FACTOR PRODUCTIVITY AND FACTOR INTENSITY IN PHILIPPINE MANUFACTURING, 1969 AND 1972

By

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Introduction

Rapid industrial growth is generally recognized as an important element in the economic development of present-day less developed countries. The proper structuring of the industrial sector on criteria of efficiency and growth is necessary for it to maximize its contribution to the country's economic performance.

The extensive literature on the development process gives much attention to the utilization of scarce resources in production. Developing economies such as the Philippines have two common characteristics, namely, the very limited capital resources and the relatively abundant labor in these economies. A thorough examination of factor productivity and intensity in the different industries would be useful in providing informational guidance to economic planners in promoting industries that could utilize capital resources more efficiently and those that could provide productive employment for the existing surplus labor.

The objective of the present study is to identify and examine industries in the manufacturing sector at the 3-digit International Standard Industrial Classification (ISIC) level which exhibit high productivity per peso of capital investment and have the capacity to generate large employment opportunities with minimum capital requirements. The study will include two relatively recent years — 1969 and 1972. An examination of the structure of the industries in each year will be conducted and then a comparison of the results for the two years will be made.

The primary source of data for 1969 is different from that of 1972. The methods of deriving the relevant variables are also different for the two years. The industry analysis for the year 1969 will first be presented. The methodology used will be discussed in detail and will be followed by a discussion of the results. The same will be done for 1972. In the concluding section of the paper, the results for the two years will be reconciled.

The industry study will be made by considering the productivity of the two factors of production — capital and labor. The relative intensity of the factors used as measured by the capital-labor ratio will also be considered. By knowing the productivity of capital and labor, one can have an idea of the efficiency in the utilization of resources of the different industries. On the other hand, by knowing the factor proportion, one can get an insight of the employment generating capacity of the industries.

This study utilizes the replacement value of capital in the computation of capital productivity and the capital-labor ratio. So far, only the recent ILO Employment Mission has made use of the replacement value of capital in computing the said ratios.[1] However, this was done only by estimating the replacement value of capital from the *Annual Survey of Manufactures* published by the Bureau of Census and Statistics (BCS).

In the present study, factor productivity and factor intensity will be examined by using the replacement value of capital, both as estimated using the ILO procedure and also as directly obtained in a survey report. For 1969, the replacement value of capital is estimated from the undepreciated value of capital, assuming straight line depreciation among manufacturing firms. On the other hand, the value for 1972 is obtained from original data solicited in the recent NEDA-World Bank Capital Utilization Survey of Philippine manufacturing.

Although two different methods are employed in getting the replacement value of capital for 1969 and 1972, the result of the analysis reveals no contradiction in the computed values of capital productivity and capital-labor ratio of the industries for the two years. This shows the consistency of the two different methods of

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[1] As reported in *Sharing in Development: A Program of Employment, Equity and Growth for the Philippines* (Geneva, 1974).

deriving the replacement value of capital and the two different sets of data used.

Another important feature of this study is the use of daytime shift employment in measuring the capital-labor ratios. For 1972, factor intensity is measured using both total employment and daytime shift employment as the labor data. By utilizing daytime shift employment, more comparable values of the operating ratios across industries are obtained since distortions due to differences in the employment figures resulting from the industries having different number of workshifts are eliminated.

Analysis for 1969

All industries analyzed for the year 1969 belong to the BCS classification of "large estabishments", meaning those employing twenty or more workers. With this the industries could be examined at the 3-digit ISIC level using the *BCS Annual Survey of Manufactures*.

Productivity of capital was measured by census value added per unit of capital in terms of replacement cost (VA/K_r), while productivity of labor was measured by census value added per worker (VA/N). The capital-labor ratio was calculated by the ratio of capital, also in terms of replacement cost, to total employment (K_r/N).

Replacement costs were utilized instead of the book value because the latter becomes meaningless if the average useful life of the assets is not well approximated, resulting in an over- or under-estimation of depreciation. Since book value is the original cost minus accumulated depreciation, an inaccurate estimate of depreciation will result in inaccurate book values.

The value added and employment figures are obtained directly from the *BCS Survey of Manufactures*. The only variable that had to be determined was the replacement value of capital in the computation of the three ratios needed, *viz.*, VA/K_r, VA/N, K_r/N.

In calculating the replacement value of capital (K_r) for each industry, the undepreciated (original cost) value of capital (K_g) was adjusted for the observed price increase of durable equipment from the average year the fixed capital was installed to the year of the survey (1969). The undepreciated value of capital was computed by

multiplying the average standard life of the fixed capital, given in n years, by the reported amount of depreciation in the year of the survey. The assumption here is that the straight line depreciation method overwhelmingly predominates among firms. Therefore,

$$K_g = nD$$

The year the fixed capital was bought is T years (the average age of fixed capital) less the year of the survey. Hence, the replacement value of capital in 1969 is given by

$$K_r = K_g \left(\frac{P_{1969}}{P_{1969-T}} \right)$$

where P is the price index for durable equipment.

The average age of fixed capital (T) was computed by subtracting the remaining life of capital which is book value divided by depreciation, from the average standard life of capital which is n.

$$T = n - \frac{K_d}{D}$$

The values of K_d and D are provided in the *BCS Survey* while the implicit price index for durable equipment (P) is given in the *NEDA National Income Accounts*. The average standard life of fixed capital is as reported in the *Asset Depreciation Range* of the U.S. Department of Treasury but multiplied by an adjustment factor of 1.5 to account for the longer economic lifespan of capital equipment in less developed countries. Table I shows the estimated replacement value of capital as well as the relevant variables used in the computation for each 3-digit industry in Philippine manufacturing for the year 1969.

In Table II factor productivities and intensity are presented for the fifty 3-digit industries. The industries are ranked according to capital productivity. Seen to be most efficient in the use of capital are those producing wood and cane containers, liquors and malt products, embroideries, wearing apparel, batteries, electric lamps and wires, made-up textile goods, drugs and cosmetics, non-ferrous metal

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vegetable oils and fats, footwear, and wood and rattan furniture and fixtures.

Of these industries, those that have low capital-labor ratios, which indicate great capacity to generate employment, deserve special attention. Most noteworthy among these labor-intensive industries are wood and cane containers with P1,842 capital per worker, textile goods with P3,449, and embroideries with P4,313. For footwear, it is P4,447 per worker while for wearing apparel, P4,814 per worker. Wood and rattan furniture and fixtures also have a relatively low capital-labor ratio of P6,391.

Other promising labor-intensive industries are those which exhibit average efficiency in capital use: sawmills and planning mills, doors, windows and other fabricated millworks, other rubber products, fabricated structural metal products, other printing, publishing and allied industries, household electrical appliances and wares, and miscellaneous manufactures.

Many of the new manufactured export industries are ranked in the first half of the list given in Table II. The most outstanding are embroideries, manufacture of wearing apparel and made-up textile goods. Good performance is also attributed to drugs and cosmetics, footwear, wood and rattan furniture and fixtures, and cigars, cigarettes and smoking tobacco. The capacity to expand output and employment in these industries is high because demand is not only confined to the domestic market but to the foreign market as well.

A further look at the lower half of the table shows that many of the heavy manufacturing or capital-intensive industries have very low values of capital productivity. Among these are cutlery, hand tools and general hardware, slaughtering, preparing and preserving of meat, structural clay products, special industry machinery, and general industrial machinery and equipment.

Analysis for 1972

For the study of the industries in 1972, the source of basic data is the recent NEDA-World Bank comprehensive survey on capital utilization among manufacturing establishments in the country.[2]

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[2] Cf. R.M. Bautista, "The NEDA-World Bank Capital Utilization Survey of Philippine Manufacturing," I.E.D.R. Discussion Paper No. 74-14, U.P. School of Economics (October 7, 1974).

Data needed in computing the productivity of capital and labor as well as the capital-labor ratio can be obtained from this survey. These are the following: replacement value of capital, value added, total employment, and the number of workers in the daytime shift.

For this 1972 survey, industries were classified according to the 1968-revised International Standard Industrial Classification.[3] However, for the 1969 industry study, the classification as based on the *BCS Annual Survey of Manufactures* were patterned after the 1958 ISIC. Due to such difference in the classification system for the two years, the industries in the 1972 survey had to be reclassified in accordance with the 1969 classification to permit a comparison between the two years. It may be noted that with this reclassification, some industries singly classified for 1969 were grouped for 1972. Another point to be made is that industries listed in the 1972 survey were not necessarily present in the 1969 study and vice versa simply because the samples in the two surveys for the two years were different.

Having obtained the needed data from the survey report, value added and replacement value of capital were deflated to eliminate the influence of price changes. The deflated figures would provide a better comparison of the productivity of capital and labor and also the capital-labor ratio of 1972 to that previously obtained for 1969 in the preceding section of this paper.

For the replacement value of capital, the deflator used was the implicit price index for durable equipment. This was taken from the *NEDA National Income Accounts.* On the other hand, the deflator used for value added was the Central Bank wholesale price index for domestic products. This price index included non-manufactures, but only those divisions pertaining to manufactures were utilized. This was chosen as the appropriate price index because it provided a measure of the pricing of domestic commodity production both for home consumption and for exports. Since the industries being studied are industries which produce commodities for home use as well as for exports, it is correct to use the wholesale price index of domestic products.

As in the previous part of this paper, the productivity of capital

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[3]*Indexes to International Standard Industrial Classification of All Economic Activities,* U.N. Statistical Office, New York, 1971.

was obtained by the ratio of value added to replacement value of capital, VA/K_r. However, in obtaining the productivity of labor and the capital-labor ratio, two different measures of the labor input were used, namely, total employment and employment in the daytime shift. Thus, productivity of labor could be obtained by the ratio of value added over total employment (VA/N) or value added per worker in the daytime shift (VA/DS); the capital-labor ratio could be measured by the replacement value of capital total employment (K_r/N) or replacement value of capital over employment in the daytime shift (K_r/DS).

Total employment is necessarily greater than employment in the daytime shift. This is because total employment includes, in addition to workers in the daytime shift, workers in two other shifts. In fully utilized plants there are three shifts with eight hours each, that is, the industries operate twenty-four hours a day. However, the difference between total employment and employment in the daytime shift varies a lot from industry to industry. In many of the industries, there is a great difference between these two employment figures. Of the fifty-nine industries, there are twenty-three industries whose total employment is less than twice daytime shift employment and thirty-four industries whose total employment is less than 2.5 times the number of workers in the daytime shift. Since there is a difference in daytime employment and total employment, one gets different values for labor productivity and the capital-labor ratio depending on what employment figure is used.

Table III gives the computed values of the productivity and capital-labor ratios for the different industries ranked according to productivity of capital. Most efficient in the use of capital are: musical instruments; wood and cane containers and small cane wares; carpets, rugs and mattings; batteries, electric lamps and wires; tobacco products; scientific equipments; household electrical appliances and wares; distilled, rectified and blended liquors including malt products; soft drinks and carbonated water; and wood products, n.e.c. and cork products.

Of these industries, the most labor intensive in terms of both total and daytime employment are: wood and cane containers and small cane wares; musical instruments; carpets and mattings; and wood products n.e.c. and cork products. Each of these industries is seen to have capital requirements per daytime laborer of less than P5,400. Other industries which show moderate efficiency in the use of capital

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but are labor intensive are wearing apparel; manufacture of footwear, rattan furniture and fixtures; and other furniture and fixtures. New manufactured exports exhibiting both high capital efficiency and high labor intensity are: tobacco products; wearing apparel; drugs, cosmetics and cleaning preparations; footwear; rattan furniture and fixtures; and other furniture and fixtures, n.e.c.

A closer examination of the industries in Table IV shows that generally more capital intensive industries exhibit lower efficiency in terms of productivity of capital. The most capital intensive industries in the list are: petroleum refineries; manufacture of cement, lime and plaster; basic industrial chemicals and fertilizers; plastic materials, synthetic resins and man-made fibers except glass; and manufacture of grain mill products.

The structure of the industries from this 1972 study is roughly similar to that of 1969. There are, however, certain slight variations in the characteristics of the industries for 1969 and for 1972. This will be discussed in the next section which also includes some general conclusions.

General Evaluation and Conclusions

From the industry studies for 1969 as well as for 1972, it is evident that there are many labor intensive industries which are also efficient in the use of capital, in terms of the operating ratios used in the present study. The structure of the industries presented in the two previous sections show that almost all industries in the upper half of the capital efficiency scale for 1969 are also in the first half of the scale for 1972. It was noted, however, that there were some industries which had high efficiency but were included in only one year of the study. This is probably attributable to the fact that the sample of industrial plants in the BCS survey for 1969 was not the same one used in the capital utilization survey for 1972.

Comparing the magnitude of the productivities of capital as well as the capital-labor ratios for corresponding industries between the two years, it can be observed that the productivity of capital generally increased from 1969 to 1972. The productivity of capital for 1969 had a mean and median of .367 and .263 value added per peso of capital investment, respectively. On the other hand, the productivity of capital for 1972 had a mean of .445 value added per peso of capital and a median of .325 value added per capital. The industries

capital-labor ratios also increased generally over this same period. The average capital-labor ratio for 1969 was P52,006 per worker while for 1972 it was P57,599 per worker.

Some of the labor intensive industries which are efficient in high and moderate degrees in the use of capital during 1969 and 1972 have been identified in the earlier discussions. However, it is worth enumerating once more some of these industries. The following are industries which exhibit high efficiency as shown by their positions in the upper half of the efficiency scale for *both* 1969 and 1972, and have capital requirements per worker of only P10,000 or less, also for either of the two years: wood and cane containers and small cane wares; wearing apparel; manufacture of footwear; and rattan furniture and fixtures. Other efficient industries which have a capital-labor ratio of less than P30,000 (which is very much below the average capital-labor ratio for either year) are: batteries, electric lamps and wires; household electrical appliances and wares; wood products n.e.c. and cork products; manufacture of bakery products; and canning and preserving of fish and other sea foods.

Among the industries studied, only the industry for made-up articles including embroideries showed very inconsistent results for the two years. For 1969, this industry was one of the most efficient in the use of capital with .764 value added per peso of capital. However, for 1972, it was one of the least efficient, having only .105 value added per peso of capital invested. The difference was the result of a very high replacement value of capital for 1972 in comparison to 1969. One probable explanation for such wide difference in value added and replacement value of capital for the two years is the difference in samples used in the two surveys. The possibility of the inaccuracy in the values of the variables used in obtaining the replacement value of capital for 1969 should also be noted.

Generally, however, the study showed the structure of the manufacturing industries to be essentially similar in 1969 and 1972. There were a considerable number of the industries which exhibited an overlap of high capital efficiency and high labor intensity. It was also noted that many of the country's new manufactured exports fall under this category. Allowing these industries to expand will therefore give high social returns to the country in terms of the industries' contribution to economic growth and provision of additional employment. This does not imply, however, that econo-

mic policies should favor only labor intensive industries, but that all efficient ones should be allowed to grow.

What is well-known is that the growing structural imbalance in the industrial sector during the past decades had been accompanied by increasing unemployment and underemployment, which was only partly due to the slow to moderate growth of manufacturing output. But it was also due to the character of that growth, concentrating on large scale, capital intensive industries, which failed to contribute significantly to employment.[4] Emphasis should therefore be laid on the restructuring of the manufacturing sector toward industries that efficiently use the country's scarce capital resources *and* employ more of the abundant labor resource. A proper economic environment should be provided for efficient, labor intensive industries so that the manufacturing sector can fully contribute to the country's development goals.

[4] *Sharing in Development, op. cit.*, esp. Chapter 4.

Table 1
Replacement Value of Capital in the Manufacturing Sector and Other Relevant Variables, 1969

ISIC Code	Book Value Kd (P1,000)	Depreciation D (Pesos)	Remaining Life $\frac{Kd}{D}$ (Years)	No. of Useful Life n (Years)	Age T (Years)	Original Cost Kg (P1,000)	Replacement Value Kr (P1,000)
	24,726	1,560	15.8	26.4	11	41,187	98,025
	25,177	3,552	7.1	26.4	18	93,797	208,229
	87,577	8,905	9.8	26.4	17	235,095	493,700
	65,973	7,760	8.5	26.4	18	204,877	454,827
	11,647	1,490	7.8	26.4	19	39,344	112,917
	448,991	31,637	14.2	26.4	12	835,238	2,046,333
	87,749	7,736	11.3	18.0	7	139,252	167,102
	67,039	13,366	5.0	22.5	18	300,753	667,672
	436,330	51,048	8.5	17.5	9	893,356	1,724,177
	46,829	4,859	9.6	17.5	8	85,038	107,998
	11,168	1,171	9.5	17.5	8	20,494	26,027
	6,888	913	7.5	13.5	6	12,335	13,692
	10,978	1,581	6.9	13.5	7	21,353	25,623
	26,182	2,628	10.0	16.5	6	43,375	48,146
	2,131	210	10.1	16.5	6	3,477	3,860
	47,832	11,507	4.2	11.0	7	126,582	151,898
	1,514	275	5.5	11.0	6	3,035	3,369
	357	55	6.5	11.0	4	605	659
	3,062	931	3.3	11.0	8	10,241	13,006
	13,728	1,519	9.0	15.0	6	22,790	25,297
	5,433	308	-	-	-	-	-
	4,088	4,420	9.3	21.0	12	92,826	227,424
	921	173	5.3	16.5	11	2,854	6,792
	45,510	5,423	8.4	18.8	10	101,952	236,529
	20,045	1,479	13.5	18.8	5	27,805	30,307
	277,914	23,606	11.8	16.5	5	389,499	424,554
	26,495	2,748	9.6	16.5	7	45,344	54,413
	90,442	13,028	6.9	16.5	10	214,964	498,716
	24,641	3,610	6.8	16.5	10	59,580	138,226
	22,691	2,416	10.8	24.5	14	59,192	152,123
	72,115	9,416	7.6	24.5	17	230,692	484,453
	5,806	429	13.5	24.5	11	10,518	25,033
	19,123	3,475	5.5	24.5	19	85,150	244,380
	97,750	16,409	6.0	24.0	18	393,818	874,276
	22,551	2,351	9.6	18.0	8	56,434	71,671
	30,615	4,149	7.4	18.0	11	74,687	177,755
	1,366	589	2.3	18.0	16	10,602	24,491
	26,605	3,922	6.8	18.0	11	70,596	168,018
	21,975	3,452	6.4	18.0	12	62,149	152,265
	8,056	1,225	6.6	18.0	11	22,055	52,491
	1,148	292	3.9	18.0	14	5,263	13,526
	16,696	2,120	7.9	18.0	10	38,174	88,564
	1,625	313	5.2	18.0	13	5,643	14,220
	3,466	827	4.2	18.0	14	14,886	38,257
	2,052	607	3.4	15.0	12	10,928	26,774
	24,365	3,416	7.1	15.0	8	51,240	65,075
	50,017	7,204	6.9	15.0	8	108,064	137,241
	18,718	3,407	5.5	15.0	10	51,118	118,594
	36,318	6,200	5.8	16.5	11	102,300	243,474
	50,707	8,760	5.8	16.5	11	144,543	344,012
	5,362	923	5.8	18.0	12	16,625	40,731

Source of basic data: *Annual Survey of Manufactures*, Bureau of Census and Statistics.

ISIC Code	Industry	VA/Kr	VA/N (P/worker)	Kr/N (P/worker)
255	Wood and cane containers and small cane wares	2.276	4,193	1,842
211	Distilled, rectified and blended liquors including malt products⁻	1.518	58,152	38,291
244	Embroideries	.838	3,618	4,315
243	Manufacture of wearing apparel except footwear	.808	3,889	4,814
373	Batteries, electric lamps and wires	.762	19,250	25,262
245	Make-up textile goods except embroideries	.690	2,380	3,449
315	Drugs, medicine, cosmetics and cleaning preparations	.642	27,271	42,476
342	Non-ferrous metal basic industries	.625	26,172	41,840
312	Vegetables and animal oils and fats	.581	18,548	31,876
241	Manufacture of footwear except rubber and plastic	.566	2,537	4,447
261	Wood and rattan furniture and fixture	.560	3,584	6,391
221	Cigars, cigarettes and smoking tobacco	.540	22,092	40,880
353	Fabricated structural metal products	.493	9,078	18,406
309	Other rubber products	.482	7,324	15,192
374	Household electrical appliances and wares	.457	11,943	26,116
202	Manufacture of dairy products	.382	42,532	111,298
251	Sawmills and planning mills	.378	4,786	12,650
259	Wood products NEC and cork products	.376	4,022	10,687
302	Tires and related products	.372	39,639	106,448
289	Other printing, publishing and allied industries	.322	7,428	23,026
333	Pottery, china and earthenware	.310	21,359	68,771
351	Metal cans, boxes and containers	.308	10,318	33,428
399	Miscellaneous manufactures, n.e.c.	.290	8,621	29,709
253	Doors, windows and other fabricated millworks	.279	4,000	14,336
207	Sugar milling and refining	.274	24,808	90,366
383	Motor vehicles	.264	16,021	60,480
375	Household radio, T.V., phonographs and accessories	.262	10,363	39,531
232	Knitting mills	.234	6,730	28,670
356	Heating, lighting and plumbing equipment except electrical	.226	7,496	33,071
359	Other fabricated metal products	.223	8,975	40,098
354	Stamped, coated and engraved metal products	.220	15,224	69,180
319	Miscellaneous chemical products	.217	13,097	60,334
355	Fabricated wire products	.198	14,247	71,700
206	Manufacture of bakery products	.182	5,868	32,186
311	Basic industrial chemicals and fertilizers except plastic	.178	18,867	105,558
205	Manufacture of grain mill products	.177	21,772	122,364
279	Pulp, paper and paperboard converted products	.169	14,731	86,704
363	Metal and wood working machinery	.162	6,055	37,324
239	Manufacture of textile, n.e.c.	.156	7,789	49,766
332	Glass and glass products	.145	12,443	85,487
231	Spinning, weaving and finishing mills	.142	6,078	42,661
203	Canning and preserving of fruits and vegetables	.140	8,109	57.790
339	Non-metallic mineral products	.114	9,364	81,487
341	Iron and steel basic industries	.096	11,419	118,358
381	Shipbuilding and repairing	.080	4,854	60,400
365	General industrial machinery and equipment except electrical	.078	6,067	77,380
364	Special industry machinery	.075	4,238	56,260
331	Structural clay products	.071	8,489	118,470
201	Slaughtering, preparing and preserving of meat	.069	8,058	115,458
352	Cutlery, hand tools and general hardware	.031	4,571	143,220

Note: VA = value added; Kr = replacement value of fixed capital;

Code No.	Industry	VA/Kr	VA/N (P/worker)	VA/DS (P/worker)	Kr/N (P/worker)	Kr/DS (P/worker)
	Musical instruments	2.562	5,559	6,694	2,169	2,612
	Wood and cane containers and small cane wares	1.880	3,273	4,500	1,740	2,393
	Carpets, rugs and mattings except rubber	1.478	7,122	7,973	4,818	5,393
	Batteries, electric lamps and wires	1.050	9,949	28,198	9,475	26,854
	Tobacco products	.942	15,822	26,239	16,792	27,848
	Scientific equipments	.855	13,550	54,200	15,835	63,340
	Household, electrical appliances and wares	.838	21,469	32,220	25,609	38,433
	Distilled, rectified and blended liquors including malt products	.831	78,232	136,198	94,039	163,717
	Soft drinks and carbonated water	.690	18,272	105,601	26,473	152,998
	Wood products, n.e.c. and cork products	.681	2,875	3,546	4,221	5,207
	Manufacture of dairy products	.621	24,538	99,603	39,517	160,402
	Paints, varnishes and related compounds	.616	28,854	51,194	46,808	83,046
	Non-ferrous metal basic industries	.589	25,752	41,795	43,654	70,848
	Non-metallic mineral products, n.e.c.	.555	8,698	15,897	15,655	28,614
	Wearing apparel	.526	3,930	6,729	7,468	12,786
	Drugs, medicine, cosmetics and cleaning preparations	.503	19,048	46,860	37,837	93,082
	Vegetable and animal oils and fats	.481	3,193	85,793	65,359	178,272
	Household radio, T.V., phonograph & accessories	.452	15,203	25,000	33,608	55,267
	Cordage, rope and twine industries	.441	9,480	19,769	21,488	44,813
	Fabricated structural metal products	.415	8,852	19,730	21,327	47,534
	Manufacture of bakery products	.413	4,671	9,873	11,287	23,861
	Miscellaneous manufactures, n.e.c.	.400	9,294	15,287	23,193	38,150
	Manufacture of footwear, except rubber and plastic	.381	3,833	5,242	10,058	13,753

Table III (continued)

302	Tires and related products	.374	20,300	157,379	54,152	419,8##
261,269	Rattan furniture and fixtures and others	.365	3,610	7,501	9,886	20,5##
204	Canning and preserving of fish & other sea foods	.364	4,420	9,409	12,114	25,7##
362	Agricultural machinery and equipment	.344	16,845	28,917	48,951	84,0##
393	Eyeglasses and spectacles	.343	6,960	20,879	20,293	60,8##
251	Sawmills and planning mills	.334	7,399	21,047	22,154	63,0##
271	Paper and paperboard mill products	.325	15,056	44,335	46,290	136,##
398	Fabricated plastic products, n.e.c.	.324	8,534	19,842	26,290	61,1##
369	Machinery except electrical	.324	8,928	15,238	27,540	47,00#
243	Manufactures of wearing apparel	.308	9,649	11,824	31,328	38,3##
383	Motor vehicles	.304	16,864	55,207	55,328	181,1##
201	Slaughtering, preparing and preserving of meat	.299	12,516	23,248	41,761	77,5##
209	Miscellaneous food products manufacturing	.294	9,033	29,721	30,668	100,9##
232	Knitting mills	.290	6,937	14,944	23,849	51,8##
385	Motorcycles and bicycles	.289	2,709	4,280	9,354	14,7##
333	Pottery, china and earthenware	.265	16,178	41,925	60,933	157,9##
203	Canning and preserving of fruits and vegetables	.262	5,430	27,148	20,717	103,5##
332	Glass and glass products	.258	13,587	28,566	52,527	110,4##
208	Manufacture of cocoa, chocolate & sugar confectionary	.211	6,044	15,266	28,622	72,2##
281,283, 289	Printing, publishing and allied industries	.197	6,710	15,345	34,072	77,9##
309	Other rubber products, n.e.c.	.191	10,116	17,026	52,716	88,7##
207	Sugar milling and refining	.183	13,851	61,308	75,614	334,0##
205	Manufacture of grain mill products	1.78	21,640	82,968	121,102	464,8##
314	Plastic materials, synthetic resins and man-made fibers except glass	.164	21,464	67,242	130,514	408,8##
272	Paper and paperboard bags, boxes and containers	.157	10,708	23,854	67,986	151,4##
341	Iron and steel basic industries	.154	11,351	47,235	73,292	304,9##
319	Miscellaneous chemical products, n.e.c.	.153	3,416	12,563	22,244	81,8##

Table III (continued)

321	Spinning, weaving and finishing mills	1.44	5,613	19,078	38,988	332,516
311	Basic industrial chemicals and fertilizers, except plastic materials	1.33	25,178	186,379	188,899	1,298,287
383	Electrical industrial machinery and apparatus	.124	11,133	14,844	89,688	119,583
361	Structural clay products	.121	7,606	24,972	24,972	205,497
322,345	Made-up textile goods plus embroideries	.105	1,066	5,066	10,105	51,200
364	Manufacture of cement, lime and plaster	.092	17,838	67,741	192,579	731,346
353	Petroleum refineries	.072	73,157	1,101,270	1,004,623	13,873,365
381	Cutlery, hand tools and general hardware	.002	41	47	18,043	20,750
381	Metal furniture & fixtures	.001	13	17	14,085	17,892

Note: VA = value added; Kr = replacement value of fixed capital; N = total employment; DN = employment in daytime shift; n.e.c. = not elsewhere classified.