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INDUSTRIAL GROWTH PROSPECTS FOR ARAB COUNTRIES: 1975–1980

PREPARED BY THE

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I. INTRODUCTION

Industrialization has long been regarded as the dynamic force in the development process. Today, however, the perspective in which governments and planners deal with industrialization problems and industrial progress is much broader than was the case two decades ago. A steady increase in the degree of international interdependence, as exemplified in the flow of natural resources, capital, labour, technology and trade, has been instrumental in bringing about this change in perspective. Most modern industrial products are dependent in some way on foreign economies, as suppliers of technology and raw materials, intermediate inputs, capital equipment and labour, or as providers of export markets for the goods. Such a phenomenon can pose serious problems to today's developing countries. However, it may also offer advantages where interdependence among developing countries can be used to forge common programmes on issues of mutual interest.

An important consequence of the trend toward interdependence is the need for governments and planners to evaluate their industrial objectives in light of the corresponding objectives of other developing countries with common geographical, cultural and economic characteristics. Regionalism, in its broadest sense, is a logical outgrowth of the economic interdependence observed today. The need to develop a co-ordinated approach to industrialization at the regional level and to press regional objectives in the world's international fora seems apparent.

The purpose of this paper is to elaborate on the industrial growth prospects of some of the Arab countries in the year 1980. No high degree of accuracy can be claimed for the forecasts presented here. However, considerable efforts have been made to ensure that the results can serve as reliable indications of probable industrial growth, given our understanding of each country's present industrial objectives. It is hoped that insights into the industrial growth prospects of the Arab countries, however approximate, will serve as one useful backdrop for the elaboration of regional approaches to industrialization.

II. SUMMARY OF RESULTS

The industrial growth prospects of the following Arab countries were focused on in this study: Algeria, Egypt, Jordan, Morocco, Sudan, Syria and Tunisia. The data requirements to satisfy the projection methodology used precluded the possibility of extending the study to additional Arab countries. The projection techniques are based on the premise that industrialization tends to follow a roughly uniform pattern in most countries.[1/] Once this development pattern is known with a reasonable degree of certainty, a picture of future industrial growth in a given country can be approximated, at least in the short-run.

The projections are made on the basis of the current industrial structure in each Arab country, using the assumption that growth up to 1980 will conform to an "average" or "normal" growth path. This average growth path has been calculated from data for 109 countries over fourteen years of development and growth. It is the largest data base ever used for a projection of this type. In order to make the projections planned figures for GDP in 1980 were used along with population projections provided by the United Nations publications.

The projections should be interpreted as indications of future conditions if the country follows a "normal" or "average" growth path. Thus, these projections may be regarded as benchmarks against which present or planned industrial growth can be compared. They do not imply normative judgements, representing only a probable development path.

A final feature of the present study is an investigation of the growth patterns of individual industrial sub-sectors. The methodology used here allows one to estimate the average increase in production of each sub-sector, given an increase in per capita income or population. On this basis, industries which tend to grow most rapidly in the course of industrial progress can be identified. Three broad industrial groups are singled out: "early industries" in which the share in total manufacturing grows slowly or eventually declines as economic development takes place; "intermediate industries", where production tends to grow at a rate which exceeds the overall rate of development; and "late industries", the share of which is usually insignificant in the early phases of industrialization but often grows very rapidly as development continues. These trends reflect averages or tendencies, compiled for a number of countries and are, therefore, not regarded as indicative for any specific country. Like the estimated growth of the industrial sector, they should be treated as benchmarks for comparative purposes.

Results of the Regional Analysis

In addition to the analysis of industrial growth prospects in individual Arab countries, the study considered the regional pattern of industrial development.[2/] Examining long-run

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1/ The methodology employed in the study constitutes an analysis of structural change. It is widely used in the work of the IBRD [see reference 1]. The UN [reference 9], UNCTAD [reference 8] and ESCAP [reference 4] have employed the same methodology when carrying out projections for industrial growth. The approach is described in more detail later in the paper.

2/ The data requirements for this exercise differed from that of the individual country investigation. Country coverage for the regional study included: Algeria, Egypt, Iraq, Jordan, Lebanon, Libya, Morocco, Saudi Arabia, Sudan, Syria and Tunisia.

changes in the industrial structure of several Arab countries as a group separate from other developing countries provides insights which cannot be obtained by other means. The analysis reveals that during the early 1960's industrial growth in the Arab countries was subject to a diverse set of factors. Over time, however, the major factors influencing industrial growth have become more similar. While individual Arab countries may have followed different growth paths, they have begun to respond to the same types of determining factors in roughly the same ways.

Under such conditions, the economic opportunities for industrial co-operation between several or all of these countries is enhanced. The types of co-operation referred to here would include policy harmonization, the development of regional or sub-regional positions on matters of international economic consequence, etc. These are much broader in concept than the more traditional regional trading agreements.

III. APPROACH AND RATIONALE FOR THE UNIDO PROJECTIONS

The methodology employed in this paper draws heavily on the structuralist approach to economic development. The approach's essential feature is that differences in the industrial structure of countries are largely a function of differences in their levels of income [see reference 2]. A country's growth pattern is thought to be dominated by a set of universal factors or structural rigidities which are common to all countries. The universal factors which influence a country's development have been described as follows [see reference 1, p. 5]:

(i) Similar variations in the composition of consumer demand with rising per capita income, dominated by a decline in the share of foodstuffs and a rise in the share of manufactured goods;

(ii) Accumulation of physical and human capital at a rate exceeding the growth of the labour force;

(iii) Access to the same types of technology;

(iv) Access to international trade and capital flows.

Due to the existence of these universal factors the industrialization process has been found to occur with sufficient uniformity among countries to produce a consistent pattern of change in resource allocation, factor use and other structural features as the level of per capita income rises. This is the key hypothesis utilized in studies of structural change and adopted in this study.

The idea of a uniform pattern of industrial growth is subject to certain qualifications. First, rapid changes in production technology in some Arab countries may lead to a pattern of industrial growth which deviates from the average or norm that we have observed. Second, differences in development patterns can result from varying degrees of resource endowment among the countries studied or from different forms of social organization. The statistical procedures employed here are designed to test for uniformity in development patterns due to similarities in production relations, domestic demand, trade and capital movements. The remaining variations in historical and forecasted growth are attributed to forces specific to each country.

IV. "NORMAL" PATTERNS OF INDUSTRIAL GROWTH

The equations presented here should be interpreted as indicators of the "normal" growth patterns. Several alternative mathematical expressions for estimating "normal" growth patterns have been developed by other authors. Each different form was tested in this study for its ability to explain patterns of industrial growth, in particular, those of the Arab countries.

In earlier studies of growth patterns the most important explanatory variables were found to be per capita income and population. The importance of per capita income is a consequence of changes in the pattern of demand as income grows. The distribution of total demand among investment, government consumption and private consumption also tends to vary with per capita income. On the supply side, per capita income tends to be correlated with the relative costs of labour and capital and, to some extent, with labour skills. For these reasons, the measure serves as an excellent overall index of industrial development. Population is included as an explanatory variable to allow for the effects of economies of scale and transport costs on patterns of trade and production.

For purposes of illustration, a general equation was calculated for 109 countries in the UNIDO sample using the years 1963-1973. Figure 1 provides a composite picture of the development pattern derived from this equation for a country of medium size (a population of 10 million).

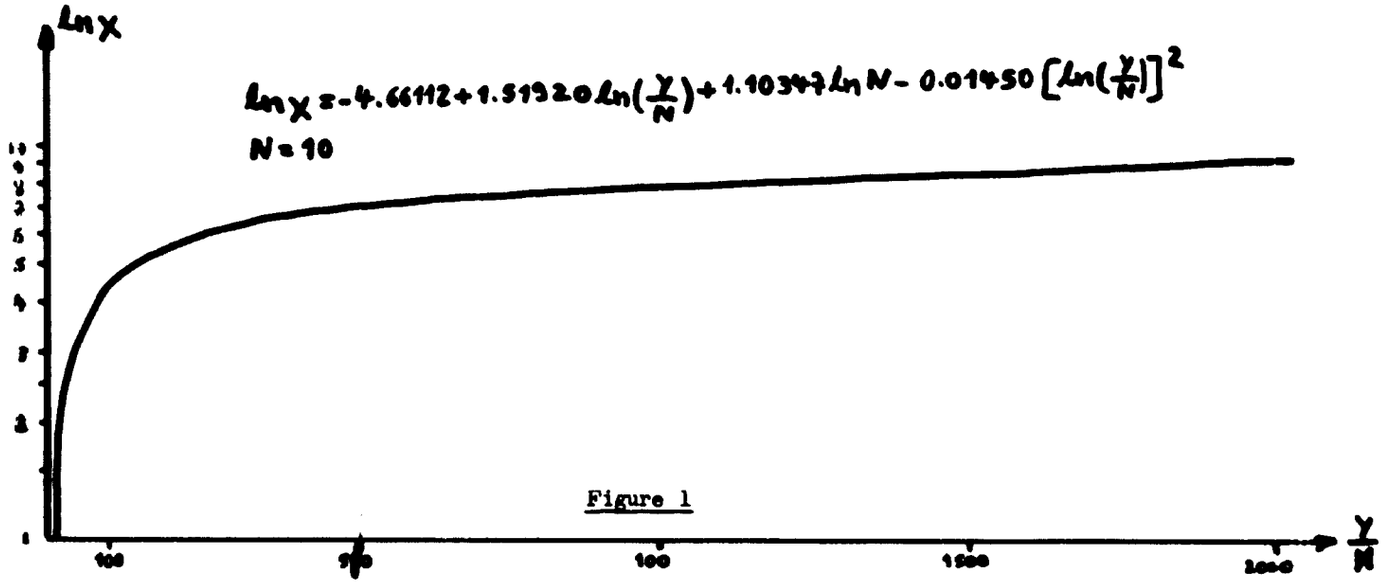

Figure 1

With regard to the industrial growth patterns estimated for Arab countries, further refinements were introduced. First, the advisability of sub-dividing the UNIDO sample into "small" and "large" countries was considered. Generally, large countries are expected to industrialize more quickly than small countries because economies of scale permit industries in large countries to operate at more efficient levels. A dividing line of 15 million population in 1965 was chosen for grouping the sample into large and small countries, and separate regressions calculated for each group. Growth patterns were also estimated for the Arab region separately. The results of this exercise provided a measure of the extent to which industrial growth in the Arab countries was a function of uniform regional growth factors.

Finally, a country's pattern of industrial growth has been found to be sensitive to the relative stage of development which it has achieved. The relationship between industrial growth and per capita income will be different for countries with per capita incomes of $100 and $1,000. Two alternative techniques were tested as a means of accounting for a wide range of income levels. One technique was to include an additional variable in the equations used to approximate the industrial growth path which takes account of wide differences in income levels. The second technique was to estimate industrial growth for several groups of countries at similar levels of per capita income.[1/]

The regression equations which were tested are stated below:

$$\text{I.A.} \quad \ln(x/y) = \alpha + \beta \ln(y/N) + \gamma \ln N$$

$$\text{I.B.} \quad \ln(x/v) = \alpha + \beta \ln(y/N) + \gamma \ln N + \delta (\ln y)^2$$

$$\text{II.A.} \quad (x/y) = \alpha + \beta \ln(y/N) + \gamma \ln N$$

$$\text{II.B.} \quad (x/y) = \alpha + \beta \ln(y/N) + \gamma \ln N + \delta (\ln y)^2$$

$$\text{III.A.} \quad \ln x = \alpha + \beta \ln(y/N) + \gamma \ln N$$

$$\text{III.B.} \quad \ln x = \alpha + \beta \ln(y/N) + \gamma \ln N + \delta (\ln y)^2$$

The following notation was employed:

- x = value added in millions of US dollars (at 1970 constant prices);
- y = Gross Domestic Product in million of US dollars (at 1970 constant prices);
- N = population in millions.

Since there is no generally accepted mathematical expression for estimating growth paths, each of these alternatives was tested extensively for the years 1960-1973. Equations III.A. and III.B. yielded results which were economically and statistically acceptable. Equation forms I and II did not provide results which always satisfied statistical criteria and, after thorough testing, were not employed for forecasting purposes. A summary of the results obtained for equations III.A. and III.B. is shown in Table 1.

The general trend described by the equations is for the industrial share in large countries to grow rapidly during the early phases of development. The rate of industrial growth tends to decline when higher levels of per capita income are reached. Likewise, in small countries, the industrial share increases rapidly in the early growth phases, though its growth rate does not match that of large countries. Furthermore, there is little evidence to suggest a tendency for growth in the industrial share to decline at higher levels. This feature distinguishes the small country pattern from that of the large countries.

The results of rather extensive tests, summarized in the following pages, strongly support the structural hypothesis that there is considerable uniformity in the growth pattern of different countries. The findings summarized here were utilized in the forecasts for industrial growth

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1/ The interested reader may refer to the detailed description of these two methods in this paper on page 19.

in Arab countries. The statistical and economic issues involved are discussed in some detail.

Table 1. Summary Equations to Estimated Production Patterns, 1969-1973[a/]

(α)	(β)	(δ)	(δ)	R^2
		Large countries		
- 5.803	1.989	1.048	- 0.054	.987
	(9.01)	(32.40)	(3.09)	
		Small countries		
- 3.577	1.136	1.140	0.017	.963
	(6.99)	(60.00)	(1.30)	

Source: UNIDO, based on data supplied by the UN Statistical Office.

a/ The equations are for a pooled sample of observations for the years 1969-1973. The "t" values are in parentheses.

Cross-country studies such as this one must confront many problems of a technical and statistical nature. The purpose of the following sections is to elaborate on the considerations involved in several of the formulations and approaches adopted in the study.

The Choice of Variables to Estimate Growth Patterns

Various models for structural change may be found in the literature and are not necessarily restricted to the variables used in this study. However, those employed here (GDP and population) are always included in structural studies and are generally conceded to be the most important ones.

The selection of variables for a structural model is largely a question of the framework in which the model will be used. For example, studies of the pattern of resource allocation devoted to industry, agriculture and services might include among the independent variables (i) the composition of exports (manufactured and primary), (ii) the proportion of physical and human capital in relation to the country's population, and (iii) the policy approaches followed (e.g. primary specialization or industrial specialization). Models emphasizing changes in the social structure usually single out urbanization, income distribution or education as explanatory variables.

In this paper, the primary objective was to obtain a reliable picture of the industrial growth pattern in Arab countries. To incorporate trends in technology, social structure or the resource allocation process would have carried us far beyond the original objective, and would have required considerably more resources.

The decision to restrict the model to the two major explanatory variables, income and population, was made on the basis of available time and resources. Future work might include the more ambitious objectives of (i) examining the growth pattern of other structural features in addition to manufacturing value added and (ii) more detailed specification of the explanatory variables in estimating the industrial growth path, including those mentioned above.

The choice of the mathematical expressions for each of the variables as well as the specification of the equations also held implications for interpreting the results. With regard to the dependent variables, the expression of manufacturing value added as a share of GDP serve to emphasize the relative rate of expansion rather than the absolute increase. When the dependent variable is expressed as a total and not as a share (e.g. III.A. and III.B.), attention is focused on the significance of the expansion itself and not on the change in the relative productive structure.

The Choice of Equational Forms

Before specifying the structural equations, decisions had to be made with regard to the functional form and the mathematical expressions to be tested. There are few standard formulations or accepted conventions to guide the researcher in this matter. Both double-log and semi-log formulations are found in the literature. The double-log expression serves to emphasize hypothesized relationships between the growth rate for manufactured value added and the growth rates of the explanatory variables. The semi-log formulation is intended to relate growth in manufacturing value added (that is, the absolute level) with the rate of growth of the explanatory variables. Both forms were tested extensively in this study.

The final decision with regard to the most appropriate equational form for purposes of forecasting industrial growth presents a complex choice. The selection took into account the statistical criteria such as the "t" ratios, the stability of the regression coefficients, the proportion of explained variance (R^2) and the standard errors.[1/] Three alternative approximations to the growth pattern were employed in this study and the final choice of a common equational form was made on the basis of all these results. Additional tests using hypothetical projection results were also taken into account. On this basis, equation III was thought to be the most reliable.

Sub-division of the UNIDO Country Sample

Two procedures are available to take account of the heterogeneous effects of income, population, etc., when making quantitative comparisons of economic structure. One approach is to use the values of key variables as a means for stratifying the sample into country groups which, a priori, may be expected to have homogeneous growth patterns. The alternative is to combine the explanatory variables in one multiple regression equation. Both procedures were considered in this study.

1/ Straightforward comparisons of statistical measures such as R^2 between equations I, II and III is, of course, not valid. The equational form employed in each case will increase or decrease total variance and, thus, influence the resultant coefficients of determination.

To determine whether large countries have growth patterns which are significantly different from small countries, the country sample was divided into two groups. The dividing line between large and small countries (set at a population of 15 million in 1965) was largely arbitrary but is a conventional one found in other studies.[1/] Tests were conducted using a dividing line of 10 million in order to determine the sensitivity of the regressions to this grouping. In general, a demarcation point of 10 million provided slightly better statistical results (as defined in terms of "t" values and explained variance) for the large country sample than did a demarcation point of 15 million. The converse was true in the case of small countries. The regression results were not greatly different in either case and, to preserve comparability with previous studies, a dividing line of 15 million was retained throughout the study.

A second issue which may be treated by stratifying the country sample involves the decline in elasticities with rising income in most industrial sectors. The characteristic implies that nonlinearities may exist among the individual countries when grouped by per capita income. An alternative to stratifying the country sample according to levels of per capita income is to fit a non-linear form to the data. Inclusion of a non-linear income term, $(\ln y)^2$, avoids the necessity of subdividing the sample by income level. Both possibilities were tested in the present study.

Tables 2 and 3 provide a summary of the regression results for large and small countries using the maximal country samples. With the exception of Egypt, all the Arab countries are small, i.e. with a population smaller than 15 million. Thus, the performance of these equations was of prime consideration in selecting the appropriate equational form for further use.

Equations I.A. and I.B. are the same expressions adopted by Chenery and Taylor (see reference) and tested for data spanning the period 1950-1963 for a sample of 54 countries. The formulation of the dependent variable for equations II.A. and II.B. follows the convention used in the recent IBRD study [see reference 17]. In this study structural change for a variety of concepts, including manufacturing value added, was analyzed for the period 1950-1970. All equations in that study incorporated the log quadratic term. For purposes of comparison with the other equational forms, the present study includes equations (II.A.) without the quadratic. Equation III.A. is an alternative which reflects the approach adopted in an earlier UN study [see reference 9] in which cross-section and time series regressions were calculated for selected years. The log quadratic term was not incorporated in the UN study but, in view of current convention, it was desirable to test the performance of this variable in the present study. Cross-section regressions were calculated for each set of equations for the years 1960-1973 for both large and small countries.

1/ The same definition of 15 million population was employed by Chenery. An alternative definition of 25 million was tested in that study with "essentially the same statistical results" [see reference 2, p. 395].

Table 2. Summary of Regression Results for Small Countries, 1960-1973[a/]

Equation	Year	(α)	(β)	(γ)	(δ)	SEE	R^2
I.A.	1960	- 5.455	0.542* (10.96)	0.113 (2.10)		0.473	0.92
	1966	- 4.787	0.434* (10.09)	0.113* (3.02)		0.420	0.93
	1972	- 4.136	0.341* (9.63)	0.128* (3.36)		0.374	0.93
I.B.	1960	- 9.613	2.992* (5.84)	0.121* (2.31)	- 0.122* (- 2.64)	.453	0.95
	1966	- 6.610	2.061* (5.04)	0.150* (4.14)	- 0.052 (- 1.54)	0.416	0.96
	1972	- 3.549	0.143 (0.41)	0.125* (3.23)	0.016 (0.56)	0.376	0.97
II.A.	1960	- 0.244	0.64* (13.46)	0.013* (3.31)		0.057	0.92
	1966	- 0.226	0.560* (13.50)	0.015* (2.72)		0.049	0.95
	1972	- 0.193	0.057* (11.07)	0.016* (2.52)		0.056	0.92
II.B.	1960	- 0.139	0.027 (0.51)	0.013* (2.44)	0.003 (0.69)	0.047	0.70
	1966	- 0.006	- 0.013 (- 0.28)	0.014* (2.68)	0.006 (1.54)	0.049	0.69
	1972	0.141	- 0.056 (- 1.09)	0.014 (2.32)	0.009 (2.22)	0.054	0.64
	1969-1973	0.160	- 0.063* (- 2.85)	0.015* (5.75)	0.010* (5.45)	0.052	0.65
III.A.	1960	- 5.455	1.542* (31.18)	1.113* (20.74)		0.473	0.95
	1966	- 4.787	1.434* (35.00)	1.143* (24.16)		0.420	0.96
	1972	- 4.136	1.341* (38.63)	1.128* (26.98)		0.374	0.96
	1969-1973	- 4.202	1.347* (84.90)	1.143* (60.41)		0.378	0.96
III.B.	1960	- 9.613	2.992* (5.84)	1.124* (21.82)	- 0.122* (- 2.84)	0.453	0.95
	1966	- 6.610	2.061* (5.04)	1.150* (24.41)	- 0.052 (- 1.54)	0.416	0.96
	1972	- 3.549	1.143* (3.23)	1.125* (26.64)	0.016 (0.56)	0.376	0.96
	1969-1973	- 3.577	1.136* (6.99)	1.140* (60.00)	0.017 (1.30)	0.378	0.96

Source: UNIDO, based on data provided by the UN Statistical Office.

*/ Statistical significance at a 99 per cent level of confidence is indicated by an asterisk.

a/ Total number of observations for each year is 81.

Table 3. Summary of regression results for Large Countries, 1960-1972[a]

I.A.	1960	- 4.428	0.383* (7.29)	0.077 (1.61)		0.329	0.70
	1966	- 3.811	0.325* (7.32)	0.039 (0.51)		.290	0.69
	1972	- 4.622	0.306* (6.57)	0.018 (0.24)		0.315	0.68
I.B.	1960	- 8.386	1.691* (3.01)	0.128 (1.75)	- 0.10 (- 1.34)	0.303	0.76
	1966	- 6.205	1.095 (2.24)	0.066 (0.93)	- 0.063 (- 1.58)	0.282	0.72
	1972	- 5.933	1.006 (1.98)	0.080 (0.65)	- 0.057 (- 1.40)	0.310	0.67
II.A.	1960	- 0.239	0.063* (8.10)	0.013 (1.17)		0.047	0.75
	1966	- 0.195	0.061* (8.39)	0.008 (0.72)		0.047	0.75
	1972	- 0.163	0.061* (7.37)	0.005 (0.35)		0.056	0.69
II.B.	1960	- 0.587	0.178 (2.03)	0.017 (1.53)	- 0.010 (- 1.31)	0.047	0.76
	1966	- 0.432	0.137 (1.67)	0.011 (0.97)	- 0.006 (- 0.93)	0.047	0.76
	1972	- 0.451	0.145 (1.53)	0.008 (0.59)	- 0.007 (0.89)	0.057	0.70
	1969-1973	- 0.430	0.138* (3.51)	0.009 (1.51)	- 0.006 (- 1.95)	0.051	0.71
III.A.	1960	- 4.428	1.388* (25.92)	1.077* (14.21)		0.328	0.98
	1966	- 3.811	1.325* (29.84)	1 035* (15.21)		0.290	0.98
	1972	- 3.622	1.306* (28.06)	1.018* (13.67)		0.315	0.98
	1969-1973	- 3.647	1.309* (65.27)	1.019* (31.91)		0.300	0.98
III.B.	1960	- 8.386	2.691* (4.78)	1.128* (15.39)	- 0.108 (- 2.33)	0.303	0.98
	1966	- 6.205	2.095* (4.28)	1.068* (15.41)	- 0.063 (- 1.58)	0.282	0.98
	1972	- 5.933	2.030* (3.90)	1.050* (13.72)	- 0.057 (- 1.40)	0.310	0.98
	1969-1973	- 5.803	1.989* (9.01)	1.048* (32.40)	- 0.054* (- 3.09)	0.290	0.98

Source: UNIDO, based on data provided by the UN Statistical Office.
*/ Statistical significance at a 99 per cent level of confidence is indicated by an asterisk.

a/ Total number of observations for each year is 28.

Interpretation of Results for Large and Small Country Regressions:

The regression coefficients for (β) in equations I.A and III.A are interpreted as income or growth elasticities of output. For example, in 1960 equation I.A. implies that in small countries a one per cent increase in GDP per capita would have led to a 0.54 per cent increase in manufacturing value added, assuming population was held constant. The coefficients for population (γ) have a similar interpretation when income is held constant and are usually referred to as size elasticities. In the case of the semi-log equations (II.A. and II.B), income and size elasticities are not constant for all values of income or population which is the case for double-log equations. Given the predicted level of income or population, they can be easily calculated, however. Introduction of the log quadratic term also means that elasticities were no longer directly observed but can be calculated. 1/

With one exception, all the coefficients and/or elasticities calculated according to these methods had the expected sign. The coefficients for population and income were expected to be positive, implying a direct relationship with changes in total manufacturing value added. The coefficient for the log quadratic terms was expected to be negative, reflecting the decline in elasticities with rising income. Equation II.B. for small countries was the only case where the sign of the coefficient did not conform to the expected pattern. The explanation for this occurence involves the problem of built-in multicollinearity between ln y and $(\ln y)^2$. 2/ Equation II employs the "share concept" which substantially reduces variance of the sample. The negative sign is attributed to the problem of collinearity, coupled with the reduced variance of the sample in this equational form.

1/ For example, the income elasticity for equation II.B. may be found by the following formula : $\eta_y = \frac{\beta + 2\delta \ln(y/N)}{\hat{X}}$

where $\hat{X}$ is the predicted value of manufacturing value added corresponding to a given level of income. Similarly, the growth elasticity for equation III. B. is given by the following formula :

$$\eta_y = \beta + 2\delta \ln(y/N)$$

2/ Collinearity can be expected in all of the equations using both income terms. For purposes of prediction it is not, in general, a problem if the collinearity can be expected to remain in the future. This is obviously the case for ln y and $(\ln y)^2$. A persuasive argument for retaining the quadratic term despite collinearity can be found in reference 1, p. 143 - 145.

Additional investigation using hypothetical projections and taking into account the standard error of estimate revealed that equations I.A. and I.B. gave results which were less satisfactory than the other two equational forms. Further tests were applied to samples stratified according to criteria other than population size such as level of income and geographical region. 1/ On this basis, equation form III was chosen for forecasting purposes.

The practice of pooling cross-section data was followed in several instances for equational forms of particular interest. Where the null hypothesis of homogeneity is acceptable, this step is a routine extension of the cross-section results. Pooling is useful in the present circumstances since (i) it introduces a time dimension to the study and (ii) the results provide an approximation of the average growth pattern which may be more desirable for forecasting purposes. An F test for homogeneity was applied in each case where the equations in Tables 2 and 3 were pooled, and the null hypothesis of homogeneity was accepted. 2/

An example of hypothetical projections using average cross-section results for several Arab countries is shown in Table 4. The predicted results for 1970, using 1960 - 1964 data, are compared with actual values for 1970. Under-estimation resulted in four cases, while the other four countries were overestimated. Apparently, in countries such as Sudan and Egypt the manufacturing sector has tended to grow more rapidly (relative to per capita GDP and population) than was the "normal" or average case for all developing countries. On the other hand, in countries whose manufacturing sectors were overestimated, actual growth lagged behind the normal pattern. The case of Algeria and Iraq are exceptional due to the growing impact of petroleum activity on their overall economies. 3/

1/ The results of these approaches are discussed in a later section.

2/ The formula followed in this case was as follows:

$$F = \frac{(Q_1 - Q_2)/ k}{Q_2/ (m + n - 2k)}$$

where Q_1 is the sum of the squared residuals for the pooled sample and Q_2 is the corresponding value(s) for the individual year(s). The total number of observations is m+n and k refers to the number of explanatory variables. See reference 6 p. 136-138.

3/ Rich natural resources tend to shift comparative advantage away from industry due to the lower resource costs of earning foreign exchange through primary (e.g. petroleum) exports. The size of the manufacturing sector will always tend to be lower than "the normal" structure. This problem is discussed further in a later section.

The Natural Resource Factor: The question of how population size or level of income may be appropriately treated in studies of structural change is relatively straightforward compared to natural resource considerations. A rich endowment of natural resources influences industrial growth in an opposite manner from country size or level of income. On balance, it tends to shift comparative advantage away from industry since the resource cost of earning foreign exchange through primary exports is lower than for manufactured exports.

No single criteria for classifying countries according to resource endowment is both statistically practical and theoretically satisfactory. The practice sometimes adopted in the literature is to divide countries into groups on the basis of an index of their trade orientation - toward primary or manufactured exports. Those countries where trade is oriented toward primary goods are thought to be "resource rich" while those whose trade is large in manufactures are described as "resource poor".

This alternative was not thought to be practical in the case of the Arab countries. Regional differences in resource endowment are largely a result of the various countries' oil and petroleum reserves. Division of the UNIDO small country sample (81 countries) on the basis of trade orientation would not adequately reflect this distinction between Arab countries.

Table 4. Hypothetical Projections from Maximal Sample and Actual Performance, Arab Countries, 1960-1970 1/

Country	Ratio of predicted to actual output (x), (1970)
Sudan	87.3
Morocco	93.3
Syria	71.3
Jordan	115.3
Tunisia	118.4
Egypt	63.2
Algeria	126.0
Iraq	146.0

Source: UNIDO, based on data supplied by the UN Statistical Office

1/ The following regression equations were employed:

small countries: $\ln x = 15.231 + 1.506 \ln (y/N) + 1.117 \ln N$ $R^2 = 0.956$
(76.96) (51.16) SEE = 0.432

large countries: $\ln x = -4.265 + 1.365 \ln (y/N) + 1.976 \ln N$ $R^2 = 0.979$
(63.72) (34.47) SEE = 0.301

These equations are based on the maximal number of countries in the large and small country samples. The years 1960-1964 were pooled for purposes of this calculation.

Two additional alternatives were available. One approach, similar to the division of the sample on the basis of trade orientation, is to classify countries according to criteria which reflect the bias in their resource allocation pattern between industry and agriculture. 1/ The recent experience of other studies with regard to this particular approach was not encouraging. Both indices (trade and production) require sharply drawn dividing lines between primary and industrial exports and agricultural and industrial production. In practice, such general distinctions are not applicable across countries; nor would they be relevant over time. 2/

Another alternative is to consider the Arab countries as a distinct subgroup for regression analysis. In some cases, a justification for this approach can be based on similarities within the country subgroup which influence their growth patterns in a way which is common to the group and distinct from that of developing countries in general. 3/ Natural resource endowment is not a completely satisfactory argument for treating the Arab countries as a special subgroup since petroleum resources and production are not the dominant economic feature of several important Arab countries. Other considerations such as levels of skill endowment, demographic characteristics, similarities in industrial trading patterns, and patterns of domestic demand can contribute to a unique structural pattern for the Arab countries. In general, these factors are secondary, and, alone, do not constitute a persuasive argument for special treatment as a separate country grouping.

The main justification for the creation of this separate country subgroup is primarily of a policy nature. The intention was to determine if industrial growth of the Arab countries is subject to the same, broad structural constraints and if the countries, as a group, respond in a similar manner to these constraints. Where these conditions pertain, the opportunities for regional co-operation, in the broad sense described in the introduction to this paper, are more promising than for countries whose economies are subject to divergent structural forces or tend to follow distinctly different growth paths. One consequence of this approach is that the regression results will reflect, to a large extent, the natural resource endowment of several of the countries included. A priori, there is no reason to expect that the differences in resource endowments would contribute to a uniform growth path or to common structural constraints.

1/ The index of production orientation is derived according to the following formula: $PO = P - \hat{P} = (V_p - V_m) - (\hat{V}_p - \hat{V}_m)$ where P is the normal production bias and $\hat{P}$ is the actual bias. V_p and V_m refer to the corresponding concepts for primary and industrial production respectively. The trade index may be derived in an analogous manner.

2/ For a brief discussion of this point see reference 3, p. 402.

3/ See, for example, the ESCAP work on this subject, reference 4, p. 141 - 163.

Based on those considerations, explicit treatment of the natural resource factor was not attempted. Analysis of the growth paths of the Arab countries as a special country subgroup led to a situation where the resource factorwas an important force implicit in the statistical results.

The results of this approach are summarized in Table 5. Again, two basic equational forms were tested. 1/ Cross section equations for each of the 14 years were calculated along with pooled equations for the latest years. The performance of the equations (as measured by "t"values, standard error estimates and proportion of explained variance) is not as good for earlier years (1960-1966) as was the case for recent years (1969-1973).

An explanation for the improved performance of ln y and $(\ln y)^2$ would require further study. On the surface, non-linear effects appear to have become more pronounced in the later years. The population or size elasticities remained statistically significant in this subgroup as in the case of the maximal sample. In contrast, income was no longer a significant explanatory variabls.

In view of the fact that (i) the coefficients were not stable over the period 1960-1973 and (ii) that the coefficients vary substantially between different country subsets (including this one), no strong conclusions can be drawn from these facts. In so far as the reliability of the population elasticities can be accepted, the results imply that market size may be relatively more important in the Arab countries than in other country subgroups or as reflected in the maximal country sample. The implementation of the quadratic term in these equations is that there may be a relatively important decline in the elasticities as income rises.

Table 6 provides a set of hypothetical projections for total manufacturing value for 1973 based on the cross section regression for 1966. The range of the various country projections is somewhat narrower than for those based on the maximal samples in Table 4. In general, the regional equations (including the sample in Table 6) do not tend to overestimate manufacturing growth to the same extent as estimations using the maximal sample. Underestimation in some cases (e.g. Syria) was considerable. Furthermore, a comparison between the maximal and the regional results as to the direction of over-or underestimation does not show any clear evidence of a consistent trend.

1/ Unlike some other sub-samples, inclusion of the $(\ln y)^2$ term yielded considerable improvements in the statistical results which suggests non-linearities in country growth patterns. Expressions with the squared term were, therefore, analyzed for the Arab country sample.

Table 5. Regression Results for Arab Countries, Selected Years [a/]

I. $x/y = \alpha + \beta \ln y + \gamma \ln N + \delta (\ln y)^2$

Year					R^2	SEE
1960	- 0.9190	0.3380	0.0242	- 0.0289	0.17	0.0526
		(0.34)	(1.11)	(-0.32)		
1963	- 1.4934	0.4993	0.0406	- 0.0405	0.37	0.0479
		(0.76)	(1.70)	(-0.70)		
1969	- 0.6907	0.2581	0.0267	- 0.0220	0.62	0.0333
		(1.34)	(1.63)	(-1.45)		
1973	- 0.9239	0.3585	0.0139	- 0.0313	0.68	0.0312
		(1.99)	(1.01)	(-2.17)		

II. $\ln x = \alpha + \beta \ln y + \gamma \ln N + \delta (\ln y)^2$

1960	-14.9251	5.1705	1.2171*	- 0.3533	0.83	0.5071
		(0.54)	(5.81)	(-0.40)		
1963	-25.8356	8.8521	1.3220*	- 0.6704	0.87	0.4390
		(1.47)	(6.04)	(-1.27)		
1969	-16.1784	5.8485*	1.2099*	- 0.4317*	0.93	0.2938
		(3.44)	(8.36)	(-3.22)		
1973	-18.1398	6.6374*	1.0921*	- 0.4980	0.95	0.2190
		(5.26)	(11.28)	(-4.92)		
1969-1973	-18.7693	6.8005*	1.1412*	- 0.5123	0.94	0.2286
		(10.10)	(22.18)	(-9.48)		

Source: UNIDO, based on data supplied by the UN Statistical Office

*/ Statistical significance at a 99 per cent level of confidence is indicated by an asterisk.

a/ The countries included in the regressions were determined by data availability for the entire time period 1960 - 1973. They are as follows: Algeria, Egypt, Iraq, Jordan, Lebanon, Libya, Morocco, Saudi Arabia, Sudan, Syria and Tunisia.

Table 6. Hypothetical Projections for Individual Arab Countries, Regional Country Sample, 1966 - 1973

Country	Projected Value Added, 1973, as a % of Actual Value Added,
Algeria	109.9
Iraq	85.4
Jordan	82.7
Morocco	103.8
Sudan	104.8
Syria	68.9
Tunisia	92.3
Egypt	83.6

$$\ln VA = -18.1888 + 6.5548 \ln y + 1.2417 \ln N - 0.4967 (\ln y)^2$$
$$(2.45) \quad (6.80)^* \quad (-2.26)$$

$R^2 = 0.90$ SEE = 0.3537

Country Samples Stratified by Income Levels: Two alternative estimations of industrial growth patterns in Arab countries have been developed. The first set of estimations was based on country samples divided according to population. Non-linearities were accounted for through the use of a log quadratic term, $(\ln y)^2$. The second set of estimations utilized regional data for the Arab countries themselves and also employed a quadratic term. A third alternative is considered now; estimating elasticities from country samples stratified according to levels of income as well as population size.

Non-linearities in the growth pattern reflect a phenomena which can entail difficult empirical and theoretical problems. In general, a logistic curve is thought to provide the most reasonable approximation to growth patterns while the log quadratic is a simplified alternative. Stratifying by levels of income may provide a more explicit meane of dealing with non-linearities resulting from large differences in income levels.

The UNIDO maximal samples for large and small countries were further divided according to income levels. The range for the income level of each country subgroup took into account: (i) the 1965 levels of per capita GDP (in US Dollars), (ii) population size of the Arab country in queetion and (iii) where available, planned GDP per capita for 1980 in Arab countries.

Table 7 presents a summary of the regression resulte for individual Arab countries using 1960 and 1973 data. The same stratified sample was used for Morocco,

Jordan, Syria and Tunisia since they are all small countries (less than 15 million population in 1965) and the range of per capita GDP was only $ 34 among the four in 1965. Different levels of per capita income among the various Arab countries resulted in different country samples in the other cases. For countries where no planned GDP figures were available, the income range for stratification was set to include roughly the same proportion of the total sample as in those cases where planned targets were available. The hypothesis implied by this procedure is that countries at different income levels will have different growth patterns. By splitting according to income levels, the regression results may better demonstrate such non-linearities. 1/

Table 7. Representative Regressions for Individual Arab Countries, Stratified Samples according to Income Levels, 1960-1973

Sample Group	Year	Intercept	lny	lnN	R^2	SEE
Morocco	1960	-4.6451	1.4126	1.1471	.93	0.3754
Jordan			(12.14)	(10.06)		
Syria						
Tunisia	1973	-3.7092	1.2805	1.1341	.96	0.2784
			(17.85)	(13.52)		
	1960	-4.5433	1.3967	1.1357	0.99	0.2150
Egypt			(24.37)	(9.59)		
	1973	-3.6994	1.3444	1.0090	0.99	0.1607
			(35.79)	(10.24)		
	1960	-5.0233	1.5183	0.9418	.92	0.3832
Sudan			(15.07)	(8.86)		
	1973	-3.3524	1.2726	0.9363	.96	0.2637
			(20.65)	(12.75)		
	1960	-4.5835	1.3896	1.1605	.93	0.3750
Iraq			(12.58)	(11.00)		
	1973	-2.7862	1.0900	1.1907	.81	0.5949
			(7.71)	(7.07)		
	1960	-4.5587	1.3971	1.1114	.93	0.3545
Algeria			(12.56)	(10.06)		
	1973	-3.5956	1.2613	1.1063	.97	0.2373
			(20.07)	(15.20)		

Source: UNIDO, based on data provided by the UN Statistical Office

Note: All coefficients are statistically significant at 99 per cent.

1/ The procedure for splitting into income groups is admittedly somewhat arbitrary and should be the subject of considerable additional study. The objective of such study should be to ascertain the presence of non-linearities at various income levels. The results presented here must be regarded as tentative.

The basic rationale behind the statistical hypothesis is that univereal factors produce a sufficient regularity in the development process so that future growth can be predicted with some degree of aesurance. However, strong "group factore" (as dietinct from the univereal factors) may influence the growth patterns of the countries in question and lead to sizeable deviations from the uniform. Although the deviations may be of a short-run nature (say, 5 yeare), they can influence the forecaets. Stratification by income may provide results which more readily reflect non-linearities due to group factore.

In general, the cross section analyeis carried out on theee samples yielded equatione which were somewhat more etable than those calculated for the Arab region. Growth elaeticities were statistically significant for all years for the equations eummarized in Table 7. Such was not the caee when the log quadratic term was included, although this feature ie to be expected in view of collinearity between the two terms.

A eet of hypothetical projectione ueing country samplee stratified according to income levele are ehown in Table 8. The range of ratioe for predicted/annual value added by manufacturing ie somewhat greater than those derived from the regional eample. The tendency to over-eetimate value added of epecific countriee eeems to be exaggerated when stratifying the eample by income levels. This is evident in the case of Iraq, and, to a lesser extent, Algeria.

Table 8. Hypothetical Projectione from Reduced Samplee and Actual Performance, Arab Countries, 1966 and 1973

Year for Cross Section		Country	Intercept (α)	ln y (β)	ln N (γ)	R^2	SEE	Predicted 1973 as a % of Actual 1973
I.	1966	Sudan	-3.9337	1.3346 (18.91)	1.0231 (13.17)	0.95	0.2781	106.5
II.	1966	Morocco	-4.9581	1.4504 (15.93)	1.2067 (12.24)	0.95	0.3226	110.6
III.	1966	Syria	-4.9581	1.4504 (15.93)	1.2067 (12.24)	0.95	0.3226	84.9
IV.	1966	Jordan	-4.9581	1.4504 (15.93)	1.2067 (12.24)	0.95	0.3226	95.3
V.	1966	Tunisia	-4.9581	1.4504 (15.93)	1.2067 (12.24)	0.95	0.3226	123.3
VI.	1966	Egypt	-3.9908	1.3673 (36.42)	1.0411 (11.81)	0.99	0.1498	79.8
VII.	1966	Iraq	-4.2369	1.2842 (8.90)	1.2894 (8.13)	0.85	0.5539	118.0
VIII.	1966	Algeria	-4.910	1.4401 (18.07)	1.1764 (13.61)	0.96	0.2762	135.0

Source: UNIDO, based on data supplied by the UN Statistical Office

Note: All coefficients are statistically significant at 99 per cent.

The lag in growth of manufacturing in these two countries is thus highlighted when compared with other countries at similar income levels. This fact has already been explained in terms of these countries' comparatively large resource endowments. In the case of Egypt, the tendency to underestimate manufacturing value added remained, although the extent of underestimation was reduced.

With the exception of the equation for Iraq, the standard error estimates for these equations are smaller than for the other approaches and were given primary consideration in developing the forecasts in the first section of this paper.

Sectoral Growth Patterns: Growth patterns of individual sub-sectors were analyzed in some detail. Differences in patterns of growth can be sharpened considerably when investigation is carried to the level of industrial sub-sectors. A total of 25 industrial sub-sectors were included in this exercise.[1/] The time period covered, 1960-1973, was the same as that studied in the case of the total manufacturing sector.

Annual cross-section regressions were calculated for each of the 14 years according to both the following equations:

A: $\ln x_1 = \alpha + \beta \ln y + \gamma \ln N$

B: $\ln x_1 = \alpha + \beta \ln y + \gamma \ln N + \delta (\ln y)^2$

where x_1 = value added per capita of ISIC sector i; y = GDP per capita in US$ and N = population in millions.[2/] Each equation was calculated for both large and small countries using the same population criterion adopted for the calculation of total manufacturing. Obviously, to present the complete results of the sectoral regressions (1600 equations) is not possible. The results are summarized for two years, 1969 and 1973 for both large and small countries in Tables 9 and 10 for equation A.

A traditional approach to industrial growth is to describe sub-sectors as "early", "middle" or "late", depending upon the stage of development in which they make their main contribution to the country's overall industrial growth. Figure 2 provides a guide to the classification of sub-sectors according to this criterion.[3/]

1/ Certain industrial sectors such as ISIC 353 and 354 were not included because the country sample for these groups was considerably smaller than that of other ISIC sectors. The problem is largely a consequence of divergent collection practices at the country level.

2/ The maximal country sample was used for these calculations.

3/ The figures refer to the following equation: $\ln x_1 = \alpha + \beta \ln y + \gamma \ln N$

Industries with income elasticities of domestic demand of 1.0 or less are described as early industries. Normally, these industries provide basic necessities, they are typified by their use of relatively simple production techniques and their share of GDP is not likely to increase after income levels exceed $ 200 - $ 300 in the country in question.

A comparison of the growth elasticities (denoted by β) for small countries reveals a consistent pattern which can be explained in terms of the sub-sectors demand and production characteristics. Industries which have a relatively low growth elasticity (about 1.0 or less) include food, beverages and tobacco, textiles, leather and footwear. Most consumer goods closely fit the description. This finding is consistent with those of earlier studies covering limited periods of the 1950's and 1960's at a more aggregate industrial level. All the coefficients are statistically significant at a 99 per cent level of confidence.

The size or population elasticities (denoted by γ) reflect the change in value added relative to a change in population while per capita GDP is held constant. These size elasticities are small in comparison with the income elasticities and are not statistically significant.

Middle industries are those whose share of GDP rises most rapidly at low and intermediate levels of national income. In more developed countries (i.e. those at intermediate income levels) these industries are already "mature" in so far as their growth phase is concerned; their relative contributions to additional industrial growth are not substantial.

Sub-sectors for which intermediate values of income elasticities were found are the following: clothing, wood products, furniture, rubber products, plastic products, glass products and non-metallic mineral products. The range of income elasticities is between 1.2 and 1.4. These industries typically account for a significant proportion of total manufacturing value added at relatively low levels of per capita GDP but their proportion declines as higher income levels are attained.

Late industries are those whose output grows more rapidly once the country has reached high income levels. They include paper, printing, chemicals, iron and steel, non-ferrous metals, metal products machinery, electricity machinery and transport equipment. The obvious characteristics of this group are that: (i) it comprises all of the capital good producing sectors and (ii) it largely consists of production activities which require relatively complex technologies.

Figure 3 summarizes the growth paths of the three industrial groups in small countries. The division into three groups - early, middle and late - demonstrates that early industries predominate until per capita income levels of $ 800 - $ 1,000 are reached. The middle industries, while making a moderate contribution to growth are, on average, not major contributors to industrial growth over the income range studied.[1/]

With few exceptions, the growth elasticities of both the large and small countries declined over time. These coefficients are statistically significant at a 99 per cent level of confidence as are the F values.

The emphasis of the study is on growth patterns of small countries since most of the Arab countries fall into this category. For purposes of comparison, a number of equations for large countries were calculated where the number of observations were of the same order of magnitude as for the small-country regressions. No clear pattern is evident from a cursory comparison of the two equational groups. In the case of several sub-sectors, however, the growth elasticities for the small countries tend to be slightly higher than the corresponding figures for large countries. For most of the capital-goods producing sectors the curves for small countries would be further to the right than those of the large countries. This implies that a specified percentage of value added would be achieved at a higher level of per capita income in a small country than in a large one.

1/ Alternative groupings of industrial sub-sectors might be considered and could be more informative. The classification chosen here was to provide a basis of comparison with earlier studies.

Table 9. Small Country Regressions, Growth and Size Elasticities for Industrial Sub-Sectors

Sub-Sector (ISIC)	Year	α	β	γ	R^2	Standard error of estimate	F
Food Processing (311/2)	1969	-2.850	0.918* (11.990)	-0.057 (-0.698)	0.782	0.529	73.658
	1973	-2.652	0.886* (11.482)	-0.056 (-0.607)	0.737	0.516	66.887
Beverages (313)	1969	-4.507	1.003* (9.320)	-0.335 (-2.696)	0.708	0.717	46.056
	1973	-2.861	0.775* (8.233)	-0.266 (-2.309)	0.697	0.570	34.541
Tobacco (314)	1969	-3.844	0.716* (5.653)	-0.058 (-0.411)	0.471	0.791	16.002
	1973	-2.682	0.569* (4.173)	-0.132 (-0.822)	0.383	0.709	8.708
Textiles (321)	1969	-4.730	1.037* (10.423)	0.080 (0.665)	0.757	0.619	54.430
	1973	-3.984	0.935* (9.072)	0.074 (0.459)	0.740	0.577	41.253
Clothing (322)	1969	-6.304	1.220* (9.242)	-0.134 (-1.107)	0.812	0.550	43.191
	1973	-6.120	1.200* (8.300)	-0.227 (-1.247)	0.804	0.570	34.312
Leather (323)	1969	-5.691	0.871* (8.764)	-0.022 (-0.210)	0.719	0.550	38.417
	1973	-5.113	0.747* (6.930)	-0.004 (-0.027)	0.670	0.558	24.387
Footwear (324)	1969	-5.472	0.960* (8.657)	-0.164 (-1.533)	0.775	0.529	37.928
	1973	-4.037	0.736* (4.729)	-0.204 (-1.208)	0.544	0.679	11.346
Wood products (331)	1969	-7.736	1.330* (8.037)	0.099 (0.533)	0.655	1.046	32.334
	1973	-6.683	1.236* (7.024)	-0.387 (-1.630)	0.673	0.980	24.750
Furniture (332)	1969	-6.342	1.224* (9.182)	-0.194 (-1.462)	0.803	0.611	42.301
	1973	-7.693	1.332* (10.241)	-0.186 (-1.038)	0.868	0.550	52.466
Pulp and Paper (341)	1969	-12.080	1.858* (12.838)	0.443* (2.822)	0.846	0.819	85.046
	1973	-11.411	1.734* (10.798)	0.257 (1.035)	0.828	0.847	60.388
Printing (342)	1969	-10.155	1.756* (18.415)	-0.048 (-0.353)	0.930	0.484	172.218
	1973	-9.109	1.575* (15.835)	0.023 (0.206)	0.924	0.465	127.787
Industrial Chemicals (351)	1969	-8.708	1.459* (7.485)	-0.004 (-0.019)	0.789	0.775	28.016
	1973	-8.168	1.334* (8.273)	0.047 (0.189)	0.820	0.682	34.276
Other Chemicals (352)	1969	-7.810	1.303* (10.040)	0.351 (2.130)	0.857	0.581	53.739
	1973	-7.822	1.312* (8.337)	0.373 (1.324)	0.820	0.715	36.511
Rubber Products (355)	1969	-8.015	1.267* (6.733)	0.079 (0.393)	0.637	1.001	22.782
	1973	-8.376	1.253* (5.436)	0.587 (1.793)	0.658	1.055	18.250

Table 9 (continued)

Sub-Sector (ISIC)	Year	α	β	γ	R^2	Standard error of estimate	F
Plastic Products (356)	1969	-5.419	[illegible]*	-0.777	0.962	0.668	[illegible]
			([illegible])	(-1.3[illegible])			
	1973	-[illegible].910	1.1[illegible]*	-0.[illegible]10	0.[illegible]	0.[illegible]	[illegible]
			([illegible])	(-1.332)			
Glass (362)	1969	-12.405	1.[illegible]06*	1.248*	0.947	0.90[illegible]	24.[illegible]
			([illegible].176)	(4.227)			
	1973	-10.24[illegible]	1.[illegible]*	[illegible]	[illegible]	[illegible]	[illegible]
			([illegible])	(1.727)			
Other non-metallic mineral products (369)	1969	-[illegible].21[illegible]	1.214*	-0.203	[illegible].814	[illegible]	[illegible]
			([illegible].161)	(-1.1[illegible])			
	1973	-9.[illegible]12	1.1[illegible]*	-[illegible].2[illegible]	0.906	[illegible]	[illegible]29
			([illegible].200)	(-1.530)			
Iron and Steel (371)	1969	-14.[illegible]	[illegible]*	1.[illegible]*	[illegible]	[illegible]	[illegible]
			(1[illegible].1[illegible])	(3.[illegible])			
	1973	-14.[illegible]	2.013*	1.33[illegible]*	0.[illegible]	[illegible]	[illegible]
			([illegible])	(3.645)			
Non-ferrous metals (372)	1969	-11.740	1.[illegible]*	1.130	[illegible]	[illegible]	[illegible]
			([illegible].41[illegible])	(1.115)			
	1973	-1[illegible].[illegible]87	1.[illegible]*	0.[illegible]	0.560	1.[illegible]61	[illegible]
			(3.630)	(1.023)			
Metal products (381)	1969	-8.140	1.477*	0.137	0.[illegible]	0.4[illegible]	124.[illegible]
			(1[illegible].[illegible]0)	(1.414)			
	1973	-7.[illegible]	1.41[illegible]*	0.173	0.[illegible]	[illegible].4[illegible]	1[illegible].052
			(15.159)	(1.300)			
Non-electrical machinery (382)	1969	-12.072	1.[illegible]7*	0.161	0.[illegible]	[illegible].[illegible]55	[illegible]
			(13.061)	(1.148)			
	1973	-11.282	1.[illegible]1*	0.208	0.[illegible]	[illegible]	[illegible]4.[illegible]2
			(11.21[illegible])	(0.820)			
Electrical machinery (383)	1969	-11.[illegible]	1.[illegible]7*	0.573*	0.[illegible]	[illegible]	[illegible].[illegible]47
			(13.[illegible]26)	(3.268)			
	1973	-[illegible].[illegible]72	1.[illegible]*	0.173	[illegible].8[illegible]	0.[illegible]07	[illegible].57[illegible]
			(11.[illegible]05)	(0.[illegible])			
Transport equipment (384)	1969	-[illegible].203	1.[illegible]2*	0.225	0.7[illegible]5	0.94[illegible]	[illegible]
			([illegible].176)	(1.26[illegible])			
	1973	-[illegible].515	1.[illegible]71*	0.123	0.868	0.72[illegible]	[illegible].123
			(10.727)	(0.503)			

Source: UNIDO, based on data supplied by the UN Statistical Office

*/ Statistical significance at a 99 per cent level of confidence is indicated by an asterisk.

Table 10. Large Country Regressions Growth and Size Elasticities for Industrial Sub-Sectors

Sub-Sector (ISIC)	Year	(α)	(β)	(γ)	R^2	Standard error of estimate	F
Food Processing	1969	-3.124	1.022*	-0.189	0.933	0.354	194.526
			(14.343)	(-1.866)			
	1973	-2.689	0.983*	-0.233	0.917	0.385	72.262
(311/2)			(11.515)	(-1.954)			
Beverages	1969	-3.074	0.930*	-0.394	0.761	0.661	23.895
			(6.911)	(-1.551)			
	1973	-2.238	0.819*	-0.360	0.774	0.568	23.940
(313)			(6.898)	(-1.628)			
Leather	1969	-7.418	0.995*	0.206	0.734	0.716	19.344
			(6.178)	(1.014)			
	1973	-5.713	0.843*	0.034	0.638	0.782	11.442
(323)			(4.765)	(0.150)			
Footwear	1969	-4.046	0.883*	-0.322	0.627	0.796	7.562
			(3.552)	(0.775)			
	1973	-2.877	0.675	-0.248	0.524	0.732	4.397
(324)			(2.725)	(-0.360)			
Wood Products	1969	-5.512	1.034*	-0.045	0.773	0.758	22.083
			(5.887)	(-0.122)			
	1973	-6.717	1.233*	-0.095	0.863	0.627	31.473
(331)			(7.358)	(-0.312)			
Furniture	1969	-9.063	1.589*	-0.205	0.897	0.636	39.058
			(7.868)	(-0.580)			
	1973	-9.932	1.687*	-0.177	0.856	0.835	23.723
(332)			(6.278)	(-0.380)			
Pulp and Paper	1969	-8.030	1.488*	-0.122	0.932	0.489	110.091
			(14.792)	(-0.875)			
	1973	-7.911	1.468*	-0.126	0.947	0.432	142.839
(341)			(16.771)	(-1.012)			
Printing	1969	-7.746	1.351	0.127	0.966	0.284	197.171
			(17.337)	(1.008)			
	1973	-5.959	1.157*	0.035	0.896	0.456	51.551
(342)			(9.272)	(0.161)			
Industrial Chemicals	1969	-5.225	1.118*	-0.054	0.932	0.411	47.893
			(9.342)	(-0.414)			
	1973	-5.117	1.092*	-0.010	0.937	0.388	51.861
(351)			(9.686)	(-0.083)			

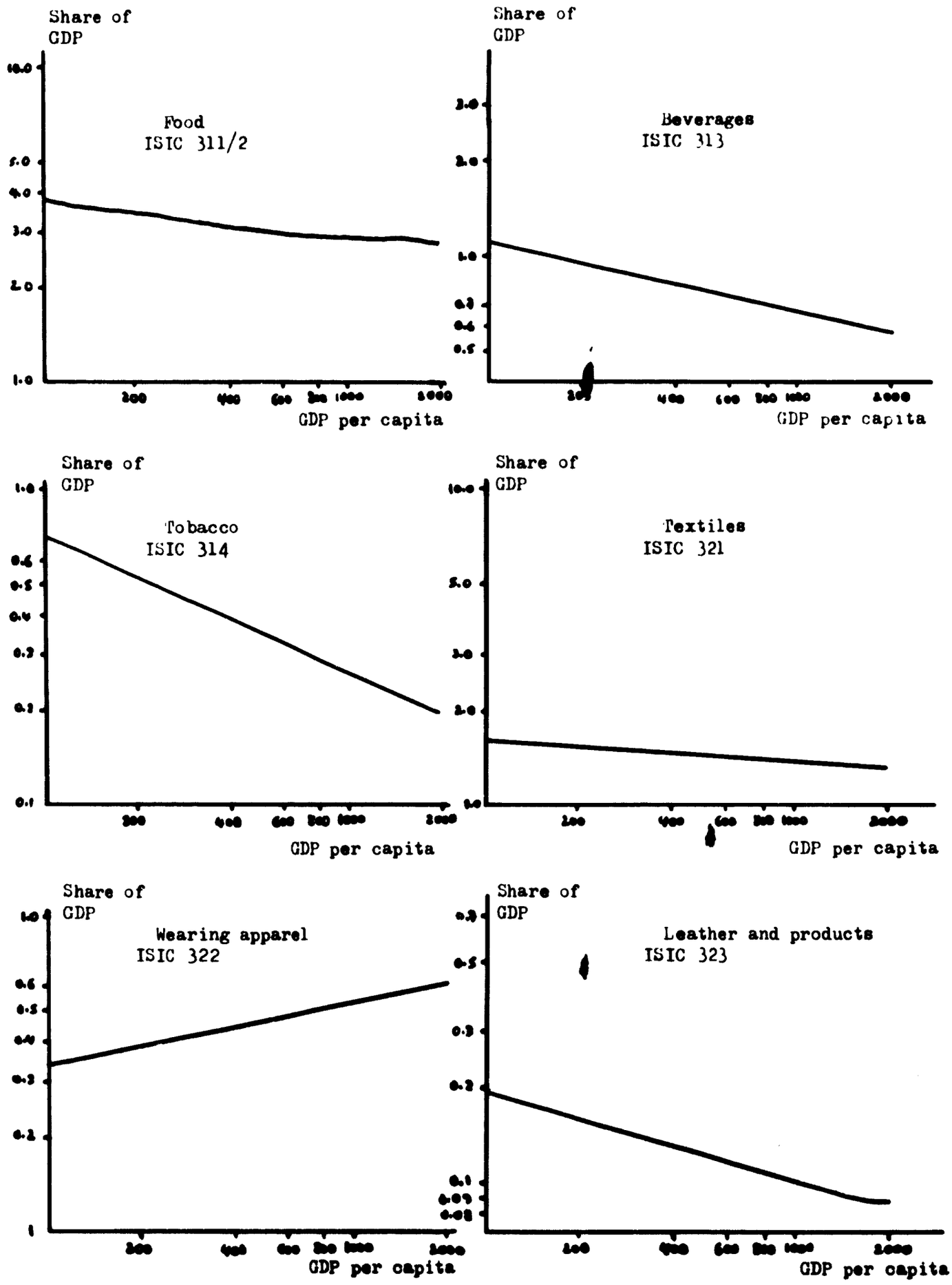
Table 10 (continued)

Other Chemicals	1969	-5.238	1.111*	-0.29	0.918	0.446	44.970
			(9.260)	(-0.211)			
	1973	-4.684	1.056*	-0.054	0.923	0.421	47.642
(352)			(9.368)	(-0.408)			
Glass	1969	-7.888	1.262*	-0.025	0.952	0.374	89.416
			(12.994)	(-0.211)			
	1973	-7.548	1.230*	-0.031	0.919	0.486	51.198
(362)			(9.662)	(-0.194)			
Other non-metallic mineral products	1969	-6.242	1.302*	-0.175	0.923	0.524	59.811
			(9.994)	(-0.925)			
	1973	-5.999	1.245*	-0.142	0.926	0.501	56.207
(369)			(9.609)	(-0.772)			
Iron and Steel	1969	-6.658	1.304*	0.067	0.924	0.437	73.220
			(11.919)	(0.497)			
	1973	-6.172	1.255*	0.006	0.925	0.429	73.571
(371)			(11.729)	(0.044)			
Non-ferrous metals	1969	-9.425	1.516*	0.049	0.953	0.434	82.010
			(12.478)	(0.350)			
(372)	1973	-9.363	1.474*	0.088	0.938	0.493	60.657
			(10.672)	(0.549)			
Metal products	1969	-9.248	1.555*	0.232	0.831	0.848	34.443
			(8.298)	(0.924)			
	1973	-7.527	1.419*	0.061	0.938	0.473	83.779
(381)			(12.819)	(0.426)			
Non-electrical Machinery	1969	-11.654	1.817*	0.394	0.879	0.846	43.785
			(9.315)	(1.555)			
	1973	-10.522	1.716*	0.287	0.933	0.599	76,112
(382)			(12.333)	(1.554)			
Electrical machinery	1969	-8.670	1.525*	0.171	0.967	0.341	205.183
			(20.257)	(1.696)			
	1973	-7.967	1.477*	0.101	0.954	0.404	135.458
(383)			(16.331)	(0.823)			
Transport Equipment	1969	-8.116	1.561*	0.040	0.960	0.386	168.739
			(18.321)	(0.351)			
	1973	-7.541	1.518*	-.022	0.931	0.522	87.542
(384)			(13.005)	(-0.138)			

Source: UNIDO, based on data supplied by the UN Statistical Office.

*/ Statistical significance at a 99 per cent level of confidence is indicated by an asterisk.

Figure 2. Sector Growth Patterns



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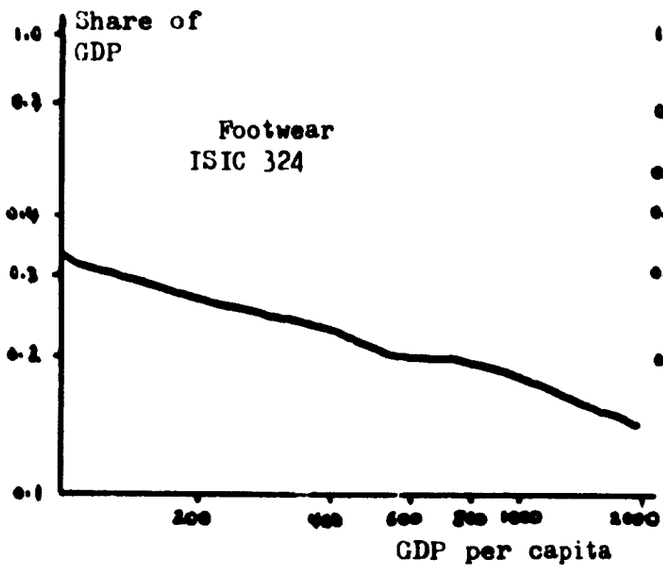

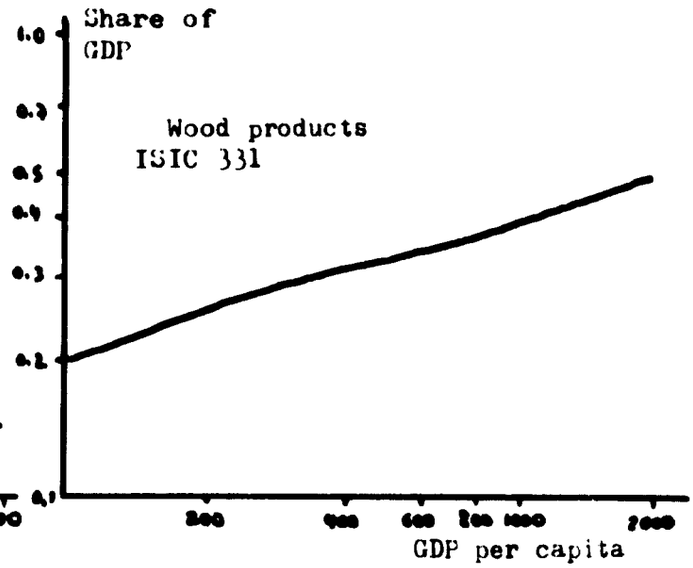

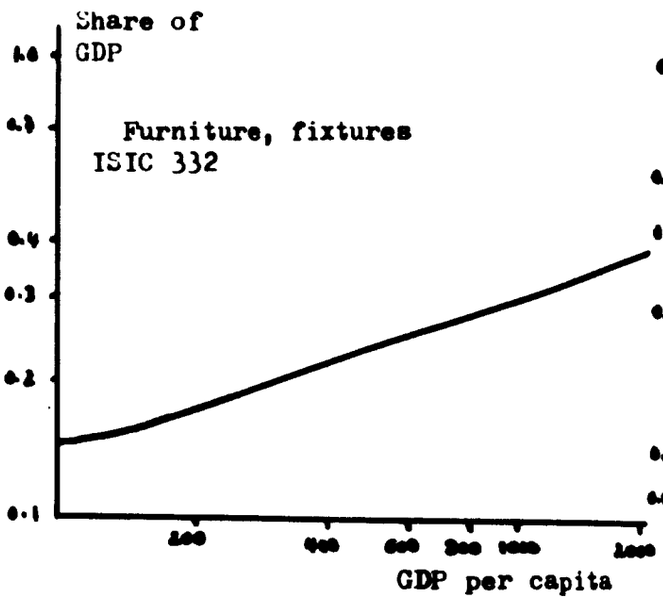

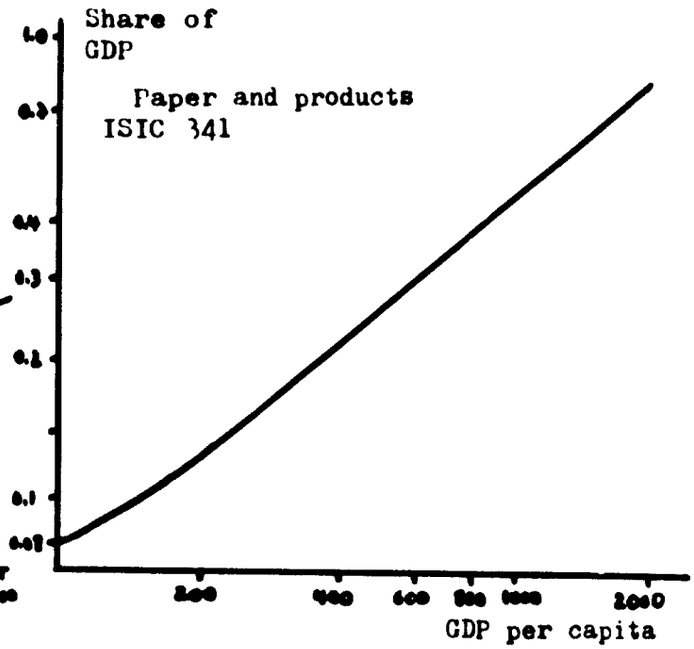

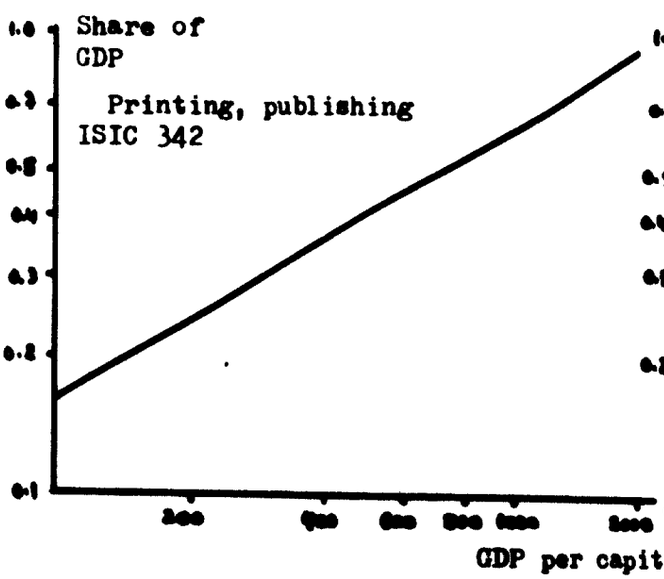

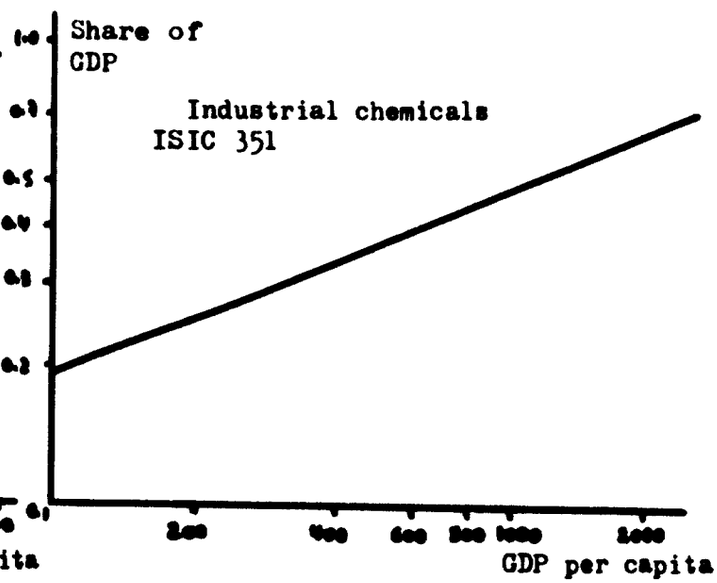

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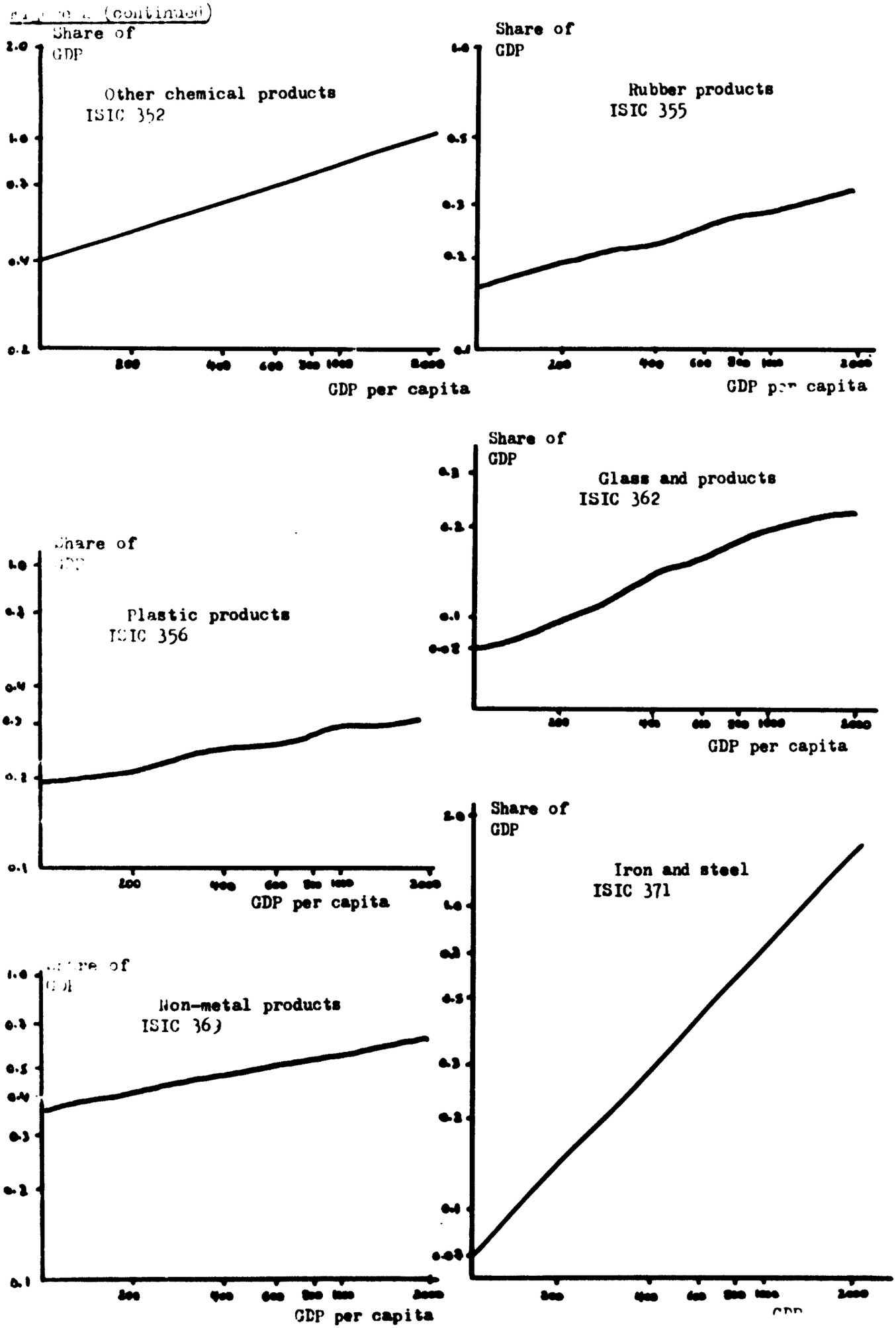

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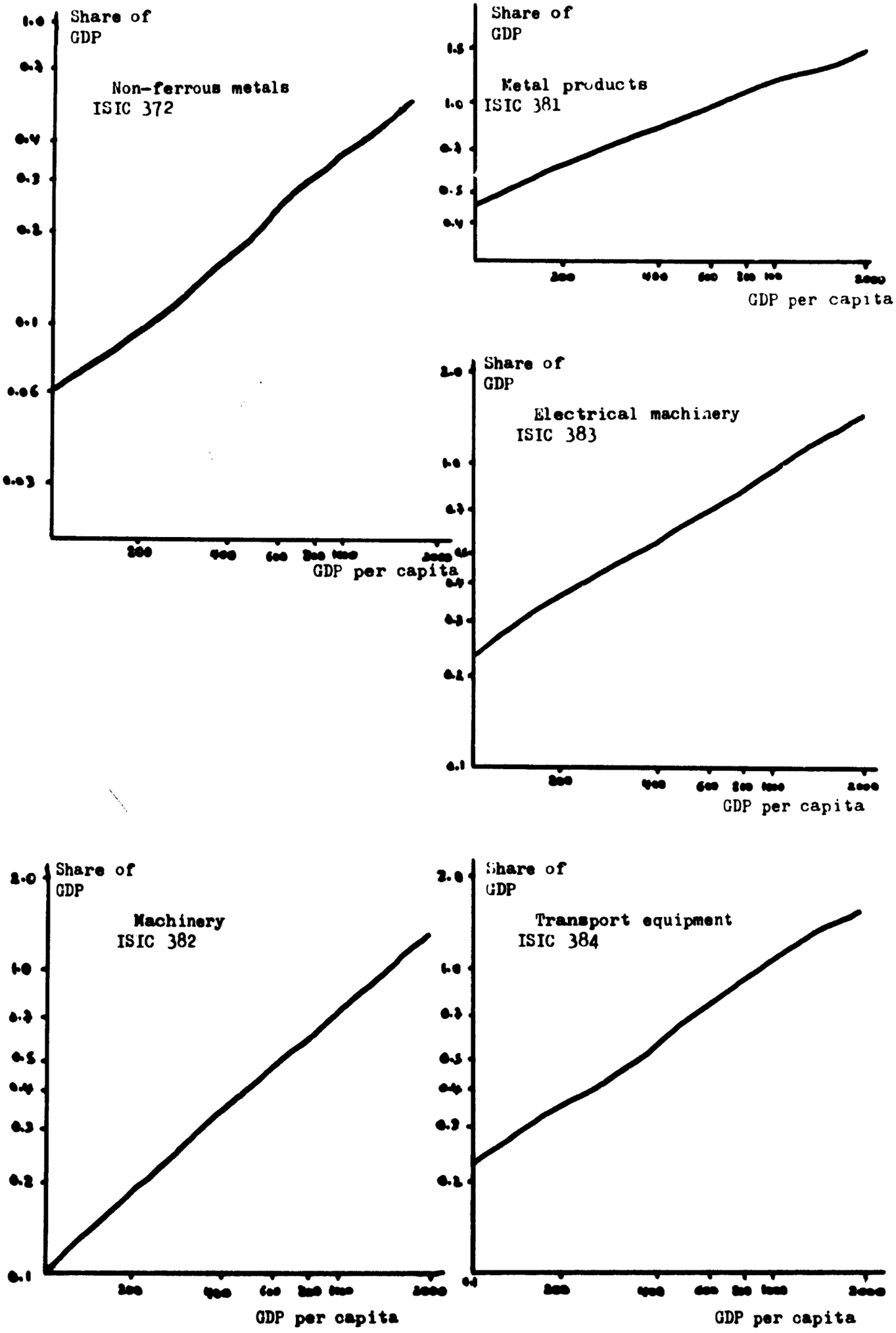
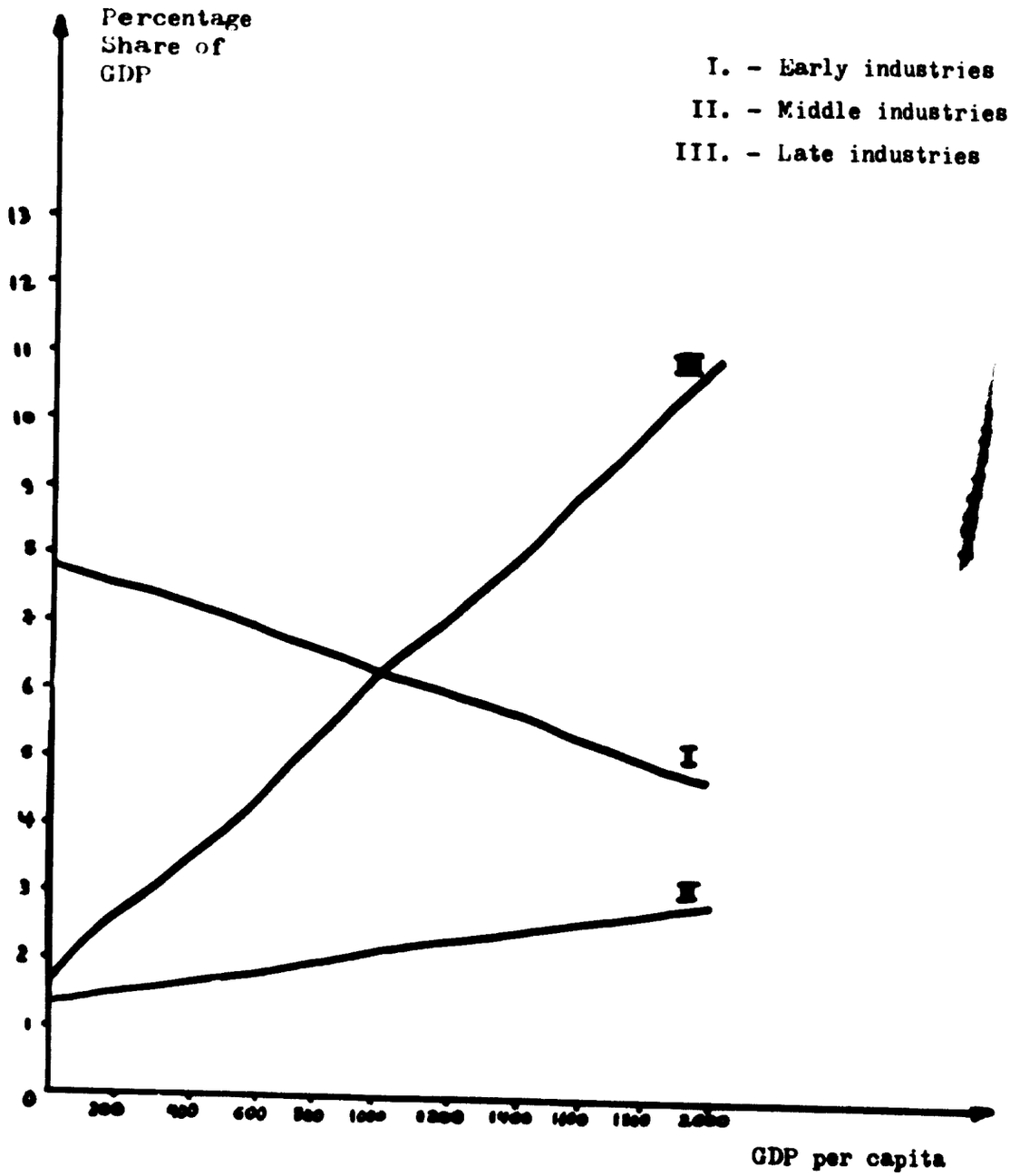


Figure 3


Percentage
Share of
GDP
I. - Early industries
II. - Middle industries
III. - Late industries
13
12
11
10
9
8
7
6
5
4
3
2
1
0
III
I
II
GDP per capita

V. APPLICATION OF STATISTICAL FINDINGS TO A SELECTED NUMBER OF ARAB COUNTRIES

ALGERIA

Salient Features of the Industrial Plan: The 1974-1977 Four-Year Plan seems to mark the beginning of a new phase in Algerian industrialization. By 1980 the long-term goals pursued since 1966 could be achieved in the course of this development phase. The main feature of the current phase is continuity, with industrialization remaining the principal instrument of national economic development (44 per cent of total capital expenditure under the current Plan). An intensified investment effort is contemplated to achieve a higher degree of intersectoral integration and a better distribution of the effects of industrialization across the country.

The total expenditure authorized by the Plan for industrial expansion is DA 47 billion. Of this amount, about 41 per cent is allocated to hydrocarbons, 17 per cent to iron and steel, and 8 per cent to chemicals (the bulk to petrochemicals). It should be noted that this basic orientation is intended to bring about an important qualitative change: the integration of previously parallel but separate lines of production, concerned with the exploitation of natural resources and the creation of basic industries. Maximum development of primary processing for mineral resources is the mechanism for realizing this qualitative change. The planned projects involving refineries and petrochemical complexes reflect this priority. Similarly, the planned expansion of steel production capacity, which may exceed two million tons by 1980, will contribute to the objective.

Projected Industrial Growth in 1980: The projection equations developed for Algeria lead to an estimate for manufacturing value added between US $ 3,100 million and US $ 3,000 million in 1980.[1/] Based on the statistical investigation presented, the possibility of achieving a level of manufacturing output in the range of US $ 3,100 - 3,200 million is a more reliable indication.[2/] In comparison, if the growth rate set in the Four-Year Plan for 1974-1977 were continued to 1980, total manufacturing value added would amount to approximately US $ 2,677 million. Thus, there are grounds to expect Algerian industrial growth to accelerate in the future if it follows the average trend of other developing countries of similar size and levels of per capita income. This would be the case regardless of whether the upper or lower estimates were regarded as more probable.

1/ All projections in this paper are expressed in constant 1970 US dollars. The actual equations employed are shown in the appropriate tables. An indicative figure for GDP in 1980 was derived from the planned growth from the 1974-1977 Four-Year Plan and used to project growth of manufacturing. For a detailed explanation, see previous analysis.

2/ The equations exhibited an apparent tendency to over-estimate industrial growth in the Algerian case. This is largely attributed to the country's petroleum resources which, to some extent, means that its growth path does not always conform to the normal or average path followed by all developing countries. For a discussion of this point, see pages 13 and 14 - 17.

The result is consistent with this study's findings concerning the growth patterns of industrial sub-sectors. The importance of specific industrial sub-sectors may be gauged by calculating the percentage of total manufacturing value added accounted for by each industry. In these terms the industries listed in Table 11 have accounted for a large proportion of total manufacturing activity in the past:

Table 11. Major Manufacturing Sub-sectors in Algerian Industry

Industry (ISIC)[a]	Percentage of total manufacturing value added, 1969
Food, beverages and tobacco (311,312,313,314)	34.5
Textiles and wearing apparel (321,322)	12.5
Pottery, glass and non-metallic products (361,362,369)	7.6
Iron, steel and non-ferrous metals (371,372)	7.4

Source: UN, Growth of World Industry, Vol. I (Sales No. E.75.XVII.3), New York, 1975

a/ Industrial sub-sectors are all defined according to the UN International Standard Industrial Classification (ISIC). For definitions, see reference 10.

The table includes a variety of sub-sectors which the present study shows to be early industries (food and textiles), intermediate industries (glass, non-metallic products) and late or high growth industries (iron, steel and non-ferrous metals). The emphasis which the 1974-1977 Plan gives to iron and steel and petrochemicals suggests an increasing prominence of high-growth industries in the future. As such projects come on-stream, an accelerated rate of industrial growth can be expected.

EGYPT

Salient Planning Features in Industry: While the 1976-1980 Five-Year Plan was under preparation, Egypt's priorities concentrated on the following:

- reconstruction in the Suez Canal area;
- completion of ongoing projects;
- expansion and better utilization of existing industrial capacity;
- new projects considered essential for economic development, such as fertilizers and cement.

Compared with the prsvious development policies, the new stratsgy assigns a greater role to the private sector and foreign capital, and concentrates its efforts on increasing output by fuller utilization of existing industrial capacity. The objective is to raise the GDP by 9.2 per cent, the major contribution to this growth coming from the commodity sectors. Among the commodity sectors, manufacturing is sstimated to grow at 11.1 per cent while agriculture is expected to grow at 3.7 per cent.

Egypt's economic potsntial over the long-run is promising because of the following reasons:

- the country has a large market, a skilled population, low wages, varied raw materials,and a key geographical location, which makes it a natural base for industriss that wish to supply the domestic market and the growing regional market. Development prospects in the medium-term hinge, to a large extent, on the country'e ability to attract external capital and technology. The promulgation of Law No. 43 of 1974, coupled with successful efforts to attract bilateral and international aid, are exampls of eteps taken to increase the flow of external capital and technology;
- Suez Canal revenues are estimated to reach a level of around LE 300 million per year by 1980; thsse could increase to a possible LE 500 million per year as a result of physical expansion and greater usage of the Canal;
- the improved prospects for oil production, which could reach one million barrels/ day by 1980-1982;
- considerably increased earnings from tourism;
- a much more intensive utilization of agricultural land, with greater emphasis on the higher valus crops.

Projected Industrial Growth in 1980: The projection equations used to estimate total manufacturing value added in 1980 provide a predicted range of $ 4,050 - 4,500 million.[1/] In this connexion, two characteristics are worthy of note: First, manufacturing growth in Egypt has generally tended to exceed the performance of other countries of a similar size and at comparable income levels. Second, the Egyptian industrial sector is relatively diversified, covering a broader range of industrial activities than most other countries at the same level of development. One consequence of these characteristics is that the projection, or at least the lower limit, may be regarded as a conservative one.

1/ At the time of writing, details regarding finalization of the 1976-1980 Plan were not available. For purposes of projecting manufacturing growth, we have assumed a planned GDP in 1980 equivalent to a 10 per cent rate of growth over 1975.

Table 12. Major Manufacturing Sub-sectors in Egyptian Industry

Industry (ISIC)[a/]	Percentage of total manufacturing value added, 1972
Food and beverages (311,312)	16.1
Textiles (321)	28.1

Source: UN, Yearbook of Industrial Statistics, Vol. I (Sales No. E.76.XVII.3), New York, 1976

a/ For notes, see Table 11, page .

With regard to specific industrial sub-sectors Egypt's industrial structure is distinguished by its diversification. The major industries are the same as for most other developing countries of a similar size and at the same approximate level of development. On the average, typical growth sectors for most developing countries at this stage would include several of the intermediate and growth sectors identified in the preceding sections.[1/] Future development will almost certainly see a shift into several of these industrial sub-sectors. However, if the current pattern of industrial diversification is maintained, no industrial growth sector will be such a dominant force as in the case of countries which tend to specialize in specific industrial sub-sectors.

JORDAN

Salient Planning Features in Industry: Jordan's Five-Year Plan for 1976-1980 places considerable emphasis on industrial growth. Planned investment in mining and manufacturing is JD 229.1 million. Development will concentrate on import substituting industries and export industries. An annual growth rate of 12 per cent in GDP is planned. Accordingly, GDP would increase from JD 290 million in 1975 to JD 508 million in 1980. Specific industrial sectors which are singled out in the Plan include petroleum products, phosphates and phosphate fertilizers, cement and copper. An average annual growth rate of 26.2 per cent is contemplated for the mining and manufacturing sector.

1/ See p22.

Projected Industrial Growth in 1980: The equations used to project industrial growth in Jordan yield a predicted range of US $ 159 million to US $ 174.1 million for total value added by manufacturing in 1980.[1] In general, the various statistical tests applied to determine the approach's reliability for projecting Jordanian growth demonstrated a good performance. The country's past growth pattern has tended to coincide closely with the average growth path of other countries with a similar market size and level of per capita income.

The industrial sub-sectors cited above include a number of industries described as intermediate and late industries. Growth in these sub-sectors is a logical step and, again, would match the average sectoral growth patterns described in an earlier section.

Table 13. Major Manufacturing Sub-sectors in Jordanian Industry

Sub-sector (ISIC)	Percentage of total manufacturing value added, 1971
Chemicals and chemical products (351/352)	8.6
Petroleum refineries (353)	29.8
China, glass and non-metallic mineral products (361,362,369)	18.2

Source: UN, Yearbook of Industrial Statistics, Vol. I (Sales No. E.76.XVII.3), New York, 1976

MOROCCO

Salient Planning Features in Industry: During the Second Plan period, Morocco succeeded in accelerating the growth of its economy and improving the situation of its external payments. By 1973 its GDP in current prices amounted to US $ 5,125 million. Industry contributed approximately 16.0 per cent and agriculture, 27.0 per cent.

The Third Plan (1973-1977) proposed a considerable increase in investment and emphasized export growth to achieve a GDP growth objective of 7.5 per cent a year. Moreover, the industrial sector is expected to register an annual increase of 9.6 per cent.

Plan revisions for the 1975-1977 period aim at:

- assuring that original plan targets will be met through increases and modifications in original allocations and through some new projects; and
- preparing the move into heavy chemicals and steel.

1/ Figures are in 1970 constant dollars. For details regarding the projection see previous presentation.

The concomitant industrial investment was estimated to be DH 2,200 million.

Beyond 1977, Morocco could continue to pursue an ambitious investment policy accompanied by rapid economic growth. Present conditions suggest that investment could rise at an annual rate of approximately 10 per cent (which would correspond to an average rate of nearly 13 per cent in 1975-1980). GDP could increase by about 7 per cent yearly. These possibilities are particularly sensitive to future production levels and international price fluctuations for phosphate. During the period 1977-1980 external borrowing requirements on a commitment basis could increase, averaging about US $ 700 million annually compared with US $ 540 million in 1975-1977. Increased import requirements - for consumption but especially for investment - will be a major determinant of these borrowing requirements along with future trends in the country's terms of trade. Morocco's borrowing capacity seems sufficient to mobilize this amount from available sources, provided the necessary effort in project preparation for external financing is made.

Projected Industrial Growth in 1980: The projections of total manufacturing value added provide an estimated range of US$ 1,044 - 1,141.7 million. The country's growth path has closely followed that of other developing countries with a similar size and levels of per capita income. The tests applied to the equations to verify their predictive reliability indicated relatively good performance.

With regard to individual industrial sub-sectors, the figures in Table 14 indicate those sectors with at least 10 per cent of total manufacturing value added. The planned move into heavy chemicals and steel will eventually provide two additional "high-growth" sub-sectors. In addition to these, petroleum refining which is already an important sub-sector and the manufacture of fabricated metal products (ISIC 381) have grown rapidly in recent years.

In general, expected industrial trends will be typified by an increasing utilization of the country's abundant natural resources, leading to further expansion of the existing major industrial sub-sectors. During the 1980's the development of new growth sectors can be expected to further alter the country's industrial structure.

Table 14. Major Manufacturing Sub-sectors in Moroccan Industry

Sub-sector (ISIC)	Percentage of total manufacturing value added, 1969
Food (311,312)	24.3
Tobacco (314)	11.1
Textiles (321)	10.7
Petroleum refineries (353)	10.0

Source: UN, Growth of World Industry, Vol. I, 1974 (Sales No. E.75.XVII.3), New York, 1975

SUDA..

Salient Planning Features in Industry: With an area of 2.5 million square kilometers, the Sudan is the largest country in Africa. In 1974, gross domestic product (at 1973 prices) was US$ 2,837 million while manufacturing value added totalled US $ 253 million or about 8.9 per cent of total production. During the 1960-1974 period the average annual growth rate for GDP was 3.7 per cent in real terms. The corresponding rate for manufacturing was 6.0 per cent. Per capita GDP was approximately US $ 130.

According to the new Six-Year Plan, the 1980 targets for total GDP and manufacturing value added, at constant 1973 prices, are estimated to be US $ 3,733 million and US $ 390 million, respectively. During the years 1977 to 1983, a planned investment of about US $ 2,300 million is to be allocated to mining and manufacturing. The annual planned growth rates for gross domestic product and manufacturing value added are 7.0 and 8.9 per cent, respectively. Thus, industry's contribution to GDP should increase moderately.

Among other aspects, the plan emphasizes the following:

- development of agro-industries for processing agricultural products;
- production of inputs for agriculture such as fertilizers, insecticides, etc;
- development of small-scale industries based on appropriate technology and local raw materials;
- improved productivity standards and emphasis on export orientation for industrial products;
- exploration of the country's abilities in the fields of mineral resources and petroleum to create a base for further industrialization;
- continuation of the import substitution process.

Projected Industrial Growth in 1980: The projections methodology yielded an estimated range for total manufacturing value added between $ 330.1 and $ 385.3 million. The country's historical growth path has closely matched that of other developing countries at a similar stage of development. Therefore, the statistical reliability of the equations was reasonably well confirmed.

Table 15 shows the major industrial sub-sectors in recent years. Each of these sub-sectors have been found to be early industries. Their prominence is a common feature of most countries with per capita income levels similar to Sudan's. The prominence of these sub-sectors is further enhanced in view of the country's relatively large agricultural sector and its comparative advantage in agricultural production.

Table 15. Major Manufacturing Sub-sectors in Sudanese Industry

Industry (ISIC)	Percentage of total manufacturing value added, 1971
Food (311, 312)	22.0
Beverages (313)	12.1
Textiles and Wearing Apparel (321,322)	28.2

Source: UN, Yearbook of Industrial Statistics, Vol. I (Sales No. E.76.XVII.3), New York, 1976

The major developments in the industrial sector which are foreseen in the next years relate to the processing of agricultural products such as sugar and cotton. Indeed, the Sudanese Government regards the development of sugar, oil and textiles industries a top priority. Although the planned investments are not specified for the majority of industry sectors, rough estimates are given for the food sector (US$ 580 million), the textile sector (US$ 207 million) and the engineering sector (US $ 170 million).[1/]

The information on planned industrial development, coupled with the country's tendency to follow a relatively consistent development path leads to some general conclusions regarding the future industrial picture. First, further development of those sub-sectors most closely linked with agriculture will continue. More extensive integration of those sub-sectors which supply inputs to agriculture can also be expected. These industrial sub-sectors will continue to account for the bulk of manufacturing activity, industrial employment and income generated from industry. At the same time, new growth industries which are likely to emerge during the next 5 - 10 years will be based on further utilization of the country's natural resources and could account for a significant proportion of total manufacturing activity during the 1980's.

SYRIA

Salient Planning Aspects for Industry: The objectives of the Syrian Plan for 1971-1975 included a growth rate for Net Domestic Product of 8.2 per cent per annum.[2/] In 1970 GNP (at market prices) was $ 1,750 million. The corresponding per capita figure was $ 290. In the first half of the 1970's prominent industrial policy matters

1/ Figures are in 1973 prices.

2/ At the time of writing, the new development plan was not yet available. These comments are based on the Plan for 1971-1975. Since no target figure for GDP in 1980 was available, the projections for manufacturing value added were, based on indicative GDP target, estimated independently by the Economic Intelligence Unit, Annual Supplement, 1976.

included an emphasis on capital goods production, petroleum exploration and the expansion of refining capacity and the increased export of processed goods. Major industrial sub-sectors which were singled out in the earlier plan included textiles, food, chemicals, machinery and equipment, cement and glass.

Projected Industrial Growth in 1980: Manufactured value added in 1980 is projected to be in the range of $ 784.7 - 832.7 million. This would be equivalent to 14 - 16 per cent of the hypothetical GDP target for 1980.

Table 16. Major Manufacturing Sub-sectors in Syrian Industry

Industry (ISIC)	Percentage of total manufacturing value added, 1972
Food, beverages and tobacco (311,312, 313, 314)	31.8
Textiles, leather and wearing apparel (321,322,323,324)	40.7

Source: UN, Yearbook of Industrial Statistics, 1974 (Sales No. E.76.XVII.4), New York, 1976

The largest industrial sub-sectors are shown in Table 16. As in the case of other countries, the important sub-sectors are early industries. Although there are strong indications - based on both planned development and empirical justification - that certain middle and late industries will gain greater prominence during the late 1970's and 1980's.

TUNISIA

Salient Features of Planning for Industry: During the period 1960-1974 Tunisia's gross domestic product and manufacturing value added registered growth rates of 7.0 and 3.5 per cent annually, respectively. Gross national product at market prices was US$ 3,112 million in 1974, 11.7 per cent of which originated from the manufacturing sector and 20.7 per cent from agriculture.

The chief objectives for the decade 1972-1981 have been defined as follows:

- an acceleration of growth through promotion of export industries;
- absorption of underemployed manpower;
- more equitable distribution of income from production;
- maintenance of domestic and external financial stability.

Among the main components of the strategy adopted are an increase in the proportion of investments devoted to directly productive projects and expansion of the role of private

investment, both domestic and foreign. The growth target was set at 8.7 per cent per year for the period 1976-1981. This will give for year 1980 a gross domestic product of US $ 3,457 million in 1970 prices.

Projected Industrial Growth in 1980: The projection methodology led to a predicted range of $ 585.5 - $ 623.8 million for total manufactured value added in 1980. At that time manufacturing would account for roughly 16 - 18 per cent of total GDP compared with 12 per cent in 1974.

The major industrial sub-sectors are shown in Table 17. Future industrial development may lead to further increases in the total production of industries such as food and textiles. It is unlikely, however, that the industries will expand their share in manufacturing value added by all industry. The major growth stimulus is likely to come from sub-sectors such as non-metallic minerals, iron and steel or chemicals.

Table 17. Major Manufacturing Sub-sectors in Tunisian Industry

Industry (ISIC)	Percentage of total manufacturing value added, 1973
Food, beverages and tobacco (311,312, 313,314)	23.2
Textiles	11.5
Chemicals (351,352)	16.8
Non-metallic mineral products (369)	9.7

Source: UN, Yearbook of Industrial Statistics, 1974 (Sales No. E.76.XVII.4), New York, 1976

APPENDIX A

Statistical Data

The basic statistics used in the exercise include 120 countries. In general, available data covered the period 1960-1973 although for some countries the entire time series was not available. The original data source is the United Nations Statistical Office.

The definition of variables used in the study was as follows:

Gross Domestic Product: GDP in millions of US dollars, 1970.

Population: The data used were generally mid-year estimates, in millions.

Manufacturing Value Added: The definition of the manufacturing sector employed here was according to the International Standard Industrial Classification (ICIS) for manufacturing. Value added is in million constant US dollars at 1970 prices. The country coverage and qualifications stated in the country notes, Yearbook of Industrial Statistics, Volume I, is applicable.

Value Added in Manufacturing Sub-sectors: The definitions of sub-sectors is according to ISIC. In general, the data relate to constant prices (1970) of census value added or, in some instances, to the contributions to the gross or net domestic product. The figures are usually in approximate factor values (factor costs).

APPENDIX B
Countries covered in UNIDO Sample

Afghanistan
Algeria
Angola
Argentina
Australia
Austria
Belgium
Bolivia
Botswana
Brazil
Burma
Burundi
Cambodia (Khmer Republic)
Canada
Central African Republic
Chad
Chile
Colombia
Congo
Costa Rica
Cyprus
Dahomey
Denmark
Dominican Republic
Ecuador
Egypt
El Salvador
Ethiopia
Finland
France
Gabon
Gambia
Germany, Federal Republic of
Ghana
Greece
Guatemala
Guinea
Guyana
Haiti
Honduras
Hong Kong
Iceland
India
Indonesia
Iran
Iraq
Ireland
Italy
Ivory Coast
Jamaica
Japan
Jordan
Kenya
Korea, Republic of
Laos
Lebanon
Lesotho
Liberia
Libyan Arab Republic
Luxembourg
Madagascar
Malawi
Malaysia
Mali
Malta
Mauritania
Mauritius
Mexico
Morocco
Netherlands
New Zealand
Nicaragua
Niger
Nigeria
Norway
Pakistan
[illegible] Zone)
Paraguay
Peru
Philippines
Portugal
Puerto Rico
Rwanda
Saudi Arabia
Senegal
Sierra Leone
Singapore
Somalia
Spain
Sri Lanka
Sudan
Swaziland
Sweden
Switzerland
Syrian Arab Republic
Thailand
Togo
Tunisia
Turkey
Uganda
United Kingdom
United Republic of Cameroon
United Republic of Tanzania
United States of America
Upper Volta
Uruguay
Venezuela
Zaire
Zambia

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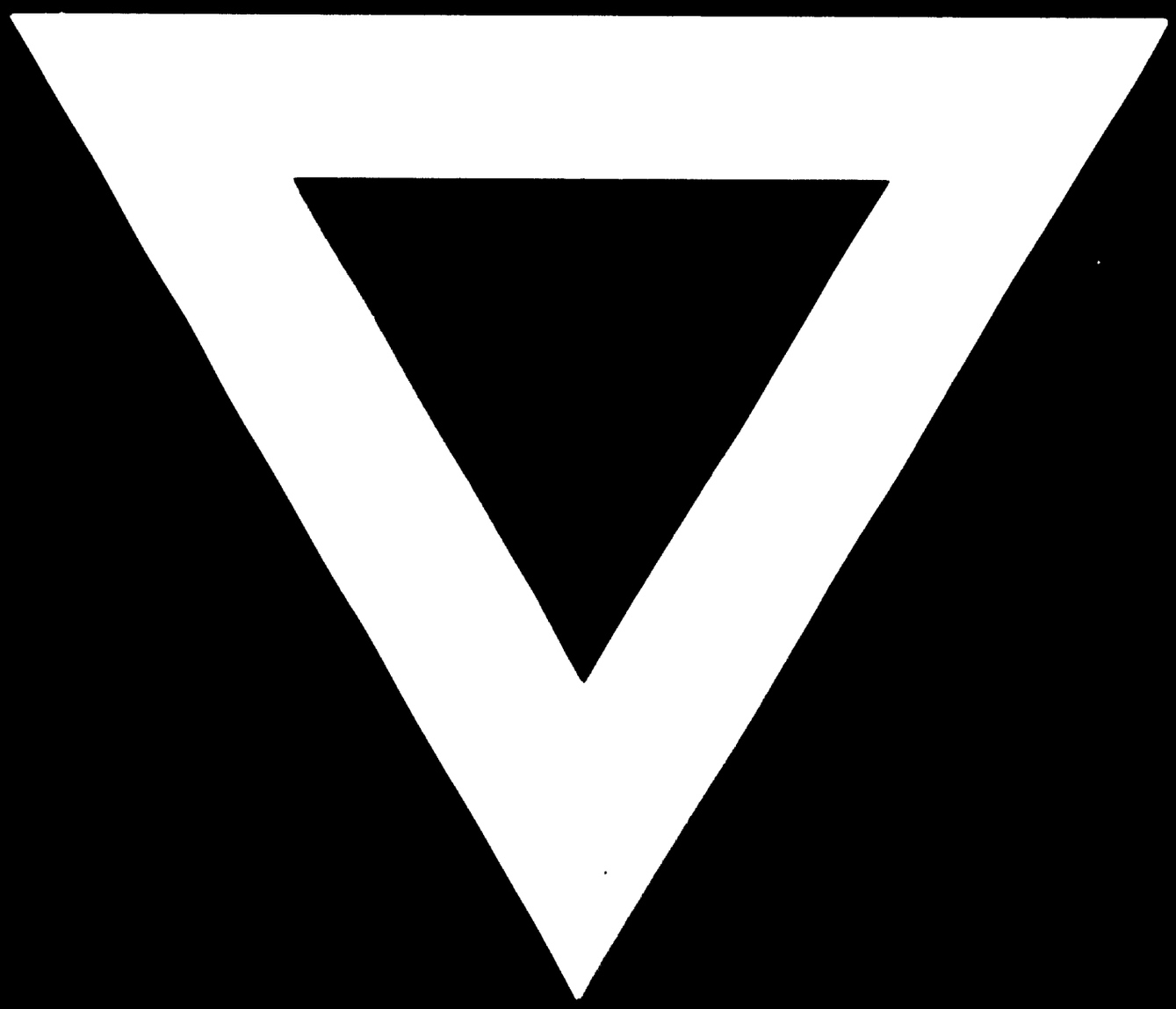

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