

## EMPLOYMENT IN EXPORT-ORIENTED MANUFACTURING INDUSTRIES: A NEW PERSPECTIVE

By

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Export-led growth is not altogether a new orientation for the Philippine economy. The first two decades of the century were periods of rapid expansion in world trade in which the Philippines actively participated. Agriculture was the leading economic sector then, producing the principal export commodities and employing the bulk of the labor force.<sup>1</sup>

Today, the Philippine government has committed itself also to export-oriented growth, dependent not on the traditional sector, but on the expansion of a labor-intensive export-oriented manufacturing sector.<sup>2</sup> The objective of the current stress on an export-oriented manufacturing sector is two-pronged. The development of labor-intensive export-oriented industries is both an industrialization strategy as well as a mechanism for absorbing the swelling ranks of the unemployed Filipinos.

Many studies have been written on the export performance and potential export capacity of the industrial sector. A few have evaluated the number of new jobs generated by them.<sup>3</sup> However, no study has been undertaken to find out if any structural shift in labor utilization occurs with changes in the export orientation of industries. This is what the present study aims to do. It examines the degree of export orientation of industries rather than the absolute value of exports; the factor intensity and skill composition of industries rather than just the absolute number of employment generated by exports. The degree of export orientation, factor intensity, and level of skills are structural characteristics of indus-

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tries, and changes in these reflect important adjustments within industries, such as the rationalization of production techniques. If, indeed, the current export promotion scheme is meant to be a two-pronged approach to economic growth, then changes in these structural features should be given more attention rather than mere increases in export earnings or in the total number of employment. Previous studies have stressed the latter while apparently assuming the structural features to be static.

More specifically, the study will test the following hypotheses:

- (1) that export-oriented industries are labor-intensive,
- (2) that they embody a lower level of skills, and
- (3) that the degree of export orientation, factor intensity, and skill composition of industries are not static, but respond to economic inducements; in particular, to export incentives.

### A Review of Theory

Development efforts in labor surplus economies like the Philippines consist in gainfully employing the unemployed. This is by no means easy. The distinctive feature of labor-surplus less developed economies is the predominance of an agricultural sector characterized by widespread disguised underemployment. The young but hopefully growing industrial sector, therefore, has to generate employment opportunities in order to absorb labor released from agriculture and the new entrants to the labor force.

If the modern sector is to grow speedily in such a way that employment opportunities are rapidly augmented, it must find an outlet for growth which will continue to be profitable even when output is greatly increased. The solution to this problem would be for the Philippine industrial sector to grow outward into the world export markets, to increasingly shift from exportation of traditional agricultural crops to the production and exportation of manufactured goods, thereby embodying a larger share of the abundant labor resources.

The idea that labor-surplus economies should export commodities which embody more labor than capital or other factors receives theoretical justification from the Heckscher-Ohlin theorem. This theory of international trade asserts that two trading countries will

find that their comparative advantage in international trade lies with products requiring proportionately large inputs of each country's relatively abundant productive resources. Thus, labor surplus economies such as the Philippines will tend to specialize in the production of labor-intensive commodities for which its costs are comparatively lower.

In view of the purpose of this study, further discussion of "factors" and "factor intensity" is in order. Land, labor, and capital are the three factors of production commonly enumerated. Yet the labor factor alone can be divided into groups according to different levels of skills and according to different tasks or occupations performed.

A broad classification of employment into unskilled, skilled, and technical labor may be more realistic than a fine distinction between a great number of labor groups because the skill composition of labor and its occupational structure is not static. True, unskilled labor may become skilled, but mobility is greatest *within* these broad skills groups, not between them. Broad labor groups over a period of time receive unequal wages and the flow of individuals from one group to another — from production workers to clerical workers, or from sales workers to technical workers — may neither be free nor easy. Should not these groups of labor then be regarded as different factors of production? <sup>4</sup>

Thus, it may be more meaningful if the term "factor" applies, not only to labor, capital, or land, but rather to kinds of labor, capital, or land. Labor is not one factor of production but includes several factors of production. It follows then that "labor intensity" should further be modified to specify the levels of skills within industries. Since the bulk of the Philippine labor force is unskilled labor<sup>5</sup>, comparative advantage lies in the industries which use a relatively greater amount of unskilled labor.

#### Data Sources and Limitations

The period under discussion extends over six years. The year 1965 has been chosen as an appropriate starting year because it ushers in the new economic policy of an export-led growth made official in 1967. It is the first year of complete decontrol, marking the termination of the import and foreign exchange controls of the fifties and early sixties.

The data used here, however, pertain only to five observation years because the *Annual Survey of Manufactures*, the main source of data, was not conducted in 1967 which was a census year. The study ends with 1970 due to inavailability of labor data.

The Bureau of Census and Statistics' *Annual Survey of Manufactures*, which contains important relevant data on the manufacturing sector, is the main source of statistics. The Bureau of Census and Statistics' *Foreign Trade Statistics* from 1965 to 1970 were used for all export data.

Before presenting the methodology used in the study, the limitations of the available and derived data should be discussed first.

(1) One limitation of the *Annual Survey of Manufactures* is its scope. The survey covers all large manufacturing establishments (that is, all establishments with 20 or more workers). Because of this, tables which disaggregate all manufacturing industries into three- and four-digit classification levels are available only for large manufacturing establishments. Granting that any meaningful study of the manufacturing sector should not end with an analysis only of the broad industrial classifications, the present study is forced to use data for only the large manufacturing establishments.

This particular data limitation, however, should not be overrated. Only a little over fifteen per cent of total labor employed in the manufacturing sector is employed in small establishments. Furthermore, an even smaller share of total value of gross output (only an average of six per cent for all manufacturing industries<sup>6</sup>) is contributed by small establishments. It may be said, therefore, that the use of data of large manufacturing establishments in order to estimate the data of all establishments does not impair the validity of the results of the study.

(2) In order to get the percentage of gross output exported per industry, exports have to be classified by industrial origin. The United Nations' (UN) *Classification of Commodities by Industrial Origin* was used as a guide to reconcile the Standard International Trade Classification (SITC) and the Philippine Standard Industrial Classification (PSIC). It provides a way of tracing exports to two- and three-digit level industries. The classification of exports by four-digit levels is not explicitly given in the guide but can be inferred from the UN paper by a simple process of matching

commodity classifications.

(3) The export values themselves need an adjustment involving the removal of price differences between goods for domestic consumption and goods for export. Differences in domestic and international prices alter the valuation of export and output, and any ratio between these two. Higher peso prices of exports inflate the ratio of output exported to total output, and deflate the ratio of domestically consumed output (which is total output minus output exported) to total output.

The Central Bank *Statistical Bulletin* contains wholesale price indices of locally consumed goods and of exported goods. By multiplying the value of exports by the ratio of these price indices, price adjustment to the base year 1955 is achieved.

(4) A final imperfection of derived data used is the overstatement of export orientation arising from the exclusion of small establishments, which do not export as much as the large firms.

The *Annual Survey of Manufactures* is also the main source of employment figures. It classifies workers into three groups:

- a. Production and related workers
- b. Working owners and unpaid family workers
- c. All other employees.

These three groups approximate the occupational distribution in the manufacturing industries.

The ratio of *production and related workers* to total employment per industry will be used as an estimate of the proportion of unskilled labor employed in manufacturing industries. On the other hand, the ratio of skilled workers is approximated by the ratio of total employment.

### Methodology

The present study will test the hypotheses that export industries are labor-intensive, and that exported manufactures embody lower skills than non-exported manufactures. Firstly, we determine the

export industries in the manufacturing sector by the degree of export orientation, defined as the proportion of the value of gross output exported. Secondly, industries are classified according to factor intensity using Lary's method which provides a measure of labor intensity based on "value added per employee". The *Annual Survey of Manufactures* defines "census value added" thus: "the value of gross output less total cost of raw materials, containers and fuels consumed, purchased electrical energy, contract work done by others, and resale goods sold". Lary states that labor-intensive industries have low census value added per employee, while capital-intensive industries have high census value added per employee. The terms "low" and "high" are, of course, relative terms. In the present study, "highness" or "lowness" is based, not on the international comparisons that Lary made, but on comparisons among local manufacturing industries. Thirdly, the skill composition of labor will be measured by the proportion of production workers to total employment.<sup>9</sup> The bigger this ratio is for an industry, the lower the level of skills it uses.

Export orientation will then be mapped against the factor intensity of each industry, and against the ratio of production workers to total employment. It is expected that export-oriented industries have lower census value added per employee than non-export-oriented industries. Moreover, it is also expected that export-oriented industries employ relatively more unskilled workers than other industries. Specific manufacturing industries may then be selected which would hasten both processes of industrialization and labor absorption given the current export promotion scheme.

The employment elasticities of output of major industries will also be obtained and analyzed. The manufacturing industries are classified into 13 industrial divisions, namely,

- (1) food
- (2) beverage and tobacco
- (3) textiles
- (4) textile goods and wearing apparel
- (5) wood manufactures
- (6) furnitures and fixtures
- (7) printing industries
- (8) chemicals
- (9) non-metallic products
- (10) metallic manufactures

- (11) electrical machinery and transport equipment
- (12) non-electrical machinery
- (13) principal exports.

As will be noted, not all manufacturing industries are covered by these categories. This is because industries such as vegetable oils, petroleum products, paper manufactures, and miscellaneous manufactures have observations less than the number of variables used in the regressions. Some of the industries left out, such as the first two enumerated above, are chief exports, and, therefore, belong to the last industry group.

Total employment of each of these industries will be regressed on output according to the following equation:

$$L = a O_x^{b_1} O_d^{b_2}$$

where  $L$  is total employment,  $O_x$  is the value of output exported, and  $O_d$  is the value of output locally consumed. By transforming the values of the variables into logarithms, this equation becomes a log-linear equation:

$$\log L = \log a + b_1 \log O_x + b_2 \log O_d.$$

Output has been decomposed into two components in order to predict the amount of employment generated by exports. Previous studies<sup>10</sup> have used a proportionality method, given as

$$\text{Employment generated by exports} = \frac{\text{Exports}}{\text{Total Output}} \times \text{Total employment.}$$

However, this proportionality method is obviously a very simplified way of obtaining the amount of employment generated by exports. The fraction of gross output exported may not require a simple fraction of total employment in its production. In contrast, the "output elasticity of employment" approach takes into consideration the impact of both output components on employment. A regression coefficient in the regression equation above gives the percentage change in employment, given a percentage change in an output component. From a comparison of the regression coefficients of each industry, employment generated by exports and that generated by output for domestic consumption can be approximated. In addition, the resulting equations also have predictive value.

## Export Orientation

The export performance of the manufacturing sector can be inferred from two parameters — the export orientation of the manufacturing sector (that is, the ratio of the value of all manufactured exports to the value of gross output of the entire manufacturing sector), and the annual average export orientation of manufacturing industries. Let us denote the first by  $E_m$ , and the second, by  $\bar{E}$ . The growth of  $E_m$  shows the degree of export orientation of the industrial sector, while the pattern of  $\bar{E}$  is an index of the general export performance of each manufacturing industry. The table below summarizes the export performance of the entire sector for the period 1965-1970.

Export Orientation of the Manufacturing Sector ( $E_m$ ),  
and Average Export Orientation of Manufacturing  
Industries ( $\bar{E}$ ), 1965-1970 (in per cent)

	1965	1966	1968	1969	1970
$E_m$	17.24	15.66	14.16	11.52	16.56
$\bar{E}$	10.28	11.18	10.68	10.10	12.47
Number of exporting Industries	90	91	114	112	112

Here, a decreasing trend in export orientation until 1969 is noted. However, by separating the consistently exporting industries from the newly exporting industries, both  $E_m$  and  $\bar{E}$  could be better evaluated. The table below shows very clearly how the emergence of newly exporting industries in 1968 pulled down the  $\bar{E}$  for the year despite actual increases in export performance of the manufacturing sector.



**Mean Orientation of Consistently Exporting and Newly  
Exporting Industries, 1965-1970**  
(in per cent)

	1965	1966	1968	1969	1970
Consistently Exporting Industries (64 industries)	12.28	12.87	14.31	12.72	17.53
Newly Exporting Industries (24 industries)	0.0	0.0	7.48	7.46	11.46

From this table, a few general conclusions can be made: first, there was a generally increasing trend in export orientation; second, while 1968 was a "good" year, 1969 was a "bad" year for exports; and, third, 1970 has yet to be the "best" year. The rise in export orientation in 1968 and the slump in 1969 can best be explained by the pervading economic conditions during those years. As was pointed out earlier, 1967 marks the official pronouncement of a new industrialization strategy based on export expansion. The upswing in export activities in 1968 then was a likely result of such a public policy. Within a year, however, the impending threat of a peso devaluation had offset this trend to export. In anticipation of windfall profits due to higher peso prices of exports, exports fell temporarily. True enough, after the official devaluation in February 1970 and the adoption of a floating exchange rate, exports rose with new vigor.

A closer look at the export orientation of each manufacturing industry reveals other features of the industrial sector, such as the industrial concentration of export orientation. But before going into this, a cut-off point for export orientation is necessary for a five-year analysis of the industries. The rounded-off value of the lowest  $\bar{E}$  for the period, which is 10 per cent, is deemed to be a valid cut-off point. Hence, for this discussion, industries shall be regarded as export industries only if they export at least 10 per cent of their gross output.

To compare the export orientation of industries, three cut-off lines have been used. These are the annual  $\bar{E}_1$ , 10 per cent and 1 per

cent levels of export orientation. The number of industries which lie above the cut-off line of 10 per cent is nearly the same as the number of industries which exported at least as much as their  $\bar{E}$ .

The lowest cut-off value of 1 per cent serves to emphasize the low export orientation of the majority of the manufacturing industries. Only about one-half of all manufacturing industries with any export earnings at all exported at least 1 per cent of their gross output. The table below summarizes that portion of the graphs.

Number of Manufacturing Industries with 1%  
Level of Export Orientation, 1965-70

	<u>1965</u>	<u>1966</u>	<u>1968</u>	<u>1969</u>	<u>1970</u>
Number	39	41	62	58	63
Per cent of total no. of industries	43.33	45.11	54.38	51.78	55.36

The general pattern of manufacturing industries — both the consistently exporting and the newly exporting industries — shows a movement towards greater export orientation. This was most evident in the following major industries: textile goods and wearing apparel, leather goods, furniture and fixtures, non-metallic products, vegetable oils, and the manufacture of miscellaneous products. Credit is due to the export expansion program in the modern sector and to the manufacturing industries which have taken advantage of the export incentives.

### Factor Intensity of Manufacturing Industries

The factor intensity of industries will be measured using Lary's method. A low census value added per employee implies labor intensity; a high census value added per employee indicates capital intensity. For the study, "low" and "high" values will be determined by the sign of their deviation from the annual average census value added per employee,  $(C_i - \bar{C})$ . A negative deviation, that is,  $C_i < \bar{C}$ , means labor intensity, while a positive deviation,  $C_i > \bar{C}$ , points to capital intensity.

The cut-off point between labor and capital intensity is P9,912 for 1965 and P20,429 for 1970, both of which are the means of census value added per employee for the two years. Furthermore, to distinguish the low labor-intensive from the high labor-intensive, two more demarcation points have been chosen. In both years the median value of the census value added per employee of the labor-intensive industries and of the capital-intensive industries were selected. The rounded-off median values for the labor-intensive industries in 1965 and 1970 are P4,850 and P8,000, respectively. For the capital-intensive industries, they are P14,800 and P32,000, respectively.

Major industries can be said to be generally labor-intensive or capital-intensive. The labor-intensive major industry groups are textiles, textile products and wearing apparel, wood manufactures, furniture and fixtures, printing and publishing industries, leather goods, paper manufactures, non-metallic basic products, and miscellaneous manufactures. The capital-intensive industries are beverages, chemicals, vegetable oils, and petroleum products. Among the major industry groups, food preparations, rubber manufactures, basic metal manufactures, and machinery are neither labor — nor capital-intensive industries. For instance, some food industries like the manufacture of grain mill products, sugar and margarine are capital-intensive, while the manufacture of fruit, fish and meat preparations are labor-intensive. It may be observed, however, that most of the industries of these major industry divisions are labor-intensive rather than capital-intensive.

Differentiating further the degree of labor intensity, highly labor-intensive and low labor-intensive industries can be selected. The following industries are highly labor-intensive: the textile products and wearing apparel industry, the wood industry, the furniture industry, and the leather industry. The printing industry, and the manufacture of non-metallic basic materials are generally low labor-intensive. Many food industries and many textile mills products are low labor-intensive. Likewise, many basic metal industries, machinery industries, and manufacture of miscellaneous goods are also low labor-intensive.

Among the capital-intensive industries, paper manufactures, and tobacco products are generally low capital-intensive, while the vegetable and animal oils industry, and the petroleum industry are highly capital-intensive. Some of the chemical industries, and the metal, machinery, and food industries which are capital-intensive are low capital-intensive; the rest are highly capital-intensive.

A comparison of the relative position of industries for boundary years 1965 and 1970 reveals that very little change in factor intensity occurred in the manufacturing sector. Only four industries showed any shift in factor intensity.

The table below gives the percentage distribution of manufacturing industries according to factor intensity. It proves that in 1970 there was a marked shift from capital to labor intensity, and in fact to high labor intensity in the manufacturing sector. Moreover, where capital intensity prevailed, the evidence showed a movement towards a relatively lower degree of capital intensity than in 1965.

**Percentage Distribution of Manufacturing Industries, According to Factor Intensity**

	1965	1970
Labor Intensive Industries	67.57	70.00
Highly labor-intensive industries	36.49	38.00
Low labor-intensive industries	31.08	32.00
Capital Intensive Industries		
Highly capital-intensive industries	16.21	10.00
Low capital-intensive industries	16.22	18.40

Discovering the different factors which have brought about the shift in factor intensity of industries is beyond the scope of this paper. At this point, it suffices to hypothesize that the government's deliberate export-orientation policy (which covers a host of incentives along this line) is one major factor which influenced the changes in the relative use of productive factors in the said industries. This hypothesis will be examined later.

#### **Skill Composition of Industries**

In this section, the level of skills in the manufacturing industries being considered will be estimated. The ratio of production workers to total employment, denoted by  $P_i$ , is used to determine the level of

skills. To differentiate which industries use a lower level of skills from those which require a higher level, standard levels will be selected. Industries which employ a lower level of skills will be termed "unskilled-labor intensive", and those which employ a higher level of skills will be termed "skilled-labor intensive". The first category has further been divided into two: "highly unskilled-labor intensive" and "low unskilled-labor intensive" industries. The second category has also been divided into two other classifications: "highly skilled-labor intensive" and "low skilled-labor intensive" industries.

To determine the levels of skills, three standard values are used for each year: the mean  $P_i$  (denoted by  $\bar{P}$ ), the median values of those with  $P_i > \bar{P}$ , and those with  $P_i < \bar{P}$ . The value of  $\bar{P}$  is 77.42 per cent in 1965 and 73.67 per cent in 1970.  $\bar{P}$  separates all unskilled-labor intensive industries. The median value of industries with  $P_i > \bar{P}$  (83.00 per cent in 1965 and 82.00 per cent in 1970) differentiates industries with high unskilled-labor intensity from those with low unskilled-labor intensity. Similarly, the median value of industries with  $P_i < \bar{P}$  (66.00 per cent in 1965 and 64.00 per cent in 1970) further divides industries according to high skilled-labor intensity and low skilled-labor intensity. Data for the initial and terminal years of the period are used.

Industries which utilize a lower level of skills are those producing tobacco, textiles, wearing apparel, wood products, furniture, non-metallic products, leather, miscellaneous goods and the printing industry. The last five industries are classified under the low unskilled-labor intensive division, while the first four belong to the highly unskilled-labor intensive portion of industries.

Industries which employ labor with higher levels of skills are the chemical industry, the manufacture of vegetable oils, and the petroleum industry. Many industries which belong to one major industry group require varying levels of skills. Among those are the food industries, the machinery industries, the rubber industries, and the paper products industries. None of the machinery industries belong to the high skilled-labor intensive group although they belong to the other groups. The paper products industries are found in the middle categories of low unskilled-labor intensity and low skilled-labor intensity. The rest of the industries are spread throughout the four skill categories.

The shifts from skilled labor to unskilled labor intensity, from low unskilled to high unskilled-labor intensity, and from high skilled- to low skilled-labor intensity are of primary interest in the study. Most of the industries which experienced shifts in the levels of skills landed in the middle categories of low unskilled- and low skilled-labor intensity.

The following table summarizes the skill composition of manufacturing industries at the beginning and at the end of the period.

Percentage Distribution of Manufacturing Industries  
According to Skill Composition, in per cent

	1965	1970
Unskilled-Labor Intensive Industries	56.42	62.16
Highly Unskilled-labor intensive industries	30.85	32.48
Low Unskilled-labor intensive industries	25.53	29.78
Skilled-labor Intensive Industries	43.58	37.84
Highly skilled-labor intensive industries	22.34	18.08
Low skilled-labor intensive industries	21.28	19.82

The pattern of changes in skill composition of industries is evident from the table above. In general, there was a movement toward the use of lower levels of skills. Of the unskilled-labor intensive industries, a greater portion in 1970 belong to the highly unskilled-labor intensive category — 32 per cent as compared to the 30 per cent in 1965. Moreover, even among the skilled-labor using industries there was a tendency to use a lower level of skills.

The preceding sections have shown the pattern of change in the structural characteristics of manufacturing industries; namely, the

degree of export orientation, factor intensity, and skill composition of labor employed. Since the period under study is characterized by the beginning of renewed interest in the export capacity of the industrial sector, the shifts in export orientation are regarded as fruits of the general economic conditions of the time; in particular, of the government's program to encourage exports. In fact, the changes in factor intensity and skill composition, it is hypothesized, are influenced by the export expansion program. To establish the association between export orientation and the other two variables, factor intensity and skill composition, correlation techniques were used.

As expected, a positive correlation exists between export orientation and the ratio of unskilled labor to total employment, while a negative correlation exists between export orientation and census value added per employee. These results confirm the hypotheses that export-oriented industries are more labor-intensive than non-export industries, and that they use lower levels of skills than the latter. Thus, it is safe to attribute the shifts in factor intensity and in the skill composition of labor in manufacturing industries in 1970 to changes in the degree of export orientation of the industries.

The findings on the structural characteristics of manufacturing industries can be integrated in a mapping of the industries' export orientation against their factor intensity and skill composition.

The following conclusions emerged from such examination of 1965 and 1970 data:

- (1) Most industries are highly labor-intensive with low export orientation;
- (2) Nearly all industries with at least 10 per cent export orientation are labor-intensive, while only a couple of capital-intensive industries are export-oriented;
- (3) Most capital-intensive industries export less than one per cent of their output;
- (4) Except for the petroleum industries, none of the Philippine manufacturing industries considered are really highly capital-intensive;

(5) Nearly all the labor-intensive industries use relatively high levels of skills.

### Output Elasticities of Employment

The employment and output data of manufacturing industries were fitted into the following multiple regression equation:

$$L = a O_x^{b_1} O_d^{b_2}$$

The regression coefficients  $b_1$  and  $b_2$  give the percentage change in  $L$  given a percentage change in the explanatory variables and are called the output elasticities of employment. Of particular interest, then, is the magnitude of each of these coefficients. Whether  $b_1 > b_2$  or  $b_1 < b_2$  and to what degree they diverge is of importance to policymaking.

Below is a summary of the findings on the employment elasticities with respect to the output components:

#### Regression Results

Name of Industry	Intercept	$b_1$	$b_2$	$\bar{R}^2$
Food	0.313	0.164	0.515*	0.7050
Beverage and Tobacco	0.282	-0.022	0.646**	0.4512
Textile Mills Products	0.697	0.435*	0.359*	0.9712
Textile Goods & Wearing Apparel	-0.748	0.589*	0.483*	0.8871
Wood Manufactures	-0.362	0.265*	0.624*	0.9927
Furniture & Fixtures	0.116	0.453**	0.420**	0.5181
Printed Manufactures	2.200	1.778**	-0.583	0.2178
Chemicals	-1.084	0.093	0.785*	0.7284
Non-Metallic Products	0.636	-0.127	0.678*	0.9438
Metallic Products	0.504	-0.053	0.617*	0.5547
Non-electrical Machinery	0.957	0.159	0.673*	0.9438
Metallic Products	0.504	-0.053	0.617*	0.5547
Non-electrical Machinery	0.957	0.159	0.673*	0.9214
Electrical Machinery & Transport Equipment	-1.988	0.452*	0.848*	0.9512
Principal Manufactured Exports	0.404	0.265	0.402*	0.4439

\*Significant at least at the 5 per cent level.

\*\*Significant at the 10 per cent level.



Of the twelve major industry divisions included in the regressions, only employment elasticity with respect to exports rather than employment elasticity with respect to domestically-consumed output were included. These were the textile, textile products and wearing apparel, furniture and printing industries. All the rest possessed higher  $b_2$  than  $b_1$ .

Of the five industries with  $b_1$  greater than  $b_2$ , the printing industry possessed the highest employment elasticity of exports, and the textile goods and wearing apparel industry had the second highest employment elasticity of exports. The printing industry, however, is not an export-oriented industry. Only one of its industries, the printing of books and pamphlets, ever exported at least 1 per cent of total output, and only for one year during the entire period. Because of this, the high employment elasticity of its exports cannot be utilized to generate employment.

On the other hand, the textile goods and wearing apparel industry has exhibited an upward trend of export orientation. Moreover, it is one of the highly labor-intensive manufacturing industries, and employs lower levels of skills than most of the other industries. It is clear then that an export promotion scheme that is designed to absorb labor as well will be most effective for this industry.

The preceding comparison of the output elasticities of employment of manufacturing industries illustrates the importance of the regression coefficients for policymaking. Considering the government's current policy of promotion as an industrialization strategy and as an effective solution to the severe unemployment problem, industries with greater  $b_1$  and  $b_2$  should rapidly increase export earnings. In fact, by comparing the  $b_1$ 's of different industries, an export schedule designed to absorb the unemployed can be prepared.

### Summary and Conclusion

The study was undertaken to evaluate the impact of a vigorous export promotion scheme in the industrial sector on some of the structural features of the manufacturing industries; namely, degree of export orientation, factor intensity, and skill composition. It was hypothesized that Philippine export-oriented manufacturing industries are labor-intensive, using a lower level of skills than non-export-oriented industries. Furthermore, the study tested whether increases in export orientation go hand in hand with shifts towards more

labor-intensive production techniques and towards the use of more unskilled labor. The findings discussed in the sections above give evidence to these.

An analysis of the degree of export orientation of industries revealed that about half of all manufacturing industries export at least 1 per cent of their total output. The industries with an export orientation of at least 10 per cent constitute only about one-fourth of all manufacturing industries. These industries are mostly labor-intensive industries. The exceptions are the manufacture of sugar, coconut oil, and of non-ferrous basic metal products. It may be noted that the first two are principal manufactured exports which enjoy special treatment in their respective markets. The other export industries which have to compete in the world export markets have to take advantage of the comparative advantage of the Philippines in labor-intensive production processes and in the use of a lower level of skills. It was found that a great portion of the manufacturing industries indeed use a lower level of skills, and that nearly all exported manufactures embody lower skills.

However, more important perhaps than these findings are the conclusions drawn from the analyses of the trend of export orientation and the structural shifts in factor intensity and skill composition. As was hypothesized, the generally increasing trend in export orientation of the manufacturing sector is accompanied by a movement of industries towards the use of lower levels of skills. In other words, during the period 1965-1970 which was characterized by a new consciousness to promote manufactured exports, manufacturing industries responded by employing relatively more labor than capital and more unskilled laborers than skilled laborers, and by increasing the degree of export orientation.

The findings of the study very briefly summarized above carry strong policy implications. For one, if the government is serious about the promotion of export-oriented, labor-intensive manufacturing industries to ease the unemployment problem, then better estimators of the labor absorption capacity of industries should be used. The industries which would benefit from export incentives should be selected not only on the basis of the growth trend or the stability of the absolute value of exports, or the number of employment generated by exports. More important than the growth pattern of the absolute value of exports is the growth trend of export orientation. The former may rise and yet not necessarily indicate

adjustments taking place within the industry. An increasing export orientation (that is, the growth of exports exceeds the growth of output) or a steady export orientation (that is, the growth of exports is equal to that of output) disclose the ability of the industry to rationalize its production processes and to continually extend outward into the world export markets. In other words, to claim that an industry shows a generally upward trend of export orientation is to mean more than just an increase in the absolute value of exports; it is to recognize the ability of the industry to realize the comparative advantage of Philippine industries.

With respect to labor use, although the proportionality method is an easy way to compute for employment generated by exports, the ability of already labor-intensive industries to shift to even more labor-intensive processes and the employment elasticity of output exported of industries might be a more sound criterion to determine which industries would best contribute to the targets of the export promotion scheme. The responsiveness of industries regarding factor mix actually refers to the elasticity of substitution of industries. The study did not dwell on this. The movements in factor intensity and in skill composition may roughly suggest the ability of industries to substitute labor for capital.

The employment elasticity with respect to output exported gives the percentage change in employment corresponding to a percentage change in exports. The comparison between this and the employment elasticity with respect to domestically-consumed output further identifies which industries should receive export incentives. This was done for broad industry divisions. Time-series output elasticities of employment computed for every four-digit level industry would be most useful for policymaking.

In addition to labor intensity, the skill composition of the labor employed in manufacturing industries should be another criterion for choosing priority industries. Since a great majority of the Philippine labor force is unskilled labor, the comparative advantage of export manufactures lies in the use of lower levels of skills.

But aside from improving the criteria used for determining priority industries, the means for evaluating the entire export expansion program should also be upgraded. This brings to the fore the problem of inavailability of data. In particular, the *Annual Survey of Manufactures* may be geared towards the collection of various

statistics needed for an evaluation of the export promotion scheme in the manufacturing sector. For a start, output data in quantity as well as money terms need to be available. The fraction of output exported, the fraction of employment generated for export purposes alone, and the breakdown of employment into at least three groups (unskilled, skilled, and technical labor groups) are other relevant statistics which are not available at present.

Finally, further studies on the export performance of the manufacturing sector and on its labor absorption capacity along the approach proposed in this paper may look into the elasticities of substitution of export-oriented industries. Then a broader perspective on the employment impact of export-oriented labor-intensive manufacturing industries can be achieved.

## FOOTNOTES

<sup>1</sup>John H. Power and Gerardo P. Sicat, *Industrialization in the Philippines*, (EDR Discussion Paper No. 70-11, April, 1970).

<sup>2</sup>"The basic strategy for industrial development under the current plan calls for the promotion of export-oriented industries; the encouragement of labor-intensive techniques of production . . . in the industrial sector . . . For the present development decade, export expansion of manufactured products based on comparative advantage . . . shall serve as the new engine for economic growth;" quotation from the *Four-Year Development Plan, FY 1974-77, Condensed Report*, National Economic & Development Authority.

<sup>3</sup>One of the few articles which relate exports to employment is "The Employment Impact of Exports of Labor-Intensive Manufactures", written by Benvenido Noriega for the Workshop on Manpower and Human Resources (October 13-15, 1972). Using Hal Lary's measure of factor-intensity (average census value added per industry), he drew up a list of labor-intensive manufactures based on employment generated for the period 1964-70 and on their stability as export products. However, there was no attempt to relate the export orientation of industries to structural changes in employment.

<sup>4</sup>Ohlin, Bertil, *Interregional and International Trade* (Cambridge: Harvard University Press, 1933).

<sup>5</sup>Computations made by Mijares and Tidalgo in *Labor Absorption in the Philippines*, May 1971, using the 1965 BCS Survey of Households, disclose that 62 per cent of the labor force reached only elementary school (with only 21 per cent completing Grade 6 or 7), 16 per cent stepped into secondary school (with only 7 per cent finishing it), 8 per cent went to college (with 4 per cent completing their fourth year), and 14 per cent did not go to school at all.

<sup>6</sup>Computed from *Annual Survey of Manufactures* data.

<sup>7</sup>This category comprises non-production personnel of the establishment including those engaged in the following activities: factory supervision above the working foreman level, sales delivery (truck drivers and their helpers), advertising, purchasing, finance, legal, personnel (including cafeterias, medical, etc.), professional and technical. It includes executives, supervisors and all non-production employees of the establishment.

<sup>8</sup>Hal B. Lary, *Imports of Manufactures from Less Developed Countries* (New York: Columbia University Press, 1968).

<sup>9</sup>An attempt was made to investigate the educational attainment of employees in each occupational division to reconcile the occupational index with the educational or skills index. Since no such information is available, production workers will be used to estimate the unskilled labor employed in manufacturing industries.

**<sup>10</sup>Gerardo P. Sicat, *Towards Industrial and Employment Expansion: Alternative Proposals for Economic Incentives Legislation Applied to Export and Industrial Promotion*, IEDR Discussion Paper No. 68-22, July, 1968 and Noriega, *op. cit.***