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CONSUMPTION OF EXOTIC CONSUMER GOODS AS AN INDICATOR OF ECONOMIC ACHIEVEMENT IN TEN COUNTRIES OF TROPICAL AFRICA*

Persons acquainted with the course of events in tropical Africa during the past fifty years cannot but be impressed by the great changes that occurred during the period of European rule now ending. Societies that the new African states seized or inherited from their European masters are changed almost beyond recognition from what they were when the European take-over occurred. The once barren and sparsely populated shores of Stanley Pool are occupied by two modern cities with elaborate port facilities, railroad stations, airports, splendid buildings and boulevards, and most appurtenances of the capitals of Western states. City states of the Yoruba, fiercely independent villages of the Ibo, and proud emirates of the Hausa are linked together by road and rail, by trade, and now by nationality. The aggressive Fang have become cocoa farmers, and even the once-feared Masai are beginning to experiment with the sale of cattle and the growing of food crops.

Economic change in Africa appears to have been as great or greater than changes in other human activities. Production of crops and minerals for sale abroad, availability of a wide range of exotic articles, greatly increased mobility of men and goods, work for wages, private ownership of land, and widespread familiarity with money and its use have profoundly altered the traditional economic order. They have undoubtedly also increased the economic product and the economic well-being of the people of tropical Africa, especially since the end of World War I. So much is clear, but the amount of the increases in well-being and productivity, and the relative effectiveness of varying policies, investments, and innovations in promoting economic growth are largely unknown.

National accounts for the industrial countries have shown their worth in formulating national policies and in understanding the economic processes

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themselves. But national accounts can only be constructed when a considerable body of reasonably reliable economic statistics already exists, and they can have meaning only when the economy they measure is knit together closely enough so that all economic activity can be described by a common measure, typically money, but conceivably some other sort of quantitative numeraire. In Africa neither of these conditions is met. Statistics are notoriously defective, and a great and unmeasurable part of economic activity is conducted outside the money economy (*1*, pp. 670–75).

The need for quantitative information about the underdeveloped countries of the world has been stressed by most economists who have grappled with their problems. Kenneth J. Arrow, in his presidential address before the Econometric Society in 1956, after pointing out that "economic statistics . . . are the least developed precisely in those underdeveloped countries which have the greatest felt need for economic plans," argued that in such countries the marginal productivity of investment in better statistics might perhaps be higher than almost any conceivable alternative (*2*, pp. 523, 530).

In discussions in the *Review of Economic Studies* in 1952–54 about the usefulness of national income estimates in underdeveloped countries where statistical sources are very scarce, Dudley Seers, thinking primarily of the British African territories, suggested that first priority should not be given to construction of national accounts but instead to answering questions about specific aspects of a country's economy. In particular, he criticized the use of national income estimates (1) to compare "total product and some economic category," (2) to make international comparisons, and (3) to indicate changes in a single country over time. His criticism of the three kinds of comparisons was based essentially on the difficulties of assigning commensurate values to an economic product in market and nonmarket activities in two different countries, or even two regions within one country, and, over time, in a country whose economy is undergoing rapid structural change (*3*, pp. 160–63).[1]

Seers's recommendation that a body of statistics specific to the principal economic magnitudes be built up without concern about construction of over-all accounts tended to draw attention away from his explication of difficulties arising from the problem of valuation in national accounts for countries like those of tropical Africa. There can be little dispute about these. The indicator presented in this study attempts to avoid the problem of valuation by calculating only in terms of physical quantities of commodities that appear to occupy similar positions in the expressed demand of the populations studied.

The only reliable quantitative measures over time that are closely related to aggregate economic performance of the African countries are statistics of international trade. For many countries even estimates of population are unreliable, and data for years prior to 1948 are extremely defective.

Statistics of international trade are available for most African countries bordering the sea from about 1920 to date, although data for certain years are missing

[1] Seers's original article provoked comment by A. R. Prest, who, with I. G. Stewart, had recently completed an estimate of the national income of Nigeria, and a later comment by W. C. Hollinger, and by Stewart (see *4*, *5*, *6*, *7*). In a recent paper presented before the International Statistical Institute Conference (Aug. 28–Sept. 7, 1961), Helen C. Farnsworth discusses in some detail the difficulties involved in introducing estimates of production of food crops into national accounts (*8*).

in some published series. They probably provide fairly complete coverage of imports and exports of the political units for which they were compiled because much the largest part of African international trade has been with non-African countries over sea frontiers. Records of trade over the long and poorly policed land frontiers are incomplete, but this trade is relatively small. It is possible to obtain reasonable approximations of imports and exports for many of the African territories over a period of about 40 years.[2]

Changes in total value of exports over time provide a measure of one part of economic activity; in economies like the African ones, where most commercial activity is directed toward the production and marketing of agricultural and mineral products for sale in international markets, the value of exports makes up a preponderant part of market-oriented production. But the value of exports alone can hardly serve as a measure of the economic well-being of a country's inhabitants, and it may provide a biased estimate of changes in national product if production for export is achieved partly at the cost of production for domestic use.

Statistics of imports may be a better measure of economic welfare to the extent that imported goods provide services directly for a country's inhabitants. But the composition of imports can vary significantly from country to country and from decade to decade, sometimes from year to year. Capital goods, which may or may not eventually yield a flow of goods and services to domestic consumers, can account for a large part of total value of imports, and luxury consumer goods destined for the use of a small elite (in Africa under foreign rule an expatriate elite) may swell the import figures. Comparisons between countries and over time are also hampered and distorted by differences in market values, by difficulties of comparing the purchasing power of national currencies, and by arbitrary formulas for valuing commodities in customs statistics.

If import statistics are published in detail sufficient to permit identification of commodities used by a fairly large part of the consuming population, and if statistics of physical imports of the commodities can be aggregated without resort to value measures, it should be possible to construct from them an indicator of economic well-being, and in that sense of economic progress. This paper is a preliminary report of an attempt to construct such an indicator for 10 countries of tropical Africa.[3]

IMPORTED GOODS A MAJOR COMPONENT OF AFRICAN STANDARD OF LIVING

Tropical African consumers are fed by domestic producers, and housing, of course, is also provided from home production. Clothing, however, is mostly made from cloth of foreign origin, and a very large part of all other consumer goods comes from overseas. In all of the African countries there seems to be a strong general craving for the industrial products of the Western world.

[2] Some of the reporting units included more than one of the new African nations: the trade of the former Belgian Congo and of Ruanda-Urundi was pooled; the trade of the eight countries which until recently made up French West Africa was most often reported only in aggregate; the four countries which were French Equatorial Africa were similarly grouped together; and more recently the foreign trade of Nyasaland and the two Rhodesias has been treated as that of one country, the Central African Federation.

[3] This approach was first suggested by M. K. Bennett's use of nonmonetary indicators of consumption levels in 9.

Imperfect though it may be, our knowledge of per capita income in countries of tropical Africa indicates substantial intercountry variations. Estimates published by the United Nations suggest that around 1956 per capita income might have been three times as high in Ghana as it was in Uganda (*10*). Countries like Nigeria, Sierra Leone, the Republic of Congo (Léopoldville), the former Federation of French West Africa, and Cameroon appear to lie between these two extremes. As a result, per capita consumption of imported consumer goods for which the income elasticity of demand is high should be expected to differ significantly from country to country.

Some commodities have been major imports and the desire for them a principal stimulus to economic production for sale ever since the first European trading vessels visited the African coasts. In particular, cloth and implements and utensils of copper and iron have consistently been mainstays of European, American, and Asian traders in their transactions with Africa. D'O. Dapper, in a detailed description of the West African coast published in 1686, provides lists of the trade goods considered then to be most suitable for African stations from the Gambia to Angola (*11*). The list he gives for the Gold Coast suggests the nature of African demand at that time (*11*, p. 300):

Silesian cloths, half-bleached
Hessian cloths, unbleached
Secondhand bed sheets
Chaplet beads with crosslike shape
Cyprus cloaks
Red, blue, yellow, and green La Rochelle cloth
Turkish carpets
Reddish Leyden etamine (cloth)
Leyden blankets, made of white, red, and green frisé cloth
Turkish billhooks and sabres
Clothing made of yellow and red etamine (cloth)
Harlem common clothing
Stewing bowls
Barber bowls
Large Scottish pails, two fathoms in circumference
Burnished cauldrons
Hammered dishes with figures of men
Hammered buckets
Copper lockers
Trumpets
Copper bracelets
Tin vats
Dishes and bowls
Very deep bowls without ears
Long and short fishing lines
Lead, flat and rounded in the shape of organ pipes
Spanish wine
Sarsaparilla
Iron rods weighing ten quintals the 32 or 33
Amersfort axes
Cutlasses
Looking glasses
Venetian coral
All kinds of Venetian foils
Acori, a kind of bluish coral
Sheepskins
Striped and checkered calico
Round copper pots, tinned inside, to extinguish fires

In the seventeenth century woolen fabrics were a major import; in the twentieth century their place was taken by cotton cloth, later supplemented by synthetic fabrics. In the years 1955–57, cotton and synthetic piece goods accounted for 6–17 per cent of the total value of imports in the ten countries considered in this study, and amounted to 12 per cent or more in seven of the countries. No other group of consumer goods was as important in the 1950's, but in each of the African countries there was effective demand for a fairly extended list of consumer

goods of foreign manufacture, including certain foodstuffs, such as wheat flour, sugar, and preserved meat and fish; commodities for household use like soap, utensils, and lamp oil; and consumer durables like sewing machines, bicycles, and radios.

The first assumption on which our index was constructed was that a collection of goods could be found for which the demand functions were similar in a number of African countries, and that these goods stand high on the preference scale.

Imported or exotic consumer goods, of course, make up only one component of the level of living in African countries. To compute an over-all index of level of living, weight should be given to measures of food supply, health, education, housing, conditions of employment, recreation, entertainment, and perhaps other more intangible aspects of existence (cf. *12*). Evidence on these other components is not good, but on the basis of a variety of sources—family budget and diet studies, descriptions of village and urban life, the character of agriculture and other production for home use, and other activities of African life—there appear to be no gross variations from country to country, or at least no variations tending to offset significantly variations in consumption of exotic goods.[4] This is the second assumption made in constructing the index.

In constructing the index of imports of consumer goods, a set of 28 commodities believed to be generally desired and purchased was first selected. When statistics of imports were compared, demand for some of these appeared to differ, primarily because countries were under different metropolitan rule, and these were accordingly dropped from the index. But 18 commodities showed no regular variation with geography or political control; imports of the 18 varied more or less together, and it is assumed that they varied with the extent to which consumers were able to satisfy their desire for goods and services beyond those provided by the domestic economy.

If we assume, then, that demand functions are generally similar from country to country, and that variations in income are expressed primarily in purchases of a fairly uniform set of consumer goods, we should be able to obtain an indirect measure of consumer income by computing per capita consumption of a group of commodities representative of this set. Such an index should permit comparison of incomes among countries, and comparison over time.

The index presented here is for 10 countries in tropical Africa for the years 1955–57. It is presented now, before much attempt to press it backward over time, to invite the critical scrutiny of persons who know the African countries well and can attest to its apparent reliability or unreliability. If the indicator passes this examination, we intend to compute similar ones for a series of years as indicators of economic growth.

SELECTION OF COUNTRIES AND COMMODITIES

The first step in the investigation was to select the countries and commodities to be included. The purpose of the study, to obtain an indirect measure of con-

[4] A general study by B. F. Johnston and Hiromitsu Kaneda of the income of elasticity of consumer expenditures in tropical African cities shows considerable variation in the composition of expenditure on foodstuffs—particularly in the starchy-staple ratio—but these variations may be largely explained by differences in the income groups which the surveying agencies selected for study (*13*).

sumer income for a number of countries in tropical Africa, was to be accomplished by computing per capita consumption of a set of imported commodities on the assumption that two characteristics of African consumers' behavior are true: (1) that a sort of Duesenberry "demonstration effect" influences African consumers' behavior more or less alike, so that a standard pattern and intensity of demand for most exotic commodities tends to prevail in countries of tropical Africa; and (2) that a set of imported consumer goods can be isolated, the consumption of which is primarily influenced by, and is sensitive to, the level of consumers' real incomes. The criteria used in selecting countries and commodities follow from this purpose and these two assumptions.

For the commodities, the pertinent criteria are that they should be generally desired, that they should be imported, and that they should be used primarily for personal consumption. In fact, local production and industrial use of some of the commodities selected are sizable in a few countries. This has been taken into account.

Countries with significant minorities of non-Africans (Asians and Europeans) were excluded from the study in the belief that the large per capita purchasing power of these expatriate groups would influence unduly the import of consumers' goods.[5] It was also desired to keep the number of countries small in this first trial run. Of the original group of 12 countries or groups of countries selected for study, Togo and Dahomey were rejected because of inadequacy of the data. The final list was as follows:

Senegal-Mali-Mauretania[6]	Sierra Leone
Ivory Coast	Ghana
Cameroon	Nigeria
Guinea	Uganda
Congo Customs Union	Liberia

Adequate comparative data can be obtained for all of them with relative ease, and they satisfy the selection criteria.

Objective information supplemented by judgment, availability of comparative data, and the criteria stated earlier determined the list of imported commodities. Quantitative information concerning the consumption of imported commodities in African households found in recent surveys of food consumption in a number of urban centers and in a few rural areas in the 10 countries listed above was used as a guide in the process of selection. The Abidjan survey illustrates the kind of information provided by these surveys (Table 1). It is especially convenient since it explicitly distinguishes imported items from domestic goods and gives their relative importance in the average family budget. Slightly different lists can be derived from other consumption surveys.

Not all of the 38 commodities enumerated in Table 1 could be included in the investigation, nor was it intended that they should be. Tea and wine were omitted because their consumption seemed to be related to consumption patterns in the

[5] In fact, the number of expatriates in the countries of tropical Africa, even in Kenya and Southern Rhodesia, is so small that their influence on demand for the commodities included in the study could not have affected the results materially.

[6] Considered as a single group because official trade reports do not give any breakdown for the countries in the group.

TABLE 1.—RELATIVE IMPORTANCE OF EXOTIC CONSUMER GOODS IN ABIDJAN FAMILY CONSUMPTION 1956*

(Expenditure per 10,000 francs of total consumption expenditures)

Commodity	Expenditure	Commodity	Expenditure
Imported food:		Clothing:	
Meat, fresh and canned	15	Cloth, dresses	387
Sardines, canned	24	Shirts, pants	39
Rice, imported	353	Skirts	59
Milk	60	Underwear	72
Butter, margarine	6	Shoes	53
Cheese	2	Other clothing	14
Wheat and flour (bread)	143	Children's clothing	60
Sugar	44	Children's shoes	5
Spaghetti	8	Clothing material	94
Biscuits	3	Durables:	
Couscous meal	6	Radio sets, records	62
Tomatoes	26	Bicycles	112
Other vegetables	7	Watches	14
Drink and tobacco:		Household utensils	62
Tea	10	Others	209
Coffee	16	Miscellaneous:	
Wine	251	Kerosene, candles	120
Beer—European type	102	Paper	4
Imported spirits	30	Books	2
Tobacco	263	Medicine	104
		Soap	124

* Data from Territoire de la Côte d'Ivoire, Ministère du Plan, Serv. de la Stat. et de la Mécanographie, *Les Budgets Familiaux des Salaires Africains en Abidjan, Août–Septembre 1956* (August 1958), p. 103. These relatives were destined to serve as weights for an index of retail prices.

metropolitan countries, and hand tools because they could not be isolated clearly in import statistics. Inclusion of rice was contemplated, but because several of the West African countries have a large domestic production for which estimates are untrustworthy, when they exist at all, rice was excluded. The final list includes 18 consumer goods:

Food:

1. Canned meat
2. Canned fish
3. Evaporated milk
4. Wheat flour
5. Sugar

Drink and tobacco:

6. Beer
7. Tobacco

Clothing:

8. Cotton fabrics
9. Synthetic fabrics
10. Shoes

Durables:

11. Sewing machines
12. Radio sets
13. Bicycles
14. Watches and clocks
15. Household utensils
16. Iron sheets

Miscellaneous:

17. Lamp Oil
18. Soap

TABLE 2.—RELATIVE AVAILABILITY PER CAPITA OF 18 IMPORTED CONSUMER GOODS IN 10 COUNTRIES OF TROPICAL AFRICA, 1953–57*

(Per cent of average, except column 1)

Commodity	Average amount[a]	Ghana	Ivory Coast	Sierra Leone	Senegal-Mali-Mauretania	Cameroon	Uganda	Congo Customs Union	Liberia	Nigeria inc. Br. Cameroons	Guinea
Food:											
1. Canned meat	106	391	85	88	74	109	15	101	83	23	31
2. Canned fish	552	311	79	228	41	88	1	55	162	14	22
3. Evaporated milk	391	199	158	137	146	94	30	35	113	34	54
4. Wheat flour	4,108	154	203	100	196	117	30	54	22	27	97
5. Sugar	3,660	140	96	96	221	34	266	40	21	35	50
Drink and tobacco:											
6. Beer	3,345[b]	95	126	124	64	185	45	225	54	33	50
7. Tobacco	444	63	93	95	95	125	157	76	166	82	48
Clothing:											
8. Cotton fabrics	998	185	120	133	170	57	42	76	60	67	91
9. Synthetic fabrics	445	282	105	156	82	51	109	40	19	123	31
10. Shoes	221[c]	179	80	181	193	39	44	105	74	75	30
Durables:											
11. Sewing machines	(1,252)[d]	200	100	104	74	181	44	113	93	73	17
12. Radio sets	(1,736)[d,e]	159	136	125	58	...[f]	135	85	...[f]	71	30
13. Bicycles	(5,241)[d]	97	195	43	104	66	210	119	16	89	62
14. Watches and clocks	(11,493)[d]	284	86	166	42	79	58	70	77	116	22
15. Household utensils	596[g]	159	149	137	71	94	16	49	...[f]	80	145
16. Iron sheets	2,082	121	147	149	95	142	98	63	50	65	69
Miscellaneous:											
17. Lamp oil	3,831	142	222	124	67	114	89	52	69	48	74
18. Soap	1,579	183	180	62	101	94	159	93	40	52	36
Index A[h]	...	186	131	125	105	98	86	81	73	62	53

* Computed from Appendix Table II. Average amounts in parentheses are per million inhabitants, rather than per thousand.

[a] Kilograms per thousand inhabitants except as noted [b] to [d].

[b] Liters per thousand inhabitants.

[c] Pairs per thousand inhabitants.

[d] Number per million inhabitants.

[e] Average of eight countries.

[f] Included at the average (100) in the totals for all commodities.

[g] Average of nine countries.

[h] Sum as per cent of average of sums (per cent of 1800).

Though no precise percentage can be given, the expenditure on this group of commodities probably represents a small share of total family expenditure (15–20 per cent in the Abidjan survey). In rural areas, the share would be even smaller. But, with respect to most of these commodities, consumption is sensitive to income in all 10 countries. Corrugated iron sheets, although not strictly a consumer good, were included in the final list because they are widely used as roofing material for houses in towns and in prosperous rural areas. They are also used, of course, for commercial and industrial buildings; we do not know what part of the total available supply is employed in each use.

The years 1955–57 were selected because, when the study was begun, they were the most recent ones for which trade reports were available. By 1954 or 1955, all 10 countries had finally adopted either the United Nations Standard International Trade Classification or the Brussels Tariff Nomenclature in officially reporting their imports and exports. Though detailed breakdowns by commodities do not coincide exactly for all 10 countries, adoption of the international classifications tremendously improved the intercountry comparability of trade statistics. For those countries in which some of the commodities included in our set are produced locally, there was an additional reason for choosing the latest years possible. Statistics of manufactures in the African countries are still incomplete and sometimes only approximate. They have, however, steadily improved over the years; the more recent the period, the better the data are. A three-year average was used in order to reduce the effect of transitory influences, and in particular, to average out the effect of changes in stocks.

THE INDEX

Table 2 presents calculations of the relative availability per capita of the 18 commodities in the 10 countries; the averages of these relatives for each country are designated Index A. (Total supplies of each of these commodities, in metric tons and quantities per capita, are shown in Appendix Tables I and II.) In constructing the relatives and the index, "supplies" substitute for "consumption." They are the sum of net imports and domestic production without allowance for waste, changes in stocks, or industrial use. Adjustments required to take these three factors into account would probably affect the totals little. Losses and waste tend to be small, and by taking a three-year average the effect of stock changes is minimized. For most commodities personal consumption is the exclusive final use, although industrial and commercial use of iron sheets and "lamp oil" may be substantial. Statistics of available supplies are probably the closest approximation of consumption that can be achieved with the existing data.

Conversion of total supplies into supplies per capita may introduce greater errors. Recent population censuses of Nigeria, Ghana, and Guinea showed the standing estimates to be as much as 20 per cent too low. We can only hope that the latest counts provide reasonably good approximations of the true magnitudes.

By making the comparison in terms of physical quantities we have avoided distortions resulting from differing market values in the various countries and from varying arbitrary valuations of commodities in customs statistics, and have also eliminated the problems of converting varying currencies into a common

measure. Aggregation of these nonadditive physical quantities is achieved by expressing a country's imports of each commodity as a per cent of the average (unweighted) imports of that commodity by all countries.[7]

The foregoing procedure implicitly assigns weights[8] to each commodity in proportion to the variability in its consumption among the 10 countries and without regard to its relative value or to its relative importance in domestic family budgets. Are we justified in using the same set of weighting coefficients for each of the 10 countries and in using a procedure that weights each commodity by its variability?

Consumption of imported consumer goods is influenced by a number of factors, among which income, price, taste, and trade organization are the most important ones. Earlier the assumption was made that for the set of commodities analyzed, income is the primary determinant of consumption. In another sense, we are assuming that consumption of each commodity is in itself income. If our earlier assumptions about the nature of demand in these countries are right, then reality would not be done too much violence by use of the same set of weighting coefficients for all 10 countries.

We could have weighted each commodity by an estimate of average price in the 10 countries, but we would then have reintroduced just the kinds of value problems that the indices are intended to avoid. Prices vary considerably from country to country and from market place to market place. Nor is there reason to believe that consumption of cotton fabrics, say, is a better indicator of income than consumption of canned meat because the value of cotton fabrics purchased is 20 times the value of purchases of canned meat (see Table 4). Cotton textiles are purchased in some amount by most consumers; canned meat, although generally desired, is usually bought only when income is high enough to permit enjoyment of something more than the basic necessities. Consumer goods can probably be arranged in a progression or hierarchy, with a basic set that is purchased by most persons, and progressively higher-ranking commodities which are purchased with each increase in income, or which become a part of the standard, if not the level, of living as income rises. This difference is likely to apply to a wide set of commodities, the commodities with highest variability being those that are most responsive to changes in income (see below, p. 52). By permitting them to assume greater weight we are in effect making the index more sensitive to changes in income. Measures of the dispersions of the relatives indicate that the relative influence of commodities ranges from one to three, the standard deviation of canned meat being about three times that of tobacco or iron sheets (Table 7).

The index is intended primarily to reflect differences in per capita income, or level of living. If the level of prices of our 18 commodities differs substantially from one country to another, their consumption should be influenced. If the relative prices of the various commodities also differ, the quantitative composition of the set of commodities is bound to vary. But this does not detract from

[7] The mean of these averages of relatives is, of course, 100.

[8] Perhaps "weights" is not the right word. It is suggested by analogy with a rating system in which independent evaluations of a characteristic are made by several observers. Some observers use scales with greater or less range than those used by others. They can affect in this way their influence on the aggregate measure, that is, they can alter the weight given to their observations.

the usefulness of the indices as indicators of consumption, of income enjoyed; it merely helps to explain why consumption is higher in one place than in another.

RELIABILITY OF THE INDEX

The nature of the data on which our calculations are based does not permit an objective test, based on known sampling distributions, of the degree of error in the index. A crude test of the general effectiveness of the index in ordering the countries on the basis of estimates of available supplies of the 18 commodities can be made, however, on the basis of an ordinal index (with a considerable loss of information) constructed from the same data. This is presented in Table 3, and it designated as Index R. Computation of χ_r^2 from this table yields a value of 58.04, which is significant for nine degrees of freedom at the .001 level.[9] It is

TABLE 3.—RANKING OF 10 COUNTRIES OF TROPICAL AFRICA ACCORDING TO PER CAPITA AVAILABILITY OF 18 COMMODITIES, 1955–57*

Commodity	Ghana	Ivory Coast	Sierra Leone	SMM[a]	Cameroon	Uganda	Congo[b]	Liberia	Nigeria[c]	Guinea
Canned meat	1	5	4	7	2	10	3	6	9	8
Canned fish	1	5	2	7	4	10	6	3	9	8
Evaporated milk	1	2	4	3	6	10	8	5	9	7
Wheat flour	3	1	5	2	4	8	7	10	9	6
Sugar	3	5	4	2	9	1	7	10	8	6
Beer	5	3	4	6	2	9	1	7	10	8
Tobacco	9	6	5	4	3	2	8	1	7	10
Cotton fabrics	1	4	3	2	9	10	6	8	7	5
Synthetic fabrics	1	5	2	6	7	4	8	10	3	9
Shoes	3	5	2	1	9	8	4	7	6	10
Sewing machines	1	5	4	7	2	9	3	6	8	10
Radio sets	1	2	5	9	7[d]	3	4	6[d]	8	10
Bicycles	5	2	9	4	7	1	3	10	6	8
Watches and clocks	1	4	2	9	5	8	7	6	3	10
Household utensils	1	2	4	8	5	10	9	6[d]	7	3
Iron sheets	4	2	1	6	3	5	9	10	8	7
Lamp oil	2	1	3	8	4	5	9	7	10	6
Soap	1	2	7	4	5	3	6	9	8	10
Rank totals Index R	44	61	70	95	93	116	108	127	135	141

* Based on Appendix Table II.
[a] Senegal-Mali-Mauretania.
[b] Congo Customs Union.
[c] Including British Cameroons.
[d] Ranked in middle for use in totals.

[9] χ_r^2 measures the ratio of the variance of the rank totals to the variance of all the observations and its distribution tends to that of χ^2. See *14*.

very unlikely, therefore, that the ranking of countries by Index R is the result of chance only.

Comparison of Index R with Index A (Chart 1) shows correspondence of the two measures to be close, except for the value given to Ghana, which stands about 55 points higher than the Ivory Coast on Index A, but only 5 points lower on Index R. Most of this difference results from the greater weight given to differences in availability of canned meat, canned fish, and synthetic fabrics by Index A, partly because Index A gives heavier weight to commodities with high variability, partly because Index A is a cardinal measure.

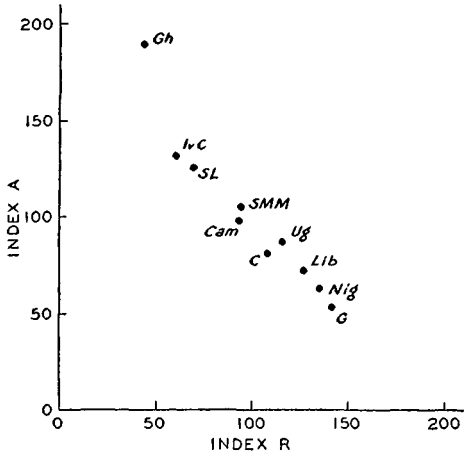
Index R also reverses the ranks of Cameroon and Senegal-Mali-Mauretania and of Congo and Liberia. Scores of these pairs are so close together in Index A, however, as to be only barely distinguishable.

CONSUMER GOODS INDICATORS AND TOTAL FOREIGN TRADE

If our assumptions about the nature of consumer demand and about the relative level of other components of the level of living in these countries are correct, our index provides us with an indicator of the relative well-being of their inhabitants. Does it provide us with a better indicator, or even a different indicator, than would result from simply comparing the total value of all exports and the total value of all imports per head of population?

The principal components of our index are imports which must eventually be paid for by exports. Some correlation is to be expected, therefore, between

CHART 1.—COMPARISON OF TWO INDICES OF PER CAPITA AVAILABILITY OF 18 CONSUMER GOODS*



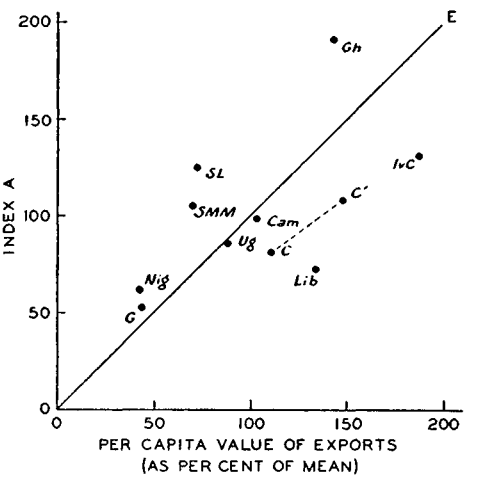
C - Congo Customs Union
Cam - Cameroon
G - Guinea
Gh - Ghana
IvC - Ivory Coast
Lib - Liberia
Nig - Nigeria
SL - Sierra Leone
SMM - Senegal, Mali, & Mauretania
Ug - Uganda

* From Tables 2 and 3.

these two measures. The extreme values in Chart 2, in which Index A is plotted against per capita value of all exports, do in fact show a rough relationship, but the general departure from constant proportionality (line OE) is so great as to suggest that other factors strongly affect the index.[10] If Index A measures consumer well-being, it seems clear that per capita value of exports does not.

Some possible reasons for the considerable departure of the index from the line of constant proportions for particular countries suggest themselves. Ghana stands 29 per cent higher than exports suggest. Does this result from a drawdown of foreign reserves for investment or for consumption? The Ivory Coast is 30 per cent below the line of equal proportions. Is it to be inferred that imports of consumer goods were being restrained by government control, or that there was a net movement of funds out of the country, or is the explanation elsewhere? The relatively high value of the index for Sierra Leone may be due in part to omissions from export statistics of the sizable illicit trade in diamonds. Liberia's low index value may result in part from defective trade statistics in which the two principal exports—rubber and iron ore—are valued at arbitrary official prices rather than world prices, but it may also reflect the fact that these two principal export industries are "enclaves" in the Liberian economy (*15*) and have but little influence on general consumer well-being.

CHART 2.—INDEX A COMPARED WITH PER CAPITA VALUE OF EXPORTS*

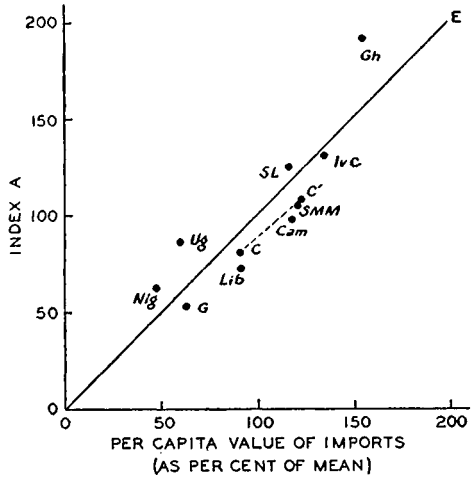


C - Congo Customs Union
Cam - Cameroon
G - Guinea
Gh - Ghana
IvC - Ivory Coast
Lib - Liberia
Nig - Nigeria
SMM - Senegal, Mali, & Mauretania
SL - Sierra Leone
Ug - Uganda

* Index A from Table 2. Per capita value of exports computed from official sources.

[10] Variance of Index A around the line of constant proportions is almost the same (1393) as around the mean (1395).

CHART 3.—INDEX A COMPARED WITH PER CAPITA VALUE OF IMPORTS*



C - Congo Customs Union
Cam - Cameroon
G - Guinea
Gh - Ghana
IvC - Ivory Coast
Lib - Liberia
Nig - Nigeria
SMM-Senegal, Mali, & Mauretania
SL - Sierra Leone
Ug - Uganda

* Index A from Table 2. Per capita value of imports computed from official sources.

When we turn to comparison of Index A with per capita value of net imports (Chart 3), the situation is much different. All values lie close to the line of constant proportions ($r = .88$) and the index appears to add little, if anything, to information obtainable from comparison of per capita value of all imports.

Perhaps this high correlation between per capita availability of our set of 18 consumer goods and per capita value of all imports should have been expected from the outset. If we have caught in our selected commodities a large part of the value of all imports, then we are merely showing in Chart 3 the correlation of a part with the whole. Or it may be that over the years imports of our 18 commodities tend to vary closely with all imports, reflecting the uniformity of governmental import policies and the similarity of the 10 countries.

When the reported value of the imported commodities is compared with the value of all imports, however, it appears that the 18 do not account for a constant share of total import value among countries, and that the relative values of major commodities for which figures are readily available also vary markedly (Table 4). The 18 commodities account for between 30 and 40 per cent of all imports into Ghana, Ivory Coast, Sierra Leone, and Nigeria. But they make up less than 15 per cent of imports into Uganda and Congo and only 18 per cent for Liberia. Values are not available for imports of all 18 commodities into the SMM group, Cameroon, and Guinea, but consider cotton fabrics and synthetic fabrics alone: they account for from 14 to 19 per cent of all imports into Ghana, Sierra Leone,

TABLE 4.—NET IMPORT VALUE OF SELECTED COMMODITIES AS PER CENT OF TOTAL VALUE OF NET IMPORTS, AND IN DOLLARS PER CAPITA, FOR 10 COUNTRIES OF TROPICAL AFRICA, 1955–57*

Commodity	Ghana	Ivory Coast	Sierra Leone	SMM[a]	Cameroon	Uganda	Congo[b]	Liberia	Nigeria[c]	Guinea
					Per cent of total value of imports					
Total[d]	37.1	29.5	37.6	...	...	13.0[e]	14.3	18.2	35.4	...
Canned meat	.8	.3	.3	...	.4[f]	.1	.4	.3	.1	...
Canned fish	2.1	.7	1.8	...	.5[f]	.0	.5	1.4	.3	.4[f]
Evaporated milk	.8	.7	.8	...	.5	.3	.3	.6	.4	...
Wheat flour	2.6	3.2	2.0	...	2.4	1.0	1.2	.5	1.4	3.4[f]
Sugar	2.2	2.3	2.2	6.1	1.0	[e]	.3	.4	1.9	2.9
Beer	1.8	.7	4.3	.3	1.4	.6	.1	2.0	2.1	...
Tobacco	1.9	2.2	3.1	.8	1.4[g]	[e]	1.0	1.7	1.2	1.8
Cotton fabrics	11.6	9.3	10.1	12.2	4.6	4.7	4.2	5.3	10.9	12.3
Synthetic fabrics	5.8	2.7	4.6	2.5[f]	1.8	7.2	1.9	1.2	8.1	1.7[f]
Shoes	1.2	1.6	1.8	1.4	2.3	.9	.7	1.6	1.7	.8
Sewing machines	.3	.2	.2	...	.4	.3	.3	.2	.3	...
Radio sets	.2	.2	.3	...	.6	.4	.2	.5	.3	...
Household utensils	1.2	1.3	1.5	...	...	.3	.6	.7	1.9	3.9[f]
Soap	1.8	.5	.8	...	.3	.4	.1	.6	.1	.7[f]
					Dollars per capita					
Total[d]	15.0	10.4	10.7	...	...	2.1[e]	3.3	4.4	4.3	...

* For note on sources see Appendix Table I.
[a] Senegal-Mali-Mauretania.
[b] Congo Customs Union.
[c] Including British Cameroons.
[d] Eighteen commodities; includes, besides those listed, bicycles, watches and clocks, iron sheets, and lamp oil.
[e] Uganda reported net exports of sugar and tobacco. The totals shown above are for 18 commodities deducting the net exports. For the 16 net imports the totals are 22 per cent and $3.5, respectively.
[f] Two years only.
[g] Gross imports.

the SMM group, Nigeria, and Guinea, but for less than 7 per cent in Cameroon, Congo, and Liberia.

Additional information about the relationship between an index based on the 18 commodities and total imports will be provided by our proposed examination of the index over time. At this point we have only begun to analyze data for earlier periods, but a preliminary check of import data for Ghana and Congo suggests that the relationship is not stable.

For each year in the period 1935–39 quantity indices of imports of the selected commodities, expressed as the mean of relatives to 1955–57 imports, have been compared with the annual value of all imports. Within the five-year period quantities and values move together. When comparison is made over a longer period of time, however, the relationships change markedly. In Table 5 comparison is made between quantity and value of imports into Ghana and the Congo Customs Union in 1935–37 and 1955–57. All values were first transformed into dollars in order to correct for changing relative values of the West African pound and Congo franc. Between 1935–37 and 1955–57 the quantitative index of selected

TABLE 5.—VALUE AND QUANTITY OF SELECTED IMPORTS AND VALUE OF ALL IMPORTS, GHANA AND CONGO CUSTOMS UNION, 1935–37 AND 1955–57*

Item	Ghana	Congo
INDICES 1955–57 = 100		
Quantity of selected imports, 1935–37	37.5	20.8
Value of selected imports, 1935–37	18.8	12.9
Value of all imports, 1935–37	18.8	7.2
VALUE OF SELECTED IMPORTS AS PER CENT OF ALL IMPORTS		
1935–37	35.8	27.5
1955–57	37.1	13.9

* Quantity indices are the mean of relatives of 1935–37 and 1955–57 imports, in physical units, of each commodity. Value indices were computed after first converting values for Ghana, reported in pounds, and values for the Congo Customs Union, reported in Congo francs, into dollars at import conversion rates shown in UN, *Yearbook of International Trade Statistics, 1958*, Vol. I. Computations for Ghana omit radio sets and household utensils, for Congo Customs Union omit evaporated milk and radio sets.

imports rose more relative to their values in Congo than in Ghana. For each 10 per cent rise in values of selected imports into Congo, the quantity index rose 5.6 per cent; for each 10 per cent rise in values of selected imports into Ghana, the quantity index rose 3.9 per cent. When comparison is made with total value of all imports, the situation is reversed: for each 10 per cent increase in values in Congo, quantities of selected imports rose 3.0 per cent; in Ghana, where values of selected imports and values of all imports changed in the same proportion, the quantity change is again 3.9 per cent. Comparison of changes in the two countries on the basis of total imports alone would tend to show a greater relative advance in Congo than the quantity index does; comparison based solely on the value of selected imports would show a relatively greater advance in Ghana than the quantity index shows.

The differences in the three measures result from differences in price changes in the two countries, from differences in the proportions of the selected commodities imported, both between countries and within each country over time, and from changes in the proportion of all imports represented by the selected commodities. In Ghana this proportion remained substantially unchanged between 1935–37 and 1955–57, but in Congo it fell almost 50 per cent.

These variations are of the sort to be expected; they leave unexplained, however, the close correlation found between Index A and the total value of imports by the 10 countries in 1955–57. Very tentatively it is suggested that this may result from an import effect of domestic manufactures, that is, from a decline in imports of goods produced at home equal to the increase in domestic supply. At this stage in our investigations, however, such an explanation can be no more than conjecture.

Index A is something more than an approximation of total value of imports, as of course it should be, inasmuch as it includes domestic production as well as imports, and weights the various commodities in terms of their values.

Statistics of domestic production are less accurate than statistics of imports; for many countries they are simple estimates without firm quantitative bases. They are best for commodities such as beer and tobacco that are subject to special

licensing; they are probably worst for commodities such as soap, which can be produced in small factories without much special equipment or machinery. It is anticipated that when indices are computed over time, home production will be of little importance in most countries and the reliability of the estimates of total supplies will therefore increase, although population estimates will be much less reliable.

The relative contribution of home production to total supplies is shown in Table 6. Explanation of the small part of total expenditures on imports represented by the 18 selected commodities in the Congo Customs Union obviously lies in the large supplies of beer, soap, sugar, cotton fabrics, shoes, and tobacco available from domestic production. Home-produced household utensils and wheat (mostly from Ruanda-Urundi) also made a significant contribution to total supplies.

No correlation appears between the standings of the 10 countries according to Index A and the importance of domestic production: Sierra Leone, which stands near the top of our list, and Liberia, which stands near the bottom, had no domestic production of consequence. On the other hand, the Senegal group and Nigeria both show important production of four commodities. Domestic pro-

TABLE 6.—LOCAL PRODUCTION AS PER CENT OF TOTAL SUPPLIES, SPECIFIED COMMODITIES IN 10 COUNTRIES OF TROPICAL AFRICA, 1955–57*

Commodity	Ghana	Ivory Coast	Sierra Leone	SMM[a]	Cameroon	Uganda	Congo[b]	Liberia	Nigeria[c]	Guinea
Canned meat	—	—	—	—	—	—	—	—	31.1[d]	—
Canned fish	—	—	—	41.7[e]	—	—	—	—	—	—
Wheat flour	—	—	—	—	—	—	19.5[f]	—	—	—
Sugar	—	—	—	—	—	123.5[g]	68.2	—	—	—
Beer	20.8	76.0	—	84.0	45.5	83.3	99.5	—	24.6	—
Tobacco[h]	4.5	1.1[i]	—	50.3[j]	96.6	114.0	31.4	—	81.9[k]	29.8
Cotton fabrics	—[l]	2.4[m]	—	11.9[n]	—	.8	54.3	—	—[l]	—
Shoes	—	—	—	—	34.9[m]	—	53.2	—	5.4[o]	—
Household utensils	—	—	—	—	—[l]	—	12.4[d]	—	—	—
Soap	—[l]	81.1	—	73.2	89.0	92.4	96.1	—[l]	96.6	33.1

* See Appendix Table I for notes on sources.

[a] Senegal-Mali-Mauretania.

[b] Congo Customs Union.

[c] Includes British Cameroons.

[d] Production approximated.

[e] May be too high by as much as 20 per cent since source shows amount of raw fish processed rather than weight of final product.

[f] Includes reported equivalent of wheat commercialized for Belgian Congo plus flour equivalent of total wheat production for Ruanda-Urundi at 72 per cent.

[g] May be slightly overstated since local production and its interterritorial transfers, presumably plantation white, have not been reduced to refined basis.

[h] Manufactured and unmanufactured. For computation see Appendix Table I, note *i*.

[i] Average production is for two years only.

[j] Production is for 1948–49 only.

[k] Local production as reported by FAO; may be too high.

[l] Some local production known to exist, but no figures available and no approximation included.

[m] Production for 1956 only.

[n] May be up to 10 per cent too high since local production of yarn is included, some or all of which may be used for hand weaving.

[o] Capacity rather than production.

duction of beer, tobacco, and soap was most important in the period 1955–57, accounting for 80 per cent of total available supply of these commodities in a number of countries. Most of this production has come into being since the 1930's.

The magnitude of domestic production lends credence to the suggestion made earlier that the high correlation between Index A and per capita value of all imports is not spurious, and that it may result from substitution of home production for imports in approximately equal amounts.

VARIATION IN CONSUMPTION OF INDIVIDUAL COMMODITIES

It has been pointed out earlier that the influence of each commodity on Index A is a function of the dispersion of values obtained for that commodity, in contrast with Index R in which each commodity has an equal dispersion. Table 7 shows the standard deviations of the commodity relatives. They range from 1.02 for canned meat and .97 for fish down to .36 for tobacco and iron sheets. The influence of canned-meat supplies on the index was 2.9 times that of supplies of tobacco and iron sheets. If we are correct in believing that consumption of these commodities is directly correlated with level of living, then the commodities with higher variances are more sensitive indicators of differences in level of living; they are the commodities with higher income elasticity of demand. This

TABLE 7.—VARIATION IN RELATIVE PER CAPITA AVAILABILITY OF SELECTED COMMODITIES AMONG 10 COUNTRIES, 1955–57, AND IN QUANTITIES OF IMPORTS OF THESE COMMODITIES INTO GHANA AND THE CONGO CUSTOMS UNION, 1935–39*

Commodity	Ten countries, 1955–57		"Year-to-year," 1935–39[a]	
	Standard deviation	Rank	Ghana rank	Congo rank
Canned meat	1.02	1	8	6
Canned fish	.97	2	9	2
Sugar	.80	3	11	12
Synthetic fabrics	.74	4	7	7
Watches and clocks	.72	5	5	11
Wheat and wheat flour	.64	6	14	13
Beer	.61	7	6	14
Shoes	.59	8–9	4	3
Bicycles	.59	8–9	2	4
Evaporated milk	.57	10	12	...
Soap	.53	11–12	15	15
Sewing machines	.53	11–12	1	1
Lamp oil	.50	13	10	5
Household utensils	.47	[b]	...	...
Cotton fabrics	.47	14	13	8
Radio sets	.42	[b]	...	...
Tobacco	.36	15–16	16	9
Iron sheets	.36	15–16	3	10

* Standard deviation computed from Table 2, "year-to-year" from Tables 8 and 9.

[a] Rank of range as per cent of average, for relatives (1955–57 = 100) of quantity imports in each of the years 1935–39.

[b] Not assigned a rank so as to facilitate comparison with 1935–39 data.

proposition requires independent corroboration which we do not have. It does not seem unreasonable on the basis of qualitative information that watches and synthetic fabrics, for example, should be more of a luxury than iron and tobacco; it is somewhat surprising, however, to find sugar near the top of the scale and radios near the bottom. Perhaps explanations can be offered for the relative positions of these commodities too, for economists have often shown themselves apt at explaining almost anything that appears to have happened, sometimes when it has not happened at all. But it would be well to tread gingerly here until we have obtained some confirmation of our inferences from expenditure studies and from changes over time.

Examination of year-to-year variation in imports of individual commodities into Ghana and Congo in 1935–39 is not particularly helpful (Tables 8, 9). During this period in Ghana the greatest fluctuations seem to have been in imports of sewing machines, bicycles, iron sheets, shoes, and watches and clocks; the smallest fluctuations were in tobacco, soap, wheat flour, cotton fabrics, and evaporated milk. In Congo imports of sewing machines, canned fish, shoes,

TABLE 8.—TOTAL IMPORTS AND SELECTED IMPORTS INTO GHANA, 1935–39 AS A PER CENT OF 1955–57*

Commodity	1935	1936	1937	1938	1939	Average, 1935–39
			Quantities			
Canned meat	62.2	73.4	76.4	19.8	32.1	52.8
Canned fish	14.6	26.0	43.5	31.9	31.0	29.4
Evaporated milk	10.8	13.9	19.3	14.1	13.7	14.4
Wheat flour	16.2	19.4	23.1	17.4	24.8	20.2
Sugar	13.8	16.6	28.0	19.6	21.6	19.9
Beer	5.6	13.3	26.7	17.6	16.4	15.9
Tobacco	49.0	55.4	56.1	48.2	38.9	49.5
Cotton fabrics	57.1	62.8	63.4	34.9	37.5	51.1
Synthetic fabrics	3.3	4.9	8.7	5.7	2.7	5.1
Shoes	21.4	21.3	35.2	9.9	5.9	18.7
Sewing machines	24.5	55.0	144.3	18.9	17.6	52.1
Bicycles	7.6	9.3	21.8	4.8	5.0	9.7
Watches and clocks	52.9	42.9	102.3	33.8	29.0	52.2
Iron sheets	56.0	79.4	101.3	10.2	17.1	52.8
Lamp oil	26.8	22.1	43.7	32.2	22.6	29.5
Soap	20.0	21.7	27.7	19.0	19.8	21.6
Mean 16 selected commodities	27.6	33.6	51.3	21.1	21.0	30.9
			Values			
16 Selected commodities	8.5	9.8	13.6	6.6	6.7	9.0
Total imports	8.4	9.6	13.8	8.6	8.3	9.7

* Computed from data for 1935–39 from Gold Coast, Off. Gov't. Stat., *Statistics of External Trade and Shipping and Aircraft Movements* (Stat. Abstr. No. 1, February 1956), and 1955–57 average from sources for Appendix Table I. Values are in domestic currency, and thus differ from Table 5.

TABLE 9.—TOTAL IMPORTS AND SELECTED IMPORTS INTO THE CONGO CUSTOMS UNION, 1935–39 AVERAGE AS PER CENT OF 1955–57*

Commodity	1935	1936	1937	1938	1939	Average, 1935–39
			Quantities			
Canned meat	22.8	20.9	35.6	19.1	25.6	24.8
Canned fish	8.6	7.9	21.6	11.2	13.1	12.5
Wheat flour	7.3[a]	7.2[a]	8.8	9.0	9.6	8.4
Sugar	6.4	5.8	7.1	5.3	5.7	6.1
Beer	52.8	49.0	65.3	57.2	61.5	57.2
Tobacco	11.2	14.4	20.1	20.7	19.1	17.1
Cotton fabrics	54.4	112.4	110.9	89.7	102.9	94.1
Synthetic fabrics	2.0	3.0	3.8	3.0	2.2	2.8
Shoes	15.0	27.4	41.4	23.1	20.0	25.4
Sewing machines	9.9	13.9	31.5	14.9	23.6	18.8
Bicycles	4.7	6.1	12.9	11.6	8.0	8.7
Watches and clocks	5.8	6.9	7.8	8.2	5.2	6.8
Household utensils	12.0[a]	20.6[a]	30.5	26.6	11.1	20.2
Iron sheets	22.1	27.6	36.3	26.6	27.3	28.0
Lamp oil	4.2	5.3	7.2	8.6	10.6	7.2
Soap	25.7	28.5	24.9	29.5	28.2	27.3
Mean 16 selected commodities	16.6	22.3	29.1	22.8	23.4	22.8
			Values			
16 Selected commodities	6.1	8.3	11.1	8.8	8.1	8.5
Total imports	2.8	3.9	6.1	5.4	5.0	4.6

* Computed from data for the Belgian Congo plus Ruanda-Urundi, 1935–39, from issues of Belgium, Min. Col., *Statistiques du Commerce Extérieur du Congo Belge,* and 1955 to 1957 from sources for Appendix Table I. Values are in domestic currency, and thus differ from Table 5.

[a] Including 1937–39 average for Ruanda-Urundi, since comparable data are lacking.

bicycles, and lamp oil varied most during the five years, and imports of soap, beer, wheat flour, sugar, and watches and clocks varied least. There is a notable lack of correspondence between variation from country to country and variation within one country over time. An unknown part of the year-to-year variation may be due to stockpiling by merchants or to stockpiling or deferred consumption by consumers. Purchases of durable consumer goods like sewing machines, bicycles, iron sheets (for house roofs), watches and clocks tend to be put off when income is low, whereas items purchased daily or weekly like tobacco, soap, and flour may be less influenced by short-term changes in income. The relatively greater variability of purchases of canned fish, shoes, and lamp oil in Congo may reflect the generally lower income there.

It may also be illogical to expect the range of variations between countries to resemble the range within a country where higher incomes in the past may have already translated luxury into necessity.

The individual commodity relatives in the present indices have been subjected to a simple check for bias between the former British and French posses-

sions on the basis of the number of countries in each group showing a score above the average, and the number showing a score below the average. On these grounds two commodities are suspect—synthetic fabrics and watches and clocks. All four of the British countries show greater than average availability of synthetic fabrics, whereas three of the French countries, and Congo and Liberia, show less than average. Three of the British countries show greater than average availability of watches and clocks, while all other countries show less than average. With standard deviations of .74 and .72 these two commodities may tend to bias the indices in favor of the British countries.

POPULATION DISTRIBUTION AND THE INDICES

Like all aggregate measures, and particularly those computed for political units, our index does not relate to culturally or economically homogeneous groups. The values are averages, and the range of economic well-being of groups and individuals who make up a state may vary from much above the national average to much below it. By concentrating on consumer goods which are within the conceivable standard of living we have tried to circumvent some of the problems of measuring "welfare" that arise from differences in patterns of income distribution among countries. But our index is still a statistical average and may conceal the existence of large groups whose economics status departs widely from the mean. If we could compute an index for the Western Region of Nigeria alone, for example, we might find it to be far above the value we have shown for the entire country. Certainly the index for Ghana without its Northern Region would be much higher than for all Ghana. But the political-economic decision unit is all-Ghana, all-Nigeria; our inability to obtain statistics for smaller units is simply a reflection of this.

One distinction among subgroups of a national population may have special influence on the index—their distance from the sea. It is obviously easier for people to obtain imported goods if they need not pay for costly land transport from the port of entry, and differences in national scores may be influenced to a considerable extent by the proportion of the population that lives in the economically remote interior. Comparison of the index values with a population map of tropical Africa, however, permits no easy generalizations (*16*). Ghana's population is relatively dense along the seacoast, although there is also a concentration on the northern frontior. The Ivory Coast's population, however, is relatively evenly distributed throughout its territory. Uganda's tends to concentrate along the shores of Lake Victoria, but all of Uganda, of course, must pay for a costly rail haul from the sea. Population distribution appears clearly to be a factor only in the Congo Customs Union, and perhaps in Nigeria.

Congo and Ruanda-Urundi, although bound together in a customs union during the 1950's, are separate countries with separate political and economic organizations. Combination of Ruanda-Urundi's population and imports with those for Congo greatly reduces the values of the index, and correct values for Congo would be much higher than are shown for the Customs Union. In the 1930's, when international trade statistics for the two territories were reported separately, Ruanda-Urundi's imports amounted to only about 7 per cent of those into Congo, although its population was probably about 25 per cent of Congo's.

Even allowing for considerable under-reporting of imports into Ruanda-Urundi over its long land frontier with Congo, per capita imports of the two countries must differ greatly. In Chart 2, the approximate values of Index A and of total imports per capita, assuming all imports and all home production were consumed within Congo alone, would be at point C′. The correct value for Congo lies somewhere between C and C′, but probably close to C′.

The large population in Nigeria's Northern Region undoubtedly affects the index values similarly for that country, but Nigeria is one country and high transport costs to the interior are simply one of the factors entering into its general level of economic achievement.

The prevalence of urban life might also be expected to affect a country's standing on our index because city dwellers have greater opportunities for becoming acquainted with Western goods. However, comparison of the index with per cent of population living in towns of 5,000 or more shows no systematic relationship (Table 10).

THE INDEX OVER TIME

If indices based on per capita consumption of a selected group of imported commodities are useful indicators of economic well-being of a population—and we now believe them to be—their greatest value will not be in comparing the absolute level of achievement of various countries at a given time, but in comparing rates of change. When we can obtain some indication of change over time, it should be possible to interpret more accurately the consequences of various kinds of economic activity and of government regulations. It will be interesting, for example, to examine the rate of change in an index of availability of consumer goods in Ghana and Ivory Coast during the period when the two countries were subjected to different government regulation of cocoa and coffee marketing and labor. Comparison of the consequences for the consumer of mineral exports *vs.* agricultural exports, of plantation production *vs.* smallholder production, and

TABLE 10.—URBAN POPULATION BY COUNTRY ABOUT 1950, AND INDEX A*

Country	Percentage of population in towns of 5,000 or more	Index A
Ghana	12.0	186
Ivory Coast	8.6	131
Sierra Leone	4.8	125
Senegal-Mali-Mauretania	10.4	105
Cameroons	5.8	98
Uganda	.7	86
Congo Customs Union	6.3	81
Liberia	1.2	73
Nigeria	9.4	62
Guinea	5.8	53

* Population data from G. T. Trewartha and Wilbur Zelinsky, "Population Patterns in Tropical Africa," *Ann. Assn. Am. Geog.*, June 1954, p. 146; and France, Haut Commissariat de la République en Afrique Occidentale Française, *A.O.F., 1957* (1957), pp. 94–96, for Ivory Coast, Senegal-Mali-Mauretania, and Guinea, 1955–56. Index A is from Table 2 above.

of other similar differences in economic organization should permit more reliable appraisal of the desirability of various recommended programs.

Construction of such an index presents new problems in overcoming deficiencies in the statistics of international trade and of domestic production, but the difficulties resulting from differences in commodity classification may not be as great as when intercountry comparisons are attempted. If the index presented now stands the test of critical review by African specialists, we shall attempt to develop similar measures over time.

Appendix Table I.—Availability of 18 Imported Consumer Goods in 10 Countries of Tropical Africa, 1955–57*

(Thousand metric tons, except as noted [a–c])

Commodity	Ghana	Ivory Coast	Sierra Leone	Senegal-Mali-Mauretania	Cameroon	Uganda	Congo Customs Union	Liberia	Nigeria inc. Br. Cameroons	Guinea
Food:										
1. Canned meat	2.6	.3	.2	.5	.4	.1	1.8	.1	*.8*[d]	.1
2. Canned fish	10.8	1.3	2.6	*1.5*[e]	1.5	.0	5.2	1.1	2.5	.3
3. Evaporated milk	4.9	1.9	1.1	3.7	1.2	.7	2.3	.6	4.4	.5
4. Wheat flour	40.0	25.1	8.7	52.5	15.2	6.8	*38.4*[f]	1.1	36.6	10.0[g]
5. Sugar	32.2	10.5	7.4	52.7	4.0	*59.0*[h]	*25.6*	1.0	43.3	4.6[g]
Drink and tobacco:										
6. Beer[a]	*20.0*	*12.6*	8.7	*14.0*	*19.6*	*9.1*	*130.0*	2.2	*36.9*	4.2[g]
7. Tobacco[i]	*1.8*	*1.2*[j]	.9	*2.7*[k]	*1.8*	*4.2*	*5.8*	.9	*12.2*[l]	*.5*
Clothing:										
8. Cotton fabrics	11.7[m]	*3.6*[n]	2.8	*11.0*[o]	1.8	*2.6*	*13.0*	.8	22.3[m]	2.3
9. Synthetic fabrics	7.9	1.4	1.5	2.4	.7	2.9	3.1	.1	18.2[p]	4
10. Shoes[b]	2.5	.5	.8	*2.8*	*.3*[n]	.6	4.0	.2	*5.5*[q]	.2
Durables:										
11. Sewing machines[c]	15.8	3.8	2.7	6.0	7.2	3.5	24.5	1.5	30.6	.5
12. Radio sets[c]	17.4	7.1	4.6	6.6	...[r]	14.2	25.4	...[s]	41.3	1.3
13. Bicycles[c]	32.0	30.6	4.7	35.6	10.9	66.6	107.2	1.1	155.8	8.2
14. Watches and clocks[c]	205.8	29.5	40.1	31.8	28.8	40.1	139.2	11.1	444.4	6.3
15. Household utensils	6.0	2.7	1.7	2.8	1.8	.6	*5.1*[d]	...[t]	15.8	2.2
16. Iron sheets	15.9	9.2	6.5	12.9	9.4	12.4	22.5	1.3	45.3	3.6
Miscellaneous:										
17. Lamp oil	34.3	25.5	9.9	16.7	13.8	20.6	34.1	3.3	61.7	7.1
18. Soap	18.2[m]	*8.5*	2.1	*10.4*	*4.7*	*15.2*	*25.4*	.8[m]	*27.5*	*1.4*

* Largely net imports; figures in italics include local production as shown in Table 6. Data from official sources, or obtained by correspondence with the government agencies concerned. Availability less than 50 metric tons indicated by .0.

[a] Million liters.

[b] Million pairs.

[c] Number in thousands.

[d] Local production approximated.

[e] May be too high by as much as 20 per cent since source shows amount of raw fish processed rather than weight of final product.

[f] Includes reported flour equivalent of wheat commercialized for Belgian Congo, and flour equivalent of total wheat production for Ruanda-Urundi at 72 per cent.

[g] Including imports from Senegal.

[h] May be slightly overstated since local production and its interterritorial transfers, presumably plantation-white, have not been reduced to refined basis.

[i] Imports, and local production, if any, of unmanufactured tobacco times .8, plus the weight of imports of cigars, cigarettes, and other manufactured tobacco. For French areas which do not specify, imports were treated as manufactured.

[j] The average production included is for two years only.

[k] The production included is for 1948–49 only.

[l] Included local production as reported by FAO; may be too high.

[m] Some local production known to exist, but no figures are available and no approximation included.

[n] Production included is for 1956 only.

[o] May be up to 10 per cent too high since local production of yarn is included, some or all of which may be used for hand weaving.

[p] Includes approximation for 1955.

[q] Capacity rather than production included.

[r] Total metric tons available 77.

[s] Net imports valued at U.S. $126,839.

[t] Net imports of 52,639 dozen.

APPENDIX TABLE II.—PER CAPITA AVAILABILITY OF 18 IMPORTED CONSUMER GOODS IN 10 COUNTRIES OF TROPICAL AFRICA, 1955–57*

(Metric tons per thousand inhabitants, except as noted [a–c])

Commodity	Average	Ghana	Ivory Coast	Sierra Leone	Senegal-Mali-Mauretania	Cameroon	Uganda	Congo Customs Union	Liberia	Nigeria inc. Br. Cameroons	Guinea
Food:											
1. Canned meat	.1	.4	.1	.1	.1	.1	.0	.1	.1	.0[d]	.0
2. Canned fish	.6	1.7	.4	1.3	.2[e]	.5	.0	.3	.9	.1	.1
3. Evaporated milk	.4	.8	.6	.5	.6	.4	.1	.1	.4	.1	.2
4. Wheat flour	4.1	6.3	8.4	4.1	8.1	4.8	1.2	2.2[f]	.9	1.1	4.0[g]
5. Sugar	3.7	5.1	3.5	3.5	8.1	1.3	9.8[h]	1.5	.8	1.3	1.8[g]
Drink and tobacco:											
6. Beer[a]	3.3	3.2	4.2	4.1	2.1	6.2	1.5	7.5	1.8	1.1	1.7[g]
7. Tobacco[i]	.4	.3	.4[j]	.4	.4[k]	.6	.7	.3	.7	.4[l]	2
Clothing:											
8. Cotton fabrics	1.0	1.8[m]	1.2[n]	1.3	1.7[o]	.6	.4	.8	.6	.7[m]	.9
9. Synthetic fabrics	.4	1.3	.5	.7	.4	.2	.5	.2	.1	.5[p]	.1
10. Shoes[b]	.2	.4	.2	.4	.4	.1[n]	.1	.2	.2	.2[q]	.1
Durables:											
11. Sewing machines[c]	1.3	2.5	1.3	1.3	.9	2.3	.5	1.4	1.2	.9	.2
12. Radio sets[c]	1.7[r]	2.8	2.4	2.2	1.0	...[s]	2.3	1.5	...[t]	1.2	.5
13. Bicycles[c]	5.2	5.1	10.2	2.2	5.5	3.4	11.0	6.2	.9	4.7	3.2
14. Watches and clocks[c]	11.5	32.7	9.8	19.1	4.9	9.1	6.6	8.1	8.9	13.3	2.5
15. Household utensils	.6[u]	.9	.9	.8	.4	.6[m]	.1	.3[d]	...[v]	.5	.9
16. Iron sheets	2.1	2.5	3.1	3.1	2.0	3.0	2.0	1.3	1.0	1.4	1.4
Miscellaneous:											
17. Lamp oil	3.8	5.5	8.5	4.7	2.6	4.4	3.4	2.0	2.7	1.8	2.8
18. Soap	1.6	2.9[m]	2.8	1.0	1.6	1.5	2.5	1.5	.6[m]	.8	.6

* Computed from less rounded data for Appendix Table I, and midyear population estimates from various issues of UN, *Demographic Yearbook*, with approximations for Ghana (6.3 million taking account of 1960 census) and for Ivory Coast (3.0 million taking account of 1958 sample census). Figures in italics include local production. Per capita less than 50 kg. indicated by .0.

[a] Liters per inhabitant.

[b] Pairs per inhabitant.

[c] Number per thousand inhabitants.

[d] Local production approximated.

[e] May be too high by as much as 20 per cent since source shows amount of raw fish processed rather than weight of final product.

[f] Includes reported flour equivalent of wheat commercialized for Belgian Congo, and flour equivalent of total wheat production for Ruanda-Urundi at 72 per cent.

[g] Including imports from Senegal.

[h] May be slightly overstated since local production and its interterritorial transfers, presumably plantation-white, have not been reduced to refined basis.

[i] Imports, and local production, if any, of unmanufactured tobacco times .8, plus the weight of imports of cigars, cigarettes, and other manufactured tobacco. For French areas which do not specify, imports were treated as manufactured.

[j] The average production included is for two years only.

[k] The production included is for 1948–49 only.

[l] Includes local production as reported by FAO; may be too high.

[m] Some local production known to exist, but no figures are available and no approximation included.

[n] Production included is for 1956 only.

[o] May be up to 10 per cent too high since local production of yarn is included, some or all of which may be used for hand weaving.

[p] Includes approximation for 1955.

[q] Capacity rather than production included.

[r] Average of eight countries.

[s] Net imports of 24 kg. per thousand inhabitants.

[t] Imports valued at U.S. $101.5 per thousand inhabitants.

[u] Average of nine countries.

[v] Net imports of 505 utensils per thousand inhabitants.

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