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MARKET CONCENTRATION IN PHILIPPINE FOOD, HOME APPLIANCE, AND TEXTILE INDUSTRIES

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1. Introduction

This study attempts to quantitatively analyze the degree of concentration in specific Philippine industries, namely, food, home appliance, and textile. Market concentration (also called economic or business concentration) has been increasingly studied because it is associated with monopolistic and restrictive practices which impair the ability of markets to perform effectively. A higher degree of concentration in the markets for food, home appliance, and textile, among others, would have a significant effect on the overall performance of the Philippine economy. Thus, the measurement of concentration in Philippine markets is of more than merely intellectual interest. Such an examination not only may help to identify those areas in which effective competition is impeded, but may serve also as an input in changing public policy efforts into avenues which will enhance market competition and economic efficiency. There are those who argue that the promise of monopoly power serves as an inducement for private investment, but the cost of such a market structure, in terms of inefficiency and consumer welfare loss, cannot be economically rationalized.

Existing studies have documented the level and direction of market concentration in Philippine manufacturing. The need for research is evident not only in the current emphasis on small- and medium-scale industries in Philippine development policy, but also in the marked absence of definitive industrial structure studies that evaluate the influence of market concentration on market profitability. Such a study is a necessary step in the direction of more comprehensive industrial development research. Just recently (Times Journal, 1982), the business community sought for a clear-cut guideline from the government on the role of the private sector in economic development. Likewise, the Central Bank and NEDA's Philippine Institute of Development Studies want to initiate studies that would guide the formulation of policies which harmonize government-business relations.

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Thus, it is the intention of this study to fill this gap, and to help set the direction of future research along this line.

The vast literature on market concentration is confined almost entirely to the advanced industrialized countries. Recently, however, there seemed to be a growing concern on the consequences of market power in Third World countries. Several concentration studies in less developed countries have appeared in the literature. White (1974) studied the relationship between industrial concentration and monopoly power in Pakistan. Gan Wee Beng (1978) evaluated the relationship between market concentration and industry profitability in Malaysia. Sicat and Villaroel (1974) presented several concentration measures based on the 2-digit ISIC level of aggregation. Lindsey (1977) further enriched the literature by evaluating the level of market concentration in Philippine manufacturing in 1970, and the relation between concentration and profits. Again, Lindsey (1978) provided additional empirical evidence by examining the changes in market concentration in Philippine manufacturing between 1960 and 1970. Finally, Lindsey (1980) found a positive association between firm size and growth rate in the manufacturing sector of the Philippine economy. He further suggested that the positive relationship indicates the existence of significant concentration of economic power.

2. The Analytical Framework

Market concentration is measured by three sets of concentration ratios: (1) the ratio of sales of n establishments to industry sales, (2) the ratio of employment of n establishments to industry employment and (3) the ratio of assets of n establishments to industry assets. A major criticism against the use of the concentration ratio is that it measures only one point on the distribution of an industry's sales (value-added) among establishments. Gan Wee Beng (1978) has shown that no one measure appears superior, and that the top-four establishment concentration ratio sufficiently measures the effect of concentration on economic efficiency.

Scitovsky (1955) has also shown that sales and value-added are the best measures of size because large firms tend to use more capital intensive techniques while small firms tend to use more labor-intensive techniques. Thus, a concentration measure based on employment is understated, and one based on assets is overstated.

The present study shall attempt to enrich the existing concentration studies on the Philippine business and industrial sector by employing a slightly different approach. All existing measurements of industry concentration in the Philippines have been done on the 2-digit ISIC level of aggregation. This work attempts to measure market concentration by utilizing the 4-digit level of aggregation. This industry classification scheme is more detailed and approximates the theoretical industry boundary. Koch (1980) has considered the four-digit level of detail as the most appropriate economic concept of an industry.

Our approach further departs from those employed in existing studies by applying the market concentration analysis to a particular industry (i.e., food, home appliance, and textile, respectively) instead of a cross-section of industries. This approach obviously provides a useful detail on the structure of each industry being studied. Finally, existing studies have focused only on the level of plant technology relative to the size of the market. This study attempts to incorporate a combination of the pattern of establishment ownership in a particular industry and the type of plant technology for use relative to the size of the market.

3. Characteristics of Data

The primary source of data for this study is the preliminary report of the 1978 *Census of Establishments: Manufacturing Sector.* Data on the relative sizes of establishments within a given industry classification are not available in the published reports of the *Census of Establishments.* Thus, the EDP staff of the National Census and Statistics Office had to run a special tabulation of the data we needed for this study.[1] The expected total number of large[2] establishments is 6,837 but only 4,712 responded to the NCSO questionnaire. Furthermore, only establishments with an average monthly sales/receipts of ₱50,000 or more are included in the unpublished NCSO data for the top three and the top four establishments.

4. Empirical Findings

The concentration ratios for the food industry in 1978 are listed in Tables 1, 2, and 3. The level of concentration is considerably wider in both 3-establishment and 4-establishment concentration ratios. Moreover, the pattern of concentration persists irrespective of whether assets, employment, or sales are measured. The range of employment concentration is relatively wider than the range of assets concentration. In turn, assets concentration is insignificantly wider than sales concentration. Manufacture of Dairy Products, Except Milk (Industry Code 3113) is consistently ranked fourth or fifth using sales and assets concentration ratios, but it is ranked tenth using employment concentration ratio. Dairy Products industry is relatively less concentrated in terms of employment because it is basically a capital-intensive industry.

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[1] The assistance of Dr. Tito Mijares, NCSO Executive Director, is highly appreciated.

[2] Those with an average monthly sales of ₱5,000 or more.

Table 1—Market Concentration in Food Industry: Sales, 1978

Code	Industry Description	3-Establishment Concentration Ratio	4-Establishment Concentration Ratio	Number of Establishments
3111	Slaughtering, preparing and preserving meat	62.97 (6)	100.00 (1)	138
3112	Manufacture of Processed Milk	99.63 (2)	99.95 (3)	6
3113	Manufacture of Dairy Products, Except Milk	78.83 (4)	78.83 (5)	365
3114	Canning and Preserving of Fruits and Vegetables	53.60 (10)	61.69 (9)	57
3115	Canning, Preserving and Processing of Fish, Crustacea and Other Seafoods	36.22 (16)	49.44 (12)	749
3116	Production of Crude Coconut Oil, Including Cake and Meal	38.27 (14)	45.60 (15)	157
3117	Manufacture of Vegetable and Animal Oils and Fats	46.45 (11)	46.45 (14)	35
3118	Rice and Corn Milling	11.69 (22)	17.09 (22)	18445
3119	Flour Milling, Except Cassava	62.13 (7)	71.69 (6)	23
3121	Manufacture of Other Grain Mill Products	19.37 (21)	19.37 (21)	57
3122	Manufacture of Bakery Products	24.48 (19)	24.50 (20)	6162
3123	Sugar Milling and Refining	24.22 (20)	28.97 (19)	432
3124	Manufacture of Cocoa, Chocolate and Sugar Confectionary	54.52 (9)	54.52 (11)	514
3125	Manufacture of Desiccated Coconut	38.43 (13)	45.23 (16)	112
3126	Manufacture of Ice, Except Dry Ice	34.81 (17)	40.30 (17)	200
3127	Coffee Roasting and Processing	96.87 (3)	96.87 (4)	53
3128	Manufacture of Prepared and Unprepared Animal Feeds	58.45 (8)	63.62 (8)	75
3129	Food Manufacturing, NEC	46.27 (12)	55.50 (10)	678
3131	Distilling, Rectifying and Blending Spirits	64.17 (5)	70.02 (7)	333
3132	Wine Manufacturing	37.88 (15)	46.81 (13)	666
3133	Malt Liquors and Malt	100.00 (1)	100.00 (2)	1
3134	Soft Drinks and Carbonated Water Mfg.	31.80 (18)	39.23 (18)	28

SOURCES: National Census and Statistics Office, *1978 Census of Establishments* (Manila, 1980), Preliminary Report and unpublished data.
NOTE: Ranks are in parentheses.

Table 2—Market Concentration in Food Industry: Assets, 1978

Code	Industry Description	3-Establishment Concentration Ratio	4-Establishment Concentration Ratio	Number of Establishments
3111	Slaughtering, Preparing and Preserving Meat	48.36 (14)	52.38 (14)	138
3112	Manufacture of Processed Milk	97.96 (3)	99.99 (2)	6
3113	Manufacture of Dairy Products, Except Milk	79.18 (5)	84.70 (5)	365
3114	Canning and Preserving of Fruits and Vegetables	67.46 (7)	76.83 (4)	57
3115	Canning, Preserving and Processing of Fish, Crustacea and Other Seafoods	11.47 (21)	15.21 (21)	749
3116	Production of Crude Coconut Oil, Including Cake and Meal	31.94 (19)	38.51 (18)	157
3117	Manufacture of Vegetable and Animal Oils and Fats	34.66 (18)	34.66 (19)	35
3118	Rice and Corn Milling	7.68 (22)	8.82 (22)	18445
3119	Flour Milling, Except Cassava	80.34 (4)	85.83 (4)	23
3121	Manufacture of Other Grain Mill Products	46.74 (15)	46.74 (17)	57
3122	Manufacture of Bakery Products	56.02 (13)	59.44 (13)	6162
3123	Sugar Milling and Refining	25.79 (20)	34.21 (20)	432
3124	Manufacture of Cocoa, Chocolate and Sugar Confectionary	60.28 (11)	67.21 (11)	514
3125	Manufacture of Desiccated Coconut	42.43 (16)	50.30 (15)	112
3126	Manufacture of Ice, Except Dry Ice	64.70 (9)	73.25 (9)	200
3127	Coffee Roasting and Processing	99.24 (2)	99.24 (3)	53
3128	Manufacture of Prepared and Unprepared Feeds	76.63 (6)	78.71 (6)	75
3129	Food Manufacturing, NEC	65.20 (8)	76.02 (8)	678
3131	Distilling, Rectifying and Blending Spirits	59.10 (12)	66.96 (12)	333
3132	Wine Manufacturing	63.42 (10)	68.86 (10)	666
3133	Malt Liquors and Malt	100.00 (1)	100.00 (1)	1
3134	Soft Drinks and Carbonated Water Mfg.	37.13 (17)	46.86 (16)	28

SOURCES: National Census and Statistics Office, *1978 Census of Establishments* (Manila, 1980), Preliminary Report and unpublished data.

NOTE: Ranks are in parentheses.

Table 3—Market Concentration in Food Industry: Employment, 1978

Code	Industry Description	3-Establishment Concentration Ratio	4-Establishment Concentration Ratio	Number of Establishments
3111	Slaughtering, Preparing and Preserving Meat	33.57 (12)	40.01 (11)	138
3112	Manufacture of Processed Milk	96.16 (2)	99.64 (2)	6
3113	Manufacture of Dairy Product, Except Milk	52.19 (10)	54.55 (10)	365
3114	Canning and Preserving of Fruits and Vegetables	81.03 (4)	84.09 (3)	57
3115	Canning, Preserving and Processing of Fish, Crustacea and Other Seafoods	9.23 (20)	11.52 (20)	749
3116	Production of Crude Coconut Oil, Including Cake and Meal	29.93 (14)	35.38 (14)	157
3117	Manufacture of Vegetable, and Animal Oils and Fats	31.44 (13)	38.70 (13)	35
3118	Rice and Corn Milling	.84 (22)	1.00 (22)	18445
3119	Flour Milling, Except Cassava	61.33 (7)	76.21 (5)	23
3121	Manufacture of Other Grain Mill Products	11.72 (19)	11.72 (19)	57
3122	Manufacture of Bakery Products	4.24 (21)	4.89 (21)	6162
3123	Sugar Milling and Refining	21.77 (15)	24.93 (15)	432
3124	Manufacture of Cocoa, Chocolate and Sugar Confectionary	14.87 (18)	18.45 (17)	514
3125	Manufacture of Desiccated Coconut	53.01 (8)	58.56 (9)	112
3126	Manufacture of Ice, Except Dry Ice	20.97 (16)	23.91 (16)	200
3127	Coffee Roasting and Processing	82.96 (3)	82.96 (4)	53
3128	Manufacture of Prepared and Unprepared Animal Feeds	63.55 (6)	67.93 (7)	75
3129	Food Manufacturing, NEC	52.73 (9)	61.36 (8)	678
3131	Distilling, Rectifying and Blending Spirits	65.37 (5)	69.85 (6)	333
3132	Wine Manufacturing	15.78 (17)	17.35 (18)	666
3133	Malt Liquors and Malt	100.00 (1)	100.00 (1)	1
3134	Soft Drinks and Carbonated Water Mfg.	33.67 (11)	40.52 (12)	28

SOURCES: National Census and Statistics Office, *1978 Census of Establishments* (Manila, 1980), Preliminary Report and unpublished data.

NOTE: Ranks are in parentheses.

Tables 4, 5 and 6 present similar concentration ratios for the home appliance industry. Four-establishment concentration ratios are slightly higher than three-establishment concentration ratios. Furthermore, the pattern of concentration is essentially similar regardless of whether sales, assets, or employment is measured. The ranges of sales concentration are wider than those of employment concentration, while those of assets concentration are relatively narrower. Manufacture of Radio, Television and Communication Equipment and Apparatus (Industry Code 3882) consistently has the lowest concentration ratio among the sub-industries in the home appliance group.

Tables 7, 8 and 9 show the concentration ratios for the textile industry. Three-establishment and four-establishment concentration ratios have practically the same range of concentration using sales, assets, or employment. Likewise, the pattern of concentration follows the same ordering as shown in the three tables. The range of assets concentration is relatively narrower compared to those of sales and employment. Surprisingly, Manufacture of Wearing Apparel (Industry Code 3229) has an employment concentration lower than both its sales and assets concentration. Although we expect the wearing apparel industry to be labor intensive, 44 per cent of total employment in this industry is due to the largest three establishments, and 55 per cent is due to the largest four establishments.

The Spearman rank correlations between sales, assets, and employment concentration ratios are shown in Table 10. The coefficients indicate that the 3-establishment ratio gives the same ranking as the 4-establishment ratio. They also indicate that all measures (sales, assets, and employment) are consistent with each other in ranking the degree of concentration within an industry.[3]

At the four-digit level of industry aggregation, 62 per cent of assets, 67 per cent of sales, and 47 per cent of employment in the food industry were attributed to the largest four establishments in that industry. For the home appliance industry, 74 per cent of assets, 70 per cent of sales, and 60 per cent of employment were concentrated in the top four establishments in that industry. And in the textile industry, 61 per cent of assets, 49 per cent of sales, and 44 per cent of employment were controlled by the largest four establishments in that industry.[4]

The findings on both the range and the average level of concentration ratios indicate that the degree of monopoly is quite significant in food, home appliance, and textile industries. Since the study analyzes

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[3] Since we are measuring plant or establishment concentration, firm concentration is expected to be much higher than what is indicated in this study.

[4] These findings are consistent with Lindsey's (1977) expectation that concentration ratios would increase if data at a more disaggregated industrial classification were used.

Table 4—Market Concentration in the Home Appliance Industry
Sales, 1978

Code	Industry Description	3-Establishment Concentration Ratio	4-Establishment Concentration Ratio	Numb… Estab… men…
3831	Manufacture of Electrical Machinery and Apparatus	50.96 (5)	60.45 (4)	[illegible]
3832	Manufacture of Radio, Television and Comm. Equipment and Apparatus	35.28 (7)	4[illegible].94 (7)	[illegible]
3833	Manufacture of Electrical Appliances and Housewares	56.40 (4)	56.47 (5)	[illegible]
3834	Manufacture of Primary Cells and Batteries	85.39 (3)	85.39 (3)	[illegible]
3835	Manufacture of Electrical Accumulators	97.29 (1)	97.29 (1)	[illegible]
3836	Manufacture of Electrical Wires and Wiring Devices	42.13 (6)	54.92 (6)	[illegible]
3839	Manufacture of Electrical Apparatus and Supplies, NEC	93.58 (2)	93.58 (2)	[illegible]

SOURCES: National Census and Statistics Office, *1978 Census of Establishm…* (Manila, 1980), Preliminary Report and unpublished data.

NOTE: Ranks are in parentheses.

Table 5—Market Concentration in the Home Appliance Industry
Assets, 1978

Code	Industry Description	3-Establishment Concentration Ratio	4-Establishment Concentration Ratio	Number … Establish… ments
3831	Manufacture of Electrical Machinery and Apparatus	67.96 (4)	75.38 (3)	[illegible]
3832	Manufacture of Radio, Television and Comm. Equipment and Apparatus	48.95 (7)	53.90 (7)	[illegible]
3833	Manufacture of Electrical Appliances and Housewares	53.21 (6)	63.29 (5)	[illegible]
3834	Manufacture of Primary Cells and Batteries	88.11 (2)	88.71 (2)	[illegible]
3835	Manufacture of Electrical Accumulators	98.66 (1)	98.86 (1)	[illegible]
3836	Manufacture of Electrical Wires and Wiring Devices	55.17 (5)	62.59 (6)	[illegible]
3839	Manufacture of Electrical Apparatus and Supplies, NEC	69.89 (3)	74.16 (4)	[illegible]

SOURCES: National Census and Statistics Office, *1978 Census of Establishment…* (Manila, 1980), Preliminary Report and unpublished data.

NOTE: Ranks are in parentheses.

Table 6—Market Concentration in the Home Appliance Industry: Employment, 1978

Code	Industry Description	3-Establishment Concentration Ratio	4-Establishment Concentration Ratio	Number of Establish-ments
3831	Manufacture of Electrical Machinery and Apparatus	34.09 (7)	43.79 (6)	61
3832	Manufacture of Radio, Television and Comm. Equipment and Apparatus	35.20 (6)	43.37 (7)	64
3833	Manufacture of Electrical Appliances and Housewares	56.71 (3)	62.70 (3)	28
3834	Manufacture of Primary Cells and Batteries	72.70 (2)	77.10 (2)	28
3835	Manufacture of Electrical Accumulators	84.87 (1)	85.70 (1)	8
3836	Manufacture of Electrical Wires and Wiring Devices	39.93 (5)	48.96 (5)	23
3839	Manufacture of Electrical Apparatus and Supplies, NEC	53.09 (4)	60.22 (4)	17

SOURCES: National Census and Statistics Office, *1978 Census of Establishments* (Manila, 1980), Preliminary Report and unpublished data.

NOTE: Ranks are in parentheses.

Table 7—Market Concentration in the Textile Industry: Sales, 1978

Code	Industry Description	3-Establishment Concentration Ratio	4-Establishment Concentration Ratio	Number of Establish-ments
3211	Spinning, Weaving, Texturing and Finishing Textiles	17.88 (8)	23.62 (8)	1618
3212	Knitting Mills	19.79 (7)	24.86 (7)	212
3213	Manufacture of Made-Up Textile Goods Except Wearing Apparel	66.46 (4)	74.48 (4)	215
3214	Manufacture of Carpets and Rugs	—	—	364
3215	Cordage, Rope & Twine Mfg.	31.13 (5)	34.76 (5)	1735
3216	Manufacture of Artificial Leather, Oil Cloth and Other Impregnated and Coated Fabrics, Except Rubberized	100.00 (1)	100.00 (1)	2
3217	Manufacture of Fiber Batting, Padding and Upholstery Filling Including Coir	99.93 (2)	99.93 (2)	10
3219	Manufacture of Textile, NEC	—	—	1
3221	Custom Tailoring and Dressmaking Shops	3.37 (10)	3.54 (10)	26716

Table 7 (continued)

Code	Industry Description	3-Establishment Concentration Ratio	4-Establishment Concentration Ratio	Number of Establishments
3222	Ready-Made Clothing Manufacturing	16.62 (9)	20.87 (9)	837
3223	Embroidery Establishments	28.16 (6)	28.51 (6)	382
3229	Manufacture of Wearing Apparel Except Footwear, NEC	66.81 (3)	74.93 (3)	96

SOURCES: National Census and Statistics Office, *1978 Census of Establishments* (Manila, 1980), Preliminary Report and unpublished data.

NOTE: Ranks are in parentheses.

Table 8—Market Concentration in the Textile Industry: Assets, 1978

Code	Industry Description	3-Establishment Concentration Ratio	4-Establishment Concentration Ratio	Number of Establishments
3211	Spinning, Weaving, Texturizing and Finishing Textiles	34.26 (7)	43.01 (7)	1618
3212	Knitting Mills	59.98 (4)	61.65 (4)	212
3213	Manufacture of Made-Up Textile Goods, Except Wearing Apparel	64.34 (3)	69.07 (3)	215
3214	Manufacture of Carpets and Rugs	—	—	364
3215	Cordage, Rope and Twine Mfg.	27.53 (8)	34.60 (8)	1735
3216	Manufacture of Artificial Leather, Oil Cloth and Other Impregnated and Coated Fabrics, Except Rubberized	100.00 (1.5)	100.00 (1.5)	9
3217	Manufacture of Fiber Batting, Padding and Upholstery Filling Including Coir	100.00 (1.5)	100.00 (1.5)	10
3219	Manufacture of Textiles, NEC	—	—	1
3221	Custom Tailoring and Dressmaking Shops	14.23 (9)	16.77 (9)	26716
3222	Ready-Made Clothing Mfg.	42.15 (6)	46.90 (6)	837
3223	Embroidery Establishments	59.24 (5)	59.25 (5)	382
3229	Manufacture of Wearing Apparel Except Footwear, NEC	71.56 (2)	80.31 (2)	96

SOURCES: National Census and Statistics Office, *1978 Census of Establishments* (Manila, 1980), Preliminary Report and unpublished data.

NOTE: Ranks are in parentheses.

Table 9—Market Concentration in the Textile Industry: Employment, 1978

Code	Industry Description	3-Establishment Concentration Ratio	4-Establishment Concentration Ratio	Number of Establishments
3211	Spinning, Weaving, Texturizing and Finishing Textiles	16.29 (8)	20.57 (8)	1618
3212	Knitting Mills	29.14 (6)	36.01 (6)	212
3213	Manufacture of Made-up Textile Goods, Except Wearing Apparel	31.86 (5)	40.95 (4)	215
3214	Manufacture of Carpets and Rugs	—	—	364
3215	Cordage, Rope & Twine Mfg.	15.58 (9)	18.10 (9)	1735
3216	Manufacture of Artificial Leather, Oil Cloth and Other Impregnated and Coated Fabrics, Except Rubberized	100.00 (1)	100.00 (1)	2
3217	Manufacture of Fiber Batting, Padding and Upholstery Filling, Including Coir	94.87 (2)	94.87 (2)	10
3219	Manufacture of Textiles, NEC	—	—	1
3221	Custom Tailoring and Dressmaking Shops	.63 (10)	.71 (10)	26716
3222	Ready-Made Clothing Mfg.	36.62 (4)	40.65 (5)	837
3223	Embroidery Establishments			
3229	Manufacture of Wearing Apparel Except Footwear, NEC	43.79 (7)	54.92 (3)	96

SOURCES: National Census and Statistics Office, *1978 Census of Establishments* (Manila, 1980), Preliminary Report and unpublished data.

NOTE: Ranks are in parentheses.

industries which are narrowly defined (four-digit classification), the evidence suggests that some narrowly defined industries are so highly concentrated that they raise the average concentration ratio of the broader industry classification (e.g., food, home appliance, textile, etc.) under which they belong.

Monopoly power in a market exists as a result of manufacturing technology that is utilized, the limited size of the market, control of raw materials, patents, and other factors. For a given market, the concentration ratio is still expected to be high, even if a large number of establishments exist, as long as the size distribution of establishments is highly skewed. Tables 11, 12 and 13 show the distinction

Table 10—Rank Correlations Among Sales, Assets, and Employment Concentration

Variables	Correlation Coefficient 3-Establishment	Correlation Coefficient 4-Establishment
I. Food Industry		
Sales and Assets	0.7583	0.7792
Sales and Employment	0.8114	0.7719
Assets and Employment	0.7165	0.7538
II. Home Appliance Industry		
Sales and Assets	0.8030	0.8030
Sales and Employment	0.7333	0.7994
Assets and Employment	0.8758	0.9121
III. Textile Industry		
Sales and Assets	0.8571	0.8750
Sales and Employment	0.7857	0.7500
Assets and Employment	0.6429	0.7500

SOURCES: National Census and Statistics Office, *1978 Census of Establishments* (Manila, 1980), Preliminary Report and unpublished data.

between monopoly power due to limited size of the market (number ratio) and monopoly power due to size inequality of establishments (size ratio).[5] Ranked concentration ratios shown on these tables should be related with their corresponding number and size ratios.

Table 14 presents the correlations between concentration ratios, number ratios, and size ratios. In the food industry, concentration is highly related with relative market size than with size inequality of establishments, regardless of whether concentration is measured in terms of sales, assets, or employment. The home appliance industry gives a different picture. Concentration in this industry (except for employment concentration) is highly associated with size inequality than with relative market size. The negative correlation between employment number ratio and size ratio implies that industries with large number of establishments tend to have less size inequality. In the textile industry, concentration (sales, assets, or employment) is more closely associated with relative market size than with size inequality.

[5]See Lindsey (1977) for application of this analysis at the two-digit industrial classification.

Some negative correlation coefficients between concentration ratio and size ratio appear in the textile industry. The underlying explanation behind this negative correlation between employment concentration ratio and size ratio is that "only in the larger industries can relatively small establishments survive" (Lindsey, 1977, p. 297). Similarly, this can explain the negative correlation between assets concentration and size ratio, as well as between sales concentration and size ratio.

The averages of assets size ratios in food, home appliance and textile industries are consistently higher than the corresponding averages of sales and employment size ratios. Thus, food, home appliance, and textile industries are consistent with the capital-intensive feature of the Philippine manufacturing sector.

In terms of ownership of the largest 25 manufacturing firms (Yoshihara, 1982, p. 53), 52 per cent are owned by Americans, 24 per cent by Chinese, and 24 per cent by Filipinos. Of the 61[6] food establishments analyzed by Yoshihara, 40 were owned by Filipinos and 21 by foreigners. Sixteen of the latter group are owned by Americans (Yoshihara, 1982, pp. 49-51). The pattern of ownership that was observed in the food industry applies likewise in the home appliance and textile industries. The market structure in the three major industries studied is characterized by high-capital intensity and concentration of ownership. Both factors explain the high concentration ratios in these industries.

5. Conclusion

Much of the empirical studies purporting to demonstrate that Philippine industries are highly concentrated were based on a broader (2-digit) classification of industries. This study analyzes the pattern and level of market concentration using a narrower (4-digit) industrial classification. Nevertheless, the evidence supports the conclusions of earlier studies. Although we look only at three major industry groups, intra-industry concentration ratios are not different from the inter-industry concentration ratios. A meaningful policy recommendation will have to wait until complete data on all industries across time become available. However, the study has found that food, home appliance, and textile industries are highly concentrated. Since highly concentrated industries are linked with undesirable market conduct and performance (e.g., higher price-cost margins, less output, higher rates of profit, absence of technological innovation, etc.), then policy planners will have to take a serious look at both the direction of industrial growth and the structure of industries now and in the future.

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[6] Sample is taken from the *Business Day Special Report: The Top 1000 Largest Corporations* (1970).

Table 11—Ranked Concentration Ratios, Size Ratios, and Number Ratios For 1978: Food Industry

SALES				ASSETS				EMPLOYMENT			
Industry Number	Concentration Ratio[a] %	Size Ratio[b]	Number Ratio[c]	Industry Number	Concentration Ratio[a] %	Size Ratio[b]	Number Ratio[c]	Industry Number	Concentration Ratio[a] %	Size Ratio[b]	Number Ratio[c]
3111	101.22	-2790.18	29.85	3133	100.00	—	-133.00	3133	100.00	-	-133.00
3133	100.00	—	-133.00	3112	99.99	2347.50	200.00	3112	99.64	136.77	200.00
3112	99.95	991.31	200.00	3127	99.24	670.25	8.16	3114	84.09	70.29	7.55
3127	96.87	379.18	8.16	3119	85.83	28.78	21.05	3127	82.96	59.70	8.16
3113	78.83	336.00	1.11	3113	84.70	499.62	1.11	3119	76.21	15.22	21.05
3119	71.69	12.03	21.05	3128	78.71	65.61	5.63	3131	69.85	190.55	1.22
3131	70.02	192.13	1.22	3114	76.83	43.92	7.55	3128	67.93	37.60	5.63
3128	63.62	31.05	5:63	3129	76.02	532.59	.59	3129	61.36	267.43	.59
3114	61.69	21.33	7.55	3126	73.25	134.18	2.04	3125	58.56	38.15	3.70
3129	55.50	210.13	.59	3132	68.86	365.91	.60	3113	54.55	108.31	1.11
3124	54.52	15.45	.78	3124	67.21	261.29	.78	3111	40.01	22.33	29.85
3115	49.44	182.16	.54	3131	66.96	166.67	1.22	3134	45.52	4.09	16.67
3132	46.81	145.62	.60	3122	59.44	2256.27	.06	3117	38.70	4.89	12.90
3117	46.45	11.39	12.90	3111	52.38	36.84	29.85	3116	35.38	20.94	2.61
3116	45.60	17.44	2.61	3125	50.30	27.32	3.70	3123	24.93	35.53	.93
3125	45.23	22.30	3.70	3134	46.86	5.29	16.67	3126	23.91	13.79	2.04
3126	40.30	33.38	2.04	3121	46.74	11.68	7.55	3124	18.45	28.84	.78
3134	39.23	3.88	16.67	3116	38.51	23.96	2.61	3132	[illegible]	[illegible]	[illegible]

Table 11 (continued)

SALES				ASSETS				EMPLOYMENT			
Industry Number	Concentration Ratio[a] %	Size Ratio[b]	Number Ratio[c]	Industry Number	Concentration Ratio[a] %	Size Ratio[b]	Number Ratio[c]	Industry Number	Concentration Ratio[a] %	Size Ratio[b]	Number Ratio[c]
3123	28.97	43.64	.93	3117	34.66	4.11	12.90	3121	11.72	1.76	7.55
3122	24.50	499.44	.06	3123	34.21	55.63	.93	3115	11.52	24.25	.54
3121	19.37	3.18	7.55	3115	15.21	33.42	.54	3122	4.89	79.12	.06
3118	17.09	950.10	.02	3118	8.82	446.43	.02	3118	.99	46.35	.02

Sources: National Census and Statistics Office, *1978 Census of Establishments*, Preliminary Report (Manila, 1980), and unpublished data.

[a]Concentration is the four-establishment ratio.

[b]Size Ratio = $\dfrac{\sum_{n=1}^{4} y_{n_i} / 4}{\sum_{n=1}^{N_i} y_{n_i} / (N_i - 4)}$ where y_{n_i} is the size (employment, sales or assets) of the nth largest establishments in industry i., and N_i is the number of establishments in industry i.)

[c]Number Ratio = $\dfrac{4}{(N_i - 4)}$

Table 12—Ranked Concentration Ratios, Size Ratios, and Number Ratios for 1978: Home Appliance Industry

SALES				ASSETS				EMPLOYMENT			
Industry Number	Concentration Ratio %	Size Ratio	Number Ratio	Industry Number	Concentration Ratio %	Size Ratio	Number Ratio	Industry Number	Concentration Ratio %	Size Ratio	Number Ratio
3835	97.29	35.96	100.00	3835	98.86	130.25	100.00	3835	85.70	5.99	100.00
3839	93.58	41.41	30.77	3834	88.71	94.07	16.67	3834	77.10	20.20	16.67
3834	85.39	35.08	16.67	3831	75.38	43.70	7.02	3833	62.70	10.08	16.67
3831	60.45	21.78	7.02	3839	74.16	9.32	30.77	3839	60.22	4.92	30.77
3833	56.47	6.91	16.67	3833	63.29	10.35	16.67	3836	48.96	4.56	21.05
3836	54.94	5.79	21.05	3836	62.59	7.95	21.05	3831	43.79	11.10	7.02
3832	42.94	11.29	6.67	3832	53.90	17.54	6.67	3832	43.37	11.52	6.67

Sources: National Census and Statistics Office, *1978 Census of Establishments,* Preliminary Report (Manila, 1980), and unpublished data.

Notes: For definition of concentration, size, and number ratios, see Table 11.

Table 13—Ranked Concentration Ratios, Size Ratios and Number Ratios for 1978: Textile Industry

SALES				ASSETS				EMPLOYMENT			
Industry Number	Concentration Ratio %	Size Ratio	Number Ratio	Industry Number	Concentration Ratio %	Size Ratio	Number Ratio	Industry Number	Concentration Ratio %	Size Ratio	Number Ratio
3216	100.00	—	−200.00	3216	100.00	—	−200.00	3216	100.00	—	−200.00
3217	99.93	224.66	66.67	3217	100.00	—	66.67	3217	94.87	27.74	66.67
3229	74.93	68.73	4.35	3229	80.31	93.80	4.35	3229	54.92	28.03	4.35
3213	74.48	153.96	1.90	3213	69.07	117.82	1.90	3213	40.95	36.58	1.90
3215	34.76	230.59	.23	3212	61.65	83.57	1.92	3222	40.65	142.60	.48
3223	28.51	37.68	1.06	3223	59.25	137.42	1.06	3212	36.01	29.26	1.92
3212	24.86	17.20	1.92	3222	46.90	183.93	.48	3223	30.28	41.04	1.06
3211	23.62	124.77	.25	3211	43.01	304.46	.25	3211	20.57	104.45	.25
3222	20.87	54.86	.48	3215	34.60	228.99	.23	3215	18.10	95.63	.23
3221	3.54	245.31	.01	3221	16.77	1342.57	.01	3221	.71	47.50	.01

Sources: National Census and Statistics Office, *1978 Census of Establishments,* Preliminary Report (Manila, 1980), and unpublished data.

Note: For definitions of concentration, size and number ratios, see Table 11.

Table 14—Correlations Among Concentration, Size, and Number Ratios

Variables[a]	Correlation Coefficient		
	Sales	Assets	Employment
I. Food Industry			
(a) Concentration and Number Ratio	0.545	0.527	0.770
(b) Concentration and Size Ratio	0.297	0.299	0.191
(c) Number Ratio and Size Ratio	−0.353	−0.179	−0.270
II. Home Appliance Industry			
(a) Concentration and Number Ratio	0.769	0.651	0.788
(b) Concentration and Size Ratio	0.824	0.801	0.072
(c) Number Ratio and Size Ratio	0.393	0.300	−0.535
III. Textile Industry			
(a) Concentration and Number Ratio	0.881	0.991	0.870
(b) Concentration and Size Ratio	−0.033	−0.566	−0.188
(c) Number Ratio and Size Ratio	0.175	−0.602	−0.555

Sources: National Census and Statistics Office, *1978 Census of Establishments,* Preliminary Report (Manila, 1980) and unpublished data.

[a]Correlations are of logarithms of variables. Concentration is the Four-Establishment Concentration Ratio. For definitions of number and size ratios, see Table 11.

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