

PRELIMINARY AND INCOMPLETE DRAFT; PLEASE DO NOT QUOTE

Economic Downturns and Foreign Multinationals in Asian Manufacturing

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Abstract

This paper first examines trends in the shares of foreign-owned multinational corporations (MNCs) in the manufacturing industries of eight of Asia's larger economies, Japan, Hong Kong, Korea, China, Singapore, Malaysia, Thailand, Indonesia, and Vietnam, focusing on four periods of economic slowdown surrounding 1985, 1998, 2001, and 2009.

To be completed...

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Request

Please note that this is a preliminary draft with many remaining errors and omissions and we thus ask that you please refrain from quoting this version. We have also omitted the list of references to save paper. A working paper version will be available from the authors by the mid-March 2010 at the latest and will be posted on www.icsead.or.jp shortly thereafter. We would, however, be most grateful for any comments and hope to reflect them in the working paper version or a future revision.

1. Introduction

There is now a substantial literature illustrating how foreign multinational corporations (MNCs) have made relatively large and important contributions to the manufacturing industries in many of Asia's economies over the last three to four decades, a period when many of these economies achieved remarkable economy-wide growth.¹ However, since Asian financial crisis in 1997-1998, growth has tended to decline some in several economies, partially as a result of the crisis and two subsequent downturns surrounding 2001 dot.com crash and 2008-2009 sub-prime crisis. Both of these latter downturns differed from 1997-1998 in that they appear to have been caused primarily by large fluctuations in U.S. asset prices, which destroyed investor and consumer confidence in many advanced economies and adversely affected Asian exporters, most of whom are manufacturers. Even as late as the fall of 2008, it was not uncommon to hear the view that Asia, in particular Asian manufacturing, was decoupling and unlikely to be affected much by the recent crisis because Asian manufacturers and financial institutions were not heavily exposed to these asset price fluctuations. However, by early 2009, it became clear that the contraction of European and U.S. aggregate demand resulting from the crisis was large enough to lead to sharp drops in Asian exports, many of which were manufactures eventually bound for these markets. These declines in turn soured consumer and investor confidence in Asia, compounding the contractionary effect in several of the region's economies.

Several previous studies have emphasized how foreign direct investment (FDI) by MNCs has been more stable than other forms of international capital flows, especially after the 1997-1998 crisis.² These studies also emphasize how MNCs have generally been more stable financially, making them better able to exploit investment and export opportunities that resulted from adjustment (e.g., declines in asset prices and exchange rates) to the downturns. In addition, the most influential effects of MNCs are generally thought to result from the exploitation of MNCs' firm-specific, generally intangible assets (e.g., patents, other results of R&D and technology development, marketing networks, and management know-how) that affect long-term firm performance, both in MNCs and in local firms in host economies.³ In the context of Asian downturns, which have often been accompanied by exchange rate

¹ See, for example, Athukorala (2007), Galenson (1985), Hill (1988), Kohpaiboon (2006), Kumar (1994), Ramstetter (1991, 1999, 2009), Ramstetter and Haji Ahmad (2009), Phan and Ramstetter (2004, 2009), and Ramstetter and Sjöholm (2006).

² For examples of this literature, see Aguiar, and Gopinath (2005), Athukorala (2003); Chung et al. (2007), Fukao (2001), Hill and Jongwanich (2009); Lipsey (2001), Narjoko and Hill (2007), Wang and Wong (2007).

³ See Caves (2007), Dunning (2003), and Rugman and Brewer (2001) for summaries of or compilations of relevant literature.

depreciations, the fact that MNCs tend to be much more export-oriented than local firms is particularly important.

The purpose of this paper is to analyze how foreign-based manufacturing MNCs in Asia have performed during these downturns, and to the extent that information is available, a previous one centered on 1985. In particular, we ask whether there were any conspicuous trends in MNC shares of manufacturing in Asian economies or MNC-local differentials of firm performance measures such as size, average labor productivity, wage levels, capital intensity or export orientation. Because data availability, definitions, and compilation methodologies differ greatly across host economies, the core analysis is presented in eight subsections of Section 3 organized by host economy. Before these analyses, overall manufacturing trends and macroeconomic trends are summarized in order to identify periods of economic downturn (Section 2). Finally, the paper concludes with a summary of the major patterns emerging and the long agenda for future research discussed (Section 4). Foreshadowing these conclusions, it should be emphasized that the purpose of this paper is to paint the “big” or “aggregate” picture, and show how MNC shares and MNC performance relative to local firms varied during economic downturns across many economies. Accordingly this paper will not be able to examine differences among industries or control for other influences that may explain the variations observed. On the other hand, the paper will provide a relatively comprehensive region-wide and up-to-date summary of related trends than would be impossible in a more statistically rigorous study.

2. Identifying Downturns and Their Influence in Asian Manufacturing

In principle, employment should be one of the better indicators of general trends in manufacturing, primarily because it is easily measured in real terms (persons) and widely reported in labor force surveys as well as economic or industrial censuses and surveys.⁴ However, if one collects the most comprehensive (labor force) estimates, one quickly realizes that declines in manufacturing employment seem to have been unusually common in a region that supposedly is a manufacturing powerhouse (see Appendix Table 11). These declines were most common in relatively high wage economies (23 of 29 years 1981-2009 in Hong Kong, 13 years in Singapore, and 12 years in Japan), which rely increasingly on services to supply growth and on the substitution of capital and other factors of production to maintain competitiveness in all sectors. On the other hand, declines were also surprising common in the

⁴ Manufacturing GDP is another potentially interesting indicator but this indicator is not available for China or Vietnam in many years, making it difficult to use in this context.

relatively low wage, industrializing economies of Malaysia (10 years), Thailand and Indonesia (7 years each). Moreover, there were declines in a number of years where the overall economy did not experience large downturns (e.g., 1995, 2004-2005, 2007 in Malaysia; 1984, 1988, and 2006 in Thailand; 1983, 1986, 1995 2003-2004, 2006 in Indonesia).

This discussion also points to a fundamental problem with using a sectoral measure such as manufacturing employment or GDP to identify economic cycles, including downturns. Namely, as economies grow and mature, they experience structural change with factors of production and output tending to shift first from agriculture and traditional services to manufacturing and then increasingly into modern services. These structural changes have been particularly pronounced in many Asian economies, which have grown and industrialized rapidly during the period studied in this paper (1981-2009). Moreover, these structural changes have often been uneven, causing fluctuations in manufacturing employment (or GDP) that were unrelated to economic cycles and making sectoral indicators of limited use to identify economic downturns.

In short, economic downturns are macroeconomic phenomena and thus best measured at the macroeconomic level. Correspondingly, recessionary periods (mild downturns) are usually defined as periods during which total, real GDP declines two or more consecutive quarters and this paper will follow this convention with two important modifications. First, because most of the data used in this paper are not available quarterly, this paper must rely on annual data. Second, it is important to recognize the fact that average growth has been relatively high in Asia over the last three decades. For example, according to International Monetary Fund (2009) estimates and forecasts as of October 2009, the mean of annual growth rates during 1981-2009 was below 3.5 percent in only two economies (Japan and the Philippines) and above 5.5 percent in eight (Korea, China, Taiwan, Singapore, Malaysia, Thailand, Vietnam, and India). Correspondingly, even slow, positive growth is usually considered a slowdown in most Asian economies. Thus, this paper defines a downturn as any year during which the annual growth rate falls below 1.00 percent. As detailed by Ramstetter and Haji Ahmad (2010, Table 1), this definition suggests two periods of rather widespread regional downturn in Asia's largest economies in 1998 and 2009 (8 of 14 in each year) and two less widespread of downturns in 1985 and 2001 (4-5 economies). On the other hand, no more than 2 economies experienced a similar downturn in any other year between 1981 and 2009.

The standard definition of recessions ignores changes in domestic prices (inflation or deflation) and exchange rates that have also been key elements of many recent downturns in

Asia. It is therefore instructive to look at alternative measures that reflect the influence of these factors, for example nominal GDP growth measured in U.S. dollars. Again using the International Monetary Fund's October 2009 estimates and a 1.00 percent growth criterion, the 1998 and 2001 downturns appear much more widespread (affecting 11 of 14 economies) when using the U.S. dollar estimates than when using the real GDP criteria (Ramstetter and Haji Ahmad 2010, Table 1). By this definition, only China and Vietnam avoided a marked slowdown in both of these years, while Bangladesh (1998) and India (2001) experienced a marked slow in only one year each. The 1985 downturn also appears more widespread when growth is measured in U.S. dollars, affecting half the 14 economies. Moreover, the U.S. dollar measure indicates that all three of these episodes extended lasted 2 years or more in a larger number of economies surrounding 1985 (4 vs. 1), 1997 (7 vs. 1), and 2001 (5 vs. 1) around 2001, and 9 around the 1997 downturn. On the other hand, the October 2009 estimates suggest that 2009 is unlikely to extend more than one year, Korea (both criteria) and Japan (real GDP criterion only) being the only exceptions.

Despite important differences in the scope and length of these slowdowns depending on the measure used, it is most important to emphasize that both criteria clearly identify 4 periods of economic downturn in several of Asia's large economies over the last three decades, the years surrounding 1985, 1998, 2001, and 2009. The remainder of this paper will thus analyze how MNC shares of manufacturing and the performance of MNCs relative to local firms or plants has changed since the early 1980s, focusing on the periods surrounding these slowdowns.

3. Trends in MNC Shares and Relative Performance

There are two important problems that any analyst must confront when trying to conduct an analyses such as these. First, there are important data constraints that prohibit, limit, and/or influence the nature of the analyses one can perform. For example, this draft only includes data for eight of the 14 large Asian economies so far, though we hope to add two or three additional economies in a future revision.⁵ Even when available, data for some countries includes only a limited number of indicators, which can make meaningful analysis difficult. Moreover, official compilations of the data used in this study often exclude compilations by ownership category, making it necessary to compile the underlying micro-data. Also

⁵ In this respect, we know of useful, privately published firm-level databases for large firms India and Taiwan but have not yet had time to purchase and/or compile them; there is a also a potentially interesting large-firm database for the Philippines but we are as yet unsure if it can be obtained for a long enough period to be useful in these analyses.

definitions of ownership categories (e.g., the threshold foreign ownership share used to define MNCs) differ greatly across some economies. In principle, this paper tries to use two relatively standard criteria, all MNCs defined as firms or plants with foreign ownership shares of 10 percent or more, or the closest available alternative, and those majority-foreign or a higher foreign share. Especially when compilations of firm-level data are used (and even sometimes with compilations of plant-level data), it is important to understand that manufacturing firms, especially large multi-product, multi-activity firms, may also be heavily involved in trade and services or other industries, even if their main activity is manufacturing. Sample coverage is another particularly important issue in these analyses because the coverage of surveys for some countries varies greatly from year to year, which greatly complicates analysis of how MNC shares and relative performance relates to cycles. Correspondingly, the analysis of MNC shares usually employs ratios to estimates for total manufacturing, which are usually lower than ratios to sample totals. On the other hand, analysis of relative performance has to rely on sample data alone to facilitate consistent comparisons.

Second, there are important methodological problems. The major problem results because the questions this paper asks are best analyzed in single-country time series, in order to capture important differences in the nature of economic cycles and MNC involvement often differs greatly across economies. However, the time series available are far too short to facilitate sophisticated econometric modeling. Moreover, the periods of downturns are so few and short that it is difficult to perform even more simplistic correlation analyses, which are more robust in small samples. Correspondingly, the paper's methodology is descriptive, focusing on how to interpret the trends observed.

3a. Japan

The Japanese data on foreign MNCs come from official compilations of voluntary survey data. Because firms are not legally required to participate in these surveys (unlike most of the official survey/census data used in this study), survey coverage has sometimes been relatively uneven. On the other hand, the number of foreign MNCs has been relatively limited (675 firms maximum, Appendix Table 1) so the coverage problems are probably relatively small in most years, especially regarding large MNCs. Another important point is that the ownership threshold for inclusion in these surveys has changed over time, from 25 percent in 1981 and previous years to 50 percent and more in 1982-1990 and then 33 percent from 1991. The influence of these changes was not that large until 1998, however, when Renault acquired a

substantial minority share in Nissan. These MNC data are compared to Japan's corporation statistics to calculate MNC shares and impute data for local firms (by subtracting MNC totals from national totals). The coverage of this database appears to have increased markedly in the early-to-mid-1990s (from 101,991 in 1991 to 226,005 or more in 1997-2002), though subsequent declines in firm numbers (to 202,686 in 2007) probably reflect consolidation in Japan's corporate sector rather than changes in coverage.

Correspondingly, although Table 1 suggests that MNC shares fell sharply in 1993, mid-year of the 1992-1994 slowdown that followed the bursting of Japan's asset price bubble, part of the decline might also be related to changes in the coverage of the corporation statistics. On the other hand, MNC shares rose markedly in 1998 (employment) or 1999 (sales), during a subsequent, sharper slowdown in 1998-1999, mainly as a result of the investment in Nissan. In this case, in particular, the recession was most likely an important factor in the worsening of Nissan's balance sheet and its subsequent acceptance of a large foreign investor. During a final period of decline, MNC shares did not change much from previous years. In short, there was no consistent, clear trend in MNC shares during the rather frequent downturns experienced after 1992. It is also important to point out that although Japan remains one of Asia's largest and richest economies leading one to expect large MNC activity, foreign MNC shares of manufacturing have remained markedly smaller in Japan than in any other economy examined in this paper.

Although foreign MNCs were relatively small in Japan and the sample of local firms includes a large number of sophisticated Japanese MNCs that would theoretically be expected to resemble foreign MNCs more than non-MNC Japanese firms, foreign MNCs tended to be much larger and more export-oriented than local firms (Table 1). They also tended to pay higher wages and have higher sales per worker in most years. On the other hand, differences in value added per worker were much smaller. The size differential first declined in 1992 and then increased markedly as the slowdown continued into 1993-1994. It also increased again in the 1998 downturn, but fell in 1999 and again in 2001-2002. Sales per worker increased in 1992-1993, but both labor productivity differentials fell sharply in 1998 before increasing again in the 2001-2002 slowdown. Finally, export propensity differentials rose sharply in 1998-1999 but remained relatively unchanged during the 2001-2002 slowdown. In short, there also appear to be no consistent relationships between downturns and relative MNC performance. On the other hand, the foreign acquisition of Nissan in 1998 clearly had a large impact on relative MNC performance and was probably partially related to the sharp decline in Japan during this year.

3b. Hong Kong

Data for Hong Kong refer to manufacturing plants from standard industrial surveys and samples were quite comprehensive through 1992 (over 90 percent of all manufacturing employment, Appendix Table 2), but less so in several years afterwards (e.g., 60-69 percent of manufacturing employment in 1995-2003). On the other hand, coverage of MNCs seems to have been rather consistent; for example MNC shares of all manufacturing employment (taken from labor force data) were steady at 11 percent while shares of value added rose from 19 to 29 percent in 1992-1998 (Table 2). Published compilations are also quite useful because they allow identification of several MNC ownership thresholds.

During two of the three slowdowns experienced by Hong Kong in 1985 and 2001, total MNC shares declined (Table 2). However, shares of majority-foreign MNCs did not decline in the latter year, and both MNC shares changed very little during the much sharper decline during the 1998 Asian crisis. And, conversely, most shares increased sharply in 2008 just before another downturn in 2009, when real growth fell to -3.6 percent (Appendix Table 9). It is also important to understand that Hong Kong's manufacturing sector has shrunk markedly with total manufacturing employment falling 80 percent in 1984-1998 and employment of sample plants falling even more (85 percent, Appendix Table 2). Hence even when MNC shares rose, absolute levels of MNC activity were often declining. Many of these declines were also accompanied by the transfer of production facilities from Hong Kong to China, both by MNCs and local firms.

MNC plants have always much larger than local plants, had substantially higher labor productivity by both measures, and paid higher wages in all years (Table 2). Size differentials did not change that much during the three downturns, but labor productivity differentials declined quite a bit in the 1985 and 2001 slowdowns but increased some in 1998. There was also a sharp decline in the value added per worker differential in 2008, perhaps foreshadowing the effect of the 2009 slowdown. On the other hand, wage differentials changed relatively little, but increased a small amount in 1998 and 2001. In short, trends in MNC shares, as well as size and wage differentials were not consistent surrounding the four regional downturns, all of which had large effects on the open Hong Kong economy, but labor productivity differentials did increase some during the three of the four slowdowns. This suggests that MNCs tended to increase production and/or reduce employment more than local plants.

3c. China

Analysis of the Chinese case is problematic for three important reasons. First, the data constraint is severe, especially before 1998. After 1998, this constraint loosened markedly because China's large-firm surveys became more standardized. However, the format of published compilations from these data omitted employment until 2004, making it difficult to perform calculations similar to those done for most other economies. Moreover, estimation of manufacturing totals is impossible for value added before 2004 and Second, China has not experienced real growth lower than the 1.00 percent criterion in any year since 1980 and growth never fell below 7.6 percent after FDI and MNC activity increased sharply beginning in the early 1990s when data on MNCs first became available (Table 3, Appendix Table 9). Third, for most of the 1993-2007 period, there was a strong upward trend in both absolute levels of MNC activity and MNC shares of the Chinese economy, though these increases have abated some in recent years. Thus, it is practically impossible to examine how MNC shares and relative performance have changed over time in China.

The Chinese data do highlight a couple of another important point in this context, however. Namely, the data suggest that average labor and capital productivity differentials were relatively small compared to many other economies in this study, and tended to disappear toward the end of the sample period (Table 3). This may be partially related to the fact that sample firms are all relatively large, and productivity differentials are probably related to firm size, at least to some extent. On the other hand, there are substantial size differentials between MNCs and local firms in this sample and they increased in recent years when productivity differentials decreased. Thus, it is unlikely that the size factor explains much of these patterns. Conversely, similar to shares of manufacturing production, MNC shares of exports (the vast majority of which are manufactures), also flattened out, though at relatively high levels. This in turn suggests that, MNC-local differentials have probably declined in recent years, though they remain substantial.

This discussion highlights the important point that the MNC-local differentials examined in this paper are partial measures and related to factors not accounted for in important ways. For example, even if there are large differences in average labor productivity, it is entirely possible that these differentials can be largely explained by differences in capital intensity, scale, ability to export, and other factors in MNCs and local firms. Moreover, once these influences are accounted for, ownership related differentials might disappear or be reversed.

3d. Singapore

The Singaporean data are very similar to the Hong Kong data in many respects, coming from annual industrial censuses and published compilations allow for the use of several ownership thresholds to identify MNCs in manufacturing. The coverage of the censuses relative to labor force estimates of manufacturing employment, for example, also declined some in recent years (Appendix Table 4). Like Hong Kong, Singapore is small, open, regional hub, and felt the effects of the four regional downturns very strongly. On the other hand, the Singapore case contrasts sharply in that total manufacturing employment increased markedly (68 percent in 1984-1998), despite similarly large Singaporean investments in China and surrounding ASEAN economies (Table 4).

Two other important contrasts are that MNC shares of Singaporean manufacturing have always been extremely large (e.g., about three-fifths of employment in several years), but have tended to decrease substantially in recent years (e.g., to about one-third or less of employment in 2005-2008, Table 4). During 1985-1986 all MNC, shares increased some and similar increases were also observed in value added shares for 1998-1999 and again in 2001-2002, but employment shares were not. On the other hand, MNC shares fell in 2008 when GDP growth slowed almost to 1.00 percent and before the 2009 contraction. Thus, prior to most recent slowdown MNC shares, especially production shares tended to increase in Singapore.

In Singapore MNCs have always been larger, produced and paid more per worker, used more fixed capital per worker, exported more of their output than local manufacturing plants. Labor productivity differentials fell some in 1985 and 2001 but increased in 1998; in 2008 the two differentials moved in opposite directions. Wage differentials also rose sharply in 1998, but changed little during the other downturns. Similarly, capital intensity and export propensity differentials increased in 1998, and again in 2001. However, capital intensity differentials declined in 1985, while export propensity differentials changed relatively little. Moreover, there have been some stronger, longer-term trends in some performance differentials for recent years (increases in size, labor productivity, wage, and capital intensity differentials with shares falling and decreases in export propensity differentials). In short, the story in Singapore seems similar to many other host economies; changes MNC shares and relative performance indicators seem to depend heavily on the particular downturn and the indicator examined.

3e. Malaysia

Malaysian data also come from industrial surveys and censuses are similar to those from Singapore and Hong Kong in several respects, but differ in two important ways. First, these estimates come from stratified sample surveys in most years but from more comprehensive censuses for 1981, 1993, 2000, and 2005. This means that coverage of the underlying micro data varies greatly around census years (Appendix Table 5), though the published estimates seem to have used the stratified sample information to smooth out the various series generated. Second, it is only possible identify MNCs that have ownership shares of 50 percent or more.

Although smaller than in Singapore, MNC shares have been relatively large in Malaysia and tended to increase until the 2005 census. Malaysia is also a very open economy and experienced marked slowdowns during the region-wide downturns in 1985, 1998, 2001, and 2008. The available data suggest that long-term trends toward increasing shares were slowed briefly during the slowdowns of 1985 and 2001 but data for 1998 were not published and 2008 data are not likely to be available for some time. Plant size differentials also decreased some in 1985 and 2001 as employment grew relatively slowly in MNCs, but were quite large.

On the other hand, differentials in labor productivity and earnings per worker were relatively small Malaysia, and capital intensity differentials were negative in many years. The small and negative differentials is probably related to the fact that MNCs in Malaysian manufacturing are highly concentrated in relatively labor intensive assembly of electric and electronic machinery. The large positive differentials in export propensities is probably related to this compositional factor as well, because MNCs in this industry generate a very large portion of Malaysia's exports. Size differentials declined and wage differentials increased some during 1985 and 2001, but here again patterns during downturns were not generally consistent.

3f. Thailand

To be completed

3g. Indonesia

To be completed

3h. Vietnam

To be completed

4. Conclusions and the Future Research Agenda

To be completed

Table 1: Economic Growth, MNC Shares of Total Manufacturing, and Relative Performance in Japanese Manufacturing Firms (percent)

Year	GDP growth		MNC shares of manufacturing				Percentage differences, MNCs less local firms (imputed)									
	Real yen	Nominal US\$	Workers		Sales		Workers/firm		Sales/worker		Value added/worker		Earnings/worker		Exports/sales	
			33%+	50%+	33%+	50%+	33%+	50%+	33%+	50%+	33%+	50%+	33%+	50%+	33%+	50%+
1982	3.4	-7.0	-	0.93	-	3.29	-	95	-	261	-	-	-	-	-	-
1983	3.1	9.1	-	1.34	-	3.34	-	112	-	155	-	-	-	-	-	-
1984	4.5	6.3	-	1.14	-	3.54	-	128	-	218	-	-	-	-	-	-
1985	6.3	6.9	-	0.83	-	2.11	-	111	-	157	-	-	-	-	-	-
1986	2.8	48.1	-	1.11	-	2.62	-	96	-	138	-	-	-	-	-	-
1987	4.1	21.2	-	1.27	-	2.45	-	115	-	94	-	-	-	-	-	-
1988	7.1	21.3	-	1.33	-	2.51	-	107	-	91	-	-	-	-	-	-
1989	5.4	0.1	-	1.42	-	2.67	-	130	-	90	-	-	-	-	-	-
1990	5.6	2.9	-	1.43	-	2.86	-	136	-	102	-	-	-	-	-	-
1991	3.3	14.0	1.47	1.40	2.74	2.65	142	148	88	92	-	-	-	-	-	-
1992	0.8	8.9	1.41	-	2.75	-	133	-	97	-	-	-	-	-	-	-
1993	0.2	14.6	1.29	-	2.58	-	185	-	103	-	-	-	-	-	-	-
1994	0.9	9.9	1.57	-	3.06	2.75	271	-	98	-	90	-	-2	-	14	-
1995	1.9	10.2	1.45	-	3.10	2.57	378	-	118	-	8	-	67	-	25	-
1996	2.6	-11.8	1.49	-	2.85	2.35	442	-	94	-	-4	-	54	-	40	-
1997	1.6	-8.2	1.50	-	3.21	2.81	566	-	117	-	1	-	58	-	19	-
1998	-2.0	-9.5	2.09	-	3.29	2.86	851	-	59	-	-41	-	12	-	47	-
1999	-0.1	13.3	1.96	-	4.21	3.71	823	-	120	-	-6	-	61	-	147	-
2000	2.9	6.8	2.22	-	4.59	3.38	922	-	112	-	2	-	74	-	107	-
2001	0.2	-12.3	2.18	1.56	4.69	3.44	878	688	121	127	8	17	70	72	105	83
2002	0.3	-4.3	2.02	1.36	4.40	3.07	766	554	123	131	24	40	72	79	101	65
2003	1.4	7.9	2.38	1.80	5.03	3.86	819	668	118	121	10	20	75	77	75	51
2004	2.7	8.9	2.34	1.91	4.65	3.82	691	603	103	105	11	19	85	90	46	46
2005	1.9	-1.2	2.27	1.92	4.56	3.87	656	599	106	107	20	27	81	83	33	37
2006	2.0	-4.2	2.28	1.96	4.61	3.83	660	620	107	100	5	5	40	35	31	34
2007	2.3	0.4	2.27	1.96	4.68	3.88	640	600	111	103	8	8	67	61	37	28

Note: Local firms are implicitly defined as those with under 50% foreign ownership in 1982-1990 and under 33% in 1991-2007; 33%+ and 50%+ refer to MNCs with ownership shares exceeding these thresholds; see Appendix Table 1 for further details.

Table 2: Economic Growth, MNC Shares of Total Manufacturing, and Relative Performance in Hong Kong Manufacturing Plants (percent)

Year	GDP Growth		MNC Shares of Mfg. Totals				Percentage Differences, MNCs less Local Sample Plants							
	Real HK\$	Nominal US\$	Workers		Value added		Employees/ Plant		Output/ Worker		Value Added/ Worker		Earnings/ Worker	
			1%+	50%+	1%+	50%+	1%+	50%+	1%+	50%+	1%+	50%+	1%+	50%+
1983	6.0	-7.5	10.42	7.99	15.76	12.50	562	830	92	96	77	83	19	18
1984	9.9	12.0	10.08	7.83	15.07	11.98	772	860	88	92	80	84	20	19
1985	0.7	6.5	9.34	7.21	12.37	9.73	722	864	65	73	50	53	21	19
1986	11.1	15.1	11.61	8.66	15.72	12.21	699	956	57	68	54	60	19	18
1987	13.4	23.4	12.19	9.09	16.08	12.87	714	727	52	61	50	61	12	16
1988	8.4	18.1	12.08	9.50	16.24	13.47	688	761	68	73	55	63	16	15
1989	2.2	15.4	12.18	9.97	16.39	13.87	649	740	59	66	55	60	21	20
1990	3.9	11.8	11.80	9.77	18.00	15.50	689	777	85	95	76	83	31	32
1991	5.7	15.5	10.46	8.91	18.86	16.97	764	859	75	84	82	92	26	26
1992	6.1	17.1	10.72	9.00	19.53	17.25	705	796	83	89	80	89	31	32
1993	6.0	15.3	10.55	8.79	21.37	19.02	812	897	96	106	88	101	34	36
1994	6.0	13.0	10.72	9.33	24.41	22.20	825	972	106	113	94	103	40	38
1995	2.3	6.4	10.86	9.72	25.56	23.03	854	965	93	97	76	78	38	37
1996	4.2	10.2	10.61	9.39	25.39	22.82	858	916	78	83	72	74	41	40
1997	5.1	10.9	10.83	9.63	28.42	25.74	982	1,116	81	86	94	97	47	48
1998	-6.0	-5.3	10.97	9.86	28.99	26.71	1,068	1,100	107	116	97	102	50	50
1999	2.6	-2.2	9.14	8.01	22.99	20.45	1,048	1,181	105	115	70	73	50	50
2000	8.0	3.6	10.36	8.31	23.11	18.92	879	904	86	105	52	55	37	39
2001	0.5	-1.5	9.94	8.37	21.31	18.94	886	838	66	80	30	38	41	44
2002	1.8	-1.7	8.34	7.03	21.32	18.53	855	770	86	96	73	78	48	50
2003	3.0	-3.2	9.01	7.80	23.14	20.49	786	953	104	112	71	75	54	58
2004	8.5	4.6	10.71	9.05	22.37	19.39	1,182	1,281	101	116	57	61	52	53
2005	7.1	7.2	10.05	7.74	21.48	17.88	873	1,110	160	189	68	81	41	52
2006	7.0	6.8	9.67	7.99	22.22	19.34	438	1,325	209	243	63	72	33	38
2007	6.4	9.0	10.50	9.29	24.80	19.67	446	418	219	170	71	54	34	17
2008	2.4	4.0	15.36	14.71	26.23	25.39	647	618	228	240	25	27	37	38

Notes and Sources: 1%+ and 50%+ refer to MNCs with ownership shares exceeding these thresholds; see Appendix Table 2 for further details.

Table 3: Economic Growth, MNC Shares of Total Manufacturing and All Industries, and Relative Performance in Chinese Manufacturing Firms (percent)

Year	GDP Growth		MNC Shares of Mfg.			Percentage Differences, MNCs less Local Sample Firms						MNC Shares of All Industries		
	Real Yuan	Nominal US\$	Workers, nation	Value added, nation	Value added, sample	Output/firm	Output/worker	Value added/worker	Output/fixed assets	Value added/fixed assets	Value added/worker	Workers, nation	Earnings, nation	Exports, nation
1993	14.0	25.6	-	-	-	-	-	-	-	-	-	1.94	3.01	27.51
1994	13.1	-8.8	-	-	-	-	-	-	-	-	-	2.73	3.83	28.69
1995	10.9	30.2	-	-	19.61	127	-	-	-	-	-	3.44	4.75	31.51
1996	10.0	17.6	-	-	16.60	143	-	-	-	-	-	3.64	5.07	40.72
1997	9.3	11.3	-	-	20.64	161	-	-	-	-	-	3.96	5.87	40.98
1998	7.8	7.0	-	-	-	-	-	-	-	-	-	4.76	6.66	44.07
1999	7.6	6.3	-	-	26.66	86	-	-	30	19	-	5.20	7.13	45.47
2000	8.4	10.6	-	-	28.06	87	-	-	34	22	-	5.70	7.66	47.93
2001	8.3	10.5	-	-	29.18	84	-	-	29	20	-	6.22	7.88	50.06
2002	9.1	9.7	-	-	29.69	84	-	-	-	-	-	7.17	8.72	52.21
2003	10.0	12.9	-	-	31.54	90	-	-	32	20	-	8.23	9.53	54.84
2004	10.1	17.7	15.16	-	-	75	22	-	13	-	7	9.77	10.54	57.07
2005	10.4	15.7	18.63	31.71	33.31	93	18	8	16	6	2	11.48	11.81	58.30
2006	11.6	18.9	19.55	33.78	33.21	100	11	1	9	-1	2	12.61	12.72	58.19
2007	13.0	27.3	20.22	34.72	32.31	100	5	-7	4	-8	1	13.85	13.39	57.10
2008	9.0	27.9	21.65	-	-	104	-0	-	-2	-	2	14.09	13.59	55.25

Notes and Sources: ownership share thresholds for defining MNCs are not clear from the data source; see Appendix Table 2 for further details.

Table 4: Economic Growth, MNC Shares of Total Manufacturing, and Relative Performance in Singaporean Manufacturing Plants (percent)

Year	GDP Growth		MNC Shares of Mfg. Totals				Percentage Differences, MNCs less Local Sample Plants											
	Real HK\$	Nominal US\$	Workers		Value added		Workers/plant		Output/worker		Value added/worker		Earnings/worker		Fixed assets/worker		Direct exports/output	
			1%+	50%+	1%+	50%+	1%+	50%+	1%+	50%+	1%+	50%+	1%+	50%+	1%+	50%+	1%+	50%+
1981	9.7	18.5	54.61	42.31	78.30	64.15	334	409	155	188	97	108	14	12	136	155	146	157
1982	7.1	10.0	50.17	38.18	73.71	61.11	301	361	159	199	101	119	23	23	123	141	110	117
1983	8.5	13.9	52.88	40.23	69.62	57.57	323	392	140	178	94	110	26	26	114	126	103	114
1984	8.3	8.1	54.59	42.79	71.87	60.16	349	434	126	155	91	104	27	25	121	109	96	107
1985	-1.4	-5.7	55.48	44.47	73.58	61.58	344	431	119	141	82	90	25	26	110	92	100	110
1986	2.1	1.5	55.83	45.38	80.21	70.50	383	475	111	129	125	143	23	23	121	107	107	118
1987	9.8	14.2	57.77	47.33	83.19	72.75	404	488	134	153	126	141	20	21	130	120	144	156
1988	11.5	23.6	62.06	51.03	83.26	70.17	465	553	132	147	131	137	20	19	113	104	137	150
1989	10.0	18.5	59.86	49.97	81.17	71.20	444	525	129	146	121	133	18	16	121	127	121	130
1990	9.2	22.3	57.42	47.79	80.72	70.69	431	508	133	151	120	132	23	21	131	135	132	141
1991	6.6	17.2	57.88	48.39	73.86	64.95	394	471	131	148	113	124	23	21	109	113	104	112
1992	6.3	15.2	56.79	46.91	71.81	60.84	413	483	134	151	106	112	27	23	113	118	112	121
1993	11.7	17.0	55.57	45.66	72.53	62.76	388	450	150	173	123	135	25	23	97	108	105	113
1994	11.6	21.5	58.19	47.59	72.87	62.31	394	453	152	177	125	135	28	25	94	102	103	109
1995	8.2	19.3	64.49	52.73	75.99	65.81	402	457	168	196	145	159	28	25	94	101	107	114
1996	7.8	9.8	58.48	48.62	75.42	66.07	367	421	190	216	153	166	20	18	91	80	141	147
1997	8.3	3.6	56.34	46.53	75.97	67.00	353	391	200	229	162	180	24	23	131	134	142	149
1998	-1.4	-14.0	54.95	44.00	77.61	68.85	354	377	220	266	179	209	33	34	151	162	177	185
1999	7.2	0.3	51.89	42.45	92.71	82.99	318	342	263	307	256	289	38	38	178	189	133	139
2000	10.1	12.2	47.37	37.82	78.87	68.96	326	340	304	365	238	270	47	48	224	234	119	123
2001	-2.4	-7.6	47.34	38.68	72.76	65.36	310	325	288	339	179	207	49	49	279	293	137	143
2002	4.1	3.1	45.89	37.76	76.64	69.28	734	762	363	420	243	276	55	55	287	303	109	112
2003	3.8	5.5	45.15	36.92	77.53	69.94	744	786	399	470	259	295	56	57	299	320	122	127
2004	9.3	17.7	43.47	35.28	79.04	69.68	778	809	378	428	281	314	55	56	343	361	110	115
2005	7.3	10.3	41.38	33.89	75.32	65.99	718	758	368	409	220	243	55	54	359	371	63	66
2006	8.4	15.1	37.47	31.27	78.73	70.31	623	656	448	493	349	381	59	57	465	470	47	49
2007	7.8	20.0	34.36	29.60	75.67	67.96	586	623	446	475	302	320	62	59	464	464	26	28
2008	1.1	9.0	32.69	27.78	67.58	60.37	528	556	519	553	239	256	76	75	543	551	44	48

Notes and Sources: 1%+ and 50%+ refer to MNCs with ownership shares exceeding these thresholds; growth figures are estimates and projections as of October 2009 from International Monetary Fund (2009); see Appendix Table 4 for further details.

Table 5: MNC Shares and Relative Performance in Malaysian Manufacturing (percent)

Year	GDP Growth		MNC Shares of Mfg. Totals		Percentage Differences, MNCs less Local Sample Plants					
	Real Dom.	Nom. US\$	Employees	Value Added	Employee/Plant	Output/Employee	ValueAdd/Employee	Compen./Employee	FixAssets/Employee	Export/Sales
1981	6.9	2.1	18.59	-	1,132	100	-	28	23	-
1982	5.9	7.2	16.32	-	459	94	-	23	16	-
1983	6.3	11.8	16.56	-	370	70	31	17	-27	-
1984	7.8	13.3	17.48	-	414	46	14	14	-33	-
1985	-0.9	-8.1	16.58	-	374	33	13	17	-43	-
1986	1.2	-11.1	16.62	-	375	33	15	18	-42	-
1987	5.4	13.9	18.65	29.05	390	33	7	14	-43	-
1988	9.9	9.6	22.18	29.75	388	21	3	8	-35	-
1989	9.1	10.1	23.35	32.97	399	21	4	6	-28	-
1990	9.0	13.3	26.91	35.73	316	13	-2	-1	-16	-
1991	9.5	13.3	29.92	39.22	299	13	-6	2	-15	-
1992	8.9	20.4	28.62	40.84	292	18	-0	4	-20	-
1993	9.9	13.1	28.68	39.53	871	30	3	7	-11	-
1994	9.2	11.3	27.97	41.91	326	26	4	5	-13	-
1995	9.8	19.3	29.58	42.35	748	38	17	11	1	-
1996	10.0	13.5	29.05	44.19	690	39	25	17	3	-
1997	7.3	-0.7	27.89	44.37	642	38	24	15	-10	-
1998	-7.4	-27.9	-	-	-	-	-	-	-	-
1999	6.1	9.7	28.65	47.67	365	58	41	22	-20	-
2000	8.7	16.7	27.63	42.63	582	64	28	19	1	124
2001	0.5	-1.1	25.09	41.62	540	64	27	26	11	100
2002	5.4	8.7	27.65	42.66	458	61	24	21	3	124
2003	5.8	9.3	26.97	41.74	500	53	21	21	-16	167
2004	6.8	13.2	30.05	41.79	501	43	19	18	-12	68
2005	5.3	10.6	27.71	28.63	716	56	22	25	3	-
2006	5.8	13.8	29.64	28.75	939	49	7	30	-12	-

Notes and Sources: data refer to MNCs with 50% or more; see Appendix Table 6 for further details.

Table 6: Economic Growth, MNC Shares of Total Manufacturing, and Relative Performance in Thai Manufacturing Firms and Plants (percent)

Year	GDP Growth		MNC Shares of Mfg. Totals				Percentage Differences, MNCs less Local Sample Plants											
	Real Dom.	Nom. US\$	Employees		Sales		Sales/Unit		Sales/Emp.		Value Add./Emp.		Compen./Emp.		Fixed Ass./Emp.		Export/Output	
			1%+	50%+	1%+	50%+	1%+	50%+	1%+	50%+	1%+	50%+	1%+	50%+	1%+	50%+		
COMPILATIONS OF PLANTS FROM MICRO DATA UNDERLYING INDUSTRIAL CENSUSES																		
1996	5.9	8.3	21.86	9.29	49.25	20.33	1,270	1,454	185	180	153	136	144	146	176	175	-	-
2006	5.2	17.4	17.15	11.61	36.77	24.82	2,001	2,497	220	219	196	229	144	148	210	211	166	192
COMPILATIONS OF THE TOP 15+ FIRMS IN 66 MANUFACTURING INDUSTRIES FROM KOHPAIBOON AND RAMSTETTER (2008)																		
1996	5.9	8.3	-	-	35.00	20.76	176	205	-	-	-	-	-	-	-	-	-	-
2006	5.2	17.4	-	-	54.65	41.00	170	185	-	-	-	-	-	-	-	-	-	-
COMPILATIONS OF LARGE FIRMS FROM RAMSTETTER (2003)																		
1990	11.6	18.5	17.03	-	34.63	-	161	-	48	-	-	-	-	-	-	-	-	-
1991	8.1	12.3	14.22	-	35.76	-	132	-	45	-	-	-	-	-	-	-	-	-
1992	8.1	13.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1993	8.3	11.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1994	9.0	18.5	-	-	32.09	-	138	-	-	-	-	-	-	-	-	-	-	-
1995	9.2	16.4	5.96	-	34.39	-	142	-	82	-	-	-	-	-	-	-	-	-
1996	5.9	8.3	9.80	-	36.57	-	151	-	68	-	-	-	-	-	-	-	-	-
1997	-1.4	-17.1	10.69	-	27.99	-	134	-	53	-	-	-	-	-	-	-	-	-
1998	-10.5	-25.9	11.23	-	36.21	-	135	-	68	-	-	-	-	-	-	-	-	-
1999	4.4	9.6	12.87	-	38.30	-	156	-	58	-	-	-	-	-	-	-	-	-
2000	4.8	0.1	-	-	45.83	-	180	-	-	-	-	-	-	-	-	-	-	-

Notes and Sources: 1%+ and 50%+ refer to MNCs with ownership shares exceeding these thresholds; growth figures are estimates and projections as of October 2009 from International Monetary Fund (2009); for compilations of plants, gross output is used as a proxy for sales; see Appendix Table 4 for further details.

Table 7: MNC Shares and Relative Performance in Indonesian Manufacturing Plants (percent)

Year	GDP Growth		MNC Shares of Mfg. Totals				Percentage Differences, MNCs less Local Sample Plants									
	Real Dom.	Nom. US\$	Employees		Value added		Employees/Plant		Production/Emp.		Value Add./Emp.		Compen./Emp.		Export/Prod.	
			10%+	50%+	10%+	50%+	10%+	50%+	10%+	50%+	10%+	50%+	10%+	50%+	10%+	50%+
1981	7.6	18.5	2.85	2.58	13.27	12.08	262	280	144	147	179	181	117	120	-	-
1982	2.2	10.0	2.22	1.94	12.92	11.46	221	220	170	184	179	183	155	171	-	-
1983	4.2	13.9	2.48	2.08	11.17	9.78	212	211	165	177	184	197	148	159	-	-
1984	7.0	8.1	2.30	1.90	9.49	8.19	177	180	209	224	170	182	190	206	-	-
1985	2.5	-5.7	2.86	2.25	11.41	9.55	163	156	187	209	156	171	173	200	-	-
1986	5.9	1.5	2.80	2.14	13.06	10.66	199	190	162	176	147	163	165	180	-	-
1987	4.9	14.2	2.87	2.08	12.11	8.86	199	181	152	163	185	187	131	141	-	-
1988	5.8	23.6	2.93	2.04	8.83	6.22	170	149	177	182	148	151	157	170	-	-
1989	7.5	18.5	2.56	1.76	12.33	7.80	164	144	202	199	231	204	-11	-7	-	-
1990	7.2	22.3	3.49	2.49	12.61	7.32	201	192	155	129	149	102	119	128	-0	10
1991	7.0	17.2	4.37	3.31	11.87	8.21	184	186	113	89	105	87	109	93	-1	4
1992	6.5	15.2	5.67	4.38	15.74	12.09	209	207	78	78	87	86	100	87	63	72
1993	6.8	17.0	6.13	4.84	15.70	10.82	207	214	63	47	70	48	97	80	36	54
1994	7.5	21.5	5.96	4.75	18.36	12.45	226	232	75	57	85	57	84	67	31	52
1995	8.2	19.3	7.06	5.62	19.46	14.21	251	243	98	91	96	80	72	75	21	35
1996	7.8	9.8	7.13	5.52	20.87	14.26	266	242	93	82	97	74	32	41	37	49
1997	4.7	3.6	7.09	5.81	17.65	14.42	243	228	95	101	136	135	105	107	37	36
1998	-13.1	-14.0	7.94	6.69	22.63	18.41	200	190	106	104	127	119	85	80	-	-
1999	0.8	0.3	7.51	6.34	23.41	18.90	206	195	100	95	110	100	85	81	67	75
2000	5.4	12.2	8.01	6.80	23.39	18.60	216	205	119	102	126	112	61	56	21	36
2001	3.6	-7.6	7.79	6.65	17.97	12.75	215	205	81	71	86	55	33	32	-	-
2002	4.5	3.1	7.68	6.58	19.67	13.54	216	203	74	50	84	48	37	34	-	-
2003	4.8	5.5	8.58	7.38	20.79	17.33	215	205	72	70	89	83	95	104	-	-
2004	5.0	17.7	8.70	7.37	19.87	16.70	223	207	74	76	93	92	39	42	67	78
2005	5.7	10.3	8.28	7.19	19.19	16.14	241	229	66	63	94	87	36	39	-	-
2006	5.5	15.1	9.90	8.68	22.19	19.19	310	297	86	83	104	101	31	27	67	75
2007	6.3	20.0	9.79	8.77	21.36	18.35	314	309	51	46	76	69	31	32	-	-

Notes and Sources: 10%+ and 50%+ refer to MNCs with ownership shares exceeding these thresholds; see Appendix Tables 7 for further details.

Table 8: Economic Growth, MNC Shares of Total Manufacturing, and Relative Performance in Vietnamese Manufacturing Firms (percent)

Year	GDP growth		MNC shares of mfg.		Percentage differences, MNCs less local firms, sample					
	Real Dong	Nominal US\$	Workers		Workers/firm		Sales/worker		Earnings/worker	
			10%+	100%	1%+	50%+	1%+	50%+	1%+	50%+
2000	6.8	8.6	10.03	7.75	157	197	145	67	56	35
2001	6.9	4.3	11.21	8.96	146	165	100	33	49	31
2002	7.1	7.9	15.10	12.37	211	234	73	17	32	15
2003	7.3	12.7	17.36	14.55	237	260	64	12	26	15
2004	7.8	14.9	19.98	17.22	292	316	49	8	19	10
2005	8.4	16.5	21.45	18.82	359	382	35	-0	14	5
2006	8.2	15.1	23.70	21.00	447	468	24	-4	14	7
2007	8.5	16.7	26.22	23.43	491	507	18	-10	9	3
2008	6.2	26.3	26.21	23.76	468	481	-9	-28	7	-3

Notes and Sources: 1%+ and 50%+ refer to MNCs with ownership shares exceeding these thresholds; growth figures are estimates and projections as of October 2009 from International Monetary Fund (2009); see Appendix Table 8 for further details.