

6-1970

Technical Appendix: Construction of all Cities Consumer Price Index for the Lower Income Group in Nigeria

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Recommended Citation

Central Bank of Nigeria (1970). Technical Appendix: Construction of all Cities Consumer Price Index for the Lower Income Group in Nigeria. CBN Economical and Financial Review. 8(1), 21-27.

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TECHNICAL APPENDIX

CONSTRUCTION OF ALL-CITIES CONSUMER PRICE INDEX FOR THE LOWER INCOME GROUP IN NIGERIA

The all-cities index is computed from price indices of goods and services purchased by the low income workers in the country compiled by the Federal Office of Statistics.

FEDERAL OFFICE OF STATISTICS (F.O.S.) CONSUMER PRICE INDICES

The Federal Office of Statistics prepares, on a monthly basis, a consumer price index for the 'lower income group' in many of the urban centres of the country. The group of consumers is limited to wage earners and clerical workers whose basic earnings are not greater than £N400 per annum. For the purpose of construction of the index for each centre, items of consumption, selected on the basis of a survey of expenditure in the particular centre, are organized by the Office into the following groups: accommodation, food, drink, tobacco and kola nuts, fuel and light, transport, miscellaneous purchases, clothing and other services. The weights assigned to each commodity or group of commodities are also derived from the surveys of expenditure. For each centre, the consumer price index is calculated as a weighted average of price ratios of these commodities. The list of urban centres for which the Federal Office of Statistics prepares consumer price indices, and the periods in which the expenditure surveys were conducted are shown in Table 1 below.

TABLE 1

CENTRES FOR WHICH F.O.S. PRICE INDICES ARE AVAILABLE

Urban centres*	Years of surveys
Lagos	1959/60
Ibadan	1955 and 1961/62
Kaduna	1955/56 and 1962/63
Zaria	1955/56
Ilorin	1957/58
Benin	1957/58
Kano	1958/59
Sapele	1957/58
Warri	1957/58

*Urban centres in the eastern states of the country are not included owing to the non-availability of current statistics.

LIMITATIONS OF THE FEDERAL OFFICE OF STATISTICS PRICE INDICES

Since the expenditure surveys conducted in the various urban centres were not undertaken in the same period, the reference period from which the price indices are calculated generally differs from one centre to another. The price index for Ibadan is based on the average of 1953, those for Kaduna, Zaria, Benin, Sapele, Warri and Ilorin are based on 1957, while those for Lagos and Kano are based on 1960 and 1958, respectively. Because of the differences in base periods, changes in the index in one centre are generally not comparable with those in the other centres.

A more serious limitation of the index prepared by the Federal Office of Statistics is the absence of a composite consumer price index to measure average change in the prices of goods and services purchased by the specified group of consumers. At present, such changes can only be obtained by the process of calculating from time to time the unweighted arithmetic average of the individual city indices. The obvious weakness of this method is the attachment of equal importance to all the urban centres with regard to consumer spending.

ADJUSTMENT OF F.O.S. PRICE INDICES TO THE SAME BASE PERIOD

For the purpose of the Central Bank's all-cities index, the price indices as compiled by the Federal Office of Statistics have been adjusted to the same base period. The common base chosen is the average of prices in 1960. In every selected urban centre and for every consumer item, the price index for any given period is adjusted on the basis that the average price index for the same item in 1960 is 100. The index for any item and for any given period is the product of the index for that period and the reciprocal of the index for 1960 multiplied by 100.

Example:

$$\begin{aligned} &\text{The average price index for drinks in} \\ &\text{Kaduna in 1960} = 119.7 \text{ points.} \\ &\text{The price index for drinks in Kaduna in} \\ &\text{August 1966 (1957=100)} = 135.5 \text{ points.} \\ &\text{Therefore the price index for drinks in} \\ &\text{Kaduna in August 1966 (1960=100)} = \\ &\frac{100}{119.7} \times \frac{135.5}{1} \text{ points} = 113.2 \text{ points} \end{aligned}$$

¹ Subsequently revised upwards to £N450 per annum. (See Urban Consumer Surveys for Ibadan, Enugu and Kaduna conducted between 1961 and 1963 by the Federal Office of Statistics).

² 'Urban Consumer Surveys in Nigeria', published by the Federal Office of Statistics.

**CHOICE OF THE URBAN CENTRES AND
ASSIGNMENT OF WEIGHTS**

The urban centres included in the index (see Table 2) are limited to those in which price data are collected by the Federal Office of Statistics. For the purpose of weighting, total monthly expenditures by wage-earner and clerical worker population¹ are used. The weight attached to the price index for any item in each centre corresponds to the total monthly expenditure on the item in the particular centre.

**COMPUTATION OF THE ALL-CITIES
CONSUMER PRICE INDEX**

Two separate methods were employed in computing the composite consumer price index. Both methods yield approximately identical results.

Method A

This method involves: (a) computation of price indices for the component items of the all-cities consumer price index, and (b) the computation of the consumer price index.

**(a) COMPUTATION OF PRICE INDICES FOR
THE COMPONENT ITEMS OF THE ALL-CITIES
CONSUMER PRICE INDEX**

As shown in the example below, the new price index for any item is the sum of the product of the relative share of the weights of each centre and its price index, divided by the sum of the expenditure weights. The computed price index for miscellaneous purchases in March 1967 (see Table 2) =

$$\frac{(\text{Wt. Px.})}{\text{Wt.}} = \frac{117,291.0}{1,000} = 117.3 \text{ points}$$

In the same way, price indices are computed for each of the component items — accommodation, food, drinks, tobacco and kolanuts fuel and light, transportation, clothing and other services — of the all-cities consumer price index.

**(b) COMPUTATION OF THE ALL-CITIES
CONSUMER PRICE INDICES**

The price indices of the component items based on the computation in Table 2 are weighted on the basis of the items' respective proportions of aggregate expenditure² on all goods and services. The consumer price index (all-items index) is obtained by dividing the sum of the weighted price indices by the sum of the expenditure weights. (See Table 3 below).

$$(1960=100) = \frac{(\text{Wt. Px.})}{\text{Wt.}} = \frac{121,486.1}{1,000} = 121.5 \text{ points}$$

The movements between 1960 and 1968 of the consumer price index based on the computation in Table 3 and of the indices of the component items based on the computation in Table 2 are shown in the tables at the end of this article.

Method B

By this method, the composite consumer price index is calculated as the weighted average of the F.O.S. consumer price indices (all-item indices) of the selected urban centres. These urban centre consumer price indices are for the purpose of the calculation adjusted to a common base year, 1960. The weight assigned to the index in each centre is proportional to the total monthly expenditure by wage-earner and clerical worker consumers on all goods and services in that centre. (See Table 4).

¹ Whose basic earnings are not greater than £N450 per annum.

² Overall expenditures on goods and services by wage-earner and clerical worker population in all the selected urban centres.

TABLE 2
COMPUTATION OF ALL-CITIES PRICE INDEX FOR
MISCELLANEOUS PURCHASES FOR THE MONTH OF
MARCH 1967

(Base : Average 1960 = 100)

<i>Urban centres</i>	<i>Wage earner and clerical worker population¹</i>	<i>Average monthly expenditure per household¹ (in shillings)</i>	<i>Total monthly expenditure (in thousand shillings)</i>	<i>Expenditure weights (Wt.)</i>	<i>Price index² (Px)</i>	<i>Wt. Px</i>
Lagos (Lagos Territory) ...	114,530	20.9	2,394	586	119.5	70,027.0
Ibadan	41,718	11.4	476	116	116.3	13,490.8
Kaduna	26,417	15.8	417	102	114.0	11,628.0
Zaria	10,039	18.1	182	45	125.2	5,634.0
Ilorin	4,443	8.2	36	9	112.2	1,009.8
Benin	15,784	16.2	256	63	102.5	6,457.5
Kano	17,471	11.8	206	50	117.8	5,890.0
Sapele	5,875	12.7	75	18	109.4	1,969.2
Warri	4,325	10.8	47	11	107.7	1,184.7
	—	—	4,089	1,000	—	117,291.0
<i>Price Index ...</i>	—	—	—	—	—	117.3

¹ Based on *Report on Employment and Earnings Enquiry*, Federal Ministry of Labour.

² Figures obtained from *Urban Consumer Surveys in Nigeria*, published by the Federal Office of Statistics

³ As compiled by the Federal Office of Statistics but adjusted for the purpose of the present exercise to 1960 as the base year.

TABLE 3
COMPUTATION OF ALL-CITIES CONSUMER PRICE INDEX
FOR THE MONTH OF MARCH 1967
(Base : Average 1960 = 100)

<i>Item</i>	<i>Total monthly expenditure by wage-earner and clerical worker population (in thousand shillings)</i>	<i>Expenditure weights (Wt.)</i>	<i>Price-index based on computation in Table 5 (Px)</i>	<i>Wt. Px.</i>
Accommodation	8,031	112	118.9	13,316.8
Food	32,690	455	123.3	56,101.5
Drinks	5,817	81	117.3	9,501.3
Tobacco and kolanuts	2,652	37	88.2	3,263.4
Fuel and light	2,669	37	127.4	4,713.8
Transport	4,646	65	124.6	8,099.0
Miscellaneous purchases ...	4,038	56	117.3	6,568.8
Clothing	6,759	94	130.3	12,248.2
Other services	4,533	63	121.8	7,673.4
	71,835	1,000	—	121,486.5
<i>Consumer price index</i> ...	—	—	—	121.5

TABLE 4
COMPUTATION OF ALL-CITIES CONSUMER PRICE INDEX
FOR THE MONTH OF MARCH 1967
(Base : Average 1960 = 100)

<i>Urban centres</i>	<i>Monthly expenditure on all goods and services (in thousand shillings)</i>	<i>Expenditure weights (Wt.)</i>	<i>F.O.S. consumer price index (all-items-index (Px.)</i>	<i>Wt. Px.</i>
Lagos (Federal Territory) ...	38,957	543	123.4	67,006.2
Ibadan	12,122	169	123.0	20,787.0
Kaduna	7,883	111	115.6	12,831.6
Zaria	2,654	34	111.6	3,794.4
Ilorin	798	12	133.7	1,604.4
Benin	3,196	44	121.6	5,350.4
Kano	4,016	53	124.5	6,598.6
Sapele	1,333	19	112.6	2,139.4
Warri	876	12	121.9	1,462.8
	71,835	1,000		121,574.7
<i>Composite consumer price index</i>				121.6

The consumer price index in March 1967 (1960 = 100) =

(Wt. Px.) 121,547.7

$\frac{\quad}{\quad} = \frac{\quad}{\quad} = 121.6$ points

Wt. 1,000

Consumer Price Index¹ for the lower income group in Nigeria
(Base: Average 1960=100)

Year and month	Consumer price index	COMPONENT INDICES ²								
		Food	Accommodation	Drinks	Tobacco and kolanuts	Fuel and light	Transport	Miscellaneous purchases	Clothing	Other services
1960										
January	98.7	98.5	98.4	99.6	99.9	99.4	101.4	98.8	96.5	98.4
February	98.4	97.9	98.3	99.2	101.8	99.4	100.4	98.8	96.6	98.7
March	99.2	99.5	99.0	99.0	101.9	99.7	100.3	99.2	96.9	98.7
April	98.7	98.5	99.1	98.4	101.3	98.0	100.3	99.2	97.1	99.6
May	99.6	99.8	99.2	99.0	101.3	99.5	100.3	99.3	98.9	99.9
June	101.2	102.8	99.8	98.1	100.4	100.0	100.4	99.2	100.7	100.0
July	102.2	104.2	99.8	98.2	100.9	102.5	101.3	100.9	101.3	100.8
August	101.2	102.1	99.9	101.4	98.2	101.7	99.5	100.7	101.2	100.1
September	99.9	99.6	99.8	100.2	97.7	99.3	100.0	100.7	102.3	99.9
October	100.1	99.1	101.0	100.3	100.5	100.4	99.7	100.5	102.8	101.4
November	100.5	99.8	101.0	99.8	100.2	100.3	100.4	100.4	103.1	101.4
December	101.1	99.3	101.0	107.3	100.9	102.3	100.3	101.3	104.2	101.5
Average ³	100.1	100.1	99.7	100.0	100.3	100.2	100.3	99.9	100.1	100.0
1961										
January	103.4	104.7	101.1	109.3	99.4	103.2	100.8	100.7	101.3	100.6
February	103.9	106.1	101.6	108.6	99.6	104.6	100.3	100.9	100.0	100.1
March	103.8	105.6	101.7	109.7	100.0	102.2	101.5	100.9	100.7	106.3
April	104.4	105.6	101.7	108.1	100.4	108.4	101.2	100.7	105.4	101.0
May	105.3	107.8	101.8	108.9	99.0	108.8	101.1	100.6	104.4	101.0
June	108.7	114.9	101.8	106.7	100.1	115.4	101.2	100.5	104.3	101.8
July	110.2	117.5	102.4	108.5	100.4	119.7	101.3	99.9	103.6	101.7
August	108.2	113.1	102.4	107.8	101.0	116.3	101.6	99.9	104.2	101.8
September	107.1	111.4	103.0	103.7	99.7	113.6	101.7	101.7	105.7	100.0
October	106.9	110.5	103.0	106.2	99.6	109.8	101.5	101.2	105.9	104.0
November	107.0	110.0	103.5	108.4	99.5	112.2	101.6	101.5	106.3	104.2
December	107.3	110.8	103.5	108.8	99.4	108.1	101.4	101.6	106.0	104.4
Average	106.4	109.8	102.3	107.9	99.8	110.2	101.3	100.8	104.0	101.7
1962										
January	108.0	113.8	104.9	106.3	99.0	103.0	101.8	99.5	103.7	102.8
February	109.7	116.9	104.9	107.1	98.6	104.6	102.2	101.1	103.0	103.8
March	110.9	117.8	104.9	111.6	98.9	113.4	102.2	102.7	103.7	105.0
April	113.2	120.3	105.5	117.2	99.3	115.4	103.8	103.5	106.3	105.4
May	114.5	122.1	105.5	118.1	99.7	113.7	103.7	104.3	110.5	106.3
June	116.3	126.2	105.5	114.1	99.8	119.6	103.6	102.8	112.8	106.4
July	116.7	126.5	106.2	120.0	99.6	117.6	103.5	102.5	110.2	106.4
August	114.6	122.7	106.2	115.9	99.7	114.1	103.0	102.6	111.3	106.5
September	112.6	119.2	106.2	114.8	99.6	110.8	102.3	102.5	109.8	106.5
October	110.2	113.1	106.8	113.9	99.4	110.2	102.6	102.6	113.1	107.1
November	108.8	109.7	106.8	117.3	99.3	108.4	102.8	102.5	112.0	107.5
December	107.9	107.9	106.8	114.4	98.7	106.2	103.3	102.8	114.0	107.7
Average	112.0	118.0	105.8	114.2	99.3	111.4	102.9	102.5	109.1	106.0

¹ Based on computation in Table 2, page 23

² Based on computation in Table 2, page 23

³ Higher or lower than 100 because of rounding.

Year and month	Consumer price index	COMPONENT INDICES								
		Food	Accommodation	Drinks	Tobacco and kolanuts	Fuel and light	Transport	Miscellaneous purchases	Clothing	Other services
1963										
January	109.3	109.6	107.4	113.5	100.8	110.7	103.3	102.2	115.5	112.4
February	108.6	107.5	107.4	114.3	100.8	114.6	103.1	102.1	115.7	112.5
March	109.0	108.2	108.0	114.6	100.1	113.3	102.7	102.5	116.8	112.1
April	109.4	108.8	108.0	114.7	99.8	111.8	103.8	102.9	117.6	112.8
May	109.9	109.6	108.0	113.7	99.9	113.9	104.2	105.2	117.9	112.9
June	110.6	110.0	108.7	115.5	99.9	115.8	104.1	104.5	117.6	116.5
July	109.2	106.8	108.7	114.6	100.7	116.0	104.8	104.9	117.7	116.8
August	107.9	103.3	108.6	114.4	100.6	117.5	108.4	104.8	117.7	117.1
September	108.2	104.3	108.9	113.7	100.3	115.1	108.1	106.1	117.2	117.1
October	108.4	104.3	109.0	113.4	100.3	116.7	108.0	105.7	119.0	116.0
November	108.1	103.5	109.4	113.8	100.3	116.7	108.2	105.9	118.5	117.2
December	108.6	104.5	109.6	113.9	101.5	115.6	107.7	105.8	119.2	117.3
Average	108.9	106.7	108.5	114.2	100.4	114.8	105.6	104.4	117.5	115.1
1964										
January	107.9	103.1	109.8	113.1	100.5	110.7	108.2	107.2	119.8	118.3
February	108.0	102.9	110.1	113.7	101.8	106.5	107.2	107.2	122.4	118.0
March	107.8	103.6	110.3	113.6	100.6	104.4	105.4	107.2	120.2	117.0
April	108.4	104.1	110.4	113.7	101.5	105.8	107.9	106.2	121.3	118.6
May	110.7	108.7	110.7	113.7	102.3	106.8	107.8	106.7	121.4	118.4
June	112.3	112.1	110.9	113.4	102.1	107.4	108.0	106.6	121.6	118.5
July	111.9	109.6	111.2	116.3	103.0	113.4	109.0	108.4	122.9	118.5
August	111.3	106.7	111.4	123.0	103.4	111.2	109.5	106.8	123.1	118.0
September	110.5	105.2	111.6	123.2	105.2	109.5	109.6	108.4	123.3	118.0
October	110.1	104.5	111.9	125.5	92.1	110.4	110.2	109.0	123.5	118.5
November	109.8	103.8	112.4	125.5	91.9	109.5	110.2	108.8	123.8	118.4
December	109.7	103.8	112.4	125.5	89.8	111.3	110.2	108.7	123.9	118.4
Average	110.1	105.7	111.1	118.4	99.5	108.9	108.8	107.6	122.3	118.2
1965										
January	111.2	104.9	112.9	126.5	89.9	110.4	118.1	108.3	124.8	121.6
February	112.5	106.7	113.2	126.5	90.0	118.2	121.2	108.3	124.6	121.7
March	113.0	107.6	113.5	127.0	89.6	119.7	121.8	108.4	124.6	121.3
April	114.0	109.6	113.7	128.1	89.6	117.8	121.8	108.4	125.0	121.3
May	116.3	114.5	113.8	127.3	89.4	119.3	121.9	108.2	125.1	121.3
June	115.6	114.6	114.1	124.2	87.2	121.8	122.1	108.7	125.3	121.2
July	116.1	114.3	114.2	124.3	87.5	122.5	122.1	110.8	124.2	121.2
August	115.0	111.8	114.4	124.3	87.6	121.2	121.9	111.0	124.9	121.2
September	115.0	111.3	114.6	124.3	87.4	123.8	122.0	111.1	124.4	123.4
October	114.2	109.6	114.9	124.8	87.9	121.8	121.9	110.9	124.3	123.4
November	114.3	109.6	115.3	125.0	86.6	121.1	122.4	111.0	125.1	123.4
December	115.3	111.9	115.4	125.0	87.7	119.1	122.6	111.3	125.1	123.5
Average	114.4	110.5	114.2	125.7	88.4	119.6	121.7	109.7	124.8	122.0

Year and month	COMPONENT INDICES									
	Consumer price index	Food	Accommodation	Drinks	Tobacco and kolanuts	Fuel and light	Transport	Miscellaneous purchases	Clothing	Other services
1966										
January	118.4	118.4	115.5	124.3	86.5	119.3	122.7	111.6	125.0	123.5
February	117.7	116.9	115.8	123.3	86.0	120.9	122.6	112.0	126.2	123.4
March	120.6	123.4	116.0	124.1	86.6	118.2	122.9	112.4	125.2	123.3
April	125.5	133.3	116.3	124.1	87.3	121.2	122.9	112.8	127.2	123.3
May	129.2	141.3	116.4	123.7	86.9	120.7	122.9	114.3	128.0	123.3
June	133.3	150.1	116.7	123.5	87.9	118.6	123.1	114.9	128.9	122.7
July	130.2	143.1	116.9	123.0	89.1	121.7	122.5	113.8	128.5	124.0
August	128.6	139.5	117.2	122.5	88.5	120.5	123.9	113.3	128.9	124.0
September	127.2	137.1	117.2	122.8	88.5	121.6	121.6	113.5	126.2	124.1
October	128.0	138.0	117.6	122.4	88.7	118.8	123.9	114.1	130.1	123.7
November	123.9	138.9	118.0	122.7	89.0	120.1	123.9	112.2	129.9	123.6
December	122.9	126.9	118.1	122.8	88.8	121.6	122.3	114.2	128.5	123.5
Average	125.5	133.1	116.8	123.3	87.8	120.3	122.9	113.3	127.7	123.5
1967										
January	122.8	125.3	118.4	123.4	88.4	125.0	124.0	117.2	129.6	123.7
February	122.2	124.1	118.7	123.6	88.2	126.4	124.3	117.0	129.3	121.7
March	121.5	123.3	118.9	117.3	88.2	127.4	124.6	117.3	130.3	121.8
April	122.8	120.8	119.1	118.3	88.5	128.0	125.5	117.9	133.0	121.8
May	122.3	123.4	119.4	124.9	90.4	126.7	123.9	117.4	131.2	121.7
June	123.0	125.1	119.6	124.6	90.4	130.3	124.4	116.4	130.1	120.9
July	122.0	122.6	119.9	124.3	90.5	131.6	123.6	116.1	129.5	120.7
August	122.2	123.1	120.0	125.3	91.1	133.3	124.5	116.9	128.3	121.2
September	120.3	119.4	120.3	124.9	84.2	128.5	124.2	118.0	130.0	121.2
October	118.0	114.1	120.5	125.1	83.0	130.7	124.0	119.1	130.1	121.1
November	116.0	109.9	120.7	124.3	84.2	130.5	125.2	118.6	128.5	121.0
December	116.3	110.3	120.9	125.7	82.5	129.0	125.6	119.3	128.2	121.5
Average	120.8	119.3	119.7	123.5	87.5	129.0	124.5	117.6	129.8	121.5
1968										
January	118.3	112.4	121.2	128.9	82.1	128.7	128.2	125.4	128.4	121.3
February	118.3	111.7	121.5	127.6	84.3	128.3	127.8	126.9	133.7	121.9
March	117.5	109.3	121.8	127.4	84.5	128.2	130.6	127.7	137.2	119.2
April	118.4	110.7	122.0	127.3	85.6	129.9	133.0	125.8	135.7	120.7
May	121.3	114.2	122.4	138.7	93.0	125.6	132.4	127.2	138.0	120.4
June	121.2	113.6	122.6	138.0	92.7	130.6	132.3	127.6	138.0	120.8
July	120.6	111.9	122.8	138.5	92.7	127.5	130.8	129.1	140.0	121.2
August	119.9	110.7	123.1	138.9	91.8	127.9	128.7	131.0	138.7	120.8
September	120.9	112.7	123.3	138.8	89.5	127.5	129.4	132.0	139.0	122.2
October	121.5	113.6	123.4	138.3	90.7	131.8	129.6	132.9	139.1	121.5
November	122.1	114.4	123.7	139.9	90.7	129.2	129.4	130.9	141.4	122.0
December	123.2	116.5	123.9	139.4	89.2	131.1	130.2	131.2	143.1	121.6
Average	120.3	112.6	122.6	135.7	88.9	128.9	130.2	129.0	137.7	121.7