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Differentials in Indonesian Manufacturing, 1975-2001**

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# Multinational Presence and Labor Productivity Differentials in Indonesian Manufacturing, 1975-2001\*

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## Abstract

Foreign multinational corporations (MNCs) have accounted for important shares of employment and production in Indonesian manufacturing since 1975 and these shares increased especially rapidly in the early- to mid-1990s. These increases were concentrated in the machinery industries and MNCs with large foreign ownership shares, and continued through and after the crisis of 1997-1998, despite apparently large withdrawals inward FDI in 1998 and subsequent years. MNCs generally had much higher average labor productivity than local plants and these differentials persisted after accounting for plant-wise variation in electricity consumption per employee, size, and vintage in about three-fourths of the cases examined. However, there was also large variation in MNC presence and productivity differentials across industries and time, with statistically insignificant differentials most common in apparel and footwear, as well as in MNCs with small foreign-ownership shares.

*JEL classification:* D24, F23, O14, O53

*Keywords:* multinational corporations, Indonesia, manufacturing, employment, production, productivity

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## 1. INTRODUCTION

Foreign-owned multinational corporations (MNCs) have played an important role in many of Indonesia's manufacturing industries over the last three decades. Employment and production (value added) of MNCs increased especially rapidly, both absolutely and relative to Indonesian totals, during the rapid economic growth of the early- and mid-1990s. Moreover, contrary to the impression created by large outflows of foreign direct investment (FDI) after the crisis of 1997-1998, manufacturing MNCs' employment and production, and their shares of total manufacturing employment and production, continued to increase through 2001. The first purpose of this paper is to analyze these and related trends since 1975, highlighting the large variation in shares of MNCs across time, industry, and foreign ownership group, as well as some of the factors responsible for the observed patterns.

One of the most important contributions of MNCs in developing economies stems from the fact that they are generally expected to possess superior firm-specific assets such as production technology, management know-how, and marketing networks compared to non-MNCs. Because most local firms in Indonesia are non-MNCs, MNCs are generally expected to be more productive than local firms in some respect. In addition, the presence of MNCs is also thought to lead to higher productivity in local firms, or positive productivity spillovers. Previous studies of MNCs in Indonesian manufacturing (Blomström and Sjöholm 1999; Hill 1988, pp. 107-117, 1990a, 1990b; Sjöholm 1998, 1999a, 1999b, 2000; Takii 2001, 2002) provide evidence that is generally consistent with these expectations. In addition, MNCs are often asserted to restrict the provision of firm-specific assets such as production technology to minority-foreign MNCs, leading to the expectation that productivity may be relatively low in this group of MNCs (Moran 2001). However, previous evidence indicates that is not always the case in Indonesian

manufacturing (Blomström and Sjöholm 1999; Takii 2002; Takii and Ramstetter 2000, 2003).<sup>1</sup> Previous studies of these issues in Indonesia have generally assumed that technology was very similar across manufacturing industries and focused on relatively short periods of time. Thus, the second major purpose of this study is to allow for more general differences in technology across industries and to examine the variation of labor productivity over longer periods of time, although data constraints mandate significant simplifications regarding the specification of production technology.

The next section first examines trends in and patterns of MNC presence in Indonesian manufacturing. The following section then compares average labor productivity in MNCs and local plants. In all of these analyses, three ownership groups of MNCs, minority-foreign MNCs with foreign ownership shares of 10-49%, majority-foreign MNCs with foreign ownership shares of 50-89%, and heavily-foreign MNCs with foreign ownership shares of 90% or more, are distinguished to see if there are important differences among these groups as often hypothesized. Finally, the concluding section summarizes the main results, emphasizing the point Indonesia little to gain and a lot to lose by restricting the activities of firms on the basis of ownership.

## **2. MULTINATIONAL PRESENCE IN INDONESIA'S MANUFACTURING INDUSTRIES**

Indonesia has long welcomed MNCs and actively promoted FDI by these MNCs as part of its attempts to promote economic growth and industrialization, though it has also sought to regulate those MNCs in several respects. However, patterns of MNC presence in Indonesia have

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<sup>1</sup> Evidence for Malaysia (Menon 1998, Oguchi et al. 2002) and Thailand (Ramstetter 2002b, 2004) differs from the Indonesian evidence by suggesting that MNCs are often not more productive than local plants in individual industries, but is similar in suggesting that MNCs productivity levels are not systematically related to foreign ownership shares in Thailand.

varied greatly over time and across industries, partially in response to changes in the macroeconomic environment and economic policies. This section details some of the more conspicuous patterns observed in this respect.

## **2.1. The Macroeconomic Environment, Economic Policies, and Aggregate Trends**

Before 1985 the Indonesian economy was heavily dependent on oil and gas, a sector in which MNCs played key roles. Consequently, manufacturing remained rather limited, accounting for an average of 9% of the workforce and 13% of GDP at current prices in the 1975-1985 decade (Table 1). Although Indonesian economic growth averaged a respectable 6.2% per year during this decade, growth slowed markedly toward the end of the period, to 2.2%-4.2% in 1982-1983 and 1985 (BPS various years b) as large declines in oil and gas prices reduced exports and government revenues. Indonesia's policy makers responded with far reaching reforms. Perhaps the most important reform was the rationalization and drastic reduction of previously high levels of import protection that often penalized exporters. Other measures promoting of non-oil exports, many of which were manufactures, were also adopted. Partially as a result of these efforts, economic growth recovered in 1986-1988 and accelerated to between 6.5% and 8.2% percent annually in 1989-1996 while manufacturing's shares of employment and GDP rose to 13% and 26%, respectively, in 1995-1997. Economic growth, both in manufacturing and in the economy as a whole, fell to much lower levels after the 1997-1998 crisis, however.

There were also important changes in Indonesia's policies toward MNCs. According to Pangestu (1996, p. 150), these changes were related to changes in external conditions and resource availability, among other factors. For example, in the early years of the New Order regime, there were initially no restrictions on foreign ownership as the primary concern was

restoring economic stability.<sup>2</sup> However, high oil prices reduced concerns about stability in the 1970s while rising nationalism created political pressure that resulted in various restrictions on MNCs, including the closure of some sectors to foreign investment, restrictions on foreign ownership shares, as well as requirements regarding divestment, minimum capital investment, and local content. These restrictions were gradually relaxed beginning in the early-1990s and in 1994 there was a formal deregulation that removed restrictions regarding foreign ownership shares and minimum capital requirements, in addition to relaxing divestment requirements.

Rapid growth and industrialization were both causes and results of even larger increases in net flows (remittances less withdrawals) of inward FDI during the economic boom of the late-1980s and the early to mid-1990s. Net FDI stocks, calculated as the cumulative value of net flows reported in the balance of payments from 1970 forward, first increased from US\$3 billion in 1985 to US\$8 billion in 1991 and then accelerated to a peak of US\$29 billion in 1997 (Table 1).<sup>3</sup> The ratio of these stocks to the U.S. dollar value of GDP more than quadrupled from only 3% in 1985 to 13% in 1997. If FDI flows are first translated in rupiah at annual exchange rates, and then cumulated, the resulting rupiah value of FDI stocks was a somewhat smaller portion of GDP, but the increase in this ratio was even more rapid, from 2% in 1985 to 10% in 1997. Policy changes including the trade liberalization of the mid-1980s and the relaxation of restrictions on MNCs in the early 1990s, also contributed to increases in FDI. External factors were also important. For example, strong growth and/or appreciating currencies for much of this period also made MNCs from important home economies such as Hong Kong, Japan, Korea, Singapore, and Taiwan, bullish on the prospects in Indonesia, other Southeast Asian economies, and China. Increasingly complex and sophisticated networks also evolved among manufacturing MNCs in

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<sup>2</sup> See Pangestu (2002) for details about foreign investment policy under the New Order regime.

<sup>3</sup> This is the most standard estimate of FDI and refers to net remittances of equity and loans from foreign-owned multinational groups to affiliates in Indonesia in which the foreign group has ownership shares of 10% or more.

Southeast Asia, reducing the perceived risks of investing. These networks initially involved MNCs in Singapore, Malaysia, and Thailand, but Indonesia-based MNCs became increasingly involved in these networks by the mid- to late-1990s.

Some of the data in Table 1 might be interpreted as suggesting that the 1997-1998 crisis marked an abrupt end to this process. For example, economic growth plunged to annual averages of -6.2 percent in 1998-1999 and 4.2 percent in 2000-2001. Manufacturing shares of employment and value added stagnated. Net FDI flows turned strongly negative as withdrawals exceeding remittances by US\$11 billion in 1998-2001 period alone. FDI stocks plunged to US\$18 billion in 2001, though they continued to account for 13 percent of the U.S. dollar value of GDP, which was greatly reduced by the fall of the rupiah.<sup>4</sup> The large decline in the value of the rupiah also meant that the rupiah value of FDI stocks turned negative by 2001, because the rupiah value of negative flows in post-crisis years was far greater than the rupiah value of positive flows in previous years. These declines are often attributed to a loss of MNC confidence in Indonesia resulting from the perceived inability of post-Suharto governments to manage the economy, decentralization that led to locally mandated increases in minimum wages, increasingly militant labor movements, and the revival of economic nationalism, among other factors.

However, in marked contrast to the FDI data, compilations of industrial survey data on employment and production (value added) of MNCs in Indonesian manufacturing suggest that MNC presence increased somewhat more slowly before the crisis and continued to increase at a modest rate after the crisis, both absolutely and relative to Indonesian manufacturing totals.<sup>5</sup> For example, the number of employees working in manufacturing MNCs increased from an average

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<sup>4</sup> Before the crisis the rupiah had depreciated rather steadily from an average of 661 per U.S. dollar in 1975-1985 to 1,696 in 1986-1991, 2,093 in 1992-1994, and 2,500 in 1995-1997, but the depreciation accelerated to 8,934 in 1998-1999 and 9,341 in 2000-2001 (International Monetary Fund, various years).

<sup>5</sup> Data for MNCs are not published by BPS but are compiled by the authors from raw data sets in BPS (various years a). See Takii and Ramstetter (2004) for details by MNC ownership group and industry for 1975-2001.

of 115,000 in 1975-1985 to 223,000 in 1986-1991, 559,000 in 1992-1994, 777,000 in 1995-1997, and then continued to increase to 937,000 in 2000-2001 (Table 1). MNC shares of employment in large and medium-sized manufacturing plants (plants with 20 or more employees) first fell 12% to 10% between 1975-1985 and 1986-1991 and then increased to 16% in 1992-1994 and 21% after 1998 (Table 2). MNC shares of total manufacturing employment reported in the labor force surveys were much smaller, reflecting the existence of many small manufacturing plants not covered by these surveys. In addition, these shares increased more steadily from 2% in 1975-1985 to 3% percent in 1986-1991, 6% in 1992-1994, and 7-8% thereafter, probably because industrial survey coverage was markedly poorer in earlier years and because some local plants increased in size (see below).

Value added measured in current prices increased much more rapidly than employment, largely because of persistent inflation that accelerated with the fall of the rupiah after the crisis (Table 1). MNC shares of value added in large and medium-sized manufacturing plants were larger than corresponding shares of employment but increased more slowly, from 27% in 1975-1985, 22% in 1986-1991, and 26% percent in 1992-1994 to 32% in 1995-1996 and 36% thereafter (Table 3). Here again MNC shares of economy-wide GDP estimates were smaller and increased more steadily, from 11% to 12% between 1975-1985 and 1986-1991, and then to 17% in 1992-1994, 19% in 1995-1997, and 24-27% thereafter. Thus, although some prominent manufacturing MNCs, such as Sony Electronics Indonesia, withdrew after the crisis, these data indicate that the growth of employment and production in new or expanding MNC plants far exceeded the reductions in MNC plants that downsized or closed.

## **2.2. Data Issues**

How does one reconcile the seemingly contradictory stories told by the FDI data and the data on manufacturing MNCs? One important possibility is that withdrawals of FDI after the crisis



were concentrated in non-manufacturing. Data on realized FDI stocks in manufacturing from the Investment Coordinating Board (BKPM) might tempt one to draw this conclusion as they indicate an US\$8 billion increase between yearend 1997 and mid-year 2000, the latest period for which realized FDI data are available.<sup>6</sup> However, these estimates refer only to new remittances and exclude withdrawals. Correspondingly, BKPM estimates of realized FDI stocks in manufacturing are much larger than balance of payments estimates of FDI stocks in all industries. These definitional differences, the exclusion of the oil and finance sectors from the BKPM estimates, and the lack of industry detail in the balance of payments estimates, make it impossible to ascertain whether the large withdrawals of FDI originated in manufacturing or non-manufacturing.

A second possibility is that manufacturing MNCs simultaneously experienced large declines in manufacturing FDI stocks and modest growth of employment and value added. This would be most likely to occur if FDI withdrawals, which are reductions in equity and loan contributions from the foreign parent group, resulted from (1) withdrawals of proceeds from sales of non-fixed assets, such as stocks, bonds, and cash holdings, or (2) increases in equity and loans from other (primarily local) sources. In post crisis Indonesia, the former seems like a greater possibility than the latter. Likewise increases in FDI stocks may have been more rapid than increases in MNC employment and production in the early- to mid-1990s because portions of the increase in FDI stocks were used to finance the purchases of financial assets or reductions in equity and loans from other sources. Although there are no data that allow one to ascertain how important this

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<sup>6</sup> These and other BKPM data cited below come from Investment Coordinating Board (1997) and Board of Investment and State Owned Enterprises Development (2000). Realized FDI stocks increased from US\$56 billion at yearend 1997 and US\$70 billion at mid-year 2000 in all non-finance and non-oil industries and from US\$37 billion at yearend 1997 to US\$45 billion in manufacturing. BKPM also publishes data on approved FDI but the gap between approvals and realization is so large as to make the approval data useless in this context.

factor actually was in Indonesian manufacturing, trends in FDI and trends in employment or production of the MNCs receiving the FDI often differ for these reasons.

A third possibility is that Indonesia's balance of payments' estimates of inward FDI may overestimate the amounts of FDI withdrawals relative to new remittances after the crisis. For example, home country data indicate that net FDI flows from three major investors, Japan, Singapore, and the United States amounted to US\$2.2 billion, US\$0.2 billion and US\$ -0.2 billion, respectively, in 1998-2001. Home country based estimates of FDI flows from all 22 Development Assistance Committee (DAC) donors, including Japan, the United States, Canada, Australia, New Zealand and most Western European economies, remained strongly positive, amounting to US\$7.0 billion during this period.<sup>7</sup> In short, there is no evidence of large scale withdrawals in the data from these important home economies. If estimates from the Indonesian balance of payments, the DAC, and Singapore are combined, they imply that net FDI flows from non-DAC economies other than Singapore amounted to US\$ -18.1 billion in these four years alone. This is possible but it seems highly unlikely because the DAC and Singapore probably combined to account for well over half of all FDI stocks during the period.<sup>8</sup> However, it is also important to recognize that all estimates of FDI tend to be subject to large margins of error and there are often large gaps between home country estimates and host country estimates.

A fourth potentially important factor is that the coverage of the industrial survey data may have improved after the crisis, thereby inflating estimates of the growth of employment and value added in MNCs. As indicated above, coverage appears to have improved in earlier years with

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<sup>7</sup> These estimates come from Bank of Japan (various years), Singapore Department of Statistics (2003), United States Bureau of Economic Analysis (2003), and Organisation for Economic Development and Cooperation (2003).

<sup>8</sup> According to the BKPM data, 20 of the 22 DAC economies (all except Greece and Portugal) and Singapore combined to account for 50% of the FDI stock in non-oil and non-finance industries in 1997 and 48% in the middle of 2000 (see note 2 for sources). Because there are large investments by European, Japanese, and U.S. MNCs in oil (and gas), as well as some important investments by MNCs from these countries in finance, these shares are likely to have been much larger if oil and finance are included.

employment in the large and medium-sized plants covered in the industrial surveys increasing from an average of 20% of manufacturing employment reported in the labor force surveys in 1975-1985 to 33% in 1986-1991 and 37%-39% thereafter (Table 1). Comparisons of compilations from BPS's backcast datasets, which attempt to include estimates for non-reporting plants and correct mistakes in the raw datasets, and the raw datasets used in this study also suggest that the coverage of the raw datasets improved markedly between the mid-1980s and the 1990s.<sup>9</sup> However, it also seems likely that these apparent changes in coverage were far more pronounced for local plants than for MNCs, who were relatively well known to surveyors. Moreover, the stability of these ratios after 1992 suggests that changes in survey coverage were not large in later periods. In the earlier periods trends in the value added data were similar with large and medium-sized plants' shares of GDP rising from 40% in 1975-1985 to 67% in 1992-1994. This ratio then fell during the crisis period to 60% in 1995-1997, solely because of poor coverage in 1997 (48%, Appendix Table 1e and BPS various years b), before rebounding to 66% in 1998-1999 and rebounded to 75% in 2000-2001. Given the lack of similarly large changes in employment coverage, it seems most likely that these changes resulted primarily from a larger reduction of production in large and medium-sized plants than in small plants. Estimation errors in both the industrial statistics and the national accounts may also have been involved.

This study relies primarily on the industrial survey data because the primary concern here is to analyze patterns and trends in MNC employment, production, and labor productivity. Although Indonesia's industrial surveys are unusually rich which makes them very useful for analytical purposes, four points about sample characteristics and coverage need to be kept in mind. First, the surveys cover only large and medium-sized plants with 20 or more employees. This is not a large problem in this context because it is not meaningful to compare MNCs, which

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<sup>9</sup> For example, the ratio of raw data-based estimates of manufacturing employment to estimates based on the 1998 backcast increased from 86% in 1985-1989 to 91% in 1991-1993 and 95% in 1994-1995 (Takii and Ramstetter 2000). See this source for further details on the backcast data sets and comparisons to raw data for 1985-1998.

tend to be relatively large, with small local plants. Second, as noted above, the coverage of these surveys apparently improved markedly in the 1980s and has generally been better in the 1990s than in previous decades. One possible reason for this increase is that a larger proportion of plants exceeded the 20 person threshold in recent years, but better sample coverage was probably an important factor as well. Third, BPS estimates variables for numerous non-reporting plants using information from surveys of previous years and or the non-reporting plant's industry. Thus, it is important to note changes observed over time in these data may result from errors in data estimation as well as from changes in survey coverage. Despite these problems, these data are some of the best of their kind in the developing world, and probably yield an accurate depiction of Indonesian manufacturing. Fourth, when compiling the raw data sets a number of apparent inconsistencies and apparent mistakes in information on foreign ownership shares were found. We attempted to correct these inconsistencies as described in the appendix. Generally speaking adjustments were made when foreign shares for one or two years in the middle of a series differed greatly from estimates for surrounding years.<sup>10</sup>

### **2.3. Patterns of Multinational Presence by Industry and Ownership Share**

The industry-wise distribution of MNC employment and production (value added) has changed markedly over the years. For example, among the 10 individual industries examined in this study, textiles and chemicals accounted for relatively large portions of manufacturing MNC employment and production through 1991, but smaller portions thereafter (Table 1). Electric and

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<sup>10</sup> The ownership share corrections made in this version differ from similar corrections in Takii and Ramstetter (2003) in that additional information was used to inform the corrections (see steps 8-11 in the Appendix). As a result, a small number of generally small plants (an annual average of 29 plants per year with an average of 3,422 workers per year in 1975-2000) that were classified as MNCs in Takii and Ramstetter (2003) were reclassified as local plants in this compilation, which is thought to be more accurate.

precision machinery was initially a large industry for foreign MNCs in 1975-1985, but the share of this industry in manufacturing MNC totals fell in 1985-1991, before increasing to become the largest industry of MNC activity in 2000-2001. MNC production in apparel and footwear has always been rather small, but MNC employment in these industries increased to high levels after 1992. Conversely, MNCs in transportation machinery (mainly motor vehicle plants) have always employed a small number of workers but their production was large in 1986-1997 and 2000-2001, the decline in 1998-1999 reflecting the large impacts of the crisis on this MNC-dominated industry.

Despite increasing in Indonesian manufacturing overall, the degree of MNC presence relative to the size of the local industry has also varied greatly across industries and time, reflecting changes in the industrial structure of both MNCs and local plants. As in numerous other countries, MNC presence has tended to be among the largest in the electric and precision machinery industry. In this industry a high proportion of costs is devoted to production of intangible assets that can easily be shared across long distances, such as the product designs, and it is possible to divide production into many stages with distinctly different factor requirements. This makes it possible to decentralize production and lower costs by using labor-intensive operations in low-wage economies such as Indonesia. However, Indonesia's electric and precision machinery industries did not become very large until the mid-1990s and MNC shares employment and value added in the industry were 56% or smaller through 1995-1997 (Tables 2, 3). MNC shares also dipped to low levels in 1986-1991 (22% of employment and 39% of value added) after the withdrawal of two large MNCs, Fairchild in 1985 and National Semiconductor in 1986 (Pangestu 2002, p. 48). After the crisis, however, MNC shares increased markedly to about two-thirds of employment and three-fourths of production as MNCs continued to expand (Table 1) while local plants grew more slowly.

Transportation machinery is another industry in which MNC shares increased rapidly after the crisis to 38% of employment and 64% of value added in 2000-2001 (Tables 2, 3). There was

also a large increase in the MNC share of value added between 1975-1985 and 1986-1991 and a more gradual increase in MNC shares of employment. This is another industry in which intangible asset development accounts for a large portion of costs but operations tend to be more capital-intensive, reducing the benefits from location in low-wage economies. Import protection remains relatively high in this industry (James and Ramstetter 2004), especially in motor vehicles where most MNCs are active, and the inability to export to Indonesia has encouraged MNCs to set up manufacturing plants in Indonesia. However, the existing evidence suggests that both MNCs and local plants remain very inefficient in this industry (Aswicahyono, Basri, and Hill 2000; Ito 2004).

MNCs have also played an important role in the rapid growth of Indonesia's footwear and apparel industries. Here again the ability to use labor intensive production methods and the ability to easily transfer product designs from abroad give Indonesian plants in these industries some strong competitive advantages. In footwear, MNC shares of employment grew from about one-fourth in 1975-1985 to slightly less than half after 1992 (Table 2). Corresponding shares of value added were actually much larger in 1975-1985 at over two-thirds (Table 3), but absolute production levels were very small (Table 1). Although MNC shares were initially much smaller in apparel, only 4% of both employment and value added in 1975-1985 to 8-9% in 1986-1991, they increased markedly after 1992 to roughly one-fourth of employment and one-third of production after the crisis.<sup>11</sup>

Chemicals and metal products are two industries that tend to be more capital intensive and MNCs have accounted for large and increasing shares of production in these industries, these shares fluctuating in the 40-50 percent range, except during and immediately after the crisis in 1998-1999, when they rose to 59 percent in chemicals and 54 percent in metals products (Table

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<sup>11</sup> A part of the increase in the share of apparel resulted from the reclassification of some textile products as apparel from 1989 forward.

3). MNC shares of employment were much smaller than shares of value added in these industries at 29 percent or less Table 2). The absolute level of MNC production and employment was also much larger than in chemicals than in metal products (Table 1).

After 1992 there was an important trend toward higher shares for heavily-foreign MNCs (foreign ownership shares of 90% or more). Shares of these MNCs increased from 2% of employment and production in 1986-1991 to 6% of employment and 7% of production in 1996-1997 and 11% of employment and 15% of production in 2000-2001 (Tables 2, 3). Meanwhile shares of majority-foreign MNCs (foreign ownership shares of 50-89%) and minority-foreign MNCs (foreign ownership shares of 10-49%) remained largely unchanged during most for the post-1992 period. Majority-foreign MNCs accounted for at 6-7% of employment in 1992-2001, 12-14% of production in 1992-1999 and 10% in 2000-2001, while minority-foreign MNCs had a 5% share of employment and 9-12% shares of production in this period. These trends followed weaker trends toward lower shares of production for both heavily-foreign MNCs and lower shares of both production and employment for majority-foreign MNCs between 1975-1985 and 1986-1991, trends which were likely related to changes in ownership or closures of some large firms.

The removal of ownership restrictions on MNCs in the late-1980s and early-1990s was clearly an important reason for the trend toward higher shares for heavily-foreign MNCs. Consequently, similar trends were observed in almost all industries, with rubber being the one exception. Another cause of this trend was the changing industrial distribution of MNC operations in Indonesian manufacturing, in particular the rapid growth of MNCs in electric and precision machinery. In this industry, shares of heavily-foreign MNCs reached 48% of employment and 60% of production in 2000-2001, when this industry alone accounted for 25% of the employment and 42% of the production by all heavily-foreign MNCs. It is important to recognize that many of the MNCs in this industry were large exporters and would likely have been granted exemptions to ownership restrictions even before the removal of ownership

restrictions. Correspondingly, the combined share of related products in Indonesian exports rose from 0-1% in 1986-1990 4-6% in 1992-1994, 7-9% in 1994-1999, and 14-15% in 2000-2002.<sup>12</sup> These changes are extremely important and indicate that Indonesia is finally being integrated into the network of MNCs that dominate this industry in Southeast Asia.

Another reason for the increase in heavily-foreign MNCs is the fact that several local joint-venture partners incurred large debts after the financial crisis and were forced to sell their shares to foreign MNCs. For example, according to Toyo Keizai (various years), there were about 70 Japanese MNCs in Indonesian manufacturing in which the foreign ownership share increased from under 90% in November 1996 to 90% or more by November 2001. A large number of these MNCs were in chemicals including pharmaceuticals, electric machinery, textiles, and auto parts.<sup>13</sup>

### **3. COMPARING LABOR PRODUCTIVITY IN MULTINATIONALS AND LOCAL PLANTS**

This section compares labor productivity in MNCs and local plants. As explained in the introduction, economists generally expect MNCs to be more productive in some respect than non-MNCs because they are thought to have relatively large endowments of firm-specific, generally intangible assets. Also as explained in the introduction, MNCs are thought to restrict

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<sup>12</sup> These are the combined shares of office and computing machinery (SITC 75), telecommunications machinery (SITC 76), other electrical machinery (SITC 77), professional and scientific instruments (SITC 87), and photographic and optical equipment (SITC 88) (International Centre for the Study of East Asian Development, 2004).

<sup>13</sup> This trend appears to have continued thereafter as several Japan-owned automakers increased or planned to increase foreign ownership shares in their affiliates in Indonesia. These firms include Honda (49% to 51% in 2002), Nissan (35% to 75% in September 2001), Daihatsu (40% to 61.75%, announced in August 2002), Suzuki (49% to 90%, announced in November 2002), Hino (60.15% to 90% of its manufacturing firm, announced in January 2003) and Toyota (49% to 95% of its manufacturing firm, announced in Feb 2003; these data are taken from press releases on the home pages of these companies).



the access of minority-foreign affiliates to these firm-specific assets in order to avoid losing control of them. This in turn implies that minority-foreign MNCs may be less productive than other MNCs. On the other hand, MNCs also want to facilitate profitability and growth in their affiliates, giving them a motive to share firm-specific assets to the extent profitability increases. The relative strength of these motives and their effects on productivity levels is thus an empirical issue, which is examined in detail below. Labor productivity is only one aspect of productivity, but it is also an extremely important one that has important influences on wage levels.

### **3.1. Labor Productivity Differentials**

The previous section indicated that MNC shares of production (value added) tended to be larger than corresponding shares of employment, implying that average labor productivity (value added per worker) was higher in MNCs than in local plants. The simple comparisons in Table 4 confirm this basic pattern and indicate that labor productivity differentials were often very large in Indonesian manufacturing. If all manufacturing is combined, average labor productivity was between 388% and 745% larger in minority-foreign plants than in local plants, 436% to 594% larger in majority-foreign plants, and 164% to 542% larger in heavily-foreign plants. On average, labor productivity in all manufacturing combined was highest in majority-owned MNCs through in 1975-1991, but highest in minority-foreign MNCs in 1992-2001. Among MNCs it was lowest in minority-foreign MNCs in 1975-1985 and in heavily-foreign plants in 1986-2001.

In addition to large time-wise variation, there was also great variation across industries. Differentials between MNCs and local plants tended to be quite large (100% or more) for all MNC ownership groups in food, textiles, chemicals, plastics, metal products, transportation machinery, and other manufacturing. Large differentials were also observed for majority- and heavily-foreign MNCs in rubber. A few exceptions to these patterns were observed for heavily-foreign MNCs in textiles in 1992-1994, plastics in 1975-1991, and transportation machinery in

1992-1994, and for majority-foreign MNCs in rubber in 1992-1994. This list includes several industries where relatively capital-intensive production techniques tend to be used. Consistently small (below 100%) differentials were not observed for majority- or heavily-foreign MNCs in any of the industries listed in table 4, but they were observed for most periods in minority-foreign MNCs in footwear and rubber. For other industry-group combinations, there was notable variation in differentials over time. In apparel, differentials tended to be small or negative through 1991 and larger thereafter. In footwear, differentials were large for majority-foreign MNCs in 1975-1991 and 1998-2001 and for heavily-foreign MNCs in 1975-1985 and 1998-1999, but small in other periods. In electric and precision machinery there were pronounced fluctuations with differentials being large for heavily-foreign MNCs in 1975-1985, 1992-1994, and 1998-2001, for majority-foreign MNCs in 1975-1991 and 1995-1997, and for minority-foreign MNCs in 1975-1994. Labor-intensive techniques tend to dominate in these three industries.

Negative differentials, suggesting higher labor productivity in local plants, were extremely rare. The few negative differentials were observed for most ownership groups in apparel in 1975-1991, minority-foreign MNCs in footwear in 1992-1994 and rubber in 2000-2001, as well as heavily-foreign MNCs in electric and precision machinery in 1986-1991 and transportation machinery in 1992-1994. With the exception of rubber in 2000-2001, these comparisons all involved very small numbers of MNCs and it is thus difficult to attach a lot of meaning to these observations.

### **3.2. Comparisons after Controlling for Other Influences on Labor Productivity**

Comparisons of productivity differentials like those in Tables 4 are an instructive starting point but they suffer an important shortcoming. Namely, they cannot sort out differences in labor productivity that result from the presence of foreign ownership or from variation in other factors related to labor productivity such as factor intensities, plant size, and plant vintage (e.g., Blomström and Sjöholm 1999; Ramstetter 2004; Takii and Ramstetter 2000). For example,

MNCs may have higher labor productivity simply because they are more capital intensive or because they are larger allowing them to realize scale economies, not because they are foreign. Plant vintage may have one of two important effects. On the one hand, to the extent that learning by doing exists, older plants might be expected to be more productive. On the other hand, in countries like Indonesia where there have been important policy changes from an emphasis on import substitution to export promotion, older plants may be less productive because they were established under a policy regime that fostered inefficiency.

In order to further examine the relationship between foreign ownership and labor productivity after accounting for these factors, the following equation is estimated:

$$\ln(V_{it}/E_{it}) = b_0 + b_1(\ln(P_{it}/E_{it})) + b_2(Dlar_{it}) + b_3(Dfh_{it}) + b_4(Dfm_{it}) + b_5(Dfn_{it}) + b_6(Ds75-85_{it}) + b_7(Ds86-91_{it}) + b_8(Ds92-94_{it}) + \mathbf{b}_9(\mathbf{Dy}_{it}) \quad (1)$$

where  $Dfh_{it}$  = dummy variable equal to 1 if establishment  $i$  is a heavily-foreign MNC in year  $t$ , 0 otherwise;  $Dfm_{it}$  = dummy variable equal to 1 if establishment  $i$  is a majority-foreign MNC in year  $t$ , 0 otherwise;  $Dfn_{it}$  = dummy variable equal to 1 if establishment  $i$  is a minority-foreign MNC in year  $t$ , 0 otherwise;  $Dlar_{it}$  = dummy variable equal to 1 if the output of establishment  $i$  in year  $t$  is larger than the industry average output plus one standard deviation, 0 otherwise;  $Ds75-85_{it}$  = dummy variable equal to 1 if establishment  $i$  in year  $t$  first reported positive employment and value added in the industrial survey in 1975-1985, 0 otherwise (omitted for 1975-1985 sample);  $Ds86-91_{it}$  = dummy variable equal to 1 if establishment  $i$  in year  $t$  first reported positive employment and value added in the industrial survey in 1986-1991, 0 otherwise (omitted for 1975-1985 and 1986-1991 samples);  $D92-94_{it}$  = dummy variable equal to 1 if establishment  $i$  in year  $t$  first reported positive employment and value added in the industrial survey in 1992-1994, 0 otherwise (omitted for 1975-1985, 1986-1991, and 1992-1994 samples);  $\mathbf{Dy}_{it}$  = a vector of year dummy variables;  $E_{it}$  = number of employees working in establishment  $i$  in year  $t$ ;  $P_{it}$  = electric power consumption (kilowatts) of establishment  $i$  in year  $t$ ; and  $V_{it}$  = value added (thousand rupiah) of establishment  $i$  in year  $t$ .

The first distinguishing characteristic of this specification is the use of electric power consumption per employee as a proxy for fixed capital per employee. This proxy is necessary because data on fixed capital are not available before 1988 and is expected to be positively correlated with average labor productivity. Detailed regression results (Appendix Table 5) show that the coefficient on this variable ( $b_1$ ) was indeed positive and highly significant in all 60 samples for which estimates were made. Second, although the specification of average labor productivity as a function of a proxy for capital per employee implies constant returns to scale, it is still important to account for the likelihood that large plants have higher average labor productivity than smaller ones. Correspondingly, the coefficient on the dummy variable for large plants ( $b_2$ ) is expected to be positive and it too was positive and highly significant in all 60 samples. The third set of control variables attempt to account for the effects of plant vintage by identifying plants that first reported positive employment and value added in the three of the older periods examined, 1975-1985, 1986-1991, and 1992-1994, with plants first reporting in the recent period(s) being the control group.<sup>14</sup> Results for these dummies vary more across industries than results for other control variables and corresponding coefficients were statistically insignificant in a number of cases. For example, establishments founded before 1985 had significantly lower labor productivity in all five relevant periods in four of the ten industries (food, textiles, apparel, metal products) but only two or fewer periods in the other six industries and these plants never had significantly higher labor productivity. In general, correlations between labor productivity and vintage were negative or statistically insignificant.

Although previous estimates of equations similar to (1) indicated large variation across years (Takii and Ramstetter 2000, 2003), estimates are made for six pooled periods in this study. Reflecting large change in related policies and macroeconomic trends, the periods 1975-1985,

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<sup>14</sup> Although the period dummies are a reasonable proxy for vintage in plants that have always had 20 or more employees and always reported data in the industrial surveys, this variable also captures the characteristics of plants that first employed 20 or more workers and/or reported data in a period.

1986-1991, 1992-1994, 1995-1997, 1998-1999, and 2000-2001 are distinguished. The pooling approach is used because the large annual variation in estimates is often difficult to make sense of and because the more important concern here is to compare productivity differentials across periods rather than individual years.<sup>15</sup> Pooling restricts all slope coefficients to be equal for each year in a sample period, but part of the annual variation is accounted for by specifying a set of year dummies that allow intercepts ( $b_0 + \mathbf{b}_y(\mathbf{Dy}_i)$ ) to differ across years.

Because the dependent variable is the log of value added per employee, coefficients on foreign ownership dummies ( $b_3, b_4, b_5$ ) can be interpreted as percentage differences between average labor productivity between respective foreign ownership groups (heavily-foreign, majority-foreign, and minority-foreign plants) and average labor productivity in local plants, after accounting for plant-wise variation in electric power per employee and the measures of size and vintage explained above. Not surprisingly, accounting for variation in these other variables greatly reduces the size of productivity differentials between MNCs in local plants. For example, in contrast to the simple comparisons in Table 4, coefficients on foreign ownership dummies revealed large differentials exceeding 100% in very few of the comparisons made (9 of 177, Table 5). Large differentials were concentrated in earlier years, being observed in 1975-1985 or 1986-1991 for footwear (majority- and heavily-foreign MNCs), metal products (heavily-foreign MNCs), plastics (minority-foreign MNCs), and electric and precision machinery (minority-foreign MNCs). Large differentials were also observed in recent years (1998-1999 or 2000) for chemicals (majority-foreign MNCs), plastics (heavily-foreign MNCs), and transportation machinery (minority-foreign MNCs). Insignificant differentials were observed in 30 percent (53 of 177) of the comparisons and concentrated in apparel and footwear, as well as in minority-foreign MNCs.

On the other hand, results were consistent with the patterns observed in Table 4 in that most foreign ownership coefficients were significantly positive. This was observed in a little more than

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<sup>15</sup> We thank Hal Hill and an anonymous referee for this suggestion.

two-thirds (118 of 177) of the ownership-period combinations examined. Positive and significant differentials were consistently observed for all ownership groups and periods in only one industry, chemicals. Although inconsistent across ownership groups, positive and significant differentials were also common in food (13 of 18 comparisons), textiles (15 of 18), rubber (14 of 18), plastics (12 of 18), metal products (16 of 18), electric and precision machinery (11 of 18), and transportation machinery (13 of 16). Positive and significant differentials were not very common in apparel (2 of 18 comparisons) and footwear (4 of 17 comparisons), and these two industries also accounted for most (4 of 6) the negative and significant differentials observed.

By ownership group, positive and significant differentials were most common for majority-foreign MNCs, being observed for all six periods in six industries (textiles, chemicals, rubber, metal products, electric and precision machinery, and transportation machinery) and in five of six periods for two more (food and plastics, Table 5). Positive and significant differentials were also observed for heavily-foreign MNCs for five or six periods in half of the industries examined (food, textiles, chemicals, rubber, and metal products). However, positive and significant differentials were less common for minority-foreign MNCs, being observed in five or more periods in only three industries (chemicals, metal products, and transportation machinery).

Majority-foreign MNCs also had the highest labor productivity of all MNC groups in most of the cases (30 of 55) in which at least one MNC group had significantly higher labor productivity than local plants, followed distantly by heavily-foreign and minority-foreign MNCs (14 and 11 cases, respectively). Majority-foreign MNCs also had higher labor productivity than minority-foreign MNCs the vast majority of cases for which comparisons were possible (41 of 52 cases) but heavily-foreign MNCs had higher labor productivity than minority-foreign MNCs in only slightly more than one half of the cases in which comparisons were possible (28 of 49). This latter finding is somewhat puzzling from a theoretical point of view and contrasts with results from previous studies suggesting that heavily-foreign MNCs have the highest export propensities, followed by majority-foreign MNCs and then minority-foreign MNCs (Ramstetter 1999).

However, similar results have been obtained for Thai manufacturing and relatively low labor productivity in heavily-foreign MNCs in Indonesia reflects their tendency to be concentrated in labor-intensive assembly operations, which are especially large in electric and precision machinery and in apparel.<sup>16</sup>

#### **4. CONCLUDING REMARKS**

This paper first documented the important role MNCs have played in many of Indonesia's manufacturing industries over the last three decades. Employment and production (value added) of MNCs increased rather steadily through the early 1990s and the increase then accelerated markedly, both absolutely and relative to Indonesian totals, during the rapid economic growth of the early- and mid-1990s. These increases were concentrated in the machinery industries and majority-foreign MNCs, and continued through and after the crisis of 1997-1998, despite apparently large withdrawals inward FDI in 1998 and subsequent years. MNCs also tended to account for much larger shares of manufacturing production than of manufacturing employment. Correspondingly, MNCs generally had much higher average labor productivity than local plants and these differentials persisted after accounting for plant-wise variation in electricity consumption per worker, size, and vintage in about three-fourths of the cases examined. However, there was also large variation in MNC presence and productivity differentials across industry and time with statistically insignificant differentials most common in apparel and footwear, as well as in minority-foreign MNCs. On the other hand, positive and statistically significant differentials were most common in chemicals, metal products, and transportation

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<sup>16</sup> In Thai manufacturing, wholly-foreign MNCs (100% foreign-owned) often have lower labor productivity than other MNCs and local plants (Ramstetter 2004), but there is a strong positive correlation between foreign ownership shares and the probability of a plant having a high export propensity (Ramstetter 2002a).

machinery, and in majority-foreign MNCs. Majority-foreign MNCs also tended to have the highest average labor productivity of MNC groups.

These conclusions are subject to two important qualifications. First, the methodology employed in this study is extremely simple and it is possible that systematic use of more sophisticated methodologies such as those in Takii (2002) could generate different results, though such analysis would probably have to be limited to the post-1988 period because of data constraints. Second, alternative methodologies for dealing with important data issues such as the existence of apparent outliers and incorrect reporting or entries could affect the results obtained. In this respect, it would be particularly helpful to obtain a recent backcast dataset to help check which observations are unreasonable outliers and which are meaningful data points. In particular, it would be helpful to see if newer data generate results consistent with previous findings suggesting that the backcast datasets are more reliable, but that the results of analyzing labor productivity differentials are similar in both the backcast and the raw datasets (Takii and Ramstetter 2000).

Despite these qualifications, these results are a significant addition to the growing literature suggesting that significant and positive productivity differentials between MNCs and local plants have been rather common in Indonesian manufacturing. The major contribution of the study is to show that these results obtain over many industries and periods from 1975 forward, not just the more limited periods analyzed in many previous studies. The results also highlight the fact that minority-foreign and heavily-foreign MNCs often appear to have relatively low labor productivity compared to majority-foreign MNCs. Although theory would suggest lower productivity in minority-foreign MNCs, it is hard to think of a good theoretical reason why this should be the case in heavily-foreign MNCs, which tend to be concentrated in labor-intensive assembly operations in industries such as electric and precision machinery and in apparel. Although these assembly operations generate substantial employment and exports, for example, they do not appear to be characterized by high labor productivity. Here it is important to



reemphasize that labor productivity is only one aspect of productivity, and productivity is only one aspect of MNC contributions to the Indonesian economy. Moreover, the large variation in labor productivity differentials over time and across industries also suggests that it would be very difficult to use labor productivity as a criterion for prioritizing one form of MNC over another. Rather it seems far more important to recognize that all groups of MNCs tend to have higher labor productivity than local plants, in addition to making other contributions to the Indonesian economy.

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TABLE 1 *Estimates of FDI stocks, employment, and value added in all industries and manufacturing*

Industry, sample, data source	1975- 1985	1986- 1991	1992- 1994	1995- 1997	1998- 1999	2000- 2001
FDI STOCKS (CUMULATIVE FLOWS) IN ALL INDUSTRIES (end of period, units as noted)						
All industries (current US\$ millions, original)	3,317	7,793	13,683	28,900	25,799	17,971
(ratio to US\$ value of GDP, %)	3.5	6.1	7.7	13.4	18.4	12.7
All industries (current rupiah billions)-a	2,042	10,088	22,435	60,323	35,195	-36,759
(ratio to rupiah value of GDP, %)	1.9	4.1	5.9	9.6	3.2	-2.5
EMPLOYMENT (period averages in thousands except as noted)						
All industries, labor force statistics-b	54,724	72,826	79,919	84,287	88,245	90,323
(average of annual growth rates, %)-b	3.2	3.5	2.4	2.1	1.0	1.1
Manufacturing, labor force statistics-b	4,959	6,733	9,293	10,705	10,725	11,864
(average of annual growth rates, %)-b	5.6	5.7	11.2	1.3	2.3	2.5
L&M plants, industrial statistics-c	981	2,232	3,567	4,143	4,179	4,376
(ratio to manufacturing labor force, %)	20	33	38	39	39	37
Foreign L&M plants, industrial statistics-c	115	223	559	777	857	937
Food	7	21	37	49	58	58
Textiles	32	44	75	88	100	96
Apparel	1	12	64	90	104	123
Footwear	2	13	110	141	120	116
Chemicals	13	20	29	40	46	59
Rubber	5	18	19	20	23	29
Plastics	2	2	10	18	15	25
Metal products	9	12	25	38	31	35
Electric & precision machinery	12	12	53	103	138	157
Transportation machinery	4	11	19	30	35	45
Other manufacturing	30	57	119	161	187	194
VALUE ADDED (period averages in billion current rupiah, except as noted)						
All industries, national accounts (trillions)	54.38	174.68	331.92	538.26	1,028	1,357
(average of annual real growth rates, %)	6.2	6.4	6.8	6.9	-6.2	4.2
(average of annual deflator inflation rates, %)	14.5	8.5	8.1	10.4	44.7	10.2
Manufacturing, national accounts (trillions)	6.97	32.99	74.82	138.10	262.39	338.47
(average of annual real growth rates, %)	12.2	10.5	10.6	9.2	-3.8	5.0
(average of annual deflator inflation rates, %)	15.1	9.2	8.3	13.1	37.8	7.2
L&M plants, industrial statistics (trillions)	2.85	18.11	50.37	82.58	173.02	253.24
(ratio to manufacturing value added, %)	41	55	67	60	66	75
Foreign L&M plants, industrial statistics	763	4,060	13,043	26,171	62,941	90,589
Food	50	295	793	1,676	5,274	5,687
Textiles	90	450	1,046	2,132	6,860	5,442
Apparel	1	42	575	1,028	2,705	3,024
Footwear	11	68	715	1,194	3,093	3,302
Chemicals	116	622	2,030	3,813	11,210	10,419
Rubber	27	164	344	530	1,074	1,805
Plastics	18	35	129	564	1,134	1,074
Metal products	46	309	898	1,598	3,038	3,763
Electric & precision machinery	67	210	1,054	3,148	9,627	19,157
Transportation machinery	32	495	1,528	2,709	5,213	16,927
Other manufacturing	304	1,370	3,932	7,778	13,713	19,990

Notes: a-Annual flows in US\$ converted to rupiah at annual average exchange rates and then cumulated;

b-Labor force estimates are for 1976 forward and labor force growth rates are for 1977 forward;

c-L&M plants=large & medium-sized plants with 20 or more employees included in the annual industrial surveys.

Sources: BPS (various years b); International Monetary Fund (various years); Appendix Tables 2a-2e, 3a-3e

TABLE 2 MNC shares of employment in large & medium-sized plants by industry and ownership group  
(% shares of industry totals, period averages)

Industry	1975- 1985	1986- 1991	1992- 1994	1995- 1997	1998- 1999	2000- 2001
Manufacturing	12	10	16	19	21	21
Heavily-foreign	2	2	4	6	9	11
Majority-foreign	7	5	7	7	7	6
(MNCs/manufacturing labor force-a)	2	3	6	7	8	8
Food	4	6	7	9	10	10
Heavily-foreign	1	1	1	2	2	3
Majority-foreign	2	2	3	3	4	4
Textiles	14	12	13	14	16	15
Heavily-foreign	2	2	3	4	7	7
Majority-foreign	11	8	8	7	7	6
Apparel	4	8	19	23	25	25
Heavily-foreign	0	3	7	11	14	17
Majority-foreign	3	3	7	5	4	3
Footwear	23	32	48	48	46	46
Heavily-foreign	15	11	12	14	17	17
Majority-foreign	8	19	28	24	19	16
Chemicals	21	17	18	22	24	29
Heavily-foreign	8	1	1	4	8	14
Majority-foreign	11	11	11	12	10	9
Rubber	14	15	14	16	18	20
Heavily-foreign	6	6	4	6	6	6
Majority-foreign	5	5	6	6	6	8
Plastics	10	3	8	11	10	14
Heavily-foreign	2	0	2	4	6	8
Majority-foreign	6	2	3	4	3	3
Metal products	22	16	21	25	25	26
Heavily-foreign	1	0	2	4	9	12
Majority-foreign	13	9	12	13	10	10
Electric & precision machinery	37	22	44	56	63	65
Heavily-foreign	18	1	17	31	44	48
Majority-foreign	17	16	18	17	12	11
Transportation machinery	12	14	18	24	33	38
Heavily-foreign	0	0	2	4	9	9
Majority-foreign	8	8	8	12	13	11
Other manufacturing	9	7	10	12	13	14
Heavily-foreign	1	1	2	3	5	7
Majority-foreign	5	3	4	4	4	4

Note: a-excludes 1975.

Source: Appendix Tables 2a-2e; Table 1.

TABLE 3 *MNC shares of value added in large & medium-sized plants by industry and ownership group*  
*(% shares of industry totals, period averages)*

Industry	1975- 1985	1986- 1991	1992- 1994	1995- 1997	1998- 1999	2000- 2001
Manufacturing	27	22	26	32	36	36
Heavily-foreign	4	2	3	7	14	15
Majority-foreign	17	12	12	14	13	10
(MNCs/manufacturing GDP)	11	12	17	19	24	27
Food	15	13	13	19	25	19
Heavily-foreign	3	1	1	4	7	5
Majority-foreign	9	4	6	8	9	10
Textiles	30	24	19	23	34	27
Heavily-foreign	3	3	2	4	13	11
Majority-foreign	26	19	13	14	19	12
Apparel	4	9	24	33	37	34
Heavily-foreign	0	3	8	15	17	23
Majority-foreign	3	4	8	6	8	4
Footwear	68	36	42	47	58	56
Heavily-foreign	30	9	13	14	23	24
Majority-foreign	38	24	23	25	26	15
Chemicals	37	35	45	48	59	40
Heavily-foreign	10	2	2	7	14	15
Majority-foreign	21	22	30	30	30	18
Rubber	25	25	30	34	28	33
Heavily-foreign	11	7	6	7	8	9
Majority-foreign	11	7	13	24	16	19
Plastics	46	12	12	29	31	22
Heavily-foreign	1	0	3	13	19	13
Majority-foreign	38	6	6	7	8	6
Metal products	43	42	50	49	54	44
Heavily-foreign	3	1	2	7	13	11
Majority-foreign	26	17	22	25	27	26
Electric & precision machinery	55	39	50	53	76	75
Heavily-foreign	16	1	16	31	62	60
Majority-foreign	35	28	19	15	8	9
Transportation machinery	18	41	31	39	37	64
Heavily-foreign	0	0	0	3	6	10
Majority-foreign	13	13	9	11	11	6
Other manufacturing	23	17	20	25	23	22
Heavily-foreign	2	1	2	3	7	6
Majority-foreign	15	9	8	11	8	6

*Source:* Appendix Tables 3a-3e; Table 1.

TABLE 4 *Percentage differences between average labor productivity in MNC ownership groups and local plants (period average of value added per worker for MNC group compared to period average for local plants)*

Industry, ownership group	1975- 1985	1986- 1991	1992- 1994	1995- 1997	1998- 1999	2000- 2001
Manufacturing						
Heavily-foreign	542	351	164	375	401	281
Majority-foreign	594	533	487	501	562	436
Minority-foreign	388	499	650	745	707	468
Food						
Heavily-foreign	505	508	322	448	677	347
Majority-foreign	608	394	445	441	398	382
Minority-foreign	183	437	226	283	394	289
Textiles						
Heavily-foreign	230	156	78	108	247	124
Majority-foreign	442	474	313	366	412	218
Minority-foreign	168	139	281	266	175	113
Apparel						
Heavily-foreign-a	-78	-10	83	108	158	662
Majority-foreign-b	-36	58	102	163	368	132
Minority-foreign-c	-36	-20	107	134	167	78
Footwear						
Heavily-foreign-d	202	80	83	67	138	95
Majority-foreign-b	288	245	14	80	172	183
Minority-foreign-e	-	26	-2	4	38	50
Chemicals						
Heavily-foreign	190	270	214	325	381	168
Majority-foreign	295	271	465	379	524	246
Minority-foreign	375	392	334	345	555	147
Rubber						
Heavily-foreign	134	181	106	152	104	178
Majority-foreign	161	104	80	198	193	193
Minority-foreign	42	303	99	24	18	-6
Plastics						
Heavily-foreign-f	24	1	125	2,076	418	232
Majority-foreign	1,431	387	185	221	310	234
Minority-foreign	650	680	145	322	195	167
Metal products						
Heavily-foreign	1,534	344	148	149	264	121
Majority-foreign	394	402	728	553	1,166	816
Minority-foreign	182	280	513	238	487	242
Electric & precision machinery						
Heavily-foreign-g	146	-32	119	90	229	109
Majority-foreign	355	271	83	146	86	41
Minority-foreign	324	277	135	77	56	44
Transportation machinery						
Heavily-foreign-h	-	-	-54	450	161	225
Majority-foreign	228	288	257	281	214	121
Minority-foreign	139	527	283	360	509	832
Other manufacturing						
Heavily-foreign	938	410	200	265	454	246
Majority-foreign	743	786	561	591	487	395
Minority-foreign	334	410	1,406	1,705	1,294	664

Notes: a-excludes 1975-1979, 1982-1984, 1986-1987; b-excludes 1975-1981; c-excludes 1975-1979, 1984; d-excludes 1982-1985, 1987-1988; e-excludes 1975-1987; f-excludes 1985-1988; g-excludes 1986-1989; h-excludes 1975-1991

Source: Appendix Tables 4a-4d.



TABLE 5 *Percentage differences between average labor productivity in MNCs and local plants from estimates of Eq.(1)*

Industry, ownership group or indicator	1975-85	1986-91	1992-94	1995-97	1998-99	2000
<b>Food</b>						
Heavily-foreign	79	40	38	34	52	44
Majority-foreign	66	64	51	23	ns	44
Minority-foreign	ns	31	ns	ns	36	ns
Adjusted R-squared	0.50	0.44	0.44	0.42	0.44	0.45
Wald: Heavily=Majority=Minority	*	*	ns	ns	ns	ns
<b>Textiles</b>						
Heavily-foreign	54	33	ns	21	80	71
Majority-foreign	70	61	48	64	71	80
Minority-foreign	ns	ns	27	39	60	62
Adjusted R-squared	0.48	0.35	0.37	0.41	0.45	0.39
Wald: Heavily=Majority=Minority	**	**	*	**	ns	ns
<b>Apparel</b>						
Heavily-foreign	-57	-45	ns	ns	ns	ns
Majority-foreign	ns	ns	18	ns	46	ns
Minority-foreign	ns	-65	ns	ns	ns	ns
Adjusted R-squared	0.42	0.24	0.26	0.24	0.32	0.28
Wald: Heavily=Majority=Minority	ns	**	ns	ns	*	ns
<b>Footwear</b>						
Heavily-foreign	174	ns	ns	ns	36	ns
Majority-foreign	143	ns	ns	ns	ns	ns
Minority-foreign	-	45	ns	-32	ns	ns
Adjusted R-squared	0.37	0.18	0.11	0.17	0.29	0.29
Wald: Heavily=Majority=Minority	**	ns	ns	ns	ns	ns
<b>Chemicals</b>						
Heavily-foreign	54	67	53	71	78	72
Majority-foreign	86	72	89	86	101	100
Minority-foreign	63	76	79	72	69	67
Adjusted R-squared	0.52	0.50	0.49	0.45	0.46	0.54
Wald: Heavily=Majority=Minority	**	ns	ns	ns	ns	ns
<b>Rubber</b>						
Heavily-foreign	65	47	55	50	48	88
Majority-foreign	63	41	59	60	44	78
Minority-foreign	ns	55	50	ns	ns	ns
Adjusted R-squared	0.44	0.35	0.35	0.39	0.32	0.28
Wald: Heavily=Majority=Minority	**	ns	ns	*	ns	*
<b>Plastics</b>						
Heavily-foreign	-46	ns	ns	46	100	60
Majority-foreign	89	94	ns	38	60	61
Minority-foreign	109	104	ns	56	59	ns
Adjusted R-squared	0.45	0.33	0.37	0.33	0.36	0.40
Wald: Heavily=Majority=Minority	**	ns	ns	ns	ns	*
<b>Metal products</b>						
Heavily-foreign	149	50	45	ns	51	46
Majority-foreign	63	66	68	50	64	89
Minority-foreign	41	39	48	47	45	ns
Adjusted R-squared	0.60	0.40	0.39	0.37	0.44	0.48
Wald: Heavily=Majority=Minority	**	ns	ns	ns	ns	ns
<b>Electric &amp; precision machinery</b>						
Heavily-foreign	ns	ns	ns	ns	45	60
Majority-foreign	79	82	36	47	50	75
Minority-foreign	107	73	45	ns	ns	ns
Adjusted R-squared	0.51	0.39	0.32	0.36	0.31	0.39
Wald: Heavily=Majority=Minority	**	ns	ns	**	ns	ns
<b>Transportation machinery</b>						
Heavily-foreign	-	-	-68	ns	59	77
Majority-foreign	50	49	43	69	74	108
Minority-foreign	36	64	ns	49	63	120
Adjusted R-squared	0.54	0.45	0.43	0.39	0.44	0.56
Wald: Heavily=Majority=Minority	**	**	**	*	ns	ns

Notes: - =no plants in ownership group; ns=coefficient or Wald statistic not significantly different from zero at the 5 percent level; tests of coefficient significance based on heteroscedasticity-consistent errors; \*\*=Wald statistic significant at 1 percent level or better, \*=Wald statistic significant at 5 percent level.

Source: Appendix Table 5.

## Appendix

The purpose of this appendix is first to describe how data on foreign ownership were checked and corrected. This is done in the paragraphs below. The second purpose is to present compilations of data underlying the descriptive text Table 1-4 in Appendix Tables 1a-4d. Because these compilations have not been published before, these tables include details by year and industry that are omitted from the text tables to save space. Third, Appendix Table 5 presents detailed regression results which are summarized in text Table 5.

As described in the text, we corrected a number of apparent inconsistencies in foreign ownership shares in the original data. The most obvious inconsistencies were when the foreign ownership share was recorded as K% for all but one or two years when the share was recorded as 100-K%. Some of these apparent inconsistencies reflect real changes in ownership but most are probably the result of incorrect data entry or reporting. To correct these apparent inconsistencies we adjusted the data in the steps listed below. These adjustments affected a total of 1472 observations in 1042 records. For the explanation below, we define the following vectors and variables:  $\mathbf{S}_t = (F_t, P_t, C_t, L_t)'$ ,  $F_t$ =(foreign ownership share),  $P_t$ =(domestic-private ownership share),  $C_t$ =(central government ownership share),  $L_t$ =(local government ownership share).

Step 1. We checked for records where the sum of ownership shares for four types of owners (domestic-private, foreign, central government, and local government) did not equal 100% ( $F_t+P_t+C_t+L_t \neq 100$ ). In most of these cases we replaced  $\mathbf{S}_t$  with  $\mathbf{S}_{t-1}$ .

Step 2. We checked for records where  $F_t = \dots = F_{t+k} = 0$  and  $\mathbf{S}_{t-1} = \mathbf{S}_{t+k+1}$  ( $k > 0$ ). In these cases, we replaced  $\mathbf{S}_t, \dots, \mathbf{S}_{t+k}$  with  $\mathbf{S}_{t-1}$ .

Step 3. We checked for records where (1)  $F_t = 0, 0 < F_{t-1}, F_{t+1} < 100$ , or (2)  $F_t = F_{t+1} = 0, 0 < F_{t-1}, F_{t+2} < 100$ . In these cases we replaced  $\mathbf{S}_t$  with  $\mathbf{S}_{t-1}$ , and replaced  $\mathbf{S}_{t+1}$  with  $\mathbf{S}_{t+2}$  in the case of (2).

Step 4. We checked for records where (1)  $F_t = 100, 0 < F_{t-1}, F_{t+1} < 100$ , or (2)  $F_t = F_{t+1} = 100, 0 < F_{t-1}, F_{t+2} < 100$ . In these cases we replaced  $\mathbf{S}_t$  with  $\mathbf{S}_{t-1}$ , and replaced  $\mathbf{S}_{t+1}$  with  $\mathbf{S}_{t+2}$  in the case of (2).

Step 5. We checked for records where (1)  $F_t=100, F_{t+1}=0, 0 < F_{t-1}, F_{t+2} < 100$ , or (2)  $F_t=0, F_{t+1}=100, 0 < F_{t-1}, F_{t+2} < 100$ . In these cases we replaced  $S_t$  with  $S_{t-1}$  and replaced  $S_{t+1}$  with  $S_{t+2}$ .

Step 6. We checked for records where (1)  $F_t=K, F_{t+1}=100-K$  and (2)  $F_{t+2}=K, F_{t+1}=100-K$  ( $0 < K < 100$ ) and modified some of these records. For example, in the case that  $F_t=35$  and  $F_{t+1}=65$ , and  $F_{t+2}$ =approximately 35, we replaced  $S_{t+1}$  with  $S_t$  in the case of (1), and replaced  $S_{t+1}$  with  $S_{t+2}$  in the case of (2).

Step 7. We checked for the records where  $F_t=0, 0 < F_{t-1} < 100, F_{t+1}=100$ . In the case, we replaced  $S_t$  with  $S_{t-1}$ .

Step 8. We checked for the records where (1)  $F_t > 0$ , and reporting that the legal status of plants is “individual” (or “CV”/“Firm” ) in 1975-1979, (2)  $F_t > 0, F_{t-1}=F_{t+1}=0$ , and reporting that capital source is not “PMA/Foreign” in year  $t-1, t$ , and  $t+1$  ( $t=1980-1999$ ), (3)  $F_t > 0, F_{t+1} > 0, F_{t-1}=F_{t+2}=0$ , and reporting that capital source is not “PMA/Foreign” in year  $t-1, t, t+1$ , and  $t+2$  ( $t=1980-1998$ ). In these cases we replaced  $S_t$  with  $S_{t-1}$ , and replaced  $S_{t+1}$  with  $S_{t+2}$  in the case of (3).

Step 9. We checked for the records where  $F_t=100$  (for only a year), and  $F_s=0$ (any  $s \neq t$ ). In this case we replaced  $S_t$  with  $S_{t-1}$ . However, if the plant didn't appear in the data in either years  $s < t$  or  $s > t$ , and  $t > 1995$ , then the replacement was not made because large changes in ownership during this period ( $t > 1995$ ) made it very difficult to discern actual changes from apparent errors in the data

Step 10. We checked for the records where  $F_t=\dots=F_{t+k}=100, F_s=0$ (any  $s \neq t, \dots, t+k$ ), and reporting that the legal status of plants is “individual” (or “CV”/“Firm” ) during  $t$  to  $t+k$ . In this case we replaced  $S_t \dots S_{t-1}$  with  $S_{t-1}$ .

Step 11. We checked for the records where  $F_t=0$  (for only a year) and  $F_s=100$ (any  $s \neq t$ ). In this case we replaced  $S_t$  with  $S_{t-1}$ .

Appendix Table 1a: Number of Minority-Foreign Manufacturing Establishments Reporting Positive Employment and Value Added by Industry (raw data, number)

Industry	ISIC	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
All manufacturing	300	39	46	58	66	67	78	79	82	93	98	137	143	152	168
Food	311+312	4	5	7	6	6	6	6	5	5	7	13	17	24	23
Textiles	321	3	4	4	4	3	6	6	6	8	10	10	11	10	11
Apparel	322	0	0	0	0	0	1	1	1	1	0	1	1	1	5
Footwear	324	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Chemicals	351+352	2	3	6	8	7	12	13	12	16	19	25	24	25	26
Industrial chemicals	351	0	0	1	1	1	4	6	6	9	8	11	10	12	11
Other chemicals	352	2	3	5	7	6	8	7	6	7	11	14	14	13	15
Rubber	355	4	4	4	6	4	4	2	3	3	3	7	7	8	9
Plastics	356	1	4	4	4	3	3	3	3	3	4	2	2	3	5
Metal products	381	10	10	11	14	14	15	13	14	15	13	16	19	17	16
Electric & precision machinery	383+385	1	1	1	1	1	2	2	2	4	4	10	9	9	8
Electric machinery	383	1	1	1	1	1	2	2	2	4	4	9	8	7	7
Precision machinery	385	0	0	0	0	0	0	0	0	0	0	1	1	2	1
Transportation machinery	384	1	2	4	3	5	4	4	6	6	5	5	5	6	5
Other manufacturing	calc	13	13	17	20	24	25	29	30	32	33	48	48	49	59
Beverages	313	0	1	1	0	1	2	0	0	0	1	1	1	2	6
Tobacco	314	3	3	4	5	4	2	2	1	1	1	2	3	5	5
Leather	323	2	1	1	1	0	0	0	0	0	0	0	0	0	0
Wood	331	3	3	3	4	5	7	11	13	12	14	23	20	18	22
Furniture	332	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Paper	341	0	0	0	0	1	1	2	2	2	2	3	4	3	4
Printing, publishing	342	1	0	1	2	2	1	2	3	3	2	2	2	2	2
Oil refineries & gas	353	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other oil & coal	354	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Porcelain	361	1	1	1	1	2	2	2	2	3	3	3	3	3	3
Glass	362	1	1	1	1	2	2	2	2	1	1	1	1	0	0
Cement	363	1	1	1	1	1	1	1	2	3	3	4	4	4	4
Clay	364	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other nonmetallic mineral prod.	369	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Basic metals	370	0	0	0	0	0	0	0	0	0	0	1	0	0	0
Iron, steel	371	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nonferrous metals	372	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nonelectrical machinery	382	1	1	3	4	4	5	6	5	7	6	8	9	10	12
Miscellaneous	390	0	1	1	1	2	2	1	0	0	0	0	1	1	0

Appendix Table 1a (continued)

Industry	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
All manufacturing	170	210	254	301	329	351	330	351	339	331	341	324	295
Food	25	26	33	34	38	44	42	44	42	46	45	45	32
Textiles	10	9	14	21	23	21	22	21	25	19	21	19	19
Apparel	2	7	14	17	25	25	21	23	22	20	19	17	16
Footwear	1	3	4	11	10	9	12	11	7	9	8	10	6
Chemicals	28	35	42	46	44	41	38	49	40	41	43	44	37
Industrial chemicals	12	19	23	25	25	21	19	28	24	27	25	30	24
Other chemicals	16	16	19	21	19	20	19	21	16	14	18	14	13
Rubber	10	9	9	7	5	7	5	7	9	9	12	10	13
Plastics	4	5	4	6	13	13	13	15	14	11	15	16	14
Metal products	18	15	14	12	17	20	20	24	23	17	19	17	15
Electric & precision machinery	8	17	21	27	29	32	31	29	28	31	30	28	26
Electric machinery	7	15	19	25	28	32	30	27	27	29	29	27	25
Precision machinery	1	2	2	2	1	0	1	2	1	2	1	1	1
Transportation machinery	7	10	12	15	13	16	15	19	17	21	23	26	24
Other manufacturing	57	74	87	105	112	123	111	109	112	107	106	92	93
Beverages	4	4	4	10	12	16	9	5	5	6	7	6	2
Tobacco	5	4	1	1	2	2	1	0	0	0	2	2	0
Leather	1	0	2	5	3	4	2	2	2	3	1	0	4
Wood	21	25	28	25	24	26	29	22	19	18	17	17	16
Furniture	2	4	5	6	8	5	2	9	14	9	11	9	11
Paper	4	5	6	8	6	7	7	8	10	12	8	7	8
Printing, publishing	2	2	2	3	3	3	5	7	5	3	3	3	2
Oil refineries & gas	0	0	0	0	0	0	0	0	0	0	2	1	0
Other oil & coal	0	1	2	2	2	1	1	2	1	1	1	2	3
Porcelain	3	4	5	7	6	6	5	5	6	5	4	4	3
Glass	0	0	1	2	2	2	5	6	7	7	8	6	4
Cement	4	3	4	6	8	10	9	8	9	7	8	9	7
Clay	0	0	0	1	1	1	1	1	1	1	1	1	1
Other nonmetallic mineral prod.	0	1	1	1	1	2	1	0	0	2	2	1	2
Basic metals	0	8	11	11	13	9	9	10	9	13	11	7	8
371	-	7	8	9	10	8	8	8	7	12	8	6	8
372	-	1	3	2	3	1	1	2	2	1	3	1	0
Nonelectrical machinery	11	10	10	13	14	18	17	15	17	12	12	8	7
Miscellaneous	0	3	5	4	7	11	8	9	7	8	8	9	15

Notes: - = not available; ISIC is the corresponding code from revision 2 of the Indonesian Standard Industry Classification (calc=calculated)

Sources: Authors compilations from BPS (various years a).

Appendix Table 1b: Number of Majority-Foreign Manufacturing Establishments Reporting Positive Employment and Value Added by Industry (raw data, number)

Industry	ISIC	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
All manufacturing	300	112	144	165	169	176	187	195	194	192	184	235	227	222	237
Food	311+312	8	10	11	13	11	13	17	17	11	11	18	23	19	23
Textiles	321	13	27	31	30	32	28	30	30	30	27	33	33	33	32
Apparel	322	0	0	0	0	0	0	0	1	2	2	2	1	1	1
Footwear	324	0	0	0	0	0	0	0	1	1	1	1	1	1	3
Chemicals	351+352	17	22	25	26	28	31	29	32	37	38	60	54	52	60
Industrial chemicals	351	3	5	7	7	8	8	6	6	6	9	11	9	8	14
Other chemicals	352	14	17	18	19	20	23	23	26	31	29	49	45	44	46
Rubber	355	1	1	1	5	6	6	7	5	4	4	1	6	6	9
Plastics	356	7	6	6	6	7	6	8	8	6	6	8	7	7	3
Metal products	381	19	20	22	20	20	22	22	21	22	22	26	23	23	23
Electric & precision machinery	383+385	10	10	11	11	12	14	14	16	14	14	18	16	17	20
Electric machinery	383	10	10	11	11	12	14	14	16	14	14	18	16	17	19
Precision machinery	385	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Transportation machinery	384	1	3	4	4	5	6	6	6	8	7	10	10	11	10
Other manufacturing	calc	36	45	54	54	55	61	62	57	57	52	58	53	52	53
Beverages	313	3	3	5	6	5	4	7	7	6	5	6	6	6	4
Tobacco	314	3	4	4	2	3	3	3	3	3	3	4	3	2	2
Leather	323	1	1	1	1	1	1	1	1	0	0	0	0	0	0
Wood	331	10	12	15	15	15	18	18	15	16	14	19	19	19	14
Furniture	332	0	1	1	1	1	2	2	2	2	2	2	2	2	3
Paper	341	5	4	5	5	5	5	3	3	3	1	2	2	2	2
Printing, publishing	342	3	3	3	3	2	3	3	3	3	3	3	2	3	3
Oil refineries & gas	353	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other oil & coal	354	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Porcelain	361	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Glass	362	1	3	3	3	2	2	3	3	3	3	3	2	2	2
Cement	363	2	3	4	4	5	6	6	4	4	4	4	4	5	4
Clay	364	0	0	0	0	0	0	0	0	0	0	1	1	1	1
Other nonmetallic mineral prod.	369	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Basic metals	370	3	5	5	5	6	6	5	5	6	6	2	2	2	6
Iron, steel	371	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nonferrous metals	372	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nonelectrical machinery	382	5	5	5	6	7	7	6	6	6	6	8	7	5	7
Miscellaneous	390	0	1	3	3	3	4	5	5	5	5	4	3	3	3

Appendix Table 1b (continued)

Industry	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
All manufacturing	258	283	330	412	453	504	511	527	558	568	548	507	472
Food	23	24	27	31	40	47	48	50	61	70	67	63	54
Textiles	32	32	36	46	51	53	54	56	58	55	55	46	35
Apparel	5	11	14	31	34	34	29	30	32	25	24	21	19
Footwear	3	6	13	21	25	27	25	23	19	18	17	15	11
Chemicals	65	68	63	70	71	79	87	85	83	92	89	84	74
Industrial chemicals	11	16	19	24	25	29	38	39	39	45	44	43	37
Other chemicals	54	52	44	46	46	50	49	46	44	47	45	41	37
Rubber	11	11	13	16	15	16	16	21	18	18	11	12	12
Plastics	4	7	6	7	9	12	15	15	18	17	20	19	20
Metal products	24	21	26	36	34	44	42	41	35	30	34	37	34
Electric & precision machinery	24	22	24	30	39	46	47	54	63	61	51	43	45
Electric machinery	23	21	23	26	35	41	42	50	59	57	48	41	43
Precision machinery	1	1	1	4	4	5	5	4	4	4	3	2	2
Transportation machinery	11	14	17	17	22	25	28	29	34	31	38	30	31
Other manufacturing	56	67	91	107	113	121	120	123	137	151	142	137	137
Beverages	3	3	4	3	3	2	3	2	3	6	5	8	10
Tobacco	1	1	1	2	2	2	1	2	2	2	1	1	1
Leather	0	1	6	4	6	3	3	3	5	6	2	2	2
Wood	15	13	14	22	17	17	14	22	22	25	30	24	19
Furniture	3	7	11	13	11	14	13	7	10	5	7	9	10
Paper	2	3	3	5	7	9	11	12	13	15	14	13	13
Printing, publishing	3	2	3	4	4	4	3	2	1	0	0	0	0
Oil refineries & gas	0	0	0	0	0	0	0	0	0	0	2	1	0
Other oil & coal	0	0	0	0	0	1	1	0	1	2	2	2	1
Porcelain	1	2	3	3	2	3	4	4	4	7	8	8	7
Glass	1	0	0	0	2	2	1	2	1	3	2	1	2
Cement	4	4	4	3	4	5	7	5	6	5	5	4	4
Clay	1	1	0	1	0	0	0	1	4	2	2	4	5
Other nonmetallic mineral prod.	0	1	1	3	1	2	1	3	3	3	2	2	4
Basic metals	8	9	9	9	9	14	13	13	14	16	14	14	11
371	-	6	6	6	6	8	8	8	9	9	8	10	10
372	-	3	3	3	3	6	5	5	5	7	6	4	1
Nonelectrical machinery	9	12	13	17	21	17	19	22	23	30	25	25	31
Miscellaneous	5	8	19	18	24	26	26	23	25	24	21	19	17

Notes: - = not available; ISIC is the corresponding code from revision 2 of the Indonesian Standard Industry Classification (calc=calculated)

Sources: Authors compilations from BPS (various years a).

Appendix Table 1c: Number of Heavily-Foreign Manufacturing Establishments Reporting Positive Employment and Value Added by Industry (raw data, number)

Industry	ISIC	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
All manufacturing	300	48	55	53	58	59	61	61	57	47	44	55	47	48	61
Food	311+312	4	5	3	4	5	6	5	4	2	2	10	6	7	10
Textiles	321	3	5	4	5	3	5	5	5	4	4	3	3	2	3
Apparel	322	0	0	0	0	0	1	2	0	0	0	1	0	0	2
Footwear	324	1	1	1	1	1	1	1	0	0	0	0	1	0	0
Chemicals	351+352	25	26	27	26	27	26	26	26	19	17	14	13	13	11
Industrial chemicals	351	1	1	1	0	1	1	1	2	1	1	1	2	2	1
Other chemicals	352	24	25	26	26	26	25	25	24	18	16	13	11	11	10
Rubber	355	2	2	2	7	9	9	8	8	8	8	15	17	16	20
Plastics	356	1	1	1	1	1	1	1	1	1	1	0	0	0	0
Metal products	381	1	3	3	3	3	3	3	3	3	2	1	1	1	2
Electric & precision machinery	383+385	2	3	3	3	3	3	3	3	3	3	3	0	0	0
Electric machinery	383	2	3	3	3	3	3	3	3	3	3	3	0	0	0
Precision machinery	385	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Transportation machinery	384	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other manufacturing	calc	9	9	9	8	7	6	7	7	7	7	8	6	9	13
Beverages	313	0	0	0	0	1	1	1	1	2	2	2	2	0	0
Tobacco	314	3	3	3	3	1	1	1	1	1	1	1	1	1	1
Leather	323	0	0	0	0	0	0	0	0	0	0	1	1	1	0
Wood	331	2	1	1	1	1	0	1	2	2	2	3	1	5	8
Furniture	332	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Paper	341	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Printing, publishing	342	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oil refineries & gas	353	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other oil & coal	354	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Porcelain	361	0	0	0	0	0	0	0	0	0	0	0	1	1	0
Glass	362	1	1	1	0	0	0	0	0	0	0	0	0	0	1
Cement	363	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Clay	364	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other nonmetallic mineral prod.	369	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Basic metals	370	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Iron, steel	371	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nonferrous metals	372	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nonelectrical machinery	382	2	3	3	3	3	3	3	2	1	1	0	0	0	1
Miscellaneous	390	1	1	1	1	1	1	1	1	1	1	1	0	0	0



Appendix Table 1c (continued)

Industry	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
All manufacturing	62	96	124	184	209	266	359	440	566	719	832	923	943
Food	11	9	11	16	15	18	27	29	35	43	52	58	67
Textiles	3	7	7	13	16	24	25	33	39	55	80	75	66
Apparel	4	15	23	28	33	37	51	66	59	70	80	102	107
Footwear	1	4	8	11	11	11	12	17	15	20	22	20	18
Chemicals	10	11	8	7	9	12	20	34	47	62	65	85	86
Industrial chemicals	1	1	2	1	3	5	7	14	21	28	32	43	44
Other chemicals	9	10	6	6	6	7	13	20	26	34	33	42	42
Rubber	21	29	23	23	23	20	19	14	18	20	24	26	25
Plastics	1	1	4	7	8	14	23	24	32	35	41	49	45
Metal products	2	5	3	7	10	11	21	25	43	57	59	63	67
Electric & precision machinery	0	1	11	29	30	53	67	75	112	150	162	166	175
Electric machinery	0	1	10	27	28	49	63	71	107	144	152	156	168
Precision machinery	0	0	1	2	2	4	4	4	5	6	10	10	7
Transportation machinery	0	0	0	3	2	5	8	8	16	21	30	31	26
Other manufacturing	9	14	26	40	52	61	86	115	150	186	217	248	261
Beverages	1	0	0	1	3	2	7	10	11	9	9	10	12
Tobacco	1	1	1	1	1	2	4	4	4	4	4	3	3
Leather	0	0	0	3	4	2	2	4	7	9	7	7	12
Wood	5	4	8	10	11	12	14	17	22	23	23	34	40
Furniture	0	0	2	2	6	6	16	25	33	34	46	53	41
Paper	0	1	1	1	0	2	4	6	7	11	13	12	11
Printing, publishing	0	0	0	0	1	0	0	0	0	1	2	4	2
Oil refineries & gas	0	0	0	0	0	0	0	0	2	4	7	8	3
Other oil & coal	0	0	0	1	1	1	1	2	2	4	4	4	3
Porcelain	1	1	1	0	1	1	1	0	0	2	3	4	5
Glass	0	0	0	0	0	1	1	1	2	0	0	2	5
Cement	0	0	0	0	0	0	1	1	2	5	6	6	5
Clay	0	0	0	0	0	0	0	0	0	0	0	3	4
Other nonmetallic mineral prod.	0	0	0	0	0	1	0	0	0	1	0	1	1
Basic metals	1	2	3	3	2	2	6	13	22	29	32	32	26
371	-	0	0	1	1	1	2	3	7	14	13	17	13
372	-	2	3	2	1	1	4	10	15	15	19	15	13
Nonelectrical machinery	0	2	1	3	5	7	7	11	14	24	26	24	34
Miscellaneous	0	3	9	15	17	22	22	21	22	26	35	41	54

Notes: - = not available; ISIC is the corresponding code from revision 2 of the Indonesian Standard Industry Classification (calc=calculated)

Sources: Authors compilations from BPS (various years a).

**Appendix Table 1d: Number of Local Manufacturing Establishments Reporting Positive Employment and Value Added by Industry (raw data, number)**

Industry	ISIC	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
All manufacturing	300	7,270	7,006	7,377	7,529	7,657	7,761	7,562	7,641	7,538	7,636	12,434	12,300	12,301	14,155
Food	311+312	1,492	1,309	1,495	1,625	1,608	1,639	1,620	1,567	1,564	1,650	2,801	2,846	2,807	3,161
Textiles	321	2,131	2,094	2,052	1,950	1,905	1,908	1,850	1,781	1,713	1,628	1,987	1,980	1,983	2,090
Apparel	322	76	95	99	103	112	131	153	167	187	205	641	631	653	790
Footwear	324	38	45	47	41	51	57	63	55	54	60	115	113	114	145
Chemicals	351+352	336	317	330	337	335	385	345	371	385	393	568	571	576	646
Industrial chemicals	351	81	76	82	85	90	96	86	100	106	112	170	170	168	192
Other chemicals	352	255	241	248	252	245	289	259	271	279	281	398	401	408	454
Rubber	355	98	92	95	187	189	220	194	187	192	197	378	355	348	412
Plastics	356	175	184	189	199	207	230	215	264	278	283	548	535	548	646
Metal products	381	264	278	290	295	316	324	317	322	325	316	505	513	509	551
Electric & precision machinery	383+385	90	92	100	103	109	118	123	123	127	123	208	203	210	243
Electric machinery	383	70	72	78	81	85	93	96	97	100	94	169	161	166	202
Precision machinery	385	20	20	22	22	24	25	27	26	27	29	39	42	44	41
Transportation machinery	384	146	148	149	155	176	167	178	192	189	183	292	291	298	358
Other manufacturing	calc	2,424	2,352	2,531	2,534	2,649	2,582	2,504	2,612	2,524	2,598	4,391	4,262	4,255	5,113
Beverages	313	66	64	74	76	84	93	86	91	96	99	122	123	128	159
Tobacco	314	737	653	726	691	691	660	550	525	527	530	858	802	780	918
Leather	323	33	33	38	39	39	39	39	40	42	42	79	75	70	84
Wood	331	368	392	418	434	470	466	480	543	480	533	875	823	872	1,315
Furniture	332	127	122	134	132	141	134	135	130	118	134	282	295	295	345
Paper	341	70	71	74	78	82	78	81	80	75	75	130	121	120	135
Printing, publishing	342	258	230	246	252	265	274	275	287	278	292	464	471	466	492
Oil refineries & gas	353	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other oil & coal	354	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Porcelain	361	7	11	13	13	16	19	20	23	25	26	42	38	39	48
Glass	362	48	46	48	47	48	45	41	39	33	30	36	29	32	38
Cement	363	272	276	292	302	324	323	333	355	362	355	472	464	451	455
Clay	364	215	225	225	220	228	204	219	231	225	209	583	563	541	543
Other nonmetallic mineral prod.	369	36	39	43	49	47	37	38	43	41	42	98	97	97	155
Basic metals	370	12	13	14	13	16	16	17	18	18	20	27	27	28	30
Iron, steel	371	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nonferrous metals	372	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nonelectrical machinery	382	100	105	106	110	118	118	113	118	118	118	171	164	160	170
Miscellaneous	390	75	72	80	78	80	76	77	89	86	93	152	170	176	226

Appendix Table 1d (continued)

Industry	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
All manufacturing	14,186	15,945	15,786	16,751	17,172	17,896	20,351	21,673	20,909	19,805	20,349	20,420	19,686
Food	3,134	3,453	3,301	3,529	3,646	3,754	4,155	4,375	4,257	4,142	4,244	4,213	4,135
Textiles	2,115	1,779	1,737	1,801	1,863	1,919	2,141	2,144	2,051	1,971	1,903	1,890	1,790
Apparel	826	1,733	1,648	1,794	1,706	1,766	2,009	2,210	2,046	1,835	2,091	2,116	1,981
Footwear	155	221	256	271	281	298	340	369	345	367	377	378	325
Chemicals	630	750	701	729	768	790	863	866	869	840	886	883	865
Industrial chemicals	188	268	241	257	272	288	339	332	329	331	363	360	359
Other chemicals	442	482	460	472	496	502	524	534	540	509	523	523	506
Rubber	424	462	423	427	405	405	401	405	382	384	418	422	406
Plastics	654	666	688	740	771	815	887	1,007	989	815	898	905	879
Metal products	544	591	604	635	662	722	875	962	870	816	869	872	854
Electric & precision machinery	248	279	293	307	312	342	387	414	406	341	338	338	359
Electric machinery	206	229	241	249	258	285	324	350	353	284	292	294	310
Precision machinery	42	50	52	58	54	57	63	64	53	57	46	44	49
Transportation machinery	372	412	412	455	476	489	526	563	532	465	474	468	488
Other manufacturing	5,084	5,599	5,723	6,063	6,282	6,596	7,767	8,358	8,162	7,829	7,851	7,935	7,604
Beverages	154	136	136	166	186	195	230	251	256	250	237	235	229
Tobacco	898	954	940	898	875	742	809	833	866	779	800	815	804
Leather	90	129	153	155	167	190	210	217	210	191	165	148	181
Wood	1,296	1,298	1,203	1,348	1,422	1,534	1,697	1,721	1,617	1,611	1,664	1,626	1,553
Furniture	362	595	677	701	757	873	1,128	1,322	1,332	1,299	1,319	1,362	1,305
Paper	139	175	207	244	255	287	289	333	314	319	398	397	351
Printing, publishing	489	514	481	493	503	521	586	667	653	602	524	528	523
Oil refineries & gas	0	0	0	2	0	1	4	8	6	6	16	8	10
Other oil & coal	0	4	7	8	10	8	18	25	27	27	32	30	27
Porcelain	47	58	67	70	77	85	85	77	70	73	68	72	68
Glass	40	44	51	49	53	51	64	68	56	82	82	77	74
Cement	428	475	455	463	479	514	612	639	568	492	482	482	392
Clay	541	548	612	642	639	684	956	1,056	1,019	963	949	953	785
Other nonmetallic mineral prod.	155	181	188	210	222	233	273	281	306	277	248	255	273
Basic metals	33	76	93	104	115	126	141	146	153	153	170	180	172
371	-	49	60	65	70	76	85	84	92	84	110	118	112
372	-	27	33	39	45	50	56	62	61	69	60	62	60
Nonelectrical machinery	178	184	197	215	226	227	279	305	304	247	261	253	284
Miscellaneous	234	228	256	295	296	325	386	409	405	458	436	514	573

Notes: - = not available; ISIC is the corresponding code from revision 2 of the Indonesian Standard Industry Classification (calc=calculated)

Sources: Authors compilations from BPS (various years a).

**Appendix Table 1e: Number of All Manufacturing Establishments Reporting Positive Employment and Value Added by Industry (raw data, number)**

Industry	ISIC	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
All manufacturing	300	7,469	7,251	7,653	7,822	7,959	8,087	7,897	7,974	7,870	7,962	12,861	12,717	12,723	14,621
Food	311+312	1,508	1,329	1,516	1,648	1,630	1,664	1,648	1,593	1,582	1,670	2,842	2,892	2,857	3,217
Textiles	321	2,150	2,130	2,091	1,989	1,943	1,947	1,891	1,822	1,755	1,669	2,033	2,027	2,028	2,136
Apparel	322	76	95	99	103	112	133	156	169	190	207	645	633	655	798
Footwear	324	39	46	48	42	52	58	64	56	55	61	116	115	115	149
Chemicals	351+352	380	368	388	397	397	454	413	441	457	467	667	662	666	743
Industrial chemicals	351	85	82	91	93	100	109	99	114	122	130	193	191	190	218
Other chemicals	352	295	286	297	304	297	345	314	327	335	337	474	471	476	525
Rubber	355	105	99	102	205	208	239	211	203	207	212	401	385	378	450
Plastics	356	184	195	200	210	218	240	227	276	288	294	558	544	558	654
Metal products	381	294	311	326	332	353	364	355	360	365	353	548	556	550	592
Electric & precision machinery	383+385	103	106	115	118	125	137	142	144	148	144	239	228	236	271
Electric machinery	383	83	86	93	96	101	112	115	118	121	115	199	185	190	228
Precision machinery	385	20	20	22	22	24	25	27	26	27	29	40	43	46	43
Transportation machinery	384	148	153	157	162	186	177	188	204	203	195	307	306	315	373
Other manufacturing	calc	2,482	2,419	2,611	2,616	2,735	2,674	2,602	2,706	2,620	2,690	4,505	4,369	4,365	5,238
Beverages	313	69	68	80	82	91	100	94	99	104	107	131	132	136	169
Tobacco	314	746	663	737	701	699	666	556	530	532	535	865	809	788	926
Leather	323	36	35	40	41	40	40	40	41	42	42	80	76	71	84
Wood	331	383	408	437	454	491	491	510	573	510	563	920	863	914	1,359
Furniture	332	127	123	135	133	142	136	137	132	120	136	284	297	299	350
Paper	341	75	75	79	83	88	84	86	85	80	78	135	127	125	141
Printing, publishing	342	262	233	250	257	269	278	280	293	284	297	469	475	471	497
Oil refineries & gas	353	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other oil & coal	354	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Porcelain	361	8	12	14	14	18	21	22	25	28	29	45	42	43	53
Glass	362	51	51	53	51	52	49	46	44	37	34	40	32	34	41
Cement	363	275	280	297	307	330	330	340	361	369	362	480	472	460	463
Clay	364	215	225	225	220	228	204	219	231	225	209	584	564	542	544
Other nonmetallic mineral prod.	369	36	39	43	49	47	37	38	43	41	42	98	97	97	155
Basic metals	370	15	18	19	18	22	22	22	23	24	26	30	29	30	37
Iron, steel	371	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nonferrous metals	372	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nonelectrical machinery	382	108	114	117	123	132	133	128	131	132	131	187	180	175	190
Miscellaneous	390	76	75	85	83	86	83	84	95	92	99	157	174	180	229

Appendix Table 1e (continued)

Industry	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
All manufacturing	14,676	16,534	16,494	17,648	18,163	19,017	21,551	22,991	22,372	21,423	22,070	22,174	21,396
Food	3,193	3,512	3,372	3,610	3,739	3,863	4,272	4,498	4,395	4,301	4,408	4,379	4,288
Textiles	2,160	1,827	1,794	1,881	1,953	2,017	2,242	2,254	2,173	2,100	2,059	2,030	1,910
Apparel	837	1,766	1,699	1,870	1,798	1,862	2,110	2,329	2,159	1,950	2,214	2,256	2,123
Footwear	160	234	281	314	327	345	389	420	386	414	424	423	360
Chemicals	733	864	814	852	892	922	1,008	1,034	1,039	1,035	1,083	1,096	1,062
Industrial chemicals	212	304	285	307	325	343	403	413	413	431	464	476	464
Other chemicals	521	560	529	545	567	579	605	621	626	604	619	620	598
Rubber	466	511	468	473	448	448	441	447	427	431	465	470	456
Plastics	663	679	702	760	801	854	938	1,061	1,053	878	974	989	958
Metal products	588	632	647	690	723	797	958	1,052	971	920	981	989	970
Electric & precision machinery	280	319	349	393	410	473	532	572	609	583	581	575	605
Electric machinery	236	266	293	327	349	407	459	498	546	514	521	518	546
Precision machinery	44	53	56	66	61	66	73	74	63	69	60	57	59
Transportation machinery	390	436	441	490	513	535	577	619	599	538	565	555	569
Other manufacturing	5,206	5,754	5,927	6,315	6,559	6,901	8,084	8,705	8,561	8,273	8,316	8,412	8,095
Beverages	162	143	144	180	204	215	249	268	275	271	258	259	253
Tobacco	905	960	943	902	880	748	815	839	872	785	807	821	808
Leather	91	130	161	167	180	199	217	226	224	209	175	157	199
Wood	1,337	1,340	1,253	1,405	1,474	1,589	1,754	1,782	1,680	1,677	1,734	1,701	1,628
Furniture	367	606	695	722	782	898	1,159	1,363	1,389	1,347	1,383	1,433	1,367
Paper	145	184	217	258	268	305	311	359	344	357	433	429	383
Printing, publishing	494	518	486	500	511	528	594	676	659	606	529	535	527
Oil refineries & gas	0	0	0	2	0	1	4	8	8	10	27	18	13
Other oil & coal	0	5	9	11	13	11	21	29	31	34	39	38	34
Porcelain	52	65	76	80	86	95	95	86	80	87	83	88	83
Glass	41	44	52	51	57	56	71	77	66	92	92	86	85
Cement	436	482	463	472	491	529	629	653	585	509	501	501	408
Clay	542	549	612	644	640	685	957	1,058	1,024	966	952	961	795
Other nonmetallic mineral prod.	155	183	190	214	224	238	275	284	309	283	252	259	280
Basic metals	42	95	116	127	139	151	169	182	198	211	227	233	217
Iron, steel	-	62	74	81	87	93	103	103	115	119	139	151	143
Nonferrous metals	-	33	42	46	52	58	66	79	83	92	88	82	74
Nonelectrical machinery	198	208	221	248	266	269	322	353	358	313	324	310	356
Miscellaneous	239	242	289	332	344	384	442	462	459	516	500	583	659

Notes: - = not available; ISIC is the corresponding code from revision 2 of the Indonesian Standard Industry Classification (calc=calculated)

Sources: Authors compilations from BPS (various years a).

Appendix Table 2a: Employment of Minority-Foreign Manufacturing Establishments Reporting Positive Employment and Value Added by Industry (raw data, thousands)

Industry	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
All manufacturing	8.039	13.527	16.231	16.901	18.165	23.828	26.036	30.363	34.180	37.187	49.393	50.749	59.263	68.320
Food	0.749	1.058	1.416	1.408	0.890	1.132	1.434	0.718	0.687	0.959	3.808	4.688	8.328	8.224
Textiles	0.749	2.551	2.353	2.198	1.661	3.080	3.255	3.197	4.786	7.963	5.862	5.868	7.242	5.678
Apparel	0.000	0.000	0.000	0.000	0.000	0.299	0.411	0.496	0.542	0.000	1.154	1.454	1.419	2.937
Footwear	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.287
Chemicals	0.069	0.414	0.776	0.828	0.888	1.498	1.773	1.953	2.328	2.870	4.509	4.368	4.627	4.389
Industrial chemicals	0.000	0.000	0.124	0.124	0.136	0.426	0.696	0.774	0.933	0.861	1.938	1.770	2.254	2.106
Other chemicals	0.069	0.414	0.652	0.704	0.752	1.072	1.077	1.179	1.395	2.009	2.571	2.598	2.373	2.283
Rubber	0.478	0.518	0.544	1.093	0.655	0.922	0.459	0.959	0.919	0.881	2.185	2.293	4.135	5.906
Plastics	0.333	0.632	0.660	0.657	0.339	0.381	0.440	0.441	0.457	0.499	0.353	0.338	0.538	1.065
Metal products	1.606	1.601	2.129	2.749	2.932	3.773	3.554	4.682	5.105	4.127	3.460	5.426	4.327	5.749
Electric & precision machinery	0.129	0.162	0.162	0.229	0.236	0.285	0.307	0.357	0.868	0.894	1.628	1.273	1.562	1.501
Electric machinery	0.129	0.162	0.162	0.229	0.236	0.285	0.307	0.357	0.868	0.894	1.504	1.152	1.163	1.393
Precision machinery	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.124	0.121	0.399	0.108
Transportation machinery	0.262	0.449	0.752	0.682	1.638	1.739	2.161	2.508	2.428	2.115	2.515	2.237	3.128	1.967
Other manufacturing	3.664	6.142	7.439	7.057	8.926	10.719	12.242	15.052	16.060	16.879	23.919	22.804	23.957	30.617
Beverages	0.000	0.795	0.793	0.000	0.562	1.119	0.000	0.000	0.000	0.840	0.840	0.800	0.841	1.722
Tobacco	0.466	1.667	2.053	1.947	1.679	1.626	1.030	0.039	0.057	0.052	1.152	0.829	3.222	4.886
Leather	0.145	0.082	0.082	0.082	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Wood	0.719	0.719	0.719	0.653	1.085	2.743	5.901	8.833	9.619	9.869	15.185	13.556	13.479	15.950
Furniture	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.336	0.297
Paper	0.000	0.000	0.000	0.000	0.379	0.394	0.457	0.613	0.619	0.673	0.777	1.488	1.488	2.138
Printing, publishing	0.074	0.000	0.074	0.199	0.347	0.076	0.174	0.293	0.301	0.184	0.176	0.446	0.456	0.386
Oil refineries & gas	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Other oil & coal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Porcelain	0.833	0.786	0.775	0.771	1.020	1.029	1.077	1.158	1.399	1.373	1.374	1.318	1.518	1.731
Glass	0.689	0.706	0.944	1.246	1.544	1.537	1.613	1.819	1.727	1.727	1.722	1.766	0.000	0.000
Cement	0.332	0.914	1.193	1.278	1.466	1.260	0.996	1.337	1.332	1.141	1.112	1.240	1.221	1.933
Clay	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Other nonmetallic mineral prod.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Basic metals	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.157	0.000	0.000	0.000
Iron, steel	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nonferrous metals	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nonelectrical machinery	0.406	0.418	0.751	0.834	0.773	0.868	0.952	0.960	1.006	1.020	1.424	1.329	1.366	1.574
Miscellaneous	0.000	0.055	0.055	0.047	0.071	0.067	0.042	0.000	0.000	0.000	0.000	0.032	0.030	0.000

Appendix Table 2a (continued)

Industry	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
All manufacturing	73.375	95.086	119.832	151.158	163.166	188.474	211.950	235.464	212.816	199.326	206.720	218.437	204.032
Food	7.876	9.970	13.865	16.112	17.276	19.810	17.954	26.799	19.684	23.847	23.289	19.663	15.295
Textiles	6.818	5.857	11.343	15.201	16.294	16.569	17.711	19.195	22.619	13.686	12.762	20.311	15.989
Apparel	1.966	4.368	9.819	13.355	17.512	17.863	24.496	27.425	23.993	27.386	34.701	26.905	31.174
Footwear	0.326	2.163	4.269	16.283	18.208	20.364	32.678	29.649	26.204	23.222	27.341	37.461	29.780
Chemicals	4.758	6.397	8.257	9.093	10.532	10.578	11.778	13.293	9.349	10.484	12.824	11.860	9.424
Industrial chemicals	2.186	3.284	3.659	3.895	4.059	3.916	3.435	4.566	3.852	4.958	5.453	5.911	5.287
Other chemicals	2.572	3.113	4.598	5.198	6.473	6.662	8.343	8.727	5.497	5.526	7.371	5.949	4.137
Rubber	6.857	7.290	7.462	4.786	3.953	6.377	4.554	4.882	5.197	8.309	8.283	7.670	9.820
Plastics	1.048	1.051	1.130	1.932	3.011	4.577	4.661	6.355	4.709	3.583	2.549	2.936	4.066
Metal products	6.522	4.957	5.146	8.043	7.725	9.271	9.343	15.186	11.123	6.434	6.548	5.787	5.882
Electric & precision machinery	2.457	4.948	7.500	9.582	11.109	15.744	16.607	13.501	15.290	13.632	15.148	14.369	13.969
Electric machinery	2.353	4.725	7.312	9.339	10.962	15.744	16.548	13.095	14.845	13.157	15.123	14.344	13.945
Precision machinery	0.104	0.223	0.188	0.243	0.147	0.000	0.059	0.406	0.445	0.475	0.025	0.025	0.024
Transportation machinery	4.520	7.824	10.926	8.176	7.671	10.013	10.153	13.242	8.546	11.229	11.695	21.479	21.590
Other manufacturing	30.227	40.261	40.115	48.595	49.875	57.308	62.015	65.937	66.102	57.514	51.580	49.996	47.043
Beverages	1.193	1.526	1.437	2.967	3.412	3.892	1.980	1.498	1.611	0.958	1.326	1.096	0.554
Tobacco	3.308	1.622	0.228	0.131	0.280	0.360	0.282	0.000	0.000	0.000	0.316	0.280	0.000
Leather	0.126	0.000	0.690	2.121	1.027	1.552	0.786	0.567	0.792	1.445	0.292	0.000	1.623
Wood	16.340	19.263	19.580	16.074	15.519	21.300	22.951	20.325	13.697	9.871	10.962	8.782	7.671
Furniture	0.663	1.965	1.553	1.074	2.623	2.110	0.376	3.116	4.477	4.853	4.879	4.416	3.885
Paper	2.781	5.541	6.256	9.235	7.308	7.772	13.158	13.662	18.128	19.041	12.099	11.606	11.130
Printing, publishing	0.457	0.368	0.339	0.663	0.579	0.581	0.639	1.239	0.890	0.721	0.388	0.392	0.305
Oil refineries & gas	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.444	0.265	0.000
Other oil & coal	0.000	0.044	0.092	0.092	0.276	0.036	0.036	0.091	0.036	0.036	0.036	0.165	0.298
Porcelain	1.752	2.809	3.647	4.100	4.087	4.322	4.021	4.138	4.137	3.215	2.849	2.852	3.638
Glass	0.000	0.000	0.087	2.317	0.376	0.352	2.147	5.504	3.849	2.166	3.321	2.533	1.928
Cement	1.984	1.781	1.533	3.498	3.898	4.609	4.493	4.536	3.694	2.921	4.197	6.621	4.261
Clay	0.000	0.000	0.000	0.582	0.582	0.580	0.814	0.949	0.500	2.033	2.033	2.033	2.033
Other nonmetallic mineral prod.	0.000	0.242	0.265	0.212	0.229	0.293	0.275	0.000	0.000	0.116	0.281	0.245	0.258
Basic metals	0.000	3.102	1.984	2.099	3.021	1.580	1.492	1.669	1.874	2.594	1.704	1.121	1.997
Iron, steel	-	2.933	1.258	1.447	2.172	1.394	1.308	1.330	1.609	2.371	1.045	1.041	1.997
Nonferrous metals	-	0.169	0.726	0.652	0.849	0.186	0.184	0.339	0.265	0.223	0.659	0.080	0.000
Nonelectrical machinery	1.623	0.885	1.017	1.286	1.765	2.510	3.514	2.936	6.930	3.383	3.224	2.643	1.624
Miscellaneous	0.000	1.113	1.407	2.144	4.893	5.459	5.051	5.707	5.487	4.161	3.229	4.946	5.838

Notes: - = not available.

Sources: Authors compilations from BPS (various years a).

Appendix Table 2b: Employment of Majority-Foreign Manufacturing Establishments Reporting Positive Employment and Value Added by Industry (raw data, thousands)

Industry	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
All manufacturing	32.825	49.534	55.590	59.070	62.846	68.625	79.625	83.677	84.954	78.873	91.942	98.955	93.752	90.873
Food	2.024	2.438	2.567	2.893	3.246	4.224	5.133	5.703	4.334	4.055	5.907	9.822	7.147	7.439
Textiles	11.264	23.141	25.598	25.394	25.654	24.587	27.730	28.026	26.814	23.460	28.482	30.542	28.952	29.176
Apparel	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.862	1.531	1.552	1.579	1.431	1.883	2.049
Footwear	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.507	1.498	1.568	1.453	1.414	1.467	3.050
Chemicals	2.089	2.581	3.062	3.525	4.252	5.064	6.169	10.365	9.657	9.681	14.514	12.979	11.284	11.563
Industrial chemicals	0.382	0.527	0.769	0.829	1.029	1.381	1.160	4.013	1.692	1.911	2.369	1.164	1.027	1.226
Other chemicals	1.707	2.054	2.293	2.696	3.223	3.683	5.009	6.352	7.965	7.770	12.145	11.815	10.257	10.337
Rubber	0.036	0.553	0.609	1.537	1.826	1.886	3.730	3.110	2.770	2.635	1.278	6.721	6.303	2.716
Plastics	0.734	0.662	0.623	0.660	1.110	1.265	2.024	2.050	1.644	1.583	1.835	1.669	1.718	0.446
Metal products	3.679	3.625	4.470	4.843	4.839	6.026	6.275	5.145	5.152	4.881	6.280	4.618	5.605	5.550
Electric & precision machinery	4.906	4.895	4.967	4.944	4.976	5.113	5.765	6.209	6.009	5.680	6.298	6.058	6.938	7.450
Electric machinery	4.906	4.895	4.967	4.944	4.976	5.113	5.765	6.209	6.009	5.680	6.298	6.058	6.938	7.430
Precision machinery	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.020
Transportation machinery	0.205	1.270	1.388	1.500	1.899	3.334	3.529	3.656	5.176	3.632	4.645	4.797	4.826	4.385
Other manufacturing	7.888	10.369	12.306	13.774	15.044	17.126	19.270	17.044	20.369	20.146	19.671	18.904	17.629	17.049
Beverages	1.005	1.398	1.667	2.424	1.772	1.786	3.077	2.802	2.456	1.614	2.014	2.141	2.187	1.002
Tobacco	1.030	1.470	1.292	0.466	1.868	1.904	1.866	1.681	1.667	1.617	1.982	1.326	0.743	0.655
Leather	0.040	0.027	0.035	0.035	0.035	0.035	0.035	0.032	0.000	0.000	0.000	0.000	0.000	0.000
Wood	2.415	2.476	3.237	3.436	3.142	3.547	3.868	3.576	4.232	5.227	5.199	5.550	4.662	3.788
Furniture	0.000	0.145	0.160	0.186	0.187	0.327	0.356	0.244	0.294	0.289	0.271	0.251	0.250	0.722
Paper	1.132	1.029	1.194	1.219	1.518	1.518	1.115	1.176	1.053	0.338	1.111	0.902	0.912	0.859
Printing, publishing	0.466	0.514	0.514	0.665	0.448	0.711	0.767	0.815	0.784	0.963	0.963	0.676	0.758	0.747
Oil refineries & gas	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Other oil & coal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Porcelain	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.314
Glass	0.344	0.608	0.662	0.762	0.558	0.561	0.929	0.841	1.090	1.082	1.120	1.083	1.082	0.982
Cement	0.679	0.917	1.432	1.733	1.812	2.436	2.459	1.226	1.738	1.851	1.543	1.528	1.674	1.463
Clay	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.177	0.156	0.137	0.127
Other nonmetallic mineral prod.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Basic metals	0.287	1.067	1.245	1.468	1.755	1.942	2.088	1.959	4.425	4.389	2.880	2.951	2.872	4.021
Iron, steel	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nonferrous metals	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nonelectrical machinery	0.490	0.343	0.422	0.594	0.820	1.169	1.277	1.290	1.330	1.374	1.204	1.233	1.173	1.287
Miscellaneous	0.000	0.375	0.446	0.786	1.129	1.190	1.433	1.402	1.300	1.402	1.207	1.107	1.179	1.082



Appendix Table 2b (continued)

Industry	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
All manufacturing	99.248	123.860	157.128	224.408	257.446	296.275	313.699	309.429	301.018	280.412	265.773	247.130	253.654
Food	6.257	6.776	7.381	11.280	12.856	16.190	14.982	15.410	18.069	22.112	19.654	20.773	24.638
Textiles	27.233	28.087	31.976	43.754	45.604	42.920	46.486	45.516	42.422	44.027	47.290	39.718	32.529
Apparel	3.296	6.682	8.627	19.989	24.803	24.052	21.019	19.058	21.305	16.215	13.564	14.059	11.582
Footwear	5.576	13.253	21.673	47.223	62.327	80.646	80.160	73.178	55.483	50.977	47.748	40.621	38.320
Chemicals	12.422	17.264	14.114	16.546	16.776	17.233	20.700	19.757	23.514	18.290	19.000	18.979	19.648
Industrial chemicals	0.952	4.805	4.196	5.697	5.611	5.562	8.226	7.436	10.132	7.760	8.070	6.846	9.393
Other chemicals	11.470	12.459	9.918	10.849	11.165	11.671	12.474	12.321	13.382	10.530	10.930	12.133	10.255
Rubber	3.095	7.186	9.735	8.841	7.821	8.012	7.642	7.751	6.996	7.793	6.687	7.436	15.189
Plastics	0.396	1.463	1.805	2.286	2.288	6.715	8.403	5.662	6.642	3.812	4.272	4.115	7.887
Metal products	6.012	7.216	8.996	13.110	11.125	18.141	20.418	20.970	15.902	12.686	13.435	13.149	14.461
Electric & precision machinery	9.465	9.100	12.643	14.380	21.340	27.494	28.457	31.232	34.253	28.590	22.561	24.110	27.458
Electric machinery	9.444	9.079	12.623	12.690	20.750	26.384	24.574	27.820	29.986	25.953	21.238	23.068	25.271
Precision machinery	0.021	0.021	0.020	1.690	0.590	1.110	3.883	3.412	4.267	2.637	1.323	1.042	2.187
Transportation machinery	5.260	6.825	9.682	8.837	7.571	9.993	16.348	15.899	11.883	11.990	15.627	11.767	13.390
Other manufacturing	20.236	20.008	30.496	38.162	44.935	44.879	49.084	54.996	64.549	63.920	55.935	52.403	48.552
Beverages	0.934	0.933	2.234	0.814	0.844	0.743	1.346	0.405	0.774	0.716	0.615	2.611	3.415
Tobacco	0.406	0.378	0.344	0.412	0.443	0.610	0.349	0.675	0.714	0.739	0.456	0.387	0.301
Leather	0.000	0.139	1.717	2.728	3.381	0.931	1.119	1.721	3.413	4.697	2.146	2.166	1.729
Wood	5.958	3.650	2.957	11.389	11.102	8.725	7.001	13.231	15.937	17.808	18.526	17.861	12.275
Furniture	1.147	3.084	4.368	3.430	3.149	3.746	4.222	2.956	2.211	1.459	2.299	2.271	1.856
Paper	0.846	1.461	1.163	1.455	2.238	3.732	7.510	7.976	3.842	7.747	5.437	5.955	7.524
Printing, publishing	0.910	0.084	0.319	0.394	1.387	1.509	1.898	2.043	1.889	0.000	0.000	0.000	0.000
Oil refineries & gas	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.128	0.052	0.000
Other oil & coal	0.000	0.000	0.000	0.000	0.000	0.165	0.165	0.000	0.563	0.568	0.676	0.605	0.021
Porcelain	0.285	1.212	1.305	1.496	1.413	2.049	3.053	2.971	3.205	3.256	3.617	4.455	3.629
Glass	0.475	0.000	0.000	0.000	0.591	0.684	0.123	0.387	0.075	2.025	0.089	0.078	0.283
Cement	1.648	1.742	1.758	1.561	1.313	1.557	1.838	1.249	1.394	1.209	1.035	0.894	1.035
Clay	0.179	0.123	0.000	0.128	0.000	0.000	0.000	0.241	1.538	1.371	0.555	0.733	1.602
Other nonmetallic mineral prod.	0.000	0.021	0.020	0.427	0.475	0.525	0.560	0.911	0.858	0.670	0.462	0.488	0.650
Basic metals	4.315	2.598	3.214	3.339	2.913	6.326	6.336	7.103	7.258	6.258	5.850	2.903	2.295
Iron, steel	-	2.317	2.413	2.381	1.854	2.919	2.938	2.852	3.029	1.952	1.617	0.832	1.371
Nonferrous metals	-	0.281	0.801	0.958	1.059	3.407	3.398	4.251	4.229	4.306	4.233	2.071	0.924
Nonelectrical machinery	1.608	2.813	3.541	3.650	4.050	3.630	3.806	4.721	4.554	5.435	7.115	4.809	6.701
Miscellaneous	1.525	1.770	7.556	6.939	11.636	9.947	9.758	8.406	16.324	9.962	6.929	6.135	5.236

Notes: - = not available.

Sources: Authors compilations from BPS (various years a).

Appendix Table 2c: Employment of Heavily-Foreign Manufacturing Establishments Reporting Positive Employment and Value Added by Industry (raw data, thousands)

Industry	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
All manufacturing	15.153	20.857	21.124	24.595	26.289	31.851	27.108	23.049	18.354	17.353	20.280	13.753	17.185	22.994
Food	1.410	1.187	1.063	1.376	2.539	2.521	1.921	0.986	0.523	0.522	4.510	2.162	4.497	5.293
Textiles	0.996	3.531	2.764	4.022	2.709	5.011	4.611	5.630	4.375	4.337	3.973	5.146	3.514	6.297
Apparel	0.000	0.000	0.000	0.000	0.000	0.193	0.448	0.000	0.000	0.000	0.022	0.000	0.000	0.738
Footwear	1.529	1.529	1.529	1.529	1.555	1.556	1.513	0.000	0.000	0.000	0.000	0.062	0.000	0.000
Chemicals	4.533	4.973	5.571	5.642	5.830	6.564	5.630	5.394	4.135	2.965	2.254	1.896	1.898	1.932
Industrial chemicals	0.102	0.106	0.114	0.000	0.110	0.107	0.107	0.240	0.115	0.119	0.047	0.162	0.184	0.150
Other chemicals	4.431	4.867	5.457	5.642	5.720	6.457	5.523	5.154	4.020	2.846	2.207	1.734	1.714	1.782
Rubber	1.780	1.850	1.739	2.651	3.226	3.437	1.770	1.543	1.463	1.529	3.632	3.431	3.779	4.480
Plastics	0.301	0.413	0.490	0.533	0.519	0.715	0.727	0.585	0.573	0.603	0.000	0.000	0.000	0.000
Metal products	0.033	0.450	0.450	0.380	0.487	0.527	0.481	0.435	0.523	0.443	0.054	0.055	0.051	0.201
Electric & precision machinery	0.865	3.704	4.392	5.579	7.797	9.701	8.234	6.730	5.086	5.323	4.436	0.000	0.000	0.000
Electric machinery	0.865	3.704	4.392	5.579	7.797	9.701	8.234	6.730	5.086	5.323	4.436	0.000	0.000	0.000
Precision machinery	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Transportation machinery	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Other manufacturing	3.706	3.220	3.126	2.883	1.627	1.626	1.773	1.746	1.676	1.631	1.399	1.001	3.446	4.053
Beverages	0.000	0.000	0.000	0.000	0.100	0.100	0.096	0.095	0.424	0.424	0.202	0.183	0.000	0.000
Tobacco	2.756	2.542	2.422	2.297	0.846	0.827	0.820	0.764	0.668	0.668	0.675	0.719	0.526	0.516
Leather	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.054	0.052	0.052	0.000
Wood	0.288	0.032	0.032	0.032	0.032	0.000	0.163	0.269	0.207	0.209	0.218	0.023	2.749	3.094
Furniture	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.096	0.208
Paper	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Printing, publishing	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Oil refineries & gas	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Other oil & coal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Porcelain	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.024	0.023	0.000
Glass	0.190	0.159	0.147	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.052
Cement	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Clay	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Other nonmetallic mineral prod.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Basic metals	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.022
Iron, steel	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nonferrous metals	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nonelectrical machinery	0.305	0.310	0.331	0.345	0.400	0.413	0.390	0.310	0.068	0.042	0.000	0.000	0.000	0.161
Miscellaneous	0.167	0.177	0.194	0.209	0.249	0.286	0.304	0.308	0.309	0.288	0.250	0.000	0.000	0.000

Appendix Table 2c (continued)

Industry	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
All manufacturing	25.139	55.676	73.574	98.699	127.699	170.858	207.387	245.006	293.179	354.647	407.337	466.792	483.725
Food	4.993	5.391	6.231	6.858	3.668	7.109	13.433	9.313	12.240	11.979	14.401	16.213	18.646
Textiles	7.297	12.432	10.082	9.636	15.627	19.273	18.844	23.264	26.936	35.037	46.276	45.151	38.715
Apparel	2.413	6.752	13.807	18.244	24.682	31.085	36.089	48.160	48.652	53.136	62.566	82.724	80.061
Footwear	0.538	5.212	20.728	28.303	28.540	27.828	30.420	40.804	52.952	49.817	40.178	35.686	50.585
Chemicals	1.648	1.704	1.134	1.208	1.114	2.744	5.210	6.914	8.454	15.257	16.893	22.055	36.936
Industrial chemicals	0.149	0.095	0.211	0.109	0.355	1.588	2.029	2.616	3.019	6.409	8.403	11.911	27.139
Other chemicals	1.499	1.609	0.923	1.099	0.759	1.156	3.181	4.298	5.435	8.848	8.490	10.144	9.797
Rubber	4.218	17.493	7.606	4.624	5.482	6.401	7.397	6.700	8.046	7.092	7.522	10.881	7.242
Plastics	0.154	0.144	0.620	1.181	1.486	5.218	6.705	5.021	5.870	8.669	7.981	15.036	15.003
Metal products	0.205	0.440	0.311	0.762	2.561	4.538	5.079	6.608	7.973	12.062	11.176	14.578	16.389
Electric & precision machinery	0.000	0.336	2.490	9.618	16.215	34.799	46.472	55.029	67.953	86.896	110.066	128.178	105.238
Electric machinery	0.000	0.336	2.430	9.301	15.506	32.757	43.333	51.207	63.660	83.107	104.077	119.158	103.067
Precision machinery	0.000	0.000	0.060	0.317	0.709	2.042	3.139	3.822	4.293	3.789	5.989	9.020	2.171
Transportation machinery	0.000	0.000	0.000	1.283	1.640	2.827	3.737	4.012	5.821	7.043	12.236	12.893	8.613
Other manufacturing	3.673	5.772	10.565	16.982	26.684	29.036	34.001	39.181	48.282	67.659	78.042	83.397	106.297
Beverages	0.090	0.000	0.000	0.121	0.322	0.283	1.505	2.046	2.567	1.743	1.791	2.139	2.663
Tobacco	0.511	0.501	0.621	0.681	0.624	0.868	1.518	1.667	2.206	2.470	2.055	1.045	1.772
Leather	0.000	0.000	0.000	1.170	1.447	0.573	0.512	1.491	2.335	4.971	2.791	2.455	1.166
Wood	3.006	0.905	2.188	3.601	5.492	4.827	5.576	6.420	8.735	8.579	8.676	11.366	18.495
Furniture	0.000	0.000	0.646	0.611	1.398	2.024	3.515	4.534	6.749	7.966	11.876	15.661	11.842
Paper	0.000	0.163	0.172	0.182	0.000	0.198	0.280	2.663	2.056	2.542	2.806	2.256	2.935
Printing, publishing	0.000	0.000	0.000	0.000	0.020	0.000	0.000	0.000	0.000	0.107	1.791	1.109	0.425
Oil refineries & gas	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.231	0.535	0.623	0.725	0.246
Other oil & coal	0.000	0.000	0.000	0.050	0.053	0.511	0.496	0.476	0.348	0.397	0.175	0.149	0.105
Porcelain	0.043	0.032	0.037	0.000	0.680	0.680	0.670	0.000	0.000	0.319	1.301	1.397	1.554
Glass	0.000	0.000	0.000	0.000	0.000	0.072	0.068	0.074	0.478	0.000	0.000	0.527	5.274
Cement	0.000	0.000	0.000	0.000	0.000	0.000	0.020	0.029	0.336	1.074	1.189	1.515	1.211
Clay	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.272	0.729
Other nonmetallic mineral prod.	0.000	0.000	0.000	0.000	0.000	0.380	0.000	0.000	0.000	0.200	0.000	0.038	0.025
Basic metals	0.023	2.281	2.363	2.484	2.791	0.655	1.314	2.235	3.190	3.530	5.020	6.178	4.981
Iron, steel	-	0.000	0.000	0.222	0.183	0.230	0.461	0.643	1.465	1.825	2.771	4.309	2.712
Nonferrous metals	-	2.281	2.363	2.262	2.608	0.425	0.853	1.592	1.725	1.705	2.249	1.869	2.269
Nonelectrical machinery	0.000	0.081	0.067	0.260	0.923	1.362	2.024	2.720	3.373	7.079	6.480	5.938	7.274
Miscellaneous	0.000	1.809	4.471	7.822	12.934	16.603	16.503	14.826	15.678	26.147	31.468	30.627	37.600

Notes: - = not available.

Sources: Authors compilations from BPS (various years a).

**Appendix Table 2d: Employment of Local Manufacturing Establishments Reporting Positive Employment and Value Added by Industry (raw data, thousands)**

Industry	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
All manufacturing	642.227	637.310	679.392	712.400	762.695	852.275	856.457	906.107	934.533	1,039.457	1,500.566	1,506.371	1,594.829	1,861.450
Food	132.044	126.791	133.795	136.731	137.811	147.834	147.327	147.595	156.713	160.085	289.168	292.601	308.646	339.027
Textiles	173.341	170.589	170.537	172.865	181.040	195.358	199.183	196.286	190.479	204.633	260.335	268.091	286.431	314.007
Apparel	3.097	4.352	4.983	5.558	8.101	15.292	18.936	22.700	27.341	34.322	66.937	63.213	75.649	101.752
Footwear	3.728	4.300	4.555	4.010	4.452	6.177	6.011	4.848	4.782	5.250	7.457	7.219	7.237	12.496
Chemicals	33.935	30.879	35.310	37.089	40.650	46.262	48.672	52.337	56.789	60.252	83.785	85.267	87.724	96.681
Industrial chemicals	9.112	7.929	9.003	9.986	12.005	13.043	14.627	15.467	17.966	20.179	32.578	33.222	32.736	36.013
Other chemicals	24.823	22.950	26.307	27.103	28.645	33.219	34.045	36.870	38.823	40.073	51.207	52.045	54.988	60.668
Rubber	7.596	7.660	7.828	23.939	29.904	32.360	32.470	32.488	33.112	34.963	87.080	78.186	81.900	106.726
Plastics	10.851	12.497	12.792	13.328	14.604	16.501	17.296	21.237	26.593	28.387	47.206	48.271	50.841	61.166
Metal products	19.221	23.139	24.666	25.484	27.977	31.576	33.727	34.027	34.282	33.632	49.617	49.029	51.158	56.497
Electric & precision machinery	8.549	10.570	11.825	13.498	16.354	23.197	25.495	24.526	26.211	26.190	33.072	33.492	34.134	39.400
Electric machinery	7.935	9.973	11.068	12.773	15.563	22.202	24.472	23.576	25.218	24.736	31.038	31.225	31.798	36.654
Precision machinery	0.614	0.597	0.757	0.725	0.791	0.995	1.023	0.950	0.993	1.454	2.034	2.267	2.336	2.746
Transportation machinery	22.779	21.842	21.846	22.731	24.660	25.367	30.259	38.371	38.493	37.143	50.458	57.993	58.329	62.657
Other manufacturing	227.086	224.691	251.255	257.167	277.142	312.351	297.081	331.692	339.738	414.600	525.451	523.009	552.780	671.041
Beverages	4.520	3.104	3.374	3.386	3.753	4.377	4.193	4.532	5.415	5.729	8.383	8.712	8.738	10.503
Tobacco	125.052	121.896	141.199	142.305	139.379	153.844	131.794	134.825	140.427	140.518	179.098	175.614	176.253	177.485
Leather	1.836	1.905	2.360	2.388	2.580	3.060	2.782	2.858	3.086	3.189	4.301	3.980	4.272	5.754
Wood	24.506	27.478	30.506	32.415	41.645	54.719	55.949	78.707	78.554	150.968	148.651	149.466	175.522	253.991
Furniture	4.992	4.917	4.927	4.837	5.130	5.291	4.969	5.260	4.796	5.362	12.359	12.606	13.764	20.691
Paper	6.332	7.104	7.621	7.848	9.683	10.087	11.664	12.693	12.552	12.744	19.694	22.788	24.069	27.475
Printing, publishing	16.397	14.879	15.889	16.685	17.473	19.452	20.272	21.661	21.207	20.752	33.959	36.231	34.280	36.789
Oil refineries & gas	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Other oil & coal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Porcelain	1.001	2.017	2.347	2.533	4.269	5.789	6.311	7.043	8.038	8.968	10.960	10.541	11.052	14.142
Glass	5.247	5.286	5.474	6.744	5.984	6.799	6.956	7.525	7.256	6.960	7.688	7.226	9.698	10.715
Cement	12.722	12.689	13.367	13.905	15.398	16.846	18.486	19.460	21.367	20.596	31.977	26.688	28.540	30.437
Clay	8.374	7.422	7.428	7.186	8.120	8.134	8.738	9.388	8.994	8.456	23.467	22.253	20.067	21.839
Other nonmetallic mineral prod.	1.844	1.674	2.023	2.321	2.829	2.867	2.737	3.319	3.098	3.507	7.770	7.127	7.480	13.313
Basic metals	1.981	2.516	2.619	2.459	6.492	7.012	7.395	8.107	8.436	9.584	12.610	13.882	13.747	15.417
Iron, steel	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nonferrous metals	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nonelectrical machinery	8.375	8.270	8.182	8.056	9.898	9.754	10.039	10.447	10.319	10.351	13.976	13.745	12.957	13.757
Miscellaneous	3.907	3.534	3.939	4.099	4.509	4.320	4.796	5.867	6.193	6.916	10.558	12.150	12.341	18.733

Appendix Table 2d (continued)

Industry	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
All manufacturing	2,061.408	2,386.397	2,643.445	2,838.617	3,026.498	3,158.063	3,441.106	3,424.419	3,234.745	3,289.226	3,355.153	3,434.457	3,444.502
Food	342.798	374.351	414.361	435.993	482.940	457.618	478.574	509.439	484.086	519.741	490.782	514.285	497.412
Textiles	356.343	368.520	425.624	476.393	504.672	532.529	542.605	543.670	533.014	507.610	533.440	558.266	519.169
Apparel	121.805	225.340	245.219	267.443	284.962	285.115	291.706	300.374	301.294	304.463	325.425	361.059	375.124
Footwear	18.784	38.923	83.194	101.636	122.060	136.700	148.428	158.117	150.464	137.163	147.806	146.689	127.886
Chemicals	99.228	109.605	113.920	121.770	132.251	138.935	146.872	146.332	141.140	148.587	142.173	142.276	147.578
Industrial chemicals	38.020	42.198	42.471	44.387	50.216	52.108	56.894	55.560	49.350	62.787	58.490	55.270	57.972
Other chemicals	61.208	67.407	71.449	77.383	82.035	86.827	89.978	90.772	91.790	85.800	83.683	87.006	89.606
Rubber	114.095	133.969	109.914	130.124	104.378	110.348	107.972	107.483	88.777	100.418	105.953	110.973	117.957
Plastics	69.092	79.475	100.539	88.382	113.292	125.357	138.237	152.745	146.790	125.682	141.065	143.868	160.972
Metal products	60.017	68.095	81.183	95.597	96.695	98.693	112.974	120.700	106.737	90.495	97.392	96.056	98.854
Electric & precision machinery	44.598	48.808	54.655	60.021	64.910	75.769	87.640	82.183	76.462	71.559	94.465	88.236	83.361
Electric machinery	41.189	45.696	51.090	54.616	60.042	69.332	80.004	74.273	68.896	63.049	82.471	77.555	74.412
Precision machinery	3.409	3.112	3.565	5.405	4.868	6.437	7.636	7.910	7.566	8.510	11.994	10.681	8.949
Transportation machinery	65.921	71.961	78.479	79.253	83.681	92.643	98.568	99.511	86.804	71.425	69.034	71.304	72.772
Other manufacturing	768.727	867.350	936.357	982.005	1,036.657	1,104.356	1,287.530	1,203.865	1,119.177	1,212.083	1,207.618	1,201.445	1,243.417
Beverages	10.265	10.196	12.922	12.979	16.756	17.459	19.982	21.581	20.730	20.979	19.372	17.596	18.637
Tobacco	210.107	203.455	183.405	182.865	184.265	214.191	343.857	220.965	156.991	235.639	241.695	243.914	256.674
Leather	6.788	12.814	18.395	16.086	17.613	17.536	19.709	22.484	19.508	19.485	14.660	13.375	20.267
Wood	292.070	302.478	317.612	339.919	346.807	359.332	358.412	364.775	362.002	359.016	369.919	346.582	357.953
Furniture	24.947	74.837	96.305	98.666	116.955	125.034	136.882	146.874	143.976	161.315	164.741	165.555	159.522
Paper	30.440	36.102	51.458	63.001	64.626	66.958	67.870	70.130	70.977	97.508	79.049	86.934	93.789
Printing, publishing	37.583	43.183	42.722	43.966	47.070	51.711	57.661	67.677	60.169	51.698	51.765	55.947	45.308
Oil refineries & gas	0.000	0.000	0.000	0.552	0.000	0.340	0.581	0.709	0.390	0.517	1.360	0.270	0.393
Other oil & coal	0.000	0.693	1.449	0.740	0.443	0.493	0.925	1.347	1.463	2.757	2.806	2.364	2.175
Porcelain	15.664	19.741	25.973	27.522	32.567	34.462	38.191	34.498	30.886	29.584	31.768	33.263	28.092
Glass	11.866	14.133	19.097	16.757	19.171	18.734	18.967	19.538	19.483	22.627	24.637	23.670	21.385
Cement	30.874	31.875	34.761	33.681	37.380	38.526	43.041	44.638	43.350	36.234	35.790	32.736	36.963
Clay	21.686	22.464	23.124	27.032	29.567	30.635	39.509	45.704	43.734	38.817	38.798	36.852	37.869
Other nonmetallic mineral prod.	22.427	17.972	18.312	17.442	17.677	18.444	22.057	24.941	26.244	19.739	17.676	18.770	20.683
Basic metals	16.885	24.751	29.959	32.121	34.821	38.213	38.502	39.413	34.794	34.973	35.352	41.833	38.415
Iron, steel	-	20.192	23.895	25.518	27.275	29.383	27.799	28.031	23.218	26.109	26.502	30.185	26.906
Nonferrous metals	-	4.559	6.064	6.603	7.546	8.830	10.703	11.382	11.576	8.864	8.850	11.648	11.509
Nonelectrical machinery	16.419	26.789	28.543	29.808	29.600	29.751	34.579	34.988	35.951	28.127	27.607	27.899	29.717
Miscellaneous	20.706	25.867	32.320	38.868	41.339	42.537	46.805	43.603	48.529	53.068	50.623	53.885	75.575

Notes: - = not available.

Sources: Authors compilations from BPS (various years a).

Appendix Table 2c: Employment of All Manufacturing Establishments Reporting Positive Employment and Value Added by Industry (raw data, thousands)

Industry	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
All manufacturing	698.244	721.228	772.337	812.966	869.995	976.579	989.226	1,043.196	1,072.021	1,172.870	1,662.181	1,669.828	1,765.029	2,043.637
Food	136.227	131.474	138.841	142.408	144.486	155.711	155.815	155.002	162.257	165.621	303.393	309.273	328.618	359.983
Textiles	186.350	199.812	201.252	204.479	211.064	228.036	234.779	233.139	226.454	240.393	298.652	309.647	326.139	355.158
Apparel	3.097	4.352	4.983	5.558	8.101	15.784	19.795	24.058	29.414	35.874	69.692	66.098	78.951	107.476
Footwear	5.257	5.829	6.084	5.539	6.007	7.733	7.524	6.355	6.280	6.818	8.910	8.695	8.704	15.833
Chemicals	40.626	38.847	44.719	47.084	51.620	59.388	62.244	70.049	72.909	75.768	105.062	104.510	105.533	114.565
Industrial chemicals	9.596	8.562	10.010	10.939	13.280	14.957	16.590	20.494	20.706	23.070	36.932	36.318	36.201	39.495
Other chemicals	31.030	30.285	34.709	36.145	38.340	44.431	45.654	49.555	52.203	52.698	68.130	68.192	69.332	75.070
Rubber	9.890	10.581	10.720	29.220	35.611	38.605	38.429	38.100	38.264	40.008	94.175	90.631	96.117	119.828
Plastics	12.219	14.204	14.565	15.178	16.572	18.862	20.487	24.313	29.267	31.072	49.394	50.278	53.097	62.677
Metal products	24.539	28.815	31.715	33.456	36.235	41.902	44.037	44.289	45.062	43.083	59.411	59.128	61.141	67.997
Electric & precision machinery	14.449	19.331	21.346	24.250	29.363	38.296	39.801	37.822	38.174	38.087	45.434	40.823	42.634	48.351
Electric machinery	13.835	18.734	20.589	23.525	28.572	37.301	38.778	36.872	37.181	36.633	43.276	38.435	39.899	45.477
Precision machinery	0.614	0.597	0.757	0.725	0.791	0.995	1.023	0.950	0.993	1.454	2.158	2.388	2.735	2.874
Transportation machinery	23.246	23.561	23.986	24.913	28.197	30.440	35.949	44.535	46.097	42.890	57.618	65.027	66.283	69.009
Other manufacturing	242.344	244.422	274.126	280.881	302.739	341.822	330.366	365.534	377.843	453.256	570.440	565.718	597.812	722.760
Beverages	5.525	5.297	5.834	5.810	6.187	7.382	7.366	7.429	8.295	8.607	11.439	11.836	11.766	13.227
Tobacco	129.304	127.575	146.966	147.015	143.772	158.201	135.510	137.309	142.819	142.855	182.907	178.488	180.744	183.542
Leather	2.021	2.014	2.477	2.505	2.615	3.095	2.817	2.890	3.086	3.189	4.355	4.032	4.324	5.754
Wood	27.928	30.705	34.494	36.536	45.904	61.009	65.881	91.385	92.612	166.273	169.253	168.595	196.412	276.823
Furniture	4.992	5.062	5.087	5.023	5.317	5.618	5.325	5.504	5.090	5.651	12.630	12.857	14.446	21.918
Paper	7.464	8.133	8.815	9.067	11.580	11.999	13.236	14.482	14.224	13.755	21.582	25.178	26.469	30.472
Printing, publishing	16.937	15.393	16.477	17.549	18.268	20.239	21.213	22.769	22.292	21.899	35.098	37.353	35.494	37.922
Oil refineries & gas	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Other oil & coal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Porcelain	1.834	2.803	3.122	3.304	5.289	6.818	7.388	8.201	9.437	10.341	12.334	11.883	12.593	16.187
Glass	6.470	6.759	7.227	8.752	8.086	8.897	9.498	10.185	10.073	9.769	10.530	10.075	10.780	11.749
Cement	13.733	14.520	15.992	16.916	18.676	20.542	21.941	22.023	24.437	23.588	34.632	29.456	31.435	33.833
Clay	8.374	7.422	7.428	7.186	8.120	8.134	8.738	9.388	8.994	8.456	23.644	22.409	20.204	21.966
Other nonmetallic mineral prod.	1.844	1.674	2.023	2.321	2.829	2.867	2.737	3.319	3.098	3.507	7.770	7.127	7.480	13.313
Basic metals	2.268	3.583	3.864	3.927	8.247	8.954	9.483	10.066	12.861	13.973	15.647	16.833	16.619	19.460
Iron, steel	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nonferrous metals	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nonelectrical machinery	9.576	9.341	9.686	9.829	11.891	12.204	12.658	13.007	12.723	12.787	16.604	16.307	15.496	16.779
Miscellaneous	4.074	4.141	4.634	5.141	5.958	5.863	6.575	7.577	7.802	8.606	12.015	13.289	13.550	19.815

Appendix Table 2e (continued)

Industry	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
All manufacturing	2,259.170	2,661.019	2,993.979	3,312.882	3,574.809	3,813.670	4,174.142	4,214.318	4,041.758	4,123.611	4,234.983	4,366.816	4,385.913
Food	361.924	396.488	441.838	470.243	516.740	500.727	524.943	560.961	534.079	577.679	548.126	570.934	555.991
Textiles	397.691	414.896	479.025	544.984	582.197	611.291	625.646	631.645	624.991	600.360	639.768	663.446	606.402
Apparel	129.480	243.142	277.472	319.031	351.959	358.115	373.310	395.017	395.244	401.200	436.256	484.747	497.941
Footwear	25.224	59.551	129.864	193.445	231.135	265.538	291.686	301.748	285.103	261.179	263.073	260.457	246.571
Chemicals	118.056	134.970	137.425	148.617	160.673	169.490	184.560	186.296	182.457	192.618	190.890	195.170	213.586
Industrial chemicals	41.307	50.382	50.537	54.088	60.241	63.174	70.584	70.178	66.353	81.914	80.416	79.938	99.791
Other chemicals	76.749	84.588	86.888	94.529	100.432	106.316	113.976	116.118	116.104	110.704	110.474	115.232	113.795
Rubber	128.265	165.938	134.717	148.375	121.634	131.138	127.565	126.816	109.016	123.612	128.445	136.960	150.208
Plastics	70.690	82.133	104.094	93.781	120.077	141.867	158.006	169.783	164.011	141.746	155.867	165.955	187.928
Metal products	72.756	80.708	95.636	117.512	118.106	130.643	147.814	163.464	141.735	121.677	128.551	129.570	135.586
Electric & precision machinery	56.520	63.192	77.288	93.601	113.574	153.806	179.176	181.945	193.958	200.677	242.240	254.893	230.026
Electric machinery	52.986	59.836	73.455	85.946	107.260	144.217	164.459	166.395	177.387	185.266	222.909	234.125	216.695
Precision machinery	3.534	3.356	3.833	7.655	6.314	9.589	14.717	15.550	16.571	15.411	19.331	20.768	13.331
Transportation machinery	75.701	86.610	99.087	97.549	100.563	115.476	128.806	132.664	113.054	101.687	108.592	117.443	116.365
Other manufacturing	822.863	933.391	1,017.533	1,085.744	1,158.151	1,235.579	1,432.630	1,363.979	1,298.110	1,401.176	1,393.175	1,387.241	1,445.309
Beverages	12.482	12.655	16.593	16.881	21.334	22.377	24.813	25.530	25.682	24.396	23.104	23.442	25.269
Tobacco	214.332	205.956	184.598	184.089	185.612	216.029	346.006	223.307	159.911	238.848	244.522	245.626	258.747
Leather	6.914	12.953	20.802	22.105	23.468	20.592	22.126	26.263	26.048	30.598	19.889	17.996	32.785
Wood	317.374	326.296	342.337	370.983	378.920	394.184	393.940	404.751	400.371	395.274	408.083	384.591	396.394
Furniture	26.757	79.886	102.872	103.781	124.125	132.914	144.995	157.480	157.413	175.593	183.795	187.903	177.105
Paper	34.067	43.267	59.049	73.873	74.172	78.660	88.818	94.431	95.003	126.838	99.391	106.751	115.378
Printing, publishing	38.950	43.635	43.380	45.023	49.056	53.801	60.198	70.959	62.948	52.526	53.944	57.448	46.038
Oil refineries & gas	0.000	0.000	0.000	0.552	0.000	0.340	0.581	0.709	0.621	1.052	2.555	1.312	0.639
Other oil & coal	0.000	0.737	1.541	0.882	0.772	1.205	1.622	1.914	2.410	3.758	3.693	3.283	2.599
Porcelain	17.744	23.794	30.962	33.118	38.747	41.513	45.935	41.607	38.228	36.374	39.535	41.967	36.913
Glass	12.341	14.133	19.184	19.074	20.138	19.842	21.305	25.503	23.885	26.818	28.047	26.808	28.870
Cement	34.506	35.398	38.052	38.740	42.591	44.692	49.392	50.452	48.774	41.438	42.211	41.766	43.470
Clay	21.865	22.587	23.124	27.742	30.149	31.215	40.323	46.894	45.772	42.221	41.386	39.890	42.233
Other nonmetallic mineral prod.	22.427	18.235	18.597	18.081	18.381	19.642	22.892	25.852	27.102	20.725	18.419	19.541	21.616
Basic metals	21.223	32.732	37.520	40.043	43.546	46.774	47.644	50.420	47.116	47.355	47.926	52.035	47.688
Iron, steel	-	25.442	27.566	29.568	31.484	33.926	32.506	32.856	29.321	32.257	31.935	36.367	32.986
Nonferrous metals	-	7.290	9.954	10.475	12.062	12.848	15.138	17.564	17.795	15.098	15.991	15.668	14.702
Nonelectrical machinery	19.650	30.568	33.168	35.004	36.338	37.253	43.923	45.365	50.808	44.024	44.426	41.289	45.316
Miscellaneous	22.231	30.559	45.754	55.773	70.802	74.546	78.117	72.542	86.018	93.338	92.249	95.593	124.249

Notes: - = not available.

Sources: Authors compilations from BPS (various years a).

Appendix Table 3a: Value Added of Minority-Foreign Manufacturing Establishments Reporting Positive Employment and Value Added by Industry (raw data, billion rupiah)

Industry	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
All manufacturing	8.50	26.78	45.77	48.79	68.79	116.77	154.73	171.12	202.10	285.22	508.29	632.19	851.24	994.11
Food	0.25	1.40	4.08	3.78	3.62	3.45	3.44	2.86	3.90	9.39	38.01	48.53	107.98	119.58
Textiles	0.64	2.34	1.78	1.94	1.16	3.80	3.30	1.94	3.31	32.27	15.09	29.67	22.77	26.34
Apparel	0.00	0.00	0.00	0.00	0.00	0.70	0.34	0.49	0.68	0.00	0.81	1.07	1.41	4.20
Footwear	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.64
Chemicals	0.11	1.56	1.62	2.31	4.18	11.30	17.37	17.59	18.55	20.86	117.74	125.28	102.51	103.02
Industrial chemicals	0.00	0.00	0.35	0.35	0.50	4.74	10.81	7.42	5.14	5.85	56.67	47.75	49.61	58.81
Other chemicals	0.11	1.56	1.26	1.95	3.68	6.56	6.56	10.17	13.41	15.00	61.07	77.53	52.90	44.21
Rubber	0.25	0.40	0.41	0.83	0.61	2.37	0.65	2.51	1.14	6.20	16.43	13.34	63.56	57.27
Plastics	0.07	0.93	3.40	4.21	1.72	2.20	2.60	1.66	3.14	9.04	2.40	2.77	22.89	25.65
Metal products	1.88	2.18	2.68	4.82	5.17	10.91	12.26	38.98	31.20	22.03	35.02	46.82	94.65	164.20
Electric & precision machinery	0.43	0.37	0.37	1.12	1.57	2.62	5.56	5.34	7.24	8.48	17.30	13.06	24.36	28.21
Electric machinery	0.43	0.37	0.37	1.12	1.57	2.62	5.56	5.34	7.24	8.48	15.59	11.91	23.03	27.02
Precision machinery	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.71	1.15	1.33	1.19	
Transportation machinery	0.18	0.58	1.39	1.52	4.64	6.86	15.53	17.58	15.02	18.63	27.88	35.20	63.06	69.08
Other manufacturing	4.69	17.03	30.04	28.26	46.11	72.57	93.68	82.18	117.92	158.34	237.60	316.44	348.03	394.93
Beverages	0.00	5.63	5.72	0.00	8.56	25.62	0.00	0.00	0.00	26.30	26.66	28.93	45.99	63.87
Tobacco	0.97	1.52	1.98	1.80	0.16	0.57	0.22	0.01	0.00	0.03	0.21	0.86	0.97	5.40
Leather	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wood	0.79	0.98	0.98	1.33	2.16	6.59	25.35	34.53	44.18	46.66	69.50	130.02	162.31	166.50
Furniture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.51	0.59
Paper	0.00	0.00	0.00	0.00	0.92	1.00	1.04	0.52	1.27	1.56	8.88	25.11	76.62	101.25
Printing, publishing	0.03	0.00	0.04	0.07	0.70	0.09	0.34	1.29	0.72	0.66	0.57	2.64	2.53	2.18
Oil refineries & gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other oil & coal	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Porcelain	0.60	0.76	0.59	0.65	1.59	1.85	2.85	2.20	5.86	7.75	5.39	9.10	11.43	11.73
Glass	0.57	1.10	4.64	13.27	14.13	13.45	33.50	26.55	31.10	35.93	82.46	82.43	0.00	0.00
Cement	1.49	6.55	14.53	9.02	14.25	20.04	26.68	4.13	30.69	31.79	25.02	22.86	26.32	29.82
Clay	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other nonmetallic mineral prod.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Basic metals	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.19	0.00	0.00	0.00
Iron, steel	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nonferrous metals	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nonelectrical machinery	0.24	0.48	1.42	2.02	3.52	3.23	3.66	12.94	4.10	7.68	16.73	14.35	21.16	13.58
Miscellaneous	0.00	0.00	0.12	0.10	0.12	0.13	0.04	0.00	0.00	0.00	0.00	0.13	0.19	0.00



Appendix Table 3a (continued)

Industry	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
All manufacturing	2,001.16	2,636.58	2,598.34	3,544.39	5,385.93	7,223.45	8,137.94	11,385.77	6,953.11	14,230.77	17,395.13	25,716.65	32,560.95
Food	195.63	219.98	379.64	404.78	399.16	402.19	339.34	725.93	778.36	2,096.54	1,457.03	1,257.88	1,373.36
Textiles	40.84	38.36	75.47	114.51	216.38	212.58	298.52	465.04	439.33	518.20	488.73	962.62	713.49
Apparel	2.90	8.49	39.90	78.10	220.26	222.64	393.48	449.60	288.08	618.67	1,106.31	598.26	638.78
Footwear	2.44	16.92	23.85	128.34	107.21	99.60	172.98	250.55	220.50	564.06	401.49	1,355.05	666.60
Chemicals	122.87	273.36	368.71	379.46	523.21	791.00	761.76	1,295.29	716.50	2,661.69	2,929.97	2,527.21	1,121.59
Industrial chemicals	69.83	211.92	265.92	233.42	329.17	563.12	422.10	875.34	337.01	2,160.96	1,778.88	1,601.48	909.00
Other chemicals	53.04	61.44	102.79	146.04	194.03	227.88	339.66	419.95	379.49	500.73	1,151.08	925.73	212.59
Rubber	71.69	96.38	118.75	162.47	106.54	101.11	21.32	47.74	94.63	94.10	170.63	153.33	404.84
Plastics	25.81	12.61	12.86	18.75	47.62	49.17	99.01	165.18	247.08	194.13	124.95	134.79	202.97
Metal products	564.32	102.60	119.18	378.21	484.54	531.97	396.75	818.06	447.19	304.97	1,281.66	594.34	448.59
Electric & precision machinery	47.90	81.57	115.52	260.55	196.10	486.22	636.92	319.01	391.24	611.57	913.52	1,053.00	1,985.91
Electric machinery	46.22	77.94	110.86	256.45	190.99	486.22	636.09	311.56	381.15	567.88	913.41	1,052.92	1,985.02
Precision machinery	1.68	3.62	4.66	4.10	5.11	0.00	0.83	7.45	10.09	43.69	0.11	0.08	0.89
Transportation machinery	510.55	925.69	444.34	173.30	1,132.17	1,957.33	1,984.92	2,435.47	712.15	1,861.07	3,938.37	11,421.63	13,919.52
Other manufacturing	416.22	860.64	900.12	1,445.91	1,952.76	2,369.64	3,032.93	4,413.90	2,618.05	4,705.76	4,582.47	5,658.54	11,085.31
Beverages	61.63	63.41	94.78	221.61	172.30	274.14	69.93	67.33	112.87	12.42	43.24	41.72	76.17
Tobacco	9.39	1.43	0.14	0.11	2.15	3.26	0.18	0.00	0.00	0.00	0.32	1.15	0.00
Leather	0.53	0.00	3.61	32.39	3.83	9.46	4.94	4.96	1.50	15.51	20.95	0.00	26.95
Wood	198.35	214.74	283.86	192.70	286.69	369.99	457.40	1,035.54	164.96	232.75	299.76	161.26	315.13
Furniture	1.60	4.66	6.36	3.81	14.38	15.92	1.37	23.26	118.45	285.90	95.58	67.39	46.78
Paper	80.73	262.00	357.11	403.90	309.51	229.45	576.84	585.10	665.49	1,461.83	856.16	976.23	5,629.43
Printing, publishing	2.68	2.26	1.92	9.24	5.43	5.33	13.87	21.33	15.96	21.58	9.24	10.66	5.33
Oil refineries & gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.68	0.52	0.00
Other oil & coal	0.00	7.47	7.43	11.97	8.34	0.24	0.24	1.27	0.13	0.14	0.99	4.60	3.76
Porcelain	15.65	30.46	44.62	57.70	64.95	85.59	90.75	165.03	224.81	318.45	256.93	332.65	140.25
Glass	0.00	0.00	0.34	137.49	4.34	2.17	85.18	546.73	161.87	88.97	630.39	936.04	930.54
Cement	33.40	36.19	33.65	165.88	258.27	325.88	312.66	418.28	232.97	454.00	710.54	1,299.75	1,967.96
Clay	0.00	0.00	0.00	2.55	2.55	3.24	9.93	19.35	18.49	3.34	41.12	93.45	16.68
Other nonmetallic mineral prod.	0.00	1.54	2.41	0.48	0.95	2.93	3.90	0.00	0.00	2.39	10.04	11.31	4.44
Basic metals	0.00	222.82	40.05	139.46	742.05	940.39	1,269.38	1,327.29	204.91	1,478.00	1,503.90	1,481.64	1,079.99
Iron, steel	-	212.40	31.87	123.95	714.45	919.68	1,252.40	1,314.30	173.68	1,428.23	1,427.15	1,481.30	1,079.99
Nonferrous metals	-	10.42	8.17	15.51	27.59	20.71	16.98	12.98	31.23	49.76	76.76	0.34	0.00
Nonelectrical machinery	12.26	11.39	19.25	54.18	56.40	59.29	102.04	136.42	667.90	164.59	61.02	144.94	636.79
Miscellaneous	0.00	2.29	4.59	12.43	20.62	42.38	34.32	62.02	27.73	165.90	35.60	95.23	205.11

Notes: - = not available.

Sources: Authors compilations from BPS (various years a).

**Appendix Table 3b: Value Added of Majority-Foreign Manufacturing Establishments Reporting Positive Employment and Value Added by Industry (raw data, trillion rupiah)**

Industry	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
All manufacturing	62.96	114.95	132.09	177.06	321.45	472.00	651.66	705.35	819.00	907.43	1,123.23	1,313.45	1,591.77	1,987.55
Food	5.33	6.64	4.73	10.25	12.50	27.06	41.58	37.25	66.73	62.04	78.52	91.48	55.05	102.28
Textiles	13.05	36.46	31.96	39.44	58.57	73.57	83.96	109.66	97.90	75.81	218.61	251.72	286.94	315.32
Apparel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.69	3.20	4.77	1.69	2.26	2.17	2.84
Footwear	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.50	18.54	17.04	23.27	25.58	26.42	10.93
Chemicals	6.48	9.18	13.09	12.34	18.11	40.16	105.66	120.58	126.28	136.79	136.90	155.43	208.77	241.13
Industrial chemicals	0.60	3.16	3.07	4.67	4.77	6.91	17.49	23.13	32.15	33.92	23.66	30.49	29.66	54.69
Other chemicals	5.88	6.02	10.03	7.67	13.34	33.25	88.17	97.45	94.13	102.88	113.24	124.93	179.11	186.43
Rubber	0.05	3.39	0.47	4.19	5.35	5.85	33.46	24.82	22.10	23.11	10.39	52.69	37.91	20.14
Plastics	0.58	0.58	1.49	1.04	3.90	2.63	3.29	8.77	7.74	11.71	120.16	9.63	19.94	5.83
Metal products	7.65	8.26	9.47	13.93	17.74	26.59	28.58	34.72	40.58	58.44	55.04	43.15	89.51	120.31
Electric & precision machinery	7.04	9.77	16.07	15.04	21.94	60.21	64.34	81.83	60.11	61.75	75.17	99.71	105.26	86.47
Electric machinery	7.04	9.77	16.07	15.04	21.94	60.21	64.34	81.83	60.11	61.75	75.17	99.71	105.26	85.29
Precision machinery	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.18
Transportation machinery	0.50	2.09	1.99	2.22	6.86	24.08	26.49	38.84	36.51	36.08	68.15	75.58	89.09	185.36
Other manufacturing	22.27	38.58	52.82	78.60	176.50	211.85	264.31	240.69	339.29	419.87	335.32	506.24	670.69	896.94
Beverages	6.22	10.30	15.06	19.36	16.88	13.37	52.07	67.73	62.42	35.63	48.37	47.60	46.15	46.27
Tobacco	6.00	6.04	5.59	4.88	75.70	94.10	97.62	90.77	88.85	97.26	74.31	70.69	70.27	71.75
Leather	0.00	0.10	0.07	0.10	0.07	0.08	0.08	0.09	0.00	0.00	0.00	0.00	0.00	0.00
Wood	3.24	2.98	3.74	5.18	11.11	13.46	13.33	15.05	18.68	21.45	26.08	42.98	29.68	36.32
Furniture	0.00	0.13	0.08	0.25	0.32	0.48	0.61	0.59	0.79	0.77	1.18	2.30	0.92	1.62
Paper	2.35	2.66	3.41	2.86	5.04	3.97	2.22	4.11	5.27	2.55	6.93	16.94	4.39	49.41
Printing, publishing	1.58	1.82	1.82	2.37	2.49	3.24	2.19	2.88	4.91	5.87	6.55	7.03	10.77	22.51
Oil refineries & gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other oil & coal	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Porcelain	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.64
Glass	0.63	1.02	0.43	0.60	0.69	0.90	2.61	0.31	6.14	8.84	8.07	6.49	11.43	5.87
Cement	0.94	8.97	18.42	32.94	41.01	41.25	49.58	17.23	16.09	25.28	67.23	64.09	84.07	48.86
Clay	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.96	1.92	1.49	1.71
Other nonmetallic mineral prod.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Basic metals	0.41	2.32	1.33	1.61	13.19	22.67	23.93	20.33	113.73	188.35	64.29	222.49	368.21	560.00
Iron, steel	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nonferrous metals	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nonelectrical machinery	0.91	1.23	1.43	5.64	7.33	12.49	15.58	15.01	16.66	23.45	17.68	10.27	29.19	45.37
Miscellaneous	0.00	1.01	1.44	2.81	2.66	5.85	4.49	6.60	5.76	10.43	12.68	13.43	14.13	6.62

Appendix Table 3b (continued)

Industry	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
All manufacturing	2,160.63	2,251.46	3,340.08	5,413.02	5,378.97	7,453.63	9,114.49	11,936.24	13,557.44	23,177.50	23,350.11	25,586.17	23,703.21
Food	59.51	62.07	122.37	237.81	295.40	441.36	415.31	462.68	1,242.22	1,937.31	1,939.55	3,120.34	2,670.08
Textiles	494.21	312.14	432.51	656.15	630.13	911.68	948.98	1,464.04	1,625.81	4,024.81	3,583.91	3,156.71	1,654.31
Apparel	20.20	24.60	54.97	190.43	189.02	206.90	122.01	139.01	283.99	511.78	644.07	331.37	310.00
Footwear	37.59	88.76	74.70	322.65	371.93	470.61	476.42	667.20	746.65	1,566.81	1,205.75	942.62	824.66
Chemicals	269.81	615.16	894.50	1,309.51	1,312.53	1,499.03	1,784.99	2,510.94	2,778.19	5,413.85	6,148.59	5,540.24	3,821.04
Industrial chemicals	42.08	329.78	511.75	1,026.60	630.21	660.48	874.44	1,597.99	1,495.84	3,896.26	4,054.87	3,626.18	2,285.36
Other chemicals	227.73	285.38	382.75	282.90	682.32	838.54	910.56	912.95	1,282.35	1,517.60	2,093.71	1,914.06	1,535.67
Rubber	34.44	46.43	99.99	83.82	148.22	212.20	285.08	461.24	350.56	426.08	829.53	881.64	1,152.17
Plastics	7.45	15.45	45.21	51.88	38.17	96.09	122.44	105.27	208.72	297.79	305.37	356.63	198.03
Metal products	174.28	127.69	179.46	385.17	367.30	428.40	819.37	1,044.72	620.67	1,178.81	1,807.22	3,381.00	1,127.53
Electric & precision machinery	153.93	219.60	248.10	277.33	357.32	555.51	568.89	873.18	1,191.42	1,133.71	888.04	1,402.25	3,425.29
Electric machinery	153.09	218.81	247.69	260.74	351.64	530.80	512.74	799.96	976.14	928.47	846.20	1,366.13	3,388.40
Precision machinery	0.84	0.79	0.41	16.59	5.68	24.71	56.14	73.22	215.28	205.24	41.84	36.12	36.89
Transportation machinery	152.46	184.82	232.89	551.37	219.75	517.23	563.74	670.80	1,047.93	1,478.07	1,597.01	1,900.20	1,361.47
Other manufacturing	756.76	554.74	955.39	1,346.90	1,449.22	2,114.62	3,007.26	3,537.16	3,461.28	5,208.47	4,401.06	4,573.16	7,158.65
Beverages	49.95	60.99	53.20	48.35	78.19	82.25	188.70	257.91	206.54	11.57	39.84	285.38	135.68
Tobacco	69.26	84.43	110.77	143.21	183.19	311.38	321.72	414.86	468.24	1,011.88	1,336.85	1,394.83	1,526.33
Leather	0.00	0.09	10.51	13.67	59.26	7.94	48.36	53.67	97.11	90.38	99.44	99.55	103.28
Wood	70.80	36.45	18.51	219.33	187.28	187.74	201.66	386.89	609.14	776.76	739.80	343.37	797.97
Furniture	4.65	16.71	38.01	27.35	41.16	68.56	87.49	59.35	66.26	47.96	67.67	39.03	44.98
Paper	46.96	75.41	76.64	91.59	63.36	328.01	397.64	495.83	290.87	178.58	597.01	662.44	2,391.15
Printing, publishing	3.88	0.66	2.15	11.53	99.37	117.51	144.64	196.21	189.63	0.00	0.00	0.00	0.00
Oil refineries & gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.27	8.13	0.00
Other oil & coal	0.00	0.00	0.00	0.00	0.00	0.93	1.30	0.00	0.71	6.29	17.77	12.26	0.56
Porcelain	0.74	15.91	15.95	9.13	17.80	19.91	21.97	18.79	34.10	83.55	130.92	88.77	97.55
Glass	3.13	0.00	0.00	0.00	7.00	15.40	2.13	8.10	1.13	519.90	7.23	1.53	16.08
Cement	49.27	99.21	121.57	203.69	143.39	32.65	136.20	157.73	226.78	120.10	107.07	110.99	239.97
Clay	1.07	2.48	0.00	4.02	0.00	0.00	0.00	6.46	117.00	203.77	98.33	132.77	15.42
Other nonmetallic mineral prod.	0.00	9.78	3.95	7.41	20.56	6.03	6.66	3.92	16.01	88.80	43.98	22.89	7.24
Basic metals	392.23	78.21	320.14	364.64	309.80	661.29	1,126.70	1,054.14	719.02	931.45	634.63	460.13	744.36
Iron, steel	-	70.36	176.87	59.92	233.48	195.04	393.80	237.81	363.11	116.08	236.39	147.14	363.72
Nonferrous metals	-	7.85	143.27	304.71	76.32	466.25	732.90	816.33	355.92	815.37	398.24	312.99	380.64
Nonelectrical machinery	47.87	60.02	149.92	118.87	117.69	204.42	276.13	345.60	201.10	839.36	342.44	734.86	899.67
Miscellaneous	16.93	14.41	34.06	84.10	121.16	70.61	45.97	77.66	217.64	298.13	137.82	176.22	138.42

Notes: - = not available.

Sources: Authors compilations from BPS (various years a).

Appendix Table 3c: Value Added of Heavily-Foreign Manufacturing Establishments Reporting Positive Employment and Value Added by Industry (raw data, trillion rupiah)

Industry	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
All manufacturing	64.16	91.57	119.23	141.53	116.40	181.82	105.26	106.18	105.18	113.08	119.71	94.81	139.94	220.33
Food	3.33	8.54	14.44	16.56	22.64	21.54	13.49	5.25	0.27	0.71	21.13	13.89	17.43	29.82
Textiles	1.63	2.67	1.41	3.49	4.75	8.64	8.56	15.51	9.62	16.10	11.99	18.20	22.98	15.73
Apparel	0.00	0.00	0.00	0.00	0.00	0.15	0.25	0.00	0.00	0.00	0.02	0.00	0.00	0.53
Footwear	7.60	6.08	6.08	5.56	10.61	11.64	5.47	0.00	0.00	0.00	0.00	1.16	0.00	0.00
Chemicals	9.09	21.00	32.05	35.98	24.94	74.62	34.78	32.81	30.30	26.91	12.95	32.13	29.65	49.55
Industrial chemicals	0.32	0.60	2.39	0.00	0.45	0.77	0.77	1.58	4.77	3.49	1.41	10.53	6.69	20.74
Other chemicals	8.77	20.40	29.66	35.98	24.49	73.85	34.01	31.23	25.53	23.42	11.54	21.60	22.97	28.81
Rubber	6.09	9.11	10.57	19.56	23.80	20.73	7.00	5.89	6.06	8.66	13.05	11.77	10.80	43.53
Plastics	0.10	0.19	0.24	0.10	0.50	0.54	0.47	0.44	0.99	2.09	0.00	0.00	0.00	0.00
Metal products	0.09	0.89	0.89	0.72	1.91	3.73	3.58	7.29	6.71	8.29	2.15	0.22	0.22	3.40
Electric & precision machinery	2.35	10.38	12.73	13.65	10.80	28.02	20.17	27.67	24.38	19.82	45.64	0.00	0.00	0.00
Electric machinery	2.35	10.38	12.73	13.65	10.80	28.02	20.17	27.67	24.38	19.82	45.64	0.00	0.00	0.00
Precision machinery	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Transportation machinery	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other manufacturing	33.88	32.72	40.82	45.91	16.44	12.22	11.48	11.31	26.84	30.51	12.79	17.45	58.85	77.77
Beverages	0.00	0.00	0.00	0.00	2.37	2.61	2.02	2.88	17.24	19.87	2.27	8.55	0.00	0.00
Tobacco	33.37	32.08	39.94	44.77	12.81	8.36	7.97	6.44	8.64	9.53	4.81	7.92	7.43	8.08
Leather	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.76	0.17	0.06	0.00
Wood	0.06	0.01	0.01	0.01	0.04	0.00	0.08	0.28	0.40	0.51	0.78	0.81	51.09	67.00
Furniture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.26	1.35
Paper	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Printing, publishing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Oil refineries & gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other oil & coal	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Porcelain	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.01	0.00
Glass	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.16
Cement	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Clay	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other nonmetallic mineral prod.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Basic metals	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09
Iron, steel	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nonferrous metals	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nonelectrical machinery	0.40	0.59	0.83	1.10	1.12	1.08	1.32	1.57	0.43	0.48	0.00	0.00	0.00	1.09
Miscellaneous	0.03	0.04	0.05	0.04	0.09	0.16	0.10	0.13	0.12	0.11	0.16	0.00	0.00	0.00

Appendix Table 3c (continued)

Industry	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
All manufacturing	260.20	689.58	595.86	1,289.77	1,305.29	2,135.48	4,243.05	5,524.28	7,660.55	19,428.45	28,300.94	38,870.72	34,740.75
Food	58.72	53.79	29.46	72.21	55.28	70.13	242.20	287.84	535.29	1,808.18	1,309.92	1,349.34	1,602.22
Textiles	52.20	134.15	132.29	46.41	163.74	187.83	203.68	345.88	603.47	1,872.72	3,232.38	2,511.59	1,884.40
Apparel	9.82	34.90	40.84	128.51	155.34	332.78	363.82	512.86	531.55	1,033.99	1,495.54	2,544.62	1,625.22
Footwear	4.70	18.51	72.36	157.36	195.36	291.21	265.12	375.48	408.45	874.40	1,573.40	748.84	2,065.67
Chemicals	43.71	64.49	34.56	39.06	53.93	180.84	239.94	550.08	800.54	2,151.32	3,114.86	4,602.02	3,226.85
Industrial chemicals	23.45	6.02	22.73	0.16	2.93	118.18	140.48	270.30	489.48	1,401.69	2,143.72	3,300.82	1,928.59
Other chemicals	20.26	58.48	11.84	38.90	51.01	62.66	99.46	279.78	311.06	749.63	971.14	1,301.20	1,298.26
Rubber	48.53	100.84	57.68	47.54	72.06	97.78	108.65	74.44	146.96	236.30	391.05	605.74	412.12
Plastics	1.67	0.67	0.66	8.35	29.00	48.24	544.51	76.15	124.78	793.81	552.29	833.55	421.31
Metal products	7.16	10.20	5.44	22.86	55.74	39.73	100.54	169.99	378.19	736.17	766.66	1,099.31	874.35
Electric & precision machinery	0.00	3.17	34.99	351.00	182.92	494.74	1,045.91	1,923.77	2,494.30	5,715.00	9,992.57	17,725.87	12,721.47
Electric machinery	0.00	3.17	34.63	347.41	173.59	477.62	1,024.28	1,895.66	2,441.08	5,530.92	9,481.62	17,247.72	12,337.06
Precision machinery	0.00	0.00	0.36	3.58	9.33	17.13	21.63	28.11	53.22	184.08	510.95	478.15	384.41
Transportation machinery	0.00	0.00	0.00	5.28	6.63	21.78	513.42	70.27	127.59	484.86	1,066.45	2,548.79	2,703.13
Other manufacturing	33.70	268.86	187.58	411.20	335.28	370.40	615.26	1,137.52	1,509.44	3,721.69	4,805.82	4,301.03	7,204.01
Beverages	4.55	0.00	0.00	24.46	30.36	52.60	150.01	245.16	283.01	255.50	401.08	612.73	552.60
Tobacco	6.08	13.66	29.14	3.66	6.54	52.48	59.66	59.93	101.06	308.03	251.10	97.22	393.35
Leather	0.00	0.00	0.00	2.94	13.51	1.19	0.20	10.05	18.47	55.79	30.61	49.86	388.39
Wood	22.91	5.89	12.06	20.28	35.68	36.85	40.12	48.82	86.32	159.96	893.13	345.29	1,610.01
Furniture	0.00	0.00	5.74	3.93	12.03	17.82	22.56	46.33	75.17	200.05	327.50	343.39	383.49
Paper	0.00	1.32	0.35	0.43	0.00	0.55	2.32	321.92	216.95	744.80	740.62	81.04	215.72
Printing, publishing	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.70	33.02	25.80	12.79
Oil refineries & gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	23.23	40.01	178.49	253.18	1.26
Other oil & coal	0.00	0.00	0.00	2.11	0.37	7.06	13.28	13.31	14.88	19.78	75.90	84.46	9.93
Porcelain	0.05	0.05	0.06	0.00	2.21	2.98	3.10	0.00	0.00	5.42	56.12	65.47	121.20
Glass	0.00	0.00	0.00	0.00	0.00	0.16	0.10	0.46	10.25	0.00	0.00	59.28	390.26
Cement	0.00	0.00	0.00	0.00	0.00	0.00	0.96	1.20	1.94	27.71	80.06	104.63	69.56
Clay	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.20	9.85
Other nonmetallic mineral prod.	0.00	0.00	0.00	0.00	0.00	1.54	0.00	0.00	0.00	1.74	0.00	3.25	0.26
Basic metals	0.11	243.24	126.42	228.55	156.80	35.30	13.36	40.89	189.07	445.92	592.03	1,208.61	859.10
Iron, steel	-	0.00	0.00	0.79	2.13	3.14	9.17	8.31	57.43	295.87	400.83	858.39	627.50
Nonferrous metals	-	243.24	126.42	227.76	154.67	32.15	4.19	32.58	131.64	150.04	191.20	350.22	231.60
Nonelectrical machinery	0.00	0.57	0.58	2.03	6.08	17.84	52.96	87.61	146.69	746.74	341.61	332.39	1,401.91
Miscellaneous	0.00	4.14	13.23	122.81	71.68	144.02	256.62	261.84	342.41	709.54	804.55	633.22	784.34

Notes: - = not available.

Sources: Authors compilations from BPS (various years a).

**Appendix Table 3d: Value Added of Local Manufacturing Establishments Reporting Positive Employment and Value Added by Industry (raw data, billion rupiah)**

Industry	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
All manufacturing	453.14	505.28	625.54	882.32	1,153.79	1,709.23	2,205.19	2,400.22	2,812.71	3,785.32	6,474.83	7,310.08	8,700.42	10,679.77
Food	95.58	97.04	119.69	163.86	206.44	198.63	298.60	328.13	352.57	430.40	918.57	920.80	1,039.90	1,396.65
Textiles	61.01	70.31	72.42	121.96	120.17	182.44	199.19	219.48	246.34	449.58	546.08	801.69	840.41	965.46
Apparel	0.74	1.77	1.97	3.01	5.72	8.51	15.57	32.12	41.14	66.91	116.96	161.70	183.31	268.52
Footwear	1.36	1.73	2.02	1.63	2.19	5.84	5.66	6.50	6.00	9.18	13.51	18.22	20.52	64.67
Chemicals	46.92	54.18	51.26	91.54	113.04	143.27	217.16	194.47	241.16	359.74	689.81	653.98	807.22	1,057.63
Industrial chemicals	32.67	40.84	32.59	71.91	85.53	99.34	167.13	134.91	168.11	214.67	412.93	398.41	502.06	649.75
Other chemicals	14.25	13.33	18.68	19.63	27.52	43.93	50.03	59.57	73.05	145.07	276.87	255.58	305.17	407.88
Rubber	6.10	8.59	8.92	45.38	59.04	68.67	60.42	68.17	105.82	106.36	351.89	207.57	253.63	484.24
Plastics	4.61	5.24	6.66	7.23	9.29	11.91	14.26	15.92	28.49	47.47	81.19	116.50	141.56	187.07
Metal products	12.45	16.53	15.32	20.22	22.88	38.29	47.62	63.68	86.18	97.40	237.45	270.43	268.69	449.12
Electric & precision machinery	13.37	9.72	12.04	14.71	29.59	50.86	53.89	74.16	69.68	87.51	181.59	179.26	184.11	227.48
Electric machinery	12.96	9.37	11.45	13.96	28.45	49.36	53.14	73.23	68.63	85.89	178.20	175.93	178.83	220.04
Precision machinery	0.41	0.34	0.59	0.76	1.14	1.50	0.75	0.93	1.05	1.62	3.40	3.33	5.28	7.43
Transportation machinery	39.19	37.54	45.88	50.75	74.46	120.02	244.01	183.05	179.37	208.18	381.74	452.72	519.88	542.41
Other manufacturing	171.81	202.64	289.37	362.03	510.98	880.79	1,048.82	1,214.54	1,455.95	1,922.58	2,956.04	3,527.20	4,441.19	5,036.51
Beverages	10.74	2.88	4.21	3.37	5.63	8.89	6.77	9.03	17.08	16.92	31.22	38.40	54.58	62.85
Tobacco	93.45	123.13	190.74	250.35	306.78	534.93	630.67	724.65	899.45	1,038.10	1,259.03	1,485.86	1,733.57	1,781.88
Leather	0.98	1.55	2.21	2.68	3.87	3.46	4.74	7.85	10.17	17.59	11.17	30.66	15.44	26.23
Wood	11.77	18.10	26.71	31.89	46.61	142.42	166.84	200.39	191.40	250.91	617.92	756.62	1,085.25	1,463.59
Furniture	1.53	1.77	1.85	1.94	2.46	3.29	3.45	4.24	4.85	6.95	19.58	25.45	30.68	51.83
Paper	6.90	8.40	12.08	10.62	20.42	26.04	19.39	29.18	21.01	38.80	116.29	82.89	151.69	253.13
Printing, publishing	12.64	9.55	11.15	13.57	19.71	28.10	34.44	43.48	42.77	54.63	101.20	172.54	170.02	193.96
Oil refineries & gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other oil & coal	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Porcelain	0.25	0.67	0.98	1.12	2.03	3.48	4.30	7.08	6.62	7.37	23.57	25.45	26.23	41.62
Glass	2.28	3.24	5.01	5.97	4.62	8.85	12.88	15.07	15.86	12.26	21.91	32.17	66.21	71.36
Cement	18.11	20.12	21.37	20.67	33.35	46.14	73.53	86.34	109.69	118.12	181.33	189.91	248.48	261.13
Clay	1.02	1.03	1.13	2.72	2.24	3.10	4.41	4.51	5.23	5.46	17.14	21.52	19.95	24.18
Other nonmetallic mineral prod.	0.53	0.63	1.04	0.95	1.11	1.44	1.55	3.26	5.50	6.78	19.34	26.38	30.35	34.94
Basic metals	2.16	2.64	3.63	3.37	45.95	49.24	57.77	50.64	92.56	306.82	462.58	564.44	723.76	642.68
Iron, steel	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nonferrous metals	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nonelectrical machinery	7.48	7.73	6.03	11.39	14.15	18.27	24.13	25.12	29.54	34.80	55.28	49.02	54.42	74.84
Miscellaneous	1.98	1.21	1.22	1.42	2.04	3.14	3.93	3.71	4.22	7.09	18.49	25.89	30.54	52.29

Appendix Table 3d (continued)

Industry	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
All manufacturing	14,624.27	19,596.98	23,391.24	31,190.35	37,751.28	43,043.72	52,413.33	64,486.19	52,334.48	97,814.74	122,347.94	146,684.69	178,624.98
Food	1,751.66	3,183.34	3,785.92	5,068.18	5,888.65	4,379.66	5,626.02	6,386.09	9,199.11	14,647.41	17,552.49	19,696.52	27,498.83
Textiles	1,622.86	1,926.57	2,279.18	3,275.36	3,363.60	6,743.28	6,744.92	7,336.82	7,445.66	12,190.78	14,001.75	16,476.85	12,895.89
Apparel	407.34	775.27	801.02	1,130.91	2,885.83	1,517.43	1,723.91	2,170.13	2,410.45	4,094.23	5,172.92	5,484.65	6,459.04
Footwear	107.56	223.82	281.46	469.37	1,120.81	1,400.54	1,247.44	1,444.72	1,347.09	2,015.56	2,516.35	2,659.84	2,441.30
Chemicals	1,124.54	1,299.32	2,052.79	2,090.22	2,486.48	2,951.88	3,544.10	4,075.15	4,576.67	6,484.74	9,400.05	11,471.75	19,850.14
Industrial chemicals	669.53	718.01	1,042.84	1,343.52	1,438.49	1,486.29	2,238.84	2,511.93	2,368.25	3,523.64	4,799.39	6,697.23	9,963.66
Other chemicals	455.01	581.31	1,009.95	746.70	1,048.00	1,465.59	1,305.26	1,563.22	2,208.42	2,961.11	4,600.66	4,774.51	9,886.47
Rubber	670.58	667.50	650.34	935.05	663.62	763.50	936.88	1,151.95	977.57	2,161.45	3,325.30	3,372.90	3,806.98
Plastics	222.80	392.06	474.33	830.97	1,013.31	928.44	1,134.55	1,499.02	1,507.17	1,583.56	3,365.51	4,091.13	3,576.90
Metal products	418.41	500.51	630.02	724.06	898.96	1,080.03	1,432.21	1,905.82	1,616.54	2,302.79	2,790.40	3,563.87	6,116.23
Electric & precision machinery	322.21	456.61	603.26	1,088.60	1,043.16	972.59	2,169.00	3,919.59	2,264.67	3,042.14	3,067.69	5,088.60	7,567.01
Electric machinery	311.37	442.74	584.75	1,051.10	1,021.49	899.02	2,072.50	3,758.98	2,118.07	2,915.43	2,597.33	4,443.35	7,447.30
Precision machinery	10.83	13.87	18.51	37.50	21.67	73.57	96.50	160.60	146.60	126.70	470.36	645.26	119.71
Transportation machinery	683.53	799.28	1,280.96	2,548.58	3,195.51	4,300.41	4,920.85	6,154.04	1,797.75	8,167.83	9,396.28	12,432.12	6,643.69
Other manufacturing	7,292.78	9,372.70	10,551.96	13,029.04	15,191.34	18,005.97	22,933.46	28,442.86	19,191.80	41,124.25	51,759.21	62,346.45	81,768.97
Beverages	72.97	81.78	114.10	100.93	131.22	213.42	358.44	321.56	390.06	432.54	664.96	542.34	765.27
Tobacco	2,740.21	3,091.81	3,053.20	4,069.57	4,856.29	5,827.49	8,729.85	8,365.10	2,050.16	13,099.60	20,063.34	21,684.40	29,061.85
Leather	25.27	78.98	159.49	127.14	114.36	156.98	168.63	218.91	304.13	297.08	321.35	302.29	709.50
Wood	1,920.04	2,289.01	2,803.45	3,434.40	3,589.97	4,068.75	4,599.52	4,400.07	5,480.42	8,985.39	10,597.58	11,968.92	15,145.11
Furniture	74.27	194.71	315.61	431.68	461.48	482.44	649.04	863.73	963.70	3,395.00	2,357.41	2,247.56	5,869.82
Paper	339.53	540.17	879.74	950.75	1,036.58	1,362.06	1,456.24	1,732.21	1,812.06	6,318.90	4,392.49	6,973.89	8,127.76
Printing, publishing	246.75	273.00	332.25	525.25	583.54	732.07	974.72	1,463.16	1,138.46	1,281.60	4,748.55	6,220.30	1,035.19
Oil refineries & gas	0.00	0.00	0.00	15.13	0.00	61.58	62.93	144.02	435.77	174.44	16.67	4.30	9.90
Other oil & coal	0.00	6.88	25.42	11.31	13.39	13.88	20.01	18.94	33.27	34.86	75.91	111.88	62.80
Porcelain	63.63	95.84	172.95	164.16	363.30	482.70	376.43	579.58	576.31	840.68	887.78	1,106.50	1,264.76
Glass	85.45	118.76	212.90	213.30	432.49	258.25	390.74	305.65	297.79	450.32	571.09	1,010.39	1,687.09
Cement	262.45	433.80	587.32	390.26	611.50	884.34	862.70	1,046.64	1,898.84	1,075.48	1,578.33	1,965.80	5,365.23
Clay	27.60	28.63	37.82	75.84	58.02	64.72	89.35	134.29	127.90	138.28	137.60	144.56	227.97
Other nonmetallic mineral prod.	41.30	77.49	127.95	139.04	156.52	141.52	269.43	336.54	439.93	431.54	456.38	732.81	569.36
Basic metals	1,184.80	1,727.36	1,220.39	1,829.23	2,205.43	2,559.13	3,148.98	7,429.04	1,902.37	2,863.81	3,652.28	4,913.82	7,806.59
Iron, steel	-	1,642.36	1,155.40	1,701.92	2,052.32	2,344.71	2,988.33	7,142.71	1,319.90	2,175.20	2,215.16	2,957.48	5,293.71
Nonferrous metals	-	84.99	64.99	127.30	153.10	214.42	160.64	286.33	582.48	688.61	1,437.12	1,956.34	2,512.88
Nonelectrical machinery	123.69	242.52	392.95	361.63	345.03	510.20	566.47	802.63	1,008.77	725.55	426.63	1,217.94	2,200.29
Miscellaneous	84.81	91.96	116.43	189.44	232.23	186.43	209.99	280.80	331.84	579.18	810.85	1,198.75	1,860.49

Notes: - = not available.

Sources: Authors compilations from BPS (various years a).

Appendix Table 3e: Value Added of All Manufacturing Establishments Reporting Positive Employment and Value Added by Industry (raw data, billion rupiah)

Industry	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
All manufacturing	588.77	738.57	922.64	1,249.70	1,660.44	2,479.82	3,116.84	3,382.86	3,938.99	5,091.04	8,226.07	9,350.53	11,283.38	13,881.76
Food	104.50	113.62	142.93	194.45	245.20	250.68	357.10	373.49	423.47	502.54	1,056.23	1,074.70	1,220.37	1,648.33
Textiles	76.33	111.77	107.57	166.83	184.65	268.45	295.01	346.59	357.17	573.76	791.76	1,101.27	1,173.11	1,322.85
Apparel	0.74	1.77	1.97	3.01	5.72	9.35	16.16	33.30	45.02	71.69	119.47	165.04	186.89	276.09
Footwear	8.96	7.80	8.10	7.19	12.80	17.48	11.13	14.00	24.54	26.23	36.78	44.96	46.94	77.24
Chemicals	62.60	85.91	98.02	142.17	160.28	269.34	374.97	365.45	416.30	544.30	957.40	966.82	1,148.17	1,451.33
Industrial chemicals	33.59	44.61	38.40	76.94	91.25	111.75	196.20	167.03	210.18	257.93	494.66	487.18	588.02	783.99
Other chemicals	29.01	41.31	59.63	65.23	69.03	157.59	178.77	198.42	206.12	286.37	462.73	479.64	560.15	667.33
Rubber	12.48	21.49	20.37	69.96	88.80	97.61	101.52	101.39	135.12	144.33	391.76	285.36	365.91	605.18
Plastics	5.36	6.94	11.79	12.59	15.40	17.28	20.62	26.79	40.36	70.30	203.75	128.90	184.39	218.55
Metal products	22.07	27.86	28.36	39.69	47.70	79.52	92.04	144.67	164.68	186.15	329.68	360.62	453.08	737.03
Electric & precision machinery	23.19	30.23	41.21	44.52	63.90	141.71	143.96	188.99	161.42	177.55	319.70	292.03	313.74	342.15
Electric machinery	22.78	29.88	40.62	43.76	62.76	140.21	143.21	188.07	160.36	175.93	314.59	287.54	307.13	332.35
Precision machinery	0.41	0.34	0.59	0.76	1.14	1.50	0.75	0.93	1.05	1.62	5.11	4.49	6.61	9.80
Transportation machinery	39.87	40.21	49.26	54.49	85.97	150.96	286.03	239.47	230.90	262.88	477.78	563.50	672.03	796.85
Other manufacturing	232.66	290.97	413.05	514.81	750.02	1,177.43	1,418.29	1,548.72	1,940.00	2,531.31	3,541.75	4,367.33	5,518.76	6,406.15
Beverages	16.96	18.81	24.99	22.73	33.44	50.50	60.86	79.64	96.74	98.73	108.52	123.47	146.73	172.99
Tobacco	133.80	162.77	238.25	301.80	395.44	637.95	736.49	821.87	996.94	1,144.91	1,338.35	1,565.33	1,812.23	1,867.11
Leather	0.99	1.66	2.29	2.79	3.94	3.54	4.82	7.94	10.17	17.59	15.94	30.83	15.50	26.23
Wood	15.86	22.07	31.44	38.40	59.93	162.47	205.60	250.24	254.65	319.52	714.29	930.43	1,328.33	1,733.41
Furniture	1.53	1.90	1.93	2.19	2.78	3.78	4.06	4.83	5.64	7.72	20.76	27.75	32.36	55.38
Paper	9.24	11.05	15.50	13.48	26.38	31.00	22.65	33.80	27.55	42.91	132.09	124.94	232.70	403.79
Printing, publishing	14.25	11.37	13.01	16.01	22.89	31.43	36.96	47.65	48.40	61.16	108.32	182.21	183.33	218.64
Oil refineries & gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other oil & coal	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Porcelain	0.85	1.43	1.56	1.78	3.62	5.33	7.15	9.28	12.48	15.12	28.95	34.56	37.68	53.99
Glass	3.49	5.37	10.09	19.84	19.45	23.20	48.99	41.93	53.10	57.03	112.44	121.09	77.63	77.40
Cement	20.54	35.64	54.32	62.63	88.62	107.43	149.78	107.70	156.46	175.18	273.58	276.87	358.88	339.81
Clay	1.02	1.03	1.13	2.72	2.24	3.10	4.41	4.51	5.23	5.46	19.11	23.44	21.45	25.89
Other nonmetallic mineral prod.	0.53	0.63	1.04	0.95	1.11	1.44	1.55	3.26	5.50	6.78	19.34	26.38	30.35	34.94
Basic metals	2.57	4.96	4.96	4.99	59.15	71.91	81.70	70.97	206.29	495.17	529.06	786.93	1,091.96	1,202.77
Iron, steel	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nonferrous metals	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nonelectrical machinery	9.03	10.02	9.72	20.14	26.12	35.07	44.69	54.64	50.74	66.41	89.68	73.65	104.77	134.89
Miscellaneous	2.01	2.26	2.83	4.37	4.91	9.29	8.55	10.45	10.10	17.63	31.33	39.45	44.86	58.91



Appendix Table 3e (continued)

Industry	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
All manufacturing	19,046.27	25,174.61	29,925.52	41,437.53	49,821.47	59,856.29	73,908.81	93,332.48	80,505.57	154,651.45	191,394.12	236,858.23	269,629.90
Food	2,065.52	3,519.18	4,317.39	5,782.98	6,638.49	5,293.34	6,622.87	7,862.54	11,754.98	20,489.44	22,258.98	25,424.08	33,144.48
Textiles	2,210.11	2,411.21	2,919.45	4,092.43	4,373.85	8,055.37	8,196.10	9,611.78	10,114.26	18,606.50	21,306.78	23,107.78	17,148.09
Apparel	440.25	843.25	936.73	1,527.95	3,450.45	2,279.75	2,603.22	3,271.59	3,514.07	6,258.68	8,418.84	8,958.90	9,033.04
Footwear	152.29	348.01	452.36	1,077.73	1,795.32	2,261.96	2,161.96	2,737.95	2,722.70	5,020.84	5,697.00	5,706.35	5,998.23
Chemicals	1,560.92	2,252.34	3,350.57	3,818.24	4,376.15	5,422.75	6,330.80	8,431.46	8,871.90	16,711.62	21,593.47	24,141.22	28,019.62
Industrial chemicals	804.89	1,265.73	1,843.24	2,603.71	2,400.79	2,828.08	3,675.86	5,255.55	4,690.58	10,982.55	12,776.87	15,225.71	15,086.62
Other chemicals	756.04	986.61	1,507.32	1,214.54	1,975.36	2,594.67	2,654.94	3,175.91	4,181.32	5,729.06	8,816.60	8,915.51	12,933.00
Rubber	825.25	911.15	926.75	1,228.89	990.44	1,174.58	1,351.92	1,735.37	1,569.72	2,917.93	4,716.51	5,013.61	5,776.11
Plastics	257.72	420.79	533.06	909.95	1,128.09	1,121.95	1,900.52	1,845.62	2,087.75	2,869.29	4,348.12	5,416.10	4,399.22
Metal products	1,164.17	741.00	934.10	1,510.30	1,806.54	2,080.14	2,748.88	3,938.58	3,062.59	4,522.74	6,645.94	8,638.52	8,566.69
Electric & precision machinery	524.03	760.94	1,001.87	1,977.47	1,779.50	2,509.06	4,420.72	7,035.54	6,341.63	10,502.42	14,861.82	25,269.73	25,699.68
Electric machinery	510.68	742.66	977.93	1,915.69	1,737.70	2,393.65	4,245.61	6,766.16	5,916.44	9,942.71	13,838.56	24,110.12	25,157.78
Precision machinery	13.35	18.28	23.95	61.77	41.80	115.41	175.11	269.38	425.19	559.71	1,023.25	1,159.61	541.90
Transportation machinery	1,346.54	1,909.79	1,958.19	3,278.53	4,554.06	6,796.74	7,982.92	9,330.59	3,685.42	11,991.83	15,998.11	28,302.74	24,627.81
Other manufacturing	8,499.45	11,056.94	12,595.06	16,233.05	18,928.59	22,860.63	29,588.91	37,531.45	26,780.56	54,760.17	65,548.56	76,879.19	107,216.93
Beverages	189.11	206.18	262.07	395.35	412.08	622.41	767.07	891.96	992.48	712.03	1,149.12	1,482.17	1,529.73
Tobacco	2,824.94	3,191.33	3,193.25	4,216.55	5,048.16	6,194.61	9,111.42	8,839.89	2,619.46	14,419.51	21,651.59	23,177.60	30,981.53
Leather	25.80	79.07	173.62	176.14	190.95	175.57	222.13	287.59	421.21	458.76	472.35	451.70	1,228.12
Wood	2,212.10	2,546.08	3,117.89	3,866.71	4,099.62	4,663.32	5,298.71	5,871.32	6,340.85	10,154.86	12,530.27	12,818.84	17,868.21
Furniture	80.51	216.07	365.71	466.77	529.05	584.73	760.46	992.67	1,223.58	3,928.91	2,848.17	2,697.37	6,345.07
Paper	467.22	878.90	1,313.84	1,446.67	1,409.44	1,920.07	2,433.04	3,135.07	2,985.36	8,704.11	6,586.29	8,693.61	16,364.05
Printing, publishing	253.30	275.92	336.32	546.02	688.35	854.91	1,133.23	1,680.71	1,344.05	1,303.88	4,790.82	6,256.75	1,053.31
Oil refineries & gas	0.00	0.00	0.00	15.13	0.00	61.58	62.93	144.02	459.00	214.44	202.11	266.13	11.17
Other oil & coal	0.00	14.35	32.85	25.39	22.10	22.10	34.83	33.52	48.98	61.07	170.56	213.21	77.04
Porcelain	80.08	142.26	233.58	231.00	448.26	591.18	492.25	763.40	835.22	1,248.11	1,331.75	1,593.40	1,623.75
Glass	88.59	118.76	213.24	350.79	443.83	275.98	478.15	860.94	471.04	1,059.19	1,208.71	2,007.25	3,023.97
Cement	345.12	569.19	742.54	759.82	1,013.17	1,242.87	1,312.52	1,623.86	2,360.53	1,677.29	2,476.00	3,481.18	7,642.72
Clay	28.68	31.11	37.82	82.41	60.58	67.97	99.28	160.11	263.39	345.39	277.05	371.97	269.92
Other nonmetallic mineral prod.	41.30	88.81	134.32	146.92	178.03	152.02	279.99	340.47	455.94	524.47	510.40	770.26	581.30
Basic metals	1,577.15	2,271.63	1,707.00	2,561.87	3,414.08	4,196.11	5,558.41	9,851.36	3,015.38	5,719.17	6,382.84	8,064.20	10,490.05
Iron, steel	-	1,925.12	1,364.14	1,886.59	3,002.39	3,462.58	4,643.71	8,703.13	1,914.11	4,015.39	4,279.53	5,444.31	7,364.93
Nonferrous metals	-	346.50	342.86	675.28	411.69	733.53	914.71	1,148.22	1,101.27	1,703.79	2,103.32	2,619.88	3,125.13
Nonelectrical machinery	183.82	314.50	562.71	536.72	525.21	791.75	997.61	1,372.26	2,024.45	2,476.24	1,171.70	2,430.13	5,138.65
Miscellaneous	101.75	112.79	168.32	408.78	445.69	443.44	546.89	682.32	919.62	1,752.74	1,788.82	2,103.43	2,988.36

Notes: - = not available.

Sources: Authors compilations from BPS (various years a).

**Appendix Table 4a: Value Added per Employee in Minority-Foreign Manufacturing Establishments Reporting Positive Employment and Value Added by Industry (raw data, million rupiah)**

Industry	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
All manufacturing	1.018	1.701	2.193	2.293	2.909	4.492	5.141	5.140	5.272	7.318	15.564	17.456	16.350	17.120
Food	0.302	1.004	2.435	1.734	2.072	3.126	1.938	3.168	3.164	6.167	6.309	8.965	13.657	17.459
Textiles	1.075	1.063	0.973	1.213	0.742	1.463	1.628	1.236	0.966	4.464	2.240	4.747	3.737	4.386
Apparel	0.000	0.000	0.000	0.000	0.000	2.327	0.835	0.984	1.264	0.000	0.703	0.737	0.996	1.371
Footwear	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5.712
Chemicals	1.139	2.366	1.857	2.424	4.556	7.797	9.817	8.098	8.518	9.048	52.826	60.500	23.971	29.742
Industrial chemicals	0.000	0.000	2.853	2.853	3.702	9.221	12.346	6.970	6.846	5.603	20.695	16.901	14.569	20.746
Other chemicals	1.139	2.366	1.658	2.362	4.699	7.085	7.650	9.225	10.669	11.554	78.071	91.642	32.651	36.339
Rubber	0.393	0.687	0.693	0.740	1.184	2.250	1.546	3.656	1.191	8.445	7.213	6.460	23.693	19.099
Plastics	0.219	2.292	5.909	7.377	4.645	5.061	5.555	3.524	5.214	12.056	7.432	8.962	42.857	25.316
Metal products	1.256	1.669	1.647	2.142	2.141	2.728	3.454	6.648	5.343	4.638	7.850	6.969	13.679	14.969
Electric & precision machinery	3.340	2.277	2.277	4.883	6.657	11.124	16.709	11.491	6.733	8.465	10.266	8.626	18.279	21.778
Electric machinery	3.340	2.277	2.277	4.883	6.657	11.124	16.709	11.491	6.733	8.465	9.876	8.513	22.414	23.318
Precision machinery	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	13.776	9.526	3.808	10.999
Transportation machinery	0.694	1.188	1.408	1.685	3.464	4.700	6.876	7.734	9.097	11.532	15.995	15.522	22.195	29.601
Other manufacturing	1.123	2.200	2.511	2.141	3.155	4.833	4.506	3.870	4.634	7.032	6.936	10.168	13.704	13.227
Beverages	0.000	7.080	7.216	0.000	15.235	23.269	0.000	0.000	0.000	31.310	31.743	36.164	38.068	30.479
Tobacco	1.252	2.013	1.444	1.039	0.134	0.367	0.299	0.245	0.055	0.522	0.196	0.858	0.453	0.808
Leather	0.098	0.094	0.104	0.106	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Wood	1.206	1.507	1.507	1.340	1.947	2.378	3.155	2.761	2.452	3.690	3.759	8.789	10.558	8.563
Furniture	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.514	1.999
Paper	0.000	0.000	0.000	0.000	2.415	2.527	1.611	0.590	1.307	1.619	5.915	10.808	37.859	27.657
Printing, publishing	0.419	0.000	0.524	0.426	1.652	1.203	1.861	4.230	2.297	3.313	3.035	5.465	5.276	5.701
Oil refineries & gas	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Other oil & coal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Porcelain	0.719	0.964	0.757	0.849	2.675	2.454	3.323	1.526	6.296	7.622	5.463	8.501	8.443	6.698
Glass	0.827	1.559	4.914	10.650	5.449	5.197	12.311	7.946	18.006	20.806	47.887	46.677	0.000	0.000
Cement	4.480	7.166	12.182	7.056	9.723	15.901	26.783	4.550	15.090	18.225	13.955	14.329	15.544	15.618
Clay	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Other nonmetallic mineral prod.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Basic metals	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	13.955	0.000	0.000	0.000
Iron, steel	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nonferrous metals	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nonelectrical machinery	0.589	1.142	1.490	2.678	3.659	3.488	4.893	7.611	3.877	6.727	7.056	9.523	18.351	16.542
Miscellaneous	0.000	0.040	2.229	2.050	1.947	2.274	1.012	0.000	0.000	0.000	0.000	4.191	6.364	0.000

Appendix Table 4a (continued)

Industry	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
All manufacturing	24.995	24.068	23.601	29.541	51.524	61.730	79.493	93.758	39.162	130.175	155.009	206.418	119.024
Food	22.538	23.361	32.066	23.200	22.157	20.695	19.498	36.010	47.371	111.133	98.201	149.338	91.143
Textiles	4.293	5.830	7.981	9.068	28.625	12.438	21.902	28.697	21.011	50.718	39.989	41.804	51.803
Apparel	1.443	2.460	3.632	5.974	10.101	9.371	9.721	10.860	12.494	19.594	27.520	21.196	19.237
Footwear	7.480	6.541	4.368	6.119	4.739	5.466	4.756	7.806	7.716	18.964	14.571	24.872	19.790
Chemicals	26.208	42.031	37.878	42.125	52.232	82.358	68.090	116.153	82.281	237.906	285.128	249.633	146.762
Industrial chemicals	27.961	51.494	43.512	40.744	58.148	113.518	74.649	156.750	89.968	311.144	378.866	306.143	168.433
Other chemicals	24.893	30.794	31.058	43.770	44.448	49.639	61.532	62.023	70.750	96.661	154.938	128.541	106.756
Rubber	23.373	20.153	23.652	33.200	17.210	10.915	4.117	10.829	23.300	24.105	24.659	19.856	31.546
Plastics	28.989	11.768	12.793	16.412	17.941	13.292	27.404	30.049	41.316	47.001	42.685	49.317	65.262
Metal products	47.649	10.574	16.831	57.964	41.984	39.094	29.302	41.055	31.774	55.568	158.835	193.822	85.539
Electric & precision machinery	18.849	25.039	21.963	20.138	18.044	27.269	34.556	25.007	22.989	39.675	57.958	70.891	121.194
Electric machinery	19.232	26.245	21.465	20.548	17.446	27.269	35.240	25.329	23.000	39.006	59.806	73.393	124.554
Precision machinery	16.167	15.992	26.691	15.020	34.791	0.000	14.065	20.651	22.683	49.383	4.363	3.326	37.205
Transportation machinery	100.216	54.494	22.915	22.921	64.649	70.537	67.789	76.983	49.410	79.823	352.443	703.493	346.509
Other manufacturing	14.718	20.500	22.181	37.066	93.359	112.221	171.463	192.616	36.950	206.641	197.172	252.324	121.294
Beverages	48.642	29.161	41.590	39.667	32.131	45.627	27.403	32.865	32.237	17.418	30.946	42.841	204.366
Tobacco	10.211	0.702	0.614	0.806	11.498	15.113	0.648	0.000	0.000	0.000	0.794	2.599	0.000
Leather	4.203	0.000	5.391	10.786	2.944	5.778	5.389	8.665	2.431	16.608	71.761	0.000	14.467
Wood	10.586	9.432	11.852	9.939	22.563	34.075	23.275	27.327	10.388	23.886	23.106	16.594	31.173
Furniture	2.428	2.398	3.890	5.444	8.793	3.857	3.382	5.507	16.118	27.527	15.014	10.712	12.220
Paper	17.121	28.023	50.933	32.736	36.500	22.199	40.104	35.996	48.680	53.295	57.087	80.390	146.223
Printing, publishing	7.875	6.316	5.720	12.698	8.705	8.771	24.174	22.077	21.867	39.364	30.204	21.832	17.168
Oil refineries & gas	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	16.910	1.957	0.000
Other oil & coal	0.000	169.701	80.815	130.145	66.454	6.571	6.571	13.806	3.611	3.865	27.370	25.474	10.941
Porcelain	10.988	11.556	12.526	12.582	15.112	18.143	21.009	31.672	43.958	75.332	83.163	94.048	39.768
Glass	0.000	0.000	3.860	39.286	8.614	7.265	26.993	48.774	27.511	32.953	68.693	147.742	172.732
Cement	13.854	23.796	39.813	30.784	33.518	35.149	41.191	51.619	33.150	74.577	99.781	130.607	297.051
Clay	0.000	0.000	0.000	4.389	4.389	5.588	12.199	20.394	36.979	1.642	20.227	45.965	8.203
Other nonmetallic mineral prod.	0.000	6.362	9.104	2.249	4.160	11.559	14.181	0.000	0.000	24.674	30.747	46.154	20.957
Basic metals	0.000	62.534	36.084	134.334	622.757	1,199.563	1,836.056	1,806.943	141.730	1,416.917	1,561.984	2,676.732	423.785
Iron, steel	-	62.662	45.027	158.477	798.323	1,335.591	2,054.030	2,249.491	153.841	1,516.397	2,113.236	3,122.156	423.785
Nonferrous metals	-	61.639	12.234	25.690	37.539	111.343	92.269	36.752	99.341	223.159	91.979	4.189	0.000
Nonelectrical machinery	17.210	20.092	26.757	57.342	38.811	30.525	26.975	42.434	49.133	55.380	33.487	59.918	230.825
Miscellaneous	0.000	1.506	4.533	4.497	3.598	7.017	8.030	11.369	6.734	31.531	12.249	16.142	66.525

Notes: - = not available.

Sources: Authors compilations from BPS (various years a).

**Appendix Table 4b: Value Added per Employee in Majority-Foreign Manufacturing Establishments Reporting Positive Employment and Value Added by Industry (raw data, million rupiah)**

Industry	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
All manufacturing	2.164	2.921	2.693	3.218	4.770	6.887	8.808	9.048	8.872	10.602	15.536	14.078	16.793	22.296
Food	2.436	3.297	2.129	3.338	4.195	7.271	7.201	6.234	13.187	12.206	17.177	14.686	13.990	21.261
Textiles	1.052	3.844	1.557	1.791	2.278	2.804	3.001	3.527	3.626	3.087	8.002	10.291	10.950	11.695
Apparel	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.799	1.787	2.547	1.024	1.581	1.155	1.386
Footwear	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.977	12.376	10.870	16.015	18.090	18.008	5.566
Chemicals	2.944	3.920	4.508	4.102	4.916	7.432	15.742	10.921	10.471	12.250	12.979	14.294	16.831	24.412
Industrial chemicals	1.499	5.220	3.839	6.506	5.447	4.058	13.661	7.978	16.041	13.661	17.820	25.239	29.302	43.140
Other chemicals	3.253	3.537	4.768	3.217	4.704	8.605	16.285	11.600	9.393	11.812	11.892	12.106	14.563	18.713
Rubber	1.424	6.137	0.772	1.836	3.464	4.840	5.922	5.938	6.096	6.781	8.133	5.830	9.897	10.535
Plastics	2.035	0.746	2.576	2.352	6.867	3.397	3.313	6.524	5.525	7.503	80.099	8.109	12.613	13.797
Metal products	2.455	2.116	2.239	2.551	4.047	4.964	5.316	7.745	9.268	11.698	16.810	12.642	17.612	26.331
Electric & precision machinery	1.499	2.255	2.670	2.826	4.526	16.452	17.439	16.049	6.145	10.532	9.918	15.165	15.545	16.726
Electric machinery	1.499	2.255	2.670	2.826	4.526	16.452	17.439	16.049	6.145	10.532	9.918	15.165	15.545	14.497
Precision machinery	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	59.095
Transportation machinery	2.442	1.379	1.673	1.750	2.816	8.728	10.897	14.899	11.034	16.790	15.933	12.424	20.178	38.291
Other manufacturing	2.207	2.623	2.933	4.216	6.631	7.264	8.937	10.483	10.711	12.637	14.776	18.440	22.451	27.901
Beverages	5.778	6.686	7.002	7.023	7.375	7.602	17.725	26.072	24.076	23.547	24.819	26.732	24.789	42.743
Tobacco	6.486	4.104	4.943	10.886	31.722	37.516	40.120	42.188	42.183	47.810	30.848	62.077	90.737	97.750
Leather	0.115	3.843	1.890	2.719	1.879	2.245	2.211	2.672	0.000	0.000	0.000	0.000	0.000	0.000
Wood	0.951	0.944	0.970	1.183	2.356	3.358	3.028	3.257	4.218	4.003	3.963	6.374	7.376	8.351
Furniture	0.000	0.905	0.510	1.336	1.686	1.500	2.066	2.510	2.871	2.875	5.300	11.805	4.540	4.633
Paper	1.413	1.724	1.638	1.514	2.728	2.073	1.765	3.232	4.559	7.545	7.060	17.070	5.837	52.760
Printing, publishing	3.219	3.029	3.029	2.921	4.575	3.865	2.583	3.213	5.378	6.106	6.919	10.639	10.912	22.668
Oil refineries & gas	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Other oil & coal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Porcelain	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.578
Glass	1.841	1.056	0.444	0.498	0.940	1.140	2.398	0.366	3.962	5.673	5.061	5.011	10.350	6.009
Cement	1.514	6.380	9.358	13.272	13.568	12.442	15.206	12.449	8.753	12.268	48.744	47.679	48.189	27.576
Clay	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	11.089	12.304	10.880	13.440
Other nonmetallic mineral prod.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Basic metals	1.430	1.784	1.112	1.149	5.478	8.586	10.457	10.904	13.952	18.278	17.151	50.780	83.200	65.717
Iron, steel	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nonferrous metals	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nonelectrical machinery	1.430	3.116	2.936	8.084	8.386	8.794	10.326	11.609	12.571	13.767	16.595	7.652	27.598	36.755
Miscellaneous	0.000	2.692	3.460	5.587	3.226	5.616	4.621	7.504	6.091	9.992	18.909	20.804	22.227	5.812

Appendix Table 4b (continued)

Industry	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
All manufacturing	23.888	25.584	28.003	39.114	34.467	38.209	41.037	50.866	59.342	106.382	127.556	180.280	126.546
Food	20.159	20.553	17.780	36.565	37.399	36.454	34.459	32.992	77.821	90.280	120.667	172.154	125.572
Textiles	18.130	10.736	12.569	14.599	16.175	23.602	22.064	30.145	38.802	87.480	81.735	91.103	48.274
Apparel	8.014	4.033	4.896	7.833	8.109	8.832	6.265	7.867	23.116	36.425	46.179	27.402	25.431
Footwear	11.583	8.663	4.116	5.826	5.712	7.443	6.489	9.731	18.784	38.232	27.806	54.200	29.773
Chemicals	26.971	34.131	49.621	67.253	78.926	84.011	77.154	101.177	108.997	220.777	277.541	338.048	215.613
Industrial chemicals	42.559	69.797	91.012	136.517	130.071	98.621	85.404	137.100	101.998	271.092	352.256	434.999	218.018
Other chemicals	23.795	23.157	31.748	31.115	51.130	75.537	70.756	70.721	115.202	172.603	204.487	236.369	213.208
Rubber	14.154	7.425	11.093	10.315	16.374	28.618	26.703	36.937	28.307	51.974	69.531	90.791	69.963
Plastics	17.811	12.938	16.355	22.726	14.169	18.384	16.813	23.651	34.701	54.165	70.348	99.829	43.570
Metal products	36.537	23.472	29.472	114.517	43.785	29.681	50.210	71.036	76.233	152.400	309.834	603.011	145.884
Electric & precision machinery	18.965	24.625	21.844	18.285	14.532	18.209	30.786	40.601	43.417	60.743	55.762	63.987	123.714
Electric machinery	18.053	24.011	21.907	19.599	15.016	17.068	31.315	39.121	44.553	61.311	56.310	64.817	128.601
Precision machinery	39.929	37.514	20.392	9.739	10.294	27.572	26.338	59.101	26.665	52.643	46.986	46.973	18.639
Transportation machinery	32.164	23.421	24.993	34.068	46.366	67.139	40.524	37.723	82.607	102.181	120.354	132.340	116.924
Other manufacturing	24.618	36.589	34.095	34.228	33.823	38.468	47.484	57.555	48.361	93.262	76.866	106.290	135.988
Beverages	58.571	65.340	44.685	54.655	88.051	130.905	145.116	383.061	230.684	28.541	64.658	89.960	44.597
Tobacco	170.591	223.355	322.007	218.389	287.487	445.956	921.844	488.875	533.493	1,168.757	2,931.679	3,604.203	5,070.867
Leather	0.000	0.614	9.808	5.277	26.761	8.494	34.526	29.433	25.482	20.173	45.550	44.983	47.375
Wood	9.750	8.319	7.558	14.848	14.525	18.171	21.664	24.079	28.591	52.023	33.170	21.533	60.105
Furniture	6.884	9.363	28.385	15.855	31.318	38.435	43.087	63.602	29.593	34.822	30.740	15.102	20.333
Paper	45.122	61.203	46.911	40.157	24.732	33.772	30.233	33.030	45.306	34.121	86.148	129.548	204.030
Printing, publishing	5.197	7.826	10.510	32.295	28.499	30.826	37.238	58.636	100.385	0.000	0.000	0.000	0.000
Oil refineries & gas	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.748	156.428	0.000
Other oil & coal	0.000	0.000	0.000	0.000	0.000	5.624	7.886	0.000	1.253	14.932	25.036	16.762	26.455
Porcelain	2.598	173.716	74.020	18.153	49.741	30.612	20.881	11.897	24.289	25.723	34.682	32.484	33.639
Glass	6.598	0.000	0.000	0.000	7.617	26.364	17.319	16.203	15.069	108.316	83.770	19.595	46.624
Cement	24.853	46.569	61.668	115.752	71.176	27.062	41.643	103.180	108.530	72.954	102.737	153.888	109.354
Clay	5.997	20.136	0.000	31.370	0.000	0.000	0.000	26.815	54.463	154.351	109.936	146.321	14.632
Other nonmetallic mineral prod.	0.000	465.602	197.609	16.182	43.292	7.043	11.887	4.278	12.708	1,275.824	59.576	34.665	16.772
Basic metals	37.509	26.318	62.816	62.323	67.500	57.396	93.649	102.048	74.803	67.248	153.851	196.493	287.421
Iron, steel	-	22.799	40.767	19.781	77.541	60.371	93.698	96.717	84.318	50.268	214.144	237.058	274.968
Nonferrous metals	-	33.355	106.912	147.406	47.418	53.430	93.569	110.577	57.676	89.079	73.460	95.082	411.953
Nonelectrical machinery	31.680	27.144	47.074	46.455	30.741	50.701	60.833	70.632	34.751	87.425	46.231	97.116	140.641
Miscellaneous	11.953	9.559	5.740	19.198	10.333	9.082	5.550	10.543	10.303	30.491	23.314	46.984	33.336

Notes: - = not available.

Sources: Authors compilations from BPS (various years a).

**Appendix Table 4c: Value Added per Employee in Heavily-Foreign Manufacturing Establishments Reporting Positive Employment and Value Added by Industry (raw data, million rupiah)**

Industry	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
All manufacturing	2.782	3.754	5.000	5.243	5.486	6.437	5.661	7.533	8.665	10.933	8.316	12.104	10.502	17.131
Food	3.126	5.833	13.525	11.146	9.701	7.063	5.947	3.810	0.404	0.876	5.746	13.437	12.923	18.493
Textiles	0.987	0.793	0.540	0.881	1.732	1.746	1.876	3.011	2.245	3.770	3.428	4.176	6.989	2.400
Apparel	0.000	0.000	0.000	0.000	0.000	0.754	0.603	0.000	0.000	0.000	0.799	0.000	0.000	0.719
Footwear	4.972	3.974	3.974	3.638	6.824	7.481	3.616	0.000	0.000	0.000	0.000	18.719	0.000	0.000
Chemicals	2.431	3.377	4.708	4.644	4.830	7.471	6.624	7.200	7.697	8.895	8.454	17.588	14.678	24.824
Industrial chemicals	3.120	5.674	20.964	0.000	4.102	7.153	7.153	6.194	41.487	29.307	29.930	54.706	25.411	138.239
Other chemicals	2.403	3.285	4.082	4.644	4.858	7.484	6.603	7.284	5.819	7.619	6.802	10.839	12.727	13.482
Rubber	2.419	3.028	3.616	5.544	5.811	3.873	3.928	4.253	4.438	4.930	4.055	4.571	6.244	17.652
Plastics	0.325	0.451	0.495	0.192	0.958	0.758	0.647	0.750	1.720	3.461	0.000	0.000	0.000	0.000
Metal products	2.814	4.329	4.329	4.226	8.421	15.378	15.867	36.160	31.426	66.112	39.906	3.938	4.276	20.703
Electric & precision machinery	2.578	5.869	4.115	3.050	2.281	4.499	3.042	5.253	3.799	3.156	11.286	0.000	0.000	0.000
Electric machinery	2.578	5.869	4.115	3.050	2.281	4.499	3.042	5.253	3.799	3.156	11.286	0.000	0.000	0.000
Precision machinery	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Transportation machinery	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Other manufacturing	4.356	4.940	6.460	8.736	6.771	7.299	5.767	7.554	15.478	18.347	16.987	24.453	11.629	14.149
Beverages	0.000	0.000	0.000	0.000	23.735	26.108	21.022	30.343	42.257	48.572	13.423	48.368	0.000	0.000
Tobacco	12.114	12.937	17.140	19.900	15.140	10.104	9.719	8.431	12.940	14.272	7.132	11.011	14.125	15.651
Leather	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	88.190	3.241	1.160	0.000
Wood	0.176	0.264	0.264	0.264	1.337	0.000	0.486	1.225	2.052	2.628	4.364	35.006	17.222	18.499
Furniture	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.672	6.482
Paper	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Printing, publishing	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Oil refineries & gas	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Other oil & coal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Porcelain	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.721	0.600	0.000
Glass	0.057	0.059	0.055	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.048
Cement	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Clay	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Other nonmetallic mineral prod.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Basic metals	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.992
Iron, steel	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nonferrous metals	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nonelectrical machinery	1.131	1.706	2.051	3.240	2.271	2.336	2.940	5.608	6.391	11.360	0.000	0.000	0.000	6.780
Miscellaneous	0.187	0.208	0.243	0.205	0.373	0.576	0.322	0.436	0.396	0.397	0.638	0.000	0.000	0.000

Appendix Table 4c (continued)

Industry	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
All manufacturing	21.893	20.241	11.156	17.017	15.169	18.182	54.091	26.334	39.092	83.864	93.149	124.594	93.391
Food	38.714	38.179	11.866	26.009	26.523	33.017	32.002	51.788	63.236	178.774	150.422	128.522	147.309
Textiles	6.723	6.219	6.683	4.062	9.380	9.948	8.816	13.672	18.077	48.590	66.008	60.825	37.634
Apparel	3.851	5.111	2.360	6.686	5.816	9.897	8.761	11.142	9.485	23.394	22.112	153.369	19.981
Footwear	8.738	3.552	3.366	5.415	12.654	12.288	11.783	7.876	12.779	20.864	36.863	24.318	33.739
Chemicals	26.297	45.727	36.511	38.423	40.718	48.642	71.573	70.363	112.616	193.562	190.519	250.445	179.590
Industrial chemicals	157.405	63.319	108.010	1.437	8.016	33.945	42.550	49.433	159.533	177.973	212.668	318.268	229.106
Other chemicals	11.730	43.968	12.677	44.587	57.069	59.140	87.201	85.015	74.722	206.400	169.041	181.007	127.715
Rubber	19.330	18.118	15.212	13.203	19.938	30.338	37.248	15.447	25.136	35.273	49.168	74.713	77.660
Plastics	10.817	4.638	1.529	10.102	20.200	13.290	470.287	14.595	24.696	76.833	80.740	98.978	43.652
Metal products	47.917	24.555	27.805	28.077	18.152	9.987	16.896	24.230	34.052	60.973	72.011	97.512	83.113
Electric & precision machinery	0.000	9.427	11.200	30.201	14.811	16.115	19.483	29.603	39.781	98.769	106.712	159.563	117.991
Electric machinery	0.000	9.427	11.715	30.679	14.838	16.401	20.024	30.728	40.413	101.624	109.305	165.051	117.550
Precision machinery	0.000	0.000	6.055	23.754	14.430	12.621	10.962	9.632	26.241	30.245	67.309	73.952	128.574
Transportation machinery	0.000	0.000	0.000	2.684	6.204	10.307	178.138	30.033	23.882	68.459	116.509	193.312	172.367
Other manufacturing	12.405	21.417	10.393	17.290	12.815	18.195	19.826	23.820	37.459	68.599	91.759	81.252	87.814
Beverages	50.543	0.000	0.000	202.169	82.297	204.112	97.630	109.297	136.766	218.992	515.480	396.265	192.750
Tobacco	11.889	27.260	46.922	5.375	10.489	38.041	30.817	32.908	49.111	131.124	156.057	172.197	380.589
Leather	0.000	0.000	0.000	3.102	7.672	2.660	0.272	5.635	8.233	21.729	10.375	22.571	50.945
Wood	8.640	30.875	8.018	8.438	8.353	10.211	9.887	10.465	11.773	24.917	41.132	35.057	56.759
Furniture	0.000	0.000	8.879	6.252	6.427	8.608	6.122	9.680	10.149	19.639	27.324	23.584	43.594
Paper	0.000	8.095	2.021	2.345	0.000	3.180	8.530	38.262	82.184	195.081	159.716	53.895	120.667
Printing, publishing	0.000	0.000	0.000	0.000	0.728	0.000	0.000	0.000	0.000	6.588	38.383	24.270	34.214
Oil refineries & gas	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	216.379	127.767	458.062	397.459	5.140
Other oil & coal	0.000	0.000	0.000	42.230	6.917	13.815	26.780	20.267	63.952	33.644	329.152	424.564	104.870
Porcelain	1.238	1.538	1.589	0.000	3.244	4.387	4.623	0.000	0.000	18.343	31.981	28.971	68.937
Glass	0.000	0.000	0.000	0.000	0.000	2.232	1.486	6.163	16.395	0.000	0.000	74.066	112.353
Cement	0.000	0.000	0.000	0.000	0.000	0.000	48.012	41.541	26.129	76.444	77.128	75.597	38.838
Clay	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5.780	12.614
Other nonmetallic mineral prod.	0.000	0.000	0.000	0.000	0.000	4.055	0.000	0.000	0.000	8.721	0.000	85.486	10.370
Basic metals	4.780	56.227	31.410	36.771	35.476	44.663	13.104	14.938	47.505	69.176	75.918	117.245	137.515
Iron, steel	-	0.000	0.000	3.577	11.645	13.673	26.182	14.627	28.441	86.830	101.393	135.040	158.012
Nonferrous metals	-	56.227	31.410	53.368	59.307	75.653	6.564	15.032	56.402	52.699	58.489	97.078	117.018
Nonelectrical machinery	0.000	10.178	8.669	9.421	9.963	15.334	17.120	20.166	34.639	98.757	47.411	58.400	205.092
Miscellaneous	0.000	2.212	3.876	12.981	6.834	9.936	15.815	16.116	23.426	47.141	42.165	35.992	25.182

Notes: - = not available.

Sources: Authors compilations from BPS (various years a).

**Appendix Table 4d: Value Added per Employee in Local Manufacturing Establishments Reporting Positive Employment and Value Added by Industry (raw data, million rupiah)**

Industry	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
All manufacturing	0.309	0.359	0.477	0.521	0.634	0.881	1.009	1.127	1.313	1.661	2.582	2.579	2.591	3.034
Food	0.320	0.380	0.397	0.637	0.726	0.811	1.028	1.103	1.400	1.748	2.560	2.343	2.455	3.122
Textiles	0.190	0.234	0.223	0.322	0.364	0.528	0.573	0.644	0.736	1.172	1.386	2.067	1.502	1.631
Apparel	0.226	0.324	0.357	0.420	0.456	0.622	0.778	1.049	1.431	2.505	1.420	2.056	1.741	2.067
Footwear	0.361	0.464	0.546	0.564	0.624	0.990	1.023	1.255	1.424	2.048	2.107	2.979	2.424	3.027
Chemicals	0.608	0.572	0.697	0.719	0.985	1.393	1.738	1.874	1.963	3.384	8.907	5.120	5.633	7.060
Industrial chemicals	0.957	0.843	1.008	1.148	1.337	2.517	3.336	3.489	3.139	4.201	5.706	5.408	7.698	9.973
Other chemicals	0.497	0.486	0.594	0.574	0.856	1.020	1.207	1.278	1.516	3.058	10.275	4.997	4.783	5.827
Rubber	0.340	0.392	0.428	1.251	1.717	2.194	1.620	1.717	2.316	2.044	5.628	3.193	2.747	5.036
Plastics	0.362	0.420	0.432	0.492	0.567	0.629	0.700	0.725	1.019	1.151	1.402	1.871	2.038	2.310
Metal products	0.445	0.521	0.508	0.645	0.748	1.017	1.375	1.675	1.798	2.177	3.102	3.243	3.678	5.105
Electric & precision machinery	1.058	0.693	0.808	0.974	1.222	1.926	1.693	2.393	2.219	2.461	4.411	3.798	3.797	4.252
Electric machinery	1.198	0.748	0.881	1.040	1.294	2.146	1.953	2.784	2.560	2.838	5.075	4.419	4.242	4.634
Precision machinery	0.570	0.494	0.548	0.732	0.968	1.106	0.769	0.936	0.955	1.239	1.534	1.420	2.118	2.374
Transportation machinery	0.826	0.894	0.982	0.995	1.359	2.366	3.007	2.831	3.253	3.336	7.048	5.260	5.835	5.913
Other manufacturing	0.289	0.358	0.663	0.465	0.579	0.871	0.990	1.113	1.242	1.383	1.942	2.418	2.554	2.640
Beverages	0.519	0.431	0.579	0.453	0.746	1.077	0.974	1.175	1.483	1.222	2.338	2.555	3.315	3.158
Tobacco	0.178	0.239	0.255	0.297	0.419	0.504	0.565	0.629	0.821	0.772	0.860	1.066	1.116	0.919
Leather	0.495	0.687	0.570	0.744	0.933	1.077	1.286	1.906	3.134	5.067	2.172	6.776	3.162	3.391
Wood	0.383	0.492	2.135	0.695	0.848	1.684	1.766	1.709	1.703	1.649	3.418	4.472	4.252	4.262
Furniture	0.268	0.340	0.344	0.361	0.445	0.603	0.676	0.824	0.911	1.136	1.290	1.687	1.778	1.815
Paper	0.336	0.616	0.570	0.527	0.699	0.996	0.925	1.229	0.899	1.512	2.348	2.576	3.559	4.168
Printing, publishing	0.466	0.495	0.757	0.874	0.848	1.177	1.362	1.568	1.623	2.063	2.647	3.043	3.383	3.197
Oil refineries & gas	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Other oil & coal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Porcelain	0.201	0.292	0.421	0.463	0.493	0.616	0.662	1.080	0.762	0.882	1.667	1.883	1.938	2.306
Glass	0.233	0.274	0.352	0.327	0.320	0.489	0.667	0.749	1.169	1.066	1.780	2.778	3.796	2.795
Cement	0.317	0.348	0.359	0.378	0.471	0.588	0.697	1.012	1.116	1.242	1.888	1.950	2.354	2.124
Clay	0.119	0.123	0.135	0.216	0.237	0.318	0.447	0.402	0.549	0.500	0.593	0.683	0.786	0.774
Other nonmetallic mineral prod.	0.295	0.300	0.394	0.336	0.400	0.504	0.540	0.856	1.822	1.595	2.390	3.427	4.441	3.015
Basic metals	0.776	0.722	1.050	1.187	2.414	2.857	3.073	3.299	4.138	7.139	8.005	7.375	9.988	11.291
Iron, steel	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nonferrous metals	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nonelectrical machinery	0.353	0.578	0.476	0.558	0.682	0.927	1.288	1.264	1.573	1.794	2.369	2.914	2.336	3.612
Miscellaneous	0.292	0.323	0.255	0.292	0.411	0.612	0.728	0.671	0.741	0.875	1.446	1.491	1.964	2.122



Appendix Table 4d (continued)

Industry	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
All manufacturing	3.626	4.137	4.660	6.105	6.298	6.644	6.983	8.263	9.903	16.137	19.207	22.233	35.054
Food	3.796	4.692	5.558	7.116	6.360	6.772	7.472	8.488	10.880	18.932	23.410	25.821	35.923
Textiles	2.243	2.737	2.784	4.108	4.061	4.993	5.248	6.233	8.060	13.978	19.064	25.305	18.565
Apparel	2.640	2.352	2.488	3.244	5.191	3.836	4.405	4.668	5.072	7.829	9.807	10.025	12.715
Footwear	3.660	3.902	3.134	4.461	5.458	6.702	5.763	6.342	7.319	9.594	14.689	13.938	15.760
Chemicals	8.082	8.520	10.401	13.136	12.829	14.742	16.252	18.857	24.841	33.042	46.832	50.456	109.787
Industrial chemicals	10.871	10.701	12.112	19.050	15.614	17.668	20.887	24.934	27.523	40.476	64.016	70.062	125.022
Other chemicals	6.896	7.308	9.505	9.916	11.302	13.064	13.253	15.079	23.206	28.208	34.905	36.962	98.978
Rubber	6.339	5.515	6.079	17.185	6.467	7.112	9.501	9.910	11.426	18.855	22.568	23.027	31.852
Plastics	2.630	3.877	4.027	5.851	7.720	5.839	6.810	7.926	8.685	11.341	19.060	22.378	20.544
Metal products	5.244	5.524	6.308	6.476	7.309	8.908	8.733	11.354	10.145	16.162	20.342	26.371	55.375
Electric & precision machinery	5.488	6.107	6.954	9.289	9.631	8.983	12.690	17.884	16.160	30.319	32.199	43.769	89.191
Electric machinery	6.001	6.645	7.496	10.123	10.812	9.816	14.067	19.712	17.252	32.430	34.012	45.882	100.638
Precision machinery	2.970	3.639	4.439	5.707	3.988	4.817	5.606	7.885	8.887	19.802	20.685	29.651	16.767
Transportation machinery	6.017	7.614	8.448	13.024	12.824	15.481	12.360	16.374	13.487	22.576	48.387	54.824	57.806
Other manufacturing	3.166	3.631	4.109	4.715	5.514	5.878	5.935	7.187	9.093	15.005	13.964	16.754	32.155
Beverages	3.677	4.027	4.656	4.165	4.138	5.719	6.385	7.492	10.436	12.052	18.282	17.823	28.981
Tobacco	1.271	1.217	1.105	1.470	1.724	2.441	2.942	3.091	3.113	6.313	6.768	8.615	18.184
Leather	3.344	5.285	7.324	6.227	5.782	7.091	6.374	6.779	11.685	9.986	15.531	15.372	28.901
Wood	4.678	4.859	5.401	6.042	7.053	6.285	6.286	7.141	8.810	12.765	15.307	21.346	31.544
Furniture	2.277	2.422	2.807	3.473	3.721	3.677	4.310	5.047	5.455	30.828	12.721	10.719	55.250
Paper	6.180	5.712	6.986	6.909	10.782	11.523	10.759	12.246	14.902	24.499	27.250	33.964	47.881
Printing, publishing	3.483	4.244	4.993	6.285	6.139	7.241	8.080	9.979	10.028	14.347	14.613	16.154	18.365
Oil refineries & gas	0.000	0.000	0.000	33.369	0.000	181.113	46.191	91.053	1,123.728	116.473	14.196	16.144	37.009
Other oil & coal	0.000	9.061	18.725	20.035	27.502	27.731	19.883	14.867	34.189	15.748	28.909	91.359	35.652
Porcelain	2.998	2.833	5.034	4.299	7.453	8.945	6.688	22.172	28.956	22.857	18.954	24.098	29.682
Glass	3.363	4.105	4.988	5.810	9.255	7.196	9.380	11.862	9.967	12.072	13.093	21.876	61.312
Cement	2.493	3.718	4.200	4.784	5.642	6.640	6.593	8.750	9.854	9.029	10.210	14.901	23.640
Clay	0.841	0.975	1.118	1.434	1.404	1.661	1.887	2.000	1.983	2.951	2.999	3.606	4.997
Other nonmetallic mineral prod.	3.595	4.662	6.048	7.254	7.484	6.321	8.183	8.633	10.456	12.136	12.920	18.103	14.118
Basic metals	20.429	20.168	17.202	18.699	24.009	24.396	23.449	30.874	32.452	46.796	77.960	77.741	103.667
Iron, steel	-	23.215	22.495	17.147	30.918	31.034	29.510	39.845	38.031	48.063	65.133	63.353	106.684
Nonferrous metals	-	14.640	7.577	21.286	13.261	14.307	14.250	18.719	24.038	45.254	101.474	105.124	98.034
Nonelectrical machinery	5.490	6.957	8.653	8.955	9.244	11.647	10.506	13.415	17.273	19.551	13.428	21.224	63.269
Miscellaneous	2.692	2.953	2.804	3.078	4.254	3.996	3.919	5.146	5.858	9.079	12.217	14.112	17.078

Notes: - = not available.

Sources: Authors compilations from BPS (various years a).

**Appendix Table 5 Detailed regression results**

Industry, independent variable or indicator	1975-1985	1986-1991	1992-1994	1995-1997	1998-1999	2000
<b>Food (ISIC 311+312)</b>						
Constant	4.06 (0.00)	5.80 (0.00)	6.39 (0.00)	6.79 (0.00)	7.36 (0.00)	7.52 (0.00)
ln (P/E)	0.17 (0.00)	0.18 (0.00)	0.20 (0.00)	0.19 (0.00)	0.18 (0.00)	0.19 (0.00)
Dlar	1.25 (0.00)	1.28 (0.00)	1.26 (0.00)	1.31 (0.00)	1.66 (0.00)	1.63 (0.00)
Dfh	0.79 (0.00)	0.40 (0.03)	0.38 (0.02)	0.34 (0.04)	0.52 (0.00)	0.44 (0.00)
Dfm	0.66 (0.00)	0.64 (0.00)	0.51 (0.00)	0.23 (0.03)	0.21 (0.07)	0.44 (0.01)
Dfn	0.23 (0.11)	0.31 (0.00)	0.19 (0.06)	0.03 (0.75)	0.36 (0.02)	0.21 (0.38)
Ds75-85	- -	-0.14 (0.00)	-0.15 (0.00)	-0.16 (0.00)	-0.24 (0.00)	-0.22 (0.00)
Ds86-91	- -	- -	0.01 (0.75)	-0.03 (0.21)	-0.07 (0.02)	-0.10 (0.03)
Ds92-94	- -	- -	- -	-0.02 (0.37)	-0.04 (0.31)	-0.02 (0.63)
Year Dummies	Included	Included	Included	Included	Included	Included
Number of observations	11,735	15,140	9,669	11,561	7,634	3,851
Adjusted R-squared	0.50	0.44	0.44	0.42	0.44	0.45
F-statistic	799 (0.00)	1097 (0.00)	861 (0.00)	848 (0.00)	677 (0.00)	402 (0.00)
Wald (Dfh=Dfm=Dfn)	9 (0.01)	6 (0.05)	5 (0.10)	3 (0.22)	3 (0.25)	1 (0.68)
<b>Textiles (ISIC 321)</b>						
Constant	4.40 (0.00)	6.03 (0.00)	6.44 (0.00)	6.65 (0.00)	6.86 (0.00)	7.35 (0.00)
ln (P/E)	0.11 (0.00)	0.16 (0.00)	0.18 (0.00)	0.19 (0.00)	0.22 (0.00)	0.21 (0.00)
Dlar	0.63 (0.00)	0.83 (0.00)	0.92 (0.00)	0.86 (0.00)	1.06 (0.00)	0.93 (0.00)
Dfh	0.54 (0.00)	0.33 (0.03)	0.01 (0.96)	0.21 (0.05)	0.80 (0.00)	0.71 (0.00)
Dfm	0.70 (0.00)	0.61 (0.00)	0.48 (0.00)	0.64 (0.00)	0.71 (0.00)	0.80 (0.00)
Dfn	0.07 (0.64)	0.14 (0.28)	0.27 (0.03)	0.39 (0.02)	0.60 (0.00)	0.62 (0.00)
Ds75-85	- -	-0.17 (0.00)	-0.23 (0.00)	-0.21 (0.00)	-0.22 (0.00)	-0.27 (0.00)
Ds86-91	- -	- -	-0.02 (0.55)	-0.11 (0.00)	-0.13 (0.00)	-0.17 (0.01)
Ds92-94	- -	- -	- -	0.04 (0.30)	0.04 (0.46)	0.02 (0.78)
Year Dummies	Included	Included	Included	Included	Included	Included
Number of observations	12,980	9,173	5,092	5,823	3,717	1,825
Adjusted R-squared	0.48	0.35	0.37	0.41	0.45	0.39
F-statistic	813 (0.00)	454 (0.00)	337 (0.00)	404 (0.00)	339 (0.00)	145 (0.00)
Wald (Dfh=Dfm=Dfn)	18 (0.00)	11 (0.00)	7 (0.02)	11 (0.00)	1 (0.58)	1 (0.76)
<b>Apparel (ISIC 322)</b>						
Constant	4.35 (0.00)	6.19 (0.00)	6.62 (0.00)	6.99 (0.00)	7.06 (0.00)	7.22 (0.00)
ln (P/E)	0.15 (0.00)	0.16 (0.00)	0.17 (0.00)	0.16 (0.00)	0.22 (0.00)	0.21 (0.00)
Dlar	0.74 (0.00)	0.86 (0.00)	0.86 (0.00)	0.85 (0.00)	1.05 (0.00)	0.93 (0.00)
Dfh	-0.57 (0.01)	-0.45 (0.01)	0.06 (0.50)	-0.05 (0.51)	0.08 (0.35)	0.16 (0.16)
Dfm	-0.09 (0.68)	0.10 (0.49)	0.18 (0.03)	-0.01 (0.90)	0.46 (0.00)	0.14 (0.40)
Dfn	-0.19 (0.55)	-0.65 (0.00)	0.12 (0.29)	0.11 (0.29)	0.03 (0.89)	0.16 (0.30)
Ds75-85	- -	-0.08 (0.00)	-0.22 (0.00)	-0.19 (0.00)	-0.15 (0.00)	-0.10 (0.06)
Ds86-91	- -	- -	0.01 (0.73)	0.00 (0.97)	-0.05 (0.20)	-0.02 (0.73)
Ds92-94	- -	- -	- -	0.03 (0.28)	0.07 (0.08)	0.05 (0.35)
Year Dummies	Included	Included	Included	Included	Included	Included
Number of observations	1,768	5,688	4,961	6,087	3,528	1,940
Adjusted R-squared	0.42	0.24	0.26	0.24	0.32	0.28
F-statistic	86 (0.00)	168 (0.00)	198 (0.00)	195 (0.00)	188 (0.00)	97 (0.00)
Wald (Dfh=Dfm=Dfn)	3 (0.23)	13 (0.00)	1 (0.58)	2 (0.42)	7 (0.04)	0 (0.99)

**Appendix Table 5 Detailed regression results**

Industry, independent variable or indicator	1975-1985	1986-1991	1992-1994	1995-1997	1998-1999	2000
<b>Footwear (ISIC 324)</b>						
Constant	4.93 (0.00)	6.30 (0.00)	7.08 (0.00)	7.20 (0.00)	7.37 (0.00)	7.80 (0.00)
ln (P/E)	0.11 (0.00)	0.17 (0.00)	0.13 (0.00)	0.16 (0.00)	0.17 (0.00)	0.16 (0.00)
Dlar	0.71 (0.00)	0.82 (0.00)	0.57 (0.00)	0.70 (0.00)	1.14 (0.00)	1.18 (0.00)
Dfh	1.74 (0.00)	-0.09 (0.68)	0.29 (0.06)	0.12 (0.41)	0.36 (0.01)	-0.13 (0.58)
Dfm	1.43 (0.00)	-0.23 (0.48)	-0.07 (0.58)	-0.10 (0.43)	-0.07 (0.73)	0.12 (0.64)
Dfn	- -	0.45 (0.02)	-0.02 (0.91)	-0.32 (0.03)	-0.13 (0.55)	-0.36 (0.31)
Ds75-85	- -	-0.09 (0.13)	-0.08 (0.37)	-0.18 (0.02)	-0.12 (0.19)	-0.22 (0.06)
Ds86-91	- -	- -	-0.05 (0.46)	-0.11 (0.11)	-0.04 (0.65)	0.02 (0.85)
Ds92-94	- -	- -	- -	-0.04 (0.57)	0.02 (0.85)	0.02 (0.87)
Year Dummies	Included	Included	Included	Included	Included	Included
Number of observations	561	1,008	973	1,175	779	390
Adjusted R-squared	0.37	0.18	0.11	0.17	0.29	0.29
F-statistic	23 (0.00)	20 (0.00)	15 (0.00)	25 (0.00)	36 (0.00)	21 (0.00)
Wald (Dfh=Dfm=Dfn)	88 (0.00)	6 (0.06)	4 (0.11)	5 (0.07)	6 (0.06)	1 (0.47)
<b>Chemicals (ISIC 351+352)</b>						
Constant	4.38 (0.00)	5.51 (0.00)	6.25 (0.00)	6.76 (0.00)	7.05 (0.00)	6.98 (0.00)
ln (P/E)	0.20 (0.00)	0.28 (0.00)	0.28 (0.00)	0.26 (0.00)	0.27 (0.00)	0.32 (0.00)
Dlar	1.27 (0.00)	1.30 (0.00)	1.35 (0.00)	1.39 (0.00)	1.62 (0.00)	1.42 (0.00)
Dfh	0.54 (0.00)	0.67 (0.00)	0.53 (0.04)	0.71 (0.00)	0.78 (0.00)	0.72 (0.00)
Dfm	0.86 (0.00)	0.72 (0.00)	0.89 (0.00)	0.86 (0.00)	1.01 (0.00)	1.00 (0.00)
Dfn	0.63 (0.00)	0.76 (0.00)	0.79 (0.00)	0.72 (0.00)	0.69 (0.00)	0.67 (0.00)
Ds75-85	- -	-0.08 (0.04)	-0.11 (0.08)	-0.15 (0.01)	-0.15 (0.03)	0.05 (0.55)
Ds86-91	- -	- -	0.13 (0.05)	0.11 (0.08)	0.16 (0.04)	0.16 (0.08)
Ds92-94	- -	- -	- -	-0.08 (0.29)	0.08 (0.38)	0.00 (0.97)
Year Dummies	Included	Included	Included	Included	Included	Included
Number of observations	3,908	4,254	2,578	2,964	1,998	1,023
Adjusted R-squared	0.52	0.50	0.49	0.45	0.46	0.54
F-statistic	287 (0.00)	394 (0.00)	281 (0.00)	247 (0.00)	190 (0.00)	151 (0.00)
Wald (Dfh=Dfm=Dfn)	14 (0.00)	0 (0.80)	2 (0.38)	2 (0.42)	4 (0.14)	3 (0.19)
<b>Rubber (ISIC 355)</b>						
Constant	4.28 (0.00)	5.22 (0.00)	6.34 (0.00)	6.79 (0.00)	7.27 (0.00)	7.40 (0.00)
ln (P/E)	0.15 (0.00)	0.27 (0.00)	0.23 (0.00)	0.23 (0.00)	0.20 (0.00)	0.23 (0.00)
Dlar	1.23 (0.00)	0.82 (0.00)	0.97 (0.00)	0.83 (0.00)	0.97 (0.00)	0.82 (0.00)
Dfh	0.65 (0.00)	0.47 (0.00)	0.55 (0.00)	0.50 (0.00)	0.48 (0.00)	0.44 (0.10)
Dfm	0.63 (0.00)	0.41 (0.00)	0.59 (0.00)	0.60 (0.00)	0.44 (0.02)	0.78 (0.02)
Dfn	0.08 (0.57)	0.55 (0.00)	0.50 (0.03)	0.13 (0.44)	0.10 (0.65)	-0.27 (0.29)
Ds75-85	- -	-0.13 (0.01)	-0.19 (0.04)	-0.14 (0.12)	0.13 (0.20)	0.02 (0.88)
Ds86-91	- -	- -	-0.05 (0.61)	-0.04 (0.68)	0.35 (0.00)	0.20 (0.19)
Ds92-94	- -	- -	- -	-0.01 (0.92)	0.23 (0.05)	0.11 (0.53)
Year Dummies	Included	Included	Included	Included	Included	Included
Number of observations	1,876	2,493	1,309	1,255	817	431
Adjusted R-squared	0.44	0.35	0.35	0.39	0.32	0.28
F-statistic	98 (0.00)	122 (0.00)	78 (0.00)	82 (0.00)	43 (0.00)	22 (0.00)
Wald (Dfh=Dfm=Dfn)	11 (0.00)	1 (0.73)	0 (0.94)	6 (0.05)	2 (0.32)	8 (0.02)

**Appendix Table 5 Detailed regression results**

Industry, independent variable or indicator	1975-1985	1986-1991	1992-1994	1995-1997	1998-1999	2000
<b>Plastics (ISIC 356)</b>						
Constant	4.51 (0.00)	5.85 (0.00)	6.24 (0.00)	6.73 (0.00)	7.10 (0.00)	7.57 (0.00)
ln (P/E)	0.11 (0.00)	0.13 (0.00)	0.21 (0.00)	0.18 (0.00)	0.20 (0.00)	0.20 (0.00)
Dlar	0.97 (0.00)	1.07 (0.00)	1.14 (0.00)	1.01 (0.00)	1.17 (0.00)	1.21 (0.00)
Dfh	-0.46 (0.01)	0.52 (0.10)	0.32 (0.13)	0.46 (0.00)	1.00 (0.00)	0.88 (0.00)
Dfm	0.89 (0.00)	0.94 (0.00)	0.34 (0.14)	0.38 (0.02)	0.60 (0.00)	0.78 (0.00)
Dfn	1.09 (0.00)	1.04 (0.00)	0.22 (0.15)	0.56 (0.00)	0.59 (0.00)	0.13 (0.57)
Ds75-85	- -	0.06 (0.08)	-0.13 (0.01)	-0.03 (0.56)	-0.18 (0.00)	-0.26 (0.00)
Ds86-91	- -	- -	-0.12 (0.02)	-0.01 (0.88)	-0.19 (0.00)	-0.19 (0.01)
Ds92-94	- -	- -	- -	0.17 (0.00)	-0.08 (0.25)	-0.16 (0.07)
Year Dummies	Included	Included	Included	Included	Included	Included
Number of observations	2,584	3,732	2,385	3,024	1,796	955
Adjusted R-squared	0.45	0.33	0.37	0.33	0.36	0.40
F-statistic	142 (0.00)	165 (0.00)	155 (0.00)	153 (0.00)	115 (0.00)	81 (0.00)
Wald (Dfh=Dfm=Dfn)	47 (0.00)	2 (0.39)	0 (0.88)	1 (0.69)	6 (0.06)	7 (0.02)
<b>Metal products (ISIC 381)</b>						
Constant	4.25 (0.00)	5.99 (0.00)	6.52 (0.00)	6.60 (0.00)	7.17 (0.00)	7.65 (0.00)
ln (P/E)	0.17 (0.00)	0.20 (0.00)	0.21 (0.00)	0.24 (0.00)	0.23 (0.00)	0.21 (0.00)
Dlar	1.31 (0.00)	1.29 (0.00)	1.20 (0.00)	1.11 (0.00)	1.42 (0.00)	1.49 (0.00)
Dfh	1.49 (0.00)	0.50 (0.04)	0.45 (0.01)	0.27 (0.08)	0.51 (0.00)	0.46 (0.00)
Dfm	0.63 (0.00)	0.66 (0.00)	0.68 (0.00)	0.50 (0.00)	0.64 (0.00)	0.89 (0.00)
Dfn	0.41 (0.00)	0.39 (0.01)	0.48 (0.00)	0.47 (0.00)	0.45 (0.02)	0.49 (0.09)
Ds75-85	- -	-0.21 (0.00)	-0.17 (0.00)	-0.18 (0.00)	-0.29 (0.00)	-0.31 (0.00)
Ds86-91	- -	- -	0.03 (0.66)	0.03 (0.55)	-0.12 (0.05)	-0.11 (0.20)
Ds92-94	- -	- -	- -	0.07 (0.17)	-0.11 (0.10)	-0.23 (0.01)
Year Dummies	Included	Included	Included	Included	Included	Included
Number of observations	3,426	3,343	2,100	2,806	1,778	917
Adjusted R-squared	0.60	0.40	0.39	0.37	0.44	0.48
F-statistic	338 (0.00)	207 (0.00)	152 (0.00)	166 (0.00)	155 (0.00)	107 (0.00)
Wald (Dfh=Dfm=Dfn)	30 (0.00)	2 (0.29)	2 (0.46)	2 (0.41)	1 (0.71)	3 (0.28)
<b>Electric &amp; precision machinery (ISIC 383+385)</b>						
Constant	5.03 (0.00)	6.11 (0.00)	6.74 (0.00)	6.56 (0.00)	7.37 (0.00)	7.57 (0.00)
ln (P/E)	0.13 (0.00)	0.19 (0.00)	0.18 (0.00)	0.29 (0.00)	0.22 (0.00)	0.24 (0.00)
Dlar	1.18 (0.00)	1.12 (0.00)	1.26 (0.00)	1.28 (0.00)	1.46 (0.00)	1.42 (0.00)
Dfh	0.04 (0.82)	0.18 (0.57)	0.21 (0.11)	0.10 (0.26)	0.45 (0.00)	0.60 (0.00)
Dfm	0.79 (0.00)	0.82 (0.00)	0.36 (0.00)	0.47 (0.00)	0.50 (0.00)	0.75 (0.00)
Dfn	1.07 (0.00)	0.73 (0.00)	0.45 (0.00)	-0.10 (0.45)	0.20 (0.30)	0.29 (0.29)
Ds75-85	- -	0.00 (0.98)	0.12 (0.11)	-0.13 (0.08)	-0.16 (0.12)	-0.03 (0.85)
Ds86-91	- -	- -	0.36 (0.00)	-0.01 (0.91)	-0.09 (0.36)	-0.05 (0.74)
Ds92-94	- -	- -	- -	-0.08 (0.26)	-0.18 (0.06)	-0.15 (0.24)
Year Dummies	Included	Included	Included	Included	Included	Included
Number of observations	1,450	1,649	1,252	1,680	1,080	511
Adjusted R-squared	0.51	0.39	0.32	0.36	0.31	0.39
F-statistic	101 (0.00)	98 (0.00)	67 (0.00)	95 (0.00)	55 (0.00)	42 (0.00)
Wald (Dfh=Dfm=Dfn)	21 (0.00)	4 (0.14)	2 (0.30)	19 (0.00)	2 (0.38)	2 (0.32)

**Appendix Table 5 Detailed regression results**

Industry, independent variable or indicator	1975-1985	1986-1991	1992-1994	1995-1997	1998-1999	2000
<b>Transportation machinery (ISIC 384)</b>						
Constant	4.50 (0.00)	6.20 (0.00)	6.66 (0.00)	7.01 (0.00)	7.33 (0.00)	7.34 (0.00)
ln (P/E)	0.17 (0.00)	0.20 (0.00)	0.20 (0.00)	0.20 (0.00)	0.20 (0.00)	0.24 (0.00)
Dlar	1.58 (0.00)	1.68 (0.00)	1.71 (0.00)	1.35 (0.00)	1.60 (0.00)	1.60 (0.00)
Dfh	-	-	-0.68 (0.05)	-0.03 (0.91)	0.59 (0.00)	0.77 (0.00)
Dfm	0.50 (0.00)	0.49 (0.00)	0.43 (0.00)	0.69 (0.00)	0.74 (0.00)	1.08 (0.00)
Dfn	0.36 (0.00)	0.64 (0.00)	0.34 (0.06)	0.49 (0.00)	0.63 (0.00)	1.20 (0.00)
Ds75-85	-	-0.25 (0.00)	-0.07 (0.29)	-0.04 (0.59)	0.03 (0.78)	0.09 (0.44)
Ds86-91	-	-	0.11 (0.11)	0.10 (0.15)	0.06 (0.48)	0.08 (0.43)
Ds92-94	-	-	-	-0.03 (0.68)	0.03 (0.73)	-0.03 (0.81)
Year Dummies	Included	Included	Included	Included	Included	Included
Number of observations	1,931	2,045	1,363	1,663	1,014	503
Adjusted R-squared	0.54	0.45	0.43	0.39	0.44	0.56
F-statistic	151 (0.00)	155 (0.00)	115 (0.00)	106 (0.00)	91 (0.00)	82 (0.00)
Wald (Dfh=Dfm=Dfn)	28 (0.00)	26 (0.00)	9 (0.01)	7 (0.03)	0 (0.79)	2.3 (0.32)

*Notes:* - =no corresponding plants in sample; figures in parentheses are significance levels; heteroscedasticity-consistent standard errors are used to calculate coefficient significance levels.