

L'EGYPTE CONTEMPORAINE

(LXIXème ANNEE, AVRIL 1978, No. 372)

Rédacteur en Chef : Conseiller MAHMOUD HAFEZ GHANEM

**Secrétaire - Général
de la Société**

**Imp. AL-AHRAM
LE CAIRE**

Prix : P.T. 50

MEMBRES DE LA SOCIÉTÉ

Les membres de la Société sont de quatre catégories : les membres actifs payant une cotisation de P.T. 150 par an, les membres cotisants, banques, institutions ou organismes publics et autres personnes morales payant une cotisation annuelle de L.E. 100 au minimum, les membres honoraires, égyptiens ou étrangers, ayant rendu d'éminents services à la Société ou aux sciences économiques, sociales ou juridiques et les membres correspondants, personnes résidant à l'étranger et collaborant aux activités de la Société et à ses publications.

Tous les membres ont droit au service gratuit de la revue de la Société.

CONDITIONS D'ABONNEMENT

Le prix de l'abonnement annuel à la revue est de P.T. 150 pour la R.A.E. et 100 Shillings ou \$ 12.00 pour tous les pays faisant partie de l'Union Postale.

Les numéros non réclamés par Messieurs les Membres et Abonnés dans l'intervalle entre la parution de deux fascicules consécutifs ne leur seront livrés que contre paiement du prix.

Le prix du fascicule est de P.T. 50 pour la R.A.E. et 25 shillings ou \$ 4.00 pour l'étranger.

Les opinions émises par les collaborateurs de la revue n'engagent pas la responsabilité de la Société.

La reproduction et la traduction des articles publiés dans la présente revue sont interdites, sauf autorisation préalable de la Société.

Tout manuscrit soumis à «L'Egypte Contemporaine» devient la propriété de la Société.

Les demandes d'adhésion, d'abonnement ou d'information doivent être adressées au Secrétariat de la Société, Boîte Postale No. 732

Siège : Le Caire, 16, Avenue Ramsès, Téléphone 750797.

S O M M A I R E

<i>Articles</i>	<i>Page</i>
Dr. MAURICE GIRGIS : Import Substitution and Export Expansion : Their Contribution to Industrial Output and Employment in Egypt (1954 - 1970)	113
Dr. JOHN OSGOOD FIELD and Dr. GEORGE ROPES : Development in the Egyptian Governorates : A Modified Physical Quality of Life Index	149
x Me. HASSAN ABBAS ZAKI : Vers une stratégie globale de l'investissement des capitaux arabes (<i>en arabe</i>)	137
Dr. MOHAMED DOUEIDAR : Vers une stratégie alternative en matière d'industrialisation arabe (<i>en arabe</i>)	157
M. ELIAS HANNA TOMA : L'agriculture et la réforme agraire au Moyen-Orient (<i>en arabe</i>)	229
Dr. ABDEL HAMID EL-KADI : Rationalisation des exemptions de l'impôt sur les successions dans la législation égyptienne (<i>en arabe</i>)... ..	279
Dr. EMADEDDINE EL CHERBINI : Dispositions sur le transfert du droit dans le code commercial et le droit musulman (<i>en arabe</i>)... ..	295

IMPORT SUBSTITUTION AND EXPORT EXPANSION : THEIR CONTRIBUTION TO INDUSTRIAL OUTPUT AND EMPLOY- MENT IN EGYPT*, 1954-1970

Dr. MAURICE GIRGIS
Ball State University Indiana, USA

A statement such as "industrial value added in Egypt increased at an annual rate of about seven percent over the period 1954 to 1967" describes but does not explain the factors which generated the growth of industrial output. In this paper, we are interested in estimating (a) the causes of industrial growth from the demand side, that is from the side of domestic demand, foreign demand or export expansion (EE), and import substitution (IS), and (b) the labor absorptive capacity of IS and EE over the period 1954 to 1969/70.

The organization of this paper is as follows : Section I measures the relative contribution of IS, EE, and domestic demand to industrial growth from 1954 to 1967. The degree of the manufacturing sector's dependency on foreign intermediates during the IS process from 1954 to 1969-70 is examined in Section II. The following section is devoted to an evaluation of the impact of IS and EE on labor employment from 1954 to 1969-70. Finally, some concluding remarks are given in Section IV.

1. Sources of Industrial Growth : IS and EE

Import substitution simply means the extent to which domestic production replaces products previously imported. Hence, it is a durational process. In his celebrated article, Chenery offered the following formula to measure IS between any two points in time :¹

$$(1) \quad IS = Z^t \left[\frac{M^0}{Z^0} - \frac{M^t}{Z^t} \right]$$

* I wish to acknowledge my indebtedness to C. Y. Cheng, J. B. Donges, R. Banarji, G. Lynch, J. Riedel, W. Tyler, and A. Zegeye for their helpful comments on an earlier draft of this paper. Financial support was provided by the Kiel Institute of World Economy, West Germany and Ball State University.

(1) Hollis B. Chenery, "Patterns of Industrial Growth," *American Economic Review*, Vol. 50, No. 34 (September, 1960), pp. 324-354.

where Z and M represent total available supply consisting of domestic output plus imports, and imports, respectively; superscripts o and t denote the period from time o to time t. According to⁽¹⁾, IS would, for example, be considered not to have taken place if imports and total supply increased at the same rate. IS, on the other hand, would be considered infinitely significant if total supply remained the same and if imports were completely eliminated. Positive IS, thus, may be defined as a more proportionate increase in domestic output than in aggregate supply within a given period of time.

Chenery's concept came under some strong conceptual and statistical attacks² despite its widespread use in development literature.³ First, inconsistencies result when one uses different methods of aggregation over time periods or across industries.⁴ Second, the results may be extremely sensitive to the choice of the beginning and end of the period under study.⁵ Third, the formula ignores the income multiplier effect

(2) See for example P. Desai, "Alternative Measures of Import Substitution," *Oxford Economic Papers*, Vol. 21 (November, 1969), pp. 312-324; and R. Sutcliffe, *Industrial Underdevelopment*, Addison Wesley Co. 1971, Ch. 7.

(3) The concept was used by Stephen R. Lewis, Jr. and Ronald Soligo, "Growth and Structural Change in Pakistan Manufacturing Industry, 1954-1964," *Pakistan Development Review*, Vol. 5 (1965), pp. 94-114; William F. Steel, "Import Substitutions and Excess Capacity in Ghana," *Oxford Economic Papers*, Vol. 24, No. 2 (July, 1972), pp. 212-240; T. Ademala Oyejide, "Tariff Protection and an Industrialization via Import Substitution: An Empirical Analysis of the Nigerian Case", *Bangladesh Economic Review*, Vol. 1, No. 4 (October, 1973), pp. 331-340; Jaleel Ahmed, "Import Substitution and Structural Change in Indian Manufacturing Industry, 1950-1966," *Journal of Development Studies*, Vol. 4, No. 3 (October, 1968), pp. 352-379; Hollis B. Chenery et al, "The Pattern of Japanese Growth, 1914-1954," *Econometrica*, Vol. 30, No. 1 (January, 1962), pp. 98-139.

(4) George Fane, "Consistent Measures of Import Substitution," *Oxford Economic Papers*, Vol. 25, No. 2 (July, 1973), pp. 251-261.

(5) P. Desai, p. 322.

on the growth of the domestic market resulting from IS.⁶ Fourth, it does not take into account the indirect effects on intermediate demand⁷.

Let us take up the last criticism first. Morely and Smith elaborate on the last drawback by pointing out an extreme case in which import substitution will not appear in Chenery's formula if the industry in question produces only for intermediate demand. To overcome this problem, they suggest using an input-output table to re-define imports and aggregate supply accordingly; that is, to include the indirect effect of IS on intermediate demand. With this redefinition, import substitution may be computed from the following equation*:

$$(2) X_i^t - \lambda X_i^0 = (Z_i^* - \lambda Z_i^{*0}) (I - M_i^{*0}/Z_i^{*0}) + Z_i^{*t} (M^{*0}/Z^{*0} - M^{*t}/Z^{*t})$$

where :

X_i = total domestic output

$M_i^* = (I - A)^{-1} M$

$Z_i^* = M_i^* + X_i$

$\lambda = GNP^t/GNP^0$

$(I-A)^{-1}$ = Leontief's inverted total matrix

The first term on the r.h.s. of (2) measures the contribution of domestic and foreign demands to output growth, and the last term measures IS. By separating foreign from domestic demand, (2) may be rewritten as follows :

(6) William G. Tyler, *Manufactured Export Expansion and Industrialization in Brazil*, (Kiel: Institut für Weltwirtschaft, forthcoming, 1976), Ch. III.

(7) Samuel A. Morley and Gordon W. Smith, "On the Measurement of Import Substitution," *American Economic Review*, Vol. 60, No. 4 (September, 1970), pp. 728-735.

(8) Morely and Smith, p. 730.

(3)

$$X_i^t - \lambda X_i^o = Y^{*o} \left[\frac{Y_i^{*t}}{Y_i^{*o}} - \lambda + \frac{M_i^{*o}}{Y_i^{*o}} (\lambda - I_{ij}) \right] \\ + (E_i^{*t} - \lambda E_j^{*o}) + Z_i^{*t} [(M_i^{*o}/Z_i^{*o}) - (M_i^{*t}/Z_i^{*t})]$$

where

E = exports

 $E_i^* = (I-A)^{-1} E$

Y = domestic demand

 $Y^* = (I-A)^{-1} Y$ $I_{ij} = Z_i^{*t}/Z_i^{*o}$

For the i th industry, the deviation of the actual change in output from a given proportional, change λ can therefore be classified into one of the following three components :⁹ a) The first term on the r.h.s. of (3) quantifies the effects of changes in the pattern of domestic demand, i.e. the effects of nonunitary income elasticity, b) the second term gives the effects of nonproportional growth in exports defined here as export expansion (EE), and c) the third term measures the impact of import substitution; that is, it measures the difference between output in period t and what it would have been had imports expanded at the same rate as total supply.

Although (3) avoids the last drawbacks in Chenery's IS measure, it remains subject to the first three weaknesses mentioned above. Because (3) will be used in this study, an assessment of the influence of the remaining weaknesses on our results is in order. First, aggregation problems will not be encountered here, for the analysis is neither aggregated over

(9) It is assumed in the model that $\sum_j r_{ij}^o = \sum_j r_{ij}^t$ where $\sum_j r_{ij}$ represents the elements of Leontief's inverted matrix $(I-A)^{-1}$. Had this assumption not been made, it would have been possible to measure the contribution of technological progress to output growth. Symbolically, it is equal to $[(I-A)^t - (I-A)^o] \times t$ See H.B. Chenery et al.; footnote 16, p. 106.

periods nor across industries. Second, the choice of the time period studied is actually dictated by data availability.¹⁰ Third, due to paucity of data required to estimate it, the multiplier effect will be ignored.

The results are summarized in Table 1. Let us first consider the sectoral deviations. We notice that industries with positive deviations or above average growth belong to the group of traditional or "middle industries", e.g. chemical, metal, metal product, machinery, cement, fertilizer, and petroleum industries. This group of industries shows a pattern of growth characterized by a tendency to expand faster, to absorb a large proportion of the increase in industrial output, to exhibit high forward and backward linkages, and to typically have income elasticities ranging between 1.2 and 1.5 at lower income levels. This group's positive deviations are attributed, according to Chenery and Taylor, to "a considerable extent to import substitution which is exhausted at fairly low income levels."¹¹ Our quantitative analysis confirms this contention; for in all but a few sectors, import substitutions either turned out to be negative, indicating that it has already been exhausted, or positive and large, i.e. reaching its limit.

A positive contribution of the changing pattern of domestic demand to industrial growth can be seen in only seven industries. All are basically consumer oriented and produce cement, meat products, flour, sugar, oils and fats, other foods, and chemicals primarily consisting of pharmaceuticals, soap, cosmetics, and matches. This reflects the influence of both the relatively fast rate of population growth in Egypt and of a low per capita income on the total demand structure wherein an upward bias for basic necessities would be expected.

(10) At the time of writing this section, only the 1954 input-output table was available; thus, the beginning of the period had to be 1954. Even though other input-output tables became available later on, it was still extremely difficult to use any of them in connection with the 1954 table since the sector's breakdown was markedly different. The choice of the end period was again determined by total output data availability. The first time the Statistical Office in Egypt expanded its industrial census to include all establishments. It should be noted that the period from 1954 to 1966/67 is long enough to contain strong structural changes in production coefficients, changes which would tend to bias the results in as much as the same input-output table is used for both years.

(11) Hollis B. Chenery and Lance Taylor, "Development Patterns, Among Countries and Over Time," *The Review of Economics and Statistics*, Vol. 50, No. 4 (November, 1968), p. 409.

Table 1.—Sources of Industrial Growth in Egypt, 1954 - 1967
(EI 1000)

	Demand Pattern		Export Expansion		Import Substitution (IS)			
	Deviation	Value	Index	Value	Index	Value	Index	IS/AX
1. Metals	29,497	-1629	-5.5	-1037	-3.5	32163	109.03	.847
2. Metal Products	3,267	-7268	-233.5	-294	-0.3	10995	336.5	.545
3. Cement	11,291	9573	84.4	-2855	-25.3	4574	40.5	.259
4. Petroleum Refining	726	-15800	-2176.3	1877	258.5	14650	2017.9	.778
5. Machinery	19,414	-6800	-35.0	1795	9.2	24419	125.8	.623
6. Basic Chemicals	-1,209	-2071	-166.8	343	28.4	518	42.8	.253
7. Other Chemicals	53,533	3612	6.7	-409	-0.8	50330	94.0	.738
8. Meat Products	193	429	222.3	-3	-1.6	-232	-120.3	-.302
9. Dairy Products	573	-1397	-243.8	-151	-26.4	2122	370.3	.698
10. Grain Milling	7,087	42546	600.3	18909	266.8	-54368	-767.2	-.911
11. Bakery Products	-14,819	-14883	-100.5	-106	-0.7	170	1.2	.008
12. Sugar	5,221	12216	234.0	-1152	-22.1	-5843	-111.9	-.134
13. Oils and Fats	-1,358	20	1.5	-1809	-133.2	431	31.7	.885
14. Other Food Products	-36,826	742	2.0	-8133	-22.1	-29435	-79.9	.733

15. Spinning and Weaving	5,259	-57943	-1101.8	34212	650.5	28991	551.3	.152
16. Clothing	-3,200	-3136	-98.0	-212	-0.1	149	4.7	.270
17. Paper & Paper Products	9,767	-1514	-15.9	-2225	-22.8	13507	138.3	.707
18. Tobacco	-29,196	-40308	-138.1	1869	6.4	9243	31.7	.124
19. Wood and Furniture	-5,540	-5242	-94.5	-178	-3.2	-120	-2.2	-.094
20. Fertilizers	16,421	-5491	-33.8	3858	23.5	18054	109.9	.763
21. Other Industries	54,321	-29833	-189.1	-9107	-57.7	23160	146.8	.586

NOTES : Deviation = $(X_i^t - \lambda \times \lambda_i^o)$

$$\text{Demand Pattern} = Y_i^{*o} \left[\frac{Y_i^{*t}}{Y_i^{*o}} - \lambda + \frac{M_i^{*o}}{Y_i^{*o}} (-I_{ij}) \right]$$

$$\text{Export Expansion} = (E_i^{*t} - \lambda E_i^{*o})$$

$$\text{Import Substitution} = Z_i^{*t} [(M_i^{*o}/Z_i^{*o}) - (M_i^{*t}/Z_i^{*t})]$$

Indices are calculated for each factor as a percentage of deviation.

The sum of the three indices must add up to ± 100 depending upon the sign of the deviation.

Sources : See Appendix

The rate of export expansion registered above average growth in seven industries which are either heavy users of natural resources (petroleum, basic chemical, grain milling, spinning and weaving, and fertilizer industries) or which utilize standard technological processes of production (machinery and tobacco industries). One may interpret these findings as indicators of the areas in which Egypt may have potential cost advantage.¹² All industries seek to expand their exports; those which not only succeed in doing so but also surpass the average level of growth of the rest show that, *ceteris paribus*, they a) can mobilize their required resources more readily, and b) can compete more effectively abroad.

The results further indicate rather clearly that the vigorous campaign of the government to replace imports during the interim period 1954-1967 has been remarkably effective.¹³ The industrial sector began substituting domestic production for imports in earnest in about 1956 with newly established factories in such fields as railway equipment, auto batteries, tires, electric cables, pencils and graphic products, and canned vegetables. By 1966, the list of commodities produced for the first time in Egypt had grown astronomically.¹⁴ This increase explains the dominance of IS over all other sources of growth as indicated in Table 1. Of twenty-one industries, IS shows five negative signs compared to 13 negative signs for each of the domestic demand and export factors. The five industries with negative IS are characterized by a supply curve with a price elasticity approaching zero beyond a given level of output.¹⁵ With an ideal exclusion of non-competitive imports in the calculation of IS, all signs would have probably been positive.

(12) A more precise method of identifying areas of comparative advantages using the domestic resource cost analysis is given in Maurice Girgis, *Import-Substitution Industrialization Policies and Resource Allocation in Egypt: 1948-1974*, Institut für Weltwirtschaft, Kiel, W. Germany. Forthcoming, 1976, pp. 242-277.

(13) Cf. Hollis B. Chenery, "Alternative Strategies for Development", paper presented at the Rehovot Conference on Economic Growth in Developing Countries, Israel, September, 1973.

(14) See General Organization of Mobilization and Statistics, *12 Years of Industrial Development, 1952-1964*, Cairo, 1964.

(15) Of the five sectors with negative IS signs, four belong to the food industry. Despite the fact that yield per hectare in the major crops, as defined by the FAO, is by far greater in Egypt than it is even in Western Europe (See M. Girgis, "Development and Trade Patterns in the Arab World," *Review of World Economics*, 109 (1973), pp. 121-168) Egypt=

That import substitution has contributed significantly to industrial growth can be seen from the last column of Table I where IS is divided by the change in output. For example, IS in metals, petroleum, refining, fertilizers, chemicals, paper and machinery accounted for, respectively, 78%, 76%, 74%, 71%, and 62% of output growth from 1954 to 1966-67. These are the same industries which received relatively high investment priorities from the state since 1955.

Another important observation emerges from our empirical results. Contrary to the general tendency found in development literature to consider IS and export expansion as mutually exclusive, the data show six industries whose output growth has been generated by IS and export expansion simultaneously. Supply rigidities at home may explain to a large extent why these commodities used to be imported. With capital widening and deepening, and with an overall tariff protection, however, these industries are able to regain their natural comparative advantage and to engage in export activities. A good example is the textile industry, which used to be a net importer when most of the Egyptian cotton was exported as a raw material. But when new textile plants were established and old ones expanded, it became possible to meet domestic as well as foreign demand. Indeed, the findings in Table I seem to have captured the transformation of six industries from the stage of IS to export expansion.

This shift to export expansion brings us to the next question : Is the industrial sector in Egypt approaching the end of IS ? It is difficult to give a definite answer, for if we rely on circumstantial evidence based on governmental measures designed to affect exports and imports in one way or the other, our answer may be incorrect provided the government itself is not well aware of the true situation in the industrial sector. To wit, it is customary to find certain changes, sometimes gradual and some-

-- still relies heavily on foreign sources for foodstuff imports because of the extremely limited supply of land (only 2% of total area) and the pressures exerted by the fast-growing population size (2.5% per annum). Although the Aswan Dam is expected to relax the supply of land constraint, its total benefits have not been realized yet. It is estimated that only 10 to 15% of its expected pay-off to the agricultural sector had materialized by 1970. The fifth sector with negative IS is wood and furniture. Here again, the scarcity of forests resulting from the extreme shortage of rainfall in Egypt accounts for the negative sign.

times radical and abrupt,¹⁶ in governmental policies introducing more export incentives, relaxing foreign exchange controls, easing import restrictions, and undertaking a move to bring the official exchange rate close to the equilibrium rate. These measures all signal the advent of an outward looking strategy of development. The absence of these indicators, however, can be construed in two ways : Either the country is still undergoing the process of IS and cannot afford to introduce these measures, or it does not recognize that the time has come for an overhaul of policies. The latter may be the case in Egypt, for signs of liberation policies were not visible and are still very weak in 1975; yet our empirical evidence strongly suggests that a great deal of IS has already taken place and that there are six industries which have thus far begun the transformation. In addition, Table II shows that there are only a few industries with the ratio of imports to total supply approaching the early fifties' high levels, which indicates that these industries might still benefit from IS. The remaining industries, however, do not have much room left for IS. In addition, export growth in Egypt has failed to keep up with the world average, and export composition and country destinations have been to a greater extent responsible for the poor performance of manufactured as well as nonmanufactured exports.¹⁷ When all these structural evidences, that is the low import-supply ratios, the significant role thus far played by IS, the actual transformation of certain industries, and the weak performance of the export sector are combined, there is little doubt that IS in Egypt is indeed approaching its limitations and that the government should start taking the necessary steps to carefully change its whole attitude toward the foreign trade sector.²¹

(16) See for example, J. B. Donges, "Spain's Industrial Exports," *Review of World Economics*, 108 (1972), pp. 191-198; I. Little, T. Scitovsky and M. Scott, *Industry and Trade in Some Developing Countries*, London, 1970, chapter 10; James Riedel, "Import Substitution, Export Expansion and the Problem of Capacity Utilisation in Developing Countries", working paper, (Kiel: Institut für Weltwirtschaft, 1973).

(17) Girgis, *Import Substitution*, Chapters VI and VII.

(18) One area that needs special attention is the high tariff protection granted the no longer infant industries. Certain infant industries should be kept in check by allowing foreign competition in the domestic market. The paper industry, for example, is protected by an embargo on many types of paper and, in addition, has strong monopoly power at home. The total absence of any form of competition gave rise to inefficiencies in production, higher prices, shortages, black markets, and lower=

Table II.—Ratio of Imports to Total Supply, 1954 and 1967

Sector	1954		1967	
	Direct (a)	Total (b)	Direct (a)	Total (b)
1. Metals	.776	.902	.328	.546
2. Metal Products	.424	.624	.129	.366
3. Cement	.073	.274	.050	.044
4. Petroleum Refining	.651	.723	.156	.394
5. Machinery	.782	.844	.590	.682
6. Basic Chemicals	.069	.641	.250	.566
7. Other Chemicals	.701	.798	.297	.368
8. Meat Products	.902	.623	.667	.694
9. Dairy Products	.545	.660	.200	.276
10. Grain Milling	.082	.214	.489	.512
11. Bakery Products	.005	.005	.000	.000
12. Sugar	.043	.073	.076	.154
13. Oils & Fats	.977	.997	.929	.978
14. Other Food Products	.056	.073	.330	.353
15. Spinning & Weaving	.095	.170	.032	.074
16. Clothing	.722	.726	.833	.704
17. Paper and Paper Products	.677	.796	.353	.471
18. Tobacco	.103	.176	.064	.106
19. Wood & Furniture	.095	.144	.200	.169
20. Fertilizers	.721	.731	.125	.242
21. Other Industries	.413	.538	.096	.288

Notes : (a) Imports divided by domestic output plus imports, M/Z .

(b) Total direct and indirect imports divided by domestic output and total direct and indirect imports, M^*/Z^* .

Source : See Table I

II. Import Substitution and the Egyptian Economy's Dependency on Imports of Intermediate Products

The extent of IS is one thing, and its success is another. We have seen that IS in Egypt has been quite extensive during the time from 1954 to 1966-67 and that in many industries it seems to be grinding to a halt. If the main objective of IS was to expand the industrial output, then it has been successful as well. However, if its success is measured against its ability to reduce the manufacturing sector's dependency on imports, IS in Egypt could be considered a failure, for the total (direct plus indirect) amount of intermediate goods required to produce an average unit of output in industry has actually increased from 1954 to 1959-70¹⁹.

Import substitution necessarily begins in the final consumer goods sector. Obviously, it would not begin in the capital or intermediate goods sectors because of the lack of highly skilled labor including scientists and engineers, infrastructure, capital, and, above all, sufficient domestic demand at home. Import substitution would start in the final consumer goods sector because demand size is readily available from import data, required technology is not complex, availability of raw materials at home reduces entrepreneurial risk and, in many cases, the production

=quality of products. Under these conditions, a gradual lifting of the embargo seems to be an optimal strategy to improve the paper market. See Federation of Egyptian Industries, Yearbook, 1970, Cairo, pp. 109-110.

(19) This section deals primarily with the impact of IS on the Egyptian economy's dependency on imports of intermediate products, not total imports. IS's impact on total imports has already been discussed in the preceding section. It is worth noting that the ratio of total imports to GDP, which has been shown by I. Little et al to fluctuate during the process of IS, has behaved in a similar fashion in Egypt as illustrated in the following comparison :

Country	1950-52	1957-59	1964-66	1969/70-73
Argentina	9%	11%	7%	
Brazil	12	10	8	
Mexico	12	11	8	
India	8	7	7	
Pakistan	8	7	10	
Philippines	14	13	19	
Taiwan	13	14	19	
Egypt	28	18	20	19%

For Egypt, see Ministry of Planning, Follow-up Report, several issues ; for the remaining countries, see I. Little et. al., p. 63.

process involves the assembling of imported parts and components²⁰.

As the process of import substitution continues, it is not clear *a priori* whether the economy's dependency on imports would tend to decrease or increase. One would expect it to decrease because of the obvious substitution of finished consumer goods. This process, however, generates new and additional demands for intermediate goods, e.g. materials, parts, components, and machinery. If these products are produced or producible at home, the demand for imported inputs will depend upon the elasticity of substitution of domestic for foreign intermediate goods. The magnitude of the elasticity coefficient will depend upon a host of variables including the domestic price relative to the foreign price, tariffs, import quotas, foreign exchange holdings, quality, delivery conditions, and credit facilities. If they are not available at home, the elasticity coefficient will be zero, and the economy's dependency on imports would necessarily increase. There are two additional factors which tend to increase the economy's dependency on imports. The first can be ascribed to the domestic production's bias toward capital intensive techniques as the process of IS continues. This bias would shift domestic intermediate demand toward inputs which are either not available at home, which can be produced at a cost appreciably higher than their foreign counterparts, or whose domestic quality is definitely low because of the prevailing rudimentary stage of the industrial arts. Under any of these conditions, demand for imported inputs would grow relatively faster than that for domestic equivalents. The second factor stems from a similar bias but in demand pattern. Here, IS increases output and generates income, thus creating demands for new and different categories of product. This process has a number of ramifications on the economy: Increased incomes through the multiplier and accelerator effects tend : a) to increase the average propensity to import, b) to increase the marginal propensity to import particularly in higher income brackets-groups, and, more importantly, c) to bias demand profile toward capital-intensive products beyond a given low income level. The net effect of these three changes is to increase demand for imported finished products in general and capital-intensive goods in particular, which in turn increase the demand for imported inputs.

(20) Compare Little et. al., pp. 59-66.

One would thus expect *a priori* that the economy's degree of dependency on imported inputs would show a rising trend throughout the IS process. The rising trend should be visible particularly during the first stage of IS in which imported finished consumer goods are substituted through domestic production. To test this hypothesis, two input-output tables were used to calculate the direct and indirect amounts of imported intermediate products required to produce one unit of output. The test was carried out for the years 1954 and 1969-70 for about 24 industrial branches in each year. During this period, IS in Egypt has evidently exhausted IS possibilities in the final consumer goods sector as illustrated in the preceding section. The extent of the IS process in the intermediate goods sector can then be judged from this test because, loosely speaking, a reduction of the economy's dependency on these products would indicate an effective IS of intermediate goods and vice versa.

The method of calculation follows the standard techniques of input-output analysis. Consider

$$m_i = \frac{M_i}{X_i}$$

$$M^*_i = (I-A)^{-1}m_i$$

where

m_i = the ratio of imported intermediates to output in industry i

M_i = total intermediates required in industry i

X_i = total output of industry i

M^*_i = total, direct and indirect, amount of intermediates required to produce one unit of output in industry i

$(I-A)^{-1}$ = the Leontief inverted total matrix

The results of this test, which are reported in Table III for 1954 and IV for 1969-70, support the hypothesis. The direct amounts of intermediate products required to produce total industrial output, i.e.

Table III.—Direct and Indirect Imported Intermediates Required
in Domestic Industrial Production, 1954 (L.E. 10,000)

Sector	m_i	M_i^*	X_i	$m_i X_i$	$M_i^* X_i$
1. Mining and Quarrying	.068	.285	1,305	89	372
2. Metals	.224	.573	985	221	564
3. Metal Products	.222	.327	1,187	263	388
4. Cement	.132	.146	555	73	81
5. Petroleum Refining	.132	.326	2,578	339	880
6. Machinery	.166	.340	3,083	571	1,048
7. Basic Chemicals	.077	.103	286	22	29
8. Other Chemicals	.146	.332	1,274	186	423
9. Meat Products	.026	.031	4,642	120	144
10. Dairy Products	.028	.048	4,461	126	214
11. Grain Milling	.027	.194	8,166	222	1,584
12. Bakery Products	.064	.066	5,705	364	377
13. Sugar	.033	.063	2,110	69	133
14. Oils and Fats	.052	.117	1,355	70	159
15. Other Food Products	.080	.099	2,684	214	266
16. Spinning and Weaving	.055	.161	8,681	480	1,398
17. Processing of Cotton	.006	.051	8,706	52	444
18. Clothing	.050	.051	1,433	71	73
19. Paper and Paper Products	.238	.370	362	86	134
20. Tobacco	.059	.110	4,913	292	540
21. Wood and Furniture	.186	.194	1,006	187	196
22. Fertilizers	.075	.090	575	43	52
Other Industries	.162	.431	3,696	598	1,593
Total			69,748	4,759	11,052

Sources : Computed from Eleish, Table I, p. 119.

Table IV.—Direct and Indirect Imported Intermediates
Required in Domestic Industrial Production, 1969-70
(L.E. million)

Sector	m_i	M_i^*	X_i	$m_i X_i$	$M_i^* X_i$
1. Cotton Processing	.001	.027	180,011	260	4,860
2. Quarrying	.084	.110	12,724	1,074	1,400
3. Crude Petroleum	.055	.099	61,712	3,388	6,110
4. Food Products	.143	.258	773,719	110,513	199,620
5. Beverages	.019	.019	16,086	313	306
6. Tobacco	.785	.785	132,655	104,098	104,134
7. Spinning and Weaving	.060	.140	374,245	22,447	52,394
8. Clothing	.011	.012	67,238	756	809
9. Wood and Furniture	.160	.193	36,397	5,831	7,025
10. Paper	.261	.383	24,737	6,463	9,474
11. Publishing	.181	.186	30,850	5,598	5,738
12. Leather	.176	.217	17,843	3,134	3,872
13. Rubber	.319	.346	14,891	4,956	5,152
14. Chemicals	.223	.391	126,012	28,046	49,271
15. Petroleum	.148	.235	62,850	9,294	14,770
16. Non-Ferrous Metals	.118	.156	48,287	5,700	7,533
17. Ferrous Metals	.244	.507	66,228	16,136	33,578
18. Fabricated Metals	.182	.234	34,092	6,204	7,978
19. Machinery	.206	.221	15,275	3,149	3,376
20. Electric Machinery	.220	.267	44,340	9,761	11,839
21. Transport Equipment	.294	.336	45,008	13,235	15,123
Other Industries	.084	.090	23,430	1,977	2,109
Total.			2,208,630	362,333	546,471

Sources : Input-output coefficients from CAPMS, Input/Output Table for ARE, 1966/67, Cairo, 1973 (in Arabic) and 1969/70 output data from CAPMS, Industrial Census, 1969/70, Cairo, 1973 (in Arabic), and Federation of Egyptian Industry, Yearbook, 1970 and 1971 issues.

weighted average, increased from 6.8% in 1954 to 16.4% in 1969-70. Total requirements likewise increased from 15.9% to 24.7% over the same period of time. Though IS seems to have been very effective, it is clear from this test that its effectiveness conceals an increasing dependency on foreign intermediate goods to support production at the final stages of fabrication. Even though price movements in domestic output relative to imported inputs from 1954 to 1969-70 were not taken into account, it is doubtful that their inclusion would change the results appreciably.

III. The Impact of IS and EE on Industrial Employment

Besides their contribution to industrial output, IS and EE can generate a great number of job opportunities in the manufacturing sector directly and in the entire economy indirectly. It is interesting to note in passing that while the economists and non-economists alike have proposed several remedial policies to the unemployment problem in LDC's in general and in Egypt in particular, the role of the foreign trade sector has remained in the background²¹. In this section, I will present some evidence which indicates that during the last two decades both EE and IS have had a significant influence on the level and rate of employment in Egypt²².

(21) See for example the results of four major studies on Iran, Kenya, Ceylon, and Colombia sponsored and published by the International Labour Organization, 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 for Colombia*, 1970. See also, G. Ranis, "Industrial Sector Labor Absorption," *Economic Development and Cultural Change*, Vol. 21, No. 3 (April 1973), pp. 387-408.

(22) Cf. I. Little et. al.; 1970; William G. Tyler, "Employment Generation and the Promotion of Manufactured Exports in Less Developed Countries: Some Suggestive Evidence," In *Problems of the International Division of Labour*, ed. Herbert Giersch (Tubingen: J.C.B. Mohr, 1974); S. Watanabe, "Exports and Employment: The Case of the Republic of Korea," and C. Hsieh, "Measuring the Effects of Trade Expansion on Employment: A Review of Some Research," *International Labour Review*, Vol. 106, No. 6 (December 1972) and Vol. 107, No. 1 (January 1973).

A. The Model

An estimate of employment directly generated by exports in a given sector is arrived at by calculating :

$$(1) \quad l_i = L_i / X_i \quad (i = 1 \dots n)$$

$$(2) \quad e l_i = l_i E_i$$

where L_i , X_i , E_i , l_i , and eL_i represent labor, output, exports, labor per unit of output, and employment generated by exports in the i th sector, respectively. Total direct employment generated by exports in the economy is then defined as

$$(3) \quad eL = \sum_{i=1}^n eL_i$$

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

$$(4) \quad l_i = \sum_{j=1}^n r_{ij} l_j$$

The r_{ij} 's represent elements of the inverted Leontief *domestic* interflow matrix²³. Total direct and indirect labor employment generated by exports in a given sector is the estimated in the following manner:²⁴

(23) 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 labor employed abroad in the production of the imported inputs.

(24) This model can also be used to determine the sectoral distribution of income generated by exports. The only modification required is to replace labor per unit of output by value added per unit of output.

$$(5) {}_eL'_i = P_i E_i \quad (i = 1, \dots, n)$$

For all sectors, total labor requirements can be obtained by summing equation (5) across the i 's as follows ;²⁵

$$(6) {}_eL' = \sum_{i=1}^n P_i E_i$$

Employment generated by IS between two points in time may therefore be calculated as follows :

$$(7) {}_mL'_i = \sum_{i=1}^n l_i (IS)_i$$

where ${}_mL'_i$ represents the total direct and indirect labor employment generated as a result of replacing imports by equivalent domestic production in the i th sector. IS is obtained from Table 1 above. To calculate equation(7) properly one ought to exclude noncompetitive imports. However, such a distinction was not available in the 1954 table; hence, the results should be interpreted with this caveat.

The use of the input-output table in this type of empirical work has the advantage of reaching beyond the direct labor employment; therefore, it takes into account the sectoral interrelatedness which characterized the existing production relations. It has certain analytical limitations, however. In the first place, there are the well-known basic assumptions made with respect to any static input-output analysis. The validity of such assumptions is naturally open to question²⁶. Furthermore, estimates of labor employment generated by exports in a given sector may be biased upwards (downwards), because while values of l_i are based on production conditions in the entire sector, production of exportables may be more (less) efficient, i.e. exhibit a lower (higher) l_i than that of products destined for domestic consumption. Hence, the use of an average l_i may be misleading in that it tends to overestimate (underestimate) export-generated employment in that sector.

(25) Cf. William G. Tyler, "Methodological Notes of Analyzing Manufactured Exports Performance in Less Developed Countries", *Kieler Diskussionsbeiträge*, No. 28 (February 1973), p. 28; James Riedel, "Manufacturing for Exports and the Labor Absorption Problem in LDC's: An Anatomy of Taiwan's Footloose Industries," April 1973, memo, Kiel: Institut für Weltwirtschaft, 1973, pp. 6 and 7.

(26) Hollis B. Chenery, and Paul G. Clark, *Interindustry Economics*, (John Wiley Sons, Inc., 1959), pp. 33-42.

The model also 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 the short to medium run — rests on the *vera causa* of labor employment. First, if unemployment is due to significant market imperfections, export expansion may do little in the way of reducing it because these imperfections are an institutional problem which can be solved by institutional remedies and not by merely expanding output. Second, if unemployment is due to lack of complementary resources, especially of physical capital, export expansion will have no effect whatsoever on unemployment. 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 labor market imperfections and supply rigidities of complementary resources are absent.²⁷ Even then, there is still the possibility that expanding exports may require specific categories of labor occupations which are not available among those who are unemployed. These bottlenecks, to be sure, will weaken the potency of exports in reducing unemployment in the short run²⁷.

(27) The model, however, can be readily extended so as to take this factor into account. Instead of treating labor as a homogenous input, it can be broken down into separate categories of skills. Thus, let

$$L = L_1 + L_2 + L_3 + L_4$$

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

$$eL' = \sum_{i=1}^n l_{i1} E_i + \sum_{i=1}^n L_{i2} E_i + \sum_{i=1}^n L_{i3} E_i + \sum_{i=1}^n l_{i4} E_i$$

where the l'_{xi} 's represent total labor of category x required per unit of output in industry i . Once export requirements of certain labor categories are determined eL'_{xi} , they can be matched against what is available at home especially among the ranks of the unemployed labor force. Bottlenecks can then be determined, and their limitational effects on the export-generating power of reducing unemployment in a dynamic setting can be quantified. A meaningful effort in this direction has unfortunately been made impossible by the lack of data.

B. RESULTS

1. Exports and Export Expansion

If one distills their most important features, the results reported in Tables V for 1954 and VI for 1969-70 express the following characteristics of the relationship between exports and labor employment:^{27a}

a. As could be expected, total direct and indirect labor required per L.E. 1,000 of output is greater in every sector than the direct alone. The cardinal differences are increasing functions of backward linkages, which characterize each sector; thus, in agriculture, mining, quarrying, and crude petroleum where backward linkages travel a short distance, the differences are fairly small. There are industries, on the other hand, which can be distinguished by their high backward linkages. This is the case especially for the labor-intensive industries, i.e. cotton processing, food, wood, furniture, textile, and fabricated metals industries. These industries' direct labor intensity is significantly smaller than their total labor intensity.

The relation of total to direct labor intensity can reveal additional information. If one ranks industries according to their direct and total labor intensities, the results indicate that these industries are generally similar to each other. For 1954, the Spearman rank correlation coefficient of all 29 sectors is .509, and it is .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, both significant at the .01 probability level. These results reveal, *inter alia*, the following set of non-mutually exclusive phenomena : i) The mode of production in certain economic activities is so diverse from others that one sector which exhibits a low direct labor intensity may triple or even quadruple this value when indirect labor is included and still be much lower than the direct labor intensity of another sector, e.g. agriculture as opposed to fertilizers in 1954. This phenomenon could be attributed to a certain

(27a) Estimates of labor absorptive capacity of exports in 1969/70 was derived by applying (the most recent) input-output coefficients of 1966/67 to export values in 1969/70.

Table V.—Labor Absorptive Capacity of Exports in Egypt, 1954

Sector	(1)	(2)	(3)	(4)	(5)	(6)
	Direct Labor Requirement per L.E. 1000 output	Total Labor Requirement per L.E. 1000 output (man year)	Total Value of Exports	Direct Labor Employment Generated by Exports (1) × (3)	Total Labor Employment Generated by Exports (2) × (3)	Direct Labor Employment Generated by Exports as a % of Total Sectoral Employment (%)
	(man year)	value	Rank	(L.E. 1000)	(man year)	
Agriculture	10.70883	13.88633	1	3,170	33,946	44,018
Mining and quarrying	1.07280	1.93538	23	900	966	1,741
Metals	2.92995	4.08409	14	340	996	1,389
Metal products	1.69402	2.97809	18	220	373	655
Cement	1.04991	2.33905	22	800	840	1,871
Petroleum refining	0.31032	1.71366	25	850	264	1,457
Machinery	2.59488	4.56813	12	1,140	2,958	5,208
Basic chemicals	0.34965	2.53249	21	—	—	—
Other chemicals	0.31397	1.30820	27	910	286	1,190
Meat products	0.86170	11.67484	4	180	165	2,102
Dairy products	2.15198	9.28961	6	30	65	279
Grain milling	0.22043	12.02182	3	1,750	386	21,038
Bakery products	0.40316	9.81149	7	50	20	440
Sugar	0.61611	5.40532	11	20	12	108

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	1.80301	24	82,649	10,298	149,000	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
Transport. & communication	2.32099	2.97799	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	0.97
Mining & manufacturing				107,600	49,262	301,818	44.994
Services				78,800	123,240	173,290	6.32
The entire economy				189,570	206,448	519,126	2.85

Notes : Column (1) = I_i ; Column (2) = I'_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.

Table VI.—Labor Absorptive Capacity of Exports in Egypt, 1969/70

Sector	(1) Direct Labor Requirement per L.E.1000 Output (man year)	(2) Total Labor Requirement per L.E.1000 (man year)	(3) Total Value of Exports (L.E. 1000) Exports	(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 sectoral em- ployment(%)
Agriculture	4.166	5.313	2	37,689	48,067	0.91
Coton processing	0.035	4.613	4	3,668	483,415	58.00
Quarrying	1.737	2.161	12	4,735	5,891	21.43
Crude petroleum	0.193	0.403	25	9,645	20,140	81.05
Food	0.175	3.571	6	8,256	168,458	6.09
Beverages	0.572	2.305	10	849	3,421	9.23
Tobacco	0.087	0.257	27	242	714	2.11
Textiles	0.828	2.886	8	53,010	185,079	17.11
Clothing	2.617	2.617	5	13,216	22,326	7.51
Wood and furniture	4.241	5.615	1	12,087	16,003	7.83
Paper	0.395	0.979	21	—	—	—
Publishing	0.870	1.317	16	1,349	2,041	5.03
Leather	0.687	2.260	11	460	1,514	3.75

Rubber	0.233	0.746	24	610	197	455	5.93
Chemicals	0.407	1.043	20	7,107	2,813	7,413	5.48
Petroleum	0.222	0.340	26	2,690	597	915	4.29
Non-ferrous metals	1.039	1.821	14	6,200	6,442	11,290	12.79
Wetrous metals	0.341	0.799	23	2,500	853	1,998	3.78
Fabricated metals	4.175	4.859	3	325	1,357	1,579	0.95
Machinery	0.588	1.256	18	—	—	—	—
Electric machinery	0.569	1.251	19	1,335	760	1,670	3.01
Transportation	0.181	0.932	22	1,751	317	1,632	3.90
Miscellaneous	0.478	1.303	17	1,261	603	1,643	5.39
Construction	0.904	2.017	13	—	—	—	—
Electricity	1.002	1.339	15	—	—	—	—
Transport. & communication	1.751	2.367	9	8,550	14,971	20,238	4.19
Other aervices	2.772	3.278	7	53,882	149,360	176,636	6.64
Sectoral Totals				9,047	37,689	48,067	0.91
Mining & manufacturing				306,962	121,536	937,597	9.89
Services				62,432	164,337	196,874	5.76
Entire Economy				378,441	323,562	1,182,538	3.93

Notes : Column (1) = L_i Column (2) = L'_i Column (4) = ${}_eL_i$ Column (5) = ${}_eL'_i$

Sources : See Appendix.

measure of economic dualism. ii) The economy underwent noticeable structural changes from 1954 to 1969-70. The general profile of direct labor intensities across industries seems to have decreased appreciably. Such a decrease has the effect of reducing the value of sectoral indirect labor intensity, a reduction which in turn narrows the magnitudinal differences between direct and total labor requirements. This explains in part the more significant rank correlation coefficients observed above in 1969/70 as compared to 1954.

b. In 1954, exports created a total number of jobs of about 519 thousand which are 7.1% of the total labor force. In 1969/70, the corresponding number of jobs rose to about 1.2 million, which constitute about 14.4% of total employment in the economy. When compared to that of other countries, the labor absorptive capacity of exports in Egypt seems to be high indeed. In a recent study, similar calculations were made for Egypt, Brazil, India, Mexico, Philippines, South Korea, Taiwan, and Yugoslavia. The results show that the 8-country weighted average of total export-generated employment in the manufacturing sector alone, as a percentage of total employment using manufactured exports in constant 1969 prices, was about 3%²⁸. In Egypt it was 4.2% in 1954 and 11.4% in 1969/70. These figures may be explained in part by Egypt's success in changing the export composition towards more labor intensive commodities vis-a-vis the above countries. The explanation becomes clear when one considers the industries which contributed the most to exports in 1969/70. According to Table VI, cotton processing, textile, and food contributed about 70% of total exports. Each of these industries relies heavily on the agricultural sector, which employs 4,092,200 workers of a labor force of 7,233,000 !

c. When one looks at direct job opportunities offered by exports in the agriculture, mining and manufacturing, and services sectors, it is clear that services benefit the most from exports. Statistically, direct employment generated in this sector accounted for about 60% in 1954 and for about 51% in 1969-70 of the total employment generated by exports; see Tables V and VI. This amount stems from tourism. Dynamically, however, the mining and manufacturing sector seems to bene-

(28) See Tyler, "Employment Generation."

fit 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 that labor productivity in the manufacturing sector is normally higher than in the other two sectors, the export-generated employment in this sector is actually under-estimated; for if labor 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 the expansion of export-generated employment 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 1953 to 1972 grew at an annual compound rate of 15.14% as opposed to 5.65% for total exports, 12.30% for foodstuff (SITC 0-1), 2.43% for crude materials (SITC 3), and 2.02% for raw cotton.

d. We can assess the impact of exports on sectoral employment in a different way by looking at Table VII below, which is derived from Tables V and VI. Notice that the value of exports required to generate one direct unit of employment differs from one sector to another. The difference between the sectors is to a large extent a reflection of their disparate levels of labor productivities. When we compare the value of exports required to create one direct job as opposed to one total (direct and indirect) job, furthermore, the difference is greatest in the manufacturing sector because of its strong backward linkages within itself and with the agricultural and services sectors. It is clear, then, that the Egyptian economy has indeed surpassed the stage of a rudimentary industrial structure and is now characterized by strong linkages among sectors. We can support this observation from a different perspective. Given the amount of exports required to create one direct job, how many jobs are actually created throughout the economy? Obviously, the extent of job generation is an increasing function of the extent of backward linkages. As shown in the Table VI, one direct job created in the manufacturing sector means that 18.50 jobs in 1954 or 7.72 in 1969/70 will be generated throughout. It should be noted that the decrease from 18.50 to 7.72 during this period is not a consequence of a weakening in sectoral interrelatedness but of a rising labor productivity and capital intensity in the manufacturing sector. One more observation should be made on Table VI. The decrease in the amount of exports required to produce

Table VII.—Value of Exports Required to Increase Employment by one unit, 1954, and 1969/70
(In Current Prices)

	Agriculture		Manufacturing		Services		Total
	1954	1969/70	1954	1969/70	1954	1969/70	1954 1969/70
(1) Exports required to generate one unit of direct employment (L.E.)	93.38	240.04	2184.44	2525.69	639.40	379.91	918.25 1169.61
(2) Exports required to generate one unit of direct and indirect employment(L.E.)	72.02	188.18	118.05	327.39	454.73	317.12	226.54 320.02
(3) 1 + 2 = man-year units	1.29	1.27	18.50	7.72	1.41	1.20	4.05 3.66

Source : Figures are computed from Tables III and IV.

one additional job in the services sector in 1969/70 is caused by the closure of the Suez Canal and the slack in tourism.²⁹

Finally, the effect of export expansion on employment opportunities is determined simply as the difference between total export-generated labor employment in 1954 and 1969/70, which amounted to a little more than 663,000 jobs most of which are in the manufacturing sector³⁰. This increase in laborabsorptive capacity of exports is tantamount to an average of about 47,000 jobs each year or 17.8% of the annual increase in the labor force.³¹

(29) The total number of direct and indirect workers displaced as a result of closing the Suez Canal can be estimated as follows: if one knows that total revenues from the Canal increased from LE 31.4m. in 1954 to LE 95.0 in 1966 and if one assumes that the total labor-intensity of a unit of exports of the Canal remained the same during the same period, the total number of workers who lost their jobs is about 64,000 in 1967. For 1971/72, I constructed a time-trend-regression equation to estimate revenues for that year. The resulting equation was $Y = 16.074 + 6.713 t$ where Y represents revenues and $t = 1 (1, \dots, 13)$ and $R^2 = 0.95$. Revenues in 1971/72 are estimated at LE 127.5m., which would have provided 86,000 jobs. We may add that this figure amounts to 11.7% of total open unemployment in Egypt in the same year. Sources of data used to estimate the regression equation are taken from the Statistical Department, Statistical Pocket Year Book, Cairo, 1959 and 1961, and the Central Agency of Public Mobilization and Statistics (CAPMS), Statistical Year Book, 1952-1971, Cairo, 1972. Estimation of national open unemployment is explained below.

(30) The potential of export expansion as a means to alleviating or eliminating unemployment in Egypt in 1980 and 1985 is discussed, in appendix IV, see M. Girgis, *Import Substitution*, pp. 415-522.

(31) The Ministry of Planning in Egypt estimates that about 711,100 workers were unemployed in 1969/70. Its estimate of about 7.9% of the adult labor force does not seem to be far off the target. During the last five years, an average of 680,000 young people became 15 years old each year. About 60% of these groups either continue their education or stay at home as custom dictates in certain rural areas — especially for females. This leaves roughly 272,000 as the natural increase in the labor force. It is also estimated that about 92,000 enter the labor force each year at older ages, and about 100,000 persons exist due to deaths or superannuation in the 15-65 age interval. This leaves a net increase in the labor force each year in the neighborhood of 264,000. Of this number, =

2. Import Substitution

Total labor requirement per L.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 VIII. Although the role of import substitution has been frequently hailed by politicians in Egypt and in other LDC's as the road towards self-sufficiency, imports actually increased nearly each year since the beginning of IS in Egypt in the late fifties. Rather than reducing imports, IS has manifested its real benefits in terms of domestic output and employment growth. Concerning the latter, about 835,209 jobs were created as a result of replacing foreign goods by domestically produced equivalents.³² This amounts to an average of about 60,000 jobs each year or 22.7% of the total number of the yearly entrants in the labor force. Now, export expansion is added to IS, it may be estimated that roughly 40% of the yearly increment in labor force has been accommodated in either export or import replacement activities during the last 16 years.

IV. Concluding Remarks

Assuming no changes in industrial technology, output growth in the manufacturing sector from 1954 to 1967 in Egypt is ascribed to EE, IS, and domestic demand. The results indicate that :

- i) Import-substitution has been by far the largest contributor to output growth.

-- only half are able to find jobs. By 1970, there are 660,000 unemployed workers. If approximately 75,000 are added to this number as a backlog from previous years, then the total number of unemployed in 1970 was about 735,000 or 8.75% of the labor force. 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 (in Arabic), Table 5.

(32) It should be noted that import composition has also changed such that most of it now is in the form of raw materials and intermediate goods. This is a natural outcome of the IS strategy; see Little et al., pp. 59-63.

Table VIII.—Labor Absorptive Capacity of Import Substitution in Egypt, 1954 to 1967

Sector	Increase in Output Due to Import Substitution (L.E. 1000)	Total Labor Requirement per L.E. 1000 Output (man-year)	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	4.366813	111,549
Basic Chemicals	518	3.53249	1,312
Other Chemicals	50,330	1.30820	65,842
Dairy Products	2,122	9.328061	19,713
Bakery Products	170	8.81149	1,498
Oil and Fats	431	0.89897	387
Spinning and 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

Source and Notes : Column (1) from Table I, Column (2) from Table V, and Column (3) = (1) x (2).

- ii) Import-substitution is approaching its limits
- iii) Import-substitution and export expansion in certain industries have occurred concomitantly.
- iv) Import-substitution has increased and not decreased as policy makers expected—the degree of dependency of the industrial sector on imports of intermediate goods.

The evidence presented in the second half of the paper shows that exports alone provided jobs for more than one million workers in Egypt in 1969-70. Import substitution as well created more than another million jobs between 1954 and 1970. When export expansion and import replacement were combined, they helped to absorb about 40% of the annual increment in the labor force each year from 1954 to 1970; 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.

APPENDIX

Sources of Data—Table I

Basic data are obtained from the 1954 input-output table published in Gamal E. Eleish, "The Input-Output Model in a Developing Economy: Egypt", *Structural Interdependence and Economic Development*, Ed. T. Barna, 1963, pp. 199-270. The calculations of IS, export expansion, and demand pattern required data on output, exports, and imports in 1954 and 1967. The 1967 output data are taken from UN, *Growth of World Industry*, 1966 edition, but a problem of data comparability arose because the 1954 output data in the input-output table did not coincide with those published in CAPMS, *Census of Industrial Production*, of the same year, due to differences in coverage. In order to achieve comparability, consequently, I used output data of the two census years 1954 and 1967 and matched them with the sector breakdown in the input-output table. However, the original output data in the input-output table were used to calculate the inverted matrix. Export and import data for 1967 were taken from UN, *Commodity Trade Statistics*, Series D. Vol. 17, No. 1-35 and were carefully matched with the input-output classification and the import and export columns provided in the input-output table for 1954.

Sources of Data—Tables V & VI

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 *Structural Interdependence and Ecanomic Development*, Tibor Barna (ed.) 1963, pp. 199-270. (2) CAPMS, *Input-Output Table for the Arab Republic of Egypt*, 1966-67, Cairo, 1973 (in Arabic).

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.

I. 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*, 1974, 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, labor 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 uniformly 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 19.7%. Therefore since the detailed breakdown for 1969-70 was not available, we adjusted uniformly the 1966 figures upward by 19.7%. 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 100) :

	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

1969-70 exports and imports were computed from CAPMS, *Monthly Foreign Trade Statistics*, several issues (in Arabic).

THE UNIVERSITY OF CHICAGO

THE UNIVERSITY OF CHICAGO
LIBRARY
540 EAST 57TH STREET
CHICAGO, ILL. 60637
TEL. 733-4331
FAX 733-8328
WWW.CHICAGO.EDU
LIBRARY@CHICAGO.EDU

THE UNIVERSITY OF CHICAGO
LIBRARY
540 EAST 57TH STREET
CHICAGO, ILL. 60637
TEL. 733-4331
FAX 733-8328
WWW.CHICAGO.EDU
LIBRARY@CHICAGO.EDU

THE UNIVERSITY OF CHICAGO
LIBRARY
540 EAST 57TH STREET
CHICAGO, ILL. 60637
TEL. 733-4331
FAX 733-8328
WWW.CHICAGO.EDU
LIBRARY@CHICAGO.EDU

DEVELOPMENT IN THE EGYPTIAN GOVERNORATES: A MODIFIED PHYSICAL QUALITY OF LIFE INDEX

John Osgood Field¹ and George Ropes²

This paper³ addresses two questions about development in Egypt that are often asked about low income countries generally. One question has to do with the relationship between economic growth and popular wellbeing. To what extent do aggregate economic measures — the value of goods produced, per capita income, even urbanization—convey a sense of how well ordinary people are living? At issue is the association between conventional indicators of economic performance and the dissemination of benefits in society. The second question concerns which pattern, aggregate development or disseminated development, is more closely linked to population dynamics. If fertility reduction is a goal of public policy, is it best achieved by a development strategy emphasizing growth or by a strategy emphasizing distribution? And if the latter, the distribution of what?

(1) Associate Professor of Nutrition and Political Science, Tufts University, and Research Associate, Center for International Studies, Massachusetts Institute of Technology (U.S.A.).

(2) Doctoral candidate, Department of Political Science, Massachusetts Institute of Technology (U.S.A.)

(3) This is one of several papers analyzing the dynamics of health and population growth in Egypt based on governorate-level data, a crude but instructive level of analysis. Our collection of papers, appropriately integrated, will soon appear as a monograph in a new series of studies undertaken by the M.I.T. — Cairo University Health Care Delivery Systems Project, which is one of several within the framework of the Cairo University — M.I.T. Technological Planning Program. We are grateful to our colleagues at Cairo University and the Ministry of Health, A.R.E., for their support. This paper has benefitted from comments made on an earlier draft by Amr Mohie-Eldine, Professor of Economics at Cairo University, and by Shafika S. Nasser, Assistant Professor in the Department of Public Health, Cairo University Faculty of Medicine. Our research funding comes from the United States Agency for International Development, but we alone are responsible for the analysis reported here.

Both sets of question are germane to Egypt. Our analysis of a very limited body of data comparing the Egyptian governorates is suggestive of the work that needs to be done if the many trade-offs involved in development planning are to be properly understood.

Our point of departure is the Physical Quality of Life Index (PQLI) put together by Morris David Morris and his colleagues at the Overseas Development Council in Washington, D.C. (U.S.A.). The PQLI takes the infant mortality rate, life expectancy at age one, and the literacy rate for different countries, ranks each country's three figures separately on a 0 to 100 scale in relation to every other country's figure on the same measure, and then averages the scores produced for a final tally.⁴ Applying the PQLI to 150 countries based on data collected, like ours, in the early-mid 1970's, Morris et. al. found Sweden to be highest on the Physical Quality of Life Index with a composite score of 98 and Guinea-Bissau in Africa to be lowest with a score of 12.

Egypt's PQLI of 43 puts it close to the bottom third of the international ranking. More telling, however, is the fact that Egypt's performance in promoting popular wellbeing, as measured by the PQLI, is quite creditable given its resource base. As Table 1 reveals, Egypt has the same PQLI as Iran but less than a fifth of Iran's per capita income. Only India among the four countries with a PQLI of 43 has a per capita income lower than Egypt's. Moreover, as shown in Table 2, Egypt's PQLI compares quite favorably with those of other Arab states even though Egypt is among the poorest countries in the region. Algeria has triple the per capita income of Egypt but a lower PQLI. Libya's PQLI is only two points higher than Egypt's, but Libya's income is almost 20 times greater. Perhaps the most glaring contrast is with Saudi Arabia. Saudi Arabia has 14 times the per capita income of Egypt but a PQLI that is 14 points lower ! Obviously, oil wealth does not trickle down automatically. Not so obviously, Egypt has done quite well with the little it has.

(4) The most complete exposition of the PQLI may be found in Morris David Morris, *Measuring the Condition of the World's Poor: The Physical Quality of Life Index* (Elmsford, New York: Pergamon, 1979 — forthcoming). See also John W. Sewell, *The United States and World Development: Agenda 1977* (New York: Praeger, 1977), pp. 147-154 and 160-171.

Table 1.—Egypt and the Three Other Countries with PQLI Scores of 43 Compared in Terms of Per Capita Income

Country	PQLI	Average Per Capita Income(U.S.\$)
Iran	43	1,260
Bolivia	43	332
EGYPT	43	245
India	43	133

Source: Morris David Morris, *Measuring the Condition of the World's Poor : The Physical Quality of Life Index*, manuscript dated August 31, 1978, to be published by Pergamon, 1979.

Table 2.—The RPQLI Scores of Arab Countries Ranked According to Per Capita Income

Country	Average Per Capita Income(U.S.\$)	PQLI
1. United Arab Emirates	14,368	34
2. Kuwait	13,787	75
3. Qatar	11,779	31
4. Libya	4,402	45
5. Saudi Arabia	3,529	29
6. Bahrain	1,370	61
7. Iraq	999	45
8. Lebanon	822	79
9. Algeria	780	41
10. Syria	662	54
11. Tunisia	626	47
12. Jordan	452	47
13. Morocco	436	41
14. Yemen (People's Republic)	260	33
15. EGYPT	245	43
16. Sudan	241	36
17. Yemen Arab Republic	180	27
18. Somalia	111	19

Source: Morris David Morris, *Measuring the Condition of the World's Poor : The Physical Quality of Life Index*, manuscript date August 31, 1978, to be published by Pergamon, 1979.

A virtue of the PQLI is that it measures the extent to which ordinary citizens share some of the benefits of modernization: a reduced incidence of infant mortality, greater overall life expectancy, and the acquisition of literacy. These are not the only benefits of modernization, of course, but they are basic in defining the human condition at its mass base in a country, and they offer a clue to the general thrust of development pursued by many governments.

Our data permit us to replicate two-thirds of the PQLI for the Egyptian governorates: the rates of literacy and of infant mortality. We do not have a measure of life expectancy at age one and have, therefore, substituted for it a measure on the availability of purified water in the buildings where people live. We assume that having access to pure water improves the quality of life, especially with regard to health. Water purification is also a responsibility of government in Egypt, where the need is considerable; and hence the proportion of people for whom pure water is available in the different governorates is, in part at least, a reflection of official action. We identify our modified version of the PQLI with an asterisk (PQLI)*.⁵

We thought it of interest to begin by relating the governorates of Egypt to the PQLI scores established at the national level for the 150 countries studied by Morris. To do so we created an "external PQLI*", in effect treating the governorates as countries and locating them on the existing PQLI scale.⁶ The results appear in Table 3.

(5) The effect of substituting purified water for life expectancy at age one is to raise the physical quality of life in Egypt from 43 (PQLI) to 46 (PQLI*) on the international scale. The latter figure represents the average of governorate scores weighted by population.

(6) Because it was not in the original PQLI, the availability of purified water is simply a percentage figure reflecting population coverage. Our PQLI* averages it with the component scores, also based on a 1 to 100 scale, for infant mortality and literacy.

Table 3.—A Modified Physical Quality of Life Index for the Egyptian Governorates in International Comparison (Drawn to Scale)

External PQLI* by Governorates		Country Equivalents : PQLI	
		Sweden (98) ^a , Argentina (85), Cuba (84), Sri Lanka (82), Lebanon (79), Chile (77)	
1. Port Said	76	Guadeloupe, Kuwait (75)	
2. Alexandria	70	Colombia (71), Phillippines (71), China (69)	
3. Suez	66	Malaysia	
4. Cairo	64	El Salvador, Dominican Republic, Bahrain (61)	
5. Damietta	56	Turkey, Syria (54)	
6. Ismailia	50		
7. Dakahlia, Giza	47	Jordan, Tunisia	
9. Gharbia	44	Iraq (45), Libya (45)	
10. Kafr-el-Sheik, Behera	42	Algeria (41), Morocco (41)	
12. Sharkia, Kalyubia	39	Kenya, Pakistan (38)	
14. Kena, Aswan	37	Papua New Guinea	
16. Menufia, Assiut	36	Haiti, Sudan	
18. Souhag	35	Bangladesh, Swaziland, Ghana, UAE (34)	
19. Beni-Suef, Fayoum	33	Yemen (People's Republic)	

Table 3 (continued)

External PQLI* by Governorates	Country Equivalents: PQLI
21. Minya	32 Zaire, Qatar (31) Saudi Arabi (29), Yemen Arab Republic (27), Somalia (19), Guinea:- Bissau(12) ^b

Note : The "External PQLI*" for the Egyptian governorates summarizes the governorate scores for infant mortality, literacy, and the availability of purified water in residential buildings when each score is related to the comparable scores for 150 countries employing data collected in the early 1970's. In effect, governorates are treated as countries and located accordingly. Because it was not in the original PQLI, availability of purified water is simply a percentage figure in terms of population coverage. The three scores are then averaged. Countries not matching the Egyptian governorates exactly have their PQLI scores indicated in parentheses. All Arab countries are included, as are all matching countries.

(a) The highest PQLI

(b) The lowest PQLI

Source for the PQLI country equivalents : Morris David Morris, *Measuring the Condition of the World's Poor : The Physical Quality of Life Index*, manuscript dated August 31, 1978, to be published by Pergamon, 1979.

Several observations may be made on the strength of this table. First, it is apparent that, even when compared in terms of international experience, there are marked differences among the Egyptian governorates. While the international spread is 98 to 12 on the PQLI, the Egyptian spread is from 76 to 32 on the PQLI*. In short, Egypt internally covers the entire middle range of international experience. The "physical quality of life" in Port Said (highest in Egypt) resembles what one finds in very much more affluent countries such as Kuwait and Chile. On the other hand, Minya, with a PQLI* of only 32 (lowest in Egypt, notwithstanding Minya's agricultural wealth) resembles Zaire, one of the world's poorest countries. Cairo's PQLI* of 64 puts it in league with countries like El Salvador and the Dominican Republic. Alexandria is on par with the People's Republic of China. No Egyptian governorate can match Sri Lanka's impressive PQLI of 82, which has been achieved on an average per capita GNP of only \$ 179. On the other hand, every Egyptian governorate comes out above Saudi Arabia, one of the world's richest countries, in terms of popular wellbeing.

Moreover, since Table 3 is drawn to scale, it is easily seen how the governorates cluster. The four urban governorates have the highest PQLI*'s by far, although the differences among them tend also to be ample. (Cairo fares least well among the urban governorates because of its very high incidence of infant mortality⁷). The governorates of Lower Egypt come next, by and large, led by Damietta with a score of 56, with Menufia trailing at 36 — a large spread for a highly concentrated ecological zone. Except for Giza, a special case, the governorates of Upper Egypt have the lowest PQLI* scores, and the differences among them are small. In sum, the data indicate that popular wellbeing is greatest in Egypt's four urban centers, notwithstanding the migrant poor. Delta residents are, on average, next well off, although with significant spatial differences among them. Least advantaged in PQLI* terms are the people of Upper Egypt. These patterns are pretty much what one would expect, save possibly for the heterogeneity of the Delta and for the overall spread, which also testifies to the considerable diversity of the Egyptian governorates with regard to social wellbeing.

(7) The infant mortality rate for Cairo was 128 per 1,000 live births in 1973, second highest in the country after Aswan's 132.

The interest value of our "external PQLI*" is that it treats the governorates as countries and ranks them as they would be ranked on an international scale. For comparison with other governorate-level data within Egypt, however, we have chosen to convert the "external PQLI*" into an "internal PQLI*", in effect taking the governorates as the universe and re-scoring them on a 1-100 scale limited to themselves. The principal reason for doing so is to permit a more matched set of comparisons with other relevant governorate-level data. The effect of converting to an "internal PQLI*" is to spread the governorate scores upward and downward, thereby accentuating the differences among them and, in the process, breaking several tie scores. While the "internal, PQLI*" for Egypt as a whole declines to 39, the new rankings differ only slightly from the old.

Table 4 presents the "internal PQLI*" for the Egyptian governorates along with the values and scores derived from them for each component measure.

Table 4.—A Modified Physical Quality of Life Index for the Egyptian Governorates in Internal Comparison, Plus Components

				a		b		c	
				Infant Mortality		Literacy		Pure water	
				Internal PQLI*	Value	Score	Value	Score	Value
1.	Port Said	95	48	100	60	88	87	96	
2.	Suez	78	60	86	56	78	65	69	
3.	Alexandria	77	103	35	63	95	90	100	
4.	Cairo	65	128	6	65	100	81	89	
5.	Damietta	57	85	26	51	65	50	50	
6.	Ismailia	51	74	69	49	60	30	25	
7.	Dakahlia	45	79	64	44	48	29	24	
8.	Giza	40	109	28	47	55	40	38	
9.	Kafr-el-Sheik	38	55	92	30	13	17	9	
10.	Gharbia	38	99	40	45	50	29	24	
11.	Behera	36	71	73	34	23	20	13	

Table 4 (continued)

				a	b	c	
	Internal PQLI*	Value	Score	Value	Score	Value	Score
12. Sharkia	30	89	52	37	30	16	8
13. Kalyubia	28	118	18	46	53	20	13
14. Kena	27	75	68	29	10	12	3
15. Menufia	23	115	21	43	45	13	4
16. Assiut	22	98	41	31	15	17	9
17. Souhag	21	88	53	27	5	14	5
18. Aswan	21	132	1	44	48	22	15
19. Beni-Suef	18	106	32	32	18	12	3
20. Fayoum	15	97	42	26	1	12	3
21. Minya	15	103	35	29	10	11	1
EGYPT	39	98	41	43	45	34	31

Note : The "Internal PQLI*" is the average for each governorate of its scores on infant mortality, literacy, and the availability of purified water in residential buildings. Each score is derived from the relative position of the governorates on a 1-100 scale, thereby standardizing the three component measures. The scores shown for Egypt as a whole exclude the four frontier governorates. The composite PQLI* as well as its constituent values and scores represents an average weighted by population.

(a) The number of infant deaths reported per 1,000 live births in 1973 (Ministry of Health). The higher the infant mortality, the lower the score.

(b) The percentage of the total population in each governorate that was recorded as literate in the CAPMAS household census of 1967. Higher literacy produces a higher score.

(c) The percentage of each governorate's population having access to pure water in the buildings where they reside, from the CAPMAS household census of 1976. The higher the percentage, the higher the score.

As the distributions in Table 4 imply, the component variables of the PQLI* are not all that closely correlated.⁸ Governorates high in literacy are not necessarily low in their rates of infant mortality. The PQLI*, as it turns out, is comprised of largely independent changes in Egyptian society, suggesting that no single component is an adequate proxy for the whole concept.⁹ In effect, popular wellbeing in Egypt is empirically as well as conceptually diverse.

Of greater interest is how the PQLI* relates to other aspects of change. Inasmuch as the four urban governorates have the highest PQLI* scores in Egypt, it comes as no surprise that, overall, urbanization is closely associated with wellbeing as measured by the PQLI*. If the four urban governorates are excluded from consideration, however, the association collapses. Urbanization elsewhere in Egypt does almost nothing to improve the "physical quality of life"¹⁰.

(8) In terms of simple Pearson correlation coefficients, only one of the three relationships — that between literacy and water availability — is statistically significant, and it crumbles when the influence of another measure of disseminated development, the electrification of homes, is partialled.

(9) Our research indicates that literacy and infant mortality are, in fact, significantly associated but in a rather curious way. The basic point stands that the PQLI* is not merely a cumbersome way of talking about one of its components.

(10) Including the urban governorates the Pearson coefficient is .86 (sig. at .001). Without them it is .35 (n.s.). The respective Spearman rank-order coefficients are .6 (sig. at .001) and .2 (n.s.). Because this finding came as a surprise, we checked to see whether the relative importance of degree of urbanization in rural governorates means that urban areas are no better off than rural areas in these governorates. The data did not permit our making definitive comparisons (literacy not having been broken down by urban and rural contexts in the CAPMAS census). Even so, the patterns are of interest. The data suggest that urban centers in rural governorates do have higher PQLI*s than the surrounding countryside (44 versus 36 for the 17 rural governorates of the Nile system when taken together). This is as one would expect. On the other hand, there are numerous exceptions. In five governorates the urban PQLI* exceeds the rural PQLI* by two points or less, and in four additional governorates the rural scores are actually higher. Urbanity, like urbanization, would appear to be only a qualified blessing in PQLI* terms.

When attention turns to explicit measures of productivity and the generation of wealth, the pattern is even more clear. One variable in our arsenal is the per capita value of agricultural production in the rural governorates. Were popular wellbeing related to aggregate productivity, at least on the farm, this variable could correlate significantly with the PQLI*. Governorates relatively high in the value of their agricultural produce would also be governorates relatively high in wellbeing, while those relatively low in production would also be relatively low on the PQLI*.

In fact, no such pattern emerges. Indeed, the relationship is actually negative.¹¹ The same holds for second variable, the average per capita income derived from agriculture in the governorates. Higher rural incomes not only do not dispose toward greater wellbeing, the relationship is again, on balance, slightly negative.¹²

In short, when viewed in terms of conventional economic development indicators — productivity and income — the economic performance of Egypt's rural governorates says nothing about living standards as measured by the PQLI*. The reasons are not difficult to discern. Aggregate growth is one thing; distribution is another.¹³ Similarly, incrementally greater productivity and income have no necessary spillover effects on infant mortality rates, literacy, and the availability of purified water. In Egypt, as in other countries, wealth and wellbeing are substantially divorced in the sense that improvements in the former do not lead immediately or even automatically to improvements in the

(11) $r = -.22$ (n.s.). It is also negative when only rural populations are taken into account ($r = -.15$).

(12) $r = -.02$ (n.s.). The result is again negative when only rural populations are considered ($r = -.08$). As might be expected, the productivity and income measures are significantly correlated (.76; significant at .001).

(13) To illustrate, correlating the rural PQLI* with the percentage of households having an annual income of less than LE 250 (1975 Ministry of Labor survey) produces a significant relationship in the predicted direction ($r = -.46$, significant at .05). The larger the number of rural poor in a governorate, the lower the PQLI*. If income in the aggregate does not affect wellbeing, the distribution of income certainly does.

latter. As we are now painfully aware from much international experience, the "trickle down" benefits of growth often take a long time to reach the poor¹⁴.

This being the case, the relationship between the PQLI* and population growth in Egypt is a matter of considerable interest. If patterns observed elsewhere are any guide, greater popular wellbeing in PQLI* terms should be associated with lessened birth rates¹⁵. That is, governorates with higher PQLI* scores might be expected to have lower birth rates than governorates whose PQLI* scores are not so high, whereas governorates with conspicuously low PQLI*'s (Minya, Fayoum, and Beni-Suef, for example) might be expected to show particularly high rates of population growth.

Both expectations are sustained by the data. Minya, Fayoum, and Beni-Suef do have notably high birth rates, while the correlation coefficient linking the PQLI* with fertility for all 21 governorates of the Nile system is a strong $-.82$ (sig. at $.001$)¹⁶. In short, the higher the PQLI*, the lower the birthrate in Egypt. This is a pattern, moreover, which withstands controls for agricultural productivity, rural income, and urbanization.

The PQLI* is not simply a blind for other kinds of change. On the contrary, it represents one kind of change (dispersed benefits) that really counts in fertility reduction¹⁷. We might add that neither our measure of agricultural productivity nor our measure of income derived from

(14) James P. Grant, "Development: The End of Trickle Down?," *Foreign Policy*, 12 (Fall 1973), 43-65.

(15) See William Rich, *Smaller Families Through Social and Economic Progress*, Overseas Development Council, monograph No. 7 (January 1973). More recent research also supports this argument.

(16) The fact that the urban governorates have relatively high PQLI* scores and relatively low birth rates is not the sole reason for this association. The coefficient is also significant when the four urban governorates are removed from the calculations ($r = -.52$, sig. at $.02$).

(17) For a very different set of reasons, urbanization is also a factor in bringing birth rates down. We shall discuss this in another paper.

agriculture relates significantly to the birth rate at all¹⁸. It would appear that, in and of itself, general economic growth in Egypt will have little bearing on fertility, much as it has little bearing on popular wellbeing. What it is going to take for the birth rate to come down significantly and fast are improvements in the human condition, notably access to purified water, a dramatically reduced incidence of infant mortality, and expanded literacy : the ingredients of the PQLI*.

To conclude, our adaptation of the PQLI to Egypt, while intriguing, is hardly definitive. What we have done is — at best — an initial probe suggesting that not all which comes under the heading of “development” enhances popular wellbeing or contributes to lowered birth rates. Both of these findings, along with that showing a strong connection between disseminated development and reduced fertility, have profound implications for policy. Accordingly, there is a need for others to pursue this line of inquiry in order to develop a richer perspective on the dynamics involved.

Two recommendations follow from our own effort. First, the time has come to create an index that is empirically grounded. Both the original PQLI and our PQLI* are conceptual constructs that, whatever their abstract validity, may not be most suited to Egyptian conditions. Other parameters may be equally important or more so. One task, therefore, is to explore a wide range of variables, including measures of income distribution, employment, and land ownership, and to establish a much richer index of popular wellbeing whose components have more than a logical relationship to one another. The promise of more complete data empirically tied together is that it should become possible to predict the effects of specified kinds of change quite precisely¹⁹.

(18) Although not significant, the association between agricultural productivity and income, on the one hand, and the birth rate, on the other, tends to be positive (the more, the higher), even when appropriate partials are introduced. While this pattern runs counter to expectations, there are others in our data consistent with it, suggesting that incremental change, as inferred from cross-sectional analysis, may pose more problems that it solves, at least in the short run.

(19) Also desirable would be more recent data. Some of the data that we were obliged to use — infant mortality and the birth rate, in particular — date back to 1973, the last year for which reliable figures exist. Other =

Second, the governorate level of analysis places so many constraints on what can be done with data that it is clearly preferable to disaggregate to, say, the district level if at all possible. Not only are there too few governorates, and hence data points, for meaningful statistical manipulation; the governorates themselves are probably too heterogeneous internally to be substantively appropriate for sensitive analysis. Both those who collect demographic and economic data in Egypt and those who examine these data should insist on finer, more numerous, and more useful units of analysis. The payoffs to knowledge and to policy could be considerable.

In any event, our findings offer reason to believe that, in Egypt as in other low income countries experiencing serious population pressures, the "basic human needs" approach to development is more than a fad, that it represents an important dimension of development which governments cannot afford to neglect. Promoting the "physical quality of life" (whatever it really is) and curbing population growth are dual challenges facing the Egyptian government as the prospects for a genuine peace brighten. If the analysis reported here is sustained by further inquiry, Egypt needs more than development *per se*; in particular, it must have development that reaches the *fellahin* at large and provides them with better standards of living and greater opportunities for good health, education, productive employment, and personal fulfillment in a changing social order.

= data — literacy and water availability in the PQLI*, along with virtually all measures of development examined in this paper — pertain to 1976. While the time gap is not large, we may appear to be arguing that circumstance in 1976 affected deaths and births in 1973. This is not as preposterous as it sounds if one assumes that distributions in 1976 reflect realities, to some meaningful degree, in 1973 as well. Nevertheless, it would certainly be helpful to standardize the time frame involved and to get away from having to use data from 1973 and succeeding years since the war conditions then undoubtedly bias one's results, especially with regard to the Suez Canal zone.

QUESTA MANCATA LA

LA STAGIONE DEL 1880-1881-1882

AL AHRAM PRESS

رقم الايداع بدار الكتب ١٩٧٠/١٢٨٥