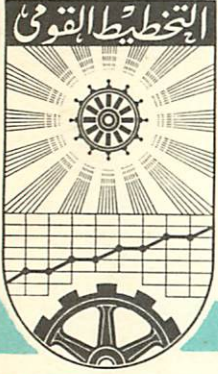الجمهورية العربية المتحدة

التخطيط القومي

معهد التخطيط القومي

Memo. No. 355

THE NATIONAL INCOME OF
THE U.A.R. (Egypt)
1939 -- 1962

By

Bent Hansen
& Donald Mead

21 July, 1963

<u>The National Income of the UAR (Egypt)</u>

<u>1939 - 1962</u>.

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Several estimates of national income in Egypt are available. Apart from
an attempt to measure the development from 1913 to 1957, they cover together the
period 1937 to 1962. Due to differences in definition they are not directly com-
parable, and at first glance they show rather disparate levels and developments
for identical periods. A comparison between the growth rates shown by the various
estimates - adjusted for some of the definitional differences - revealed, however,
a good agreement between the estimates,[1] and we found it therefore worth while to
try to make the main estimates comparable in order to come out with a fairly com-
plete and reliable picture of the post-war development of national income in Egypt.
We have therefore concentrated our efforts on two of the estimates available, one
for the period 1945-54 and one for the period 1952/53-1961/62, both of which ori-
ginate from the National Planning Committee (Ministry of Planning); the results
are given in Tables 4 and 8. Although there are still several improvements of these
estimates which remain to be done and which seem feasible on the basis of available
statistics, we feel sufficiently confident about the level and the main trends and
fluctuations shown by the adjusted estimates to present them for publication.

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1) Bent Hansen, "The Growth of National Income in the UAR(Egypt)", Memo No.343,
The Institute of National Planning, Cairo, 17th June, 1963.

There are, of course, many uncertainties and biases inherent in the statistics and methods used, but we have tried as far as possible to warn the reader against such pitfalls. In doing this, we have in particular stressed such biases which may affect the measured growth-rates.

1. A Note on the Trend 1913-1939.

Measurements for the time before World War II are difficult due to lack of relevant statistics. As a background for the post-war developments it may, however, be of interest for the reader to know that an attempt to estimate the per capita income from 1913 to 1957 showed a falling tendency in real per capita income from 1913 to 1939, accentuated after 1930 due to the fall at that time of the terms of trade.[1] This result fits with what is known from another source about the development of agricultural production (field crops) per inhabitant from 1913 to 1939.[2]

2. The Period 1937-1945: Dr. Anis' Estimate.

The only estimate available for 1937-1945 is a private one made by Dr. M.A. Anis[3]; it is crude, but its results look quite sensible. It was made both from the income side and the production side. Since no regard was paid to income from abroad, net domestic product (at factor costs) and net national income coincide. No attempt was made to calculate total real national income, but fixed price calculations were made for the commodity producing sectors (agriculture and industry). In the table below, we have deflated Anis' nominal income (adjusted for indirect taxes and subsidies) by the official wholesale price index.[4] Since the national income figures calculated by Anis for 1937 and 1938 were about the same as for 1939, they are left out. The neglect of net factor payments to abroad means probably that the increase in nominal national income from 1939 to 1945 was somewhat larger than shown in Table 1. During World War II, Egypt paid off all her

1) Dr. A.F. Sherif, Memo No.121 from the National Planning Committee, Cairo 1959, (in Arabic).

2) Dr. M.M. El Imam, "A Production Function for Egyptian Agriculture 1913-1955," Memo No.259, Institute of National Planning, Cairo Dec.31, 1962.

3) Mahmoud Amin Anis, "A Study of the National Income of Egypt", L'Egypt Contemporaine, 1950, Nos 261-2, S.O.P.-Press, Cairo 1950.

4) The official wholesale price index is a Laspeyres index based on weights from 1939. The weights were chosen at that time according to the Statistical Department's best judgement about the importance of the individual commodities entering the index. Anis' fixed price estimate for industry was also made through application of the official wholesale price index.

public foreign debts and accumulated a very large foreign exchange reserve, partly invested in British long-term Government bonds. The net factor payments to abroad (equal to £E 4 mill. in 1945) must therefore have fallen from 1939 to 1945, but we are not able to judge by how much. The terms of trade effects for this period were negligible and may have been taken care of through the method of deflation used (see below).

Table 1.

Year	Net National Income at factor costs, current pr. £E mill.	Indirect taxes minus subsi-dies [o] £E mill.	Net National Income at current market pr. £E mill.	Whole-sale price index 1939= 100	Net National Income at constant market pr. £E mill.	Value Added at f.c. at constant 1939-pr. £E mill.	
						Agricul-ture	Industry
1939	168	15	183	100	183	54	13
1940	191	15	206	113	182	49	15
1941	233	17	250	141	177	47	18
1942	326	19	345	189	182	40	20
1943	390	16	406	238	171	39	20
1944	464	24	488	271	180	43	20
1945	502	26	528	288	183	44	18
Average annual rate of change comp. pct. 1939-45					0.0		
Annual rate of change of popu-lation comp. pct.1937-47					1.2-1.8		

o) For the budget years 1 March - 28 February.

3. A Comparison of the Three Basic Series.

In the post-war period, three major attempts have been made to estimate the income of the country. These estimates cover different periods, were done on different bases, and add to conceptually different totals. We have tried to check on their degree of comparability by adjusting each to bring it as near as possible to a total representing Gross National Product at market price. Table 2 gives these comparative figures for 1954, the only year when such a comparison is possible. The fairly close agreements of the totals should not distract us from the fact that the sectorial divergencies are sometimes quite substantial. As the note to the table indicates, there are possible explanations for some of these discrepancies,

although others (dwellings, for example) must reflect rough and differing estimates based on quite incomplete basic statistics. The fact remains, however, that in outlines the figures can be said to be consistent.

Table 2.

Gross National Product at Market Price 1954.
(£E mill.)

	NPC - Memo A	NPC - Memo B	Statistics Department	NPC Atlas
Agriculture	312	312	311	312
Industry	146	146	128	147
Construction	33	33	26	27
Transport and Communications	88	88	94	56
Dwellings	77	77	63	59
Trade and Finance	188	188	163	160
Other services: a) Government	90	124	124	
b) Households	17	28	28	
c) Others	72	72	64	
Total	179	224	216	234
Gross Domestic Product at market prices	1023	1068	1001	
+ Net Factor returns from abroad	-13	-13	-13	
Gross National Product at market prices	1010	1055	988	995

Sources: NPC Memo: National Planning Committee, Special Memo No.1, "Evaluation of Local Production from 1945 to 1954" Cairo 1959 (in Arabic);
- Department of Statistics and Census: Central Statistical Committee, Basic Statistics, June 1962, p.231;
- NPC Atlas: Ten Years of Revolution, Statistical Atlas, Department of Statistics and Census, Cairo, S.O.P.-Press, July 1963, Table 9.

Adjustments: - NPC Memo: This estimate does not cover Government or household sectors; in series A we have added our own estimates of these items (see Table 4), in series B those from the Statistical Department study. The divergencies in the transport sector are due primarily to the different treatments of the Suez Canal; while the Atlas-estimate includes only national income here, the other estimates are concerned with the domestic product. The difference is of the order of magnitude of £E 15 mill. For the agricultural sector, we have used the figures from the Statistics Department's recent study, National Income in Agriculture, 1958-1960 (in Arabic), Department of Statistics, Cairo (see section 4 below);
- Statistics Department: We have taken the main Government enterprises out of the Government services sector (see below, section 5) and allocated them among the other sectors. It is likely, however, that some other minor enterprises remain, accounting in part for the high figures for the Government sector and the lower figures in some of the other sectors. This figure for the Government sector also includes £E 10 mill. imputed rent on Government buildings, not included in our estimate (NPC Memo, series A).

Finally, we have added indirect taxes and customs duties net of subsidies. The Statistics Department estimate is published as a net estimate, although it is not clear to what extent it has been possible to exclude depreciation. In the main, this would affect only industry, and may add to the explanation for the low figure in this sector.
- NPC Atlas: Average of current price figures for 1953/54 and 1954/55, with customs duties added. Agriculture is treated as for the NPC Memo. These figures differ from those in Table 8 in that those are at 1953/54 prices; the differences are quite important for agriculture, small for industry and construction, and insignificant in other sectors, see below.

4. The Period 1945-1954.

For these years the most important statistics are those found in the National Planning Committee Memo referred to above. For this study, a quite detailed set of national accounts was drawn up for 1954[1], with the economy divided into a large number of sectors; these accounts were then pushed backwards to 1945 in constant 1954-prices by applying to each sector an index of physical output or of employment.[2] In general, this estimate can be characterized as a very careful, scholarly piece of work.[3]

We have adjusted these figures in several ways to bring them to a total of Gross National Product at market prices. The first and most important adjustment is to include the Government services sector, which is excluded from the original estimate. Table 3 below gives our estimate of total wages paid in Government services, in current as well as constant 1954-prices (the note to that table explains how these figures were obtained).

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1) These detailed accounts, which were published as Memo 95 of the Planning Committee, Cairo 1958, agree quite closely with those given for the NPC Memo, Series A in Table 2 above.

2) The employment figures used for this purpose were quite weak. Judging from other information, which is available, this seems not to have introduced any major distortions into the results; in case productivity was increasing (which it actually was in industry, at least) the use of employment figures should, however, in principle imply a downward bias in the real domestic product estimate.

3) It was worked out by a team of economists under the leadership of Dr. Ibrahim Helmi Abdel-Rahman.

Table 3.

Government Wage Payments.

	Total wage payments, including cost-of-living allowances £E mill.	Index of Government wage rates 1954=100	Wage payments, including cost-of-living at 1954-prices £E mill.
1945	31.8	105.9	30.1
1946	32.7	100.0	32.7
1947	33.6	94.5	35.5
1948	44.6	91.1	49.0
1949	54.4	84.8	64.2
1950	75.9	102.9	70.3
1951	80.3	105.2	76.3
1952	88.1	105.8	83.3
1953	84.5	104.2	80.7
1954	89.5	100.0	89.5

Notes and sources: For the fiscal years 1947/48 to 1954/55, we have used preliminary estimates by Dr. R.O. Khalid for the UN of wage payments and cost of living allowances in the Government sector; these include military pay, but exclude Government enterprises. Before 1951 the fiscal year was March 1 - Feb. 28, so we used fiscal 1947/48 for calendar 1947 etc. From 1951, when the fiscal year was changed to July-June, we used the average of the two fiscal years for the calendar estimate. The figures were extrapolated back to 1945 on the basis of estimates of non-military pay in other UN-sources. For the wage rate index, we started with average basic pay rates in a representative cadre (grade 7), taken from Statistics Department publications. For each year, we computed total cost of living allowances as a percentage of total basic wage payments in the whole Government sector. This percentage was applied to the basic wage in our representative cadre, giving us an estimate of the wage rate in this grade including cost of living allowances. This was converted to an index basis, which was then used to deflate the series on total wages in current values.

In the agriculture sector, the original NPC Memo figures were computed on the basis of an output index; due to a changing pattern of inputs to agriculture (particularly fertilizers), this is not a satisfactory indicator of changes in real value added in the sector. We therefore preferred to use the figures in a recent study by the Statistics Department,[1] which computed both output and inputs in constant 1954-prices (see section 5 below). These figures are not available before 1950; before that we have been forced to use the implied output index in the NPC Memo figures. As a result, and to the extent that there was a marked increase in fertilizer consumption in the immediate post-war years, our figures therefore overstate the increase in real value added in agriculture from 1945-50.

1) op.cit.

As a third adjustment, we have added an estimate of value added in household services. In the absence of other information, we have assumed these to be unchanged (in real terms) throughout the period, at a level of £E 17 mill.[1] Finally, since the figures refer to domestic product, we have added net factor returns from abroad. The adjusted figures are given in Table 4.

With the methods here applied in calculating the "real" domestic product, regard has obviously not been paid to effects on real national income from changes in the terms of trade. The gains and losses in connection with changes in the terms of trade may be calculated in many different ways. Here we have chosen the following method. For each year exports and imports were estimated in terms of 1954-prices; this was done through deflating the current price figures by the export and import price indices of the National Bank of Egypt.[2] In this way we arrived at a hypothetical surplus (deficit) on the balance of trade which would have ruled, ceteris paribus, if the prices of export and import commodities had been the same as in 1954. The difference between this hypothetical surplus and the actual surplus is what the country could have spent extra abroad without deteriorating its net debt position towards the rest of the world _if_ ceteris paribus the 1954-prices had been ruling in that particular year. This difference is then taken to be the loss from terms of trade shifts in the particular year compared with 1954; to express it in terms of 1954-prices it was deflated by the import price index.[3] Given the definition of gains (losses) from terms of trade changes the estimates are defective for at least two reasons: they do not take invisibles into account, and the import price index does only comprise a limited number of import goods (machinery and equipment are, for instance, not included). For 1945-54 we were unable to form an opinion about the development of the prices for all invisibles.

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1) This is the estimate for 1954 given in NPC Memo 95.

2) These indices are chained Fisher-ideal-indices. For a description of the methods of calculation, see _Economic Bulletin_, National Bank of Egypt, 1951.

3) We have actually calculated the gains and losses from terms of trade on two other definitions, also. The results differ somewhat, but agree on the main features, namely the big shifts in 1947/48 and during the years 1950 to 1952.

Year
1945
1946
1947
1948
1949
1950
1951
1952
1953
1954

Aver
rate
comp

1945-5

1951-5

1945-5

Rate
in p
comp
1937
1947

Several comments can be made on this table. Looking first at the totals, one is struck by the large and erratic movements introduced into the figures by the estimated gains and losses from the terms of trade.[1] One hears many comments about the violent effects on domestic income of fluctuating export prices in developing countries; this is the first attempt we have seen to find a quantitative measure of these effects, which can be related to national income totals.

Looking at the individual sectors, the marked crop fluctuations in agriculture make it difficult to say what should be considered as a "representative year" in computing growth rates; the sub-periods 1945-51 and 1951-54 are rather misleading here, although it is not clear what alternative is most meaningful. In this sector as well as in industry, construction, and transport, there are other independent output indices available which make the pattern of developments shown here seem reasonable. Relating commerce to real commodity flows in agriculture and industry and foreign trade in the manner used in section 6 below, gives us some confidence in the trade component.[2] Beyond this, it is difficult to say much about the figures except that they look quite reasonable; with the reservation mentioned concerning the underlying employment figures, the methods of calculation seem quite satisfactory.

For this period there is also available a private estimate of national product at current market prices, done by Dr. S.H. Abdel-Rahman.[3] Deflated by the wholesale price index, this estimate shows an annual average growth rate of 8.2 pct. from 1945 to 1951, and 0.2 pct. from 1951 to 1954. These growth rates compare well with those found in Table 4.[4] The current price estimate can also be related to

1) It is possible that the method we have used in computing the gains from terms of trade exaggerates the increase which took place in 1947. Other methods of computing this gain support the idea that the gain was substantial, and that the largest increase took place in 1947; but they imply that a part of the improvement took place in 1946 and 1948, thereby smoothing the rate of increase of real income somewhat.

2) While the "real commodity flow" increased by 41 pct. real product in commerce rose by 54 pct.

3) El Sayed Hafez Abdel Rahman, A Survey of Foreign Trade in Egypt in the Post-War Period, University of Cairo, Fac. of Commerce Library, unpubl. doct. th. 1959. The author calls his total net national product, but it seems likely that, in general, it was gross of depreciation.

4) For 1950 an independent estimate was made by Dr. Anis, "The National Income of Egypt: 1950" L'Egypt Contemporaine, No.270, 1953. Compared with Anis' 1945 estimate and deflated by the Wholesale price index, this estimate points to an annual compound rate of growth of 10.4 pct. from 1945-50, as compared with 8.8 pct. in our figures.

our constant-price estimate for deriving an implicit price deflator; in fact, we
have derived two deflators in this way, using the constant price GNP figures with
and without the adjustments for terms of trade gains. The resulting figures,
along with the wholesale price index for the period, are given in Table 5.

Table 5.

| Year | GNP at current market prices £E mill. x) | Implicit price deflators | | Whole-sale price index |
		Without terms of trade adjustment	With terms of trade adjustment	
1945	552	100	100	100
1946	534	93	93	97
1947	578	96	96	92
1948	718	106	96	100
1949	829	115	108	94
1950	952	130	115	104
1951	1016	135	114	116
1952	920	119	112	112
1953	888	117	113	108
1954	936	119	113	104

x) According to Dr. Abdel Rahman op.cit.

These figures indicate in a quite striking way how revealing it can be
to take account of terms of trade changes in deriving implicit price deflators.
Unless one does this, the derived deflator is a joint measure of domestic price
developments and terms of trade shifts. Similarly a current price GNP series deflated
by the wholesale price index is likely to tell us more about changes in real national
income (i.e. including terms of trade effects) than about real national product.
As we have seen, these two can diverge quite markedly. It also seems that, for this
period at least, the wholesale price-index serves as a reasonably good national
income deflator - in spite of its obvious deficiencies. In section 6 we shall see
that also for the period 1953/54-1959/60 the wholesale price index and the implicit
national income deflator coincides. Wholesale price indices have in developed coun-
tries proved themselves to be bad national income deflators, and the explanation
given is usually that they mainly comprise "big" staple commodities only. But exact-
ly for this reason the wholesale price indexes may be better deflators in under-
developed countries; in such countries the "big" staple commodities do actually

dominate the economies. In underdeveloped countries the wholesale
prices may give a better expression for "final expenditure" prices than in
developed countries.[1]

5. The Department of Statistics Estimate for 1954 to 1958.

This estimate has been published for the years 1954 to 1958.[2] It is
made both at current prices and at fixed 1954-prices. Since the department is still
experimenting with classifications and methods of calculations, the figures for
individual sectors are not comparable from year to year; we refrain therefore from
giving the break-down on sectors which is actually available. It is uncertain to
what extent the totals are comparable and the fixed price calculation seems to be
affected by the non-comparability of the sectors. The estimate gives both the net
national income and the domestic product almost at factor costs; due to the methods
of calculation the growth rate is actually influenced by indirect taxes in some of
the sectors.

Concerning the methods of computation of the current and fixed price
estimates for 1957 and 1958, various methods have been applied for the different
sectors.[3] With some modifications and extensions the Department of Statistics
and Census took over an early 1954-estimate of the NPC.

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1) As pointed out by M. Gilbert and W. Beckerman, "International Comparisons of
   Real Product and Productivity by Final Expenditures and by Industry", in <u>Output,
   Input, and Productivity Measurements</u>, Studies in Income and Wealth, Vol.XXV,
   Ed. J.W. Kendrick, Princeton 1961, deflation by final expenditure prices takes
   fully account of the effects of terms of trade changes. For a theoretical
   treatment of this problem, see Bent Hansen, "Output-Productivity and Value Added
   Productivity", Memo No. 163, Institute of National Planning, Cairo 1962.

2) <u>Basic Statistics</u>, Central Statistical Committee, S.O.P.-Press, Cairo, June 1962,
   p.231 and 232. Actually the table there on national income at constant prices
   comprise the years 1950 to 1953 too, but a sector by sector inspection shows
   clearly that for most sectors the figures for these years are not at fixed 1954
   prices. Also, the current price figures for 1950-53 are not comparable with
   those for 1954 to 1958. For these reasons we have left them out of the picture
   here.

3) Department of Statistics and Census, "Estimates of National Income in the UAR
   (Egypt), 1957 and 1958", Cairo July 1962, and "Methods of Estimation of National
   Income in the UAR (Egypt), 1957-1958", Cairo 1962, (both in Arabic). For 1955
   and 1956 other methods were used, but we shall not enter upon these here.

Table 6.

| Year | Net National Income almost at factor cost | | Implicit deflator 1954=100 | Wholesale price index 1954=100 |
	At current prices £E mill.	At fixed 1954-prices £E mill.		
1954	869.4 x)	869.4	100	100
1955	- x)	918.2	-	99
1956	- x)	947.3	-	110
1957	1086.2	980.7	111	120
1958	1187.8	1103.2	107	119
1959				
Average annual rate of change comp. pct. 1954-1958		6.1 o)		
Rate of change of population 1947-1960 pct.		2.5-2.9		

x) Not computed.
o) Should probably be adjusted to about 5.5, see text below.

Agricultural value added has been estimated as the difference between total output value and total input value. A fairly complete (although for certain crops quite uncertain) statistical material for crops and prices and for input quantities and prices is available. It permits a straight forward calculation in both current and fixed prices of both total output and total input. Agriculture in Egypt is well covered by both price and quantity statistics and presents relatively few and small problems.[1]

Industrial value added has been calculated with various censuses of enterprises and production as a background. Direct information from establishments with 10 or more persons engaged about their net value added is given in the censuses. For establishments with less than 10 persons, net value added is estimated as the total number of persons multiplied by average wages with addition of the profit

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1) Production is estimated on the basis of estimates of total area and average yield. The problem (well-known from many underdeveloped countries) of estimating the farmers' own consumption does therefore not appear in Egyptian production estimates.