A Statistical Survey of Productivity, Monetary and Financial Indicators in Nigeria

Omolora O. Akanji (Mrs)[*]

I.   Introduction

In the last 3 years, we have had prolonged spell of economic uncertainty, which coupled with the development of public and private policies are aimed at cultivating a competitive local, regional and international environment, and have significantly augmented the demand for a more valid and comprehensive set of economic indicators. In this regard, the measurement of changes in the productivity, monetary and financial indices must be viewed as critical addition to the current range of consistently available statistics on Nigeria's economy for analysts to take rational decisions about the economic fundamentals in Nigeria.

However, over the decade, productivity and economic growth measurement had preoccupied the global statistical expert communities' work. This work has included both efforts to improve the measurement of productivity and the inter-relationship of the macroeconomic statistics with the productivity and growth indicators as shown in the System of National Accounts (SNA) 1993 and the OECD productivity manual 2001, which set a more in-depth understanding of the drivers of productivity performance. In the same vein, the IMF in collaboration with the statistical country experts developed Monetary and Financial Statistics Manual (MFSM2000) and the Balance of Payments Manual (BOPM 2000). In the course of the preparation of these manuals, the understanding and the concerns were that statistics across nations must conform to the test of comparability and consistency.

Productivity, monetary and financial indicators will provide policymakers, local business establishments and international investors the means to adequately detect and eliminate inefficiencies within the production process, price level changes, monetary aggregates, investment instruments and financial stability indicators that can eventually lead to lower real costs and greater competitiveness.

Within the Nigerian Statistical Systems, the development of productivity indicators is statistically handled by the National Bureau of Statistics (NBS) while the monetary and financial indicators are within the purview of the Central Bank of

---

[*] Mrs. Akanji is the Consultant (Statistics), Central Bank of Nigeria. The views expressed in this paper are those of the author and do not necessarily represent the views of the CBN or its policies.

Nigeria (CBN). The development of these indicators open up new opportunities to satisfy the need for critical information needed to achieve the national developmental goals. At the national level, the NBS is the main institution mandated by law to:

- Collaborate with departments of Government and with local authorities in the collection, compilation, analysis and publication of statistical records, and

- Organize a co-ordinated scheme of social and economic statistics relating to the Nigerian economy.

However, the intensive development of statistics covering financial institutions has always been within the process of the CBN. This is attributable to two main factors. First, monetary aggregates have been gaining increasing prominence, both in economic theory and in the framing of economic policies and determination of financial sector stability. The rate of increase in money has become an important economic indicator, for which countries often set a target and to which the public also attaches considerable interest. Second, statistics covering monetary as well as other financial institutions are increasingly being used as a basis for a system of flow-of-funds accounts, which trace the flow of financial resources through the economy. It is also used for analytics of the financial markets.

Therefore, the NBS and the Statistics Department of the CBN naturally work in collaboration on various projects such as computations on productivity indicators- Quarterly Gross Domestic Product, and other relevant production indicators. In addition, NBS in order to address the sub-sector of the SNA called "other monetary institutions" do have recourse to the CBN monetary statistics. This is defined to include all banks, except the central bank, that have liabilities in the form of deposits payable on demand and transferable by cheques or otherwise usable in making deposits. Consequently, the NBS obtains data on deposit money banks to use as a proxy to the SNA grouping of "other monetary institutions". Another set of data in demand by the NBS include numbers on the Balance of Payments to facilitate the preparation of the 'rest of the world account'.

This paper is structured into three sections. Section 1 is the introduction. Section 2 discusses the methodological and conceptual issues guiding the preparation of productivity, monetary and financial indicators. Section 3 highlights the challenges and proffers recommendations on the way forward.

II.   Methodological and Conceptual Issues

II.1   Statistical Survey of Productivity Indicator

Productivity is commonly defined as the ratio of a volume measure of output to a volume measure of inputs. It measures how efficiently inputs are being used in the economy to produce output. Krugman (1992) defined productivity indicator as the ratio of output to input per worker. He explained that it is the common indicator that a country uses to determine the ability to improve its standard of living over time as it depends almost entirely on the country's ability to raise its output per worker. In order to address more analytical questions, different measures of productivity are required. In this section, we survey the methodological and conceptual issues of productivity indicator.

To understand the basic principles for measuring productivity, we must understand the overriding consideration in the measurement of the domestic product. The best method is the use of value-added of input to output per labour. This is to avoid duplication by deducting from the output of each producing unit (e.g., an enterprise) the value of the inputs of goods and services which it has received from other producing units, at home or abroad. The output of a resident enterprise which is used as input by another resident enterprise should be counted twice. The value of the output of an enterprise or other producing unit less the value of its input is referred to as value-added. The total value-added in all resident producing units is gross domestic product while the unit of input per unit of output per unit worker gives the productivity indicator.

In calculating the value-added for the country as a whole, the production accounts of all resident producing units are consolidated. In the process, all output produced locally that is used at a later stage of production within the country, say, raw materials and intermediary products, cancel against the deductions made for input in the production units using it for further production. Thus, only imports of goods and services are deducted from the final output of the economy (see Appendix 1 for the methodology of computing value-added).

The NBS computes labour productivity by using value-added approach. This is greatly influenced by the availability of establishment survey and the relative simplicity of the calculations involved. For instance, for total economy, labour productivity in local currency is easily measured by dividing the gross domestic product at constant 1990 prices by the total number of persons employed in the economy. For manufacturing, the calculation is done using the total manufacturing value-added and the total number of persons employed in manufacturing. However, the OECD Productivity Manual points out that this

particular type of productivity measurement "only partially reflects the productivity of labour in terms of the personal capacities of workers or the intensity of their effort" and is influenced by the degree of capitalisation and the dynamics of other technological and organizational factors. In addition, since this indicator of productivity is measured residually, additional factors, including the conceptual and practical difficulties associated with the measurement of value-added, would have influenced any observed changes in productivity.

Establishment Survey conducted by NBS presents a proxy for unit labour cost which is defined by the quotient obtained by dividing total labour cost by the gross domestic product. It is pertinent to note that in the establishment survey the United Nations International Standard Industrial Classification (ISIC) is used to classify the industrial activities observed by all the surveys relevant to the computation of the productivity indicators. All local economic activities are defined, without deviation, by applying the codes of the ISIC. Therefore, there is little need for reconciliation of differences in the use of the industrial classification by the NBS.

II.1.1   Analytical Reasons for Computing Productivity Indicator
Productivity indicator being derived from the National Account compilation is used to measure standard of living and many other economic growth measures as follows:

- Productivity indicator is used in the analysis of labour and product market

- Productivity growth indicator is a key source of economic growth and competitiveness and as such form a basic statistics for many international comparisons and country assessments.

- Productivity change constitutes an important element in modelling the productive capacity of any economy. This permits computation of capacity utilisation measures so as to gauge the position of the economy in the business cycle and to forecast economic growth.

- Productivity indicator measures the degree to which an economy's capacity is used and this informs analysts about the pressure from economic demand and, thereby, the risk of inflationary development.

II.2   Statistical Survey of Monetary Indicators
Monetary aggregates have become important as intermediate target for macroeconomic policy in many countries in recent years. Although some

countries have moved away from specific monetary targeting, monetary aggregates still constitute important indicators and instrument of policy. This section examines the monetary concepts and definitions in an effort to establish the necessary indicators.

There are two main strands of monetary statistics that emphasize the concept of money in macroeconomic policy. One is based on the use of analytical models (money market models) to measure the relationship between quantity of money and nominal income or gross national product (GNP). This concept tends to emphasize the importance of controlling money supply in the interest of maintaining price stability. Consequently, the statistics emphasized here is the targeting of the growth rate of money stock. The second concept is the extension of the monetary approach to the analysis of balance of payments problems, and this concept is referred to as the "monetary approach to the balance of payments". This concept underlies the IMF's financial programming framework.

These two concepts drive the computation of the monetary indicators. Money is defined in terms of the banking sector, and it is linked by the balance-sheet identity to the asset base of the banking system, explained in large measure by the balance of payments and domestic credit (the latter with particular emphasis on government operations in relation to the banking system).

The characteristics of money based on transactional motives is computed as narrow money (M1) - encompasses currency plus chequeable demand deposit at commercial banks; while the broad money (M2) – encompasses currency plus chequeable demand deposit, time deposit at commercial banks, and savings and loan association. The narrow money is used in the analytical work and it throws light on the scope and impact of monetary policy. Broader monetary aggregates encompass a wider use of financial instruments than M1. The broad money indicator encompasses various subsets of liabilities of banking and nonbank financial institutions. The construction of broader aggregates is supportive of money and liquidity measures.

The monetary indicators or monetary aggregates include a wide variety of instrument such as currency; demand deposits (both chequeable and non-chequaeable); call deposits; time, savings, and fixed deposits; foreign-currency deposits; repurchase agreements; bills; certificates of deposit; bonds; other commercial papers, restricted deposits; and savings deposit schemes. In Nigeria, most of these instruments are not available and so only the bonds, other commercial papers, restricted deposits and the contractual savings are included

in the broader money measure. Before 2000, the foreign-currency deposits were not often identified and included in the money measures. Now, the foreign-currency deposits of the demand, time and savings types are included in money measures.

In the discussion of monetary indicator, the issuance of the monetary instruments must be identified. In Nigeria, there are four monetary institutions that issue monetary instruments and these are – the CBN, commercial banks, the treasury or the government (through debt management office), other financial institutions.

The consolidation of the central bank and the deposit money bank brings out the monetary aggregates which are the indicators of monetary measurement. The money measure M1- generally designated as narrow money- is based on the narrowest level of consolidation, usually comprising currency and demand deposits held with the banking system primarily by the private, public enterprise, and general government sectors. The measure M2- the broadest level of money includes instruments included in M1, as well as time, savings, fixed, and foreign-currency deposits held with the banking system by the private, public, and non-bank financial institutions sectors. (see Appendix 2 for the methodology of computing monetary aggregates).

II.2.1   Analytical Reasons for Computing Monetary Aggregates

Among macroeconomic accounts, monetary statistics have two special merits: they become available with a very short delay, and they are the most reliable of all macroeconomic statistics. They are based on the balance sheets and are usually published in that form, but they are often analysed in terms of changes in assets and liabilities from one period to the next, or in terms of flows. They are applied to measure the following monetary developments:

- Narrow money (M1) measures the demand for money and helps in the forecast of demand for money

- Broad money (M2) measures the demand for money and the liquidity in the system.

- Currency in circulation measures the level of liability of the central bank in terms of the money issuance

- Demand deposit measures the liability of the central bank in terms of the commercial banks deposits with the central bank as banker to the banks

- Reserve money is the currency in circulation and DMBs demand deposits with the central bank and measure central bank's liability to the economy

- Net credit to the government measures the fiscal operations of the government in relation to the banking system

- Net foreign assets/foreign liabilities are used to define a balance of payments objective in financial programming. Changes are viewed as the outcome of the change in broad money (sources) and domestic credit expansion (uses), with due allowance for movements in the other items, including the residual.

- Domestic credit expansion is the main monetary policy instrument used to reconcile the monetary targets with the balance of payments objective.

II.3   Statistical Survey of the Financial Indicators

Financial institutions are defined in both the SNA and the MFSM as "incorporated and unincorporated enterprises, which are primarily engaged in financial transactions in the market consisting of both incurring liabilities and acquiring financial assets." There is, therefore, the need to distinguish financial activities recorded in the financial sector from related services provided by institutions that do not, or do not on a major scale, incur liabilities and acquire financial assets. Some of these services may have a close relation to the activities of deposit money banks, whereas others relate more closely to those of other financial institutions or those of both of these sub-sectors of the financial sector. These services include those provided by securities brokers, dealers, and finance houses, mortgage houses that are included in the financial sector only if they incur liabilities and acquire financial assets on their own account. If their activities do not meet this criterion, they would be attributed to non-financial sectors.

With this definition, the financial indicators are established to measure the financial market developments. As mentioned, most of the financial indicators are derived from the monetary developments in both the deposit money banks and the central bank. The indicators also run through both the domestic and foreign market operations.

In collecting statistics from financial institutions, it is highly important that financial assets and liabilities be classified by the sector of the debtor and creditor. This

classification helps one to obtain information on the financial transaction of the non-financial sectors as well as check the consistency of the statistical reports of the financial institutions.

The financial indicators are basically driven by the type of the financial instruments and calculate the "moneyness" of the instrument through the use of interest rates or the yield on the instruments. Non-monetary intermediate targets used in monetary policy include credit, prices, exchange rates and interest rates. The paths of many of these indicators (variables) may be influenced by the stance of monetary policy. This fact brings up the issue of the independence of these targets compared with monetary targets. The choice between money and credit targets is largely an empirical issue, depending on factors such as the exchange rate regime, the openness of the economy, and the ability of the authorities to monitor and control all potential sources of credit to the economy (it is possible for domestic prices to be affected not only by exchange rate adjustments but also by changes in reserve money).

Financial market indicators are high frequency statistics as they are available on real time, hourly, daily, and monthly basis and as at when the analyst demands. Financial market indicators are useful when trending is applied to the statistics from the market. The indicators are derived from the central bank balance sheet and government position; domestic operations, market prices and volumes (domestic and foreign exchange markets) (see Appendix 3 for the methodology of compiling financial sector indicator).

II.3.1   Analytical Reasons for Computing Financial Indicators

The changing financial environment has caused a shift in the demand for money and the rapid pace of financial innovations in many countries have contributed to the increased adaptation of instruments and institutions in financial markets. These developments have contributed to the perception that monetary policy effects are now channeled more through interest rate and exchange rate adjustments than through the quantity of credit or money, leading to a search for new targets for monetary policy, including the use of broader monetary aggregates and non-monetary targets such as credit targets, interest rates, and exchange rates. Consequently, the financial indicators are used to measure the financial market performance as it relates to:

- High nominal interest rates as it relates to holding cash and non-interest bearing deposits whose yields are limited by law;

- Exchange rate differential as it relates to investment in foreign or local instruments;

- ˙Exchange rate risk in the international trade;

- Credit risk in both the domestic and international transactions;

- Government bonds and the interest rate risks;

- The performance of the public debt instruments in terms of volume and value;

- Trends in the trade (foreign exchange market, stock market, futures market; commodity market, etc) to help obtain trend line analysis; and

- To determine "psychological" price levels to support or resist the market.

III.   Challenges of Computing Indicators and the Way Forward.

The System of National Accounts (SNA) 1993 was structured to contain consistent and integrated set of macroeconomic accounts that covers all sectors and sub-sectors of the economy and the economic relationships of an economy with the rest of the world. This comprehensive accounting framework forms the bedrock of the indicators so described above. It facilitates a whole range of analysis covering production (productivity), income distribution, financial sector and monetary aggregates. Because of the integral links between the 1993 SNA productivity and income accounts and the monetary and financial statistics with respect to principles and concepts, the challenges of their computation are very generic.

However, individual sector compilation has its own challenges which are discussed in this section along the three dimensions of the indicators described above- (i) Productivity, (ii) Monetary and (iii) Financial.

III.1   Productivity Indicator Challenges.

(1)   **Data Challenges**: the choice of data is a challenge in the computation of productivity indicators. Productivity measures rely heavily on the integration of measures of output and input, creating problems of data choices and linkages. For example, the combination of employment, hours worked and GDP. This is evidenced in the computation of labour productivity growth in the business sector. Business sector output is defined as economy-wide GDP less government wage bill, less net direct taxes

and government consumption of fixed capital. The use of a table of discrete output and input combinations do facilitate the efforts of the compilers.

(2)   **Data Inconsistency**: Productivity is poorly measured in the public sector where accountability of the timing of work done is not taken serious; consequently, it is a sector not included in the measurement. Beffy, *et al* (2006) advocated for total economy basis as an ideal method of measuring productivity.

(3)   **Constraint of Data Availability**: The NBS use of establishment survey has a lot of constraints of data availability. This is because of poor record-keeping and inconsistency of accounting methods in the establishments. Also, non-availability of an appropriate series of data on employment, labour costs payments and other missing data values constitute enormous challenges to the computation of productivity indicator.

(4)   **Developmental and other Challenges:** Computing productivity indicators is not an institutionalized activity within the National Bureau of Statistics. Although data from the database for establishment survey are used, however, the productivity tables are not produced on a regular basis. There is the need for the NBS to have consistent presentation of productivity statistics.

III.2   Monetary Indicator Challenges.

It has been mentioned that the most reliable of all macroeconomic statistics is the monetary statistics which are readily available. They are based on balance sheet but analysed in terms of the changes in assets and liabilities from one period to the next, or in terms of flows. The challenges come in the efforts at getting the transactional report into the assets and liabilities **classification**, and to get the monetary aggregates reflect the actual development in the market. Most of the challenges are in the area of **aggregation, consolidation and netting.**

The challenge of **aggregation of data** across the institutional units within a sector or sub-sector is very pronounced, more so where the aggregation is done semi-manually. The challenge of **consolidation** has been a source of concern. Consolidation refers to the elimination of stocks and flows that occur between institutional units. In consolidation, compilers do get confused about the stock and flow concept. And so you get a situation of double-counting where an institutional unit consisting of a headquarter and branch offices should have

reported stock and flow data consolidated across all offices of the institutional unit, but rather submit stock and flow data for all the branches except the headquarter. Again, sectoral consolidation also poses challenges. For sectors and sub-sectors, flows between constituent units should not be consolidated. This should be based on aggregation rather than consolidation. However, for analytical purposes, the data in the sectoral balance sheets are consolidated to obtain the surveys of the financial corporation sub-sectors.

The challenge of **netting** has been a long standing issue even as we discuss. The general principle as it relates to the 1993 SNA is that data should be collected and compiled on a gross basis. For example, deposit transactions in a particular category should be defined as the amount of new deposits less withdrawals during the period. In exceptional circumstances, it may be necessary to compile and present data on a net basis, simply because the data are not available on a gross basis.

III.3   Financial Sector Indicator Challenges
The financial sector indicator encompasses both monetary indicators and financial stocks and flows among all sectors of the economy and between these sectors and the rest of the world. Consequently, the challenges encountered in the compilation are similar but not the same with the monetary sector indicator compilation. The challenges of compiling financial indicators are as follows:

- The challenge of **pricing of financial assets**;

- The challenge of **calculating the accrued interest for traded securities;**

- The challenge of **time of recording transactions and valuation;** and

- The challenge of **exchange rate and interest rate risks**.

III.4   The Way Forward in Addressing these Challenges.
This paper discussed the definition and concepts that drive the statistical survey of productivity, monetary and financial indicators. The paper observed the relationships between the productivity and monetary and financial indicators by presenting the methodological approach to the compilation of monetary accounts and the balance sheet approach of the SNA 1993. The challenges are also very similar in the sense that they are driven by the need for consistent and clean data. Also, availability of survey data that conform to the underlying transaction and the concept of analytical compilation are of paramount need

within the context of the three indicators discussed. Most crucial is the need to have daily market data for financial indicators, market intelligence report and industry trend data.

We must strengthen the collaboration effort of the CBN with the NBS to ensure that we have more robust sets of analytical statistics. We must continuously gather and clean up data, provide up-to-date insight on market behavior through comprehensive compilation of market data, product/productivity and services data.

The NBS must start to consolidate the processing of productivity data, improve the methods and sources to enhance the quality of the productivity calculation. We are aware that the National Accounts questionnaires have already been modified to supply data on hours worked, payments to labour and the number of persons employed by industry and establishment. This will in future facilitate efficient and effective productivity calculations. National account tables will offer all the input data required to produce productivity indicators. This will limit the extent to which final productivity figures are affected by the difference in reference periods, data coverage and other conceptual definitions employed by varying data sources.

Dissemination of the indicators is very necessary by the relevant institutions that generate the data. Productivity data dissemination should essentially be targeted at the manufacturers' Association, the Income and Productivity Council, the Economic Council, the Chamber of Commerce, the Research and Policy Units of the Ministry of Finance and the Central Bank of Nigeria.

There is need to follow up on the activities of the NBS in the area of their collaboration with the CBN and other agencies/institutions. This will ensure that the series of indicators are released as and when due. Finally, there must be continuous training and retraining of the compilers of these indicators. The institutions must adopt the seamless succession program that makes for ease of exit of the matured compilers for the younger compilers to take over the schedule.

References

Armington, P. S. (1969). "A Theory of Demand for Products Distinguished by Place of Production" Staff Papers, International Monetary Fund (Washington), Vol.16 (March 1969).

Craig, C. and R. Harris (1973). 'Total Productivity Measurement at the Firm Level"- Sloan Management Review (Spring 1973): 13-28.

Davis, H. S. (1955). Productivity Accounting. University of Pennsylvania.

National Bureau of Statistics (1993). Labour Force Report (Nigeria).

National Bureau of Statistics (2000). Establishment Survey Report (Nigeria).

National Bureau of Statistics (2000). National Accounts Report (Nigeria).

Organization for Economic Cooperation and Development (2001). OECD Productivity Manual: A Guide to the Measurement of Industry- Level and Aggregate Productivity Growth, OECD Statistics Directorate, Paris.

Krugman, P. (1992). The Age of Diminished Expectations: US Economic Policy in the 1980s, MIT Press, Cambridge, p.9.

United Nations (1993). System of National Accounts: prepared under the auspices of the Inter-Secretariat Working Group on National Accounts: Commission of European Communities Eurostat, International Monetary Fund, Organization for Economic Cooperation and Development, United Nations, World Bank, Brussels/Luxembourg, New York, Paris. Washington D.C.

www.oecd.org/statistical/productivity

Appendix 1

Computing Value-Added for the Measurement of Productivity

In the establishment survey, the productivity indicator is computed using value-added of input to output of labour.

Sources and Methods: value-added for each economic sector in the establishment survey (Table1) is calculated by using one of the following methods, (a) the production, (b) income, and (c) expenditure and commodity flow approach; summing the value-added for all economic sectors that are classified for international comparison by ISIC (International Standard for Industrial Classification) and deducting an imputation made for banking service charge, results in the aggregate, Gross Domestic Product at factor cost.

Gross Domestic Product that is derived is used as a benchmark data to calculate market prices GDP, Gross National Product (GNP) and Gross Savings.

Production Approach: The production approach consists of deducting intermediate inputs from gross value of output to derive the value-added. This approach is compiled mainly for industries producing commodities e.g agriculture, mining and quarrying, manufacturing, etc.

Income Approach: The income approach consists of amassing estimates of compensation of employees and operating surplus. This approach is mainly used to estimate value-added for the services sectors.

Expenditure Approach: The expenditure approach is used to generate market prices GDP, it also satisfies the criteria for the accounting identity GDP = C+G+I+X-M for key aggregates of balance of payments flows and accounts of the total economy.

C	=	private final consumption expenditure
G	=	government final consumption expenditure
I	=	gross domestic investments
X	=	exports of goods and services
M	=	imports of goods and services
GDP	=	gross domestic product (market prices)

Gross Domestic Product at market prices is derived by adding to factor cost GDP, indirect taxes and deducting subsidies. Net exports of goods and services identified in the accounting identity as X-M (GDP= C+G+I+X-M) is obtained from the Balance of Payment statistics

Gross Capital Formation (I) is sourced from the CIF values of capital goods imported.

Government consumption expenditure calculated as the sum of compensation of employees (salaries, wages, social security, etc.) plus intermediate expenses less non-industrial sales of government identified in the accounting identify as (G) and the residual private consumption expenditure (C) is derived as the difference between GDP market prices (G+I+X-M)= C

Table 1: Economic Sectors in the Establishment Survey

ITEM	ISIC	CLASSIFICATION APPROACH
1	Agriculture	Production Method
2	Mining and Quarrying	Production Method
3	Manufacturing	Production Method
4	Construction	Commodity Flow
5	Electricity and Water	Production Method
6	Wholesale and Retail Trade	Commodity Flow
7	Hotel and Restaurants	Production Method
8	Transport	Production Method
9	Communication	Production Method
10	Financial Intermediation	Production Method
11	Banking	Production Method
12	Insurance	Production Method
13	Real estate and Owner Occupied Dwellings	Commodity Flow
14	Producers of Government	Income Approach
15	Services and Other Services	Production Method

Appendix 2

Computation of the Monetary Aggregates

Monetary aggregates are the monetary indicators that facilitate the analysis of the monetary conditions of the economy and the effect of monetary policy.

The framework involves consolidation at three levels. The first level is the consolidation of the asset and liabilities of the monetary authorities. Second, the assets and liabilities of deposit money banks must be consolidated (for comparability, the stock and flow data reported by individual units are aggregated into sectoral balance sheets). The third level is the account of the monetary system as a whole, consolidated by combining the accounts of the monetary authorities with those of the deposit money banks by eliminating intra-system entries.

The items in the consolidated balance sheets of the monetary system are classified in certain standardized categories. The main distinctions are between assets and liabilities and, within each of these, between those that are domestic and those that are foreign. Foreign assets cover gold, SDRs, foreign exchange balances and the claims on the government and holdings of Treasury Bills. The only important category within the domestic assets is usually domestic credit. On the liabilities side, is the money and quasi-money. Money consists of currency and coin (liability of the monetary authority), and demand deposits, in most cases overwhelmingly the liability of deposit money banks. Quasi-money consists mainly of savings and time deposits, together with deposits denominated in foreign exchange, held by residents with domestic deposit money banks and the central bank. Both exclude the holdings of the central government. Deposits held by the central government with the monetary system are netted against credit extended to the central government in the monetary survey. In the consolidated balance sheets of the sub-sectors of the monetary system as published in the IFS, credit to the central government are shown on a gross basis.

Other items in the consolidated balance sheet of the monetary system are usually shown on a net basis (almost invariably a liability). The behavioral equation of the monetary aggregates which is structured to facilitate macroeconomic analysis is shown below:

BM (liabilities)= NFA+ DC- OIN.

Where: BM is Base Money (liabilities)

NFA is Net Foreign Asset

DC is Domestic Credit, composed of the net claims on central government and claims on the private sector

OIN is Other Items Net, made up of a residual category of other liabilities less other assets, when other liabilities include all liabilities not included in the broad money

This framework is analyzed into total flows which are closing stocks less opening stocks for the Depository Corporation sector as follows:

$\Delta BM = \Delta NFA + \Delta DC - \Delta OIN$

where Δ denotes a total flow (period-to-period change)

The flow data in each category in the Deposit Corporation Sector are decomposed into separate flows for transactions and valuation changes. For example, changes in broad money liabilities can arise from changes in the foreign assets and foreign liabilities of the deposit corporations as can be seen from the behavioral identity ΔBM to ΔNFA; also ΔDC is decomposed into $\Delta NCG + \Delta NPS$

The text below is an example and an observation of the effect of conceptual and definitional understanding of the computation of monetary indicators. This was an issue when the country was under the Policy Support Instrument (PSI) of the IMF during 2005 to 2007

An Observation on the Computation of the Base Money for End-December 2006.
1.   The computation of the Base money target for end-December 2006 which resulted in ₦776.9 billion did not take cognizance of the accounting framework consistent with analytical balance sheet identity.

2.   The accounting framework implies that assets must equal liability components of the balance sheet. The balance sheet identity is presented below as:

$$BM = NFA + NCG + CDMB + CPS + OIN$$

⇩   ⇩   ⇩   ⇩

Liability side   =   Assets side

The base money is part of a balance sheet identity; and as such, changes in the base money components which is on the liability side has to be compensated with changes in the components on the asset side of the balance sheet in order to preserve the accounting consistency.

3.   However, the computation done to arrive at the end –December 2006 base money did not consider the implication of the changes of Deposit Money Banks' balances based on the balance sheet identity and accounting framework. This was due to the fact that all the changes in banks' deposit with Central Bank was netted out on the liability side which resulted in negative banks' balances with the CBN.

4.   The changes should have been treated holistically in the context of the balance sheet identity as shown below.

Table 2: Summarised Analytical Balance Sheet of the Central Bank

Assets	Liabilities
1. Net Foreign Assets (NFA)	**4. Reserve Money (RM)**
2. Net Domestic Assets (NDA)	4.1 Currency in Circulation (CIC)
2.1 Domestic credit (Net) (NDC)	4.2 DMBs Deposits (DDMBs)
2.1.1 Claims on the Central government (net) (NCG)	4.2.1 Required Reserves
2.1.2 Claims on the DMBs (CDMBs)	4.2.2 Other Reserves
2.1.3 Claims on other Private Sectors (CPS)	
2.2. Other items (net) (OIN)	

5.   In view of the above, it is expected that those deposit money banks that exhibited negative closing balances (overdrawn position) and have received temporary lending facility (under the new monetary policy framework) from the CBN should be reflected on the assets side of the CBN analytical balance sheet as *claims* on *Deposit* money banks.

6.   Also banks with positive closing balances should be considered as a component of the base money because they own reserves and their balances should be treated as *other reserves* under the base money on the liability side of the balance sheet.

7.   Using the information obtained by the Monetary Policy Department (MPD) on banks' opening balances and the daily analytical balance sheet, the base money and other components of the balance were computed.

8.   The figures for the Base Money in the analytical balance sheet was replaced with the banks' balances, computed required reserves less domiciliary deposits and currency in circulation figures obtained by MPD on daily basis.

9.   Banks with positive daily balances were summed up under the "other reserves" component of the Base Money, while those with negative balances were summed up under claims on DMBs by the Central Bank.

10.   A second scenario was computed using a maximum of five million naira as opening balances for banks with positive balances and whose opening balances had exceeded five million.

11.   Going by international best practice, accounting consistency and balance sheet identity should be preserved in the treatment of sectoral balances.

Appendix 3

Computation of the Financial Sector Indicators

The financial sector indicators are derived from the monetary indicators and are based on financial assets and liabilities. The financial assets and liabilities are classified by creditor/debtor sectors. The three sub-sectors are consolidated to obtain the financial sector survey of which the indicators are derived.

The balance sheets and accumulation accounts are the recommended framework for financial statistics because they provide an internationally-recognized set of guidelines for integrating financial stocks and flows into a complete system of accounts. Some of the financial sector indicators are listed below and they are usually transactional and balancing items:

- Net lending(+)/net borrowing (-)

- Net acquisition of financial assets/Net incurrence of liabilities made up of (currency, transferable deposits, other deposits, securities other than shares, loans, shares and equity, insurance and other equity, financial derivatives and other accounts receivable)

- Currency and deposit