A SPATIAL ANALYSIS OF INDUSTRIAL GROWTH AND DECLINE IN KANO METROPOLIS, NIGERIA

By

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APRIL, 2015

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By

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(PhD/SCIE/17708/2007-08)

A DISSERTATION SUBMITTED TO THE SCHOOL OF POSTGRADUATE STUDIES, AHMADU BELLO UNIVERSITY, ZARIA

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DOCTOR OF PHILOSOPHY DEGREE IN GEOGRAPHY

DEPARTMENT OF GEOGRAPHY,
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APRIL, 2015

DECLARATION

I declare that the work in this Dissertation entitled "A Spatial Analysis of Industrial Growth and Decline in Kano Metropolis, Nigeria" has been carried out by me in the Department of Geography. The information derived from the literature has been duly acknowledged in the text and a list of references provided. No part of this dissertation was previously presented for another degree or diploma at this or any other Institution.

Muhammad Abubakar LIMAN	_____	_____
Name of Student	Signature	Date

CERTIFICATION

This dissertation titled "A SPATIAL ANALYSIS OF INDUSTRIAL GROWTH AND DECLINE IN KANO METROPOLIS, NIGERIA", by Muhammad Abubakar Liman, meets the regulations governing the award of Doctorate Degree (PhD) in Geography of the Ahmadu Bello University, Zaria and is approved for its contribution to knowledge and literary presentation.

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DEDICATION

To the memories of my late

father, Alhaji Abubakar Liman Umar OFR (Waziri of Koton-Karfe),

mother, Hajiya Hawwa Kulu Liman (Inna)

step mother, Hajiya Hawwa Kulu Liman (mama Kulu)

brothers, Abdurrahman Liman (baba tsoho) and Hashimu Liman

ACKNOWLEDGEMENT

In the name of Allah, the most merciful, the most beneficent. All praise to Him, the Lord of the worlds; who made this and all other things possible. Alhamdu lil Lah.

My profound gratitude goes to Prof. J. A. Ariyo, my supervisor, for his unflinching meticulous guidance, supervision, encouragement and concern in the course of this work. I have no words enough to adequately describe my heartfelt thanks for the challenge, the tutorial sessions, and the "bloody" pages carrying incisive remarks that came back to me. I only hope I have squeezed out the best from him. My two other supervisors have, in different ways, also contributed to this work. My thanks therefore goes to Dr. J. A. Ukoje and Dr. J. O. Adefila. Other members of the department have also made contributions to this work both within and outside the seminar hall. My thanks go to them especially, Dr. I.J. Musa (the current H.O.D), Prof. E. O. Iguisi, Dr. A. I. Abdulhamid (the exam officer) and Dr. R. O. Yusuf (Dr. ROY).

This work would not have been possible without the contributions of many other people, too numerous to mention here. However, I must give special mention of the person of Alhaji Sani Umar, the Chairman, Manufacturers' Association of Nigeria (MAN) Bompai branch, without whose intervention no industry responded. My gratitude also goes to Hajiya Rabi who introduced me to the Chairman. Alhaji Tijjani Ahmed, (the Executive Secretary, MAN, Kano), made MAN materials available and organized the collection of filled questionnaires despite the security challenges at the time. I am deeply grateful to them.

Colleagues in the departments of geography, BUK, and FCE Kumbotso have assisted beyond measure. Special mention must be made of Dr. Umar Faruk Isa (Dr. IUF) who in many possible ways contributed to this work. May Allah reward him; Amen. Many thanks also to Prof. J. A. Falola, Mairo Haruna, Dr. Murtala M. Badamasi, Dr. I. Mallam and Dr. T. R. Yalwa. I have also shared ideas with and received encouragements from Nura Ibrahim Hassan, and many others, too numerous to mention here. My thanks go to them too. To those other colleagues and friends who understood where I was heading and made

contributions, I say thanks. I am also indebted to those other colleagues and friends, who did not understand where I was heading and thank them for making me reconsider other ways of putting my views across.

Members of my family, (my two wives, Children, and grand child) have all sacrificed their time and contributed in many ways in the conduct of this study. My gratitude goes to them all.

Muhammad Abubakar Liman

LIST OF ABBREVIATIONS USED

AMR	Abubakar Muhammadu Rimi
ANOM	Analysis of Means
ANOVA	Analysis of Variance
BIZ	Bompai Industrial Zone
CIZ	Challawa/Sharada Industrial Zone
EEG	Export Expansion Grant
ENDC	Eastern Nigeria Development Corporation
GDP	Gross Domestic Product
ISI	Import Substitution Industries
ISIC	International Standard for Industrial Classification
KNUPDA	Kano state Urban Planning and Development Agency
MAKIA	Mallam Aminu Kano International Airport
NCEMA	National Centre for Economic Management and Administration
NDIC	Nigeria Deposit Insurance Corporation
NEXIM	Nigeria Export and Import Bank
NNDC	Northern Nigeria Development Corporation
R & D	Research and Development
SAP	Structural Adjustment Programme
SPF	Stochastic Production Frontiers
WAFF	West African Frontier Force
WAPA	West African Pilgrims Agency
WNDC	Western Nigeria Development Corporation

ABSTRACT

Nigeria's poor industrial performance as compared to some developing countries' and the eventual closure of industries by the end of the 1970s, especially in Kano, remains the central problem addressed in this work. The aim of the study is to determine the factors that affect the nature and pattern of industrial growth and decline in Kano metropolis, using the Path Dependence theory. The objectives are to a) examine the growth of manufacturing industries in Kano metropolis by types, b) examine the effects of macroeconomic policies, operating in the country, on industrial performance in Kano metropolis, c) determine the pattern of collapse and survival of manufacturing industries in Kano metropolis, d) examine the factors underlying the observed pattern of collapse and survival of manufacturing industries in the study area, and e) assess measures industries in the study area are taking to stay in business. The study is a basic research rooted in the positivist approach employing the survey method. The documented data used for this study is made up of 381 industries while the stratified random sampling method was used in collecting the survey data with a sample size of 25. General descriptive statistics was used to analyse the data while ANOM was used to test hypotheses I and II and the three-way ANOVA was used to test hypothesis III. The findings of the study show that industrial development in Kano metropolis is poor in industrial mix. Although it is made of 20 out of the 24 ISIC Revision 4 divisions spread in 59 out of 121 industrial classes it is not as comprehensive in coverage as it may at first appear to be and only boasts of change in overall numbers of industries. Although the industries mainly depend on local sources of raw materials only 12% have added new product lines and more than 75% producing mainly for internal consumption. The ownership structure is more foreign (45.4%) than Nigerian (33.9%) and more of individual (79.3%) than joint ownership. The pre-SAP period produced slow but uncompetitive growth while dramatic growth in the number of industries as well as closures was witnessed during the SAP period. The ANOM reveals that while the proportion of industries that closed is associated with their ISIC groupings, contrary to popular thinking it is independent of SAP. The pattern of survival and collapse of industries in Kano metropolis is best described as epileptic with industries declining, comatose or permanently closed. The ANOVA test reveals that the three-way and two-way interactions were not significant but endogenous, endowment, and macroeconomic policy factors were important in that order. Thus, the impact of the combination of the different factors does not differ with industry groups. In general, industrial production in Kano is an uphill task as about 80% of industries self-provide basic infrastructure such as electricity and water. However, industries differ in their perception of the factors affecting them and their Likert-type rankings. Moreover their perceptions and their Likert-type rankings differ suggesting industrialists' inability to objectively assess their situations. Endogenous factor scoring was therefore used to assess industries individually and collectively and to place them on the Path Dependence Model. Only 40% of industries are committed and fewer (20%) can be said to be successful. The study recommends that industrialization should not be a hobby but professionally-driven through 'self-discovery' that is knowledge-driven. Rather than leave industries loose without guidance, centralised coordination of industrialization through policy and central provision of vital infrastructure is recommended. A policy of industrial mergers and acquisition, as is currently being done in the banking sector, is also recommended as closed industries tie down land and other resources.

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CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND TO THE STUDY

Human existence on the surface of the earth is punctuated by what have generally been referred to as "revolutions" in recognition of the profound impact of the successive technological innovations of new tools and ideas that led to the inventions and innovations of new processes and techniques of doing things and the distinct changes to life occasioned by them. Each of these "revolutions" represents a turning point in the history of mankind. The Neolithic Revolution (or Agricultural Revolution) was one of them. It marks the departure from hunting and gathering and the beginning of sedentary complex community life based on agricultural production and the domestication of animals leading to the rise of permanent settlements and, eventually, urban civilizations. The Industrial Revolution which in turn ushered in the Industrial era is another. The other is being referred to as the Digital Revolution which has brought the world to the current post-industrial era (Bell, 1976; Short, 1996) or the Information era. None of these "revolutions" happened overnight although the speed and the magnitude of the changes became progressively overwhelming. The focus of this work is to do with the changes brought by the Industrial era.

The main thrust of the Industrial Revolution was getting machines to do the tasks hitherto undertaken manually or hitherto impossible manually. Indeed, the fact that mechanical contraptions could be put to human advantage was not new and was not the only defining point of the Industrial Revolution as ever since the Renaissance (14th century to 17th century), Europeans had been inventing and using ever more complex machinery (Microsoft Encarta,

2008). It was the progress achieved by running machines from fresh sources of power rather than human and animal energy as well as the discovery of novel forms of organizing business and labour around the machines that sparked off the revolution in Britain.

The advancement of using the steam engine meant that a factory could be located anywhere, not just close to water. Similar achievements with respect to the use of coal in iron foundries also helped bring about industrialization. In 1775 James Watt (a mechanical engineer) and Matthew Boulton (a manufacturer) formed a partnership (Boulton and Watt) to pool and share resources. By 1800 the firm was second to none in the construction of engines, pumps, blast furnaces, and powering mill machinery. Similarly, the series of innovations in the textile industry not only reduced and replaced the human labour required but also sharply divided labour between spinning and weaving and therefore changed the nature of work in the textile industry (Wikipedia, 2014).

These achievements applied to the field of manufacturing gave birth to modern industries which produced goods in logarithmic scale in contrast to the traditional industry or "the cottage or putting-out and collection system of pre-industrial Europe" (Mbagwu, 1983:277). The traditional industry includes, at its lower stratum, giving different shapes and designs to materials without any change in the original form of the basic raw material (traditional crafts) and, at its upper stratum, it involves some form of processing or conversion of the primary raw materials into an intermediate form different from its primary base (see Mbagwu, 1983:278). As the Industrial Revolution progressed, machine-made and standardised machines with metal parts and frames replaced pre-industrial machines which were labouriously hand-made by various craftsmen, with

variable quality and costly. In turn, the modern industry, in addition to being able to do what traditional industry does, can convert basic raw materials to a form that bears no resemblance to its primary base: its products are standardized, produced in a factory setting and often using mechanized procedures.

France, Belgium, Holland, some of the German states and the USA set out to imitate Britain's success. Setting up industrial manufacture, particularly based on the principles of *centralisation*, *concentration*, *maximisation*, *specialisation*, *standardisation*, and *synchronisation* (see details in Chapter 2), came to be known as industrialization. Industrial development, in turn, refers to the enhancement and increase in manufacturing activities as well as the number of industries, from a lower stage to a higher stage, producing different types of products. Altogether, how industrial manufacture is organised and used, as well as its total effects on society came to be known as "industrialism".

The total impact of industrialization on the economy is such that industrialization became an important pre-requisite of economic growth and national development (Teriba and Kayode 1977; Onyemulekwe 1978; Hodder 1980; Onyemelukwe and Filani, 1980; Abdulkadir, 1981; Ciroma, 1981; Zayyad, 1981; Adekoya 1987; Ajayi, 1993, Isa and Ibrahim 2008) as it enables a country to expand and diversify its economy as well as balance its economic growth and improve its balance of payments (French, 1990; Egbon, 1995). The ability to develop industries as an economic sector, particularly for a country monolithically dependent on agriculture, meant more employment with the attendant increase in income and standard of living as well as diffusion of technological and managerial skills. The additional income for the country, from both import

substitution (the replacement of imports of manufactured goods by domestic production), and export promotion (especially by adding value and thereby increasing the earnings of goods which it now exports as raw materials), translated into increasing ability of the country to balance its payments and grow its GDP.

Indeed, the degree and extent of economic advancement of individual countries, and the roles they play in the industrial economy generally, vary, depending on the degree and extent of their industrialization. Thus, countries came to be broadly categorised based on their different positions on the industrial economic spectrum, where the index of placement is the degree of industrialisation achieved. The "developed" (or industrialised) nations are those where a high index of industrialisation, among other things, forms the basis of their economy, while the "developing" (or the Third World) nations have a relatively lower index of industrialisation. Thus, industrialization has resulted in the polarization of the space economy whereby industrialized countries or areas remain distinct from those not industrialized (Castells, 2000).

Naturally, looking up to contemporary advanced countries, many developing countries aspire toward industrial development. Thus, the yearning for industrial development by most developing countries is a yearning for material development as well as for a place in the world. For most developing countries, the turbulence created by World War II, in essence, marked the crystallization point for industrialization as well as the beginnings of de-colonization. It seemed the path to economic development required political independence as well as economic independence. In Nigeria, however, industrialization started just after World War II and before

political independence in about a dozen settlements across the country among which are Lagos, Ibadan and Kano.

1.2 STATEMENT OF THE RESEARCH PROBLEM

Much as it is generally agreed that progress from a "traditional" rural society to a "modern" industrial society is desirable, the question remains how the transition from one to the other is to be achieved. No sooner had developing nations embarked on the drive to industrialize than they realized that transformation to an industrial society is not a process to be taken for granted. For instance, industrial performance in Nigeria, at any point in its history, has been behind other developing countries such as Brazil, Mexico, South Korea, Argentina, and India (Phillips, 1986; Sani, 1995). Secondly, by the end of the 1970s industries in Nigeria began to be distressed. Yet historical accounts of Nigeria's economic development show how the country played a leading role in supporting the industries of Britain. For instance, groundnut export to Britain rose from less than 2,000 tons in 1911 to about 20,000 tons in 1913 (Mabogunje, 1968), a year after the railway reached Kano. How is it that assembling industrial raw materials (such as cotton, tobacco, groundnuts, cocoa, palm kernels, coal, tin and columbite, etc.) for industries in far away Britain generated so much wealth in the past, but the actual industrial production (within the country) now yields disappointing results?.

In Kano, for instance, even an industry which contributed immensely to the economy of the metropolis and whose product (sweets) has been internalized in the Hausa culture has collapsed! These un-intended industrial decline and eventual collapse, as opposed to de-industrialization, are not addressed in the studies of transition from a "traditional" rural society to a "modern"

industrial society. What, therefore, is the nature of industrial development in Kano metropolis and, how can the decline be stemmed so that the life of surviving industries can be extended beyond what obtains now?

1.3 THE RESEARCH QUESTIONS

The research questions this work addresses are as follows:

1. What is the nature of industries in Kano metropolis?
2. What are the factors affecting industrial growth and decline in Kano metropolis?
3. What is the pattern of growth, decline and collapse of industries in Kano metropolis?
4. Why did some of the industries survive while others collapsed?
5. What are the lessons for industrial development in Kano metropolis?

1.4 STUDY AIM AND OBJECTIVES

The aim of this study is to determine the factors that affect the nature and pattern of industrial growth and decline in Kano metropolis. The specific objectives of the study are to

i) examine the growth of manufacturing industries in Kano metropolis by types;

ii) examine the effects of macroeconomic policies, operating in the country, on industrial performance in Kano metropolis;

iii) determine the pattern of collapse and survival of manufacturing industries in Kano metropolis;

iv) Examine the factors underlying the observed pattern of collapse and survival of manufacturing industries in the study area, and

v) assess measures industries in the study area are taking to stay in business.

1.5 JUSTIFICATION OF THE STUDY

Indeed, studies such as Teriba and Kayode, (1977), Onyemelukwe, (1983), Mabogunje, (1990), Badri, (2007), and Isa, and Ibrahim, (2008) dwell on how to improve industrial production in the country generally or in specific parts. However, their emphasis which was on the factor endowments of the different parts of the country places their studies in the realm of regional analysis. The Developmental Approach (as it came to be known) is therefore a regional approach that hardly addresses individual industries let alone feels individual industry's pulse.

Other studies such as Lubeck, (1977), Onyemelukwe, (1978), Ayeni (1979), Adegbola, (1983), Akpobasah, (1986), Eleazu, (1986), Eze, (1986), Olashore, (1986), and Sani, (1995) are more specific to individual industries or groups of industries. Their treatment is neither regional nor based on endowment factors. But these studies have no 'barometer' for testing the health of the industry. Although Phillips (1986) has come out with the input-output matrix (that could be used as a 'barometer'), but the requirement of the technique for high quality quantitative industrial data makes its use in Nigerian situation almost impossible. Thus, the Structuralist and Dependency theorists (as these studies came to be known) failed to diagnose industrial problems on industry-by-industry basis.

Although this study is fundamentally a structuralist approach, it is also rooted in Path Dependence theory which holds that "the combination of historical contingency and the emergence of self-reinforcing effects, steers a technology, industry or regional economy along one 'path' rather than another" (Martin, 2009:3). The in-depth study of the industries in the tradition of the structuralist approach is used to derive the Endogenous Factor Scores of the

individual industries and this enables diagnosis of particular industries. Furthermore, the Endogenous Factor Scores are used to determine the positions of the industries on the Path Dependence model and to examine how well the industries in Kano metropolis are doing. This allows one to estimate the resilience or vulnerability of the individual industries with a view to discovering the point beyond which their chances of survival is high. It is hoped that this holistic approach will result in a realistic assessment of industrial production in Kano metropolis and also reveal the actual problems that have plagued them. How can one discern a problem before an industry collapses? The present study is an attempt to answer this nagging question.

1.6 SIGNIFICANCE OF THE STUDY

In an era where industrialized nations are embarking on de-industrialization and are transferring their manufacturing activities to developing countries, it is disheartening that industries in Nigeria are collapsing. There is, therefore, the need to examine the problems associated with industrial collapse in Kano metropolis in particular and other industrial axis in Nigeria in general. At the moment, industrial capital in the form of machines as well as the money invested is tied up and idle. In addition there is the loss of jobs as well as the loss of revenue due to no production. On their part, consumers are forced to look elsewhere for the products they want and the economy suffers.

It doesn't have to be so. The onset of the Industrial era rather than do away with agriculture made it more efficient. It is therefore reasonable to expect that the Information era will not do away with the industry but require it to be more effective and efficient. Indeed, as a manifestation of cumulative, and sometimes sustained, malfunction in the industrial process,

industrial collapse can be delayed or, at best, avoided. Addressing industrial collapse is therefore the necessary first step towards a more effective and efficient industries. It is hoped that the findings, apart from contributing to available literature, will lead to realistic prescriptions that will significantly reduce the problems of industrial collapse.

1.7 RESEARCH HYPOTHESES

The following hypotheses were tested in pursuit of the study objectives:

1. Some industry groups in Kano metropolis are more susceptible to declining performance than others. Thus,

   H_o : The proportion of industries that closed is independent of their ISIC grouping.

   H_1 : The proportion of industries that closed is associated with their ISIC grouping.

2. The Structural Adjustment Programme (SAP) has been responsible for declining industrial performance in Kano metropolis. Thus,

   H_o : The proportion of industries that closed is independent of SAP.

   H_1 : The proportion of industries that closed is associated with SAP.

3. The relative importance of macroeconomic policies and other identified factors on the growth and decline of industries in Kano metropolis varies with industry groups. Corollary hypotheses can be stated as follows:

a) Endogenous factors rather than Endowment factors are responsible for the declining industrial performance in Kano metropolis.

b) Endowment factors rather than Macroeconomic factors are responsible for the declining industrial performance in Kano metropolis.

c) Macroeconomic factors rather than endogenous factors are responsible for the declining industrial performance in Kano metropolis.

1.8 SCOPE OF THE STUDY

The term metropolis refers to a large city or urban area and in the case of Kano metropolis comprises of the area within the eight LGAs (Dala, Fagge, Gwale, Kumbotso, Municipal, Nassarawa, Tarauni, and Ungogo) as in Figures 3.3 and 3.5. While the industry remains the unit of investigation, the discussion in this work largely focuses on modern industrial set-ups, as against traditional industries, that are located within Kano metropolis. Therefore small-scale industries are excluded (as they contravene the principles of concentration and maximization).

1.9 ORGANIZATION AND PRESENTATION OF THE STUDY

Chapter One introduces the study, stating its background, the research problem which gives birth to the research questions, aim and objectives of the study and the approach adopted. Chapter Two presents the conceptual framework and literature review starts with the concept of Path Dependence model and factors of industrial location and production. This is followed by the underlying principles of modern industrialism and a review of International Standard for Industrial Classification (ISIC). The second part of Chapter Two reviews available literature on how to modernize as well as a review of industrialization and industrial policy in Nigeria. The chapter ends with the relevance of the concepts and literature to the study.

The first part of Chapter Three - Research Methodology - gives an overview of the development of Kano metropolis - the study area. Focus is placed on the spatial growth of the area of study as well as the factors responsible for its growth. The section therefore dwells on a review of these factors in the study area emphasizing the roles played by geology, relief, climate, river system, vegetation resources (physical factors), population, commerce, manufacturing industries,

financial services and transport (population and economic activities). The second part, which dwells on the method of study adopted, starts with the research design followed by the types and sources of the data acquired. Stratified random sampling technique was used and questionnaires distributed to industries. A description of the various methods used to gather the data and analyze them and the test of the research hypotheses conclude this chapter. Chapters Four and Five dwell on the presentation of results. Chapter Four focuses on the nature of industries in Kano metropolis – their dynamics, industrial mix and ownership structure – and how they have been affected by the macroeconomic policies in operation. The chapter concludes by testing hypotheses I and II. Chapter Five starts with the characteristics of respondent industries, followed by the pattern of industrial decline and the contributory factors in Kano metropolis. An examination of the relative importance of the factors identified leads to developing the Endogenous Factor Scoring system. The chapter then concludes with the test of Hypothesis III. Chapter Six begins with a summary of the entire work. This is followed by the conclusions, and recommendations.

CHAPTER TWO

CONCEPTUAL FRAMEWORK AND LITERATURE REVIEW

2.1 CONCEPTUAL FRAMEWORK

2.1.1 The Path Dependence Model

The Path Dependence Model, introduced by David (1985; 2000; 2007) and Arthur (1989) as a way of explaining the evolution of technologies and technological standards, holds that given a number of competing economic productions (say a, b, and c) each with its specific outcomes (say x, y, and z), the choice made is a declaration of path an entrepreneur or society is willing to take. A choice of a, for instance, not only commits the entrepreneur but gives the chosen technology a foot-hold which, with Network Externalities (according to David) or Increasing Returns effects (according to Arthur), steers the technology, industry or regional economy along one path rather than another, obviated by the historical contingency necessitating the choice.

The idea has been adopted and applied in a variety of disciplines and is widely applied to local and regional industrial evolution. It is essentially a combination of a) historical contingency and b) economic growth. The latter is growth of technically interrelated production system (according to David) or a system of large initial fixed setup costs (according to Arthur) that enjoys economies of scale (according to David) or dynamic learning effects (according to Arthur) and the attainment of quasi-irreversibility of investment (according to David) or coordinating effects aided by self-reinforcing expectations (according to Arthur). The combination of which 'locks-in' the technology, industry or regional economy in a way that is not deterministic. But it "may be said to be 'pre-destined', in the sense of being governed from the outset by a unique asymptotic probability distribution" (David, 2000:5) just as the historicity

of the Dependency theories claim. This time however, it is based on equilibrist thinking, in stages, as illustrated in Figure 2.1.

The 'Historical Accident' stage is where the 'path' is selected. The 'Early Path Creation' stage emphasizes self-reinforcing effects of the industry resulting in growth. Once in the Path Dependent 'Lock-In' stage the industry continues in this stable state enjoying economies of scale as well as quasi-irreversibility of investment until an exogenous shock is introduced.

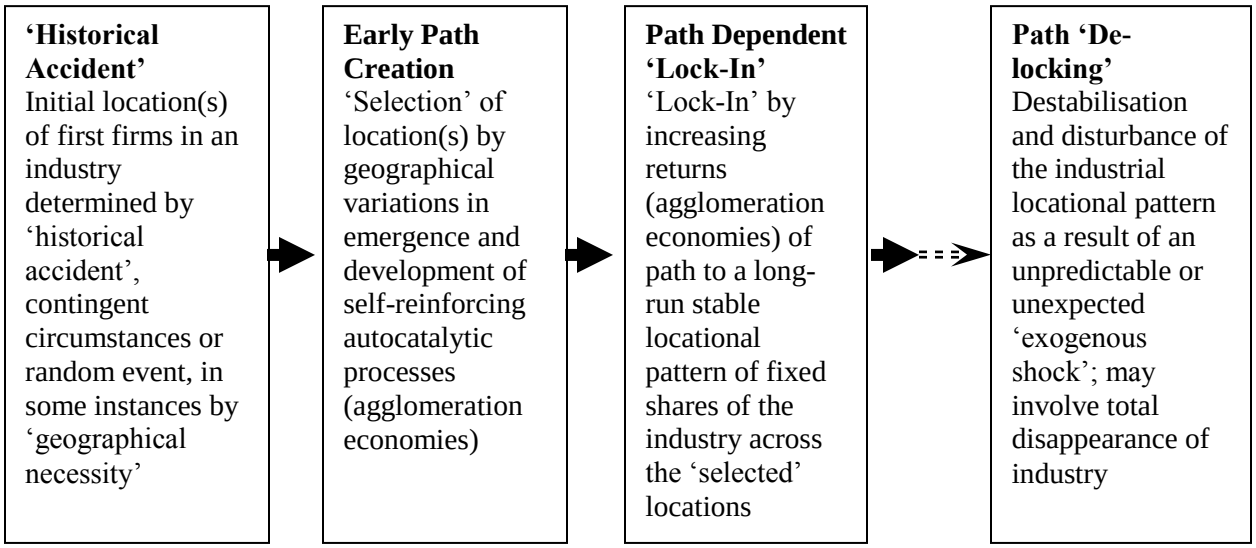


Figure 2.1: The Canonical Path Dependence Model of Spatial Industrial Evolution
Source: Martin, 2009:6

The major attraction for this emerging paradigm of evolutionary economic geography is that Path Dependence "explains current state of affairs from its history …" (Boschma and Frenken in Martin, 2009:2). However, in this form, the model stresses continuity rather than change (Martin, 2009). Thus, a reformulated version is suggested as in Figure 2.2 where the Pre-Formation Phase and Path Creation Phase are the same as the 'Historical Accident' and Early Path Creation

phases in Figure 2.1. However, whether the initial event of an industry was historically determined, purposive, or occasioned by chance does not 'lock-in' the industry to a pre-determined end as in Figure 2.1.

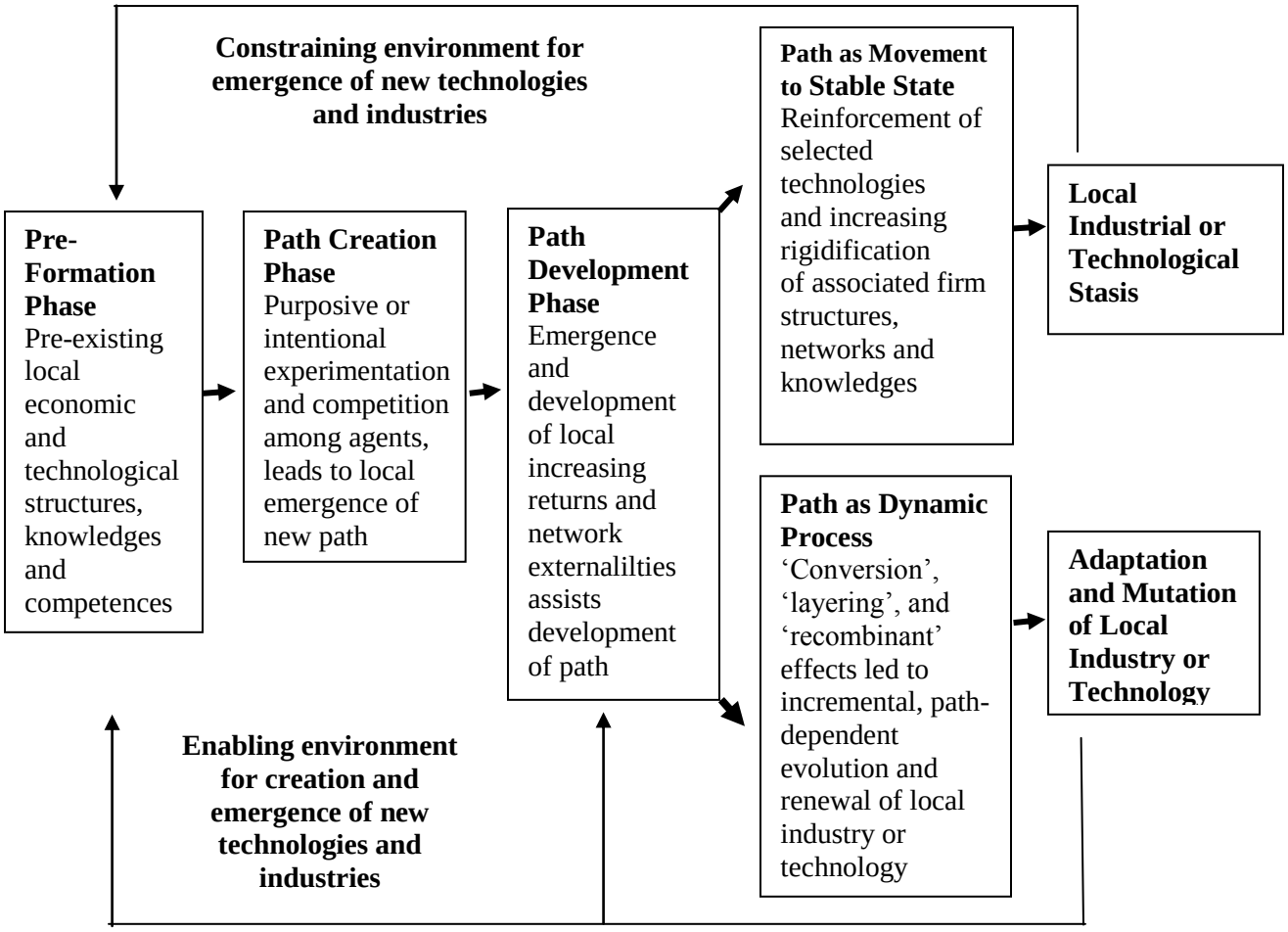


Figure 2. 2: Towards an Alternative Path Dependence Model of Local Industrial Evolution
Source: Martin, 2009:32

Rather, the industry goes into the Path Development Phase where development is a function of incentives, capabilities, and institutions as well as a mixture of local and external networks. Therefore both success (as now generally acknowledged of the "Asian tigers'" industrial experience) and failure (as in the Nigerian case) are equal possibilities. A good (and probably a

sustainable) mixture leads to the Path as Dynamic Process resulting in adaptation and mutation of local industry or technology while a conventional approach (or mixture) leads to a Stable State and industrial or technological stasis. In both cases there is a loop back to the Pre-Formation Phase. Whereas the loop back resulting from industrial or technological stasis creates a new set-up (or industry) without a link to the past, the loop back resulting from adaptation and mutation feeds from its past. Using the Path Dependence model therefore enables one to tell which stage or stages an individual or group of industries are at.

2.1.2 Factors of Industrial Location and Production

Generally, economic and non-economic factors influence both industrial location and industrial production. In terms of location Weber (in Friedrich, 1929) singles out three main factors - transport costs, labor costs and agglomeration economies. Location thus implies an optimal consideration of these factors by minimising their costs in order to maximize profit. Thus, in general, activities having a high level of raw materials requirement tend to locate near supply sources, while activities using ubiquitous raw materials, such as water tend to locate close to markets. According to Weber (op. cit.) activities with a material index (weight of the inputs divided by the weight of the final product or output) greater than 1.0 would tend to locate toward sources of materials while those with material index of less than 1.0 tend to locate toward the market. However, contemporary developments in manufacturing, the reduction of transport costs and new economic sectors (high technology) have changed locational behavior substantially, making industries foot-loose.

The plethora of factors affecting industrial production include climate, community, global competition, government attitude, government regulation, labour, land (Industrial site), market,

political situation (stability), raw materials, tax structure, utilities (in one way or the other), and transportation (Teriba and Kayode, 1977; Badri, 2007). These, directly or indirectly, affect industrial production and can be reclassified as macroeconomic policy, Endowment, and Endogenous factors. These are examined in further detail.

i) Macroeconomic policy factors, such as global competition (presence or absence of), government attitude/regulation, and tax structure, are official government policies which act more or less as rules and regulations defining the environment where industrial development takes place. These can be at national and/or international levels. For instance, the "infant industry" thesis which emphasizes the need to protect juvenile industry formations from world-wide free-trade (Egbon, 1995; Sani, 1995) was accepted universally. The paradigm shift in global thinking that crystallized in 1980s was in tune with Adam Smith's late 18^{th} century political idea of liberalism as a rationalization for unfettered capitalism. Neo-liberalism of the 1980s, based on the works of Friedrich Hayek and Milton Friedman, was strongly advocated globally to replace the "Keynesian" model of development which was introduced in the 1930s. It encourages privatization (enhancing the role of the private sector in modern society) and deregulation (economic liberalizations, free trade and open markets) with the view that unregulated markets are the best way to increase economic growth that will benefit everyone ultimately.

ii) Each area is, to some degree, endowed with factors such as capital (money needed to invest in business), community, labour (workers needed to make the product), land (industrial site), market (places to sell the product at home and abroad), political situation (stability), raw materials (all natural resources used to produce a product), utilities (in one way or the other), and

transportation. How much of these is available remains how much endowed the area in question is and therefore its endowment factors. These are usually at national or sub-national (regional) levels like the often cited examples of the states of Texas and Nevada in the United States of America (see Mabogunje, 2011:668). Like macroeconomic policy factors, endowment factors can be improved upon.

iii) It is increasingly becoming clear that industries with the same endowment factors do not necessarily perform equally. It is like, on the one hand, two football teams each endowed with eleven players but with different success; and on the other hand, although with the same endowment one team can decide to use five strikers while the other uses less. Thus, endogenous factors include what individual industries do with the opportunities and constraints (macroeconomic policy factors, microeconomic decisions, and endowment factors) before them - in other words, entrepreneurship or enterprise. These are at industry level.

2.1.3 The Underlying Principles of Modern Industries and Industrialism

The six principles that underlie modern industrial development are *standardisation, specialisation, synchronisation centralisation, maximisation and concentration* According to Toffler (1981:46-47)

> Every civilization has a hidden code - a set of rules or principles that run through all its activities like a repeated design… Everyone knows that industrial societies turn out millions of identical products. Fewer people have stopped to notice, however, that … we did more than simply standardize Coca-Cola bottles, light bulbs, and auto transmissions.

The machines were the "hardware" and the six principles are the "software" of the industrial era. Like today's computer, the hardware would not function without the software.

i) Standardisation, (according to Toffler, 1981:46-48), is probably the hallmark of industrialization. The idea is to standardise the machines, the raw materials and the processes in order to have standardised products. Theodore Vail and Frederick Winslow Taylor (Toffler, op. cit.) were first to grasp the importance of this principle. The former revolutionized the post office by introducing standardized routing before the latter built the American Telephone & Telegram Company (AT&T) into a giant by standardizing its business procedures and administration. Taylor believed that work could be made scientific by standardizing the steps each worker performed and became the world's leading management guru. In the end, as a result of the industrial revolution and the industry, work came to be standardized (hiring procedures, work environment, work schedules, pay scales and fringe benefits, grievance procedures etc.). The aim is to produce millions of identical products for the market and in that way, more can be produced within the shortest time possible.

ii) Specialisation: For standardisation to be efficient there must be specialisation. The machines and the processes are not only standardised but they are also specialised. So also are the people involved in production required to specialise in particular processes. Each industry specialised in particular products and within the industry different sections specialised in different aspects of the production process. Adam Smith and Henry Ford were not only first to grasp the importance of this principle but exemplified it. The former, in 1776, exemplified the effects of division of labour in a classic passage describing the manufacture of the office pin. Whereas a worker in the old style turned out not more than twenty per day, ten specialized workers, each performing only one or a few of the eighteen different operations required to make a pin, together produced more

than forty-eight thousand pins per day -- over four thousand, eight hundred pins per worker. (Toffler, 1981).

On the production of Model T cars in 1908 Ford said 7,882 different operations were required, and noted that:

> of these 7,882 specialized jobs, 949 required 'strong, able-bodied, and practically physically 'perfect men,' 3,338 needed men of merely 'ordinary' physical strength, most of the rest could be performed by 'women or older children,' and, he continued coolly, 'we found that 670 could be filled by legless men, 2,637 by one-legged men, two by armless men, 715 by one-armed men and 10 by blind men.' In short, the specialized job required not a whole person, but only a part (Toffler, 1981:51)

iii) Synchronisation: For specialisation to achieve the desired effect, synchronisation is necessary. Expensive machines and people involved in the production process cannot be allowed to sit idly; nor are the people to be left to produce at their whims. Each is required to synchronise his activities with those of others for continuity and to achieve maximum effect. "Thus punctuality, never very important in agricultural communities, became a social necessity, and clocks and watches began to proliferate." (Toffler, 1981:51). The industry and eventually the society became clock-driven.

iv) Concentration: When agents of the production process are scattered energy is dissipated. The idea is that capital is best pooled or concentrated in one place for better results. For the first time manufacturing concerns are encouraged to come together rather than scattered as they were. Thus, it was considered desirable for manufacturing activities in a settlement to come together to achieve the benefits of agglomeration and economies of scale. This principle was applied in almost all aspects of society – the factory, the school, the hospital, the asylum, the prison were

all products of this era. In effect, concentration of production came to be synonymous with efficiency.

v) Maximisation: Toffler (1981) still holds that the principle of maximisation encourages industries to grow and get bigger - the bigger, the better. Since industrialism, from the point of view of capitalism, is for profit, whatever form the profit takes (monetary, or simply advantages), the idea here is to maximise it. This can be interpreted as efficiency - getting the most from the least. Following from the same argument, bigger settlements were regarded more desirable to smaller settlements. The introduction of motorized transport gave credence to this line of reasoning and the industrial era, therefore, marked the beginning of the phenomenal growth of settlements. The city became the norm.

vi) Centralisation: The co-ordination necessary for both standardisation and specialisation to achieve the desired effect is to be found in centralisation. Centralisation as a decision making strategy was not entirely new but it became crucial in the new dispensation as it was necessary not only to pass down instructions from top to bottom, but like in puppetry to continuously pull the strings, to achieve the desired effect. Thus, the top-down command chain of the industrial era (Toffler, 1981).

2.1.4 International Standard for Industrial Classification (ISIC)

The ISIC code developed by the UN (obtained at Unstats.un.org) as a standard way of classifying economic activities is a typical example of standardization. It is now used widely by governments and international bodies as a way of classifying data according to economic activity. The codes group together enterprises by their products or by the processes (i.e. the same raw materials, process of production, skills or technology) used to obtain the products. Thus, economic activities would belong in the same section if they produce the same type of goods or service or if they use similar processes. The original code was adopted in 1948 and the ISIC code has since then been reviewed a number of times as new types of economic activities become important and to harmonize with other classification systems. Revision 1 was issued in 1958 followed by Revision 2 in 1968. The idea has been to classify economic activities into Major Divisions (one-digit codes), Divisions (two-digit codes), Major Groups (three-digit codes) and Groups (four-digit codes). The Major Division for Manufacturing was 3.

Revision 3 was introduced in 1989. Instead of using numerical values for the Major Divisions letters were adopted and so economic activities were classified from A to Q with manufacturing in Major Division D. ISIC coding beyond 4-digits have been discontinued with the adoption of Revision 4 (since 2000). Revision 4 therefore is the latest and is organized in Major Divisions (A – U) as in Appendix III. (Table 2.1 compares Revisions 2, 3, and 4). Manufacturing, this time, is in Major Division C.

Each Major Division is further organised into different levels containing increasing details in three nested levels. The Division level (2-digit codes) for manufacturing, for instance, starts from

Table 2.1: Comparisons of ISIC Codes (Revisions 2, 3, and 4)

ISIC Revision 2		ISIC Revision 3 – Section D. Manufacturing		ISIC Revision 4 – Section C. Manufacturing	
Code	Industry classes	Code	Industry classes	Code	Industry classes
31	Manufacture of food products, beverages and tobacco	15	Manufacture of food products and beverages	10	Manufacture of food products
				11	Manufacture of food beverages
		16	Manufacture of tobacco products	12	Manufacture of tobacco products
32	Textiles, wearing apparel and leather industries	17	Manufacture of textiles	13	Manufacture of textiles
		18	Manufacture of wearing apparel; dressing and dyeing of fur	14	Manufacture of wearing apparel
		19	Tanning and dressing of leather; manufacture of luggage, handbags, saddlery, harness and footwear	15	Manufacture of leather and related products
33	Manufacture of wood and wood products ; including furniture	20	Manufacture of wood and of products of wood and cork, except furniture; articles of straw and plaiting materials	16	Manufacture of wood and of products of wood and cork, except furniture; articles of straw and plaiting materials
34	Manufacture of paper and paper products; printing and publishing	21	Manufacture of paper and paper products	17	Manufacture of paper and paper products
		22	Publishing, printing and reproduction of recorded media	18	Printing and reproduction of recorded media
35	Manufacture of chemicals and chemical products; petroleum, coal, rubber and plastic products	23	Manufacture of coke and refined petroleum products and nuclear fuel	19	Manufacture of coke and refined petroleum products
		24	Manufacture of chemicals and chemical products	20	Manufacture of chemicals and chemical products
				21	Manufacture of basic pharmaceutical products and pharmaceutical preparations
		25	Manufacture of rubber and plastics products	22	Manufacture of rubber and plastics products
36	Manufacture of other non-metallic mineral products; except products of petroleum and coal	26	Manufacture of other non-metallic mineral products	23	Manufacture of other non-metallic mineral products

Table 2.1 Cont'd: Comparisons of ISIC Codes (Revisions 2, 3, and 4)

ISIC Revision 2		ISIC Revision 3 – (Section D. Manufacturing)		ISIC Revision 4 – (Section C. Manufacturing)	
Code	Industry classes	Code	Industry classes	Code	Industry classes
37	Basic metal industries	27	Manufacture of basic metals	24	Manufacture of basic metals
38	Manufacture of fabricated metal products, machinery and equipment	28	Manufacture of fabricated metal products; except machinery and equipment	25	Manufacture of fabricated metal products; except machinery and equipment
		30	Manufacture of office, accounting and computing machinery	26	Manufacture of computer, electronic and optical products
		31	Manufacture of electrical machinery and apparatus not elsewhere classified	27	Manufacture of electrical equipment
		29	Manufacture of machinery and equipment not elsewhere classified	28	Manufacture of machinery and equipment not elsewhere classified
		32	Manufacture of radio, television and communication equipment and apparatus		
		33	Manufacture of medical, precision and optical instruments, watches and clocks		
		34	Manufacture of motor vehicles, trailers and semi-trailers	29	Manufacture of motor vehicles, trailers and semi-trailers
		35	Manufacture of other transport equipment	30	Manufacture of other transport equipment
	(furniture from code 33 above)	36	Manufacture of furniture; manufacturing not elsewhere classified	31	Manufacture of furniture
39	Other Manufacturing Industries			32	Other manufacturing
				33	Repair and installation of machinery and equipment
		37	Recycling		

Source: Compiled from publications obtained at Unstats.un.org (retrieved on 7th July, 2012)

Table 2.2: Two-digit ISIC codes (Revision 4) for Manufacturing industries

Code	Industry
10	Manufacture of food products
11	Manufacture of beverages
12	Manufacture of tobacco products
13	Manufacture of textiles
14	Manufacture of wearing apparel
15	Manufacture of leather and related products
16	Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials
17	Manufacture of paper and paper products
18	Printing and reproduction of recorded media
19	Manufacture of coke and refined petroleum products
20	Manufacture of chemicals and chemical products
21	Manufacture of basic pharmaceutical products and pharmaceutical preparations
22	Manufacture of rubber and plastics products
23	Manufacture of other non- metallic mineral products
24	Manufacture of basic metals
25	Manufacture of fabricated metal products, except machinery and equipment
26	Manufacture of computer, electronic and optical products
27	Manufacture of electrical equipment
28	Manufacture of machinery and equipment n.e.c.
29	Manufacture of motor vehicles, trailers and semi- trailers
30	Manufacture of other transport equipment
31	Manufacture of furniture
32	Other manufacturing
33	Repair and installation of machinery and equipment

Source: Compiled from publications obtained at Unstats.un.org (retrieved on 7th July, 2012)

10 – 33 and the Group level for each Division would be 3-digit codes. The Class level for each Division and Group (where available) would be 4-digit codes. Thus, manufacturing is subdivided into a little more than 20 Divisions (see Table 2.2), 30 Groups and 81 Classes (see Appendix IV). ISIC coding beyond 4 levels have been discontinued in the latest ISIC revision.

2.2 CROSSING THE "MODERN" DIVIDE

2.2.1 Introduction

The Modernization theories try to explain the passage to industrialization. This development issue, particularly how to cross from being underdeveloped to being developed, has generated many theories which can be explained by the Developmental Approach or the Urban-bias Approach (Knox and McCarthy, 2005, Willis, 2005).

2.2.2 The Developmental Approach

At the centre of the Developmental Approach are Perroux's Growth Pole theory, Hirschman's 'trickle-down effects' theory, Myrdal's 'circular-causation' model, of the 1950s and Rostow's stages of economic growth and Friedmann's core-periphery model and its satellite-metropolis variant of the 1960s. In essence, economic as well as industrial development is a regional affair with different locations contributing their endowments for the emergence of one or more industrial centres. Policy prescriptions are equally meant to encourage the development of a core-periphery (or satellite-metropolis) relationship with a growth centre (the core) from where benefits will trickle down to the periphery. In the end, focus is on the endowment factors (location, raw materials, finance, infrastructure, etc.) of the country or different parts of the country and the rationale (or lack of it) for industrial developments in the areas. In this category falls the works by Teriba and Kayode (1977), Onyemelukwe (1983), Mabogunje (1990), and Badri, (2007).

Still in this category and focused on Kaduna State, is the work by Isa and Ibrahim (2008) which can be seen as specific to a smaller unit of Nigeria. In all of these studies, the tendency is to see

industrial development (or lack of it) as a function of the endowment factors. Thus, even the disappointing industrial experience in the country has been explained in the light of endowment factors as the Odama report of 1983, (as cited in Olukoshi, 1996:1, 5 and 17) attributed the decline in manufacturing output to Nigeria's inability to finance the import needs of industries following the collapse of the world oil market of the 1980s. In effect it reduces the whole matter to that of capital and raw materials deficits.

2.2.3 The Urban-bias Approach

The Structuralist and Dependency theorists maintain that Third World societies differ structurally from western societies and employ urban-bias approach which maintains that "underdevelopment stemmed directly from the unequal nature of the relationships between the developed and less developed parts of the worlds" (Knox and McCarthy, 2005:180). This is a line towed by Bello (2011) who sees, in many ways, how British colonial administration underdeveloped the Kano economy. Lower down the scale, proponents of this school of thought maintain that at the national level underdevelopment was a result of the unequal nature of the relationships between cities (core) and their hinterlands (peripheries). Thus for instance, Lubeck (1977:289), notes that "the prior historical development of a city and the manner in which an urban area is incorporated into the world system provide important sources of variation" which therefore, explains Kano's failure in sustainable industrialization.

Therefore policy prescriptions recommend the promotion of state intervention and protectionist policies by promoting import substitution industries (ISI) as necessary in order to build up domestic manufacturing. However, despite the success of the "Asian Tigers", the failure of the

ISI in promoting industries in developing countries was imminent as they require larger markets than their domestic markets, and also needed to import technically advanced equipment.

To understand the variations between industries, the structuralists therefore recommend a more in-depth analysis of the industries concerned. Such in-depth analysis of industrial development in Nigeria include notable works by Ayeni (1979), Adegbola (1983), Akpobasah, (1986), Eleazu, (1986), Eze, (1986), Phillips, (1986), and Olashore (1986), who maintain that in addition to factor endowments, the nature of an industry (its structural characteristics), how it is run and the various industrial linkages obtaining, determine its success or otherwise. Thus, with the aid of some analytical techniques (Location Quotient, Coefficient of Localization, and Coefficient of Total Net Shift), Adegbola (1983:301) concluded that Nigeria's industrialization, especially the manufacturing sector, is still under-developed and "has a narrow base which cannot guarantee self-sustaining growth". On his part, Phillips (1986:21), using input-output structure matrix which shows the origin and destination of the output of each industry (i.e. who produces what, with what input and used by whom), concluded that Nigeria's industrialization is a superficial development with no real manufacturing taking place. In varying degrees, these are views shared by Onyemelukwe (1978), and Sani (1995). Ayeni (1979:85), using the shift-share method to analyze industries in Lagos metropolitan area, showed that "it is a useful technique for identifying the emerging strengths and weaknesses that exist in the structure of manufacturing (or any other) activity". Not a specific industry, though!

2.3 INDUSTRIALIZATION AND INDUSTRIAL POLICY IN NIGERIA

2.3.1 Traditional Industries in Nigeria

According to Mbagwu (1983:276) "that there are non-primary sectors in the occupational mix of the countryside is hardly realized, nor is the place of these other sectors in the economy adequately assessed or duly appreciated". The author further adds that both traditional crafts and traditional industries date back to prehistoric times and could also be urban based. These industries are non-mechanised and produce small quantity of non-standardised goods at a time. They can be classified as follows:

1. Processing and extraction of flour (from cassava, grains, plantain, and yam), oil (from oil palm fruits and nuts), salt (from salt rocks and brine water), tanning of hides and skin, dyeing of cloths, and alcoholic and non-alcoholic beverages.
2. Craft such as carvings (doors, stools, statutes, canoes from wood), pottery products and organic fiber products from grass and plants (mats, calabashes).
3. Manufacturing activities such as ginning and carding of cotton, yarn from cotton, weaving from cotton yarn, and leather works.
4. Smelting, foundering, casting and smithing of ferrous, non-ferrous ores and metals for the productions of simple ornaments, weapons and tools, household utensils, and glass works

Mbagwu (1983:288) concludes by advocating "a speedy transformation of the traditional industries and crafts into modern businesses". It is obvious that Nigeria needs to industrialize by internalizing and applying the new skills and techniques (machines or the Hardware and the Software) to their traditional industries and crafts.

2.3.2 Industrial Development in Nigeria

Industrialization in Nigeria started just before political independence, after the World War II, with the setting up of some industries in Lagos, Ibadan, Port Harcourt, Aba, Enugu, Ilorin, Kaduna, Funtua, Jos, and Kano. These cities not only attracted more people but also remained growth centres in reality. Indeed each separately, or in combination with others, acted as a nucleus in the formation of the various industrial axes that firmly set the country within the ambit of industrial capitalism. The Lagos/Ibadan/Ilorin industrial axis, the Aba/Nnewi/Port-Harcourt industrial axis, the Kaduna/Jos industrial axis, and the Kano axis are some of the notable ones in the country. By 1975, according to Olukoshi (1996:16), Lagos and its environs, on the one hand, accounted for 50% of manufacturing output in Nigeria while on the other hand, Kano in second place accounted for 14% of manufacturing output in Nigeria as well as 10% of total employment in Nigeria's industrial sector.

From the outset the Production Development Board and the Development Loans Board handled and guided industrial development in the country before the formation of the three regional boards that catered for the needs of their regions. Thus the ENDC and the WNDC were responsible for the eastern region and the western region respectively, while the NNDC operated in the northern region. With the creation of states in 1967 these regional agencies were further decimated to correspond with the states created. This notwithstanding, manufacturing which accounted for 4% of the GDP in 1958 rose to 8.4% in 1967 (Onyemelukwe, 1983:266; Adegbola, 1983:295). The number of industries in the country was estimated to be more than 700 by 1970 (Onyemelukwe, 1983:266) and their contribution to the GDP was only second to the oil sector. However with the onset of the economic crisis in the country in 1980s the

contribution of the industrial sector to the GDP, like that of many other sectors of the economy, declined from 8.2% in 1990 to as low as 4.2% in 2003 while industrial capacity utilization dropped to between 37.1% and 48.8% in 2003 (Egbon, 1995; Charles, 2007). However Olukoshi (1996:1) noted that "even before the onset of the current economic crisis, the industrial sector suffered from serious structural imbalances … The intermediate goods sector is relatively underdeveloped and the capital goods sector almost non-existent".

2.3.3 Industrial Development in Kano

As in many Nigeria cities, Kano's industrial development is constituted by the state, indigenous businessmen, foreign businessmen, and multi-national corporations. But each settlement in the country has its unique industrial experiences. For instance, only soap, oil mill and groundnut paste industries were the first to have been established in Kano before Nigeria attained independence in 1960. Foreign businessmen (especially the Levantine group) were the trail blazers. But unique to Kano is the Kano Citizen's Trading Company (formed by a group of indigenous businessmen) which established the first textile mill in Kano in the second half of the 1950s (Olukoshi, 1996). Of course, they were aided by the NNDC which was established in 1956.

Later in the 1970s leather tanning, production of plastics and plastic goods, rubber processing, soft drinks and mineral water, wooden and metal furniture, enamelware, sweets and confectionery, and perfumes and cosmetics were added to Kano's industrial profile. "The Levantines were, in several cases, the pioneers of the production of particular commodities in

Kano and their high profile in sub-sectors like plastics, soft drinks, sweets and confectionery, and textiles, to cite a few, is unmistakable (Olukoshi, 1996:12). By 1985 Kano

> also boasts one of the highest concentrations of textile mills, sweets and confectionery factories, plastics and plastic product plants, perfumes and cosmetic factories, and metal and wooden furniture factories in the country….although it has far fewer intermediate goods firms and no capital goods producing plants (Olukoshi, 1996:16).

Olukoshi further observes that for about half the Levantine and indigenous manufacturers, manufacturing was only one of several spheres of business in which they were involved. This notwithstanding, Kano's industrial achievement translated to 47% of the manufacturing output and over 40% of total industrial sector employment of the northern states of Nigeria. However, the impact of the economic crisis in the country in 1980s "on the Kano manufacturing sector, as on the rest of the national economy, was immediate and drastic" (Olukoshi, 1996:17).

2.3.4 Industrial Policy in Nigeria

Nigeria's industrial policy can be seen in two phases – pre-SAP and during SAP. The first period of the pre-SAP period began from 1900 – 1954. During this period the colonial government established the NLDB and the DCI. The former was to promote and develop village crafts and industries in the form of products from Nigeria and setting the modalities for research and development in processing industries and other matters concerning industrial development. The DCI was responsible for overseeing and promoting local trade and industrial development in the country.

From 1954 – 1958 the regional governments began to take active roles in industrial and commercial activities. During this period three major statutes were enacted namely:

a) the Industrial Development (Import Duty Relief) Act of 1957

b) the Industrial Development (Income Tax Relief) Act of 1958, and

c) the Customs Duties (Dumping and Subsidised Goods) Act of 1958

These were used to advance industrial development programmes in Nigeria and so are together regarded as the corner stone that laid the foundation for import substitution programmes in the country (Uzor, undated, p.5).

The period 1960 – 1970 saw the enactment of the Immigration Act of 1962 which specified the ratio of Nigerians to non-Nigerians employed in foreign firms, the Companies Decree of 1968 which sought to bring local subsidiaries of foreign firms under the control of the Federal government and later to secure the participation of Nigerians in such businesses. In addition, industrial development featured in the National Development Plan of 1962-1968 with about 14% of public investment allocated to it. This policy period emphasized the desire to encourage "a shift from commerce into processing and manufacturing industries" (Egbon, 1995:2) and the ISI was adopted as the policy that will effectively accomplish the objective. The first stage of ISI was limited to the replacement of imports of non-durable consumer goods, or what is referred to by Ajayi (2007:142) as the assembly-type pattern of import substitution. This includes the extractive (oil mills and flour mills), additive (soft drinks etc.), and assembly types of industries (bicycle assemblies). The second stage of ISI in Nigeria was to focus on the replacement of imported intermediate inputs and producer and consumer durables.

The period 1970 – 1985 is the last period of the pre-SAP phase. It began with the decree establishing ITF, promulgated in 1971, with the aim to encourage skills acquisition in industries and the Nigerian Enterprises Promotion Decree of 1971. Again industrial development featured

in the second National Development Plan 1970-1974. This period also witnessed the promulgation of the Nigerian Enterprises Promotion Decree of 1972 (popularly known as the Indigenization decree) which was later modified in 1978.

From 1978 onwards industrial policy in Nigeria was subsumed in the economic policy packages articulated to engender recovery from the economic crisis of the time. In addition to all other economic woes the industrial sector was inefficient. For instance, at this time, it was noted that at least 45% of raw material inputs were imported (Phillips, 1986; Onyemelukwe, 1983:265; Olukoshi, 1996). The UNIDO's survey of the 1980s showed that Nigeria imported 60 percent of the raw materials consumed in the manufacturing sector (Egbon, 1995:5). Indeed, the ISI in Nigeria was described as import-dependent ISI. Thus, the Indigenization Decree of 1978, the Economic Stabilization Acts of 1982 and 1983 as well the Counter-trade policy of 1983-85 were all "geared towards rationalizing overall expenditure pattern so as to restore both fiscal balance and equilibrium on the domestic front and in the external sector" (Egbon, 1995:4; NCEMA, not dated, p. 5).

The Economic Stabilization Act (1982) as well as its modification in 1983, in particular, comprised a package of stringent policies and measures that include a severe tightening of import controls, the imposition of exchange restrictions, increases in customs tariffs, an increase in petroleum product prices and utility tariffs. However, the Bretton Woods institutions, better known as the World Bank and the International Monetary Fund (IMF) agencies - known for imposing Neo-Liberal economic doctrines around the world - wanted tougher measures. In an attempt to avoid IMF's deregulation policies the counter trade policy was implemented to

provide raw materials that were needed in industries, and thereby stem further closure of industries, and halt the unemployment problems as well as the spiraling inflation. It only succeeded in delaying the introduction of SAP until 1986.

SAP marks the beginning of the second phase of Nigeria's Industrial Policy. In essence the policy advocated for the decentralization and privatization of state-owned enterprises (Anyanwu, 1992:6; NCEMA, not dated, p. 7; Tackie, and Abhulimen, 2001:3). The specific objectives of the SAP were:

- to restructure and diversify the productive base of the economy in order to reduce dependency on the oil sector and on imports
- to achieve fiscal and balance of payments viability over the period
- to lay the basis for a sustainable non-inflationary growth
- to reduce the dominance of unproductive investment in the public sector, improve that sector's efficiency and enhance the growth potential of the private sector through liberalized trade and privatization of public sector enterprises.
- to allow the Naira find its true value vis-à-vis other currencies,

The New Industrial Policy of 1989, the Nigerian Investment Promotion Decree No. 16 and the Foreign Exchange (Monitoring and Miscellaneous Provision) Decree N0. 17 of 1995 as well as the Commercialisation and Privatisation Decree No. 25, are all to entrench the SAP. Thus, SAP signaled the end of protectionism for industries in Nigeria and another side of the ISI coin.

There are claims of the Neo-Liberal economic doctrine's success elsewhere (though largely contentious but this is not the place for the debate) but in Nigeria, where it was introduced as the

SAP, it is only associated with monumental hardships and its devastating impact on the industries in Kano metropolis (Olukoshi, 1996).

2.4 RELEVANCE OF REVIEW TO THE STUDY

The ease with which other western European nations and the USA industrialized on the one hand, and the catalogues of failures from the developing countries (Nigeria especially) on the other, suggests something missing as Ali Mazrui (in Klitgaard, 1994:80) succinctly puts it:

> Africa as a whole has borrowed the wrong things from the West, even the wrong components of capitalism. We borrowed the profit motive but not the entrepreneurial spirit. We borrowed the acquisitive appetites of capitalism, but not the creative risk taking. We are at home with western gadgets but bewildered by western workshops. We wear the wristwatch but refuse to watch it for the culture of punctuality. We have learnt to parade in display, but not to drill in discipline. The west's consumption patterns have arrived but not necessarily the West's techniques of production.

With the recent industrial successes of the "Asian Tigers" it could be said that the entrepreneurial spirit exemplified by the Industrial Revolution in Britain, Western Europe, and the USA, had been one of the missing links In addition, it is apparent that many Nigerian industrialists are unaware of the unwritten codes or principles of industrialization. For long, the conventional belief is that land, labour and capital are all that was needed, and hence the establishment of development and financial agencies to help willing industrialists have access to capital. As a result, many industries in Nigeria only depend on the incentives and waivers to make profit!

The performance of industries is not uniform. While some industries are sliding down the scale others seem to be doing well. Looking at industrial growth from the perspectives of the Path

Dependence model not only allows one to determine what stages specific individual industries are at, but also gives anticipatory knowledge of what stages they are likely to pass through. Above all it offers the possibility of treating industries at the level of individual manufacturing unit and at the different stages of growth.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 STUDY AREA

3.1.1 Origin and Growth of Kano Metropolis

Believed to have originated in the 7th century, Kano can be said to have been in existence for over 1,000 years and therefore among the oldest settlements in Nigeria. It remained much unknown and unstable until the 12th century when the first wall was built round the settlement. Kano experienced incremental organic growth. The initial wall was extended in the 15th century, the 16th century, and the 17th century (see Figure 3.1). The wall around a pre-industrial settlement guaranteed a sense of security, corporate identity, a central place, and the "Birni" or a central place for the surrounding settlements (Liman & Yusuf, 2002; Liman & Adamu, 2003). Kano city was so firmly entrenched that not even an upheaval like the Sokoto Jihad, which shook and uprooted many settlements in northern Nigeria, could unsettle it. Instead, Kano city not only became an important node of the Sokoto caliphate but continued to be an important terminus of the trans-Saharan trade for the next 100 years.

By the beginning of the 20th century Kano city was the largest urban settlement in Hausaland (Liman & Adamu, 2003:146). It comprised of the space within the wall and the adjoining Fagge settlement just outside it. With its subjugation by the British in 1903, the colonial administration and economy translated in space as Nassarawa, and Bompai (for the Europeans), and Sabon Gari (for non-Europeans and non-natives). Later, Tudun

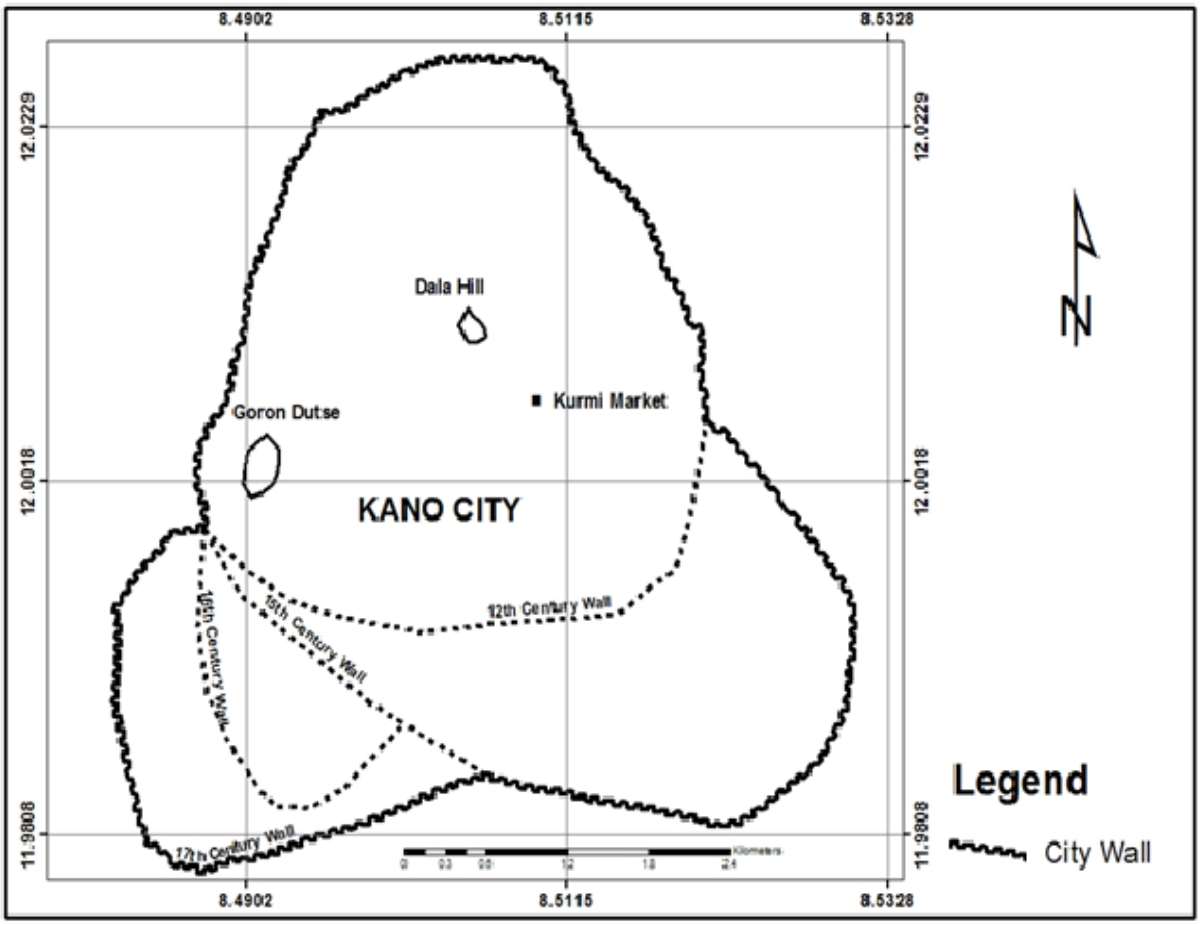


Figure 3.1: Kano City walls
Source: Liman, and Adamu (2003:149)

Wada. Gwagwarwa and Brigade (for natives) came into existence. All together these residential units were known as Kano township – an addition to Kano City but larger. These two units formed what came to be referred to as urban Kano. (See Fig. 3.2)

Although with political independence in 1960 Urban Kano's political influence and economic attraction was unrivaled by any other settlement in northern Nigeria, it did not register spatially until the end of the civil war in 1970. The Oil boom era developments have incorporated adjoining villages such as Gama, Dawakin Dakata, Hotoro, Kawo,

Giginyu, Unguwa Uku, Na'ibawa, Sharada, and Dorayi into the urban Kano and transformed it into a metropolis.

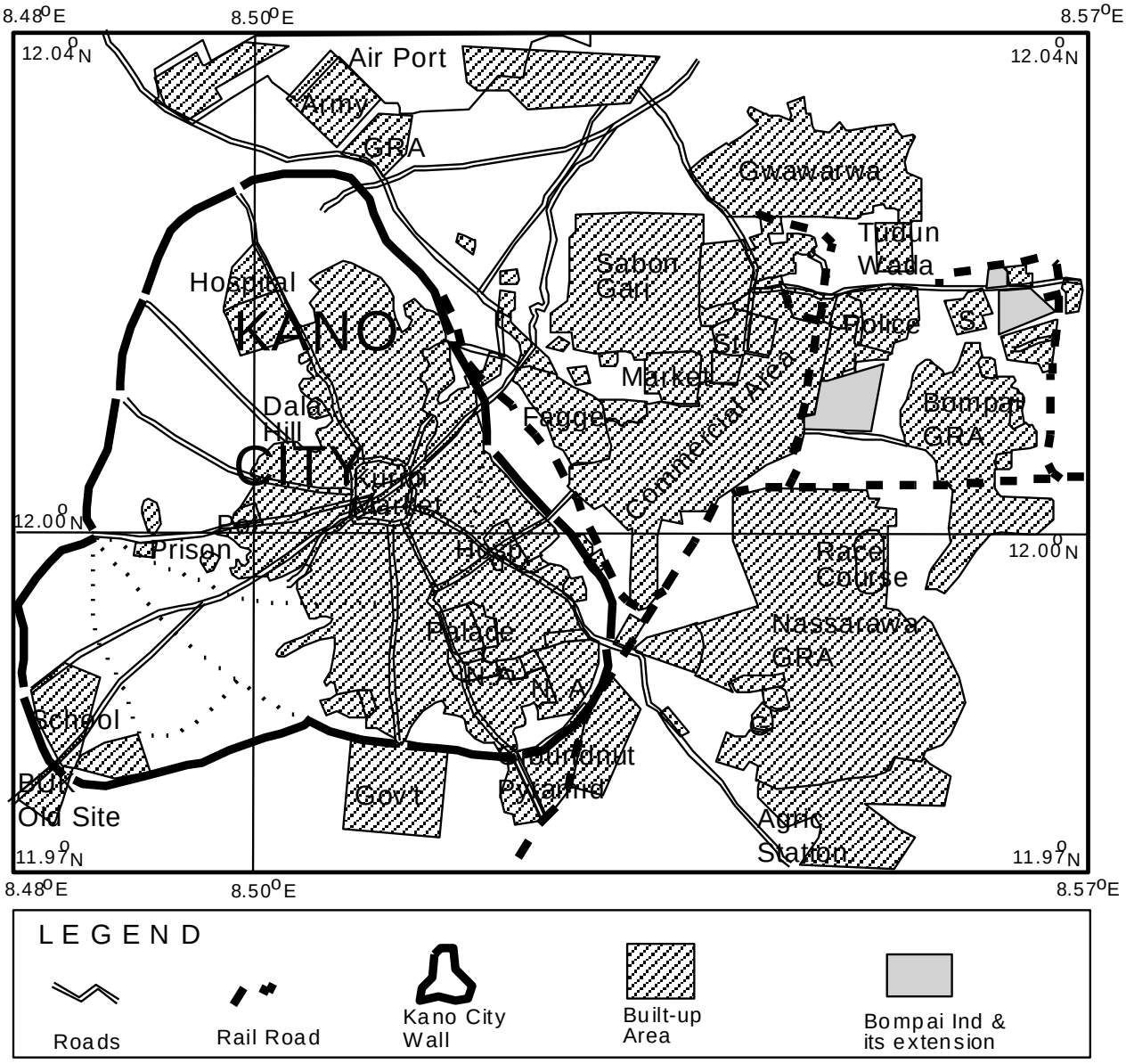


Figure 3.2: Urban Kano (1967)
Source: Urquhart, (1977:67)

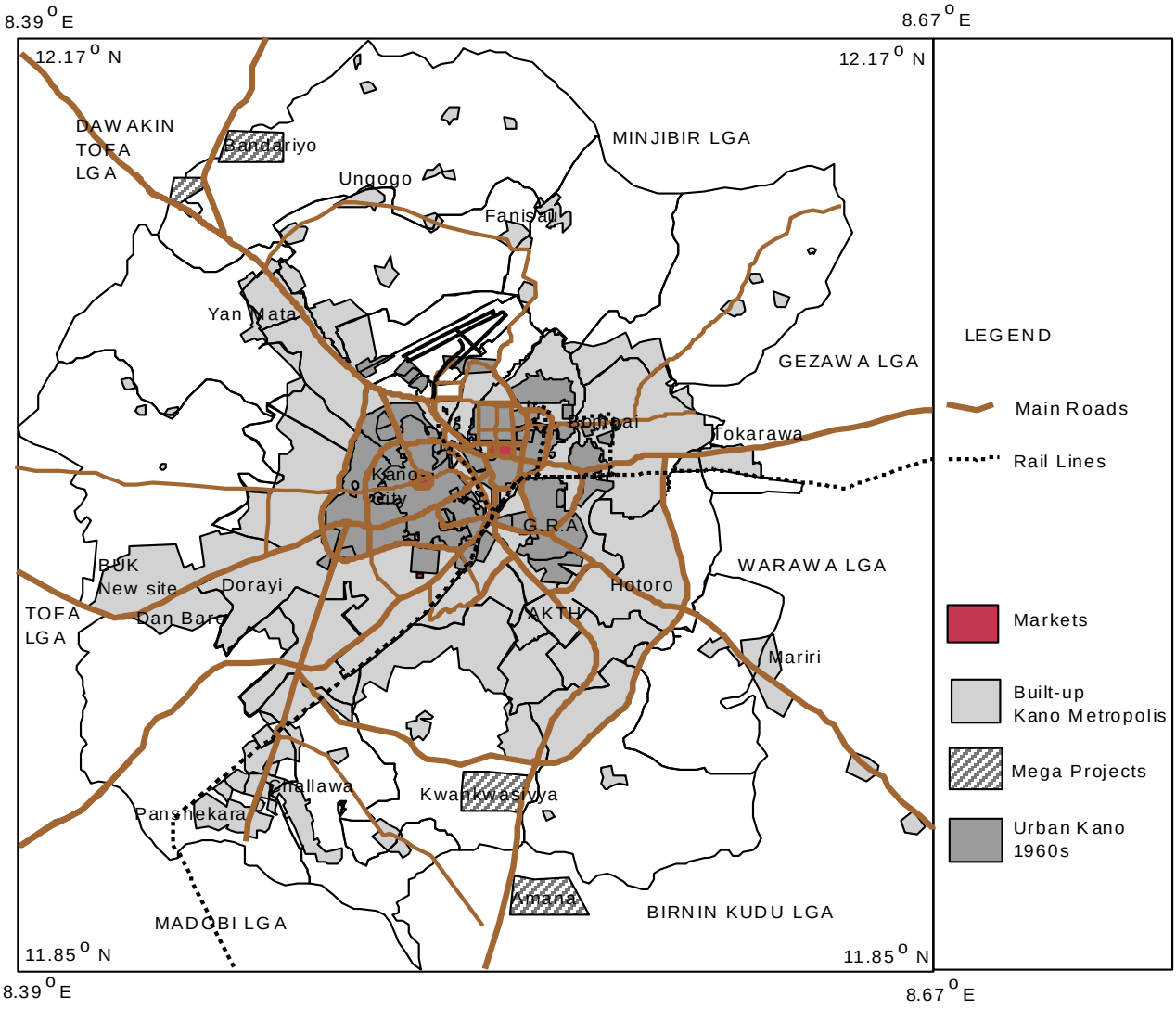


Figure 3.3: Present-day (2012) Kano metropolis
Source: Extracted from Quickbird Satellite image 2011 of Kano environment

3.1.2 The Physical Environment of Kano metropolis

3.1.2.1 Location and Extent of Kano metropolis

As a rule, pre-colonial walled settlements reserved half of the walled space un-built to be used for cultivation during times of siege. This kind of leap-frog development was also characteristic of the British colonial period but was complemented by in-filling of the

interstices in lull period of the civil war (1967 – 1970). With the oil boom came another leap-frog period which was followed by in-filling during the SAP period. From all indication, with the creation of Amana city and Kwankwasiyya Kano metropolis has taken another leap-frog jump only for the interstitial spaces to be filled in later. Thus, while the extent of Kano city kept expanding, so did that of urban Kano and Kano metropolis. Today Kano metropolis covers the whole of Dala, Fagge, Gwale, Kano Municipal, Nassarawa, Tarauni, and parts of Kumbotso and Ungogo Local Government Areas (LGA). As a result, Kano metropolis lies between latitudes 11.85^{o} N and 12.17^{o} N and longitudes 8.39^{o} E and 8.67^{o} E. (encompassing eight LGAs).

3.1.2.2 Geology, Relief and Climate of Kano Environment

Kano State lies on three geological formations, namely the Basement complex, Younger granites, and the Chad sediments (Ahmed, 2006). The basement complex covers over 70% of the State while the Younger granite is found mainly in the southern part of the state and the Chad sediments occur mostly in the north-eastern part of the state. Thus, the area of study lies on the basement complex of the state, an area known as the High Plains of Hausaland (Olofin, 2014). The study area is therefore a plain with occasional outcrops that rise up to 100m above the plains (such as the residual hills of Dala and Gwauron Dutse) .

According to Liman and Idris and Mohammed (2014) the climate affecting the Kano environment is closely associated with the movements of the ITD resulting in the following seasons a) Hot and dry season (“rani” in Hausa), b) Warm and wet season

("damina" in Hausa), c) Warm and dry season ("kaka" in Hausa) and d) the Cool and dry season ("bazara" in Hausa). The geology and soils of Kano state combined with the climate have given rise to a flourishing agricultural area with immense potential for manufacturing industries

3.1.2.3 River System and Vegetation Resources of Kano Environment

The Challawa, Jakara, Kano, and Watari river systems together provide the drainage pattern of the area of study. With the exception of the Jakara, the other river systems are tributaries of the Hadejia river system and contribute about 80% of the latter's flow at Wudil (Abdulhamid, 2014). The Challawa, Jakara, Kano, and Watari river systems therefore provide water for human consumption, irrigation and industrial activities in Kano metropolis.

Derived Savanna is the dominant vegetation in Kano state with about 75% of the land cultivated (Badamasi, 2014). Except along river courses and low-lying Fadama areas tree density is less than 25 per hectare. Forestry, Forest Reserves, and Afforestation projects are the major efforts going on in order to improve the vegetation landscape. Although Kano state lies in the savanna, the river systems ensure availability of water which has been tapped for irrigation purposes. The additional agriculture from irrigation activities increases the potentials of the study area as a manufacturing region.

3.1.3 Population and Economic Activities in Kano metropolis

3.1.3.1 Population of Kano metropolis

No settlement in Nigeria can boast of readily available and accurate population figures and Kano is no exception. As a result, one has to rely on population estimates from European travellers' accounts such as Clapperton (1824), Barth (1857), Staudinger (1885), Montev (1891) and Robinson (1894). Thus, a look at Table 3.1 shows that while Kano city was thought to have had a population of about 75,000 inhabitants or more in the 16th century, after the city had recovered from a Songhai invasion, it is estimated to be between 30,000 to 40,000 inhabitants in 1824. Similarly when Henry Barth came to Kano in 1857 he estimated the population at 30,000 and much later with the visit of C.H. Robinson in 1894, the estimated population of Kano was given at 100,000.

Table 3.1: Kano's population from 16th century to date

Year	Source	Estimate	Spatial Unit
16th century		About 75,000	Kano City
1824	Clapperton	30,000 - 40,000	Kano City
1857	Barth	About 30,000	Kano City
1894	Robinson	About 100,000	Kano City & Fagge
1911	Frishman 1977	39,368	Kano City & Fagge
1933	Frishman 1977	88,458	Urban Kano
1963	Frishman 1977	250,000	Urban Kano
1973	Frishman 1977	322,000	Urban Kano
1991	1991 Census	1,579,721	Kano metropolis
2006	2006 Census	About 3 million	Kano metropolis

Source: Author's compilation from various sources

By the most liberal estimate, urban Kano was not more than half a million in population in the early 1980s. The dramatic growth not only attracted more population but confirmed

Kano as a growth centre in reality as it became firmly set within the ambit of industrial capitalism. From the 1991 census figures Kano metropolis had a population of at least 1.6 million inhabitants. Today, Kano metropolis has a projected population of about 3 million inhabitants. Only Lagos can boast of such a population.

3.1.3.2 Commerce

Kano city has always been in the limelight and known to both Arab and European civilizations. Its fame is usually tied to commerce. Just as the ward ("unguwa" in Hausa) is the lowest viable spatial unit comprising of several smaller units ("loko" in Hausa) and with a designated ward head so is the market ("Kasuwa" in Hausa) is a commercial unit in space with a designated chief ("Sarkin kasuwa) with smaller trading posts under it. These markets were neatly arranged in space in a fashion Christaller would have been proud of. The Kurmi market stood at the apex of this arrangement for centuries. Below it stood markets like the Rimi market and so on down the ladder.

No sooner had Kano been subjugated by the British than colonial trading area was declared which eventually became the Central Business District (CBD) of urban Kano. It equaled the Kurmi market in importance, as the go-between in the new colonial economy, and within ten years the firms in Table 3.2 were located in the CBD. These were Nigerian, British, German, Levantine, Italian, and French companies.

Table 3.2: Commercial firms operating in Kano by the end of 1913

S/No.	Names of Establishments
1.	The Lagos Stores Limited
2.	The Niger Company
3.	Tin Areas of Nigeria
4.	Paterson-Zochinis Ltd
5.	G. L. Gaiser
6.	Campagne Francaise Afrique Occidentale (CFAO)
7.	John Holt
8.	W. B. Maclever
9.	John Walker
10.	G. B. Olivant
11.	John D. Fairley Ltd
12.	Ferris George & Brothers
13.	Ambrosini and Co.
14.	St. Thomas and Co.
15.	The Niger Trading Syndicate
16.	J. H. Doherty
17.	The Nigerian Foodstuff Syndicate
18.	London and Kano Trading Company

Source: Bako, (1990:65)

Of course, with the creation of Kano Township other markets sprang up, in addition to the CBD, especially in non-European units, catering for the needs of their respective areas. The Sabon Gari market, now officially Abubakar Muhammad Rimi market (AMR market) was created in 1918 (Bako, 1990:263) much after the CBD was created. The AMR market, because of its size and the variety of goods it offers, immediately rivals the Kurmi market and therefore stood at the top of markets in Kano Township as shown in Figure 3.4.

A lot of restructuring is still going on as observed in Liman & Adamu (2003, pp. 166-167). One expects the expansion of the CBD by its swallowing up the AMR market.

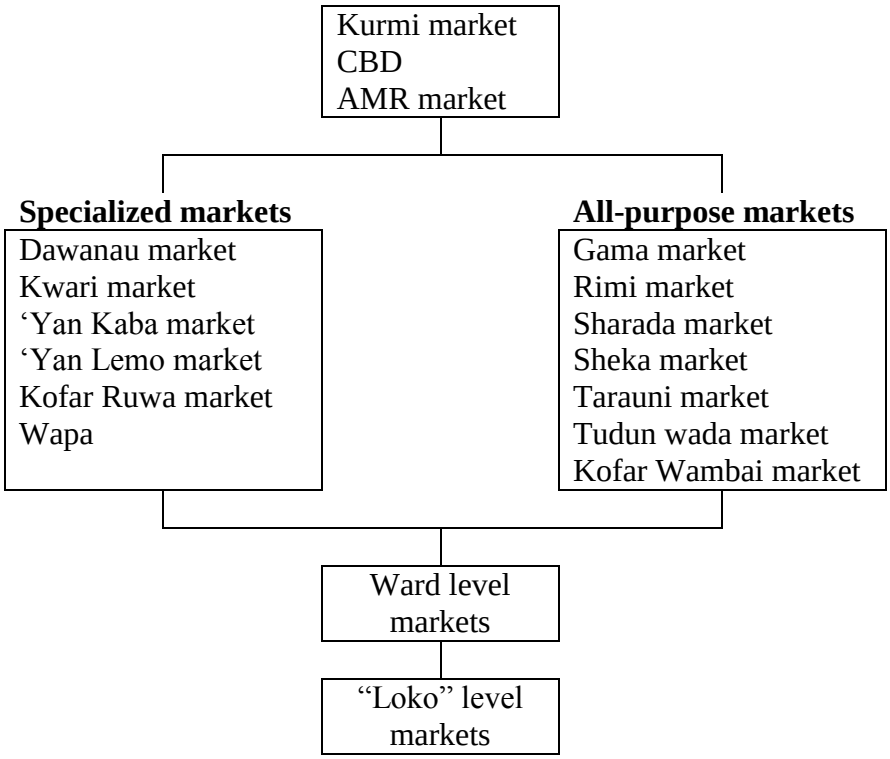


Figure 3.4: Hierarchy of markets in Kano metropolis
Source: Author's compilation

3.1.3.3 Manufacturing industries and industrial estates in Kano metropolis

Very little, if anything, is mentioned of pre-colonial Kano industries. But much of the commodities taken away from Kano city included leather (the renowned Moroccan leather), dyed cloths ('yan Kura) and plain woven cloths (see Shea, 1974/77; Shea, 1975; Olukoshi, 1996) and are sufficient proof of the traditional industries that existed particularly in leather, textiles and dyeing.

Modern industrial activities came with colonial administration. Just as the traditional dyeing industry was harmful in many ways and so the activity was concentrated in one place and usually at the outskirts of the city or the ward ("Karofi" in Hausa) so is the

modern industrial set-up of the time polluting to the environment by way of its discharge or noise and so had to be secluded in estates. Economic reasons, in the form of benefits of agglomeration and economies of scale, also dictate the formation of industrial estates. Although industries don't have to be concentrated in one place any more, Kano metropolis already has the Bompai, Challawa, Sharada, and Tokarawa industrial estates which in design could be home to 1,200 industries.

In terms of organization, the Manufacturers' Association of Nigeria (MAN) is, so far, the voice of industrialists in Nigeria. In Kano MAN has an Executive Secretary and two chairmen managing the two industrial zones. The Bompai Industrial Zone (BIZ) is made up of the Bompai and Tokarawa (Gunduwawa) industrial estates, including all industries located outside the estates in the northern parts of Kano metropolis (Dala, Fagge, Nassarawa, and Tarauni LGAs). The Challawa/Sharada Industrial Zone (CIZ) comprises the Challawa and Sharada industrial estates, including all industries located outside the estates in the southern parts of Kano metropolis (Gwale, Kumbotso and Municipal LGAs). These are shown in Figure 3.5.

The Bompai industrial estate was created in the 1950s (see Bako, 1990; Olukoshi, 1996). Being the oldest industrial estate in Kano metropolis, it is home to some of the oldest industries in Kano. The estate is bordered in the south by the northern edge of the CBD, in the west by Sabon Gari and the Bompai G.R.A in the east. It was so successful that the Dakata industrial area was planned. However, Dakata industrial estate was only partially implemented. Thus the newly established industries were considered extensions of the Bompai industrial area.

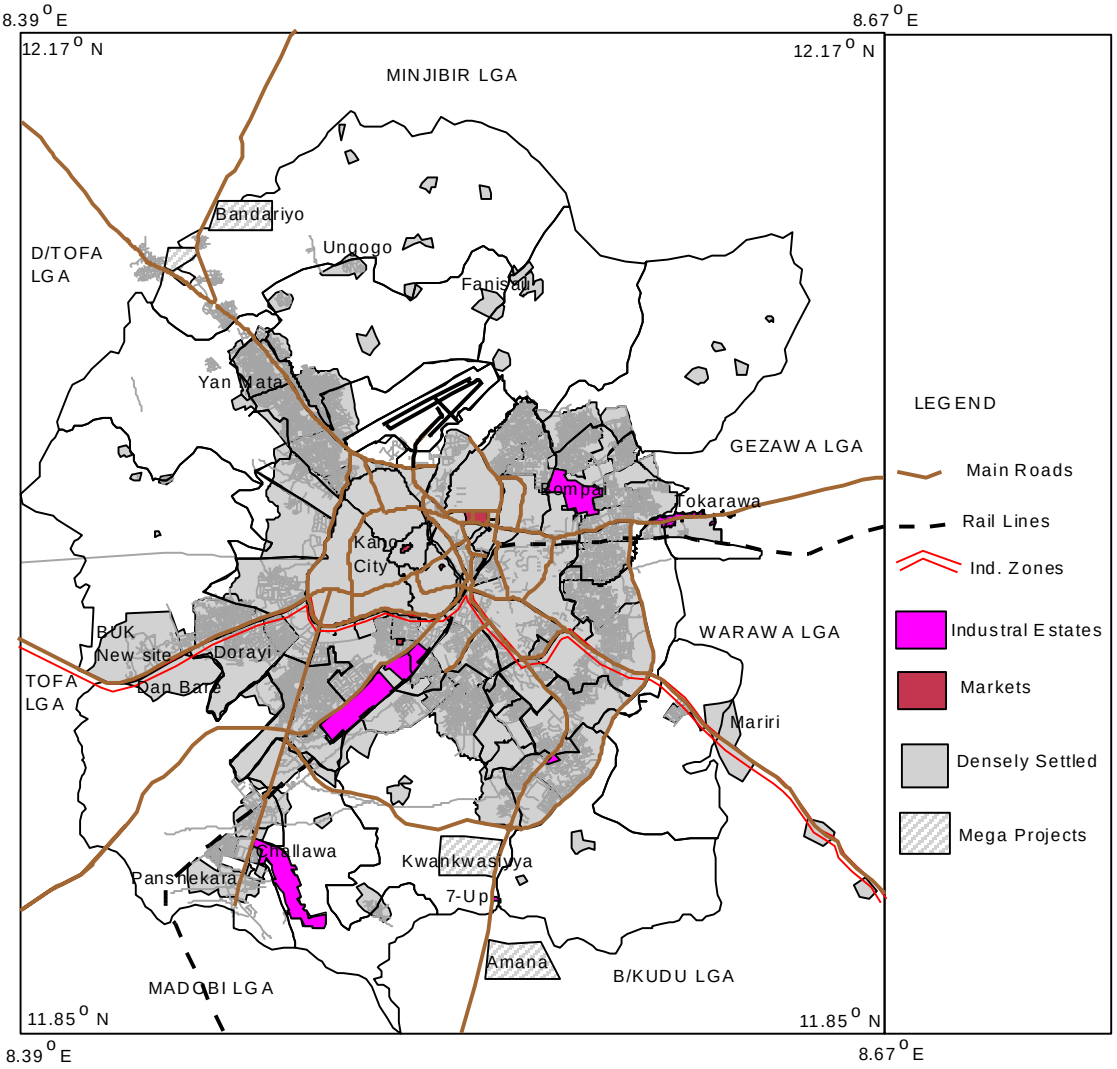


Figure 3.5: Industrial Estates in Kano metropolis
Source: Extracted from Quickbird Satellite image 2011 of Kano environment

By the second half of the 1970s Kano's population and spatial extent was beyond expectations. There was need for additional industrial estates to provide employment for the teeming population. The Sharada industrial estates were created then. Phase 1 of the estate was quickly taken up and there was need for the second phase.

The idea of dispersing industrial employments made Kano more vibrant and there was the need to separate the industries especially those that produced wet effluents. The Challawa industrial estate (in the south) and Tokarawa industrial estate (in the north) were created to fulfill these needs. Altogether, the estates add up to 1,200 industrial plots meaning they could be home to 1,200 industries.

3.1.3.4 Financial services

It is a fact of history that people traded by barter. This worked well when the two parties are interested in each others' goods. Although currency was introduced to solve the problem arising when only one party is interested in the other's goods, it was not without its problems. How does one come to grips with the different currencies from different clients? Kano's increasing involvement in commercial activities eventually gave birth to the development of financial services with a currency exchange market registered in space.

Three events are significant in the creation of a currency exchange market in Kano. The first is to be found in the creation of colonies which segmented the area served by the short- and long-distance trade zones into different colonies. Thus, for instance, the area served by the trans-Saharan trade zone became distinctly British and French. Although this event standardized money it also created formal and informal cross-border trading. But owing to historical and economic reasons Nigeria, in general, and Kano specifically have operated as epicenters of extensive market integration from cross-border trade flows in West Africa (Hashim and Meagher, 1999). Not only did people continue both (especially the informal cross-border trading), currency exchange outside the bank also boomed.

The second event is related to the Annual pilgrimage to Mecca (the Hajj) which became a feature of West Africa since the introduction of Islam in the region. However with colonization and the subsequent introduction of motorized transport, Hajj operation took a new turn especially with the formation in 1948 of the West African Pilgrims Agency (WAPA) operating in Kano to make provision for Muslim pilgrims' financial arrangement (Hanga, 1999; Hashim and Meagher, 1999). It was not by accident that WAPA was located in Fagge, an area that has been historically and intimately linked with the development of informal cross-border trading networks (in this case, the trans-Saharan trade). Even though WAPA now ceases to exist, the area of Fagge where financial exchange services take place is known as Wapa.

The third event is the extensive and comprehensive financial sector reforms as a result of the introduction of SAP in the country. It started with the establishment of a two-tier foreign exchange market in 1986. Government controlled the first-tier while the second-tier was market-determined. The former was eliminated in 1987 leaving single-tier market determined foreign exchange market. To enlarge the formal foreign exchange market the three players (Banks, Government, and the Informal financial operators) were merged as Bureau de Change in 1989. Banks were also allowed to open foreign currency denominated accounts (domiciliary accounts) for individuals and institutions. Also, The People's Bank with branches across the country was introduced in 1989.

In 1991 the Nigeria Deposit Insurance Corporation (NDIC), and Community Banks were established while the Nigeria Export Import Bank (NEXIM) began operations the same

year. “Finance companies which predated the reforms but existed in the informal financial market gained recognition” (Hashim and Meagher, 1999:9) the same year and were licensed. Although “the main thrust of the foreign exchange markets and institutions created under SAP reforms is the elimination of the informal currency markets such as Wapa” (Hashim and Meagre, 1999:10) the reverse happened. Wapa today remains visibly transformed as a result of growth in the volume of transactions as well as increase in the diversity of currencies traded.

3.1.3.5 Transport

The complex travel demands of Kano in the various stages of its growth have been catered for in different ways. Throughout its pre-colonial days travel within Kano or between Kano and other settlements was either on foot or animals (horses and camels). The European trading companies that came before British colonial administration introduced steam ships on the Niger and Benue waterways but this did not affect Kano much. It was the link between Kano and Baro by rail in 1911 and subsequently between Kano and Lagos in 1912 that dramatically affected Kano. The rail extension from Kano to Nguru in 1930 only further consolidated Kano as an economic centre of the former Northern Region. Within Kano metropolis, however, railway sidings were developed, first to service the fledgling CBD and the groundnut evacuation centre around Kofar Mazugal and later, to service the new industrial area in Bompai. Indeed, it is not by accident that later industrial developments (Sharada and Challawa) were located along the railway transport spine that traversed Kano.

A Royal Air Force airfield created in 1936 to cater for the West Africa Frontier Force (WAFF) eventually grew to a full-fledge airport and later renamed Mallam Aminu Kano International Airport (MAKIA) making it the oldest airport in Nigeria. After the 2nd world war it became the centre for the airlift of Muslim pilgrims from all over West Africa. It is now used for military purposes as well as for international and domestic flights.

Although modern road development was introduced much later than rail and air transports it is more comprehensive in its coverage. Road transport linkage between Kano and other settlements in Nigeria and Niger also contributed to Kano's position as an economic centre. Although the present-day Kano state no longer shares borders with Niger Republic it has direct road link (not through another state capital) to that country through at least two routes. Notable among these are Dambatta–Kazaure–Daura, and Minjibir–Babura routes.

Kano is similarly directly connected by road (without passing through another state capital) to Bauchi, Gombe, Jigawa, Kaduna, Katsina, Plateau, Yobe, and Zamfara states. Notable routes include:

Wudil-Birnin Kudu-Ningi-Bauchi,

Wudil-Birnin Kudu-Darazo-Gombe,

Wudil-Birnin Kudu- Darazo-Damaturu,

Wudil-Gaya-Dutse.

Bichi-Kankiya-Katsina,

Gwarzo-Malumfashi-Funtua-Gusau,

Kura-Kwanan Dangora-Zaria-Kaduna, and

Kura-Bagauda-Tudun Wada-Saminaka-Jos.

Together, these connections make Kano very accessible and a focal point in Nigeria.

Of equal importance is the available transport within the Kano region (Kano and Jigawa states), Kano State, and Kano metropolis. There are road links to all Local Government Area (LGA) headquarters in the Kano region with only a very few LGAs connected by rail courtesy of the Kano-Nguru rail extension (Isa and Liman, 2014). As a result of the road links commercial transport services, on a daily basis, have evolved catering for the transportation of people and goods within the region. Thus, commercial transport services are also available to all LGA headquarters in Kano State. Rail service within the region is still erratic.

Commercial transport service within Kano metropolis also evolved gradually and, in part, as a complement to other transport modes linking Kano with the wider world. As a result of the introduction of the rail and air services came the need for transport from the spatial receptacles created by them (railway station and airport) to destinations in Kano metropolis. Taxi services began in response to these demands and later evolved to cover wider areas of the metropolis. Bus services began as a link with the AMR market and the Bompai industrial area and later evolved to cover wider areas of the metropolis (for details see Isa and Liman, 2014). The need for door-to-door transport service coupled with the inaccessibility of many areas in the metropolis due to rapid and uncontrolled development gave birth to the “Achaba” (two-wheel motor cycle service) but is currently

stopped due to security reasons. In its place came the safer and more acceptable "a daidaita sahu" (three-wheel motor cycle service).

A radical transport development is going on introducing over-head bridges and under-passes at strategic places in the metropolis in addition to the dualised roads and the introduction of formal bus system and light rails in the metropolis. These would make the metropolis more vibrant as activities would flow faster to create a new urban rhythm.

3.2 RESEARCH METHODS

3.2.1 Research Design

This research is an attempt at advancing fundamental knowledge of industrial development in a metropolis situated in a largely agrarian region. It is a basic research and explanatory in nature (Neuman, 2003:23 & 29) rooted in the positivist approach that sees social science as "an organized method for combining deductive logic with precise empirical observations of individual behaviour in order to discover and confirm a set of probabilistic causal laws that can be used to predict general patterns of human activity" (Neuman, 2003:71). The research employs the survey approach (Bryman, 2004) and the industrial establishment is the unit of analysis.

The first stage involved data collection about industries at two levels. The first level involved data collected from national and state sources. Such general data collected at this level form the baseline data for this study. The second level involved data collected at individual industry level from documented sources to determine the industry groupings

using the ISIC codes (in line with Table 2.1). One key purpose of the codes is to standardize data collection and promote international comparability.

The second stage was devoted to the conduct of the survey proper which involved the collection and collation of data for subsequent analysis to achieve the remaining objectives of the study. Descriptive statistics were used to summarize the data and some of the results were illustrated with maps and diagrams.

3.2.2 Types and Sources of Data

In order to achieve the stated objectives of this study data were derived from secondary or documentary and primary sources. This study is interested in both functioning and closed manufacturing industries in Kano metropolis.

3.2.2.1 Documentary Sources

Data from this secondary source formed the baseline information from which subsequent primary data collection and analyses were derived. Documented data remain useful as available records on surviving and closed industries which complement primary data. Such documented data was collected from three broad sources. The first is the Industrial Directory of the Federal Republic of Nigeria (2005) which contains a listing of industries in all states of the federation. From the listing for Kano state 118 industries were supposed to be located in Kano metropolis. The second source is from records kept by the Manufacturers Association of Nigeria (MAN), as well as its publications (at the national and state levels). Information from these sources (such as year of establishment, year

industry closed, products manufactured, ownership etc) was used to update the data so collected from the first secondary source. Although membership of MAN is voluntary the association has 337 industries registered. Some industries have registered with MAN and so are captured in MAN's publications and at the same time have registered with the Industrial Directory. Other industries only registered with either MAN or the Industrial Directory. Thus, out of the 118 industries picked out from the Industrial Directory, 75 are also captured in MAN's publications leaving out 44.

The third secondary sources included data acquired from libraries, the Internet, as well as any other spatial and attribute data on industrial estates (cadastral maps & satellite images of study area) in Kano metropolis. In particular, the Internet remains an important source on the ISIC codes. MAN uses divisions from ISIC revision 2 codes (first published 1968) while the Industrial Directory of Nigeria (2005) uses classes from ISIC revision 3 Codes (first published 1989). This study adopts ISIC revision 4, which is the most current classification scheme. Collectively data from these sources provided the background information on industries in Nigeria generally and Kano metropolis in particular. In addition, they state the condition of the industries (whether closed, comatose, or surviving) and enabled the determination of the industry groups.

3.2.1.2 Primary Data Source

The primary data used in this study were derived through the administration of structured questionnaire on owners of industrial plants (or their appointed representatives) and the conduct of personal interviews. Data sought through this medium included additional

background information on the firm, data on the input-output structure, ownership structure, and product structure of the firms (see Appendix I). Some of the data derived directly from industries in the study area such as line of activity, location, year of establishment and status of establishments (single plant, branch plant, or subsidiary plant) only served to complement information already collected from documented sources earlier mentioned.

Data on raw material source (within Kano, within Nigeria, Outside Nigeria), types of raw materials (primary, processed, and manufactured), labour force (management, skilled, unskilled, foreign, indigenous, male, female), operating cost, raw material cost, labour cost, land costs, as well as input costs (as a % of total cost of production), and line of activity form the basis of an examination of the input-output structure of industries in Kano metropolis. While the product type (consumer, intermediate, capital goods) forms the basis of an examination of the product structure, ownership types (foreign, indigenous, government, joint) form the basis of an examination of the ownership structure of industries in Kano metropolis.

Location (which estate an establishment is found), access to land (direct government allocation, leased from someone), and available infrastructure (water, electricity, banking, health, telephone, postal) together form the basis of an examination of the spatial structure of industries in Kano metropolis.

3.2.3 Sampling and Administration of Research Instruments

Conventionally, industrial development in Kano metropolis had been carried out in industrial estates. Now there is growing freedom for industries such as the Seven-up Bottling Company along Zaria Road, and at one time on the outskirts of Kano metropolis, to locate where they so choose. The industrial estates did not come about at the same time and so some are as a result of the pressure of demand for industrial plots at the height of the industrial developments in Kano metropolis. The industries located in the industrial estates and those outside but in Kano metropolis (whether surviving or closed) together make up the sampling frame.

Looking at Kano Urban Planning and Development Agency (KNUPDA) layout plans of industrial estates in Kano metropolis it is easy to conclude that there are 1,200 industries in Kano metropolis (Liman, 2011, Table 2, p.16). For some reasons, most industries occupy more than one industrial plot! Then again, a few industries had located there (bought farmlands and registered their holdings) before the entire area was regularized as an industrial estate. At any rate, industrial landmarks of Kano in 1994 indicate 216 industries (Ajayi, 2007:147). As a result, rather than accommodate 1,200 industries, the industrial estates accommodate only 337 industries. Together with the 44 industries located outside the estates there are 381 industries (whether closed or working) in Kano metropolis (Table 3.3).

Table 3.3: Distribution of Industries in Kano metropolis

Industrial Zones	Location of Industries	Closed	Working	Totals	Samples Expected	Returned
Bompai	Bompai	80	38	118	12	6
Zone	Tokarawa	29	26	55	5	2
	Outside estate	11	20	31	3	3
Challawa/	Challawa	21	26	47	5	2
Sharada	Sharada 1	20	17	37	4	3
Zone	Sharada 2	32	18	50	5	5
	Sharada 3	18	12	30	3	3
	Outside estate	9	4	13	1	1
Totals		220	161	381	38	25

Compiled from: Federal Republic of Nigeria, (2005), Manufacturers' Association of Nigeria (2009), Manufacturers' Association of Nigeria (2010)

The ease with which the industries close in one year and operate the next year, and vice-versa, makes them epileptic and so a sample of 10% of all the industries in Kano metropolis was taken which came to 38 industrial establishments as shown in Table 4.1. But as can be seen in Table 4.1 the industries are not uniformly distributed across the industrial estates in their number (and assumedly not in size). Thus, a stratified sampling which "enables one to obtain proportional representations of the different categories within a population" (Neuman, 2003; Okoko, 2000:24) was employed. According to Neuman (2003:152), "In stratified sampling, a researcher first divides the population into sub-populations (strata) on the basis of supplementary information". In effect, the industries were stratified by zone, each of which was further stratified into the various sub-strata as shown in Table 4.1. Selection was then made randomly from each industrial zone (by estate subgroups and outside estate subgroups), in direct proportion to the number of industries, in order to obtain the 10% that make the respondents for this study as indicated in Table 4.1. In the end, 28 of the 38 copies of questionnaire distributed were completed and returned. However, on scrutiny 3 of these had to be discarded as they

contained little or no data and therefore impossible to use them. The 25 completed copies of questionnaire received (10 from BIZ and 15 from CIZ) changed the confidence level to 19% and represent an acceptable success rate of 65.8%.

The data gathered generally focus on

1. background and general information on industries that tell how well they are doing.
2. input factors such as raw materials, labour, costs, and infrastructure
3. output of industries that enable a categorization of the industries into industry groups (using a 4-digit ISIC code), their production capacity as well as product linkages
4. perceptions of the industries regarding the relative importance of the three factors to their activities
5. industries' self-assessment on steps being taken to survive

3.2.4 Methods of Data Analysis

3.2.4.1 General Descriptive Statistics

The data collected from the survey was analysed using a number of statistical techniques while recognizing the different levels of analyses at the same time. The analyses at the metropolitan level was sectoral and aggregative. In other words, both existing and closed industries were grouped according to the ISIC code (objective 1) and analyzed according to industry groups. The Minitab 15 statistical package was used for the analysis of means (ANOM) while the SPSS package was used for all other calculations and statistical analysis throughout this work.

This is followed by an examination of the macroeconomic policies operating in Kano metropolis and specific policy instruments affecting individual industries. Together, they give an indication of the contributions of macroeconomic factors to industrial development in Kano metropolis or otherwise. Subjecting the above to the Analysis of Means (ANOM) indicates whether the introduction of SAP has effect on industrial performance in Kano metropolis (objective 2).

The analysis at the individual industry group level mainly involved descriptive statistics that focused on the characteristics of the industries, analysis of the input factors, analysis of the outputs (the capacity to produce and the actual production) and perception analysis (of the relative importance of endowment factors and infrastructure to the industries). These reveal the structure of the industries as well as the linkages between existing industries in Kano metropolis. Together with the number of collapsed industries an analysis of the outputs and production capacity, establish the fact of poor industrial performance in Kano metropolis.

Further analysis of the production capacity and the actual industrial production over the years an industry has been in production tell a story of how the industry has been faring. At this stage the input-output structure matrix showing the origin and destination of the output of each industry (i.e. who produces what, with what input and used by whom) reveal the linkages between existing industries in Kano metropolis and outside. The input-output structure matrix assumes that the product of an industry is either consumed by it, another industry or to the final consumers (government, households, or export).

This is complemented by an analysis of the capacity utilization of respondent industries in Kano metropolis.

In effect, this analysis reveals

a) the nature, strength and direction of inter-industry linkages by showing the extent to which the industries in Kano metropolis depend on each other, or other industries in the country and sources outside the country.
b) How industries are struggling to re-invent themselves in the face of the various factors affecting them.

3.2.4.2 Likert-type Scale

A Likert-type scale was employed to measure perceptions of industrist to a number of factor items. The average of the scores on a particular factor item divided by the total possible scores indicates the strength of the factor item in question. Similarly, the Likert-type scale was used in Endogenous Factor Scoring to determine the entrepreneurship of the individual industries.

3.2.4.3 Test of Hypotheses I and II

Hypotheses one and two were tested using ANOM. The ANOM provides a "confidence interval type of approach" and is "more sensitive than a chi-square test in detecting a few extreme deviations from the average" (Ryan, 2011:594). It allows one to determine which, if any, of the identified groups has a mean significantly different from the overall average of all the group means combined. Although initially used for means, target

values, and Factorial designs it is now applied to proportions and count data (Ryan, 2011). Thus, the main advantages of ANOM are that if any of the treatments are statistically different it indicates exactly which ones are different and in a graphical form (Balakrishnan, 2013): as a matter of fact, both the magnitude and the direction of the effects are easily discernible from the plots. For count data the decision lines are obtained from

$$\bar{c} \pm h_{;,k,:} \sqrt{\bar{c}} \sqrt{\frac{k-1}{k}}$$

Where

$\bar{c}$ is the average of k "counts" (e.g. number of closures)

For a given value of ;(0.05 in this study), $h_{;,k,:}$ is obtained with the use of *Nelson's h statistic* which is a table of critical values (see Appendix II)

3.2.4.4 Test of Hypothesis III

The third hypothesis was tested using a 3-way Analysis of Variance (ANOVA), a technique useful in situations where there are more than two arithmetic means to compare in order to assess the contribution made by each separate factor to the total variability of a set of data. Generally, this is symbolically represented as follows:

$$S^2 = \frac{\sum\left(X_i - \bar{X}\right)^2}{N}$$

This, in a 3-way ANOVA (factorial analysis of variance) is decomposed to

$SS_T = SS_R + SS_C + SS_L + SS_{RC} + SS_{RL} + SS_{CL} + SS_{RCL} + SS_W$ (Sambo, 2008, pp. 474 -502).

Thus, the row sum of squares plus the column sum of squares plus the layer sum of squares plus the interaction effect (row-col, row-lay, col-lay, and row, column and layer) plus the sum of squares within together make up the total sum of squares. The approach involves deriving the F-ratio to compare the mean values from the three different factors by testing the following hypotheses:

$H_{0rc} : \mu_{.rc.} - \mu_{.r..} - \mu_{.c.} + \mu = 0$ --- for Endogenous factors

$H_{0rl} : \mu_{.r.l} - \mu_{.r..} - \mu_{..l} + \mu = 0$ --- for Endowment factors

$H_{0cl} : \mu_{.cl} - \mu_{.c.} - \mu_{..l} + \mu = 0$ --- for Macroeconomic factors

$H_{0rcl} : \mu_{.rcl.} - \mu_{.rc.} - \mu_{.rl} - \mu_{.cl} + \mu_{.r..} + \mu_{.c.} + \mu_{..l} - \mu = 0$

Labour costs; managerial costs; raw materials costs; generating set & fuel costs; costs of water supply; security costs; installed capacity of industry; current production capacity; transport for employees are the variables to be used as endogenous factors in this analysis.

The variables to be used as endowment factors in this analysis include quantity of material inputs from industries located in Kano; quantity of material inputs from elsewhere in Nigeria; water; and labour while electricity; taxes; foreign exchange costs; interest rates; and import duty are the variables to be used as macroeconomic factors in this analysis.

CHAPTER FOUR

INDUSTRIAL GROWTH IN KANO METROPOLIS AND THEIR ISIC GROUPINGS

4.1 INTRODUCTION

This chapter, and the next, is about processes known as layering (industrial mix, or mix of firms or firm population dynamics), conversion, and recombination in Path Dependence. Layering refers to the changing mix whereby additional industries are created or added to the existing pool either as spin-offs of the existing industries or as new ventures. Conversion refers to the ongoing innovation by firms - in terms of new products, techniques, business organisation and the like – in response to market opportunities, competitive pressures, knowledge spillovers and similar stimuli (such as macroeconomic policy provisions). Layering and conversion processes frequently co-exist and interact. In Recombination the idea is that any structure is in effect a system of resources and properties that can be recombined and redefined, in conjunction with new resources and properties, to produce a new structure. In effect, options not taken become 'paths not taken' that can serve as resources of knowledge, experience and competences that, under certain circumstances, can be redeployed or rejuvenated to support alternative developments (see Martin, 2009:21-25).

The analysis in terms of the industrial mix reveals the dynamics and is focused on establishment of industries, distribution of the industries, their ownership as well as their nature by ISIC code divisions and classes. These distributions in pre-SAP and SAP periods

show how industries in Kano metropolis in particular are affected by the macroeconomic policies operating in the country.

4.2 NATURE OF INDUSTRIES IN KANO METROPOLIS

4.2.1 Establishment of Industries in Kano metropolis

The establishment of industries in Kano metropolis dated back to the 1940s with P. S. Mandrides as the only industry on ground. W. J. Bush & Co. Ltd. and Northern Enamelware Co. Ltd. were later established in the 1950s. By the end of the Nigerian Civil War 4.5% of the industries had been established.

Table 4.1: Establishment of Industries in Kano metropolis

Location of Industries	1940s	1950s	1960s	1970s	1980s	1990s	2000s	2010s	ni	Totals
Bompai	1	2	11	30	30	30	12	0	2	118
Tokarawa	0	0	0	8	17	18	10	0	2	55
Outside estate	0	0	0	4	8	12	6	0	0	30
Challawa	0	0	1	4	12	15	11	0	4	47
Sharada 1	0	0	1	9	5	10	3	0	9	37
Sharada 2	0	0	1	9	7	13	4	1	16	51
Sharada 3	0	0	0	3	11	10	2	0	4	30
Outside estate	0	0	0	4	1	6	2	0	0	13
Totals	1	2	14	71	91	114	50	1	37	381

Key: ni = not indicated
Source: Fieldwork, 2012

The oil boom of the 1970s marks the beginning of the period of dramatic growth as can be seen in Table 4.1. This started with the establishment of additional 18.6% of the industries which was followed by another 23.8% in the 1980s. The peak was reached in the 1990s with the addition of 29.9% of the industries which brought the number of industries

established in Kano metropolis then to 293. In the 2000s 13.1% of the industries were established and another 0.3% was added in the 2010s. The years when 9.7% of the industries were established could not be ascertained by this writer.

4.2.2 ISIC (revision 4) Classification of Industries in Kano metropolis

Classification of the industries in Kano metropolis into the ISIC (revision 4) codes was done based on their outputs. On this basis, 0.5% of the establishments located on the estates do not belong to category C and therefore are not manufacturing industries (see Appendix III). An additional 6.3% of the industries could not be properly classified because of incomplete information to enable a determination of their divisions and/or classes. The remaining 93.2% of the industries are classified into 20 out of the 24 divisions of ISIC (Revision 4) as in Table 4.2

Division 22 (Manufacture of rubber and plastics products), ranks highest, accounting for 20.7% of industries in Kano, followed by division 10 (Manufacture of food products) accounting for 11.3% and division 15 (Manufacture of leather and related products) accounting for 10.2%.

The divisions not found in Kano metropolis include manufacture of tobacco products (division 11); wearing apparels (division 14); wood and products of wood and cork (except furniture), straw and plaiting materials (division 16); and repair and installation of machinery and equipment (division 33). (See details of the various ISIC (revision 4) divisions, groups, and classes in Appendix IV).

Table 4.2: ISIC (Revision 4) Codes for Industries in Kano Metropolis

	Bompai Zone			Challawa/Sharada Zone						Industrial Mix	
Divisions	Bompai	Tokarawa	Not on Estate	Challawa	Sharada 1	Sharada 2	Sharada 3	Not on Estate	Totals	ISIC Code (Revision 4) Classes	Ratio
10	17	6	2	2	4	7	4	1	43	1010; 1040; 1061; 1071; 1072; 1073; 1079, 1080; 10xx	9:14
11	1	0	0	3	2	1	0	2	9	1103; 1104	2:4
13	16	1	2	2	0	3	1	0	25	1311; 1312; 1391; 1392; 1393; 1399	6:8
15	4	5	0	18	5	3	5	0	40	1511; 1520	2:3
17	6	1	2	1	1	2	1	1	15	1701; 1702; 1709	3:3
18	5	1	5	0	2	0	0	1	14	1811	1:3
19	2	0	0	1	0	0	1	0	4	1920	1:2
20	11	3	5	2	3	0	2	0	26	2012; 2013; 2021; 2022; 2023; 2029	6:8
21	4	2	1	0	0	0	0	2	9	2100	1:1
22	22	13	4	8	11	12	8	1	79	2211; 2219; 2220	3:3
23	2	0	0	2	0	4	1	0	9	2310; 2391; 2393; 2395	4:8
24	4	4	0	1	0	2	1	0	12	2410; 2420; 24xx	3:4
25	4	3	0	2	3	4	1	0	17	2511; 2512; 2592; 2599	4:8
26	0	0	0	0	0	1	0	0	1	2610	1:9
27	0	1	0	2	0	1	1	0	5	2720; 2732	2:8
28	0	1	1	2	1	2	0	2	9	2817; 2821; 2829; 28xx	4:16
29	6	1	1	0	2	0	0	1	11	2910; 2920; 2930	3:3
30	1	3	4	0	0	0	0	0	8	3091; 3092	2:8
31	5	3	1	1	3	2	2	0	17	3100;	1:1
32	0	0	1	0	0	0	0	1	2	3250	1:7
Totals	110	48	27	47	36	44	28	12	355		

Source: Fieldwork, 2012

Some industries produce more than one product such as in the manufacture of vegetable and animal oils and fats (class 1040) and at the same time animal feeds (class 1080). There are others whose products do not belong in the same division and these, (6 industries) are, all the same, classified into the first of the two divisions they belong to as shown in Table 4.2 and distributed according to the zones and estates they are found.

4.2.3 Industrial Mix in Kano metropolis

There are, in addition, other industries accounting for 1.0% (2 in Div 10, 1 in Div 24, and another 1 in Div 28) that could not be classified beyond the division level due to insufficient data on them. These are denoted by "xx" as the last two digits in Table 4.2. Nonetheless, a picture of the industrial mix emerges showing areas of strengths and weaknesses. The column labeled "Ratio" shows the number of classes found in Kano metropolis on the left against the total number of classes in the division. Thus, for instance, although manufacture of food products ranks second in numbers it is weak in product mix with only 64.3% of the classes established. Other more glaring cases include manufacture of other non-metallic mineral products (Division 23), manufacture of electrical equipment (Division 27), manufacture of machinery and equipment – not covered elsewhere (Division 28), manufacture of other transport equipment (Division 30), and other manufacturing (Division 32).

Some of the principles of industrialism could not be applied to the data in hand due to insufficient details. However, the weakness of the industrial mix in Kano metropolis is better seen in terms of the principles of concentration and maximization which together require fewer but larger industrial formations. Looking at Table 4.2 still, one finds that, on

the one hand all the industry classes of divisions 17, 21, 22, 29, and 31 are found in Kano metropolis. On the other hand, there is only 1 industry class for Divisions 21 and 31 with 17 industries in the latter competing with each other. Divisions 17, 22 and 29 have 3 classes each and 15, 79, and 11 industries respectively. Each of these five divisions (17, 21, 22, 29, 31) could have been more efficient with far less number of industries.

Indeed, some of the industry classes for the remaining divisions are not to be found in Kano metropolis. Despite this lack of spread, with the exception of divisions 19, 26 and 32, all the others suffer from the kind of over-capacity mentioned above. Although competition is a necessary feature of capitalism, unnecessary or needless competition is counter-productive.

In Kano metropolis only 4 industry divisions (manufacture of food products, leather and related products, rubber and plastic products, and furniture) can be said to be about normally distributed spatially. In fact, on the one hand, there is over capacity for manufacture of food products and therefore a need to cut down the number of industries or diversify them. On the other hand, the distribution of manufacture of leather and related products, and rubber and plastic products is skewed in favour of Challawa/Sharada zone. While it is a deliberate policy in terms of leather and related products, there is no such policy on rubber and plastic.

4.2.4 Ownership pattern of Industries

The industries in Kano metropolis can be classified by ownership as can be seen in Table 4.3. The majority of industries - 79.3% – are owned by individuals. However, while 33.9%

of the industries belong to individual Nigerians 45.4% belong to individual foreigners. The latter is dominated by Lebanese who account for 33.3% followed by the Chinese (5.5%), Indians (4.2%), the Sudanese (1.6%) while British, Italian, and Pakistani ownership accounts for 0.3% each.

Table 4.3: Ownership of Industries in Kano Metropolis 1940 to 2010

Location of Industries	Kano State	Individual Nigerians	Individual Foreigners	Nigerians/ Nigerians	Multi-Nationals	Nigerians/ Foreigners	ni	Totals
Bompai	0	32	67	1	1	3	14	118
Tokarawa	0	15	29	0	0	2	9	55
Outside estate	0	19	4	0	0	1	7	31
Challawa	0	16	22	0	1	1	7	47
Sharada 1	0	17	11	0	0	1	8	37
Sharada 2	1	11	26	1	0	2	9	50
Sharada 3	1	11	13	0	0	4	1	30
Outside estate	0	8	1	0	1	1	2	13
Totals	2	129	173	2	3	15	57	381

Source: Fieldwork, 2012

Industries that are jointly owned - 5.2% – are made up of 0.5% industries jointly owned by groups of Nigerians, 0.8% of industries owned by multinational organizations, and 3.9% industries jointly owned by a group of Nigerians and foreigners. The latter is again dominated by the 2.6% industries in Nigerians/Lebanese ownership followed by 0.5% industries in Nigerians/Indians ownership, and 1 0.3% industry each in Nigerians/German, Nigerians/Ghanaian, and Nigerians/USA ownership.

Only 0.5% of the industries are in Government ownership although ownerships of 15% of the industries were not indicated. Therefore, the industrial manufacturing sector in Kano metropolis is dominated by foreign-owned firms and not necessarily transnational firms as held by Egbon (1995:vi).

4.3 EFFECT OF MACROECONOMIC POLICIES ON INDUSTRIAL PERFORMANCE IN KANO METROPOLIS

The effects of Nigeria's macroeconomic policies on industrial development in Kano metropolis can best be seen in terms of what happened in pre-SAP and SAP periods. These are viewed in terms of establishments and closures of industries, industrial mix, and ownership.

4.3.1 Establishments and closures of industries in Kano metropolis

The SAP period remains unique as can be seen in Table 4.4 which shows the paradox of Establishments and Closures of industries in Kano metropolis where 34.6% of the industries were established in pre-SAP days and 55.6% were established during the SAP period. Similarly, only 0.3% experienced closure in pre-SAP days while 57.5% experienced closure during SAP! That SAP accounts for the highest births and closure remains unique to Nigeria and suggests other equally, if not more, important factors at play. For instance, there are claims that with the introduction of SAP establishing manufacturing industries was one of the few ways of getting foreign exchange and some industries were established to get foreign currency at government rate which were sold in the parallel market at profit rates (see Olukoshi, 1996). Thus, many Nigerian entrepreneurs only take

advantage of government policies that make access to resources (land, foreign exchange, or inputs) easier, which they divert to uses other than what they were approved to be used for.

Table 4.4: Establishments and closures of industries in Kano metropolis 1940 to 2010

Industries Established	Bompai	Tokarawa	Not on Estate	Challawa	Sharada 1	Sharada 2	Sharada 3	Not on Estate	Total
1940 – 1969	14	0	0	1	1	1	0	0	17
1970 – 1984	48	14	4	12	11	12	9	5	115
1985 – 2010	54	39	26	30	16	22	17	8	212
Not indicated	2	2	0	4	9	16	4	0	37
TOTAL	118	55	30	47	37	51	30	13	381
Closures									
1970 – 1984	0	0	0	0	0	1	0	0	1
1985 – 2010	80	29	11	19	16	19	12	9	195
Not indicated	0	0	0	2	4	12	6	0	24
TOTAL	80	29	11	21	20	32	18	9	220

Source: Fieldwork, 2012

Table 4.5 presents industry closures and survivals in terms of the ISIC code divisions of the industries. A cursory look through the table reveals that 65% of the industries have higher number of closed industries than functioning ones. Secondly, the number of closed rubber and plastics industries is greater than the totals (closed and working) of the other industries except Food products (division 10) and Leather and leather products (division 15). Thirdly, of all the industry groups with a total of 19 or greater only division 22 (manufacture of rubber and plastics) has more industries functioning than those closed. All these either suggest the use of industries for acquiring foreign exchange at government rate as suggested above and/or over-capacity and unnecessary competition.

Table 4.5: Status of Industries in Kano Metropolis by their ISIC Codes (Revision 4)

ISIC Divisions	Industry Classes Closed Classes	No.	Industry Classes Working Classes	No.	Totals
10	1010; 1050; 1061; 1071 1072; 1073; 10xx	31	1040; 1061; 1073; 1079;	12	43
11	1103; 1104	6	1104;	3	9
13	1311;	15	1311; 1312; 1391; 1392; 1393; 1399	10	25
15	1511; 1520	21	1511; 1520;	19	40
17	1701; 1709	8	1701; 1702; 1709;	7	15
18	1811	4	1811;	10	14
19	1920;	1	1920;	3	4
20	2012; 2013; 2021; 2022; 2023; 2029	15	2012; 2013; 2021; 2023;	11	26
21	2100	3	2100;	6	9
22	2211; 2220	37	2219; 2220;	42	79
23	2310; 2391; 2393; 2395	6	2395;	3	9
24	2410; 2420; 24xx	7	2410; 2420;	5	12
25	2512; 2599;	13	2511; 2512; 2592;	4	17
26	-	0	2610	1	1
27	2720; 2732	3	2710; 2732;	2	5
28	2817; 2821; 2829; 28xx	6	2821; 2822;	3	9
29	2910; 2930	6	2910; 2920; 2930;	5	11
30	3092	2	3091; 3092;	6	8
31	3100;	12	3100;	5	17
32	3250	2	-	0	2
Sub-Totals		198		157	355
Unclassified	99xx	22	99xx	2	24
Not Industries	-	0		2	2
Totals		220		161	381

Source: Fieldwork, 2012

4.3.2 Industrial mix in Kano metropolis by Macroeconomic Policy Periods

One other important thing about the distribution of manufacturing industries in Kano metropolis is the period when the different classes of the same group of industries emerged thereby giving an idea of the progress made in those categories of industries. Indeed, Industrial mix in Kano metropolis is also governed by pre-SAP policies and SAP policies. Thus, Table 4.6 reveals that 5 divisions (13, 17, 23, 24, and 26) have benefited more from the pre-SAP policies (i.e 1970 – 1984), while 13 divisions (10, 15, 18, 19, 20, 21, 22, 25, 27, 28, 30, 31, and 32) have benefited more from the SAP policies (i.e 1985 – 2010). The new industrial classes added are underlined and in bold while the column "pre-SAP/SAP ratio" shows that except for Food products (division 10) where two additional classes emerged all the others can only boast of an increase of one class, if at all. Thus, the SAP period is slightly better than the preceding period as it has added no less than 10 new industrial classes.

However, on comparison between Tables 4.5 and 4.6 only 5 divisions have higher number of industries working than closed and 7 out of 10 of the new industrial classes have closed. In addition to confirming (as Table 4.4 shows) that there is more change in overall numbers than in the addition of classes the fact that all the class "xx" emerged during SAP period lends credence to the thinking that much of the growth in this period is unrelated to manufacturing activities as suggested earlier.

Table 4.6: ISIC (Revision 4) Code Classes for industries in Kano Metropolis

Divisions	1940s -1960s	1970s – 1984	1985 – 2010s	Totals	Pre-SAP – SAP ratio
10	1040; 1073; 1080	1040; 1061; 1071; 1073; 1079; 1080;	**1010**; 1040; 1061; **1072**; 1080; 10xx	43	7:2
11		1104;	**1103**; 1104;	9	1:1
13	1311; 1399;	1311; 1312; 1391; 1393;	**1392**;	25	5:1
15		1511; 1520;	1511; 1520;	40	2:0
17	1702;	1701; 1709;	1701;	15	3:0
18	1811;	1811;	1811;	14	1:0
19		1920;	1920;	4	1:0
20	2013; 2023;	2021; 2023; 2029;	2012; 2013; **2022**; 2023;	26	5:1
21		2100;	2100;	9	1:0
22		2211; 2220;	**2219**; 2220;	79	2:1
23		2310; 2391; 2393; 2395;		9	4:0
24		2410; 2420;	24xx;	12	1:0
25	2512; 2599;	2512; 2592; 2599	**2511**;	17	3:1
26		2610;		1	1:0
27		2720; 2732;	2732;	5	2:0
28	2821;	2817; 2821;	2821; **2829**; 28xx;	9	3:1
29	2920;	2910; 2930;		11	3:0
30		3092;	**3091**;	8	1:1
31	3100;	3100;	3100;	17	1:0
32			**3250**;	2	0:1

Source: Fieldwork, 2012

4.3.3 Industrial Ownership in Kano metropolis

In terms of ownership however, the 1978 Indigenization Decree has been more favourable to foreign ownership which it sought to discourage but has encouraged joint Nigerian/Foreign ownership. Thus, Table 4.7 shows that despite the Indigenization Decree foreign ownership rose from 3.1% to 14.7%) while Nigerian ownership rose from 0.3% to

8.4%. However, despite SAP foreign ownership rose to 24.1% and Nigerian ownership rose to 21.8%.

Table 4.7: Ownership of Industries in Kano metropolis

Industries Established	Kano State	Individual Nigerians	Individual Foreigners	Nigerians/ Nigerians	Multi-Nationals	Nigerians/ Foreigners	ni	Totals
1940s – 1960s	0	1	12	0	0	0	4	17
1970s - 1984	1	32	56	2	2	9	13	115
1985 – 2000s	0	83	92	0	1	5	31	212
Not indicated	1	13	13	0	0	1	9	37
Totals	2	129	173	2	3	15	57	381

Source: Fieldwork, 2012

4.4 TEST OF HYPOTHESES I AND II

4.4.1 Test of Hypothesis I

What has been revealed so far is the disturbing fact of a substantial number of industries that experienced closure since the shift in macroeconomic policy which led to the introduction of SAP. Indeed, a look back at Table 4.5 which shows the distribution of the industries in Kano metropolis according to ISIC (revision 4) classifications and also according to whether they are closed or working reveals that there is hardly any industry group that has not experienced closure to date and so a test of hypothesis I is done which states that some industry groups in Kano metropolis are more susceptible to declining performance or collapse than others. This is tested using ANOM.

The number of closures for the 20 divisions identified in Table 5.5 was fed into a Minitab 15 worksheet and the graph (Figure 4.1) is generated. The centre line is fixed at 9.9 representing the overall mean. While the upper decision limit (UDL) is at 19.17 the lower decision limit (LDL) is at 0.63

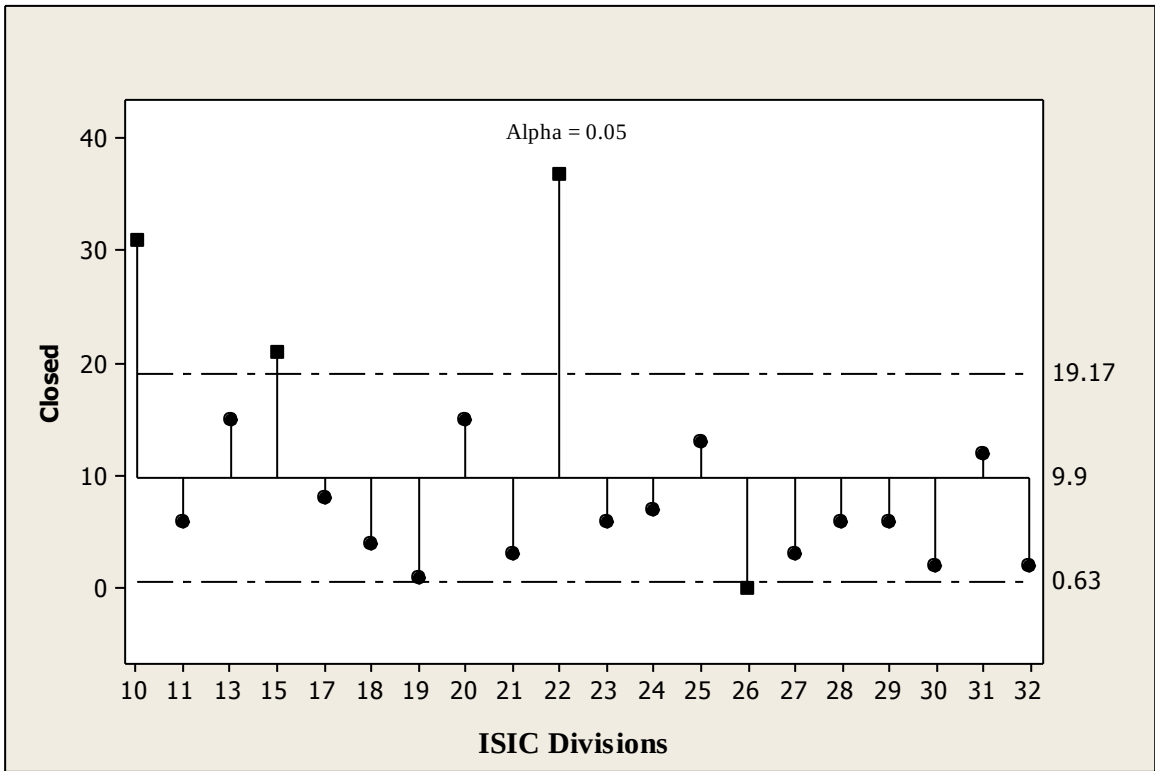


Figure 4.1: ANOM Display for Closed Industries by their ISIC Divisions in Kano

The graphic representation of the industry groups relative to the overall mean reveals that four divisions fall outside the UDL & LDL region. Therefore the H_o hypothesis is rejected meaning that some industries are more susceptible to collapse than others. Specifically, this implies that Divisions 10 (manufacture of food products), 15 (leather and related products), 22 (rubber & plastics products), and 26 (computer, electronic & optical products), despite their appeal, require more planning and skill to manage.

4.4.2 Test of Hypothesis II

The general opinion of industrialists is that SAP has been responsible for many of their woes including the declining performance of their industries. Indeed, Olukoshi (1996:17) says the result of the SAP was "immediate and drastic". Could the poor industrial performance be statistically associated to SAP? To resolve this nagging question the status of industries (whether closed or working) was tabulated by pre-SAP and during SAP as in Figure 4.2.

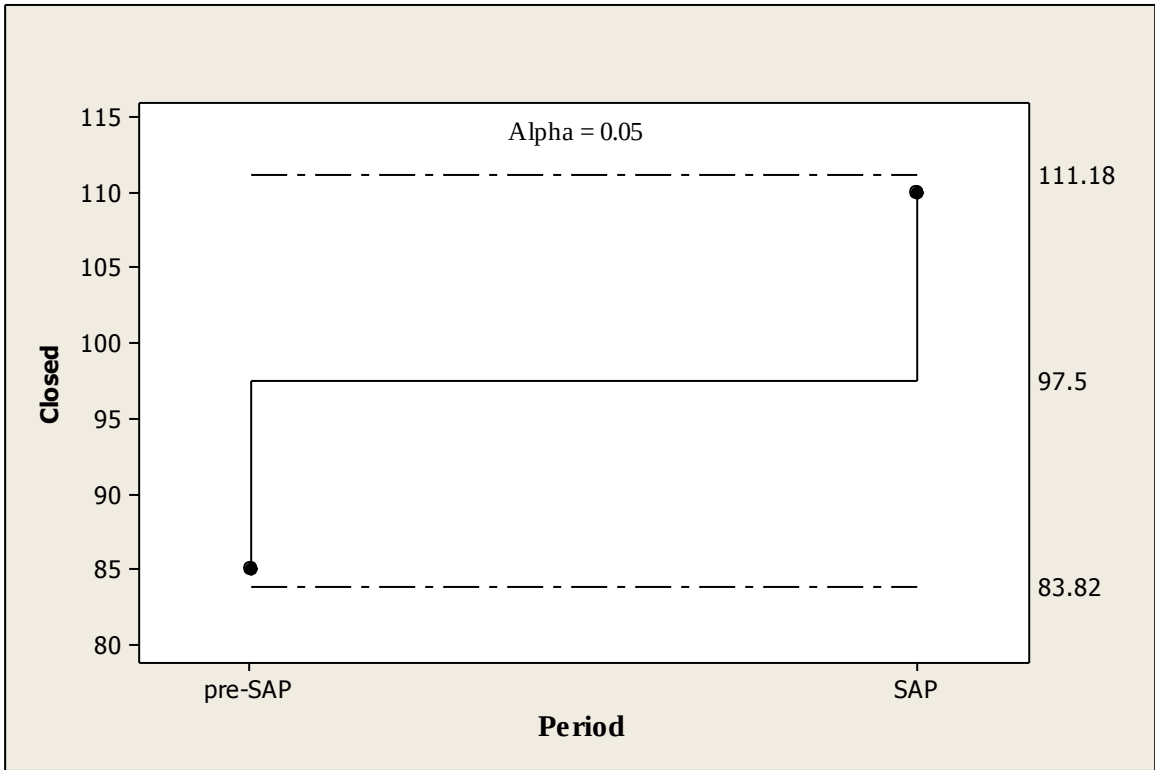


Figure 4.2: ANOM Display for Closed Industries by Period in Kano

The number of closures, this time, is 195 (51.2%) as 6.6% of the industries (25) did not indicate when they closed. Again, the data of closures by the period of closure was fed into a Minitab 15 worksheet and the graph (Figure 4.2) is generated. The centre line is fixed at

97.5 representing the overall mean. While the upper decision limit (UDL) is at 111.18 the lower decision limit (LDL) is at 83.82. The graphic representation of the closures relative to the overall mean reveals that no industry falls outside the UDL & LDL region. Therefore the Ho hypothesis that the proportion of industries that closed is independent of SAP is accepted meaning that, contrary to popular view, the closures are not statistically due to SAP!

4.5 DISCUSSIONS

The presentation in this chapter shows that there has been both industrial growth and decline in Kano metropolis. What remains unique is that both industrial growth and decline seem to be overwhelming in the same period. Comparing Tables 4.2, 4.5 and 4.6 gives a complete picture. Except for the two extremities – division 26 which is unaffected and division 32 which lost all, the rest is either a story of loss in number of industries, that of industry classes or both. This implies that something else is needed to retain the positive and reduce or eliminate the negative.

The Industrial mix in Kano metropolis, with only 5 divisions complete (4 divisions absent and 15 divisions incomplete), is less than satisfactory giving credence to the fact that Nigeria's industrialization is a superficial development with no real manufacturing taking place (Phillips, 1986). The impact of growth and decline on industrial mix in Kano metropolis also seem to be as a result of the SAP policies. The test of hypotheses however reveal that while different industry divisions may require skill and "dexterity" in handling, the closure is not necessarily due to SAP policies. This is in line with the finding that

whether in pre-SAP or during SAP macroeconomic policies have been largely abused and therefore ineffective in producing the desired results. Nature of ownership structure has not changed and industrial formations were used for other reasons other than to increase productions.

In general, only about half the industries in Kano metropolis can be considered committed industrialists giving credence to Adegbola's (1983:301) view that Nigeria's industrialization, especially the manufacturing sector, is still under-developed and "has a narrow base which cannot guarantee self-sustaining growth". The finding here is also in line with Soludo's, (2006:10) assertion that "While manufactures as percentage of total exports is about 40% in Indonesia, it is less than one percent in Nigeria".

CHAPTER FIVE
FACTORS AFFECTING THE GROWTH OF INDUSTRIES IN KANO METROPOLIS

5.1 INTRODUCTION

While the factors of industrial decline have been established in Chapter Four, this chapter looks at the pattern of industrial decline in Kano metropolis. In addition, it examines the implications of these on industrial growth in Kano metropolis in particular and Nigeria in general. The data in this chapter mainly comes from the questionnaire administered to the industries.

5.2 GENERAL CHARACTERISTICS OF RESPONDENT INDUSTRIES

5.2.1 Industrial plant and ownership structure

A total of 80% of the industries began with single plants which, as Table 5.1 shows, fell to 52.0%. Only 8.0% of the industries began their operations with two or more plants but this number rose to 44.0%. This in itself gives the impression that industries in Kano metropolis are progressing. In contrast however, industries that have R & D units declined from 68.0% initially to 56.0% at the time of this survey. Most of the industries indicated that they had Research and Development units when they took off but never made efforts to sustain them even though "today, knowledge and skills now stand alone as the only source of comparative advantage" (Thurow quoted in Soludo, 2006:26). Industrial research and general record keeping is one weak point of many establishments in Nigeria, generally and Kano specifically.

Table 5.1: Industrial plants of respondent industries from 1969 to 2010

At take-off							
Location of Industries	Plants				R & D		
	Single	Two or more	Not indicated	Total (Plants)	Yes	No	Total (R & D)
Bompai	5	0	1	6	5	1	6
Tokarawa	2	0	0	2	2	0	2
Not on Estate	1	1	1	3	2	0	3
Challawa	2	0	0	2	1	1	2
Sharada 1	3	0	0	3	2	1	3
Sharada 2	4	1	0	5	3	2	5
Sharada 3	2	0	1	3	1	2	3
Not on Estate	1	0	0	1	1	0	1
Totals	20	2	3	25	17	7	25
At time of survey (2012)							
Bompai	5	1	0	6	5	1	6
Tokarawa	1	1	0	2	1	1	2
Not on Estate	0	3	0	3	2	1	3
Challawa	1	1	0	2	1	1	2
Sharada 1	2	1	0	3	2	1	3
Sharada 2	2	3	0	5	1	4	5
Sharada 3	1	1	1	3	1	2	3
Not on Estate	1	0	0	1	1	0	1
Totals	13	11	1	25	14	11	25

Source: Fieldwork, 2012

The ownership structure of industries shown in Table 5.2 can be said to be encouraging. The industries owned by individual Nigerians marginally rose from 44.0% to 48.0% while ownership by individual foreigners remained unchanged at 20%. However there is an interesting development in joint ownership of industries worthy of note. On the one hand, joint ownership by Nigerian/Nigerian industrialists declined from 4.0% to 0%. On the other hand, joint ownership by Nigerians/foreign industrialists rose from the initial 16.0% to 28.0% within the same period.

Table 5.2: Ownership structure of respondent industries from 1969 to 2010

At take-off									
	Individual Owners			Joint Ownership					
Location of Industries	Nigerian	Foreign	Foreign Owners	Nigerian/ Nigerian	Foreign/ Foreign	Nigerian/ Foreign	Not indicated	Foreign Owners	Total
Bompai	3	1	Lebanese	0	0	2	0	Lebanese	6
Tokarawa	1	0	-	0	0	0	1	-	2
Not on Estate	0	0	-	1	1	0	1		3
Challawa	0	2	Lebanese	0	0	0	0	-	2
Sharada 1	2	1	Indians	0	0	0	0	-	3
Sharada 2	3	0	-			1	1	Lebanese	5
Sharada 3	2	0	-	0	0	1	0	Lebanese	3
Not on Estate	0	1	Lebanese	0	0	0	0	-	1
Totals	11	5		1	1	4	3		25
At time of survey (2012)									
Bompai	3	1	Lebanese	0	0	2	0	Lebanese	6
Tokarawa	0	0	-	0	0	1	1	Chinese	2
Not on Estate	2	1	ni	0	0	0	0	-	3
Challawa	0	1	Lebanese	0	0	1	0	Lebanese	2
Sharada 1	2	1	Indians	0	0	0	0	-	3
						1		Chinese	
Sharada 2	3	0	-	0	0	1	0	Lebanese	5
Sharada 3	2	0	-	0	0	1	0	Lebanese	3
Not on Estate	0	1	Lebanese	0	0	0	0	-	1
Totals	12	5		0	0	7	1		25

Key: ni = not indicated
Source: Fieldwork, 2012

5.2.2 Raw material inputs and their sources

There are no significant changes in the type of raw materials respondent industries require and their total number, as shown in Table 5.3, except for 8.0% of industries. As for the first (Industry 1), it has added another product line while the second (Industry 10) now only takes hides instead of taking the various animal hides spelt out in Table 5.3.

Table 5.3: Raw material requirements of respondent industries as at 2012

Industry	Raw material input requirements		Total
	At take-off	**At time of survey (2012)**	
1	Packaging materials; Raw tea	Millet; Tamarind; Spices	**2/5**
2	IPA; LDPE; Master Batch; PP Rafia	No change	4/4
3	LLDPE; Printing Ink; PVC Resins	No change	3/3
4	Cartons; Granulated Sugar; Hot melt glue; shrink wrap; Skillets (pkts); Starch glue	No change	6/6
5	Cotton oil	No change	1/1
6	Iron & steel; Metal scraps	No change	2/2
7	Metal scraps	No change	1/1
8	Raw materials & others	No change	ni
9	Calcium; CAP; Carbon; dCp; Recycled rubber	No change	5/5
10	Cow hides; Goat skin; Sheep skin	Cow hides	**3/1**
11	Cotton	No change	1/1
12	Master Batch (colour); Polyproplene (PP); Recycle PP (black)	No change	3/3
13	Chili pepper; Ginger; Gum Arabic; Hibiscus flower; Sesame seeds	No change	5/5
14	ni	No change	ni
15	caustic soda; Diesel; LPFD; Oil & fats	No change	4/4
16	DAP; LSG; MOP; UREA	No change	4/4
17	Groundnuts; Soya bean seeds	No change	2/2
18	Glucose; Sugar; Wrapping materials, Flavours & colours; Packing materials	No change	5/5
19	Paper reels (KLB, white top); SCF paper Ink; Starch; Borax	No change	5/5
20	Cotton waste; Polyester; Acrylic waste; Yarn	No change	4/4
21	ni	No change	ni
22	Raw skins; Chemicals; Water	No change	3/3
23	Cotton; Chemicals	No change	2/2
24	Chemicals; Agro-chemicals	No change	2/2
25	Agro-chemicals	No change	1/1

Key: ni = not indicated
Source: Fieldwork, 2012

The source of the raw material inputs determines their cost and therefore the cost of production. In general, raw material inputs secured locally are cheaper than those secured from sources overseas. Thus, three sources are considered in this study – Kano State, the rest of Nigeria, and overseas. In addition, assuming all raw material inputs are of equal importance, a weight of 1 is attached to each raw material input required by individual industries, and each industry would have a total weight equal to the total number of the raw material inputs it requires to be in production (columns labeled Total_1 and Total_2 in Table 5.4).

The quantities of the raw material inputs got from the three different sources were then converted to percentages and reflected in Table 5.4. The total of the individual sources (Kano, Nigeria, and Overseas) is each divided by the number of industries that responded (22 in this case). An industry dependent on overseas sources will have a higher dependency ratio and therefore a higher production cost than one dependent on Nigerian sources. Industries dependent on Kano state sources have the least dependency ratio and by implication lower production cost. Of particular interest is the fact that raw material inputs from overseas dropped from 25.9% to 20.2% in favour of Kano State which rose to 31.1% and other Nigerian sources which rose to 48.7%. Thus, although most of the industries could not cut down their raw material input requirements they have looked inward for their supplies.

Table 5.4: Sources and total number of raw material inputs of individual industries surveyed as at 2012

Industries	At takeoff				At time of survey (2012)			
	Total_1	Kano (%)	Nigeria (%)	Overseas (%)	Total_2	Kano (%)	Nigeria (%)	Overseas (%)
1	2	20	40	40	5	35	45	20
2	4	0	**100**	0	4	0	**100**	0
3	3	0	33	**67**	3	0	**67**	33
4	6	**82**	9	9	6	**82**	9	9
5	1	0	**100**	0	1	0	**100**	0
6	2	25	**75**	0	2	25	**75**	0
7	1	50	50	0	1	50	50	0
8	1	**100**	0	0	1	**100**	0	0
9	5	0	10	**90**	5	0	10	**90**
10	3	50	50	0	1	50	50	0
11	1	33	33	33	1	34	33	33
12	3	27	**60**	10	3	30	**60**	10
13	5	0	0	0	5	0	0	0
14	ni	0	0	0	ni	0	0	0
15	4	50	50	0	4	50	50	0
16	4	14	**86**	0	4	13	**87**	0
17	2	50	50	0	2	50	50	0
18	5	0	0	**100**	5	20	30	50
19	5	0	**60**	40	5	20	**60**	20
20	4	50	50	0	4	50	50	0
21	ni	0	0	0	ni	0	0	0
22	3	50	20	30	3	50	20	30
23	2	0	50	50	2	25	25	50
24	2	0	50	50	2	0	50	50
25	1	0	50	50	1	0	50	50
Totals	69	601	1026	569	70	684	1071	445

Key: ni = not indicated
Source: Fieldwork, 2012

By examining Table 5.4, it is possible to say whether an industry is more dependent on overseas, Nigerian, or Kano state sources. For the purpose of this study, any industry that relies on a particular source for at least 60% of its raw materials is dependent on that

source (bold values). Table 5.4 further shows the dependency ratio for the respondent industries. While 12.0% were initially dependent on overseas sources only 4.0% are now dependent on this source. These industries now source from within the country for their raw materials. This is evident in the fact that while there is no change in the percentage of industries dependent on sources from within Kano, the percentage of industries dependent on other Nigerian sources has changed from 24% at take-off to 28% at time of study (2012).

5.2.3 Labour input

Generally, the total number of people working in the industries has marginally increased over time as revealed in Table 5.5 which gives the distribution of the labour force in the respondent industries. Females and foreigners constitute an insignificant proportion of the labour force while Nigerian male workers are dominant.

By itself, labour force data are, generally, not a reliable index for deciding on the health of industries but for a Third world country it is indicative of the spread effect of the industries in question. Looking at it this way, it is worth noting that the labour force in 40.0% of the respondent industries has increased. Thus, industries 1, 3, 6, 7, 10, 12, 14, 19, 23, and 25 belong in this category. For 28.0% of the respondent industries the labour force has decreased. Industries 2, 4, 5, 8, 11, 18, 21, and 24 belong in this category. For the remaining 28.0% of the respondent industries the position has virtually remained the same. (This excludes the respondent industry 13 that is not a manufacturing industry).

Table 5.5: Labour force distribution of industries surveyed as at 2012

	Nigerians						Foreigners					
	On takeoff			In 2012			On takeoff			In 2012		
Industry	Males	Females	Sub-Total	Males	Females	Sub-Total	Males	Females	Sub-Total	Males	Females	Sub-Total
1	26	8	34	70	87	157	1	0	1	0	0	0
2	199	2	201	189	2	191	1	0	1	1	0	1
3	20	0	20	50	0	50	14	0	14	30	0	30
4	170	1	171	71	1	72	0	0	0	0	0	0
5	48	0	48	26	0	26	0	0	0	0	0	0
6	27	0	27	32	0	32	0	0	0	0	0	0
7	254	0	254	304	0	304	6	0	6	6	0	6
8	143	57	200	122	28	150	0	0	0	0	0	0
9	92	2	94	92	2	94	2	0	2	2	0	2
10	0	0	0	32	3	35	0	0	0	1	0	1
11	197	41	238	160	20	180	4	0	4	2	0	2
12	216	57	273	289	67	356	2	0	2	5	0	5
13	101	251	352	101	251	352	3	0	3	3	0	3
14	117	2	119	197	2	199	3	0	3	2	0	2
15	116	30	146	116	30	146	8	2	10	8	2	10
16	10	0	10	10	0	10	0	0	0	0	0	0
17	64	8	72	64	8	72	0	0	0	0	0	0
18	238	200	438	0	0	0	4	0	4	0	0	0
19	174	2	176	210	5	215	9	0	9	8	0	8
20	274	0	274	274	0	274	0	0	0	0	0	0
21	695	89	784	20	0	20	48	0	48	25	0	25
22	400	100	500	400	100	500	6	0	6	6	0	6
23	1535	0	1535	1746	0	1746	26	0	26	42	0	42
24	7080	15	7095	3090	12	3102	70	0	70	70	0	70
25	4090	3	4093	10100	6	10106	85	0	85	90	0	90
Totals	16,286	868	17,154	17,765	624	18,389	292	2	294	301	2	303

Source: Fieldwork, 2012

This notwithstanding, it is important to note that only 16.0% industries have labour force above average. Thus, the labour force in 80.0% of the industries is less than the average

(698 at take-off and 748 at the time of study – 2012) and some consistently so. Thus, industries in Kano metropolis are yet to be a major employer of labour as to reduce unemployment that has plagued urban centres in Nigeria.

5.2.4 Production Costs

A reliable production costs data would enable an observer feel the 'pulse' of the industry. Unfortunately this is one data that was poorly provided by the respondents. While some of the respondent industries gave percentages of the production cost items others ranked them. Less than 50% of the respondent industries gave near-meaningful breakdown of their production cost. The saving grace is that while availability of production costs breakdown tells a story, lack of it also does. The assumption is that, in most cases, attempts have been made to lower their production cost with or without success. Industries that did not provide their production costs may not have been keeping records. Others may well have the records but fear suffering information externalities. Others, still, probably do not want to share their records because they now realize the bizarre pattern and are ashamed of it.

5.2.5 Industrial Outputs

It is interesting to note that one of the respondents does not fit into any of the ISIC revision 4 codes for manufacturing and cannot therefore be considered as a manufacturing industry! One other industry did not indicate what its outputs are. Again industries in ISIC divisions 10 (manufacture of food products), 13 (manufacture of textiles), 20 (manufacture of chemicals and chemical products), and 22 (manufacture of

rubber and plastic products) constitute 72.0% of the respondent industries. There are one each of the remaining and these include divisions 15 (manufacture of leather and leather products), 17 (manufacture of paper and paper products), 24 (manufacture of basic metals), and 25 (manufacture of fabricated metal products). See Table 5.6 for details.

Only 12.0% of the industries have added new products to what they are used to produce at take-off. However, the real progress is in the innovations that their new products entailed. Thus, for instance, going from the production of tea bags to the production of a local beverage ("kunun tsamiya" in Hausa) or expanding from the production of chemicals and agrochemicals to the production of medicated soap are not only worthy of note but highly commendable. Similarly, the progress from production of mosquito coils and other insecticides to the production of aerosols or transforming from ordinary packaging materials to blister packaging represent a commendable technological leap.

It is also noteworthy that 60.0% of the respondent industries classified their products as consumer goods while 32.0% classified their products as intermediate goods. The remaining 8.0% classified their products as both. Whereas 44.0% respondents claim to use their own products others do not. The way these industries classified their products and whether they use their products or not remains the same at the time of the survey as it was when the industries took off.

Table 5.6: Outputs of industries surveyed as at 2012

Industry	Products – At Take-off	Products – At time of survey (2012)	Product type	Use by self	ISIC R4 Class
1	Tea bags	Tea bags + (Kunun Tsamiya)	A	N	1079
2	Woven sacks & threads	No Change	A/B	N	2220
3	Packaging Materials	No Change	B	N	2220
4	Sugar Cubes	No Change	A	N	1073
5	Vegetable oil & cake	No Change	A	Y	1040/1080
6	Underground Fuel Tanks	No Change	A	N	2512
7	Iron rods	No Change	A	N	2410
8	ni	No Change	B	Y	ni
9	Plastic & Rubber products	No Change	B	Y	2220
10	Finished leather	No Change	B	Y	1511/2220
11	Cotton lint/seed	No Change	B	Y	1311
12	Plastic Mats	No Change	A	N	2220
13	Agric products Export	No Change	A	Y	-
14	Textile materials	No Change	A	Y	1312
15	Soap & Beauty care products	No Change	A	Y	2023
16	Fertilizer	No Change	A	N	2012
17	Vegetable oil & cake	No Change	A/B	Y	1040/1080
18	Sweets/confectionery	No Change	A	N	1073
19	Packaging Materials	No Change	B	Y	1702
20	Textile materials	No Change	A	N	1392
21	Textile materials	No Change	A	Y	1311
22	Finished leather	No Change	B	N	1511
23	Wrappers	No Change	A	N	1311
24	Chemicals/Agrochemicals	Chemicals/ Agrochemicals + medicated soaps	A	N	2023
25	Insecticides	Aerosols/Insecticides	A	N	2021

Key: A = Consumer goods B = Intermediate goods
N = No Y = Yes ni – not indicated

Source: Fieldwork, 2012

Table 5.7: Market outlets for the products of industries surveyed as at 2012

		At Take-off						At time of Survey (2012)					
Industry	ISIC R4 Classes	Export	Market-K	Market-N	IND-Self	IND-K	IND-N	Export	Market-K	Market-N	IND-Self	IND-K	IND-N
1	1079	0	90	10	0	0	0	0	80	20	0	0	0
2	2220	0	100	0	0	0	0	0	100	0	0	0	0
3	2220	0	38	16	0	5	41	0	20	45	0	35	0
4	1073	0	30	70	0	0	0	0	95	5	0	0	0
5	1040/1080	0	35	55	0	10	0	0	35	55	0	10	0
6	2512	0	50	50	0	0	0	0	50	50	0	0	0
7	2410	0	20	80	0	0	0	0	20	80	0	0	0
8	ni	0	50	50	0	0	0	0	50	50	0	0	0
9	2220	0	50	50	0	0	0	0	50	50	0	0	0
10	1511/2220	0	45	25	20	10	0	30	35	20	15	0	0
11	1311	0	0	0	0	100	0	0	0	0	0	100	0
12	2220	0	60	40	0	0	0	0	60	40	0	0	0
14	1312	0	45	55	0	0	0	0	22	28	28	0	22
15	2023	0	45	35	20	0	0	0	50	35	15	0	0
16	2012	0	60	40	0	0	0	0	45	55	0	0	0
17	1040/1080	0	45	20	0	0	35	0	45	20	0	0	35
18	1073	0	50	50	0	0	0	0	75	25	0	0	0
19	1702	0	10	25	0	65	0	0	20	15	0	20	45
20	1392	0	60	40	0	0	0	0	55	45	0	0	0
21	1311	15	50	15	20	0	0	10	30	20	40	0	0
22	1511	100	0	0	0	0	0	100	0	0	0	0	0
23	1311	70	30	0	0	0	0	50	50	0	0	0	0
24	2023	0	75	25	0	0	0	0	75	25	0	0	0
25	2021	0	50	50	0	0	0	20	50	30	0	0	0

Key: IND = Industry K = Kano N = Nigeria ni – not indicated
Source: Fieldwork, 2012

Table 5.7 reveals the various market outlets for the products from sampled industries, showing the proportions of the outputs of each industrial group that go for export, domestic markets, or to industries as inputs for added value products. Again, the totals of the columns divided by 24 respondents gives the percentage for the column. Thus only 8.8% goes for export at the time of survey (2012) which is a slight improvement on the

7.7% when the industries took off (excluding industry 13). Therefore 78.7% of industrial products (at take off) and 76.0% (at time of survey) go to the domestic markets. It is interesting to note that the bulk of it (about two-thirds) is consumed within Kano while the balance goes to other parts of Nigeria. In the end, only 13.6% (at take-off) and 15.3% (in 2012) gets fed into the industries for added value. Of course this means a very weak linkage from the input-output structure as can be seen in Table 5.8

Table 5.8: Product input-output of sampled industries as at 2012

At take-off

Industries	Self	Industries in Kano		Industries in Nigeria		Total % sales to industries
		%	Name	%	Name	
3	0	5	Gongoni; W J Bush	41	Hoechst; May & Baker	46
5	0	10	not indicated	0	-	10
10	20	10	Local shoe industries	0	-	30
11	0	100	AS & D Ltd	0	-	100
14	0	0	-	0	-	0
15	20	0	Shamartaka Ind. Ltd	0	-	20
17	0	0	-	35	Grand Cereals, Jos	35
19	0	65	Gongoni; W J Bush	0	-	65
21	20	0	African Textiles Ltd	0	-	20

At time of Survey (2012)

3	0	35	Gongoni; W J Bush	0	-	35
5	0	10	not indicated	0	-	10
10	15	0	Loquart Classic Ltd	0	-	15
11	0	100	AS & D Ltd	0	-	100
14	28	0	Terytex Nig. Ltd	22	Zaria Ind. Ltd	50
15	15	0	Shamartaka Ind. Ltd	0	-	15
17	0	0	-	35	Grand Cereals, Jos	35
19	0	20	Gongoni; W J Bush	45	Nigeria Bottling Co. Lagos; W A Ceramic, Ajaokuta	65
21	40	0	African Textiles Ltd	0	-	40

Source: Fieldwork, 2012

A more critical look at Table 5.8 reveals that respondent industries using their own products for further processing have risen from 2.7% to 4.1%. Similarly, the percentage of industries selling their products to industries outside Kano (but within Nigeria) has also risen from 3.2% to 4.3%. However the percentage of industries in Kano selling to industries in Kano has declined from 8.1% to 6.8%.

5.2.6 Managing Infrastructure

The focus here is on some industry requirements (such as land, electricity, and water) and how they are catered for. A total of 32.0% of industries got the plots of land for the industry directly from government while 12.0% leased the land from someone else. Those who purchased the land constitute 28.0% while the remaining 24.0% did not indicate how they got their land.

Next comes the ideal requirements of the industries with respect to electricity and water supplies, what they provide for themselves as well as what government provides. Their response is shown in Table 5.9. In terms of electricity 16.0% of industries did not indicate their requirements – at take-off and at time of survey. Only 4.0% of the industries at take-off required less than 12 hours of electricity daily and this has increased to 8.0% at the time of the study in 2012. But the industries requiring 12 hours of electricity daily has reduced from the 28.0% at take-off to 16.0% in 2012 whereas those requiring 24 hours of electricity daily has risen from 48.0% to 56.0%) in 2012. As a result 80.0% of the industries now cater for most of their electricity needs from the 56.0% at take-off because

government supply has deteriorated from being regular but inadequate (44.0%) initially to unpredictable (52.0%) at the time of survey.

Table 5.9: Industry requirements and how they are catered for at takeoff and in 2012

Facility/ Infrastructure	At takeoff								At time of Survey (2012)							
	Ideal	Provided for Self		Provided by Government					Ideal	Provided for Self		Provided by Government				
		No	Yes	a	b	c	d	ni		No	Yes	a	b	c	d	ni
Electricity																
<12 hours	1	0	1	0	0	0	1	0	2	0	2	0	0	1	1	0
12 hours	7	4	3	1	3	3	0	0	4	0	4	0	0	3	0	1
24 hours	12	4	8	2	6	3	0	1	14	4	10	0	5	6	0	3
ni	4	2	2	1	2	0	0	1	4	0	4	0	1	3	0	0
Sub-Total	24	10	14	4	11	6	1	2	24	4	20	0	6	13	1	4
Water Supply																
<12 hours	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12 hours	4	2	2	0	2	2	0	0	4	1	3	0	1	2	0	1
24 hours	14	6	8	5	5	1	1	2	15	3	12	1	3	5	1	5
ni	6	5	1	1	1	1	2	1	5	2	3	0	1	1	3	0
Sub-Total	24	13	11	6	8	4	3	3	24	6	18	1	5	8	4	6
Health Services																
<12 hours	-	10	14	-	-	-	-	-	-	5	19	-	-	-	-	-
Sub-Total	-	10	14	-	-	-	-	-	-	5	19	-	-	-	-	-
Transport for employees	-	11	13	2	2	2	10	8	-	10	14	0	2	2	11	9
Sub-Total	-	11	13	2	2	2	10	8	-	10	14	0	2	2	11	9

Key: a = regular & adequate b = regular but inadequate c = unpredictable
d = not at all ni = not indicated
Source: Fieldwork, 2012

As for water, 24.0% of industries did not indicate their requirements when they took off and this has fallen to 20.0% now (2012). The industries with 12 hours' daily requirement has remained 16.0% but those requiring water for 24 hours daily has changed from 56.0% at take-off to 60.0% now (2012). As a result, 72.0% of the industries now cater for their water needs from the 44.0% when they took off because government supply has

deteriorated from being regular and adequate (24.0%) through to being regular but inadequate (32.0%) and now unpredictable (32.0%).

It is the same story with respect to health services and transport for employees. In terms of the former, 56.0% of industries, at take-off, and 76.0% now (2012) cater for their health service needs. In terms of transport for employees however, 52.0% of industries, at take-off, and 56.0% now (2012) cater for their staff's transport needs mostly because alternative transport facility is either not initially provided (40.0%), and not indicated (32.0%) or now not provided (44.0%), and not indicated (36.0%).

5.3 PATTERN OF INDUSTRIAL DECLINE AND THE CONTRIBUTORY FACTORS IN KANO METROPOLIS

The concept of capacity utilization can be tricky and difficult to measure, especially in Third World countries where access to the relevant data can be near-impossible or downright impossible. Nonetheless, in the absence of a reliable data on cost of production a review of the capacity utilization gives a good picture of how industries struggle to keep afloat and also gives an insight into what should be done for better results. Capacity utilization refers to the actual output an industrial plant turns out using the installed machinery and infrastructure. In other words, the **actual** output of an industrial plant against the **potential** achievable with the installed machinery and infrastructure (installed capacity). The potential capacity or installed capacity is therefore a target. Each industry, in this study, was asked what its target was and whether it has achieved it and when. Whether the target is realized or not the industry is asked if it has ever experienced a

decline in its capacity utilization, and to what level and when. In addition the industry was asked the most recent (current) capacity utilization as at the time of this study.

In terms of methodology therefore this approach can be referred to as surveys and expert opinion method (expert opinion provided by the industry itself), as against Rapid appraisal, Peak-to-peak analysis, or the SPF methods.

5.3.1 Capacity utilization of respondent industries in Kano metropolis

With a very weak product input-output relationship amongst manufacturing industries in Kano that reveals very little, nothing illustrates the epileptic nature of industries in Kano metropolis better than an examination of their capacity utilization. The first noticeable group from Table 5.10 is the 20.0% of industries that either provided partial data or have not indicated their installed capacities at all. In this category is the respondent that is not a manufacturing industry. Of the remaining 16.0% there is insufficient information on 8.0% of the industries to bring out a pattern (except that the current capacity of one of them is 25%). The other 8.0% claim to have produced at full capacities (but did not indicate when) and later at below capacity (25% and 35%) both in 2010 and now (at time survey) have current capacities of 70% and 55% respectively. One can only assume their installed capacities to be 70% and 55% respectively or higher.

Table 5.10 Capacity utilization of Sampled Industries as at 2012

Industry	ISIC R4 Class	Take-off Year	Installed Capacity	Full Capacity	When Full	Capacity Utilization	OK?	Decline?	When Decline	Fell to	Reasons for Decline	Prospect
1	1079	1979	70	N	na	60	Y	Y	1998	40	Spare parts not adequately available	increase
2	2220	2010	70	N	na	50	N	Y	2010	30	Cost of materials / power failure	increase
3	2220	1988	65	Y	1990	65	N	Y	1997	50	Low demand	ni
4	1073	1979	60	Y	1993	10	N	Y	2000	45	Working capital	decline
5	1040/1080	2006	45	Y	2006	15	N	Y	2010	35	Power failure / government failure	decline
6	2512	1970	ni	ni	ni	ni	ni	ni	na	ni	ni	ni
7	2410	1978	ni	Y	ni	70	Y	Y	2010	25	Power failure	increase
8	ni	1974	40	N	na	25	N	Y	1998	35	ni	decline
9	2220	2009	ni	Y	ni	55	Y	Y	2010	35	Problems of machines	decline
10	1511/2220	2007	ni	N	na	25	N	ni	na	ni	ni	ni
11	1311	1998	65	N	na	65	N	Y	1999	50	Power failure	decline
12	2220	1979	80	Y	2011	80	Y	Y	2009	70	Power failure	increase
14	1312	1979	50	N	na	50	Y	Y	2002	30	ni	increase
15	2023	2009	45	N	na	45	N	ni	na	ni	na	increase
16	2012	1999	60	Y	2002	45	N	Y	2007	45	Government policies	decline
17	1040/1080	2005	70	Y	ni	30	N	Y	2009	30	Importation / smuggling of the product	decline
18	1073	1969	10	Y	1979	0	N	Y	1982	0	Infrastructure / power failure / SAP	decline
19	1702	1969	40	Y	2001	25	N	Y	2004	20	Lack of working capital	increase
20	1392	2006	60	N	na	60	N	ni	na	ni	na	ni
21	1311	1990	95	N	na	25	N	Y	2003	30	Smuggling / government policies	decline
22	1511	1994	80	Y	1999	80	N	Y	2005	45	Working capital / raw materials	increase
23	1311	1983	100	ni	ni	ni	ni	Y	2010	45	Economic factors	increase
24	2023	1952	100	Y	1985	100	Y	N	na	na	na	increase
25	2021	1982	100	Y	1985	100	Y	N	na	na	na	increase

Source: Fieldwork, 2012

The remaining 20 industries (80.0%) have installed capacities of between 10% and 100%. Out of these, 6 industries (24.0%) have installed capacities of 10% – 50%. Half of these (12.0%) have operated at full capacity (4.0% in pre-SAP period and 8.0% during SAP). The remaining 12.0% could not operate at full capacity. As a matter of fact, 5 of these industries (20.0%) experienced declines in their production, all but one of them during SAP. The current capacity utilization of 3 of them (12.0%), as at the time of this study, is less than their installed capacities while 1 (4.0%) is operating at full capacity (current capacity utilization = installed capacity). The sweets industry has never recovered since 1982 and therefore remains closed..

The other 14 industries (52.0%) have installed capacities of 51% – 100%. Out of these 8 industries (32.0%) have operated at full capacity (7 during SAP; I did not indicate when) while 5 (20.0%) could not. The remaining industry did not indicate whether or not it has operated at full capacity. As many as 11 of these industries, (44.0%), have experienced declines in their production all of them during SAP. The current capacity utilization of 6 industries (24.0%) is less than their installed capacities while 7 industries (28.0%) are operating at full capacity as at the time of this study (2 of the latter have consistently operated at full capacity without experiencing drop in production). The remaining 1 industry did not disclose its current capacity utilization.

5.3.2 Perceived reasons for the decline

Except the 4 industries (16.0%), who did not indicate whether they had suffered a decline only 2 (8.0%) did not have a decline in their capacity utilization. Indeed, 18 industries (72.0%) have had a decline in their capacity unitization and all but 1 (4.0%) during SAP period. The purpose

of this sub-section, therefore, is to capture respondent industries' perception of the reasons for the decline in their industrial production.

Though the reasons given by the respondent industries vary, only 5 (20.0%) think it was all due to something to do with them - endogenous factors (i.e lack of working capital, raw materials and spare parts for machinery maintenance not being readily available). Thus 10 of the industries (40.0%) attribute the decline in production capacity to macroeconomic factors (cost of materials, economic factors, government policies/government failure, importation/smuggling of the product, power failure, and SAP). Only 1 respondent (4.0%) thinks endowment factor is to blame (low demand) for its declining production.

5.4 RELATIVE IMPORTANCE OF THE FACTORS IDENTIFIED AND THE TEST OF HYPOTHESIS III

This section concentrates on the relative importance of the factors at play (macroeconomic, endowment, and endogenous). It starts with the perception of the respondents. This is followed by a more objective assessment based on how individual industries handle such factors as ownership, source of raw materials, labour, outlets, capacity utilization, electricity and water to advantage given that macroeconomic policy factors affect all the industries more or less equally. This is used to test hypothesis 2, and to decide individual industry's placement on the Path Dependence model.

5.4.1 Relative importance of macroeconomic, endowment, and endogenous factors

Here the aim is to capture industries' perception of the relative importance of the factors at play in the industries. Asked to rank the importance of a range of factors on a Likert-type scale of 5 to 1 (5 = very important; 1 = not important). None of the factors was rated 5 (very important) by the industries. All the other macroeconomic policy factors are weighted 2 by the respondents except for "Economic factors" with an average weight of 3. The overall average of macroeconomic policy factors ("economic factors", "excise duties", "foreign exchange rate", "foreign policy & influence", "global competition", "government regulation", "government attitude", "import duties", "interest rates", "smuggled goods", and "tax structure") by the respondent industries came to 2. In effect, although macroeconomic policy factors are blamed most, in reality, they are considered (are ranked) only slightly important.

The endowment factors include climate, nature of the *community*, *communications*, *fuel* (diesel & engine oil), *electricity*, *health facilities*, *labour*, *land*, *location*, *market*, *raw materials*, *transportation*, *water supply*. Whereas the respondent industries gave *raw materials* and *electricity* an average weighting of 4 (highly important) *climate* and *community* were given an average weighting of 2 each. The rest of the endowment factors (communications, diesel & engine oil, health facilities, labour, land, location, market, road, transportation, water supplies) were given an average weighting of 3 each. Therefore on average, endowment factors weighed 3. Altogether, endowment factors are least blamed and considered (are ranked) important with a weight of 3.

5.4.2 Endogenous Factor scoring

The factors considered here include ownership, inputs, labour, outlets, capacity utilization, land, electricity, and water. Each variable is graded on a Likert-type scale of 5 (summarized in Table 5.11) and individual industries are graded accordingly and the result is shown in Table 5.12.

Table 5.11: Likert-Type Scale for Endogenous Factor Scoring

	S C A L E				
Variables	**1**	**2**	**3**	**4**	**5**
- Labour					
Employees	< 100	101 – 299	301 – 500	501 – 2,000	> 2,000
- Land					
Access to Land	Purchase		Lease		Government
- Ownership					
Individual	N or F				
Joint			N/N or F/F		N/F
- RM Sources					
Foreign	81% – 100%	61% - 80%	41% - 60%	21% - 40%	0 – 20%
Local	0 – 20%	21% - 40%	41% - 60%	61% - 80%	81% – 100%
- Capacity Util.					
Installed	I known; I attained				
Utilization		I = C or C = I			
Decline	No Decline				
- Electricity					
Self Help	Ideal (known), Self-provides	Ideal & self-provides			
Government	Unpredictable	Reg/inadequate	Reg/adequate		
- Outlets					
Exports		Export			
Markets	Kano or Nigeria				
Industries	Self, Kano, Nig.	Combination			
- Water					
Self Help	Ideal (known) Self-provides	Ideal & self-provides			
Government	Unpredictable	Reg/inadequate	Reg/adequate		

Key: N = Nigerian F = Foreign RM = Raw Materials
I = Installed capacity C = Current capacity Nig. = Nigeria
Util = Utilization Reg = Regular

Source: Derived from Fieldwork, 2012

The Likert-type scale used (Table 5.11) is a scale of five without a neutral point. Labour, land, ownership, and raw material sources scores each is a unique score up to, but not more than, 5. Capacity utilization, electricity, outlets, and water scores each is a sum of likert items scores that make the variable (some two, some three) that would add up to, but not more than, 5.

Given 24 respondent industries, as in Table 5.12, the maximum score possible on each factor is 120 (24 x 5). Ownership gives a total endogenous factor scoring of 42 for the 24 respondents. As for raw materials the more raw materials are sourced from overseas the more the industry is weighed down. However the total endogenous factor scoring for sources of raw materials is 93 for the 24 respondents. Outlets gives a total endogenous factor scoring of 42 for 24 respondents while that of labour, for 24 respondents, is 49. Capacity utilization has a total endogenous factor scoring of 62 for the 24 respondents while land gives a total of 63 for the 24 respondents. As for electricity and water the total endogenous factor scoring is 71 and 68 respectively for the 24 respondents.

It is worth noting that contrary to the held view that electricity (with endogenous factor scoring of 71) is the major problem of industries in Kano, ownership, labour and outlets, with total endogenous factor scorings of less than 60 each should be the priority areas of concern. Of course an industry may choose to raise its factor scoring in electricity but doing so without doing anything to labour, for instance, will do very little to the industry. Conversely, raising the factor scoring in labour, ownership, or outlets will add more to total earnings as well as the endogenous factor scoring of the industry.

Table 5.12: Endogenous Factor scoring of inputs by industries as at 2012

Industries	Ownership	Raw Material Source	Labour	Outlets	Capacity Utilization	Land	Electricity	Water	Total	Percentage	Remarks
1	1	5	2	1	2	3	2	2	18	45	Weak
2	1	5	2	1	2	1	3	2	17	43	Weak
3	1	3	1	2	4	0	3	4	18	45	Weak
4	1	5	1	1	3	5	3	4	23	58	Strong
5	1	5	1	2	3	5	3	2	22	55	Strong
6	1	5	1	1	2	0	2	0	12	30	Very Weak
7	1	5	3	1	1	5	3	1	20	50	Weak
8	1	5	2	1	2	0	3	3	17	43	Weak
9	3	1	1	1	1	1	3	4	15	38	Very Weak
10	1	5	1	4	0	0	2	2	15	38	Very Weak
11	1	4	2	1	3	1	3	3	18	45	Weak
12	1	5	3	1	4	3	4	4	25	63	Strong
14	3	0	2	3	3	5	3	3	22	55	Strong
15	0	5	2	2	3	0	4	3	19	48	Weak
16	1	5	1	1	3	1	4	4	20	50	Weak
17	1	5	1	2	3	1	4	5	22	55	Strong
18	4	2	0	1	1	5	0	0	13	33	Very Weak
19	1	5	2	3	3	3	3	3	23	58	Strong
20	1	5	2	1	3	1	3	4	20	50	Weak
21	1	0	1	3	2	5	4	3	19	48	Weak
22	1	4	4	2	4	3	4	4	26	65	Very Strong
23	5	3	4	3	0	5	3	2	25	63	Strong
24	5	3	5	1	5	5	3	4	31	78	Very Strong
25	5	3	5	3	5	5	2	2	30	75	Very Strong
	42	93	49	42	62	63	71	68			

Source: Fieldwork, 2012

5.4.3 Test of Hypothesis III

Hypothesis three states that the relative importance of macroeconomic policies and other identified factors on the growth and decline of industries in Kano metropolis varies with industry

groups. In other words, each combination of factors is of variable importance to different groups of industries. This will be true, for instance, if any two combination (Endogenous and Endowment; Endogenous and Macroeconomic; Endowment and Macroeconomic) is true. In other words, proving any of these corollary hypotheses proves the main hypothesis. The data in Table 5.12 was subjected to a 3-way analysis of variance the result of which is shown in Table 5.13.

Table-5.13: Summary of the ANOVA test Result

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	431.417[a]	15	28.761	5.403	.011
Intercept	6577.208	1	6577.208	1235.640	.000
Endogenous	134.306	2	67.153	12.616	.003
Endowment	88.985	3	29.662	5.572	.023
Macroeconomic	8.560	2	4.280	.804	.481
Endogenous and Endowment	.250	1	.250	.047	.834
Endogenous and Macroeconomic	.133	1	.133	.025	.878
Endowment and Macroeconomic	5.476	2	2.738	.514	.616
Endogenous and Endowment and Macroeconomic	.000	0	.	.	.
Error	42.583	8	5.323		
Total	10560.000	24			
Corrected Total	474.000	23			

a. R Squared = .910 (Adjusted R Squared = .742)

Following the top-down convention of factorial ANOVA interpretation, the three-way interaction or second-order interaction (Endogenous and Endowment and Macroeconomic in this table) is distinctly not significant. Similarly, the two-way interactions or first-order interactions

are not significant with F-ratio values greater than the significant (sig.). Therefore the impact of the different factors does not differ with industry groups.

In fact, based on the F-values being greater than the significant (sig.) values one can say that Endogenous, Endowment, and macroeconomic policy factors, individually, are important in that order. Again, being the last of the three, this goes against the popularly held view that SAP (macroeconomic policy factors) is responsible for industrial woes in Nigeria. This, means that efforts should be directed at improving endogenous factors in order to either stem the declining performance or improve the performance of industries in Kano metropolis.

5.4.4 Placement of industries in Kano metropolis on the Path Dependence Model

The manufacturing industries surveyed in Kano metropolis have been fitted into the Path Dependence Model using the classifications in Table 5.12. This is illustrated in Figure 5.1. The industries classified as very weak (in Table 5.12) are struggling at the Path Formation Phase with scores of less than 40%. The 4 industries in this category include Industry 6 (with a total score of 30), 18 (with a score of 33) and 9, and 10, (each with a score of 38). Ironically, industry 6 involved in fabricating underground tanks with a score of 30% is still in operation while industry 18 (a sweets manufacturing industry), with a score of 33, has shut down completely. Such is the strength of endogenous factors that while industry 6 is still at the primitive production stage with nothing going for it except that its raw materials are sourced locally the relatively more favoured industry 18 cannot continue production depending on foreign sources for its raw materials. Industries 9 and 10 though very weak, for now, can make progress to the next class by easily improving their ownership structure, for instance.

Although classed as weak the industries in the *path creation phase* of the model have scores of between 40% and 54%. These industries are still experimenting and competing for production agents. They constitute 40% of the respondents. Thus, the bulk of respondent industries (56%) belong in the weak or very weak categories. In effect, only 40% of the industries in Kano metropolis are in the path development phase, path as movement to stable state, or path as dynamic process.

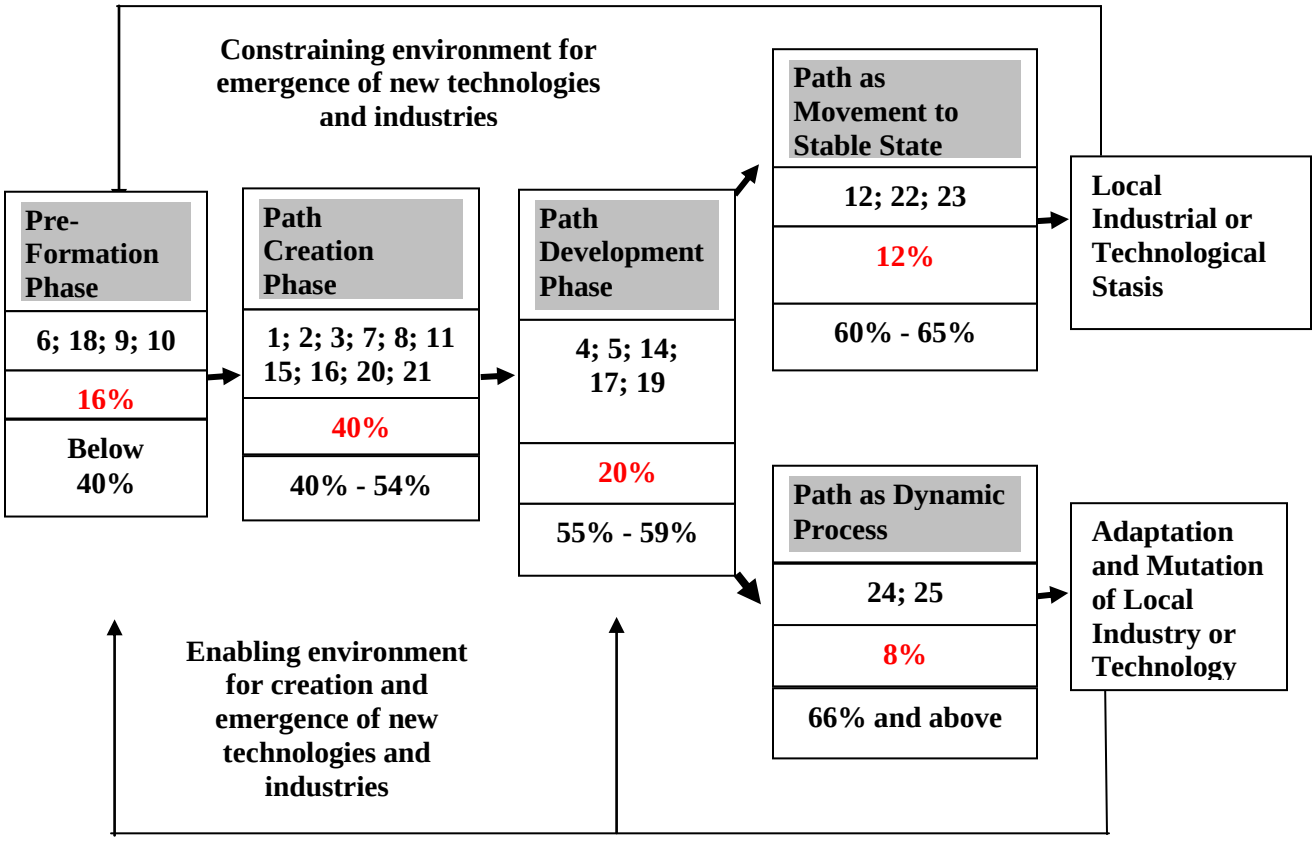


Fig. 5.1: The relative positions of the industries surveyed in Kano metropolis on the Path Dependence Model

. Source: Fieldwork, 2012

Of the 7 industries classified as "strong" in Table 5.11 only 5 (those with scores of less than 60%) belong in the Path Development Phase. These must be experiencing increasing returns and

network externalities. The remaining 2 (with scores of 60% or more) have been grouped in the Path as Movement to Stable State. Together with the one other industry classed as very strong (but with a score of less than 70%), they have a choice to continue reinforcing selected technologies and associated firm structure and remain where they are (Path as Movement to Stable State) until an unexpected policy, event, etc. tips them over. Industries 12, 22, and 23 constituting 12.0% belong in this category with scores ranging between 60% and 70%. Alternatively, they can demonstrate their understanding of the factors at play and employ "conversion", "layering", and "recombinants" for incremental path-dependent evolution and renewal of local industry or technology to engage in a dynamic process as industries 24 and 25 have done. Each of the latter has a score of more than 70%, placing them on the dynamic process path.

5.5 DISCUSSION

The industrialists owned single or more plants, some with Research and Development units but with no evidence of industrial research. Their ownership structure is largely individual Nigerian or foreign ownership with evidence of change towards joint Nigerian/Foreign ownership particularly. There are no significant changes in the type of raw materials and the total number respondent industries require but industries now look inwards for their raw materials. In terms of labour, industries in Kano metropolis contribute little to employment. The industries in Kano metropolis produce mostly consumer goods for domestic market with very little linkages to other industries. Only very few of them have added product lines.

Industrial production in Kano is really an uphill task. While some industries get land from government some have to purchase land. About 80% of industries cater for most of their electricity needs because government supply has deteriorated from being regular but inadequate to unpredictable. Also, 72.0% of the industries now cater for their water needs because government supply has deteriorated from being regular and adequate and now unpredictable. It is the same story with respect to health services and transport for employees.

Not only is industrial production in Kano metropolis epileptic, a large proportion of respondent industries can be classified as exploratory (16% that are not aware of their installed capacity and 24% with installed capacities of 10% – 50%) leaving only 56% that can be said to be committed industrialists. Indeed only 12% of industries have installed capacity of 100% and only 52% have realized their installed capacities.

At least 72% have experienced decline in production at one time or the other. It is interesting to note that 40% attribute this to macroeconomic policy factors while 20% attribute it to endogenous factors and 4% to endowment factors. However, asked to rank the factors as they affect their production (so as to establish the relative importance of these factors), macroeconomic policy factors were ranked only slightly important behind endowment factors which were ranked important. Thus, endogenous factor scoring was conducted to determine the relative importance of the factors and to feel the pulse of the individual industries. The respondent industries scored highest in source of raw materials, followed by electricity, water, land, capacity utilization, ownership and outlets, and then labour in that order. This only says endogenous factors (how far individual industries take advantage of both endowment and macroeconomic policy factors) are most

important. This is in line with the 3-way ANOVA which reveals that the three-way interaction or second-order interaction as well as the two-way interactions or first-order interactions are not significant. Rather, endogenous, endowment, and macroeconomic policy factors, individually, is important in that order.

Translating the factor scores for placement on the Path Dependence Model 16% of industries (with scores of less than 40%) are in the Path Formation Phase, 40% (with scores of between 40% and 54%) are in the Path Creation phase, 20% (with scores of just less than 60%) are in the Path Development phase. Only 8% (with scores of 60% or more) are in the Path as movement to stable state, and 12% (with scores approaching 65% -70%) are in the Path as dynamic process.

CHAPTER SIX

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

7.1 SUMMARY

Although there are evidences of flourishing traditional industrial development in Kano and its surrounding region these did not evolve into modern industrial setups. Indeed, whatever modern industrial setup there is came after the introduction of colonial administration. Thus, modern industrial development in today's Kano metropolis only dates back to the 1940s and predominantly located in industrial estates. The number of industrial establishments in Kano metropolis peaked in 1990s and at the time of this study (2012) reached 381. Not many settlements in Nigeria can boast of such achievements but modern industrial development in Kano metropolis, like elsewhere in Nigeria, is yet to hit the desired production level.

The classification of 355 (93.2%) of these industries into 20 out of the 24 ISIC (revision 4) divisions not only, to some extent, shows how comprehensive the distribution of industries in Kano metropolis is, but also reveals the nature of the industries in question. The four divisions of industries not found include ISIC divisions 11, 14, 16, and 33. Although the three leading industries (divisions 22, 10, and 15) account for 42.2% of industries in Kano metropolis they are however weak in product mix. In fact for division 10, for instance, it may be advisable to either cut down their number or diversify them.

This kind of lopsidedness is also found in terms of ownership. Nearly 80% of the industries in Kano metropolis are individually owned! Although joint Nigerians/foreign

ownership is replacing joint Nigerian/Nigerian ownership it is still on the low side and yet to make the desired impact. On a similar note, while there are no significant changes in the raw material requirements of the respondent industries they have looked inward for their supplies. However, only 12% of respondent industries have added new product lines and more than 75% produce mostly consumer goods for domestic markets within Kano or the rest of Nigeria with very little linkages to other industries. Not even one-quarter of industrial products goes for export or fed back to industries. In terms of labour, more than 80% of respondent industries are below average with poor record of production costs.

In terms of the effects of macroeconomic policies on industries in Kano metropolis, the introduction of SAP accounts for both the highest births and highest closures of manufacturing industries in Kano metropolis. This suggests other equally, if not more, important factors at play. It is possible, on the one hand, that the non-committed industrialists abused SAP policies (such as guaranteed and controlled foreign exchange), and used them other than for industrial production as has been suggested. On the other hand the growth resultant from the SAP policies was overwhelming and could not be accommodated. The latter only emphasizes the importance of endogenous factors. Thus, growth in terms of number of industries or industrial plants of respondent industries gives the impression that industries in Kano metropolis are progressing. In contrast the number of industrial closures and loss of industrial classes as well as declining number of Research and Development units with the attendant lack of industrial research and general record keeping in industrial establishments only point to the poor industrial development in, Nigeria generally and, Kano specifically.

The pattern of collapse and survival of industries in Kano metropolis is best described as epileptic with industries declining, comatose or permanently closed. Only the industries in the *Path as movement to Stable State* and those in *Path as Dynamic Process* on the Path Dependence Model can be said to be stable. Thus, about 25% of industries in Kano metropolis are producing at less-than-fifty to 50% installed capacity and only 12% at 100% installed capacity. Three-quarters of respondent industries have experienced decline in production!

There was divergence in industries' perception of the factors responsible for their decline and their Likert-type rankings of the factors affecting them. Only 40% of industries blamed macroeconomic policy factors (economic factors, government policies, government failure, importation/smuggling of the product, power failure, and SAP) for their declining production with 20% blaming endogenous factors (lack of working capital, raw materials and spare parts for machinery maintenance not being readily available). Only 4% blamed endowment factors. However they ranked endowment above macroeconomic policy factors. Thus, endowment factors that were least blamed were ranked higher than macroeconomic policy factors. There is therefore a need for a more objective method of assessment – endogenous factor scoring.

The results of the endogenous factor scoring for industries in Kano metropolis suggest they have overcome their raw materials and infrastructure (electricity and water) problems to advantage. More than anything else, the idea of endogenous factor scoring

emphasizes entrepreneurship as the major dividing line between industries. Thus, not only can it be used to feel the pulse of the industries, it can also be used to place the industries on the Path Dependence Model. In other words, it can be used to diagnose industries individually or collectively.

Industrial production in Kano is really an uphill task and industries are taking various measures to stay in business. Some of the measures taken by industries in Kano metropolis include purchase of land, provision of electricity, water, health services and transport. Thus some industries have to purchase land and about 80% cater for most of their electricity and water needs because government supply has deteriorated to being unpredictable. It is the same story with respect to health services and transport for employees. Indeed, the more industries, at individual level, are able to cater for these needs the more they are successful in their production.

7.2 CONCLUSIONS

In terms of industries Kano stands out unique. It boasts of well over 300 industries that span across 20 out of the 24 divisions of ISIC (revision 4) codes. However, most of these industries are yet to produce the desired results. Viewed from Path Dependence model, these industries are weak in product mix and ownership as revealed in Chapter Five. A further examination revealed that the 20 divisions only cover 59 out of the 121 classes (48.8%) while most industries are individually owned with very few joint ownership.

Although the majority of industries depend largely on raw materials found in the country they are hardly innovative. Most industries have not added new product lines and mainly produce for the domestic markets with very little aimed for export.

For the obvious reason that they affect industries uniformly, macroeconomic policy factors (such as foreign exchange regulation) have always come to the forefront. In this respect, SAP stands out as being the policy that resulted in a dramatic growth in the number of industries. However, it was growth that could not be sustained and therefore "deceptive". The fact that no industry can survive without raw materials, makes endowment factors (such as electricity, labour, land, location, market) important also. The place of endogenous factors in the equation is hardly taken into account.

In pre-SAP period industries enjoyed protectionist policies that resulted in slow, uncompetitive growth. With the introduction of SAP one does not expect any or much dramatic growth! It is ironical that when such protection was removed during SAP it resulted in dramatic growth in the number of industries that sprang up. It has been suggested that uncommitted industrialists cashed in on the policies for other reasons (such as collecting foreign currency at controlled exchange rate to sell at profit rates in the currency market). The corresponding closure of industries that followed was simply because the growth could only be sustained by employing endogenous factors and therefore industries remain epileptic – closed one day and operating the next one. Thus, the natural pattern was the dramatic slide down the scale, comatose, and finally closure.

Some of the estates, particularly Sharada Phase 1, are desolate as the industries are overgrown with weeds.

In comparing the two periods, it is fair to say industrialists know when they are doing well (in pre-SAP) just as they know when they are not doing well (during SAP). What they do not know is why they are not doing well (absence of endogenous factors). Self-provision of infrastructure that should have been provided centrally, is hardly the best way to run industries. But industries that provided their own infrastructure survived.

7.3 RECOMMENDATIONS

There is a need for industrialization through self-discovery: True industrialization, anywhere in the world, begins with what Rodrik (2004) terms "self-discovery". This involves "discovering" that certain goods, already well-established in a culture (such as "kunun tsamiya" in Hausa), or in the world markets, can be produced at lower cost at home by adopting or adapting foreign technology to domestic conditions. Of all the myriads of things waiting to be industrialized one wonders why the industrialists in Kano (or even elsewhere in Nigeria) are still lamenting and waiting for favourable conditions to resume production. There is a need for an agency to fulfill this role.

Industries should be knowledge-driven: Industries should be knowledge-driven rather than capital-driven as it is at the moment. Although 68.0% of the industries could boast of a research and development unit but this is hardly anything to write home about where knowledge and skills now remain the only difference between two similar industries.

Each industry in Kano metropolis needs a functional research and development unit. As a rule, industries should adopt endogenous factor scoring in order to appropriate resources and capital wisely. It is interesting to note that the ANOM was first designed for use in industries. There should be no industry without a functional research and development unit.

Need for centralised coordination of industrialization through Policy and Central provision of vital Infrastructure: The issue of ailing industries in Kano metropolis is a serious one that must be addressed by all the stakeholders – Government (i.e. the authority), the industrialists and MAN, the academia, and society in general. There is a need for realistic and effective policies. Government must design a policy package to revive and sustain manufacturing industries not only in Kano metropolis but Nigeria generally. Such a package should include the following:

i) Ownership: The ownership pattern of industries in Kano needs to be addressed. The rationale of the various Indigenization decrees referred to in chapter 2 hinges on the assumption that foreign investment in industrial production will not be used to produce what Nigerians need; indigenous industrialists are more apt to be responsive to what Nigerians need. Already the cry in Kano is that the Chinese are colonizing the "Kwari" market in Kano metropolis and the industries will be next, if care is not taken, as, to some extent, foreign invasion of the manufacturing sector is inevitable. There is a need to encourage joint Nigerian/Foreign ownership to cross-fertilize ideas and capital.

ii) Infrastructure: Not only should government continue providing easy access to land to manufacturers as an incentive but it should also endeavour to provide electricity and water, for instance. It should be possible to provide such essentials centrally rather than individually, if government, for any reason, fails in this regard. It is for this reason that the idea of industrial estates remain appealing because it is easier to provide infrastructure that are best provided centrally (such as sewage, access roads, electricity and water) whether by government or otherwise, to an estate.

iii) Industrial mergers: As it is, if industries collapse they tie down such a vital state resource as land. As a policy therefore, industries must not be allowed to collapse. Rather, following the principles of concentration and maximization, as is done in the developed world and now in our banking sector, the more vibrant industry should take over the ailing one. In this way, the committed industrialists will dominate while the non-committed ones will concentrate in other economic sectors.

Need for professionalism: On the part of the industrialists and MAN the relationship should be more professional. One of the findings from this study is that having the financial capital alone is not enough to run an industry. Someone (the universities, MAN, government, or all of these) has to be charged with the responsibility for directing these willing rich men. MAN should ensure, among other things, that

i) it is mandatory on industries to have functional research and development units.

ii) it has a monitoring and evaluation unit that should be in direct link and collaboration with the research and development units of each industry.

iii) non-manufacturers are not accommodated on the estates

iv) it adopts endogenous factor scoring in order to monitor performance of industries regularly.

v) tertiary institutions in the country and the ITF relate more with these industries for collaborative research in the manufacturing sector.

Finally, there is a definite need for more incisive studies of industries. For instance, there is a need to assess the impacts of policies, such as the EEG, on industrial production in the country in general and Kano specifically.

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APPENDICES

APPENDIX I

Appendix 1: Questionnaire for Industries in Kano metropolis

Section A: General

A1. Name of Industry:_____

A2. The Industry is located in: (circle the appropriate answer)

a) Bompai b) Challawa c) Dakata d) Sharada e) Tokarawa

A3. Year Industry was established: _____

A4. This industrial plant is:

	INITIALLY
1	A single plant
2	Two plants or more
3	A branch plant
4	A subsidiary plant

	NOW
1	A single plant
2	Two plants or more
3	A branch plant
4	A subsidiary plant

A5. Does the industry have a Research & Development section?

Initially:
a) Yes
b) No

Now:
a) Yes
b) No

Answer either A6a or A6b below

A6a. The Industry is **Solely** owned by:

		Initially	Now
a)	Nigerian individuals		
b)	Federal Government		
c)	Kano State Government		
d)	Other Nigerian State Government (state which)		
e)	Foreigners (State country below)		
f)	Others (please specify)		

A6b. The Industry is **Jointly** owned by: (you can check more than one)

		Initially	Now
a)	Nigerian individuals		
b)	Federal Government		
c)	Kano State Government		
d)	Other Nigerian State Government (state which)		
e)	Foreigners (State country below)		
f)	Others (please specify)		

Section B: Inputs

B1. Please indicate below the sources and quantities of the material inputs used by your industry

INITIALLY

Material Inputs	**Quantity obtained from**		
	Industries Located in Kano	Industries elsewhere in Nigeria	Overseas

NOW

Material Inputs	**Quantity obtained from**		
	Industries Located in Kano	Industries elsewhere in Nigeria	Overseas

Appendix 1: Questionnaire for Industries in Kano metropolis Cont'd

B2. Please indicate below the **number** of different **categories** of employees in your industry

	I N I T I A L L Y						
	MALES			FEMALES			
	Management	Skilled	Unskilled	Management	Skilled	Unskilled	Totals
Nigerians							
Foreigners							
TOTALS							

N O W

	MALES			FEMALES			
	Management	Skilled	Unskilled	Management	Skilled	Unskilled	Totals
Nigerians							
Foreigners							
TOTALS							

B3. Please indicate the following costs **as a %** of your production costs

Types of Costs		Initially	Now
a)	Labour costs		
b)	Managerial costs		
c)	Raw material costs		
d)	Electricity (NEPA or PHCN)		
e)	Generating set & fuel		
f)	Diesel & engine oil		
g)	Water supply		
h)	Security		
i)	Foreign Exchange costs		
j)	Interest rates		
k)	Import duties		
l)	Excise duties		
m)	Tax		
n)	Transport for employees		
o)	Other Costs (please specify) i) ii) iii)		

Appendix 1: Questionnaire for Industries in Kano metropolis Cont'd

Section C: Outputs

C1. Please indicate the final product of your industry below and the quantity produced

Name of Product	Quantity Initially	Quantity Now

C2. Which of these best describes the product from your industry?

		Initially	Now
a)	Consumer good		
b)	Intermediate good		
c)	Capital goods		
d)	Others (please Specify)		

C3. Do you use any of your products as inputs for other products?

Initially:
a) Yes
b) No

Now:
a) Yes
b) No

C4. Please indicate how your product is consumed (in %)

	% Initially	% Now
Export (to other countries)		
Domestic market (Kano)		
Domestic market (rest of Nigeria)		
Used as an input by your (this) industry		
Used as an input by other industries in Kano (name industry)		
Used as an input by other industries outside Kano (name industry)		

C5. Which Industries use your product(s) in the production of their products?

	% Initially	% Now

C6. What was your installed capacity when you started the industry (in % please) _____

C7 Was there a time when you operated at full production capacity? (If Yes state year) _____

C8a. What is the current production capacity? _____

C8b. Is the current production capacity satisfactory to the industry? a) Yes b) No

C9a. Was there a time when your capacity utilization started declining? a) Yes b) No

C9b. If Yes above state year: _____ and C9c. To what level? _____

C9d. What do you think was responsible _____

C9e. Judging from the industrial climate in Kano and the country do you think your production level would increase or decline? a) Increase b) Decline

Section D: Land & Infrastructure

D1. Ideally, how much of the following was your industry's need on a daily basis **and** how much is your industry's need now, on a daily basis?

	Initially		Now	
	24 hrs/day	12 hrs/day	24 hrs/day	12 hrs/day
Electricity				
Water supply				
Others (please specify) i) ii) iii)				

Appendix 1: Questionnaire for Industries in Kano metropolis Cont'd

D2. Indicate which of these your industry provides for itself

		Initially	Now
a)	Electricity (own a generator for use)		
b)	Water supply		
c)	Health facilities		
d)	Transport for employees		
e)	Others (please Specify)		

D3a. Indicate the status of the following as provided to the industry by the government when the industry started

	Regular & Adequate (24/7)	Regular & inadequate (12 hrs/day)	Irregular & Erratic (unpredictable)	Not Provided At all
Electricity				
Water supply				
Public Transport Service				
Others (please specify) i) ii) iii)				

D3b. Indicate the present status of the following as provided to the industry by the government

	Regular & Adequate (24/7)	Regular & inadequate (12 hrs/day)	Irregular & Erratic (unpredictable)	Not Provided At all
Electricity				
Water supply				
Transport Service				
Others (please specify) i) ii) iii)				

D4. Indicate how you got the plot of land for the industry

a) Government allocation b) Leased from someone

c) Others (please specify) _____

Appendix 1: Questionnaire for Industries in Kano metropolis Cont'd

Section E: Perceptions of relative importance of factors

E. Please rank the following factors (E1 on the left) and infrastructure (E2 on the right) according to their importance to your industry (5 = Very Important; 4 = Highly Important; 3 = Important; 2 = Slightly Important; 1 = Not Important)

E1

Fators	**Ranking**
Transportation	
Labour	
Location (industrial site)	
Economic factors (e.g Management or Entrepreneurship etc.)	
Raw materials	
Markets	
Interest rates	
Foreign Exchange rates	
Utilities	
Government attitude	
Smuggled goods	
Tax structure	
Import duties	
Excise duty	
Diesel & Engine oil	
Climate	
Community	
Foreign politics/influence	
Global competition	
Government regulations	

E2

Infrastructure	**Ranking**
Communications	
Electricity	
Health facilities	
Land	
Roads	
Water supply	

Thank you.

Appendix II

Analysis of Means Constants [a]

Number of Means, k																		
d,f,[b] (ν)	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
a,h 0.05																		
3	4.18																	
4	3.56	3.89																
5	3.25	3.53	3.72															
6	3.07	3.31	3.49	3.62														
7	2.94	3.17	3.33	3.45	3.56													
8	2.86	3.07	3.21	3.33	3.43	3.51												
9	2.79	2.99	3.13	3.24	3.33	3.41	3.48											
10	2.74	2.93	3.07	3.17	3.26	3.33	3.40	3.45										
11	2.70	2.88	3.01	3.12	3.20	3.27	3.33	3.39	3.44									
12	2.67	2.85	2.97	3.07	3.15	3.22	3.28	3.33	3.38	3.42								
13	2.64	2.81	2.94	3.03	3.11	3.18	3.24	3.29	3.34	3.38	3.42							
14	2.62	2.79	2.91	3.00	3.08	3.14	3.20	3.25	3.30	3.34	3.37	3.41						
15	2.60	2.76	2.88	2.97	3.05	3.11	3.17	3.22	3.26	3.30	3.34	3.37	3.40					
16	2.58	2.74	2.86	2.95	3.02	3.09	3.14	3.19	3.23	3.27	3.31	3.34	3.37	3.40				
17	2.57	2.73	2.84	2.93	3.00	3.06	3.12	3.16	3.21	3.25	3.28	3.31	3.34	3.37	3.40			
18	2.55	2.71	2.82	2.91	2.98	3.04	3.10	3.14	3.18	3.22	3.26	3.29	3.32	3.35	3.37	3.40		
19	2.54	2.70	2.81	2.89	2.96	3.02	3.08	3.12	3.16	3.20	5.24	3.27	3.30	3.32	3.35	3.37	3.40	
20	2.53	2.68	2.79	2.88	2.95	3.01	3.06	3.11	3.15	3.18	3.22	3.25	3.28	3.30	3.33	3.35	3.37	3.40
24	2.50	2.65	2.75	2.83	2.90	2.96	3.01	3.05	3.09	3.13	3.16	3.19	3.22	3.24	3.27	3.29	3.31	3.33
30	2.47	2.61	2.71	2.79	2.85	2.91	2.96	3.00	3.04	3.07	3.10	3.13	3.16	3.18	3.20	3.22	3.25	3.27
40	2.43	2.57	2.67	2.75	2.81	2.86	2.91	2.95	2.98	3.01	3.04	3.07	3.10	3.12	3.14	3.16	3.18	3.20
60	2.40	2.54	2.63	2,70	2.76	2.81	2.86	2.90	2.93	2.96	2.99	3.02	3.04	3.06	3.08	3.10	3.12	3.14
120	2.37	2.50	2.59	2.66	2.72	2.77	2.81	2.84	2.88	2.91	2.93	2.96	2.98	3.00	3.02	3.04	3.06	3.08
Infinity	2.34	2.47	2.56	2.62	2.68	2.72	2.76	2.80	2.83	2.86	2.88	2.90	2.93	2.95	2.97	2.98	3.00	3.0

Analysis of Means Constants (Continued)

d,f,[b] (ν)	Number of Means, k																	
	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	b. h 0.01																	
3	7.51																	
4	5.74	6.21																
5	4.93	5.29	5.55															
6	4.48	4.77	4.98	5.16														
7	4.18	4.44	4.63	4.78	4.90													
8	3.98	4.21	4.38	4.52	4.63	4.72												
9	3.84	4.05	4.20	4.33	4.43	4.51	4.59											
10	3.73	3.92	4.07	4.18	4.28	4.36	4.43	4.49										
11	3.64	3.82	3.96	4.07	4.16	4.23	4.30	4.36	4.41									
12	3.57	3.74	3.87	3.98	4.06	4.13	4.20	4.25	4.31	4.35								
13	3.51	3.68	3.80	3.90	3.98	4.05	4.11	4.17	4.22	4.26	4.30							
14	3.46	3.63	3.74	3.84	3.92	3.98	4.04	4.09	4.14	4.18	4.22	4.26						
15	3.42	3.58	3.69	3.79	3.86	3.92	3.98	4.03	4.08	4.12	4.16	4.19	4.22					
16	3.38	3.54	3.65	3.74	3.81	3.87	3.93	3.98	4.02	4.06	4.10	4.14	4.17	4.20				
17	3.35	3.50	3.61	3.70	3.77	3.83	3.85	3.93	3.98	4.02	4.05	4.09	4.12	4.14	4.17			
18	3.33	3.47	3.58	3.66	3.73	3.79	3.85	3.89	3.94	3.97	4.01	4.04	4.07	4.10	4.12	4.15		
19	3.30	3.45	3.55	3.63	3.70	3.76	3.81	3.86	3.90	3.94	3.97	4.00	4.03	4.06	4.08	4.11	4.13	
20	3.28	3.42	3.53	3.61	3.67	3.73	3.78	3.83	3.87	3.90	3.94	3.97	4.00	4.02	4.05	4.07	4.09	4.12
24	3.21	3.35	3.45	3.52	3.58	3.64	3.69	3.73	3.77	3.80	3.83	3.86	3.89	3.91	3.94	3.96	3.98	4.00
30	3.15	3.28	3.37	3.44	3.50	3.55	3.59	3.63	3.67	3.70	3.73	3.76	3.78	3.81	3.83	3.85	3.87	3.89
40	3.09	3.21	3.29	3.36	3.42	3.46	3.50	3.54	3.58	3.60	3.63	3.66	3.68	3.70	3.72	3.74	3.76	3.78
60	3.03	3.14	3.22	3.29	3.34	3.38	3.42	3.46	3.49	3.51	3.54	3.56	3.59	3.61	3.63	3.64	3.66	3.68
120	2.97	3.07	3.15	3.21	3.26	3.30	3.34	3.37	3.40	3.42	3.45	3.47	3.49	3.51	3.55	3.55	3.56	3.58
Infinity	2.91	3.01	3.08	3.14	3.18	3.22	3.26	3.29	3.32	3.34	3.36	3.38	3.40	3.42	3.44	3.45	3.47	3.48

[a] From Tables 2 and 3 of L. S. Nelson, Exact critical values for use with the analysis of means, Journal of Quality Technology 15(1), January 1983. Reprinted with permission of the American Society for Quality control.

[b] Degrees of freedom for s

APPENDIX III

Summary of Industrial Classifications According to ISIC Revision 4

Major Division	Economic Activities	Divisions
A	Agriculture, forestry and fishing	01 - 03
B	Mining and quarrying	05 – 09
C	Manufacturing	10 - 33
D	Electricity, gas, steam and air conditioning supply	35 - 35
E	Water supply; sewerage, waste management and remediation activities	36 - 39
F	Construction	41 - 43
G	Wholesale and retail trade; repair of motor vehicles and motorcycles	45 - 47
H	Transportation and storage	49 - 53
I	Accommodation and food service activities	55 - 56
J	Information and communication	58 - 63
K	Financial and insurance activities	64 - 66
L	Real estate activities	68 - 68
M	Professional, scientific and technical activities	69 - 75
N	Administrative and support service activities	77 - 82
O	Public administration and defence; compulsory social security	84 - 84
P	Education	85 - 85
Q	Human health and social work activities	86 - 88
R	Arts, entertainment and recreation	90 - 93
S	Other service activities	94 - 96
T	Activities of households as employers; undifferentiated goods- and services-producing activities of households for own use	97 - 98
U	Activities of extraterritorial organizations and bodies	99 - 99

Source: Compiled from publications obtained at Unstats.un.org (retrieved on 7th July, 2012)

APPENDIX IV

Details On Section C (Manufacturing): Divisions, Groups, and Classes

Division: 10 - Manufacture of food products
Class: 1010 - Processing and preserving of meat
Class: 1020 - Processing and preserving of fish, crustaceans and molluscs
Class: 1030 - Processing and preserving of fruit and vegetables
Class: 1040 - Manufacture of vegetable and animal oils and fats
Class: 1050 - Manufacture of dairy products
Group 106: Manufacture of grain mill products, starches and starch products
Class: 1061 - Manufacture of grain mill products
Class: 1062 - Manufacture of starches and starch products
Group 107: Manufacture of other food products
Class: 1071 - Manufacture of bakery products
Class: 1072 - Manufacture of sugar
Class: 1073 - Manufacture of cocoa, chocolate and sugar confectionery
Class: 1074 - Manufacture of macaroni, noodles, couscous and similar farinaceous products
Class: 1075 - Manufacture of prepared meals and dishes
Class: 1079 - Manufacture of other food products n.e.c.
Class: 1080 - Manufacture of prepared animal feeds

Division: 11 - Manufacture of beverages
Class: 1101 - Distilling, rectifying and blending of spirits
Class: 1102 - Manufacture of wines
Class: 1103 - Manufacture of malt liquors and malt
Class: 1104 - Manufacture of soft drinks; production of mineral waters and other bottled waters

Division: 12 - Manufacture of tobacco products
Class: 1200 - Manufacture of tobacco products

Division: 13 - Manufacture of textiles
Group 131 Spinning, weaving and finishing of textiles
Class: 1311 - Preparation and spinning of textile fibres
Class: 1312 - Weaving of textiles
Class: 1313 - Finishing of textiles
Group 139: Manufacture of other textiles
Class: 1391 - Manufacture of knitted and crocheted fabrics
Class: 1392 - Manufacture of made-up textile articles, except apparel
Class: 1393 - Manufacture of carpets and rugs
Class: 1394 - Manufacture of cordage, rope, twine and netting
Class: 1399 - Manufacture of other textiles n.e.c.

APPENDIX IV Cont'd

Division: 14 - Manufacture of wearing apparel
Class: 1410 - Manufacture of wearing apparel, except fur apparel
Class: 1420 - Manufacture of articles of fur
Class: 1430 - Manufacture of knitted and crocheted apparel

Division: 15 - Manufacture of leather and related products
Group 151: Tanning and dressing of leather; manufacture of luggage, handbags, saddlery and harness; dressing and dyeing of fur
Class: 1511 - Tanning and dressing of leather; dressing and dyeing of fur
Class: 1512 - Manufacture of luggage, handbags and the like, saddlery and harness
Group: 152: Manufacture of footwear
Class: 1520 - Manufacture of footwear

Division: 16 - Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials
Group 161: Sawmilling and planing of wood
Class: 1610 - Sawmilling and planing of wood
Group 162: Manufacture of products of wood, cork, straw and plaiting materials
Class: 1621 - Manufacture of veneer sheets and wood-based panels
Class: 1622 - Manufacture of builders' carpentry and joinery
Class: 1623 - Manufacture of wooden containers
Class: 1629 - Manufacture of other products of wood; manufacture of articles of cork, straw and plaiting materials

Division: 17 - Manufacture of paper and paper products
Class: 1701 - Manufacture of pulp, paper and paperboard
Class: 1702 - Manufacture of corrugated paper and paperboard and of containers of paper and paperboard
Class: 1709 - Manufacture of other articles of paper and paperboard

Division: 18 - Printing and reproduction of recorded media
Group 181: Printing and service activities related to printing
Class: 1811 - Printing
Class: 1812 - Service activities related to printing
Group 182: Reproduction of recorded media
Class: 1820 - Reproduction of recorded media

Division: 19 - Manufacture of coke and refined petroleum products
Group 191: Manufacture of coke oven products
Class: 1910 - Manufacture of coke oven products
Group 192: Manufacture of refined petroleum products
Class: 1920 - Manufacture of refined petroleum products

APPENDIX IV Cont'd

Division: 20 - Manufacture of chemicals and chemical products
Group 201: Manufacture of basic chemicals, fertilizers and nitrogen compounds, plastics and synthetic rubber in primary forms
Class: 2011 - Manufacture of basic chemicals
Class: 2012 - Manufacture of fertilizers and nitrogen compounds
Class: 2013 - Manufacture of plastics and synthetic rubber in primary forms
Group 202: Manufacture of other chemical products
Class: 2021 - Manufacture of pesticides and other agrochemical products
Class: 2022 - Manufacture of paints, varnishes and similar coatings, printing ink and mastics
Class: 2023 - Manufacture of soap and detergents, cleaning and polishing preparations, perfumes and toilet preparations
Class: 2029 - Manufacture of other chemical products n.e.c.
Group 203: Manufacture of man-made fibres
Class: 2030 - Manufacture of man-made fibres

Division: 21 - Manufacture of basic pharmaceutical products and pharmaceutical preparations
Group: 210 - Manufacture of pharmaceuticals, medicinal chemical and botanical products
Class: 2100 - Manufacture of pharmaceuticals, medicinal chemical and botanical products

Division: 22 - Manufacture of rubber and plastics products
Group: 221 - Manufacture of rubber products
Class: 2211 - Manufacture of rubber tyres and tubes; retreading and rebuilding of rubber tyres
Class: 2219 - Manufacture of other rubber products
Group: 222 - Manufacture of plastics products
Class: 2220 - Manufacture of plastics products

Division: 23 - Manufacture of other non-metallic mineral products
Group: 231 - Manufacture of glass and glass products
Class: 2310 - Manufacture of glass and glass products
Group: 239 - Manufacture of non-metallic mineral products n.e.c.
Class: 2391 - Manufacture of refractory products
Class: 2392 - Manufacture of clay building materials
Class: 2393 - Manufacture of other porcelain and ceramic products
Class: 2394 - Manufacture of cement, lime and plaster
Class: 2395 - Manufacture of articles of concrete, cement and plaster
Class: 2396 - Cutting, shaping and finishing of stone
Class: 2399 - Manufacture of other non-metallic mineral products n.e.c.

Division: 24 - Manufacture of basic metals
Group: 241 - Manufacture of basic iron and steel
Class: 2410 - Manufacture of basic iron and steel
Group: 242 - Manufacture of basic precious and other non-ferrous metals
Class: 2420 - Manufacture of basic precious and other non-ferrous metals

APPENDIX IV Cont'd

Group: 243 - Casting of metals
Class: 2431 - Casting of iron and steel
Class: 2432 - Casting of non-ferrous metals

Division: 25 - Manufacture of fabricated metal products, except machinery and equipment
Group: 251 - Manufacture of structural metal products, tanks, reservoirs and steam generators
Class: 2511 - Manufacture of structural metal products
Class: 2512 - Manufacture of tanks, reservoirs and containers of metal
Class: 2513 - Manufacture of steam generators, except central heating hot water boilers
Group: 252 - Manufacture of weapons and ammunition
Class: 2520 - Manufacture of weapons and ammunition
Group: 259 - Manufacture of other fabricated metal products; metalworking service activities
Class: 2591 - Forging, pressing, stamping and roll-forming of metal; powder metallurgy
Class: 2592 - Treatment and coating of metals; machining
Class: 2593 - Manufacture of cutlery, hand tools and general hardware
Class: 2599 - Manufacture of other fabricated metal products n.e.c.

Division: 26 - Manufacture of computer, electronic and optical products
Group: 261 - Manufacture of electronic components and boards
Class: 2610 - Manufacture of electronic components and boards
Group: 262 - Manufacture of computers and peripheral equipment
Class: 2620 - Manufacture of computers and peripheral equipment
Group: 263 - Manufacture of communication equipment
Class: 2630 - Manufacture of communication equipment
Group: 264 - Manufacture of consumer electronics
Class: 2640 - Manufacture of consumer electronics
Group: 265 - Manufacture of measuring, testing, navigating and control equipment; watches and clocks
Class: 2651 - Manufacture of measuring, testing, navigating and control equipment
Class: 2652 - Manufacture of watches and clocks
Group: 266 - Manufacture of irradiation, electromedical and electrotherapeutic equipment
Class: 2660 - Manufacture of irradiation, electromedical and electrotherapeutic equipment
Group: 267 - Manufacture of optical instruments and photographic equipment
Class: 2670 - Manufacture of optical instruments and photographic equipment
Group: 268 - Manufacture of magnetic and optical media
Class: 2680 - Manufacture of magnetic and optical media

Division: 27 - Manufacture of electrical equipment
Group: 271 - Manufacture of electric motors, generators, transformers and electricity distribution and control apparatus
Class: 2710 - Manufacture of electric motors, generators, transformers and electricity distribution and control apparatus

APPENDIX IV Cont'd

Group: 272 - Manufacture of batteries and accumulators
Class: 2720 - Manufacture of batteries and accumulators

Group: 273 - Manufacture of wiring and wiring devices
Class: 2731 - Manufacture of fibre optic cables
Class: 2732 - Manufacture of other electronic and electric wires and cables
Class: 2733 - Manufacture of wiring devices
Group: 274 - Manufacture of electric lighting equipment
Class: 2740 - Manufacture of electric lighting equipment
Group: 275 - Manufacture of domestic appliances
Class: 2750 - Manufacture of domestic appliances
Group: 279 - Manufacture of other electrical equipment
Class: 2790 - Manufacture of other electrical equipment

Division: 28 - Manufacture of machinery and equipment n.e.c.
Group: 281 - Manufacture of general-purpose machinery
Class: 2811 - Manufacture of engines and turbines, except aircraft, vehicle and cycle engines
Class: 2812 - Manufacture of fluid power equipment
Class: 2813 - Manufacture of other pumps, compressors, taps and valves
Class: 2814 - Manufacture of bearings, gears, gearing and driving elements
Class: 2815 - Manufacture of ovens, furnaces and furnace burners
Class: 2816 - Manufacture of lifting and handling equipment
Class: 2817 - Manufacture of office machinery and equipment (except computers and peripheral equipment)
Class: 2818 - Manufacture of power-driven hand tools
Class: 2819 - Manufacture of other general-purpose machinery
Group: 282 - Manufacture of special-purpose machinery
Class: 2821 - Manufacture of agricultural and forestry machinery
Class: 2822 - Manufacture of metal-forming machinery and machine tools
Class: 2823 - Manufacture of machinery for metallurgy
Class: 2824 - Manufacture of machinery for mining, quarrying and construction
Class: 2825 - Manufacture of machinery for food, beverage and tobacco processing
Class: 2826 - Manufacture of machinery for textile, apparel and leather production
Class: 2829 - Manufacture of other special-purpose machinery

Division: 29 - Manufacture of motor vehicles, trailers and semi-trailers
Group: 291 - Manufacture of motor vehicles
Class: 2910 - Manufacture of motor vehicles
Group: 292 - Manufacture of bodies (coachwork) for motor vehicles; manufacture of trailers and semi-trailers
Class: 2920 - Manufacture of bodies (coachwork) for motor vehicles; manufacture of trailers and semi-trailers
Group: 293 - Manufacture of parts and accessories for motor vehicles
Class: 2930 - Manufacture of parts and accessories for motor vehicles

APPENDIX IV Cont'd

Division: 30 - Manufacture of other transport equipment
Group: 301 - Building of ships and boats
Class: 3011 - Building of ships and floating structures
Class: 3012 - Building of pleasure and sporting boats
Class: 3020 - Manufacture of railway locomotives and rolling stock
Class: 3030 - Manufacture of air and spacecraft and related machinery
Class: 3040 - Manufacture of military fighting vehicles
Group: 309 - Manufacture of transport equipment n.e.c.
Class: 3091 - Manufacture of motorcycles
Class: 3092 - Manufacture of bicycles and invalid carriages
Class: 3099 - Manufacture of other transport equipment n.e.c.

Division: 31 - Manufacture of furniture
Class: 3100 - Manufacture of furniture

Division: 32 - Other manufacturing
Group: 321 - Manufacture of jewellery, bijouterie and related articles
Class: 3211 - Manufacture of jewellery and related articles
Class: 3212 - Manufacture of imitation jewellery and related articles
Class: 3220 - Manufacture of musical instruments
Class: 3230 - Manufacture of sports goods
Class: 3240 - Manufacture of games and toys
Class: 3250 - Manufacture of medical and dental instruments and supplies
Class: 3290 - Other manufacturing n.e.c.

Division: 33 - Repair and installation of machinery and equipment
Group: 331 - Repair of fabricated metal products, machinery and equipment
Class: 3311 - Repair of fabricated metal products
Class: 3312 - Repair of machinery
Class: 3313 - Repair of electronic and optical equipment
Class: 3314 - Repair of electrical equipment
Class: 3315 - Repair of transport equipment, except motor vehicles
Class: 3319 - Repair of other equipment
Class: 3320 - Installation of industrial machinery and equipment