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AN INTERINDUSTRY ANALYSIS OF THE ECONOMY OF CROSS RIVER STATE, NIGERIA

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Doctor of Philosophy

Degree

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ABSTRACT

This study provides needed information for effective development planning in Cross River State, Nigeria. Basic information was developed by using the Leontief input-output model. Quantitative measures of the interrelationships among the various producing and distribution sectors showed the importance of the various sectors and their relationships to outside markets. The analytical framework provided the basis for determining the direct and indirect effects of alternative courses of actions and for forecasting impacts of altered output by a given sector in the overall economy.

Linear and homogeneous production functions were utilized to develop the transaction flow matrix to show the distribution of goods and services from the producing sectors to the purchasing sectors. The economic activities were classified into 19 endogenous sectors and three exogenous sectors. A direct requirements matrix was also developed that demonstrated the input structures of all the producing sectors. A matrix of interdependence coefficients was computed to measure the relationships that existed among the sectors. Finally, final demand, income, and employment multipliers were computed to measure the sectorial influence on the Cross River State economy.

The results of this study indicated that the regional inter-industry model revealed in detail the impact of a projected change in economic activity on the region. The model provides a sound basis for enhancing economic development in the Cross River State, Nigeria.

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CHAPTER 1

INTRODUCTION

There is an increased awareness of social and economic interdependence and an expansion of regional economic planning activities in Cross River State of Nigeria (30:192-193). Also, emphasis on rural development has stimulated the needs for information which can help planners in making policy prescriptions. Much of the regional economy is linked closely to that in the other parts of the state; thus, an understanding of the Nigerian economy's complexity and its interrelationships is critical in designing effective economic development programs (31:745-758).

With the growing commercialization of the regional economy, agriculture and industry have become increasingly interdependent. The interrelationship has extended the production problems found in agriculture to other sectors of economy. Therefore, there is a strong need to develop a methodology (27:1). Such a methodology should account fully for the backward linkages. For example, any effects induced by a change in agricultural output on any other sector and on resources used by these industries are backward linkages. Whereas any effects stemming from such a change on transportation, processing, and merchandising sectors, for example, as well as on final consumption, are forward linkages (64:14-16). The backward linkages are accounted for in this study.

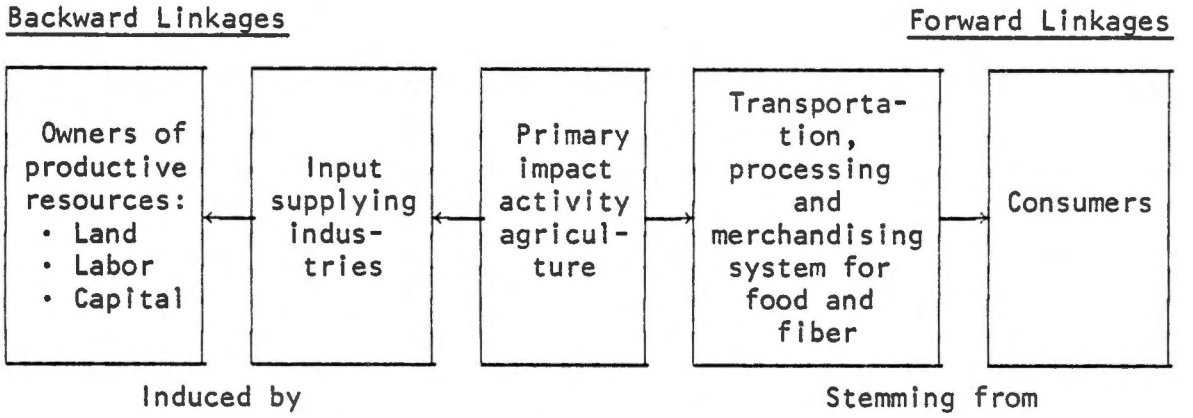

Figure 1.1. Impact Classification

While a few of the qualitative interrelationships between agriculture and other sectors of the economy are known, information on the quantitative interrelationships is meager. Therefore, the ultimate goal of this study is to develop a set of estimates of sector interrelationships which will provide the needed information for regional planning (4:66-70).

The main question dealt with in an input-output analysis is the level of output needed by each of n industries in an economy to satisfy the total demand of the product of a particular industry. The solution of this question for all the industries involved is very useful information for production planning, particularly with respect to economic development. Because of interindustry dependence among the industries of an economy, any set of correct output levels for n industries must be one that is consistent with the input requirements in the economy if no bottlenecks are to arise (52:132-136).

Input-output statistics are used for such a purpose as estimating the total effect on the economy of changes occurring in a single industry or the effects on different industries of a change in the supply

of a particular material (41:148-151). The input-output model has been widely utilized in planned economies. Strictly speaking, input-output analysis is not a general equilibrium analysis; the output levels envisaged are those which satisfy technical input-output relationships rather than market equilibrium conditions (10:123).

The purpose of the study is to provide information to persons interested in the process of rural economic development in Cross River State and Nigeria. The transaction table provides information on the directional flows of the products while the technical coefficient table provides the estimates of sector interdependence. The interdependence coefficients provide the estimates of both direct and indirect interdependence and the multipliers provide estimates of sector influence upon the total economy (63:2).

Problem Statement

To foster an effective rural program, the underlying characteristics and associated interdependence present in a rural economy need to be investigated. Since policies directed toward one sector may have repercussions on many other sectors due to sector interdependence, it becomes imperative to investigate the extent of the contribution of the different sectors. The problem of development in Africa is a lack of hard facts in crucial fields (59:171-172).

Although Nigeria has a national input-output model, it is not particularly useful in measuring regional interdependence (21:121). The industry size is smaller in a state than in a country, and thus its impact will be meager. A national analysis is based on industry production techniques which represent an average for all the regions, but a

regional analysis must consider the technical relationships applicable only to that region (62:26-27).

Besides, industry composition may be different from that of the national economy because of the location of some of the industries. Also, interregional trade that exists in the region is not accounted for in the national analysis, but such interregional trade may form the central issue in regional planning. Since any rural development consideration must recognize the relationship between the different sectors of the economy, the national aggregate data need to be linked to empirical regional data (51:32-34).

The lack of statistics has hindered the effectiveness of economists because policy prescriptions spring from the recognition of historic uniqueness. Any long-term planning must be dovetailed to take into account the interdependence of the sectors that exist in the region (58:6-7).

Objectives

The general objective of this study is to establish quantitative interrelationships of the economy of the study area and to draw from those interrelationships economic development implications.

The specific objectives are to:

1. Identify a set of economic sectors.
2. Determine the flow of goods and services among various sectors of the economy.
3. Provide estimates of sector interrelationships and to interpret the meaning and significance of the interrelationships.

The Study Area

Cross River State, formerly the Southeastern State after the creation of the 12 states in 1967, is bounded on the north by Benue State, on the west by Anambra and Imo states, on the southwest by Rivers State, on the east by the Cameroun Republic, and on the south by the Atlantic Ocean (25:399). The study area covers a total area of 10,877.27 square miles (14:1). The estimated population was 5.04 million in 1978 (18:1). Cross River State consists of 14 divisions which are politically and economically linked closely together (Figure 1.2). The major towns are Abak, Akamkpa, Calabar, Eket, Etinan, Ikom, Ikot Abasi, Itu, Obubra, Obudu, Ogoja, Oron, and Uyo.

The topography of the area is nearly level, apart from the two highland areas of Oban and Obudu. The Oban and Obudu uplands are extensions of the Cameroun-Adamawa highlands. The Oban Hills which lie north of Calabar are generally over 3,000 feet above sea level. The two highlands are covered with dense forest vegetation except where clearing for farms has occurred. The absence of tsetse flies and the cool climate on the grassland of Obudu Plateau have been exploited by the establishment of a holiday resort and large cattle ranches (57:1-5).

The wettest parts of the Cross River State are the south and east. The average rainfall decreases inland from about 125 inches at Eket to about 73 inches at Ogoja. The hottest months are February and March when the average temperature is above 80°F (60:66-67). Throughout the study area, over 83 percent of the annual rainfall comes between May and October.

Mangrove swamps characterize the Cross River State estuary and the swamps are used as rice fields. The soil types represent those of



Figure 1.2. Nigeria and Cross River State

the humid, tropical forest climatic zones. They are well drained and in some places excessive leaching occurs. The soils are yellowish-brown in color and are friable, porous sands to sandy clays. But around Uyo the soil is clayey loam and is relatively more productive than slightly sands (3:53).

Agriculture is still the mainstay of the area, although the agricultural sector is mainly characterized by its traditional structure. The yields per acre in the principal food crops are low due to the traditional way of cultivation. Other industries are mining, construction, manufacturing, and trade (24:14-15).

Natural Resources

The area has a wide range of resources and the agricultural land offers a rich variety of crops. The export crops include palm oil and kernels, cocoa, and rubber. Table 1.1 presents the location of plantations in the area. The first plantation was established in 1908, and the most recent one came into existence in 1975. The main food crops are rice, maize, yam, cassava, and cocoyam. The model farms for food crops are shown in Table 1.2.

There are no livestock ranches in the southern part of the Cross River State because of tsetse flies, but livestock production thrives in the northern divisions of the state. Livestock species common in the area are goats, cattle, sheep, and swine. These species could thrive well if husbandry is improved (32:47-48).

The study area possesses 80 miles of coastline and four important rivers, namely: the Cross River, the Calabar River, the Great Kwa River, and the Kwa-Iboe River. In 1972 a total of 18,500 tons of fish was

Table 1.1. Type and Number of Plantations by Division, Cross River State, Nigeria

Type of plantation	Division	Name of plantation	Acreage under cultivation	Year established
Palm plantation				
1	Akamkpa	Calaro Oil Palm Estate	5,975	1954
2	Akamkpa	Kwa Falls Oil Palm Estate	1,917	1955
3	Akamkpa	Ibiae Oil Palm Estate	5,361	1962
4	Eket	Eket Oil Palm Estate	1,184	1964
5	Ikom	Nsadop Oil Palm Estate	5,383	1953
6	Ikom	Boki Oil Palm Estate	4,595	1962
Rubber plantation				
1	Akamkpa	Oban (Nig) Rubber Estate Ltd.	4,081	1952
2	Akamkpa	Cross River State Rubber Plantation Ltd.	13,651	1956
3	Akamkpa	Biakpan Rubber Estate	2,584	1963
4	Calabar	Pamol (Nig) Rubber Estate Ltd.	3,986	1908
5	Itu	Use Ikot Amama Rubber Estate	2,267	1975
6	Obubra	Nko Rubber Estate	3,865	1963
Citrus plantation				
	Oron	Citrus Model Farm	200	1962
Cocoa plantation				
1	Ikom	Cross River State Forest and Cocoa Project	4,046	1962
2	Ikom	Ikom Cocoa Estate	1,732	1954
3	Ikom	Abia Bendeghe-Ayuk Cocoa Estate	2,521	1962
4	Ikom	Aboninta Cocoa Estate	2,548	1976

Table 1.1 (continued)

Type of plantation	Division	Name of plantation	Acreage under cultivation	Year established
Coffee plantation				
	Ikom	Boje Coffee Estate	1,399	1976

Source: Cross River State, Nigeria, Ministry of Economic Planning, Plantation Statistics, 1976-78. Government Printer, 1979.

Table 1.2. Model Farms and Crops Grown, Cross River State, Nigeria, 1978

Name of model farm	Division	Crop grown	Acreage planted	Year established
Equatorial Guinea Returnees Farm, Ikot Ibritan	Abak	Cassava and rice	264	1976
Government Farm Complex, Obio Akpa	Abak	Cassava and maize	400	1973
Swamp Rice Irrigation Project, Akim	Calabar	Swamp rice	450	1972
Government Model Farm, Ikot Efanga	Calabar	Cassava and maize	127	1962
Equatorial Guinea Returnees Farm, Ikot Ebidang	Eket	Rice and cassava	382	1976
Government Model Farm, Afaha	Eket	Rice and cassava	773	1974
Equatorial Guinea Returnees Farm, Nsit Ibom	Etinan	Cassava	823	1976
Irrigation Swamp Rice Project, Mbiabet Ikpe	Itu	Swamp rice	368	1972
Model Farm Project, Bebi	Obudu	Upland rice and cassava	107	1972
Equatorial Guinea Returnees Farm, Bansara	Ogoja	Cassava and rice	3,720	1976
Government Model Farm, Nkum	Ogoja	Rice	172	1972
Government Model Farm, Use Offot	Uyo	Cassava and maize	120	1962

Source: Ministry of Economic Planning, Plantation Statistics, 1976-78. Calabar, Nigeria: The Government Printer, 1979.

harvested (15:21-22). Fishing methods must also be modernized to meet the demand of an increasing population. The abundance of shrimp in Cross River State coastal waters has led to the establishment of the Seastate Seafoods Company by Mundomer Enterprises Incorporated of Florida, U.S.A. (13:25).

Cross River State holds a third of Nigeria's forest area. The total area of forested lands is about 4,500 square miles. More than half of these forms the Forest Reserve, and 85 percent of the Forest Reserve is classified as productive forest; that is, the timber resources from the Forest Reserve are extracted. There is enough forest area to satisfy the needs of the people with wood products and also for exportation of veneer, plywood, and lumber (24:239-243).

Natural gas and crude petroleum oil have been discovered at the following places: Ikot Akata, Ibotio, Uquo, and at present offshore oil is being tapped near Ibeno. The daily production stands at 300,000 barrels. Limestone deposits are found at Mfamosing, Etankpini, and Odukpani. The deposit at Mfamosing is mined for the manufacture of cement. Salt ponds occur at Okoro Ete and Ibeno. Clay deposits for pottery occur in many places--for example, Calabar, Etinan, Ikot Ubo, Ikot Equere, and Oron. Silica sand, suitable for glass production, has been found at Abak, Itu, Oban, Obudu, and Ukpom. The silica sand in Itu division was shipped before the civil war to Port Harcourt's Glass Factory. Tin ores exist in Oban Hills, Obudu, and Ogoja. Also, manganese deposits are located in Oban Rubber Estate (5:164-174). Also, feldar veins with large admixtures of quartz, mica, and turmalin occur in the Oban Hills and Obudu.

Population Characteristics

Selected population characteristics for the study area are presented in Table 1.3. The females outnumber the males in all the divisions except Akampa, Calabar, Etinan, and Ikom. Fifty-one percent of the population consists of persons under 19 years of age, while only 5 percent is made up of people who are older than 49 years of age. The rural population constituted 88 percent of the population in the study area in 1971 (14:6-9).

Economic Characteristics

The total labor force in the study area in 1971 was 1,367,000 (Table 1.4). Of these workers, 72 percent were male. Fifty-three percent of the total labor force was engaged in agriculture and fishing. Although income is still low in rural areas, plans are underway to better the situation. In 1971, only 5 percent of the work force was unemployed (14:7).

Table 1.3. Population of Cross River State by Sex, Age Group, Urban, Rural and Division, 1971

Division	Male	Female	Age group 0-19 Male	0-19 Female	20-49 Male	20-49 Female	50 and over Male	50 and over Female	Urban Male	Urban Female	Rural Male	Rural Female
	thousands											
Abak	215	220	109	112	94	97	11	11	17	17	198	201
Akamkpa	59	53	30	27	26	23	3	3	5	5	53	48
Calabar	168	133	86	67	74	59	8	7	52	41	116	92
Eket	193	218	98	111	85	96	10	11	20	22	173	196
Etinan	211	192	108	98	93	84	11	10	26	23	169	184
Ikom	76	66	39	33	33	29	4	3	9	8	66	57
Ikot Abasi	239	255	122	130	105	112	12	13	27	29	203	235
Ikot Ekpene	148	162	76	83	65	71	7	8	26	28	123	133
Itu	204	219	104	112	90	96	10	11	8	9	197	209
Obubra	149	149	76	76	65	66	7	7	3	3	145	146
Obudu	45	47	23	24	20	21	2	2	8	8	37	39
Ogoja	108	113	55	58	48	50	5	6	8	9	100	105
Oron	183	207	93	106	80	91	9	10	15	29	158	198
Uyo	177	185	90	94	78	81	9	9	23	24	155	161
Total	2,175	2,219	1,109	1,131	956	976	108	111	247	255	1,893	2,004

Source: Government of Nigeria, Ministry of Finance and Economic Development, Statistical Digest. Calabar, Nigeria: The Government Printer, 1971.

Table 1.4. Population of Cross River State by Sex, Main Occupation Group, and Division, 1971

Division	Males							Females				
	Agriculture and fishing	Crafts	Trading and clerical	Administrative, professional and technical	Other occupation	Unemployment	Total	Agriculture and fishing	Trading and clerical	Other occupation	Unemployment	Total
	thousands											
Abak	59	12	13	4	6	5	99	13	6	19	1	39
Akamkpa	16	3	3	1	2	1	26	4	2	5	*	11
Calabar	41	8	9	3	4	3	68	9	4	13	1	27
Eket	55	11	12	4	6	5	93	12	6	17	1	36
Etinan	55	11	12	4	5	5	92	12	6	17	1	36
Ikom	20	4	4	1	2	2	33	4	2	6	*	12
Ikot Abasi	66	13	14	4	7	6	110	15	7	21	1	44
Ikot Ekpene	42	8	9	3	4	4	70	9	5	13	1	28
Itu	57	11	12	4	6	5	95	13	6	18	1	38
Obubra	41	8	9	3	4	3	68	9	4	12	1	26
Obudu	3	1	1	*	*	*	5	1	*	1	*	2
Ogoja	30	6	7	2	3	3	51	7	3	9	1	20
Oron	53	11	11	4	5	4	88	12	6	17	1	36
Uyo	49	10	11	3	5	4	82	11	5	15	1	32
Total	587	117	127	40	59	50	980	131	62	183	11	387

*Less than 0.5.

Source: Government of Nigeria, Ministry of Finance and Economic Development, Statistical Digest. Calabar, Nigeria: The Government Printer, 1971.

CHAPTER 2

THEORETICAL FRAMEWORK

Quesnay (12:2) published the Tableau Economique about two centuries ago. In the Tableau Economique, the existence of interrelationships within any economic system was recognized. Although Quesnay was the forerunner of modern input-output analysis, Walras (44:7) was the first to develop a consistent model of production and consumption interdependence in 1874 in his Elements of Pure Economics. Thus, the general equilibrium model forms the theoretical basis for input-output analysis. Walras considered his general equilibrium model as strictly a theoretical device. Further contribution to the foundations of input-output analysis and the study of interdependencies were made by Cassel and Pareto (45:4-5). The major modern-day contributions were made by Leontief (40). He pioneered the development of an input-output table for the American economy based on empirical data. Leontief's model for the American economy was highly aggregated, but the use of the computer has made possible fine degrees of disaggregation of input-output models and has added a valuable contribution to this type of analysis (38:412). The basic Leontief model has been used in several studies, and Leontief's input-output analysis has been applied to national, regional, and local studies. This study will utilize the Leontief model.

Several important input-output studies have been made that provide useful procedure ideas for the study undertaken here. Some of the major ones are described in the paragraphs that follow.

Peterson and Heady (53:401-419) utilized an interindustry input-output model in analyzing the United States of America national economy with emphasis on agriculture. Agriculture and industry have become increasingly interdependent with the growing commercialization of the national economy. A small decline in farm output relative to employment in the national economy causes farm prices to spiral upward, and a slight increase in farm production causes a rapid recession of farm income. Although this general relationship is known, knowledge of the exact quantitative interrelationship is meager. Thus, the main objective of the input-output study is to provide quantitative information on interdependence coefficients between agriculture and industry.

By the use of an input-output model the effects of the depleting groundwater used for irrigation in the Southern High Plains of the United States of America was determined. A decline in the groundwater supply led to a major adjustment in the economy. The number of irrigated acres declined from 5.7 to 2.4 million, and the value of all crop production was estimated to have decreased by 39.9 percent (50:1-12).

Input-output analysis is a particular technique that is often employed to obtain data on small governing units for evaluating proposed development programs. For example, the study of the economy of Talladega County, Alabama, utilized input-output analysis to provide a quantitative measure of the interdependence of various sectors of the economy. This technique is popular and most favorable for state and national studies; and there has been a reluctance to apply input-output techniques in the study of a small area because of the data disaggregation problem, data disclosure problems related to small individual firms, and the high cost of obtaining the needed data. The limitations of data availability for

local areas have led to the use of adjusted coefficients and secondary data. Even though the input-output model of an economy reflected the existing economic activity of Talladega County, Alabama, the use of such a model to plan new expenditures for investment and employment depended greatly on the stability of the input-mix of the economy. By the use of input-output model, the study estimated the impact of watershed development in the economy and developed a predictive model for determining future expenditures in any of the various sectors of the economy (51: 1-50).

Developing nations have also made use of input-output methodology to allow detailed analysis of the structures of their economies. By 1965, input-output models had been prepared for at least 40 countries (45:4). Chenery (11:11) stated that, although interindustry analysis is now widely recognized, the use of an input-output model for developing countries has met with dissatisfaction. This is because the establishment of new industries, the adoption of new techniques in place of old, and the rapid change in the composition of output within sectors seriously affects the stability of input coefficients. Linear programming framework has been suggested for use in analyzing the structures of the developing nations' economies instead of the Leontief's model, but this method has not yet been adopted in any country.

In some underdeveloped countries, interindustry analysis is not very useful since 50 to 60 percent of the per capita income is derived from primary production, and only 10 to 12 percent of the income accrues from manufacturing accounts. Besides, more than half of the manufacturing industry may consist of food processing and textiles whose main inputs are derived directly from agriculture. Of the remaining inter-

mediate goods, more than half are imported. This is true for the underdeveloped countries with low per capita incomes of under $100. In underdeveloped countries where income levels are higher, interindustry analysis may be quite important, for example, for countries having per capita income of $200-$300, such as countries like India and Pakistan (11:12-14).

The changes that occur in the productive structure of developing economies together with the limited amount of interindustry statistics available exhibit the characteristics that call for an interindustry framework. Whereas input-output analysis deals with partial analysis for each sector, linear programming undertakes the calculation of shadow prices for each factor and activity, and the choice criterion is the profitability of the activities. Thus, linear programming does not serve the same purpose as an input-output analysis because the latter assumed that there are a number of activities for producing or importing the commodities included in a given industrial sector. Leontief's input-output model does not use optimizing procedures to determine the best combination of activities. Since an interindustry framework is useful for two purposes--namely, to determine intermediate demands for commodities and to estimate accounting prices and requirement for labor, capital, and inputs--it is essential to construct input-output models for the developing economies (11:14-26).

Sengupta (55:76-77) had designed an input-output framework for less developed economies. He emphasized that the collection of data was difficult, time-consuming, and expensive unless confined to a benchmark year. He strongly advocated for a model consisting of a few rather

closely integrated sectors where the essential data can be kept up-to-date with little cost or difficulty.

An input-output model for Egypt was first constructed in 1954. It contained 83 productive sectors, and a revised input-output model was set up in 1959. The final demand consisted of six categories, and government and private investments were distinguished. Another characteristic of the input-output model is the fact that domestic inputs are separated from imports in each cell. This is important for a developing economy because of its heavy dependence on imports.

One alternative is to distinguish between competitive and non-competitive imports. The noncompetitive import is assigned a separate row in the table, while the competitive imports are combined with domestic inputs. This method raises some problems because an import matrix is an essential tool in the calculation of savings which arise from a policy of import substitution. In addition, the combination of competitive imports with domestic inputs would lead to complication in some of the calculations based on the input-output matrix (22:199-210).

The argument against the construction of an input-output table for a developing country is based on the idea that there is a lack of data. The experience in Latin American countries shows that there is a heavy reliance on imports for both intermediate and final demand; so, in the case of these countries, it was found that input-output models provided a unique tool for calculating the effects of an import substitution policy. It has been argued, however, that the economies, though not developed, could not be described as highly underdeveloped because a major characteristic of a highly underdeveloped economy is the lack of interdependence among the productive sectors. Although the lack

of reliable data is a stumbling block for the construction of input-output tables in underdeveloped countries, this is not an adequate justification for not doing it (8:52-54). The postponement of constructing such a table may lead to the postponement of a serious review of the gaps in the data and their processing. Therefore, it is really the lack of interdependence rather than the lack of statistics which hinders the construction of input-output tables for the underdeveloped economies.

Input-output analysis has gained much ground in the developing countries. The first suggestion for the counstruction of an input-output model for Nigeria was made by the Economic Planning Unit in the Ministry of Finance in early 1962 (58:323). In order to execute the first National Development Plan which was to be followed by the second and third development plans, the Federal Republic of Nigeria commissioned a study of the Nigerian economy in 1962. Carter (9:1) constructed the first input-output tables in order to portray the structure of the Nigerian economy using 1960 as the base year. The input-output tables developed formed the basis for a considerable amount of further work in the area of Nigerian national accounts. The foundations for the construction of the input-output model were the accounts of Okigbo (48), published works of the Federal Office of Statistics, the estimates of the Economic Planning Unit, the work of Kilby on small industry, and some unpublished reports on manufacturing (58:323-324).

In the first Nigerian input-output analysis, selection of sectors reflected a bias in favor of manufacturing. Agriculture was split into two sectors, and the line of demarcation was the introduction of mechanical processes. More detail for manufacturing than for agriculture demonstrated the extent of industrialization in Nigeria. Although the

blank "boxes" in the input-output calculations amounted to 49 percent of the total, the matrix remained both nonsingular and nontriangular.

Every attempt in the study of Nigerian economy was made to put all figures in 1959-60 producer's prices because the manufacturing section's prices were taken from unpublished statistical returns for that year. Imports were treated as though they were all noncompetitive, and they appeared in a row vector beneath the main matrix. This approach was adopted for computational convenience.

The first Nigerian input-output table consisted of 20 sectors, namely: agriculture, livestock and fishing, agricultural processing, textiles, clothing, drink and tobacco, food, metal mining, nonmetal mining, chemicals, transportation, utilities, trade, construction, services, transport equipment, nonmetallic mineral products, metal manufacturing, products of wood, leather, rubber and plastic and miscellaneous manufacturing. The structure of the economy and interrelationships were revealed by this study (9:49-52).

A broad spectrum of the application of input-output analysis has been explored. Since input-output analysis provides a series of links between final demand and the outputs and inputs of industries, it becomes a powerful fool for analyzing changes in an economy. The widespread use of input-output analysis illustrates the need to provide guidelines for resource utilization and economic development programs.

Assumptions of Interindustry Analysis

The basic assumptions of input-output analysis are: 1) fixed technical coefficients, and 2) no errors of aggregation.

The first implies that technology is constant. This assumption does not conform to the real world in a strict sense, but it may be realistic for a short period of time. The fixed technical coefficient assumption is the most restrictive, and several implications are involved (28:5-6). The assumption implies that the optimum scale of production has been reached and that any shift in technology would change the technical coefficients. Another implication of the assumption is that external economies and diseconomies do not exist, and price ratios are constant. Furthermore, the assumption does not allow for substitution effects. Therefore, the fixed coefficient assumption limits the use of an input-output model for long-range forecasting.

The second assumption is not as restrictive as the first. No errors of aggregation imply that each industry produces a homogeneous product. This means that a sector could not produce a joint product nor could two different sectors produce the same product. This is not entirely correct. The assumption that there are no errors of aggregation means that as the number of sectors increases, aggregation errors decrease. Thus, model accuracy should increase with size (33:259-261).

While the above assumptions are restrictive, they are necessary in order to establish a starting point. Because of the abstract nature of the model, interpretation of the findings should recognize the abstraction involved.

The Interindustry Model

The interindustry models used in this study present the relationships that exist among the industries. The gross output used implies that the total output of each producing sector is accounted for in the

model. The model is an "open" model because the final demand sectors are exogenous. In a "closed" model all sectors are endogenous (7:14). The unit of measurement used is naira (₦ = $1.70). All input-output models consist of three fundamental parts: the flow table, the table of technical coefficients, and the table of interdependence coefficients.

The Flow Table

The interindustry flow table for an economy describes the interaction of the various sectors (Table 2.1). The flow of transactions may be expressed mathematically (39:106-109):

$$\sum_{j=1}^{n} x_{ij} + Y_i = X_i \quad (i = 1, 2, \ldots, n)$$

where:

x_{ij} = amount of output sector i ships to sector j

Y_i = final demand for output of sector i

X_i = total output of sector i

Sales are read from left to right across the rows, while purchases are read down the columns. Thus, each column entry in the flow table indicates a purchase by the sector named at the top of each column from each sector listed at the left of the row.

Technical Coefficients

A technical coefficient measures the amount of a given sector's output that is used by another sector per unit of output produced by the purchasing sector. It is calculated from the flow table. The calculation of these coefficients could be represented as follows (6:27):

$$a_{ij} = \frac{x_{ij}}{X_j}$$

Table 2.1. The Flow Table

Producing sectors	Purchasing sectors 1	2	3 .... j .... n	Final demand Y	Total sales X
1	x_{11}	x_{12}	$x_{13}\cdots x_{ij}\cdots x_{1n}$	Y_1	X_1
2	x_{21}	x_{22}	$x_{23}\cdots x_{2j}\cdots x_{2n}$	Y_2	X_2
3	x_{31}	x_{32}	$x_{33}\cdots x_{3j}\cdots x_{3n}$	Y_3	X_3
.	.	.	. . .	.	.
i	x_{i1}	x_{i2}	$x_{i3}\cdots x_{ij}\cdots x_{in}$	Y_i	X_i
.	.	.	. . .	.	.
m[a]	x_{m1}	x_{m2}	$x_{m3}\cdots x_{mj}\cdots x_{mn}$	Y_m	X_m

[a] $m = n$.

where:

a_{ij} = technical coefficient

x_{ij} = amount of output produced by sector i and used by sector j

X_j = total amount of output produced by sector j

The use of the technical coefficients assumes a linear relationship between the producing sector and the purchasing sector.

Technical coefficients are useful in estimating the direct effect among different sectors; but since total effect--both direct and indirect effects--is required in this study, it is necessary to discuss the interdependence coefficients.

Interdependence Coefficients

Interdependence coefficients estimate the total direct and indirect expansion of output in the economy that will be required to sustain an increase in final demand by one naira in any given sector.

Interdependence coefficients are calculated by subtracting the technical coefficients matrix from an identity matrix of the same magnitude. The resulting matrix from the above calculation is inverted to obtain the interdependence coefficients matrix.

This could be expressed mathematically as follows (2:15-16):

$$(I - A)X = Y$$

where:

I = identity matrix

A = technical coefficients matrix

X = vector of total output by industry

Y = vector representing final demand by industry

In matrix notation the solution becomes (37:6):

$$\begin{bmatrix} 1 - a_{11} & - a_{12} & - a_{13} \cdots & - a_{1j} \cdots & - a_{1n} \\ - a_{21} & 1 - a_{22} & - a_{23} \cdots & - a_{2j} \cdots & - a_{2n} \\ - a_{31} & - a_{32} & 1 - a_{33} \cdots & - a_{3j} \cdots & - a_{3n} \\ \cdot & \cdot & \cdot & \cdot & \cdot \\ - a_{i1} & - a_{i2} & - a_{i3} \cdots 1 - a_{ij} \cdots & & - a_{in} \\ \cdot & \cdot & \cdot & \cdot & \cdot \\ - a_{m1} & - a_{m2} & - a_{m3} \cdots & - a_{mj} \cdots 1 - a_{mn} & \end{bmatrix} \cdot \begin{bmatrix} X_1 \\ X_2 \\ X_3 \\ \cdot \\ X_i \\ \cdot \\ X_m \end{bmatrix} = \begin{bmatrix} Y_1 \\ Y_2 \\ Y_3 \\ \cdot \\ Y_i \\ \cdot \\ Y_m \end{bmatrix}$$

Leontief matrix has the properties that all the elements on the diagonal are positive, while those off the diagonal are negative or zero. By solving for X, the solution becomes:

$$X = (I - A)^{-1} Y$$

where $(I - A)^{-1}$ is the inverse of the matrix $(I - A)$. The general solution in matrix notation may be stated as:

$$\begin{bmatrix} X_1 \\ X_2 \\ X_3 \\ \cdot \\ X_i \\ \cdot \\ X_m \end{bmatrix} = \begin{bmatrix} r_{11} & r_{12} & r_{13} \cdots & r_{1j} \cdots & r_{1n} \\ r_{21} & r_{22} & r_{23} \cdots & r_{2j} \cdots & r_{2n} \\ r_{31} & r_{32} & r_{33} \cdots & r_{3j} \cdots & r_{3n} \\ \cdot & \cdot & \cdot & \cdot & \cdot \\ r_{i1} & r_{i2} & r_{i3} \cdots & r_{ij} \cdots & r_{in} \\ \cdot & \cdot & \cdot & \cdot & \cdot \\ r_{m1} & r_{m2} & r_{m3} \cdots & r_{mj} \cdots & r_{mn} \end{bmatrix} \cdot \begin{bmatrix} Y_1 \\ Y_2 \\ Y_3 \\ \cdot \\ Y_i \\ \cdot \\ Y_m \end{bmatrix}$$

where r_{ij} are the elements in inverse matrix. The solution is assured because of the special properties of Leontief matrix.

Multipliers

Final demand multipliers are estimates of the total amount that output would increase in business sectors if a given sector were to

increase sales to final demand by one naira. Since final demand multipliers measure the direct and indirect effects of the interrelationships, they form the basis for the predictive capacity of an input-output study. The multipliers are computed directly from the interdependence coefficients. Individual sector's column coefficients are added to derive the multiplier:

$$a_{11} + a_{21} + a_{31} \cdots a_{i1} + a_{m1} = \sum_{m=1}^{m} a_{m1} \quad (20:17)$$

CHAPTER 3

METHODOLOGY

Input-output analysis is an analytical tool for examining interrelationships that exist among sectors of an economy. Also, for an economy it facilitates the estimation of output, income, and employment multipliers. Several studies have utilized the Leontief model in analyzing rural and regional economies (1, 31, 35, 42, 43).

Interdependency studies require an accounting of input and product flows within and between sectors in order to identify and quantify the intersectoral dependencies that exist in the economy. Secondary data are inadequate; hence, field interviewing of representative units to evaluate the flow of inputs and outputs within the economy is mandatory. In developing the methodology, the following steps were followed: 1) delimitation of the study area, 2) the secondary data search, 3) listing the population of firms and establishments by industry, 4) definition of economic sectors, 5) development of control totals, 6) the sample selection of industries to include in the study, 7) conduct of the survey, 8) development of the interindustry flow accounts, and 9) identification of the analytical methods to be used.

Delimitation of the Study Area

The study area, Cross River State, is an existing administrative unit. The interregional trade coefficients are stable since there are fixed supply areas. The area input-output model can, therefore, be used

for forecasting or for making an economic impact analysis of the study area. The study area is not a nodal region, but it is large; and it encompasses all the nodal regions of the Cross River State. Furthermore, the delimitation of the study area is dependent on the objectives of the research. Since an input-output table is to be constructed as an adjunt to the development of a regional policy, economic policy decision will apply to the study area (54:86-88).

The predictive capabilities of the model could be limited if the economy were dominated by one or two firms. The presence of this dominance in a small economy would limit generalizing results to other area economies (36:8). These limitations would not materialize in this study because the study area is large enough to eliminate any economic dominance (18:1). There were no sectors that were controlled by one or two firms, consequently, stable results would be obtained. The large size of the study area facilitated more diversification; and, therefore, the local interindustry matrix will exhibit more interdependence and have fewer zero cells than would be the case in a small region. Hence, the area input-output tables will be more reliable than if they were developed for a small region.

Secondary Data Search

Secondary data were needed to identify the structure of the economy. Such data were useful for estimating gross output. The process of identifying gross output was a very crucial step in the construction of the input-output table for the different sectors because sampling procedures were used. The gross output data were published by government and industries. Gross output data facilitated selection of the

sectors and identification of firms. Published information was the only data source for developing and estimating most of the exogenous final demand sectors. Secondary data were essential even in the most primary-data-based input-output study (54:90-91).

Listing the Population of Firms and Establishments by Industry

A complete listing of the population of firms and establishments by sectors was obtained from the Cross River State Ministry of Trade and Industries Trade Directory (19). To obtain a comprehensive master list, the listing in the Ministry of Trade and Industries Trade Directory was compared with the master list kept by the Cross River State Ministry of Economic Planning. The accuracy of the lists was checked with the aid of small cluster surveys in Calabar, Cross River State.

A list of economic activities was compiled from the directories kept by the Cross River State Ministries of Trade and Industries and Economic Planning. The sectors are presented in Table 3.1.

Definition of Economic Sectors

The number of sectors in an input-output table was determined by a host of factors such as costs, research objectives, and data availability. The International Standard Industrial Classification and the Government Industrial Survey provided the bases for the selection of sectors (61:26-48). Adjustments were made involving disaggregation to reflect more precisely the region's industrial structure. The main criterion for selection was that of homogeneity. The more homogeneous the input-output sectors, the more accurate would be the input-output forecasts (54:91-92).

Table 3.1. Number of Identified Economic Units by Sector, for Cross River State Economy, 1978

Sector	Number of economic units
1. Cash crops	20
2. Food crops	21
3. Forestry	3
4. Fishery	18
5. Livestock and feeds	20
6. Vegetable oil	9
7. Bakery	9
8. Beer and soft drinks	3
9. Textiles and apparels	20
10. Wood products	19
11. Printing and publishing	5
12. Nonmetallic products	14
13. Metallic products	12
14. Utilities	3
15. Services	18
16. Trade	7
17. Transport and communications	7
18. Miscellaneous	8
Total	216

Two problems for the input-output analyst to solve are classification and aggregation (38:412). The former refers to devising a meaningful and operational grouping of all economic activities to be covered in the input-output study. The latter refers to the summation of essentially heterogeneous quantitites. The problem of classification was not really unsurmountable because the researcher can choose the sectors according to research needs or according to data availability. In this study, the availability of data was the deciding factor.

Besides availability of data, the input-output analyst has at his disposal several classification schemes to choose from if he is compiling the input-output table starting from an existing model or from the census level. In this particular study, the classification system employed in the 1959-60 table for the Nigerian economy by Carter (9:49-52), and the International Standard Industrial Classification and Government Industrial Survey provided the base for the classification.

Aggregation is a more serious problem than classification (8:64-67). Aggregation conceals a great deal of information. Although it is generally preferable to start with as much disaggregation as possible, the costs incurred in constructing a large input-output table generally inhibit the accomplishment of this ideal. Aggregation causes a loss of information, but disaggregation may be costlier in terms of time and manpower. Furthermore, it is possible that more details in the input-output table may not be needed in view of the goals for which the table was constructed.

A brief description of the endogenous sectors follows.

Agriculture

Agricultural production contributes about 60 percent to the study area's gross product (49:1-5). Since data were available, the values of gross output were obtained from the state data prepared by the Ministries of Economic Planning and Agriculture and Natural Resources (16).

The agricultural sector comprised all the farm enterprises that were engaged in farming, for example, cocoa, palm produce, rubber, palm wine, root crops, cereals, kola nuts, bananas, plantains, and vegetables. To facilitate the analysis, agriculture was subdivided into cash and food crops. Cash crops are earners of foreign exchange, while food crops are produced for domestic consumption. Cocoa, palm produce, and rubber are the major cash crops, while yams, cassava, cereals, and vegetables are the major food crops.

Forestry

Forestry in this study covered all wood from the time it appeared as export logs, sawmill logs, or as firewood (34:137-140).

Fishery

The fishery industry in this context included artisanal (marine and brackish water fishing), ponds, and fresh water fishing (5:148-152).

Livestock and Feeds

Agriculture and livestock tend to be grouped together in some of the statistics, so there was the difficulty of having to make estimates to separate the two. The livestock and feeds sector is still in its infancy, but government development programs have laid much emphasis on removing protein deficiencies in the state. Therefore, many new firms have started operations in recent years. All enterprises that were

engaged in the production of animals, livestock, and animal feeds were included in this sector.

Vegetable Oil

Vegetable oil and processors, representing the major processing firms, were treated in this section.

Bakery

Bakery products such as bread, rolls, and cakes were included in this sector.

Beer and Soft Drinks

This sector covered all manufactured drinks--alcoholic and non-alcoholic drinks. Palm wine was included in agriculture although it is quite alcoholic. Champion lager beer, Pepsi Cola, and Plasto Crown Company which produces crates and bottle caps were the components of this sector.

Textiles and Apparels

The manufacture of clothing and shoes and the making of cloth were grouped in this sector.

Wood Products

All forms of carpentry and furniture making were the components of this sector. The main supply was the forestry sector.

Printing and Publishing

This sector covered the printing presses, newspaper corporations, and publishing companies.

Nonmetallic Products

The nonmetallic products sector was comprised of the following: pottery, cement, petroleum refining, and soap manufacturing. It also covered the extraction of sand, stone, and gravels.

Metallic Products

This sector covered the manufacture of metal goods such as metal structures, tanks, drums, metal furniture and repair, and assembly of machinery, boats, and bicycles. Also, the boatyard industry was included in this sector.

Utilities

The major components of this sector were electricity and water supply. Public corporations are the main suppliers of these utilities. There were very few private firms that provided utility services where the public corporations did not operate.

Services

These definite activities were included in the service sector: domestic service, entertainment, ownership of buildings, professional services, banks, and insurance companies. The public and the private owned financial services were grouped together.

Trade

This is a rather diffuse sector in that it is related closely to the service sector. The Marketing Boards play a key role in this sector. Only that portion of distribution which was actually concerned with the buying and selling of goods was included in this sector. The components were the wholesale and retail businesses.

Transport and Communications

Included in this sector were both public and private passenger transport, ferries, and the communication system. Overall, the total for this sector was furnished by the Ministry of Transport and Communication.

Miscellaneous

All industrial production that was excluded in the previous categories was included in this sector. Construction was the leading component.

Household

This sector was included in the model so that the induced effect could be captured. The household provided labor, entrepreneurial ability, and capital. The consumption of goods and services emanated from the household.

This study specified only three final demand sectors. Both public and private consumption and investment were grouped together. A brief description of the three demand sectors follows:

Consumption

Consumption is defined as all purchases of the final goods and services by both public and private consumers (8:76). The data for this sector were taken from the Report on Rural Consumer's Expenditures Survey published by the Statistics Division of the Ministry of Finance and Economic Development (17).

Investment

This sector consisted of both public and private investments.

Exports

All items exported from the study area were grouped together under this sector. All goods and services were valued at producers' price.

Development of Control Totals

The gross output for each sector was compiled. In some cases, where all firm managers in the sector were individually interviewed, the control totals were used for consistency checking. When interindustry transactions were estimated through sampling of firms, gross output was needed in order to expand the sample data. Gross output was obtained through published sources. The gross output for all sectors in 1978 was presented in thousand nairas in Table 3.2.

Sample Selection

The key to a successful construction of an input-output table is efficient sampling. A master list of all establishments included in this study was reduced in the first instance by the elimination of all firms with less than 10 employees. This criterion reduced the number of establishments from 216 to 150 (Table 3.3). In each division, the number of firms identified from the directories was then subdivided into their respective sectors. Then, a random sample, stratified by size, was drawn for cash crops, food crops, fishery, livestock and feeds, vegetable oil, bakery, textiles and apparels, wood products, printing and publishing, nonmetallic products, metallic products, services, trade, and the miscellaneous sectors. A minimum coverage of about 33 percent by stratified sampling was maintained. The forestry, transport and communications,

Table 3.2. Cross River State, Gross Domestic Product, 1978

Sector	₦ (000)
1. Cash crops	16,600.5
2. Food crops	5,215.5
3. Forestry	651.0
4. Fishery	109,259.4
5. Livestock and feeds	2,607.3
6. Vegetable oil	3,670.5
7. Bakery	10,843.0
8. Beer and soft drinks	19,680.0
9. Textiles and apparels	369.0
10. Wood products	1,632.0
11. Printing and publishing	243.0
12. Nonmetallic products	73,241.6
13. Metallic products	426.0
14. Utilities	958.5
15. Services	1,948.0
16. Trade	2,768.6
17. Transport and communications	3,194.3
18. Miscellaneous	1,320.0
Total	254,628.2

Table 3.3. Number of Identified Economic Units and Number of Units Sampled, by Sector, for Cross River State Economy, 1978

Sector	Number of economic units[a]	Number of units sampled
1. Cash crops	18	9
2. Food crops	12	6
3. Forestry	3	3
4. Fishery	13	7
5. Livestock and feeds	14	7
6. Vegetable oil	9	3
7. Bakery	9	4
8. Beer and soft drinks	3	3
9. Textiles and apparels	8	6
10. Wood products	12	9
11. Printing and publishing	5	3
12. Nonmetallic products	10	9
13. Metallic products	8	7
14. Utilities	1	1
15. Services	14	5
16. Trade	5	2
17. Transport and communications	3	3
18. Miscellaneous	3	2
19. Household	--	--[b]
Total	150	89

[a]These economic units employed at least 10 employees before they were included in Government Industrial Survey.

[b]Based on Ministry of Economic Planning Report only 5 percent was sampled to crosscheck.

utilities, and the beer and soft drinks sectors required no sampling because there were only a few firms in these sectors. For example, there was only one firm that produced beer, only one firm that produced Pepsi Cola, and one firm that manufactured bottle and crates. All these firms were included in the survey. The National Electric Power Authority (NEPA) is the sole authority commissioned for the supply of public utilities; thus, the NEPA headquarters in Calabar provided the necessary information.

The managers in the firms in the above-mentioned sectors--namely, forestry, transport and communications, utilities, and beer and soft drinks--were individually interviewed. The Report on Rural Consumers' Expenditures Survey published by the Statistics Division of the Ministry of Economic Planning provided the needed information on household expenditures (17). As a further check, a stratified random sample was drawn to crosscheck the secondary data. The secondary data provided a great deal of information on consumption. Such data are fundamental to the development of income multipliers.

Questionnaires were employed in order to obtain the expense and income flows within a sector (46:73-74). Cash flows into and out of the geographical area were also accounted for. A sample of the survey questionnaire that was used in the survey interview is included in Appendix A. The base year for the study was 1978.

Conduct of the Survey

The primary data which were considered necessary for a regional interindustry study were obtained from field interview because information

regarding the distribution of goods and services and money flows on fine geographical areas was not available from secondary sources (27:59).

The degree of accuracy in the collection of data was determined by these factors: 1) the quality of the field staff engaged in the collection of data; 2) the cooperativeness of the firms being interviewed; and 3) the logistics and financial resources available for the project (47:9-15). To some extent the ease of fulfilling items 1 and 2 depended on the availability of logistics and financial support.

Ten experienced university graduates participated in the collection of data. The background and knowledge of the enumerators facilitated the collection of accurate data. Besides the role playing that the enumerators undertook before actually collecting data, close supervision of their work and the crosschecking of interview forms after completion enhanced the collection of accurate data (47:23).

Accurate data collection was dependent on the cooperativeness of the business managers interviewed. A letter of introduction issued by the Chief Economic Planning Officer to all heads of firms that were interviewed enhanced the cooperation of the firms. Moreover, the use of enumerators who were acceptable to the firms and the prompt settlement of any misunderstanding that arose enhanced the cooperation between managers and interviewers. The enumerators were assigned to their respective area of specialty; for example, economists manned the industrial sectors, agriculturists handled the agricultural sectors, and engineers manned the mining sector.

Good quality staff and cooperative businesses can create a conducive environment for collecting information; such was the case in this study. This alone, however, does not ensure the acquirement of adequate

data. The availability of data is an equally deciding factor. It was costly to conduct personal interviews, but the benefits outweigh the costs. Since all the enumerators were already employees of the government, the cost of the survey was held to a minimum.

It is worth noting that personal interviews were not always easy. In some cases, two to three personal visits were paid to firms before the necessary data were obtained. The management dictated the date for the interview, and this prolonged the completion of the task. In some cases "guess estimates" on missing items were accepted in place of hard data as answers to particular questions. These difficulties were overcome by good public relations, willingness to take time to explain the purposes of the project, and the insistence of being courteous in making requests for information.

Interindustry Flow Accounts

Interindustry flow accounts were developed for each individual sector. The construction of input-output matrices was based on the flow accounts. But the flow accounts are very important to the analyst who is concerned with every detail. Flow accounts make the analysis dynamic instead of static. This is because the results can be revised constantly as additional information becomes available. Thus, the cost of conducting an entirely new study again will be saved. Moreover, the presentation of the flow accounts fits the general purpose of the study which is to create an analytical tool, a working model, and an information source (9:53-54).

It must be stressed that the interindustry flow accounts for each individual sector are an aggregation of all the flow accounts for each

individual industry in that particular sector. For example, individal flow accounts were first developed in the cash crops sector for palm oil and kernel, rubber, cocoa, and citrus. Then, these individual accounts were summed together to obtain the interindustry flow accounts for the cash crops sector. The interindustry flow accounts are presented on a double entry basis with inputs on the left and the outputs on the right-hand side of the table (Appendix B) (23:101-103).

Analytical Methods

The data of the total gross flows and the interindustry transactions were assembled either by direct summation in sectors where complete counts were made or by expanding the sample results with the aid of secondary data (54:104-105). The direct requirements table was then constructed. The direct requirements may be interpreted as the value of the input required by the purchasing sector in order to produce its output. It is customary to measure interindustry flows at the producers' prices since it strengthens the constant coefficients assumption. This implies that transactions data were not affected by cost of transportation and double counting of transport and distribution costs were eliminated.

Based on the direct requirements for all sectors, the secondary impacts created in the study area economy were estimated. An increase in the final demand for a product leads to increased output in other sectors. Also, the number of added full-time jobs, which would result from any sector hiring one more employee, could be determined. In sum, the study analyzed the final demand, income, and employment multipliers that would occur in the economy.

CHAPTER 4

EMPIRICAL RESULTS

The principal results of this study are contained in the input-output tables which quantitatively describe the industrial interrelationships of the Cross River State economy. This chapter is devoted to the interpretation of the data contained in the tables. Also, specified application of the input-output tables to changes in final demand is analyzed.

Transaction Matrix

A 19x19 matrix was developed to represent the transactions in the economy (Table 4.1). The rows in the matrix refer to producers while the columns represent the purchasing sectors. The total gross output of each sector in Cross River State, distributed among the existing establishments, and final demand was determined. The transactions table portrays the naira flows of goods and services among sectors in the economy for the 1978 accounting period.

Each row in the table shows how the gross output of each sector was distributed to each of the purchasing sectors in the economy. In order to account fully for all the sectors' total output, a detailed distribution to the various components of final demand is shown in Table 4.1. However, it must be mentioned that in an economy where every transaction is not fully marketed, the total output in the economy is greater than the recorded transactions. Reading down a column of the

Table 4.1. Transaction Flows of Goods and Services for Cross River State Economy, 1978

Selling sector	Purchasing sector					
	Cash crops	Food crops	Forestry	Fishery	Livestock and feeds	Vegetable oils
	₦ (000)					
Cash crops	1,920.3	0	0	0	0	1,124.3
Food crops	0	55.6	0	0	601.0	0
Forestry	0	12.5	30.6	20.0	0	0
Fishery	0	0	0	0	61.6	0
Livestock and feeds	0	0	0	0	999.4	0
Vegetable oils	0	0	0	0	0	0
Bakery	0	0	0	0	0	0
Beer and soft drinks	0	0	0	0	0	0
Textiles and apparels	0	0	0	0	0	0
Wood products	0	0	0	290.1	0	0
Printing and publishing	0.2	0.1	0.1	0.0	0	0
Nonmetallic products	8.0	7.4	3.0	55.0	0	30.2
Metallic products	83.3	3.0	2.9	10.0	3.9	9.1
Utilities	94.1	5.8	4.5	37.0	9.8	36.7
Services	133.6	14.6	2.6	92.0	17.3	15.0
Trade	98.2	9.2	3.8	103.0	7.8	8.1
Transport and communications	747.2	8.5	9.5	45.0	26.4	5.8
Miscellaneous	187.1	6.7	2.7	260.0	92.5	10.1
Household	6,285.4	274.0	104.6	3,900.0	97.8	483.6
Total endogeneous sector	9,557.4	397.4	164.3	4,812.1	1,917.4	1,722.9
Imports	40.0	80.1	60.1	3,755.0	129.2	75.4
Value added	7,003.1	4,738.0	426.6	100,692.3	560.6	1,872.2
Total outlay	16,600.5	5,215.5	651.0	109,259.4	2,607.3	3,670.5

Table 4.1 (continued)

Selling sector	Purchasing sector: Bakery	Beer and soft drinks	Textiles and apparels	Wood products	Printing and publishing	Nonmetallic products
	₦ (000)					
Cash crops	0	0	9.6	0	0	3,858.2
Food crops	51.4	560.1	0.0	0.0	0	0
Forestry	135.5	0	0	50.5	10.2	0
Fishery	0	0	0	0	0	0
Livestock and feeds	0	0	0	0	0	0
Vegetable oils	821.1	0	0	0	0	377.6
Bakery	0	0	0	0	0	0
Beer and soft drinks	0	1,500.0	0	0	0	0
Textiles and apparels	0	0	31.3	0	0	0
Wood products	0	0	1.5	164.3	0	0
Printing and publishing	0.3	0.1	0	0	23.2	0.1
Nonmetallic products	0	0	0	0	0	19,040.9
Metallic products	1.9	2.0	0	0	3.1	187.8
Utilities	86.7	358.6	3.6	16.3	1.8	175.5
Services	20.6	869.0	12.1	20.4	4.7	238.8
Trade	33.7	675.4	13.1	6.1	9.4	526.6
Transport and communications	4.5	634.0	7.4	32.6	9.1	359.4
Miscellaneous	0.0	15.0	0.0	40.8	2.4	26.4
Household	1,559.6	1,605.0	26.6	97.9	158.0	8,789.0
Total endogeneous sector	2,715.3	6,219.2	105.2	428.9	221.9	33,580.3
Imports	1,081.0	6,250.0	62.6	30.4	3.1	10,153.2
Value added	7,046.7	7,210.8	201.2	1,172.7	18.0	29,508.1
Total outlay	10,843.0	19,680.0	369.0	1,632.0	243.0	73,241.6

Table 4.1 (continued)

Selling sector	Purchasing sector: Metallic products	Utilities	Services	Trade	Transport and communications	Miscellaneous	Household
	₦ (000)						
Cash crops	0	0	0	0	0	0	0
Food crops	0	0	0	0	0	0	3,548.2
Forestry	0	0	0	0	0	0	0
Fishery	0	0	0	0	0	0	1,315.2
Livestock and feeds	0	0	0	0	0	0	747.2
Vegetable oils	0	0	0	0	0	0	846.0
Bakery	0	0	0	0	0	0	734.4
Beer and soft drinks	0	0	0	0	0	0	887.0
Textiles and apparels	0	0	1.8	0	0	0	6.7
Wood products	0	0	0	42.9	9.3	6.2	793.2
Printing and publishing	0.1	0.1	1.4	10.7	0	0.1	152.9
Nonmetallic products	1.5	15.9	3.0	96.2	27.9	26.4	836.8
Metallic products	8.5	1.4	1.5	78.2	3.6	2.6	0
Utilities	42.6	0.8	0.9	2.3	0.6	1.2	36.3
Services	25.6	8.0	0.0	69.4	8.6	12.3	218.5
Trade	10.7	0	29.8	0	0	29.4	1,085.9
Transport and communications	9.7	1.7	4.9	85.1	0	55.6	684.0
Miscellaneous	2.7	11.5	30.7	29.4	0.3	0	362.6
Household	98.0	58.5	297.6	347.1	92.9	171.6	0
Total Endogeneous sector	199.4	97.9	371.6	761.3	143.2	305.4	12,255.0
Imports	38.3	50.7	44.6	254.5	154.8	303.6	651.1
Value added	188.3	809.9	1,531.8	1,752.8	2,896.3	711.0	11,541.1
Total outlay	426.0	958.5	1,948.0	2,768.6	3,194.3	1,320.0	24,447.2

Table 4.1 (continued)

Selling sector	Total endogeneous sector	Final demand			Total output
		Investment	Consumption	Exports	
	₦ (000)				
Cash crops	6,912.4	118.7	0	9,569.4	16,600.5
Food crops	4,816.3	16.1	383.4	0	5,215.8
Forestry	259.3	2.7	7.0	382.0	651.0
Fishery	1,976.9	5,700.0	90,082.5	12,100.0	109,259.4
Livestock and feeds	1,746.6	0	860.7	0	2,607.3
Vegetable oils	2,044.7	99.1	773.7	753.0	3,670.5
Bakery	734.4	0	6,692.6	3,416.0	10,843.0
Beer and soft drinks	2,387.0	200.0	10,533.0	5,560.0	19,680.0
Textiles and apparels	39.8	0	329.2	0	369.0
Wood products	1,307.5	0	324.5	0	1,632.0
Printing and publishing	189.4	0	43.6	10.0	243.0
Nonmetallic products	20,152.2	20,000.0	26,177.4	6,912.0	73,241.6
Metallic products	402.8	11.8	11.4	0	426.0
Utilities	915.1	0	43.4	0	958.5
Services	1,783.1	0	164.9	0	1,948.0
Trade	2,650.2	0	118.4	0	2,768.6
Transport and communications	2,730.4	217.0	246.9	0	3,194.3
Miscellaneous	1,080.9	0	239.1	0	1,320.0
Total	52,129.0	26,365.4	137,031.7	38,702.4	254,628.5

transaction table shows the purchases made by each sector from the producing sectors.

For example, the cash crops sector purchased inputs in the amount of ₦1,920,300 from firms in the same sector. It also spent ₦200 on printing and publishing, ₦8,000 on nonmetallic products, ₦83,300 on metallic products, ₦94,100 on utilities, ₦133,600 on services, ₦98,200 on trade, ₦747,200 on transport and communications, ₦187,100 on miscellaneous items, and ₦6,285,400 on the household sector. In addition to purchasing inputs from the above sectors, the cash crops sector bought imported inputs for ₦40,000. Therefore, the total amount spent on inputs amounted to ₦9,597,400. On the other hand, reading across the same cash crops sector, the sector sold its output worth ₦1,920,300 to the cash crops sector. Also, some of the output were sold to the vegetable oil sector (₦1,124,300), textiles and apparels sector (₦9,600), and to the nonmetallic products sector (₦6,912,400). The same sector exported output worth ₦9,569,400. Its total output was worth ₦16,600,500.

Value added is defined as the difference between the value of production in a given sector and payments for inputs purchased from other productive sectors. It is the normal procedure to disaggregate the value added by each sector into payments to the factors--wages, rent, interest, and profits, as well as the two nonincome allocations, depreciation and indirect business taxes.

In Table 4.1 value added is disaggregated into two components only: payments to labor and other payments. In this study, all other payments, except payments to labor, were treated as leakages. They were considered leakages because many of the firms are owned by foreigners; also, many of the firms are branch firms with headquarters located in

other states. Thus, the residual value added was not captured in the interindustry analysis. Therefore, the impacts may be smaller than they would nominally be because of the leakages.

Other figures, say for the forestry, fishery, and vegetable oil sectors, can be interpreted in a similar way. Also, purchases of goods and services by the final demand sector was indicated.

The total gross output for the study area was 254.6 million nairas. Only eight sectors--namely, cash crops, forestry, fishery, vegetable oil, bakery, beer and soft drinks, printing and publishing, and nonmetallic products sectors--exported their products outside the study area. Total imports into the area amounted to 23.2 million nairas.

Technical Coefficients

Table 4.2 is a table of technical coefficients derived from the transaction table. The technical coefficients, which comprise the direct requirements table, indicated the naira value of product from one producing sector needed before the purchasing sector could produce a unit of its output. The percentage of money spent locally indicates the dependency of each sector on the other sectors of the economy of Cross River State. For example, a total of ₦0.1971 was spent in local businesses while ₦0.3786 was spent in the household sector by the cash crops sector per naira of output. Besides spending the largest percentage of its total expenditures in the household sector, the cash crops sector also spent ₦0.1157 among firms in its own sector and ₦0.045 in the transport and communications sector. Other sectors that also benefited nominally from the cash crops sector expenditures were printing and publishing,

Table 4.2. Technical Coefficients for Cross River State Economy, 1978

Selling sector	Purchasing sector					
	Cash crops	Food crops	Forestry	Fishery	Livestock and feeds	Vegetable oils
Cash crops	.1157	.0000	.0000	.0000	.0000	.3063
Food crops	.0000	.0107	.0000	.0000	.2305	.0000
Forestry	.0000	.0024	.0470	.0002	.0000	.0000
Fishery	.0000	.0000	.0000	.0000	.0236	.0000
Livestock and feeds	.0000	.0000	.0000	.0000	.3833	.0000
Vegetable oils	.0000	.0000	.0000	.0000	.0000	.0000
Bakery	.0000	.0000	.0000	.0000	.0000	.0000
Beer and soft drinks	.0000	.0000	.0000	.0000	.0000	.0000
Textiles and apparels	.0000	.0000	.0000	.0000	.0000	.0000
Wood products	.0000	.0000	.0000	.0027	.0000	.0000
Printing and publishing	+	+	.0002	.0000	.0000	.0000
Nonmetallic products	.0005	.0014	.0046	.0005	.0000	.0082
Metallic products	.0050	.0006	.0045	.0001	.0015	.0025
Utilities	.0057	.0011	.0069	.0003	.0038	.0100
Services	.0080	.0028	.0040	.0008	.0066	.0041
Trade	.0059	.0018	.0058	.0009	.0030	.0022
Transport and communications	.0450	.0016	.0146	.0004	.0101	.0016
Miscellaneous	.0113	.0013	.0041	.0024	.0355	.0028
Summation (rows 1-18)	.1971	.0237	.0917	.0083	.6979	.3377
Household	.3786	.0525	.1607	.0357	.0375	.1318
Total local purchases	.5757	.0762	.2524	.0440	.7354	.4695

Table 4.2 (continued)

Selling sector	Purchasing sector: Bakery products	Beer and soft drinks	Textiles and apparels	Wood products	Printing and publishing	Non-metallic products	Metallic products
Cash crops	.0000	.0000	.0260	.0000	.0000	.0527	.0000
Food crops	.0047	.0285	.0000	.0000	.0000	.0000	.0000
Forestry	.0125	.0000	.0000	.0309	.0420	.0000	.0000
Fishery	.0000	.0000	.0000	.0000	.0000	.0000	.0000
Livestock and feeds	.0000	.0000	.0000	.0000	.0000	.0000	.0000
Vegetable oils	.0757	.0000	.0000	.0000	.0000	.0052	.0000
Bakery	.0000	.0000	.0000	.0000	.0000	.0000	.0000
Beer and soft drinks	.0000	.0762	.0000	.0000	.0000	.0000	.0000
Textiles and apparels	.0000	.0000	.0848	.0000	.0000	.0000	.0000
Wood products	.0000	.0000	.0041	.1007	.0000	.0000	.0000
Printing and publishing	+	+	.0000	.0000	.0955	+	.0002
Nonmetallic products	.0000	.0000	.0000	.0000	.0000	.2600	.0035
Metallic products	.0002	.0001	.0000	.0000	+	.0026	.0200
Utilities	.0080	.0182	.0098	.0100	.0074	.0024	.1000
Services	.0019	.0442	.0328	.0125	.0193	.0033	.0601
Trade	.0031	.0343	.0355	.0037	.0387	.0072	.0251
Transport and communications	.0004	.0322	.0201	.0200	.0374	.0049	.0228
Miscellaneous	.0000	.0008	.0000	.0250	.0099	.0004	.0063
Summation (rows 1-18)	.1065	.2345	.2131	.2028	.2630	.3387	.2380
Household	.1438	.0816	.0721	.0600	.6502	.1200	.2300
Total local purchases	.2503	.3161	.2852	.2628	.9132	.4587	.4680

Table 4.2 (continued)

Selling sector	Purchasing sector: Utilities	Services	Trade	Transport and communications	Miscellaneous	Household
Cash crops	.0000	.0000	.0000	.0000	.0000	.0000
Food crops	.0000	.0000	.0000	.0000	.0000	.1451
Forestry	.0000	.0000	.0000	.0000	.0000	.0000
Fishery	.0000	.0000	.0000	.0000	.0000	.0538
Livestock and feeds	.0000	.0000	.0000	.0000	.0000	.0306
Vegetable oils	.0000	.0000	.0000	.0000	.0000	.0346
Bakery	.0000	.0000	.0000	.0000	.0000	.0300
Beer and soft drinks	.0000	.0000	.0000	.0000	.0000	.0363
Textiles and apparels	.0000	.0009	.0000	.0000	.0000	.0003
Wood products	.0000	.0000	.0155	.0029	.0047	.0324
Printing and publishing	.0001	.0007	.0039	.0000	.0001	.0063
Nonmetallic products	.0166	.0015	.0347	.0087	.0200	.0342
Metallic products	.0015	.0008	.0282	.0011	.0020	.0000
Utilities	.0008	.0005	.0008	.0002	.0009	.0015
Services	.0083	.0000	.0251	.0027	.0093	.0089
Trade	.0000	.0153	.0000	.0000	.0223	.0444
Transport and communications	.0018	.0025	.0307	.0000	.0421	.0280
Miscellaneous	.0120	.0158	.0106	.0001	.0000	.0148
Summation (rows 1-18)	.0411	.0380	.1495	.0157	.1014	.5012
Household	.0610	.1528	.1254	.0291	.1300	.0000
Total local purchases	.1021	.1908	.2749	.0448	.2314	.5012

+ = small positive transaction, a_{ij}.

nonmetallic products, metallic products, utilities, services, trade, and miscellaneous.

The pattern of expenditure among sectors varied. The largest portion spent on the local businesses was 69.8 percnet, while the lowest portion was 0.8 percent. The livestock and feeds sector spent most of its expenditures locally because most of its inputs were produced locally, while the fishery sector relied heavily on imported inputs.

The household row represents the percentage of total expenditures spent on the household sector by each of the purchasing sectors. The percentage ranged from 2.91 percent for the transport and communications sector to 65 percent for the printing and publishing sector; the cash crops sector spent 37.9 percent of its total expenditures on the household sector. This was quite obvious because over 5,136 persons were engaged in cash crops production. Also, most of the cultural operations like weeding, harvesting, and spraying were done by hand. The sum of the column entries for each sector revealed the percentage of expenditures that each sector contributed to the local economy. The largest contribution, 91.3 percent, to the local economy was made by the printing and publishing sector. The livestock and feeds and the cash crops sectors spent 73.5 percent and 57.6 percent, respectively, of their total expenditures in the local economy.

Although the impact of sectoral linkages in the economy was evident in the direct requirements table, all the trade linkages were not captured. The direct purchase of inputs locally was not only important for the direct impacts, but also for the interdependence created.

Direct and Secondary Coefficients

The direct and secondary coefficients were derived from the direct trade requirements in Table 4.2. The direct purchases made by any sector in order to produce one naira of output generated the direct coefficients. If the demand for the output in, for example, the cash crops sector were increased by one naira, the sector would then purchase more inputs from other sectors. In order for those sectors to provide the necessary inputs needed by the cash crops sector, they, in turn, must acquire additional purchases of goods and services. This indirect effect of an increase in the output of the cash crops sector gives rise to the secondary or indirect coefficients. The indirect effect gets progressively smaller with each round of purchase because of leakages. The summation of all business entries in each column in Table 4.3 reveals the amount by which each selling sector would increase output if each purchasing sector increased sales to the final demand by one naira. The coefficients for each column include both direct and secondary effects.

For example, if the cash crops sector were to increase sales to final demand by one naira, then output in the food crops sector would increase by ₦0.074, output in the forestry sector would increase by ₦0.001, and the output in the cash crops sector would increase by ₦1.138. One naira of this amount (₦1.138) represents the assumed increase in output.

The sum of the business entries in each column reveals the distributional impact of altered output by a given sector in the economy. Since the output effects were based on a one-naira increase in output by

Table 4.3. Interdependence Coefficients for Cross River State Economy, 1978

Selling sector	Purchasing sector					
	Cash crops	Food crops	Forestry	Fishery	Livestock and feeds	Vegetable oils
Cash crops	1.1383	.0011	.0034	.0007	.0018	.3517
Food crops	.0737	1.0201	.0294	.0062	.3938	.0456
Forestry	.0011	.0027	1.0498	.0004	.0012	.0007
Fishery	.0254	.0032	.0101	1.0021	.0438	.0157
Livestock and feeds	.0229	.0029	.0092	.0019	1.6265	.0142
Vegetable oils	.0172	.0022	.0069	.0014	.0037	1.0107
Bakery	.0139	.0017	.0055	.0012	.0030	.0086
Beer and soft drinks	.0182	.0023	.0073	.0015	.0040	.0112
Textiles and apparels	.0002	+	.0001	+	+	.0001
Wood products	.0176	.0022	.0071	.0045	.0044	.0108
Printing and publishing	.0034	.0004	.0016	.0003	.0008	.0021
Nonmetallic products	.0255	.0050	.0166	.0028	.0082	.0266
Metallic products	.0071	.0008	.0055	.0002	.0033	.0051
Utilities	.0090	.0015	.0086	.0005	.0074	.0137
Services	.0165	.0038	.0075	.0015	.0143	.0116
Trade	.0295	.0047	.0153	.0029	.0120	.0184
Transport and communications	.0678	.0038	.0223	.0020	.0233	.0277
Miscellaneous	.0220	.0025	.0081	.0032	.0605	.0125
Summation (rows 1-18)	1.5093	1.0609	1.2143	1.0333	2.1200	1.5870
Household	0.4620	.0582	.1845	.0389	.1005	.2858
Total local purchases	1.9713	1.1191	1.3988	1.0727	2.3125	1.8728

Table 4.3 (continued)

Selling sector	Purchasing sector: Bakery	Beer and soft drinks	Textiles and apparels	Wood products	Printing and publishing	Nonmetallic products
Cash crops	.0291	.0020	.0340	.0015	.0127	.0864
Feed crops	.0332	.0491	.0177	.0137	.1257	.0336
Forestry	.0135	.0004	.0005	.0363	.0506	.0005
Fishery	.0098	.0062	.0061	.0047	.0433	.0116
Livestock and feeds	.0088	.0056	.0055	.0043	.0391	.0104
Vegetable oils	.0823	.0042	.0041	.0032	.0293	.0149
Bakery	1.0053	.0034	.0033	.0026	.0236	.0063
Beer and soft drinks	.0070	1.0869	.0044	.0034	.0310	.0083
Textiles and apparels	.0001	.0001	1.0927	+	.0003	.0001
Wood products	.0067	.0050	.0099	1.1155	.0303	.0081
Printing and publishing	.0013	.0010	.0010	.0007	1.1115	.0016
Nonmetallic products	.0103	.0085	.0081	.0061	.0432	1.3629
Metallic products	.0011	.0016	.0016	.0006	.0177	.0048
Utilities	.0098	.0204	.0116	.0118	.0135	.0051
Services	.0052	.0509	.0390	.0159	.0352	.0088
Trade	.0121	.0434	.0450	.0093	.0820	.0206
Transport and communications	.0082	.0403	.0288	.0272	.0716	.0182
Miscellaneous	.0042	.0045	.0038	.0300	.0273	.0058
Summation (rows 1-18)	1.2480	1.3335	1.3171	1.2868	1.7879	1.6080
Household	.1781	.1121	.1107	.0857	.7882	.2106
Total local purchases	1.4261	1.4456	1.4278	1.3725	2.5761	1.8186

Table 4.3 (continued)

Selling sector	Purchasing sector: Metallic products	Utilities	Services	Trade	Transport and communications	Miscellaneous	Households
Cash crops	.0049	.0025	.0029	.0055	.0013	.0041	.0168
Food crops	.0436	.0115	.0268	.0254	.0054	.0239	.1690
Forestry	.0007	.0002	.0004	.0011	.0002	.0005	.0025
Fishery	.0150	.0040	.0092	.0088	.0019	.0082	.0583
Livestock and feeds	.0136	.0036	.0083	.0079	.0017	.0074	.0526
Vegetable oils	.0102	.0028	.0063	.0062	.0013	.0057	.0394
Bakery	.0002	.0022	.0050	.0048	.0010	.0045	.0318
Beer and soft drinks	.0107	.0028	.0066	.0063	.0013	.0059	.0416
Textiles and apparels	.0002	+	.0010	.0001	+	.0001	.0004
Wood products	.0108	.0028	.0066	.0234	.0045	.0113	.0395
Printing and publishing	.0024	.0006	.0021	.0055	.0002	.0013	.0076
Nonmetallic products	.0228	.0265	.0117	.0560	.0135	.0362	.0533
Metallic products	1.0220	.0018	.0017	.0295	.0012	.0032	.0022
Utilities	.1035	1.0014	.0014	.0048	.0005	.0020	.0044
Services	.0670	.0097	1.0031	.0299	.0033	.0125	.0151
Trade	.0400	.0041	.0239	1.0097	.0018	.0300	.0509
Transport and communications	.0344	.0051	.0096	.0384	1.0014	.0484	.0366
Miscellaneous	.0142	.0136	.0192	.0149	.0009	1.0035	.0202
Summation (rows 1-18)	1.4242	1.0952	1.1458	1.2782	1.0414	1.2087	.6422
Household	.2731	.0719	.1680	.1592	.0337	.1496	1.0597
Total local purchases	1.6973	1.1671	1.3138	1.4374	1.0751	1.3583	1.7019

+ = small positive transaction.

a particular sector, it follows that these coefficients could be used to calculate the expected increase in sales for the other sectors. An example will illustrate the point. If it were known that the cash crops sector was going to increase output by ₦100, then the food crops sector would be expected to increase sales by ₦7.37 (₦100 x 0.0737). By similar conversions, the expected increase in sales for the other sectors could be calculated.

Final Demand Multipliers

The final demand multipliers are presented in Table 4.4. The final demand multipliers estimate the impact on the economy of an additional naira of sales to final demand sector while output multipliers are based on a one-naira increase in total output by a sector including both sales to final demand and to the intermediate sectors.

There are two types of final demand multipliers. Final demand multipliers which are derived under the assumption that the household sector is an exogenous sector are Type I multipliers. Whereas, if the household sector was considered as an endogenous sector, then Type II multipliers would be obtained. Type II multipliers are larger than Type I because household expenditures create other significant production changes in the economy. Type II multipliers accounted for increased economic activity due to induced changes in income and increased consumer spending. Although Type II multipliers are larger than Type I, they may slightly overstate the induced effect of income changes because it was assumed that changes in consumer spending were proportional to changes in income.

Table 4.4. Final Demand Output Multipliers, by Sector, for Cross River State Economy, 1978

Sector	Final demand output multipliers	
	Type I	Type II
1. Cash crops	1.23	1.51
2. Food crops	1.03	1.06
3. Forestry	1.10	1.21
4. Fishery	1.01	1.03
5. Livestock and feeds	2.15	2.21
6. Vegetable oil	1.41	1.59
7. Bakery	1.14	1.25
8. Beer and soft drinks	1.27	1.33
9. Textiles and apparels	1.13	1.32
10. Wood products	1.23	1.29
11. Printing and publishing	1.31	1.79
12. Nonmetallic products	1.48	1.61
13. Metallic products	1.26	1.42
14. Utilities	1.05	1.09
15. Services	1.04	1.15
16. Trade	1.18	1.28
17. Transport and communications	1.02	1.04
18. Miscellaneous	1.12	1.21

The final demand multipliers ranged from 1.01 to 2.15 for Type I and 1.03 and 2.21 for Type II multipliers. The livestock and feeds sector showed the largest final demand multipliers in the two types of multipliers. The average final demand multiplier in the economy was 1.23 and 1.35 for Type I and Type II, respectively.

Multipliers show the total interaction that would occur when any sector changes its output. A Type II multiplier, for example, 1.03 for the fishery sector, means that for every additional naira of output that sector sells to the final demand sector, total output would increase by ₦1.03. A small final demand multiplier implies a limited participation in the local economy by the sector with a small multiplier. A limited participation indicates that expenditures in the sectors with small multipliers may have little effect in the local economy. The sectors with high participation in the economy included cash crops, vegetable oil, nonmetallic products, printing and publishing, and livestock and feeds.

Income Effects and Multipliers

Although income effects and income multipliers are separate measures, they are related because both measure the impact of a change in economic activity on household income. Income effects measure the marginal income which will accrue to the household sector if a one-naira increase in final demand output by a particular sector was envisioned in the economy. On the other hand, income multipliers reflect the total income to household in the economy resulting from a one-naira direct payment to the household sector.

The basis for income multipliers rests on the assumption that a certain amount of household income is generated with each change in output. Income multipliers are of two types. A Type I income multiplier is the ratio of direct and indirect income effects to direct income effects resulting from sectoral changes in the final demand. Whereas, Type II income multiplier is a ratio of direct, indirect, and induced income effects to direct income effects per unit change in final demand of a given sector. Only Type II income multipliers are presented in Table 4.5.

The direct income effect column represents an estimate of the direct change in household income per naira change in output. But direct and indirect income effects are the direct and indirect changes in income accruing to the household sector as a result of a one-naira change in the final demand in any given sector, while the direct, indirect, and induced income effects represent the total changes in household income per naira change in output when the household sector is an endogenous sector.

Table 4.5 presents the household income effects and multipliers for the Cross River State economy. The direct income effect ranged from a low ₦0.03 for transport and communications sector to a high ₦0.65 for the printing and publishing sector. These figures indicate the amount by which the household sector income would increase if a one-naira increase in sales to final demand had occurred. If the printing and publishing sector were to increase its sales by one naira, then the household sector would benefit by receiving ₦0.65 from the printing and publishing sector. The total income effects, as a result of the transactions, would be ₦0.79 because both the direct, indirect, and induced effects were all taken into account.

Table 4.5. Household Income Effects and Multipliers, by Sector, for the Cross River State Economy, 1978

Sector	Direct income effect	Total income effect	Income multiplier
1. Cash crops	.3786	.4620	1.22
2. Food crops	.0525	.0582	1.11
3. Forestry	.1607	.1845	1.15
4. Fishery	.0357	.0389	1.09
5. Livestock and feeds	.0375	.1005	2.68
6. Vegetable oil	.1318	.2858	2.17
7. Bakery	.1438	.1781	1.24
8. Beer and soft drinks	.0816	.1121	1.37
9. Textiles and apparels	.0721	.1107	1.54
10. Wood products	.0600	.0857	1.43
11. Printing and publishing	.6502	.7882	1.21
12. Nonmetallic products	.1200	.2106	1.75
13. Metallic products	.2300	.2731	1.19
14. Utilities	.0610	.0719	1.18
15. Services	.1528	.1680	1.10
16. Trade	.1254	.1592	1.27
17. Transport and communications	.0291	.0337	1.16
18. Miscellaneous	.1300	.1496	1.15

Income multipliers, which measure the income impact on the household sector, ranged from 1.09 for the fishery sector to 2.68 for the livestock and feeds sector. The figure 1.09 implies that if the fishery sector were to increase its output sufficiently to deliver one additional naira to the household sector as a direct payment, then the household income would be expected to increase by ₦1.09.

Income effects and multipliers differ in their impact magnitudes for different sectors. This is true because of their computational base. For example, the printing and publishing sector showed the largest income effects, 0.79, but the same printing and publishing sector is ranked tenth in terms of its income multiplier, 1.21.

Employment Multipliers

Regional impact analysis is frequently estimated with employment multipliers because regional policy makers are concerned with forecasting jobs and industrial expansion in a particular area. Employment multipliers measure the total effect on local employment due to a change in employment in a particular sector of the economy.

Changes in employment and employment multipliers are presented in Table 4.6. The direct employment effect represents employment per thousand nairas of gross output. The figures revealed the intensity of labor use in each sector. For all sectors, the food crops sector had the largest, 1.83, number of full-time employees for every ₦1,000 of output. The number of full-time employees used per ₦1,000 was 1.22 for the wood products sector, 0.98 for the printing and publishing sector, 0.92 for the vegetable oil sector, 0.64 for the cash crops sector, 0.63 for the fishery sector, and 0.51 for the trade sector. The rest of the

Table 4.6. Change in Total Employment Resulting from a ₦1,000 Change in Output, by Sector, for Cross River State Economy, 1978

Sector	Per ₦1,000 change in output		
	Direct change in employment	Total change in employment	Employment multiplier
1. Cash crops	.6361	.9669	1.52
2. Food crops	1.8289	1.8793	1.03
3. Forestry	.3469	.4599	1.33
4. Fishery	.6305	.6538	1.04
5. Livestock and feeds	.0716	.8955	12.51
6. Vegetable oil	.9169	1.2819	1.40
7. Bakery	.1563	.3443	2.20
8. Beer and soft drinks	.0125	.1598	12.78
9. Textiles and apparels	.1310	.2560	1.95
10. Wood products	1.2214	1.4230	1.17
11. Printing and publishing	.9806	2.5972	2.65
12. Nonmetallic products	.1237	.3343	2.70
13. Metallic products	.1681	.3425	2.04
14. Utilities	.1565	.1980	1.27
15. Services	.1155	.2073	1.79
16. Trade	.5095	.6365	1.25
17. Transport and communications	.0554	.0780	1.41
18. Miscellaneous	.1283	.2268	1.77

sectors had less than 0.5 employees per ₦1,000 of output. The smallest, 0.01, number of full-time employees was observed in the beer and soft drinks sector.

The total change in employment per ₦1,000 change in output was calculated by multiplying and summing entries in the direct change in employment column multiplied by the respective entries in each column of Table 4.3. The figures in the second column in Table 4.6 are larger than the respective figures in the direct change in employment (first column) in the same Table 4.6 because total change included the direct, indirect, and induced employment requirements per ₦1,000 change in final demand. Indirect changes were the residual of total, minus direct requirements. Secondary or indirect changes portray the degree of sector interaction with other sectors. For example, the direct change in employment per ₦1,000 change in final demand output was 0.98 for printing and publishing; but because of interaction with other sectors, the total change in employment was 2.60. The largest estimated total employment effect was observed in the printing and publishing sector, and the smallest total employment effect, 0.08, was in the transport and communications sector. Stated in another way, this means that for an additional ₦1,000 sale to final demand, an additional 2.60 jobs would be created in the economy. For the transport and communications sector, an additional ₦1,000 sale would result in only 0.08 additional jobs.

The employment multiplier is the ratio of the direct plus indirect employment change to direct employment change. Employment multipliers measure the total employment generated in the economy by a change in employment in a particular sector. The employment multipliers ranged from 1.03 for the food crops sector to 12.78 for the beer and soft drinks

sector. The figure, 1.03, revealed that if the food crops sector employed one additional employee, 1.03 jobs would be generated in the economy. On the other hand, one unit change in employment in the beer and soft drinks sector would stimulate 12.78 jobs in the study area. Similar interpretations could be applied to other multipliers.

CHAPTER 5

SUMMARY AND CONCLUSIONS

The purpose of this study was to develop an input-output model for the economy of Cross River State. The model was to be used in analyzing interindustry relationships in a regional economy. The information provided is intended to help policy makers in evaluating rural development alternatives.

The study contains five chapters. Chapter 1, the introductory chapter, includes a statement of the objectives, the problem, and provides a short discussion of the study area. Chapter 2 is devoted to a discussion of the development of the input-output model. The model's origin can be traced back to the work of the French physiocrat, Francois Quesnay. The modern input-output model, however, owes its theoretical base to the general equilibrium analysis of the neoclassicist, Leon Walras. Despite the model's theoretical foundation, the first empirical interpretation of it was performed by Wassily Leontief. Limitations of the input-output model are also discussed in Chapter 2.

Chapter 3 discusses the methodology applied in this study. The study area is defined, and a list of firms and establishment in the study area was compiled. In addition to defining the economic sectors in the study area, the gross product for each sector was developed with the aid of data provided by Marketing Boards and the Ministries of Economic Planning, Agriculture and Natural Resources. With assistance from the Ministry of Economic Planning in conducting the survey, at

least one-third of the firm's management in each economic sector was individually interviewed. The questionnaire included questions that when answered provided information on total sales, expenditures, employment, and investment both within and outside the study area. Inter-industry flow accounts were developed for each sector based on information provided by the survey.

Results of the input-output model were analyzed in Chapter 4. The model is composed of three basic input-output tables--namely, the transactions table, the direct requirements or technical coefficients table, and the interdependence table. The transactions table is an economic picture of the economy as it existed in 1978. It portrays the intricate flow of goods and services from the producing sectors to the purchasing and the final demand sectors. The binding linkages that existed in the economy are exhibited; that is, each sector depended on other sectors' inputs for the production of its output. The interdependence binded the sectors together.

The technical coefficients table was derived from the transactions table. A technical coefficient revealed the direct requirement of inputs needed by a sector to produce one naira's worth of its output. The technical coefficients table was obtained by dividing each entry in a column of the transactions table by the respective sum of the column outlays.

The interdependence table was derived by, first, subtracting the technical coefficients matrix from an identity matrix of the same magnitude and, second, inverting the resulting matrix to obtain the direct and secondary coefficients matrix. The interdependence coefficients table portrayed the interdependence that existed between the

various sectors which made up the economy in 1978. The direct and secondary coefficients reflected the output from other sectors needed to sustain an increase in final demand of one naira's worth of output for any given sector.

The development of multipliers was the final goal of the model. Since multipliers form the basis for the predictive capacity of an input-output study, output, income, and employment multipliers were developed. Both Type I and Type II output multipliers were compared, and in all cases Type II multipliers were larger than Type I.

Final demand multipliers revealed the total amount that output would increase in the economy if there were an increase in sales by one naira to the final demand of a given sector. When the household sector was considered endogenous to the economy, the final demand output multipliers ranged from 1.03 for the fishery sector to 2.21 for the livestock and feeds sector.

Income multipliers measured the impact on the household sector's income of an altered economic activity. If, for example, in this study the livestock and feeds sector made an additional one naira direct payment to the household sector, a total increase of ₦2.68 would be realized by the household sector.

The employment multiplier measured the change in total employment in the economy as a result of a one-unit change in employment for a particular sector. The largest employment multiplier, 12.78, was observed in the beer and soft drinks sector, and the smallest employment multiplier, 1.03, was in the food crops sector.

This study was undertaken to provide information on economic interactions in the economy of Cross River State. The study provided

decision makers with information concerning the impact on the economy of any sector altering its economic activity. The costs of each alternative added to this impact display on the economy provide project planners and decision makers valuable information on the local returns per naira spent for each development alternative.

The printing and publishing sector made the largest proportion of its total expenditure within the study area. The livestock and feeds sector followed the printing and publishing sector. The smallest proportion of total expenditure with the local economy was made by the fishery sector.

In assessing the income multipliers, the livestock and feeds sector had the largest income multiplier. The smallest income multiplier was observed in the fishery sector. In generating local economic growth, decision makers should look beyond the simple magnitude of multipliers. For example, if the government set as its goal the increasing of the household income by ₦100, an additional output of ₦995 would be required by the livestock and feeds sector. Likewise, if the government's target is to be met, an additional ₦2,571 worth of output would be required by the fishery sector. Any one of these alternatives might be obtained more easily than the other given different circumstances existing in the economy.

This study does not recommend any sector to be pushed in preference to another because it may be impossible to push the sector with the highest impact. The decision of pushing a given sector rests ultimately with the decision makers. However, the study has presented information which will help decision makers to make responsible decisions.

The input-output model is a predictive model provided the model assumptions are accepted. However, additional research is needed. Further disaggregation of the economic sectors and the inclusion of some of the leakages would enhance more precise estimations.

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APPENDICES

APPENDIX A

SURVEY QUESTIONNAIRE

1. Code Name _____

2. Location _____

3. What is the organizational form of this business?

   a. Single owner-operator _____ Resident of the study area _____

   b. Partnership _____ Number of partners _____
      Do all partners reside in the study area? _____

   c. Corporation _____ Is this establishment part of a "chain" operation? _____ If yes, what is the location of the main office? _____ About what percent of this business is locally owned? (Owners residing in the study area) _____

4. What were the total expenses for 1980? _____
   How much did you spend on the following:

	Outside the study area	Inside the study area	Total
a. Cash crops (oil palm, rubber, cocoa, coffee, etc.)	_____	_____	_____
b. Staple crops (rice, maize, cassava, yam, plantain, etc.)	_____	_____	_____
c. Livestock (cattle, pigs, small stock, etc.)	_____	_____	_____
d. Poultry	_____	_____	_____
e. Fishing	_____	_____	_____
f. Forestry	_____	_____	_____
g. Agricultural processing (rice, palm oil processing, sawing of wood, flour milling, etc.)	_____	_____	_____
h. Food (bread, bakery, etc.)	_____	_____	_____
i. Beverages and tobacco (beer, wine, cigar, cigarettes, etc.)	_____	_____	_____

	Outside the study area	Inside the study area	Total
j. Textiles (spinning and making of the cloth)	_____	_____	_____
k. Apparel (manufacture of clothing)	_____	_____	_____
l. Chemicals (soap, carbon dioxide, paints, etc.)	_____	_____	_____
m. Mining (metallic and non-metallic mining, extraction of crude petroleum, clay, sand, gravel, natural gas, etc.)	_____	_____	_____
n. Metallic products (ironwork, spikes, manufacture of tanks, drums, nails, assembly of boats, bicycles, etc.)	_____	_____	_____
o. Nonmetallic products (pottery, cement, glass and rubber products, wooden furniture, paper products, printing, etc.)	_____	_____	_____
p. Other manufacturing (photographic material, record, jewelry, etc.)	_____	_____	_____
q. Transport and communication (means of transport, telephone, telegraph)	_____	_____	_____
r. Construction (buildings, highways, bridges, sewers, repair of buildings, etc.)	_____	_____	_____
s. Utilities (electricity, water supply)	_____	_____	_____
t. Commerce (wholesale and retail business)	_____	_____	_____
u. Service (professional services, such as lawyers, doctors, accountants, domestic service, ownership of buildings, entertainments, buying agencies for export crops, etc.)	_____	_____	_____
v. Local government (employee personal income tax, retirement fund, hospitals, schools, etc.)	_____	_____	_____

	Outside the study area	Inside the study area	Total
w. Household (salaries, wages, commissions)	_____	_____	_____

5. What was the firm's average number of employees in 1980?

a. Full-time employees	_____	_____	_____
b. Part-time employees	_____	_____	_____

6. Approximately how much did your firm spend in 1980 for new capital equipment and furniture? _____ About what percent of these purchases were made from suppliers located in the study area? _____ What were the major types of new capital equipment purchased from suppliers or dealers in the study area and about how much was spent in each?

Type	Amount
_____	_____
_____	_____
_____	_____
_____	_____

7. Approximately how much did your firm charge against depreciation in 1980? _____

8. Approximately what was your change in inventory between the beginning and end of the year in 1980? _____

9. Approximately what were your total sales (or income) in 1980, including accounts receivable? _____

10. About what percent of your total sales (or income) would you estimate was from purchases by the study area year-round residents? _____ About what percentage of this amount was from:

	Within the study area	Inside the study area	Total
a. Cash crop firm	_____	_____	_____
b. Stable crop firm	_____	_____	_____
c. Livestock crop firm	_____	_____	_____
d. Poultry crop firm	_____	_____	_____
e. Fish crop firm	_____	_____	_____
f. Forestry crop firm	_____	_____	_____
g. Household	_____	_____	_____
h. Local government	_____	_____	_____

	Within the study area	Inside the study area	Total
i. Contractors	_____	_____	_____
j. Wholesalers and retailers	_____	_____	_____
k. Miners	_____	_____	_____
l. Other (please specify)	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

11. How much new investment did the firm make in 1980? _____

12. What are the major problems faced by your business establishments, both currently and anticipated in the future, relative to its location in the study area? _____

APPENDIX B

INTERINDUSTRY FLOW ACCOUNTS

Sector 1. Cash Crops (₦1,000)

Inputs		Outputs	
Cash crops	1,920.3	Export	9,569.4
Transport	747.2	Nonmetallic products	3,858.2
Miscellaneous	187.1	Cash crops	1,920.3
Services	133.6	Vegetable oil	1,124.3
Trade	98.2	Investment	118.7
Utilities	94.1	Textiles	9.6
Metallic products	83.3	Total	16,600.5
Imports	40.0		
Nonmetallic products	8.0		
Printing and publishing	0.2		
	3,312.0		
Value added	13,288.5		
Total	16,600.5		

Sector 2. Food Crops (₦1,000)

Inputs		Outputs	
Imports	80.1	Consumption	3,931.6
Food crops	55.6	Livestock and feeds	601.0
Services	14.6	Beer and soft drinks	560.1
Forestry	12.5	Food crops	55.6
Trade	9.2	Bakery	51.4
Transport	8.5	Investment	16.4
Nonmetallic products	7.4	Total	5,215.8
Miscellaneous	6.7		
Utilities	5.8		
Metallic products	3.0		
Printing and publishing	0.1		
	203.5		
Value added	5,012.3		
Total	5,215.8		

Sector 3. Forestry (₦1,000)

Inputs	
Imports	60.1
Forestry	30.6
Transport	9.5
Utilities	4.5
Trade	3.8
Nonmetallic products	3.0
Metallic products	2.9
Miscellaneous	2.7
Services	2.6
Printing and publishing	0.1
	119.8
Value added	531.2
Total	651.0

Outputs	
Exports	382.0
Bakery	135.5
Wood products	50.5
Forestry	30.6
Fishery	20.0
Food crops	12.5
Printing and publishing	10.2
Consumption	7.0
Investment	2.7
Total	651.0

Sector 4. Fishery (₦1,000)

Inputs	
Imports	3,755.0
Wood products	290.1
Miscellaneous	260.0
Trade	103.0
Services	92.0
Nonmetallic products	55.0
Transport	45.0
Utilities	37.0
Forestry	20.0
Metallic products	10.0
	4,667.1
Value added	104,592.3
Total	109,259.4

Outputs	
Consumption	103,497.8
Investment	5,700.0
Livestock and feeds	61.6
Total	109,259.4

Sector 5. Livestock and Feeds (₦1,000)

Inputs	
Livestock and feeds	999.4
Food crops	601.0
Imports	129.2
Miscellaneous	92.5
Fishery	61.6
Transport	26.4
Services	17.3
Utilities	9.8
Trade	7.8
Metallic products	3.9
	1,948.9
Value added	658.4
Total	2,607.3

Outputs	
Livestock and feeds	999.4
Consumption	1,607.9
Total	2,607.3

Sector 6. Vegetable Oil (₦1,000)

Inputs	
Cash crops	1,124.3
Imports	75.4
Utilities	36.7
Nonmetallic products	30.2
Services	15.0
Miscellaneous	10.1
Metallic products	9.1
Trade	8.1
Transport and communications	5.8
	1,314.7
Value added	2,355.8
Total	3,670.5

Outputs	
Consumption	1,619.7
Bakery	821.1
Export	753.0
Nonmetallic products	377.6
Investment	99.1
Total	3,670.5

Sector 7. Bakery (₦1,000)

Inputs	
Imports	1,081.0
Vegetable oil	821.1
Forestry	135.5
Utilities	86.7
Food crops	51.4
Trade	33.7
Services	20.6
Transport	4.5
Metallic products	1.9
Printing and publishing	0.3
	2,236.7
Value added	8,606.3
Total	10,843.0

Outputs	
Consumption	7,427.0
Export	3,416.0
Total	10,843.0

Sector 8. Beer and Soft Drinks (₦1,000)

Inputs	
Imports	6,250.0
Beer and soft drinks	1,500.0
Services	869.0
Trade	675.4
Transport	634.0
Food crops	560.1
Utilities	358.6
Miscellaneous	15.0
Metallic products	2.0
Printing and publishing	0.1
	10,864.2
Value added	8,815.8
Total	19,680.0

Outputs	
Consumption	11,420.0
Export	6,560.0
Beer and soft drinks	1,500.0
Investment	200.0
Total	19,680.0

Sector 9. Textiles and Apparel (₦1,000)

Inputs	
Imports	62.6
Textiles and apparels	31.3
Trade	13.1
Services	12.1
Cash crops	9.6
Transport	7.4
Utilities	3.6
Wood products	1.5
	141.1
Value added	227.8
Total	369.0

Outputs	
Consumption	335.9
Textiles and apparels	33.1
Total	369.0

Sector 10. Wood Products (₦1,000)

Inputs	
Wood products	164.3
Forestry	50.5
Miscellaneous	40.8
Transport	32.6
Imports	30.4
Services	20.4
Utilities	16.3
Trade	6.1
	361.4
Value added	1,270.6
Total	1,632.0

Outputs	
Consumption	1,117.7
Fishery	290.1
Wood products	164.3
Trade	42.9
Transport	9.3
Miscellaneous	6.2
Textiles and apparels	1.5
Total	1,632.0

Sector 11. Printing and Publishing (₦1,000)

Inputs	
Printing and publishing	23.2
Forestry	10.2
Trade	9.4
Transport	9.1
Services	4.7
Imports	3.1
Metallic products	3.1
Miscellaneous	2.4
Utilities	1.8
	67.0
Value added	176.0
Total	243.0

Outputs	
Consumption	196.5
Printing and publishing	23.2
Trade	10.7
Export	10.0
Services	1.4
Bakery	0.3
Cash crops	0.2
Food crops	0.1
Forestry	0.1
Beer and soft drinks	0.1
Nonmetallic products	0.1
Metallic products	0.1
Utilities	0.1
Miscellaneous	0.1
Total	243.0

Sector 12. Nonmetallic Products (₦1,000)

Inputs	
Nonmetallic products	19,040.9
Imports	10,153.2
Cash crops	3,858.2
Trade	526.6
Vegetable oil	377.6
Transport	359.4
Services	238.8
Metallic prodicts	187.8
Utilities	175.5
Miscellaneous	26.4
Printing and publishing	0.1
	34,944.5
Value added	38,297.1
Total	73,241.6

Outputs	
Consumption	27,014.2
Investment	20,000.0
Nonmetallic products	19,040.9
Export	6,912.0
Trade	96.2
Fishery	55.0
Vegetable oil	30.2
Transport	27.9
Miscellaneous	26.4
Utilities	15.9
Cash crops	8.0
Food crops	7.4
Forestry	3.0
Services	3.0
Metallic products	1.5
Total	73,241.6

Sector 13. Metallic Products (₦1,000)

Inputs	
Utilities	42.6
Imports	38.3
Services	25.6
Trade	10.7
Transport	9.7
Metallic products	8.5
Miscellaneous	2.7
Nonmetallic products	1.5
Printing and publishing	0.1
	139.7
Value added	286.3
Total	426.0

Outputs	
Nonmetallic products	187.8
Cash crops	83.3
Trade	78.2
Investment	11.8
Consumption	11.4
Fishery	10.0
Vegetable oil	9.1
Metallic products	8.5
Livestock and feeds	3.9
Transport	3.6
Printing and publishing	3.1
Food crops	3.0
Forestry	2.9
Miscellaneous	2.6
Beer and soft drinks	2.0
Bakery	1.9
Services	1.5
Utilities	1.4
Total	426.0

Sector 14. Utilities (₦1,000)

Inputs	
Imports	50.7
Nonmetallic products	15.9
Miscellaneous	11.5
Services	8.0
Transport	1.7
Metallic products	1.4
Utilities	0.8
Printing and publishing	0.1
	90.1
Value added	868.4
Total	958.5

Outputs	
Beer and soft drinks	358.6
Nonmetallic products	175.5
Cash crops	94.1
Bakery	86.7
Consumption	79.7
Metallic products	42.6
Fishery	37.0
Vegetable oil	36.7
Wood products	16.3
Livestock and feeds	9.8
Food crops	5.8
Forestry	4.5
Textiles and apparels	3.6
Trade	2.3
Printing and publishing	1.8
Miscellaneous	1.2
Services	0.9
Utilities	0.8
Transport	0.6
Total	958.5

Sector 15. Services (₦1,000)

Inputs	
Imports	44.6
Miscellaneous	30.7
Trade	29.8
Transport	4.9
Nonmetallic products	3.0
Textiles and apparels	1.8
Metallic products	1.5
Printing and publishing	1.4
Utilities	0.9
	118.6
Value added	1,829.4
Total	1,948.0

Outputs	
Beer and soft drinks	869.0
Consumption	383.4
Nonmetallic products	238.8
Cash crops	133.6
Fishery	92.0
Trade	69.4
Metallic products	25.6
Bakery	20.6
Wood products	20.4
Livestock and feeds	17.3
Vegetable oil	15.0
Food crops	14.6
Miscellaneous	12.3
Textiles and apparels	12.1
Transport	8.6
Utilities	8.0
Printing and publishing	4.7
Forestry	2.6
Total	1,948.0

Sector 16. Trade (₦1,000)

Inputs	
Imports	254.5
Nonmetallic products	96.2
Transport	85.1
Metallic products	78.2
Services	69.4
Wood products	42.9
Miscellaneous	29.4
Printing and publishing	10.7
Utilities	2.3
	668.7
Value added	2,099.9
Total	2,768.6

Outputs	
Consumption	1,204.3
Beer and soft drinks	675.4
Nonmetallic products	526.6
Fishery	103.0
Cash crops	98.2
Bakery	33.7
Services	29.8
Miscellaneous	29.4
Textiles and apparels	13.1
Metallic products	10.7
Printing and publishing	9.4
Food crops	9.2
Vegetable oil	8.1
Livestock and feeds	7.8
Wood products	6.1
Forestry	3.8
Total	2,768.6

Sector 17. Transport (₦1,000)

Inputs	
Imports	154.8
Nonmetallic products	27.9
Wood products	9.3
Services	8.6
Metallic products	3.6
Utilities	0.6
Miscellaneous	0.3
	205.1
Value added	2,989.2
Total	3,194.3

Outputs	
Consumption	930.9
Cash crops	747.2
Beer and soft drinks	634.0
Nonmetallic products	359.4
Investment	217.0
Trade	85.1
Miscellaneous	55.6
Fishery	45.0
Wood products	32.6
Livestock and feeds	26.4
Metallic products	9.7
Forestry	9.5
Printing and publishing	9.1
Food crops	8.5
Textiles and apparels	7.4
Vegetable oil	5.8
Services	4.9
Bakery	4.5
Utilities	1.7
Total	3,194.3

Sector 18. Miscellaneous (₦1,000)

Inputs	
Imports	303.6
Transport	55.6
Trade	29.4
Nonmetallic products	26.4
Services	12.3
Wood products	6.2
Metallic products	2.6
Utilities	1.2
Printing and publishing	0.1
	436.9
Value added	883.1
Total	1,320.0

Outputs	
Consumption	601.7
Fishery	260.0
Cash crops	187.1
Livestock and feeds	92.5
Wood products	40.8
Services	30.7
Trade	29.4
Nonmetallic products	26.4
Beer and soft drinks	15.0
Utilities	11.5
Vegetable oil	10.1
Food crops	6.7
Forestry	2.7
Metallic products	2.7
Printing and publishing	2.4
Transport	0.3
Total	1,320.0

VITA

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