12

NIGERIAN NATIONAL ACCOUNTS, 1950–7

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I. AN HISTORICAL NOTE

THE history of national income accounting in Nigeria does not go far beyond 1950. Limited efforts were made in the Colonial Office in London during the war years and in the immediate post World War II years to determine the level of capital formation and to assess the balance of trade. The first assault on the problem was made when Prest and Stewart were commissioned to estimate the national income of Nigeria for 1950–1. Subsequently the International Bank Mission to Nigeria in their Report published in 1954 tried to bring up these estimates to 1952–3, using the same format as Prest and Stewart and applying exactly the same methods. In 1956 the Federal Department of Statistics made a limited effort to estimate the national income for 1956–7 very much on the same basis as the 1950–1 estimates. The results of this exercise have now become available in permanent form in the *Nigerian Economic Survey*, 1959. The most recent attempt has only just been completed by Mr. E. F. Jackson and the present author, who have provided a national income series for 1950–7, both at current and at constant 1957 prices.

Prest and Stewart attempted three estimates: output, expenditure and income. Of these three the income estimates contained the largest elements of imputation because of the paucity of data. The income of the large corporations could be estimated from internal revenue records – even here, however, there were serious gaps in the returns made by extra-territorial companies; data on wage income covered only those in the service of governments and large corporations; it was inevitable that the bulk of income from self-employment could not be satisfactorily accounted for. We therefore deliberately left out income estimates and confined ourselves to estimates of output and expenditure on product.

[1] In the preparation of this paper I had the assistance of Mr. Bisi Adu of the Nigerian Institute of Social and Economic Research, Ibadan.

II. ORGANIZATION OF THE SURVEY

It may be of interest to indicate the organization available to us for carrying out our survey. From the start we were determined to build up a small unit capable of continuing the work and to utilize to the full the facilities of other Government agencies. We had, therefore, to persuade Government Departments – most of them already overtaxed – to carry out specific assignments for us: the Federal and Regional Ministries of Trade and Industry were asked to administer our Census of Industrial Production; the Ministries of Local Government and the local councils helped with tabulation of building-permit data in Western Nigeria and with our census of private residential construction in Eastern Nigeria; the Ministries of Finance assisted us in our analysis of income-tax data; the Ministries of Works with our analysis and tabulation of public investment in building and construction. Our hosts, the Federal Department of Statistics, helped us with Government accounts, analysis of import trade, and balance of payments and provided us with clerical and computing staff in addition to making available their records and files on many subjects; the figures always had to be checked carefully, however, as the bases for their estimates were not always clear.

We undertook a number of investigations ourselves in addition to piecing together the data in scattered Government records. It was necessary to travel extensively and frequently to explain our needs to harassed Government officials, who often did not understand the relevance of what they were asked to tabulate, and to persuade and help businessmen to fill our questionnaire forms correctly and punctually.

The problem should become smaller in the future, when business establishments understand the necessity for detailed enquiries and learn to live with requests for information on their activity. Similarly, the development of planning agencies in each Government of the Federation will enable Government officials to appreciate the need for detailed work on regional and national accounts.

III. THE STRUCTURE OF THE ACCOUNTS

1. *Interdependence of the output and expenditure estimates*

The Nigerian national accounts refer to the gross domestic product obtained from two methods which were highly inter-

dependent. Our estimates of the national expenditure on product are obtained substantially from our output estimates. Some independent estimates of expenditure, for instance on food, could be obtained from household budget studies available for several large townships for single years, and from cost of living studies available for Lagos for several years. On the whole, however, the budget studies were for different places at different points of time – Enugu 1954, Ibadan 1955 – and for very few places at that in a country as large as Nigeria. We did not, therefore, feel justified in using them to build up a series except where we had no alternative. We relied on our figures of output valued at retail market prices to obtain expenditure on food and used the budget studies to cross-check our estimates on particular items.

We thus have in reality only one set of tables, because of the interdependence of our output and expenditure estimates and the absence of income estimates. Our output tables are partially based on expenditure estimates and our expenditure estimates are derived for the most part from output tables. It is to be hoped that as refinements are made in the series we have produced the two accounts will be more independent of each other, so that one can truly be used as a check on the other.

The estimates measure gross domestic product as well as gross national product. The former measure gives the value of production within Nigeria, including the activity of Nigerians temporarily resident abroad as well as that of foreigners temporarily resident in Nigeria. It excludes, however, net income from abroad which enters into the gross national product. A further distinction is often drawn between these two measures already referred to and the territorial (or geographic) product. This last is defined by reference to the value of production within Nigeria *plus* income of foreigners resident in Nigeria *less* income of Nigerians resident abroad. Our procedure in defining our gross domestic product makes it evident that we have adopted the territorial or geographic concept. As we made estimates of depreciation for only 1956 and 1957, the net domestic (geographic) and net national product are given for these two years only.

2. *Regional estimates in a Federal territory*

One feature of the Nigerian accounts was the necessity to

provide estimates for each of the political regions which make up the Federation. We found it convenient for statistical reasons to merge Lagos Federal territory with Western Nigeria and the Southern Cameroons with Eastern Nigeria, because in many branches of activity it is impossible to maintain the division. On the output side, we built up our national figures in most branches of activity from regional data, whilst in other branches it was easy to split the national figures between the regions, except in the case of value added by trade, to which we shall refer later. We were therefore able to show the output of Northern Nigeria (including Northern Cameroons), Western Nigeria (including Lagos), and Eastern Nigeria (including, wherever it was convenient to do so, Southern Cameroons). We could not show the expenditure on product by region, because we could not identify the extent of interregional trade in foodstuffs. However, we were able to show regional expenditure on a number of sub-aggregates and specific items: domestic fixed investment, drink, tobacco, fuel and light, clothing and other non-durable goods, durable goods, travel, education and miscellaneous services.

3. *Summary tables for the Federation of Nigeria, 1950–7*

Tables I and II show the gross domestic (geographic) product of Nigeria, 1950–7, at current and at 1957 (factor) cost; Tables III and IV show respectively the expenditure on product at current and at 1957 market prices. We cannot enter here into the details of the estimation or into an interpretation of our findings. A note of warning is, however, in order. In Table IV we have left the row of net income from abroad undeflated. It would be evident that the entries in this row are sufficiently small not to cause us any anxiety. Tables V and VI show the gross domestic fixed investment by type of assets.

From Tables II and IV we see that the gross domestic product in real terms increased by 32 per cent between 1950 and 1957. Some branches of activity grew faster than the economy as a whole – manufacturing, public utilities, transport and communications, building and civil engineering construction, and Government each stood in 1957 at over 200 per cent of the 1950 output measured at 1957 prices. By contrast, some of the large sectors, particularly agriculture and livestock, grew at a much slower rate than the economy.

TABLE I

Gross domestic product by branch of activity at current prices £ million

	1950	1951	1952	1953	1954	1955	1956	1957
Agriculture	285·7	323·8	327·0	365·6	427·3	455·8	450·9	471·4
Livestock	37·9	44·3	39·2	42·9	48·7	52·5	57·2	57·7
Fishing	6·3	6·7	6·4	6·3	7·4	9·8	12·8	13·3
Forest products	7·5	10·8	8·8	10·3	11·4	12·2	13·8	14·6
Mining and oil exploration	5·5	10·7	11·4	11·2	11·0	10·2	8·2	9·4
Manufacturing and public utilities	3·3	3·5	4·9	6·4	7·1	8·4	12·2	13·1
Communications	1·9	2·0	2·2	2·4	2·3	2·1	2·9	3·1
Building and civil engineering	8·1	12·2	16·8	17·6	28·0	31·4	36·5	43·0
Ownership of buildings	5·9	6·2	6·4	7·1	7·5	8·8	8·2	10·3
Transport	22·8	26·9	29·3	40·5	45·9	54·2	65·2	74·6
Crafts	15·8	15·9	16·0	16·1	16·2	16·4	16·5	16·7
Missions	3·4	4·0	4·6	5·3	6·0	9·0	12·7	15·9
Government	10·8	11·8	14·3	15·0	16·0	21·3	28·7	30·5
Marketing boards	35·5	19·5	36·5	36·2	51·2	16·3	41·0	11·7
Banking, insurance and the professions	0·7	0·7	0·9	1·1	1·4	1·8	2·1	2·5
Domestic services	2·6	2·6	3·0	3·5	3·9	4·4	5·4	5·5
Miscellaneous services	0·7	0·7	0·7	1·0	1·0	1·2	1·8	2·0
Land development	3·5	3·5	4·0	4·7	5·2	5·9	7·0	8·2
Distribution, residual error, etc.	54·2	67·4	82·1	71·8	76·7	105·8	87·5	106·5
Gross domestic product at factor cost	512·1	573·2	614·5	665·0	774·2	827·5	870·6	910·0
Indirect taxes *less* subsidies	12·2	13·8	16·3	17·9	20·6	23·7	29·4	28·7
Gross domestic product at market prices	524·3	587·0	630·8	682·9	794·8	851·2	900·0	938·7
Net income from abroad	−3·3	−4·5	−3·0	−3·2	−1·4	−0·6	0·9	4·2
Gross national product at market prices	521·0	582·5	627·8	679·7	793·4	850·6	900·9	942·9

TABLE II

Gross domestic product by branch of activity at 1957 prices

£ million

	1950	1951	1952	1953	1954	1955	1956	1957
Agriculture	377·6	415·0	430·5	446·0	471·3	483·9	459·8	471·4
Livestock	60·1	57·7	52·5	53·5	55·7	56·5	57·6	57·7
Fishing	9·7	9·8	9·9	10·0	10·2	10·3	12·6	13·3
Forest products	9·4	12·0	10·1	11·9	12·3	13·4	13·6	14·6
Mining and oil exploration	7·6	7·6	8·2	7·9	8·1	9·0	9·6	9·4
Manufacturing and public utilities	3·9	4·0	5·8	6·3	7·9	8·7	12·0	13·1
Communications	2·7	2·7	3·0	2·9	2·6	2·4	2·6	3·1
Building and civil engineering	20·3	25·4	19·4	25·9	37·8	38·3	36·5	43·0
Ownership of buildings	8·9	9·1	9·2	9·4	9·6	9·7	9·8	10·3
Transport	28·6	34·0	35·3	45·4	50·9	60·2	65·1	74·6
Crafts	15·8	15·9	16·0	16·1	16·2	16·4	16·5	16·7
Missions	6·9	7·0	7·6	7·8	8·7	11·4	12·7	15·9
Government	15·0	16·4	19·9	16·5	17·6	23·4	28·7	30·5
Marketing boards	41·0	10·5	28·0	28·8	42·7	25·0	44·9	11·7
Banking, insurance and the professions	1·5	1·2	1·3	1·7	1·7	2·1	2·2	2·5
Domestic services	4·4	4·4	4·4	4·7	4·8	5·0	5·7	5·5
Miscellaneous services	0·9	1·0	1·1	1·1	1·2	1·5	1·9	2·0
Land development	8·2	8·2	8·2	8·2	8·2	8·2	8·2	8·2
Distribution, residual error, etc.	64·6	98·3	122·6	105·7	104·7	112·7	74·1	106·5
Gross domestic product at factor cost	687·1	740·2	793·0	809·8	872·2	898·1	874·1	910·0

TABLE III

Gross national product by category of expenditure at current prices £ million

	1950	1951	1952	1953	1954	1955	1956	1957
Consumers' expenditure	457·1	514·9	536·5	580·3	673·3	743·1	792·7	815·5
Government expenditure on goods and services	17·3	19·3	24·1	27·2	28·4	41·4	43·8	47·6
Gross fixed investment in Nigeria	30·8	37·8	54·0	58·8	71·5	85·7	101·2	113·0
Increase in marketing boards' stocks	−3·8	4·3	0·3	−0·2	−6·8	5·1	−4·3	9·1
Plus exports of goods and services	88·9	114·2	126·3	128·6	154·3	128·2	135·7	129·1
Final expenditure	590·3	690·5	741·2	794·7	920·7	1003·5	1069·1	1114·3
Less imports of goods and services	66·0	103·5	110·4	111·8	125·9	152·3	169·1	175·6
Gross domestic product at market prices	524·3	587·0	630·8	682·9	794·8	851·2	900·0	938·7
Plus net income from abroad	−3·3	−4·5	−3·0	−3·2	−1·4	−0·6	0·9	4·2
Gross national product at market prices	521·0	582·5	627·8	679·7	793·4	850·6	900·9	942·9

TABLE IV

Gross domestic product by category of expenditure at 1957 prices £ million

	1950	1951	1952	1953	1954	1955	1956	1957
Consumers' expenditure	609·4	650·2	695·9	717·3	774·6	805·5	798·9	815·5
Government expenditure on goods and services	24·0	26·8	33·5	29·9	31·2	45·5	43·8	47·6
Gross fixed investment in Nigeria	48·4	59·7	75·0	79·9	92·9	102·6	108·0	113·0
Increase in marketing boards' stocks	−7·3	6·3	1·5	−0·1	−6·2	4·6	−4·8	9·1
Plus exports of goods and services	99·9	93·6	111·7	114·8	131·9	126·9	138·5	129·1
Final expenditure	774·4	836·6	917·6	941·8	1024·4	1085·1	1084·4	1114·3
Less imports of goods and services	75·1	82·6	108·3	114·1	131·6	163·3	180·9	175·6
Gross domestic product at market prices	699·3	754·0	809·3	827·7	892·8	921·8	903·5	938·7

TABLE V

Gross fixed investment by type of assets at current prices

£ million

	1950	1951	1952	1953	1954	1955	1956	1957
New buildings:								
Dwellings		13·4	18·8	19·5	23·7	27·7	35·3	41·9
Other		3·0	4·7	6·0	9·7	9·3	10·0	12·6
Total		16·4	23·5	25·5	33·4	37·0	45·3	54·5
Civil Engineering works								
Roads		0·4	0·5	0·8	3·3	4·5	1·7	2·5
Bridges		0·2	0·5	0·3	0·8	0·6	0·5	0·3
Maintenance of roads and bridges		0·9	1·0	1·3	1·6	1·8	2·0	2·3
Railways		1·7	2·1	2·0	2·3	2·5	2·5	2·7
Ports, harbours and rivers		0·1	0·1	0·2	0·3	0·5	6·0	1·0
Waterworks and wells		0·8	1·0	1·0	1·0	1·3	1·6	1·6
Other		1·2	2·2	1·7	1·4	2·8	1·0	3·1
Total		5·3	7·4	7·3	10·7	14·0	15·3	13·5
Vehicles								
Road		2·8	4·6	5·0	5·0	6·8	9·7	8·1
Rail		0·7	0·4	0·6	1·4	2·6	1·6	2·1
Water		0·8	0·8	0·9	0·6	0·5	0·5	1·3
Air		0·1	0·5	0·4	0·3	0·9	0·5	0·6
Total		4·4	6·3	6·9	7·3	10·8	12·3	12·1
Plant, machinery and equipment		6·7	10·9	11·9	11·3	13·6	17·8	19·3
Plantations and mineral explorations		1·5	1·9	2·5	3·6	4·4	3·5	5·4
Total of above		34·3	50·0	54·1	66·3	79·8	94·2	104·8
Land clearance by peasants (imputed)	3.5	3·5	4·0	4·7	5·2	5·9	7·0	8·2
Total	30·8	37·8	54·0	58·8	71·5	85·7	101·2	113·0

TABLE VI

Gross fixed investment by type of assets at 1957 prices

£ million

	1950	1951	1952	1953	1954	1955	1956	1957
New buildings:								
Dwellings		17·5	23·3	25·5	29·4	32·3	36·9	41·9
Other		4·5	6·6	7·4	11·3	10·3	10·5	12·6
Total		22·0	29·9	32·9	40·7	42·6	47·4	54·5
Civil engineering works:								
Roads		1·1	1·5	1·8	5·2	6·6	2·0	2·5
Bridges		0·4	0·8	0·5	0·9	0·6	0·5	0·3
Maintenance of roads and bridges		1·8	1·8	2·2	2·4	2·2	2·2	2·3
Railways		5·0	5·8	4·3	3·8	3·7	3·0	2·7
Ports, harbours and rivers		0·2	0·2	0·3	0·4	0·6	6·4	1·0
Waterworks and wells		1·4	1·4	1·3	1·2	1·5	1·7	1·6
Other		1·6	2·6	2·1	1·7	3·1	1·0	3·1
Total		11·5	14·1	12·5	15·6	18·3	16·8	13·5
Vehicles:								
Road		3·7	5·2	5·8	6·0	7·8	9·9	8·1
Rail		0·9	0·4	0·7	1·7	2·9	1·7	2·1
Water		1·0	0·9	1·1	0·7	0·6	0·5	1·3
Air		0·1	0·5	0·5	0·4	1·0	0·5	0·6
Total		5·7	7·0	8·1	8·8	12·3	12·6	12·1
Plant, machinery and equipment		8·6	12·0	14·0	13·6	14·9	19·1	19·3
Plantations and mineral exploration		3·7	3·8	4·2	6·0	6·3	3·9	5·4
Total of above		51·5	66·8	71·7	84·7	94·4	99·8	104·8
Land clearance by peasants (imputed)	8·2	8·2	8·2	8·2	8·2	8·2	8·2	8·2
Total		59·7	75·0	79·9	92·9	102·6	108·0	113·0

IV. SPECIAL PROBLEMS: METHODOLOGY

We now turn to the special problems with which we had to deal in our exercise. Discussion of our project with the potential users of our results in Government showed that almost invariably interest was centred on the following sets of questions: What is the national income per head? How does Nigeria compare with Ghana and other African territories? How much higher is our current standard of living than it was ten years ago? Which region in the country is least well off? In short, in the minds of Government officials the use of national income figures was to be dominated by welfare considerations, i.e. by international and intertemporal comparisons of welfare.

1. *The definition of product*

The design of national accounts depends to a large extent on how much we focus on measuring welfare or how much on providing a consistent time series. For measuring welfare we may have to define production in its widest sense to cover all output produced by members of the household whether for themselves or for other households. Prest and Stewart's estimates referred to a single year. In the absence of any figures for other years, their estimates for 1950–1 could not be expected to show the movement of the Nigerian economy. It did not, therefore, matter a great deal how large their estimate of the gross domestic product turned out to be. In our view, their focus on measuring welfare led them to the amusing but dubious exercise of measuring intra-household services by reference to the number of wives and the average bride price. We decided not to be unduly concerned with welfare questions, because we believed that an articulated and consistent time series would be more meaningful in Nigeria. We therefore defined production much more narrowly in our effort to keep subjective estimates and imputations to a minimum. All identifiable product was thus counted in our gross domestic product, including intra-household activity yielding marketable product, but excluding intra-household services of a general nature. Thus we eliminated the output of drummers, beggars, praisers and housewives – and, for purely statistical reasons, prostitutes.

2. *Valuation of agricultural production*

In valuing agricultural output we came up against the same problem in another form. First, Prest and Stewart had chosen

to weigh the output of farm crops by retail prices. Second, they chose to value food crops in their most processed form, not because these crops were sold in that form, but because it was considered desirable to extend the coverage of national income to include intra-household services. Third, they chose to use retail prices ruling in or near the place where the output was actually consumed.

Our decisions followed different lines. First, since we wished to focus on constructing a time series of agricultural output we decided that weighting by 'producer' prices was preferable to weighting by retail prices. Second, we had chosen to exclude intra-household services of a general nature and there was, therefore, no question of valuing farm output in its most processed form. Food crops were, therefore, accounted for in their natural state, except cassava which is sold as 'gari' (grated and baked cassava) in Lagos and Western Nigeria and as 'akpu' (fermented and strained cassava) in Eastern and Northern Nigeria. Third, it became evident to us that in the absence of firm figures of interregional trade in these commodities it would be unreasonable to weight farm output by prices ruling in or near the place where the output was actually consumed. We therefore valued the farm output of each region at a single price ruling in the producing region.

We were still left with the problem of selecting the prices to represent 'producer' prices. Ex-farm prices were non-existent and we had to resort to the more manageable expedient of taking for each crop for each year a simple average of the unweighted average of prices ruling over the year in representative markets in the main producing areas of each region. This procedure, it must be explained, introduced a certain downward bias in our figures. We were convinced that the value added by agricultural production is somewhere between our valuation at 'producer' prices and valuation at retail market prices. The former is too low because it treats all output as if it were sold in rural markets and the latter too high because it assumes that all output is sold in urban markets. However, it is arguable that even if price data were better it was preferable to keep down imputations to a minimum by adopting our procedure of single price valuation and by weighting, wherever possible, by rural farm prices ruling in the main producing areas of each region.

There is a distinction between marketed, marketable and non-marketable output. The first category would cover output in the cash economy; the second would cover output mainly in the agricultural sector, where a part of the output of each crop is sold and a part is withheld for domestic use; the third would consist predominantly of general services within the household. Prest adopted a definition wide enough to include the third category; we have been more ambivalent by counting marketable output in the agricultural sector, but only marketed output in all other branches of activity.

Take as another example our procedure in another branch of activity – forest products. If we used Prest's definition we would treat all firewood as part of the gross domestic product. We know, however, that in the rural areas firewood was there to be collected by anyone who so wished, and that no further effort was spent beyond that of collection. We decided to count only urban consumption of firewood as part of the gross domestic product. We were fully aware of the suggestion that this procedure would appear inconsistent with our treating the output of wild palm groves as part of the national income. We took the position that the two situations were not strictly analogous. We treated rural firewood as a free good because it was, in fact, free to any villager who cared to collect it from any bush; palm fruit, whether from wild groves or from plantations, is not free to anyone but to the owner of the land on which the trees stand.

3. *Transfer payments*

Some transactions are excluded from national accounts because they are regarded as transfer payments, for example purchase of old houses and gifts to beggars. Prest observed in 1957 that in Nigeria 'it is a recognized social necessity to hand money over to beggars',[1] and concluded that it is not indubitably true that this should be excluded from productive activity. Our judgement was that the so-called 'social necessity' is no stronger and no more necessary in Nigeria than elsewhere and that the Nigerian economy did not offer any special reason either in 1950 or 1960 for the position taken by Prest.

[1] A. R. Prest, *The Investigation of National Income in British Tropical Dependencies* (Commonwealth Papers, No. IV, London, 1957), p. 20.

4. *Capital formation*

Our estimates of gross fixed capital formation cover expenditures on new construction (excluding repair and maintenance), civil engineering works – roads, bridges, harbours, airfields, railroads, and waterways, vehicles – road vehicles (excluding bicycles and mopeds and personal cars), railway vehicles and rolling stock, aircraft and rivercraft, plant, machinery and equipment (including farm implements and sewing machines), mining (including oil), land development – plantations and peasant investment in agriculture. In the more mature economies the classification of goods into capital or consumer durables has been conventionally determined. In the final analysis the decision to treat them one way or the other must be arbitrary. The usual criteria – capital assets are expected to last for more than a year, to yield an income, or to be used for production – can be satisfied by a number of goods conventionally treated as durable consumer goods in the more advanced countries. We have, therefore, drawn the line arbitrarily to exclude from our capital formation estimates expenditure on bicycles and personal motor-cars (the proportion of expenditure on motor-cars which we treated as personal was derived from vehicle registration data). In our view what is important is that whatever convention is adopted the figures should be so displayed that any one who wants to should be able to rearrange them to suit his own convention.

TABLE VII

Gross fixed capital formation by type of assets at current prices (in £ million)

	1955		1956		1957	
Assets	Official series	New series	Official series	New series	Official series	New series
Vehicles	17·6	10·8	21·2	12·3	21·3	12·1
Plant, machinery and equipment	7·8	13·6	10·5	17·8	18·0	19·3
Buildings and other construction	48·8	51·0	62·0	60·6	62·6	68·0
Mining and plantation development	4·4	4·4	3·5	3·5	5·1	5·4
Total of above	79·3	79·8	97·3	94·2	107·1	104·8
Peasant investment in agriculture (imputed)	—	5·9	—	7·0	—	8·2
Total	79·3	85·7	97·3	101·2	107·1	113·0

In Table VII we show the Federal Department of Statistics' series for three years, 1955, 1956 and 1957, side by side with our new series. It will be seen from this table that the main differences between the official series and the new series occur in respect of vehicles, plant, machinery and equipment. These differences are due mainly to conceptual differences – our estimate of investment in vehicles is consistently lower than the official series, because we excluded bicycles and personal cars. Similarly, our estimate of investment in plant, machinery and equipment is higher because we have counted items of equipment, e.g. imported farm implements, which were omitted from the official series. We shall refer later to the method we adopted to measure investment in buildings, which yielded results strikingly close to the official figures.

V. SPECIAL PROBLEMS: STATISTICAL

There were problems which one could describe as purely statistical rather than methodological. Our estimates of the output of agriculture were, to say the least, quite shaky; those of livestock sheer guesses. Difficulties arose from paucity of records, and from the strange attitude within Ministries that if exact figures did not exist no attempt should be made to estimate.

1. *Estimation of output of agriculture*

We can illustrate our problem by reference to two branches of activity: agriculture and construction. On agriculture there were the following sets of data: for 1950 we had the Report on the Census of Agriculture; for 1957 we had only the results of a sample survey carried out in Northern Nigeria for different groups of provinces from 1955 to 1957, but such that a different group was surveyed each year and no province was surveyed more than once; there was also the result of a limited sample of villages in Western Nigeria in 1958 and, of much more doubtful usefulness for our purpose, of villages in Eastern Nigeria in 1959. Within the limits imposed by these difficulties we were able to estimate from the data on acreages and yields the output of each crop in 1950 and 1957.

For the intervening years it was obvious that interpolation on the basis of the 1950 and 1957 figures was out of question. In agricultural production interpolation is reasonable only if it

is based on detailed and reliable information on weather conditions or information on yields and changes in acreages under different crops. We found that the Regional Ministries of Agriculture kept records of crop and weather prospects prepared every quarter in respect of each agricultural province by field agricultural officers. However, these reports were highly subjective and did not lend themselves easily to quantification. We had no choice but to use them to quantify changes in output in the period 1951–6. Since foodcrop production dominates the accounts, it would be clear that in the national accounts for 1951–6, one of the softest series refers to the most important branch of activity.

It would be of interest to compare our figures for 1950 with those of Prest and Stewart in this branch of activity. Table VIII below shows that our estimate is some £36·1 million lower than the Prest – Stewart figures.

TABLE VIII

Crops grown primarily for domestic use: comparison with Prest's estimates for 1950

	Quantities (million tons)		Prices (£ per ton)		Values (£ million)	
	Prest	Revised estimates	Prest	Revised estimates	Prest	Revised estimates
Root crops:						
Yams	15·2[1]	6·63	4·6[1]	16·8	70·6	111·5
Cassava	19·7[1]	3·61	4·7[1]	6 8	93·2	24·5
Cocoyams	0·78	0·60	8·4	8·4	6·4	5·1
Total					170·2	141·1
Cereals:						
Guinea-corn	1·81	1·38	20·5	19·6	37·1	27·1
Millet	0·93	0·92	19·5	18·7	18·1	17·2
Maize	0·62	0·47	20·5	20·5	12·7	9·6
Rice	0·19	0·19	47·4	44·8	9·3	8·7
Total					77·2	62·6
Kolanuts		0·08		46·0	4·7	3·9
Beans	0·29	0·07	23·3	27·1	6·7	2·0
Other food crops					15·4	18·5
Total					274·2	228·1

[1] The quantities of yam flour and gari given in Prest, *National Income of Nigeria* (H.M.S.O., 1953), Table 2, have been re-calculated so as to refer to the natural products, yams and cassava. The prices shown are the result of dividing the values by the adjusted quantities.

This is explained by the differences in our estimates of quantities and in the prices used for valuation. Take rootcrops as an example. Our figures refer to the natural products – yams and cassava – rather than to their most processed equivalents – yam flour and gari. We have adjusted Prest's quantities to conform to our procedure. Second, our quantities differ from Prest's also because we have had access to data which were not available to him and his colleague. It should be recalled that they completed their fieldwork before the Report of the Census of Agriculture (1950) was published and that although they had some of the preliminary Census data they did not have the benefit of the later criticism of the Census Report which became available after their work was published. Third, what we have shown in Table VIII as Prest's prices are obtained as a result of dividing Prest's values by the adjusted quantities.

2. *Investment in building and construction*

When we came to estimate gross investment our methods were generally similar to those used by the Federal Department of Statistics to produce the official series. The major point of departure was in respect of building and construction. The official series estimated investment in building from the supply side – investment in new construction was obtained from a presumed ratio between imports of cement and the gross output of the building and construction industry. The global estimates obtained by this method could not, however, be broken down by class or type of building. We decided to estimate from the demand side and soon discovered that the sources available were not uniform throughout the country – a problem which is, however, not unique to Nigeria.

New construction can be measured by reference to work done or paid for, contract awards, building permits, or other sources. In Nigeria, Government records show work done or paid for by Government, so that public buildings can be estimated from Government accounts. Contract awards are not a helpful guide, because the records are scanty and are available only in the public sector. The coverage of permit issuing localities varied from region to region. In Lagos, the coverage is almost complete and, aided by supplementary information from the Government Valuation Unit's records, we were able to estimate the gross investment in private residential construction. In

Western Nigeria, although permits were not issued prior to the start of building, there was a widespread system of control through the requirement that each prospective home builder was to submit a building plan or sketch. These plans were available for many local authority areas. Adjustments had to be made for coverage, for the lag between submission of plan and completion of building and for contravention of the plan. In Eastern Nigeria, there were five permit-issuing townships, only three of which maintained usable records. It was, therefore, necessary to conduct a census of private dwellings with the help of the Ministry of Local Government. In Northern Nigeria we abandoned the attack from the demand side and reverted to the cement calculation for a global estimate of investment in buildings using cement, but we estimated mud buildings by reference to population.

3. *Census of private buildings in Eastern Nigeria, 1957*

It would be of interest to describe briefly how we tackled the problem of tabulating investment in private dwellings in Eastern Nigeria. This represented a first attempt to estimate the stock of private capital in the form of buildings. We were assisted by local government authorities – there were about a hundred of them. Each District Council was requested to tabulate on our behalf on forms supplied by us the following information in respect of each building in each ward: year of completion, year of commencement if this is known, materials used for walls, materials used for roof, and number of rooms. Churches, schools, hospitals, halls and buildings owned by major firms, missions, local authorities, regional and federal governments were excluded.

There were complete returns – i.e. certified as complete by secretaries of councils – from sixty of the one hundred district council areas in the Region; incomplete returns were received from six areas; and no returns were submitted for thirty-five areas. We then tabulated the returns to show the number of buildings completed each year, the number of rooms, and type of building classified by type of materials used for walls and roof.

We then made imputations for the areas for which no returns were submitted and for the wards for which we had incomplete returns. In each case we relied on the advice of the local authorities and on our estimates for neighbouring areas or areas which

in our view had similar experience of building activity. As a result we had a quantity series for the Region as a whole.

We must point to the dangers which one must expect in an enumeration of this kind. It was impossible to check the accuracy of the enumerators' records; the enumerators had no previous experience of this type of work – this was the first major exercise of this kind in Nigeria. Finally, house-owners had to rely on their memory to recall when the building was completed. We believe that the estimates have a downward bias for the earlier years and an upward bias for the later years.

4. *Value added by trade*

How to measure the contribution of trade presented us with an almost insoluble problem. In a country in which everyone engages in some petty trade [1] this might assume quite a large significance. The value added by trade is made up of the following elements: value added by trade in exports, value added by trade in imports, and value added by trade in goods produced and consumed in Nigeria. Of these three components, trade in exports presents no serious problem. For goods handled by the marketing boards the value added by trade is represented by the difference between marketing-board receipts and payments for produce. Other exports which represent a very small fraction of the total can be estimated from the export values (f.o.b.) and identifiable expenses – transport, and payment to producers.

The problem with trade in imports is to determine the margins between c.i.f. values and retail values, bearing in mind the long chain of distribution between the wholesaler and the final consumer. We could not follow this chain to its ultimate end nor could we tell the quantities which moved from port to retail points in the country. There is still much room for improvement, and our figures shown in the rows of national expenditure on particular imports beg this question. In respect of commodities produced and consumed in Nigeria we can separate trade in local manufactures, e.g. beer and cigarettes, from trade in agricultural foodcrops. The former presented no difficulty, as factory records offered us detailed information. In respect of foodcrops we had no estimates of total quantities traded – in the absence of estimates of home consumption – nor had we

[1] cf. P. T. Bauer, *West African Trade* (Cambridge University Press, 1954), Chap. 2.

firm estimates of movements of crops from region to region. We adopted the simple device of valuing all such output as if they were all purchased in the producing region. In the end our estimate of trade was obtained as a residual figure incorporating within it the errors in all other estimates.

5. *Inventories*

One serious omission – again for purely statistical reasons – was that we did not include any estimate of inventory changes except the changes in marketing-board stocks. Changes in stocks of imported merchandise and foodcrops (this latter can be taken to be quite negligible because of the high degree of perishability and lack of adequte storage facilities) were therefore left out of account. It is quite clear that in a country apparently growing as fast as Nigeria, inventory changes would constitute a significant element of capital accumulation. It is to be hoped that future workers in this field will fill this gap in our work.

6. *Peasant investment in agriculture*

There is one more problem to which we wish to refer. After the publication of Prest and Stewart's estimates for 1950–1 and of the International Bank Mission's Report on Nigeria, Peter Bauer raised the criticism that substantial peasant investment in agriculture had been left out of account in both works.[1] We had tried to accommodate Bauer's criticism. Peasant investment takes the form of new seedlings, clearing and preparing new land, purchase of new farm implements, and inventory accumulation. We have already referred to our inability to estimate changes in inventories of farm crops except for the changes in stocks held by marketing boards; our allowance for farm implements was taken from our estimates of the output of blacksmiths. With regard to new farm land, our method was to estimate peasant investment by reference to yearly increases in the total cultivated acreage and to the average cost of clearing and preparing an acre of new farm land.

7. *Calculation of real national income*

When we came to derive estimates of real income a new crop of problems emerged. First, what should we use as our

[1] P. T. Bauer, 'Economic Development of Nigeria', *Journal of Political Economy*, LXIII, October, 1955.

base year, 1950 or 1957 (our terminal point) or some year in between? We finally settled on using 1957 as the base year for two reasons:

(*a*) price data were much better for the last year than for any other year in the series; and
(*b*) if the series was to be continued, it seemed desirable to use 1957 so that with the continuation of the series our base year would become more central.

Second, we were quite eclectic in our choice of deflators, our guiding principle being what could be continued easily in future years. We switched quite frequently from quantity to price deflators depending on which was the more manageable. In some cases we were prepared to adopt very crude devices in the interest of simplicity. Take, for example, Government expenditure. Much of this is on wages and salaries, but a not inconsiderable part is on goods (some imported) and other services. We were confronted with a choice of deflating the components separately or of deflating the aggregate sum by reference to either a simple index or a composite index. For the sake of simplicity we deflated the aggregate Government expenditure by means of an index of wages paid to general labour. Again, take exports and imports. Here we found it possible to strive for elegance. If we agree that the real value of exports is the amount of imports we can buy with it, then we should deflate exports by means of an index of import prices. There is much to commend this view, since what enters into the expenditure on gross domestic product is the difference between exports and imports. Although it was easier to deflate both exports and imports (or merely the difference) by reference to the same import index, we chose the more laborious method of deflating them independently.

Third, it was not always easy to find homogeneous units for our quantity indices. What, for instance, should we use to construct an index of the quantity of vehicles purchased – horsepower, cylinder capacity, tare weight, or number? We tried the following pairs of quantity indices: one in which we assigned an equal weight to each vehicle, one in which we used average cylinder capacity to weight vehicles of each make, and one in which we used the tare weight to weight vehicles of each class. The results were so similar that there is no reason why a

simple index of the number of vehicles purchased should not suffice in the future. When we came to roads and bridges we had to get around the fact that not all roads of uniform surface or bridges of uniform structure have the same breadth of carriageway. We, therefore, reduced all roads of given surface to units of foot-miles (a foot-mile being a road one foot wide and one mile long) and all bridges of given specification to units of foot-runs (a foot-run being a bridge one foot long and twelve feet wide). In most branches of activity, however, we were able to construct quantity indices without resorting to such esoteric units.

VI. CONCLUSIONS

There is already a shift in many African countries from calculating national accounts for a single year to compiling a time series. This development has been accompanied by a similar shift of emphasis from measurement of welfare to a presentation of the dynamics of the economy. There is, therefore, very little justification for defining production so extensively that we are obliged to make very large imputations.

We have not faced directly the question of measuring the so-called subsistence output. In agriculture, for instance, the real value of output may be rising over time because increasing proportions of the output are brought to the market although the total output may not have risen. It is then argued that without an estimate of subsistence output we would confuse increased monetization of activity with increased physical output. This argument is untenable, because we can get at total production directly through acreage and yield figures. Once we have reasonable figures of total output, the only virtue in measuring subsistence production is to determine what prices to use in valuing output – what weights to assign to ex-farm prices, rural and urban market prices.

We have attempted three new exercises which should be improved upon in future years. First, our series at constant prices should be kept up. The Federal Department of Statistics has built up unusually good price data; additional work would be required to maintain a useable quantity series in some branches of activity. Second, our census of industrial production should be extended – we covered all manufacturing establishments employing ten or more persons. Third, our census of

private residential construction in Eastern Nigeria, and our tabulation of building-permit data in Lagos and Western Nigeria should be carried forward. We failed, however, to provide reliable estimates of internal trade, because with the resources available to us we could not undertake a detailed survey of the movement of merchandise (imports and home-grown crops) within and across regional boundaries. We believe that this shortcoming in our work can be rectified. If these facets of the work are strengthened, sufficiently detailed and useful information will become available to the planning agencies in the country.