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Labor absorptive capacity of export expansion and import substitution in Egypt, 1954 to 1970

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Working Paper No. 1

LABOR ABSORPTIVE CAPACITY OF EXPORT EXPANSION AND IMPORT SUBSTITUTION IN EGYPT, 1954 to 1970

by

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INTRODUCTION

In the post war era, much has been said about the role of the foreign trade sector in affecting the rate and the level of domestic economic growth in the group of LDCs. The impact of exports in particular received the lion's share of attention. It has been frequently argued that exports act as an engine of growth. The line of causation here runs from exports to domestic economic growth. Through the effects of both the multiplier and the accelerator, output expands by a multiple of the initial value of exports. Exportation also tends to reduce the opportunity cost of domestic resources by providing foreign exchange necessary to meet domestic demands from abroad at relatively lower prices. Forward and backward linkages stimulate growth in export-related activities. Export expansion, in addition, gives rise to external economies, economies of scale, an efficient allocation of resources, and a greater-than-one elasticity of expectations on the part of domestic exporters.

The line of causation also runs in the other direction whereby output expansion will generate additional exports. This comes about with the passage of time as a result of a) increasing the division of labour as well as the efficiency of production at home (the learning by doing doctrine), b) enhancing the possibilities of producing differentiated products which are much more saleable abroad than standardized products b) changing the domestic product mix, and d) increasing the elasticity of export composition with respect to changes in the pattern of world demand. As such, this growth of output which is precipitated by an initial increase in exports would, in addition, enable the country in question to take advantage of the product cycle phenomenon through its partaking in the production of "matured" labour-intensive products. The result is more exports, which leads to more output, and to more exports and so on. While these aspects

x This paper is an extention of an earlier working paper titled, "The Impact of Exports on Egypt's Employment Situation, 1954" March 1973, Institut für Weltwirtschaft, Kiel. The author wishes to thank J.B. Donges and Franz Gehrels for their helpful comments on an earlier draft of this paper.

and others which portray the influence of exports on the general level of economic development have been expounded by development theorists, relatively little has heretofore been said about the employment generating power of exports. This is due, understandably, to the preoccupation of economists with the overall problem of development, and to the central role assigned to the variable output in the neoclassical theories of economic growth. It is known, however, that the beneficial repercussions of both exports and import substitution on the rate of growth of domestic output generate somewhat similar effects on labour employment.[1] Depending upon labour intensities imbedded in exports and imports, the extent of employment expansion will vary accordingly. Thus, we set out in this note to measure the labour absorptive capacity of exports and import substitution in Egypt. Our objective function which we seek to maximize (minimize) is that of labour employment (unemployment) via the foreign trade sector.

The following discussion was motivated by several factors. For one, such an inquiry has not been done on Egypt up to now. Secondly, there is an increasing amount of attention devoted in recent years to the staggering unemployment situation in LDCs.[2] Thirdly, elsewhere we have analyzed the consequences of export expansion and import substitution on the structural changes in output in Egypt over a 14-year period, so that it is natural to extend the analysis to the area of labour employment.[3]

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1 Because import-Substituting industries are generally more capital-intensive than export industries, job creation is likely to be greater in the latter than in the former for a given unit of output.

2 See, for example, the results of four major studies on Iran, Kenya, Ceylon and Colombia sponsored and published by the International Labour Organisation, Geneva: (1) Employment and Income Policies for Iran, 1973; (2) Incomes and Equality: A Strategy for Increasing Productive Employment in Kenya, 1972; (3) Matching Employment Opportunities and Expectations: A Programme of Action for Ceylon, 1971; and (4) Towards Full Employment: A Programme for Colombia, 1970.

3 See, Maurice Girgis, "Sources of Industrial Economic Growth in Egypt, 1950 - 1970", a working paper at the Institut für Weltwirtschaft, Kiel, March, 1973; reprinted (in German) in the July 1973 issue of Die Weltwirtschaft, Institut für Weltwirtschaft, Kiel, pp. 113-141.

In Section I, we outline the methodology used in calculating the effects of exports and imports on employment opportunities. The results are reported in the following section. The possibility of whether or not exports can either alleviate or eliminate unemployment in Egypt by 1980 or 1985 is explored in Section III. The last section offers some concluding remarks with reference to policy implications.

I. THE MODEL

An estimate of the number of workers directly engaged in the production of exported commodities is arrived at by first calculating the value of labour-intensity per unit of output in a given sector (ℓ_i) and then multiplying it by total exports of the same sector. In symbols, we may write:

$$(1) \quad \ell_i = L_i / X_i \qquad (i = 1, \ldots, n)$$

$$(2) \quad {}_eL_i = \ell_i E_i \qquad (i = 1, \ldots, n)$$

where L_i, X_i, E_i, ℓ_i and ${}_eL_i$ represent labour, output, exports and labour per unit of output and employment generated by exports in the ith sector, respectively. All variables are nonnegative. Total employment generated by exports is then defined as

$$(3) \quad {}_eL = \sum_{i=1}^{n} {}_eL_i \qquad (i = 1, \ldots, n)$$

This method has one major drawback, in that it ignores the indirect labour required to produce a given unit of output, which may be rather considerable in certain lines of production. The extent of the difference varies directly with the degree of interrelatedness between one sector and the others. A reasonably detailed input-output table provides the tool necessary to account for the disparity between direct and total labour requirement.

Given the technical coefficients of the sectoral production functions, one may calculate total labour intensity embodied in a unit of final demand as specified in the input-output table as follows:

$$(4) \quad \ell_i' = \sum_{j=1}^{n} r_{ij} \ell_i \qquad (i = 1, \ldots, n)$$

where the r_{ij}'s represent elements of the inverted Leontief matrix. In order to arrive at the total direct and indirect labour employment generated by exports [4] in a given sector, one needs only to multiply total labour intensity of output by exports. Thus,

$$(5) \quad {}_eL_i' = \ell_i' E_i \qquad (i = 1, \ldots, n)$$

For all sectors, total labour requirements can be obtained by summing equation (5) across the i's, as follows[5]:

$$(6) \quad {}_eL' = \sum_{i=1}^{n} \ell_i' E_i \qquad (i = 1, \ldots, n)$$

It is to be noted that only the domestic interflow matrix is appropriate in this context. If intersectoral transactions include imported inputs as well, the resulting figures of employment generated by exports will be over-estimated since ℓ_i will be biased upwards by the amount of labour employed abroad in the production of the imported inputs.

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[4] This model can also be used to determine the sectoral distribution of income generated by exports. The only modification required is to replace labour per unit of output by value added per unit of output.

[5] Cf. William G. Tyler, "Methodological Notes on Analyzing Manufactured Export Performance in Less Developed Countries, Kieler Diskussionsbeiträge No. 28, (February 1973), p. 28; James Riedel, "Manufacturing for Exports and the Labour Absorption Problem in LDC's: An Anatomy of Taiwan's "Footloose" Industries", April 1973, Unpublished, Institute für Weltwirtschaft, Kiel, pp. 6-7.

The effect of import substitution on employment is determined likewise. Viz.

$$(7) \quad {}_{m}L' = \sum_{i=1}^{n} \ell_i' \, M_i \qquad (i = 1, \ldots, n)$$

Where ${}_{m}L'$ is the total direct and indirect labour required to replace imported goods by equivalent domestic production and M_i, the total value of competitive imports of sector i. Two qualifications should be made in regard to the application of equation (7). First, each cell in the interflow matrix should have two entries, one for domestically produced inputs and the other for imported inputs (M_{ij}), the sum of the latter across the receiving sector constituting one element of the M_i vector. The availability of a single raw vector which sums the total value of imported inputs in the input-output table precludes the possibility of computing equation (7) since each of its elements represents the value of a heterogeneous set of inputs received from all sectors. Second, each element, M_{ij}, should exclude non-competitive imports since it is only competitive imports which can be replaced by domestic production. However, the general lack of such a detailed breakdown of imports may be treated by assuming that competitive imports is a linear function of total imports, thus,

$$(8) \quad \sum_{i=1}^{n} M_i = \alpha \sum_{i=1}^{n} \overline{M}_i \qquad (i = 1, \ldots, n)$$

where $\overline{M}_i$ represents the sum of competitive and non-competitive imports and α is a constant. By replacing (8) in (7), we obtain

$$(9) \quad {}_{cm}L' = \alpha \sum_{i=1}^{n} \ell_i' \, \overline{M}_i \qquad (i = 1, \ldots, n)$$

where ${}_{cm}L'$ represents total labour employment generated by import substitution. Admittedly, the fixed proportion assumption expressed in (8) is unrealistic and is likely to distort an industry by industry comparison. Yet, to the reliability of the results obtained for the economy at large, the damage is expected to be within narrow limits.

Equation (9) is derived with two purposes in mind. The first seeks to answer the hypothetical question: how many additional jobs can be filled if all competitive imports had been produced domestically. To be sure, such an inquiry serves to satisfy one's intellectual curiosity alone, for there exists no modern state which strives for complete self-sufficiency. Nevertheless, such an inquiry is not without merits for it helps to place this branch of economic activity, namely, imports, in a better perspective. The second, and more instrumental, is to estimate the number of jobs which have actually been created during a given period of time as a result of persuing an import-replacement strategy of development.

Although there are great advantages to be reaped from the use of the input-output table in this type of empirical work, there exists certain analytical limitations that should be mentioned at the outset. In the first place, there are the usual assumptions made with respect to input-output analysis in general such as: a) each sector produces but one primary output, b) inputs are non-substitutable (due to technological considerations or the absence of changes in the relative prices of inputs), c) each input is a (linear) function only of the level of output, and d) production is a simple sum of individual activities (the additivity assumption) which rules out external economies and disconomies.[6] The validity of these assumptions is obviously opened to questions. Furthermore, estimates of labour employment generated by exports in say, the agricultural sector may be biased upwards. The reason is that values of ℓ_i and ℓ_i' are based on production conditions which prevail in the entire sector; and since production of cash crops destined for exportation is normally more efficient, i.e. it exhibits a lower ℓ_i than that of products destined for domestic consumption, the use of an average ℓ_i which is higher than that of exportables tends to overestimate export-generated employment in the agricultural sector as a whole. The same is true for all other sectors. Another limitation imposed by the input-output approach is that while it is theoretically correct to talk about the total (direct and indirect) labour generated by exports (or investment, consumption,

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[6] See Hollis B. Chenery and Paul G. Clark, Interindustry Economics, John Wiley Sons, Inc., 1959, pp. 33-42.

government and what not) in the entire economy, it is not true for a given sector in view of the fact that the secondary circuitial rounds which sum the indirect effects encompass labour from other sectors as well.

Our model thus far makes the implicit assumption that all resources required by export expansion are readily available and unemployed. This is unrealistic, for the relevance of the model - at least in so far as the labour absorptive capacity of exports in the short to medium run - rests on the vera causa of labour unemployment. First, if unemployment is due to market imperfections, export expansion will do little in the way of reducing it, because this is an institutional problem that can be solved by institutional remedies and not merely by expanding output. Second, if it is due to lack of complimentary resources, especially physical capital, export expansion will have no effect whatever on unemployment unless these resources are withdrawn from other sectors. If so, the net effect on the national level of economic welfare is uncertain since output in the old localities from which a given resource was withdrawn will fall. If physical capital were to be shifted from a labour-intensive industry, export expansion will have to reckon with the compounded task of absorbing both the additional labour released along with capital and those who are already unemployed. On the other hand, the problem of generating employment by export expansion will be less difficult if capital is shifted from capital-intensive industries, since, in this case, the number of workers released along with capital is relatively fewer than in the one mentioned above. The same results follow if the input withdrawn is raw materials. Third, unemployment may be the result of a deficient aggregate demand. It is only in this case that export expansion will be able to reduce unemployment by expanding exports and generating additional incomes, given, of course, that labour market imperfections and supply rigidities of complementary resources are absent. However, there is still the possibility that expanding exports may require specific categories of labour occupations which are not available among those who are unemployed. These bottle-necks, to be sure, will weaken the potency of exports in reducing unemployment in the short run. Our model, however, can be readily extended so as to take this factor into account. Instead of treating labour as a homogeneous

input, it can be broken down into separate categories of skills. Thus, let

$$(10) \quad L = L_1 + L_2 + L_3 + L_4$$

where L_1, L_2, L_3 and L_4 represent unskilled labour, skilled labour, clerks and technicians and professional managers, respectively. Following our model, export-generated employment can be obtained from the following equation:

$$(11) \quad {}_eL' = \sum_{i=1}^{n} \ell'_{1i} E_i + \sum_{i=1}^{n} \ell'_{2i} E_i + \sum_{i=1}^{n} \ell'_{3i} E_i + \sum_{i=1}^{n} \ell'_{4i} E_i$$

$$(i = 1, \ldots, n)$$

where the ℓ'_{xi}'s represent total labour of category x required per unit of output in industry i. Once export requirements of certain labour categories are determined (${}_eL'_{xi}$), they can be matched against what is available at home especially among the ranks of the unemployed labour force. Bottle-necks can then be determined and their limitational effects on the export-generating power of reducing unemployment in a dynamic setting can be quantified.

II. RESULTS

A. Exports and Export Expansion

Because there are only two input-output tables available to us (1954 and 1969/1970), and since their sector breakdown is different, the results are reported separately in Tables I and II. Before going any further, it is only fair at this point to caution the reader against a strict interpretation of the results. Due to the vulnerability of the data with which we had to work, one would do well to view the findings not as a factual statement of the actual situation but as a proximate picture.

By distilling their most important features, the results bring out the following characteristics of the relationship between exports and labour employment:

1. Total direct and indirect labour required per E£ 1000 of output is greater in every sector than the direct alone, as would be expected. The

Table I

LABOR ABSORPTIVE CAPACITY OF EXPORTS IN EGYPT, 1954

Sector	(1) Direct Labor Requirement per E£ 1000 Output (man year)	(2) Total Labor Requirement per E£ 1000 Output (man year) value	Rank	(3) Total Value of Exports (E£ 1000)	(4) Direct Labor Employment Generated by Exports (man year)	(5) Total Labor Employment Generated by Exports (man year)	(6) Direct Labor Employment Generated by Exports as a ./. of total Employment (./.)
Agriculture	10.70883	13.88633	1	3,170	33,946	44,018	.79
Mining and quarrying	1.07280	1.93538	23	900	966	1,741	6.9
Metals	2.92995	4.08409	14	340	996	1,389	3.45
Metal products	1.69402	2.97809	18	220	373	655	1.86
Cement	1.04991	2.33905	22	800	840	1,871	14.42
Petroleum refining	0.31032	1.71366	25	850	264	1,457	3.30
Machinery	2.59488	4.56813	12	1,140	2,958	5,208	3.70
Basic chemicals	0.34965	2.53249	21	-	-	-	-
Other chemicals	0.31397	1.30820	27	910	286	1,190	7.15
Meat products	0.86170	11.67484	4	180	155	2,102	0.39
Dairy products	2.15198	9.28961	6	30	65	279	0.07
Grain milling	0.22043	12.02182	3	1,750	386	21,038	2.14
Bakery products	0.40316	8.81149	7	50	20	440	0.09
Sugar	0.61611	5.40532	11	20	12	108	0.09
Oils and fats	0.29520	0.89897	28	510	151	458	3.78
Other food products	0.96870	7.77686	8	3,120	3,020	24,264	11.62
Spinning and weaving	1.02053	7.10566	9	7,300	7,500	51,873	8.46
Processing of cotton	0.12461	1.803	24	82	10,311	149,205	80.60
Clothing	9.76961	13.64256	2	1,050	10,258	14,325	7.33
Paper & paper products	1.49917	5.50895	10	270	405	1,487	7.46
Tobacco	0.12213	2.54011	20	70	9	178	0.15
Wood and furniture	9.44334	10.92496	5	310	2,927	3,387	3.08
Fertilizer	0.46296	1.31088	26	1,180	546	1,547	20.51
Other industries	2.16450	4.55165	13	3,870	8,377	17,616	10.47
Transportation & communication	2.32099	2.97795	19	6,380	14,808	18,999	7.40
Suez Canal	0.32135	0.67480	29	31,410	10,094	21,201	1.00
Trade and finance	2.40481	3.25033	16	39,880	95,904	129,610	15.98
Banking and insurance	2.15405	3.08049	17	1,130	2,434	3,480	7.38
Other services	3.57522	3.76022	15	-	-	-	0.00
Sectoral totals:							
Agriculture				3,170	33,946	44,018	0.79
Mining & manufacturing				107,600	49,262	301,818	4.94
Services				78,600	123,240	173,290	6.32
The entire economy				189,570	206,448	519,126	2.85

Notes: Column (1) = ℓ_i ; Column (2) = ℓ_i' ; Column (4) = $_eL_i$; Column (5) = $_eL_i'$; Column (6) = Column (4) ÷ total employment in industry i; Sectors which do not contribute to either exports or imports are deleted in this table, namely, construction, electricity, medical services, and education.

Sources: See Appendix.

cardinal differences are increasing functions of the extent of backward linkages which characterizes each sector. Thus, in agriculture, mining, quarrying and crude petroleum where backward linkages travel a short distance, the differences are fairly small. On the other hand, there are industries which can be distinguished by their high backward linkages, especially with labour intensive industries such as cotton processing, food, wood, furniture, textile and fabricated metals. These industries' direct labour intensity is significantly smaller than their total labour intensity. The relation of total to direct labour intensity can reveal valuable information. By ranking industries according to their direct and total labour intensities, the results indicate that they are generally similar to each other. For 1954, the Spearman rank correlation coefficient of all 29 sectors is .509 and .338 for the manufacturing sectors alone (22 sectors)- the first coefficient is significant whereas the second is not significant at the .05 probability level. For 1969/70, the corresponding coefficients are .653 and .583, respectively, both significant at the .01 probability level. The results of these rank correlations reveal, inter alia, the following set of non-mutually exclusive phenomena:

a) The mode of production in certain economic activities is so diverse from others that one sector which exhibits a low direct labour intensity may triple or even quadruple this value when indirect labour is included and still be much lower than only the direct labour intensity of another sector (e.g. agriculture vs. fertilizers in 1954). This naturally follows from economic dualism.

b) The economy underwent noticeable structural changes from 1954 to 1969/70 whereby intrasectoral labour intensity decreased appreciably. This has the effect of reducing the value of indirect labour intensity which in turn narrows down the magnitudenal differences between direct and total labour requirements; thus, the higher and more significant rank correlation coefficients for 1969/70 as compared to 1954. At the same time, however, these results leave little doubt that intersectoral labour intensity of outputs has not changed appreciably by including the direct effects of labour requirements. We may add that while this is true for the economy at large, it may not be so for specific industries.

Table II

LABOR ABSORPTIVE CAPACITY OF EXPORTS IN EGYPT, 1969/70

Sector	(1) Direct Labor Requirement per E£ 1000 Output (man year)	(2) Total Labor Requirement per E£ 1000 Output (man year) value	rank	(3) Total Value of Exports (E£ 1000)	(4) Direct Labor Employment Generated by Exports (man year)	(5) Total Labor Employment Generated by Exports (man year)
Agriculture	4.166	5.313	2	9,047	37,689	48,067
Cotton processing	0.035	4.613	4	104,794	3,668	483,415
Quarrying	1.737	2.161	12	2,726	4,735	5,891
Crude petroleum	0.193	0.403	25	49,976	9,645	20,140
Food	0.175	3.571	6	47,174	8,256	168,458
Beverages	0.572	2.305	10	1,484	849	3,421
Tobacco	0.087	0.257	27	2,779	242	714
Textiles	0.828	2.886	8	64,180	53,010	185,079
Clothing	2.617	2.617	5	5,050	13,216	22,326
Wood and furniture	4.241	5.615	1	2,850	12,087	16,003
Paper	0.395	0.979	21	-	-	-
Publishing	0.870	1.317	16	1,550	1,349	2,041
Leather	0.687	2.260	11	670	460	1,514
Rubber	0.233	0.746	24	610	197	455
Chemicals	0.407	1.043	20	7,107	2,813	7,413
Petroleum	0.222	0.340	26	2,690	597	915
Non-ferrous metals	1.039	1.821	14	6,200	6,442	11,290
Ferrous metals	0.341	0.799	23	2,500	853	1,998
Fabricated metals	4.175	4.859	3	325	1,357	1,579
Machinery	0.588	1.256	18	-	-	-
Electric machinery	0.569	1.251	19	1,335	760	1,670
Transportation	0.181	0.932	22	1,751	317	1,632
Miscellaneous	0.478	1.303	17	1,261	603	1,643
Construction	0.904	2.017	13	-	-	-
Electricity	1.002	1.339	15	-	-	-
Transportation & communication	1.751	2.367	9	8,550	14,971	20,238
Other services	2.772	3.278	7	53,882	149,360	176,636
Sectoral Totals						
Agriculture				9,047	37,689	48,067
Mining & manufacturing				306,962	121,536	937,597
Services				62,432	164,337	196,874
Entire Economy				378,441	323,562	1,182,538

Notes: Column (1) = ℓ_i ; Column (2) = ℓ'_i ; Column (4) = ${}_eL_i$; Column (5) = ${}_eL'_i$.

Source: See Appendix.

2. The total number of jobs created by exports in 1954 is about 519 thousand which is 7.1 % of the total labour force. In 1969/70, the corresponding number rose to about 1.2 million which constitutes about 14.4 % of total employment in the economy. When compared to other countries, the labour absorptive capacity of exports in Egypt seems to be high indeed. In a recent study, similar calculations were made for seven countries (Brazil, India, Mexico, Phillipines, South Korea, Taiwan and Yugoslavia) and the results showed that the weighted average of total manufactured export-generated employment as a percentage of total employment (using manufactured exports in constant 1969 prices) was about 3 %.[7] In Egypt it was 4.2 % in 1954 and 11.4 % in 1969/70. This may be explained in part by Egypt's above-average level of exports as a percentage of GNP and in part by Egypt's ability to export relatively more labour-intensive commodities vis-à-vis the above-mentioned countries. The latter becomes obvious at once when one considers the industries which contributed the most to exports in 1969/70. From Table II, these industries (cotton, processing, textiles and food) contributed about 70 % of total exports and, in addition, they are heavily reliable on an agricultural sector which employs 4,092,200 workers out of a labour force of 7,239,000!

3. Since the composition of exports is rather similar to that of the economy, one would expect the percentage of export-generated employment in total employment to be similar to that of total exports in GNP. This is true for 1969/70 since the former is 14.4 % and the latter is 13 %. However, this situation does not hold for 1954. One reason for the discrepancy (7.1 % vs. 15 %, respectively) is perhaps the fact that total manufactured exports constituted a smaller percentage in total exports than total manufactured output did as a percentage of GNP (6.74 % vs. 11.9 %, respectively). Another is that manufactured exports were less labour intensive than the domestic national industrial average.[8]

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[7] See William G. Tyler, "Employment Generation and the Promotion of Manufactured Exports in Less Developed Countries: Some Suggestive Evidence", Institut für Weltwirtschaft, Kiel, 1973. Forthcoming in Problems of the International Division of Labour, Institut für Weltwirtschaft, Kiel.

[8] This was shown in M. Girgis, op.cit.

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4. A straightforward comparison of the impact of exports on employment in different industries could be misleading since the indirect labour employment identified with one industry is actually coming from different industries. This is particularly deceiving when one sector is compared against another. For this reason intersectoral comparisons are carried out in the following paragraphs in terms of direct labour and not total labour generation.

Looking at direct job opportunities offered by exports in the three sectors (agriculture, mining & manufacturing, and services), it is clear that services benefit the most from exports. From a static viewpoint, employment generated in this sector accounted for about 59 % in 1954 and 51 % in 1969/70 of total employment generated by exports. This stems mainly from tourism. From a dynamic standpoint, however, the mining & manufacturing sector seems to benefit the most; from 1954 to 1969/70, export-generated employment in this sector increased by 149.0 % as compared to 11.8 % in agriculture and 33.3 % in services. Given the fact that labour productivity in the manufacturing sector is normally higher than in the other two sectors, the export-generated employment in this sector is actually underestimated. For, if labour productivity remained the same between 1954 and 1969/70, more jobs would have been created by the same 1969/70 volume of exports, ceteris paribus. That employment expansion during this period was nonetheless greater in the manufacturing sector is a manifestation of the non-proportional growth of exports of manufactured products. Available data corroborate this view: manufactured exports (SITC 5-8) from 1950 to 1970 grew at an annual rate of 14.6 % vis-à-vis 5.3 % for total exports, 3.5 % for agricultural raw materials (SITC 0-2), 14.1 % for raw materials (SITC 3-4).

5. The influence of labour productivity changes on our 1969/70 results deserves further analysis. Once the rate of growth of labour productivity is determined, we can arrive at a figure which gives total labour employment which would have been created by exports in 1969/70 had labour productivity remained at its 1954 level (It should be emphasized that temporal gains in labor efficiency in Egypt during this period is due more to physical capital widening and deepening than to human capital development). Unfortunately, an industry by industry comparison is rendered impossible due to the incompatibility of sectors-classifications of the two input-output tables. Yet, some evidence can be presented regarding the whole economy.

Input/output data show that the national average labour productivity, measured as the ratio of total final demand to labour force, was E£ 169.50 in 1954 and E£ 349.76 in 1969/70. Deflating the latter by the general price index during the same period gives a value of E£ 216.70. This means that average productivity grew at approximately 1.5 % per annum, or that export absorptive capacity of employment decreased by the same percentage - other things being equal. Thus, by eliminating the effect of productivity changes while keeping price changes in, exports in 1969/70 would have generated a total of 1,296,919 jobs or 114,219 more than what it actually accomplished in that year. Not only does productivity growth adversely affect the prospects of employment generation by exports, inefficient production associated with import-substituting industries in their early stages of development leads to the same result. Unless the government is subsidizing exports, the latter will grow at an otherwise lower rate due to their high costs of intermediate inputs purchased from import-substituting industries.

Table III

VALUE OF EXPORTS REQUIRED TO INCREASE EMPLOYMENT BY ONE UNIT

IN EGYPT, 1954 and 1969/70

(E£ per man-year)

	Cotton Processing as Part of the Manufacturing Sector		Cotton Processing as Part of Agriculture	
	1954	1969/70	1954	1969/70
Agriculture	72.02	188.18	72.01	214.20
Manufacturing	118.05	327.39	163.03	445.18
Services	454.73	317.12	454.73	317.12
TOTAL	226.54	320.02	226.54	320.02

Sources: See Tables I to II above.

6. Upon examining changes in exports from 1954 to 1969/70, the increase in its labour absorptive capacity can be traced to the following major factors:

a) An increase in its volume from E£ 117.6 to E£ 378.4 million.

b) Due to Egypt's industrial progress in that interval, she became increasingly capable of manufacturing raw materials and exporting them as such. To wit, exports of textile products in 1954 amounted to E£ 4.5 million and rose to E£ 57.9 million. This was also accompanied by a steady level of raw cotton exports. The same is true regarding foodstuff. Such shifts in export composition have the effect of generating additional employment opportunities - especially when one recognizes the relatively high magnitude of indirect labour requirement in the manufacturing sector vis-à-vis the rest.

c) Export composition changed with a built-in tendency towards more labour intensive goods. This point is substantiated in the following paragraph.

d) The value of exports in recent years increased due to the price differential treatment accorded to different countries. It is evident that socialist countries are charged higher prices than the rest of the world. For example, the price of one Kentar (50.0 kg) of processed cotton in 1969/70 was E£ 5.00 or 17 % higher for socialist countries than for western countries. Likewise, the average price of textile yarns paid by socialist countries in 1969/70 was E£ 1,016.0 compared to E£ 625.3 for Arab countries, E£ 492.4 for western countries and E£ 523.1 for the rest of the world.

7. Now, given the state of its industrial arts, has the Egyptian economy been able to keep its export profile in line with that of its labour abundancy? That is to say, does a positive and direct relationship exist between export composition and intersectoral labour-intensities? For 1954, the answer is negative. The rank correlation coefficients for all 29 sectors (as well as the 21 manufacturing sectors alone) indicate the absence of any similarities between the sectoral rankings of total labour-intensity and that of total exports (.103 and .208, respectively).

This result simply suggests that industries with the highest direct and indirect labour requirement per unit of output did not always contribute the most to total exports.[9] This situation changed, however, in 1969/70 where the rank correlation coefficient of all 25 sectors became significant (.342) at the .05 probability level. This change demonstrates a definite improvement, however small, in the structure of manufactured exports in so far as maximizing labour employment is concerned. It also explains in part the significant increase in export-generated employment in 1969/70 as compared to 1954.

8. In terms of policy implications, the analysis thus far points out that Egypt can maximize the effects of her exports on domestic employment opportunities by encouraging those exports with high total labour requirements. The industries that head the list are wood, furniture, agriculture, fabricated metals, processed cotton, clothing, food, textile and beverages in a descending order. Although wood and furniture products enjoy the highest labour-intensity per unit of output, their future expansions, at least in the short to medium run, are limited due to the relative scarcity of wood in Egypt. On the other hand, the horizon is nearly limitless regarding export prospects for industries such as fabricated metals, clothing, food and textile products. In these areas, Egypt possesses all the required ingredients of comparative costs ranging from relatively cheap labour, available raw materials and the simplicity of the technological know-how associated with efficient methods of production.

At the bottom of the list lies tobacco, petroleum refining, crude petroleum, rubber and ferrous metals. These are basically capital - as well as resources - intensive products. In terms of national priorities with regard to the employment situation, the emphasis on expanding exports should be placed on the industries mentioned above and not these. Fortunately, however, the present economic conditions dictate such policy anyway, since these industries are still in their "infant" stages.

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[9] Such a phenomenon, however, should not be construed as a deviation from Egypt's pattern of comparative advantages since our model concentrates on labour alone. Thus, it is possible to find a given product whose output enjoys a comparative advantage due to the abundancy of natural resources but whose labour-intensity is relatively low and value of exports relatively high, e.g. crude petroleum. The exportation of this product, though in line with the structure of comparative advantage of the economy, may not at the same time maximize the employment objective function.

B. Imports and Import-Substitution

Table IV presents a speculative picture of the number of potential job opportunities available for Egyptian workers in case all imports are produced at home. The total labour required to produce imports domestically in 1954 is 830,309 or 11 % of total labour force which exceeds that generated by exports. Assuming a 10 % rate of unemployment, this would be more than sufficient to eliminate unemployment. Note that most of the potential jobs would be created in the manufacturing sector. When direct labour is considered alone, the strategy of substituting imports is likely to increase employment in the manufacturing sector by a significant 24 % of its total labour employment. If non-competitive imports are excluded, these estimates will decrease by the full percentage of non-competitive imports in total imports. The same analysis could not be carried out for 1969/70 because detailed import data for this year are unavailable. However, in the presence of the following assumptions during the 16-year period: a) a rate of inflation of 10 %, b) a ratio of non-competitive to total imports of 20 %, and c) a total increase of labour productivity of 25 %, we can conclude that imports in 1969/70 would create an additional 1,203,000 jobs had they been produced domestically!

Coming back to more realistic grounds, we go on to estimate the contribution of import substitution to employment-generation in Egypt. On the assumption that all elements of demand and supply in the entire economic system increase proportionally between any two points in time, the deviation of the actual change in output from a given proportional change can therefore be divided into its three components (with no concomitant changes in sectoral production functions): a) changes in the composition of domestic demand, b) export expansion, and c) import substitution. The latter was elsewhere quantified between 1954 and 1967.[10] Total labour requirement per E£ 1000 output in 1954 is applied to the source of industrial economic growth stemming from import substitution during this period with the results given in Table V.

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[10] For a discussion of the methodology and the results see M. Girgis, op. cit.

Table IV

LABOR ABSORPTIVE CAPACITY OF IMPORTS IN EGYPT, 1954

Sector	(1) Direct Labor Requirement per E£ 1000 Output (man year)	(2) Total Labor Requirement per E£ 1000 Output (man year)	(3) Total Value of Imports (E£ 1000)	(4) Direct Labor Employment (Potential) created by Import-Substitution (man year)	(5) Total Labor Employment (Potential) created by Import-Substitution (man year)	(6) Direct Labor Employment created by Import-Substitution as a ./. of total Employment (./.)
Agriculture	10.70883	13.88633	15,500	166,844	216,344	3.89
Mining and quarrying	1.07280	1.93538	4,069	4,365	8,940	31.18
Metals	2.92995	4.08409	10,612	31,093	43,339	107.74
Metal products	1.69402	2.97809	5,629	8,519	14,976	42.37
Cement	1.04991	2.33905	111	117	259	2.01
Petroleum refining	0.31032	1.71366	15,290	4,745	26,207	59.31
Machinery	2.59488	4.56813	31,789	82,489	145,212	99.99
Basic chemicals	0.34965	2.53249	70	25	177	2.50
Other chemicals	0.31397	1.30820	13,759	4,320	17,997	110.02
Meat products	0.86170	11.67484	223	192	2,604	0.48
Dairy products	2.15198	9.28961	1,140	2,453	10,591	2.56
Grain milling	0.22043	12.02182	2,636	581	31,691	3.23
Bakery products	0.40316	8.81149	70	28	617	0.12
Sugar	0.61611	5.40532	800	493	4,324	3.79
Oils & fats	0.29520	0.89897	557	164	581	4.10
Other food products	0.96870	7.77686	1,669	1,617	12,980	6.22
Spinning and weaving	1.02053	7.10566	9,341	9,533	66,377	10.76
Processing of cotton	0.81384	13.87961	-	-	-	-
Clothing	9.76961	13.64256	3,767	36,802	51,393	26.29
Paper & paper products	1.49917	5.56895	6,114	9,166	33,682	168.90
Tobacco	0.12213	2.54011	4,995	610	12,687	10.17
Wood and furniture	9.44334	10.92496	287	2,710	3,135	2.85
Fertilizers	0.46296	1.31088	11,237	5,202	14,732	195.42
Other industries	2.16450	4.55165	18,649	40,366	84,881	50.45
Transportation & communication	2.32099	2.97795	6,800	15,783	20,250	7.89
Suez Canal	0.32135	0.67480	-	-	-	-
Trade and finance	2.40481	3.25033	360	866	1,170	0.14
Banking and insurance	2.15405	3.08049	1,690	3,640	5,205	11.03
Other services	3.57522	3.76022	10	36	38	-
Sectoral totals:						
Agriculture			15,580	166,844	216,344	5.04
Mining & manufacturing			142,214	244,870	587,302	24.57
Services			8,51	20,325	26,663	1.04
The entire economy			166,645	432,039	830,309	5.97

Notes: Column (1) = ℓ_i ; Column (2) = ℓ_i' ; Column (4) = L_{m_i} ; Column (5) = L_{m_i}' ; Column (6) = column (4) ÷ total employment in industry i. Sectors which do not contribute to either exports or imports are deleted from this table, namely, construction, electricity, medical services, and education.

Sources: See Appendix.

Table V

LABOR ABSORPTIVE CAPACITY OF IMPORT SUBSTITUTION IN EGYPT, 1954 to 1967

Sector	(1) Increase in Output Due to Import Substitution (1000 E£)	(2) Total Labor Requirement per 1000 E£ Output (man year)	(3) Total Labor Generated by Import Substitution (man year)
Metals	32,163	4.08409	131,357
Metal products	10,995	2.97809	32,744
Cement	4,574	2.33905	10,699
Petroleum refining	14,650	1.71366	25,105
Machinery	24,419	4.56813	111,549
Basic chemicals	518	2.53249	1,312
Other chemicals	50,330	1.30820	65,842
Dairy products	2,122	9.28961	19,713
Bakery products	170	8.81149	1,498
Oils & fats	431	0.89897	387
Spinning & weaving	28,991	1.10566	206,000
Clothing	149	13.64256	2,033
Paper	13,507	5.50895	74,409
Tobacco	9,243	2.54011	23,478
Fertilizers	18,054	1.31088	23,667
Others	23,160	4.55165	105,416

Notes: Column (1) is taken from M. Girgis, op.cit.;
Column (2), see Table IV;
Column (3) = (1) x (2).

The role of import substitution has been frequently hailed by politicians in Egypt as the road towards self-sufficiency. It is not. Indeed, the volume of imports increased at a faster rate since the beginning of import substitution in Egypt in the late Fifties.[11] The real benefits, however, of the import substitution programme can be easily ascertained on two fronts, namely, domestic output and employment growth.[12] Concerning the latter about 835,209 jobs were created as a result of replacing foreign goods by domestically produced equivalents.[13] This amounts to an average of about 60,000 jobs each year or 22.7 % of the total number of the yearly increase in the labour force. (The latter is explained below). In addition about 47,000 jobs are generated annually as a result of export expansion.[14] This means that roughly 40.5 % of the yearly increment in labour force is accomodated in either export or import replacement activities.

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[11] It should be noted that its composition has also changed, whereby most of it now is in the form of raw materials and intermediate goods. This is a natural outcome of such a strategy; see I. Little, T. Scitovsky and M. Scott, Industry and Trade in Developing Countries, London, 1970, pp. 59-63.

[12] The effects of import substitution on the growth of domestic output are discussed in my paper, op. cit.

[13] A rank correlation between import substitution and total labour requirements per E£ 1000 was undertaken to find out if import substitution is positively and significantly correlated with industrial labour intensity. The result shows that no relationship exists between them. A priori, one would expect labour intensity in import substitution activities to be higher than in exports or domestic output. This is based on our estimates of capital intensity in output, exports and imports in 1965 (measured à la H. Larry - See M. Girgis, Structural Development of Industrial Output Exports and Imports in Egypt, 1950 - 1970. A working paper, 1973, Institut für Weltwirtschaft). The mere fact that the rank correlation coefficient turned out .224 (and .103 by deleting the two extreme cases: others are chemicals and clothing) signifies the lack of a deliberate and conscious strategy on the part of Egyptian planners regarding the choice of import substituting industrial projects, i.e., whether they should be predominantly capital or labour intensive. This view is supported by a different test which shows that import substitution is negatively and significantly correlated with backward linkages. See M. Girgis, op. cit. The results of these two tests give evidence to a distinct impression received by the author in recent discussions with experts in project evaluation in the Ministry of Industry in Egypt that the whole business of import substitution has been carried out on ad hoc basis since its inception.

[14] This is derived as the difference between total labour employment generated by exports in 1954 and in 1969/70 divided by 14 years.

III. PROSPECTS OF EXPORT EXPANSION AS A MEANS TO ALLEVIATE OR ELIMINATE UNEMPLOYMENT IN EGYPT IN 1980 and 1985

This section concerns itself with the potential impact of export expansion on the unemployment situation in Egypt during the next 10 to 15 years. To this end one must forecast the size of the labour force, employment and exports in 1980 and 1985. As is usual in the area of economic forecasting, assumptions have to be made and the results are bound by the validity of these assumptions as they turn out in the course of time.

The approach used here to tackle this problem is not a sophisticated one. First, the size of the labour force is forecasted. Then, labour unemployment in the target year is derived on the basis of a) the existing excess supply of labour and b) an assumed rate of employment during the forecast period. Now, given the present labour absorptive capacity of exports and supposing a hypothetical rate of growth of exports, export-generated employment is then estimated. If the latter constitutes a higher percentage of the labour force in the terminal rather than in the initial year (14.36 % in 1969/70), then export expansion will have a positive impact on unemployment and vice versa.

A. Labour Force and Unemployment Forecasts for 1980 and 1985

In order to predict the size of the labour force one needs three criteria: a) a point of departure or a base, b) a knowledge of fertility rates and general demographic characteristics, and c) specific estimates regarding participation rates of males and females. Our base is the census estimates in 1971. According to the sample population census of May 1971, the labour force (adults between 12 and 65 years old) is made up of 7.833 million males and 0.572 million females. In so far as fertility rates are concerned, Egypt's rate has been 2.5 % per annum (p.a.) during the Sixties. Past performance of the major demographic characteristics showed no noticeable changes, and, there is no reason to expect any during the following 10 to 15 years.[15] In addition, the present fertility rate is assumed to continue at the same level during the forecast period.

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[15] See, Central Agency for Public Mobilization & Statistics, The Increase of Population in the United Arab Republic and its Impact on Development, September 1969, Cairo. (in Arabic)

As to the participation rate, it is expected that females will increase their participation in economic life owing to an increasing awareness of women's role in the modern industrial society. Males, on the other hand, are expected to reduce their participation rate due to greater adherence to compulsory and voluntary education, longer vocational training, shorter working hours (which may decrease from 42 to 40 hours per week), and improvements in social insurance and retirement pension programmes. With the fertility rate assumed at 2.5 % p.a., the number of those entering the labour force each year, taking Egypt's demographic composition into account, is estimated to increase at an average rate of 2.8 % p.a. However, in view of the above, participation rates should be adjusted upwards for females and downwards for males. Thus, we assume that the male's rate of growth in the labour force will be at 2.7 % p.a. and that of females at 3 % p.a.. Using a progressive discontinuous growth function of the type $Y = Y_o(1+r)^n$, the labour force projections for 1980 and 1985 are estimated (see Table VI).

Regarding the rate of employment, the Ministry of Planning in Egypt estimates that about 724,200 workers were unemployed in 1971. Their estimate (about 8 % of the adult labour force) does not seem to be far off target. During the last five years, an average of 680,000 young people become 15 years old each year. About 60 % of these groups either continue their education or stay at home as customs dictate in certain rural areas, especially in the case of females. This leaves roughly 272,000 as a natural increase in the labour force. It is also estimated that about 92,000 enter the labour force each year at older ages and about 100,000 exist due to deaths or superannuation in the 15 - 65 age interval. This leaves a net increase in the labour force each year in the neighbourhood of 264,000. Out of this number, only half are able to find jobs, which means that by 1971 there were 660,000 unemployed workers. If approximately 75,000 are added to this as a carry over from previous years, then the total number of unemployed in 1971 was about 735,000 or 8.75 % of the labour force.[16]

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[16] This estimate is significantly larger than the one published officially by the Central Agency of Public Mobilization and Statistics (CAPMS) in its Annual reports on Employment. For instance, unemployment rate was put at only 1.9 % in 1971; see CAPMS, Employment Situation by Sample, 1971, November 1972, Cairo, Table 5. (in Arabic)

Note that the rate of unemployment is defined conventionally as equal to

$$\text{Unemployment rate} = \frac{\text{Labour force - employment}}{\text{Labour force}}$$

To arrive at an estimate of unemployment in target years, two assumptions are made regarding the rate of growth of employment. The first is that it maintains its previous level at 2 % p.a. The second is a little more optimistic in that it hypothesizes a faster rate of increase, which averages 2.5 % p.a. Accordingly, labour employment is estimated for 1980 and 1985 under these alternative assumptions. (See Table VI). Unemployment then is calculated as the difference between the size of the labour force in the terminal year and labour employment. To this, one should add also the size of unemployment existing in the base year, 1971. The results are shown in Table VI.

B. Potential Impact of Export Expansion on Unemployment in 1980 and 1985

In order to determine the extent to which exports can absorb the rising number of unemployed, we take export absorptive capacity of labour in 1969/70 as our point of departure. At that time, exports amounted to E£ 378.44 million and generated a total of 1,182,302 jobs. Now, let us assume that labour productivity increases at a faster rate than in the past decade, i.e. at 2 % instead of 1.5 % p.a. This seems to be a realistic assumption since the economy is growing, external and internal economies are expanding, and economic efficiency is likely to go up. Let us also assume that exports' annual rate of growth will exceed that of the last 20 years which averaged 3.6 % p.a. Here, casual observations of past export performance indicate good prospects of expansion, especially in the manufacturing sector. However, we submit that export composition will not undergo any appreciable changes during the forecast period, unless new significant oil wells are discovered. We may again postulate two rates of export growth: 4 % and 6 % which imply, after taking productivity changes into account, real growth rates of 2 % and 4 % p.a., respectively. According to these assumptions and on the basis of labour absorptive capacity of exports calculated for 1969/70, exports-generated employment are projected for 1980 and 1985 (See Table VI).

Table VI - Export Growth Rates Sufficient to Eliminate Unemployment in Egypt, 1980 and 1985

	Employment Rate is Assumed at 2 % per Annum		Employment Rate is Assumed at 2.5 % per Annum	
	1980	1985	1980	1985
Labor Force (mill.)	10.702	12.239	10.702	12.239
Employment (mill.)	10.045	11.090	10.497	11.826
Unemployment (mill.)	1.407	1.899	0.955	1.113
Unemployment as % of Labor Force (%)	13.2	15.5	8.9	9.1
Export-generated Employment				
I) When Export Growth Rate is 4 %				
a) Million Man-year	1.442	1.592	1.442	1.592
b) As % of Labor Force (%)	13.48	13.01	13.48	13.01
II) When Export Growth Rate is 6 %				
a) Million Man-year	1.683	2.130	1.683	2.130
b) As % of Labor Force (%)	15.73	17.40	15.73	17.40
Net Change in Unemployment Due to Export Expansion				
I) When Export Growth Rate is 4 %				
a) Million Man-year	-.094	-0.165	-.094	-0.165
b) As % of Unemployment (%)	-.668	-8.69	-9.8	-14.82
II) When Export Growth Rate is 6 %				
a) Million Man-year	+0.147	+0.372	+0.147	+0.372
b) As % of Unemployment (%)	10.45	19.59	15.39	33.42
Export Growth Rate Sufficient to Eliminate Unemployment (% p.a.)	10.4	9.4	9.1	7.7
(mill.)	889.0	1,104.3	752.5	866.9

The results present the reader with a fair warning, namely, if exports increase at only 4 % p.a., the unemployment situation will deteriorate in 1980 as well as in 1985, for exports would then fall short of maintaining its employment share of 1970. However, when a 6 % p.a. growth rate of exports is considered, export expansion becomes capable of not only maintaining its 14.36 % share of the labour force but also reducing future unemployment by 10.45 % to 33.42 %, depending upon the magnitude assigned to the annual rate of employment. (The latter being directly correlated with export absorptive capacity of unemployment).

At this juncture, we may extend our projections to find out just how much exports will be required to eliminate unemployment completely. Depending upon the rate of employment, exports must increase at annual rates ranging from 7.7 % to 10 % (see Table VI). These rates are not impossible to achieve. In fact, it is encouraging to know that exports have increased under a multitude of adverse institutional and economic constraints at home and abroad at 3.6 % p.a. during the last two decades. Consequently, if exporters receive certain incentives, favours and flexibility from government authorities (something they have long been denied), the above rates of export growth should be attainable indeed. It may even be prudent for the government to narrow down its choice to 1985 where a moderate rate of 7.7 % p.a. is required to eliminate unemployment.

IV. CONCLUSIONS AND POLICY IMPLICATIONS

The Egyptian economy is presently suffering from the lack of sufficient foreign exchange necessary to update, replace and augment industrial, physical capital. Required supplies of raw materials are likewise affected. Under these conditions, domestic savings, irrespective of their size, are useless; i.e. the economy is suffering from a trade gap and not from a savings gap. It is known that a country may increase its foreign exchange reserves by expanding exports, borrowing from abroad or by encouraging the inflow of foreign capital. In the case of Egypt, the economic and political atmosphere is not yet ripe for a significant inflow of foreign capital, furthermore, sources of foreign credits are becoming increasingly scarce in recent years. This leaves the country with exports as the main, if not the sole, reliable source of foreign exchange. Despite this fact, export activities have long been given little attention from the government and are still in dire need for a deliberate and an explicit long run strategy. This topic has been discussed in detail elsewhere.[17] In the present context, however, we reach the same conclusion but for different reasons. Exports must rise not only to increase foreign exchange earnings but also to alleviate, if not eliminate, labour unemployment.

We began from what seemed to be a naive idea; namely, to single out exports as the one crucial factor on which Egypt rests her hopes to relieve the strains of unemployment. Of the all too many remedies put forth by economists and non-economists alike, the foreign trade sector figured little in their calculations. The evidence presented in this paper suggests that perhaps this was an unwarranted misjudgement. First, exports alone provided jobs for more than one million workers in Egypt in 1969/70. Second, if we consider import substitution as well, it too created more than another million jobs between 1954 and 1970. Third, when export expansion and import replacement were combined together, they helped to absorb about 40.5 % of the annual increment in the labour force each year from 1954 to 1970. Moreover, the bulk of this employment pool generated by the foreign trade sector is in the manufacturing sector whose growth leads the way for the remaining sectors of the economy.

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17 See Maurice Girgis, "Causes of Egypt's Lagging Exports: Adverse External Demand Conditions or Internal Supply Rigidities", March, 1973, a Working Paper, Institut für Weltwirtschaft, Kiel.

Now, after establishing the fact that the relation of the foreign trade sector to employment was indeed important in the past, we may now turn our attention to its potential in the future. As we pointed out earlier when discussing the model, export expansion may or may not decrease unemployment depending upon its sources. Reference was made to market imperfections, insufficient aggregate demand and lack of complimentary resources as the main factors responsible for creating a less-than-full-employment situation. In Egypt, there is sufficient evidence against the existence of a deficient aggregate demand - the government's strenuous efforts to suppress price increases is only one indication. Market imperfections do exist, but they are relatively weak in the urban centres, especially Cairo, Alexandria and Giza, where one finds most of the unemployed workers. This leaves the lack of complementary resources as the main stumbling block against export expansion and, a fortiori creating jobs for the unemployed. There are several alternative policy recommendations which one can advance in order to cope with this problem. However, we may suggest the following strategy since it seems operational as well as effective.

The Egyptian economy resembles at present a situation of full employment of physical capital, albeit certain excess capacities prevailing in varying degrees in some industries, coupled with an excess supply of human capital. In order to absorb the latter, the fastest and most effective way would be to channel new investments in labour-intensive industries capable of exporting their products to hard-currency areas. The superiority of this strategy stems from its capacity to 1) absorb the excess supply of labour faster than in the case where new investments are alloted to capital-intensive industries, 2) expand output faster since capital-output ratio is lower in labour-intensive than in capital-intensive industries, 3) permit exports to increase, thus, ending a long era of economic insulation, 4) export to hard currency areas which would in turn provide enough cash assets to purchase required physical capital and raw materials from any part of the world at the best possible terms, 5) help mitigate balance of payments problems, as exports expand without any appreciable increase in imports since the latter needs only to be distributed among domestic sectors in the manner mentioned above, and 6) increase the general level of

which is a far cry from what is happening at present

national economic welfare by bringing the present allocation of resources one step closer to optimality. To be sure, this strategy does not advocate a return to an agrarian economy. On the contrary, it entreats to expand the already launched industrialization programme. Expansion could take place in labour-intensive industries such as fabricated metals, processed cotton, clothing, food, textiles, beverages and non-ferrous metals. In fact, Egypt will be better off to narrow its range of specialization down to a few new industrial products, in addition, of course, to those which are already being exported. By updating their production techniques, bringing their quality up to international standards and launching an aggressive marketing campaign in non-communist countries, exports of these new products would have great chances of expansion because a) they can be sold at cheaper prices due to Egypt's comparative advantages in their production and b) they constitute a small fraction in world trade of labour-intensive exports, so that it is unlikely that they will arouse feelings to erect new trade barriers against them in advanced countries.

Though our results suggest that exports must grow at 9.1 % per annum to eliminate unemployment by 1980, the task of elevating the present rate of growth of 3.6 % to 9.1 % may be dequantitated by the following considerations. First, it was assumed that export composition would remain the same during the forecast period. However, if the above strategy is pursued in earnest by the government, labour intensity per unit of exports will rise and so would the labour absorptive capacity of exports. Second, due to the interaction between the multiplier and accelerator, any given increase in exports will lead to a multiple increase in income, thus, amplifying the positive influence of export expansion on unemployment. In the presence of a high marginal propensity to consume and a relatively low marginal propensity to import, the multiplier is likely to be larger in Egypt than in a typical developed country. Consequently, a rate of export growth of 9.1 % p.a. is actually overestimated. With the magnifying effects of the multiplier, export expansion can push the economy toward full employment by 1980 at a rate lower than 9.1 % or if exports rise at that rate, full employment will be realized much sooner than in 1980. Third, the prospects of integrating the economics of Egypt and Libya may produce salutary effects on employment since Libya is in need of unskilled labour which is abundant and largely

unemployed or underemployed in Egypt. However, the expansion of labour-intensive and export-oriented industries in Egypt may be hampered if Libya draws heavily on the type of skill required by these industries. This may be true as far as Egypt is concerned, but since we are not faced with a zero-sum game, the new economic entity is likely to experience a net gain.

APPENDIX

Sources of Data

I. Input-Output Data:

The two input-output tables used are from:

1. Gamal E. Eleish, "The Input-Output Model in a Developing Economy: Egypt", 1954, in Tibor Barna (ed.) Structural Interdependence and Economic Development, 1963, pp. 199 - 270.

2. Ministry of Planning, Input-Output Table for 1969/70, unpublished, 1971, Cairo.

II. Employment Data:

Employment data in the entire economic system classified in accordance with the sectoral breakdown in both input-output tables are not readily available anywhere. Consequently, we had to estimate them from different sources.

1. 1954 employment data: To begin with, we chose to work within a broad sectoral employment framework published by the Central Agency of Public Mobilization and Statistics (CAPMS), The Increase of Population in the United Arab Republic and Its Development, September 1969. The framework is given below. However, its 1947 employment figures were adjusted so as to exclude domestic work in farmer's houses (3,308,150) and housekeeping, governesses (2,465,639); see, Ministry of Finance and Economy, Population Census of Egypt, 1947, Cairo, 1954.

	Employment 1947	Employment 1960	Rate of Increase
Agriculture	4,245,000	4,403,000	.0372
Manufacture & Construction	835,000	958,000	.1473
Transportation & Communication	824,000	886,000	.0752
Personal & Social Services	898,000	1,348,000	.5011
TOTAL EMPLOYMENT	6,801,000	7,595,000	.1167

Source: CAPMS, The Increase of Population ..., op.cit., p. 202.

The next step was to match the population census data of employment with the output data of the input-output table. First, we consulted data from CAPMS, Census of Industrial Production, 1954. This, however, covered establishments with ten workers or more. With the aid of both the latter source and the 1947 and 1960 population censuses, we estimated roughly the corresponding employment data for 1954 on the following bases:

a) In Industries which are typically large, Industrial Census data of output are reasonably close to those in the input-output table. Consequently, labour data of the Industrial Census were taken.

b) Whenever output data of the Industrial Census are significantly smaller than their counterparts in the input-output table, we referred to the Population Census data and extrapolated the figures forward to 1954 on the basis of the level of increase which occurred in the entire sector. We also assumed a uniform rate of increase of employment in all sectors from 1947 to 1960. Thus, if an entire sector rose by 10 % during the 14-year period, it is assumed to have increased by 5 % during the first half (1947 to 1954). Sectoral rates of increases are applied uniformally to all their components even

though it is realized that a constant growth rate of employment does not reflect the real changes which took place during this period.

2. 1969/70 employment data: The main sources came from three publications of CAPMS: a - Sample Population Census, 1966, Second Part, September, 1972, Cairo, b - Employment Survey by Sample, 1969, March, 1972, Cairo, c - Employment Survey by Sample, 1970, April, 1972, Cairo - all in Arabic. Employment data of the major economic sectors (agriculture, quarrying, manufacturing, construction, electricity, transportation and other services) were taken from (b) and (c) above as their simple average in order to coincide calendar data with the fiscal year 1969/70. Detailed employment data for the two-digit industries (ISIC 2-3) are available in (a) above. Their aggregate (sum of ISIC 2-3) increased from 1966 to 1969/70 by 19.74 %. Therefore, since the detailed breakdown for 1969/70 was not available, we adjusted uniformly the 1966 figures upward by 19.74 %. All data thus far pertain to workers in the 12 - 65 age bracket. The major sectoral employment data used in this study are as follows (in 1000):

	1966	1969	1970	1969/70
Agriculture	4,048	4,204	4,120	4,162
Quarrying	18	38	30	34
Manufacturing	1,050	1,144	1,234	1,189
Construction	200	185	203	194
Electricity	51	41	57	49
Trade & Finance	557	733	722	728
Transportation & Communication	333	341	372	357
Services	1,209	1,355	1,343	1,349
Miscellaneous	293	187	161	174
TOTAL	7,759	8,227	8,242	8,236