

NATIONAL ACCOUNTS STATISTICS

1. Introduction

The Nigerian System of National Accounts (SNA) statistics is a balance sheet of the most significant economic transactions among the major participants in the economy during a reference period. The earliest known work on national income for Nigeria was carried out by John Mars, Margery Perham and A. J. Brown in the 1930s. In 1950, A.R. Prest and I.G. Stewart were appointed by the colonial office to estimate Nigeria's national income. The result of their pioneering work (which was based on actual data for the financial year 1950-51) was published in 1953. The estimates were extended to 1954 by a visiting World Bank Mission. In late 1950s to early 1960s, E. F. Jackson and P.N.C. Okigbo led a team which produced what became a benchmark for policy analysis in the first ten years of Nigeria's independence. Their estimates of national income were modified by the then Federal Office of Statistics in 1963.

The Jackson-Okigbo estimates and their modification by the FOS continued to be used for nearly one decade before a team led by Professor O. Aboyade was commissioned by the Federal Ministry of National Planning to design an integrated system of national accounts for the country. It was to correct the deficiencies of previous estimates. Their mandate included the choice of an appropriate base year and the recommendation of measures and institutional arrangements for compiling, on a continuous basis, a regular and improved System of National Accounts for Nigeria.

Their report, published in 1981, is one of the few comprehensive documents on Nigeria's SNA. It includes descriptions of the surveys conducted, some of which were in collaboration with the then FOS. Aboyade's SNA was more disaggregated than its predecessors. The petroleum sector, for instance, was for the first time singled out for a detailed study. The SNA document contained a 25 x 25 Input-Output table in which manufacturing was disaggregated into nine sub-sectors. It, therefore, contains sectoral estimates for some value-added and final demand components.

In April 1985, Professor Adamu, at the invitation of the Federal Government, revised Nigeria's SNA from 1977/78 to 1986 and made a

number of recommendations on how to improve the quality and timeliness of the series. Two World Bank consultants — Majumdar and Hodgekinson — also made a compilation of the SNA for the period 1981 to 1986.

The SNA for the period 1981 to 1993 compiled by the then FOS (now National Bureau of Statistics) benefited from the assistance referred to above. Also the sources have been enriched by the increasing use of sample survey-based estimates. In contrast to the earliest published GDP series consisting of two tables, the current SNA has 12 different tables with the GDP series covering 17 major sectors.

2. Coverage, Scope, Uses and Users of National Accounts Statistics

Areas covered under National Accounts statistics include the activities of households, companies, public corporations, Federal, State and Local Governments. The National Accounts Statistics are used for planning, research and meeting the requirements of international organisations. They also have specific policy uses which include the determination of:

- [i] the sources and causes of inflationary pressures.
- [ii] the efficiency of new and sometimes controversial policy measures.
- [iii] the patterns of Government and household consumption.
- [iv] the productivity trends and the efficiency of the utilisation of productive capacity.

3. Sources and Methods of Compiling National Accounts Statistics in Nigeria

Two types of data are usually available for compiling the SNA. These are those collected by the statistical offices through their census and survey programmes for general use; and the second type consists of statistical information which are by-products of the administrative system.

The National Bureau of Statistics (NBS) is virtually the sole source of census- and survey-based estimates used in compiling Nigeria's SNA. The surveys and censuses conducted by the NBS fall into five categories:

- [i] National Integrated Survey of Households [NISH] with eight modules,
- [ii] General Household Survey.
- [iii] Rural Agricultural Sample Survey.
- [iv] Labour Force Survey.

[v] National Integrated Survey of Establishments [NISE] incorporating Industrial Survey (IS) and the National Census of Industries and Businesses [NCIB] each of which incorporates surveys or censuses of seven activities.

Some of these inquiries are annual, while others are less frequent.

The second type of data are those that arise as a by-product of some administrative functions, that is, tax collection, regulation and control of imports and exports, banking, other industries, registration of activities, standardised accounting acts, public financing, development projects, extra-ministerial activities, etc. In Nigeria, administrative statistics which are relevant for compiling the SNA are generated by numerous agencies, including the Central Bank of Nigeria [CBN], Commercial Banks, Nigerian National Petroleum Corporation [NNPC], other parastatals such as the Power Holding Company of Nigeria (PHCN), Nigerian Coal Corporation [NCC], Nigerian Railway Corporation [NRC], Virgin Nigeria Airways, Nigerian Ports Authority [NPA], Nigerian Telecommunications Limited [NITEL], Nigerian Postal Services [NIPOST] and National Universities Commission [NUC]. Other ministries and agencies whose annual reports contain useful information for compiling the SNA include Federal Departments of Livestock, Forestry, Fisheries, Office of the Accountant-General of the Federation and Ministries of Finance.

The methodology of compiling Nigeria's SNA will be examined from three standpoints:

- [i] the use of current year estimates.
- [ii] the use of bench mark data.
- [iii] the procedure for deriving constant value estimates.

The Use of Current Year Estimates

Current year estimates used in deriving data of the SNA are those obtained from two categories of sources. The first category are sources which generate administrative or routine data annually. These include annual reports, audited accounts, Government subventions, annual returns of companies and functional and economic analyses of actual expenditure of Governments as supplied by the Accountant-General's Office. These sources have been used in deriving components of gross domestic product and estimates for Government departments and corporations. The major problems with this category of sources are delays in returns and incomplete coverage.

The second group of sources are those based on annual sample and census surveys. Such sources are modules of the NISH, that is, Annual Crop Estimation Survey, Consumer and Household Expenditure Surveys and two other establishment surveys (Annual

Survey of Petroleum Companies and Annual Construction Survey). The main problems of using these surveys are non-response, delayed and incomplete responses.

The Use of Benchmark Data

Benchmark estimates are based on data of a survey period. Since most surveys are less frequent than annual, such estimates are usually projected for subsequent periods using appropriate indicators or indices. They continue to be projected this way until another survey is conducted when the old benchmark estimates are replaced.

The reliability of the benchmark-based estimates in the SNA will in turn depend on the credibility of the surveys from which the benchmark estimates are derived and on the procedure for projecting such estimates. Costs in terms of time and resources are the main reasons for the use of benchmark estimates. Planning, execution and analysis of most surveys cannot be completed in one year. Hence, even if the resources are available the use of current survey-based estimates will render the SNA untimely. In the absence of any other reliable estimates in compiling the current estimates of the SNA, benchmark estimates are used in respect of a few sectors and sub-sectors.

The following assumptions informed the benchmark estimates used for the current set of national accounts. The annual growth rate of 15 per cent in the consumption of fertiliser and pesticides (assumed for the period after 1988 and used in computing estimates of value-added in the crop sub-sector) was applied to estimates obtained from the Rural Agricultural Sample Survey conducted for the period 1983/84 to 1985/86.

In the livestock sub-sector, estimates such as the following, have the features of benchmark although they are based on once-and-for-all estimates which are assumed to be constant over the years:

[i] the weight of meat recovered from each type of slaughtered animal (cow, goat, sheep, pig).

[ii] cattle population, milk and egg yield per cow, and layer respectively, proportion of cattle population yielding milk.

[iii] the weight of hides and skins recoverable from each slaughtered animal (cattle, goat, sheep).

The benchmark for cost structures in the utilities sub-sector (electricity and water production and distribution) was developed from audited accounts. The time-lag in the preparation of such accounts is the major rationale for use of benchmark estimates.

In the rail transport sub-sector of the transport sector, the 1984 figures of passengers carried and freight hauled were used as benchmark and projected for the subsequent years.

In wholesale and retail trade, estimates of gross margin and of intermediate costs each as a proportion of sales were obtained from distribution survey conducted by the NBS for some years and projected for subsequent years in estimating operating surplus and value-added.

Annual consumption expenditure on housing was based on benchmark estimates obtained from the National Integrated Survey of Households for 1980/81 and 1985/86. Estimates of percentage of household expenditure on accommodation was isolated from the proportion of household expenditure on accommodation, fuel and light.

As shown above, in compiling Nigeria's current SNA, benchmark data were in some cases projected to obtain recent year estimates. Also as in the case of cost structure of utilities, cost components as proportions of gross output in benchmark year were used in estimating recent year cost components.

The small number of estimates based on benchmark figures indicate that contrary to expectation, most of the surveys and censuses are not relevant for the compilation of the SNA. The implication is that the National Accounts Division has not been playing the role of an apex division in the NBS by being in the forefront in the use of surveys and hence in the evaluation of the quality of such surveys.

Procedures for Deriving Estimates at Constant Values

The use of value as a dimension for the components of the gross domestic product is inevitable because of the aggregation problem. The GDP is the basic measure of the output arising from economic activities. Economic activities included in the compilation of the SNA are market activities, non-market activities of Government and private non-profit institutions and non-market activities resulting in outputs whose values can be imputed from those of parallel market activities.

Since the results of these activities measured in physical outputs, either as costs or expenditure, can only be aggregated in value terms, there is the need to isolate the effect of inter-temporal variation in prices, that is, to define GDP in real terms. Four procedures can be used in obtaining GDP at constant prices. These are:

- [i] revaluation of current period quantities or estimated quantities at base period estimated average values.
- [ii] projection of base period values or estimated base period values with appropriate volume or value indices.
- [iii] deflation of nominal or estimated nominal values with appropriate price indices.
- [iv] double deflation.

Each of these procedures is based on the principle of index number since real output is usually defined with reference to a particular base period. The first procedure involves the revaluation of quantities observed or estimated for each period with average base period values. The second procedure is based on the principle of quantity index numbers incorporating weighted average of quantity relatives. The last two procedures involve the use of weighted average of price relatives. Base period weights are typically used in this connection.

The use of double deflation arises in the process of obtaining real GDP in sectors where gross output and intermediate inputs have to be deflated separately before Value-Added or GDP is derived. This is often used in respect of the agricultural sector where there is considerable periodical variation in the relationship of net output to input as a result of changes in weather conditions such that changes in input may not correspond to identical changes in output. The method of double deflation is also suitable for this sector because sufficient detailed information should be available for the exercise.

In addition to providing estimates of GDP free from inflationary effects, GDP at constant and nominal prices provide a measure of overall price changes in the various sectors through the implicit price deflator.

The computation of the latest version of the SNA by the NBS is partially computerized. Thus, while the estimates obtained from surveys, censuses and administrative statistics are computed separately, the production of the 21 tables is computerised. The entries in the tables are, therefore, internally consistent with accurate totals. The tables are also mutually consistent so that gross output, intermediate consumption and Value-Added have appropriate exact relationships. For examples:

$$\mathbf{GO} = \mathbf{IC} + \mathbf{VA}$$

$$\mathbf{VACFC} = \mathbf{CoE} + \mathbf{CoFC} + \mathbf{OS}$$

$$\mathbf{VACMP} = \mathbf{VACFC} + \mathbf{IT} - \mathbf{S}$$

where:

GO = **Gross Output**

IC = **Intermediate Consumption**

VA = **Value-Added at Market Prices**

VACFC = **Value-Added at Current Factor Cost**

CoE = **Compensation of Employees**

CoFC = **Consumption of Fixed Capital**

OS = **Operating Surplus**

VACMP = **Value-Added at Current Market Prices**

IT = **Indirect Taxes**

S = **Subsidies**

The ideal situation is the complete computerization of all the stages in the production of the SNA. This will be the case when files of survey and other routine data on which the computation of the SNA is based can be accessed directly by programmes designed for generating the relevant tables.

Macro Indicators Produced

The latest version of Nigeria's SNA has 12 tables which can be grouped into seven categories as follows:

- [i] Gross Output by Sectors.
- [ii] Intermediate Consumption by Sectors.
- [iii] Value-Added Components.
- [iv] Expenditure on GDP, National Income and its Appropriation
- [v] Capital Finance
- [vi] External Transactions
- [vii] Gross Fixed Capital Formation

The most recent version of Nigeria's SNA was published in 1991 by the then FOS in two volumes containing the tables and notes on sources and methods respectively. All previous editions were in single volumes (two including and three excluding notes on sources and methods).

The current publication on sources and methods and tables of Nigeria's national accounts are titled **National Accounts of Nigeria: Sources and Methods** and **National Accounts of Nigeria: 1981-1990** respectively. The publication contains 21 tables, 2 of which are on gross domestic product and cost components. These contain time series data on 17 sectors, 24 subsectors, one subtotal for sectors 1 to 16 and a grand total. Ten of the tables are on expenditure on gdp, national income and its appropriation, capital finance, external transactions and gross fixed capital formation.

The six time-series of the SNA published by the then FOS and which are considered in this report are:

- [i] Gross Domestic Product of Nigeria 1958/59-1966/67
- [ii] Gross Domestic Product of Nigeria 1962/63-1973/74
- [iii] National Accounts of Nigeria 1973/74-1977/78
- [iv] Nigerian Gross Domestic Product and Allied Macro Aggregates 1973/74-1981
- [v] Gross Domestic Product, Sources and Methods 1981 - 1987
- [vi] National Accounts of Nigeria 1981-1990

These series are the results of different efforts made to compile Nigeria's SNA. They contain some similarities and differences. Before describing the SNA component of NBS's database it is worthwhile to compare these six series so that users of NBS's historic time series of Nigeria's national accounts statistics will be informed of their merits and limitations.

The six series of Nigeria's System of National Accounts are compared using the following criteria:

- [i] year of publication.
- [ii] period covered.
- [iii] content.
- [iv] number of major sectors.
- [v] period of overlapping with the subsequent series.
- [vi] base year used for computing estimates at constant prices.
- [vii] consistency with immediately preceding series.

TABLE 1: A COMPARISON OF SIX SERIES OF NIGERIA'S SYSTEM OF NATIONAL ACCOUNTS (SNA)

Series	Date of Base Year	Period Covered of Pub.	Content [No. of Tables]	No. of Major Sectors	Period of Ov'lapping
1	Aug. 1968	1958/59-1966/67	8	11	1962/63-1966/67
					(1 and 2) 5 Years
2	Oct. 1974	1962/63-1973/74	4	11	1973/74
					(2 and 3) 1 Year
3	April 1980	1973/74-1977/78	16	17	1973/74-1977/78
					(3 and 4) 5 years
4	April 1982	1973/74-1981	7	17	1981
					(4 and 5) 1 Year
5	Not stated	1981-1987	14	17	1981-1987
					(5 and 6) 6 Years
6	Nov. 1991	1981 - 1990	12	17	1981 - 1987 1984
					(5 and 6) 6 Years

Source: Six Series of Nigeria's SNA published by FOS (1968-1991)

The entries in Table 1 show that:

- [i] the series are published with a lag of approximately one year.

[ii] the content of the series improved in terms of the number of tables covered by the first few series and stabilised for the last two series. Series 3 is the richest in coverage.

[iii] the base period for computing the series is changed after about ten years, the only exception is series 4 which has two base years.

[iv] the series overlap by a range of one to six years.

The most elaborate is series 3 which, in addition to the usual GDP tables, also contains useful detailed information on:

[i] value-added in manufacturing.

[ii] Government final consumption by composition and purpose.

[iii] income and outlay of Government.

Apart from the broad comparison of the six series of Nigeria's SNA produced by the then FOS, it is of interest to examine the consistency of the series during the periods in which they overlap as well as the changes which have taken place in the sources and methods. This exercise will not only be a useful indicator of the reliability of a single series computable from the six series, but will also inform researchers and planners of the limitations of previous studies and forecasts based on any of these series of the SNA.

Series 4 published in April 1982 contains almost identical estimates with series 3 published in April 1980 during the overlapping period. Series 2 and 3 as well as series 4 and 5 which overlap by one period each i.e 1973/74 and 1981 respectively are the worst in terms of consistency. Since the estimates for series 2 and 4 were provisional for the periods 1973/74 and 1981 respectively these discrepancies only show that there was no reliable basis for making such estimates. The discrepancies between 5 and 6, especially in some sectors (crude petroleum, large scale manufacturing, distribution, rail transport and building and construction) suggest that series 5 was replaced by series 6 more so because the entire period covered by the former is contained in the latter. Except in the case of crude petroleum most of the discrepancies cannot be precisely explained as the following observations in respect of some sectors show:

In the Crude Petroleum sector, the notes on sources and methods in series 5 show that estimates were based on actual data on production, prices, and operating costs obtained from oil companies for all the years. Some cognisance is taken of natural gas. In series 6 the estimates were based on annual survey of establishments involved in crude petroleum production supplemented by data from the Nigerian National Petroleum Corporation. Thus changes in sources and methods revealed that series 5 estimates of gdp for this sector were biased upwards for the period 1981-1985.

The notes on sources and methods for **large-scale manufacturing, distribution, rail transport and building and construction** are

identical in series 5 and 6 and yet the estimates published for most of the overlapping period are remarkably different.

Several reasons are plausible for the observed discrepancies between the series during the overlapping period: These include:

- [i] replacement of provisional estimates by firmer estimates.
- [ii] improved response situation in respect of a survey-based estimates after the earlier series was published.
- [iii] better sources of data, and/or improved methods of estimation found for the more recent series.
- [iv] correction of mistakes committed in previous series.

With the exception of the first reason which is usually stated, for most sectors covered by series 5 and 6 and in respect of which overlapping periods differ remarkably, the notes published on sources and methods are virtually identical. The user of an earlier series, say 5, is not informed on the source(s) of the discrepancies with a subsequent series, such as 6.

4. Current Methods of Data Storage and Dissemination

The National Bureau of Statistics (NBS) is in the process of installing modern electronic data processing facilities to enable it computerise the production and storage of National Accounts Statistics.

The following are the twelve major titles for the 20 items (or tables) which have been coded and included in the SOR. They form the basis for the NBS's acquisition of numeric data on the 17 major sectors and 26 sub-sectors of the Nigerian economy.

- [i] Gross Output by Sectors.
- [ii] Intermediate Consumption by Sectors.
- [iii] Value-Added Components.
- [iv] Compensation of Employees.
- [v] Depreciation.
- [vi] Operating Surplus.
- [vii] Indirect Taxes.
- [viii] Subsidies.
- [ix] Expenditure on GDP, National Income and its Appropriation.
- [x] Capital Finance.
- [xi] External Transactions.
- [xii] Gross Fixed Capital Formation.

The series of the SNA contain estimates at constant factor cost of 1962, 1973 and 1984. They overlap and, in theory, should be possible to construct a single series of real value-added with one of the three years as base year.

5. NBS Data Base Coding System for National Accounts Statistics

The Data Base coding system for National Accounts statistics show the structure of data as contained in NBS's TSDB. The coding of 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 which identified the division to which the data set belongs, is wherever feasible taken from the ISIC. Going by this system, 'National Accounts' is given the ISIC divisional code of '78'.

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, "Gross Output by Sectors At Current Producer Prices (Factor Cost)" coded 7801 is an item with 43 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 (Statement of Requirements) for National Accounts Statistics in Nigeria is as shown below:

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6. CONCLUDING REMARKS

Nigeria's System of National Accounts has evolved in the last four decades from a simple system of two tables on GDP at current and constant factor costs to a structure consisting of 12 tables with sectoral decomposition of cost components of Value-Added by all kinds economic activities in addition to current and real GDP series as well as capital finance, capital formation and external transactions. If the scope and coverage increased consistently from series 3 published in 1980, Nigeria's SNA will by now incorporate a detailed commodity

flow system and other data items needed for compiling commodity balance sheets.

The documentation of the series has not improved during the period. In fact the documentation of first series published in 1968 contains very useful information which are not repeated in the documentation of subsequent series. It includes assessment of the reliability of the estimates and sector by sector comparisons of the sources and methods used with the previous series produced by Jackson and Okigbo. Comments on reliability of sectoral estimates will be useful absolutely and also relatively because some sectoral estimates are linked; for example small scale manufacturing Value-Added was assumed to be 30% of Value-Added in large scale manufacturing, for Value-Added in building and construction, the implicit deflator obtained from producer of Government services was used in series 6 to convert current Value-Added to constant series.

As already observed in the comparison of the six series, the sources of inconsistencies in the estimates obtained from overlapping series are not documented in most cases. Series 5 and 6 which overlap for six years are inconsistent for most sectors; yet, both are accompanied by virtually identical notes on sources and methods.

Compiling the SNA for the sectors covering activities of such agencies as the Nigerian Coal Corporation, Power Holding Company of Nigeria and Nigerian Railways Corporation has become increasingly challenging due to the untimeliness and declining quality of the annual reports of most of these bodies.