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in Asian Manufacturing**

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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 relatively large Asian larger economies, Japan, Hong Kong, China, Singapore, Malaysia, Thailand, Indonesia, and Vietnam. It focuses on four periods of economic slowdown surrounding 1985, 1998, 2001, and 2009 but finds no clear, consistent trends in MNC shares during these periods. Likewise, the paper also compares trends in performance differentials between MNCs and local firms or plants. MNCs do tend to be larger, have higher productivity, wages, and export propensities, but it seems very difficult to attribute trends in these differentials to cyclical factors, such as economic downturns, rather than other medium- to long-term factors that also influence investment and production decisions in MNCs and other Asian firms.

Keywords: Multinational corporations, Asia, manufacturing, Economic downturns and cycles
JEL categories: F23, L60, N15, N65, O53

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1. Introduction

There is now a substantial literature illustrating how foreign multinational corporations (MNCs) have made relatively large and important contributions to 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 the 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

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).

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

The purpose of this paper is to analyze how foreign-based manufacturing MNCs in Asia have performed during these three recent 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 in 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 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

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

provide a relatively comprehensive region-wide and up-to-date summary of related trends that would be impossible in a study employing more statistical rigor.

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 have been common despite strong increases in manufacturing production (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 medium-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

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.

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. As a result, sectoral indicators are of limited use to identify economic downturns.

In short, economic downturns are best viewed as macroeconomic phenomena and best measured at that 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 one economy studied here (Japan) and above 5.5 percent in seven (Hong Kong, Taiwan, China, Singapore, Malaysia, Thailand, and Vietnam). 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 14 largest economies in 1998 and 2009 (8 in each year) and two less widespread of downturns in 1985 and 2001 (4-5 economies each). 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 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 relatively widespread economic downturn in 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 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, though we hope to add three more 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 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 criteria, all MNCs defined as firms or plants with foreign ownership shares of 10 percent or more, or the closest available alternative, and MNCs with a 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 trends in MNC shares and relative performance relate to cycles. Correspondingly, the analysis of MNC shares usually employs ratios to estimates for total manufacturing, which are often 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 between economic downturns and MNC involvement among host 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

⁵ In this respect, we hope to utilize privately published firm-level databases for large firms in India, the Philippines, and Taiwan but have not yet had time to compile them for this version.

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 (a maximum of 675 firms, Appendix Table 1). Thus, coverage problems are probably relatively small in most years, especially regarding large MNCs. Another important point is that the foreign 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. Comparisons of estimates for majority-owned affiliates and all affiliates suggest small differences between alternative cutoffs in 1991 (146,340 workers vs. 154,380), but the difference became larger by 2001 (165,810 vs. 231,960), after 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 the corporation statistics appears to have increased markedly in the early-to-mid-1990s (from 101,991 firms in 1991 to 226,005 or more in 1997-2002), but most of the firms added to the sample were small in terms of sales and employment. In addition, subsequent declines in firm numbers (to 202,686 2007) probably reflect consolidation in Japan's corporate sector more than changes in data coverage.

Correspondingly, although Table 1 suggests that MNC shares fell sharply in 1993, the 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 1998 investment in Nissan. The recession was most likely a factor behind the worsening of Nissan's balance sheet and its subsequent acceptance of a large foreign investor. During a final period of decline in 2001-2002, 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 and in other major advanced economies.

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 during 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 measured at this, relatively aggregate level.

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 comprehensive in several subsequent years (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 that accompanied the Asian financial crisis. And, conversely, most shares increased sharply in 2008 just before another downturn in 2009, when real growth was projected to fall 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 foreign MNCs and local firms.

MNC plants have always been 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 during the 1985 and 2001 slowdowns while increasing 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 some 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, though labor productivity differentials did increase some during the three of the four slowdowns. This suggests that the gap between the growth of production and the growth of employment was larger in MNCs than in local plants during these downturns.

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, 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. 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 MNC activity increased sharply beginning in the early 1990s (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 abated 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 important points, 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, MNC shares of exports (the vast majority of which are manufactures), also increased rapidly but to much higher levels than shares of production (over 50% after 2001). This in turn suggests that, export propensities have been much larger in MNCs than in local firms.

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 firm or industry characteristics. 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 published compilations of annual industrial censuses that 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 the fact that Singapore-based manufacturers (local and foreign-owned) also made substantial investments in China and ASEAN economies (Table 4).

Two other important contrasts are that MNC shares of Singaporean manufacturing have

always been extremely large (as much as three-fifths of employment in several years), but have tended to decrease substantially in recent years (to about one-third or less of employment in 2005-2008, Table 4). During 1985-1986, total MNC shares of employment and value added both increased some and similar increases in value added shares were also observed in 1998-1999 and again in 2001-2002. However, employment shares did not increase during the latter turndowns. On the other hand, MNC shares fell in 2008 when GDP growth slowed almost to 1.00 percent 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, measured as either gross output per worker or value added per worker, fell some in 1985 and 2001, but increased in 1998; in 2008 the two labor productivity 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, with size, labor productivity, wage, and capital intensity differentials increasing and export propensity differentials declining. 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, and are similar to those from Singapore and Hong Kong in several respects. However, they 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 published. Second, it is only possible identify MNCs that have ownership shares of 50 percent or more.

Although smaller than in Singapore, majority-foreign MNC shares have been relatively large in Malaysia and tended to increase until the 2005 census (Tables 4-5). 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 2008-2009 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 (Table 5). Small and/or negative differentials are 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 large portion of Malaysia's exports. Size differentials declined and wage differentials increased some during the 1985 and 2001 downturns, but here again trends in other indicators were not consistent during these downturns.

3f. Thailand

The only time series estimates of MNC shares in sales or employment in Thai manufacturing are comparisons of MNC sales estimated from samples of large firms and corresponding Thai totals from the national accounts or labor force data (Table 6, top block). These compilations suggest that the MNC share of sales fell markedly in 1997 but rebounded quickly in 1998 to pre-crisis levels. However a closer examination of the underlying data indicates that this decline results largely from a fall off in the coverage of the large-firm sample after 1996. Thus, trends in MNC shares of large firm sales contrast, falling much less from 52 percent in 1996 to 49 percent in 1997, before subsequently recovering to 53 percent in 1998, and increasing to 61 percent in 2000. These in-sample ratios are probably more indicative of actual trends in MNC shares than ratios to national totals. In-sample comparisons also indicate MNC-local differentials in both size and sales per worker fell in 1997 and that the size differential remained relatively small in 1998, while the sales per worker differential returned to pre-crisis levels. Conversely, the sales per worker differential then fell back some in 1999, while the size differential returned to pre-crisis levels. The small number observations (only one downturn incidence) and indicators of course make it impossible to generalize much about the Thai case.

Compilations of micro-data from the two industrial censuses for 1996 and 2006 allow for more extensive comparisons of indicators before and after the crisis. These are of interest because Thailand was at the epicenter of the Asian financial crisis and the crisis led to very extensive corporate restructuring.⁶ These comparisons first show that total MNC shares fell between 1996 and 2006, that the fall in the sales share was particularly large.⁷ This is in

⁶ Thailand also conducts much smaller surveys periodically between censuses (e.g., 1998, 1999, 2000, 2002), but the published compilations that attempt to calculated consistent totals based on stratified samples do not contain compilations for MNCs or other ownership groups and compilations from the underlying micro data yield totals that are much smaller than census or extrapolated totals (Ramstetter 2009), and thus not comparable.

⁷ The Thai data for 1996 include some duplication because several plants belonging to large multi-plant firms apparently reported the same, firm-level information. Removing all but one of each set of duplicates reduces

marked contrast to trends in alternative estimates from large firm data, which suggest an increase in the sales share. These contrasting trends may be related to the existence of relatively large, rapidly growing, non-manufacturing operations in large manufacturing firms, which are excluded from the plant-level data but included in the firm-level compilations. Both estimates indicate that shares of majority-foreign MNCs rose (while shares of minority-foreign MNCs fell), though the firm-level data again suggest much larger increases. This reflects the fact that the crisis often forced local, joint-venture partners into bankruptcy, leaving MNCs with a choice between raising ownership shares or letting affiliates go under. In most cases, MNCs apparently had expectations of a Thai recovery and the financial resources to raise their ownership shares. Changes in Thai policy from 1998, namely the effective removal of foreign ownership restrictions, which were previously among the strictest in Asia (though with many loopholes), were also important in this respect. MNC-local differentials in size, labor productivity and capital intensity also appear to have increased substantially after the crisis, though wage differentials were more or less constant.

3g. Indonesia

Like Hong Kong and Singapore, Indonesia has a long series of annual industrial surveys and censuses but calculations by ownership group are not published and must be calculated from the underlying from the underlying micro data. These calculations indicate that MNC shares have been markedly smaller than in other Southeast Asian economies. Although Indonesia came through the other regional downturns without growth falling below 2 percent, the 1998 contraction (-13 percent) was far more severe than in any other country in the region. This sharp contraction was accompanied by a strong rise MNC shares, particularly those of majority-foreign MNCs. During the very weak growth of 1999 (below the 1 percent

MNC shares from 49 percent of national output to 40 percent (Ramstetter 2001, Appendix Table A6 and Appendix Table 6 below), but the plant-level still suggest a fall in MNC shares over the decade.

threshold), employment shares declined some, but value added shares continued to rise. MNC shares of employment continued to rise in subsequent years while shares of value added fell some, in a pattern that contrasts sharply with the increases of both shares in the early- to mid-1990s.

During 1998-1999, size differentials between MNCs and local plants were a bit lower than in previous or subsequent years. In some contrast, average labor productivity differentials were generally a bit higher in a somewhat longer period surrounding the crisis (1995-2000) than in the early 1990s or the 21st century. Similarly wage differentials were also relatively high in 1997-1999. All of these indicators thus suggest that local plants lost competitiveness relative to MNCs in the years surrounding the crisis.⁸ However, as in Thailand, there was only severe downturn that can be examined so it is very difficult to generalize from this observation.

3h. Vietnam

The Vietnamese story is similar to the Chinese one in two important respects. First, Vietnam has not experienced a major slowdown since MNCs starting investing actively in the early 1990s. Growth did fall in 1998-1999 and 2009 compared to previous years, but remained well above 4 percent. Second, partially because Vietnamese policy prohibited FDI until the late 1980s, there has been a rather strong upward trend in MNC shares of the economy since the liberalization of regulations in the late 1980s. Increases accelerated after the mid-1990s when Vietnam successfully controlled the high inflation that followed the *doi moi* (reform) in the late 1980s and early 1990s. For example, MNC shares of industrial output in manufacturing rose from 18 percent in 1995 to 30 percent in 2000 and then 41 percent in

⁸ Differentials in export propensities were also much higher in 1999 than in 1993-1997 or 2000, suggesting another aspect of this pattern. However, these differentials were not much different than in 2004 or 2006, and the coverage of the export data was clearly much lower less reliable in 1990-1991 and after 1997 than in 1992-1996, for example (Ramstetter and Takii 2005).

2008 (Table 8). Between 2000 and 2008, the MNC share of total manufacturing employment also rose sharply from 10 to 26 percent. Notably the growth of this share does appear to have slowed in 2008, when consumer price inflation rose to 23 percent, but Vietnam still did not experience a meaningful economic downturn as usually understood.

Vietnam is also similar to China in that it compiles and publishes a relative large number of economic indicators by ownership category, including all MNCs and wholly-foreign MNCs. In 1995, wholly-foreign MNCs accounted for a little under half of MNC employment (Vietnam, General Statistics Office 1998), but this share rose to over three-fourths in 2000 and over 90 percent in 2008 (Table 8). The best source of data on MNCs (and other firms) in Vietnam is the enterprise census that has been conducted annually since 2000. There was also a less comprehensive economic census in 1994-1995 and an even more limited industrial survey covering 17 main provinces (out of over 60) in 1997-1998. These censuses and surveys almost certainly cover the vast majority of MNC activity, but coverage of local firms, especially, smaller private firms is probably not as comprehensive.

These data also suggest that MNCs were much larger than local firms in all years and that they had higher sales per employee and paid higher wages in the early 21st century. However, the productivity and wage differentials were always relatively small for wholly-foreign MNCs and became quite small or negative for all MNCs by 2007-2008. In other words, this evidence suggests that on average, local firms have closed the productivity and wage gaps rather quickly in recent years. On the other hand, MNCs' share of non-oil exports has remained near half in recent years, suggesting that shares of manufacturing exports are even higher and that MNCs sell a much larger proportion of their output overseas than do local firms. Although these are all interesting long-term trends, it should be reiterated that it is very difficult, if not impossible, to relate such trends to economic downturns in the Vietnamese case because growth remained relatively high in all years.

4. Conclusions and the Future Research Agenda

This paper has examined trends in the activities of foreign manufacturing MNCs during economic downturns experienced by some of Asia's major economies over the last three decades. It first examined shares of foreign MNCs in host country employment and production, finding that such shares tended to exhibit rather strong long term trends, generally upward in Hong Kong, Japan, China, Indonesia, and Vietnam, downward since the late 1980s in Singapore, and mixed in Malaysia, upward through the mid-1990s, then downward through the 2001 downturn and upward again. Trends in MNC shares were inconsistent across countries or downturns, however (Table 9). During 1983-1987, most MNC shares increased in the region, but this was not true in subsequent downturns, especially in Hong Kong, Singapore, and Malaysia. As indicated above, these shares tended to have strong, medium-long-term trends so it is difficult to sort out whether there is a meaningful relationship between MNC shares of manufacturing and cyclical downturns in Asia. A macroeconomic or industry-level modeling exercise might be informative in this respect, because it could hopefully sort out some of the short-term factors from longer-term ones. On the other hand, any macroeconometric or industry-level model would have to embody important and probably unrealistic assumptions about the consistency of the relationship between MNC shares (or relative performance) and downturns across years and host economies in order to construct samples large enough to facilitate estimation.

The importance of such assumptions becomes even clearer when one recognizes that performance differentials between MNCs and local firms or plants have apparently differed greatly over the business cycle and depending on the host country involved. For example, in Hong Kong, wage and labor productivity differentials tended to narrow during downturns, suggesting that MNCs are relatively reluctant to cut back on worker remuneration compared to non-MNCs (Table 9). However, this pattern tended to be reversed in Japan and Singapore

and was inconsistent in Indonesia and Malaysia. Finally, the scarce evidence suggests no clear trends in export propensity differentials during downturns in Japan or Singapore. This is potentially important, because MNCs are generally more export-oriented than other firms in Asia, and their ability to expand exports relatively easily (cheaply) in responses to exchange rate shifts and other macroeconomic changes is thought to be a key difference in how MNCs react to economic downturns, particularly in Asia.

The substantial variation of MNC shares and performance differentials across industries is another important element of the discussion that this paper does not analyze closely. For example, given the large role played by electronics-related industries in Singapore, Malaysia, and Taiwan, for example, it would be very interesting to evaluate how much of the negative fallout from the 2001 downturn emanated from these industries, which were severely hit at the time. Also, it would be quite interesting to perform microanalyses of how a firm or plant's ownership relates to its chance of survival during periods of economic downturn. And although data constraints will severely limit the ability to perform such detailed analyses for most of the countries studied here, it should be possible to conduct similar, micro-studies of Indonesia and Malaysia, for example, which would be of great interest in this context.

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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 S\$	Nomi- nal 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 ringgit	Nominal US\$	Employees	Value Added	Workers/plant	Output/worker	Value added/worker	Earnings/worker	Fixed assets/worker	Exports/output
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 baht	Nominal US\$	Employees		Sales		Sales/plant or firm		Sales/worker		Value added/worker		Earnings/worker		Fixed assets/worker		Exports/output	
			1%+	50%+	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 rupiah	Nominal US\$	Employees		Value added		Workers/ plant		Production value/worker		Value added/ worker		Earnings/ worker		Exports/ production value	
			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		Enterprise census data (1994-95, 2000-2008) & industrial survey data (1998)								MNC shares	
	Real dong	Nominal US\$	MNC shares of mfg.		Percentage differences, MNCs less local firms, sample						Industrial output, mfg.	Exports, excluding oil & coal
			Workers		Workers/firm		Sales/worker		Earnings/worker			
			10%+	100%	10%+	100%	10%+	100%	10%+	100%		
1995	9.5	27.8	-	-	71	139	52	-	-	-	18	-
1996	9.3	18.7	-	-	-	-	-	-	-	-	20	-
1997	8.2	8.9	-	-	-	-	-	-	-	-	23	-
1998	5.8	1.3	-	-	79	-	148	-	70	-	26	-
1999	4.8	5.4	-	-	-	-	-	-	-	-	28	-
2000	6.8	8.6	10.03	7.75	157	197	145	67	56	35	30	-
2001	6.9	4.3	11.21	8.96	146	165	100	33	49	31	30	-
2002	7.1	7.9	15.10	12.37	211	234	73	17	32	15	32	-
2003	7.3	12.7	17.36	14.55	237	260	64	12	26	15	33	-
2004	7.8	14.9	19.98	17.22	292	316	49	8	19	10	33	-
2005	8.4	16.5	21.45	18.82	359	382	35	-0	14	5	36	46
2006	8.2	15.1	23.70	21.00	447	468	24	-4	14	7	38	48
2007	8.5	16.7	26.22	23.43	491	507	18	-10	9	3	40	50
2008	6.2	26.3	26.21	23.76	468	481	-9	-28	7	-3	41	48
2009	5.3	12.1	-	-	-	-	-	-	-	-	-	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 8 for further details.

Table 9: Changes in MNC Shares of Total Manufacturing, and Relative Performance in Asian Manufacturing: Summary

Period	First differences of MNC shares of manufacturing		First differences of percentage differences, MNCs and less local firms, sample					
	Workers	Production	Workers/ firm or plant	Sales or gross output/ worker	Value added/ worker	Earnings/ worker	Fixed assets/ worker	Exports/ sales
1987-1983								
Japan	-0.07	-0.90	3.17	-60.23	-	-	-	-
Hong Kong	1.77	0.32	151.93	-40.12	-26.79	-6.12	-	-
Singapore	4.89	13.56	80.19	-6.34	32.11	-5.86	16.07	41.55
Malaysia	2.09	-	19.99	-37.58	-24.26	-2.76	-16.40	-
Indonesia	0.38	0.94	-13.68	-13.28	0.93	-16.85	-	-
2000-1996 (1999-1996 for Thailand, 2000-1995 for Vietnam)								
Japan	0.74	1.74	479.93	17.28	5.86	19.32	-	66.22
Hong Kong	-0.25	-2.28	20.86	8.31	-19.74	-3.21	-	-
China	-	11.46	-55.97	-	-	-	-	-
Singapore	-11.11	3.44	-40.84	114.36	84.65	27.11	132.24	-22.04
Malaysia	-1.42	-1.56	-108.06	25.02	3.95	2.65	-2.06	-
Thailand	3.06	1.73	4.59	-9.97	-	-	-	-
Indonesia	0.88	2.52	-49.50	26.12	29.45	28.75	-	-15.59
Vietnam	-	-	86.21	93.56	-	-	-	-
2003-1999 (2003-1999 for Vietnam)								
Japan	0.42	0.82	-4.37	-2.53	16.07	13.63	-	-71.93
Hong Kong	-0.89	-7.11	-95.58	-14.81	-63.41	-6.48	-	-
China	-	4.88	4.18	-	-	-	-	-
Singapore	-6.74	-15.17	425.13	136.10	2.98	18.24	120.81	-11.77
Malaysia	-1.68	-5.94	134.99	-5.62	-19.71	-0.85	4.63	-
Indonesia	1.07	-2.62	9.22	-27.73	-20.56	9.76	-	-
Vietnam	7.32	-	80.17	-81.64	-	-29.62	-	-
2008-2007								
Hong Kong	4.86	1.44	200.72	8.83	-46.28	3.16	-	-
China	1.43	-	4.27	-5.61	-	-	-	-
Singapore	-1.67	-8.10	-58.68	72.26	-63.89	14.19	79.74	18.55
Vietnam	-0.01	-	-22.94	-27.26	-	-2.07	-	-

Notes and Sources: MNCs defined as all MNCs for which data are available; for China, sales per firm used instead of employees per firm; see Appendix Tables 1-8 for further details.

Appendix Table 1: Manufacturing Firms in Japan (Yen trillion, unless otherwise noted)

Year	Employees (1,000s)			Sales			Value added			Earnings			Exports			Firms (number)				
	Nat'l total	MNCs		Nat'l total	MNCs		Nat'l total	MNCs		Nat'l total	MNCs		Nat'l total	MNCs		Nat'l total	Firms, Emp+		Firms, Sales+	
		33%+	50%+		33%+	50%+		33%+	50%+		33%+	50%+		33%+	50%+		33%+	50%+	33%+	50%+
1980	8,402	-	-	229.49	-	-	64.56	-	-	23.80	-	-	28.60	-	-	68,185	-	-	-	-
1981	8,839	-	-	247.35	-	-	71.22	-	-	26.76	-	-	32.67	-	-	73,324	-	-	-	-
1982	8,530	-	79.68	243.00	-	8.00	71.14	-	-	27.06	-	-	33.79	-	0.41	75,781	-	364	-	364
1983	8,608	-	115.36	260.24	-	8.70	75.80	-	-	28.28	-	-	34.12	-	0.56	78,400	-	500	-	500
1984	9,149	-	104.35	283.08	-	10.01	83.07	-	-	31.10	-	-	39.57	-	0.59	81,186	-	409	-	409
1985	9,376	-	78.11	295.82	-	6.25	87.43	-	-	33.18	-	-	41.16	-	0.61	83,069	-	330	-	296
1986	9,305	-	103.75	272.67	-	7.14	84.59	-	-	33.17	-	-	34.62	-	0.77	86,110	-	492	-	450
1987	9,629	-	122.52	300.88	-	7.36	95.50	-	-	34.93	-	-	32.57	-	0.71	90,094	-	537	-	485
1988	9,954	-	132.19	326.17	-	8.19	104.32	-	-	37.56	-	-	33.39	-	0.85	93,999	-	606	-	562
1989	9,805	-	139.39	345.42	-	9.23	113.18	-	-	39.61	-	-	37.31	-	0.63	92,204	-	574	-	574
1990	10,107	-	144.72	375.07	-	10.71	121.78	-	-	42.38	-	-	40.82	-	0.89	96,776	-	593	-	592
1991	10,468	154.38	146.34	387.86	10.63	10.27	125.66	-	-	45.68	-	-	41.66	0.93	0.89	101,991	628	581	627	581
1992	10,786	152.59	-	368.52	10.13	-	120.96	-	-	46.54	-	-	42.27	0.93	-	110,360	675	-	675	-
1993	10,859	139.67	-	353.69	9.13	-	118.69	-	-	46.92	-	-	39.42	0.93	-	122,859	559	-	559	-
1994	11,158	175.35	-	367.24	11.24	10.11	126.62	3.79	3.53	49.19	0.76	0.69	39.70	1.38	-	135,541	581	-	581	-
1995	11,257	163.14	-	384.48	11.92	9.89	131.71	2.05	1.75	50.27	1.22	1.02	40.91	1.58	-	147,201	452	-	480	-
1996	11,106	165.05	-	410.31	11.69	9.63	136.18	1.94	1.69	50.00	1.15	0.98	43.91	1.76	-	172,375	478	-	464	-
1997	11,484	172.31	-	403.72	12.94	11.36	138.93	2.11	1.87	50.39	1.20	1.02	50.04	1.91	-	226,005	516	-	501	-
1998	11,534	241.44	-	378.47	12.43	10.83	130.99	1.61	1.47	50.37	1.18	0.99	49.97	2.41	-	234,450	526	-	454	-
1999	11,760	230.48	-	388.69	16.38	14.43	134.04	2.47	2.18	50.71	1.60	1.38	46.82	4.88	-	234,932	508	-	493	-
2000	10,818	240.33	-	399.71	18.34	13.52	134.63	3.04	2.50	48.23	1.86	1.36	50.86	4.82	-	233,486	518	-	503	-
2001	10,649	231.96	165.81	374.02	17.52	12.87	124.65	2.93	2.27	46.79	1.73	1.25	48.02	4.61	3.03	235,194	534	474	497	437
2002	9,998	201.58	136.17	372.22	16.36	11.42	123.62	3.09	2.35	43.79	1.51	1.07	51.31	4.54	2.60	232,831	552	494	534	475
2003	9,940	236.22	178.53	383.74	19.30	14.80	125.77	3.30	2.71	43.74	1.82	1.39	53.73	4.74	3.13	225,526	596	539	568	511
2004	9,780	229.15	186.49	404.00	18.77	15.42	127.33	3.30	2.88	43.10	1.87	1.56	59.99	4.07	3.34	211,345	639	585	609	554
2005	9,730	220.80	186.42	428.59	19.54	16.58	128.73	3.52	3.12	43.30	1.78	1.52	63.96	3.89	3.40	208,896	640	584	619	561
2006	9,854	224.97	193.17	449.19	20.73	17.18	135.88	3.24	2.81	44.42	1.42	1.18	73.20	4.44	3.74	205,959	631	572	587	526
2007	10,212	231.96	200.24	479.38	22.44	18.62	129.56	3.18	2.74	37.14	1.41	1.17	81.48	5.22	4.04	202,686	635	579	592	533
2008	9,926	-	-	420.19	-	-	108.00	-	-	35.44	-	-	77.29	-	-	199,092	-	-	-	-
2009e	9,818	-	-	319.53	-	-	86.04	-	-	32.87	-	-	-	-	-	194,883	-	-	-	-

Notes: All data except national exports refer to fiscal years ending 31 March of the following calendar year; the value added is estimated as sales less cost of goods sold plus worker salaries; sample sizes for cost of goods sold and labor compensation are generally smaller than for sales or employment; 2009 estimates are extrapolations based on growth rates for the first half of the fiscal year; national exports estimated as the sum of SITC section 5-9.

Sources: International Monetary Fund (2010); Japan, Ministry of Finance (2010); Japan, Ministry of Economy, Trade, and Industry (various years) United Nations (2010).

Appendix Table 2: Manufacturing Plants in Hong Kong (HK\$ billion, unless otherwise noted)

Year	Employees (1,000s)				Value added				Gross output			Earnings			Plants (number)		
	Nat'l total	Sample	MNCs		Nat'l total	Sample	MNCs		Sample	MNCs		Sample	MNCs		Sample	MNCs	
			1%+	50%+			1%+	50%+		1%+	50%+		1%+	50%+			
1983	880.00	936.61	91.72	70.33	45.07	44.14	7.10	5.63	170.68	29.44	23.05	28.06	3.20	2.44	46,309	747	408
1984	930.00	955.75	93.71	72.81	57.18	52.74	8.62	6.85	283.34	48.16	38.19	32.93	3.79	2.92	50,033	616	435
1985	920.00	908.53	85.93	66.37	55.13	50.29	6.82	5.37	177.01	26.03	21.09	34.02	3.81	2.90	49,140	617	406
1986	920.00	942.73	106.78	79.65	65.65	62.78	10.32	8.02	227.22	37.96	30.27	39.69	5.23	3.89	50,099	788	445
1987	920.00	944.08	112.18	83.65	79.20	75.76	12.74	10.20	283.34	48.16	38.19	45.57	6.00	4.60	50,756	827	607
1988	870.00	885.96	105.08	82.69	88.29	83.18	14.33	11.89	315.94	58.30	47.32	49.06	6.64	5.18	51,671	867	625
1989	810.00	829.72	98.68	80.78	94.45	89.65	15.48	13.10	325.41	57.47	49.15	52.90	7.41	6.04	52,475	929	678
1990	750.00	762.60	88.51	73.28	96.26	92.24	17.32	14.92	322.18	62.90	55.10	54.50	8.02	6.69	51,823	848	632
1991	720.00	651.40	75.29	64.12	94.28	92.69	17.78	16.00	324.22	60.31	54.15	53.08	7.49	6.40	43,893	654	502
1992	650.00	592.35	69.70	58.53	96.41	97.44	18.83	16.63	331.24	64.99	56.40	54.31	8.06	6.82	41,706	680	513
1993	590.00	504.89	62.23	51.89	89.28	91.15	19.08	16.98	311.82	67.29	59.04	51.88	8.23	6.96	34,382	522	398
1994	560.00	433.67	60.02	52.24	84.32	86.54	20.58	18.72	296.19	73.71	66.16	49.80	9.13	7.87	31,988	546	410
1995	530.00	368.00	57.57	51.54	81.42	84.42	20.81	18.75	300.16	79.19	72.27	48.02	9.81	8.69	27,599	526	422
1996	490.00	327.47	52.01	46.03	79.53	82.45	20.20	18.15	282.03	70.90	64.65	45.62	9.57	8.46	25,859	500	417
1997	440.00	289.96	47.66	42.38	77.75	80.05	22.10	20.02	263.91	69.28	63.39	44.54	10.00	8.92	24,925	445	352
1998	380.00	251.68	41.70	37.46	68.69	70.85	19.91	18.34	230.55	67.25	62.90	40.06	9.20	8.28	22,431	375	328
1999	350.00	223.21	32.00	28.05	63.36	65.77	14.57	12.96	212.05	54.10	49.86	36.00	7.22	6.34	20,383	293	230
2000	330.00	214.22	34.20	27.42	67.65	69.75	15.63	12.80	225.75	58.97	52.16	35.62	7.37	6.00	18,958	361	282
2001	330.00	197.88	32.82	27.63	59.76	61.83	12.73	11.32	198.25	49.24	44.87	33.85	7.40	6.38	17,258	341	302
2002	290.00	186.40	24.18	20.38	51.40	53.43	10.96	9.52	172.37	37.34	33.25	30.98	5.60	4.78	16,460	253	234
2003	270.00	172.40	24.33	21.05	44.40	46.75	10.27	9.10	156.43	39.32	35.25	27.71	5.58	4.96	15,156	276	201
2004	230.00	167.40	24.64	20.82	44.46	46.70	9.94	8.62	157.63	40.56	36.84	26.86	5.58	4.76	14,681	195	153
2005	220.00	164.25	22.11	17.04	45.55	47.32	9.78	8.15	163.21	47.05	40.29	26.50	4.78	3.95	14,050	221	137
2006	220.00	150.38	21.28	17.57	45.76	47.96	10.17	8.85	171.31	57.84	53.00	26.63	4.78	4.10	13,165	391	122
2007	200.00	146.78	21.00	18.58	39.32	43.81	9.75	7.73	164.32	57.11	42.74	24.24	4.44	3.41	12,535	372	347
2008	190.00	142.18	29.19	27.94	39.30	42.19	10.31	9.98	176.52	80.95	80.42	25.15	6.58	6.34	12,291	411	409
2009e	181.39	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Note: 2009 employment estimate assumes the total will fall 4.5%, which is the December-June growth rate for a sample of manufacturing plants accounting for 2/3-3/4 of manufacturing employment in 2006-2008.

Sources: Asian Development Bank (various years); Hong Kong, Census and Statistics Department (various years a; various years b)

Appendix Table 3: Manufacturing Firms in China and Related Indicators of MNC Activities in China (Yuan billions, unless otherwise noted)

Year	Manufacturing												All Industries					
	Workers (1,000s)			Value Added			Gross Output		Fixed assets		Firms (1,000s)		Staff & Workers (1,000s)		Staff & Worker Earnings		Exports (US\$ bil)	
	Nation	Sample	MNCs	Nation	Sample	MNCs	Sample	MNCs	Sample	MNCs	Sample	MNCs	Nation	MNCs	Nation	MNCs	Nation	MNCs
1993	92,950	-	-	-	-	-	-	-	-	-	-	-	148,490	2,880	501	15.1	529	145
1994	96,130	-	-	-	-	-	-	-	-	-	-	-	148,490	4,060	674	25.8	1,043	299
1995	98,030	-	-	-	1,216	238	4,842	1,030	1,913	-	460.89	48.95	149,080	5,130	820	39.0	1,243	391
1996	97,630	-	-	-	1,577	262	5,795	1,140	2,963	-	469.18	42.95	148,450	5,400	922	46.7	1,256	511
1997	96,120	-	-	-	1,571	324	5,973	1,353	2,797	-	421.24	42.47	146,680	5,810	949	55.7	1,515	621
1998	83,190	-	-	-	1,501	-	5,861	-	3,001	-	145.93	-	123,370	5,870	923	61.4	1,521	670
1999	81,090	-	-	-	1,658	442	6,284	1,789	3,208	750	143.41	25.31	117,734	6,121	983	70.1	1,614	734
2000	80,429	-	-	-	1,940	544	7,392	2,209	3,397	821	144.40	26.79	112,590	6,423	1,055	80.8	2,063	989
2001	80,828	-	-	-	2,197	641	8,310	2,556	3,558	909	152.51	29.60	107,918	6,709	1,173	92.4	2,203	1,103
2002	83,074	-	-	-	2,592	770	9,685	3,050	-	-	162.17	32.44	105,577	7,575	1,311	114	2,695	1,407
2003	89,570	-	-	-	3,409	1,075	12,735	4,274	4,170	1,153	181.19	38.05	104,920	8,631	1,473	140	3,627	1,989
2004	94,267	52,196	14,292	5,175	-	-	18,722	5,885	4,733	1,362	203.62	42.19	105,759	10,328	1,695	179	4,911	2,802
2005	100,752	59,353	18,768	6,012	5,723	1,906	21,784	7,705	5,702	1,831	251.50	55.60	108,503	12,452	1,993	235	6,244	3,640
2006	107,108	63,469	20,940	7,121	7,244	2,405	27,457	9,705	6,694	2,240	279.28	60.02	111,606	14,072	2,344	298	7,726	4,495
2007	114,931	68,555	23,236	8,746	9,398	3,037	35,363	12,387	7,817	2,670	313.05	66.49	114,270	15,830	2,849	381	9,264	5,290
2008	117,605	77,316	25,464	10,245	-	-	44,136	14,491	9,649	3,214	396.95	76.67	115,154	16,220	3,366	457	9,941	5,493
2009	-	-	-	11,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Note: Manufacturing accounted for 28-29 percent of staff and workers in all industries in 2003-2008; using a narrow definition (SITC 5-9) that excludes many food- and resource-based manufactures, shares of manufactures in total exports rose steadily from 80 in 1992, to 90 percent in 1999-2001, and 95 percent in 2006-2008; for national employment in 2004-2009 and value added in 2008-2009, estimates assume growth rates were equal to those for employment and value added in all secondary industries (including mining, utilities, and construction), respectively; this is equivalent to assuming that manufacturing accounted for 56 percent of secondary industry employment and 70 percent of secondary value added during these periods.

Sources: Asian Development Bank (various years); China, National Bureau of Statistics (2009, various years).

Appendix Table 4: Manufacturing Plants in Singapore (S\$ billions, unless otherwise noted)

Year	Workers (1,000s)				Value added				Gross output				Earnings			Fixed assets			Direct exports			Plants (number)		
	Nat'l total	Sam-ple	MNCs		Nat'l total	Sam-ple	MNCs		Sam-ple	MNCs		Sam-ple	MNCs		Sam-ple	MNCs		Sam-ple	MNCs		Sam-ple	MNCs		
			1%+	50%+			1%+	50%+		1%+	50%+		1%+	50%+		1%+	50%+		1%+	50%+				
1980	324.0	285.3	195.8	149.4	6.98	6.90	5.60	4.51	31.66	26.45	22.51	2.54	1.81	1.36	7.46	6.25	5.18	19.17	17.67	15.72	3,355	1,086	698	
1981	350.0	281.7	191.1	148.1	7.98	7.75	6.25	5.12	36.79	31.03	27.12	2.95	2.09	1.60	8.84	7.36	6.15	22.38	20.80	18.98	3,439	1,125	743	
1982	360.0	275.5	180.6	137.5	7.74	7.20	5.71	4.73	36.47	30.32	26.64	3.29	2.30	1.76	10.12	8.19	6.74	21.86	19.93	18.12	3,586	1,155	764	
1983	348.0	271.1	184.0	140.0	8.37	7.25	5.83	4.82	37.22	31.10	27.38	3.59	2.61	1.98	11.22	9.19	7.38	22.64	20.64	19.23	3,616	1,204	788	
1984	348.0	274.4	190.0	148.9	9.17	8.12	6.59	5.52	41.08	34.34	30.28	4.07	3.01	2.33	13.14	10.94	8.14	25.06	22.78	21.26	3,648	1,218	803	
1985	314.0	253.5	174.2	139.6	8.49	7.80	6.24	5.23	38.50	31.86	28.11	4.07	2.99	2.40	12.87	10.59	7.75	24.28	21.98	20.39	3,504	1,160	778	
1986	307.0	246.7	171.4	139.3	9.46	9.08	7.59	6.67	37.26	30.85	27.23	3.79	2.79	2.28	12.52	10.44	7.93	24.39	22.16	20.62	3,449	1,105	755	
1987	339.0	276.3	195.8	160.5	11.18	10.99	9.30	8.13	46.08	39.20	34.67	4.20	3.13	2.57	13.16	11.17	8.73	30.38	28.34	26.27	3,514	1,145	804	
1988	379.0	324.7	235.2	193.4	14.09	13.66	11.73	9.89	56.47	48.52	42.37	5.08	3.86	3.13	14.52	12.32	9.68	37.81	35.36	32.56	3,624	1,150	819	
1989	404.0	337.6	241.8	201.9	15.72	15.04	12.76	11.19	63.63	54.26	48.52	5.99	4.49	3.68	16.58	14.06	12.02	42.39	39.32	36.50	3,660	1,161	843	
1990	439.0	351.7	252.1	209.8	17.33	16.50	13.99	12.25	71.33	61.00	54.57	6.88	5.20	4.26	18.03	15.40	13.06	47.00	43.80	40.79	3,703	1,196	868	
1991	430.0	358.3	248.9	208.1	19.94	17.77	14.72	12.95	74.58	62.66	56.14	7.66	5.64	4.62	18.72	15.47	13.20	45.91	41.99	39.08	3,785	1,193	864	
1992	434.0	358.4	246.5	203.6	20.64	18.09	14.82	12.56	77.28	64.73	57.34	8.39	6.18	4.94	20.22	16.67	14.12	46.91	42.97	39.63	3,917	1,177	855	
1993	429.0	355.2	238.4	195.9	23.83	21.09	17.28	14.95	87.64	73.27	65.83	9.00	6.47	5.22	22.34	17.89	15.51	53.02	48.38	45.16	3,993	1,177	858	
1994	423.0	365.6	246.1	201.3	26.25	23.26	19.13	16.36	100.62	84.38	75.92	9.88	7.16	5.72	24.12	19.28	16.46	61.53	56.19	52.15	4,013	1,182	863	
1995	385.0	370.3	248.3	203.0	29.48	26.90	22.40	19.40	113.36	95.80	86.62	10.68	7.71	6.18	26.44	21.08	17.89	69.01	63.40	59.25	4,036	1,164	858	
1996	406.0	368.1	237.4	197.4	30.72	28.21	23.17	20.30	119.87	100.73	91.30	11.25	7.72	6.30	29.10	22.60	17.70	72.96	67.64	62.76	4,068	1,140	850	
1997	414.0	366.7	233.2	192.6	32.03	29.65	24.33	21.46	126.53	106.27	96.32	11.93	8.17	6.69	37.03	29.69	24.74	76.45	70.87	66.08	4,108	1,144	872	
1998	404.0	352.3	222.0	177.8	31.53	29.63	24.47	21.71	121.43	102.62	93.83	11.77	8.16	6.62	37.25	30.18	25.24	75.53	70.84	66.68	4,004	1,092	833	
1999	396.0	338.9	205.5	168.1	31.86	34.93	29.54	26.44	133.58	113.32	103.92	11.22	7.63	6.26	38.60	31.29	26.67	85.36	79.29	74.33	3,928	1,057	819	
2000	434.0	344.6	205.6	164.1	41.14	38.95	32.45	28.37	163.72	140.24	128.78	12.45	8.53	6.87	42.36	35.04	28.87	93.86	87.21	81.29	4,044	1,042	806	
2001	430.1	345.1	203.6	166.4	35.13	31.92	25.56	22.96	138.32	117.29	108.59	12.67	8.63	7.08	48.13	40.66	34.50	84.21	78.29	74.13	4,041	1,050	828	
2002	424.7	357.2	194.9	160.4	38.16	36.36	29.25	26.44	147.30	124.82	115.50	12.96	8.43	6.96	47.91	39.42	33.84	88.38	81.37	76.57	8,609	1,083	862	
2003	419.7	351.1	189.5	155.0	38.61	37.06	29.94	27.00	158.70	135.54	126.66	12.96	8.38	6.90	45.76	37.70	32.49	98.73	91.66	87.71	8,597	1,049	817	
2004	446.7	357.8	194.2	157.6	47.99	46.32	37.93	33.44	191.64	162.89	146.10	13.48	8.73	7.13	47.76	40.12	33.93	116.75	107.71	98.82	8,725	1,039	814	
2005	475.9	369.6	196.9	161.3	51.12	49.04	38.51	33.74	217.09	182.81	163.05	14.30	9.13	7.42	47.06	39.51	33.23	134.65	120.73	110.02	8,037	984	768	
2006	517.5	381.9	193.9	161.8	56.55	54.13	44.52	39.76	237.88	202.14	182.27	15.25	9.47	7.80	47.53	40.57	34.13	141.07	125.94	115.21	7,892	985	786	
2007	566.8	404.1	194.7	167.8	58.42	56.02	44.21	39.71	253.38	211.73	191.88	16.60	9.98	8.46	47.81	40.16	34.64	152.32	131.71	121.55	8,166	975	797	
2008	586.3	435.2	191.7	162.9	50.84	47.25	34.36	30.69	263.89	218.93	196.41	17.74	10.31	8.71	47.32	39.52	33.97	168.05	147.11	135.68	8,640	963	783	
2009e	541.8	-	-	-	47.34	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Note: For 2009, value added estimate is preliminary and employment estimate is as of September.

Sources: Asian Development Bank (various years); Singapore, Department of Statistics (2009); Singapore, Economic Development Board (various years), Singapore, Ministry of Manpower (2009a, 2009b); Singapore Ministry of Trade and Industry (2010), World Bank (2009).

Appendix Table 5: Manufacturing Plants in Malaysia (billion ringgit, unless otherwise noted)

Year	Workers (1,000s)			Value added			Gross output			Earnings		Fixed assets		Exports		Plants (number)	
	Nat'l total	Sample	MNCs 50%+	Nat'l total	Sample	MNCs 50%+	Sample	MNCs 50%+	Sample	MNCs 50%+	Sample	MNCs 50%+	Sample	MNCs 50%+	Sample	MNCs 50%+	
1981c	789	579	147	-	-	-	38.278	15.504	2.817	0.851	10.438	3.079	-	-	20,429	548	
1982	816	521	133	-	-	-	37.627	15.039	3.009	0.894	11.634	3.313	-	-	8,343	483	
1983	894	493	148	-	10.587	3.817	41.474	17.494	3.177	1.059	15.792	3.778	-	-	5,899	493	
1984	858	499	150	-	12.301	4.058	46.256	17.842	3.509	1.155	18.199	4.089	-	-	6,080	469	
1985	850	476	141	-	12.115	3.903	45.586	16.377	3.622	1.193	21.386	4.147	-	-	5,820	474	
1986	874	479	145	-	12.154	4.062	42.427	15.561	3.632	1.232	21.383	4.328	-	-	5,814	488	
1987	929	518	173	16.058	13.317	4.665	50.700	20.273	3.872	1.410	23.032	5.126	-	-	5,741	534	
1988	978	599	217	20.157	16.259	5.997	65.197	26.545	4.426	1.682	24.752	6.661	-	-	5,782	603	
1989	1,171	698	273	25.048	20.592	8.259	80.802	35.336	5.340	2.167	27.809	8.838	-	-	6,092	696	
1990	1,333	845	359	28.847	24.530	10.308	95.814	43.660	6.674	2.822	35.463	13.522	-	-	6,731	1,013	
1991	1,470	977	440	34.524	31.140	13.539	120.298	57.890	8.411	3.826	45.944	18.914	-	-	7,301	1,243	
1992	1,640	1,034	469	38.910	35.099	15.890	134.150	66.490	9.830	4.553	56.404	22.485	-	-	7,461	1,306	
1993c	1,727	1,267	495	44.643	44.207	17.647	164.974	74.919	12.397	5.053	69.445	25.256	-	-	23,462	1,455	
1994	1,892	1,225	529	52.072	49.532	21.825	196.912	96.197	13.603	6.030	80.777	32.120	-	-	8,328	1,260	
1995	1,781	1,390	527	58.684	59.629	24.851	246.923	113.024	16.466	6.648	98.749	37.551	-	-	22,453	1,507	
1996	1,912	1,449	555	70.646	71.538	31.216	273.439	126.959	19.171	8.065	112.831	43.956	-	-	20,204	1,474	
1997	2,003	1,411	558	79.974	79.173	35.488	297.130	140.855	20.500	8.790	127.855	47.351	-	-	23,029	1,866	
1998	1,908	-	-	81.525	-	-	-	-	-	-	-	-	-	-	-	-	
1999	1,991	1,358	570	93.045	87.790	44.359	361.389	192.876	21.443	10.034	143.879	52.691	-	-	21,891	2,949	
2000c	2,174	1,575	601	109.998	106.077	46.887	440.005	221.515	26.123	11.079	164.077	62.809	226.060	157.021	20,455	1,696	
2001	2,184	1,392	548	103.434	95.126	43.044	395.995	204.373	24.571	11.071	160.095	66.928	203.423	138.473	19,184	1,766	
2002	2,069	1,489	572	112.076	109.800	47.810	456.542	228.521	27.214	11.718	176.999	69.130	217.988	150.786	19,705	1,981	
2003	2,131	1,503	575	125.332	121.891	52.310	516.857	251.045	28.137	12.034	183.597	63.053	232.374	166.321	19,141	1,791	
2004	2,023	1,543	608	144.007	137.873	60.181	601.799	289.846	30.259	13.159	184.838	67.066	200.158	121.870	19,163	1,870	
2005c	1,989	1,675	551	154.657	118.210	44.274	655.520	284.610	32.767	12.470	190.914	63.947	-	-	28,257	1,602	
2006	2,083	1,721	617	168.736	129.868	48.510	710.238	322.375	34.910	14.674	193.383	63.936	-	-	32,046	1,636	
2007	1,977	-	-	178.705	-	-	-	-	-	-	-	-	-	-	-	-	
2008	1,945	-	-	194.103	-	-	-	-	-	-	-	-	-	-	-	-	
2009e	1,789	-	-	164.141	-	-	-	-	-	-	-	-	-	-	-	-	

Note: Figures from 1981, 1993, 2000, and 2005 are census totals; figures from other years are survey totals (1982-1992, 1994) or extrapolations from survey totals (1995-1999, 2001-2004); sample and MNC data are published totals for all indicators except exports, which come from slightly different samples compiled by Haji Ahmad and Ramstetter (2009); 2009 employment estimate is as of the third quarter; 2009 value added estimate assumes annual growth is -15.4% (the rate for the first three quarters). Sources: Asian Development Bank (various years); Malaysia, Department of Statistics (2002, 2008, 2009, various years), Haji Ahmad and Ramstetter (2009).

Appendix Table 6: Manufacturing Plants and Firms in Thailand (Baht billions, unless otherwise noted)

Year	Workers (1,000s)				Value added				Gross output or sales				Earnings			Fixed assets			Exports			Plants/Firms (no.)		
	Nat'l total	Sam-ple	MNCs		Nat'l total	Sam-ple	MNCs		Nat'l total	Sam-ple	MNCs		Sam-ple	MNCs		Sam-ple	MNCs		Sam-ple	MNCs				
			1%+	50%+			1%+	50%+			1%+	50%+		1%+	50%+		1%+	50%+		1%+	50%+			
COMPILATIONS OF PLANTS FROM MICRO DATA UNDERLYING INDUSTRIAL CENSUES																								
1996	4,333	2,445	947	403	1,370	1,001	493	186	3,898	3,557	1,920	793	234	112	48.2	1,789	942	399	-	-	-	32,489	2,746	990
2006	5,504	3,726	944	639	2,748	1,595	637	505	8,305	7,147	3,053	2,061	417	137	95.0	3,072	1,277	871	2,476	1,369	1,070	73,931	2,657	1,437
COMPILATIONS OF THE TOP 15+ FIRMS IN 66 MANUFACTURING INDUSTRIES FROM KOHPAIBOON AND RAMSTETTER (2008)																								
1996	-	-	-	-	-	-	-	-	3,898	2,368	1,364	809	-	-	-	1,250	593	285	-	-	-	1,099	479	244
2006	-	-	-	-	-	-	-	-	8,305	6,604	4,539	3,405	-	-	-	1,655	955	694	-	-	-	889	501	346
COMPILATIONS OF LARGE FIRMS FROM RAMSTETTER (2003); FIRMS NUMBERS REFER TO THE SALES' SAMPLES																								
1990	2,918	682	497	-	625	-	-	-	1,767	1,083	612	-	-	-	-	-	-	-	-	-	-	1,362	609	-
1991	3,408	682	485	-	744	-	-	-	2,047	1,392	732	-	-	-	-	-	-	-	-	-	-	1,533	699	-
1992	3,664	-	-	-	819	-	-	-	2,292	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1993	3,893	-	-	-	938	-	-	-	2,539	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1994	3,904	-	-	-	1,072	-	-	-	2,924	1,889	938	-	-	-	-	-	-	-	-	-	-	1,401	585	-
1995	4,293	467	256	-	1,252	-	-	-	3,497	2,411	1,203	-	-	-	-	-	-	-	-	-	-	1,652	682	-
1996	4,333	696	425	-	1,370	-	-	-	3,898	2,760	1,425	-	-	-	-	-	-	-	-	-	-	1,873	775	-
1997	4,327	720	463	-	1,428	-	-	-	4,059	2,336	1,136	-	-	-	-	-	-	-	-	-	-	976	405	-
1998	4,264	765	479	-	1,428	-	-	-	4,126	2,805	1,494	-	-	-	-	-	-	-	-	-	-	929	426	-
1999	4,274	795	550	-	1,514	-	-	-	4,183	2,831	1,602	-	-	-	-	-	-	-	-	-	-	1,019	464	-
2000	4,650	-	-	-	1,654	-	-	-	4,784	3,594	2,192	-	-	-	-	-	-	-	-	-	-	1,139	530	-
2001	4,927	-	-	-	1,716	-	-	-	4,977	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2002	5,052	-	-	-	1,836	-	-	-	5,207	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2003	5,299	-	-	-	2,062	-	-	-	5,895	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2004	5,476	-	-	-	2,236	-	-	-	6,597	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2005	5,588	-	-	-	2,461	-	-	-	7,503	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2006	5,504	-	-	-	2,748	-	-	-	8,305	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2007	5,619	-	-	-	3,034	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2008	5,453	-	-	-	3,170	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2009e	5,301	-	-	-	2,914	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Note: 2009 value added estimate assumes the annual growth rate equals that in the first three quarters (-8.1%); 2009 employment estimate is as of the third quarter.

Sources: Asian Development Bank (various years); Kohpaiboon and Ramstetter (2008); Ramstetter (2003); Thailand, National Economic and Social Development Board (2009, various years); Thailand, National Statistics Office (various years).

Appendix Table 7: Large- and Medium-Sized Manufacturing Plants in Indonesia (trillion rupiah, unless otherwise noted)

Year	Workers (1,000s)				Value added				Production value				Earnings				Exports			Plants (number)		
	Nat'l total	Sample	MNCs		Nat'l total	Sample	MNCs		Sample	MNCs		Sample	MNCs		Sample	MNCs		Sample	MNCs			
			10%+	50%+			10%+	50%+		10%+	50%+		10%+	50%+		10%+	50%+					
1980	4,680	979.9	119.0	107.3	5.288	2.480	0.733	0.676	4.467	1.172	1.092	0.322	0.082	0.075	-	-	-	7,960	317	283		
1981	4,727	1,012	134.6	122.0	7.067	3.124	0.938	0.853	6.708	1.826	1.675	0.463	0.116	0.106	-	-	-	8,088	329	284		
1982	6,022	1,067	133.8	117.0	7.482	3.383	0.967	0.857	8.083	2.259	2.074	0.569	0.153	0.141	-	-	-	7,942	340	298		
1983	5,339	1,097	132.6	111.2	9.896	3.937	1.105	0.968	9.135	2.439	2.140	0.747	0.190	0.167	-	-	-	8,020	338	285		
1984	5,565	1,198	128.2	105.8	13.11	5.091	1.244	1.075	11.14	3.012	2.603	0.892	0.230	0.200	-	-	-	7,919	328	268		
1985	5,796	1,685	165.7	130.5	15.50	8.116	1.769	1.480	14.15	3.373	2.862	1.073	0.246	0.213	-	-	-	8,006	319	258		
1986c	5,606	1,691	156.8	120.2	17.19	11.14	2.244	1.832	22.11	4.675	3.771	1.710	0.365	0.295	-	-	-	12,909	427	337		
1987	5,818	1,788	166.8	121.3	21.15	11.30	2.561	1.874	25.03	5.147	3.907	1.888	0.362	0.275	-	-	-	12,765	425	328		
1988	5,997	2,065	175.7	122.4	29.48	13.88	2.604	1.835	32.36	6.628	4.694	2.180	0.420	0.308	-	-	-	12,778	425	321		
1989	7,335	2,259	187.7	129.1	35.44	18.95	4.370	2.764	54.58	11.73	7.975	6.211	0.462	0.334	-	-	-	14,676	487	363		
1990	7,693	2,663	268.5	191.9	43.57	25.17	5.492	3.191	67.73	15.05	9.670	8.843	1.743	1.299	11.51	2.55	1.80	16,536	594	437		
1991	7,946	2,994	347.5	263.1	53.38	29.93	6.335	4.382	82.13	17.93	12.09	9.744	2.098	1.464	18.14	3.93	2.77	16,494	729	548		
1992	8,255	3,313	467.7	361.4	62.02	41.44	9.763	7.497	101.2	22.91	17.70	11.22	2.774	2.007	25.51	8.24	6.72	17,648	892	693		
1993	8,784	3,575	538.7	425.5	73.56	49.82	11.55	7.960	122.8	27.60	19.68	13.63	3.526	2.552	27.82	7.86	6.34	18,163	993	767		
1994	10,841	3,814	646.0	514.7	89.24	59.86	16.38	11.11	144.2	37.95	27.13	15.75	4.292	3.119	37.52	11.99	9.91	19,017	1,118	876		
1995	10,127	4,174	715.4	569.5	109.7	73.91	21.35	15.59	181.5	52.67	40.61	18.64	4.890	3.961	50.48	16.75	14.33	21,551	1,198	978		
1996c	10,773	4,215	767.9	594.3	136.4	93.33	28.47	19.45	225.8	67.97	49.49	28.64	6.517	5.391	65.28	24.21	19.13	22,997	1,321	1,092		
1997	11,009	4,155	780.9	639.3	168.2	84.06	29.69	24.26	209.1	65.00	54.95	30.44	9.805	8.113	53.14	20.32	17.00	22,386	1,416	1,210		
1998	9,934	4,124	788.6	664.4	238.9	154.7	54.05	43.97	393.1	128.7	107.2	36.47	11.09	9.114	-	-	-	21,423	1,567	1,363		
1999	11,516	4,235	865.0	730.4	285.9	191.4	66.9	54.0	488.2	165.6	136.4	30.44	9.805	8.113	100.27	46.32	39.99	22,070	1,707	1,498		
2000	11,642	4,367	932.4	791.9	385.6	236.9	90.17	71.71	628.8	234.8	184.0	36.47	11.09	9.114	150.12	62.96	55.24	22,174	1,754	1,544		
2001	12,086	4,386	941.4	803.9	506.3	269.6	91.00	64.55	722.4	239.0	192.5	52.72	14.08	11.87	-	-	-	21,396	1,710	1,506		
2002	12,110	4,365	929.7	796.5	523.2	310.0	102.9	70.83	882.5	283.0	209.1	46.41	12.58	10.53	-	-	-	21,146	1,669	1,489		
2003	11,496	4,274	986.7	848.2	568.9	326.8	118.3	98.59	838.8	285.9	242.7	60.55	22.34	20.07	-	-	-	20,324	1,766	1,571		
2004	11,070	4,325	963.7	816.3	644.3	358.9	128.1	107.6	985.9	328.3	281.4	53.07	15.15	13.04	168.65	76.56	70.20	20,685	1,686	1,505		
2005	11,803	4,227	977.8	849.1	760.4	396.4	145.9	122.8	1,089	362.9	309.7	58.12	16.91	14.94	-	-	-	20,729	1,681	1,512		
2006c	11,734	4,756	1,161	1,018	919.5	514.3	204.1	176.5	1,293	485.9	417.8	74.05	21.99	18.72	336.53	168.57	152.14	29,468	2,154	1,948		
2007	12,231	4,625	1,197	1,073	1,069	598.4	228.2	196.1	1,547	533.4	463.5	70.46	22.16	19.92	-	-	-	27,998	2,179	1,976		
2008	12,495	4,550	-	-	1,381	713.9	-	-	-	-	-	108.3	-	-	-	-	-	27,808	-	-		
2009	12,671	-	-	-	1,481	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		

Note: 2009 estimates are preliminary; the employment estimate assumes growth for the year will be equal to that from Feb 2008 to Feb 2009.

Sources: Asian Development Bank (various years); Indonesia, Badan Pusat Statistik (2010; various years).

Appendix Table 8: Manufacturing Firms in Vietnam (trillion dong [current], unless otherwise noted)

Year	Enterprise Census Data (1995, 2000-2008) & Industrial Survey Data (1998)													Alternative estimates				
	Workers (1,000s)				Sales or Output			Labor compensation			Firms 1995, 2000-2008 or plants (1998)			Industrial output in manufacturing			Non-oil/coal exports	
	Nat'l total	Sam-ple	MNCs		Sam-ple	MNCs		Sam-ple	MNCs		Sam-ple	MNCs		Nation	1994 dong		Nation	MNCs
			10%+	100%		10%+	100%		10%+	100%		Nation	Nation		MNCs			
ENTERPRISE CENSUSES AND ALTERNATIVE ESTIMATES																		
1995	-	1,000	74	33	66	7	-	-	-	-	8,577	382	124	-	83	15	-	-
1996	-	-	-	-	-	-	-	-	-	-	-	-	-	119	95	19	-	-
1997	-	-	-	-	136	46	-	-	-	-	-	-	-	145	108	25	-	-
1998	-	896	225	-	125	57	-	11.1	4.0	-	4,562	719	-	172	121	31	-	-
1999	-	-	-	-	-	-	-	-	-	-	-	-	-	194	134	38	-	-
2000	3,550	1,598	356	275	246	102	53.5	18.3	5.7	3.8	10,405	1,046	699	264	158	48	-	-
2001	3,887	1,808	436	348	302	117	62.5	21.7	7.0	4.9	13,237	1,513	1,125	321	184	55	-	-
2002	4,160	2,203	628	515	379	155	85.3	27.7	9.5	6.8	14,794	1,681	1,281	388	214	68	-	-
2003	4,560	2,557	791	664	476	202	116	35.6	12.9	9.8	16,915	1,986	1,560	504	253	83	-	-
2004	4,832	2,893	965	832	623	266	166	43.7	16.3	13.0	20,531	2,326	1,891	657	296	99	-	-
2005	5,249	3,099	1,126	988	743	323	210	51.7	20.4	16.5	24,018	2,654	2,217	825	353	127	384	177
2006	5,656	3,457	1,341	1,188	974	428	294	66.7	27.9	23.4	29,264	3,039	2,591	1,018	421	160	486	233
2007	5,963	3,827	1,564	1,397	1,216	547	373	84.3	36.2	30.7	33,723	3,527	3,073	1,255	500	198	626	312
2008	6,306	3,909	1,653	1,499	1,716	686	493	112.7	49.4	40.8	34,297	3,915	3,471	-	577	238	832	399
2009p	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	849	409

Notes: 1995 sales data refer to 1994, 2009 value added estimate is preliminary.

Sources: Vietnam, General Statistics Office (2009a, 2009b, various years).

Appendix Table 9: Indicators of Economic Downturns in Major Asian Economies (growth rates for economies experiencing downturns)

Year	Real GDP Growth in Domestic Currency														Nominal GDP Growth in US\$													
	Jp	Hk	Kr	Tw	Ch	Si	Ml	Th	Id	Ph	Vi	Ia	Pk	Bg	Jp	Hk	Kr	Tw	Ch	Si	Ml	Th	Id	Ph	Vi	Ia	Pk	Bg
1980	3.2	10.3	-1.5	7.4	7.9	9.7	7.4	4.6	9.9	5.1	-3.5	3.6	8.5	0.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	4.2	9.3	6.2	6.2	5.3	9.7	6.9	5.9	7.6	3.4	5.8	6.2	6.8	3.1	10.5	7.4	12.0	16.4	-5.4	18.5	2.1	7.7	11.6	9.9	-50.2	7.3	7.7	-2.5
1982	3.4	2.9	7.3	3.5	9.0	7.1	5.9	5.4	2.2	3.6	8.2	4.1	6.5	3.2	-7.0	4.0	6.6	0.8	-3.9	10.0	7.2	5.0	2.7	4.2	32.6	3.6	1.5	-8.4
1983	3.1	6.0	10.8	8.3	10.9	8.5	6.3	5.6	4.2	1.9	7.1	6.4	6.8	4.6	9.1	-7.5	10.9	7.8	7.3	13.9	11.8	9.4	-9.4	-10.6	50.6	8.0	3.3	4.8
1984	4.5	9.9	8.1	10.7	15.2	8.3	7.8	5.8	7.0	-7.3	8.4	4.6	5.1	4.2	6.3	12.0	10.3	13.0	2.9	8.1	13.3	4.4	2.4	-5.4	73.8	0.4	4.4	13.7
1985	6.3	0.7	6.8	5.0	13.5	-1.4	-0.9	4.6	2.5	-7.3	5.6	4.9	7.6	3.7	6.9	6.5	3.7	5.0	-1.2	-5.7	-8.1	-6.9	-0.3	-2.1	-68.9	3.5	3.5	2.9
1986	2.8	11.1	10.6	11.5	8.9	2.1	1.2	5.5	5.9	3.4	3.4	4.9	5.5	4.0	48.1	15.1	15.2	21.1	-3.1	1.5	-11.1	10.8	-8.3	-2.8	####	10.0	4.3	4.8
1987	4.1	13.4	11.1	12.7	11.6	9.8	5.4	9.5	4.9	4.3	2.5	4.2	6.5	2.9	21.2	23.4	25.8	34.9	8.9	14.2	13.9	17.3	-5.2	11.1	24.1	10.2	7.0	10.3
1988	7.1	8.4	10.6	8.0	11.3	11.5	9.9	13.3	5.8	6.8	5.1	8.3	7.6	2.4	21.3	18.1	33.9	21.5	24.7	23.6	9.6	22.0	11.0	14.1	-44.7	9.4	8.4	7.9
1989	5.4	2.2	6.7	8.5	4.1	10.0	9.1	12.2	7.5	6.2	7.8	6.8	5.0	4.3	0.1	15.4	23.0	21.3	11.7	18.5	10.1	17.2	14.3	12.6	-72.9	-0.8	3.9	10.2
1990	5.6	3.9	9.2	5.7	3.8	9.2	9.0	11.6	7.2	3.0	5.0	5.6	4.5	4.6	2.9	11.8	14.4	7.9	-13.5	22.3	13.3	18.5	12.8	3.6	2.8	7.9	10.5	3.9
1991	3.3	5.7	9.4	7.6	9.2	6.6	9.5	8.1	7.0	-0.6	5.8	2.1	5.5	4.2	14.0	15.5	16.8	11.9	4.8	17.2	13.3	12.3	12.0	2.6	18.1	-11.2	13.5	3.1
1992	0.8	6.1	5.9	7.8	14.2	6.3	8.9	8.1	6.5	0.3	8.7	4.4	7.8	4.8	8.9	17.1	7.0	18.7	19.3	15.2	20.4	13.8	8.5	16.9	29.1	0.9	8.0	0.0
1993	0.2	6.0	6.1	6.9	14.0	11.7	9.9	8.3	6.8	2.1	8.1	4.9	1.3	4.3	14.6	15.3	9.8	5.6	25.6	17.0	13.1	11.3	14.2	2.6	33.6	-2.2	5.8	4.8
1994	0.9	6.0	8.5	7.4	13.1	11.6	9.2	9.0	7.5	4.4	8.8	6.2	3.7	4.5	9.9	13.0	16.9	9.2	-8.8	21.5	11.3	18.5	12.0	17.9	23.5	13.5	0.8	8.6
1995	1.9	2.3	9.2	6.5	10.9	8.2	9.8	9.2	8.2	4.7	9.5	7.4	5.0	4.8	10.2	6.4	22.1	8.6	30.2	19.3	19.3	16.4	14.3	17.9	27.8	13.5	16.8	10.6
1996	2.6	4.2	7.0	6.3	10.0	7.8	10.0	5.9	7.8	5.8	9.3	7.6	4.8	5.0	-11.8	10.2	7.8	5.7	17.6	9.8	13.5	8.3	12.3	11.7	18.7	3.1	4.4	4.9
1997	1.6	5.1	4.7	6.6	9.3	8.3	7.3	-1.4	4.7	5.2	8.2	4.6	1.0	5.3	-8.2	10.9	-7.4	3.7	11.3	3.6	-0.7	-17.1	-4.9	-0.8	8.9	11.9	-1.4	4.5
1998	-2.0	-6.0	-6.9	4.5	7.8	-1.4	-7.4	-10.5	-13.1	-0.6	5.8	6.0	2.6	5.0	-9.5	-5.3	-33.1	-7.9	7.0	-14.0	-27.9	-25.9	-55.8	-20.5	1.3	0.8	-0.4	3.2
1999	-0.1	2.6	9.5	5.7	7.6	7.2	6.1	4.4	0.8	3.4	4.8	6.9	3.7	5.4	13.3	-2.2	28.9	8.2	6.3	0.3	9.7	9.6	46.7	14.4	5.4	6.8	-6.2	4.0
2000	2.9	8.0	8.5	5.8	8.4	10.1	8.7	4.8	5.4	6.0	6.8	5.7	4.3	5.6	6.8	3.6	14.9	7.5	10.6	12.2	16.7	0.1	7.0	-0.3	8.6	5.1	4.0	1.1
2001	0.2	0.5	4.0	-2.2	8.3	-2.4	0.5	2.2	3.6	1.8	6.9	3.9	1.9	4.8	-12.3	-1.5	-5.4	-9.2	10.5	-7.6	-1.1	-5.9	-2.9	-6.2	4.3	2.4	-2.4	0.3
2002	0.3	1.8	7.2	4.6	9.1	4.1	5.4	5.3	4.5	4.4	7.1	4.6	3.2	4.8	-4.3	-1.7	14.1	2.1	9.7	3.1	8.7	9.8	21.7	7.9	7.9	4.6	0.6	5.0
2003	1.4	3.0	2.8	3.5	10.0	3.8	5.8	7.1	4.8	4.9	7.3	6.9	4.9	5.8	7.9	-3.2	11.8	2.6	12.9	5.5	9.3	12.4	20.1	3.7	12.7	15.8	14.9	9.9
2004	2.7	8.5	4.6	6.2	10.1	9.3	6.8	6.3	5.0	6.4	7.8	7.9	7.4	6.1	8.9	4.6	12.1	8.4	17.7	17.7	13.2	13.1	9.4	9.2	14.9	16.8	17.5	8.5
2005	1.9	7.1	4.0	4.2	10.4	7.3	5.3	4.6	5.7	5.0	8.4	9.2	7.7	6.3	-1.2	7.2	17.0	7.5	15.7	10.3	10.6	9.3	11.2	13.7	16.5	17.2	11.7	3.4
2006	2.0	7.0	5.2	4.8	11.6	8.4	5.8	5.2	5.5	5.3	8.2	9.8	6.1	6.5	-4.2	6.8	12.7	2.9	18.9	15.1	13.8	17.4	27.5	18.9	15.1	11.6	16.3	6.7
2007	2.3	6.4	5.1	5.7	13.0	7.8	6.2	4.9	6.3	7.1	8.5	9.4	5.6	6.3	0.4	9.0	10.2	5.0	27.3	20.0	18.5	18.9	18.6	22.6	16.7	25.8	12.3	13.0
2008	-0.7	2.4	2.2	0.1	9.0	1.1	4.6	2.6	6.1	3.8	6.2	7.3	2.0	6.0	12.1	4.0	-11.4	1.7	27.9	9.0	19.1	11.1	18.4	15.9	26.3	9.6	14.9	14.3
2009	-5.4	-3.6	-1.0	-4.1	8.5	-3.3	-3.6	-3.5	4.0	1.0	4.6	5.4	2.0	5.4	2.8	-3.0	-13.9	-8.7	9.9	-10.3	-6.4	-2.5	0.6	-4.9	2.2	3.0	1.2	9.4
2010	1.7	3.5	3.6	3.7	9.0	4.1	2.5	3.7	4.8	3.2	5.3	6.4	3.0	5.4	2.7	5.7	6.9	7.8	10.6	9.5	4.3	6.0	10.4	7.8	12.1	7.8	7.3	7.6

Notes: Some 2007-2008 data are preliminary; 2009-2010 data are IMF forecasts as of October 2009; see Appendix Table 10 for country abbreviation definitions.

Source: International Monetary Fund (2009).

Appendix Table 10: Nominal GDP in US\$ (billions; IMF estimates and projections as of October 2009)

Year	Jp- Japan	Hk- Hong Kong	Kr- Korea	Tw- Taiwan	Ch- China	Si- Singa- pore	Ml- Malay- sia	Th- Thailand	Id- Indo- nesia	Ph- Philip- pines	Vi- Vietnam	Ia- India	Pk- Pakistan	Bg- Bangla- des
1980	1,071	29	67	42	309	12	25	32	95	32	28	177	29	20
1981	1,184	31	75	49	293	14	25	35	106	36	14	190	31	19
1982	1,100	32	79	50	281	15	27	37	109	37	18	197	31	17
1983	1,200	30	88	53	302	17	31	40	99	33	28	213	32	18
1984	1,276	33	97	60	311	19	35	42	101	31	48	213	34	21
1985	1,364	36	101	63	307	18	32	39	101	31	15	221	35	21
1986	2,021	41	116	77	298	18	28	43	93	30	34	243	36	22
1987	2,449	50	146	104	324	21	32	51	88	33	42	268	39	25
1988	2,971	60	195	126	404	25	35	62	98	38	23	293	42	27
1989	2,973	69	240	153	451	30	39	72	111	43	6	291	44	29
1990	3,058	77	275	165	390	37	44	86	126	44	6	314	48	30
1991	3,485	89	321	184	409	43	50	96	141	45	8	279	55	31
1992	3,796	104	344	219	488	50	60	109	153	53	10	281	59	31
1993	4,350	120	378	231	613	58	68	122	175	54	13	275	63	33
1994	4,779	136	441	252	559	71	76	144	195	64	16	312	63	36
1995	5,264	144	539	274	728	84	90	168	223	76	21	354	74	40
1996	4,643	159	581	289	856	93	102	182	251	84	25	365	77	42
1997	4,262	176	538	300	953	96	102	151	238	84	27	408	76	43
1998	3,857	167	360	276	1,019	82	73	112	105	67	27	412	76	45
1999	4,369	163	464	299	1,083	83	80	123	155	76	29	439	71	47
2000	4,667	169	533	321	1,198	93	94	123	166	76	31	462	74	47
2001	4,095	167	505	292	1,325	86	93	116	161	71	33	473	72	47
2002	3,918	164	576	298	1,454	88	101	127	196	77	35	495	73	50
2003	4,229	159	644	305	1,641	93	110	143	235	80	40	573	84	54
2004	4,606	166	722	331	1,932	110	125	161	257	87	45	669	98	59
2005	4,552	178	845	356	2,236	121	138	176	286	99	53	784	110	61
2006	4,363	190	952	366	2,658	139	157	207	364	118	61	875	127	65
2007	4,380	207	1,049	385	3,382	167	186	246	432	144	71	1,101	143	74
2008	4,911	215	929	391	4,327	182	222	273	512	167	90	1,207	165	84
2009	5,049	209	800	357	4,758	163	207	266	515	159	92	1,243	167	92
2010	5,187	221	855	385	5,263	179	216	282	569	171	103	1,339	179	99

Notes: Some 2007-2008 data are preliminary; 2009-2010 data are IMF forecasts as of October 2009.

Source: International Monetary Fund (2009).

Appendix Table 11: Manufacturing Employment and Current GDP in US\$, 1980-2009

Year	Employment (millions)								GDP (US\$ billions)							
	Japan	Hong Kong	China	Singapore	Malaysia	Thailand	Indonesia	Vietnam	Japan	Hong Kong	China	Singapore	Malaysia	Thailand	Indonesia	Vietnam
1980	8.402	0.940	58.990	0.324	0.749	1.667	4.680	-	285	6	-	3	-	7	8	-
1981	8.839	0.990	61.922	0.350	0.789	1.784	4.727	-	323	7	-	4	-	8	11	-
1982	8.530	0.900	63.955	0.360	0.816	1.870	6.022	-	286	6	-	4	-	8	11	-
1983	8.608	0.880	65.668	0.348	0.894	2.040	5.339	-	319	6	-	4	-	9	11	-
1984	9.149	0.930	70.400	0.348	0.858	1.989	5.565	-	350	7	-	4	-	10	13	-
1985	9.376	0.920	74.120	0.314	0.850	2.109	5.796	-	367	7	-	4	-	9	14	-
1986	9.305	0.920	80.190	0.307	0.874	2.239	5.606	-	502	8	-	4	-	11	13	-
1987	9.629	0.920	83.590	0.339	0.929	2.508	5.818	-	660	10	-	5	6	13	13	-
1988	9.954	0.870	86.520	0.379	0.978	2.432	5.997	-	814	11	-	7	8	17	17	-
1989	9.805	0.810	85.470	0.404	1.171	2.768	7.335	-	820	12	-	8	9	20	20	-
1990	10.107	0.750	86.240	0.439	1.333	2.918	7.693	-	841	12	-	10	11	24	24	-
1991	10.468	0.720	88.390	0.430	1.470	3.408	7.946	-	933	12	-	12	13	29	27	-
1992	10.786	0.650	91.060	0.434	1.640	3.664	8.255	-	955	12	-	13	15	32	31	-
1993	10.859	0.590	92.950	0.429	1.727	3.893	8.784	-	1,067	12	-	15	17	37	35	-
1994	11.158	0.560	96.130	0.423	1.892	3.904	10.841	-	1,239	11	-	17	20	43	41	-
1995	11.257	0.530	98.030	0.385	1.781	4.293	10.127	-	1,400	11	-	21	23	50	49	3
1996	11.106	0.490	97.630	0.406	1.912	4.333	10.773	-	1,252	10	-	22	28	54	58	4
1997	11.484	0.440	96.120	0.414	2.003	4.327	11.009	-	1,148	10	-	22	28	46	58	4
1998	11.534	0.380	83.190	0.404	1.908	4.264	9.934	-	1,001	9	-	19	21	35	24	5
1999	11.760	0.350	81.090	0.396	1.991	4.274	11.516	-	1,177	8	-	19	24	40	36	5
2000	10.818	0.330	80.429	0.434	2.174	4.650	11.642	3.550	1,249	9	-	24	29	41	46	6
2001	10.649	0.330	80.828	0.430	2.184	4.927	12.086	3.887	1,026	8	-	20	27	39	49	6
2002	9.998	0.290	83.074	0.425	2.069	5.052	12.110	4.160	986	7	-	21	29	43	56	7
2003	9.940	0.270	89.570	0.420	2.131	5.299	11.496	4.560	1,085	6	-	22	33	50	66	8
2004	9.780	0.230	94.267	0.447	2.023	5.476	11.070	4.832	1,177	6	625	28	38	56	72	9
2005	9.730	0.220	100.752	0.476	1.989	5.588	11.803	5.249	1,168	6	734	31	41	61	78	11
2006	9.854	0.220	107.108	0.518	2.083	5.504	11.734	5.656	1,168	6	893	36	46	73	100	13
2007	10.212	0.200	114.931	0.567	1.977	5.619	12.231	5.963	1,100	5	1,150	39	52	88	117	15
2008	9.926	0.190	117.605	0.586	1.945	5.453	12.495	6.306	1,045	5	1,474	36	58	95	142	19
2009	9.818	0.181	-	0.542	1.789	5.301	12.671	-	916	-	1,419	32	46	85	140	20

Sources and Notes: Exchange rates from International Monetary Fund (2010) and refer to the first 8 to 11 months for 2009; see Appendix Tables 1-8 for other notes and sources.