

THE CONSUMER PRICE INDEX, COMPUTER APPROACH  
AN ANALYSIS OF SOME FOOD STUFFS IN NIGER STATE

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APPROVAL PAGE

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DEDICATION

This project is dedicated to my beloved following people:

My elder brother for his successful marriage

(Mr. Godwin Orji and Alice Okoro),

Chief James N. Orji (a man of outstanding quality)

and my beloved mother Mrs Maria Orji.

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### ABSTRACT

This work covers the statistical survey on the retail prices of some selected food stuffs in Niger State from the year 1987 - 1994. It examines the fluctuation of prices and food stuffs in a year from January to December of a particular year.

The work would also ex-~~way~~ay the involvement of computer in conducting the retail prices of foodstuff for Government action. It would ascertain variations of prices of certain staple food items cut-acrose the Niger State. It would identify the movement and different pattern of prices between 1987 to 1994 and make recommendations to the Government. Base on the trend of price variation, forecast and predictions would be made to take care of the lapses within the year. These variations would be presented dragramatically and graphically so as to enalbe us find solutions to the problems In fiding the price variations some Agricultural product were used as an example like Rice, Maize grain, Guinea corn, yam etc.

ORJI MARTIN CHUKWUMA.

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## CHAPTER ONE

### 1.0 INTRODUCTION AND BRIEF HISTORY ON NIGER STATE AGRICULTURAL DEVELOPMENT PROJECT

The Niger State Agricultural Development Project is an offshoot of Bida enclave Agricultural Development Project (BADP) that ran from 1980 - 1987. Niger State Agricultural Development (NSADP) is a state wide project covering the entire Niger State.

In August, 1991 the project was increased from about 74,000 Km to about 75,000 Km as a result of the merger of Borgu Local Government Area formerly of Kwara State with Niger State. The merged local governments area were splited into two namely Borgu and Agwara. The population of farming household of the State rose from 798,887 to 322,676 as a result of the exercise (estimated from the NSADP and Kwara State Agricultural Development Project (KWADP) village listing surveys og 1987/88).

The project is of ten (10) years to turn in phases of four, three and three years period each. The project is one of the multi-state Agricultural Development Project II (MSAPP II) to be implemented with World Bank loan No 2988. The total cost of the first phase of NSADP (1989 - 1992) was put at \$28.54 million as equivalent to ₦146 million in 1988.

### 1.1 ORGANISATION AND MANAGEMENT

The project has its headquarters at Minna and is divided into three zones on the bases of cropping pattern obtained in the project area. Zone one comprises of Bida, Agaie, Gbako, Lapai, Lavun and Mokwa Local Government area with headquarters at Bida where the writer obtain his data. Zone two (II) comprises of Minna, Shiroro, Suleja, Gawu Babangida, Bosso, Paikoro and Kafi Local Government area with head-



quarters at Kuta. Zone three (III) is made up of Wushishi, Mariga, Magama, Rijau, Borgu and Agwara Local Government areas having its headquarters at Kontagora.

The project is managed by Management Committee chaired by the managing Director who is also the Chief Executive of the project. It also has an executive committee having State Governor as the Chairman.

## 1.2 AIMS OF THE PROJECT

The objective of this project is to determine the statistical survey on the retail prices of some selected food stuff in Niger State from the year 1987 - 1994. It will also highlight on the fluctuation of retail prices of some selected food stuff in the market. Furthermore, it will also involve the use of computer system so as to release the result of the retail price index of some of the food stuff for Government action.

Other areas of interest are:

- (i) To know the prices of staple food items and commodities across the state.
- (ii) To enable me know price variations within the period of 8 years (1987 - 1994).
- (iii) To enable me identify the movement and different pattern of prices between 1987 to 1994 in Niger State so as to make recommendations to the Government.
- (iv) To enable us forecast and predict where the price of food stuff are likely to be in the nearest future.
- (v) To enable us make comparison between the prices of food items annually in Niger State.

### 1.3 LIMITATION OF THE RESEARCH WORK

In studying the statistical analysis of prices of basic commodities in Niger State between 1987 - 1994 mainly food stuffs, it would not be easy for the writer to collect prices of all the staple foods in the market, therefore some food stuffs were selected as a case study.

One of the reasons for chosen some food items is that the period to which the research is to be covered and the available data to which we shall base our study is very short. The 1995 record is not available as we were told by the Agricultural Officer at Bida headquarters.

Other factors constrained is capital involved (money). The organisation were not able to obtain trained enumerators who will collect data cut across the State. Again, other factors responsible for such limitation is time constraint. The time limit does not permit me to involve in other food so as to project situations of such food items. In as much as the project is going to be defended at the end of the year, the time is not enough to involve as many food stuff as possible.

### 1.4 SCOPE OF THE PROJECT

The project titled the Consumer Price Index, a computer approach would analyse and criticize average retail prices of some of the basic food stuff in Niger State especially in Bida Local Government area between 1987 - 1994 where I could obtain available data. The selected food stuffs are milled Rice, Sorghum (Guinea Corn), Maize Grain, Yam and Cowpea. The data under study are given in Naira per Kilogramme and it is based on monthly, quarter and annually.

## 1.5 LITERATURE REVIEW

Statistics is of great importance in the collection of average retail market prices of food stuffs. In view of the research carried out on the "Consumer price index, a computer approach, the statistical analysis on the average retail market prices on food stuffs in Niger State especially in Bida (1987 - 1994) mainly on agricultural products is very essential.

During my consultations, I discovered that some similar research work has been carried out by some professionals which I lifted some of my ideas to complete my work. One of the research work consulted was that of Mr. Adebayo S. A. (1983) in his project titled "Statistical Survey of retail market price of local food stuffs in Niger State", he stated that there was an increase in prices of those local food stuffs, this might be due to lack of rain in the year 1978, 1979 and 1980.

Mallam Zakari A. S. Yahaya (an agricultural economist) with Niger State Agricultural Development project said "There was general increase in the price of food stuffs in the state (Niger) between 1987 and 1994. He commented that this might be due to the political instability in Nigeria where sellers fixed prices of commodities (food stuffs) as they wish.

From a textbook titled the Price system and Resources Association by Mr. Richard H. Leftwich said that "placing the demand curve and the supply curve for any given goods and services on a single diagram highlight the forces determining its market price" i.e the demand curve indicates what consumers are willing to do, while the supply curve shows what sellers are willing to do. But during the period of price increases of food stuffs, individual consumers are forced to

accept prices of goods hence, their choice are limited as a result of scarcity of food stuffs in the market. Therefore, within the period of prices increases, much money continue to chase few goods as a result of decline in agricultural products.

Mr. David Jimo R. (1988) on his project titled "Statistical Analysis of some basic commodities prices in Bida (1982 - 1987) mainly agricultural products stated that obvious fluctuations of prices of those food stuffs in Bida Local Government area, might be explained factors such as drought, destroy on farm products by pests and animals. He further explained that reason can also be contributed to the fluctuations of prices too, such as heavy yield of agricultural products.

Mr. E. L. Adele of Agricultural Project Monitoring and Evaluation Unit (APMEU) Kaduna in a book titled "Market prices analysis from Agricultural Development Projects" said that there was a general decrease in prices of food stuff in third quarter of each year. In his conclusion he said that this might be due to the expected new crops (food stuffs) that would be harvested in fourth quarter. Then the farmer may decide to sent out all their left over products so as to clear places for the new ones.

According to Alhaji Mamman Yusuf (Principal Evaluation Officer) with School of Agricultural and Rural Development Authority (SARDA) presented a paper at a seminar in (1988) at Kaduna titled "Market prices variations in Agricultural Development projects between 1985 - 1987)" stated that there was a general increase in the prices of agricultural products (mainly food stuffs) in the Northern part of the country (Nigeria). He explained that this might be due

to certain factors such as removal of price control, lack of enough rain during the period (1985 - 1987) and flood.

In his view, Mr. E. O. Ita (a Principal Lecturer) with University of Ibadan in his research work titled "Statistical survey on retail market prices on crops/commodities", in one of the dailies (National Concord) dated 15th May, 1987 highlighted why there is always increase and decrease in the prices of food stuffs annually.

He mentioned that high prices in the farm inputs such as fertilizers, seeds, and chemicals are factors/principal causes of increase in prices of food stuffs and in other hands availability of these inputs could cause decreases in the prices of food stuffs too.

In another contribution Mr. Clasegun B. M. (1983) in his project titled "Statistical analysis of some basic commodities prices in Ibadan mainly food stuffs" explained that there is annual increase in price of food stuffs in Ibadan from 1980 - 1993 . In his conclusion, he stated that the increase might be due to hoarding of food stuffs that led to artificial scarcity.

Mr. Ayodeji O. in his project titled "Statistical survey of retailed market prices of local food stuff in Kaduna (1986 - 1987)" commented that there is a quarterly increase in the price of some selected food stuff in Kaduna. In his survey he showed that there is an increase in the prices of those selected food stuffs, he adduce the reason as due to lack of rain fall in Kaduna State in the year 86.

In conclusion, it is generally clear that there has been a price increase in Niger State and other part of the country. The reasons were attributed to lack of rainfall within specified

period, lack of government provision of agricultural equipment at a reasonable prices, agricultural assistance to farmers, droughts, flood, hoarding etc within the periods of early eightiety's (1980's) to the present time). With the application of computer system in consumer price analysis however, results would be obtained within the shortest possible time and recommendations made to the Government for appropriate action.

CHAPTER TWOTHE ORIGIN AND GROWTH OF COMPUTER

The history of computing instrument may be considered to begin with ABACUS. Abacus is derived from the Greek word ABAKS (or Abakos) which means board, tables or calculating table. It is the oldest known mechanical aid for calculations. It originated in ORIENT more than 2000 years ago and is still used in some parts of the middle and far East. Using Abacus someone can rapidly and accurately add, subtract, multiply or divide large numbers.

In 1617 NAPIER took the next step from Abak by developing a series of "rods" or "bones" on which number were printed. This made calculation easier as calculations involving large numbers were made by shifting the rods.

In 1642, the first adding machine to resemble the desk calculator was developed by a French Scientist philosopher BLIASE PASCAL. Pascal's machine utilized a mechanised gear system to add and subtract numbers with as many as eight columns of digits.

A German mathematician Gottifried William Liebniz invented in 1671 and completed in 1694 a more advanced adding machine than Pascal's arithmetic machine of 1642. This was called the STEPPED RECKONER.

Pascal's machine can only count, the Reckoner can also multiply, divide and extract square roots.

In an efforts to develop the computing machine, an inventor named CHARLES BABBAGE in England in 1835 formulated the idea of an entirely new device, the ANALYTICAL ENGINE. The analytical engine was essentially self controlled and in the mid 19th century, became the world's first digital computer.

The search for an effective computing machine entered the 20th century when the first true computer was built by an American Scientist VANNEVAR BUSH in about 1930. Bush's machine was called a differential Analyzer and it was the first analog computers. The machine could solve complex mathematical problem very quickly. It ran on electricity and used vacuum tubes to store information.

In 1939, Dr Aiken Howard of Havard University in association with International Business Machine Corporation engineers worked for 5 years to construct a fully automatic calculator using standard machine components. This was an automatic sequence controlled calculator known as MARKII. It was completed in 1944.

Still trying to develop the computer for greater efficiency J. PRESER ECKERTT and JOHN MAUCHY both of the University of Pennysiania, used vacuum tubes in 1946 to replace most of the switches found in Dr. Aiken's device to produce a completely electronic digital computer known as ENIAC (Electrical numerical integrated and calculator). This improved machine resulted in computation are thousand times faster than Aiken's machine.

In 1951, the Universal Automatic Computers (UNINAC) was developed by UNIVAC Computers to become the first computer to handle both numerical and alphanumeric information with ease.

Since then, there have been many refinement and changes in the computer technology, but the main principle have remained the same, high speed processing for calculating, high speed data entry and printing. As technology advanced, the inside of the computer changed. the first mini-computer was born in 1965.



In 1975, the first micro-computer was introduced, since then the inside of the computer have continued to strinkled especially with the development of the CPU on a single clip. With the recent development, the era of lap top and note book computers dawned.

#### THE MEANING OF COMPUTER

Many authors have defined the computer differently. They have different grammatical definitions but of the same logical meaning.

According to SIPPLE C. J. (1966) computer is defined as "A device capable of accepting information, applying prescribed processes to the information and supplying the result of the process."

In another definition of computer, Kurshan, November and Stone (1986) write: "Computers are electronic machines that operate with remarkable speed and reliability. In addition, they are unique in that they can receive, store and use information and instructions that the user gives them. A mini processor "brain" and electronic memory work together to enable the computer to process data.

T. G. Rowan (1982) described computer as "A collection of electronic device which is capable under the control of a program of instruction of carrying out arithmetic, manipulation and processing operations on business data."

no A. (1990) defined computer as "An electro-mechanical which accepts inputs (signals, digitals, numbers, etc) and relinquishes output (result) at a fantastic

speed, usually in accordance with pre-determined program which finally transfers the processed data to an output device either for further processing or final printed form, such as business documents or statistical tables and reports."

U. Modum (1993) has this to say about computers: "An electronic device that can handle enormous masses of data at unimaginable speed and perform in seconds calculation that trained mathematicians would take years to complete. Basically, it can be seen as an electronic device that accepts data from an input device, perform arithmetic and logical operations in accordance with pre-determined instructions and transfers the processed data (information) to an output device either for further processing or in a final printed form such as business documents, schedules and management control report."

However, a close look at all these definitions shows that they all agree that computer is an electronic equipment or device that is capable of receiving data, storing the data for the length of time required and capable of performing a series of operations or logical operations effectively to obtain meaningful information.

THE MAJOR COMPONENT PARTS OF COMPUTER FUNCTIONS

Computers have two basic parts, the Hardware and the Software. The hardware consist basically of the tangible components which we see, feel or touch and are basically made up of the following functional units.

- (i) The central processing unit (CPU)
- (ii) Input devices
- (iii) Output units

The central processing unit (CPU) is the controlling center of the computer and has two main parts, the ARITHMETIC/LOGICAL unit and the control unit. The Arithmetic and logic unit perform operations such as addition, subtraction, multiplications and divisions.

The control unit of the CPU on the other hand directs and coordinates all the operations of the computer according to conditions set forth by the set of instructions stored in the system.

The internal storage at main storage of the computer is somewhat like on electronics filing cabinet, each compartment or location is capable of holding data. The storage unit contain the following:

- (i) All data being held for processing
- (ii) Data being processed
- (iii) The final result of processing until it is released as an output.

there can also be back-up storage which is usually used to increase the main storage and also to provide permanent data storage outside the computer.

## INPUT AND OUTPUT DEVICES

These are used to introduce data into the system except it has been processed respectively. They are linked directly or indirectly into the system. The input device include key board, tapes, etc, while the output devices include the screen, printers etc.

## GENERATION OF COMPUTER

There are four generation of computers, namely, the first generation, second generation, third generation and fourth generation.

Computers developed between 1946 and 1960 fall within the category of first generation computers. They include computer such as ENIAC, EDSAC, UNIVAC. The major characteristics of the first generation computers is that they used vacuum tubes, generated a lot of heat and needed special cooling system.

The second generation computers cover computers developed between 1959 and 1964 when transistors replaced vacuum tubes in the development of computers. the second generation computers are small in size and very fast in speed.

The development of INTEGRATED CIRCUITS revolutionalised the computer technology and opened the door to the third generation computers. Most of the computers developed between 1964 and 1970 were third generation computers. They were faster and more reliable than the second generation.

The latest of computers is the fourth generation computers. They are associated with large scale integrated circuit which has made it possible to produce the macro-computers, desk top computers and note book computers.

**Summary**

1. **First generation** (1951 - 1958) **Vacuum Tube**
2. **Second generation** (1959 - 1963) **Transistor**
3. **Third generation** (1964 - 1970) **Integrated Circuit**
4. **Fourth generation** (1971 - 1990) **Microminiatorized circuit**
5. **Fifth generation** (1990 - ? = **Major advances.**

COMPUTER SOFTWARE AND THEIR APPLICATIONS

In contrast to the hardwares, the softwares are the collection of program that directs the basic functions of the computer in such a way that they are for the most part transparent to the user. This permit the user to concentrate on writing efficient program to solve problem, without being concerned with such thing as the internal memory selection of memory addresses, control of inputs and output devices or error detection.

There are three categories of softwares, namely:

- (i) Operating software
- (ii) Programming software
- (iii) Application software

OPERATING SOFTWARE

This includes operating system and executive. An executive is a master program permanently held in the internal storage of the computer and only loaded prior to the commencement of processing which perform tasks of supervisory nature. Operating system on the other hand is the program that controls and monitors the execution of all other program without operating system, constant human intervention is required to enter a program, initiate its execution and manually record its successful termination. It is an organised collection of programs that act as an interface between machine hardware and the users.

CATEGORIES/TYPES OF OPERATING SYSTEMS

The categories and types of operating systems are:

BATCH PROCESSING OPERATING SYSTEM

TIME SHARING OPERATING SYSTEM

REAL TIME OPERATING SYSTEM

These are characterised by the type of interaction permissible between a user and his job and tolerance on system response time.

BATCH PROCESSING:

This is a process where the user's job are submitted in sequential batches on input device.

TIME SHARING

This is a system that provide services to many on-line users concurrently, allowing each user to interact with his computer as if he alone is using the computer. The item of peripheral equipment are connected to and controlled by CPU.

REAL TIME PROCESSING

This is an on-line system that allows immediate processing such that the result of any processing step can be obtained immediately. Data is processed immediately and the appropriate master file is updated. The most well known example is in retail (commercial Banks) for processing drawings against customers current account.

### PROGRAMMING SOFTWARE:

This includes translation softwares which include compilers and assemblers. The compiler is a complex program which translates computer instruction written in a high source language into the machine code of the particular machine. Assembler on the other hand, translates low level language into machine code.

### APPLICATION PACKAGES

These are already made program or set of programs with associated documentations used for a particular type of problem or a variety of similar problems. Some of the common packages currently in use in Banks, Consumer price application/index, Corporate bodies etc.

### LEVEL OF COMPUTERIZATION

There are three kinds/level of computerization, namely:

- (i) Complete computerization where all the simple and well define and repetitive task can be completely computerized. e.g all basic clerical functions.
- (ii) Partial computerization: This is where the computer take over routine control but may be monitored by humans, who may also deal with exceptional cases. Example is banking operation where all other routine works are computerized except the signature verifications.
- (iii) Computer Aided Application: This is where the computer can be used in many application to aid management



decision by making provision of accurate result or information e.g computer can be used to analyse problem, compute consumer price index etc.

#### WHY COMPUTER IN CONSUMER PRICE INDEX

A number of reasons make computer very necessary in our consumer price index. This can be summarised as follows:

1. Volume of Data: The growth of our consumption of food and services are at an increase and there could be complex results in enormous amount of paper work due to large number of transactions. To process this transactions manually will result to delay and excessive number of errors. Computers are specifically designed to handle a very large amount of data.
2. Repetitiveness: The jobs in consumer price index demands routine, changing and repetitive handling of large quantity of consumer goods and services. These results are required early enough so as to effect Government policy on the new price and on how to assist farmers in production of goods and services. As a result, human being tend to become bored with repetitive activities and this leads to carelessness, increase in error and delay of work. Computer in the other hand, are not subject to boredom. They are usually constant in their reactions and once booted on and using the relevant software. It happily goes on and give result duely, performing as many cycles as required. It may also have facilities for automatic data verifications and editing with

the results that an accurate and clean set of data will be produced for subsequent processing.

3. Need for timely information: The fast pace of modern business activities makes new demands on management for accurate and rapid response to changing conditions. Effective control of large consumption requires that management, planning, monitoring and evaluation office should make annually or bi-annually reports on consumer goods and services. If the office is deprived of up to date information about the consumer prices, it would be handicapped and it may affect Government decision on next season. This would enable the government to maintain control over cost and the speed, flexibility with interaction between person and machine.
4. Accuracy: The need for high degree of Accuracy in our consumer price index and other related activities are satisfied by computer application. Computers can be relied upon for accuracy once given the correct data for processing.
5. Reduction in clerical costs: The rising costs of personnel have made computer application a better alternative in our consumer price industry. This is because all or majority of the clerical works presently performed manually can now be handled by a single computer.
6. Social Acceptability: Computers are equally necessary in our consumer price industry because of its social workability and acceptability. In a fully, computerised economy, the interactive nature of computers, consumers appreciate the fastness and accuracy with which their transactions are handled.

## 2.10 TYPES/CLASSIFICATION OF COMPUTERS AND THEIR USES

### CLASSIFICATION OF COMPUTERS

Computers can be classified under the following broad headings, namely:

- (i) MAINFRAME COMPUTERS
- (ii) MINI COMPUTERS
- (iii) MACRO COMPUTERS

the most common way to distinguish between the types of computers are technological design, size and capacity (storage capacity). All computers, regardless of size, type or basic use follow certain fundamental concepts and operational principles.

### 2.11 MAINFRAME COMPUTERS

These are very large and powerful computers with enormous capacities. They are capable of handling several programmes, doing on-line programming through terminals. They have virtually no processing limitations. The processing speed of mainframe is rated in million than thousands.

Because mainframe computers are very expensive, they are usually leased to government and large corporations from two to five years by International Computer Manufacturers such as IBM, ICL, HoneyWell, etc.

### 2.12 MINI COMPUTERS

This is described as small computers with great range of instruction and processing power than the micro computers (Onyewuenyi, 1994, Page 39). Although they are smaller than mainframe, Mini computers can store large amount of instructions and perform more than one task at a time but there are limitations

to the volume of work and the number of simultaneous users they can handle. Mini computers are fairly expensive and can be bought by small firms and corporations.

### 2.13 MICRO COMPUTERS

This is the most recent category of computer. Other name for micro-computers are the Personal Computers and portable computers. Notable among the micro-computers are the Desk Top, Notebook and PALMTOP computers. Micro computers are complete small scale, cheap, low powers computer system based around a micro processor chip and having limited memory capacity. The first micro computer came on the scene in 1975 from companies like MTS and South West Technical products. The micro-computers offers one-on-one person which the consumer goods respond to the new market condition so as to maintain equilibrium.

CHAPTER THREEPRESENTATION OF DATA

3.0

DATA COLLECTION

3.1

There are two types of data collections, namely Primary and Secondary data. Primary data is referred to the statistical data which the investigator originates for the purpose of the inquiry in hand. These data are primarily collected by trained enumerators from selected markets all over the State (Niger) using a kitchen scale for the weighing. The enumerators interviewed the sellers on the prices of a Mudu or measures which they recorded in a prepared form.

Secondary data refers to the statistical data which is not originated by the investigator himself, but which he obtained from some one else's record. It is not always necessary to conduct a special surveys for the purpose of obtaining statistical data. Such data may be obtained from the records of Institution that collect and publish statistics as part of their routine duties. Statistical data appears in the trade journals, market reports, magazines and other periodicals. Secondary data may be divided into three groups:

1. Continuous or regular data: Statistical data published at short known intervals called continuous or regular data. Examples are weekly index number of wholesaler prices, and monthly figures of exports and imports etc.
2. Periodic data: Which are regularly published at long intervals such as India census etc.

3. Irregular data: Consisting of special studies of statistical phenomenon with no regular data of publication. Example, the reports of the notional income committee.

This data is extracted from the Planning, Monitoring and Evaluation (PME) Office of Niger State Agricultural Development Project. The data were collected on the monthly basis showing the prices of some selected agricultural products for each year from 1987 - 1994.

### 3.2 PRESENTATION OF DATA

Presentation of data is the process by which data are shown in a pattern to make them more attractive and eye catch. Data presentation can be in the form of tabular, diagramatical for the purpose of this research the presentation will be in the form of tabular and graphical.

### 3.3 TABULATION

When data are collected and put in numerical form they do not seem to be meaningful until they are summarised in tables. Tabulation of data is the system by which statistician present data in an ordinary manner so that they are easily comprehend. Hence tabulations of data from the basis for the reducing and simplifying the data into such a form that the main features may be brought out to make the assembled data easily understood.

Tables 1 to 5 shows the monthly average retail market prices for food stuffs under study (in naira for histogram) in Niger State. While tables 6 to 10 summarised the monthly data into

quarter form as indicated. Lastly, table 11 further summarised the prices in annual retail market prices by types (in Naira per Kilogram).

### 3.4 DIAGRAMMATICAL FORM

Figures are not always interesting, and as their size and number increases they become confusing and uninteresting to such an extent that no one (unless he/she is specifically interested) would care to study them. The aim of statistical methods of classification, tabulation, averages, percentages, index numbers are used. Diagrammatical is the presentation of statistical data in geometric figures, pictures or maps and lines or curves.

For the purpose of this project work, Bar chart was used. Bar diagram is the easiest and most adaptable general purpose of chart. The bars may be vertical or horizontal. The food stuffs under study are represented using bar charts.

Fig. I Shows a bar chart of price of milled rice (Average) between 1987 - 1994.

Fig. II Shows a bar chart of price of <sup>Guinea CORN</sup> ~~Sorghum~~ in naira per kilogram (Average)

Fig. III Shows the prices of maize grain between the year 1987 and 1994.

Fig. IV Indicate the bar chart of the prices of yam in Niger State.

Fig. V Shows the bar chart that indicate the prices of Cowpea between 1987 and 1994.

TABLE 1

## MONTHLY AVERAGE RETAIL MARKET PRICES FOR RICE (IN NAIRA PER KG)

RS	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	AV.
	1.58	1.59	1.65	1.93	1.98	2.04	2.04	2.04	2.06	1.98	1.93	1.92	1.90
3	1.76	2.03	2.36	2.50	3.42	3.47	4.24	3.88	4.02	3.50	2.68	3.39	3.10
9	4.55	5.27	5.27	4.89	5.92	6.27	5.86	5.63	5.83	4.27	4.21	5.85	5.32
0	4.67	4.80	5.61	4.67	5.15	4.94	5.71	6.23	5.56	5.86	5.36	5.05	5.38
1	5.16	5.49	6.94	6.54	6.74	7.44	7.42	8.18	7.06	6.33	6.32	7.08	6.73
2	7.30	7.48	8.98	9.70	10.00	11.76	11.07	12.78	11.55	11.73	9.72	10.07	10.18
3	10.66	11.83	12.90	15.50	17.08	16.27	16.23	16.79	15.85	14.69	12.93	12.83	14.46
4	13.39	21.15	14.78	16.47	17.73	18.10	19.23	20.00	19.29	21.00	17.86	17.24	18.02

DATA SOURCE: PLANNING, MONITORING AND EVALUATION OFFICE,  
NIGER STATE AGRICULTURAL DEVELOPMENT PROJECT.

TABLE 2

## MONTHLY AVERAGE RETAIL MARKET PRICES FOR SORGHUM (GUINEA CORN)

(IN NAIRA PER KILOGRAM)

RS	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	AV
7	0.42	0.42	0.42	0.41	0.41	0.53	0.51	0.58	0.61	0.62	0.67	0.73	.53
8	0.96	0.89	1.25	1.67	1.67	2.08	2.08	2.19	2.32	1.80	1.61	1.43	1.66
9	1.77	1.87	1.85	1.95	1.94	2.10	1.94	1.87	1.79	1.81	1.44	1.21	1.80
0	1.35	1.80	1.33	1.31	1.66	1.48	1.79	1.98	1.65	1.90	1.71	1.67	1.64
1	1.67	2.12	2.40	2.29	2.46	2.70	2.85	3.33	2.78	2.78	2.44	2.36	2.52
2	2.60	2.79	3.05	3.30	4.20	5.17	5.87	5.96	5.21	4.79	4.20	3.21	4.20
3	3.79	3.76	3.61	5.39	5.78	5.58	7.73	5.39	4.83	4.16	4.47	3.79	4.86
4	3.81	6.35	3.40	3.72	4.07	4.04	6.67	6.90	6.67	6.92	6.75	6.21	5.46

DATA SOURCE: PLANNING, MONITORING AND EVALUATION, NIGER STATE  
AGRICULTURAL DEVELOPMENT PROJECT.



TABLE 3

## MONTHLY AVERAGE RETAIL MARKET PRICES FOR MAIZE GRAIN (IN NAIRA PER KILOGRAM)

YRS	JAN	FEB	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	AV.
87	0.39	0.39	0.38	0.44	0.43	0.36	0.45	0.55	0.48	0.48	0.51	0.61	0.46
88	0.82	1.00	1.13	1.22	1.63	2.00	2.31	1.55	1.61	1.42	1.49	1.73	1.49
89	1.61	1.91	2.00	2.27	2.09	2.18	2.07	1.17	1.32	1.13	1.09	1.13	1.67
90	1.28	1.18	1.22	1.19	1.62	1.57	1.74	1.53	1.11	1.36	1.82	1.45	1.42
91	1.35	2.17	2.11	2.34	2.44	2.75	2.75	2.36	1.76	2.10	2.28	2.34	2.03
92	2.58	2.80	3.54	3.30	4.30	5.43	5.91	4.62	3.46	3.36	3.13	3.23	3.76
93	3.73	3.45	3.46	5.26	5.52	5.63	5.25	4.81	3.23	2.89	3.23	3.28	4.15
94	3.17	5.58	3.54	3.29	3.25	3.39	4.62	6.15	5.00	5.19	5.52	4.38	4.42

DATA SOURCE: PLANNING, MONITORING AND EVALUATION OFFICE,  
NIGER STATE AGRICULTURAL DEVELOPMENT PROJECT.

TABLE 4

## MONTHLY AVERAGE RETAIL MARKET PRICES FOR YAM (IN NAIRA PER KILOGRAM)

YRS	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	AV.
87	0.46	0.78	1.01	0.74	0.71	0.99	0.72	0.78	0.77	0.87	0.57	1.73	0.84
88	1.32	1.10	2.37	2.62	2.19	1.67	1.85	1.68	2.33	2.24	2.40	2.10	2.00
89	1.38	1.41	1.18	2.05	2.26	2.02	2.01	2.31	1.67	1.28	0.94	1.23	1.65
90	1.78	1.15	1.45	4.34	2.98	4.31	6.00	1.97	1.44	2.02	1.59	2.10	2.59
91	1.89	2.67	1.95	2.89	4.58	5.18	2.38	2.65	3.90	1.95	3.14	3.18	3.03
92	3.01	3.09	3.06	4.40	6.90	4.45	4.76	3.91	3.83	3.85	5.25	5.64	3.35
93	5.83	6.51	8.28	9.32	13.26	17.00	15.81	9.11	7.09	10.25	9.23	12.27	10.33
94	9.17	13.75	10.71	15.58	12.26	17.99	18.00	18.67	17.93	17.42	18.52	16.00	15.50

DATA SOURCE: PLANNING, MONITORING AND EVALUATION OFFICE,  
NIGER STATE AGRICULTURAL DEVELOPMENT PROJECT.

**TABLE 5****MONTHLY AVERAGE RETAIL MARKET PRICES FOR COWPEA (IN NAIRA PER KILOGRAM)**

JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	AV.
2.03	2.24	2.40	2.28	2.44	2.69	2.47	2.81	2.36	2.15	2.05	2.71	2.39
3.93	3.66	3.75	3.46	3.85	5.00	4.47	3.91	3.19	2.95	3.04	3.21	3.70
3.89	4.20	2.85	4.95	8.30	7.22	5.41	4.11	4.38	3.69	3.75	3.30	4.67
3.43	3.72	4.42	5.15	6.09	5.66	6.71	5.44	4.46	3.82	3.90	4.30	4.70
5.77	5.30	6.86	7.07	6.29	6.44	6.45	6.50	6.16	6.00	6.80	6.50	6.35
6.04	6.22	6.58	6.90	7.60	8.02	9.74	10.09	15.55	10.72	9.45	7.84	8.73
10.41	11.47	13.86	16.93	17.83	19.06	18.06	17.67	15.17	14.53	13.45	13.36	14.04
14.65	16.36	18.25	19.38	15.75	19.28	20.77	19.31	20.00	19.29	18.00	19.40	18.34

DATA SOURCE: PLANNING, MONITORING AND EVALUATION OFFICE,  
NIGER STATE AGRICULTURAL DEVELOPMENT PROJECT.

**QUARTERLY AVERAGE RETAIL MARKET PRICES FOR RICE****(IN NAIRA PER KILOGRAM)**

YEARS	1ST QUARTER	2ND QUARTER	3RD QUARTER	4TH QUARTER
1987	1.61	1.98	2.05	1.94
1988	2.05	3.13	4.05	3.19
1989	5.03	5.69	5.77	4.94
1990	5.03	5.25	5.83	5.42
1991	5.86	6.91	7.55	6.58
1992	7.92	10.49	11.80	10.51
1993	11.80	16.27	16.29	13.48
1994	16.44	16.33	19.51	18.70

DATA SOURCE: PLANNING, MONITORING AND EVALUATION OFFICE,  
NIGER STATE AGRICULTURAL DEVELOPMENT PROJECT.

TABLE 7

QUARTERLY AVERAGE RETAIL MARKET PRICES FOR SORGHUM (IN NAIRA PER KG.)

YEAR	FIRST QUARTER	SECOND QUARTER	THIRD QUARTER	FOURTH QUARTER
1987	0.42	0.45	0.57	0.67
1988	1.03	1.81	2.20	1.61
1989	1.83	2.00	1.87	1.49
1990	1.19	1.48	1.81	1.76
1991	2.06	2.15	2.99	2.53
1992	2.81	4.22	5.68	4.07
1993	3.72	5.58	6.32	4.15
1994	4.52	3.91	6.75	6.63

DATA SOURCE: FLEMING, MONITORING AND EVALUATION OFFICE,  
NIGER STATE AGRICULTURAL DEVELOPMENT PROJECT.

TABLE 8

QUARTERLY AVERAGE RETAIL MARKET PRICES FOR MAIZE GRAIN (IN NAIRA PER KG.)

YEAR	FIRST QUARTER	SECOND QUARTER	THIRD QUARTER	FOURTH QUARTER
1987	0.39	0.41	0.49	0.53
1988	0.98	1.02	1.22	1.55
1989	1.04	1.18	1.52	1.12
1990	1.23	1.16	1.46	1.54
1991	1.86	2.51	2.49	2.24
1992	2.97	4.34	4.63	3.24
1993	3.55	5.47	4.43	3.13
1994	4.10	3.31	5.26	5.03

DATA SOURCE: FLEMING, MONITORING AND EVALUATION, NIGER STATE  
AGRICULTURAL DEVELOPMENT PROJECT.

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TABLE 9

QUARTELY AVERAGE RETAIL MARKET PRICES FOR YAM (IN NAIRA PER KG.)

YEAR	FIRST QUARTER	SECOND QUARTER	THIRD QUARTER	FOURTH QUARTER
1987	0.75	0.82	0.76	1.06
1988	1.60	2.16	1.95	2.28
1989	1.32	2.11	2.00	1.15
1990	1.46	3.88	2.14	1.90
1991	2.17	4.22	2.98	2.76
1992	3.05	4.94	4.17	4.91
1993	6.87	11.19	10.67	10.75
1994	11.21	15.23	13.20	17.31

DATA SOURCE: PLANNING, MONITORING AND EVALUATION OFFICE,  
NIGER STATE AGRICULTURAL DEVELOPMENT PROJECT.

TABLE 10

QUARTELY AVERAGE RETAIL MARKET PRICES FOR COWPEA (IN NAIRA PER KG.)

YEAR	FIRST QUARTER	SECOND QUARTER	THIRD QUARTER	FOURTH QUARTER
1987	2.22	2.47	2.55	2.30
1988	3.78	4.10	3.86	3.07
1989	3.65	6.02	4.63	3.58
1990	3.86	5.63	5.54	4.01
1991	5.38	6.69	6.37	6.43
1992	6.28	7.54	11.78	9.34
1993	11.91	17.24	16.97	13.78
1994	16.42	19.14	20.03	18.90

DATA SOURCE: PLANNING, MONITORING AND EVALUATION OFFICE,  
NIGER STATE AGRICULTURAL DEVELOPMENT PROJECT.

TABLE 11

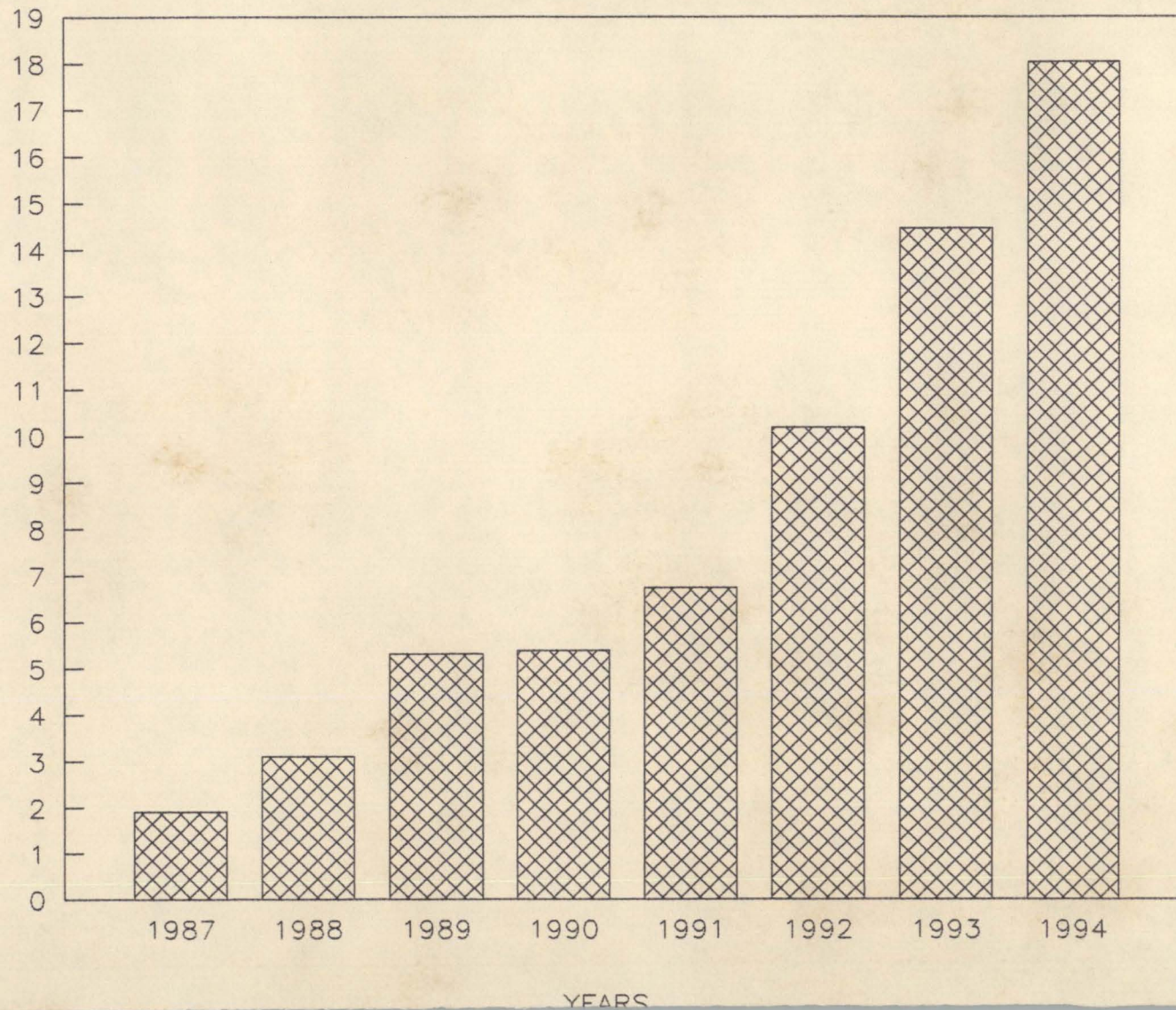
ANNUAL AVERAGE RETAIL MARKET PRICES BY TYPES (IN NAIRA PER KILOGRAM)

YEARS	MILLED RICE	GUINEA CORN	MAIZE GRAIN	YAM	COWPEA
1987	1.90	0.53	0.46	0.85	2.39
1988	3.10	1.66	1.49	1.99	3.70
1989	5.36	1.80	1.66	1.65	4.67
1990	5.38	1.63	1.42	2.59	4.76
1991	6.73	2.52	2.23	3.03	6.35
1992	10.18	4.20	3.80	4.26	8.73
1993	14.47	4.86	4.15	10.33	15.15
1994	17.97	5.46	4.46	15.50	18.37

DATA SOURCE: PLANNING, MONITORING AND EVALUATION OFFICE,  
NIGER STATE AGRICULTURAL DEVELOPMENT PROJECT.

20-11-93

BAR CHART SHOWING AVERAGE RETAIL MARKET  
PRICE OF RICE



IN NAIRA/KILOGRAM

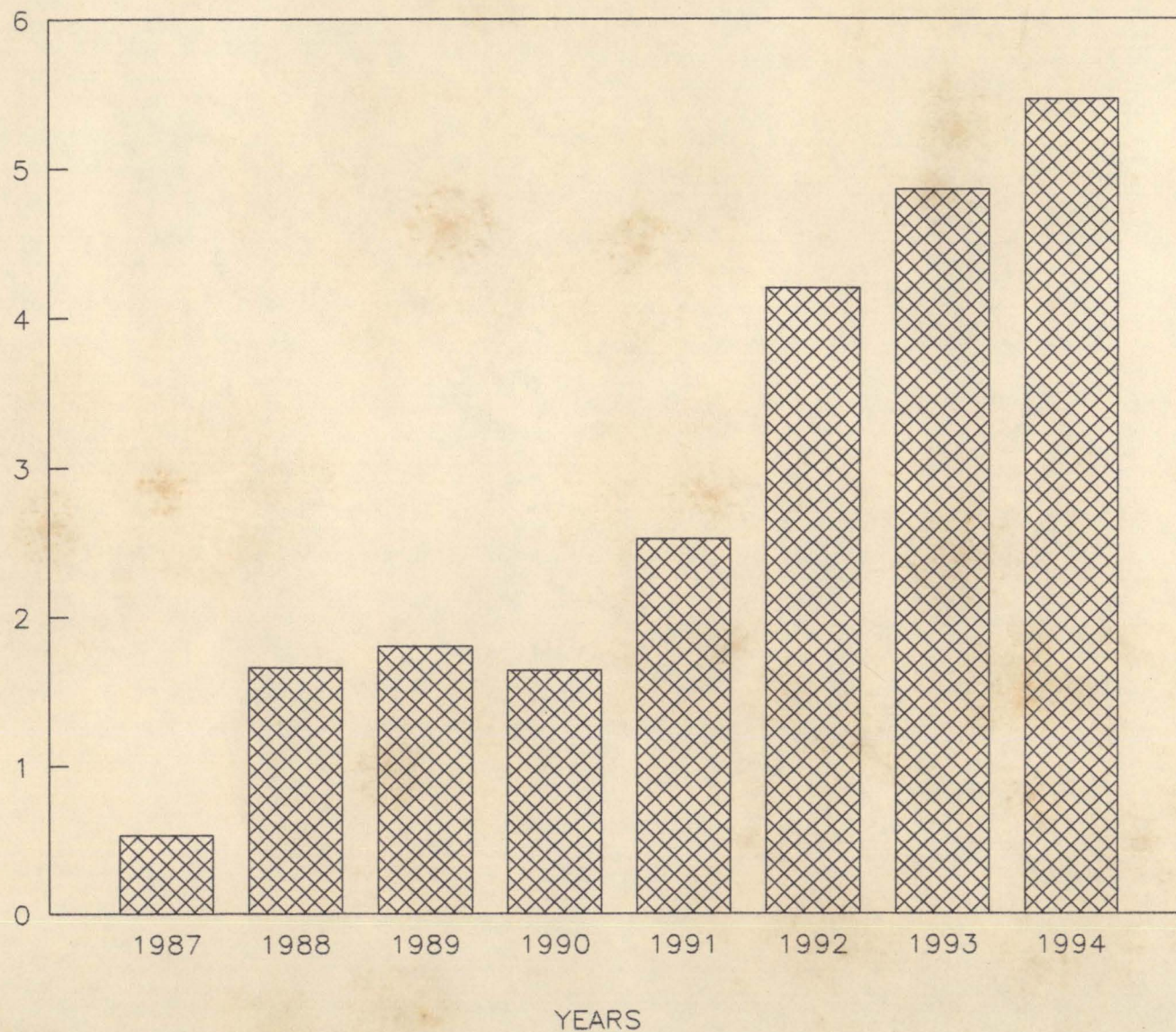
figure 1,

LOTUS 123

# BAR CHART SHOWING AVERAGE RETAIL MARKET PRICE OF GUINEA CORN

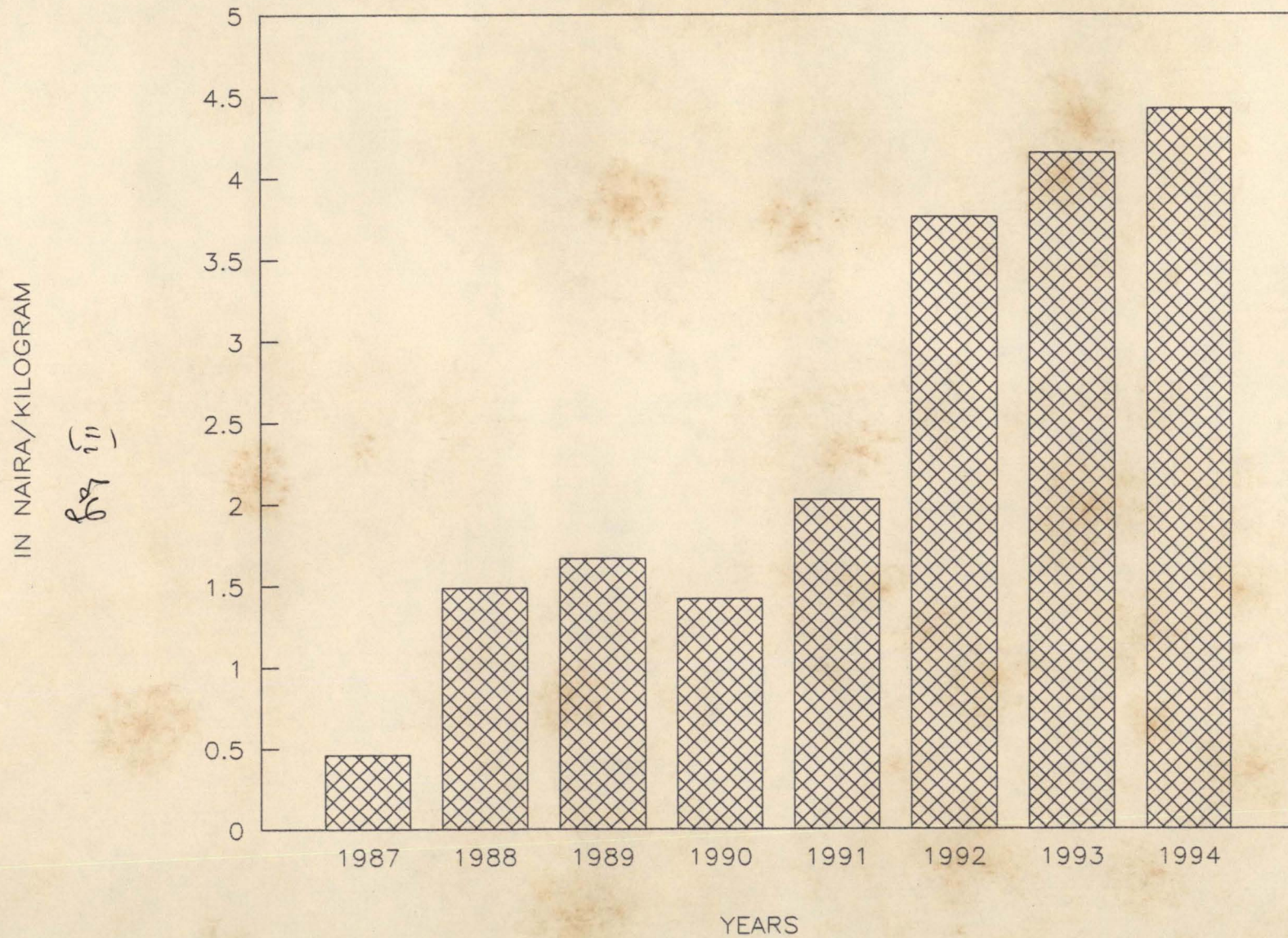
IN NAIRA/KILOGRAM

fig. 51



Lo Tus 123

BAR CHART SHOWING AVERAGE RETAIL MARKET  
PRICE OF MAIZE



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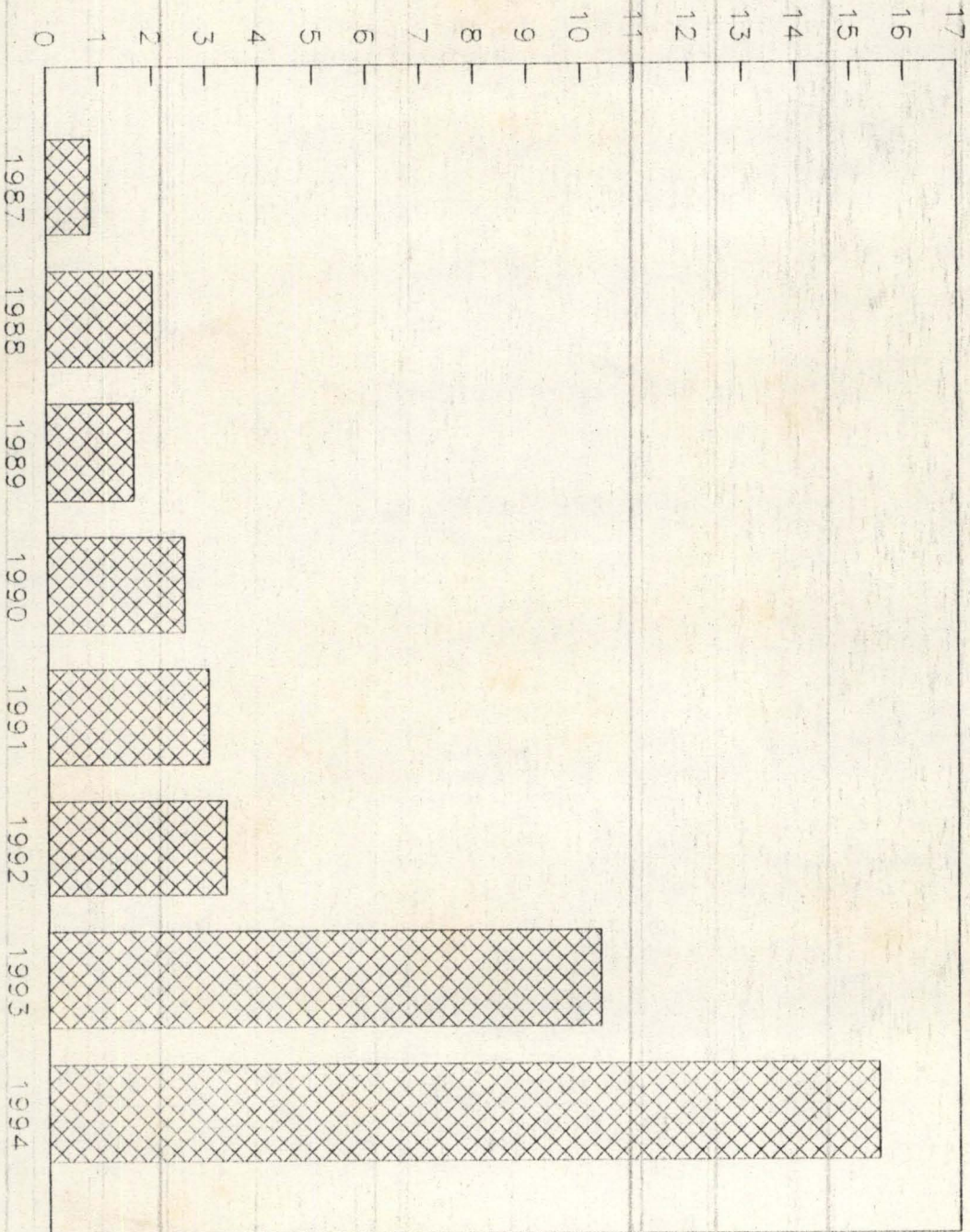


# BAR CHART SHOWING AVERAGE RETAIL MARKET PRICE OF YAM

PRICE OF YAM

IN NAIRA/KILOGRAM

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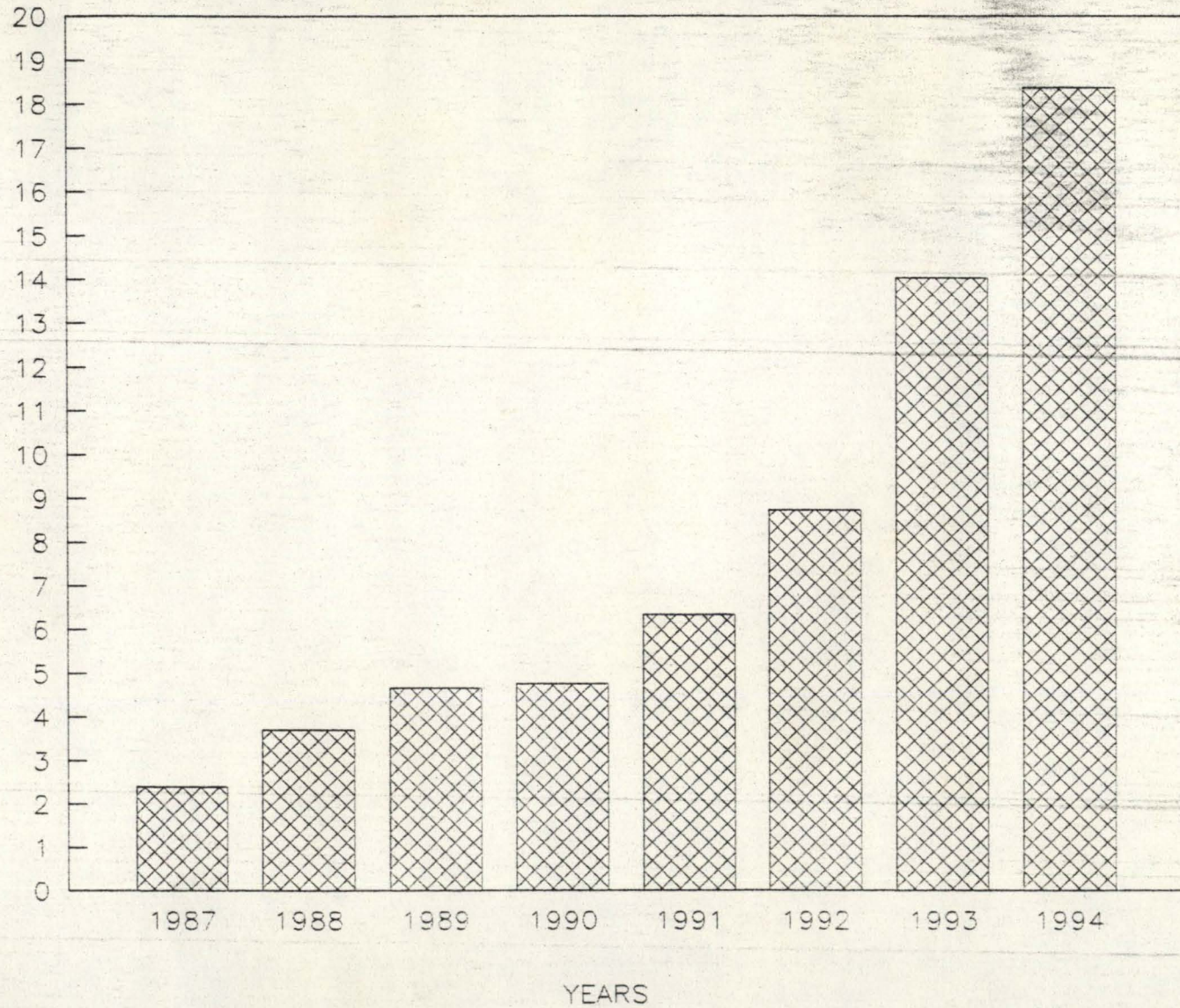


Lotus 123

BAR CHART SHOWING AVERAGE RETAIL MARKET  
PRICE OF COWPEA

IN NAIRA/KILOGRAM

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Lotus

### 3.5 PROBLEMS/LIMITATIONS OF COMPUTERIZATION OF CONSUMER PRICE INDEX

Computer application in our consumer price industry have a wide spread limitations which can affect not only the consumers, and the producers but also the entire economy. These among others include:

1. The use of computer reduces reliance on manpower and may compound the unemployment problems in the economy.

Computers are not yet manufactured in Nigeria, it is only through importation, the only means of getting computers in Nigeria. The non-mechanization of our economy/Agricultural sector discourages the heavy capital outlay of computerization. Besides, spare parts for computers and engineers to effect repairs and maintenance are not readily available.

2. There is also the problem of electricity supply. Nigeria National Electric Power Authority is everyday advancing in its incessant power cut. This creates problems for institutions that make use of computers because computers cannot function in the absence of electricity. To ensure a constant and adequate power supply, will necessitate the use of a high powered standby generator which also has to be imported. These are all added expenses and constitute a drain on the country's foreign exchange and adverse effect on its balance of payment.

3. The security of information can not be guaranteed as any one who can manipulate the computer can recall some information which may be confidential P. A. Downa (1991) listed some reported cases of insecurity of information

CHAPTER FOUR

4.0

DATA ANALYSIS AND INTERPRETATION

The data which was presented in tabular form in chapter three would be analysed using some statistical techniques such as time series analysis, trend lines, and price index etc. The analysis shall cover crops, that is, milled rice, sorghum (Guinea corn), maize grain, yam and Cowpea. The crops would be individually analysed.

4.1 TIME SERIES ANALYSIS

A time series is nothing more than a set of observations on some factors made at specific points in time, that is statistical data which are collected, observed or recorded at successive interval. For example, sales, production, prices, bank deposit, population and bank clearing. The prices of food stuff collected for past eight (8) years can be example of time series.

hence in the analysis of time series, time is the most important factor because the variables is related to time which may be either years, month, week, day, hour, minute or second.

There are four components of time series.

- (i) Trend or Secular movement
- (ii) Cyclical movement
- (iii) Seasonal movement
- (iv) Irregular movement

However, analysis of this data would be based on trend and seasonal movement.

which include theft of copies of specialised computer program  
and sale of these copies to price competitors internationally.

4.2 ANALYSIS OF TREND

By looking at the time plot one can always determine whether there is trend in a series. There are various methods of describing trend. These include the following:

- (i) Freehand method
- (ii) Semi Average method
- (iii) Moving Average method
- (iv) Mathematical Equation method.

For the purpose of this project mathematical equation method will be used for fitting a trend line using least square method. The most commonly employed and a very satisfactory one to describe the trend is by mean of the objectively determined mathematical equation. To fit a straight line trend.

A straight line is described by the equation

$$Y = a + bx$$

where Y = dependent variable i.e sales, production

X = Independent variable i.e time

a = value of Y when X = 0

b = the amount of change that comes in Y for a unit change in X.

Using the two normal equations to estimate "a" and "b". These are

$$EY = na + bEx$$

$$EXY = aEx + bEX^2$$

In time series the time variable X can be coded such that X = 0 which ease the calculation of "a" and "b". This implied that the two normal equation will reduce to the following:

$$EY = na + b(0)$$

$$EY = na \quad a = E y/n$$

$$EXY = aEX + bEX^2$$

$$EXY = a(0) + bEX^2$$

$$EXY = bEX^2 \quad b = \frac{EXY}{EX^2}$$

FITTING A TREND LINE ON THE AVERAGE RETAIL PRICES OF  
MILLED RICE FROM 1987 - 1994

YEAR	PRICES IN		X	X <sup>2</sup>	XY	TREND VALUES
	NAIRA	Y				
1987	1.90		-7	49	13.30	0.43
1988	3.10		-5	25	15.50	2.64
1989	5.36		-3	9	16.08	4.84
1990	5.38		-1	1	-5.38	7.04
1991	6.73		1	1	6.73	9.24
1992	10.18		3	9	30.54	11.44
1993	14.47		5	25	72.35	13.64
1994	17.97		7	49	125.75	15.84
65.09			EX = 0	EX <sup>2</sup> =168	EXY = 185.11	

The trend line equation

$$Y = a + bx$$

In estimating a and b we have

$$Y = a + bx$$

$$a = \frac{EY}{n} = \frac{65.09}{8} = 8.14$$

$$b = \frac{EXY}{EX^2} = \frac{185.11}{168} = 1.10$$

Trend values of retail price of milled Rice.

$$8.14 + 1.10(-7) = 8.14 - 7.7 = 0.43$$

$$8.14 + 1.10(-5) = 8.14 - 5.5 = 2.64$$

$$8.14 + 1.10(-3) = 8.14 - 3.3 = 4.84$$

$$8.14 + 1.10(-1) = 8.14 - 1.1 = 7.04$$

$$8.14 + 1.10(1) = 8.14 + 1.10 = 9.24$$

$$8.14 + 1.10(3) = 8.14 + 3.3 = 11.44$$

$$8.14 + 1.10(5) = 8.14 + 5.5 = 13.64$$

$$8.14 + 1.10(7) = 8.14 + 7.7 = 15.84$$

Trend line equation is given by

$$Y = 8.14 + 1.10X$$

In 1996  $X = 11$

$$Y = 8.14 + 1.10(11)$$

$$8.14 + 12.1$$

$$= 20.24$$

That is in 1996 the average price of milled rice will be ₦20.24 per kilogram.



FITTING A TREND LINE ON THE AVERAGE RETAIL PRICES OF  
MAIZE GRAIN FROM 1987 - 1994

YEAR	Y	X	X <sup>2</sup>	XY	TREND VALUES
1987	0.46	-7	49	-3.22	0.43
1988	1.49	-5	25	-7.45	1.01
1989	1.66	-3	9	-4.98	1.59
1990	1.42	-1	1	-1.42	2.17
1991	2.23	1	1	2.23	2.75
1992	3.80	3	9	11.40	3.33
1993	4.15	5	25	20.75	3.91
1994	4.46	7	49	31.22	4.49

$$\Sigma Y = 19.67 \quad \Sigma X = 0 \quad \Sigma X^2 = 168 \quad \Sigma XY = 48.53$$

Estimating a and b we used trend line equations

The procedure should be used as in the first table

$$Y = a + bx$$

$$a = \frac{\Sigma Y}{n} = \frac{19.67}{8} = 2.46$$

$$b = \frac{\Sigma XY}{\Sigma X^2} = \frac{48.53}{168} = 0.29$$

$$Y = 2.46 + 0.29X$$

The trend line equation will be

$$Y = 2.46 + 0.29X$$

To estimate the price of maize grain in 1996 will be

$$X = 11$$

$$Y = 2.46 + 0.29(11)$$

$$Y = 2.46 + 3.19$$

$$Y = 5.65$$

This shows that the estimated price of maize grain will be ₦5.65 per kilogram in 1996. Thus there is no likelihood that the price will fall in the next future.

FITTING A TREND LINE ON THE AVERAGE RETAIL PRICES OF SORGHUM FROM 1987 - 1994

YEAR	PRICE IN NAIRA	Y	X	X <sup>2</sup>	XY	TREND VALUES
1987	0.53		-7	49	-3.71	0.38
1988	1.66		-5	25	-8.30	1.08
1989	1.80		-3	9	-5.40	1.78
1990	1.63		-1	1	-1.63	2.48
1991	2.52		1	1	2.52	3.18
1992	4.20		3	9	12.60	3.88
1993	4.86		5	25	24.30	4.58
1994	5.46		7	49	38.22	5.28

$$EY = 22.66 \quad EX = 0 \quad EX^2 = 168 \quad EXY = 58.60$$

The trend line/value  $Y = a + bx$

$$a = \frac{EY}{n} = \frac{22.66}{8} = 2.83$$

$$b = \frac{EXY}{EX^2} = \frac{58.60}{168} = 0.35$$

The trend line equation be

$$Y = 2.83 + 0.35X$$

$$\text{In 1995 } X = 9$$

$$Y = 5.98$$

$$2.83 + 0.35(-7) =$$

$$2.83 + (-2.45)$$

$$2.83 - 2.45 = 0.38$$

$$2.83 + 0.35(-5)$$

$$2.83 - 1.75 = 1.08$$

$$2.83 + 0.35(-3) = 1.78$$

$$2.83 - 1.05$$

$$2.83 - 0.35 = 2.48$$

$$2.83 + 0.35 = 3.18$$

This shows that in 1995 there will be an increase in the prices of Sorghum in Niger State.

#### 4.3 SEASONAL VARIATION ANALYSIS

There are variations that follows a particular pattern which coincides with the season or part of the year. By season of the year it means data recorded daily, weekly, monthly, quarterly or bi-annually.

There are various methods of calculating or estimating seasonal variations but here we are going to use simple average method.

#### 4.4 STEPS IN CALCULATING SIMPLE AVERAGE METHOD

- (a) Compute the mean value for each month or quarterly for the year
- (b) Express each figure as a percentage of the average of the year.
- (c) Average result in step 2 over corresponding month or quarter for the various years.
- (d) Express this mean in step 3 as a percentage of their own average and result represent the required index.

4.5 COMPUTED SEASONAL INDEX FOR MARKET PRICES FOR MILLED RICE  
USING SIMPLE AVERAGE METHOD

YEARS	FIRST QUARTER	SECOND QUARTER	THIRD QUARTER	FOURTH QUARTER	
1987	84.7	104.2	107.9	102.1	
1988	65.9	100.6	130.2	102.6	
1989	93.8	106.2	107.6	92.2	
1990	93.5	97.6	108.4	100.7	
1991	87.1	102.7	112.2	97.8	
1992	77.8	103.0	115.9	103.2	
1993	81.6	112.5	112.7	93.2	
1994	92.6	92.0	109.9	105.4	
Mean/Average	84.6	102.4	113.1	99.7	100
Index	84.6	102.4	113.1	99.7	

4.6 INTERPRETATION

This means that in the first and fourth quarter, there is a decrease of 15.4 and 0.3 respectively while second and third quarter has an increase of 2.4 and 13.1 respectively due to seasonal variations.

4.7

ANALYSIS OF AVERAGE RETAIL MARKET PRICES FOR MILLED RICE  
USING SIMPLE AVERAGE METHOD

YEAR	FIRST QUARTER	SECOND QUARTER	THIRD QUARTER	FOURTH QUARTER	MEAN $\bar{X}$
1987	1.61	1.98	2.05	1.94	1.90
1988	2.05	3.13	4.05	3.19	3.11
1989	5.03	5.69	5.77	4.94	5.36
1990	5.03	5.25	5.83	5.42	5.38
1991	5.86	6.91	7.55	6.58	6.78
1992	7.92	10.49	11.80	10.51	10.18
1993	11.80	16.27	16.29	13.48	14.46
1994	16.44	16.33	19.51	18.70	17.75

4.8

USING SIMPLE AVERAGE METHOD TO ANALYSE THE MARKET PRICE  
FOR SORGHUM (GUINEA CORN)

YEAR	FIRST QUARTER	SECOND QUARTER	THIRD QUARTER	FOURTH QUARTER	MEAN $\bar{X}$
1987	0.42	0.45	0.57	0.67	0.53
1988	1.03	1.81	2.20	1.61	1.66
1989	1.83	2.00	1.87	1.49	1.80
1990	1.49	1.48	1.81	1.76	1.64
1991	2.06	2.48	2.99	2.53	2.52
1992	2.81	4.22	5.68	4.07	4.20
1993	3.72	5.58	6.32	4.14	4.94
1994	4.52	3.94	6.74	6.33	5.38

4.9 COMPUTED SEASONAL INDEX FOR MARKET PRICES FOR SORGHUM  
(GUINEA CORN)

YEAR	FIRST QUARTER	SECOND QUARTER	THIRD QUARTER	FOURTH QUARTER
1987	79.30	84.9	107.0	126.4
1988	62.0	109.0	132.5	97.0
1989	101.7	111.1	103.9	82.8
1990	90.9	90.2	110.4	107.3
1991	81.7	98.4	118.7	100.4
1992	66.9	100.5	135.2	96.9
1993	75.3	113.0	127.9	83.8
1994	84.0	73.2	125.3	117.7
MEAN $\bar{X}$	80.2	97.5	120.2	101.5
<del>99.9</del> INDEX	80.3	97.6	120.3	101.6

4.10 INTERPRETATION

This shows that first and second quarter has a decrease of 19.6 and 2.4 respectively while third and fourth quarter has an increase of 20.3 and 1.6 respectively.

4.11

ANALYSIS OF MARKET PRICES FOR YAM USING SIMPLE AVERAGE METHOD

YEAR	FIRST QUARTER	SECOND QUARTER	THIRD QUARTER	FOURTH QUARTER	MEAN $\bar{X}$
1987	0.75	0.82	0.76	1.06	0.85
1988	1.60	2.10	1.95	2.28	2.00
1989	1.32	2.11	2.00	1.15	1.65
1990	1.46	3.88	3.14	1.90	2.60
1991	2.17	4.22	2.98	2.76	3.03
1992	3.05	4.92	4.17	4.91	4.26
1993	6.87	13.19	10.67	10.73	10.37
1994	11.21	15.28	18.20	18.31	15.50

4.12

COMPUTED SEASONAL INDEX FOR PRICES OF MAIZE GRAIN

YEAR	FIRST QUARTER	SECOND QUARTER	THIRD QUARTER	FOURTH QUARTER	MEAN $\bar{X}$
1987	84.78	89.13	106.52	115.22	
1988	65.77	108.72	122.15	104.03	
1989	110.18	130.54	91.02	67.07	
1990	86.62	102.82	102.82	108.45	
1991	82.46	110.09	109.21	98.25	
1992	78.16	114.21	121.84	85.26	
1993	85.54	131.81	106.75	75.42	
1994	92.55	74.74	118.74	113.54	
MEAN	85.76	107.76	109.88	95.91	99.83
INDEX	85.91	107.94	110.07	96.07	

4.13 INTERPRETATION

The 1st and last quarters has a decrease of 14.09 and 3.93 respectively while 2nd and 3rd quarters has an increase of 7.94 and 10.07 respectively. This shows that at every quarter there is an effect of seasonal index in the prices of the food stuffs.

4. 4/2.14  
4-5

ANALYSIS OF THE PRICES OF COWPEA IN NAIRA PER KILOGRAM

YEAR	FIRST QUARTER	SECOND QUARTER	THIRD QUARTER	FOURTH QUARTER	MEAN $\bar{X}$
1987	2.22	2.47	2.55	2.30	2.39
1988	3.78	4.10	3.86	3.07	3.70
1989	3.65	6.82	4.62	3.58	4.67
1990	3.86	5.63	5.54	4.01	4.76
1991	5.98	6.67	6.37	6.43	6.35
1992	6.28	7.51	11.79	9.34	8.73
1993	11.91	17.94	16.97	13.78	15.15
1994	16.42	18.14	20.02	18.90	18.37

4-15  
4-6

COMPUTED SEASONAL INDEX FOR PRICES OF COWPEA

YEAR	FIRST QUARTER	SECOND QUARTER	THIRD QUARTER	FOURTH QUARTER	MEAN $\bar{X}$
1987	92.89	103.35	106.69	96.23	
1988	102.16	110.81	104.35	82.97	
1989	78.16	146.04	98.93	76.66	
1990	81.09	118.28	116.39	84.24	
1991	94.17	103.94	100.31	101.26	
1992	71.94	86.03	135.06	106.99	
1993	78.61	118.42	112.01	90.96	
1994	89.38	98.75	109.04	102.89	
MEAN $\bar{X}$	86.05	110.70	110.34	92.78	99.97
INDEX	86.08	110.73	110.37	92.81	



#### 4.16 INTERPRETATION

Due to seasonal variations there is a decrease of 13.92 in the first quarter and 7.19 in the fourth quarter. In the second and third quarters there is an increase of 10.73 and 10.37 respectively. This shows that the prices of Cowpea either decrease or increase throughout the year. Generally, the prices of food stuffs is not stable throughout the years under study which was due to seasonal effect.

#### 4.17 INDEX NUMBERS

##### 4.18 MEANING OF INDEX NUMBERS

Index number could be defined as a device for combining the variations, that have come in group of related variables over a period of time, with a view to obtain a figure that faithfully represents the net result of the change in the constituent variables. When an index number measures quantity changes, it is called quantity index or price index when it measures price changes.

For the purpose of this study, simple price index and composite price index would be used for the food stuffs under study. A simple price index deals with one commodity at a time. While a composite price index emphasizes on more than one commodity.

\*  
4.19 CONSTRUCTION OF PRICE INDEX

$P_o$  = price at base period (year)

$P_n$  = price at current period

$q_o$  = Quantity at base period

$q_u$  = Quantity at current period

4.20 BASE PERIOD

This is the time to which reference is made. The selection of base period is a task that required caution. This is because period chosen to serve as the base year should meet certain conditions and these conditions are:

- (i) It should not be too distant to the past
- (ii) It should be a period of economic normalcy

4.21 SIMPLE PRICE INDEX

The crop will be analysed using this method for milled Rice.

Using 1987 as the base year

MILLED RICE

YEAR	1987	1988	1989	1990	1991	1992	1993	1994
PRICE IN NAIRA	1.90	3.10	5.36	5.38	6.73	10.18	14.47	17.97

Let SPI represents the simple price index by definition

$$SPI = \frac{P_n}{P_o} \times \frac{100\%}{1}$$

Where  $P_n$  = price of milled rice in the current year

$P_o$  = price of milled rice in the base year

The year 1987 has been chose as the base year.

SP1 for 1988

$$\text{SP1} = \frac{\text{price in 1988}}{\text{price in 1987}} \times \frac{100}{1}$$

$$\text{SP1} = \frac{3.10}{1.90} \times \frac{100}{1} = 163\%$$

The SP1 for 1988 is 163% which indicated that milled rice has increased by 63% between 1987 and 1988.

For 1989

$$\text{SP1} = \frac{\text{price in 1989}}{\text{price in 1987}} \times \frac{100}{1}$$

$$= \frac{5.36}{1.90} \times \frac{100}{1} = 282.11\%$$

$$= 282\%$$

The result indicate that price of milled rice has increased by 182% between 1987 and 1989 in Niger State.

For 1990

$$\text{SP1} = \frac{\text{price in 199}}{\text{price in 1987}} \times 100$$

$$= \frac{5.38}{1.90} \times \frac{100}{1} = 283.20$$

$$= 283.20\%$$

This indicate an increase of 183% in the price of milled Rice. between 1987 and 1990.

SP1 for 1991 using 1987 as a base year

$$\text{SP1} = \frac{\text{price in 1991}}{\text{price in 1987}} \times \frac{100}{1}$$

$$\frac{6.73}{1.90} \times \frac{100}{1} = 354\%$$

This indicates that there is an increase of 254% between 1987 and 1991.

SP1 for 1992

$$\text{SP1} = \frac{\text{price in 1992}}{\text{price in 1987}} \times \frac{100}{1}$$

$$\frac{10.18}{1.90} \times \frac{100}{1} = 536\%$$

This result shows that there is price increase of 436% between 1987 and 1992 of milled Rice.

SP1 for 1993

$$\text{SP1} = \frac{\text{price for 1993}}{\text{price for 1987}} \times \frac{100}{1} = 762\%$$

This indicates that there is price increase of 662% between 1987 and 1993.

SP1 for 1994

$$\text{SP1} = \frac{\text{price in 1994}}{\text{price in 1987}} \times \frac{100}{1}$$

$$\frac{17.97}{1.90} \times \frac{100}{1} = 946\%$$

Which means price increase by 846% between 1987 to 1994.

The projection here means that prices of milled rice continues to increase and at an astronomical rate/at an increasing rate.

4.22

SUMMARY TABLE THAT INDICATE INCREASES FROM 1987 TO 1994

YEAR	PRICE	INDEX CHANGE 1987 BASE YEAR = 100%
1987	1.90	-
1988	3.19	63
1989	5.36	182
1990	5.38	183
1991	6.73	254
1992	10.18	436
1993	14.47	662
1994	17.97	846

From the index change table above, it is clear that there is steady increase in prices of milled rice between 1987 to 1994. This variation in increase may be due to the political instability, lack of government assistance to farmers, or no price control Board to assist in controlling the general price increase of goods and services. The increase may also be attributed to as a result of increases in the price of farm inputs within these periods. And it is anticipated that prices of milled rice would continue to rise if not adequately taking care of.

4.23

CONSTRUCTION OF COMPOSITE PRICE INDEX

The composite price index could be defined as a price index which emphasizes on more than one product. It could be on two or group of products/commodities with some period of time.

One of the advantages of this method is easy to compute. But it has limitation that the relative importance of the various food stuffs are not taken into consideration.

4224 PRICE INDEX OF FOOD STUFFS FROM 1987 TO 1994

FOODSTUFF	1987	1988	1989	1990	1991	1992	1993	1994
MILLED RICE	1.90	3.10	5.36	5.38	6.78	10.18	14.47	17.97
GUINEA CORN	0.53	1.66	1.80	1.64	2.52	4.20	4.94	5.39
MAIZE GRAIN	0.46	1.49	1.67	1.42	2.23	3.80	4.15	4.46
YAM	0.85	1.99	1.65	2.59	3.03	4.26	10.33	15.50
COWPEA	2.39	3.70	4.67	4.76	6.35	8.73	15.15	18.37
TOTAL	6.13	11.94	15.15	15.79	20.86	31.17	49.04	61.68

$$\frac{P_{1988}}{P_{1987}} = \frac{\text{sum of all commodities prices in 1988}}{\text{sum of all corresponding prices in 1987}} \times \frac{100}{1}$$

$$= \frac{11.94}{6.13} \times \frac{100}{1} = 195\%$$

The result of 195% shows that there is an increased price of 95% between the 1987 and 1988.

CPI to 1989 using 1987 as base year

$$\frac{P_{1989}}{P_{1987}} = \frac{\text{sum of all commodities prices in 1989}}{\text{sum of all corresponding prices in 1987}} \times \frac{100}{1}$$

$$\frac{15.14}{6.13} \times \frac{100}{1} = 246.98$$

$$= 246\%$$

This indicates that there is an increase of 147% of goods between 1987 and 1989.

$$\frac{P_{1990}}{P_{1987}} = \frac{\text{sum of all commodities prices in 1990}}{\text{sum of all corresponding prices in 1987}} \times \frac{100}{1}$$

$$\frac{15.78}{6.13} \times \frac{100}{1} = 257\%$$

The results indicates that prices of goods (food stuffs) has increased by 157% between 1987 and 1990 in Niger State.

$$\frac{P_{1990}}{P_{1987}} = \frac{\text{sum of all commodities prices in 1991}}{\text{sum of all corresponding prices in 1987}} \times \frac{100\%}{1}$$

$$\frac{20.86}{6.13} \times \frac{100}{1} = 340.29\%$$

This shows that there has been an increase in prices of food stuffs between 1987 and 1991 by 240.20%.

CPI for 1992 using 1987 as a base year

$$\begin{aligned} & \frac{P_{1992}}{P_{1987}} \times \frac{100\%}{1} \\ = & \frac{\text{sum of all commodities prices in 1992}}{\text{sum of all corresponding prices in 1987}} \times \frac{100\%}{1} \\ & \frac{31.17}{6.13} \times \frac{100}{1} = 508.48\% \end{aligned}$$

This result indicates that prices of food stuffs has increased between 1987 and 1992 by 408.48%.

CPI for 1993

$$\begin{aligned} \frac{P_{1993}}{P_{1987}} &= \frac{\text{sum of all commodities prices in 1993}}{\text{sum of all corresponding prices in 1987}} \times \frac{100\%}{1} \\ & \frac{49.04}{6.13} \times \frac{100}{1} = 800\% \end{aligned}$$

This result shows that prices of food stuffs has increased by 8.00% between 1987 and 1993.

CPI for 1994

$$\begin{aligned} \frac{P_{1994}}{P_{1987}} &= \frac{\text{sum of all commodities prices in 1994}}{\text{sum of all corresponding prices in 1987}} \times \frac{100\%}{1} \\ & \frac{61.68}{6.13} \times \frac{100}{1} = 1006.20 \end{aligned}$$

Prices of food stuffs increased by 1006.20% between 1987 and 1994.

From the results obtained shows that prices of food stuffs have been at an increasing rate from 1987 to 1994 and it is projected that it would continue unless if it is checked by Government.

FITTING A TREND LINE ON THE AVERAGE RETAIL PRICES OF  
MAIZE GRAIN FROM 1987 - 1994

<u>YEAR</u>	<u>Y</u>	<u>X</u>	<u>X<sup>2</sup></u>	<u>XY</u>	<u>TREND VALUES</u>
1987	0.46	-7	49	-3.22	0.43
1988	1.49	-5	25	-7.45	1.01
1989	1.66	-3	9	-4.98	1.59
1990	1.42	-1	1	-1.42	2.17
1991	2.23	1	1	2.23	2.75
1992	3.80	3	9	11.40	3.33
1993	4.15	5	25	20.75	3.91
1994	4.46	7	49	31.22	4.49

$$\Sigma Y = 19.67 \quad \Sigma X = 0 \quad \Sigma X^2 = 168 \quad \Sigma XY = 48.53$$

Estimating a and b we trend line equations

The procedure should be used as in the first table

$$Y = a + bx$$

$$a = \frac{\Sigma Y}{n} = \frac{19.67}{8} = 2.46$$

$$b = \frac{\Sigma XY}{\Sigma X^2} = \frac{48.53}{168} = 0.29$$

$$Y = 2.46 + 0.29X$$

The trend line equation will be

$$Y = 2.46 + 0.29X$$

To estimate the price of maize grain in 1996 will be

$$X = 11$$

$$Y = 2.46 + 0.29(11)$$

$$Y = 2.46 + 3.19$$

$$Y = 5.65$$

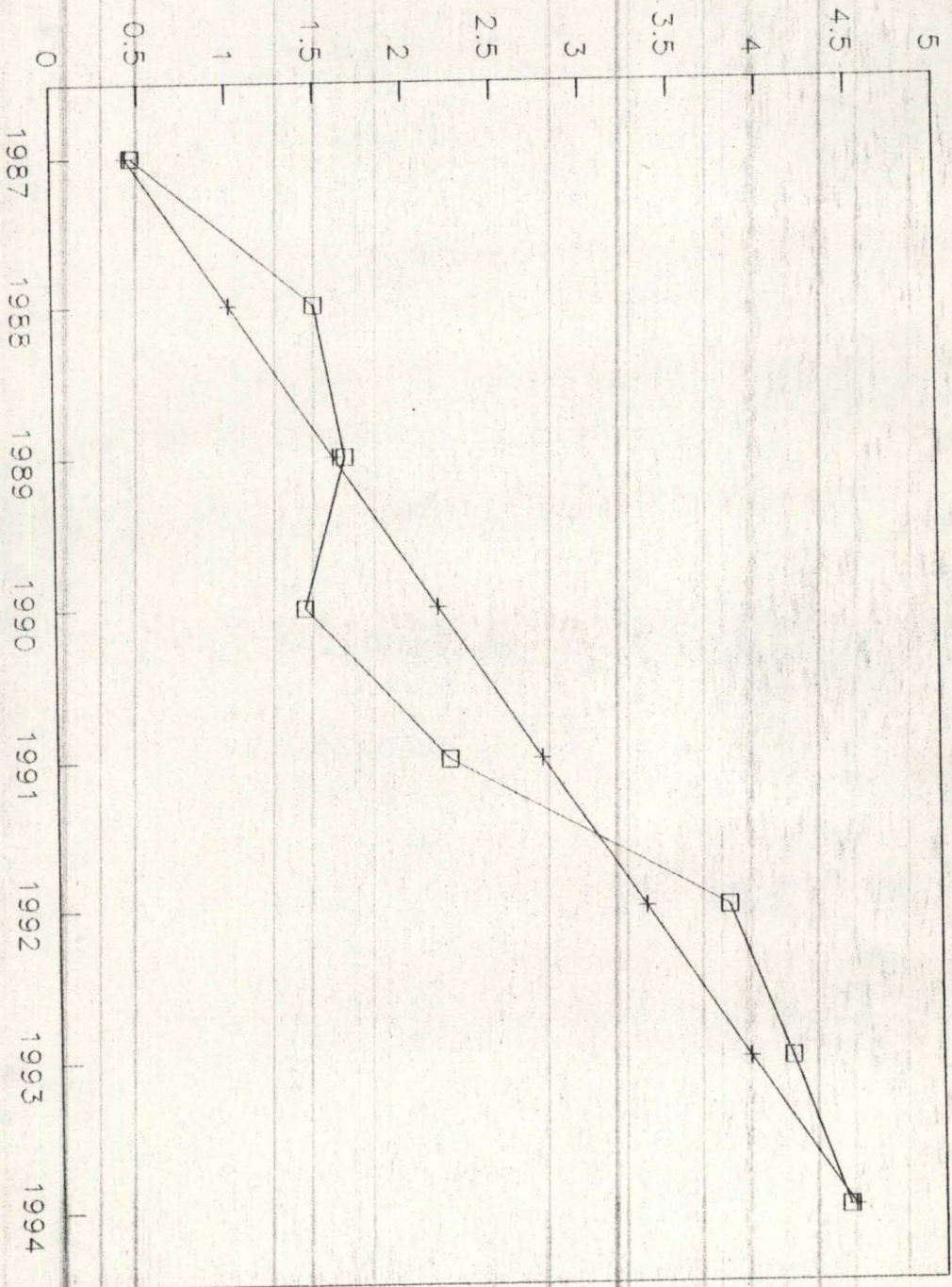
LOTUS 123



# A FITTING TREND LINE SHOWING RETAIL

PRICES OF MAIZE FROM 1987-1994

IN NAIRA/KILOGRAM



□ ORIGINAL + TREND

YEARS

Lotus 123

$$EY = na + b(0)$$

$$EY = na \quad a = E y/n$$

$$EXY = aEx + bEX^2$$

$$EXY = a(0) + bEX^2$$

$$EXY = bEX^2 \quad b = \frac{EXY}{EX^2}$$

FITTING A TREND LINE ON THE AVERAGE RETAIL PRICES OF  
MILLED RICE FROM 1987 - 1994

YEAR	NAIRA	Y	X	X <sup>2</sup>	XY	TREND VALUES
1987	1.90		-7	49	13.30	0.43
1988	3.10		-5	25	15.50	2.64
1989	5.36		-3	9	16.08	4.84
1990	5.38		-1	1	-5.38	7.04
1991	6.73		1	1	6.73	9.24
1992	10.18		3	9	30.54	11.44
1993	14.47		5	25	72.35	13.64
1994	17.97		7	49	125.75	15.84
65.09			EX = 0	EX <sup>2</sup> =168	EXY = 185.11	

The trend line equation

$$Y = a + bx$$

In estimating a and b we have

$$Y = a + bx$$

$$a = \frac{EY}{EX^2} = \frac{65.09}{8} = 8.14$$

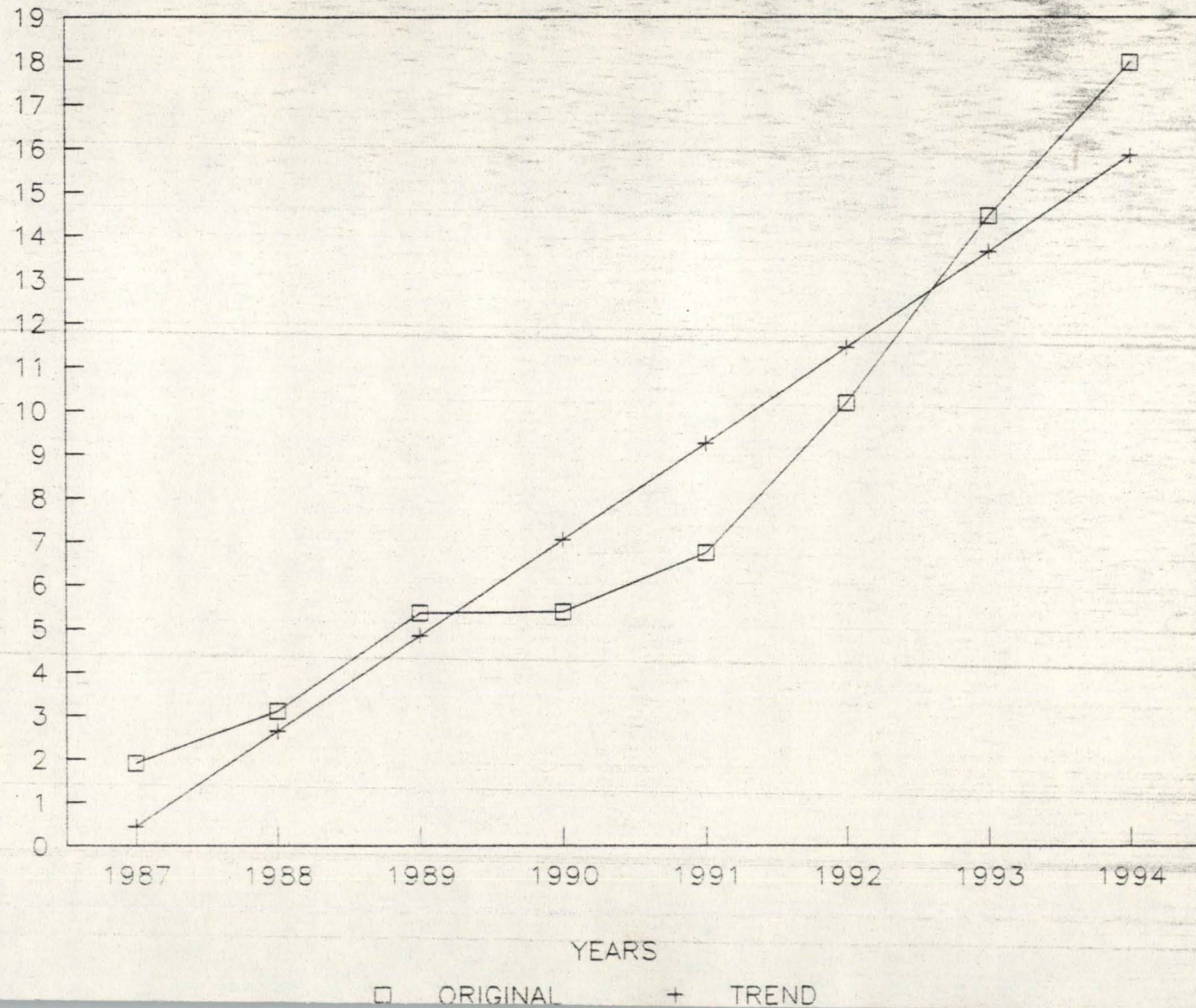
$$b = \frac{EXY}{EX^2} = \frac{185.11}{168} = 1.10$$

Lotus

# A FITTING TREND LINE OF THEE AVERAGE

RETAIL PRICES OF MILLED RICE (1987-'94)

IN NAIRA/KILOGRAM



Lotus 123

This shows that the estimated price of maize grain will be ₦5.65 per kilogram in 1996. Thus there is no likelihood that the price will fall in the next future.

FITTING A TREND LINE ON THE AVERAGE RETAIL PRICES OF SORGHUM FROM 1987 - 1994

YEAR	PRICE IN NAIRA	Y	X	X <sup>2</sup>	XY	TREND VALUES
1987	0.53		-7	49	-3.71	0.38
1988	1.66		-5	25	-8.30	1.08
1989	1.80		-3	9	-5.40	1.78
1990	1.63		-1	1	-1.63	2.48
1991	2.52		1	1	2.52	3.18
1992	4.20		3	9	12.60	3.88
1993	4.86		5	25	24.30	4.58
1994	5.46		7	49	38.22	5.28

$$EY = 22.66 \quad EX = 0 \quad EX^2 = 168 \quad EXY = 58.60$$

The trend line/value  $Y = a + bx$

$$a = \frac{EY}{n} = \frac{22.66}{8} = 2.83$$

$$b = \frac{EXY}{EX^2} = \frac{58.60}{168} = 0.35$$

The trend line equation be

$$Y = 2.83 + 0.35X$$

$$\text{In 1995 } X = 9$$

$$Y = 5.98$$

$$2.83 + 0.35(-7) =$$

$$2.83 + (-2.45)$$

$$2.83 - 2.45 = 0.38$$

$$2.83 + 0.35(-5)$$

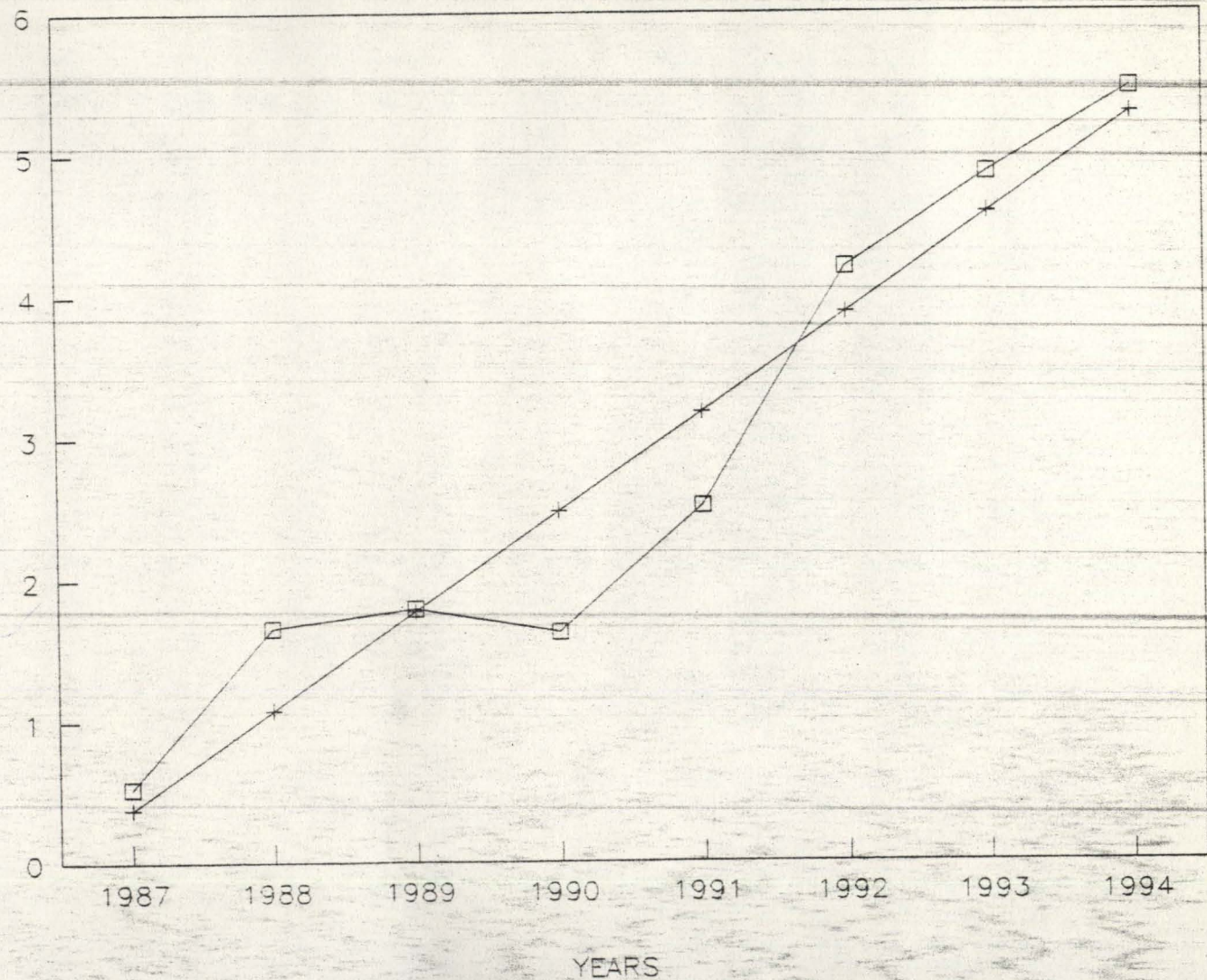
Lo tus 123

# A FITTING TREND LINE SHOWING RETAIL

PRICES OF SORGHUM FROM 1987-1994

IN NAIRA/KILOGRAM

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YEARS

ORIGINAL + TREND

CHAPTER FIVE

## 5.0

FINDINGS/CONCLUSION AND RECOMMENDATIONS

With all observations, it is clear that prices of food stuffs under study were increasing annually in Niger State.

## 5.1

FINDINGS/CONCLUSIONS

This chapter is the final and concluding part of this project work, which contains the summary, findings and recommendations.

In chapter one, a general perspective of the history of Niger State Agricultural Development Project from where some of my data were drawn was treated briefly. The organisation and management was also looked into. The scope of study and limitations were properly examined. The statistical literature was also examined so as to generate a background information about the retail market price of some consumer goods in Niger State.

In chapter two, some components of computer system were treated and their functions. How computer could be used to compile statistical prices of consumer goods. In other words, is there any need for using computer to compile prices of consumer food stuffs in Nigeria.

In chapter three is, where all the data generated were presented. The certain bar charts of some selected food stuffs were plotted.

The chapter four contain the analysis of the data presented in chapter three. The data were interpreted and inferences were made as to what would be the condition of market prices of the sampled products in Niger State. The use of time series analysis, Seasonal variations analysis, Trend equations, the index analysis,

and quarterly average etc were used to enable us to generate conditions of prices presently and time to come. With the use of all these principles we were able to discover that prices of food stuff (Maize, Yam, Guinea corn, Milled Rice etc) continued to increase at an increasing rate from 1987 to 1994. There were also different increase in price of different food stuffs in Niger State within the period of study.

Finally, the programming considered in this project would be the plotting of some data (Bar Charts) in chapter three and Trend line graph with the computer system. This would be recorded into the diskette 3.5 inch and can be retrieved any time. In this chapter we shall also make recommendations.

## 5.2 RECOMMENDATIONS/SUGGESTIONS

From the research carried out so far, we make the following recommendations to the Government of Niger State in particular and the Federal Government in general.

- (i) That the State Government should encourage farming so as to boost production of food stuffs in Niger State.
- (ii) That provision of farming facilities are very essential to agricultural production e.g storage facilities, insecticides, pesticides, fertilizer, herbicides and provision of agricultural experts to farmers so as to advise on how to use the facilities. These should be provided with both State and Federal Government. This would go along to reduce prices of food stuffs in Niger State and any part of the country.

- (iii) Loans and other incentives should be provided to farmers so as to carry out farming in an effective mood and turn out large output.
- (iv) The Government should provide good network road system so as to <sup>evacuate</sup> evaluate food stuffs from rural areas to urban areas at a cheaper rate. It has been discovered that high cost of food stuffs in Niger State is as a result of high transport cost in transporting the goods from rural areas to urban areas. In order to maintain price stability in food stuffs in Niger State the transportation system should be controlled.
- (v) Both the State and Federal Government should establish price control Board to check "shyluck" farmers who bent on exploiting individual consumers by hoarding some of the products only to sell it at exorbitant prices at the period of scarcity.
- (vi) The Federal and State Office of Statistics and Agricultural Development Project (ADP) should be equipped with modern equipment to facilitate easy collection of data in their state branches.
- (vii) Computer applications should completely be involved so as to release results before the beginning of any season to enable government know actions to follow and to arrest any abnormal situation.
- (viii) Finally the Government's present determination to establish a "Consumer Protection Council" in the country is another step towards controlling persistent increase in prices of goods. I believe that when this action is properly implemented, the standard of living of the people will be improved.



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