PRICES AND PRICE INDICES STATISTICS

1. Introduction

The significance of price statistics in the economy of any nation cannot be overemphasised. They constitute a very useful tool for policy making, economic planning, analysis and monitoring because price signals help to understand the degree of economic stability or otherwise in the system. They also expose distortions and guide decisions regarding corrections.

Every commodity produced or service rendered in an economy can be conceived of in terms of a price and quantity relation. Almost every economic transaction has a price tagt. Prices to some producers are costs to others, and in this sense the price of a commodity is a reflection of other prices.

A single commodity or service usually has more than one price at a point in time. It is, therefore, intuitively appealing to explore these sources of price differentials as a basis for collecting and studying prices. As a result, prices are usually studied in the following three forms: producers' prices; wholesale prices and retail prices. Some characteristics of these prices are discussed below.

(a) Producers' Prices

(i) Agricultural Commodities: Sources of price statistics for agricultural commodities are at two levels. Export commodity prices are determined either by Government or the market at the beginning of each crop season. There are also farm gate and secondary market

prices determined by the interplay of market forces at each market level.

(ii) Locally-Manufactured Commodities: Ex-factory prices of locally-manufactured commodities are usually available in the census of manufacturing or in the industrial survey of economic activities. In the questionnaire administered in such surveys, producers are required to supply information in respect of each manufactured good — the quantity produced, quantity sold, price and total value of sales.

(iii) Imported Commodities: Prices of imported commodities include cost, insurance and freight (c.i.f.). A substantial proportion of imported commodities pass through local manufacturers before reaching wholesalers, although many wholesalers engage directly in the import trade. In most countries, the ministry of trade/commerce or the customs and excise department are responsible for providing information on the value and volume of imported commodities.

(b) **Wholesale Prices of Manufactured Goods**

These are mostly available from major distributors. An additional source of information is the census or survey of distributive trade and services. Wholesale prices can sometimes be used to reconstruct producers' prices where the latter are not available and the wholesalers' margin is known.

(c) **Retail Prices**

In most countries, information on retail prices is usually available from retailers. Sample surveys are mounted, during which prices of selected commodities are collected at selected retail outlets. To be meaningful, such prices are weighed in indexed form. This is to ensure that the importance of each commodity to the consumer is

reflected in the computed average retail price of a group of commodities.

Surveys aimed at measuring changes in retail prices take different forms in different countries. In some countries, such surveys are titled 'Consumer Surveys'; others call them 'Cost of Living Surveys' or 'Retail Price Indices'. While they all strive to index retail prices, they usually differ in their commodity and geographical coverage. A consumer survey should be based on a stratified sample of all consumers (urban, rural, lower, middle and upper income groups) and of groups of commodities and services.

2. Coverage, Scope, Uses and Users of Prices and Price Indices Statistics

Prices and Price Indices Statistics are generated for all categories of goods in the market. These include agricultural products, household goods, transport items (including spare parts), electronics (including computers and their components), selected slaughter animals and average prices of grain and sugar.

These Statistics have a wide range of uses and users. They are used in economic planning and monitoring. They are also useful to researchers in economic development. Users include Government agencies for national economic development and international investors who want to be adequately informed about local economic conditions before taking decisions.

3. Sources and Methods of Compiling Prices and Price Indices Statistics

Data on prices in Nigeria have been available even prior to the attainment of independence in 1960. They were collected only for a few selected cities and towns in the 1960s up to the early 1970s, but have been produced and made widely available on a more systematic basis since the mid-1970s.

A large part of the data on prices and price indices are collected by the National Bureau of Statistics (NBS), while some (partly specialised and partly parallel) are also collected by the Central Bank of Nigeria (CBN).

The various sets of data dealt with in this section are:

(a) Retail prices of selected items as collected by the NBS for State capitals and by the Central Bank of Nigeria (CBN).

(b) Average livestock prices -- cattle, sheep and goats (NBS).

(c) Producer prices of selected agricultural commodities (NBS and CBN).

(d) Central Bank of Nigeria's average world prices of major agricultural commodities.

(e) Consumer Price Index (NBS).

The National Bureau of Statistics conducts surveys of retail prices of 75 selected items on a routine basis in each of the State capitals, including Abuja. The 75 items are selected from nine groups of commodities as follows: staples (12), protein (5), oils and fats (3), vegetable and fruits (7), other foods (8), drinks (5), household goods (15), transport (10) and other items (10). The prices of commodities and services are collected by trained enumerators from outlets such as stores, local shops, selected individuals and establishments providing services. Although different measures are used in the various outlets, the priced items are weighed (if solid), measured (if liquid) or otherwise counted and unit prices are quoted per unit of weight (kilogramme or gramme), measure (litre or centilitre) or in other units such as dozens or single items. In the NBS survey of retail prices, several prices (one to three per week or once a month depending on stability of item's price) are collected from several locations in each State capital, hence, unweighted arithmetic mean price (averaged over time and locations) is usually computed for each item in each State capital.

The Central Bank of Nigeria also collected prices of 75 to 90 selected commodities from 13 markets selected in the Lagos Metropolis (Mainland and Lagos Island), excluding the supermarkets.

For each commodity in the CBN survey of retail prices, simple arithmetic mean of prices from 13 markets is calculated before weights obtained from the NBS Consumer Price Index (CPI) survey are applied to derive the CBN's consumer price index.

The retail prices of selected items are published by the NBS bi-annually. (January-June and July-December). The prices are quoted for each month in Naira for standard weights and measures of units. Price quotations for all State capitals and the Federal Capital Territory, Abuja are included.

Data on livestock prices are obtained from the Farm Gate Prices Survey conducted by the NBS. During this survey, information is also collected on the stock, that is, number of livestock by sex and by kind (cattle, sheep, goats, etc.), number of births, deaths, purchases and purchase value, sales and sale value, etc. All these data are also needed and used by the National Accounts Division of ....

Until recently, the livestock prices published were collected and reported by the Livestock Department of the Federal Ministry of Agriculture. However, they were not very regular. But from its 1991 to 1992 enquiry, the NBS has been collecting this data through the above-mentioned survey.

The calculation of the average prices of livestock follows the same method as for producers' prices. The data published on livestock prices in the Annual Abstract of Statistics are averages for the year. In future, the NBS intends to publish quarterly prices. The data are processed partly manually and partly by computer, but mostly manually, and are available on hard copies. Soon, it is hoped that they will be available on diskettes.

The National Bureau of Statistics conducts the Farm Gate Prices Survey. The entire country is divided into Enumeration Areas (EAs). A rural area is defined as an area with less than 10 EAs. A semi-urban area is one with between 10 and 20 EAs. From the rural EAs in each State, 10 replicates (each consisting of 10 rural EAs) are selected with replacements and are demarcated. From these replicates, six are chosen in a year for inclusion in the survey. In the following year, one of the six replicates is dropped and is replaced by another from the 10 replicates demarcated originally. Thus sixty rural EAs are covered every year and in the course of five years, all the 100 EAs originally included in the 10 replicates would have been covered at least once. Similarly, from each State, 12 semi-urban EAs consisting of 6 replicates of two EAs each are covered every year out of a total of 10 replicates as before.

From each EA selected, a certain number of farming household is picked and monitored throughout the year. They are visited every month for collection of data on production, sales and sale value, consumption, etc. of any of the commodities that the household has produced/harvested during the month. For the estimation of yield and production, the enumerator demarcates a measured plot on the farm. At the time of harvest the enumerator is present to weigh the produce from the yield plot and calculate the yield and thus estimate the production for the farm as a whole. This also serves as an independent check on the estimate for production given by the farmer.

For each replicate of 10 EAs included in the survey for a State, the total sale value (V) of the commodity sold by all the farming households covered and the total quantity (Q) of the commodity sold by them are obtained. Thus, there is a value observation for V and a for quantity observation for Q for each of the six replicates in a State. To obtain an estimate of the price in a State, the averages of V and Q for the six replicates are calculated. The average value is then divided by the average quantity to obtain the producer price for the State,

where:

Pj   **=Estimated Producer Price of a commodity for the jth State**

    =Average Sale Value for the six replicates for the jth State

    =Average quantity sold of six replicates for the jth State.

In order to obtain an estimate for the country as a whole the sums of the values of V and Q (Vj and Qj) for the six replicates in the State are blown up using a raising factor for the State. The Raising Factor (RF) for each State is calculated as a product of two ratios.

The ratios are:

[a] **total number of households in selected EAs**
    number of households selected for the survey; and

[b] **total number of rural EAs in the state**
    number of rural EAs selected from the state

The estimates of Value and Quantity for the whole country are then calculated as **V = Σ RFj (Vj) and Q = Σ RFj (Qj)**

where RFj is the Raising Factor for the jthth state and Vj and Qj are, as defined earlier, the sums of the values of V and Q are for the six replicates.

The estimate of the producer price for the whole country is then obtained by dividing V by Q. The same method is adopted for the semi-urban sector.

Meanwhile, a number of proposals are being considered for a small modification in the design of the survey. Currently, the data published on producer prices are twelve-month averages for the year. In future, the NBS intends to publish quarterly prices.

Central Bank of Nigeria (CBN)

The CBN is another major producer of prices and price indices statistics in the country. From the list of commercial farmers who enjoy credit under the Bank's agricultural credit guarantee scheme, a ten per cent sample is chosen. The selected farmers are contacted for information on various aspects of farming of which producer prices is one. The data are collected half-yearly but the final estimates published are unweighted annual averages.

Up to 1986, the guaranteed minimum prices and producer prices were determined by the Scheduled Commodity Board and the prices were obtained from the Secretariat of the Technical Committee on Producer Prices. The data are published quarterly in the **Economic and Financial Review** and could be obtained in hard copy on request from CBN.

The **Public Ledger** and the **Financial Times**, both London dailies, are the sources of data on **Average World Prices and Price Indices of Major Agricultural Commodities**. The commodities covered are Cocoa, Coffee, Cotton, Groundnuts, Groundnut Oil, Palm Oil, Palm Kernels, Soya Beans, Ginger and Rubber. Monthly and quarterly averages of prices and price indices (with 1975 as base) are computed and published. These are calculated both in Naira (eq \O(=,N)) and US Dollar ($) per tonne. The weights for calculating the indices are based on the proportion of the export earnings for each commodity to Nigeria's GNP. Some of the prices quoted are in Pound Sterling and others in US Dollars. The former are converted to the Dollar equivalent using the official exchange rate. The data are published in the **Monthly Report**, the **Economic and Financial Review** and the **Annual Report** of the CBN.

The Consumer Price Index (CPI) measures trends in the prices paid by consumers for goods and services. It is one of the indices that are often used to measure the rate of inflation. Other price indices which can be used to measure the rate of inflation are producers' price index and the Gross Domestic Product (GDP) deflator.

As the major source of information on changes in prices paid by the consumer, the price index is an appropriate tool in the formulation of incomes policy, especially during wage negotiations and in collective bargaining. Its main defects as a measure of the rate of inflation are that its coverage of goods and services is not complete, and it cannot reflect changes in quality of consumer goods and services. Also, improved distribution methods as used by supermarkets and facilities of bulk purchasing are not usually adequately reflected by consumer price indices.

The NBS is the sole producer of Consumer Price Index [CPI] in Nigeria. The most important task in the production of a CPI is the determination of the market basket of goods and services whose current price is usually compared with its base year price to measure changes in price. The bundles of commodities and services in such a

basket are called the weights of the CPI. These weights are usually obtained from surveys of consumers' expenditure patterns. Such weights have been computed by the NBS for Nigeria for the years 1953, 1960, 1964/65, 1974/75, 1980/81 and 1985. Before 1985 the weights were computed for selected income groups resident in state capitals. With the 1975-based CPI, efforts were made to aggregate the urban and rural consumer price indices into single indices using population. Later with the 1985 - based CPI, both consumption expenditure and population were used in aggregating state and sectoral (urban and rural) to national indices.

For the 1985 survey 40 and 30 Enumeration Areas (EAs) were studied in the urban and rural areas respectively in each of the then 19 States. An urban sector is a locality containing more than 20,000 persons or 20 EAs; otherwise the locality is classified as rural. A total of 5165 and 4571 households were studied in the urban and rural sectors respectively.

A total of 265 goods and services were included in the basket of goods and services which are regularly priced for the compilation of the CPI. These are aggregated into 24 sub-groups, which are further aggregated into the following 9 major commodity groups: Food; Drinks, Tobacco and Kola; Clothing and Footwear; Accommodation, Fuel and Light; Household Goods; Medical Care and Health Expenditure; Transportation; Recreation, Entertainment; Education and Other Services.

The NBS resident field staff do the price collection and send their completed forms to the State offices from where they are forwarded to Lagos. This is currently handled by special courier service and it takes about two weeks.

The unit prices of each commodity in the market basket for two periods are formed into a price relative, that is, the current year price divided by the base year price. The price relatives are then multiplied by the corresponding weights and summed to obtain the required index number. For the CPI with 1985 as weighing and comparison base year, the Laspeyres price index formula is used and ten different types of weights are computed and used in determining eight different types of index numbers. These are:
  [i] the weights of all urban, rural and combined urban and rural sectors for each commodity group (3).
  [ii] the weights for computing State urban and rural indices.

[iii] the weights for computing country group indices (urban and rural) (2).

[iv] the weights for computing State composite (urban and rural) group indices (1).

The computation of the CPI by the NBS is computerized and with the special courier service for despatching price data, monthly indices are at present processed and published with the minimum lag.

The NBS survey discussed above is capable of generating not less than eight different types of index numbers, namely:

[i]   Country composite.*
[ii]   Country urban.*
[iii] Country rural.*
[iv]   State urban.
[v]   State rural.
[vi]   State composite.*
[vii] Country (State weighted group indices) urban.
[viii] Country (State weighted group indices) rural.

At present, the four asterisked indices appear in the NBS **Statistical News** which is published monthly and distributed free on a limited scale.

The following forms of CPI are published in the **Statistical News**:

[i]   13-month rolling indices for the most recent 13-month period on 10 groups of items and for all items in respect of the three consumer price indices: composite, urban and rural.

[ii] The combined urban and rural CPI for the two most recent months and previous year's month corresponding to the most recent month for each of the 36 States.

[iii] Measures of over-all price changes based on month-on-month, year-on-year (corresponding month) and year-on-year (12-month average) changes in the composite consumer price index for the two most recent years.

In a publication entitled **Consumer Price Index**, which has a wider circulation than the **Statistical News**, the NBS published the 1975-based group and all items indices in the form of averages of six months in each of the three most recent years and the indices of the twelve most recent months. These are published for 10 commodity groups and 5 sub-groups of food in respect of urban, rural, composite sectors and middle and lower income groups. These indices are also published for seven groups and for all items for five years including the most current 24 months in the NBS **Annual Abstract of Statistics**.

Most of these indices produced by the NBS and referred to in the last paragraph are also published by the CBN in the **Economic and Financial Review**, **Economic Report** and in the **Annual Report and**

Statement of Accounts. The annual series of prices published by the NBS in various publications include:
  [i]   producer prices of commodities.
  [ii] average livestock prices (cattle, sheep and goats).
  [iii] the Consumer Price Index.
  [iv] Retail Prices of Selected Items.
  The CBN publishes the following prices in its **Economic and Financial Review** and **Annual Report and Statement of Accounts**.
  [i]   average world prices (c.i.f) of Nigeria's agricultural commodities.
  [ii] producer prices of selected agricultural commodities.
  [iii] producer prices of selected commodities.
  [iv] average livestock prices.
  [v]   average world prices (c.i.f) of Nigeria's agricultural commodities.
  The consumer price indices computed for rural, urban and combined rural and urban areas, especially in respect of all items, are also macroeconomic indicators showing the general movement in prices of consumer goods and services. Changes in the magnitude of the all-items composite CPI have often been used as measures of the rate of inflation. As earlier observed, other plausible measures of inflation rate are the wholesale price index and the gross domestic product deflator.
  The NBS and CBN have been able to adopt sound methods to collect price data and calculate the indices. There are problems of transmitting the collected data from the field offices to the States and from the State offices to the Headquarters (which are the causes of the delay in some cases, particularly in the NBS). The NBS has also improved its method of calculation of the weights for the CPI in the new series (with 1985 as base) which are now based on consumer expenditure rather than population (which was itself an estimate).
  In the case of producer prices, the coverage of the NBS Farm Gate Prices Survey is wider than that of the CBN since the latter restricts its survey to the commercial farmers who enjoy credit under its agricultural credit guarantee scheme. These would probably be the rich farmers.
  As indicated above, the calculation of the producer price of a commodity for the State is obtained by dividing the average value per replicate by the average quantity per replicate. It can as well be obtained by dividing the total value (for the six replicates) by the total quantity since the division by 6 (the number of replicates) affects both the numerator and the denominator.

4.   Current Methods of Data Storage and Dissemination
  Currently, data storage is variable. Some of the statistics are available in hard copies, while others have been stored electronically.

The manual storage is more important in terms of the relative volume of data stored. Data transfer is also mainly in hard copies.

Some of the data received by the NBS on prices require on-line processing to satisfy many user-needs. Although some of these are already being generated by producers themselves they are in some cases not supplied in sufficiently long series.

5. NBS Data Base Coding System for Prices and Price Indices Statistics

The attempt made in coding this sector follows the International Standard Industrial Classification [ISIC], revision 3 of 1988. Thus the division code or the first two digits of the code assigned a six-code variable is taken from the ISIC. Going by this system, 'Prices and Price Indices Statistics' is given ISIC Codes '76' and '77' in the NBS data base.

The details are almost completely gender-specific in respect of obsevations on human begins. Even where numeric data are not available separately for male and female, the codes are created for each gender and the total for both genders.

While efforts have been made to ensure that the Division Code or the first two digits of the code assigned to each variable confirms as much as possible with the ISIC, the Items and Details Codes which form the last four digits of the code assigned for each variable are arbitrarily determined. The Division-Item- Details [DID] coding system is the basis for coding NBS's datasets. The item under each dataset is the elementary entity or group of elementary entities (multiple-item cases), about which statistical data are gathered. For instance, "Retail Prices of Selected Staples (per unit)" coded 7601 is an item with 12 details.

In coding the Details, six digits are used to identify a particular attribute (variable) as follows: The first two are the division code, the next two for the item and the last two as the detail (variable) under the division and the item code. Based on this coding system, the NBS data structure for Prices and Price Indices Statistics in Nigeria is as shown below:

6. CONCLUDING REMARKS

The dataset on Prices and Price Indices Statistics are obtainable from various sources, because many organisations are involved in price data gathering.

There is, therefore, a need to coordinate the activities of these agencies under the aegis of the National Bureau of Statistics (NBS) to

enable the production of reliable price data for use within and beyond the public sector.