

**ECONOMIC LIBERALISATION AND INDUSTRIAL  
RESTRUCTURING: A CASE STUDY OF THE FORMAL  
MANUFACTURING SECTOR IN THE CITY OF NAIROBI**

**BY**

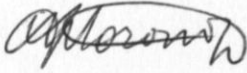
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**A THESIS SUBMITTED IN FULFILMENT OF THE REQUIREMENTS  
FOR THE DEGREE OF DOCTOR OF PHILOSOPHY (INDUSTRIAL  
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## DECLARATION

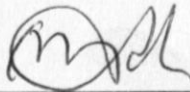
This thesis is my original work and has not been presented for a degree in any other university



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JAMES MORONGE MIYOGO

This thesis has been submitted with my approval as the University Supervisor



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PROFESSOR EVARISTUS M. IRANDU

## DEDICATION CONTENTS

This work is dedicated to my wife, Diana and my two children, Lynn and Ryan, who have been a constant source of inspiration, encouragement and love.

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## ABSTRACT

The main objective of this study is to examine and analyse economic liberalisation and industrial restructuring in the formal manufacturing sector in the City of Nairobi (hereafter CoN), with emphasis on the food processing, textiles and leather sub-sectors. Specifically, it investigates the effects of Kenya's economic liberalisation on industries in the formal manufacturing sector in the CoN and attempts to evaluate the applicability of the flexible specialisation model in the production organisation of the sector. The study also examines the industrial spatial economy of manufacturing industries in the study area.

To analyse data, both descriptive and inferential statistical techniques are utilised. The descriptive statistics used are percentages, frequencies and means while the inferential statistics are the Spearman's rank correlation coefficient, factor analysis and chi-square test.

Some of the main findings and conclusions of this study are: (a) the liberalisation of Kenya's economy has negatively affected the performance of industries in the study area. It has not only led to a decline in demand for manufactured products of the industries but also an increase in production costs as well as unemployment. (b) Industrialists in the study area have adopted a variety of strategies to deal with the effects of liberalisation, including marketing strategies, product changes strategies and technology changes strategies. (c) It is apparent from the research findings that the features of flexible specialisation model as theorised by

Piore and Sabel and other scholars are not well developed in the study area. (d) There is no significant spatial reorganisation of industries in the study area.

This study recommends that there is need for the design and implementation of deliberate policies and plans aimed at expanding the market for manufactured goods, not only in the study area and the rest of Kenya but the rest of the World as well. It is also important for planners and policy makers to put in place measures to revamp local industries that were adversely affected by liberalisation through, for instance, the design and implementation of specific and targeted incentive packages. There is also need to improve infrastructure not only in the study area but also in Kenya as a whole so as to reduce the costs associated with the transportation of inputs to industries and outputs to markets. Furthermore, there is need for further research on the effects of Kenya's economic liberalisation on other sectors of the economy such as agriculture and trade.

## LIST OF ACRONYMS AND ABBREVIATIONS

CoN	City of Nairobi
JKIA	Jomo Kenyatta International Airport
JIT	Just-in-Time
JIC	Just-in-Case
KAM	Kenya Association of Manufacturers
R&D	Research and Development
EPZ	Export Processing Zone
EPZA	Export Processing Zone Authority
OECD	Organisation for Economic Cooperation and Development

Finally, my gratitude goes to my wife, Diana and my children, Lynn and Ryan, for their love, care, prayers and constant encouragement. They created a conducive environment that enabled me to complete this work with ease.

However, I remain solely responsible for all the errors and omissions, if any, in the thesis.



## CHAPTER ONE

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# CHAPTER ONE

## 1.1 INTRODUCTION

Global industry restructuring takes a variety of forms. It may include investment in new plant and equipment, mergers and acquisitions, cessation or expansion of commercial alliances with other firms as well as general reorganization of production in an industry (OECD 2002). The restructuring process is an ongoing one, with successful firms constantly adjusting to shifts in competitive conditions in their markets. In the 1990s, there was intensified industrial restructuring worldwide due to various factors. For instance, the liberalisation of rules governing trade and capital movements, combined with privatisation and other regulatory reforms opened markets, requiring firms to adjust to rising international competition. Furthermore, the increased efficiency of capital markets as well as falling transport, computing and telecommunications costs, have facilitated and expanded international transactions. Advances made in information and communications technology (ICT) have had beneficial effects on the ability of firms to communicate and co-ordinate across geographically dispersed operations (OECD 2002).

As already noted, industrial restructuring may require general reorganisation of production processes in an industry. The organisation of production in industries has been explained by the technological paradigms of fordism and/or flexible specialisation (Piore and Sabel 1984, Storper and Scott 1989, Nielsen 1991). Fordism (also referred to as mass production) is characterised by large vertically integrated industrial establishments that use special purpose machines and unskilled labour to

produce standardised products. It aims at realising economies of scale and the labour employed performs highly specialised tasks with a top-down flow of authority and information.

On the other hand, flexible specialisation (also referred to as craft production) is characterised by small firms that utilise multipurpose machines and multi-skilled workers who produce a variety of customised goods. Workers make large segments of the entire products and the machinery operated is capable of reacting without delay or excessive costs to changes in the nature of products and volume of demand. Piore and Sabel (1984) argue that the two models of production organisation were in collusion during the 19th century until the 'first industrial divide' when industries were restructured and mass production technology emerged. This limited the growth of flexible technology that existed in various industrial districts in Europe before the first divide.

Piore and Sabel (1984) further contend that after the first divide, mass production became dominant internationally in all leading countries and in all leading industries. It should be noted that elements of flexible specialisation persisted but they were subordinate to mass production. However, the principles of craft production continued to be applied in some firms to meet small and/or irregular demand that could not justify mass production. The specific combinations of flexible specialisation and mass production were dependent on national or regional traditions. For instance, in the United States of America (USA), mass production was implemented with highly authoritarian systems of control while in Japan and West

Germany, important elements of flexible specialisation were retained on the shop floor.

The 'second industrial divide' is contemporary and dates from the 1970s when the international capitalist economy experienced a 'crisis' which continues up to date. As in the 19th century, the choice is between mass production and flexible specialisation. Piore and Sabel (1984) advocate for industrial restructuring utilising the flexible specialisation model. The crisis facing the international economy has been linked with the stagnation of demand and uncertainties associated with oil price increases; fragmentation of mass markets for standardised products due to growing diversity of consumer tastes, and saturation of markets for a lot of traditional consumer durables in developed countries. These market trends are seen to constitute a problem for the mass production model and an opportunity for the flexible specialisation model. Piore and Sabel (1984) see the current trends in manufacturing technology as reinforcing the advantage of flexible specialisation in meeting uncertain demand. For instance, small batch production will become more profitable as flexible machinery becomes more widespread. The two writers see a potential for the proliferation of small firms using flexible machines to compete in market niches both sectionally and geographically. This may lead to the emergence of new industrial districts consisting of networks of small firms similar to the 19th century districts prior to the first industrial divide. Flexible specialisation requires the reorganisation of the labour processes and industrial relations in ways radically different from those in mass production. There is greater trust between management and workers who are

given much more responsibility. Piore and Sabel (1984) identify regional islands of prosperity built on flexible specialisation model which have challenged mass production for instance, the 'Third Italy' and Silicon Valley.

The flexible specialisation thesis as theorised by Piore and Sabel (1984) has been criticised in many ways. One line of criticism centres on its 'conceptual ambiguity and theoretical unclarity' (Nielsen 1991:14). It has been argued that it is difficult to identify particular enterprises or industries as instances of mass production or flexible specialisation (Williams *et al.* 1987). Moreover, 'flexible technology, flexible work practices, output diversification, organisational restructuring and flexible labour markets are neither equivalent nor necessarily interrelated as implicitly presumed by Piore and Sabel' (Sayer 1989, Sorge and Streek 1987 cited in Nielsen 1991:15). Another line of criticism concerns the empirical premises of the second industrial divide. The premise of saturation and fragmentation of markets is said to rest on weak empirical evidence (Williams *et al.* 1987). It has also been noted that even if markets do become fragmented, this does not necessarily favour small-scale producers. Established large-scale producers have also shown the capacity for introducing a high degree of variety and flexibility into mass production (Gough 1986 cited in Nielsen 1991).

Despite the controversies surrounding the flexible specialisation model, it offers a framework for understanding industrial restructuring. By questioning the efficacy of mass production, it offers logic for understanding the organisation of production, the division of labour among the various sizes of firms of an industry and

the related size distribution of industry (Masinde 1996). The model offers various arguments which support the case for movement away from mass production to more disaggregated forms of production organisation in manufacturing industries: vertical disintegration of enterprises and the inter-firm relationships resulting from such disintegration; outsourcing of inputs; subcontracting of processes and /or work, marketing of outputs, among others. The adoption of the flexible specialisation model in the organisation of establishments leads to leaner, flatter and adaptable organisations that are capable of coping with uncertain and volatile environments (Piore and Sabel 1984; Storper and Scott 1986).

## 1.2 STATEMENT OF THE RESEARCH PROBLEM

This study examines economic liberalisation and industrial restructuring in the City of Nairobi's formal manufacturing sector. It examines the effects of Kenya's economic liberalisation on manufacturing industries and evaluates the applicability of the flexible specialisation model in the production organisation of manufacturing industries. The study also examines the industrial spatial economy of the study area, with a view to establishing whether there has been any spatial reorganisation of the industries as a result of Kenya's economic liberalisation.

Since independence, the growth of Kenya's manufacturing sector has been erratic and where increases have been recorded, these have been marginal. For instance, between 1972 and 1976 the sector's output growth was 9.6%, between 1977 and 1980, it was 10.3%, between 1981 and 1985, it was 3.8%, between 1986 and 1990, it was 5.7% (Kenya, Republic of 1996:5). In the 1990s the sector's performance declined with growth rates of 2.2% and 2.3% for the periods 1991 to 1994 and 1995 to 1998, respectively (Kenya, Republic of 1999:24) In the period 2000 to 2005 the sector registered a low growth of about 2.5% (Kenya, Republic of 2001, 2003, 2006). Among the factors cited for this low growth especially in the 1990s was the liberalisation of Kenya's economy in 1993 (Kenya, Republic of 1995, 1999). Liberalisation brought many competitors to Kenya's manufacturing sector, thus offering consumers a wide variety of both locally produced and imported goods (Kenya, Republic of 1995). However, the increased (especially external) competition has had having detrimental effects on the growth of most local industries including

textiles, brewing, leather, among others, with some having to significantly scale down their operations or close down altogether. The need for local industries to restructure in order to target and better meet the Kenyan consumer needs had been recognised by the Kenyan Government by 1986. Accordingly, 'Kenya's industry must be restructured to become more efficient and capable of ...competing against imported goods...' (Kenya, Republic of, 1986:91). This study investigates the effects of liberalisation of Kenya's economy on industries and how industrialists are restructuring in the face of intensified competition.

The significance of the flexible specialisation model in developing countries has been noted (Schmitz 1990, Pedersen 1996, Rasmusen 1992). For instance, Schmitz (1990) argues that the small size of the domestic market in most African countries offers immediate advantages to small firms undertaking small batch production. Pederson (1996) notes that although the type of flexible specialisation (and the associated networks and industrial districts) associated with Europe and the newly industrialised countries is not common in Africa, this '...does not mean that flexibility and networking are less important in Africa than in Europe' (Pedersen 1996:6). He further notes that 'as in the developed countries the response of enterprises (in Africa to market instabilities) is networking and flexible specialisation, but networking and specialisation that is of a different kind from that in the industrialised world' (Pedersen 1996:7). It will also be noted that the empirical bases on the existence and significance of the flexible model especially in developing countries and Kenya in particular have been scanty. This study attempts to evaluate



the applicability of the flexible specialisation model in the production organisation of industries in the CoN.

It has been argued that industrial restructuring may lead to alteration of the industrial space economy (Piore and Sabel 1984; Sabel 1989, Storper and Scott 1989). This is through spatial clustering/agglomeration of enterprises, which may lead to creation of new industrial spaces. The changing manufacturing environment is viewed as leading to the clustering of small firms that are production-related. Such firms interact and collaborate closely (Sabel 1989, Storper and Scott 1989 Milne 1991a). This study assesses whether there has been any spatial reorganisation of the formal manufacturing sector in the CoN, as a result of the liberalisation of Kenya's economy.

The thrust of this study is summarised by the following research questions:

- What are the effects of the liberalisation of Kenya's economy on the formal manufacturing sector in the CoN?
- What strategies have industrialists in the study area adopted to deal with the effects of liberalisation?
- How relevant is the flexible specialisation model in explaining the production organisation of formal sector industries in the study area?
- Has there been any spatial reorganisation of the formal sector industries as a result of the liberalisation of Kenya's economy?

### **1.3 THE OBJECTIVES OF THE STUDY**

The overall objective of the study is to examine economic liberalisation and industrial restructuring in the formal manufacturing sector in the CoN. The specific objectives are outlined as follows:

1. To investigate the effects of Kenya's economic liberalisation on industries in the formal manufacturing sector in the CoN.
2. To assess the strategies that have been adopted by industrialists to deal with the effects of Kenya's economic liberalisation.
3. To evaluate the applicability of the flexible specialisation model on industries in the formal manufacturing sector in the CoN
4. To assess whether there has been spatial reorganisation of the formal sector industries in the CoN as a result of the liberalisation of Kenya's economy.

### **1.4 JUSTIFICATION OF THE STUDY**

This study can be justified on several grounds, as follows:

- (a) As already noted, Kenyan manufacturing establishments have faced intensified competition mainly due to the liberalisation of the economy. The competition has had detrimental effects on the growth of most local industries including food processing, textiles, brewing and leather, with some having to significantly scale down their operations or close down altogether. The need for Kenya's industries to be restructured to become more efficient and

capable of competing against imported goods, has been recognised. A study on the effects of liberalisation of Kenya's economy and the extent to which formal manufacturing establishments in the CoN are restructuring in response to the competition is therefore imperative.

- (b) The relevance of the flexible specialisation model in developing countries particularly in Africa has been noted (Schmitz 1990, Pedersen 1996). The domestic market for manufactured product in most African countries is small. This offers immediate advantages to small firms undertaking small batch production. These are the types of firms emphasised by the flexible specialisation model. Accordingly, '... small is not only beautiful, but also versatile and flexible, and therefore usually more efficient' (Boyer 1991). However, little research has been directed towards establishing the existence and significance of the model in Kenya. This study is an attempt to fill the gap.
- (c) Some of the works of western writers (Milne 1990a, 1990b, 1991; Gertler 1988, Amin and Robbins 1990; Piore and Sabel 1984), although relevant to this study, suffer from the limitation of being irrelevant to the socio-economic and political backgrounds of developing countries. Hence, the findings, arguments and conclusions arrived at by these writers may neither be

conclusive nor representative of the circumstances in developing countries such as Kenya.

- (d) The study area, the CoN, is relevant to this study on account of the fact that it is the leading industrial centre in Kenya. It is also the headquarters of most of the industries and hence it forms an ideal study area within which to examine the various aspects related to industrial restructuring. Furthermore, the study focuses on food processing, textiles and leather industries because these sub-sectors have been identified as among those significantly affected by the liberalisation of Kenya's economy.

## 1.5 THE SCOPE AND LIMITS OF THE STUDY

This study focuses on the economic effects of the liberalisation of Kenya's economy on the formal manufacturing sector in CoN. Other effects such as political, social and environment effects are not given consideration. Furthermore, the informal sector and service industries are also excluded from the study.

The study limits itself to the CoN and excludes other industrial centres in Kenya from its analysis. Moreover, the study only focuses on three industrial sub-sectors, namely: food processing, textiles and leather. No other sub-sectors are analysed.

## **1.6 DEFINITION OF CONCEPTS**

### **Factory**

This is an individual plant in which goods are manufactured, usually in an enclosed shed. Factories are also referred to as establishments in this study.

### **Industry**

This term refers to any productive enterprise (involved in manufacturing and/or providing services, for example transport and communications) which employs relatively large amounts of capital and labour. This study focuses on the food, textiles and leather industries.

### **Manufacturing**

This is a process of transforming or converting raw materials (primary and/or secondary) of organic/inorganic origin(s) into forms directly useful to the users. Manufacturing takes place in a workshop, an open place or in an elaborate building (Ogendo 1972).

### **Formal manufacturing sector**

The formal manufacturing sector may be defined in terms of its attributes which include: operation at relatively medium to large scales; a formal organisation structure and production organisation as well as the use of predominantly capital intensive

technology. This sector emphasises on mass production and the labour employed has formally acquired the relevant skills.

### **Industrialist/Entrepreneur**

In this study, the term refers to the owner/manager of a given industrial enterprise.

### **Agglomeration economies**

These are savings to the individual productive enterprise that accrue from operating in the same location as others such as sharing of infrastructure; sourcing of inputs; subcontracting of work and processes as well as access to specialist financial services and marketing.

### **Economies of scale**

This is the lowering of unit costs that is achieved by increasing the scale of production. This may occur within an enterprise (hence internal economies of scale which are associated with greater specialisation and division of labour, spreading of costs over large production) and outside the enterprise (external economies of scale associated with the availability of skilled labour, supplies, infrastructure and specialist services).

### **Just-in-Case system (JIC)**

This term refers to an inventory control system characterised by holding of large stocks of inputs which are maintained in the factory's warehouse(s) and which are used in case need arises.

### **Just-in-Time system (JIT)**

This is an inventory system in which firms hold little or no stock(s) in their warehouses and instead depend on suppliers to supply them when the stocks are needed. The JIT system is dependent on close linkages between suppliers and industrialists and is theoretically associated with a great deal of sub-contracting/supplier-based complexes.

### **Economic Liberalisation**

This is a situation in which there is limited or no government interference in the economic system of a country. Instead, the market forces of demand and supply are supposed to determine the prices of goods and services. It has been noted that economic liberalisation leads to the opening up of a country's markets through the reduction of tariffs (taxes) and non-tariff barriers; deregulation of regulatory measures (such as the relaxation of investment and capital flows) as well as trade facilitation measures (such as the simplification of customs procedures) (Suppermanium 1999). Liberalisation differs from privatisation in the sense that the latter is a process through public (government) ownership and control of enterprises is transferred to

private ownership and control. Privatisation is also a process through which there is increased societal reliance on private establishments for the provision of goods and services (Saitoti 2002).

### **Non-tariff barriers to trade**

These are restrictions to trade targeted at imports to a country and are not in the usual form of tariffs. These barriers may be in the form of production/manufacturing requirements of goods such as how an animal is caught or a plant grown, with an import ban being imposed on products that do not meet requirements. Other non-tariff barriers to trade include the imposition of quotas, restrictive licencing requirements, subsidizing of production.

### **Industrial Restructuring**

This is the adaptation and/or change in the whole system of industrial production especially during a crisis event such as the competitive pressure on industries as a result of globalisation and liberalisation of economies. This has repercussions on the location and distribution of work in industry (Bradbury 1989).

### **Industrial space economy**

This refers to the arrangement and utilisation of space in terms of industries. It describes the industrial location patterns for the food processing, textiles and leather industries with emphasis to areas of industrial concentration within the CoN



## 1.8 CONCEPTUAL FRAMEWORK

The study's conceptual framework is discussed in this section. The framework is based on the theoretical relationship between the flexible specialisation model and performance of an industry. The effects of some variables, associated with the flexible specialisation model, on the performance of an industry are conceptualised.

The key variables in the model are:

- Innovation;
- Multipurpose machinery/equipment ;
- Vertical disintegration
- Labour skills

Innovation is a major aspect of the flexible specialisation model. It has been argued that the key to prosperity lies in moving away from the rigid mass production of standardised products toward a more innovative flexible system of multipurpose machinery operated by skilled labour and able to respond to continuous change (Piore and Sabel 1984; Hirst and Zeitlin 1989). Innovation leads to production of new differentiated products (in terms of variety, quality and design) and/or old products produced in new ways to serve different market niches. This widens the market areas for industries and hence ensures profit and/or survival (for those industries threatened with closure).

In a flexible specialisation setting, workers operate multipurpose (general) purpose machines in the production process. Such machinery/equipment has an ability to be redeployed in an endless number of ways (Valery 1987, Gertler 1988). The machines are computer programmed (for example, robots and computerised numerically controlled tools) and hence can be reprogrammed to quickly change from one operation to another. This enables the industrialist to switch from one product to another in response to changes in demand. It also reduces downtime between production runs for different products making it possible for fixed capital to be utilised more efficiently in industries for greater cost-effectiveness (Gertler 1988). The other key advantage of flexible machinery is that their technical life can be extended by simply reprogramming them to produce new products thus forestalling obsolescence of such machinery /equipment.

Flexible machinery can be combined into an integrated system involving several phases of the overall production process and which may encompass links between various industrialists and the final consumer market. Flexible manufacturing systems often integrate various phases of the overall production process, including product design, manufacture and distribution. This allows for the use of JIT system of inventory control. The JIT system has an ability to reduce both the size of inventory (of inputs) held and the length of time that the inventory is held. This enables industrialists to tie up less working capital in inventory hence 'reducing the turnover time for this capital and keeping down production costs' (Gertler 1988:420). The net effect of all this is an improvement in the performance of industries.

In flexible production organisation, vertical disintegration is emphasised. This is the downsizing of large enterprises into smaller units to better cater for particular market niches. Such units network through a variety of relationships such as the subcontracting of work or process; external sourcing of inputs, and external marketing of outputs. Networking among firms is aimed at cost reduction and may lead to spatial clustering of establishments thus reorganising industrial spatial patterns. This may lead to the emergence of newly industrialised districts arising out of the close interaction and collaboration between production-related and locationally proximate enterprises (Sabel 1989; Storper and Scott 1989).

The flexible specialisation model, borrowing heavily from a series of case studies based on Third Italy, the Silicon Valley among other areas, point to the growth of industrial agglomerations which are based around dense transactional relations between firms (Sabel 1989). Thus, a high-tech complex characterised by agglomeration tendencies is likely to develop. Such a complex arises from the intense nature of information flows and the highly developed and specialised sub-contracting environment that is in existence. The growth of new, more flexible forms of manufacturing is seen, therefore, to lead to vertical disintegration of organisational structures and result in spatial agglomeration of firms arising out of intense transactional networks (Storper and Scott 1989).

The flexible specialisation model gives emphasis to skilled workers who make large portions of or the entire products on the shop floor. Accordingly, labour is both functionally and numerically flexible. Functional flexibility involves use of the same

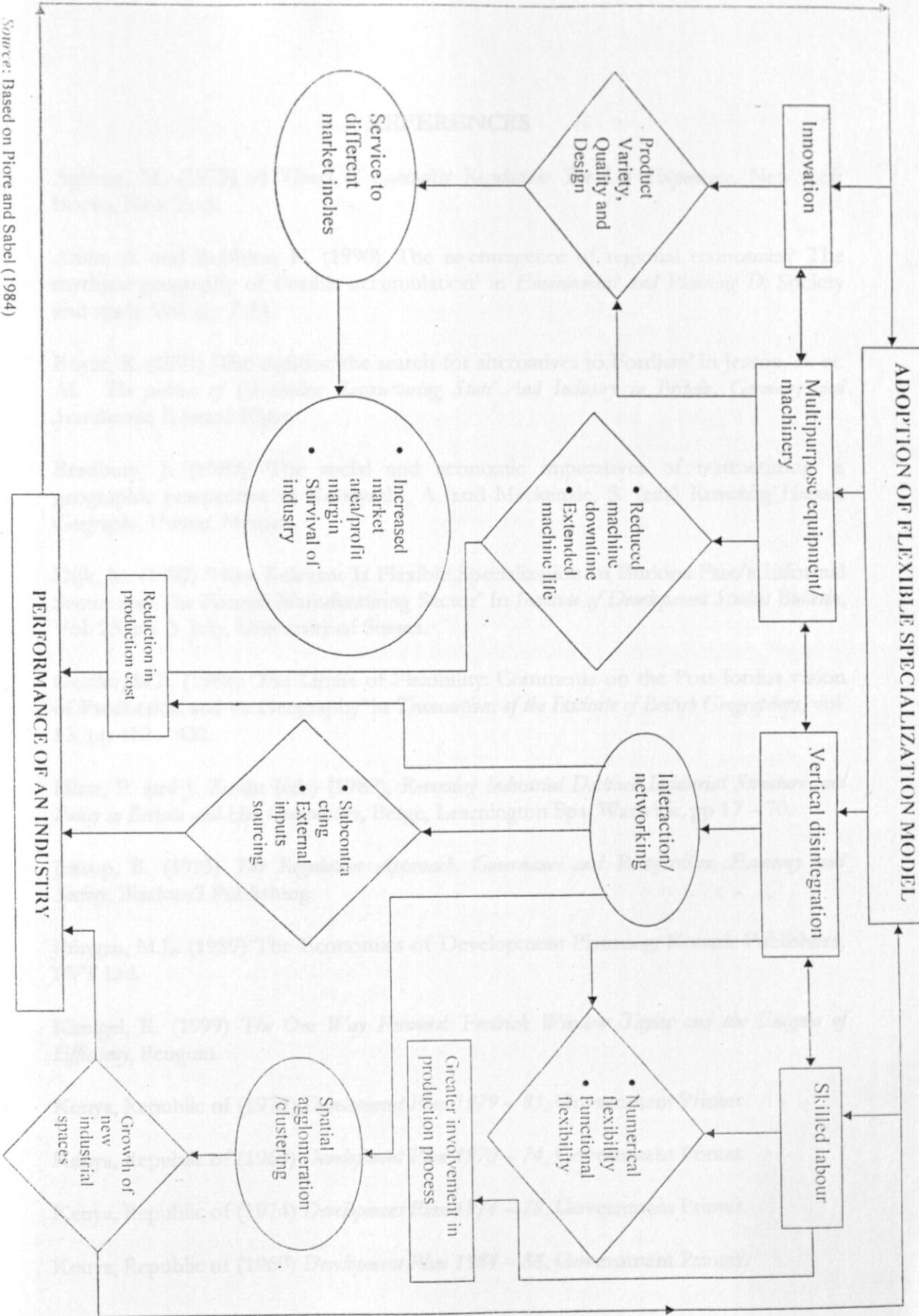
worker to perform a wider variety of tasks than before. Numerical flexibility enables firms to adjust the aggregate quantity of labour, in response to fluctuations in demand for individual products through greater use of overtime, part-time employment and temporary workers. Workers not only execute work but also participate in its conception. Thus, the model demands greater trust between management and workers and more worker involvement in technological improvement and the production process. The key variables of the flexible specialisation model and their interrelationships are outlined in Figure 1.

3. There is no significant difference between the attitudes of the flexible specialisation model and those of the production organisation of the formal manufacturing sector in the study area.
4. There has been no significant spatial reorganisation of formal manufacturing industries in the CoN as a result of the liberalisation of Kenya's economy.

## 1.9 HYPOTHESES

The null hypotheses for the study are:

1. The performance of the formal manufacturing sector in the CoN has not been significantly affected as a result of the liberalisation of the economy of Kenya.
2. There is no significant variation in the strategies adopted by industrialists in the formal manufacturing sector in the study area to deal with the effects of the liberalisation of Kenya's economy.
3. There is no significant difference between the attributes of the flexible specialisation model and those of the production organisation of the formal manufacturing sector in the study area.
4. There has been no significant spatial reorganisation of formal manufacturing industries in the CoN as a result of the liberalisation of Kenya's economy.



Source: Based on Piore and Sabel (1984)

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### Introduction

Literature review is conducted to identify the theoretical and/or empirical aspects that have been studied in the (planned) field of study with their respective weaknesses/gaps which the (planned) study should make an effort to remedy/fill in, respectively. The survey also helps to investigate research areas already studied so as to avoid repeating the same, as this may lead to a waste of time, money and duplication of work. Furthermore, it helps to establish the commonalities of past researchers and the areas of weakness, thus creating a possibility of making a contribution to the relevant area of research.

### 2.3 THEORETICAL BASES

Several theories have been advanced to explain industrial production organisation and restructuring. Among the dominant theories include Taylorism, Republican School, Mass Production and Flexible Specialisation. Taylorism refers to the scientific principles of management as elucidated by Frederick Winslow Taylor in 1911 (Korngold, 1999). The key principles include:

# CHAPTER TWO

## LITERATURE REVIEW

### 2.1 INTRODUCTION

This chapter presents the literature review of this study. Literature is reviewed on both the theoretical and empirical bases of economic liberalisation and industrial restructuring.

Literature review is undertaken to identify the theoretical and/or empirical aspects that have been studied in the (planned) field of study with their respective weaknesses/gaps which the (planned) study should make an effort to remedy/fill in, respectively. The review also helps to investigate research areas already studied so as to avoid repeating the same, as this may lead to a waste of time, money and duplication of work. Furthermore, it helps to establish the contributions of past researchers and the areas of weakness, hence creating a possibility of making a contribution to the relevant area of research.

### 2.2 THEORETICAL BASES

Several theories have been advanced to explain industrial production organisation and restructuring. Among the dominant theories include Taylorism, Regulation School, Mass Production and Flexible Specialisation. Taylorism refers to the scientific principles of management as elucidated by Fredrick Winslow Taylor in 1911 (Kanigel 1999). The key principles include:

- There is need to develop a science for every job including the rules of motion, standardisation of work implements and proper working conditions.
- Workers must be carefully selected and they must have the right abilities for the job.
- Workers must be carefully trained to do the job and should be given proper incentives.
- Management should support workers by planning their work and smoothing their way as they go about their jobs. This will ensure maximum productivity and increased income for the workers.

Taylor's principles had profound effects on the functioning of organisations, including the introduction and formalisation of hierarchy in the leadership of organisations as well as the split locations for manufacturing and office work. Taylorism has also been associated with specialisation of work and division of labour and the growth of manufacturing enterprises in the early 20<sup>th</sup> Century. Taylor's principles are the root of global revival in scientific management and other developments in the latter two decades of the 20<sup>th</sup> Century.

Taylor's principles have been criticised for ignoring individual differences among workers in organisations. For instance, the most efficient way of working for one person may be inefficient for another. Hence, the principles may not apply to all the workers in organisations. Furthermore, Taylorism ignores the fact that the economic interests of workers and management are rarely identical so that the

measurement processes and retraining required by Taylor's methods would frequently be resented and sometimes sabotaged by workforce in organisations (Kanigel 1999).

The Regulation School Theory has its origins in France in the 1970s and was refined theoretically in the 1980s. The theory explains how prolonged periods of stability are possible in capitalism, despite its contradictions and crises (Jessop 1995). Accordingly, capitalism has both a tendency towards crisis, change and instability as well as an ability to stabilize institutions, rules and norms. The theory is based on two key concepts: regimes of accumulation and modes of regulation. The regimes of accumulation refer to the systems of production and consumption while the modes of regulation are the written and unwritten laws, customs, policy paradigms and other institutional practices of society which control the regimes of accumulation and determine their form. According to the Regulation School, every regime of accumulation will reach a crisis point at which the mode of regulation no longer supports it, and the society will be forced to find new rules and norms, forming a new mode of regulation. This will lead to the beginning of a new regime of accumulation which will eventually reach a crisis, and so on (Aglietta 1974). The Regulation School has been criticised for its neglect of the role of material and technical inputs in production process and these may transform production as well as its purely economic understanding of the state which is reduced to institutions for regulating wages and credit (Aglietta 1974).

Piore and Sabel (1984) are credited with the elaboration of the Mass Production and Flexible Specialisation Theories. Accordingly, the present

deterioration of the advanced western economies is as a result of the limits of the mass production model of industrial development. They present 'flexible specialisation' as an alternative model of industrial development that offers the possibility of a prosperous future.

The two writers note that Mass Production and Flexible Specialisation can be historically realised as types of economy where one kind of production dominates over a given geographical area, regionally, nationally and internationally. Consequently, from the late 19th century, USA created a mass production national economy that was successfully imitated by other countries in the post-1945 period, thereby creating an international 'mass production economy'. On a regional basis, viable local economies that were based on flexible specialisation were realised in the 19th century European industrial districts. On the basis of the distinction between Mass Production and Flexible Specialisation, Piore and Sabel (1984) have built a superstructure consisting of: a theory of the types of economy; their characteristic problems and how they have been resolved; an interpretative meta-history of the development of modern manufacturing since 1800; and an analysis of the current crisis of the advanced economies as well as its possible solutions. Piore and Sabel introduce 'industrial divides' as rare moments of choice between mass production and flexibility. These are moments 'when the path of technological development is an issue' (Piore and Sabel 1984:5) and at which societies can choose between a future built on any of the two forms of production. Two industrial divides are identified. The first one occurred in the nineteenth century and is associated with the emergence

of mass production technology. The second industrial divide is more recent and dates from the stagnation of the international economic system in the 1970s through the 1980s and which is still continuing. Although the two divides are separated in time, the choice is necessarily the same in both cases - it is between mass production and flexible specialisation. According to Piore and Sabel (1984), the choice in the second industrial divide should be flexible specialisation.

A number of criticisms have been levelled against Piore and Sabel (1984). It is argued that the writers do not specify the criteria used in determining when one type of production organisation becomes dominant in a particular area - thereby creating a distinctive regional or national economy of the mass production or the flexible specialisation type. Moreover, it is very difficult to identify particular enterprises or industries as instances of mass production or flexible specialisation (Williams *et al.* 1987). It has further been argued that fragmented markets do not necessarily favour small-scale producers. Large-scale producers have the capacity to introduce a high degree of variety and flexibility into the production process (Gough 1986 cited in Nielsen 1991, Milne 1991b). The two writers have also been criticised for being ambiguous and theoretically unclear (Nielsen 1991) as well as not backing their claims with empirical evidence (Williams *et al.* 1987). This study seeks to establish the applicability of the flexible specialisation model as outlined by Piore and Sabel (1984) and others, in the formal manufacturing industries in the CoN.

Sessional Paper No. 2 of 1996 on *Industrial Transformation to the Year 2020*, sets out national policies and strategies to transform Kenya to a newly industrialised

country by the year 2020 (Kenya, Republic of 1996). The major policy components that are the backbone of Government strategy have been identified and they include political and social stability; macroeconomic stabilisation as well as flexible exchange rates and reduced budget deficits; investment in primary production to increase productivity, especially in smallholder agriculture; investment in human resources as well as physical infrastructure. The other strategies are reforms in financial sector, trade and investment; assistance to and cooperation with the private sector as well as increased resource allocation to technology development and management.

The Sessional Paper gives emphasis to the development of core industrial sectors that are essential for a strong and sustainable industrial base and which promote both backward and forward linkages with other industrial sectors. Accordingly, Kenya's industrialisation strategy has been divided into two phases. Phase one focuses on the promotion of micro, small and medium scale industries that are labour intensive and which use low and medium technology. They also utilise local material inputs and are export oriented. Appropriate industries for the phase have been identified as agro-based industries, building and construction as well as tourism.

Phase two industrialisation strategy lays emphasis on the promotion of capital intensive manufacturing industries that will require high capital and infrastructural investment, advanced technology and skilled manpower. The industries to be emphasised in this phase are metallurgical, petro-chemicals, pharmaceutical as well as engineering and electronics. These industries will take a longer time to fully establish



given their requirements for heavy capital, infrastructure and technology investment.

It is envisaged that this phase will be completed in the year 2020.

Sessional Paper No. 2 of 1996 is a policy framework that seeks to provide incentives, improve capabilities and provide an appropriate institutional framework that will ensure an industrialisation by the year 2020. However, it has been argued that the Sessional Paper fails to highlight the links between the industries promoted in the two phases of the industrialisation strategy. For instance, phase two industries may be underutilised unless there are close linkages between the two categories of industries. Phase two industries require substantial economies of scale and a local market before developing competitiveness for the export market (Ronge and Nyangito 2000). The policy framework does not consider the responses of actual and potential competitors to industries in Kenya, both local and international.

Sessional Paper No.2 of 2005 on *Development of Micro and Small Enterprises for Wealth and Employment Creation for Poverty Reduction*, is a policy framework aimed at developing a vibrant micro and small enterprises (MSEs) capable of creating employment opportunities; stimulating economic growth; reducing economic disparities as well as strengthening linkages between firms. The policy framework seeks to provide an enabling environment to increase the competitiveness of MSEs in Kenya.

The Sessional Paper identifies the challenges to the development of MSEs as the unfavourable policy environment; the inhibitive legal and regulatory environment; the limited access to markets, financial services, skills and technology and

infrastructure. The other bottlenecks are gender inequality; inadequate business skills; limited linkages with large enterprises; unfavourable taxation regime; entry barriers as well as the HIV/AIDS pandemic. To address the limitations, several measures are proposed, including:

- The creation of an enabling policy environment that will support MSE growth and development including a favourable institutional framework for effective policy implementation. The integration of the MSE sector into the mainstream national grid is also proposed;
- Legal and regulatory reforms which are geared towards the development of laws and regulations that are dynamic and responsive to the needs of the MSEs;
- Licensing and business registration reforms that include simplification of procedures and decentralisation of services;
- Review of land and labour laws to simplify and harmonise them as well as make the supportive and responsive to the needs of stakeholders in MSEs;
- Allocation of 25% of all Government procurement requirements to the MSE sector as a way of providing market to MSE products;
- Putting in place measures that enhance access to credit and financial services to MSEs, by the Government, including the establishment of a Micro Finance Trust Fund from which micro finance institutions can borrow for on-lending to MSEs as well as encouraging commercial banks to open up lending to MSEs;

- Infrastructural development through Government encouragement of private sector participation in the development and management of market stalls and work sites for MSEs;

To ensure effective implementation of the above policy measures, the Sessional Paper proposes effective coordination as well as monitoring and evaluation of activities and stakeholders in MSEs activities. It also provides an indicative policy implementation matrix.

The major limitation of Sessional Paper No. 2 of 2005 is that it is general in approach and fails to identify specific MSEs with the greatest potential and which should therefore be given first priority

Bradbury (1989) examines broad trends of restructuring in both developed and developing world with emphasis on the causes of geographic and economic restructuring. He notes that in capitalist societies the fundamental determinant of restructuring of geographic space and the socio-economic relations of production, is in the arena of production itself. The production system has been internationalised and hence operates within and between regions and across national boundaries making restructuring international in character. The large expansion of multinational firms has made restructuring complex with the firms able to expand and contract their system of production in accordance with differential spatial rates of profit.

Bradbury (1989) cautions against seeking the causes of restructuring, entirely within a local area, region, or even national state. Actual causes are likely to result in

the interaction between internal and external components of the international division of labour. This is particularly the case in the relations between production units such as factories, branch plants or foreign owned firms.

According to Bradbury (1989), explanations to restructuring must take into account various forms of capital and credit shortages and sources of finance. Technological change can cause restructuring, for instance through replacement of old machinery by entirely new machinery or new parts. He further notes that competitive behaviour both within and between sectors also provides impetus for restructuring. The level of competition is dependent on the success of the production unit and the set of labour/capital relationships, which can match or overcome those set up by other firms. However, not all firms can compete at all times. Evidence suggests different levels of co-operation do exist at the level of information sharing, joint ventures and management. Bradbury (1989) notes that there has been a great deal of restructuring in the third world especially as a result of the internationalisation of labour and latter day movements of specialised manufacturing and assembly firms to the third world due to relatively cheap labour and tax incentives. Accordingly, multinational corporations have established joint venture, subcontracted production and/or moved the entire production units. Although relevant to this study, Bradbury's (1989) account is general and does not address itself to the flexible specialisation model of production organisation in manufacturing industries.

Gertler (1988) examines the contentions of some economic geographers that fundamental changes have occurred in production, based on the adoption of a

flexible system in the organisation of production. He sets out the fundamental elements of the changes - adoption of flexible machines, flexible manufacturing systems, flexible specialisation and integration and flexible accumulation. He also notes the implications of flexibility on the spatial arrangement of production activities. Accordingly, producers in the just-in-time system (flexibility) do not retain buffer stocks of parts inventory. As such, input parts must be transported relatively quickly and on short notice in order not to disrupt the flow of the production process and to respond to rapidly introduced qualitative changes in the nature of the final products.

The need to remain close to equipment suppliers so that malfunctions of equipment can be repaired quickly to reduce the amount of downtime of the individual machine is noted. Thus, the producer/assembler has to be located in close proximity to the supplier/subcontractor; especially if the former constitutes an overwhelming proportion of the latter's market. However, Gertler (1988) notes that there are barriers and obstacles to the adoption of flexible technologies. These relate to the lack of sufficient capital to implement the new technology; lack of technological sophistication - there is a large gap between the ideal technologies and the modes of work organisation and technology in practice. He further argues that complex spatial outcomes may result from the adoption of flexible technologies and that the key elements of the flexible technology have been in use in factories for a long time and cannot be viewed as a clean break from the past. This study seeks to verify empirically some of the contentions and issues raised by Gertler (1988).

Suppermaniam (1999) defines economic liberalisation as the opening up of markets through the reduction of tariffs and non-tariff barriers; deregulation of regulatory measures such as the relaxation of investment and capital flows between countries as well as trade facilitation measures such as the simplification of customs procedures/practices. He notes that liberalisation provides a conducive economic and business climate necessary for continuous growth. The liberalisation of trade and investment regimes generates opportunities for expansion of trade investment and technology flows. He argues that economic liberalisation enables a country to obtain reciprocal market openings, by trading partners particularly in the context of multilateral, regional and bilateral negotiations, as well as providing wider choice of goods and services and reduced prices resulting from increased international competition and specialisation. He further argues that liberalisation may, however, result in the rapid opening of markets resulting in unrestricted entry of competing products. This would affect domestic industries which are not mature enough to face the onslaught of competition. Although useful, Suppermaniam's contentions are general.

### 2.3 EMPIRICAL BASES

Pinch *et al.* (1987) has explored the relationships between labour flexibility in manufacturing industry and the growth of 'sunbelt' areas, with particular reference to part of what has been termed the English 'Sunbelt' areas - the city-region of Southampton. The first part considers the utility of the 'sunbelt' concept in the light

of recent work on evolving spatial divisions of labour in capitalist economies. Evidence from the manufacturing sector in the Southampton city-region over the period 1981 to 1987 reveals a relatively slow rate of job loss which can be attributed to the changing status of manufacturing plants in relation to their corporate hierarchies. The second part considers the meaning of the term flexibility and analyses the extent to which labour flexibility has been introduced into the large manufacturing industries in the Southampton city-region during the 1980s. The analysis reveals less flexibility than in other studies in the United Kingdom (UK). A variety of explanations for these results are considered together with their implications for the understanding of the relationships between labour flexibility and location. Some aspects of Pinch *et al.*'s (1987) study are relevant to this study. For instance, it analyses labour flexibility in manufacturing industries, which is of interest to the current study. However, the findings and conclusions of this study are different from those of Pinch *et al.* (1987) given the different socio-economic backgrounds and levels of development of the Cities of Southampton and Nairobi.

UK Milne (1990a) has carried out research on new forms of manufacturing and their spatial implications with emphasis on the UK electronic consumer goods (ECG) industry. Interviews and discussions carried out with ECG firms indicate that they operate in an environment characterised by intense global competition, rapidly changing consumer demand, shortened product cycles and pervasive impact of new technologies. In response to these pressures, firms have been forced to operate in an efficient and highly flexible manner by reducing the labour content and increasing

efficiency through redesign of products to improve quality and shortening of labour hours required to assemble products. He notes that all ECG plants have made significant steps towards the introduction of new, more flexible manufacturing processes and the majority reported substantial improvements in productivity and product quality. The industry-wide drive to increased flexibility and efficiency constantly forces firms to update their responses to the competitive environment because failure to do so can lead to plant closure. The spatial implications are far-reaching. There is evidence of a movement of production that had previously been located in low-labour-cost developing countries to the United Kingdom. Exchange rate fluctuations and the desire to produce within the European Economic Community have precipitated the move. The declining importance of direct labour costs and the improved performance of UK operations has been additional and major incentives. Once the decision has been made to move to the United Kingdom, the preferred locations tend to be within peripheral, assisted regions. Although Milne's (1990a) study is relevant, the findings and conclusions relate specifically to the UK electronic consumer goods industry and thus may thus be somewhat irrelevant to the socio-political and economic setting of developing countries such as Kenya. Hence, there is need to carry out research that takes into account the background of the countries.

Milne (1990b) examines the diffusion of new approaches to manufacturing within the UK whiteware industry. He argues that the industry has found itself in a rapidly changing competitive environment, characterised by intensified global



competition, especially from Europe and rapidly changing demand. In order to survive and prosper in the new competitive environment, firms in the UK whiteware sector have introduced a wide range of changes in their organisational structures - more innovative firms have adopted management policies and production process technologies that take them to the forefront in the drive towards more flexible manufacturing. At the same time, many indigenous firms remain tied to the traditional approaches. As far as levels of sub-contracting are involved, no growth or decline was observed in many of the more innovative manufacturers. Just-in-time-based (JIT) inventory control system was spread throughout the sector but was yet to reach any level of real success as most manufacturers could not exert enough control over suppliers. Milne (1990b) notes that many firms have introduced changes in marketing, sales and distribution and have improved overall research and development (R&D) performance. As far as the spatial implications of the new forms of manufacturing are concerned, Milne (1990b) argues that there is little evidence to suggest that the growth of JIT approaches has forced suppliers to locate in close proximity to final manufacturers. This is due to the relatively small size of plants in the industry, which does not allow many dependent supplier relationships to develop. The spatial impacts of changes in the white ware industry have yet to develop - there is little evidence, if any, of sub-contracting /supplier-based complexes. Milne (1990b) concludes that there is need for more empirical analysis to be conducted so that broader implications of the growth of new forms of

manufacturing can be better understood. Thus, a study on the production organisation of manufacturing industries in the CoN is a response to this need.

Milne (1991) has carried out research on the UK high fidelity (hi-fi) audio sector with emphasis on the changing market demand and competitive pressures on the sector. The responses to these pressures as well as the possible spatial implications are also examined. Milne (1991) notes that small firms that produce a limited range and output of products, including loudspeakers, amplifiers, tuners, turntables and compact disk (CD) players, dominate the hi-fi sector. The sector is facing growing challenge from firstly, overseas-based manufacturers of electronic consumer goods and secondly, the growth of new technologies such as the CD and Digital Audio Tape (R-DAT). Since the 1970s, there has been an increase in consumer interest in hi-fi equipment and hence the growth of many new small UK producers. The new source of competition has been the Asian hi-fi manufacturers - especially the large consumer electronics companies, which now have the flexibility to produce small batch high quality hi-fi equipment more efficiently. In order to survive and prosper in the new competitive environment, UK hi-fi firms have introduced a wide range of changes in their organisational structures, including product diversification, production of aesthetically pleasing designs, utilisation of new audio technologies, increased levels of research and development expenditure and utilisation of computer-aided design. However, there is little evidence to indicate that the manufacturing process has become vertically disintegrated. Levels of subcontracting have declined as firms have brought certain core activities in-house or

on-site. The development of JIT-based supplier relations has spread throughout the sector but has yet to reach any 'level of success' (Milne 1991:848) as most companies are not able to exert the necessary types of control over their suppliers. The use of part-time and/or temporary labour has not been widely adopted as an approach to achieving labour flexibility. The sector has witnessed major changes in marketing, sales and distribution operations are conducted and has improved its research and development performance significantly.

Milne (1991) notes that the UK audio sector has always operated in a setting that is relatively flexible and hence the ability to improve competitiveness does not rely on the introduction of flexibility but rather on the ability to increase efficiency. The problem facing the larger manufacturers of hi-fi equipment and those smaller firms undergoing rapid growth, is how to grow and still maintain the flexibility associated with small size. The spatial ramifications of the changes in the UK hi-fi audio sector are not easily identifiable but there is a tendency for past spatial patterns to be perpetuated at least in the short run. Accordingly, the spatial clustering of manufacturing cannot be explained by the theoretical frameworks developed by the flexibility specialisation model and there is no evidence of any significant growth in subcontracting and/or supplier based complexes. Milne's study is relevant but the findings and conclusions relate specifically to the UK hi-fi audio sector and thus may be somewhat irrelevant to the socio-economic and political background of Kenya.

Dijk (1992) has examined the relevance of the flexible specialisation model in Burkina Faso formal and informal manufacturing sectors. The key terms of flexible

specialisation that he considers include: multipurpose equipment; innovation; networking/interaction, and collective efficiency. As far as the informal sector is concerned, evidence indicates that networking is not an important feature. Although, certain activities tend to cluster together, for example a motor bike repairman setting up in front of a shop selling spare parts. There are some isolated examples of product innovation but this is not a key feature in the sector, and the flexible specialisation model is not apparent yet in the sector. Dijk (1992) notes that the formal industrial sector in Burkina Faso does not play an important role in the economy of the country. It is characterised by low growth of exports of industrial products. Evidence concerning the significance of the flexible specialisation model is much more positive in the formal sector with 8 out of 50 enterprises interviewed being classified as fitting the flexible specialisation model (Dijk 1992:48). Typical examples of flexible specialisation enterprises could be found in metal and woodworking and in fruit and vegetable processing sectors. The entrepreneurs opting for flexibility have made initial capital investments to finance multi-purpose equipment. Instead of relying on protection from the government they have gone for innovation and competition. Dijk (1992) concludes that the disruptive circumstances in Burkina Faso, due to the competition from Asian NICs, have forced local entrepreneurs to adopt certain strategies for their survival. The informal sector (where flexibility is not yet apparent) uses traditional approaches for survival, including, personal relations, good locations, the choice of a promising activity, initial investments and the chosen technology. For enterprises in the formal sector, innovations, clustering and

subcontracting are some of the key survival strategies. Dijk (1992) recommends that the Government of Burkina Faso should promote flexible specialisation through: starting innovation centres; promoting subcontracting; promoting clusters of production activities and creation of industrial communities and networks. Dijk's (1992) study is very relevant to this study given its focus on the relevance of the flexible specialisation model in Burkina Faso's formal and informal manufacturing industries. However, the study does not address the spatial implications of the model in detail. The current study attempts to fill in this gap by examining in detail the spatial implications of the flexibility model in the CoN.

Masinde (1996) has carried out a study on Kenya's motor vehicle industry whose main aim was to investigate the sourcing behaviour of large firms in the motor vehicle assembly sub-sector. Three motor vehicle assemblers namely General Motors (K) Ltd, Associated Motor Assemblers and Kenya Vehicle Assemblers, have been examined. The study indicates that the motor vehicle sector in Kenya only assembles completely knocked down (CKD) kits from major manufacturers all over the world and hence most parts and components are sourced externally as part of the CKD kits. Masinde (1996) further notes that there is wide scope for outsourcing and vertical disintegration within the motor vehicle sector. The variety and complexity of the components used in the manufacture of a motor vehicle make it nearly impossible for a single assembler to produce all its requirements. Furthermore, some of the franchise holders have no assembly facilities hence they have to contract out the assembly process. There are also difficulties associated with the proliferation of

makes and models of vehicles, which work against economies of scale in components and equipment. Frequent changes of the makes and models would make it difficult for in-house production. Preliminary findings indicate that large firms are not voluntarily procuring their requirements from local firms and much less from small firms. This is attributed to the lack of competitiveness in the supply market; poor policy framework governing the motor vehicle sector; lack of control over imported CKD products and comparatively high costs of local products. Outsourcing of services in the motor vehicle industry is much more widespread. Technical services and quality control are sourced externally, from the suppliers of CKD kits or the firms' parent company.

Masinde (1996) thus recommends that there is need for institutional and policy support to improve the assembler's confidence on the capability of local suppliers. Specific efforts by stakeholders should be directed towards motivation of assemblers and franchise holders to source voluntarily from local companies. There is need to control the proliferation of makes and models of vehicles. This study seeks to establish the sourcing behaviour and subcontracting in the formal sector industries in the CoN.

Ongile and McCormick (1996) examine the barriers to small firm growth with reference to Nairobi's garment industry. They identify five types of firms, which are subject to variations. These are: custom tailors, contract workshops, specialised small producers, mini-manufacturers and mass producers. The firms' production organisation reveals elements of both mass and flexible specialisation. The

organisation of mini-manufactures and mass producers strongly resembles mass production model. They (mini-manufacturers and mass producers) attempt to realise economies of scale by producing standard garments for a fairly broad market using specialised machines. Contract workshops, specialised small producers and custom tailors are akin to the flexible specialisation model. Both have a market orientation. For a contract workshop the entrepreneur depends on contracts and will make the type of garment that the customer wants. Constant product changes make division of labour nearly impossible and skilled workers make entire garments. Specialised producers focus on market niches - usually high priced and high fashion portion of the market. Custom tailors make garments to order. The findings and arguments raised by Ongile and McCormick (1996) are useful for this study. However, their research does not focus on the spatial implications of given production organisation(s).

Empirical studies in countries such as Tanzania, Malawi, Ghana, Mali and Senegal indicate that economic liberalisation has led to increased competition among micro and small enterprises. In a study of the five countries, Parker *et al.* (1995) found out that two-thirds of the micro and small enterprises reported facing increased competition in the post-reform environment. This has led to the closure of some of the firms. In Tanzania, excessive competition amongst small firms has threatened their profit margins as well as lowering their volume of sales. Some plants in less competitive small scale activities such as soap making and die and dye cloth making

have closed down. This study seeks to establish the effects of economic liberalisation on formal sector industries in the CoN.

In a study on export processing zones (EPZs) in the CoN and Athi River, Lumbasi (2003) has established that EPZs in Kenya exhibit similar structural characteristics as the new industrial spaces in North America and Western Europe. He also found out that various survival strategies are utilised including production of quality goods; the use of non-unionised labour; standardisation of production processes; locational mobility and reliance of EPZs incentives. He further established that the contributions of EPZs to the host economy (Kenya) are not significant. Just like Lumbasi's study, this study seeks to establish whether new industrial spaces have developed in the CoN as a result of Kenya's economic restructuring. However, the study focuses on industries both within and outside the EPZs.



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## **CHAPTER THREE**

### **THE STUDY AREA**

#### **3.1 INTRODUCTION**

This chapter examines some aspects of the study area, the City of Nairobi that are relevant to the study topic. It discusses the physical and socio-economic characteristics of the study area that have a direct bearing to industrial development. The main aspects examined include its location and size; the transport networks; industrial location and structure as well as demographic characteristics.

#### **3.2 LOCATION AND SIZE**

The CoN is situated at the south-eastern end of the agricultural heartland of Kenya. The immediate environment of Nairobi consists of the productive highland area extending northwards and westwards to incorporate the rich farming lands of the Rift Valley. The study area lies at an altitude of 1670m above sea level and between latitudes  $1^{\circ} 19'$  south and longitude  $36^{\circ} 59'$  east. It is about 500 Km. west of the Indian Ocean and occupies roughly 690 Km<sup>2</sup>. The strategic location of the study area enables its industries to easily obtain inputs such as agro-based raw materials from the surrounding region. Labour with diverse skills is also readily available. Figure 2 shows the location of the study area in Kenya.

The study area is the smallest administrative province by size in Kenya but the most important in terms of activities and functions. It is bordered by Central Province to the north, Rift Valley to the west and Eastern Province to the east. The study area is subdivided into a number of administrative units including Dagoreti, Kibera, Starehe, Westlands, Makadara, Embakasi and Kasarani Divisions.

### 3.3 TOPOGRAPHY AND SOILS

The existing topography and soils in the study area have influenced agricultural production, especially in the immediate agricultural hinterland and hence the availability and type of industrial raw materials. The site of the CoN falls into two contrasting regions. To the east is the low and virtually flat Athi Plains and to the west is the hilly and dissected Kikuyu Plateau, which falls from an altitude of 1950m to 1676m above sea level at the city centre (Obara 1990). The plateau is built on successive sheets of lava and tuff known as Nairobi Trachyte. The sheets of lava are responsible for the red volcanic soils that support a variety of industrial raw materials including tea, coffee, vegetables, flowers and grains.

The Athi Plains are flat and featureless. The parent rock consists of Nairobi and Kapiti phonolites, both of which are of volcanic origin. These have weathered down to produce heavy black cotton soils which are poorly drained and largely made up of clay. Unsurfaced roads on the soils are usually muddy and slippery during wet weather (Obara 1990). However, some of the clay soil is a basic raw material for

some industries in the study area. For instance, the Kasarani Division of the study area is well known for its clayworks and clay products such as tiles and bricks.

### **3.4 TRANSPORT NETWORKS**

#### *3.4.1 Road Transport*

Road transport is one of the most important forms of transport within the CoN. The study area is the focus of a series of radial and ring roads connecting it to other parts of the City, the rest of Kenya and the neighbouring countries. These are supplemented by a series of a comprehensive network of secondary roads and minor roads. The CoN's road network is classified in terms of density, namely: high, medium and low. The network density is aligned to the colonial policy of segregated development. The high density areas comprise the CBD and the Industrial Area as well as the western part of the study area. Medium density areas are found on the fringe of the CBD such as Parklands and Ngala. Low density areas are found in former African quarters such as Eastlands, Kahawa and Kamiti. The road network in the study area facilitates the transportation of material inputs for industries as well as finished products to markets. However, during the wet season, the flooding and erosion of road surfaces by heavy downpour and run-off is common (Ogonda 1986). This not only causes delays associated with heavy traffic jams but leads to increased production costs for manufacturers.

### 3.4.2 Railway Transport

The CoN is the most important rail network centre in the country. Rail transport was the first modern mode of transport and was introduced in the study area in 1899. The site of Nairobi was chosen by the Kenya Uganda Railway (hereafter KUR) authorities because it was a suitable stopping point between Mombasa and Kisumu (Boedecker 1936). It had adequate water supply and ample ground for railway tracks and sidings. The elevated cooler ground to the west was suitable for residential use and the place was free from tropical diseases such as malaria (White *et al.* 1948). The railhead reached Nairobi in June 1899 and by July 1899 it had become the headquarters of KUR and a railway station was established. By 1906 Nairobi had grown into an urban centre with over 10,000 people (Obudho and Aduwo 1992).

The spatial pattern of the railway transport system within Nairobi can be classified into four major truck lines, namely Nairobi-Kahawa-Ruiru-Thika line; Nairobi-AthiRiver-Voi-Mombasa line, Nairobi-Kibera-Kikuyu-Nakuru line and Nairobi-JKIA-Kenya Pipeline line. Rail transport is managed by Kenya Railways. The spatial coverage of railway transport within the study area is relatively small. The area with the highest density of railway lines within Nairobi is the Industrial Area where it is primarily used in hauling bulky raw materials from the railway station to various industrial establishments and finished products from the Industrial Area to the market areas especially outside the CoN. The main Mombasa-Kampala line connects the study area with the Coast, Rift Valley, the Lake Region and Uganda. These are important markets for manufactured products of the study area. They are also

sources of the industrial raw materials. For instance, the branch lines to Nanyuki and Magadi connect the city to the Mt. Kenya agricultural region and Lake Magadi respectively.

### 3.4.3 Air Transport

The study area is the hub of Kenya's air transport system with the Jomo Kenyatta International Airport (JKIA) which has through plane scheduled services to 46 airports in Africa, Asia, Europe and America (Irindu and Rhoades 2006). JKIA is a major gateway for visitors to Kenya's game parks, cultural heritage, scenic landscapes and business opportunities (including investment in industry). The airport also serves as a major cargo centre for both inbound and outbound goods. Other airports within the study area include Wilson Airport which serves most of the domestic chartered flights and the Moi Air Base (MAB) which is a military airport for Kenya Air Force at Eastleigh (Irindu 1995). Air transport is very essential for industrialisation as it facilitates the transportation of diverse raw materials including motor vehicle parts and spares, computers and peripherals, pharmaceutical products and finished products such horticultural produce, fish, cotton yarn, among others, to the markets. Figure 4 shows the road, air and railway network.



### 3.5 INDUSTRIAL LOCATION AND STRUCTURE

One of the most important land uses in the CoN is manufacturing industry (Figure 3). The expanding and varied industrial activities are concentrated in the Industrial Area located to the north of the Nairobi Railway and extending almost to the Jomo Kenyatta International Airport. Prior to the 1948 Nairobi Master Plan, that defined the current Industrial Area, many of the industries located in the CoN were to be found mainly within the CBD (Ogendo 1978). A number of light manufacturing and service industries are still located in the CBD. Examples of such industries include coffee processing, manufacture of clothing, furniture and fixtures, printing and publishing, small scale footwear fabrication and repair, motor vehicle repair and maintenance.

Apart from the main industrial area and the CBD, other industrial areas in Nairobi include Kahawa (chemical processing); Kasarani (clay products such as bricks and tiles); Ruaraka (brewing); Kariobangi and Dandora (steel and light metal industries). The industrial location patterns in the study area have been influenced by various factors. Economic factors play a significant role in industrial location in the study area. For instance, the availability of ready markets for various manufactured products is one of the major factors. A large number of industries such as those dealing with foodstuffs, textiles, leather, furniture and fixtures and the provision of a wide range of services are largely influenced by the availability of market in the study area. The importance of availability of capital as an industrial locator factor cannot be overemphasised. The CoN is endowed with various potential sources of financial

capital including banks and cooperative societies. Specialised financial institutions such as the Industrial Development Bank provide finance for industrial investment. Fixed capital (buildings and equipment) are mainly provided with the export processing zones. The study area is well endowed with physical infrastructure including a well developed transport infrastructure consisting of networks of roads, railways and air transport. This enables industries to obtain their raw materials and distribute the finished products.

Human and historical factors have also played a role in industrial location. The availability of labour of diverse skills and which is relatively cheap has attracted especially foreign capital (through multinational corporations) to CoN. Personal consideration factors such as the diverse sources of finance, a diversified market as well as favourable climatic conditions have attracted industries to the CoN. Historically, the colonial administration concentrated industrial location in the study area and the rest of Kenya Highlands. Hence, the CoN has a long history of industrial development.

It has been observed that most of the manufacturing industries in the CoN are non-agro based in nature and largely consist of manufacturing and service industries. In terms of production and service orientation the industries are mainly market oriented (Ogendo 1978). In terms of the scale of operations, the formal sector industries may be classified as operating on a medium scale and large scale. The informal sector mainly operates at a small scale (McCormick 1991). In terms of the rates of growth, there is a dominance of the study area by relatively fast growing

industries such as the telecommunications and information technology industries within the study area.

### 3.6 INDUSTRIAL DEVELOPMENT IN KENYA

The historical development of Kenya's manufacturing industry can be traced back to the colonial period (1895-1963). Kenya was colonised by the British and became a protectorate in 1895. The industries that were set up in Kenya during the colonial period were to serve the needs of the settlers and the surplus was exported to the world market. During the inter-war period (1918-1939) industrialisation did not receive much support from Britain as the colonies were seen as suppliers of raw materials for the British industries and markets for British industrial goods (Opondo 1997).

With the outbreak of the second World War, the attitude of the British Government towards industrialisation in the colonies changed drastically in favour of their (industrialies) establishment. This was partly because of the difficulties Britain had faced in her quest to export manufactured goods to the colonies leading to an acute shortage of consumer and capital goods (Swainson 1980; Kaplinsky 1978). This policy continued to be pursued even after the war. Most of the industries established during this period were mainly owned by the European settlers and foreign firms (Opondo 1997). The post-war period (1945-1963) saw the rapid establishment and expansion of industries in Kenya. This was due to the encouragement and support for industrialisation that was received from the Colonial Office as well as the

significant amount of aid that was being channelled into the training of labour for the industrial and agricultural sectors in Kenya. Most of the industries established in Kenya during this period were import substitution oriented (Swainson 1980; Ogonda 1992; Opondo 1997).

At independence, the import-substitution industrialization strategy was pursued mainly (but not entirely) in the first two decades of independence. It was largely a continuation of the industrial strategy pursued by the colonial administration and laid emphasis on the the "infant-industry" argument as it advocated domestic production of import substitutes by industries protected from international competition (Ronge and Nyangito 2000). The instruments of protection included quantitative restrictions, high tariffs on competing imports and overvalued exchange rates as well as broad-based economic controls that subsidized the industrial sector. This was the phase that emphasized the domestic production of previously imported consumer goods demanded by the growing urban wage class.

The initial impact of this strategy on economic growth was positive. The gross domestic product (GDP) growth rates averaged 6% in the first decade and about 4% in the second. Part of this growth rate was attributed to an equally impressive growth rate in manufacturing value added, which averaged 8% in the two decades (Ronge and Nyangito 2000). However, the impressive growth in manufacturing value added of 11.7% per annum, achieved during the period 1970–75, was not matched in the second decade, when it grew at a much slower 4.9% per annum (McCormick 1998).

By the second decade, it was realized that the import substitution strategy was not achieving its intended development objectives of creating employment and reducing poverty. This was mainly due to the excessive government control mechanism put in place to support the strategy which stifled progress to further stages of import substitution. These stages would have entailed the production of intermediate and capital goods (Mwaura 1986). The small domestic market (made smaller by the collapse of the East African Community) resulted in underutilized capacity, further compounding this problem and making it not viable to undertake further expansion of industrial capacity based on this strategy. The only logical option was to seek export markets and thus adopt an export oriented industrialization policy.

The export-oriented industrialization strategy was officially spelled out in Sessional Paper No. 1 of 1986 on *Economic Management for Renewed Growth* as part of the structural adjustment reforms adopted by the government to remove the distortions created by the previous policy regime (Ronge and Nyangito 2000). The sessional paper therefore offered specific incentives to encourage industries to produce for export as well as other reforms aimed at improving the overall macroeconomic environment. The trade liberalization measures proposed in the paper included: the abolition of quantitative restrictions; the harmonization and lowering of tariff levels; export promotion incentives such as manufacturing under bond, export processing zones, and the export compensation scheme and the adoption of a competitive exchange rate policy. Although these policies sought to promote export of manufactured goods from the previous import-substituting

industries, they did not specifically target any industries (Ronge and Nyangito 2000).

Implementation of the proposed policies was gradual and punctuated by reversals.

For example, the 1989–93 Development Plan, which elaborated on the export

promotion strategy, lamented that the proposed incentives had not become

fully operational three years after they were mooted.

During the 1990s, weaknesses in implementing the reform programme reversed previous achievements in the export sector. For example, fiscal indiscipline and associated macroeconomic imbalances, the reimposition of import licences and foreign exchange controls led to a slowdown in the growth of exports. Moreover, reforms in the external trade regime were not reinforced by reforms in the internal trade regime. Consequently, price controls and licensing procedures as well as other regulations continued to fetter economic activities in the productive sectors and in manufacturing in particular. The worsening terms of trade and deteriorating relations with the donors over unfulfilled expectations further compounded these problems (Ronge and Nyangito 2000). The overall impact of these challenges on the manufacturing sector and overall economic growth was negative. Some of the far-reaching structural reforms undertaken since 1993 to reverse this decline include: price decontrols; removal of all import restrictions; tariff reductions; the liberalization of foreign exchange markets; the privatization of public enterprises and civil service reforms. These reforms marked an ideological shift in government policy away from the state to growth led by the private sector (Kenya 1994). State involvement would be limited to the more traditional role of providing an enabling environment:

macroeconomic stability, physical and social infrastructure, and law and order (Ronge and Nyangito 2000). Since the 1990s to present, Kenya has continued to pursue an export-led industrialization strategy.

### 3.7 POPULATION DENSITY AND DISTRIBUTION

The study area is endowed with a rapidly growing population that has diverse skills that make it suitable for employment in industry. The study area's population has been increasing due to:

- The post-independence repeal of colonial immigration policy led to increased rural-urban migration. This in-migration has continued to date. This is partly due to the perceived advantages the study area has over other urban centres and provinces including a high concentration of industries as well as socio-economic and political infrastructure such as well developed transport and communication network, a 'cool' climate, recreation facilities education facilities and comparatively higher wages which make it (study area) the attractive to highly skilled manpower, some of which is utilised by industry.
- Natural population increase has also contributed to the population growth. The study area's population grew from 10,512 people in 1906 to 118,976 by 1948. This had increased to 266,795 people in 1962 and 827,775 persons by 1979. In 1989 the population of Nairobi was 1,324,570 and had increased to 2,143,254 in 1999 (Kenya, Republic of 1966, 1971, 1981, 1994, 2001). Currently, the

study area's population is estimated to be 3 million people. Table 1 shows the study area's population growth.

**Table 1: Population growth in the City Of Nairobi**

Year	Area (ha)	Population	% increase per annum
1906	1,813	10,512	4.4
1928	2,537	29,864	17.1
1931	2,537	47,944	6.5
1936	2,537	49,606	6.5
1944	2,537	108,900	6.5
1948	2,537	118,976	2.2
1962	2,537	266,795	5.9
1969	68,945	509,286	9.8
1979	68,945	827,775	5.1
1989	68,945	1,324,570	6.1
1999	68,945	1,690,000	4.8

*Source:* Kenya, Republic of 1966, 1971, 1981, 1994, 2001; East African Statistical Department 1986

- The increase in the study area's population can also be attributed to administrative boundary changes. The boundaries of the CoN were extended in 1920, 1927 and 1962. for instance, at the time of Kenya's independence, the population of Nairobi had grown to an estimated 350,000 mainly due to a major boundary extension that increased the urban administrative area to 690 km<sup>2</sup> (Obudho and Aduwo 1992).



### 3.8 ECONOMIC BASES FOR INDUSTRIAL GROWTH

The CoN has a number of economic bases that have supported industrial growth. These include a vibrant commercial and service sectors consisting of retail and wholesale businesses as well as the Nairobi Stock Exchange; leading hotel chains such as the Sarova Hotels, Hilton Hotel, Intercontinental Hotel and Serena Hotels; well developed financial infrastructure consisting of leading banks and merchant houses; professional services such as insurance, legal and other consultancy services. The CoN is the headquarters of several international companies and organizations. Two United Nations agencies, the United Nations Environmental Programme and United Nations Habitat have their headquarters in Nairobi. This makes the CoN one of the most influential cities in Africa and hence attractive for industrial investment. Although the study area is not a prime tourist destination it does have several tourist attractions. The most famous is the Nairobi National Park which borders the study area. Other tourist attractions include the Nairobi Animal Orphanage, the Kenya National Museum as well as the warm climatic conditions.

As part of the export-oriented industrialisation strategy, Kenya established her export processing zone (EPZ) programme in 1990. In return, it was expected that the country would benefit from the increase in capital investment, job creation, technology transfer, development of backward linkages and diversification of the export base (EPZA 2000). EPZs are a means of attracting foreign and domestic investors through a wide range of attractive incentives that are provided for law under the Export Processing Zones Act (Cap 571, Laws of Kenya) Within the export

processing zones, incentives are provided to encourage industrial location. These include fiscal incentives (tax holidays, exemption from value added tax and import duties on imported machinery, raw materials and utilities, exemption from withholding tax on dividends, exemption from stamp duty on execution of business transactions), procedural incentives (rapid project approval and licensing through one stop shop service, logistical support for imports and exports, clearance of import and export cargoes at the zones rather than at the port, work permits for technical and managerial staff) and infrastructural incentives (clean environment, serviced plots with pre-built godowns bearing water, electricity and telecommunications, garbage collection, sewerage facilities, landscaping and other office facilities).

Several EPZs are located in the study area including: Sameer Industrial Park, Rafiki (EPZ) Ltd, Thomas De La Rue, Apex Apparels (EPZ) Ltd, Baraka Apparels (EPZ) Ltd, J.A.R Kenya (EPZ) Ltd, Purba Apparels (EPZ) Ltd, Sahara Stich (EPZ) Ltd, United Aryan (EPZ) Ltd, Upan Wasana (EPZ) Ltd and Yu-un Kenya (EPZ) Company Ltd (KAM 2005/2006). The establishment of the EPZs has led to a significant inflow of industrial investment capital (both foreign and local) to the study

area



FIGURE 2. LOCATION OF THE CITY OF NAIROBI IN KENYA

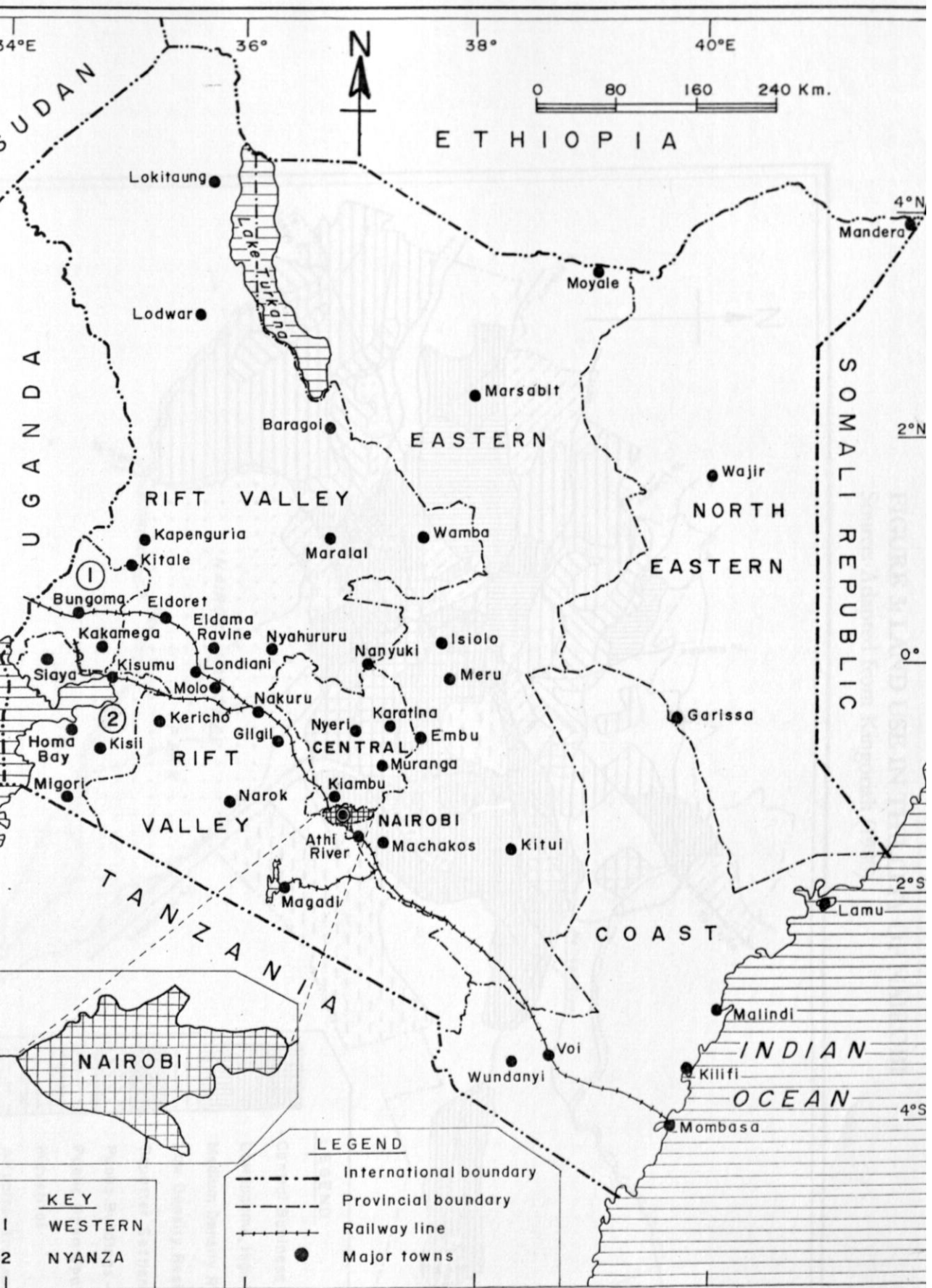
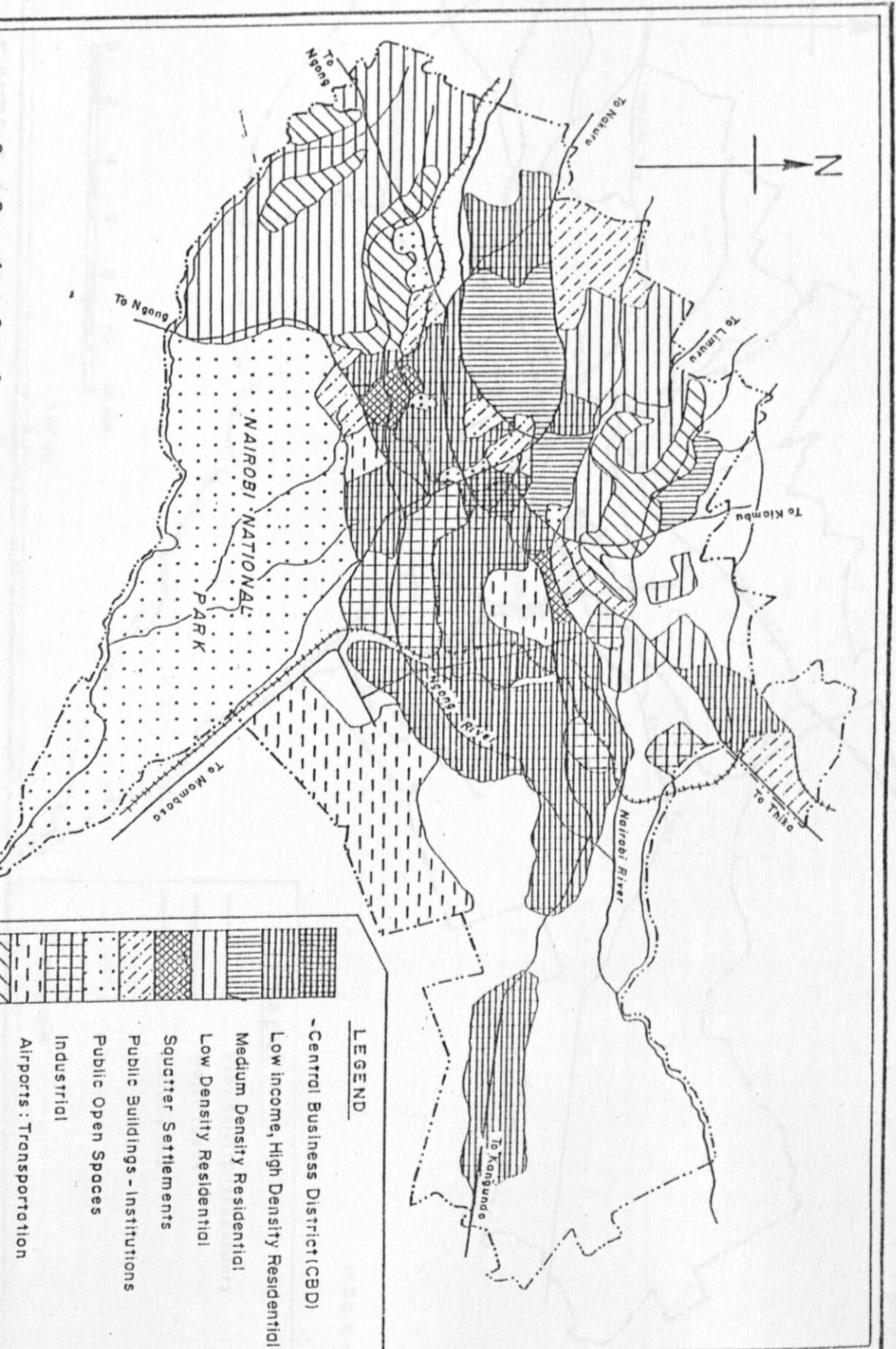


FIGURE 2 LOCATION OF THE CITY OF NAIROBI IN KENYA.

Source: Modified from Survey of Kenya 19

**FIGURE 3: LAND USE IN THE CITY OF NAIROBI**  
 Source: Adapted from Kingoriah (1980)



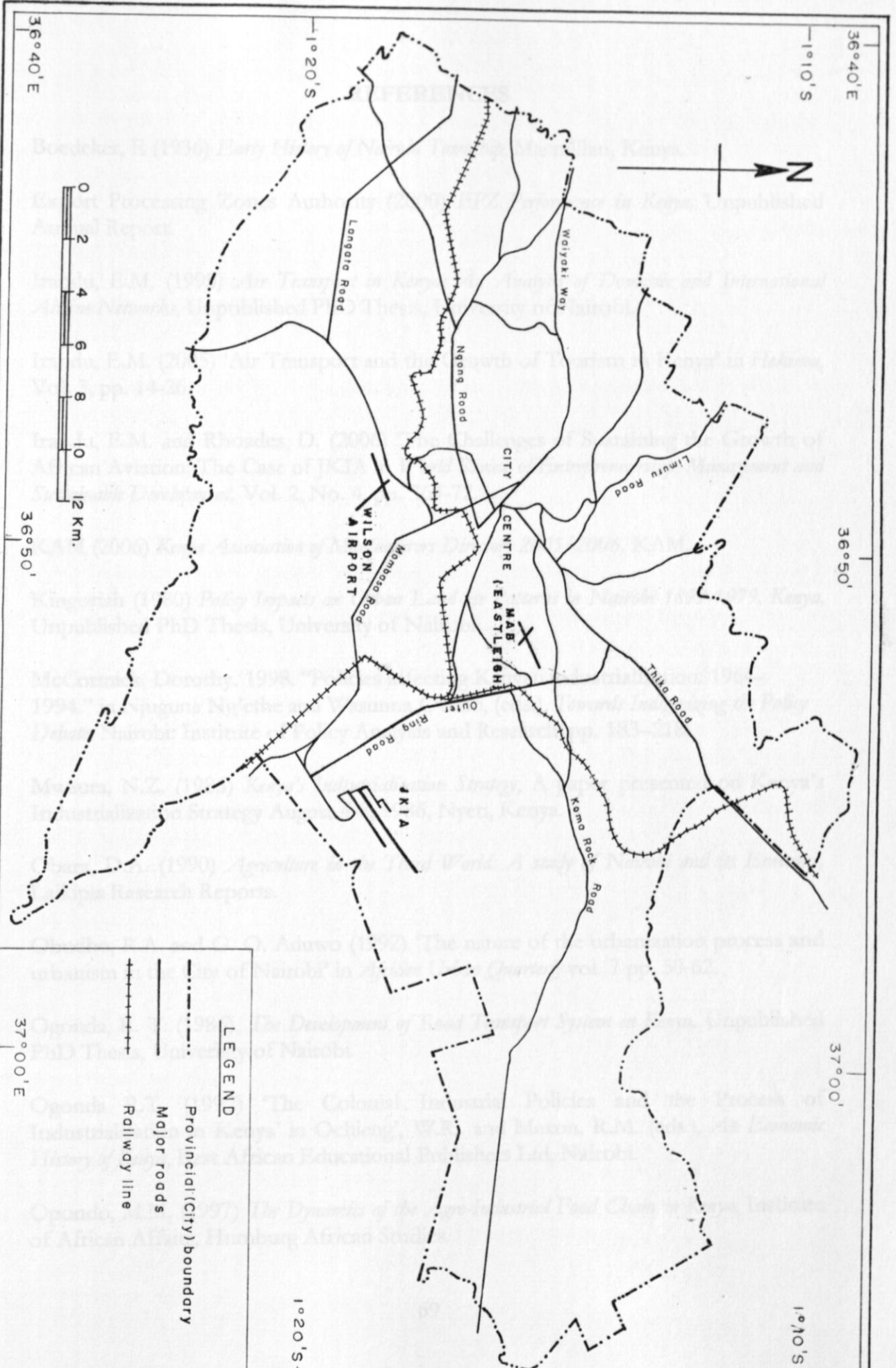


FIGURE 4 CITY OF NAIROBI: MAJOR ROADS

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## CHAPTER FOUR

### RESEARCH METHODOLOGY

#### 4.1 INTRODUCTION

This chapter presents the research methodology in this study. The research methods have been used to collect data which have been used in testing the hypotheses. Various methodological aspects are dealt with. These are: sampling design; methods of data collection; data analysis and presentation. The quality and quantity of data collected is important as it influences the data analysis tools utilised and the relevance of the research results. Prewitt (1974) has noted that the use of appropriate research methodology enables a research to avoid self deception.

#### 4.2 SAMPLING DESIGN

##### 4.2.1 *Sample Frame*

A sampling frame has been defined as the statistical population from which a sample is selected (Hammond and McCullagh 1978). The sample frame for this study consisted of the formal manufacturing industries in the following sub-sectors: food processing, textiles and leather. According to the Official National Directory of Industries 1998/99, the total number of industries in the respective sub-sectors was 535. However, during the pilot survey and data collection stage it was realized that a number of these industries had either been closed down or their locations changed. Many new ones had also been established. This necessitated repeated sampling in order to obtain the required sample size. It was felt that a sample size of 110,



representing 31.43 per cent of the estimated sampling frame of 350 establishments, was representative of the statistical population parameters. The utilisation of a sample as opposed to the entire statistical population was due to limited financial and time resources at the disposal of the researcher. It has also been noted that sampling enables a researcher to make inferences about the population characteristics on the basis of sample analysis, within the limits of statistical theory (Moser and Kalton 1971).

#### 4.2.2 Sampling Procedure

The sampling procedure adopted for the study was stratified random sampling. It has been argued that random sampling helps to 'average out' the effects of any extraneous factors that may be present in the sample frame (Hosking and Clark 1986). A random sample consists of units drawn from a population where every unit of the population has an equal chance of being selected. To draw a stratified random sample, the industries were first stratified into their respective sub-sectors, namely food processing, textiles and leather. Each industry in the respective sub-sector was allotted a number ranging from 01 to 100. Samples were then drawn from the sub-sectors using a table of random numbers as shown in Table 2.

**Table 2: Sampling of the food processing, textiles and leather industries in CoN**

Industry	Sampling frame (Population)	Sample size	Percentage
Food Processing	240	71	29.58%
Textiles	70	29	41.43%
Leather	40	10	25%
<b>Total</b>	<b>350</b>	<b>110</b>	<b>31.43%</b>

*Source:* Fieldwork 2001-2007

#### 4.3.2 Secondary Data

A pilot survey was carried out to determine the existence and actual location of industries to be visited. The researcher and his assistants visited the various industries to administer questionnaires, conducted interviews, and make observations. Data was collected from the respective industrialists.

### 4.3 METHODS OF DATA COLLECTION

#### 4.3.1 Primary Data

Primary data was obtained from the field using questionnaires, interviews and personal observations. Questionnaires were used to obtain both quantitative and qualitative data. The researcher and/or his assistants administered questionnaires on the management of the industries. The use of questionnaires facilitated personal contact with the interviewees and hence better communication and probing of issues

likely to cause confusion. The researcher and his assistants were able to allay the fears of respondents and create an atmosphere of ease.

Personal interviews were conducted with key informants in order to elaborate and expound on issues relevant to industrial restructuring. Among the respondents interviewed included industrialists and officials of the Ministry of Trade and Industry. Through the personal interviews it was possible to obtain information on industrial restructuring development and industrial development in general.

#### **4.3.2 Secondary Data**

Secondary data was collected both published and unpublished sources. Such sources included:

##### *Government publications*

Data was collected from various government publications including: Statistical Abstracts; Economic Surveys; Directory of Industries; population census reports; Development Plans. Statistical Abstracts and Economic Surveys are published annually by the Central Bureau of Statistics and contain information on various aspects of the economy. Data on the performance of Kenya's industrial sector and the economy in general was obtained these sources. The Directory of Industries was a source of data on industries in Kenya, their location as well as the products manufactured. The population census reports were a source of data on population trends in the study area.

### *Research reports*

Data was obtained from various books, research reports and theses on various aspects related to the study topic. These reports included published and unpublished materials.

### *Maps and diagrams*

Various maps and diagrams obtained from various sources have been utilised. Maps showing the location of the study area in Kenya; its land use as well as its transport network have been utilised in this study.

## **4.4 DATA ANALYSIS AND PRESENTATION**

### *4.4.1 Data Analysis*

To analyse the data obtained from the field, several statistical analytical tools have been used. Both descriptive and inferential statistical tools have been used. Descriptive statistics are used to describe the basic features of data in a study. They provide a way of summarising and displaying data. They are also useful in screening data to determine its reliability and consistency. Descriptive statistics form the basis of virtually every quantitative analysis of data (Mathews 1981). The descriptive analytical tools used in this study are: the arithmetic mean, frequency distributions and percentages. The arithmetic mean summarises a data set. It is calculated by dividing the sum of all the values in a data set by the number of values/observations.

It (arithmetic mean) is sensitive to all changes in the distribution and makes use of all the information from a set of observations. However, extreme values can seriously distort the mean. A frequency distribution is a table that shows how frequently each value of a variable occurs in a set of scores.

Inferential statistics provide a means by which inferences are made about the population from which the sample is drawn (Mathews 1981). These statistics are useful for testing hypotheses. The inferential statistics utilized in this study are: chi-square, factor analysis and Spearman's rank correlation coefficient.

#### *4.4.1.1 Factor Analysis*

Factor analysis is a broad term referring to a group of models used in a number of research strategies to:

- Evaluate/test hypotheses deduced from theory;
- Transform a set of variables into a new set of orthogonal factors for input into a regression model;
- Explore the underlying structure of a data matrix; and
- Achieve parsimony in data description.

Two of the most widely used factor models are the common factor analysis and the principal component analysis. The main difference between common factor analysis and principal component analysis is that whereas the former defines the patterns of common variation among a set of variables while ignoring the variation unique to a

variable, the latter is concerned with patterning all the variation in a set of variables, whether common or unique. Hence, common factor analysis assumes that only part of the variation of a variable referred to as 'common variance' can be explained by other variables. Principal component analysis assumes that all the variation in a variable can be explained by the other variables. Other factor models are image analysis, canonical analysis, and alpha analysis.

The general factor analysis model is defined as:

$$X_i = f(F_1, F_{11}, F_{111}, \dots, F_n) + U_i \dots \dots \dots \text{Equation 1}$$

where

- $X_i$  = dependent variable
- $F_1, \dots, F_n$  = set factors
- $U_i$  = unique variance for each variable

The technique is used in the reduction of data in such a way that new and fewer derived variables from the original data set are obtained. The application of common factor analysis in research is widespread (Shaw and Wheeler 1985; Johnston 1986; Kline 1994; Irandu 1995). The stages in common factor analysis are:

- A correlation matrix is generated for all the variables as the first step. The matrix consists of an array of correlation coefficients of the variables with each other and reveals important characteristics of the data set. For instance, the direction of the relationships among variables (as indicated by the negative and positive coefficients) as well as the strength of the relationships (as indicated by the low and high coefficients) is revealed by the matrix.
- Second, the principal factors are extracted from the matrix based on the correlation coefficients of the variables. The initial factor solution consists of factor loadings which are used in the identification and interpretation of the factors. Variables that load highly on a factor are also highly associated with it and vice versa.
- Third, the factors are rotated in order to maximise the relationship between the variables and some of the factors. Rotation makes the output more understandable and is essential in the interpretation of the factors. Factors are extracted in order of their contribution to the total variance with the first few factors accounting for most of the common variance.

In this study the technique of common factor analysis is utilised to define and test hypotheses related to the underlying structure of strategies adopted by manufacturers to deal with competition as well as the variables influencing industrial location. The

factor analysis procedure has proved to be a useful analytical tool for capturing fewer strategies and variables (from the original data) set that are representative of the set.

Despite its utility, factor analysis has a number of limitations. In the first instance, it consists of a variety of alternative approaches which normally give different results. The choice of these approaches during data analysis is often subjective limiting the comparability of factor results. A further limitation of factor analysis is that the technique is a descriptive tool and offers very little explanation especially when applied to problems with non-existing theories. Furthermore, if the variables to be used in the factor analysis are not carefully chosen, the structure of the final factors may be biased and distorted.

#### 4.4.1.2 Chi-square test

The other type of inferential statistics used in this study is the chi-square test. The chi-square test measures the discrepancy between observed and expected frequencies. Thus, it involves a comparison of the observed and expected frequencies.

It is defined by:

$$X^2 = \sum \frac{F_o - F_e}{F_e} \dots \dots \dots \text{Equation 2}$$

- Where  $X^2$  = Chi-square statistic
- $F_o$  = Observed frequencies
- $F_e$  = Expected frequencies



Despite these limitations the chi-square test is a useful statistical significance test.

If the calculated chi-square value is greater than or equal to tabulated value at a given significance level, the null hypothesis is rejected and vice versa.

The requirements for the chi-square test are:

- The sample must be randomly drawn from the population.
- The data must be in the form of frequencies for each of the categories.
- The total number of observations must exceed 20.
- The measured variables must be independent – this means that none of the variables must influence the other.
- The expected frequencies in any one cell of the bivariate table should be more than 5.

In this study the chi-square test has been used to test the significance of the results on the applicability of the flexible specialisation model in the formal manufacturing industries in the study area.

The chi-square test exhibits some weaknesses. These are:

- It is sensitive to sample size – the observed and expected frequencies must not be too small as this would compromise the validity of the results of the chi-square test.
- The test is not applicable to dependent variables, i.e. it assumes independence among variables.
- The test does not show the strength of the relationship between variables.

Despite these limitations the chi-square test is a useful statistical significance test.

4.4.1.3 Spearman's Rank Correlation Coefficient

The Spearman's rank correlation coefficient has been used in this study to describe the degree of association between variables. The coefficient is non-parametric (distribution free) and can be used both with ordinal and interval data. In computing the Spearman's rank correlation coefficient, the rank order is used to determine the association between sets of data and not actual values themselves.

The correlation coefficient is defined by:

$$r_s = 1 - \frac{6 \sum d^2}{n^3 - n} \dots\dots\dots \text{Equation 3}$$

Where  $r_s$  = Spearman's Correlation Coefficient

$d$  = Differences in rank between variables

$n$  = Number of pairs

The Spearman's rank correlation coefficient is quick and easy to calculate. However, it may not be appropriate in instances where the paired values are less than 10. The coefficient will be affected by a large number of tied ranks.

#### *4.4.2 Data Presentation*

Data has been presented using various methods. These include maps, graphs, charts and tables. Maps have been drawn to characterise various occurrences. These include: a map showing the location of Nairobi in Kenya; a map showing land use in Nairobi, and a map showing the study area's transport network. Graphs and charts have been used depending on their applicability to the data collected from the field. A number of tables have been used within the various chapters of the study. Tables present useful summaries of the data under consideration. Moreover, they provide a quick visual impression of the data, more especially in its qualitative aspects.

### **4.5 RESEARCH LIMITATIONS**

#### *Uncooperative respondents*

This was a major difficulty encountered during the research. In a number of cases the industrialists misunderstood the purpose of the study and hence became reluctant to provide the required information. There were many cases where the researcher and his assistants were given appointments that were not honoured by the respondents. Many of the questionnaires were not returned and some were partially filled with some prospective respondents arguing that research was a waste of their time. This necessitated the selection of new samples leading to a waste of time and money. To overcome this limitation attempts were made to visit as many enterprises as possible so as to ensure that the required sample size was attained.

### *Data limitations*

- There was general lack of secondary data on industrial restructuring in Kenya and Africa. A lot of the existing empirical data is based on case studies in North America, Europe and Asia. Hence, relevant data that would have been useful for comparisons purposes was lacking. The researcher tried as much as possible to supplement the data sources by interviewing industrialists. Some of the industrialists were very cooperative and availed data that was relevant.
- In some cases, the available data was out of date. For instance, the Official Directory of Industries 1998/99 contained data that was out date as some of the industries listed were found to have closed down or changed their locations. Some publication had incomplete data while some of the data was out of date. The accuracy of some of the secondary data was beyond the control of researcher. As a solution to this shortcoming, the researcher supplemented existing published material with electronic data from the internet. Some data on industrial location and structure were also obtained from various directories including KAM directories and telephone directories to supplement data in the Official Directory of Industries 1998/99.

### *Financial constraints*

The available financial resources were not sufficient for field work and related research activities. This posed a major challenge as the study involved extensive travelling throughout the study area. In most cases repeated trips were made to specific industries before appointments could be made or honoured. The researcher tried to be as economical as possible with the scarce financial resources as his disposal.

### *Delay in data acquisition*

In the initial phases of the field research it was realised that most of the industrialists had not put in place any restructuring mechanisms despite the competition they were facing. Most of these industries later closed down. Several others were unwilling to reveal their restructuring strategies and programmes fearing that the researcher might reveal the same to competitors. This led to delay in acquiring the necessary data and led to delay in the field research. To overcome this limitation, the researcher tried as much as possible reassure the respondents that the research was purely for academic purposes.

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## THE EFFECTS OF ECONOMIC LIBERALISATION ON THE FORMAL MANUFACTURING SECTOR IN THE CITY OF NAIROBI

### 5.1 INTRODUCTION

The main objective of this chapter is to analyse the effects of Kenya's economic liberalisation on the food processing, textiles and leather enterprises within the formal manufacturing sector in the CoN. The various strategies adopted by industrialists to deal with the effects of liberalisation are also discussed. Data is analysed using both descriptive and inferential statistics. The descriptive statistical tools utilised are means, percentages and frequencies while the inferential statistics are correlations, chi-square and factor analysis. Two hypotheses are tested in this chapter. These are that 'the performance of the formal manufacturing sector in the CoN has not been significantly affected as a result of the liberalisation of the economy of Kenya' and that 'there is no significant variation in the types of strategies adopted by industrialists in the formal manufacturing sector in the study area to deal with the effects of the liberalisation of Kenya's economy'.

### 5.2 THE LIBERALISATION OF KENYA'S ECONOMY

The overall performance of Kenya's economy since independence has been mixed. After attaining independence, the Government of Kenya set out its objectives for ensuring economic growth in Sessional Paper No. 10 of 1965 as *African Socialism and*

## CHAPTER FIVE

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#### 5.2 THE LIBERALISATION OF KENYA'S ECONOMY

The overall performance of Kenya's economy since independence has been mixed. After attaining independence, the Government of Kenya set out its objectives for attaining economic growth in Sessional Paper No. 10 of 1965 on *African Socialism and*



*its Application to Planning in Kenya* (Kenya, Republic of, 1965). Accordingly, the objectives sought rapid economic growth through public sector investment, encouragement of smallholder and large scale farming and by providing incentives to encourage private (foreign) investment. In the period 1964-1973, Kenya's economy grew by an average of 6.5%. However in 1973, the world oil prices were increased precipitating a crisis and the economic growth declined to 5% (Kenya, Republic of, 1974).

Between 1974 and 1986, Kenya's economic performance continued to decline. The agricultural sector experienced a decline due to inappropriate agricultural policies, inadequate credit and poor international terms of trade. The industrial sector became uncompetitive due to the limitations of the import substitution policy that was practiced and the rising oil prices in the world market. Lack of export incentives, tight import controls and foreign exchange controls made Kenya's investment climate less attractive. These problems culminated in the drawing up of Sessional Paper No. 1 of 1986 on *Economic Management for Renewed Growth* (Kenya, Republic of, 1986). This policy document sought to enhance economic recovery and growth through a process of economic liberalisation. Sessional Paper No. 1 of 1986 proposed a number of fiscal and monetary policy reforms that were far reaching in terms of opening up the economy.

In the beginning of the 1990s several economic and political reforms were introduced in Kenya. These included the privatisation of parastatals, the liberalisation of financial and energy sectors, price decontrols and the phasing out of import

controls. The main thrust of the reforms was to effect a shift from highly protected domestic market to a more competitive environment that would facilitate increased use of local resources, promote employment creation and expand exports (Wignaraja and Ikiara 1999). However, due to the slow pace of implementation of economic and political reforms, donors froze aid to Kenya in November 1991 which aggravated the country's economic crisis and balance of payments deficits. This served as a catalyst for radical economic and political reforms which culminated in the introduction of foreign exchange certificates (forex-cs), which became an important source of foreign exchange to the private sector (University of Nairobi and University of Gothenburg, 1994).

Between 1991 and 1993, Kenya experienced its worst economic performance since independence. The agricultural sector declined to 3.9% per annum while growth in GDP stagnated. As a result of these problems, multilateral and bilateral donors suspended aid to Kenya in 1991. In 1993, the Government of Kenya embarked on a major programme of economic reform and liberalisation. A series of economic measures were undertaken with the assistance and support of the World Bank and the International Monetary Fund. As part of the economic reform and liberalisation programme, the government eliminated price controls, import licensing and foreign exchange controls. A number of public companies were privatised and changes were introduced into the fiscal and monetary policies. There was marked economic growth between 1994-1996 with Kenya's gross domestic product (GDP) averaging 4% per annum (Export Promotion Council 2001).

Despite the above reforms, economic growth rates assumed decline trends from 1997 culminating into a negative growth rate of 0.3% in 2000. Between 2001-2005 the rate of growth averaged 2.8% (Kenya, Republic of, 2002, 2003, 2004, 2005, 2006).

### 5.3 EFFECTS OF LIBERALISATION ON MANUFACTURING INDUSTRIES IN CoN

In this section, the effects of liberalisation on manufacturing industries in the study area are examined. The initial pilot survey indicated that the major effects of liberalisation of manufacturing industries in the study area are on:

Industry	Period	
	Frequency	Percentage
Food	28	63.12%
Textiles	9	20.0%
Others	6	13.88%
<b>TOTAL</b>	<b>45</b>	<b>100%</b>

#### 5.3.1 Demand for Manufactured Products

##### 5.3.1.1 Nature of demand

One of the goals of this study is to establish whether the liberalisation of Kenya's economy has led to a decline in the demand for goods in the formal manufacturing sector in the study area. To achieve this goal the respondents were asked to characterise the demand for their products in terms of whether it was increasing, decreasing or constant. Two periods are compared, namely a 'pre-liberalisation'

period (1980-1992) and 'post-liberalisation' period (1993-2005). Data has been analysed using frequencies, percentages and means.

Table 3 shows that in the period the period 1980-1992, 60% of the food processing industries experienced increasing demand for the products. This proportion had increased to 65.12% in the period 1993-2005. However, the demand for textiles and leather industries declined in the period 1993-2005 as compared to the period 1980-1992.

**Table 3: Increasing demand for manufactured products in the periods 1980-1992 and 1993-2005**

Industry	Period			
	1980-1992		1993-2005	
	Frequency	Percentage	Frequency	Percentage
Food processing	27	60%	28	65.12%
Textiles	10	22.22%	9	20.93%
Leather	8	17.78%	6	13.95%
<b>TOTAL</b>	<b>45</b>	<b>100%</b>	<b>43</b>	<b>100%</b>

Source: Fieldwork 2001-2005

In terms of overall demand for manufactured periods, an overwhelming majority of the respondents (87%) indicated that their demand had increased while only 6% and 8% indicated that their demand was decreasing and constant, respectively, in the period 1980-1992. There was a reversal of this trend in the period 1993-2005. 52% of the respondents reported a decline in demand for their products while 36% indicated

that their demand had increased. Only a small proportion of the respondents (12%) indicated that their demand had remained constant.

The mean values of 1.21 and 2.45 for the periods 1980-1992 and 1993 -2005, respectively serve to underscore the difference in demand for products for the two periods (Table 4). A mean of 1.21 characterises an increasing demand while a mean of 2.45 is indicative of decreasing demand, taking into account the codes 1 and 2 used in the questionnaire to indicate increasing and decreasing demand, respectively.

**Table 4: Demand for manufactured products in 1980-1992 and 1993-2005**

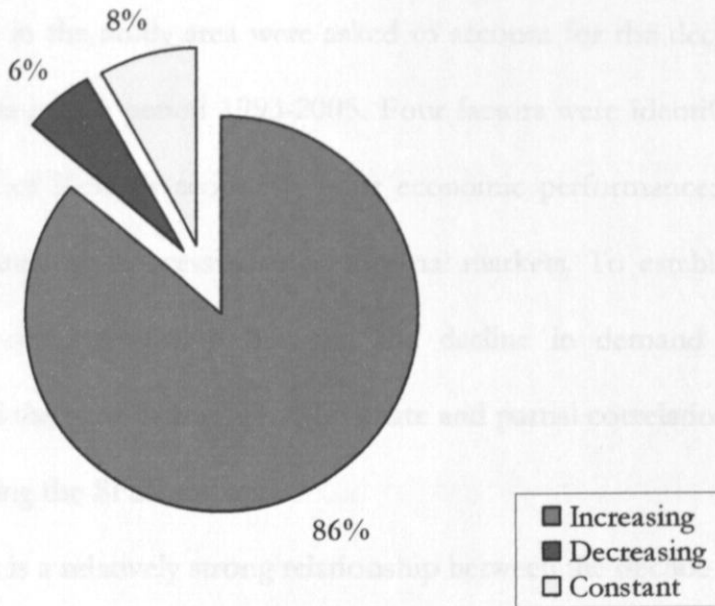
Nature of Demand	Period					
	1980-1992			1993-2005		
	Frequency	Percentage	Mean	Frequency	Percentage	Mean
Increasing	45	87%	1.21	43	36%	2.45
Decreasing	3	6%		58	52%	
Constant	4	8%		13	12%	
<b>Total</b>	<b>52<sup>a</sup></b>	<b>100%</b>		<b>110</b>	<b>100%</b>	

<sup>a</sup> Out of the 110 establishments, only 52 had been established during the period 1980-1992

Source: Fieldwork 2001-2005

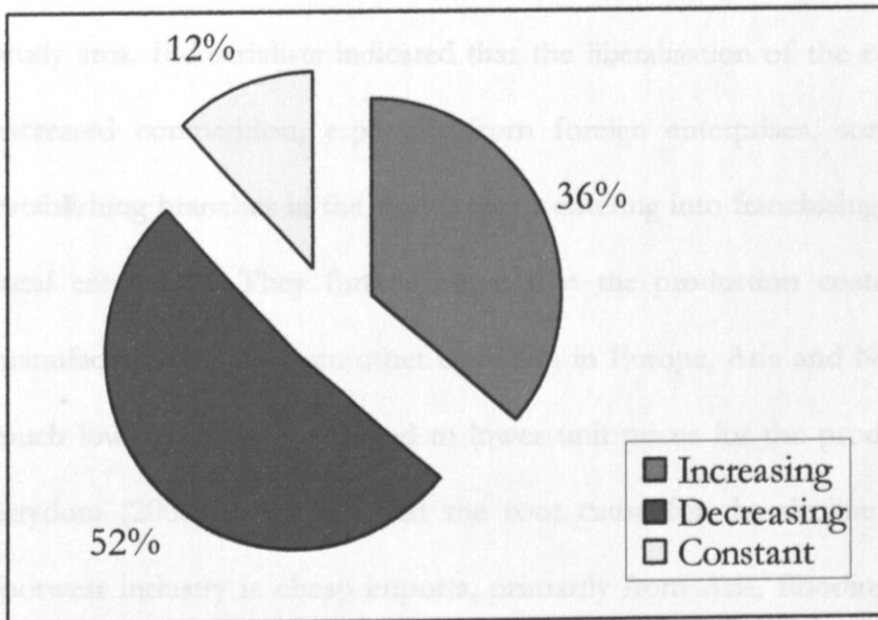
Figures 5 and 6 further illustrate the data in table 4.1 above.

**Figure 5 Demand for manufactured products 1980-1992**



Source: Fieldwork 2001-2005

**Figure 6 Demand for manufactured products 1993-2005**



Source: Fieldwork 2001-2005

### *5.3.1.2 Factors explaining the decline in demand in 1993-2005*

Industrialists in the study area were asked to account for the decline in demand for their products in the period 1993-2005. Four factors were identified. These are: the liberalisation of Kenya's economy; poor economic performance; the high costs of production and the inaccessibility of external markets. To establish the nature and strength of the relationship between the decline in demand for manufactured products and the four factors, both bivariate and partial correlation coefficients were generated using the SPSS software.

There is a relatively strong relationship between the decline in demand and the liberalisation of Kenya's economy. A correlation coefficient of 0.742 between the two factors is indicative of a strong positive relationship. This implies that the liberalisation of Kenya's economy has led to a decline in demand for products in the study area. Industrialists indicated that the liberalisation of the economy had led to increased competition, especially from foreign enterprises, some of which were establishing branches in the study area or entering into franchising arrangements with local enterprises. They further noted that the production costs for some of the manufactured goods from other countries in Europe, Asia and North America were much lower and this translated to lower unit prices for the products. For instance, Strydom (2000) has noted that the root cause for the decline of South African footwear industry is cheap imports, primarily from Asia, flooding the local market. This has forced many of the local producers out of the market with others significantly scaling down their operations.

Textile and leather enterprises indicated that their market has been eroded by the proliferation of imported second-hand products which were not only cheaper but were favoured by consumers. Ongile and McCormick (1996) have noted the role of second-hand clothes in explaining the decline in demand for new clothes in Nairobi's garment industry. They argue that the weak domestic demand experienced by Nairobi garment manufacturers is partly due to second-hand clothing whose prices are lower and whose quality is perceived to be high.

It is apparent from the research findings that poor economic performance especially in the period 1999-2002 may have led to the decline in demand for products in the study area. A correlation coefficient of 0.656 between the two factors shows their strong relationship. The respondents noted that the poor economic performance had eroded the purchasing power of consumers in the study area leading to a decline in demand. On average the Kenyan economy grew at the rate of 1.1% between the period 1999-2002 but registered a negative rate of growth of 0.3 in the year 2000 (Kenya, Republic of, 2000, 2001, 2002, 2003).

A coefficient of 0.631 between decline in demand and high production costs is explained by the fact that the high production costs are passed on to the consumer in terms of high prices. Over 50% of industrialists cited high taxation, rationing and unreliable electricity supply (especially in the year 2000) as well as poor infrastructure as the causes for the high production costs. The poor condition of roads in Industrial Area and other parts of the country was cited as a major contributor to the high costs



of obtaining raw materials and other inputs, as well as, the transportation of finished products to the market.

The correlation coefficient between inaccessibility of external markets and decline in demand is 0.342 indicating that the relationship between the two variables is not strong. Although the inaccessibility to external markets was cited by some manufacturers, it is apparent that this factor contributes to the decline in demand only to a limited extent.

A partial correlation coefficient of 0.883 is derived when the variables 'decline in demand' and 'liberalisation' are correlated (Appendix 4). The value is indicative of the strong and positive relationship existing between the two variables, when the effects of the other variables are held constant. It may therefore be concluded that the liberalisation of Kenya's economy has significantly contributed to the decline in demand for manufactured products.

### 5.3.2 Competition for products

#### 5.3.2.1 Nature of competition

This study explores the relationship between the liberalisation of Kenya's economy and the competition experienced by manufacturing industries in the study area. It has been noted that there is a close relationship between liberalisation and increased competition to previously protected industries in Africa (McCormick *et al.* 2002).

Respondents in the study area were asked whether they had experienced any competition to their products in 1980-1992 and 1993-2005. They were also required

to compare the intensity of competition between the two periods. From the research findings, it is apparent that all the enterprises in the study area experienced some form of competition for their products during the two periods (Appendix 4). Table 5 shows the sub-sectors that experienced more intensive competition in the period 1993-2005. Accordingly, the food processing sub-sector experienced the highest amount of competition while the leather sub-sector experienced the least.

Source: Fieldwork 2001-2005

**Table 5: More intensive competition in the period 1993-2005**

Industry	Frequency	Percentage
Food processing	21	52.5%
Textiles	10	25%
Leather	9	22.5%
<b>Total</b>	<b>40</b>	<b>100%</b>

Source: Fieldwork 2001-2005

A comparison of the intensity of competition between the pre-liberalisation and post-liberalisation periods indicates that a high proportion of the manufacturing industries operating in the study area (77%) noted that competition was more intensive during the post-liberalisation period. Only 19% of the industries noted that competition had been more intensive in the pre-liberalisation period while 4% indicated that they had not experienced any change in competition for their products (Table 6).

value is 46.32 while the critical value is 5.99. This implies that there is a significant

**Table 6: Intensity of competition between the periods 1980-1992 and 1993-2005**

Intensity of competition	Frequency	Percentage	Mean
More intensive in 1993-2005	40	77%	3.21
More intensive in 1980-1992	10	19%	2.44
Constant demand	2	4%	1.37
<b>Total</b>	<b>52</b>	<b>100%</b>	

Source: Fieldwork 2001-2005

It is therefore apparent that manufacturing industries in the study area experienced more competition during the post-liberalisation period. To determine the statistical significance of the observed data, the chi-square statistic was computed. Table 7 shows the observed and expected frequencies.

**Table 7: Observed and expected frequencies**

Intensity of competition	Observed frequencies	Expected frequencies
More intensive in 1993-2005	40	17.33
More intensive in 1980-1992	10	17.33
Constant demand	2	17.33
<b>Total</b>	<b>52</b>	

Source: Fieldwork 2001-2005

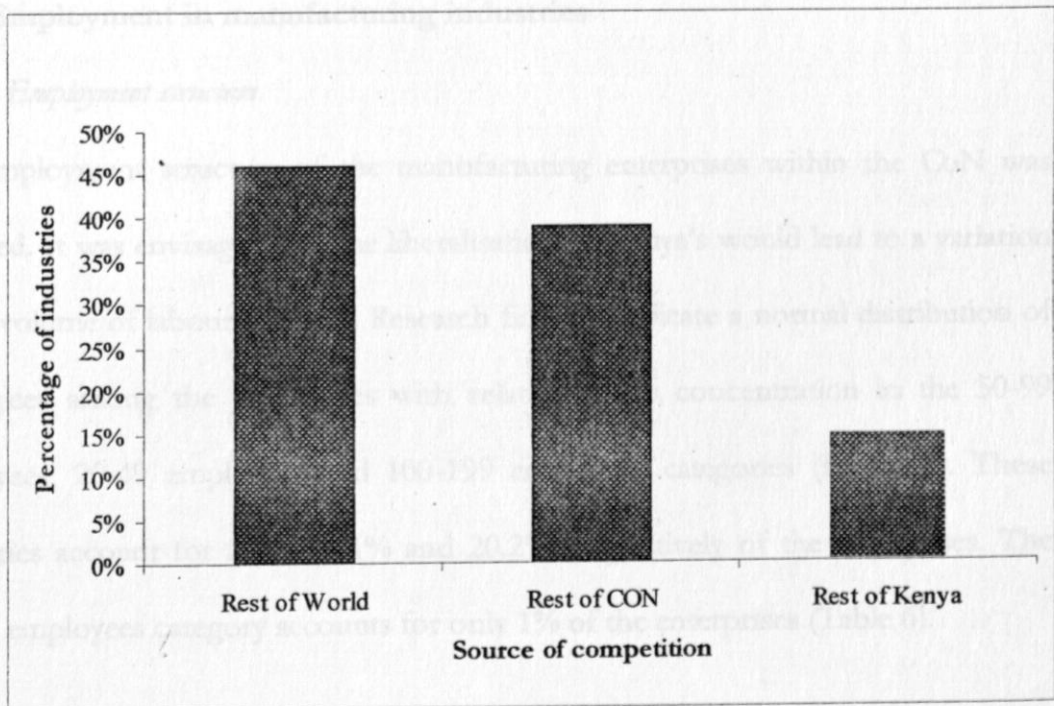
At 0.05 significant level, and with 2 degrees of freedom, the computed chi-square value is 46.32 while the critical value is 5.99. This implies that there is a significant

difference in the intensity of competition between the pre-liberalisation and post-liberalisation periods. Manufacturing industries in the study area experienced more competition during the post-liberalisation period.

#### 5.3.2.2 Source of competition

The industrialists were asked to identify their main source of competition. 46% and 39% of those interviewed indicated that their main sources of competition are establishments located in rest of the world and CoN, respectively. Only 15% of the industrialists faced competition from enterprises located in the rest of Kenya (Figure 7).

**Figure 7: Sources of competition for enterprises located in the CoN**



Source: Fieldwork data 2001-2005

The industrialists in the study area clearly indicated that a lot of competition they faced especially during the 1993-2004 period was from foreign enterprises, with the liberalisation of Kenya's economy. Some of the foreign enterprises had established their industries in the study area while others had entered into franchising agreements with local industrialists in the study area. Under such agreements, local industries are granted rights to market (in some instances to manufacture) products of foreign enterprises. It was also noted that the growing availability of imported new clothes sold in exhibitions in the city centre had contributed to the intensified competition in the textiles industry. This has also been observed by McCormick *et al.* (2002).

### **5.3.3 Employment in manufacturing industries**

#### *5.3.3.1 Employment structure*

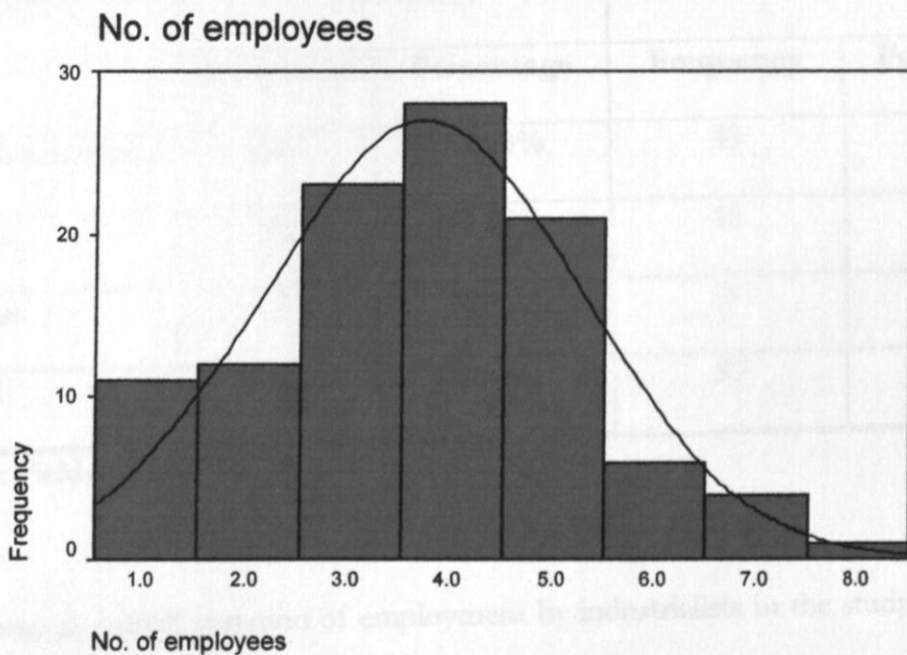
The employment structure of the manufacturing enterprises within the CoN was explored. It was envisaged that the liberalisation of Kenya's would lead to a variation in the volume of labour engaged. Research findings indicate a normal distribution of employees among the enterprises with relatively high concentration in the 50-99 employees, 20-49 employees and 100-199 employees categories (Figure 7). These categories account for 26%, 22.1% and 20.2%, respectively of the enterprises. The 1000+ employees category accounts for only 1% of the enterprises (Table 6).

**Table 8: Employment in manufacturing industries**

Number of employees	Frequency	Percentage
1-9 employees	11	10.6%
10-19 employees	12	11.5%
20-49 employees	23	22.1%
50-99 employees	28	26.0%
100-199 employees	21	20.2%
200-499 employees	6	5.8%
500-999 employees	4	2.9%
1000+ employees	1	1%
<b>Total</b>	<b>106</b>	<b>100%</b>

Source: Fieldwork 2001-2005

**Figure 8: Employment in manufacturing industries**



Source: Fieldwork 2001-2005

### 5.3.3.2 Variations in employment

Industrialists interviewed in the study area were asked whether they have significantly varied the volume of labour engaged in their enterprises. Table 9 indicates that food processing enterprises had increased their employees in the pre-liberalisation and post-liberalisation periods. However, the textiles and leather industries experienced a decline in employment of 26.32% and 15.79%, respectively, in the post-liberalisation period.

**Table 9 Increase in employees by industries in the CoN**

Industry	1980-1992		1993-2005	
	Frequency	Percentage	Frequency	Percentage
Food processing	20	52.63%	33	57.89%
Textiles	11	28.95%	15	26.32%
Leather	7	18.42%	9	15.79%
<b>Total</b>	<b>38</b>	<b>100%</b>	<b>57</b>	<b>100%</b>

Source: Fieldwork 2001-2005

In terms of overall variation of employment by industrialists in the study area, in the period 1980-1992, 81.3% of the industrialists indicated that they had varied the number of employees engaged in their enterprises. However, in the post-liberalisation period, a slightly larger number of the enterprises (91.8%) indicated that they had varied their employment (Appendix 4). With regard to the nature of the variation,

5% and 5% of the industrialists indicated that they had increased and decreased employees, respectively in the period 1980-1992. This contrasts with the period 1993-2005 when 59.8% and 40.6% of the industrialists indicated that they had decreased and increased, respectively the volume of labour engaged (Table 10).

**Table 10 Variation of employees**

Nature of variation	1980-1992		1993-2005	
	Frequencies	Percentage	Frequencies	Percentage
Increase in number of employees	38	95%	57	59.4%
Decrease in number of employees	2	5%	39	40.6%
<b>Total</b>	<b>40</b>	<b>100%</b>	<b>96</b>	<b>100%</b>

Source: Fieldwork 2001-2005

The chi-square statistic was computed to determine whether the observed differences in the nature of variation of employees were significant. Table 11 shows the observed and expected frequencies.



**Table 11 Observed and expected frequencies**

Nature of variation	1980-1992		1993-2005		Total
	Observed frequencies	Expected frequencies	Observed frequencies	Expected frequencies	
Increase in number of Employees	38	27.95	57	67.06	95
Decrease in number of Employees	2	12.06	39	28.95	41
<b>Total</b>	<b>40</b>		<b>96</b>		<b>136</b>

Source: Fieldwork 2001-2005

At 0.05 significant level, and with 1 degree of freedom, the computed chi-square value is 17.02 while the critical/tabulated value is 3.84. It may be concluded that there is a significant difference in the nature of variation of employment between the periods 1980-1992 and 1993-2005. The number of employees engaged in manufacturing declined in the post-liberalisation period.

It is apparent from research findings that the volume of labour engaged by manufacturing industries in CoN in the period 1993-2005 declined. Various reasons were cited for this decline. 65.5% of industrialists indicated the liberalisation of Kenya's economy with the associated effects of increased competition and reduced market, was responsible for the reduction in the volume of labour engaged in their enterprises. This finding has been collaborated by Mengstae and Teal (1998). In a study on trade liberalisation, regional integration and firm performance in Africa's manufacturing sector, Mengstae and Teal (1998), established a close link between

liberalisation and a fall in volume of labour employed engaged. An analysis of five manufacturing sectors (food processing; textile and garments; wood and furniture; and, metal working and machines) in eight African countries reveals that in nearly all levels of the formal sector, employment is falling during the post-liberalisation period. Other important factors influencing employment in the CoN were the desire to reduce overhead costs such as wages and salaries and the poor economic conditions which accounted for 14.8 % and 12.2% respectively, of the industries.

#### **5.3.4 Production costs**

This study attempted to establish whether manufacturing industries in the study area had experienced any significant variations in the production costs between the periods 1980-1992 and 1993-2005. Accordingly, 55.56% and 64.15% of the food processing industries experienced an increase in production costs in the pre-liberalisation and post-liberalisation periods, respectively. Fewer industries within textiles and leather subsectors reported an increase in production costs in the post-liberalisation period (Table 12).

**Table 12 Industries experiencing increased production costs in the CoN**

Industry	1980-1992		1993-2005	
	Frequency	Percentage	Frequency	Percentage
Food processing	20	52.56%	68	64.15%
Textiles	11	30.56%	28	26.42%
Leather	6	16.67%	10	9.43%
<b>Total</b>	<b>36</b>	<b>100%</b>	<b>106</b>	<b>100%</b>

Source: Fieldwork 2001-2005

An examination of the variation of overall production costs indicates that 73.5% of the industrialists experienced a variation in their production costs in 1980-1992. Of these, 59.5% indicated that their costs have increased while 40.5% indicated that their costs had declined. In the period 1993-2005, a majority of enterprises (98.1%) experienced a variation in their production costs. Accordingly, 91.8% and 8.2% of the industrialists indicated that their costs had increased and decreased, respectively (Table 13).

**Table 13: Variation of production costs among industrialists in the periods 1980-1992 and 1993-2005**

Production costs	1980-1992		1993-2005	
	Frequencies	Percentage	Frequencies	Percentage
Increasing	36	73.5%	106	98.1%
Decreasing	13	26.5%	2	1.9%
<b>Total</b>	<b>49</b>	<b>100%</b>	<b>108</b>	<b>100%</b>

Source: Fieldwork 2001-2005

To determine the significance of the research results, the chi-square test has been utilised. Table 14 shows the observed and expected frequencies.

**Table 14 Observed and expected frequencies**

PRODUCTION COSTS	1980-1992		1993-2005		TOTAL
	Observed Frequencies	Expected Frequencies	Observed Frequencies	Expected Frequencies	
Increasing	36	44.32	106	97.69	142
Decreasing	13	4.69	2	10.32	15
<b>TOTAL</b>	<b>49</b>		<b>108</b>		<b>157</b>

Source: Fieldwork 2001-2005

At 0.05 significant level, and with 1 degree of freedom, the computed chi-square value is 23.72 while the critical/tabulated value is 3.84. It may therefore be concluded that there is a significant difference in production costs between the pre-liberalisation

and the post-liberalisation periods. More industrialists reported a rise in these costs in the post-liberalisation period.

A relatively large proportion of the industrialists (68.5%) in the study area linked the increasing production costs in the post-liberalisation period to the effects of the liberalisation of Kenya's economy. The industrialists noted that the result of increased competition (associated with liberalisation) was increased expenditure in advertising; acquisition of new and better technology as well as changes in product characteristics. Other important factors cited were the poor infrastructure (transport and communications); high cost of electricity and the bureaucracies associated with business registration and licensing. These factors collectively accounted for 31.2% of the industrialists visited in the period 1993-2005 (Appendix 4).

This study has established that the liberalisation of Kenya's economy has affected food processing, textiles and leather industries in CoN in various ways. These are:

- It has contributed to a decline in demand for the manufactured products;
- It has been linked to intensified competition to the respective industries;
- It has been associated with decline in employment among the studied; and,
- It has contributed to increased production costs experienced the industrialists.

From the foregoing, the null hypothesis that 'the performance of the formal manufacturing sector in the CoN has not been significantly affected as a result of the liberalisation of the economy of Kenya' is rejected.

#### 4 STRATEGIES FOR DEALING WITH THE EFFECTS OF LIBERALISATION IN CoN

This section examines the strategies that have been adopted by manufacturers to deal with the negative effects of liberalisation in CoN. The factor analysis procedure is used to identify the most significant strategies adopted by manufacturers in dealing with the effects of liberalisation in CoN. The hypothesis to be tested in this section is that 'there is no significant variation in the types of strategies adopted by industrialists in the formal manufacturing sector in the study area to deal with the effects of the liberalisation of Kenya's economy'.

The industrialists were presented with 11 items (Table 15) which they were supposed to rank in order of significance starting with the most significant item to the least significant. The 11 items were initially derived from preliminary surveys and literature review. The responses on the 11 items were converted into a numerical scale as follows:

- Very significant variable = 3
- Significant variable = 2
- Least significant variable = 1

**Table 15 Strategies for dealing with liberalisation**

- V1 Changes in product design
- V2 Changes in product range/type
- V3 Changes in product pricing
- V4 Changes in product packaging
- V5 Increased expenditure in advertising
- V6 Acquisition of better technology
- V7 Increased research and development expenditure
- V8 Formation of strategic alliances
- V9 Increased marketing budget
- V10 Integration of production and marketing operations
- V11 Diversification of the geographical market base

The correlation matrix of the 11 variables shows values of the Spearman's rank correlation coefficients computed for the variables using the SPSS package (Table 16). The correlation matrix shows the relationships between the variables. Statistically, correlation coefficients of  $\pm 0.3000$  and above are generally regarded as significant at 0.05 significance level (Hamond and McCullagh 1978). Some of the variables exhibit high positive related while others are highly negatively related. For instance, the variable 'increased research and development expenditure' exhibits high positive correlations with the variables 'changes in product design', 'changes in product range/type' as well as 'changes in product packaging'. Such a relationship

could be explained by the fact that increased research development in manufacturing industries usually results in product transformation and hence changes in product design, type and packaging. The variable 'diversification of geographical market base' has a high positive relationship with the variables 'changes in product range/type' clearly indicating that as manufacturers diversify their market, new demands arise necessitating changes in the variety of their products. The desire by manufacturers to diversify their market is likely to lead to formation of strategic alliances with other manufacturers and service providers as well as increased marketing expenses. This is exemplified by the relationship between the variable 'diversification of the geographic market base' and the variables 'strategic alliances' and 'increased marketing budget'.

The link between marketing and advertisement is underscored by the significant positive correlation coefficient between the variables 'increased marketing budget' and 'increased expenditure in advertisement'. Apparently advertisement is one of the major marketing strategies used by manufacturers in the study area. A significant negative relationship exists between the variables 'increased research and development expenditure' and 'changes in product pricing' implying that research and development is likely to lead to the lowering of product prices.



Table 16 Correlation Matrix

Var	1	2	3	4	5	6	7	8	9	10	11
	1.000										
	.313*	1.000									
	-.056	-.106	1.000								
	.464*	.177	.210	1.000							
	.334*	.090	-.116	.161	1.000						
	.137	.326*	-.090	.018	.316*	1.000					
	.553*	.595*	-.464*	.545*	.247	.350*	1.000				
	.105	.379*	-.165	.083	.289	.026	.202	1.000			
	.208	.155	-.009	.248	.383*	.218	.361	.133	1.000		
0	.138	.080	-.105	.145	.274	.279	.441	.244	.343*	1.000	
1	-.034	.523*	.076	.314*	.194	.070	.544*	.569*	.598*	.236	1.000

denotes significant correlations at 0.05 significance level

To obtain comprehensive results, the correlation matrix was exposed to factor analysis. The major problem faced in the factor analysis procedure is deciding how many independent factors to extract from the original data set. Three major approaches have been recommended (Kline 1994; Johnson and Wichern 2002).

These are:

- The use of a predetermined eigenvalue. In this study, an eigenvalue greater than 1 is viewed as significant.
- The use of cumulative percentage graph.
- Each factor should account for at least 5% of the total variance.

The factor analysis procedure extracted three factors which together accounted for 59.5% of the total variance of the 11 items (Table 17). All the factors satisfy the above criteria.

Table 17 Variance explained by the extracted factors

Factor	Eigenvalue	% of Variance
1	2.845	25.865%
2	1.352	17.193%
3	1.273	16.481%
<b>Total</b>	<b>5.470</b>	<b>59.539%</b>

Source: Fieldwork 2001-2005

The initial factor solution was rotated using varimax rotation. Rotation has the effect of emphasising stronger factor loadings and minimising the weaker ones. The rotated factor matrix is shown in Table 18.

#### 4.1 Identification and labeling of factors

For easy and accurate interpretation of the factors, it was decided that only those variables that load on the factors with a value equal to or greater than 0.50 will be taken into account. One of the major problems associated with the identification and labeling of factors in factor analysis is the provision of a label that accurately reflects the composite importance of the various variables associated with the factor (Taylor

Table 18 Rotated factor matrix for liberalisation strategies

	FACTORS		
	1	2	3
Changes in product design	0.216	0.669	0.068
Changes in product range/type	-0.0016	0.548	-0.032
Changes in product pricing	-0.107	0.693	0.241
Changes in product packaging	0.133	0.522	-0.133
Increased expenditure in advertising	0.785	0.331	-0.251
Acquisition of better technology	0.356	0.141	0.553
Increased research and development	0.237	-0.135	0.423
Strategic alliances	0.116	0.229	0.379
Increased marketing budget	0.723	0.145	-0.037
Integration of operations	0.249	-0.046	-0.038
Diversification of market base	0.648	-0.033	0.114

Source: Fieldwork 2001-2005

#### 4.1 Identification and labelling of factors

For easy and accurate interpretation of the factors, it was decided that only those variables that load on the factors with a value equal to or greater than ( $\geq$ ) 0.400 be taken into account. One of the major problems associated with the identification and labelling of factors in factor analysis is the provision of a label that adequately reflects the composite importance of the various variables associated with the factor (Taylor

1977). In this study, an attempt has been made to ensure that the labels provided for factors are reflective of the constituent variables.

### FACTOR ONE

<u>Variables</u>	<u>Loadings</u>
Increased expenditure in advertising	0.785
Increased marketing budget	0.723
Diversification of the marketing base	0.648

Factor one is associated with three variables that load heavily on it. These are: increased expenditure in advertising, increased marketing budget and the diversification of the marketing base. This factor accounts for 25.87% of the total variance and may be interpreted as representing those strategies that are related to marketing. Therefore this factor is labelled *marketing strategies*.

### FACTOR TWO

<u>Variables</u>	<u>Loadings</u>
Changes in product pricing	0.693
Changes in product design	0.669
Changes in product range/type	0.548
Changes in product packaging	0.522

Four variables load highly to factor two. These are: changes to product pricing; changes in product design; changes in product range/type; and, changes in product packaging. Factor two may be interpreted to represent strategies that are related to changes in the product characteristics. This factor is therefore labelled *product changes strategies* and accounts for 17.19% of the total variance.

**FACTOR THREE**

<u>Variables</u>	<u>Loadings</u>
Acquisition of better technology	0.553
Increased research and development expenditure	0.423

Factor three has two factors loading heavily on it. These are: acquisition of better technology and increased research and development expenditure. This factor accounts for 16.48% of the total variation. Factor three may be interpreted to represent strategies that are related to technology. The factor is therefore labelled *technology strategies*.

It is thus evident that the strategies adopted by industrialists in the study area to deal with the negative effects of liberalisation may be collapsed into three factors. These are:

- Marketing strategies
- Product changes strategies

- Technology strategies

#### 5.4.1.1 Marketing Strategies

The first factor, labelled 'marketing strategies', represents the most important strategies adopted by industrialists in the study area to deal with the effects of liberalisation. The factor accounts for the highest variance in the original data set. Industrialists in the study area indicated that their marketing strategies are aimed at enlarging their market. Among the marketing strategies that have been adopted are:

- Increased expenditure in advertising which represents the most dominant strategy used by industrialists to retain and expand the market for their products.
- Increasing the marketing budget is the other strategy that is popular. A large number of the industrialists indicated that they had increased their marketing budgets especially during the period 1993-2005 to retain existing customers and capture new ones.
- Diversifying the market bases for the manufactured products. The industrialists indicated that they were looking for new markets for their products in the East African region, Africa and the rest of the world.

#### 5.4.1.2 Product changes strategies

The other category of strategies adopted by industrialists in the study area are product changes strategies. These are strategies that are geared towards making a product

more appealing to the consumer. The product changes strategies adopted by industrialists in the study area include the following:

- Changes in product design;
- Changes in product range(s)/type(s);
- Changes in product pricing; and
- Changes in product packaging.

#### 5.4.1.3 Technology changes

Industrialists in the study area indicated that technology changes was a strategy utilised to cope with competition. They noted that they had acquired better technology that reduced the amount of waste produced; used less electricity; produced more within any given production cycle; and which would be adjusted to vary product characteristics such design, packaging and variety. It was also noted that the increased research and development among industrialists was partly aimed at not only improvements in products but the technology as well.

The null hypothesis (noted at the beginning of this section) is tested on the basis of the factor analysis results. The utility of the factor analysis procedure in hypothesis testing is well grounded. For instance, Johnston (1978 p.158) states:

“The search for hypothesised common patterns [in data matrices] is best conducted via the ... method of factor analysis”

He further notes that both principal component analysis and factor analysis are “extremely flexible tools for finding order in large geographical data matrices, either inductively or as test of hypotheses” (Johnston 1978 p. 181).

## 5.5 SUMMARY

This study has established that the liberalisation of Kenya's economy has affected negatively the food processing, textiles and leather industries in CoN in various ways. It has contributed to the decline in demand for the manufactured products as well as intensified competition to the respective industries. Furthermore, it has been associated with decline in employment among the studied and, has contributed to increased production costs experienced the industrialists.

The analysis of research data on the strategies adopted by industrialists to deal with the effects of liberalisation indicates these strategies may be collapsed into three factors, namely: marketing strategies; product changes strategies; and technology strategies. A close examination of these factors indicates that they are distinct and unique. Therefore, the null hypothesis that “there is no significant variation in the types of strategies adopted by industrialists in the formal manufacturing sector in the study area to deal with the effects of the liberalisation of Kenya's economy’ is rejected.



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## CHAPTER SIX

# APPLICABILITY OF THE FLEXIBLE SPECIALISATION MODEL IN THE FORMAL MANUFACTURING SECTOR OF THE CITY OF NAIROBI

### 6.0 INTRODUCTION

This chapter examines the applicability of the flexible specialization model in the formal manufacturing sector of the CoN. Various elements of the model are examined. These are: multipurpose equipment; labour flexibility; interaction (networking) as well as changes in product design, product quality, product type (range), product packaging and product pricing. Descriptive and inferential statistics are used to analyse the data. These are frequencies, percentages and the chi-square. The hypothesis tested in this chapter states that 'there is no significant relationship between the attributes of the production organisation in the formal manufacturing sector in the study area and those of the flexible specialisation model'.

### 6.1 FLEXIBLE SPECIALISATION AS A MODEL OF INDUSTRIAL ORGANISATION

The flexible specialisation model has received a great deal of attention from scholars (Piore and Sabel 1984; Hirst and Zeitlin 1989; Storper and Scott 1989; Milne 1990a, 1990b, 1991; Djik 1992; McCormick and Pedersen 1996). It has been noted that between 1930s and 1970s, industrial production organisation in Europe, Japan and USA was dominated by a system of mass production often referred to as fordism.

Piore and Sabel 1984; Nielsen 1991). Fordism is characterised by the dominance of large vertically integrated enterprises that use special purpose machines and semi-skilled labour to produce standardised products for a mass market (Milne 1990a). The Fordist model gives emphasis to economies of scale and a top-down flow of authority and information in industry.

The emergence of the flexible specialisation model is viewed as stemming from the exhaustion of Fordism. In the 1970s and 1980 the advanced countries experienced a deterioration of their economic performance resulting from "...the limits of the model of industrial development that is founded on mass production" (Piore and Sabel 1984 pp.4). Market saturation, rapidly changing consumer tastes and demand, as well as, the fragmentation of mass markets led to the break down of mass production and created an environment for flexible enterprises (Nielsen 1991). It was argued that economies which favoured flexible specialisation were flourishing as was evidenced by experiences in Italy, West Germany and Japan (Schmitz 1990). Flexible enterprises could better cater for specialised and rapidly changing market niches. The flexible specialisation model emphasises on the disintegration of large industrial enterprises to create small and flexible firms that utilise multi-purpose machines and skilled workers to produce customised goods.

In flexibly specialised systems, production is organised along the interactions of a network of small firms which specialise in batch or custom production of general classes of outputs whereas in mass production firms produce specific outputs in large quantities (Storper and Christopherson 1987). Flexible specialisation requires a

fundamental reorganisation of labour and industrial relations in ways that are radically different from fordism. For instance, instead of workers along an assembly line performing repetitive and highly specialised tasks (in fordism), a flexible production organisation environment emphasises on skilled workers who make large segments of or the entire product. Table 19 below shows some differences between mass production and flexible specialisation.

**Table 19 Some differences between mass production and flexible specialisation models**

MASS PRODUCTION MODEL	FLEXIBLE SPECIALISATION MODEL
<ul style="list-style-type: none"> <li>• Mass production of homogeneous goods</li> <li>• Uniformity and standardisation of products.</li> <li>• Dominance by large vertically integrated enterprises.</li> <li>• Use of highly specialised labour to perform specific job tasks.</li> <li>• Large buffer stock and inventories held (Just-in-Case inventory system).</li> <li>• Use of highly specialised machines/equipment (also referred to as dedicated equipment)</li> </ul>	<ul style="list-style-type: none"> <li>• Small batch production of varied products</li> <li>• A variety of product types to suit varied tastes and preferences.</li> <li>• Dominance by small scale disintegrated enterprises.</li> <li>• Use of skilled and flexible labour to perform multiple job tasks.</li> <li>• Little or no inventories are held. Stocks purchased when needed (Just-in-Time inventory system).</li> <li>• Use of multi-purpose machines/equipment</li> </ul>

*Source:* Adapted from Harvey (1989) and Schmitz (1990)

## 6.2 MACHINES/EQUIPMENT UTILISED

The flexible specialisation model emphasises to the use of flexible machines/equipment. The significant characteristic of such machines is their ability to be redeployed in an endless number of ways and in various industrial processes (Murray 1985; Valery 1987; Gertler 1988). Hence, such machines are viewed as multipurpose and are capable of producing a variety of new products or old products in new ways. An industrialist using such machinery/equipment is therefore able to respond to changing consumer tastes and needs as they arise. It has also been argued that such flexibility "...obviates the need to scrap fixed capital (machines/equipment) in order to produce new products... (as)...the machines can simply be reprogrammed, thereby extending their technical life and forestalling obsolescence" (Gertler 1988 pp. 420).

Industrialists in the study area were asked to state the nature of the machinery used in the production process in their enterprises. Accordingly, 58.46% of industrialists in the food processing subsector use highly specialised machinery. This compares with 32.31% and 9.23%, respectively, by the textiles and leather subsectors (Table 20).

	14	15.2%
Multi-task	13	14.1%
Total	92	100%

**Table 20: Use of highly specialised machinery in industries in CoN**

Industry	Frequency	Percentage
Food processing	38	58.46%
Textiles	21	32.31%
Leather	6	9.23%
<b>Total</b>	<b>65</b>	<b>100%</b>

Source: Fieldwork 2001-2005

An evaluation of the nature of machinery utilised in the three subsectors shows that a majority of the respondents (70.7%) use highly specialised machinery (i.e. machines that are utilised to produce a narrow and defined range of products). Only 14.1% indicated that they were using multi-purpose (flexible) machines (Table 21).

following factors:

**Table 21: Nature of machinery utilised in manufacturing**

Nature of machinery	Frequency	Percentage
Highly specialised	65	70.7%
Specialised	14	15.2%
Multi-task	13	14.1%
<b>Total</b>	<b>92</b>	<b>100%</b>

Source: Fieldwork 2001-2003

To establish the significance of the research results, the chi-square statistic is computed. Table 22 shows the observed and expected frequencies.

**Table 22 The observed and expected frequencies**

Nature of machinery	Observed Frequency	Expected Frequency
Highly specialised	65	30.67
Specialised	14	30.67
Multi-task	13	30.67
<b>Total</b>	<b>92</b>	

Source: Fieldwork 2001-2005

At 0.05 significance level and with one degree of freedom, the calculated chi-square value is 47.29 while the tabulated value is 3.84. This implies that the observed differences in the nature of machinery used by manufacturers in the study area are statistically significant.

Research findings are indicative of the fact that flexible (multi-task) machines have not been widely embraced by industrialists. This may be explained by the following factors:

- Some industrialists indicated that changing the existing technology structure in terms of the machines/equipment used would be a costly venture for them given the purchases of new equipment or modifications of the existing equipment. Machine operators would also require retraining.
- Others argued that the machines/equipment that they were using had served them well and as long they ensured the equipment was regularly serviced and maintained (so as not to become obsolete), they did not see the need to change it.



- It was also felt that changes in the existing fixed capital setup would require the reorganisation of production processes in the shop floor and this would disrupt production.
- Others noted that extensive mechanisation of production had its own limitations given the frequent power failures and the high cost of electricity in Kenya.

However, an analysis of expenditure in capital intensive technology in the pre-liberalisation and post-liberalisation period shows that there was a significant increase in expenditure in technology in the post-liberalisation period.

Accordingly, 81% of the respondents indicated that they had increased their expenditure in capital intensive technology as compared to only 45.1% in the pre-liberalisation period. (Table 23)

**Table 23 Expenditure in capital intensive technology in the periods 1980-1992 and 1993-2005**

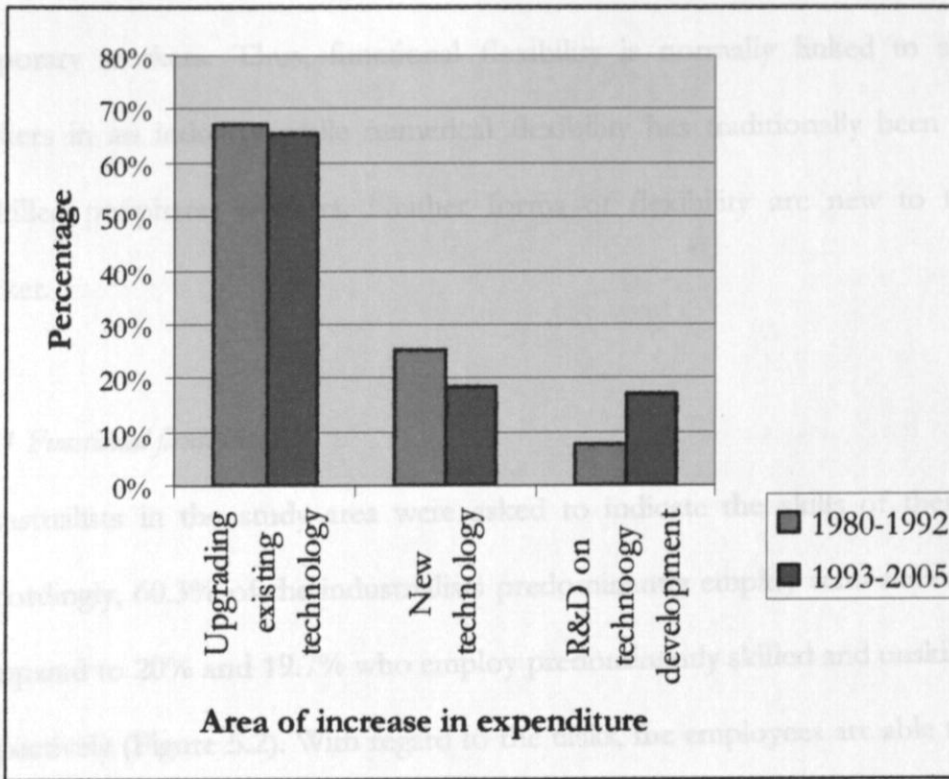
Whether expenditure in technology has increased	1980-1992		1993-2005	
	Frequency	Percentage	Frequency	Percentage
Yes	23	45.1%	85	81%
No	28	54.9%	20	19%
<b>Total</b>	<b>52</b>	<b>100%</b>	<b>105</b>	<b>100%</b>

Source: Fieldwork data 2001-2005

Industrialists in the study area were asked to state the specific areas of capital intensive technology where increases in expenditure have occurred. 67.3% of the industrialists indicated that the increases have occurred in upgrading their current in

the pre-liberalisation period as compared to 25.2% and 7.5% increased expenditure on new technology and on research and development related to technology development, respectively. In the post-liberalisation period, 65.4% of the industrialists increased their expenditure on upgrading the current technology while 18.5% and 17% increased expenditure on new technology and on research and design related to technology development, respectively (Figure 9). It is apparent from the research findings that the acquisition of new capital intensive technology (likely to be flexible) accounted for only a small proportion of the increased expenditure on technology in both the pre-liberalisation and post-liberalisation periods. A lot of the expenses were incurred on upgrading and maintaining the existing technology. Emphasis was laid on increasing the efficiency of and reducing the breakdown of machines to reduce machine downturns and increase productivity. This may be explained by the general perception among industrialists that new technology is expensive and that it would require the reorganisation of the shop floor and the attendant disruption of production. Furthermore such technology would require retraining of workers. The expenditure on R&D is minimal because most industrialists depend on R&D solutions developed elsewhere. This is especially applicable to the multi-national enterprises which depend on R&D solutions developed in the parent enterprises in Europe, North America and Asia. Other industrialists depend on R&D results of specialist research organisations both in the public and private sectors in Kenya.

**Figure 9 Areas of increase in expenditure in technology**



Source: Fieldwork 2001-2005

### 6.3 LABOUR FLEXIBILITY

A dominant characteristic of the flexible specialisation model is the use of skilled and flexible labour. This is because labour is viewed as a resource utilised to satisfy consumer needs and must therefore be in possession of relevant skills (Ongile and McCormick, 1996). Labour flexibility may be viewed from two dimensions, namely: functional flexibility and numerical flexibility. Functional flexibility is concerned with the skills of the workers and the number of different tasks they are able to perform. On the other hand, numerical flexibility concerns the size of the labour force (Gertler 1988). Functional flexibility can be enhanced by formal and informal training, while

numerical flexibility is achieved through the use of overtime, part-time workers and temporary workers. Thus, functional flexibility is normally linked to skilled key workers in an industry while numerical flexibility has traditionally been related to unskilled peripheral workers. Neither forms of flexibility are new to the labour market.

### 6.3.1 Functional flexibility

Industrialists in the study area were asked to indicate the skills of their workers. Accordingly, 60.3% of the industrialists predominantly employ semi-skilled labour as compared to 20% and 19.7% who employ predominantly skilled and unskilled labour, respectively (Figure 5.2). With regard to the tasks, the employees are able to perform, 72.8% of the industrialists noted that their employees are able to perform a wide range of tasks within the shop floor as compared to only 25.5% who indicated that their employees perform one specific task or a narrow and defined range of tasks (Appendix 5).

The respondents noted that the mix in terms of the skills of the labour force engaged is a function of the types of job tasks to be performed and the respective skill levels required. Most of the industrialists engage semi-skilled labour to perform largely routine and repetitive tasks such as packing or fixing date labels on food products. Such labour may not initially possess any specific skills but may acquire these on the job. On the other hand, skilled labour is engaged to perform job tasks that may be highly specialist or require high levels of precision. Such labour is varied

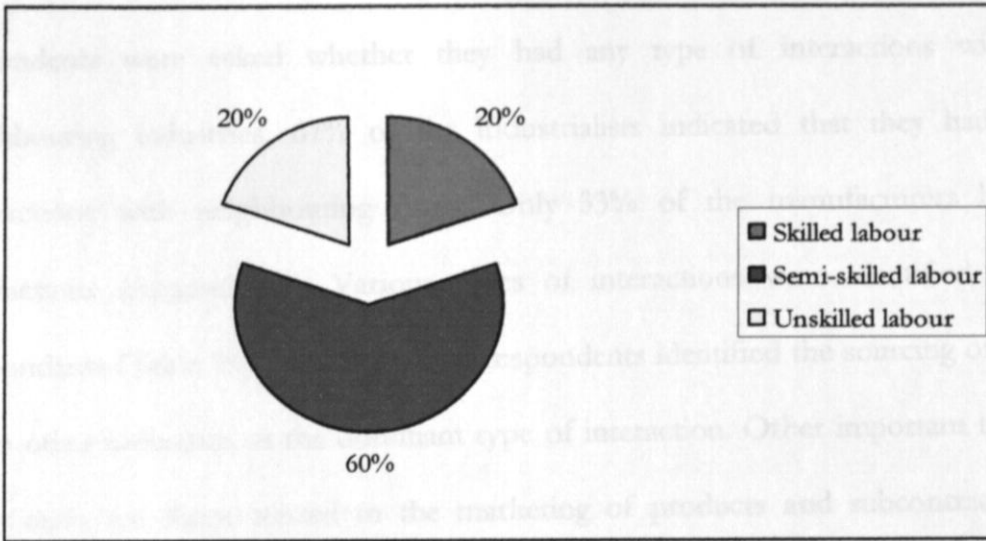
and its cost is higher than that of the semi-skilled labour. It may range from personnel involved directly in the production process to those offering support services in marketing, finance and management.

### 6.3.2 Numerical flexibility

Industrialists in the study area were asked whether they frequently vary the size of their labour force. Accordingly, only 35.5% of the industrialists varied their labour frequently in the period 1980-1992. However, an overwhelming majority of the respondents (91.8%) indicated that they frequently varied the volume of the labour engaged in their enterprises (Appendix 4). This may be explained by the instability of demand for manufactured products due to increased competition especially during the post-liberalisation period.

It may be concluded that whereas numerical labour flexibility is generally widely practised in the study area, especially during the post-liberalisation period, the notion and practice of functional labour flexibility has not gained as wide acceptance among industrialists.

**Figure 10 Labour skills in manufacturing industries**



*Source:* Fieldwork 2001-2005

#### **6.4 NETWORKING/INTERACTIONS**

The disaggregation of large units of production to smaller units linked through a variety of inter-firm relationships is a dominant characteristic of the flexible specialisation paradigm (Brusco 1982). These interrelationships are exemplified by the networks/interactions developed as a result of eternal input sourcing; subcontracting of work processes; marketing of products, research and development, repair and maintenance, sharing of innovations, among others. The flexible specialisation literature borrowing, from a series of case studies from the Third Italy, point to the growth of industrial agglomerations or networks reliant upon close interaction and collaboration between production-related and locationally proximate enterprises (Sabel 1989; Storper and Scott 1989).

To establish the nature of interactions among industries in the study area, the respondents were asked whether they had any type of interactions with the neighbouring industries. 67% of the industrialists indicated that they had some interactions with neighbouring firms. Only 33% of the manufacturers had no interactions (Appendix 3). Various types of interactions were identified by the respondents (Table 24). Majority of the respondents identified the sourcing of inputs from other industries as the dominant type of interaction. Other important types of interaction are those related to the marketing of products and subcontracting of work/processes/services. Interactions related to research and development are not dominant in the study area.

**Table 24: Types of interactions among manufacturing industries**

Type of interactions	Frequency of response	Percentage of response
Sourcing of inputs	58	42.3%
Marketing of products	38	27.7%
Research and development	13	9.5%
Subcontracting of work/ processes/ services	28	20.4%
<b>Total</b>	<b>137<sup>a</sup></b>	<b>100%</b>

137<sup>a</sup> represents the total number of responses with regard to the types of interactions since the variable analysed is a multiple response variable.

Source: Fieldwork data 2001-2005

On being asked to compare the interactions between the periods 1980-1992 and 1993-2005, 51.1% of the respondents indicated that the interactions had been more intensive during the post-liberalisation period while 24.4% noted more intense

interactions in the pre-liberalisation period. Another 24.4% of industrialists indicated that the intensity of interactions had not changed in the two periods (Table 25).

**Table 25 Intensity of interactions in manufacturing industries**

Intensity of interactions	Frequency	Percentage
More intensive between 1993-2005	23	51.1%
More intensive between 1980-1992	11	24.4%
No change	11	24.4%
<b>Total</b>	<b>45</b>	<b>100%</b>

*Source:* Fieldwork 2001-2005

To establish the significance of the research results, the chi-square statistic is computed. Table 26 shows the observed and expected frequencies.

**Table 26 The observed and expected frequencies**

Intensity of interactions	Observed Frequency	Expected Frequency
More intensive between 1993-2005	23	15
More intensive between 1980-1992	11	15
No change	11	15
<b>Total</b>	<b>45</b>	

*Source:* Fieldwork 2001-2005



At 0.05 significance level and with two degrees of freedom, the calculated chi-square value is 6.41 while the tabulated value is 5.99. Hence, the observed variations in the intensity of interactions in manufacturing, between the two periods are statistically significant.

Research findings clearly indicate that there were more interactions between manufacturing industries in the study area in the post-liberalisation period. These are manifested in the forward and backward linkages associated with the sourcing of inputs; marketing of products as well as the subcontracting of work/processes/services. Industrialists indicated that with the liberalisation of Kenya's economy and its associated competition, there was need to collaborate so as to reduce costs and remain competitive. It was felt that networking would reduce marketing costs, increase the consumer presence of their products as well as reduce operational costs. For instance, the industrialists indicated that they had subcontracted work processes and tasks considered not to be core to their mission and vision statements such as security services; transport services and advertising.

## 6.5 CHANGES IN PRODUCT CHARACTERISTICS

In this section, changes in product characteristics are evaluated. The characteristics examined are:

- Product design
- Product quality
- Product range

- Product packaging
- Product pricing

### 6.5.1 Product design

Industrialists in the study area were asked whether they had made significant changes in the product design in the two periods 1980-1992 and 1993-2005. An analysis of product design changes indicates 72.1% of the respondents had made changes in post-liberalisation period as compared to only 27.9% who had not made any product design changes (Table 26). Among the product design changes made included the generation of new products, increase in the utility of products as well as design of products so as to make them user friendly.

### 6.5.2 Product quality

With regard to product quality, manufacturers were required to indicate whether they had made any significant quality changes. A significant proportion of the industrialists (83.3%) indicated that they had improved the quality of their products in the post-liberalisation period. For instance, the use of natural fruits as opposed to fruit flavours, in the processing of fruit juices was cited as one of the quality changes. Only 16.8% of the industrialists had not made any quality changes (Table 26).

### 6.5.3 Product range

It was envisaged in the post-liberalisation period, the product range of industries in the study area would increase. This was confirmed by research findings. Accordingly, 67.6% of the industrialists indicated that they had increased the range of products they manufacture in the post-liberalisation period as compared to 34.65 in the pre-liberalisation period (Table 26).

### 6.5.4 Product packaging

Industrialists in the study area were asked whether they had made changes in the packaging of their products. From the research findings, it is apparent that 75.8% of the industrialists had repackaged their products in the post-liberalisation period as compared to only 26.8% in the pre-liberalisation period (Table 26). Among the product packaging changes include the adoption of lighter, brighter and attractive packaging material as well as the use of recycled paper in packaging.

### 6.5.5 Product pricing

With regard to product pricing, industrialists were asked to indicate whether they had made significant changes between the pre- and post-liberalisation periods. It is apparent 25.5% and 79.1%, respectively had made product pricing changes in the two periods (Table 26). Manufacturers indicated that they had adopted competitive prices to attract more customers.

Table 26 below shows changes in product characteristics.

Table 26 Changes in product characteristics

Significant changes in product characteristics	1980-1992		1993-2005	
	Frequency	Percentage	Frequency	Percentage
(i) <i>Product Design</i>				
Yes	19	37.3%	75	72.1%
No	32	62.7%	29	27.9%
<i>Total</i>	<i>51</i>	<i>100%</i>	<i>104</i>	<i>100%</i>
(ii) <i>Product Quality</i>				
Yes	33	63.5%	89	83.3%
No	19	36.5%	18	16.8%
<i>Total</i>	<i>52</i>	<i>100%</i>	<i>107</i>	<i>100%</i>
(iii) <i>Product Type/Range</i>				
Yes	18	34.6%	69	67.6%
No	34	65.4%	33	32.4%
<i>Total</i>	<i>52</i>	<i>100%</i>	<i>102</i>	<i>100%</i>
(iv) <i>Product Packaging</i>				
Yes	15	26.8%	75	75.8%
No	37	73.2%	24	24.2%
<i>Total</i>	<i>52</i>	<i>100%</i>	<i>99</i>	<i>100%</i>
(iv) <i>Product Pricing</i>				
Yes	28	25.5%	87	79.1%
No	24	22.7%	12	10.9%
<i>Total</i>	<i>52</i>	<i>100%</i>	<i>99</i>	<i>100%</i>

Source: Fieldwork 2001-2005

To determine the statistical significance of the research results, the chi-square test statistic is utilised. Table 27 shows the observed and expected frequencies.

At 0.05 significance level and with four degrees of freedom, the calculated chi-square value is 94.02 while the tabulated value is 9.49. Hence, the observed variations in the changes in product characteristics between the two periods are statistically significant.

Table 27 Observed and expected frequencies

Significant changes in product characteristics	1980-1992		1993-2005	
	Observed Frequency	Expected Frequency	Observed Frequency	Expected Frequency
(i) <i>Product Design</i>				
Yes	19	31.62	75	62.38
No	32	20.52	29	40.48
(ii) <i>Product Quality</i>				
Yes	33	41.04	89	80.96
No	19	12.45	18	24.55
(iii) <i>Product Type/Range</i>				
Yes	18	29.26	69	57.74
No	34	22.54	33	44.46
(iv) <i>Product Packaging</i>				
Yes	15	30.27	75	59.73
No	37	20.52	24	40.48
(iv) <i>Product Pricing</i>				
Yes	28	38.68	87	76.32
No	24	12.11	12	23.89
<i>Total</i>	<i>259</i>		<i>511</i>	

Source: Research 2001-2005

## 6.6 SUMMARY

Research findings clearly indicate that multipurpose machines have not been widely utilised by manufacturers in the study area. This is despite the fact that increases in expenditure on capital intensive technology have occurred in both the pre-liberalisation and post-liberalisation periods. With regard to labour flexibility, it has

been noted that functional flexibility is not a dominant feature in the study area. However, the use of numerical flexibility is widespread.

Industrialists in the study area have developed interactions/networks amongst themselves especially in the post-liberalisation period. These are manifested in the forward and backward linkages associated with the sourcing of inputs; marketing of products as well as the subcontracting of work, processes or services. However, no significant industrial agglomerations were observed to have developed as a result of the interactions/networks between manufacturers. Significant changes in product characteristics were observed to have occurred in the study area in the post-liberalisation period. The greatest changes have occurred in product quality and product pricing indicating the importance of these product characteristics among industrialists in the study area.

On the basis of the research findings, it is apparent that the features of the flexible specialisation model are not well developed in the study area. The null hypothesis that 'there is no significant difference between the attributes of the production organisation in the formal manufacturing sector in the study area and those of the flexible specialisation model' is therefore rejected.

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## CHAPTER SEVEN

### SPATIAL ORGANISATION OF THE FORMAL MANUFACTURING SECTOR IN THE CITY OF NAIROBI

#### 7.1 INTRODUCTION

This chapter examines the industrial spatial economy of manufacturing industries in the study area. It has been argued that industrial restructuring may lead to the alteration of the industrial spatial economy through spatial clustering or agglomeration of industrial enterprises (Piore and Sabel 1984; Storper and Scott 1989; Pyke and Sengenberger 1992). For instance, the vertical disintegration of the production process has been linked to the development of clusters of industries based on dense transactional networks. This may in turn lead to the creation of new industrial spaces that are production related and locationally proximate often referred to as industrial districts (Storper and Scott 1989).

The main impetus for the industrial districts model initially came from Italy, and especially the province of Emilia-Romagna. However, the characteristic features of the model have been observed elsewhere in Europe such as Baden-Württemberg in Germany and West Jutland in Denmark) as well as North America in the Silicon Valley (Pyke and Sengenberger 1992; Kristensen 1992 and Schmitz 1992). The dominant characteristics of industrial districts are:

- The existence of strong networks of many small firms, arising from the transactional relationships among the firms. These networks are related to the sourcing of materials, marketing of semi-processed and finished products; subcontracting of work processes, among others.
- Industrial districts are geographically bounded. The locational proximity between firms, individuals and institutions improves efficiency and effectiveness in the spread of ideas, innovations and other forms of collaboration.
- Co-operation among firms in an industrial district is another important characteristic. It has been observed that certain kinds of cooperation promote competitive efficiency (Pyke and Sengenberger 1992). For instance, the sharing of information on new technologies or products may enable firms within the industrial district to be more efficient through improved productivity, quality, quantity, design, pricing, among others.
- Industrial districts are characterised by flexibility. (Pyke and Sengenberger 1992 pg. 5) note that industrial districts represent '... represent a type of industrial organisation that meets competitive challenges through differentiated high quality products, flexibility of adjustment and the ability for innovation'.

In this chapter, an attempt is made to discuss the industrial location patterns and to assess whether there has been any spatial reorganization of the manufacturing industries in the study area resulting in the development of new industrial districts. The hypothesis tested states that 'there has been no significant spatial reorganisation of formal manufacturing industries in the CoN arising from the liberalisation of Kenya's economy'.

## 7.2 INDUSTRIAL LOCATION IN CoN

The food processing, textiles and leather sub-sectors are largely concentrated in the Industrial Area (mainly within Makadara Division) of CoN which accounts for about half of the total number of establishments in the sub-sectors (Table 28 and Figure 11). The Kasarani and Central Divisions are also important industrial zones. In Kasarani Division, the main industrial areas are Ruaraka and Baba Dogo which are important centres for food processing and textile export processing zones.

The other important industrial location zone in the study area is the Central Business District (CBD) and its environs, located within Central Division. The historical significance of CBD as an industrial centre has been documented (Ogendo 1978; White 1948; Tiwari 1964)). Prior to the 1948 Master Plan that delineated the current Industrial Area, most of the industries were located in the CBD. Some of the enterprises involved in food processing, textiles and leather are located within the CBD and its environs. For instance, coffee processing, footwear fabrication as well as the manufacture of clothing takes place within Central Division. In Embakasi

Division, flour milling, bakeries and soft drinks industries are important. Some of the industries dealing with the processing of horticultural produce are located near the Jomo Kenyatta International Airport, within Embakasi Division. Figure 12 shows the industrial location patterns.

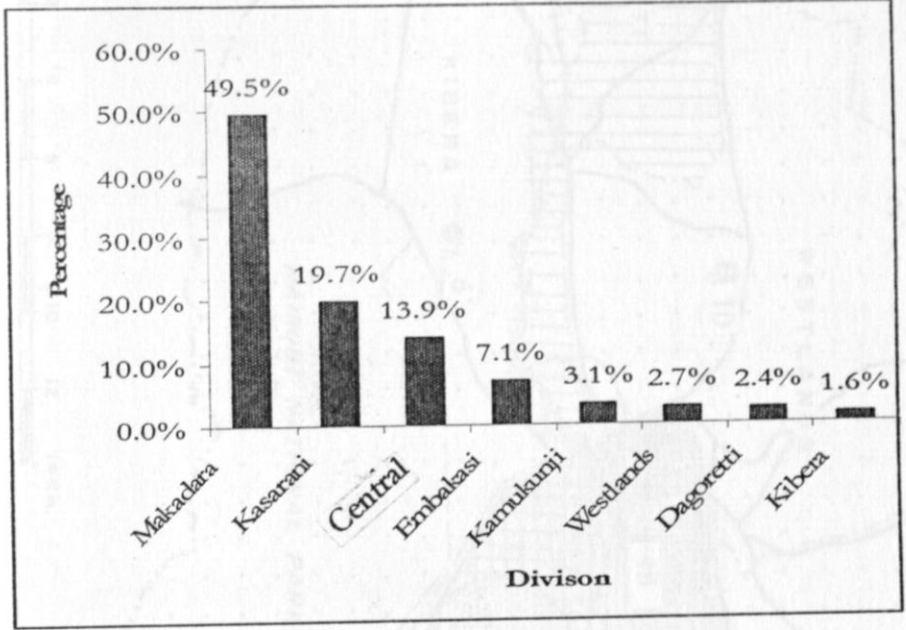
**Table 29** Number of enterprises in the food processing, textiles and leather sub-sectors in the CoN

Division	Number of Enterprises	Percentage
Makadara	173	49.5%
Kasarani	68	19.7%
Central	48	13.9%
Embakasi	26	7.1%
Kamukunji	11	3.1%
Westlands	10	2.7%
Dagoretti	8	2.4%
Kibera	6	1.6%
<b>Total</b>	<b>350</b>	<b>100%</b>

*Source:* Fieldwork data 2001-2005; KAM Directory 2005/2006, Kenya, Republic of, 1998

The above data graphically presented in figure 11.

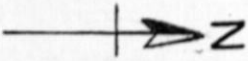
Figure 11 Enterprises engaged in food processing, textiles and leather sub-sectors in the CoN



Source: Fieldwork 2001-2005

36°40'E

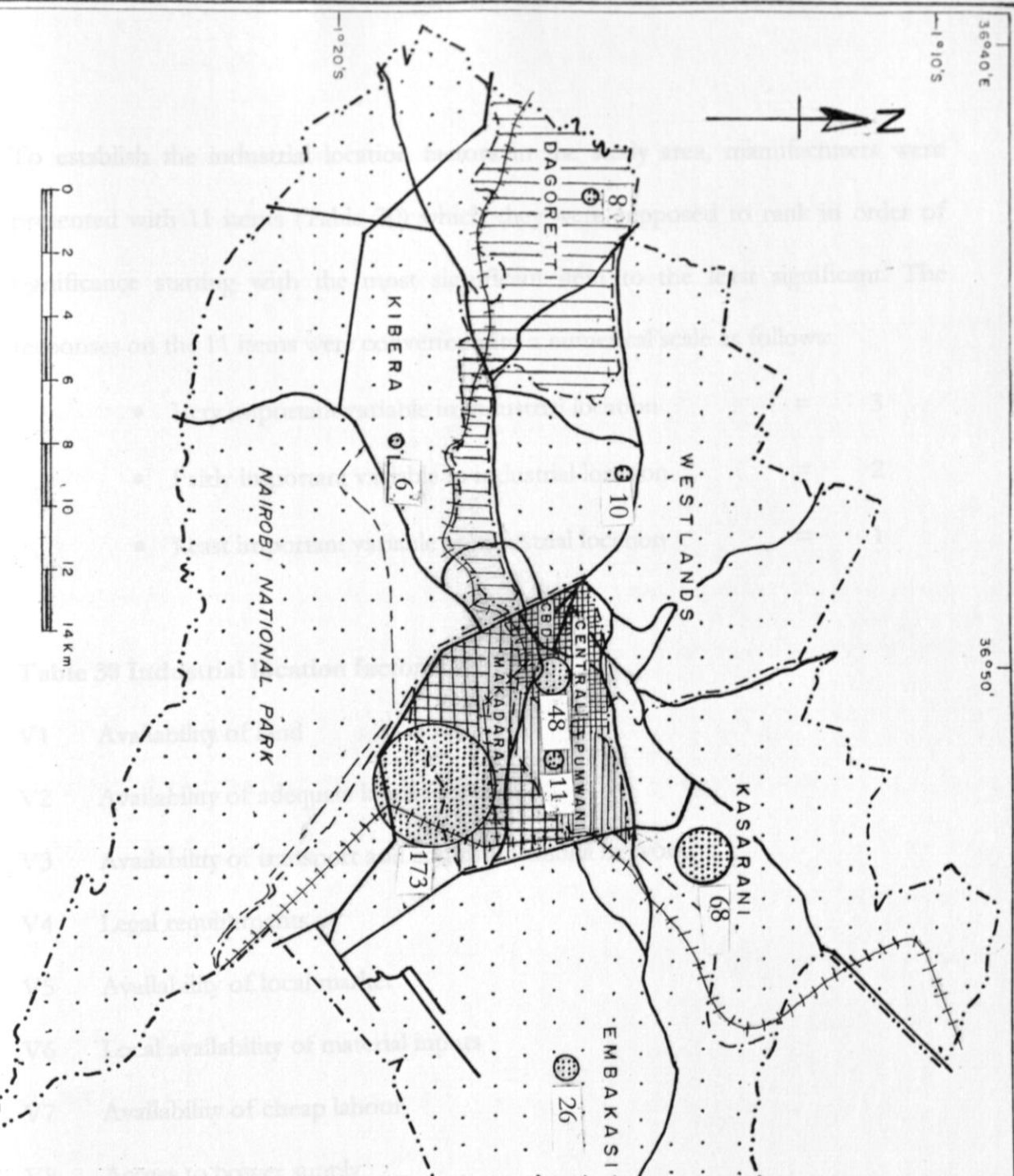
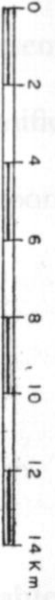
1°10'S



36°50'

37°00'E

1°1



**LEGEND**

- Nairobi City Boundary
- - - Divisional Boundary
- == Major Roads
- National Park Boundary

**Population Density**

	0	4,000
	4,001	8,000
	8,001	12,000
	12,001	16,000
	16,001	20,000
	20,001	24,000

**Number of Enterprises**



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To establish the industrial location factors in the study area, manufacturers were presented with 11 items (Table 30) which they were supposed to rank in order of significance starting with the most significant item to the least significant. The responses on the 11 items were converted into a numerical scale as follows:

- Very important variable in industrial location = 3
- Fairly important variable in industrial location = 2
- Least important variable in industrial location = 1

**Table 30 Industrial location factors**

- V1 Availability of land
- V2 Availability of adequate labour force
- V3 Availability of transport and communications network
- V4 Legal requirements
- V5 Availability of local market
- V6 Local availability of material inputs
- V7 Availability of cheap labour
- V8 Access to power supply
- V9 Availability of suitable underlying rock structure
- V10 Availability of adequate water supply
- V11 Proximity to other local establishments

The correlation matrix of the 11 variables (Table 31) shows values of the Spearman's rank correlation coefficients computed for the variables using the SPSS package. Statistically, correlation coefficients of  $\pm 0.3000$  and above are regarded as significant at 0.05 significance level (Hammond and McCullagh 1978). Accordingly, there are significant correlations between various variables. The high and positive correlations between the variable 'availability of transport and communications network' and two variables, 'availability of local market' (0.683); and 'local availability of materials' (0.596), may be explained by the fact that an efficient transport and communication network improves the accessibility of an industry to its market as well as the material inputs. The variable 'availability of local market' has a significant relationship with the variable 'proximity to other local establishments' (0.503) implying that some industries provide market for the semi-processed materials of other industries. The correlation matrix further indicates that the cost of labour, in the study area is low and that labour is available in abundance as indicated by the relationship between the variables, 'availability of cheap labour' and 'availability of adequate labour force' (0.496)

Variance explained by the extracted factors

FACTOR	EIGENVALUE	% OF VARIANCE
1	4.432	43.2%
2	1.640	15.9%
3	1.185	11.6%
TOTAL	7.197	69.7%

Source: Fieldwork 2001-2005



**Table 31 Correlation Matrix**

Var	1	2	3	4	5	6	7	8	9	10	11
1	1.000										
2	.013	1.000									
3	.016	-.106	1.000								
4	.284	.177	.310*	1.000							
5	.334*	.090	.683*	.061	1.000						
6	.107	.316*	.596*	.028	.306*	1.000					
7	.053	.496*	-.404*	.045	.267	.250	1.000				
8	.105	.309*	.125	.013	.299	.026	.212	1.000			
9	.204	.195	-.019	.208	.303*	.198	.301*	.133	1.000		
10	.148	.080	-.305*	.305*	.204	.209	.104	.244	.303*	1.000	
11	-.034	.323*	.071	.314*	.503*	.070	.044	.169	.198	.206	1.000

\*denotes significant correlations at 0.05 significance level

To obtain comprehensive results, the correlation matrix was exposed to factor analysis. The factor analysis procedure extracted three factors which together accounted for 65.15% of the total variance of the 11 items (Table 32).

**Table 32 Variance explained by the extracted factors**

FACTOR	EIGENVALUE	% OF VARIANCE
1	4.432	40.29%
2	1.649	14.99%
3	1.086	9.87%
TOTAL	7.167	65.15%

Source: Fieldwork 2001-2005

The initial factor solution was rotated using varimax rotation. As already noted, rotation has the effect of emphasising stronger factor loadings and minimising the weaker ones. The rotated factor matrix is shown in table 33.

Table 33: Rotated factor matrix for industrial location factors

	FACTORS		
	1	2	3
Availability of land	0.216	0.262	0.058
Availability of adequate labour force	0.512	-0.148	-0.022
Availability of transport and communication network	0.007	0.674	0.241
Legal requirements	0.133	0.323	0.134
Availability of local market	0.885	0.231	0.251
Local availability of material inputs	0.216	0.140	0.553
Availability of cheap labour	0.784	0.145	0.223
Access to power supply	0.126	0.627	0.379
Availability of suitable underlying rock structure	0.225	0.145	-0.037
Availability of adequate water supply	-0.209	0.446	-0.038
Proximity to other local establishments	0.268	0.533	0.114

Source: Fieldwork 2001-2005

**7.2.1 Identification and labelling of factors**

On careful examination of the factor loadings, it was that decided that only those variables that load on the factors with a value equal to or greater than ( $\geq$ ) 0.400 be taken into account. This would facilitate easy and accurate interpretation of the factors.

**FACTOR ONE**

<u>Variables</u>	<u>Loadings</u>
Availability of local market	0.885
Availability of cheap labour	0.784
Adequate labour force	0.512

Factor one is associated with three variables that load heavily on it. These are: availability of local market; availability of cheap labour and adequate labour force. This factor accounts for 40.29% of the total variance and may be interpreted as representing those factors that are related to market and labour. Therefore this factor is labelled *market-cum-labour factor*.

**FACTOR TWO**

<u>Variables</u>	<u>Loadings</u>
Availability of transport and communication network	0.674
Access to power supply	0.627
Proximity to other local establishments	0.533
Availability of adequate water supply	0.446

Four variables load highly to factor two. These are: availability of transport and communication network; access to power supply; proximity to other local establishments, and availability of adequate water supply. Factor two may be interpreted to represent factors that are associated with agglomeration economies. This factor is therefore labelled *agglomeration economies factor* and accounts for 14.99% of the total variance.

### FACTOR THREE

<u>Variables</u>	<u>Loadings</u>
Local availability of material inputs	0.553

Factor three has only one factor loading heavily on it, namely the local availability of material inputs. This factor accounts for 9.87% of the total variation. The factor is therefore labelled *material inputs factor*.

It is evident that the factors influencing the location of manufacturing industries in the study area may be categorized into three factors. These are:

- The market-cum-labour factor;
- The agglomeration economies factor; and,
- The material inputs factor

### 7.2.1.1 *The market-cum-labour factor*

The first factor, labelled 'market-cum-labour factor, represents the most important industrial location factor in the study area. The factor accounts for the highest variance in the original data set. Industrialists involved in food processing and textiles manufacture in the study area, indicated that the availability of diversified and ready market was very significant in influencing their decision to locate in CoN. They further noted that their transport costs were reduced due to easy access to the market. The influence of adequate and cheap labour force on industrial location has been underscored by the research findings. The study area is endowed with the abundance of cheap labour which has endeared it to, especially, multi-national establishments, from North America, Europe and Asia.

### 7.2.1.2 *The agglomeration economies factor*

Research findings indicate that this factor is also important in influencing the location of manufacturing industries in the study area. The most significant agglomeration economies are:

- The availability of relatively well established transport and communications networks. These consist of road-rail-air networks as well as developed telephone and internet services. This ensures that industries in the study area have access to both the sources of material inputs as well as markets for finished products.

- The accessibility to both water and power supply. The study area is endowed with relatively well established water and electricity supply networks. In food processing, textiles and leather industries, water is used as a basic input (for instance in the brewing and soft drinks industries), a cleanser and a coolant. In the study area, electricity is the main source of energy for operating machinery/equipment.
- Proximity to other enterprises. Such proximity was observed to be important especially among firms that had established subcontracting relations among themselves as well as those that supplied and/or utilised semi-processed material inputs.

#### 7.2.1.3 Local availability of materials factor

Industrialists indicated that the local availability of materials is an important factor in industrial location. For instance, agro-based food material inputs are easily obtained from the surrounding districts such as Kiambu, Thika and Machakos Districts, given the accessibility of the study area. Those industries that fabricate semi-processed materials, especially in the textiles and leather sub-sectors, find a ready source of such materials in the study area.

### 7.3 SPATIAL REORGANISATION OF MANUFACTURING INDUSTRIES

In this section, an attempt is made to establish whether there has been any significant spatial reorganisation of the food processing, textiles and leather industries in the study area, resulting in industrial districts. The variables examined are:

- Sources of inputs and markets for finished products
- Amount of stock held;
- Subcontracting of work/processes/services; and,
- Changes in physical location.

Figure 13 Sources of inputs for industries in the CoN

#### 7.3.1 Sources of inputs and markets for finished products

The development of networks between firms, related to sourcing of inputs and marketing of finished products is an important feature of industrial districts. To establish whether these networks are well developed in the study area, the industrialists were asked to state the source of inputs and the market for finished products.

With regard to the sources of inputs, industrialists in the study area obtained their inputs mainly obtained from the rest of Kenya and the wider CoN which together account for 72.2% of the total inputs (Table 34 and Figure 13). The nearby sources of inputs account for only 10.8% of the total inputs.

Regarding the markets for finished products, it is evident that the wider CoN and the rest of Kenya account for the largest share of the market for manufactured products.

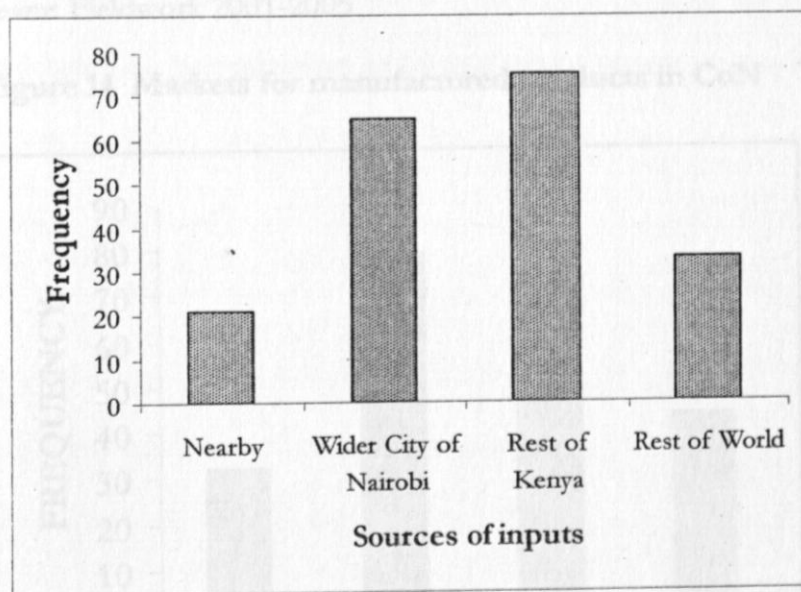
**Table 34 Sources of inputs for manufacturing industries in the CoN**

Source of Inputs	Frequencies	Percentage of responses
Nearby	21	10.8%
Wider CoN	65	33.5%
Rest of Kenya	75	38.7%
Rest of World	33	17.0%
<b>Total</b>	<b>194<sup>a</sup></b>	<b>100%</b>

194<sup>a</sup> is the total number of responses and not respondents since the variable analysed is a multiple response variable.

Source: Fieldwork 2001-2005

**Figure 13 Sources of inputs for industries in the CoN**



Source: Fieldwork 2001-2005

Regarding the markets for finished products it is evident that the wider CoN and the rest of Kenya account for the largest share of the market for manufactured products



in the study area (Table 35 and Figure 14). It is also evident that manufacturers do not sell a lot of their produce to the nearby markets.

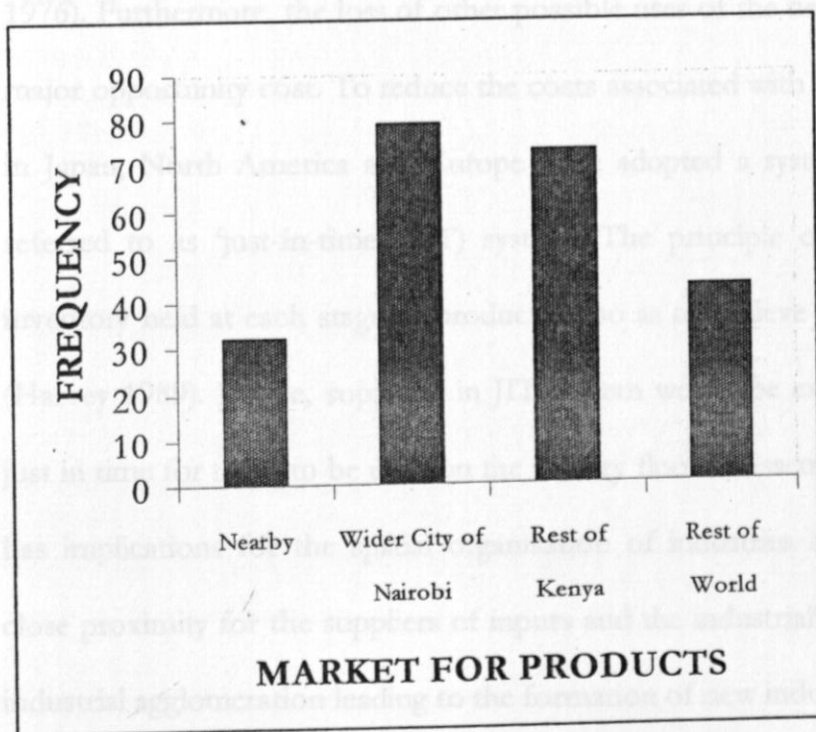
**Table 35 Market for manufactured products in CoN**

Market for manufactured products	Frequencies	Percentage of responses
Nearby	32	14.1%
Wider CoN	79	34.8%
Rest of Kenya	73	32.2%
Rest of World	43	18.9%
<b>Total</b>	<b>227</b>	<b>100%</b>

227<sup>a</sup> is the total number of responses and not respondents since the variable analysed is a multiple response variable.

Source: Fieldwork 2001-2005

**Figure 14 Markets for manufactured products in CoN**



Source: Fieldwork 2001-2005

It is apparent from the research findings that linkages related to the sourcing of inputs and marketing of produce are not well developed among manufacturing industries in the study area. The wider CoN and the rest of Kenya account for the largest share of not only the market for products, but the sources of inputs as well. The nearby enterprises account for the least share of both the sources of inputs and the market for finished products.

### *7.3.2 Amount of stock held*

Manufacturing inventories (stocks) tie up large sums of capital and are costly to maintain (Estall 1985). The direct costs of stock holding include storage, insurance, damage and deterioration, pilferage, obsolescence and administrative costs (Firth 1976). Furthermore, the loss of other possible uses of the tied-up capital represents a major opportunity cost. To reduce the costs associated with inventories, industrialists in Japan, North America and Europe have adopted a system of inventory control referred to as 'just-in-time' (JIT) system. The principle of JIT is to control the inventory held at each stage of production so as to achieve an ideal 'zero inventory' (Harvey 1989). Hence, suppliers in JIT system would be expected to deliver goods just in time for them to be used on the factory floor or assembly line. The JIT system has implications for the spatial organisation of industries of industries. It requires close proximity for the suppliers of inputs and the industrialists. This may encourage industrial agglomeration leading to the formation of new industrial spaces.

Industrialists in the study area were asked whether they hold some stocks of their inputs and the percentage of inputs held in relation to the total inputs. Research findings indicate that majority of the industrialists (83%) hold some stocks of their inputs. An examination of the percentage of stocks held indicates that over half of the industrialists hold 50% and above of their stocks in relation to total inputs. There is no significant variation in the proportion of the industrialists holding between 50%-75% of stocks and those holding less than 50% of stocks in relation to total inputs. (Table 36).

**Table 36 Percentage of stocks in relation to inputs**

Percentage of stock to inputs	Frequency	Percentage
Over 75%	13	14.8%
50-75%	37	42%
Less than 50%	38	43.2%
<b>Total</b>	<b>88</b>	<b>100</b>

Source: Fieldwork 2001-2005

To establish the statistical significance of the data, the chi-square test has been utilised. Table 37 shows the observed and expected frequencies.

**Table 37 Observed and expected frequencies**

Percentage of stock to inputs	Observed frequency	Expected frequency
Over 75%	13	29.3
50-75%	37	29.3
Less than 50%	38	29.3
<b>Total</b>	<b>88</b>	

Source: Fieldwork data 2001-2005

At 0.05 significance level and 2 degrees of freedom, the calculated chi-square value is 13.67 while the critical value is 5.99. This implies that the observed differences in the percentage of stocks held in relation to total inputs are statistically significant. This implies that the JIT system is not widely practised in the study area.

*7.3.3 Subcontracting of work, processes or services*

The pressures to reduce costs and 'lean' organisations have forced firms all over Europe, America and Japan to disaggregate and subcontract their activities as a competitive strategy (Masinde 1996). Subcontracting of non-core work process/services such as transport services; security services; advertising and marketing is common among industrialists. It has been argued that subcontracting practices may lead to industrial clustering and hence spatial reorganisation (Gertler 1988). For instance, industries subcontracting work and those carrying it out have to be located in close proximity so that production is not disrupted.

An examination of the subcontracting practices among industrialists in the study reveals that subcontracting is not widely practised. Only 29.1% of the industrialists indicated that they subcontract work, processes or services. The rest (70.9%) indicated that they meet their own requirements for work, processes or services (Appendix 6).

#### *7.3.4 Change in physical location*

Industrialists in the study area were asked whether they have changed their physical location since they were established. Research findings indicate that only a small proportion of the industrialists (31.7%) indicated that they had changed their location with a majority (68.3%) having retained their locations (Appendix 6). This serves to further confirm that no significant spatial reorganisation has occurred in the study area.

### **7.4 SUMMARY**

This study has established that the food processing, textiles and leather sub-sectors are concentrated in the Industrial Area of CoN which accounts for over half of all enterprises. The location of these enterprises is governed by the market-cum-labour, agglomeration economies and material inputs factors.

Research findings clearly indicate that no significant spatial reorganisation of manufacturing industries in the study area has occurred. This conclusion is based on the following observations:

- Linkages related to the sourcing of inputs and marketing of products are not well developed among industrialists in the study area.
- Majority of the industrialists do not practice the JIT inventory system.
- Subcontracting of work/processes/services is not widely practiced in the study area
- Majority of the industrialists have not changed their physical location since they were established.

The null hypothesis that 'there has been no significant spatial reorganisation of formal manufacturing industries in the CoN arising from the liberalisation of Kenya's economy' can, therefore, not be rejected.

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## 8.1 INTRODUCTION

This chapter presents the summary of research findings, related conclusions and the resultant recommendations. These are based on the objectives and hypotheses of the study which are outlined below. The overall objective of the study was to examine industrial restructuring in the formal manufacturing sector in the CoN. The specific objectives of the study were:

- To investigate the effects of liberalisation of Kenya's economy on industries in the formal manufacturing sector in the CoN.
- To assess the strategies that have been adopted by industrialists to deal with the effects of the liberalisation of Kenya's economy.
- To evaluate the applicability of the flexible specialisation model in industries in the formal manufacturing sector in the CoN.
- To assess whether there has been a spatial concentration of the formal sector industries in the CoN as a result of the liberalisation of Kenya's economy.

In order to achieve the objectives stated above, four null hypotheses were formulated and tested, namely:



## CHAPTER EIGHT

### SUMMARY OF RESEARCH FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

#### 8.1 INTRODUCTION

This chapter presents the summary of research findings, related conclusions and the resultant recommendations. These are based on the objectives and hypotheses of the study which are outlined below. The overall objective of the study was to examine industrial restructuring in the formal manufacturing sector in the CoN. The specific objectives of the study were:

- To investigate the effects of liberalisation of Kenya's economy on industries in the formal manufacturing sector in the CoN.

- To assess the strategies that have been adopted by industrialists to deal with the effects of the liberalisation of Kenya's economy.

- To evaluate the applicability of the flexible specialisation model on industries in the formal manufacturing sector in the CoN.

- To assess whether there has been spatial reorganisation of the formal sector industries in the CoN as a result of the liberalisation of Kenya's economy.

In order to achieve the objectives stated above, four null hypotheses were formulated and tested, namely:

- The performance of the formal manufacturing sector in the CoN has not been significantly affected by the liberalisation of the Kenya's economy.
- There is no significant variation in the strategies adopted by industrialists in the formal manufacturing sector in the study area to deal with the effects of the liberalisation of Kenya's economy.
- There is no significant difference between the attributes of the flexible specialisation model and those of the production organisation of the formal manufacturing sector in the study area.
- There has been no significant spatial reorganisation of formal manufacturing industries in the CoN as a result of the liberalisation of Kenya's economy.

## 8.2 SUMMARY OF RESEARCH FINDINGS

### 8.2.1 Major findings related to the tested hypotheses

With regard to the effects of liberalisation on the formal manufacturing sector in the study area, it has been established that industrialists experienced a decline in demand for their manufactured products in the food processing, textiles and leather sub-sectors during the post-liberalisation period. This led to job losses and a decline in the volume of labour employed in the respective industries. It is also apparent from the research findings that there was intensified competition on manufactured products and the production costs increased during the post-liberalisation period. Hence, a major finding of this study is that liberalisation has negatively affected the performance of industries in the study area.

The application of factor analysis to data on the strategies adopted by industrialists to deal with the effects of liberalisation reveals that industrialists in the study area have adopted three main strategies. These are marketing strategies, product changes strategies, and technology strategies. An analysis of the constituent variables for each of the strategies showed that each the strategies is distinct. Thus, it is apparent that there is a significant variation in the strategies adopted by industrialists to deal with the effects of liberalisation.

An analysis of the applicability of the flexible specialisation model in the formal manufacturing sector in the study area reveals that multipurpose machines are not been widely utilised by manufacturers in the study area. This is despite the fact that increases in expenditure on capital intensive technology have occurred in both the pre-liberalisation and post-liberalisation periods. With regard to labour flexibility, it has been observed that although the practice of numerical labour flexibility is widespread, functional labour flexibility is not a dominant feature in the study area.

Industrialists in the study area have some developed networks amongst themselves especially in the post-liberalisation period. These are manifested in the forward and backward linkages associated with the sourcing of inputs; marketing of products as well as the subcontracting of work, processes or services. However, no significant industrial agglomerations were observed to have developed as a result of the interactions/networks between manufacturers.

Significant changes in product characteristics were observed to have occurred in the study area in the post-liberalisation period. The greatest changes have occurred in

product quality and product pricing indicating the importance of these product characteristics among industrialists in the study area.

It has further been established that there has been no significant reorganisation of the industrial spatial economy, as a result of industrial restructuring in the study area. The assessment of the linkages related to the sourcing of inputs and marketing of products as well as the subcontracting of work, processes or services, shows that these are not well developed. Majority of the industrialists do not practice the JIT inventory system. From these observations, it is apparent that no significant industrial reorganisation has occurred in the study area.

### **8.2.1 Other findings not hypothesised in the study**

An analysis of the industrial location patterns indicates that the food processing, textiles and leather industries are concentrated in the Industrial Area within Makadara Division of the study area. Other important industrial zones are found in Kasarani, Central and Embakasi Divisions. It is also apparent that the main factors influencing the location of manufacturing industries in the study area are market-cum-labour, agglomeration economies, and, material inputs factors.

An analysis of expenditure on technology reveals a significant increase in expenditure on capital intensive technology in the post-liberalisation period. The greatest increases of this expenditure have been incurred by the industrialists in their attempt to upgrade the existing technology as compared to expenditure on new technology and on R&D.

Research findings indicate a normal distribution of employees among enterprises in the study area. There is a relatively high concentration of enterprises employing 20-199 employees. The enterprises employing 1000+ account for the least concentration in the study area.

### 8.3 CONCLUSIONS

This study sought to establish the effects of the liberalisation of Kenya's economy on the food processing, textiles and leather sub-sectors. It was hypothesised that 'the performance of the formal manufacturing sector in the CoN's has not been significantly affected by the liberalisation of the Kenya's economy'. However, it is apparent from research findings that liberalization has significantly negatively impacted on the sectors. It has led to the closure of several enterprises within the sub-sectors and in some instances, a significant scaling down of operations leading to job losses. In their bid to remain competitive, industrialists in the study area have adopted various survival strategies.

On the basis of the research findings, it is also apparent that the features of the flexible specialisation model, as theorised by Piore and Sabel (1984) and other scholars, are not well developed in the study area. Therefore, the model may not significantly characterise the organisation of production in the food processing, textiles and leather sub-sectors in the study area. Hence, the null hypothesis that 'there is no significant difference between the attributes of the flexible specialisation

model and those of the production organisation of the formal manufacturing sector in the study area' has been rejected.

An examination of research data reveals that there is industrial localisation in the study area. The food processing, textiles and leather sub-sectors are mainly located in the Industrial Area and that there has been no significant spatial reorganisation over time. It would appear that a core-periphery industrial development pattern is prevalent in the study area, with the Industrial Area being the core and the rest of CoN constituting the periphery. Although the exploitative tendencies of the Industrial Area over the rest of the study area are subtle, when compared to those operating at the Kenya and international industrial space economies, they are nonetheless significant, in view of their implications on the spatial distribution of industrial capital. The concentration of such capital in certain (industrial) areas in Kenya has been associated with polarised industrial development patterns and the attendant regional development inequalities.

#### 8.4 RECOMMENDATIONS

The findings of this study are useful to scholars, researchers, planners and policy makers. In this section, an attempt has been made to provide recommendations to the scholars, researchers, planners and policy makers.

### 8.4.1 Scholars

Scholars will find of practical use and interest the various statistical tools that have been used in this study. For instance, factor analysis has been used to derive the industrial location factors in the study area. It has also been used to determine the strategies used by industrialists to deal with the effects of liberalisation. The location patterns of industries in the study area have been mapped using the number of industrial establishments in various administrative units (Divisions) of the study area. However, manufacturing activities may be mapped using the number of employees, valued added by manufacturing; the scale of production, among others.

### 8.4.2 Researchers

This study has examined some aspects of industrial restructuring in the CoN. However, given the limitations of financial resources and time as well as the complex nature of the research topic, it was not possible to cover all relevant aspects. There is need for further research. Some of the suggested areas for further research are:

- An evaluation of the effects of liberalisation, not only on other industries but on other sectors of the economy such as agriculture and trade so as to develop a comprehensive database on the full effects of liberalisation on Kenya's economy.
- A detailed study on the strategies being adopted by industrialists to cope with competition in other sub-sectors of manufacturing in both the formal and informal sectors.

- There is need for a comparative study on the applicability of the flexible specialisation model in both the formal and informal manufacturing industries.
- A comprehensive investigation of the challenges facing industrialists in the study area and other parts of Kenya.

#### 3.4.2 Planners and Policy Makers

From the analysis made in this study, it is apparent that some planning and policy aspects should be addressed so as to ensure the survival and efficiency of manufacturing industries in the study area, in view of the liberalised and highly competitive business environment. Some the recommendations for dealing with the planning and policy aspects are outlined below.

- This study has established that the declining demand for manufactured products is one of the major challenges facing industrialists in the study area. The design and implementation of deliberate policies and plans aimed at expanding the market for manufactured products, not only in the study area but also in the rest of Kenya and the World, is a possible solution. For instance, relevant Government Ministries and Departments in conjunction with the industrialists, could organise trade fairs and promotions in various countries of the world, as part of a wider marketing strategy.



- There is need for industrialists in the study area and the rest of Kenya to forge joint forward and backward linkages among themselves and with other sectors of the economy so as to reduce their production costs and to remain competitive.
- There is urgent need to improve infrastructure in the study area and in Kenya, in general. Industrialists interviewed indicated that the increased costs they incurred in the post-liberalisation period, were partly due to the poor road network especially in the industrial area and the disruptions caused by the unstable supply and high cost of electricity. The poor networks in particular, are associated with delays in the delivery of inputs and outputs to industries and markets, respectively.
- It has been noted that for developing countries to effectively deal with the negative effects of liberalisation, they must have the ability, freedom and flexibility to make strategic choices in finance, trade and investment policies, where they can decide on the rate and scope of liberalisation, for instance by negotiating for better terms of trade with developed countries during the World Trade Organisation (WTO) meetings (Khor 1999).
- There is need to put in place aggressive measures to revamp the textile and leather industries, most of which declined with the advent of liberalisation in

Kenya. For instance, subsidizing cotton farming would ensure a steady supply of raw cotton for the ginneries, whose products would be sold to both the local and foreign markets.

- Planners and policy makers need to design and implement specific incentive packages for the industrialists operating outside the export processing zones. The elements of such incentives would include: tax incentives such as tax rebates and tax holidays; provision of infrastructure and monetary incentives.

## 8.5 CONTRIBUTIONS MADE BY THE STUDY

The findings, conclusions and recommendations highlighted in the proceeding sections of this chapter should be considered in totality as a major contribution of this study to the general field of industrial geography and specifically to the understanding and knowledge of economic liberalisation and industrial restructuring in the CoN. Various data analytical tools are used in this study including factor analysis, chi-square test, Spearman's rank correlation coefficient and frequency distributions. Although no originality is claimed in the use of these tools, their interpretation (in relation to this study) and the conclusions arrived at, should be regarded a contribution of this study.

The conceptual framework provided in Chapter one, section 1.8, on the theoretical relationship between the flexible specialisation model and the performance of an industry, is an important contribution of this study to the understanding of the

geography of industrial restructuring. The framework links the key variables of the flexible specialisation model, as theorised by Piore and Sabel (1984), to the performance of an industry. An attempt has been made within the context of the model to describe and operationalise the key concepts as well as specify the nature of their interrelationships and with the performance of an industry. Although there is an abundance of literature on flexible specialisation as a model of industrial organisation (Piore and Sabel 1984; Hirst and Zeitlin 1989; Storper and Scott 1989, Milne 1990a, 1991b, 1991), there has been little direct attempt to link specific flexible specialisation concepts to the performance of industries in a specific theoretical framework as done in this study. The conceptual model is therefore a major contribution of this study.

This study has generated maps, and diagrams which are important sources of material for further analysis and general reference. For instance, the industrial spatial patterns of the food processing, textile and leather industries have been mapped using proportional circles as opposed to the conventional mapping based on industrial towns and centres as well as the use of bar and line graphs (Ogendo 1972, Opondo 1997). Several tables, charts and graphs have been generated from the study for the presentation, summary and analysis of data. These should be considered to be contributions of this study, not only to the geography of industrial restructuring, but to the discipline of industrial geography as well.

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## APPENDIX 1

### QUESTIONNAIRE ON THE EFFECTS OF LIBERALISATION ON THE FORMAL MANUFACTURING SECTOR IN THE CoN

This study aims at obtaining information on the effects of liberalisation on the formal manufacturing industries in the City of Nairobi. The information supplied will be strictly confidential and used for academic purposes only.

Name of industry: \_\_\_\_\_

Year when started: \_\_\_\_\_

Location: \_\_\_\_\_

Date of interview: \_\_\_\_\_

1.1 In which sub-sector(s) can your industry be classified?

- |                    |   |   |
|--------------------|---|---|
| 1. Food processing | [ | ] |
| 2. Textiles        | [ | ] |
| 3. Leather         | [ | ] |
| 4. Tobacco         | [ | ] |
| 5. Metal goods     | [ | ] |

1.2 How would you describe the demand for your product(s):

between 1980-1992 ?

- |               |   |   |
|---------------|---|---|
| 1. Constant   | [ | ] |
| 2. Increasing | [ | ] |
| 3. Decreasing | [ | ] |

between 1993-2005 ?

- |               |   |   |
|---------------|---|---|
| 1. Constant   | [ | ] |
| 2. Increasing | [ | ] |
| 3. Decreasing | [ | ] |



1.2.1 If *increasing* or *decreasing*, what factor(s), in your view account(s) for this? Rank the factors in order of significance using the scale below:

Between 1980-1992

<i>Rank</i>	<i>Description</i>
1	Very significant factor
2	Significant factor
3	Fairly significant factor

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between 1993-2005

<i>Rank</i>	<i>Description</i>
1	Very significant factor
2	Significant factor
3	Fairly significant factor

---



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1.2.2 How do you respond to the *increase* or *decrease* in the demand for your product(s)?

between 1980-1992

1. Variation of employment levels [       ]
2. Variation of working hours [       ]
3. Other types of actions [       ] Specify

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between 1993-2005

1. Variation of employment levels [     ] \_\_\_\_\_
  2. Variation of working hours [     ] \_\_\_\_\_
  3. Other types of actions [     ] Specify \_\_\_\_\_
- 
- 
- 

2. Have you experienced competition to your products:

Rank between 1980-1992?

1. Yes [     ] \_\_\_\_\_
2. No [     ] \_\_\_\_\_

Rank between 1993-2005?

1. Yes [     ] \_\_\_\_\_
2. No [     ] \_\_\_\_\_

2.1 If *yes*:

2.1.1 What has been the source of the competition?

1. Establishments located nearby (within a radius of 5 km) [     ] \_\_\_\_\_
2. Establishments located in the City of Nairobi [     ] \_\_\_\_\_
3. Establishment located in the rest of Kenya [     ] \_\_\_\_\_
4. Establishments located in the rest of the World [     ] \_\_\_\_\_

2.1.1.2 What has been the nature of the competition?

1. Similar product type manufactured by competitors [     ] \_\_\_\_\_
  2. Similar product design adopted by competitors [     ] \_\_\_\_\_
  3. Similar marketing strategies adopted by competitors [     ] \_\_\_\_\_
  4. Others [     ] \_\_\_\_\_
- Specify \_\_\_\_\_

2.2 Have experienced any problem(s) related to competition?

1. Yes [     ] \_\_\_\_\_
2. No [     ] \_\_\_\_\_

2.2.1 What is the nature of the problem(s)?

2.3 What remedial measures have you put in place to counter competition? Rank the factors in order of significance using the scale below:

<i>Rank</i>	<i>Description</i>		
1	Very Significant measure		
2	Significant measure		
3	Fairly significant measure		
	1. Changes in product design	[	]
	2. Changes in product range/type	[	]
	3. Changes in product pricing	[	]
	4. Changes in product packaging	[	]
	5. Expenditure in advertising	[	]
	6. Acquisition of better technology	[	]
	7. Increased research and development expenditure	[	]
	8. Formation of strategic alliances with other firms/public sector bodies/ educational institutions	[	]
	9. Increased expenditure on market research and on the marketing of products	[	]
	10. Integration of the entire production and marketing operations on the firm	[	]
	11. Diversification of the geographical market base	[	]
	12. Others measures, specify	[	]

2.4 How many people does your establishment employ?

- |            |   |   |
|------------|---|---|
| 1. 1-10    | [ | ] |
| 2. 11-19   | [ | ] |
| 3. 20-49   | [ | ] |
| 4. 50-99   | [ | ] |
| 5. 100-199 | [ | ] |
| 6. 200-499 | [ | ] |
| 7. 500-999 | [ | ] |

- 8. 500-999 [     ]
- 9. 1000+ [     ]

2.5 Has there been any variation in the number of employees in your organisation

between 1980-1992

- 1. Yes [     ]
- 2. No [     ]

between 1993-2005

- 1. Yes [     ]
- 2. No [     ]

2.5.1 If *yes*, what is the nature of the variation?

between 1980-1992

- 1. Increase in number of employees [     ]
- 2. Decrease in number of employees [     ]

between 1993-2005

- 1. Increase in number of employees [     ]
- 2. Decrease in number of employees [     ]

2.5.2 What are the reasons for this variation? *Rank the factors in order of significance using the scale below:*

between 1980-1992

- | <i>Rank</i> | <i>Description</i>        |
|-------------|---------------------------|
| 1           | Very significant reason   |
| 2           | Significant reason        |
| 3           | Fairly significant reason |

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between 1993-2005

<i>Rank</i>	<i>Description</i>
1	Very significant reason
2	Significant reason
3	Fairly significant reason

---

---

---

2.6 Have you experienced any variations in your production costs :

between 1980-1993?

1. Yes [ ]
2. No [ ]

between 1993-2001

1. Yes [ ]
2. No [ ]

2.6.1 If *yes*, have the costs:

1. Increased [ ]
2. Decreased [ ] between 1980-1992

1. Increased [ ]
2. Decreased [ ] between 1993-2005

2.6.2 If *increased* or *decreased*, what factor(s), in your view account(s) for this? Rank the factors in order of significance using the scale below:

<i>Rank</i>	<i>Description</i>
1	Very significant factor
2	Significant factor
3	Fairly significant factor

---



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2.7 Have you experienced any variations in your production costs:

- between 1980-1992?
- 1. Yes [     ]
  - 2. No [     ]

- between 1993-2005?
- 1. Yes [     ]
  - 2. No [     ]

- 2.7.1 If *yes*, have the costs:
- 1. Increased? [     ]
  - 2. Decreased? [     ] ]between 1980-1992
  
  - 1. Increased? [     ]
  - 2. Decreased? [     ] ]between 1993-2001

2.7.2 If *increased* or *decreased*, what factor(s), in your view account(s) for this? (Rank the factors in order of significance using the scale below)

Rank	Description
------	-------------

- |   |                           |
|---|---------------------------|
| 1 | Very significant factor   |
| 2 | Significant factor        |
| 3 | Fairly significant factor |

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1. Capital intensive (use of machines)
2. Labour intensive (use of labour)
3. Multi-task (utilised in all stages in the making of the product)

- 1.2 Has your expenditure on capital intensive technology increased:
- between 1980-1992?
1. Yes
  2. No
- between 1993-2005?
1. Yes
  2. No

## APPENDIX 2

### QUESTIONNAIRE ON THE APPLICABILITY OF THE FLEXIBLE SPECIALISATION MODEL IN THE FORMAL MANUFACTURING SECTOR IN THE CITY OF NAIROBI

1. What technology do you mainly use in the manufacture of your products

between 1980-1992?

1. Capital intensive (use of machines) [     ]

2. Labour intensive (use of labour) [     ]

between 1993-2005?

1. Capital intensive (use of machines) [     ]

2. Labour intensive (use of labour) [     ]

1.1 For any given machinery/equipment utilised in the production process, is it:

1. Highly specialised (utilised in only one stage in the making of the product)? [     ]

2. Specialised (used in more than one stage in the making of the product)? [     ]

3. Multi-task (utilised in all stages in the making of the product)? [     ]

1.2 Has your expenditure on capital intensive technology increased?

between 1980-1992?

1. Yes [     ]

2. No [     ]

between 1993-2005?

1. Yes [     ]

2. No [     ]



1.2.1 If *yes*, in what specific areas of technology have increases in expenditure occurred?

between 1980-1992

1. On upgrading the current technology [     ]
2. On new technology [     ]
3. On research and design related to technology development [     ]
4. Other areas [     ]

Specify

---



---

between 1993-2005

1. On upgrading the current technology [     ]
2. On new technology [     ]
3. On research and design related to technology development [     ]
4. Other areas [     ]

Specify

---



---

1.2.2 What factors account for the increases in expenditure in technology by your firm? (*Rank factors in order of importance using the scale below*)

between 1980-1992

<i>Rank</i>	<i>Description</i>
1	Very significant factor
2	Significant factor
3	Fairly significant factor

---



---



---

between 1993-2005

Rank	Description
1	Very significant factor
2	Significant factor
3	Fairly significant factor

2. Of the total employees in your firm, how many are:

1. Skilled? [ ]
2. Semi-skilled? [ ]
3. Unskilled? [ ]

3. Of skilled and semi-skilled, are they able perform:

1. One specific task? [ ]
2. Various types of tasks? [ ]

4. What are your main sources of employees

Skilled

1. Close to the establishment (within the radius of 5km) [ ]
2. City of Nairobi [ ]
3. Rest of Kenya [ ]
4. Rest of the World [ ]

Semi-skilled

1. Close to the establishment (within the radius of 5km) [ ]
2. City of Nairobi [ ]
3. Rest of Kenya [ ]
4. Rest of the World [ ]

Unskilled

1. Close to the establishment (within the radius of 5km) [ ]
2. City of Nairobi [ ]
3. Rest of Kenya [ ]

4. Rest of the World

[ ]

5. Do you have any types of interactions with the neighbouring industries (i.e. those within the radius of 5 km?)

1. Yes [ ]

2. No [ ]

5.1 If *yes*, what is the nature of interactions?

1. Sourcing of inputs [ ]

2. Marketing of products [ ]

3. Research and development co-operation [ ]

4. Subcontracting of work/process [ ]

5. Other types [ ] Specify

5.1.2 How do you compare tie interactions with neighbouring industries in the periods between 1980-1992 and 1993-2005?

1. No change [ ]

2. More intensive between 1993-2005 [ ]

3. More intensive between 1980-1992 [ ]

5.1.3 If intensive, what has led to the increase in the level of interactions? (*Rank the factors in order of significance using the scale below*)

Rank	Description
1	Very significant factor
2	Significant factor
3	Fairly significant factor

6. For the products you manufacture, have you changed the:

a) Product design  
between 1980-1992?

1. Yes [ ]

2. No [ ]

---

---

between 1993-2005?

1. Yes [     ]

2. No [     ]

If *yes*, explain

---

---

6.1 If *yes* (in both cases above), how do you compare product design changes between the periods 1980-1992 and 1993-2001?

1. More intensive in 1980-1992 [     ]

2. More intensive in 1993-2005 [     ] Explain

---

---

b) Product quality

between 1980-1992?

1. Yes [     ]

2. No [     ]

If *yes*, explain

---

---

between 1993-2005?

1. Yes [     ]

2. No [     ]

If *yes*, explain

---

---

6.2 If *yes* (in both cases above), how do you compare product design changes between the periods 1980-1992 and 1993-2005?

1. More intensive in 1980-1992 [     ]

2. More intensive in 1993-2005 [     ] Explain

---

---

c) Product type/range  
between 1980-1992?

1. Yes [     ]

2. No [     ]

If *yes*, explain

---

---

between 1993-2005?

1. Yes [     ]

2. No [     ]

If *yes*, explain

---

---

6.3 If *yes* (in both cases above), how do you compare product range/type changes between the periods 1980-1992 and 1993-2005?

1. More intensive in 1980-1992

[     ]

2. More intensive in 1993-2005

[     ] Explain

---

---

d) Product packaging  
between 1980-1992?

1. Yes [     ]

2. No [     ]

If *yes*, explain

---

---

between 1993-2005?

1. Yes [     ]

2. No [     ]

If *yes*, explain

---

---

6.4 If *yes* (in both cases above), how do you compare product packaging changes between the periods 1980-1992 and 1993-2001?

- 1. More intensive in 1980-1992 [     ]
- 2. More intensive in 1993-2005 [     ] Explain

---



---

e) Product pricing between 1980-1992?

- 1. Yes [     ]
  - 2. No [     ]
- If *yes*, explain

---



---

between 1993-2005?

- 1. Yes [     ]
  - 2. No [     ]
- If *yes*, explain

---



---

6.5 If *yes* (in both cases above), how do you compare product pricing changes between the periods 1980-1992 and 1993-2005?

- 1. More intensive in 1980-1992 [     ]
- 2. More intensive in 1993-2005 [     ] Explain

---



---

7 How do you describe the overall scale of your operations between the periods 1980-1992 and 1993-2005?

- 1. Increased in 1980-1992 [     ]
- 2. Decreased in 1993-2005 [     ]
- 3. Constant [     ]

1.7 If *increased* or *decreased*, what factors account for this? (*Rank the factors in order of significance using the scale below*)

THE SPATIAL ORGANISATION OF THE  
FORMAL MANUFACTURING SECTOR IN THE C&N

Rank	Description
1	Very significant factor
2	Significant factor
3	Fairly significant factor

Important variable in the location of this establishment  
 Rank 1 most important variable in the location of this establishment  
 Least important variable in the location of this establishment

Variables

1. Availability of land
2. Availability of adequate labour force
3. Availability of transport and communication network
4. Legal requirements
5. Availability of local markets
6. Local availability of raw materials
7. Availability of cheap labour
8. Access to power supply
9. Availability of suitable underlying rock structure
10. Availability of adequate water supply
11. Proximity to other local establishments
12. Other factors

Specify

### APPENDIX 3

## QUESTIONNAIRE ON THE SPATIAL ORGANISATION OF THE FORMAL MANUFACTURING SECTOR IN THE CoN

1. What main factors were taken into account in locating this establishment on this site? *(Rank the factors using the scale below)*

Rank Value	Description
1	Important variable in the location of this establishment
2	Fairly important variable in the location of this establishment
3	Least important variable in the location of this establishment

#### Variables

- |  |   |           |
|--|---|-----------|
| 1. Availability of land                                | [ | ]         |
| 2. Availability of adequate labour force               | [ | ]         |
| 3. Availability of transport and communication network | [ | ]         |
| 4. Legal requirements                                  | [ | ]         |
| 5. Availability of local market                        | [ | ]         |
| 6. Local availability of raw materials                 | [ | ]         |
| 7. Availability of cheap labour                        | [ | ]         |
| 8. Access to power supply                              | [ | ]         |
| 9. Availability of suitable underlying rock structure  | [ | ]         |
| 10. Availability of adequate water supply              | [ | ]         |
| 11. Proximity to other local establishments            | [ | ]         |
| 12. Other factors                                      | [ | ] Specify |

- 
- 
- 
1. Nearly (within a radius of 5 km)
  2. City of Namibia
  3. Rest of Keops
  4. Rest of the World

- 2.1 Do you hold stocks of your inputs
1. Yes
  2. No



1.1 What main factors were taken into account in locating this establishment on the City of Nairobi? (Rank the factors using the scale below)

**Rank Value**

**Description**

- |   |   |
|---|---|
| 1 | Important variable in the location of this establishment        |
| 2 | Fairly important variable in the location of this establishment |
| 3 | Least important variable in the location of this establishment  |

**Variables**

- |   |   |           |
|---|---|-----------|
| 13. Availability of land                                | [ | ]         |
| 14. Availability of adequate labour force               | [ | ]         |
| 15. Availability of transport and communication network | [ | ]         |
| 16. Legal requirements                                  | [ | ]         |
| 17. Availability of local market                        | [ | ]         |
| 18. Local availability of raw materials                 | [ | ]         |
| 19. Availability of cheap labour                        | [ | ]         |
| 20. Access to power supply                              | [ | ]         |
| 21. Availability of suitable underlying rock structure  | [ | ]         |
| 22. Availability of adequate water supply               | [ | ]         |
| 23. Proximity to other local establishments             | [ | ]         |
| 24. Other factors                                       | [ | ] Specify |

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2. Where do you obtain your inputs from?
- |                                     |   |   |
|-------------------------------------|---|---|
| 1. Nearly (within a radius of 5 km) | [ | ] |
| 2. City of Nairobi                  | [ | ] |
| 3. Rest of Kenya                    | [ | ] |
| 4. Rest of the World                | [ | ] |

- 2.1 Do you hold stocks of your inputs
- |        |   |   |
|--------|---|---|
| 1. Yes | [ | ] |
| 2. No  | [ | ] |

APPENDIX 4

2.1.1 If *yes*, roughly what percentage of inputs are held in relation to the total inputs?

- 1. Over 75% [     ]
- 2. 50% - 75% [     ]
- 3. Less than 50% [     ]

2.1.2 If *no*, where do you get your stocks when you need them?

- 1. Nearby (within the radius of 5 km) [     ]
- 2. City of Nairobi [     ]
- 3. Rest of Kenya [     ]
- 4. Rest of the World [     ]

3. Where are your products sold?

- 1. Nearby (within the radius of 5 km) [     ]
- 2. City of Nairobi [     ]
- 3. Rest of Kenya [     ]
- 4. Rest of the World [     ]

4. Do you subcontract any work/process to the nearby establishments (i.e. those within the radius of 5 km)

- 1. Yes [     ]
- 2. No [     ]

3.1.1 If *yes*, specify the nature of work/processes

---



---



---

4. Have you changed the physical location of your firm since 1980?

- 1. Yes [     ]
- 2. No [     ]

4.1 If *yes*, what are the reasons for the change of the location of your firm?

- 1. To be near the supplier of inputs [     ]
- 2. To be near the market for my products [     ]
- 3. Subcontract work/process of production [     ]
- 4. Other reasons [     ] Specify

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## APPENDIX 4

### DATA ANALYSIS RESULTS ON THE EFFECTS OF LIBERALISATION ON THE FORMANUFACTURING SECTOR IN THE CoN

#### Correlation Matrix for decline in demand and other factors

- V1: Decline in demand  
 V2: Liberalisation of Kenya's economy  
 V3: Poor economic performance  
 V4: High production costs  
 V5: Inaccessibility of external markets

	V1	V2	V3	V4	V5
V1	1.000				
V2	0.742	1.000			
V3	0.656	0.211	1.000		
V4	0.631	0.332	0.411	1.000	
V5	0.342	-0.301	0.401	0.311	1.000

#### DEMAND FOR PRODUCT(S) 1980-1992

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Increasing	45	41.3	87.0	88.2
	Decreasing	3	2.8	6.0	94.1
	Constant	4	2.8	8.0	100.0
	Total	52	46.8	100.0	
Missing	System	58	53.2		
Total		110	100.0		

#### DEMAND FOR PRODUCTS 1993-2005

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Increasing	40	39.0	36.0	36.0
	Decreasing	57	52.3	52.0	88.0
	Constant	9	8.3	12.0	100.0
	Total	106	97.2	100.0	
Missing	System	3	2.8		
Total		109	100.0		

EXPERIENCED COMPETITION 1980-1992

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	34	31.2	68.0	68.0
	No	16	14.7	32.0	100.0
	Total	50	45.9	100.0	
Missing	System	59	54.1		
Total		109	100.0		

EXPERIENCED COMPETITION 1993-2005

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	105	96.3	99.1	99.1
	No	1	.9	.9	100.0
	Total	106	97.2	100.0	
Missing	System	3	2.8		
Total		109	100.0		

VARIATION IN NUMBER OF EMPLOYEES 1980-1992

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	38	34.9	80.9	80.9
	No	9	8.3	19.1	100.0
	Total	47	43.1	100.0	
Missing	System	62	56.9		
Total		109	100.0		

VARIATION IN NUMBER OF EMPLOYEES 1993-2005

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	100	91.7	95.2	95.2
	No	5	4.6	4.8	100.0
	Total	105	96.3	100.0	
Missing	System	4	3.7		
Total		109	100.0		

NATURE OF VARIATION 1980-1992

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Increase in employees	37	33.9	94.9	94.9
Decrease in employees	2	1.8	5.1	100.0
Total	39	35.8	100.0	
Missing System	70	64.2		
Total	109	100.0		

NATURE OF VARIATION 1993-2005

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Increase in employees	56	51.4	57.0	57.0
Decrease in employees	38	34.9	39.0	100.0
Total	94	86.2	100.0	
Missing System	15	13.8		
Total	109	100.0		

VARIATION IN PRODUCTION COSTS 1993-2005

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Yes	106	95.4	98.1	98.1
No	2	1.8	1.9	100.0
Total	108	97.2	100.0	
Missing System	2	2.8		
Total	109	100.0		

NUMBER OF EMPLOYEES

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 1-9	11	10.1	10.6	10.6
10-19	12	11.0	11.5	22.1
20-49	23	21.1	22.1	44.2
50-99	28	24.8	26.0	70.2
100-199	21	19.3	20.2	90.4
200-499	6	5.5	5.8	96.2
500-999	4	2.8	2.9	99.0
1000+	1	.9	1.0	100.0
Total	106	95.4	100.0	
Missing System	5	4.6		
Total	109	100.0		

VARIATIONS IN PRODUCTION COSTS 1980-1992

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	36	33.0	75.0	75.0
	No	12	11.0	25.0	100.0
	Total	48	44.0	100.0	
Missing	System	61	56.0		
Total		109	100.0		

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Capital intensive	23	17.9	27.1	27.1
	Labour intensive	25	22.1	31.9	100.0
	Total	48	44.0	100.0	
Missing	System	61	56.0		
Total		109	100.0		

TECHNOLOGY 1993-2005

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Capital intensive	45	41.3	50.0	50.0
	Labour intensive	45	41.3	50.0	100.0
	Total	90	82.6	100.0	
Missing	System	19	17.4		
Total		109	100.0		

NATURE OF MACHINERY

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Highly specialized	43	39.4	47.7	47.7
	Specialized	24	22.0	26.3	74.0
	Multi-task	15	13.9	17.1	100.0
	Total	82	75.4	100.0	
Missing	System	27	24.6		
Total		109	100.0		

## APPENDIX 5

### DATA ANALYSIS RESULTS ON THE APPLICABILITY OF THE FLEXIBLE SPECIALISATION MODEL IN THE FORMAL MANUFACTURING SECTOR IN THE CoN

#### TECHNOLOGY 1980-1992

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Capital intensive	13	11.9	27.1	27.1
	Labour intensive	35	32.1	72.9	100.0
	Total	48	44.0	100.0	
Missing	System	61	56.0		
Total		109	100.0		

#### TECHNOLOGY 1993-2005

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Capital intensive	45	41.3	50.0	50.0
	Labour intensive	45	41.3	50.0	100.0
	Total	90	82.6	100.0	
Missing	System	19	17.4		
Total		109	100.0		

#### NATURE OF MACHINERY

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Highly specialised	65	59.6	70.7	70.7
	Specialised	14	12.8	15.2	85.9
	Multi-task	13	11.9	14.1	100.0
	Total	92	84.4	100.0	
Missing	System	17	15.6		
Total		109	100.0		

EXPENDITURE IN TECHNOLOGY INCREASED IN 1980-1992

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	23	21.1	45.1	45.1
	No	28	25.7	54.9	100.0
	Total	51	46.8	100.0	
Missing	System	58	53.2		
Total		109	100.0		

EXPENDITURE IN TECHNOLOGY INCREASED IN 1993-2005?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	85	78.0	81.0	81.0
	No	20	18.3	19.0	100.0
	Total	105	96.3	100.0	
Missing	System	4	3.7		
Total		109	100.0		

TASKS PERFORMED

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	One task	27	24.8	26.7	26.7
	Several tasks	74	67.9	73.3	100.0
	Total	101	92.7	100.0	
Missing	System	8	7.3		
Total		109	100.0		

ANY TYPES OF INTERACTIONS?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	71	65.1	66.4	66.4
	No	36	33.0	33.6	100.0
	Total	107	98.2	100.0	
Missing	System	2	1.8		
Total		109	100.0		



COMPARISON OF INTERACTIONS

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No change	11	10.1	25.6	25.6
	More intensive between 1993-2005	22	20.2	51.2	76.7
	More intensive between 1980-1992	10	9.2	23.3	100.0
	Total	43	39.4	100.0	
Missing	System	66	60.6		
Total		109	100.0		

CHANGE IN PRODUCT DESIGN 1980-1992

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	18	16.5	36.0	36.0
	No	32	29.4	64.0	100.0
	Total	50	45.9	100.0	
Missing	System	59	54.1		
Total		109	100.0		

CHANGE IN PRODUCT DESIGN 1993-2005

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	73	67.0	71.6	71.6
	No	29	26.6	28.4	100.0
	Total	102	93.6	100.0	
Missing	System	7	6.4		
Total		109	100.0		

CHANGE IN PRODUCT QUALITY 1980-1992

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	32	29.4	62.7	62.7
	No	19	17.4	37.3	100.0
	Total	51	46.8	100.0	
Missing	System	58	53.2		
Total		109	100.0		

CHANGE IN PRODUCT QUALITY 1993-2005

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	87	79.8	82.9	82.9
	No	18	16.5	17.1	100.0
	Total	105	96.3	100.0	
Missing	System	4	3.7		
Total		109	100.0		

CHANGE IN PRODUCT TYPE/RANGE 1980-1992

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	17	15.6	33.3	33.3
	No	34	31.2	66.7	100.0
	Total	51	46.8	100.0	
Missing	System	58	53.2		
Total		109	100.0		

CHANGE IN PRODUCT TYPE/RANGE 1993-2005

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	68	62.4	68.0	68.0
	No	32	29.4	32.0	100.0
	Total	100	91.7	100.0	
Missing	System	9	8.3		
Total		109	100.0		

CHANGE IN PRODUCT PACKAGING 1980-1992

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	14	12.8	25.5	25.5
	No	41	37.6	74.5	100.0
	Total	55	50.5	100.0	
Missing	System	54	49.5		
Total		109	100.0		

CHANGE IN PRODUCT PACKAGING 1993-2005

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	73	67.0	75.3	75.3
	No	24	22.0	24.7	100.0
	Total	97	89.0	100.0	
Missing	System	12	11.0		
Total		109	100.0		

CHANGE IN PRODUCT PRICING 1980-1992

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	27	24.8	51.9	51.9
	No	25	22.9	48.1	100.0
	Total	52	47.7	100.0	
Missing	System	57	52.3		
Total		109	100.0		

CHANGE IN PRODUCT PRICING 1993-2005

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	85	78.0	87.6	87.6
	No	12	11.0	12.4	100.0
	Total	97	89.0	100.0	
Missing	System	12	11.0		
Total		109	100.0		

Sources of inputs for industries in the CoN

Dichotomy label	Name	Count	Pct of Responses	Pct of Cases
Nearby	NEARBY	21	10.8	19.6
City of Nairobi	CoN	65	33.5	60.7
West of Kenya	ROK	75	38.7	70.1
Rest of World	ROW	33	17.0	30.8
		-----	-----	-----
	Total responses	194	100.0	181.3

**Market for manufactured products in the CoN**

Dichotomy label	Name	Count	Pct of Responses	Pct of Cases
Nearby	NEARBY	32	14.1	29.9
City of Nairobi	CoN	79	34.8	73.8
Rest of Kenya	ROK	73	32.2	68.2
Rest of World	ROW	43	18.9	40.2
Total responses		227	100.0	212.1

## APPENDIX 6

### DATA ANALYSIS RESULTS ON THE SPATIAL ORGANISATION OF THE FORMAL MANUFACTURING SECTOR OF THE CoN

#### Change of physical location

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	33	30.3	31.7	31.7
	No	71	65.1	68.3	100.0
	Total	104	95.4	100.0	
Missing	System	5	4.6		
Total		109	100.0		

#### Subcontracting of work/process

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	30	27.5	29.1	29.1
	No	73	67.0	70.9	100.0
	Total	103	94.5	100.0	
Missing	System	6	5.5		
Total		109	100.0		

### Holding stocks of inputs?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	88	80.7	83.0	83.0
	No	18	16.5	17.0	100.0
	Total	106	97.2	100.0	
Missing	System	3	2.8		
Total		109	100.0		

### Percentage of stocks to total inputs

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Over 75%	13	11.9	14.8	14.8
	50-75%	37	33.9	42.0	56.8
	Less than 50%	38	34.9	43.2	100.0
	Total	88	80.7	100.0	
Missing	System	21	19.3		
Total		109	100.0		

### Source of inputs

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Nearby	3	2.8	5.6	5.6
	City of Nairobi	18	16.5	33.3	38.9
	Rest of Kenya	25	22.9	46.3	85.2
	Rest of world	8	7.3	14.8	100.0
	Total	54	49.5	100.0	
Missing	System	55	50.5		
Total		109	100.0		