Who Gained Market Share in Indonesian Manufacturing?

Sadayuki Takii and Eric D. Ramstetter
ICSEAD and Graduate School of Economics, Kyushu University

The International Centre for the Study of East Asian Development, Kitakyushu

Who Gained Market Share in Indonesian Manufacturing?

Sadayuki Takii

International Centre for the Study of East Asian Development and Kyushu University

and

Eric D. Ramstetter

International Centre for the Study of East Asian Development and Kyushu University

Abstract

This study first shows that the output of local plants fell from 68 percent of the total produced by Indonesia's medium-large manufacturing plants in 1995 to 64 percent in 2005. Local plant shares also decreased in two-thirds of the 27 examined in this paper. Second, there was a weak tendency toward decreased producer concentration as Herfindahl indexes for both all plants and local plants fell in about half of the 27 industries decreased during the period. At the industry-level, there were relatively strong correlations between changes in local plant shares and the changes in concentration indicating that MNC entry and/or expansion may have led to increases in producer concentration in several industries after the crisis. Third, Spearman's rank correlation coefficients for market shares among incumbents were generally high, indicating that rankings remained stable. Fourth, the industry-level correlation between TFP growth in local plants and Herfindahl indexes was very weak, indicating that producer concentration is not strongly correlated with TFP changes in local plants. Fifth, 2005 TFP levels were often weakly correlated with TFP and concentration, except the relatively strong tendency for incumbent plants changing into industries that were relatively concentrated in 1995 and for startups with large market shares in 2005 to have relatively high TFP in 2005. On the other hand, there was a very strong tendency for 1995 TFP levels to be highest in concentrated industries among large plants that closed during this period and among small plants with relatively large market shares in 1995.

Keywords: market structure, producer concentration, multinational corporation, foreign ownership, protection, Thailand, manufacturing
JEL Categories: F23, K22, L11, L32, L33, O53

1. Introduction

After more than a decade of rapid growth following important reforms of trade policy in the mid-1980s, the growth of Indonesia's manufacturing sector has slowed markedly since the economic crisis of 1997-1998. As has been well documented, the economic crisis was a watershed event in Indonesia's economic history, which had particularly large impacts on the financial sector and the macro economy. Although many manufacturing industries did much better than the economy as a whole and several groups of manufacturers continued to expand immediately after the crisis, almost all industries and groups grew much more slowly in 1995-2005 than in the previous decade. Moreover, total manufacturing employment actually contracted in 2001-2005 despite moderate improvements in macroeconomic performance. Comparisons of estimates from the Indonesia's industrial surveys of medium-large plants with 20 or more employees and estimates for the economy as a whole, also suggest that medium-large plants grew much more rapidly than total manufacturing in 1985-1995, but that this was reversed in 1995-2005.[1]

A further breakdown of the data from the surveys of medium-large plants also suggests that large plants have generally grown more rapidly than smaller ones in 1995-2005 (Table 1). Moreover, growth has been particularly high in plants owned by foreign multinational corporations (MNCs), especially large MNCs that are majority-foreign controlled. On the other hand, employment contracted in all size

---

[1] In 1985-1995, total manufacturing employment grew 75 percent while employment in medium-large plants increased 148 percent, but these growth rates fell to 18 percent and 1.3 percent, respectively, in 1995-2005; in 2001-2005, the growth rate of total manufacturing employment was negative, -1.1 percent for the period (Asian Development Bank, various years; BPS-Statistics, various years b). There was also an increasing discrepancy between estimates of total manufacturing employment from the labor force surveys and the sum of employment in household, small, and medium-large manufacturing establishments (Table 1). For more details on manufacturing performance after the crisis see Aswicahyono and Pangestu (2000), Takii and Ramstetter (2005, 2007), and Thee (2000).

groups of local plants.

These patterns suggest that large MNCs, particularly large MNCs have been better able to seize opportunities and expand market shares in post-crisis Indonesia. The purpose of this paper is to provide a closer examine how the market shares of Indonesia's medium-large manufacturing plants changed during the decade beginning in 1995, before the crisis hit the economy, and ending in 2005. More precisely it tries to investigate the answers to the following two questions:

1. How have local plant shares, the relative size of local plants, and producer concentration changed during this decade? Were these indicators or their changes correlated with levels or changes in producer concentration changed if calculated from plant-level data? What is the meaning of these correlations?

2. Was there a large amount of entry and exit during this period? Did new entrants have larger market shares than incumbents in 2005, or was the reverse true? How big were the 1995 market shares of exiting plants?

3. Were market shares and plant turnover related to relative size or total factor productivity (TFP)?

These questions are addressed in the following three sections and some concluding remarks are then offered.

2. Local Plants Shares and Producer Concentration

Although local plants accounted for the vast majority of employment in Indonesia's medium-large plants, they grew relatively slowly after the crisis and their share of the total declined from 83 percent in 1995 to 77 percent in 2005 (Table 1). Using the standard Indonesian definition, about two-thirds of all plants (69 percent in 1995 and 66 percent in 2005) were medium-sized, local plants, having fewer than 100

employees, but these medium-sized plants accounted for only 12-14 percent of the employment in all medium-large sized plants. On the other hand, local plants with 500 or more employees accounted for just under half of the total in all plants (47 percent in 1995 and 44 percent in 2005) while local plants with 1,000 or more workers accounted for about a third of the total employment (34 percent and 32 percent, respectively). Meanwhile, almost all of the employment generated by MNCs was in large MNCs with 100 or more employees, and their share of the total rose from 17 percent in 1995 to 23 percent in 2005. MNCs with 1000 or more employees accounted for 10 percent of the total in 1995 and this share rose somewhat more slowly to 14 percent in 2005. In other words, MNC plants had on average 3.4-3.5 times more workers per plant than their local counterparts.

As in several other Asian economies, MNC shares of production are generally larger than shares of employment and this is illustrated in Table 2 which shows local plant shares of output fell from 68 percent in 1995 to 64 percent in 2005. There was a wide variation in shares across industries however. Local shares were relatively high (three-fourths or more) in both years for six of the 27 industries examined, tobacco, textiles, wood products, publishing, furniture, and recycling. Conversely, they were relatively low (less than one-half in four industries for both years (footwear, electrical machinery, motor vehicles, and miscellaneous manufacturing), another four in 1995 only (beverages, fabricated metals, general machinery, and radio, television, & communication), and five industries in 2005 only (leather, petroleum products, office and computing machinery, precision machinery, and other transport equipment [mainly motorcycles]).[2]

---

[2] Note that motorcycle assembly and parts' plants accounted for 83 percent of the employment and 99 percent of the output in other transport equipment in 2005 (BPS-Statistics, various years b).

Measured in terms of output per plant, local plants were also much smaller than foreign plants although their median size increased 458 percent in 1995-2005 (Table 3). Even after accounting for the high level of inflation, reflected by 314 percent in the manufacturing deflator during this period (Takii 2007), this represents a substantial real increase in median production per plant and a rate of increase that was somewhat more rapid than the increase in MNC plants. Nonetheless, local plants remained much smaller in 2005, producing only 5 percent of the median output of their MNC counterparts, up from 3 percent in 1995. There were conspicuously large increases in the median size of local plants relative to MNC plants in radio, television, and communication, general machinery, precision machinery, and basic metals, where local plants grew to about one-fourth to one-half of the median size of MNC counterparts. Local plants were also relatively large compared to MNCs in petroleum products (78-82 percent).

Table 4 provides Herfindahl indexes, a measure of industry-level producer concentration.[3] When both local and foreign plants are included in calculations of industry-wide concentration, office and computing machinery is seen to be by far the most concentrated industry. This results in part from its extremely small size (Table 2). Petroleum products and precision machinery are two more relatively small industries with high levels of concentration. Motor vehicles and other transport equipment are the only two relatively large industries in which Herfindahl indexes exceeding 10 percent in both years. Overall, there is not a clear trend toward higher or lower concentration during this period. The Herfindahl index for all manufacturing plants combined was the same in both years while indexes decreased in 14 of the industries, increased in 12 and remained unchanged in one. However, the petroleum products industry was the only one

---

[3] Measures of concentration are particularly sensitive to how industries are defined. In this respect, it should be noted that four 2-digit industries in our tables (petroleum products, office and computing machinery, precision machinery, and recycling) are probably too small to obtain meaningful measures of concentration in Indonesia.

to experience a fall of over 5 percentage points and there were only five other industries (beverages, tobacco, basic metals, electrical machinery, and radio, television, and communication) that had declines of 2 percentage points or more. On the other hand, there were five industries (leather, office and computing machinery, precision machinery, other transport equipment, and recycling) that experienced relatively large increases of 4 percentage points or more. Partially because the six industries experiencing relatively large increases concentration also experienced sharp falls in local plant shares during this period, correlations between industry concentration and local plant shares were negative and relatively strong for 2005 levels (-0.54) and changes during 1995-2005 (-0.60). On the other hand, the correlation for 1995 levels was much weaker (close to zero) and positive.

When Herfindahl indexes are recalculated for samples of local plants only, indexes tended to be somewhat higher than if all plants were included (Table 4). This was true both in aggregate manufacturing and in 19 (1995) to 20 (2005) of the industries examined. However, this measure of producer concentration for local plants was generally rather low, exceeding 10 percent in four industries in both years (tobacco, basic metals, office and computing machinery, and precision machinery) another three industries in 1995 alone (petroleum products, radio, television & communication, and other transport equipment), and another one (recycling) in 2005. Simple correlations between local plant shares and the Herfindahl index for local plants were negative and relatively strong in 2005 (-0.39) but very weak (close to zero) in 1995. This suggests that MNCs tend to be relatively large in industries where producer concentration among local plants is relatively high. On the other hand, the correlation between changes in local shares and changes in producer concentration is positive and much stronger than either of the static correlations (0.60). In other words, despite a weak tendency to be

relatively low in industries with high local plant shares, producer concentration among local plants tended to increase most rapidly in industries where local plants grew relatively rapidly compared to foreign plants. Finally, correlations between producer concentration and the relative size of local plants compared to foreign plants were rather weak, both statically and dynamically.

It is important to note that distributions of plant output also varied across industries. In most industries (17 for all plants and 22 for local plants in 1995; 22 and 23, respectively, in 2005), coefficients of variation varied between 10 and 15 percent (Table 5). Tobacco was the only industry that had greater variation in both years. Coefficients of variation tended to be slightly larger in samples of all plants, reflecting the dispersing impact of relatively large MNC plants on intra-industry distributions. Coefficients of variation also tended to increase, rising in 24 industries for all plants and 22 industries for local plants. Increases were particularly (1.0 percentage points or more) in 10 industries for all plants but only four industries for local plants.

Both distributions of all plants and local plants tended were positively skewed in most industries (24-25 of for all plants and 25-27 for local plants, Table 5). Skewness was also relatively large in about half of the industries in 1995 (15 for all plants, 14 for local plants) and about a third in 2005 (nine and seven industries, respectively). Skewness was particularly large (1.0 or more) for both years for both all and local plants in non-metallic mineral products. It also exceed this threshold in 1995 for both samples in tobacco and other transport equipment, as well as for all plants in general machinery and local plants in food. In 2005, office and computing machinery (both samples) was the only other category in which this threshold was exceeded.

3. Incumbents, New Entrants, and Exiting Plants

As in most rapidly growing developing economies, Indonesia's manufacturing has been extremely dynamic with a large number plants closing and another large number starting up operation. In 1995-2005, example both the number of closing plants and the number of new entrants exceeded the number of incumbents that existed in both years (Table 6). As might be expected in a period including a major economic crisis, the number of closing plants was largest of these three groups (113 percent of the number of incumbents), but the number of new entrants was also large (105 percent of the number of incumbents). The number of plants changing industries was also substantial given the relatively high level of aggregation used here (11 percent of the number of incumbents).

Perhaps not surprisingly, the simple correlation coefficient between ratios of closing plants to incumbents on the one hand, and new entrants to incumbents on the other was quite strong (0.69, Table 6). Put another way, there were five industries with relatively high turnover in which both of these ratios were 130 percent or more (apparel, petroleum products, general machinery, radio, television, and communication, and miscellaneous manufacturing). There were also four industries with relatively low turnover where both ratios were 90 percent or less (food, publishing, chemicals, and rubber) and another five industries with both ratios in the intermediate range (basic metals, fabricated metals, electrical machinery, motor vehicles, and other transport equipment. Among incumbents, Spearman's rank correlation coefficients were generally rather high (70 percent or more in 22 of 26 industries), indicating that rankings remained stable in this group of plants.

Despite the relatively small number of incumbents compared to new entrants, in 2005 incumbents accounted for over half of local plant output in 21 of the 27 industries examined and had relatively large market shares of 70 percent or more in 10 of these

industries (tobacco, textiles, leather, wood, paper, publishing, chemicals, rubber, non-metallic mineral products, and basic metals; Table 7). Not surprisingly, plants that were relatively large in 1995 (in the top quadrille of their respective industries) tended to have the largest market shares in 2005. For example, in 9 of 10 industries listed above (all except leather), plants that were large in 1995 had market shares of 60 percent or more in 2005. By contrast, plants that were smaller in 1995 had markets shares of over 30 percent in only one industry (office and computing machinery) and between 20 and 30 percent in one more (petroleum products).

In contrast, new entrants combined for market shares of 50 percent or more in only six industries (beverages, office and computing machinery, radio, television, and communication, precision machinery, miscellaneous manufacturing, and recycling, Table 7). In most industries, startups accounted for the largest portion of this output. However, plants changing industries were also relatively large in a few industries (e.g., recycling, office & computing machinery, fabricated metals, apparel, and general machinery).

In 1995, market shares were of course largest among large plants (those in the top quartile of their respective industries, Table 8). Rather the fact that small plants (those in the bottom 3 quartiles) combined to have relatively large shares in recycling (44 percent) and petroleum products (27 percent) could be viewed as surprising, though this can be partially explained by the relatively small number of plants in both of these industries. However, this characteristic cannot explain the relatively large shares of small plants in furniture (15 percent) as well as leather and plastics (13 percent each). In industries where large plants had relatively large shares, incumbents that survived the subsequent decade in the same industry had large shares of 70 percent or more in ten industries (food, beverages, tobacco, paper, chemicals, rubber, non-metallic mineral

products, basic metals, office and computing machinery, and motor vehicles). In contrast, exiting plants had combined market shares of one half or more in only six industries (footwear, petroleum products, general machinery, radio, television, and communication, precision machinery, and other transport equipment). This list includes many industries where local shares fell markedly and it is very likely that several of the exiting large plants exiting these industries in this year were the target of MNC takeovers after the crisis.

4. Total Factor Productivity, Plant Turnover, and Market Shares

Table 9 first shows that median TFP levels were generally lower in local plants than in MNCs. There was one exception in both years and that these TFP differentials tended to widen over the 1995-2005 decade. For example, median TFP was 0.6 points higher in MNCs in 1995 and 1.2 points higher in 2005; TFP growth was also 27 percentage points higher during this decade. These aggregate differences are also reflected in the industry-level data. For example, petroleum products was the only industry in which local plants had higher TFP levels in both years and there were only three other industries where local plants had higher TFP in 1995 (leather, radio, television and communication, as well as precision machinery) or 2005 (tobacco, wood products, and general machinery). On the other hand, TFP growth was higher in local plants in nine of the 27 industries (beverages, tobacco, textiles, wood, chemicals, basic metals, electrical machinery, radio, television, & communication, and furniture). As discussed in Takii (2006), if TFP differentials are calculated at the industry-level, they are often accompanied by relatively wide variation and are thus insignificant statistically in a number of cases.[4] However, these calculations reinforce the conclusion

---

[4] TFP calculations are based on the index number formula described in Good et al.

of most previous studies that TFP levels have tended to be higher in MNCs in Indonesia.

Table 9 then shows that industry-level correlations between local and foreign plants were very weak for 1995 TFP levels and TFP growth rates, but that there was a moderately strong positive correlation (0.36) of 2005 TFP levels. Correlations between local plant shares and TFP levels were relatively strong and negative, especially with both local (-0.45) and foreign (-0.57) plant TFP levels in 2005 and with foreign plant TFP growth for the period (-0.60). Correlations between relative size and local plants' 1995 TFP levels (0.55) or TFP growth (0.46) were also relatively strong and the correlation with 2005 levels was also moderately strong (0.32). For local plants, correlations between TFP levels and producer concentration were also positive and relatively strong (0.44 or 0.51), as were correlations between the concentration of all plants and foreign plant TFP in 1995 and the concentration of local plant and foreign plant TFP in 2005 (0.60). In other words, TFP levels often tended to be relatively high in industries where concentration was also relatively high. On the other hand, there was as relatively strong negative correlation (-0.55) between TFP growth in foreign plants and the concentration of local plants, suggesting that MNCs were not generally able to increase this measure of productivity in industries where local plant concentration was high. Other correlations between TFP growth and concentration measure were much weaker, however.

Table 10 presents 2005 TFP levels for incumbents remaining in the same industry

---

(1997, p. 22). As the authors state (p. 24), "the major advantage of these index number procedures is that they do not require any estimation of the parameters in the production technology". On the other hand, TFP estimates using these procedures are also sensitive to their requisite assumptions about returns to scale, capital utilization, and specification of factors, among other aspects of the production technology. It should also be noted that the calculations of median TFP in this paper exclude outlier that are more than two standard deviations from the means of their respective groups.

and new entrants in 1995-2005. In 2005, there was a strong tendency for incumbents that were large in 1995 to have the highest TFP levels of the four groups identified; this was true in 18 of the 27 industries examined. On the other hand, incumbents that were small in 1995 had the highest TFP levels in only one industry, textiles. New entrants had the highest levels in five industries that had relatively high MNC shares by 2005, leather, footwear, electrical machinery, precision machinery, and transport machinery. Plants switching into precision machinery also shared the top spot in that industry and plants changing into petroleum products, non-metallic mineral products, and fabricated metals also had the largest shares in their respective industries. Industry level correlations between TFP on the one hand, and producer concentration or market shares on the other, were generally relatively weak. The notable exceptions were relatively strong positive correlations of TFP for plants changing into industries with both measures of industry concentration in 1995 and between TFP of startups and market shares in 2005. In other words, industries with relatively high TFP levels in plants changing industries in 2005 also tended to be relatively concentrated in 1995, while industries with high TFP levels among startups in 2005 also had relatively large market shares for those startups.

Finally, Table 11 shows 1995 TFP levels for local plants that were surviving incumbents or exited their respective industries during this period. In this case as well, relatively small plants tended to have lower TFP than corresponding large groups, the exceptions being among plants leaving the non-metallic mineral products industry and closing firms in recycling. Among large plants, closing plants had the highest productivity most often (12 industries), followed by surviving incumbents (eight industries), and finally by plants leaving their respective industries (four industries). For large plants that closed in 1995-2005, there were also particularly strong positive correlations (0.71 or more) between 1995 TFP levels and all measures of producer

concentration in 1995 or 2005. In other words, closing plants tended to have relatively high TFP in industries that were highly concentrated in both years, suggesting that high concentration may have increased the risks of bankruptcy in large, local plants. Both 1995 concentration measures were also relatively strongly correlated with TFP levels among incumbents, suggesting a similar correlation for this group. Correlations between market shares and TFP levels within respective groups were relatively high for small plants that closed and large plants that changed industries.

5. Some Preliminary Conclusions

This preliminary study generates five major conclusions. First, the output of local plants fell from 68 percent of the total produced by Indonesia's medium-large manufacturing plants in 1995 to 64 percent in 2005. Local plant shares also decreased in many industries, two-thirds of the 27 examined in this paper. There were eight industries in which local plant shares decreased more than 10 percent points.

Second, there was a weak tendency toward decreased producer concentration as Herfindahl indexes for both all plants and local plants fell in about half of the 27 industries decreased during the period. At the industry-level, there were relatively strong correlations between changes in local plant shares and the changes in concentration indicating that MNC entry and/or expansion may have led to increases in producer concentration in several industries after the crisis. However, without accounting for the influences of other entry barriers on changes in concentration, it is unclear how important this correlation was or whether MNC entry was a cause or result of changing concentration.

Third, Spearman's rank correlation coefficients for market shares among incumbents were generally high, indicating that rankings remained stable. On the other

hand, the industry-level correlation between the rank correlation coefficients and the ratio of entrants from other industries to incumbents was negative. This indicates that existing plants tended to exit industries where rankings were relatively volatile.

Fourth, the industry-level correlation between TFP growth in local plants and Herfindahl indexes was very weak, indicating that producer concentration is not strongly correlated with TFP changes in local plants. On the other hand, TFP growth had a moderately strong and positive correlation with the size of local plants relative to MNCs, suggesting that large size tended to accompany high TFP growth.

Fifth, 2005 TFP levels were often weakly correlated with TFP and concentration, except the relatively strong tendency for incumbent plants changing into industries that were relatively concentrated in 1995 and for startups with large market shares in 2005 to have relatively high TFP in 2005. On the other hand, there was a very strong tendency for 1995 TFP levels to be highest in concentrated industries among large plants that closed during this period and among small plants with relatively large market shares in 1995.

Finally, it must be reiterated that these findings are preliminary and based on simple descriptive statistics and correlations. Estimation of more complex models is required to clarify if the observed correlations persist after accounting for other entry barriers affecting market shares Several of the standard 2-digit industry definitions also probably need modification to generate more reliable results as indicated above. It will also be important to closely compare these results with those of previous studies such as Bird (1999) in future revisions.

References

Asian Development Bank (various years) *Key Indicators*, 2004 and 2007 issues. Manila: Asian Development Bank.

Aswicahyono, Haryo and Mari Pangestu (2000) "The Impact of the Economic Crisis on Indonesia's Manufacturing Sector", *The Developing Economies*, 38(4):420-453.

Bird, Kelly (1999), 'Concentration in Indonesian Manufacturing 1975-93', *Bulletin of Indonesian Economic Studies*, 35(1): 43-73.

BPS-Statistics (various years a), *Statistik Indoneisa (Statistical Yearbook of Indonesia)*, 1997 and 2007 issues. Jakarta: BPS-Statistics.

BPS-Statistics (various years b), unpublished plant-level data underlying *Statistik Industri Besar dan Sedang (Large and Medium Manufacturing Statistics)*, 1985, 1995, 2001, and 2005 issues. Jakarta: BPS-Statistics.

Good, David H., M. Ishaq Nadiri, and Robin C. Sickles (1997) "Index Number and Factor Demand Approaches to the Estimation of Productivity", in M. Hashem Pesaran and Peter Schmidt, eds., *Handbook of Applied Econometrics, Volume II: Microeconomics*, pp. 14-80.

Takii, Sadayuki (2006) "Productivity Differentials and Spillovers in Indonesian Manufacturing", in Eric D. Ramstetter and Fredrik Sjöholm, eds. *Multinational Corporations in Indonesia and Thailand: Wages, Productivity, and Exports*, Hampshire, UK: Palgrave Macmillan, pp. 85-103.

Takii, Sadayuki (2007) "Indonesia", *East Asian Economic Perspectives* 18(1): 75-86.

Takii, Sadayuki and Eric D. Ramstetter (2005) "Multinational Presence and Labor Productivity Differentials in Indonesian Manufacturing 1975-2001", Bulletin of Indonesian Economic Studies 41(2):221-242.

Takii, Sadayuki and Eric D. Ramstetter (2007) "Survey of Recent Developments", *Bulletin of Indonesian Economic Studies* 43 (3): 295-322.

Thee, Kian Wie (2000) "The Impact of the Economic Crisis on Indonesia's Manufacturing Sector", *The Developing Economies*, 38(4):420-453.

Table 1: Number of Medium-Large Establishments and Number of Persons
Engaged in Manufacturing Plants by Employment Size and Owner

Sample, plant size	Number of plants			Employment (1,000s)		
	1995	2005	% change	1995	2005	% change
Manufacturing total	-	-	-	10,127	11,953	18.0
Small & household	-	-	-	5,567	6,856	23.2
Discrepancy	-	-	-	386	870	125.4
				4	7	
MEDIUM-LARGE PLANTS, ALL						
20+ employees	21,551	20,729	-3.8	4,174	4,227	1.3
100+ employees	6,547	6,599	0.8	3,593	3,680	2.4
500+ employees	1,751	1,802	2.9	2,535	2,628	3.6
1000+ employees	773	824	6.6	1,843	1,945	5.5
MEDIUM-LARGE PLANTS, LOCAL						
20+ employees	20,353	19,048	-6.4	3,459	3,249	-6.1
100+ employees	5,573	5,347	-4.1	2,891	2,727	-5.7
500+ employees	1,355	1,323	-2.4	1,977	1,859	-6.0
1000+ employees	587	594	1.2	1,434	1,353	-5.6
MEDIUM-LARGE PLANTS, ALL FOREIGN						
20+ employees	1,198	1,681	40.3	715	978	36.7
100+ employees	974	1,252	28.5	702	953	35.8
500+ employees	396	479	21.0	558	769	37.8
1000+ employees	186	230	23.7	410	592	44.5
MAJORITY-FOREIGN PLANTS						
20+ employees	978	1,512	54.6	570	849	49.1
100+ employees	796	1,123	41.1	559	827	48.0
500+ employees	326	434	33.1	445	663	49.1
1000+ employees	148	205	38.5	318	500	57.0

Note: Small plants include

Source: BPS-Statistics (various years a); authors' calculations from BPS-Statistics
(various years b); total employment from (Asian Development Bank 2007).

Table 2: Total Output of Local Plants and Shares of Local Plants
(output in billion rupiah, shares in percent)

Industry	Local Plant Output		Local Plant Shares		
	1995	2005	1995	2005	changes
Manufacturing total	132,181	700,350	68	64	-4
Food products	20,722	136,727	79	69	-10
Beverages	625	4,172	39	67	28
Tobacco	11,811	57,446	95	97	2
Textiles	18,445	71,170	80	77	-3
Wearing apparel	4,322	21,189	67	58	-9
Leather products	531	2,547	80	37	-43
Footwear	2,528	6,203	44	39	-5
Wood products	12,625	37,126	86	83	-3
Paper	4,964	44,921	69	66	-3
Publishing	2,284	12,138	89	86	-3
Petroleum products	152	931	84	46	-38
Chemicals	9,140	74,358	53	68	15
Rubber products	4,940	44,352	76	68	-8
Plastics products	3,740	21,605	71	68	-3
Non-metallic mineral products	4,518	21,775	69	58	-11
Basic metals	8,979	57,713	66	72	6
Fabricated metals	2,748	14,758	47	61	14
General machinery	1,731	9,024	47	54	7
Office & computing machinery	50	22	54	1	-53
Electrical machinery	2,797	11,596	47	45	-2
Radio, television & communication	1,368	14,244	19	51	32
Precision machinery	247	863	50	36	-14
Motor vehicles	2,434	10,004	29	16	-13
Other transport equipment	8,090	13,329	84	37	-47
Furniture	1,748	8,206	86	85	-1
Miscellaneous manufacturing	625	3,672	44	35	-9
Recycling	17	258	100	100	0

Source: Authors' calculations from BPS-Statistics (various years b).

Table 3: Median Output of Local Plants and Relative Size of Local Plants
Compared to Foreign Plants (output in billion rupiah, relative size in percent
of median foreign plant output)

Industry	Local Plant Output		Relative Size		
	1995	2005	1995	2005	changes
Manufacturing median	0.391	2.182	3	5	2
Food products	0.353	1.930	2	3	1
Beverages	0.213	4.016	2	8	6
Tobacco	0.071	0.356	1	1	0
Textiles	0.430	1.976	2	4	2
Wearing apparel	0.274	1.399	3	3	0
Leather products	0.483	2.613	10	13	3
Footwear	0.737	2.695	2	5	3
Wood products	0.580	2.558	5	10	5
Paper	1.815	8.380	17	13	-4
Publishing	0.533	4.628	10	6	-4
Petroleum products	2.995	8.869	78	82	4
Chemicals	1.174	9.657	6	15	9
Rubber products	1.520	7.917	12	7	-5
Plastics products	0.911	4.778	9	14	5
Non-metallic mineral products	0.148	0.506	1	2	1
Basic metals	4.205	36.644	16	37	21
Fabricated metals	0.530	3.003	4	8	4
General machinery	0.333	4.086	5	38	33
Office & computing machinery	2.015	2.820	5	6	1
Electrical machinery	1.514	7.764	10	12	2
Radio, television & communication	1.137	36.336	9	52	43
Precision machinery	0.292	3.547	3	25	22
Motor vehicles	0.966	10.319	5	11	6
Other transport equipment	0.440	3.298	3	9	6
Furniture	0.424	1.797	13	21	8
Miscellaneous manufacturing	0.289	0.949	6	7	1
Recycling	0.300	1.736	-	-	-

Source: Authors' calculations from BPS-Statistics (various years b).

Table 4: Herfindahl Indexes (percent) for All Plants and Local Plants (percent)

Industry	All plants			Local Plants		
	1995	2005	change	1995	2005	change
Manufacturing median	0.3	0.3	0.0	0.5	0.4	-0.1
Food products	0.6	0.8	0.2	0.8	0.9	0.1
Beverages	5.1	2.8	-2.3	4.5	4.2	-0.4
Tobacco	23.0	20.2	-2.8	25.1	21.5	-3.6
Textiles	0.9	2.3	1.4	1.2	3.4	2.2
Wearing apparel	0.7	0.7	0.0	0.7	0.9	0.2
Leather products	3.6	31.5	27.9	3.4	4.8	1.4
Footwear	1.9	3.7	1.8	4.2	4.2	0.0
Wood products	1.4	0.9	-0.4	1.7	1.1	-0.6
Paper	6.0	5.2	-0.8	8.2	7.2	-1.1
Publishing	4.5	4.3	-0.3	4.5	4.5	0.0
Petroleum products	19.0	9.6	-9.5	25.2	9.6	-15.6
Chemicals	1.3	1.4	0.1	2.3	2.6	0.3
Rubber products	2.6	2.8	0.3	3.2	4.4	1.1
Plastics products	1.7	1.0	-0.7	1.5	1.0	-0.5
Non-metallic mineral products	2.4	4.3	1.9	3.4	5.9	2.5
Basic metals	11.3	9.0	-2.3	22.0	16.0	-6.0
Fabricated metals	1.4	1.1	-0.4	1.2	1.6	0.4
General machinery	3.6	3.3	-0.3	6.0	7.6	1.6
Office & computing machinery	45.7	86.4	40.7	84.1	59.3	-24.8
Electrical machinery	4.7	2.6	-2.1	6.7	4.5	-2.3
Radio, television & communication	4.6	2.6	-2.0	13.1	4.5	-8.6
Precision machinery	12.9	17.3	4.4	28.4	31.2	2.8
Motor vehicles	11.1	10.4	-0.7	9.5	3.2	-6.3
Other transport equipment	22.7	29.7	7.0	31.3	6.0	-25.2
Furniture	0.9	0.6	-0.3	0.9	0.7	-0.2
Miscellaneous manufacturing	3.4	5.4	2.0	6.1	5.5	-0.7
Recycling	6.4	13.8	7.4	6.4	13.8	7.4
Correlations with Herfindahl Indexes						
Local plant shares	0.05	-0.54	-0.61	-0.05	-0.39	0.56
Relative size	0.18	-0.08	-0.13	0.13	0.04	-0.05

Source: Authors' calculations from BPS-Statistics (various years b).

Table 5: Coefficients of variation (percent) and Skewness for Output Logged

| | Variation coefficients | | | | Skewness | | | |
| | All plants | | Local | | All plants | | Local | |
Industry	1995	2005	1995	2005	1995	2005	1995	2005
Manufacturing median	15.3	14.2	14.5	13.7	0.7	0.5	0.7	0.5
Food products	14.1	13.2	13.6	12.6	0.9	0.8	1.0	0.9
Beverages	15.9	12.1	14.1	11.5	0.8	0.1	0.8	0.1
Tobacco	18.9	19.8	18.7	19.7	1.2	0.7	1.2	0.7
Textiles	16.6	14.8	16.1	14.4	0.5	0.4	0.6	0.4
Wearing apparel	13.9	13.5	13.0	12.4	0.8	0.6	0.8	0.7
Leather products	12.6	12.4	12.2	11.9	0.5	0.5	0.5	0.3
Footwear	15.0	12.8	13.5	11.6	0.4	0.6	0.5	0.5
Wood products	14.1	13.1	13.7	13.0	0.7	0.4	0.8	0.4
Paper	15.2	13.1	14.8	12.6	0.3	0.5	0.3	0.4
Publishing	12.2	11.7	12.0	11.6	0.7	0.3	0.7	0.3
Petroleum products	8.0	8.5	6.8	8.3	0.1	0.6	1.4	0.4
Chemicals	15.1	13.1	14.5	13.3	0.1	-0.1	0.2	0.1
Rubber products	13.2	13.4	13.0	13.0	0.3	0.3	0.4	0.4
Plastics products	12.1	11.0	11.6	10.6	0.4	0.3	0.5	0.3
Non-metallic mineral products	13.9	14.0	13.1	13.1	1.4	1.2	1.4	1.2
Basic metals	14.9	11.0	15.0	11.5	0.0	0.1	0.1	0.3
Fabricated metals	13.7	12.0	12.6	11.4	0.6	0.4	0.5	0.5
General machinery	13.2	11.6	11.7	11.6	1.0	0.4	0.9	0.5
Office & computing machinery	15.5	13.3	15.6	6.7	-0.2	1.4	0.5	1.7
Electrical machinery	13.9	11.8	13.3	11.8	0.3	0.1	0.5	0.4
Radio, television & communication	14.5	10.1	13.2	11.2	0.2	-0.4	0.7	-0.3
Precision machinery	13.9	11.9	12.3	11.3	0.7	0.6	1.0	0.7
Motor vehicles	14.9	13.6	13.4	12.8	0.6	0.0	0.6	0.0
Other transport equipment	15.4	14.6	14.4	14.3	1.1	0.4	1.3	0.4
Furniture	11.9	9.2	11.7	9.1	0.4	0.5	0.5	0.5
Miscellaneous manufacturing	13.8	12.6	12.3	11.2	0.6	0.8	0.7	0.7
Recycling	5.8	8.8	5.8	8.8	0.7	0.5	0.7	0.5

Source: Authors' calculations from BPS-Statistics (various years b).

Table 6: Incumbents, Exiting Plants, and Entrants

Industry	Incumbents		Exiting/ Incumbents, %		Entrants/ Incumbents, %	
	Number	Spearman,%	Close	Change	Startup	Change
Manufacturing total	9,622	-	113	11	105	11
Food products	2,357	78	80	1	87	1
Beverages	129	81	88	5	119	5
Tobacco	363	84	124	0	136	0
Textiles	975	84	113	17	88	10
Wearing apparel	701	76	188	13	155	19
Leather products	69	76	201	13	125	13
Footwear	159	82	152	11	93	13
Wood products	595	79	187	10	110	13
Paper	172	85	66	15	106	34
Publishing	286	67	86	22	83	8
Petroleum products	8	-62	225	25	425	125
Chemicals	620	79	56	7	58	5
Rubber products	281	86	46	11	47	17
Plastics products	466	75	71	14	102	16
Non-metallic mineral products	807	72	149	2	86	2
Basic metals	96	68	96	22	99	21
Fabricated metals	360	77	114	22	109	29
General machinery	141	73	353	42	138	52
Office & computing machinery	1	-	-	-	-	-
Electrical machinery	123	56	95	14	90	15
Radio, television & communication	29	82	424	103	552	7
Precision machinery	24	48	138	67	83	13
Motor vehicles	114	84	103	25	114	16
Other transport equipment	132	76	122	18	106	19
Furniture	441	73	88	18	191	13
Miscellaneous manufacturing	158	79	135	18	203	30
Recycling	15	33	60	87	187	80
Industry-level correlations						
Incumbents		0.23	-0.21	-0.40	-0.27	-0.34
Spearman			-0.13	-0.23	-0.47	-0.84
Closing plants/incumbents				0.49	0.69	0.18
Changing exiters/incumbents					0.60	0.31
New entrants/incumbents						0.45

Notes: The Spearman rank correlation coefficient compares ranks of market shares in 1995 and 2005; a value of 100 indicates rankings were unchanged and a value of 0 indicates that random changes dominated, and a value of -100 indicates the exact reversal of ranks; change refers to plants changing industries.
Source: Authors' calculations from BPS-Statistics (various years b).

Table 7: 2005 Market Shares for Local Incumbents and New Entrants by Type (percent)

Industry	Incumbents		New Entrants	
	Small in 1995	Large in 1995	Startups	Change
Food products	4	57	39	0
Beverages	6	37	55	2
Tobacco	1	83	8	8
Textiles	4	73	21	2
Wearing apparel	6	48	35	12
Leather products	15	55	26	4
Footwear	10	57	30	3
Wood products	7	67	23	3
Paper	7	63	23	7
Publishing	10	64	24	2
Petroleum products	24	30	43	3
Chemicals	9	67	19	5
Rubber products	6	78	13	2
Plastics products	12	46	38	4
Non-metallic mineral products	5	68	27	0
Basic metals	7	77	10	7
Fabricated metals	7	51	26	15
General machinery	3	59	28	10
Office & computing machinery	32	5	32	32
Electrical machinery	14	40	45	0
Radio, television & communication	1	22	76	1
Precision machinery	4	45	51	0
Motor vehicles	9	55	31	4
Other transport equipment	4	49	40	6
Furniture	10	49	36	5
Miscellaneous manufacturing	10	35	49	7
Recycling	17	10	22	52

Note: Large plants are plants with market shares in the top quartile; small plants are those with shares in the bottom three quartiles.
Source: Authors' calculations from BPS-Statistics (various years b).

Table 8: Market Shares in 1995 for Local Plants by Size and Type in 1995
(percent)

Industry	Small plants in 1995			Large plants in 1995		
	Incumbents	Close	Change	Incumbents	Close	Change
Food products	3	2	0	76	18	1
Beverages	3	3	0	75	16	1
Tobacco	0	0	0	98	2	0
Textiles	2	2	0	64	26	6
Wearing apparel	3	5	0	48	38	6
Leather products	4	8	1	52	33	1
Footwear	3	5	0	36	56	0
Wood products	2	4	0	60	33	1
Paper	4	3	1	79	9	4
Publishing	5	3	1	52	10	29
Petroleum products	7	18	1	0	23	50
Chemicals	5	2	0	76	15	2
Rubber products	6	3	1	80	8	4
Plastics products	7	5	1	63	19	5
Non-metallic mineral products	2	2	0	75	20	2
Basic metals	3	2	0	82	10	2
Fabricated metals	4	5	1	51	23	15
General machinery	1	6	1	32	41	19
Office & computing machinery	0	9	0	91	0	0
Electrical machinery	3	4	0	67	23	3
Radio, television & communication	1	4	2	29	63	1
Precision machinery	3	4	1	31	9	52
Motor vehicles	3	4	1	73	10	10
Other transport equipment	1	1	0	25	73	1
Furniture	8	6	1	57	18	10
Miscellaneous manufacturing	4	6	1	63	24	3
Recycling	22	8	14	14	30	13

Note: Large plants are plants with market shares in the top quartile; small plants
are those with shares in the bottom three quartiles.
Source: Authors' calculations from BPS-Statistics (various years b).

Table 9: Median TFP Levels (values) and Median TFP Growth (percent) in Local and MNC Plants

Industry	Local plants			MNC plants		
	1995	2005	Growth	1995	2005	Growth
Manufacturing median	1.25	1.61	22	1.81	2.79	49
Food products	1.24	1.27	-2	1.65	2.03	27
Beverages	1.03	1.45	8	3.36	1.46	-78
Tobacco	0.71	1.33	11	1.78	0.92	-1
Textiles	1.13	1.75	52	1.81	2.23	48
Wearing apparel	1.47	2.26	59	1.70	3.57	65
Leather products	1.38	1.67	22	1.22	3.39	122
Footwear	1.42	1.77	17	1.54	3.52	69
Wood products	1.28	1.72	25	1.45	1.65	24
Paper	1.27	1.65	43	1.31	3.19	44
Publishing	1.20	1.59	35	2.81	7.49	63
Petroleum products	2.56	1.57	-51	1.33	1.20	440
Chemicals	1.12	1.87	41	2.39	3.37	29
Rubber products	1.00	1.52	30	1.97	2.34	51
Plastics products	0.80	1.30	59	1.08	1.64	96
Non-metallic mineral products	1.28	1.12	-22	1.70	1.43	95
Basic metals	1.47	1.83	19	3.11	3.23	-93
Fabricated metals	1.66	1.65	-10	2.36	2.47	74
General machinery	1.64	2.63	41	2.01	2.58	77
Office & computing machinery	2.14	2.14	76	2.14	12.13	250
Electrical machinery	1.88	2.93	28	1.91	3.38	2
Radio, television & communication	1.88	4.04	184	1.71	4.59	147
Precision machinery	1.71	1.88	14	1.49	3.26	92
Motor vehicles	1.51	3.20	52	2.49	4.70	67
Other transport equipment	1.65	2.46	36	3.35	3.61	132
Furniture	1.25	2.58	79	1.45	2.74	72
Miscellaneous manufacturing	1.19	2.09	76	1.46	4.51	149
Recycling	0.87	0.99	3	1.03	1.03	3
Industry-level correlations						
TFP, local-foreign plants	0.07	0.36	0.01	-	-	-
Local plant shares-TFP	-0.35	-0.45	0.24	-0.23	-0.57	-0.60
Relative size-TFP	0.55	0.32	0.46	-0.21	-0.13	0.00
Herfindahl all plants-TFP	0.44	0.02	0.15	0.51	-0.04	-0.17
Herfindahl local plants-TFP	0.51	-0.04	-0.17	0.19	0.60	-0.55

Source: Authors' calculations from BPS-Statistics (various years b).

Table 10: 2005 TFP Levels for Local Incumbents and New Entrants by Type (percent)

Industry	Incumbents		New Entrants	
	Small in 1995	Large in 1995	Startups	Change
Food products	1.10	1.54	1.31	1.09
Beverages	1.42	1.98	1.27	1.76
Tobacco	0.75	3.02	1.30	1.30
Textiles	1.82	1.70	1.71	1.53
Wearing apparel	2.06	3.23	2.19	1.82
Leather products	1.10	1.67	1.88	1.45
Footwear	1.46	1.91	1.97	1.82
Wood products	1.60	1.98	1.71	1.46
Paper	1.75	1.92	1.70	1.43
Publishing	1.38	2.15	1.67	1.92
Petroleum products	1.70	1.90	1.38	5.58
Chemicals	1.59	3.29	1.60	1.98
Rubber products	1.33	2.53	1.29	1.47
Plastics products	1.28	1.52	1.26	1.50
Non-metallic mineral products	1.03	1.08	1.22	1.92
Basic metals	1.49	3.34	1.59	2.49
Fabricated metals	1.49	1.93	1.84	2.02
General machinery	1.13	3.02	2.93	2.34
Office & computing machinery	-	1.53	-	-
Electrical machinery	2.64	3.01	3.45	1.61
Radio, television & communication	3.16	10.32	3.97	3.10
Precision machinery	2.28	1.45	2.60	2.60
Motor vehicles	1.99	3.07	3.84	0.96
Other transport equipment	2.08	2.95	2.31	2.43
Furniture	2.84	3.20	2.50	1.60
Miscellaneous manufacturing	2.12	2.64	2.02	1.69
Recycling	1.17	1.26	1.26	0.71
Industry-level correlations				
1995 Herfindahl all plants-TFP	-0.03	-0.06	0.04	0.40
2005 Herfindahl all plants-TFP	-0.16	-0.16	0.01	0.05
1995 Herfindahl local plants-TFP	0.13	-0.02	0.13	0.53
2005 Herfindahl local plants-TFP	-0.10	-0.15	-0.04	0.20
Market shares-TFP	-0.03	-0.15	0.51	-0.27

Note: Large plants are plants with market shares in the top quartile; small plants are those with shares in the bottom three quartiles.
Source: Authors' calculations from BPS-Statistics (various years b).

Table 11: Market Shares in 1995 for Local Plants by Size and Type in 1995
(percent)

Industry	Small plants in 1995			Large plants in 1995		
	Incumbents	Close	Change	Incumbents	Close	Change
Food products	1.08	1.11	0.84	1.72	1.82	1.36
Beverages	1.04	0.91	0.89	1.82	1.62	0.53
Tobacco	0.68	0.46	-	2.79	2.49	2.20
Textiles	0.98	1.08	1.25	1.23	1.55	1.35
Wearing apparel	1.28	1.33	1.20	1.87	2.15	1.55
Leather products	1.24	1.35	1.19	1.85	2.29	1.18
Footwear	1.35	1.43	0.83	1.32	1.62	-
Wood products	1.10	1.21	1.31	1.72	1.42	1.66
Paper	1.15	1.16	0.95	1.53	2.29	2.25
Publishing	0.98	1.00	0.77	1.69	2.67	1.87
Petroleum products	1.90	2.16	2.91	-	4.12	-
Chemicals	1.08	0.96	0.88	1.94	2.20	1.26
Rubber products	0.87	0.86	0.95	1.70	1.23	0.92
Plastics products	0.65	0.78	1.05	1.03	1.32	2.49
Non-metallic mineral products	1.21	1.23	2.48	1.45	1.69	1.60
Basic metals	1.64	1.22	1.92	2.54	2.37	1.86
Fabricated metals	1.50	1.50	1.44	2.23	2.10	2.46
General machinery	1.00	1.57	0.96	1.94	2.13	1.87
Office & computing machinery	-	1.53	-	-	5.90	-
Electrical machinery	1.26	1.66	1.49	4.21	3.88	-
Radio, television & communication	1.67	1.77	1.14	1.90	2.33	-
Precision machinery	1.12	1.61	2.56	2.16	3.31	4.07
Motor vehicles	1.61	1.19	1.44	1.38	2.62	5.63
Other transport equipment	1.19	1.47	0.93	3.92	2.58	1.10
Furniture	1.21	1.19	1.18	1.58	1.20	1.35
Miscellaneous manufacturing	1.03	1.07	0.79	1.79	2.22	0.84
Recycling	0.83	1.59	0.48	0.90	1.11	0.85
Industry-level correlations						
1995 Herfindahl all plants-TFP	0.17	0.20	0.43	0.55	0.79	0.28
2005 Herfindahl all plants-TFP	-0.01	0.18	0.12	0.36	0.71	0.09
1995 Herfindahl local plants-TFP	0.26	0.27	0.50	0.56	0.82	0.29
2005 Herfindahl local plants-TFP	-0.08	0.18	0.48	0.20	0.72	0.30
Market shares-TFP	-0.17	0.64	-0.24	0.03	-0.22	0.48

Note: Large plants are plants with market shares in the top quartile; small plants
are those with shares in the bottom three quartiles.
Source: Authors' calculations from BPS-Statistics (various years b).