacturing activities in Sri Lanka. However, during the last two decades the objectives of locating industries away from the Colombo city has not been achieved. The geographical distribution of private sector industries hardly changed in the 1970's. Nearly 70 percent of the registered manufacturing establishments in 1974 were located in and around Colombo and they accounted for 90 percent of the total value of industrial output. During this period it was observed, that the rapid growth of industries has caused many serious environmental problems in the city. Since the mid 1970's therefore, steps were taken by local government to decentralise the manufacturing activities from the city centre to the peripheral region. In the year 1974, the Municipal Council of Colombo passed a resolution according to which no new industries were to be allowed in the city. The Colombo Master Plan Project (1974 - 1978) (CMPP), sponsored by the United Nations Development Programme observed that although the magnitude of the problems in the city of Colombo is not as serious as in many other cities in developing countries, it is better to take remedial action before such problems assume unmanageable proportions (Colombo Master Plan Project, 1974 - 1978).

The CMPP identified some of the areas in which manufacturing and industrial activities are likely to be clustered outside the Colombo Municipal Council area.

These areas include

- i. a large area between the Colombo Airport and Ja-Ela, Industrial estate at Ekala,
- ii. vacant plots at Ratmalana,
- iii. the area around the oil refinery at Sapugaskanda and
- iv. the area adjacent to the steel mill at Oruwala and to the west of Homagama.

Attention was paid to these recommendations by the Urban Development Authority (UDA) which came into existence in 1978. Several steps were taken by the UDA to regulate the development of industries within the city.

The UDA identified the industries which could be allowed in the city of Colombo, preventing major and inappropriate industries being located in the city. The types of industries allowed in the city include cottage and domestic type industries and repair and service industries. Mainly small scale labour intensive industries which have

least impact on the available infrastructure facilities are permitted in the Colombo city. Restrictions have been imposed to disperse industries which have no specific locational advantage in operating in the city to other suitable locations. Under the newly formulated development plan by the UDA (UDA, 1982), in the residential zones only cottage industries run by electric power using not more than 3 HP, employing not more than 10 persons and occupying a floor area not exceeding 50 square meters are allowed. In a mixed residential zone cottage industries run by electric power using not more than 5 MP, employing not more than 15 persons and occupying 75 square meters are allowed. The regulations also list the type of industries permitted and prohibited in other zones.

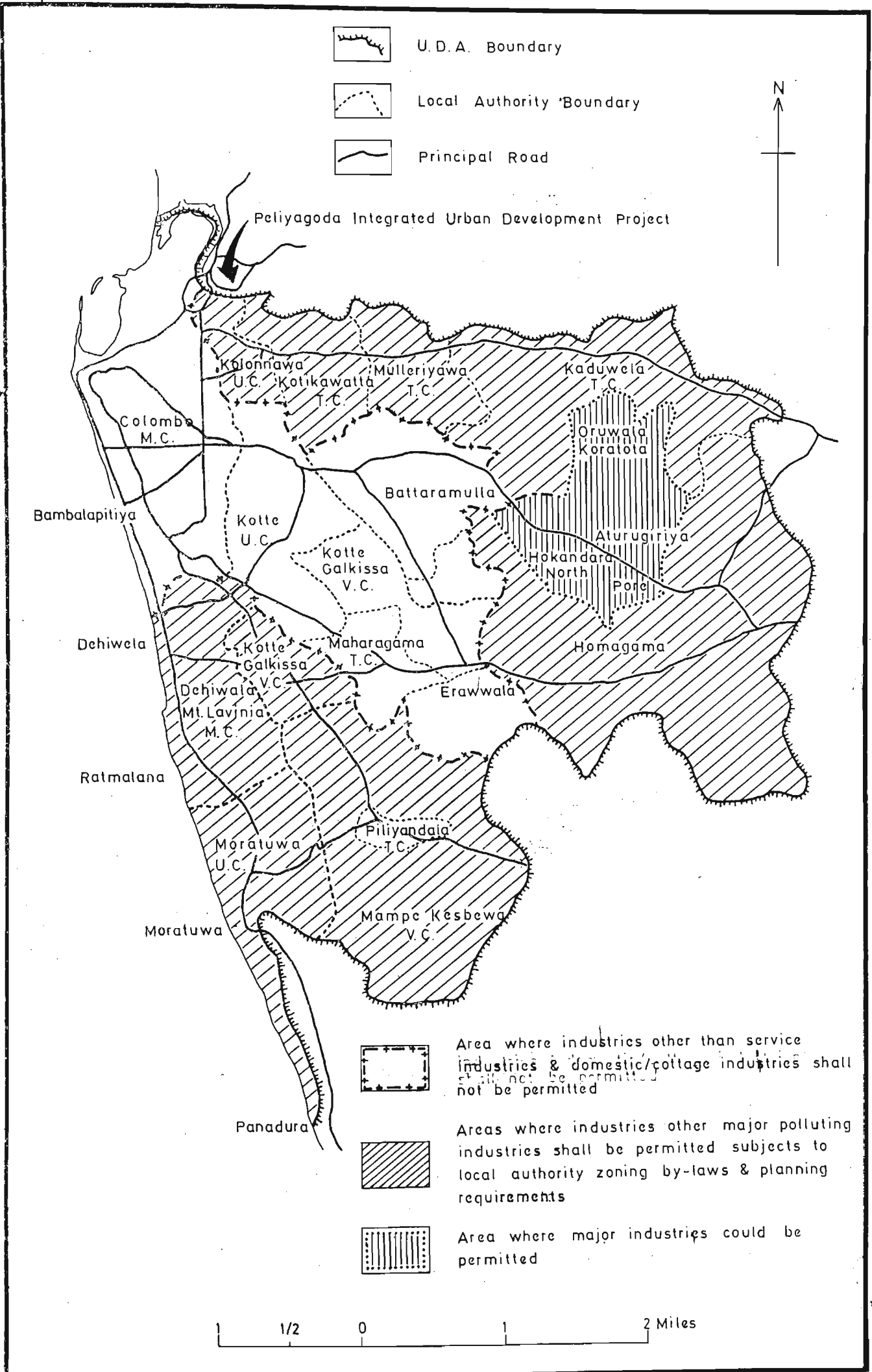
The UDA also launched a programme to identify the areas outside the city which are suitable for the location of new industries--and also for the relocation of some industries and warehouses currently located in the city. Under the programme three areas have been identified as suitable locations outside the city.

- i. in the Peliyagoda area, the provision of industry and warehousing is being developed along with housing and other community facilities under the Peliyagoda Integrated Development Project.

- ii. at Ratmalana a site of 21 acres is being developed for industries where preference will be given in allocating sites within the industrial area to industries which are being shifted out of the city
- iii. the Athurugiriya area has been earmarked for the development of major industries (Figure 8.1).

The figure shows the areas where the domestic/cottage type of industries and the polluting industries will not be permitted. It shows the areas where industries other than major polluting industries shall be permitted. Steps also have been taken by the UDA in the formulation of development and enforcement of standard by ascertaining the infrastructure and other needs of industries and warehouses.

Although considerable effort has been made by the UDA to decentralise industries from Colombo city, it is apparent that the entrepreneurs prefer to locate industries and warehouses within it. Perera (1982) pointed out that some entrepreneurs in North Colombo in fact proceed with their plans even without obtaining prior approvals from the Authority. This is so even though it is commonly accepted that certain areas to the North of Colombo are not suited for the location of industries, since the majority of



roads are less than 30 feet wide creating potential traffic congestion problems.

The available data (UDA) shows that, of the 15 applications received during the year 1981, 12 were approved by the UDA and the majority of these industries were located in North Colombo. One requirement of the UDA to consider approval for an industry is a 30 feet wide approach road; if the minimum requirement is satisfied approvals have been granted. This factor has influenced the location of small scale, domestic type new industries such as garments, lapidary, printing, tea bagging, lathe and carpentry workshops within the city. Moreover, the evidence of local market orientation for small firms and the tendency to locate in high density areas is consistent with the "incubator hypothesis" (Hoover and Vernon, 1959; Leone and Struyk, 1976). The hypothesis states that small, new manufacturing firms tend to locate in centralised areas that provide essential services and infrastructure for production and sales activities. This was also supported by some earlier studies in developing countries which indicated that small firms set up in central locations (Meyer, 1981; Lee, 1982).

On the one hand entrepreneurs are seeking space for the location of new industries in the cities and on the

other existing industries continue in their original locations. When Lever Brothers Ltd. established its factory in Colombo (at Grandpass) for example, it would have been the most appropriate location for the industry. However, with the growth of the city that location has become inappropriate, since there is no justification for the manufacturing of goods which have an island wide market in a most congested location. The high cost of relocating has forced the industry to remain at the original location (Perera, 1982). UDA is facing problems with the continuing desire of developers to locate industries and warehouses in the city despite efforts to discourage further industrial development in it. Perera (1982) also pointed out the problems faced by the UDA in the relocation of existing industries from the city. Due to the infrastructure and service facilities the city has advantages for the entrepreneurs. Again there are problems associated with the high cost of relocating industries from their present locations. These reasons are affecting the high concentration of industries within the city.

EXPORT PROMOTION POLICIES

Since the mid 1960's steps have been taken by the government to promote export oriented industrialisation.

In most developing countries the Duty Rebate Scheme (DRS) is one of the most important policy devices used to expand the export oriented industrialisation. Among the export incentive schemes in operation presently in Sri Lanka the DRS is one of the most important in terms of both the export coverage and the amount of annual cash outlay involved. Import Duty Rebate implies the reimbursement of import duties paid on imported material after the final good is exported. It was first introduced in Sri Lanka on the 15th June 1964. A revised scheme under the auspices of the Ministry of Industries was introduced in December 1969. In 1980, the scheme was further revised and its implementation was placed under the export Development Board (EDB).

In 1982, industrial exporters received a total amount of 690 million rupees as import duty concessions. According to the figures available from the Ministry of Industries and Scientific Affairs and the Ministry of Finance and Planning, during the period from 1975 to 1978 there was no clear trend in annual payments. However, since then a marked upward trend has been recorded, especially between 1980 and 1982. In the year 1980, when the revised scheme was introduced, the total payment was Rs. 338 million and there was a two fold increase in 1982

to Rs. 690 million. This increase was due to the expansion in eligible exports as well as the increased efficiency in operation of the scheme under the new revisions (Athukorala and Jayatilaka, 1984). It is also clear from the available sectoral data that the garment industry has been the main beneficiary of the scheme. The share of total rebate payment absorbed by this industry increased from the average annual level of 81 percent in 1975 to 1977 to 90 percent in 1978 to 1981. Based on the available information it can be concluded that the revised duty rebate scheme introduced in October 1980 undoubtedly shows an improvement over the previous scheme, with regard to simplifying the administrative procedure involved in rebate payments.

In analysing the impact of the DRS on export profitability in 12 garment firms, Athukorala and Jayatilaka (1984) have shown a higher degree of export profitability with the operation of the duty rebate facility. Based on the weighted average net profit to net worth ratios they suggested that the duty rebate is extremely important for the garment export industry and that without the import duty concessions the industry would not be able to survive. The revised scheme which is in operation presently is more effective than the previous ones, and compares favourably with similar schemes in other developing countries.

According to a study undertaken by the EDB in August 1982 covering rebate claims submitted between March - December 1981, under the present scheme, it takes only 4 to 6 months for the exporter to receive payment from the date of shipment. It should also be noted here, that under similar schemes in most of the less developed countries "the settlement of a drawback claim may take anything between six months and two years" (UNCTAD, 1982).

However there are criticisms of the duty rebate scheme in relation to the utilisation of local raw materials. As there is a general rebate rate for all export production sectors, some exporters have the ability to enjoy a higher subsidy by substituting imported materials for local materials. Duty rebate schemes in some developing countries have strict eligibility criteria to encourage exporters to utilise local raw materials. The Brazilian law of national similarities prevents the exporters being granted duty rebate for any import for which local substitutes are available. The Mexican and Colombian customs duty rebate schemes determine the draw back to be given, as a function of the domestic value added component of the export product (UNCTAD, 1982). However, these measures can be effectively implemented in countries with domestic resources. In a country like Sri Lanka, at least at the initial stages of

export development, it is necessary to depend on imported raw materials. Therefore, the use of the rebate scheme may be restricted by the requirement that certain products must be purchased locally, since the same product can be purchased in the world market at much lower prices.

An attempt was made during the survey to obtain information from export producers on the effectiveness of the Duty Rebate Scheme. Of the surveyed firms, 28 percent were export oriented and 18 percent manufactured more than 20 percent of their products for the export market. The DRS was utilised only by eight entrepreneurs, all being textile producers; none of the rubber or metal producers utilised the scheme. Eighteen entrepreneurs did not avail themselves of the scheme, while 12 entrepreneurs who were aware of the scheme have not utilised the facility. It was apparent that only large registered firms benefited by the scheme.

Based on the information provided by the small entrepreneurs during the interviews, one reason for the lack of response to the scheme can be identified. Many small exporters utilise only locally purchased imported raw materials in their production processes. These entrepreneurs had the misconception that the purpose of

the scheme is only to repay import duties levied directly on imported raw materials. When the production is based on locally purchased materials the import duty facility is directly not apparent to the entrepreneurs. This might make the entrepreneur indifferent about the duty rebate facility, even if he knows that general rates are applicable to all exporters.

The revised DRS introduced in October 1980 undoubtedly show a great improvement over the previous scheme, with regard simplifying administrative procedures involved in rebate payments. Of the 12 entrepreneurs who were aware of the scheme, 8 reported that even the revised procedure is too cumbersome and complicated, and that the rebate payments finally received are not worth the cost and time involved in fulfilling the administrative formalities. The entrepreneurs who utilised the facility also complained about the delay involved in the process, that is, the time lag between the submission of rebate claims and the settling of such claims. The objective of the original plan was to settle a duty rebate claim submitted by an exporter within a month to six weeks. However, more than 50 percent of entrepreneurs who utilised the scheme complained of delays of more than six months and this has usually created financial difficulties.

EDB has introduced a direct cash subsidy scheme called the Export Expansion Grant Scheme (EEGS) for selected export products with effect from 1981. Under the scheme, a tax - exempt grant is payable as a percentage of the amount by which the grant year export earnings exceeded the average export earnings in the preceding three years. Selected exports were eligible for assistance under the scheme provided the "net foreign exchange content" is more than 20 percent. In 1982 garment exports were excluded from the eligibility criteria. Three alternative rates are applied to the incremental export value in calculating the eligible grant, depending on the "net foreign exchange" content given in the commodity. viz. 5% where the net foreign exchange content is between 20 and 30 percent; 10% between 30 and 60 percent, and 15% above 60 percent.

EDB figures show the total payments under the scheme for 1981 and 1982 grant years were Rs. 127.8 million and Rs. 126.9 million respectively. Seventy seven percent of the total grant went to the industrial sector in 1981 and this was increased to 84 percent in 1982. Within the manufacturing-sector, garment industries mainly benefitted, accounting for 35 percent and 22 percent of total grant values in the years 1981 and 1982 respectively. The decline between the two years was mainly due to the exclusion of quota garments from

the eligibility list with effect from the year 1982 grant year. However, the shares of other industries have increased during this period.

Assistance provided by the EEGS was used only by four of the surveyed textile producers, these four being large producers. Available information shows that most small entrepreneurs are not aware of the scheme. Again the documentary requirements and related administrative formalities seem to dissuade small exporters. The information that should be submitted in support of the grant application includes a bank certificate of foreign exchange realised from each product exported during the grant year and a statement of exports (volume and value) during the three years preceding the grant year duly certified by an auditor nominated by the EDB. Some of the exporters seem unable to provide this information possibly because they do not maintain systematic records of their business transactions.

The provision of finance at reasonable cost through government sponsored credit schemes has been widely used as an export promotion device in most developing countries (UNCTAD, 1982, 19). In Sri Lanka this started only after 1977. At present there are two credit schemes,

- i. the Central Bank's refinancing facilities and
- ii. facilities provided by the EDB utilising the Export Development Fund.

Export credit refinancing facilities provided by the Central Bank are of three types.

- i. Pre shipment credit refinancing scheme,
- ii. Supplementary financing facility, and
- iii. the medium and long term refinancing scheme.

Under the first scheme, the Central Bank provides refinancing at a concessionary rate in respect of loans granted by the bank to exporters. The scheme was introduced in December 1987 and became operational from about the second half of 1978. Each refinanced loan is granted in the first instance for a period of 90 days, with a possible extension of up to a maximum of 180 days. According to the available data from the Central Bank it is clear that the end of year outstanding balance under the scheme has increased from Rs. 71.2 million in 1978 to Rs. 458.0 million in 1982. In addition to this a supplementary financing facility was started from 6th March 1983. At the end of the first six months of its operation the total outstanding credit under

this scheme was Rs. 190 million. Under the third scheme which was initiated in 1981, funds are provided to Commercial Banks, the National Development Bank (NDB) and the Development Finance Credit Corporation (DFCC), to provide concessionary loans to projects approved by the EDB, for periods ranging from 3 to 15 years.

Two types of financial assistance are provided by the EDB in the form of equity participation and the provision of short term finance to projects with potential for expansion of exports in the short term. Under the first scheme, EDB invested Rs. 154 million in seven projects, mainly in the rubber producing sectors, by the end of 1982. The short term credit scheme for industrial exports was introduced in 1982 to help existing export ventures to expand production and to improve product quality. Under this second scheme EDB finances up to 50 percent of total expenditure involved. In 1982, 16 projects involving a total financial commitment of Rs. 7.6 million were approved under this scheme.

The Export Credit Insurance Scheme (ECIS) was introduced to Sri Lanka in 1977. The scheme, called "the Packing Guarantee Scheme" was under the control of Development Finance Department of the Central Bank. In 1979, the Sri Lanka Export Credit Insurance Corporation (SLECIC)

was established to operate a full scale export insurance scheme with provision for

- i. issuing bank guarantees on both pre-shipment and postshipment credits and
- ii. issuing insurance policies to exporters to cover the risk of non payment or delayed payments by the buyers. Bank guarantees issued by this scheme help exporters to obtain credit facilities from banks on liberal terms. During the last five years the scheme has shown a noteworthy performance record (Central Bank Report, 1984).

As in most other developing countries, fiscal incentives have become a permanent feature of the export incentive system of Sri Lanka. For the first time three major tax concessions were introduced to industrial exports in the year 1967/68.

- i. a 3 year tax holiday on profit derived from export business,
- ii. an income tax rebate of 5 percent of the F.O.B. value of export earnings,
- iii. provision to offset all advertising and sales promotion expenditure incurred in connection

with export trade when calculating the taxable income.

A new 8 year tax holiday for companies incorporated on or after 1st April 1972, and a tax exemption for dividends arising from approved industrial ventures which engaged in industrial exports was introduced in the 1972 budget. With effect from 1st January 1976 these concessions were available only to broad based companies with view to "foster a balanced and enduring form of development in which the widest possible segment of the society participates" (Budget Speech, 1976). After the introduction of this respective provision, the tax holiday concession remained virtually inactive until the new tax reforms introduced in November 1978.

Under the new reforms a 5 year tax holiday was introduced for all export oriented companies incorporated on or after 15th November 1978. In addition to this, the full cost of advertising and other sales promotion activities and travelling in connection with export trade were made deductible in calculating taxable income with effect from the 1978/79 tax year. However, these tax incentives were not limited only to the export sector. On the 31st March 1983, the five year tax holiday on profit was accorded only

to business ventures engaged in the exportation of all products, excepting tea, rubber and coconut products.

Since the 1967/68 tax year, all manufacturing exporters have been exempted from Business Turnover Tax (BTT) on their final products. BTT was imposed on exports from 31st December 1975. BTT rate was 5 percent up to 1-9-1980 and then it was reduced to 2 percent. In August 1980, the turnover tax rebate scheme was introduced. Under this the goods or materials imported to Sri Lanka to be used in export production are exempted from import turnover tax. It is difficult to evaluate the effect of these tax incentives on the export oriented firms as the information and data are limited. During the survey some export producers were reluctant to supply the information on the tax incentives they received. Only 15 percent of export producers noted the significance of tax incentives for the development of their industries.

POLICIES ON FISCAL AND TARIFF CONCESSIONS

Industrial policy since 1966 was biased in favour of small and medium private sector industrial projects. A new tax system (Budget Speech 1967 - 1968), was announced in 1967. Under this, profits and income from industrial

business were liable to tax with lump-sum depreciation allowances for plant and machinery, a 20 percent development rebate (double the amount of projects was approved) for new plant and machinery. In order to facilitate the business of small scale enterprises a graduated business turnover tax was introduced. Approved businesses with a turnover of Rs. 100,000 had to pay 5 percent of turnover as tax. However, customs duties were also increased and averaged about 150 percent on consumable imports and some luxuries carried a duty rebate of nearly 300 percent. Karunaratne (1973) argued that these fiscal and tariff measures undertaken during this period were designed to bring in more revenue to the government and not a conscious attempt at industrial promotion.

The raw materials and machinery for industrial purposes qualifying for concessionary rates were "specified" on the basis of actual user license into three categories: specified group I imports were duty free, group II were liable to a duty of 15 percent (general) and 5 percent (preferential), group III imports were subject to 30 percent (general) and 20 percent (preferential). Industrial machinery imports for use in any industrial process or in the manufacture of goods were charged a duty of 20 percent (general) and 10 percent (preferential).

In May 1968, the FEEC scheme came into operation. An important feature of that scheme was the liberalisation of imports from quotas and licenses by scheduling them as "Open General Licenses" (OGL) imports. Registered importers could import industrial raw materials by opening up letters of credit with commercial banks. The FEEC - OGL procedure swept away partly the quota and licensing requirements for industrial imports and it also exposed domestic industries that had made high profits under protective barriers to the winds of competition. The scheme led to greater imports of raw materials and led to the reduction of under utilised capacities in certain industries. However, the free imports policy led to the indiscriminate imports of several unessential luxury items and it also created some sales problems for some products (Karunaratne, 1973).

In the early 1970's industrialists were expecting the abolition of duties on basic industrial raw materials and components. The new government announced new duties in addition to the FEEC payments (Budget Speech, 1970 - 1971). The revision of import tariffs attempted to simplify the tariff structure by proposing six basic duty rate bands. Free or nominal tariffs were specified for basic consumption imports and essential industrial and agricultural raw materials and machinery. A higher band would be applicable

to certain imports in order to "provide protection to domestic production and to induce the progressive manufacture of components locally and also to promote new ventures in fields with potential for future development, while the highest rate bands included the residual groups of commodities consisting almost wholly of non-essential luxury items" (Budget Speech, 1970 - 1971). Because of these import controls, there was a captive market for manufactured goods. With these protective tariff barriers both public and private sectors began to grow under favourable conditions.

In 1977 when the present government came into power the new industrial policies were formulated within a liberalised regime. Small and medium scale industries which commenced on or after 15th November 1977 and located outside municipalities are entitled to exemptions on tax on profits up to a limit of Rs. 200,000 per annum. A new tax holiday was introduced in terms of section 22c of the Inland Revenue Act No.28 of 1979. Industries engaged in the manufacture of finished products or assembly of goods or commodities or processing of local agricultural products are eligible for this tax holidays. Apart from the tax exemptions since November 1977 almost all the raw materials and machinery required for industries were freed from license control. Only a very few consumer items were under license control

(Sri Lanka's Industrial Policy, 1980). Imports of finished products were permitted with an introduction of high tariffs.

While certain categories of industries have benefitted to a greater extent, from these liberalisation policies adverse effects have also been felt by certain others to such an extent as to cause the closure of their establishments. It is clear from the available information that the scale of operation, types and quality of products manufactured, types of materials used, level of technology and mechanisation adopted and the individual capabilities of industrialists, determine the extent to which a particular industrialist is affected by the less restricted flow of imports. From a sample survey of manufacturing industries (IDB, 1980) it was apparent that the liberalisation of imports has caused the closure of 4.3 percent of units while another 24.6 percent have been adversely affected causing a reduction in activities in 1979. The survey indicates that 22.5 percent of units have benefitted considerably.

Of the 136 entrepreneurs interviewed, only fifteen spontaneously mentioned tax relief as being a factor influencing the development of industry and only one of these attributed any great importance to it.

None of these entrepreneurs mentioned tax relief as being a factor influencing the location of the industry. Of the 15 firms whose sales dropped, 13 were adversely affected by the liberalisation of import of finished products. All 25 firms recorded a decrease in employment as a result of these policies. Seventy five percent of entrepreneurs indicated the difficulty of competing with the high quality imports. In many small scale product areas the locally available technology is by no means adequate for the manufacture of quality products. Many small and medium scale industrialists cannot afford to spend on research and development. The difficulties in getting good quality materials also pose problems in this connection for unregistered establishments. Although the liberalisation of imports has removed legal constraints on importers as they are not in a position to import their own requirements directly. As some industrialists pointed out, certain raw materials are not available in the local market and some others though available are very highly priced.

Some other industrialists have complained of their inability to sell their products at the prices of imported brands due to the high costs of production. Small scale producers are invariably associated with higher costs and therefore, the imported goods produced by large scale foreign

companies making use of advanced cost reduction techniques could be sold at cheaper prices. There seems to be some weakness in the presently adopted tariff structure. No duty is levied on some imported items, though there are local producers of these products. There are also instances where the same tariff rate is applicable to the finished product and the raw materials that are used by local industrialists to manufacture the same product.

Moreover, with the availability of imported products many consumers have stopped purchasing the locally produced product even of superior quality, preferring imports merely because they are brought from a foreign country, sometimes without looking into the quality level of the imported product. It appears from the information given by some entrepreneurs that some consumers prefer to buy imported items at a higher price even when they are no better than the local equivalent. Moreover, since the liberalisation of imports some large scale buyers and even some government organisations have either stopped or drastically reduced purchasing local products since direct importation of required products in large quantities is more convenient and profitable. Especially the fabricated metal and rubber producers are affected by this as they have to compete with the products imported from India.

Sixty percent of small scale producers who were adversely affected noted the competition with the large scale local producers as an important factor, ranking them in first and second places. As a result of the abolition of the quota system, registered large industries are benefitted in obtaining foreign raw materials in ample quantities. These producers have forced their small scale competitors almost out of the market by making use of the advantage of economies of scale. The relatively high cost of production associated with small entrepreneurs makes it difficult to compete with the prices fixed by large scale producers. As a result they are forced to sell their products at the prices fixed by large scale producers thus losing the opportunity of obtaining a reasonable profit.

POLICIES ON FINANCIAL ASSISTANCE

In most developing countries entrepreneurs are facing problems with finances in establishing and developing the industrial sector. Financial incentive schemes have, therefore, become an important device in accelerating the development of industry. There is also a problem of obtaining adequate quantities of foreign exchange for the import of machinery and equipment. In this perspective international aid agencies such as the World Bank and

United Nations play a significant part by providing loan finances for the development of this sector. In Sri Lanka decentralisation policies were formulated and have been implemented under the guidance and assistance provided by the United Nation, while the finances for Credit Guarantee Schemes were supported by the World Bank. Recent manufacturing adjustments in the small and medium scale sector therefore, are partly a result of the assistance provided by the international agencies.

During the early independence period government was not inclined directly to offer financial incentives to the private sector. Only after the World Bank Mission recommendations (IBRD, 1952) did the government recognise the necessity for the establishment of a private development bank. In order to establish a satisfactory institutional framework, the Development Finance Corporation of Ceylon (DFCC) was set up in 1955 for the purpose of assisting the establishment, expansion and modernisation of private industrial and agricultural enterprises in Sri Lanka and to encourage and to promote the participation of private capital both internal and external in such enterprises. A noteworthy feature is that the corporation is authorised to obtain foreign exchange loans from the World Bank and other foreign resources.

During the first ten years (1955 - 1965) the corporation showed limited progress. The total value of loans granted during the ten year period amounted to Rs. 33 million (approximately) and the value of share investment amounted to Rs. 5.6 million. It took nearly ten years to exhaust the total volume of resources it received at the time of its establishment in the form of share capital and long term loans. In fact it was only around 1964 that the DFCC felt the need for additional resources which it raised from the Bank of Ceylon in the form of an overdraft. In the early sixties, with the import and exchange controls then operating the growth of industrial entrepreneurship in the private sector began to be visible. This development reflected in the period 1965 to 1970. During this period DFCC was also successful for the first time in raising a foreign credit from the IBRD (1967). To some extent this revealed the acute shortage of foreign currency felt by the industrial sector for investment purposes. The total outstanding loans and investments of the DFCC more than doubled during this period and was Rs. 59 million at the end of 1970.

Moreover with the change of government in the early 1970's, there was a change in the investment climate bringing about a slowing down of investment activity.

Between 1970 - 1974, DFCC was able to grant loans amounting to Rs. 21.1 million and the total loans and investments outstanding actually declined during this period. DFCC was compelled to cancel a part of the second World Bank line of credit because of its inability to absorb the loan.

Nevertheless, there has been a rapid increase of loans since 1975. In the year 1960 it amounted to Rs. 511 million, which is more than 67 percent of the increase over the previous five years. In the last ten years foreign currency loans have emerged as the important element in the package of assistance granted by the DFCC for industrial projects.

As pointed out by Fernando (1978) there are some noticeable short comings in the DFCC's assistance scheme. It is clear from the average size of loans that the DFCC has been mainly concentrating on large loans. Taking the total volume of net approvals since inception and the total number of companies assisted the average size of a loan for a company worked out to be Rs. 19 million (Fernando, 1978). The DFCC act was amended in the early seventies to permit it to grant assistance to partnerships and sole proprietorships, a move specifically designed to help the smaller enterprises. A study undertaken by the Development Finance Department of the Central Bank in 1974 clearly indicated a concentration of lending of the DFCC in the form of large loans. More than

80 percent of the value of loans were granted to companies in which the investments were more than Rs. 1 million. According to the available data, small and medium scale entrepreneurs were granted only 18 percent of loans. None of the surveyed entrepreneurs was benefitted by the scheme. The sector wise distribution of loans shows an increase of loans for the export oriented manufacturing activities. Until 1979, the most significant feature was the heavy commitment of resources to tourism. But since 1979, loans granted to the chemical products and textile sectors have been increasing. However, it is clear that the DFCC has failed to provide any significant volume of finances for the other production sectors. Although there are a few shortcomings of this assistance scheme, Fernando (1978) stated that the DFCC has made a positive contribution as a development bank in the context of the highly unfavourable investment climate for the private sector development prior to 1977.

During the early 1969's the commercial banks and specialised institutions were not sufficiently active in financing the development projects. It was felt at that time that the commercial banking system was reluctant to engage in the term finance of industry. In 1965, the Central Bank established a scheme for refinancing medium

and long term loans given by credit institutions for the finance of agricultural and industrial development projects. The Central Bank's scheme of refinance was intended to help commercial banks to overcome the difficulties. In the year 1966 the refinance granted from the Medium and Long Term Credit Fund to industries amounted to Rs. 2.6 million and in 1979 it increased to Rs. 24.7 million. By the year 1983 the Central Bank had provided loans amounting to about Rs. 100.2 million. The share of refinance in industry was approximately 34 percent. The major shares has been received by the manufacturing of textile, wearing apparel and made up garments (26 percent) and food and beverages (22 percent).

Due to these refinancing facilities in 1972, a scheme for financing of small scale industry was started by the People's Bank jointly with the Industrial Development Board. Small scale units defined as those units with capital investment ranging from Rs. 10,000 to Rs. 200,000 and employing not more than 75 persons were eligible for loans up to a maximum of Rs. 50,000 under this scheme. The IDB undertook a review of this scheme during 1975. This revealed that although the scheme itself was fairly satisfactory, it did not attain its objectives due to the number of difficulties at operational level. The individual loan ceiling of Rs. 50,000 was inadequate in many cases mainly due to the

significant escalation of prices of plant and machinery. The development aspect of the scheme was not given due regard by the bank officials particularly at the lower levels, who continued to insist upon conventional norms of security in processing loans. Loans advanced over the period 1973 - 1975 numbered only 169 amounting to Rs. 3.49 million, which was much less than the requirements of the small scale industrial sector.

With a view to overcoming these difficulties, the IDB and the People's Bank introduced a modified scheme in 1976. A similar scheme was drawn up by the Bank of Ceylon in collaboration with the IDB in April 1976. A major feature of this scheme was that the upper limit of the loan has been increased to Rs. 150,000 to be made available by the DFCC where applicable. Security norms were considerably relaxed. The economic feasibility of the project was increased as an important criterion, while the applicant's "integrity, experience and personal identification of the project" received due consideration. However, in spite of the considerable improvements over the original scheme, it is doubtful whether a significant improvement in the financing of the small scale sector was achieved through this scheme.

Late in the year 1978, government authority was obtained to operate Credit Guarantee Schemes. Initially for

the year 1978 a sum of Rs. 10 million provided for the operation of the scheme and it was commenced in April 1978. By the end of 1983, Rs. 31.2 million worth of loans were granted under the Small Scale Industries Credit Guarantee Scheme. Only two surveyed firms were benefited by the scheme.

Another significant Credit Guarantee Scheme has been recently introduced by the National Development Bank (NDB), with an authorised capital of Rs. 2000 million. The objective is to provide medium and long term credit and other forms of financial assistance and to stimulate the growth of a share and security market in Sri Lanka in order to mobilise internal and external capital for investment in industrial, agricultural and commercial fields.

NDB has provided financial facilities to both public and private sector enterprises in the form of long term credit. Nearly 50 percent of the loans granted were for the development of industrial projects, either for the expansion of existing industrial plant or for the setting up of new industrial projects. In 1982, 17 of the projects financed resulted in the establishment of new industrial units, while 6 were for expansion of existing ones. Eight

projects were for modernisation and replacement of existing production facilities (NDB, 1982). In addition to term lending, NDB has been intimately involved in refinancing small and medium firms under the special arrangement known as the Small and Medium Industries Project (SMI Project I and II). As a result of negotiation between the NDB and the World Bank, a loan of US Dollars 16 million was provided to the government of Sri Lanka under an IDA (International Development Association, an affiliate of the World Bank) credit of which US Dollars 12 million was available for refinancing loans granted by the selected credit institutions for the establishment and expansion of small and medium scale industries. Under this scheme, IDA funded loans are granted through five selected credit institutions; The Bank of Ceylon, People's Bank, Commercial Bank of Ceylon Ltd., Hatton National Bank and DFCC. Any enterprise which is engaged in manufacturing, mining, construction, agro-industry, fish processing, handicraft production or industrial service activities is eligible for financing under this project. The maximum loan that could be obtained was Rs. 1 million and the loans would have to be repaid within a maximum period of 10 years inclusive of a grace period not exceeding two years.

The SMI I scheme funded by IDA credit was fully utilised by 1983. Under the scheme 1585 Guarantees were

issued in respect of loans amounting to Rs. 265.7 million. With another loan of US Dollars 30 million from IDA, the SMI II scheme was commenced in January 1982. Under this scheme, loans up to a maximum of Rs. 2 million may be granted to a single project. Table 8.1 shows the salient characteristics of industry wise classification. Industries which have been promoted under the scheme mostly are rice milling, metal crushing, manufacture of ready made garments and the manufacture of brick and tiles. According to a sample survey in 1982 (NDB) some of these funded projects have ceased production, due to reasons such as lack of working capital, market failure and mismanagement. Table 8.2 shows the trends in the redistribution of credits granted among the districts.

The table indicates the concentration of the credits granted into the Colombo Metropolitan Area (Colombo and Gampaha districts). The total value of loans granted amounted to Rs. 112.8 million (50 percent of the total) under the first SMI project. Although the available information is not sufficient to evaluate the influence of the industrial credit for the regional development, it is apparent from the Table there is a regional dispersal of credit granted through these two projects. Colombo, Gampaha, Kandy and Kurunegala were the main districts to

**Table 8.1 : Sectoral distribution of financial assistance
under Small and Medium Industries Projcet
(as at 31st December, 1982)**

Industry	SMI I				SMI II			
	No.	(%)	Amount Rs.(m)	(%)	No.	Amount Rs.(m)	(%)	
Food processing	456	27.1	55,100	24.5	56	33.9	7,090	30.4
Other agro industries	119	7.1	10,526	4.8	3	1.8	183	0.9
Rubber products	26	1.5	6,425	2.8	3	1.8	480	2.0
Metal products	203	12.1	21,130	9.4	30	18.2	2,404	10.4
Construction materials	275	16.3	44,332	19.7	5	3.1	614	2.6
Construction contracting	11	0.7	5,366	2.3	-	-	-	-
Wood products	170	10.1	20,088	8.9	23	13.9	3,500	14.9
Garments	89	5.2	9,638	4.3	10	6.1	877	3.8
Textiles	52	3.1	8,114	3.6	2	1.2	424	1.8
Repair workshops	46	2.7	3,706	1.6	2	1.2	848	3.6
Miscellaneous	236	14.1	40,893	18.1	31	18.8	6,920	29.6
Total	1,683	100.0	225,318	100.0	165	100.0	23,340	100.0

Source:- National Development Bank of Sri Lanka

Table 8.2 : Districtwise distribution of financial assistance under Small and Medium Industries Projects

District	SMI I		SMI II	
	No.of units	Amount Rs.(000)	No.of units	Amount Rs.(000)
Amparai	19	2,098	1	80
Anuradhapura	51	3,926	3	161
Badulla	67	4,049	4	132
Batticaloa	21	3,531	3	800
Colombo	393	83,712	44	9,745
Galle	56	6,473	15	1,099
Gampaha	213	29,062	19	3,451
Hambantota	36	4,478	2	128
Jaffna	51	12,954	4	928
Kalutara	64	7,201	7	1,006
Kandy	149	9,079	9	132
Kegalle	27	4,216	6	440
Kurunegala	178	13,160	6	539
Matara	84	11,043	8	572
Mannar	3	1,520	-	-
Matale	50	4,287	2	184
Moneragala	3	111	9	1,251
Mullattivu	3	367	-	-
Nuwara Eliya	9	726	3	525
Polonnaruwa	30	3,652	9	1,192
Puttalam	145	14,408	2	582
Ratnapura	17	1,620	8	356
Trincomalee	7	2,084	1	32
Vavuniya	7	1,552	-	-
Total	1,683	225,318	165	23,340

Source:- National Development Bank of Sri Lanka

obtain SMI assistance under the first project, Galle, Moneragala and Polonnaruwa obtained assistance under the second project.

The sample survey of the Colombo Metropolitan Area indicates only 10 percent of surveyed firms obtained finances through these schemes. The low level of response to the SMI schemes can be attributed to two reasons. Some entrepreneurs did not seem to be aware of the scheme; there were some entrepreneurs who applied for loans only after the NDB officials explained the scheme to them. Also the documentary requirements and related administrative formalities seem to discourage the entrepreneurs in obtaining the loans through this grant scheme. The information required to be submitted with a loan application included profit and loss statements and balance sheets, costs of setting up new projects, production plans revenue and profitability, demand for product and arrangement for marketing, competitive advantages in terms of price, quality and marketing. Small unorganised entrepreneurs are unable to supply this information as they do not maintain systematic records of their business activities. Therefore, only a few registered firms were benefitted by the scheme. According to bank officials some applications of small entrepreneurs were not processed due to various deficiencies in information provided by those entrepreneurs.

SUMMARY

This chapter investigated the impact of some government policies on the location and the development of different types of firms, especially the organised registered and informal unregistered firms. Although few attempts have been taken by the government to locate industries away from Colombo most organised registered industries are concentrated in and around the city. Small scale unorganised industries also tend to locate in centralised areas because of the available services and infrastructure facilities.

With the change of import substitution strategy to the export oriented industrialisation several important policy measures were taken by the government to expand the export oriented industries. Import Duty Rebate Scheme, Export Expansion Grant Scheme, Government Sponsored Credit Schemes have become an important export incentive schemes in Sri Lanka. The chapter emphasised the way different types of firms perceived these policies and responded to them. Registered firms were benefitted by these schemes, while unregistered firms were not either aware of the schemes, or do their transactions through agents. Thus do not have an access to these incentives.

Government has also introduced some fiscal incentives and tariff concessions for small and medium scale industries. More recently, with the abolition of quota systems and the introduction of import liberalisation policies the two types of industries (registered/unregistered) were greatly affected. Liberalisation of import of finished products resulted in a decrease of production and employment in small unorganised industries, while registered large industries benefitted from the liberalisation of import of raw materials.

Financial incentives have become an important feature in the development of small and medium scale industries in Sri Lanka. The survey showed the low levels of responses to the recently introduced Credit Guarantee Schemes. From all these policies it is clear that the differential impacts of policy on small and medium scale firms have reflected the structural dichotomy between the registered and unregistered manufacturing sector in Colombo.

CHAPTER 9 : CONCLUSIONS

This study has focussed on the organisational structure of small and medium scale manufacturing firms in the Colombo Metropolitan Area in an attempt to demonstrate the locational behaviour of these manufacturing organisations. In so doing it has placed itself firmly within the conceptual framework of the enterprise/business organisations approach. In this approach considerable attention has been paid to the internal condition of the firms, and has been concerned with the organisation of large firms in developed countries. McDermott and Taylor (1982) noted that recent research following this approach has never dealt properly with the internal conditions of the firm, with different authors having used apparently randomly selected variables to describe those conditions. More recently Taylor (1984) also pointed out that the small firm has been unceremoniously neglected by this approach, while the large enterprise has been singled out for exclusive and isolated attention. This study in focussing attention on the organisational structure of small and medium scale industries, attempts to fill some of the gaps in the existing literature. Moreover, its concern with these industries in a developing country and further, within a primate city, goes some way towards redressing the imbalance which currently exists.

At the outset, and because of the emphasis in the literature on large firms in developed countries, there arose a question of the suitability of the organisational approach to smaller firms and whether or not the relationships between organisational structure and the behaviour of manufacturing firms, revealed in developed countries, also exist in developing countries. In fact the study has revealed that there exists a fundamental structural dichotomy within the small and medium scale manufacturing sector in the Colombo Metropolitan Area and in Sri Lanka generally. This sector is characterised by the existence of a "formal" sector, comprising so-called "registered firms" and an "informal" sector comprising "unregistered firms". Firms belonging to the unregistered sector are relatively small in size, sometimes employing less than five persons, controlled by owner-operators and their families and have mostly unorganised structural characteristics. Capital investment is comparatively low and the technology is mainly labour intensive. In contrast to this, registered firms have well organised structural features and special relationships with government organisations. Moreover in most of these firms the dominant role is played by the managers or the shareholders having different types of ownership patterns such as partnerships and limited liability companies.

The study has revealed that this basic structural division goes some considerable way towards explaining the behaviour of small and medium scale manufacturing firms in Colombo, Sri Lanka, and the general hypothesis that the nature of the interactions of small enterprises depend upon their internal organisational structure was formulated. The study narrowed its focus, however, to the identification of the organisational structure of three types of industries (textile, rubber and metal) and to the relationships with functional linkages, attitudes of entrepreneurs, patterns and degree of locational adjustments, and the different responses of small firms to changes in government policy. In other words, the study has attempted to show that the form of an organisation or enterprise influences its input and output linkages, its labour force structures, the capital flow, its service and communication linkages, the attitudes of entrepreneurs and the nature of its manufacturing adjustments.

The organisational structure of firms in Colombo highlighted different characteristics in the three types of industries. Export orientation, for example, has been a characteristic phenomenon of many surveyed medium sized textile firms, though the other two types of industries are oriented mainly to local markets. Both capital and

labour intensive technologies are important in metal and rubber firms, whilst labour intensity is a prominent feature of all textile firms. Both continuous and discontinuous production processes are recorded in the surveyed firms. The differences between the organised registered sector and unorganised unregistered sector activities are noteworthy in all small and medium sized industries (Chapter 3).

The study underlined the strong dependence of firms in Colombo on local suppliers and customers. It also emphasised that very often unregistered establishments rely on local retailers and customers, while registered organised firms depend on the wholesalers and government organisations for their purchases and sales. Most small industries were located adjacent to the manager's/owner's residence and obtained their skilled and unskilled employees from the immediate surrounding areas. Strong dependence on owner-finance, both for the initial and working capital, was a common feature of small and medium sized industries.

Previous studies demonstrated the strong relationships between organisational structure and linkage patterns and, in many cases, the strong degree of localisation of linkages. The analysis of the material linkages

for Colombo firms also highlighted the significance of the organisational structure of firms in determining the pattern and the degree of localisation of linkages. The different structural features in the two types of industries (registered and unregistered) have greatly influenced the patterns and the degree of these relationships. Patterns of purchasing and sales links with different suppliers and customers, and the relationships with the organisational structure were found to vary with the internal structure of firms and the types of industries involved.

The study suggested strong relationships with retailers and wholesalers and weak relationships with private manufacturers and government industries. The patterns of these relationships with suppliers and customers are due to a number of factors. Some small entrepreneurs are unable to obtain credit facilities from banks as they do not maintain sufficient transactions with banks to qualify them for credit facilities. Again the inability of small entrepreneurs to fulfil the documentary requirements or related administrative formalities required by government organisations often disqualifies them from raw material purchases from these organisations. Many small entrepreneurs who purchase their materials from retailers not only pay a higher price for their purchases but also receive lower

quality materials. Due to the liberalisation of imports some private manufacturers and government organisations do not obtain products from local manufacturers, since direct importation of the required products in large quantities proves to be more convenient and profitable. Local small producers have, therefore, lost a considerable portion of their sales with government organisations. Weaker relationships with private manufacturers is an indication of the less frequent relationships the smaller firms have with other industrialists in obtaining raw materials and supplying their products. The study also highlighted that self financing is more prevalent among the less formal unregistered industries, while registered firms sometimes have access to finances provided by government and private financial institutions.

Previous studies demonstrated a highly internalised pattern of business services and suggested the organisational structure as a major determinant of the degree of this service internalisation. In contrast, most of the service needs of manufacturing firms in Colombo are highly externalised. The study revealed the externalised pattern of transport services in all three types of industries. Plant and consultancy services were obtained internally, because major maintenance and repair services

are unusual in smaller firms and because of the uncertainty of these service needs. However, externalised links are more marked among the metal working firms, because of the specialised service need of this sector. Of the financial services only the banking services were found to be important for smaller firms and these requirements were often satisfied within the local areas.

In contrast to the research findings of the studies of firms in developed countries the relationships between the pattern of service activities and the organisational structure of firms in developing countries, and certainly in Colombo, are weaker. These are due to the highly externalised pattern of some services in the small scale sector. However, similarly to previous studies, higher order services such as financial and legal services indicated a strong relationship with the organisational structure.

Chapter 6 highlighted the significance of service facilities and utilities and interpersonal relationships in determining the locational decisions. As suggested in previous studies, the structure of manufacturing firms emerged as a major determinant of entrepreneur attitudes. The study emphasised strong relationships between

organisational structure and the attitudes towards utilities, services and personal factors.

It was apparent in Chapter 7 that manufacturing adjustments in the form of size and product changes were important during recent years in the small and medium scale sector. Moreover, the nature and the degree of changes were found to be different in the registered and unregistered firms. The results suggested that the type of organisational structure is critical in evaluating both the magnitude and rate of change of manufacturing activities of a firm.

Significantly, there have been major reorientations of industrial policy in Sri Lanka with the change of government in 1977. The new government formulated policies for developing the export oriented industrialisation within a liberalised trade regime. The new policy reforms removed the qualitative import controls, along with considerable relaxation of control on many types of exchange systems. Since November 1977, with the introduction of import liberalisation policies all the raw materials and machinery required for industries were freed from control. Import of finished products were permitted with an introduction of different tariff rates.

For the development of export oriented industries a specific export development policy package including the

Import Duty Rebate Scheme and the Subsidised Credit Scheme was introduced. In order to encourage direct foreign investment, the Greater Colombo Economic Commission was formed and began to develop the Export Processing Zones with incentives for foreign investors. The Credit Guarantee Scheme was introduced in 1979 as a major financial incentive for small and medium scale entrepreneurs. Revisions of the tariff schemes and tax holiday concessions were introduced for export oriented industries.

However, the differential impacts of policy on small and medium scale firms have reflected the structural dichotomy between the formal registered industries and the informal unregistered manufacturing sector in Colombo and Sri Lanka. The well organised registered industries have benefitted from the reformed industrial policies, while adverse effects have been felt among informal unregistered firms. As a result of the abolition of quota systems registered large firms have been able to benefit by obtaining foreign raw materials in sufficient quantities. Although the liberalisation of imports has removed legal constraints on importation of raw materials, unregistered firms have to depend on importers since they are not in a position to import their requirements. Liberalisation of import of finished products has placed again the unregistered

industries in a disadvantageous position compared with registered industries. Well organised industries can spend on research and development and acquire the necessary technical competence to improve the quality of products and therefore to compete with imported products. Also the relatively high cost of production associated with small scale operation in unregistered industries makes it difficult to compete with the prices fixed by the well organised large firms.

Registered firms obtain greater benefit, too, from the recently introduced policies on export promotion and financial incentives. The Import Duty Rebate Scheme and the Credit Guarantee Scheme have been utilised only by the registered firms. The documentary requirements and the related administrative formalities were understood by these industries. Unregistered firms on the other hand, seem unable to provide the necessary information to obtain these facilities because they do not maintain the systematic records of their business transactions. From the direct foreign investment policy only the large and medium scale producers have benefitted.

The approach which was adopted in this study has raised a number of issues which demand further research.

In particular, the organisational framework used in the study needs to be subjected to further analysis and applied in other developing countries. This study revealed the significance of the registered/unregistered dichotomy in explaining the behaviour of manufacturing organisations in Sri Lanka. Whether or not such a dichotomy exists, or is important, in other developing countries must be determined for particular cultural and social environments.

Several questions are raised with regard to the organisational structure and behaviour of manufacturing organisations. Are characteristics of registered and unregistered industries more or less evident in other developing countries? If so, how do these formal and informal characteristics affect the behaviour of these organisations compared to Sri Lankan industries? Are there, in fact, differences among the developing countries in the relationships between the structure of manufacturing organisations and the behaviour of firms? What are the spatial implications of such contrasts and how do these patterns of organisation and environment relationships among small and medium scale industries influence the operations of the large firms which operate alongside them.

There is another research area in relation to the nature of theoretical and methodological approaches, to the dynamics of the firm structure and environment. Significant structural differences emerge within manufacturing organisations as a result of the development of firms unevenly over time. Size, ownership pattern, production processes and techniques tend to change with the historical development of firms and these structural differences influence the changing pattern of the behaviour of firms. In relation to the emphasis used in the present study, future studies could examine the new patterns of relationships and this might offer a potential context within which such comparative studies could be operationalised. Not only do firms operate unevenly over time and space, but the environment of the organisation itself is a variable and this holds potential implications for organisational structure and strategies which need to be more fully explored. For example; development in a city in which a firm operates may not affect its operations in outer regions. Future studies could examine how the changing structural pattern of various organisations can act to adapt to such inequalities and change in their environments. In relation to this emphasis there is a need to investigate the influence of individual firms, on redirecting structure of organisations and spatial strategies.

The present study has focussed only on the small and medium scale industries owned by local entrepreneurs, and those firms which are wholly or partly controlled by foreign enterprises have been excluded. As the corporate structure of such firms is different from the locally owned industries there is a need for an examination of the relationships with the behaviour of these organisations.

Although the study was not designed to formulate policy decisions it does in fact have some implications for public policy. Existing relationships between small entrepreneurs and suppliers are likely to continue in the future if the formalities and the incentives of the government for small and medium scale industries remain the same. Although government organisations provide raw materials for some industries, only a few well organised registered firms benefit. In order to minimise the difficulties encountered by the unregistered firms, provision of more efficient facilities will be required. Encouraging small entrepreneurs to organise their manufacturing activities in such a way that they do maintain frequent relationships with other industrialists either by supplying their products or purchasing their raw materials, would ameliorate the present difficulties experienced by the entrepreneurs.

The lack of any administrative cohesion and planning authority over the unorganised manufacturing sector in Sri Lanka aggravates the problem even more and gives clear evidence of the need for a more adequate administrative and planning structure. It is interesting to speculate whether or not this structure reflects, in fact, a failure to recognise the importance (or perhaps even the existence) of the informal sector in the colonial period and its persistence to the present. To achieve this, there is need for a sound data base on input structures and other related aspects of manufacturing activities. This might be done in collaboration with government organisations such as the Central Bank, Department of Census and Statistics, Department of Small Industries and Industrial Development Board, which are involved in the collection of data and information on manufacturing activities.

The externalised pattern of some services of manufacturing firms in Colombo may indicate the need for public sector service activities for the development of the small and medium scale sector. The survey showed that only a few entrepreneurs benefit from the currently available institutional facilities. The study emphasises the need to expand the supply of service facilities in different locations by developing and establishing regional service centres. Such a strategy could be pursued by the government

at least on a subsidised scale since the unregistered smaller firms are unable to invest in appropriate equipment. This will also aid the unorganised small entrepreneurs to purchase their service activities locally. Clearly, this would be impossible for the complete range of services but should be practical for selected key service activities. A number of secondary centres would aim to satisfy the lower order service needs of manufacturing establishments in the immediate locality of the firms, whereas higher order service activities would be provided by the regional capital.

Although the procedures for obtaining services show a greater improvement in the simplification of administrative formalities in the last few years, small firm entrepreneurs still consider these as cumbersome and complicated. Despite the publicity given through newspaper advertisements, small entrepreneurs do not seem to be aware of the serviceschemes provided by the public organisations. Also the documentary requirements and the related administrative formalities seem to dissuade small entrepreneurs from availing themselves of these services.

The service needs are also different for the various types of industries; therefore, policy needs to be aware of the particular strategy adopted by firms towards

satisfying their service needs. Also the study highlighted considerable variations in the manufacturing adjustments in the selected three types of industries. Organised textile firms have more advantages than the other industries surveyed and showed a remarkable growth in employment and the value of output. It might be suggested, therefore, that in formulating and implementing industrial development policies attention should be given to the types of products manufactured and the organisation of enterprises.

It was apparent in Chapter 8 that, although the government has taken steps to decentralise industries from Colombo city, there are problems faced in the enforcement of a policy which is designed to prevent new industrial growth in the city and to relocate industries. It has been recognised that many problems cannot be solved by designing policies and strategies to be operative only within the Colombo city. Further physical planning efforts alone cannot provide effective and appropriate solutions. Therefore, problems should be viewed from a much broader perspective calling for a comprehensive policy which has to be determined by the concerted efforts of many agencies at national and local level, reflecting both economic and physical considerations. For instance the locational bias towards the city shown by industrialists might be lessened by

locationally directional fiscal and monetary strategies. The Ministry of Industries and Scientific Affairs could provide enhanced assistance to industries sited in locations recommended by the Urban Development Authority. Tax incentives and concessions could similarly be discriminatory in terms of locations. Other relevant ministries could respond by improving particularly the infrastructure facilities in locations identified by the Urban Development Authority, thus making such locations attractive to the prospective investors. This in effect will mean the integration of physical and economic planning where national economic strategies are located by appropriate physical strategies.

Finally the study suggests the importance of 'organisational variables' in studying the behaviour of small entrepreneurs and small and medium scale manufacturing firms. The registered/unregistered dichotomy emerged as a significant organisational characteristic in determining the patterns and the degree of linkages, locational adjustments and entrepreneurial attitudes. Different, structural features in these two types of industries have greatly influenced the nature and the degree of these relationships. 'Capitalisation' and 'export orientation' were also found to be important organisational variables in determining the behaviour of small and medium scale manufacturing firms in Colombo.

APPENDIX - I

SURVEY OF MANUFACTURING INDUSTRIES
FACTORS AFFECTING THE LOCATION AND CHANGE

Date:

Name of enterprise:

Address:

Telephone:

Location:

Person interviewed:

Position:

PART I - GENERAL

- 1.1 Year of establishment:
- 1.2 Is the firm (a) a public company? (b) a private limited liability company? (c) a partnership? (d) a sole proprietorship (tick as appropriate)
- 1.3 Has your industry been approved by the Government? yes/no
- 1.4 Is your firm a branch or a subsidiary of another company? yes/no, If yes, please give the name and the address of the head office or the parent company.
- 1.5 Does your firm have branches elsewhere? yes/no
If yes, where are they located?
- 1.6 What is/are the main product/s of your industry?

PART II . . . FACTORS AFFECTING THE LOCATION

2.1 Raw material and market

2.1.1 What are the main raw materials used in your industry?

2.1.2 What is the percentage value of foreign raw materials used?.....

2.1.3 Using the table below, can you indicate for each supplier the % value of materials used which are purchased from the given localities. (In a municipality, local means the linkage operating within the municipality area: in urban areas within urban council area and in town within the town council area).

Suppliers	(a)	(b)	(c)	(d)	Total
1) Wholesalers	-	-	-	-	100
2) Retailers	-	-	-	-	100
3) Private Manufacturers	-	-	-	-	100
4) Government Industry	-	-	-	-	100
5) Subcontractor	-	-	-	-	100
6) Others	-	-	-	-	100

(a) Local - own locality

(b) Non local - outside the locality but within the district

(c) Non local - Colombo (other than Colombo Metropolitan Area)

(d) Non local - elsewhere

2.1.4 If you obtain raw materials from outside districts, please specify the districts

2.1.5 How much importance would you give to the following factors each of which concerns the choice of your suppliers? (place a tick in the relevant column)

	Very Important	Moderately Important	Not Important
a) Proximity to supplier	-	-	-
b) Ease communication with supplier	-	-	-
c) Quality of product	-	-	-
d) Delivered price	-	-	-
e) Delivery reliability	-	-	-
f) Volume of your requirement	-	-	-
g) No alternative supplier	-	-	-
h) Others	-	-	-

2.1.6 Do you have any problems in obtaining raw materials?
If yes, please specify?

2.1.7 What is the approximate cost of raw materials as a percentage of total cost of production?

2.1.8 Using the table below, can you indicate for each outlet for your product the percentage value which is distributed to each location (e.g. goods sold to an exporter in the metropolitan area would be metropolitan not overseas)?

Outlets	(a)	(b)	(c)	(d)	Total
1) Customers	-	-	-	-	100
2) Wholesalers	-	-	-	-	100
3) Retailers	-	-	-	-	100
4) Private manufacturers	-	-	-	-	100
5) Government industry	-	-	-	-	100
6) Subcontractor	-	-	-	-	100
7) Others	-	-	-	-	100

(a) Local - own locality

(b) Non local - outside the locality but within
the district

(c) Non local - Colombo (other than Colombo
Metropolitan Area)

(d) Non local - elsewhere

2.1.9 What are the major difficulties you encounter in
selling your products?

2.1.10 If your finished products go to outside districts,
please specify the districts

2.1.11 Is your industrial production aimed at the export
market? yes/no, If yes, what is the value of
exports as a percentage of total value of production.

2.2 Infrastructure and other facilities (service
facilities, public utilities, etc.)

2.2.1 What are the modes of transportation, distance and
time involved in transporting your raw materials
and finished products?

2.2.2 Does your industry have its own transportation
facilities? yes/no, If yes, how is it organised? ...

- 2.2.3 If you obtain outside road transport services indicate the location of those services (tick as appropriate).

	Own locality	Within the district	Colombo	Elsewhere
a) Raw material purchasing	-	-	-	-
b) Disposal of output	-	-	-	-

- 2.2.4 What is the cost of transportation as a percentage of total cost of production?

- 2.2.5 What are the problems encountered in transporting the raw materials and finished products? (please tick as appropriate) (a) High cost of transportation. (b) Restricted availability of services. (c) Inefficiency of transport facilities. (d) Others (specify).

- 2.2.6 What percentage of employees come to work by the following transport modes? (a) Public - Railway... Motorway (b) Private - Own transport Others

- 2.2.7 How do you obtain other service facilities for your industry? (tick as appropriate, if not relevant leave the space blank).

	(a)	(b)	(c)	(d)
a) Establishment services	-	-	-	-
1) Maintenance	-	-	-	-
2) Repair services	-	-	-	-
B) Consultancy	-	-	-	-
1) Management	-	-	-	-
2) Engineering and technical	-	-	-	-
c) Legal services	-	-	-	-

(a) Internalised

(b) Externalised - own locality

(c) Externalised - district

(d) Externalised - elsewhere

2.2.8 What are the Government key offices with which you have frequent communications and how far are they from your location?

2.2.9 Do you find any difficulties of access to those Government offices? yes/no. If yes, what are they?

2.2.10a Does your industry need water for the manufacturing processes? yes/no.

2.2.10b Do you have any difficulties in getting the required amount of water? yes/no. If yes, what are they?

2.2.11a Indicate the sources of power utilised in your industry. (i) Electricity (ii) Oil (iii) Firewood (iv) others

2.2.11b Are there any difficulties in getting the necessary power? yes/no. If yes, specify the reasons (tick as appropriate) (i) Inadequate supply (ii) Not easily available (iii) High cost (iv) Others specify

2.2.12a Does your industry have telephone facilities? yes/no.

2.2.12b Is there any difficulty of getting the necessary telephone calls? Yes/no. If yes, specify

2.2.13 Indicate the number of contacts you had with each of the following persons by location during a period of one month

	(T-L)	(T-NL)	(F-L)	(F-NL)	(P-L)	(P-NL)
a) Raw material suppliers	-	-	-	-	-	-
b) Customers	-	-	-	-	-	-
c) Bank officers	-	-	-	-	-	-
d) Technical advisers	-	-	-	-	-	-
e) Other industrialists	-	-	-	-	-	-
f) Others	-	-	-	-	-	-

T-L Telephone - local

T-NL Telephone non local

F-L Face to face local

F-NL Face to face non local

P-L Postal local

P-NL Postal non local

2.3 Capital

2.3.1 What is the initial capital investment (plant and machinery) of your industry (in 1984 values)? Rs.

2.3.2 What percentage (approx:) of your initial/working capital investment did/do you obtain from the sources indicated below?

	Initial capital Investment	Working capital
a) From family members	-	-
b) From relatives	-	-
c) Through banks and insurance companies	-	-
d) From trade customers	-	-
e) Private individuals	-	-
f) Own savings	-	-
Total	100	100

2.3.3 Do you have any difficulties in gaining access to financial capital? yes/no. If yes, specify

2.3.4 Do you have credit facilities to purchase raw materials from suppliers? yes/no. If yes, can you pay the money within a period of (a) 30 days..... (b) 60 days (c) 90 days (tick as appropriate).

2.3.5 Do you get ready cash for your finished products? yes/no. If not what is the proportion of money owed by customers, has been owed by more than (a) 30 days (b) 60 days (c) 90 days

2.3.6 Can you indicate the location from which you obtain your financial services (tick as appropriate).

	(a)	(b)	(c)
1) Banking	-	-	-
2) Insurance	-	-	-
3) Auditing	-	-	-

a) Own locality

b) Non local - Outside the locality but within the district

c) Non local - elsewhere

2.4 Land and Labour

2.4.1 Do you own or rent the land you occupy presently?....

2.4.2 What is the size of the site? (a) Below 1000 square metres. (b) 1000 - 5000 square metres (c) Over 5000 square metres.

2.4.3 Indicate the number of employees in your industry?

	Male	Female	Total
a) Managerial	-	-	-
b) Administrative	-	-	-
c) Skilled employees	-	-	-
d) Unskilled employees	-	-	-

2.4.4 What percentage (approx:) of employees come to work from the places indicated below?

	(a)	(b)	(c)	Total
1) Managerial	-	-	-	-100
2) Administrative	-	-	-	-100
3) Skilled	-	-	-	-100
4) Unskilled	-	-	-	-100

- 2.4.5 What is the cost of labour as a percentage of total cost of production?
- 2.5 Social and cultural factors affecting the location: (owner operators only).
- 2.5.1 Was owner born in this location? yes/no. If not how long has he been here?
- 2.5.2 What is the distance between the owners house and the manufacturing site?
- 2.5.3 Do family members work in your industry? yes/no. If yes, how many?

PART III - INDUSTRIALIST ATTITUDES TOWARDS THEIR PRESENT LOCATIONS:-

How much importance would you give to the following items, each of which concerns for the location of your industry. Tick the relevant number from the five point scale to indicate the significance of each item.

Scale:

- 1 = Not important at all, never considered.
2 = Rather unimportant, rarely considered.
3 = Occasionally important, sometimes considered.
4 = Usually important, often considered.
5 = Extremely important, always considered.

No.	Item	1	2	3	4	5
1	It is easy to access to the market from this location	-	-	-	-	-
2	Potential for the market is higher for finished products	-	-	-	-	-
3	Existence of the adequate transport facilities (generally refers to the major motor-railway transport)	-	-	-	-	-
4	Required amount of localised raw materials is available	-	-	-	-	-
5	Cost of raw material is relatively low compared to the other locations	-	-	-	-	-
6	Adequate land is available for expansion	-	-	-	-	-
7	Advantages of low land prices and rent	-	-	-	-	-
8	Easy accessibility to capital (mainly govt. financial facilities through banks and other financial institutions)	-	-	-	-	-
9	Required amount of labour is available in this location	-	-	-	-	-
10	Cost of labour is relatively low compared to the other locations	-	-	-	-	-
11	Availability of public utilities (water, electricity and telephones)	-	-	-	-	-
12	Easy access to the services (technical and professional) provided by the government	-	-	-	-	-
13	Easy access to local amenities such as shopping, housing; schooling and recreational facilities	-	-	-	-	-
14	Closeness to home and the family	-	-	-	-	-
15	Personal contacts with others	-	-	-	-	-
16	Personal preference to this area	-	-	-	-	-

PART IV - MANUFACTURING CHANGE AND GOVERNMENT POLICY:

- 4.1 What type of changes has occurred in your firm during the last six year period? (January 1978 - December 1983). (Tick as appropriate).
- a) Relocation b) Site extension
 - c) Employment increase d) Employment decrease
 - e) Production capacity increase
 - f) Production capacity decrease g) Production value increase
 - h) Production value decrease
 - i) Production addition j) Product loss
 - k) Plant closure l) No changes.....
- 4.2 If the location site changed, when was the manufacturing site transferred to this place?
- 4.3a Where was the earlier location?
- 4.3b Rank the following reasons for moving in order of importance:
- a) The lack of space for expansion
 - b) Poor safety conditions of the original location
 - c) Better prospects for production in a new location
 - d) To obtain lower production costs at the new site compared to the original location
 - e) The influence of the government policy or decision
 - f) Personal reasons (specify)
 - g) Others (specify)
- 4.4 If the site has not changed during the last six years, can you give special reasons for staying at this particular location (Rank them in order of importance)

- a) Enough space at the present location
- b) External and internal economies
- c) Easy acquisition of raw materials
- d) Proximity to customers
- e) Labour advantages
- f) Personal reasons
- g) Low risk and uncertainty

4.5a Should the present site become unsuitable or for any other reason, would the industry consider moving to another location? yes/no.

4.5b Please give reasons for your answer?

4.6 If yes, what type of advantages would your industry expect to gain?

4.7 If the production floor space has expanded during the last six years, indicate the amount of space increased. (Tick as appropriate)

- a) less than 10% increase of floor space
- b) 10% - 25% increase of floor space
- c) 25% - 50% increase of floor space
- d) more than 50% increase of floor space

4.8 If the volume and values of your industrial production expanded and contracted during the last six years, please give the percentage values of changes.

- a) Increase of the volume of production
- b) Increase of the value of production
- c) Decrease of the volume of production
- d) Decrease of the value of production

- 4.9 What was the number of employees in your industry in early 1978?
- 4.10 Did your industry receive any state assistance through incentives, during the last six year period? If yes, what type? a) Tax holiday b) Income tax benefit c) Credit Guarantee Scheme..... d) Export rebate e) Liberalisation of import of raw materials f) Technical and advisory services g) Others (specify)
- 4.11 Has the government assistance influenced your manufacturing expansion? yes/no. If yes, how? If not, what reasons have influenced your industrial expansion?
- 4.12 Have you made attempts to obtain additional finance during the last six years? yes/no
a) If yes, were you successful? b) If you have obtained additional finance during the last six years, from what sources was additional finance obtained? (indicate in the following with period of loan)
a) Credit Guarantee Scheme
b) Other than CGS but through banks
c) Financial institutions
d) Insurance companies
e) Trade customers/suppliers
f) Private individuals
g) Others (specify)

- 4.13 If you did not obtain any loans from the banks, please specify the reasons by ticking as appropriate. a) Difficulty of fulfilling the requirements b) Lack of information c) Accessibility difficulties d) Problems of administration e) Others (specify)
- 4.14 If your industry is export oriented what type of facilities do you get from the government?
- 4.15 What are the difficulties you encounter in obtaining these export promotion facilities?
- 4.16 If your manufacturing industry has contracted, lost any products or closed, what are the special reasons? Rank them in order of importance.
- a) Import liberalisation of finished products
b) Competition with local products
c) Difficulty of obtaining raw materials
d) High labour costs
e) Financial difficulties
f) Other factors (specify)

APPENDIX - II

The point biserial correlation coefficient is calculated as follows:-

$$r_{pb} = \frac{(y_1 - y_0)(pq)^{1/2}}{s_{dy}}$$

y_1 and y_0 are the means of the two groups of the dichotomy. 'p' is the proportion in the other group. Point biserial r is the product moment correlation applied to the data which involve a dichotomous or "point" variable (x) and one continuous variable (y) (Cohen and Cohen 1975).

Phi coefficient is calculated dividing the product of the diagonals of a contingency table of frequencies by the square root of the product of the four marginal sums (Carrol, 1961: Cohen and Cohen, 1975). The formula is as follows:-

		x_j	
		0	1
	0	a	b
x_k	1	c	d

$$\phi = \frac{ab - bc}{((a + b)(c + d)(a + c)(b + d))^{1/2}}$$

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