THE NATIONAL INCOME OF THE U.A.R. (EGYPT) 1939–62

by Bent Hansen and Donald Mead[1]

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 comparable, 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,[2] and we found it therefore worth while to try to make the main estimates comparable in order to come out with a fairly complete and reliable picture of the postwar 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 1952/3–1961/2, both of which originate from the National Planning Committee (Ministry of Planning); the results are given in Tables IV and VIII. 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. 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 those biases which may affect the measured growth-rates.

I. A NOTE ON THE TREND 1913–39

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]

II. THE PERIOD 1937–1945: DR. ANIS'S ESTIMATE

The only estimate available for 1937–45 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's 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 I. During World War II, Egypt paid off all her public foreign debts and accumulated a very large foreign exchange reserve, partly invested in British long-term Government bonds. The net factor

[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, 31 December 1962.
[3] Mahmoud Amin Anis, 'A Study of the National Income of Egypt', *L'Egypte 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 Statistics Department's best judgement about the importance of the individual commodities entering the index. Anis's fixed price estimate for industry was also made through application of the official wholesale price index.

TABLE I

National income at current and constant prices 1939-45

	Net national income at factor cost, current prices	Indirect taxes minus subsidies[1]	Net national income at current market prices	Wholesale price index	Net national income at constant market prices	Value added at factor cost at constant 1939 prices £E million	
	£E million	£E million	£E million	1939 = 100	£E million	Agriculture	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 compound per cent 1939–45 in net national income at constant market prices is nil

Annual rate of change of population compound per cent 1937–47   1·2–1·8

[1] For the budget years 1 March–28 February.

payments to abroad (equal to £E 4 million in 1945) must there-fore 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).

III. A COMPARISON OF THE THREE BASIC SERIES

In the postwar 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 prices. Table II gives these comparative figures for 1954, the only year when such a comparison is possible. The fairly close agreement of the totals should not distract us from the fact that the sectoral divergences 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 outline the figures can be said to be consistent.

TABLE II

Gross national product at market prices 1954
(£E million)

	N.P.C.	Memo	Statistics Department	N.P.C. Atlas
	A	B		
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	1,023	10,68	1,001	
+ net factor returns from abroad	−13	−13	−13	
Gross national product at market prices	1,010	1,055	988	995

Sources: N.P.C. 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;

N.P.C. Atlas: *Ten Years of Revolution, Statistical Atlas,* Department of Statistics and Census, Cairo, S.O.P. Press, July 1963, Table IX.

Adjustments: N.P.C. Memo: This estimate does not cover Government or household sectors; in series A we have added our own estimates of these items (see Table IV), in series B those from the Statistics Department study. The discrepancies 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 million. 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 IV below);

Statistics Department: We have taken the main Government enterprises out of the Government services sector (see below, Section V) 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 million imputed rent on Government buildings, not included in our estimate (N.P.C. 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.

N.P.C. Atlas: Average of current price figures for 1953–4 and 1954–5, with customs duties added. Agriculture is treated as for the N.P.C. Memo. These figures differ from those in Table VIII in that those are at 1953–4 prices; the differences are quite important for agriculture, small for industry and construction, and insignificant in other sectors, see below.

IV. THE PERIOD 1945–54

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]

[1] These detailed accounts, which were published as Memo No. 95 of the Planning Committee, Cairo 1958, agree quite closely with those given for the N.P.C. Memo, Series A, in Table II 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.

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 III 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).

TABLE III

Government wage payments

	Total wage payments, including cost-of-living allowances	Index of Government wage rates	Wage payments, including cost-of-living at 1954 prices
	£E million	1954=100	£E million
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 1947–8 to 1954–5 we have used preliminary estimates by Dr. R. O. Khalid for the U.N. 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 1 March to 28 February, so we used fiscal 1947–8 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 U.N. 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 agricultural sector, the original N.P.C. 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

[1] op. cit.

output and inputs in constant 1954 prices (see Section V below). These figures are not available before 1950; before that we have been forced to use the implied output index in the N.P.C. Memo figures. As a result, and to the extent that there was a marked increase in fertilizer consumption in the immediate postwar years, our figures therefore overstate the increase in real value added in agriculture from 1945 to 1950.

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 million.[1] Finally, since the figures refer to domestic product, we have added net factor returns from abroad. The adjusted figures are given in Table IV.

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 additionally abroad without increasing its net debt to 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 this 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 only comprises a limited number of import goods

[1] This is the estimate for 1954 given in N.P.C. Memo No. 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 1947–8 and during the years 1950 to 1952.

TABLE IV

Gross national product and income 1945–54
(£E million, at constant 1954 prices)

	Agriculture	Industry and electricity	Construction	Transport and communications (including Suez Canal)	Housing (ownership of real estate)	Commerce and finance	Other services including Government	Total G.D.P. at 1954 market prices	+ Net factor income from abroad	G.N.P. at 1954 market prices	Net gains or losses (−) from terms of trade changes	Real G.N.I. at 1954 prices (including terms of trade effects)	Rate of increase over previous year %
1945	303	91	19	38	50	122	96	719	− 8	711	−38	673	—
1946	302	92	22	43	51	142	101	753	− 9	744	−40	704	4·6
1947	299	101	25	46	53	147	110	781	− 5	776	−45	731	3·8
1948	328	113	31	61	56	169	122	880	− 3	877	31	908	24·2
1949	325	126	25	72	59	190	139	936	− 9	927	10	937	3·2
1950	303	133	22	78	62	210	148	956	−11	945	68	1,013	8·1
1951	304	132	36	81	65	209	157	984	−13	971	113	1,084	7·0
1952	334	132	30	81	68	193	166	1,004	−12	992	9	1,001	−7·7
1953	315	134	37	86	73	181	166	992	−11	981	−25	956	−4·5
1954	312	146	33	88	77	188	179	1,023	−13	1,010	0	1,010	5·6

Average annual rate of change, compound per cent

1945–51	0·0	6·4	11·3	13·5	4·5	9·4	8·5	5·4		5·3		8·3	
1951–54	0·9	3·4	−2·9	2·8	5·8	−3·5	4·5	0·7		1·4		−2·3	
1945–54 *	0·3	5·4	6·3	9·8	4·9	4·9	7·2	3·8		4·0		4·6	

Rate of increase in population, compound per cent
    1937–47   1·2–1·8
    1947–60   2·5–2·9

(machinery and equipment are, for instance, not included). For 1945–54 we were unable to form an opinion about the price trend for all invisibles.

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] There has been much discussion of the violent effects on domestic income of fluctuating export prices in developing countries; so far as we know this is the first attempt 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 1951–4 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 VI 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 reasonable; except for the underlying employment figures, the methods of calculation seem satisfactory.

For this period there is also available a private estimate of national product at current market prices, made by Dr. S. H. Abdel Rahman.[3] Deflated by the wholesale price index, this estimate shows an annual average growth rate of 8·2 per cent from 1945 to 1951, and 0·2 per cent from 1951 to 1954. These growth rates compare well with those found in Table IV.[4] The

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[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 per cent, real product in commerce rose by 54 per cent.

[3] El Sayed Hafez Abdel Rahman, *A Survey of Foreign Trade in Egypt in the Post-War Period*, University of Cairo, Faculty of Commerce Library, unpublished doctoral thesis 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'Egypte Contemporaine*, No. 270, 1953. Compared with

current price estimate can also be related to our constant price estimate to derive an implicit price deflator; in fact, we can calculate two deflators, using the constant price G.N.P. figures with and without the adjustments for terms of trade gains. The results together with the wholesale price index for the period are given in Table V.

TABLE V

Data for the deflation of gross national product 1945-5

	G.N.P. at current market prices[1] £E million	Implicit price deflators		Wholesale 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	1,016	135	114	116
1952	920	119	112	112
1953	888	117	113	108
1954	936	119	113	104

[1] According to Dr. Abdel Rahman, op. cit.

These figures indicate in a 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 G.N.P. 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 VI we shall see that for the period 1953/4–1959/60 also the wholesale price index and the implicit national income deflator coincides. Wholesale price indices have proved to be bad national income deflators in developed countries, and the

Anis's 1945 estimate and deflated by the wholesale price index, this estimate points to an annual compound rate of growth of 10·4 per cent from 1945 to 1950, as compared with 8·8 per cent in our figures.

explanation usually given is that they mainly consist of 'big' staple commodities. But exactly for this reason the wholesale price indexes may be better deflators in underdeveloped countries; in such countries the 'big' staple commodities dominate the economies. In underdeveloped countries wholesale prices may reflect 'final expenditure' prices better than in developed countries.[1]

V. 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 breakdown by 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 at approximate factor cost; 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 N.P.C.

[1] As pointed out by M. Gilbert and W. Beckerman, 'International Comparisons of Real Product and Productivity by Final Expenditures and by Industry', in *Output, Input, and Productivity Measurements*, Studies in Income and Wealth, Vol. XXV, ed. J. W. Kendrick, Princeton 1961, deflation by final expenditure prices takes full 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] *Basic Statistics*, Central Statistical Committee, S.O.P. Press, Cairo, June 1962, pp. 231 and 232. Actually the table there on national income at constant prices comprises 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 to 1953 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 U.A.R. (Egypt), 1957 and 1958*, Cairo, July 1962, and *Methods of Estimation of National Income in the U.A.R. (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 VI

	Net national income at approx. factor cost		Implicit deflator	Wholesale price index
	At current prices £E million	At fixed 1954 prices £E million	1954 = 100	1954 = 100
1954	869·4	869·4	100	100
1955	—[1]	918·2	—	99
1956	—[1]	947·3	—	110
1957	1,086·2	980·7	111	120
1958	1,187·8	1,103·2	107	119
1959				
Average annual rate of change compound per cent 1954–8				6·1[2]
Rate of change of population per cent 1947–60				2·5–2·9

[1] Not computed.
[2] Should probably be adjusted to about 5·5; see text below.

Agricultural value added has been estimated as the difference between the total value of output and the total value of input. A fairly complete (although for certain crops unreliable) statistical material for crops and prices and for input quantities and prices is available. It permits a straightforward 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 ten or more employees about their net value added is given in the censuses. For establishments with less than ten persons net value added is estimated as the total number of persons multiplied by average wages plus the profit margins found in establishments with ten or more employees. The deflation is done by means of a weighted average of the wholesale prices of twenty-five important commodities. Since value added is (in principle) at factor cost and the wholesale price index, of course, is based on market prices, this deflation method is not fully adequate and may

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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.

imply a bias in either direction (this remark applies also to some other sectors).

Value added in *construction and building* is computed as a fixed percentage of the value of building materials used, both imported (including customs duties) and domestically produced; the ratio is derived from the accounts of organized companies in the sector. To this is added the value added in certain special construction works. Deflation is by means of the official whole-sale price sub-index for building materials.

For *commerce*, wages have been calculated as employment times average wage with addition of profit margins as known from commercial companies. Deflation is by means of a weighted average of the wholesale prices of sixteen important commodities. For *finance*, income payments are known directly from the accounts of banks, insurance companies etc. Deflation is by cost-of-living index.[1]

For *transport*, detailed output and input information is available on both the Suez Canal, the railways, trams and buses, and inland water transport, with respect to both volumes of traffic and inputs and prices. But deflation of net value added has been done by means of the official cost-of-living index.

For *housing*, value added is obtained through an 'intelligent guess' based on information from the building taxation returns of (assessed) rents and rental values in towns. Deflation is by the cost-of-living index.

Government value added is based on budgetary and other information about Government wages and salaries, including pensions and payments to pension funds. A peculiarity is that all Government enterprises are included in the Government sector. This means, e.g., that from 1957 the Suez Canal is moved from the transportation sector to the Government sector. This seems to affect the deflation strongly, and may to some extent account for the low overall implicit deflator for 1957 and 1958. Deflation is by the cost-of-living index.

Other services' value added is estimated from certain information about employment, wages, salaries and margins of profits as estimated from data for the organized sector. Deflation is by cost-of-living index.

[1] The cost-of-living index is a Laspeyres index based on weights from 1939, chosen by the Department of Statistics according to what was supposed to be the spending pattern of a low middle income family in Cairo. The weights fit rather badly with consumer surveys carried out in recent years.

In considering the results, we shall only comment on the change from 1957 to 1958. The Department of Statistics results show an increase in 1957–8 of 9 per cent in national income at current prices and 12 per cent at fixed prices. This does not look convincing, although 1958 was the year when the Suez Canal worked again at full capacity. A closer inspection shows that most of the increase accrued in commerce which from 1957 to 1958 appeared to increase by 33 per cent at current prices and 62 per cent at fixed prices. Most of this must be due to errors in the primary employment statistics and for 1958 the 'true' increase in national income at fixed prices may be of the order of magnitude of 8 per cent rather than 12 per cent. For the average rate of increase 1954–8 this may mean a drop from 6·1 per cent to about 5·5 per cent. We remark that – apart from agriculture where the double deflation method is applied – the methods of deflation should in principle take into account terms of trade changes; we have therefore found it unnecessary to make any adjustments for changes in terms of trade, which, by the way, were relatively small for the period. Finally, it will be seen that the implicit deflator shows less than half the increase of the wholesale prices; this is partly due to the transfer of activities from other sectors to the Government sector, where the deflator is lower.

VI. AN ATTEMPT TO ESTIMATE REAL NATIONAL INCOME 1952/3–1961/2

For the period 1952/3–1960/1[1] an official estimate of 'National Income by Economic Activities' has been published.[2] This is the estimate which in Table II was called 'N.P.C. Atlas'. Although published by the Department of Statistics, the estimate is not that of the Department itself, but may be considered as a continuation of the N.P.C. estimate discussed in Section IV above. The estimate is at current market prices with exclusion of customs duties. We have taken these figures as the starting-point for a fixed 1953–4 market price calculation from 1952–3 to 1959–60, the published figures for 1960–1 being already at fixed 1959–60 prices. Fixed price estimates made by the Ministry of Planning have helped to bring this calculation up to 1961–2.

[1] Budget years 1 July–30 June.
[2] *Ten Years of Revolution, Statistical Atlas,* Department of Statistics and Census, Cairo, S.O.P. Press, 23 July 1962.

The results are presented in Table VIII below, and to make them intelligible we shall give a brief description of the methods employed and point out some possible biases in the calculations; Table VII gives details for the years 1953–4 and 1959–60. Some information about price trends will also be given.

Agriculture. A calculation of net value added at 1954 prices (double deflation) is made by the Department of Statistics for the years 1950 to 1960.[1] This series is used by the Department itself in its national income estimates. There seems to be little to criticise in the methods of calculation. We have converted this series to 1953–4 prices and made interpolations on this series from the calendar years 1952 to 1960 to obtain budget year figures. The current price figures were taken from the same source. An implicit deflator was obtained.

Industry and electricity. As an expression of the volume increase in value added we have used an output index spliced together from two different sources of information. For 1952–9 the general production index of the National Bank of Egypt was used; this is a Fisher-ideal index with net value added, weights taken from the 1954 production census.[2] From 1959 to 1960 we used the value added for enterprises engaging ten persons and more in industry as shown by the production census, adjusted by the wholesale price sub-index for industrial products. Quite apart from the different nature of the two sources of information used, the following biases should be noticed:

(i) In the index of the N.B.E. input figures (employment or/and use of raw materials) are in certain cases used as substitutes for output figures. Productivity changes are thus disregarded and this means in all probability a downward bias.

(ii) The index of the N.B.E. does not include certain new products and industries established during the second half of the 'fifties. This means a downward bias.

(iii) The index of the N.B.E. is a typical 'big commodity' index and tends accordingly also to be a 'big industry' index. Obviously small-scale industry has grown more slowly than enterprises with ten persons and more, and little information is available about establishments with less than ten persons. An attempt has been made to estimate a maximum limit

[1] *National Income from the Agricultural Region, 1958–60,* Department of Statistics, Cairo, no year (in Arabic).
[2] *Economic Bulletin,* National Bank of Egypt, Vol. X, No. 1, 1957.

for the bias implied here. Under certain reasonable assumptions, it was found that this bias might amount to *at most* 11 out of a percentage increase of about 70 from 1952 to 1960.[1] Although there is here a clear upward bias, it does not seem to disturb the results so much as one could perhaps expect.

With these opposing biases in force, it is difficult to say whether the industrial production index is biased upwards or downwards in general.

Construction. Here we have deflated the sectoral income at current prices by a simple average of the official wholesale price sub-index for building materials and an index of average weekly wages for all workers. If productivity has increased, a downward bias is introduced. Most probably productivity has actually increased in construction due to a shift toward industrial buildings and construction.

Transportation and communication. The sectoral income is deflated by a crude index based on Suez Canal toll rates and railway fares.

Commerce and finance. Two alternative methods are used. (1) The real contribution is assumed to be proportional to the flow of commodities. On this assumption the change in real income (at market prices) from commerce and finance is set equal to the rate of increase of real income from agriculture and industry plus real imports with the addition of customs duties in proportion to those of 1953–4. (2) The sectoral income at current prices with addition for current customs duties is deflated by a simple average of the wholesale and a retail price index.[2] Commerce and finance thus include all customs duties.

Housing. The level of rents is taken to have been unchanged during the period. Actually rents have been fixed by the rent controls, but since an increasing part of the existing stock of houses consists of new houses built at a higher level of costs than the prewar houses, and since the income from housing is estimated on the basis of the rental value of the houses (as assessed in connection with building taxation), an upward bias in the real estimates is introduced here.

Other services. This sector includes Government administration, domestic services and certain other services. For the

[1] See forthcoming book on the *Economic Development of Egypt*, by B. Hansen and G. A. Marzouk.
[2] The retail price index is a sub-index of the cost-of-living index and covers only food, fuel and soap.

Government there may be an upward bias in the estimate of Government wages and salaries. This is due to the fact that from 1957 onwards only budget *estimates* exist, and they tend usually to exaggerate expenditures. Also it should be remembered that some Government wages and salaries are simply a form of unemployment benefit; whether this has increased during the period is difficult to say – at the beginning of the period there were large payments of this type to former employees with the British military forces. The levels of Government wages and salaries have in principle been unchanged during the whole period,[1] but from 1956 the Government's payments to the pension funds, corresponding to 10 per cent of Government wages and salaries, are included in the Government sector income, so we have taken the increase in Government wage level to be 10 per cent from 1952–3 to 1959–60. For domestic and other services little is known about the wage level or its trend. There may be a tendency for such wages to increase in conformity with wage rates for agricultural labourers (which may have experienced a 10 per cent increase in wages during the 'fifties). For the sector as a whole we assumed that the wage level increased by 3 per cent in 1956–7 and by a further 2 per cent in 1958–9 (the pension scheme was only gradually extended to comprise all Government employees), and this was used as a deflator. The results of the calculations are shown in Table VII.

Considering the results, we notice that the implicit deflator for the total gross value added shows a slightly lower increase than the wholesale price index, about the same as the retail prices, and somewhat more than the cost of living.

In Table VIII we have shown the results of the calculations for all sectors year by year from 1952–3 to 1961–2. About the estimates for 1960–1 and 1961–2, the only remark which needs to be added is that for industry the estimates are based on direct enquiries from enterprises with ten or more persons employed about their value added at constant 1959–60 prices. This gives rise to an upward bias (in addition to the various biases earlier mentioned) in that new commodities will tend to be measured

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[1] The basic rates have been unchanged, and so have the cost-of-living allowances. Closed accounts are not available for the time after 1957, and we found it therefore useless to continue the calculations of Table III, although it is known that a slow-down of the usual automatic upgrading of civil servants in the 'fifties actually may have implied a certain temporary fall in Government wage rates.

TABLE VII

	Agriculture				Industry and Electricity			
	Net value added at current prices	Net value added at constant 1953–4 prices	Net value added at constant 1953–4 prices	Implicit deflator	Gross value added at current prices	Output	Gross value added at current prices	Implicit deflator
	£E million	£E million	Index	Index	£E million	Index	£E million	Index
1953–4	295	295	100	100	140	100	140	100
1959–60	407	367	124	111	269	150	209	129

	Construction				Transport and communication			
	Gross value added at current prices	Deflator	Gross value added at constant prices	Gross value added at constant prices	Gross value added at current prices	Deflator	Gross value added at constant prices	Gross value added at constant prices
	£E million	Index	£E million	Index	£E million	Index	£E million	Index
1953–4	27	100	27	100	55	100	55	100
1959–60	47	112	42	156	92	105	88	160

	Commerce and Finance							
	Method I				Method II			
	Gross value added at current (market) prices	Total commodity flow	Gross value added at constant (market) prices	Implicit deflator	Gross value added at current (market) prices	Deflator	Gross value added at constant (market) prices	Gross value added at constant (market) prices
	£E million	Index[1]	£E million	Index	£E million	Index	£E million	Index
1953–4	158	100	158	100	158	100	158	100
1959–60	212	135	213	100	212	115	184	116

TABLE VII (*continued*)

	Housing				Other services			
	Gross value added at current prices	Deflator	Gross value added at constant prices	Gross value added at constant prices	Gross value added at current prices	Deflator	Gross value added at constant prices	Gross value added at constant prices
	£E million	Index	£E million	Index	£E million	Index	£E million	Index
1953–4	54	100	56	100	232	100	232	100
1959–60	73	100	73	130	272	105	259	117

	Total value added				Official price indexes		
	Gross value added at current prices	Gross value added at constant prices	Gross value added at constant prices	Implicit deflator	Wholesale prices	Cost of living	Retail prices
	£E million	£E million	Index	Index			
1953–4	963	963	100	100	100	100	100
1959–60	1,372	1,251–1,222	120–127	110–112	115	104	111

[1] Including customs duties.

at current (presumably higher) prices. Also it should be stressed that in underdeveloped countries with infant industry policies new commodities will usually be of a lower quality. For most of the sectors the methods of calculating real value added leave out of account effects from changes in terms of trade. In the table a column has been included containing the terms of trade gains compared with the year 1953–4 (for method of calculation, see above Section IV).[1] The real gross national income is arrived at after addition of the terms of trade gains.

At the bottom of Table VIII the reader will find the annual (compound) rates of increase for the individual sectors as well as for real gross national income. Figures are given both for the period 1953/4–1960/1 and 1953/4–1961/2, the reason being that the year 1961–2 was made exceptional by the abnormal crop failure (especially for cotton) in that year. The differences in the growth rates calculated with or without 1961–2 are not very big, however. The years 1952–3 were excluded here because 1952–4 are included in the growth rates of Table IV.

For the period as a whole we find an annual (compound) rate of increase of 4·3–4·7 per cent (disregarding 1961–2 we get 4·7–5 per cent) in real national income.[2] The rate of increase of population was 2·5–2·9 per cent. From the last two columns of the table it is seen that the rate of growth was higher during the second half of the period than during the first half. From 1952–3 to 1956–7 the average annual increase of real national income was 2·4–2·5 per cent against 5·3–5·4 per cent for 1956/7–1961/2. This trend is partly a result of the international business cycle which in the main was responsible for the slack in the beginning of the 'fifties, but most probably also of the Govern-

[1] As mentioned earlier, the import price index does not cover machinery and equipment. During the 'fifties the prices of machinery and equipment have probably increased in comparison to other import goods and the gains in terms of trade may therefore be somewhat exaggerated. This impression is reinforced if an attempt is made to take into account invisibles. The Suez Canal toll rates were constant, while the Government expenditures abroad (which is the other big invisible item) most probably faced a rising price level abroad; more than one half of the Government expenditures abroad consist of students and diplomatic service expenditures.

[2] From 1954 to 1958 we find (through interpolation) a growth rate of 3·6–4·2 per cent, which is considerably lower than the (adjusted) rate of growth (5·5 per cent) found by the Department of Statistics. Continuing the original N.P.C. estimate (excluding Government and Household Services) to 1959, Dr. M. M. El Imam of the Institute of National Planning found a growth rate of 4·5 per cent from 1954 to 1959 for domestic production, which even after addition of about 0·4 to the percentage terms of trade improvements compares fairly well with the 4·2–4·7 per cent growth in our estimates for the same period.

ment's deliberate efforts to increase growth in the second half of the 'fifties (the share of investment in gross national income may have increased from about 13–14 per cent to 16–17 per cent from 1952–3 to 1961–2).

For the individual sectors we find the highest growth rates in industry, construction and transport. Construction was speeded up rapidly from 1960–1 by the High Dam works, while the increasing Suez Canal traffic is the main factor behind the growth of transport.

Through simple interpolation it is possible from Table VIII to calculate figures for the calendar years 1953 and 1954. In Table II we have already compared the levels of the N.P.C. estimate and the present estimate. For 1953–4 it is now also possible to compare the changes sector by sector. Taking into account the crude interpolation, the figures for the changes compare fairly well. For all such comparisons it should be remembered that Table VIII is at 1953–4 prices, while Table IV is at 1954 prices. For the total national product the price level may have been 2·4–2 per cent (alternatives I and II, respectively) higher in 1954 than in 1953–4. For agriculture the corresponding figure is 6·7 per cent, for industry 2 per cent, for construction 1 per cent and for commerce 2–0 per cent (alternatives I and II respectively); for the other sectors there were no price changes.

VII. SUMMARY

In Tables IV and VIII we have given constant price figures for real national product and national income in Egypt during the periods 1945–54 and 1952/3–1961/2 broken down by sectors. Together with the probably less reliable estimates for 1939–45 presented in Table I, they cover the whole period 1939–1961/2. For the period as a whole there has been a clear upward movement in national income, but the trend has been so uneven that it is difficult to talk about one long-term trend for the period as a whole. From year to year the trend has at times been wildly erratic, and even between longer periods the differences in the growth rates are large. We find the strongest fluctuations in the growth of real national income, while real national product shows a less fluctuating trend. This difference is due to the effects of terms of trade changes, which have exerted a strong impact on the real national income. But even the real national product

TABLE VIII

Gross national product and national income 1952/3–1961/2

(£E million)

	G.N.P. at current market prices	Gross national product at constant 1953–4 market prices										Gains from terms of trade changes	Real gross national income at constant 1953–4 market prices		Rate of increase over previous year %	
		Agri-cul-ture	Industry and electricity	Con-struc-tion	Transp. and comms	Hous-ing	Commerce and finance		Other ser-vices	Total						
							I	II		I	II		I	II	I	II
1952–3	905	305	137	25	54	59	167	142	217	964	939	+8	972	947	—	—
1953–4	963	295	140	27	55	56	158	158	232	963	963	−0	963	963	−0·9	1·7
1954–5	1,014	298	149	26	58	62	161	163	235	989	991	+8	997	999	3·5	3·7
1955–6	1,072	308	160	25	62	65	171	165	237	1,028	1,022	+10	1,038	1,032	4·1	3·3
1956–7	1,125	318	170	28	58	67	172	151	236	1,049	1,028	+17	1,066	1,045	2·7	1·3
1957–8	1,195	333	186	33	62	68	189	167	240	1,111	1,089	+14	1,125	1,103	5·5	5·5
1958–9	1,256	352	198	38	69	70	205	172	245	1,177	1,144	+17	1,194	1,161	6·1	5·3
1959–60	1,372	367	209	42	88	73	213	184	259	1,251	1,222	+26	1,277	1,248	6·9	7·5
1960–1	—[1]	365	234	39	97	74	223	197	289	1,321	1,295	+30	1,351	1,325	5·8	6·2
1961–2	—[1]	338	257	55	111	76	228	(198)	(289)	1,354	1,324	(+30)	1,384	1,354	2·4	2·2
Annual rate of change compound per cent 1953-4 to 60-1 1953-4 to 61-2		3·0 1·7	7·6 7·9	5·4 9·3	8·4 9·2	4·1 3·9	5·1 4·7	3·2 2·9	3·1 2·8	4·6 4·3	4·3 4·1		5·0 4·7	4·7 4·3		

Rate of increase of population 1947–60 compound per cent 2·5–2·9

[1] Not computed.

shows strong, and to some extent erratic, fluctuations in the growth rate. From year to year the main factor here is the crop fluctuation; apart from this, the trend in national product seems to be influenced by the business cycles in Europe and U.S.A. The period from 1939 may conveniently be divided into the following sub-periods.

For the war period 1939–45 real national income was most probably stagnating, and with a population increase of 1·2–1·8 per cent[1] p.a., real *per capita* income may have fallen at the same rate. In a sense this was a continuation of a long-term pattern of development; in the preceding quarter of a century, while real income may have risen slightly, it probably did not keep pace with population growth.

For the post-war period 1945–51 real national income rose strongly by 8–9 per cent p.a., of which about one-third was due to improved terms of trade (the Korean boom). With a population increase of maybe 2–2·5 per cent[1] p.a., real *per capita* income may have risen by as much as 5·5–7 per cent p.a.

For the post-Korean boom period 1951–4, real national income fell by more than 2 per cent p.a., the terms of trade loss amounting to about 3 per cent p.a. With a population increase of 2·5–2·9 per cent p.a.,[1] the fall in real *per capita* income may have amounted to as much as 4·5–5 per cent p.a.

During the Suez War period 1954–7 national income recovered, growing at a rate of about 3 per cent p.a., of which ½ per cent was due to improved terms of trade; this was quite naturally kept down by the Suez War and its aftermath. Real *per capita* income may here have been approximately constant.

Since the Suez War, i.e. from 1957–8 onwards, the rate of growth of real national income has been high and stable, with annual increases of 5–7 per cent apart from one exceptional year. The average for 1957/8–1961/2 was 5·3 per cent p.a., but this average was pulled down somewhat by the abnormal crop failure (in cotton especially) in 1961. Disregarding 1961–2 – or including 1962–3, which with a record crop may show an increase of up to 10 per cent over 1961–2 – the 'normal' growth

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[1] The raw population census figures show an increase of 1·8 per cent p.a. from 1937 to 1947 and 2·5 per cent p.a. from 1947 to 1960. After certain adjustments, figures of 1·2 per cent and 2·9 per cent for the two periods have been postulated. Since population registration figures show an increase of 2·4 per cent p.a. only for 1953–8, a 2·9 per cent annual increase from 1947 to 1960 does not look very likely.

rate since 1957–8 seems to have been around 6 per cent p.a. During this period terms of trade played a negligible role only. With a population increase of maybe 2·5 per cent p.a., an increase in real *per capita* income by over 3 per cent p.a. since 1957–8 seems likely.

We have done very little in this paper to analyse the causes behind trends and fluctuations. In a few cases only have we found it necessary to comment briefly on certain developments in order to remove doubts from the reader's mind as to the reasonableness of the estimates; our main task has been to extend existing estimates in an attempt to present a complete, comparable and reliable set of national income statistics for the whole postwar period. To what extent we have succeeded depends very much on the gaps and short-comings in the basic statistics used, and on possible biases in the methods applied. We do not feel competent to judge whether such imperfections and biases imply over- or underestimations of the level of income and its growth rate; but we do feel, after having worked now with these estimates for some time, that improvements of the estimates are not likely to change the main picture drawn up in this summary.