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Do Foreign Firms Bring Greater Total Factor Productivity to Japan?

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1. Introduction

According to economic theory, foreign direct investment (FDI) is a form of long-term international capital movement which is accompanied by investors' intangible assets.[1] Examples of such intangible assets are the stock of technological knowledge accumulated by R&D or the accumulation of marketing know-how from past advertising activity, and it is expected that the recipient country benefit from such inflows. Consequently, Japanese Prime Minister Junichiro Koizumi, in his general policy speech to the Diet on January 31, 2003, promised to increase efforts to attract FDI with the aim of doubling the cumulative amount of investment in the next five years.. Although foreign investment in Japan has increased rapidly in the past few years, the FDI stock is still very small when compared with FDI in other developed economies.

In spite of the importance of the topic, reliable statistics on and analyses of inward FDI in Japan are very limited. Moreover, in the absence of any meaningful empirical studies on this subject, some critics argue that Japan does not need more FDI. Like FDI in other developed economies, the majority of recent inflows to Japan took the form mergers and acquisitions (M&As). The critics fear that inward M&As are dominated by "vulture" funds seeking to reap quick profits by taking advantage of troubled firms (Nippon Keizai Shinbun-sha 2003). Another argument is that some inward M&As are in fact conducted to acquire advanced technologies (Werner 2003) – rather than transfer and employ intangible assets in Japan.

This paper aims to examine whether such concerns regarding a potential "technological drain" have any foundation or whether Japan does indeed benefit from the transfer of intangible assets of foreign firms. In order to do so, we compare the performance of foreign-owned firms with that of domestically-owned firms, using micro data of Japanese firms in the manufacturing sector for the

[1] See, for example, Caves (1982) and Dunning (1992) on the standard theory of foreign direct investment.

period of 1994-1998. Our method of investigation is based on the following reasoning: if foreign-owned firms in Japan possess superior technologies than their domestically-owned counterparts, then this access to the parent's intangible asset should manifest itself in higher total factor productivity (TFP). And in this case, Japan will benefit from inward FDI. There is, of course, the possibility that foreign-owned firms may enjoy greater productivity because foreign firms target domestically-owned firms with higher TFP for M&A investments. In order to take account of this possibility, we also test whether the TFP level of Japanese firms that merged with or were acquired by foreign firms improved after the investment.

The paper is organized as follows: the succeeding section presents an overview of Japan's inward FDI; section 3 compares the performance of foreign-owned firms and domestically-owned firms; section 4 tests whether the performance of Japanese firms improved after they were acquired by or merged with a foreign firm; section 5, finally, summarizes our results and argue about policy implications of this study.

2. An Overview of Inward FDI in Japan

FDI in Japan is Very Small

As is well known, FDI in Japan is very small compared to other countries. Figure 2.1 compares Japan's inward and outward foreign direct investment with that of other developed and developing countries. Japan's accumulated stock of FDI is one-eleventh of that of the U.S. and 1/28th of that of the U.K. Moreover, it is much lower than that in South Korea or China. The figure also shows that foreign firms play an important part in other countries' economies as a whole, affecting macro-variables such as capital formation and employment. But in Japan, the role of foreign firms is very limited.

Another characteristic of Japan's FDI is that outward investment is much greater than inward

investment. The growth in Japanese firms' overseas employment far exceeds the employment of foreign firms in Japan, and is accelerating. Under current conditions, foreign firms cannot nearly compensate for the loss in jobs, investment, etc. brought about by the scale of Japanese companies' moving abroad. Compared to other countries, Japan is being disadvantaged by not receiving the benefits from transfers of management resources through FDI.

A Brief History of Inward FDI in Japan

From the Meiji period onward, inward investment was limited for a long time and technology was acquired through foreign technicians, capital investment and licensing contracts. In 1945, under the direction of the American occupation authorities (GHQ), the market was made relatively "open", but large multinational companies like Ford, General Motors and others did not foresee the rapid development of the Japanese economy and hence did not establish any major positions. Following the end of the occupation, the permission system was reinstated in 1952. FDI was difficult except in a few industries like petroleum that were essential to the Japanese economy. Scarce foreign exchange was strictly allocated to licensing and capital equipment importation.

In 1967, three years after Japan joined the OECD, the first steps at opening up the economy were taken. By the 1980s, most manufacturing sectors were nominally open to FDI with the exception of the petroleum and the leather products industries. Nevertheless, FDI inflows remained negligible – for the following reasons: 1) In areas where Japanese firms were not competitive or their costs were high, extensive restrictions had remained in place until the end of the 1970s; by the time they were finally lifted, investors were discouraged by newly competitive domestic firms or high labor costs; 2) M&As were severely restricted until the middle of the 1970s; 3) imports were restricted until the 1970s, preventing the establishment of a forward strategy for investment to follow

exports.[2] Another factor was the rise after 1964 of cross shareholdings as a mechanism for countering hostile takeovers and stabilizing stock prices.

Market Access is Limited in the Non-manufacturing Sector

Meanwhile, in some non-manufacturing industries substantial restrictions remain even today. Compared with the U.S., inward FDI in Japan has been constrained to a limited number of industries. Some industries, such as medical services, education, electricity, gas, and water supply, have been "sanctuaries" where almost no inward FDI is allowed. A comparison among APEC countries reveals the continuing closedness of Japan's economy in sectors such as transportation, medicine, posts, temporary labor services, agriculture services, ship repair, electricity and gas, etc.[3]

Barriers against FDI often go beyond "national treatment" to more fundamental questions of market access. For example, market entry in areas such as medical services and education is limited even for Japanese companies. Also, the private sector is prevented from entering areas that have long been public monopolies such as the postal service. Difficult problems need to be resolved concerning whether competition is in the public interest before the FDI question can be resolved.

The Recent FDI Boom in Japan

During the second half of the 1990s, inward FDI in Japan increased substantially. Figure 2.2 shows Ministry of Finance (MOF) statistics on FDI flows into Japan. According to the statistics, the

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[2] As often seen in the history of Japanese makers' advance overseas, companies will first export to a market and then, after having established a presence, invest to better meet the needs of that market by moving production there. Since imports into Japan were low, there were few foreign companies that followed this strategy.

[3] For more details on inward FDI in Japan's non-manufacturing sector, see Ito and Fukao (2002, 2003).

inward direct investment stock in Japan's non-manufacturing sector has grown eight-fold in the last ten years. The total of FDI flows in the three years from 1997 to 1999 is greater than the FDI stock at the end of the 1996 fiscal year. In recent years, especially the number of cross-border M&A cases has increased considerably.[4] In 1999, AT&T and British Telecom jointly bought a combined 30% share of Nippon Telecom. Cable & Wireless from Britain acquired IDC (International Digital Communications) by a takeover bid, while GE Capital from the U.S. acquired Japan Lease. And in 2000, the American company Ripplewood Holdings and others acquired The Long-Term Credit Bank of Japan.

Probably the following three factors have contributed to the recent boom in inward FDI.

1) In recent years, the Japanese government promoted important deregulatory and related measures in order to transform Japan's economic system. As a part of this deregulation program, the Japanese government relaxed or abolished several regulations on inward FDI. For example, all restrictions on foreign ownership and on foreign board members in Type I telecommunications carriers (except for NTT and KDD), including their radio station licenses, were removed in 1998. In 1999, all restrictions on foreign capital and the appointment of foreign directors in all cable TV businesses were ended.[5]

2) As Figure 2.3 shows, there was a global boom in M&A in the second half of the 1990s, and this boom contributed to inward investment expansion. The growing volume of excess facilities and plant due to the lengthy economic recession also drove M&A in Japan, prompting both domestic and foreign investors to choose acquisition over investing in new facilities.

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[4] According to METI (2001), there were 129 investments into Japan through cross-border M&As in 1999.

[5] For more detail on Japan's recent deregulation measures, see Japan Investment Council (various years).

3) A third major reason was that the collapse of stock and land prices after the 1997 financial crisis in Japan, as well as relatively weak yen attracted foreign attention. As firms failed to achieve projected earnings, they sold risky stock and cross shareholdings declined, making it easier for M&A to occur.

This FDI boom has contributed to job creation in a number of industries, including finance/insurance, telecommunications, commerce, autos, pharmaceuticals, etc. Fukao and Amano (2003) estimate that employment at foreign companies in Japan rose from 485,000 in 1996 to 694,000 in 2001.

3. TFP Comparison of Foreign-Owned and Domestically-Owned Firms

In this section, we compare the TFP level and other performance indicators of foreign-owned and domestically-owned firms. Quite a number of studies, on various countries, have dealt with this topic. These typically show that labor tends to be more productive in foreign-affiliated companies than in domestic companies.[6] However, this is generally due to a greater concentration of capital investment; total factor productivity (TFP) analysis indicates that foreign firms' productivity is not necessarily higher in all countries if differences in capital intensity are taken account of.[7]

A study that has examined the relationship between ownership and the growth rate of firms' performance indicators (such as the capital-labor ration, real value-added and TFP) is that by Kimura and Kiyota (2003), which used the same data source as the present paper. Their study showed that foreign-ownership has a positive impact on the growth rate of real value-added, the rate of return to capital, and TFP. Compared with their analysis, our study is more sharply focused on the TFP level

[6] See, for example, Blomstrom and Sjoholm (1998) on Indonesia.

[7] Ramstetter (2002) and Ito (2002b) on Indonesia and Ito (2002a) on Thailand have shown this result.

as a measure of performance and measures TFP using a more sophisticated approach; moreover, this paper looks more carefully at the effects of M&As.

The approach used here tries to deal with the following shortcomings of Kimura and Kiyota's (2003) paper. First, they set the cut-off capital participation rate for their definition of foreign-owned firms at 10%. Their data on foreign-owned firms include all the affiliates of which one or several foreigners owned 10% or more in total. A substantial amount of stocks issued by top Japanese firms is owned by foreign institutional investors as portfolio investments. By setting their cut-off ratio as low as 10%, their data probably include such portfolio investments. Taking account of this risk, we use the 33.4% cut-off ratio. Secondly, they used the book-value of capital as capital inputs. As is well known, there might exist a huge gap between the book-value of capital and real capital stock, though the latter is more appropriate as input data for TFP analysis. The third shortcoming of their study is that they used value-added instead of gross output as their output measure. As Baily (1986) has shown, value-added-based TFP may differ from gross-output-based TFP, which is commonly used in theoretical and empirical studies. Fourth, Kimura and Kiyota derived real value-added using the value-added deflator of the SNA statistics, which is based on a relatively aggregated industry classification. Their approach risks underestimating the TFP growth of firms in high-tech industries, where output prices decline more rapidly. Compared with their approach, we use the more disaggregated deflator of the I-O tables. Fifth, they used a single hypothetical firm which was derived by taking the average of the manufacturing firms from all industries, as the benchmark for the TFP comparison. Since cost shares of each input take quite different values among industries, there is a risk of large approximation errors in their approach. We use a different hypothetical firm for each industry.

Data Source and Definition of Nationality

We use the firm-level panel data underlying the *Basic Survey of Japanese Business Structure and Activities* conducted annually by the Ministry of Economy, Trade and Industry (METI).[8] The survey covers all firms with at least 50 employees or 30 million yen of paid-in capital in the Japanese manufacturing, mining and commerce sectors. We use the data for manufacturing firms. Our data covers the period of 1994-1998. After some screening of the data our unbalanced panel data consists of 68,641 observations (13,351 firms in 1994 and 13,719 firms in 1998).[9]

In the survey, firms were asked what percentage of their paid-in capital was owned by foreigners. We use this information to determine whether a firm is foreign-owned, setting our cut-off capital participation rate at 33.4%. Thus, our data on foreign-owned firms include all those affiliates of which one or several foreigners owned 33.4% or more in total.

"Entry" and "Exit" of Foreign-Owned Firms

Table 3.1, which is based on our data, shows how the presence of foreign-owned firms in Japan's manufacturing sector increased in 1994-98: their number grew from 180 in 1994 to 244 in 1998. During the same period, the sales of foreign-owned firms nearly doubled from 9.6 trillion yen to 18.2 trillion yen. 38 foreign-owned firms exited and 69 foreign-owned firms newly entered in this period.[10] 43 domestically-owned firms in 1994 had become foreign-owned by 1998. We regard

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[8] The compilation of the micro-data of the METI survey was conducted as part of the project "Japan's Economic Growth" at the Economic and Social Research Institute, Cabinet Office, Government of Japan.

[9] We exclude all observations with zero values of material costs, compensation of employees, and tangible fixed assets from our data set. We also exclude observations with an extremely high or low capital-labor ratio. By this screening process the number of observations declined by about 8% in comparison with our original set of observations.

[10] As already mentioned, the METI survey covers only those firms in the manufacturing and the commerce sector that are of a size that is greater than the cut-off level. Thus, our data on firms that

these firms as merged with or acquired by foreign firms.

The increase in foreign-owned firms' market share was mainly caused by these 43 "M&As." The total sales of these 43 firms amounted to 8.8 trillion yen in 1998, which is greater than the total increase in foreign-owned firms' sales of 8.6 trillion yen in the 1994-1998 period. We will study these 43 cases more closely in the following section.

Measurement of TFP

In this paper we measure each firm's TFP level using the method developed by Good, Nadiri, and Sickles (1997). Their method is based on Caves, Christensen, and Diewert's (1982) "hypothetical firm" approach, which measures TFP as the gap between 1) the deviation of a firm's output level from the industry average output level and 2) the summation of the deviations of the firm's input level of production factor *i* from the industry average input level of that factor multiplied by the simple mean of the firm's cost share of that factor and the industry average cost share of that factor for all the production factors. This index is particularly useful for a comparison of the productivity level of more than two firms in one particular period. However, this method is not suitable for inter-temporal comparisons.

Good, Nadiri, and Sickles (1997) overcome this problem by combining the "chain index" approach with the "hypothetical firm" approach of Caves, Christensen, and Diewert (1982). They achieve this by assuming a hypothetical firm for each cross-sectional comparison and then chaining the hypothetical firms together over time. The productivity index thus obtained is particularly useful because it provides a consistent way of summarizing the cross-sectional distribution of firms' TFP and the inter-temporal change of distribution over time. Aw, Chen, and Roberts (1997), Fukao and Ito

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"entered" includes firms which expanded or changed their main business.

(2002), and Hahn (2000) applied this approach to data of the manufacturing sector at either the firm or plant the level for Taiwan, Japan and Korea respectively.

Using the industry classification of the METI survey, we divided our data into 59 manufacturing industries. For each industry we measured the TFP level of firm *f* at time *t* by

$$\ln TFP_{ft} = (\ln Y_{ft} - \overline{\ln Y_t}) + \sum_{s=1}^{t} (\overline{\ln Y_s} - \overline{\ln Y_{s-1}}) \\ -[\sum_{i=1}^{n} \frac{1}{2}(S_{ift} + \overline{S_{it}})(\ln X_{ift} - \overline{\ln X_{it}}) + \sum_{s=1}^{t}\sum_{i=1}^{n} \frac{1}{2}(\overline{S_{is}} + \overline{S_{is-1}})(\overline{\ln X_{is}} - \overline{\ln X_{is-1}})] \quad (1)$$

where Y_{ft} denotes the output level of firm *f* in year *t* and X_{ift} the input level of factor *i* at firm *f* in year *t*. S_{ift} stands for the cost share of input *i* at firm *f* in year *t*. Upper bars indicate the average value of that variable over all firms in that industry.

Data Prepared for the Calculation of TFP

We used each firm's total sales and cost of intermediate inputs as nominal gross output and nominal intermediate input data. We derived the deflator for each industry's gross output and intermediate input by aggregating the deflator of METI's Extended IO Tables at the 3-digit level into our 59 industries.

As physical capital stock, only nominal book value data are available in the METI survey. We compiled a converter from book value to real capital stock using investment flow data in METI's *Report on Industry Statistics*, which is based on the *Census of Manufactures*. First, we aggregated the data on investment in fixed assets for 1970-98 in the *Report on Industry Statistics* into our 59 industries and then deflated them using the gross domestic capital formation deflator (plant and equipment) in the *Annual Report on National Accounts* released by the Cabinet Office, Government of

Japan. We used depreciation rates of the JIP database at the two-digit level (Fukao, Inui, Kawai, and Miyagawa 2003)[11] and estimated the real physical capital stock for 1994-1998 by the perpetual inventory method. We used ratios of real capital stock and book value of capital reported in METI's *Report on Industry Statistics*, which we aggregated into our 59 industries, as our converter. In order to derive the cost share of capital, we used capital cost data of the JIP database at the two-digit level (35 industries).

As labor input, we multiplied each firm's total number of workers by the sectoral working-hour statistics of the Cabinet Office's *SNA Statistics*. We were not able not take account of differences in labor quality among firms, though it seems fair to assume that foreign firms probably tend to employ more educated workers. Our estimates of foreign-owned firms' TFP level might be biased upwards because of this neglect of the labor quality.

Comparison of Performance by Regression Analysis

As a first step to compare foreign- and domestically-owned firms, we conduct a regression analysis in which firm's performance is regressed on the foreign-ownership dummy. In order to control for other factors which might affect firm's performance, we use industry dummies and year

[11] The JIP Database has been compiled by those four authors, several economists at ESRI, and graduate students from Keio, Hitotsubashi, Tsukuba and other universities as part of an ESRI (Economic and Social Research Institute, Cabinet Office, Government of Japan) research project. The detailed result of this project is reported in Fukao, Miyagawa, Kawai, Inui, et al. (2003). The database contains annual information on 84 sectors, including 49 non-manufacturing sectors, from 1970 to 1998. These sectors cover the whole Japanese economy. The database includes detailed information on factor inputs, annual nominal and real input-output tables, and some additional statistics, such as R&D stock, capacity utilization rate, Japan's international trade statistics by trade partner, inward and outward FDI, etc. at the detailed sectoral level. An Excel file version (in Japanese) of the JIP Database is available at <http://www.esri.go.jp/jp/archive/bun/bun170/170index. html>.

dummies as additional explanatory variables. Table 3.2 reports the results of this regression. Our main results are as follows.

1） Foreign-owned firms have about 10% higher TFP and a 2 percentage point higher current profit-sales ratio. The latter result is consistent with the fact that the average of current profit-sales ratio of foreign-owned firms is substantially higher than industry average of all firms (Figure 3.1).

2） Foreign-owned firms spend proportionately more on R&D per worker. They also have a significantly higher capital-labor ratio. Probably because of this, the labor productivity of foreign-owned firms is higher than that of Japanese firms.

3） Foreign-owned firms' growth rate of tangible assets was 4 percentage points higher and their real sales growth 1.6 percentage points faster than for domestically-owned firms.

4） Average wages at foreign firms are 1.21 million yen higher per year.

5） In the 1990s many firms conducted restructuring of their business and reduced their employment. Despite the pattern of labor saving (i.e. capital-intensive) production methods, we cannot say that foreign-owned firms reduced employment significantly compared to domestically-owned firms.

Empirical Model of the Determinants of TFP

As we have seen, foreign-owned firms tend to conduct more R&D and pay higher wage rates. Although their TFP level is significantly higher than that of Japanese firms, this difference might be caused not by the inflow of knowledge from their parent firms but by their own R&D activities and the (potentially) higher quality of their labor. In order to test which of the above two hypotheses is correct, we estimate an empirical model of the determinants of each firm's TFP level and its growth rate of TFP. Descriptive statistics of the main variables used in this regression are summarized in

Table 3.3, while the regression results of this empirical model are reported in Table 3.4. The model is estimated by OLS using pooled data for 1994-98.

Again, foreign-owned firms display a TFP level about 10% higher than that of Japanese firms even after controlling for other factors such as R&D intensity, the percentage of non-production workers, years passed since the firm was established, and firm size (sales) in addition to industry differences (industry dummies) and observation year. When we add firm dummies to the regression model, the gap between the TFP level of foreign-owned firms and Japanese firms becomes smaller (about 2.5%) but it is still positive and significant.

The overall comparison between foreign-owned and Japanese companies shows that foreign-owned companies had 10% higher TFP, and higher returns on capital. Moreover, they displayed a higher capital-labor ratio and R&D investment per worker. Probably reflecting the higher levels of capital intensity and technology, foreign-owned companies showed higher labor productivity and wage rates as well. Finally, foreign-owned firms enjoyed higher growth rates of TFP, sales, and real assets.

4. Effects of Mergers and Acquisitions

As we have seen in sections 2 and 3, the majority of recent direct investments in Japan took the form of M&As. If Japanese firms that merged with or were acquired by foreign firms receive new technologies and management skills from their foreign owners, their TFP should be boosted after the investment. In this section, we test this hypothesis.

Data Used

The same data as in section 3 are used. However, it should be noted that our analysis is limited by the small database of only 43 cases and the relatively short period of observation (1994-98).

As already mentioned, we use a 33.4% threshold level to designate the acquisition of equity by a foreign firm in a Japanese company as a case of FDI or "out-in M&A." In the case of M&As involving only domestic firms – "in-in M&As" – we have had a threshold of 50% because of data limitations. We have 347 cases of "in-in M&As.

According to our data, most manufacturing firms acquired by foreign firms in the 1994-98 period were in the electrical machinery, transportation machinery, and chemical industries, while those acquired by Japanese firms were in the electrical machinery, transportation, and general machinery industries. Although more companies were acquired through domestic than "out-in" M&As, the combined sales of the firms acquired by foreign companies were almost twice as high as those acquired by domestic companies, , probably because the former were larger on average.

Regression Results

Using dummy variables to designate firms that were targets of foreign or domestic firms, we compare the performance of "out-in" M&A target firms, "in-in" M&A target firms and all other firms during the 1994-98 period. In this regression, we exclude data of firms whose activity is not reported either in 1994 or 1998.

The regression results are reported in Table 3.5. In all the equations, we included industry dummies as explanatory variables. The results indicate that TFP levels among "out-in" M&A firms were higher than either domestic M&A firms or other firms, which was probably due to the transfer of management resources from the foreign company. In fact, M&As among domestic firms did not increase the target firm's TFP. It should be pointed out, however, that the difference in TFP levels between "out-in" M&A companies, domestic M&A companies and other companies was smaller than the difference between foreign-affiliated companies in general and Japanese domestic companies. This is probably because in the case of "out-in" M&A companies, little time had

passed since the investment and the transfer of management resources and techniques to the acquired company had not been completed and/or fully fed through. However, as time passes, recent "out-in" M&A targets are likely to have characteristics of foreign-owned firms in general, that is, a greater concentration of capital and higher R&D investment, higher labor productivity and wage rates, higher levels of capital investment per worker, and higher TFP. "Out-in" M&A activity therefore is likely to contribute to capital deepening as well as increases in research and development, labor productivity and wage levels.

Table 3.5 also shows that "out-in" M&A target companies increase sales and expand fixed capital assets by more than other companies. Since "out-in" M&A companies have higher levels of productivity and profit rates, they aggressively expand production. It has been claimed that in contrast to greenfield investment, M&A does not bring increased capital investment or employment. But at least so far as capital investment is concerned, M&A companies are observed to vigorously expand investment. As is well known, the economy as a whole realizes higher levels of TFP not only due to improvements within individual firms, but also as a result of a growing market share of such firms. Since that firms that have been the target of inward investment possess higher TFP they raise the overall TFP level in the economy.

Employment growth in all three types of companies does not differ greatly. It cannot be said that restructuring by M&A target companies has reduced employment in Japan.

Much of the "out-in" M&A activity took place in the latter half of the 1990s. Therefore, we only have a few years to observe any changes. However, in many cases it will take a long time to change management practices and put firms back onto track. In order to take account of this factor we also estimated a model similar to the one above but taking into account the number of years passed since the investment, i.e. (Dummy for firms which are merged with or acquired by a foreign firm)*(no. of years passed since the investment) and (Dummy for firms which are merged with or

acquired by a domestic firm)*(years passed since the investment). The results are reported in Table 3.6. Basically, the results are similar to those in Table 3.5. There was no substantial improvement in the results.

5. Conclusions

Summary of Findings

The overall comparison between foreign-owned and Japanese companies shows that foreign-owned companies enjoyed 10% higher TFP as well as higher earnings and returns on capital. They also displayed a higher capital-labor ratio, higher R&D intensity. Reflecting their higher TFP and labor-saving production patterns, foreign-owned companies showed higher labor productivity and wage rates as well. Foreign-owned firms tended to enjoy higher growth in sales and real assets.

Firms that were the subject of an "out-in" merger or acquisition showed similar characteristics, i.e. they enjoyed higher TFP growth and R&D intensity and adopted more labor-efficient production patterns.

When we compare "in-in" M&A targets with non-target companies, and "out-in" M&A target companies with non-target companies, the differences are not great. However, in the case of "in-in" M&A target companies, growth was observed in the labor-capital and fixed assets ratios. However, there were no improvements in TFP levels, labor productivity or earnings. Compared to "out-in" M&As, "in-in" M&A companies continue to expand in scale but without improvements in productivity or earnings.

Further, there is no evidence that foreign-owned firms or "out-in" M&A target firms, despite their tendency to labor saving production techniques, reduced employment significantly compared to other companies. This is probably because the target companies become to have higher productivity and earnings and received robust increases in plant and equipment investment, and sales support. It

is important to note that both greenfield and M&A investors undertook new investment and sales expansion in this manner.

Policy Implications

Inward FDI in Japan is remarkably small when compared to other developed countries, not only on an investment stock basis but also in terms of employment and fixed capital investment by foreign firms. Since the Meiji period, Japan has brought in foreign technologies by inviting technicians, importing industrial products, and signing licensing contracts, but FDI was strictly rejected or, later, seriously impeded. When pressed to liberalize capital controls as a condition for joining the OECD, domestic companies and their cross-shareholdings effectively blocked foreign investment until domestic firms had become competitive. In the services sector, investment barriers still successfully restrict significant entry, and even today there are many so-called "sanctuaries" where there is no foreign investment. Further, the cross shareholding structure that has grown up since the 1960s almost certainly will continue to hamper foreign investment.

The FDI flows into Japan observed in the second half of the 1990s were still tiny when compared with other developed countries. Yet, for Japan they represent an unprecedented boom, which was brought about by deregulation (mainly of non-manufacturing industries), corporate failures and falling asset values, reduced cross shareholdings and a boom in global M&A activity. However, the immediate effects of those deregulations on FDI inflows have run their course while the international M&A boom has stalled. As a result, inward investment is now stagnating.

In order to promote FDI, the government has recently announced the opening of a "one-stop window" and established "special restructuring zones." However, without major further reforms these kinds of measures will not be sufficient to achieve the government's objective. On a balance of payments basis, the flow of inward FDI in the second half of 2003 shrunk by 42%. In the year from

July 2002 to June 2003, the flow of inward FDI was ¥0.83 trillion. At this rate, in five years the total would be ¥4.15 trillion, falling way short of the ¥9.4 trillion needed to double FDI stock.

The fact that outward FDI greatly exceeds inward investment means that Japan continues to lose out in the competition to attract important global companies - including Japanese companies - that would protect the high income of Japanese workers in a globalized world market. In order for Japan to enhance its competitiveness, it is especially important to have more effective policies promoting inward FDI including M&As, and to further deregulate non-manufacturing industries.

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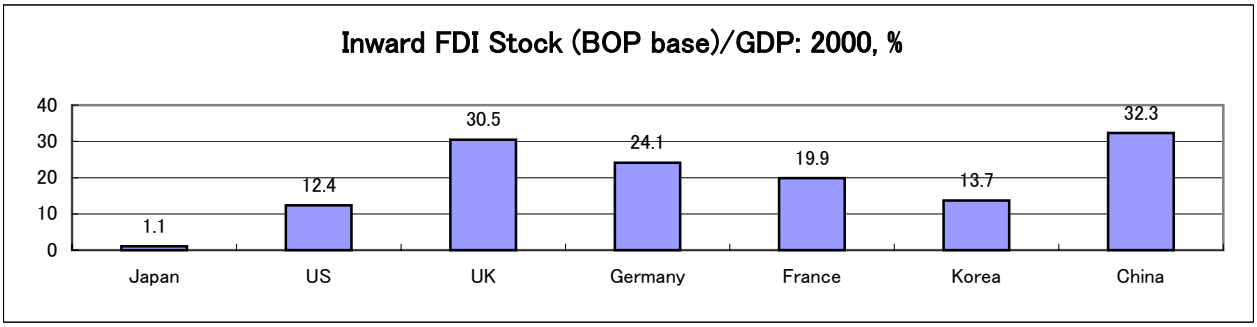
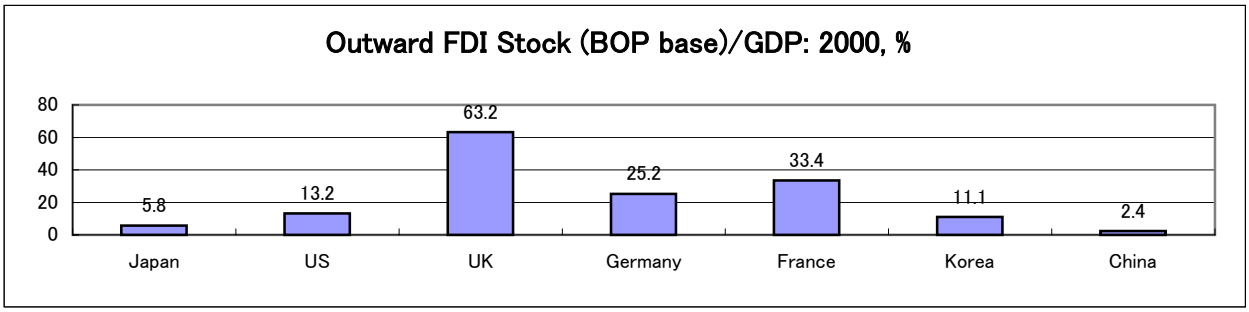
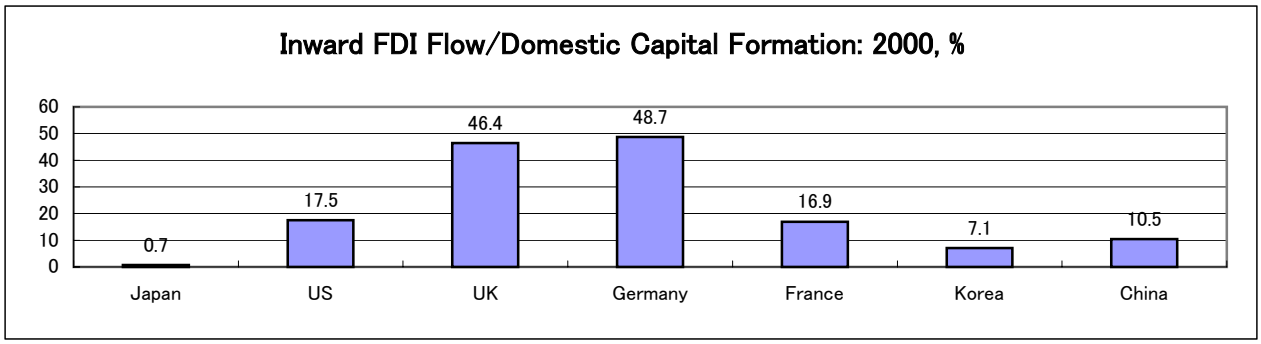
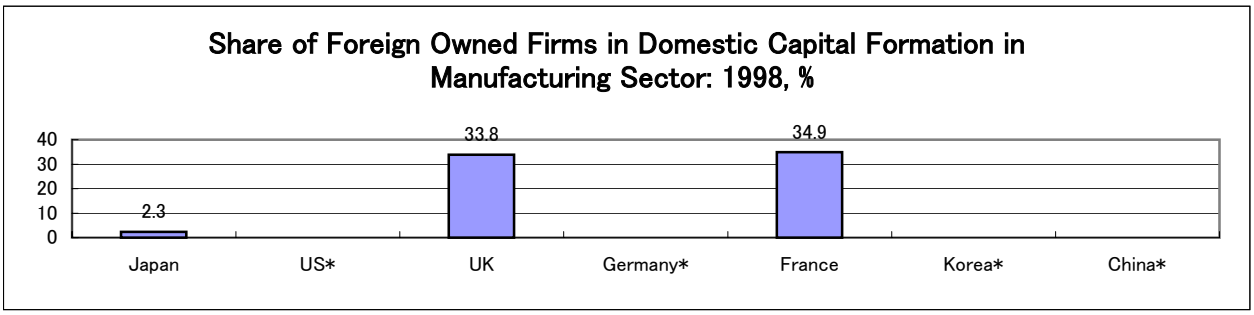
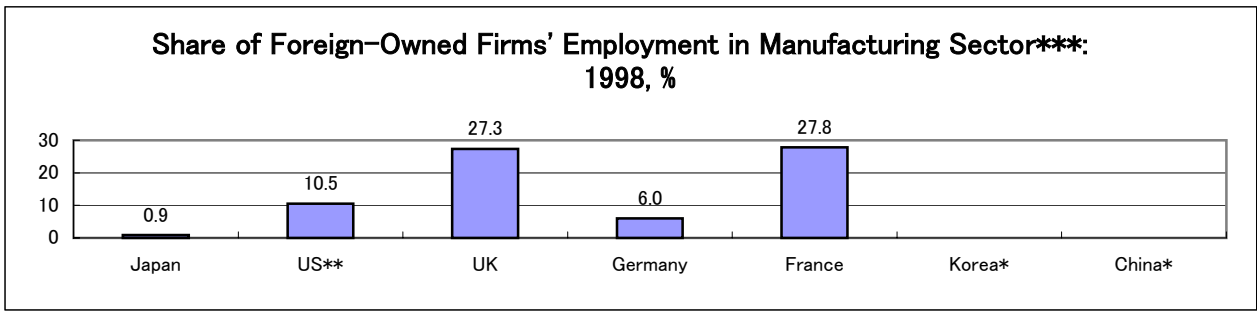
Figure 2.1 International Comparison of Outward and Inward FDI





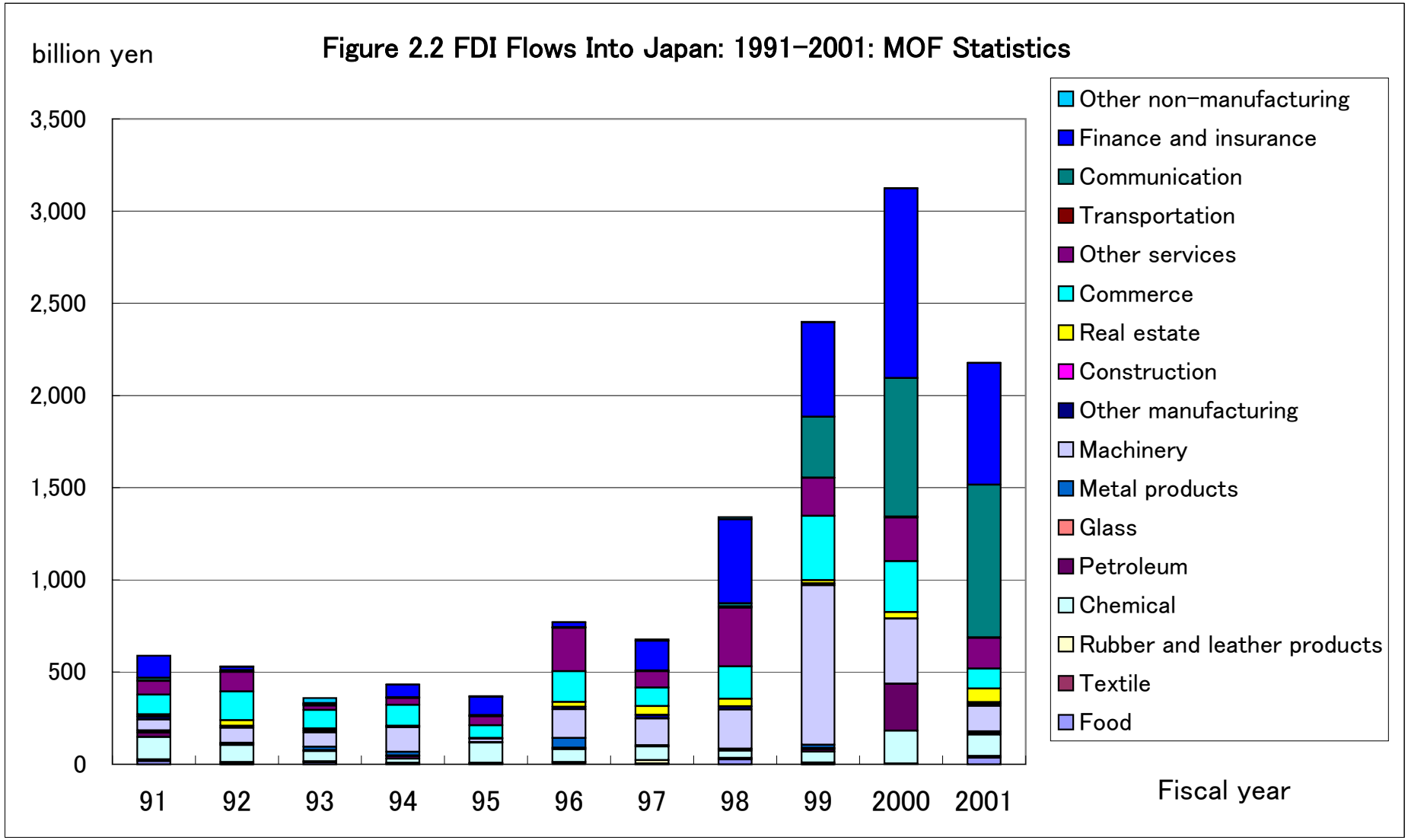






Source: UNCTAD World Investment Report 2002, OECD Measuring Globalization 2001,

* Data not available.
** Data for 1992.
***Foreign-owned firms are majority foreign-owned firms.



Source: Ministry of Finance, *Statistics on FDI in Japan*

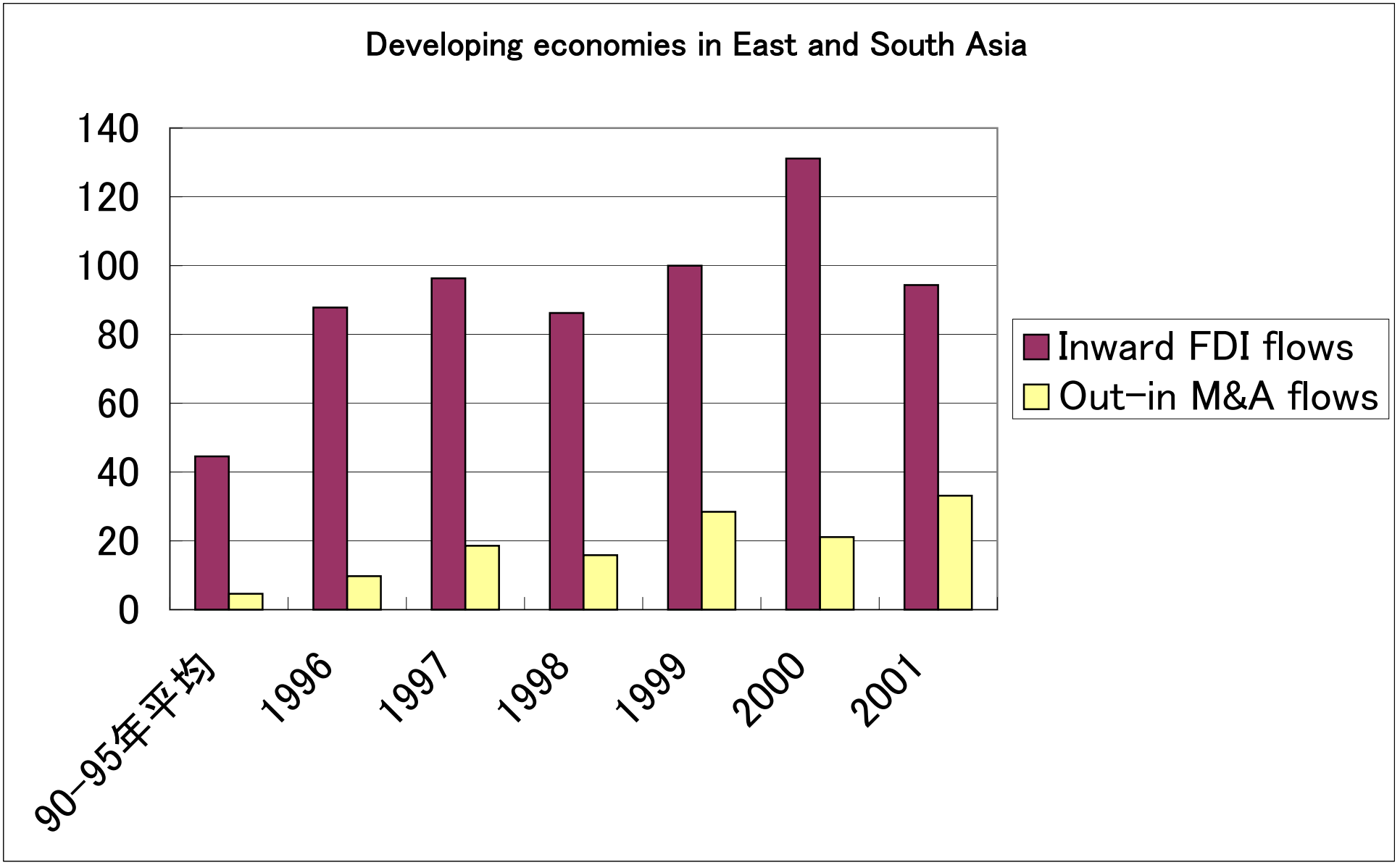

Developing economies in East and South Asia
140
120
100
80
60
40
20
0
90-95年平均
1996
1997
1998
1999
2000
2001
Inward FDI flows
Out-in M&A flows

Table 3.1 "Entry" and "Exit" of Domestically-Owned and Foreign-Owned Firms in the Manufacturing Sector

(number of firms, values in parentheses are total sales)

	1994			1998		
Manufacturing	Total firms	Domestically-owned	Foreign-owned	Total firms	Domestically-owned	Foreign-owned
Total	13351 (243821.6)	13171 -234236	**180** **(9585.6)**	13719 (239532.4)	13475 -221315.6	**244** **(18216.8)**
Firms that "exited" in 1994-98	3199 (27880.8)					
Breakdown of "exited" firms		3161 -27110.7	**38** **(770.1)**			
Firms that "entered" in 1994-98				3567 (24193.5)		
Breakdown of "entered" firms					3498 -23327.6	**69** **(865.9)**
Firms that "stayed" in 1994-98	10152 (215940.8)			10152 (215338.8)		
Breakdown of "stayed" firms						
Stayed as domestically-owned		9967 (198431.1)			9967 (197610.5)	
Stayed as foreign-owned			**132** **(8401.3)**			**132** **(8576.8)**
Changed from domestically-owned to foreign-owned		**43** **(8694.1)**				**43** **(8774.2)**
Changed from foreign-owned to domestically-owned			**10** **(414.2)**			**10** **(377.5)**

Source: Murakami and Fukao (2003).

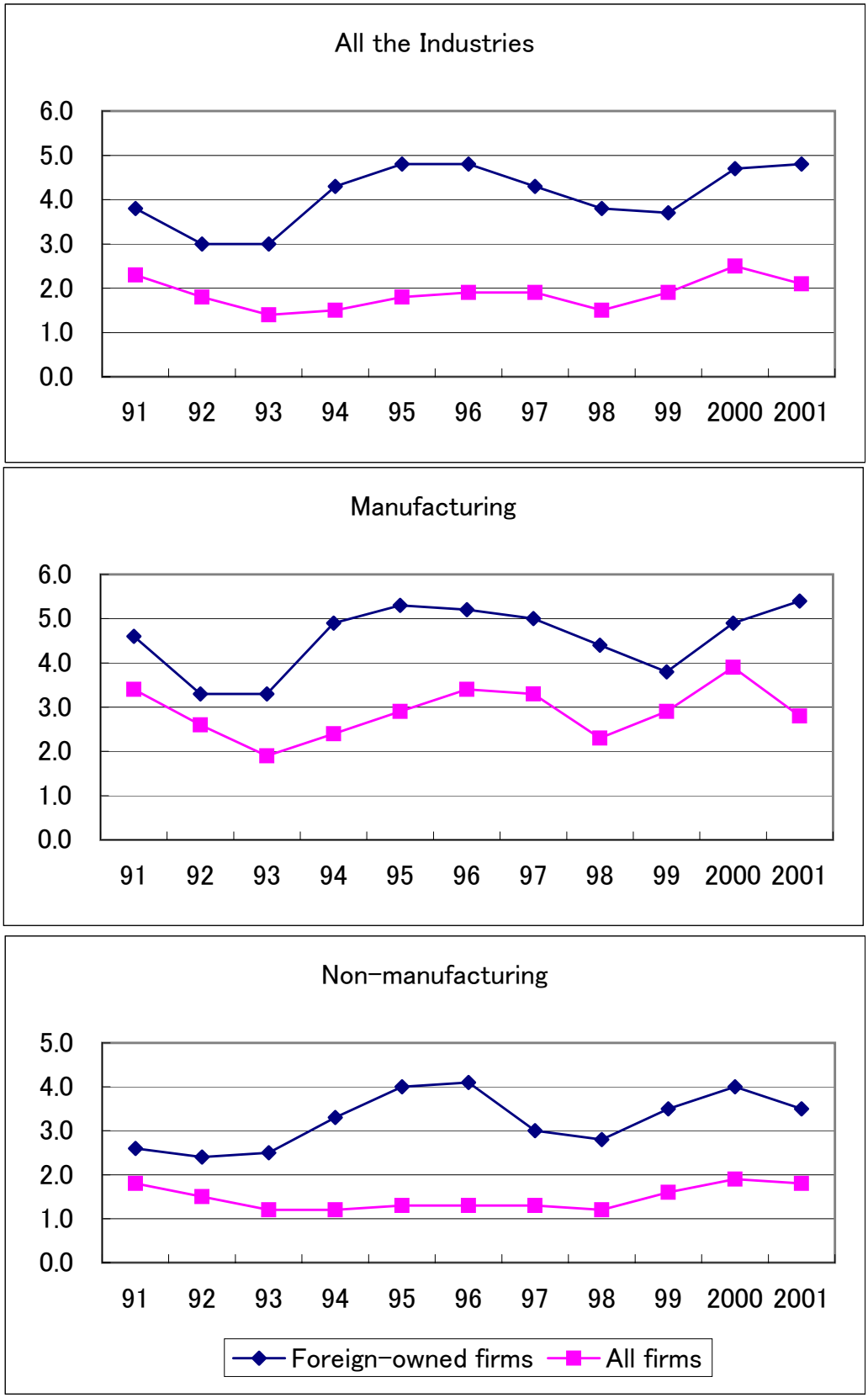
Table 3.2 OLS Estimation Results: Comparison between Foreign-Owned and Domestically-Owned Firms

	TFP level (Logged value, deviation from industry average)	Growth rate of TFP	Capital-labor ratio	R&D-sales ratio (%)	Current profit per worker (million yen per worker)
Foreign-ownership dummy	0.1082307 ***	0.0041241	1.685139 ***	1.012639 ***	2.555966 ***
	(19.89)	(0.90)	(5.79)	(8.91)	(23.70)
_cons	-0.0746326 ***	-0.0359864 ***	6.279067 ***	2.846734 ***	0.8443526 ***
	(-25.59)	(-15.02)	(38.86)	(36.99)	(14.11)
Industry dummy	yes	yes	yes	yes	yes
Year dummy	yes	yes	yes	yes	yes
No. of observations	67261	49111	68641	32076	67261
Adjusted R^2	0.3742	0.0476	0.0485	0.1633	0.0418

	Current profit-sales ratio (%)	Growth rate of real asset	Wage level (million yen per worker)	Growth rate of workers	Labor productivity (million yen per worker)	Growth rate of real sales
Foreign-ownership dummy	2.290792 ***	0.0397796 ***	1.2101687 ***	-0.001225	3.613735 ***	0.0162976 **
	(2.74)	(3.51)	(24.13)	(-0.24)	(27.94)	(2.19)
_cons	0.8481316 *	0.2066868 ***	4.201779 ***	-0.0225681 ***	4.956449 ***	0.0699164 ***
	(1.83)	(32.88)	(150.95)	(-8.06)	(69.04)	(18.13)
Industry dummy	yes	yes	yes	yes	yes	yes
Year dummy	yes	yes	yes	yes	yes	yes
No. of observations	68641	68641	68641	50213	68641	48953
Adjusted R^2	0.0031	0.0087	0.1987	0.0142	0.1116	0.0809

Pooled data for 1994-98 is used.
In the compilation of industry dummies, the computer industry is treated as a benchmark industry without an industry dummy variable.

Figure 3.1 Current Profit-Sales Ratio of Foreign-Owned Firms in Comparison with Industry Average



Source: METI (2003) *35th Gaishikei Kigyo Doko Chosa* (*Survey on Recent Trends of Foreign-Owned Firms*)

Table 3.3 Descriptive Statistics of the Main Variables Used in the Regression Analysis

Variable	Number of observations	Average	Standard deviation	Minimum value	Maximum value
TFP level	67261	−0.0060	0.1979	−3.7173	2.2991
Growth rate of TFP	49111	0.0001	0.1163	−3.5397	3.5086
R&D stock-sales ratio	63584	0.0325	0.0703	0.0000	0.4368
R&D investment-sales ratio	67261	0.0075	0.0150	0.0000	0.0965
No.of years passed since established	67261	36.8110	14.4676	0.0000	109.00
(No.of years passed since established)^2	67261	1564.35	1098.68	0.0000	11881.00
Outsourcing ratio	67261	0.1129	0.1482	0.0000	0.9659
Sales (billion yen)	67261	16.21	108.71	0.13	8671.23
Sales~2	67261	12080	552687	0	75200000
Share of non-production workers in total workers	67261	0.3292	0.2529	0.0000	1.0000

Source: Murakami and Fukao (2003)

Table 3.4 Estimation Results: Determinants of TFP Level and TFP Growth Rate
Table 3.4 Panel A. Dependent variable: TFP level

				Firms with zero R&D inv. are excluded.				Firms with zero R&D inv. are excluded.
Foreign-ownership dummy	0.0984 ***	0.0978 ***	0.0884 ***	0.0932 ***	0.0284 ***	0.0246 ***	0.0246 ***	0.0205 *
(>33.4%)	(17.92)	(18.08)	(16.49)	(16.12)	(2.95)	(2.60)	(2.61)	(1.83)
Percentage of non-production workers			0.0930 ***	0.0889 ***			-0.0010	0.0036
			(37.25)	(24.71)			(-0.38)	(0.78)
R&D stock-sales ratio	0.1356 ***			0.0108	-0.5954 ***			-0.6408 ***
	(14.01)			(1.11)	(-23.91)			(-25.55)
R&D investment-sales ratio		0.7560 ***	0.5524 ***			-0.5383 ***	-0.5379 ***	
		(16.84)	(12.34)			(-9.77)	(-9.76)	
No.of years passed since established	-0.0015 ***	-0.0015 ***	-0.0017 ***	-0.0007 ***	0.0003	0.0005 **	0.0005 **	-0.0004
	(-9.74)	(-9.69)	(-11.19)	(-3.74)	(1.10)	(2.10)	(2.10)	(-1.14)
(No.of years passed since established)^2	0.0000 ***	0.0000 ***	0.0000 ***	0.0000 ***	-0.0000	-0.0000	-0.0000	0.0000 *
	(9.23)	(9.14)	(9.95)	(4.22)	(-0.26)	(-1.52)	(-1.52)	(1.78)
Outsourcing ratio	0.0904 ***	0.0909 ***	0.0834 ***	0.0594 ***	-0.0083	-0.0082	-0.0082	-0.0073
	(20.00)	(20.39)	(18.88)	(10.20)	(-1.64)	(-1.64)	(-1.64)	(-1.05)
Sales	0.0002 ***	0.0002 ***	0.0002 ***	0.0002 ***	0.0010 ***	0.0013 ***	0.0013 ***	0.0006 ***
	(21.16)	(21.63)	(21.63)	(17.65)	(14.94)	(18.55)	(18.55)	(9.21)
Sales^2	-0.0000 ***	-0.0000 ***	-0.0000 ***	-0.0000 ***	-0.0000 ***	-0.0000 ***	-0.0000 ***	-0.0000 ***
	(-15.10)	(-15.41)	(-15.32)	(-12.07)	(-11.84)	(-14.06)	(-14.05)	(-7.93)
Constant	-0.0724 ***	-0.0735 ***	-0.0862 ***	-0.0758 ***	-0.0826 ***	-0.1061 ***	-0.1406 ***	-0.0183
	(-19.07)	(-19.45)	(-22.94)	(-14.53)	(-10.00)	(-13.18)	(-13.08)	(-1.49)
Industry dummy	yes	yes	yes	yes	yes	yes	yes	yes
Year dummy	yes	yes	yes	yes	yes	yes	yes	yes
Firm dummy	no	no	no	no	yes	yes	yes	yes
Number of observations	63584	67261	67261	29324	63584	67261	67261	29324
Adjusted R^2	0.3959	0.3885	0.4009	0.4362	0.2454	0.2342	0.234	0.2866

Table 3.4 Estimation Results: Determinants of TFP Level and TFP Growth Rate
Table 3.4 Panel B. Dependent variable: TFP level

US dummy	0.1038 ***	0.1054 ***	0.0296	0.0310	Foreign-ownership dummy (0.1<FO<0.334	0.0234 ***	-0.0009
	(10.04)	(10.37)	(1.50)	(1.57)		(2.71)	(-0.13)
European firm dummy	0.0960 ***	0.0952 ***	0.0629 ***	0.0505 ***	Foreign-ownership dummy (0.5<FO)	0.0794 ***	0.0167
	(8.42)	(8.61)	(3.09)	(2.57)		(5.66)	(0.84)
Other country dummy	0.1015 ***	0.1002 ***	0.0278 **	0.0221 **	Foreign-ownership dummy (0.334<FO<0.6)	0.1014 ***	0.0265 **
	(11.21)	(11.17)	(2.50)	(2.03)		(17.37)	(2.54)
R&D stock-sales ratio	0.1373 ***		-0.5932 ***				
	(14.17)		(-23.94)				
R&D investment-sales ratio		0.7645 ***		-0.5391 ***	R&D investment-sales ratio	0.7501 ***	-0.5383 ***
		(17.03)		(-9.78)		(16.68)	(-9.77)
No.of years passed since established	-0.0015 ***	-0.001460 ***	0.000255	0.0005 **	No.of years passed since established	-0.0014 ***	0.0005 **
	(-9.81)	(-9.75)	(1.08)	(2.09)		(-9.67)	(2.10)
(No.of years passed since established)^2	0.0000 ***	0.0000 ***	-0.0000	-0.0000	(No.of years passed since established)^2	0.0002 ***	-0.0000
	(9.25)	(9.14)	(-0.24)	(-1.51)		(9.11)	(-1.51)
Outsourcing ratio	0.0904 ***	0.0909 ***	-0.0084 *	-0.0083 *	Outsourcing ratio	0.0910 ***	-0.0082
	(20.00)	(20.38)	(-1.66)	(-1.66)		(20.42)	(-1.64)
Sales	0.0002 ***	0.0000 ***	0.0010 ***	0.0013 ***	Sales	0.0002 ***	0.0013 ***
	(21.50)	(21.96)	(14.86)	(18.50)		(20.94)	(18.54)
Sales^2	-0.0000 ***	-0.0000 ***	-0.0000 ***	-0.0000 ***	Sales^2	-0.0000 ***	-0.0000 ***
	(-15.34)	(-15.63)	(-11.81)	(-14.04)		(-15.02)	(-14.05)
Constant	-0.0721 ***	-0.0733 ***	-0.0824 ***	-0.1060 ***	Constant	-0.0737 ***	-0.1061 ***
	(-19.00)	(-19.39)	(-9.98)	(-13.17)		(-19.50)	(-13.18)
Industry dummy	yes	yes	yes	yes	Industry dummy	yes	yes
Year dummy	yes	yes	yes	yes	Year dummy	yes	yes
Firm dummy	no	no	yes	yes	Firm dummy	no	yes
Number of observations	63584	67261	63584	67261	Number of observations	67261	67261
Adjusted R^2	0.3956	0.3882	0.246	0.2347	Adjusted R^2	0.3886	0.2343

Table 3.4 Estimation Results: Determinants of TFP Level and TFP Growth Rate
Table 3.4 Panel C. Dependent variable: growth rate of TFP

				Firms with zero R&D inv. are excluded.				Firms with zero R&D inv. are excluded.
TFP level	−0.31512 ***	−0.2963 ***	−0.3099 ***	−0.3168 ***	−1.049646 ***	−1.0521 ***	−1.04965 ***	−1.0344 ***
	(−103.94)	(−95.53)	(−103.03)	(−70.25)	(−225.27)	(−216.15)	(−225.27)	(−145.31)
Foreign-ownership dummy	0.0295 ***	0.0309 ***	0.0326 ***	0.0316 ***	0.0305 ***	0.0156	0.0305 ***	0.0152
(>33.4%)	(7.33)	(7.27)	(7.78)	(6.92)	(3.07)	(1.49)	(3.07)	(1.30)
Percentage of non-production workers	0.0251 ***				−0.0001			
	(12.53)				(−0.02)			
R&D stock-sales ratio		0.2320 ***				0.0434		
		(3.94)				(0.65)		
R&D investment-sales ratio	0.3159 ***		0.3667 ***	0.2714 ***	−0.0121		−0.0121	0.0511
	(9.02)		(10.53)	(7.11)	(−0.19)		(−1.12)	(0.66)
No.of years passed since established	−0.0008 ***	−0.0008 ***	−0.0008 ***	0.0000	0.0003	0.0003	0.0003	0.0001
	(−7.26)	(−6.63)	(−6.64)	(−0.06)	(1.12)	(1.07)	(1.40)	(0.31)
(No.of years passed since established)^2	0.0000 ***	0.0000 ***	0.0000 ***	0.0000	−0.0000	−0.0000	−0.0000	−0.0000
	(6.15)	(6.05)	(5.77)	(0.27)	(−0.22)	(−0.16)	(−0.55)	(0.10)
Outsourcing ratio	0.0259 ***	0.0275 ***	0.0273 ***	0.0251 ***	−0.0038	−0.0041	−0.0041	−0.0050
	(7.52)	(7.83)	(7.92)	(5.45)	(−0.67)	(−0.71)	(−0.72)	(−0.62)
Sales	0.0001 ***	0.0001 ***	0.0001 ***	0.0000 ***	0.0012 ***	0.0011 ***	0.0011 ***	0.0008 ***
	(9.38)	(10.61)	(9.30)	(7.55)	(15.77)	(15.22)	(15.20)	(11.07)
Sales^2	−0.0000 ***	−0.0000 ***	−0.0000 ***	−0.0000 ***	−0.0000 ***	−0.0000 ***	−0.0000 ***	−0.0000 ***
	(−6.64)	(−7.35)	(−6.61)	(−5.19)	(−12.81)	(−12.43)	(−12.34)	(−9.41)
Constant	−0.0473 ***	−0.0417 ***	−0.0439 ***	−0.0541 ***	−0.1200 ***	−0.1190 ***	−0.1202 ***	−0.0946 ***
	(−16.20)	(−14.16)	(−15.06)	(−13.02)	(−13.19)	(−12.62)	(−13.10)	(−6.96)
Industry dummy	yes	yes	yes	yes	yes	yes	yes	yes
Year dummy	yes	yes	yes	yes	yes	yes	yes	yes
Firm dummy	no	no	no	no	yes	yes	yes	yes
Number of observations	48953	46138	48953	22648	48953	46138	48953	22648
Adjusted R^2	0.2212	0.2025	0.2188	0.2263	0.1423	0.1330	0.1423	0.1417

Table 3.4 Estimation Results: Determinants of TFP Level and TFP Growth Rate
Table 3.4 Panel D. Dependent variable: growth rate of TFP

TFP level	−0.2961 ***	−0.3098 ***	−1.0521 ***	−1.0496 ***	TFP level	−0.3099 ***	−1.0496 ***
	(−95.50)	(−103.03)	(−216.13)	(−225.26)		(−103.04)	(−225.25)
US dummy	0.0363 ***	0.0680 ***	0.0336	0.0449 *	Foreign-ownership dummy (0.1<FO<0.334	0.0024	−0.0030
	(4.39)	(4.66)	(1.38)	(1.89)		(0.39)	(−0.42)
European firm dummy	0.0313 ***	0.0317 ***	−0.0027	0.0105	Foreign-ownership dummy (0.5<FO)	0.0175 *	0.0048
	(3.36)	(3.55)	(−0.11)	(0.44)		(1.65)	(0.24)
Other country dummy	0.0297 ***	0.0354 ***	0.0186	0.0413 ***	Foreign-ownership dummy (0.334<FO<0.6)	0.0354 ***	0.0377 ***
	(4.39)	(5.29)	(1.55)	(3.57)		(7.79)	(3.40)
R&D stock-sales ratio	0.2339 ***		0.0455				
	(3.97)		(0.68)				
R&D investment-sales ratio		0.3694 ***		−0.0119	R&D investment-sales ratio	0.3669 ***	−0.0129
		(10.61)		(−0.18)		(10.51)	(−0.20)
No.of years passed since established	−0.0008 ***	−0.0008 ***	0.0003	0.0003	No.of years passed since established	−0.0008 ***	0.0003
	(−6.65)	(−6.67)	(1.06)	(1.11)		(−6.64)	(1.10)
(No.of years passed since established)^2	0.0000 ***	0.0000 ***	−0.0000	−0.0000	(No.of years passed since established)^2	0.0000 ***	−0.0000
	(6.06)	(5.78)	(−0.15)	(−0.20)		(5.77)	(−0.19)
Outsourcing ratio	0.0276 ***	0.0274 ***	−0.0041	−0.0037	Outsourcing ratio	0.0274 ***	−0.0038
	(7.83)	(7.93)	(−0.70)	(−0.66)		(7.94)	(−0.67)
Sales	0.0001 ***	0.0001 ***	0.0011 ***	0.0012 ***	Sales	0.0001 ***	0.0012 ***
	(10.78)	(9.46)	(15.24)	(15.79)		(7.94)	(15.76)
Sales^2	−0.0000 ***	−0.0000 ***	−0.0000 ***	−0.0000 ***	Sales^2	−0.0000 ***	−0.0000 ***
	(−7.46)	(−6.71)	(−12.46)	(−12.84)		(−6.56)	(−12.81)
Constant	−0.04165 ***	−0.0439 ***	−0.1191258 ***	−0.1200 ***	Constant	−0.044 ***	−0.1199 ***
	(−14.13)	(−15.05)	(−12.68)	(−13.19)		(−15.07)	(−13.18)
Industry dummy	yes	yes	yes	yes	Industry dummy	yes	yes
Year dummy	yes	yes	yes	yes	Year dummy	yes	yes
Firm dummy	no	no	yes	yes	Firm dummy	no	yes
Number of observations	46138	48953	46138	48953	Number of observations	48953	48953
Adjusted R^2	0.2024	0.2187	0.1328	0.1422	Adjusted R^2	0.2188	0.1424

Table 3.5 OLS Estimation Results: Comparison of Firms Targeted by Out-In M&A, In-In M&A and Other Firms

	TFP level (1994)	TFP level (1998)	Growth rate of TFP (1994-98)	Growth rate of labor (1994-98)	Growth rate of real sales (1994-98)	Growth rate of capital-labor ratio (1994-98)	Growth rate of wage rate (1994-98)
Dummy for firms which merged with or were acquired by a foreign	0.0115	0.0530 **	0.3764 *	0.2934 ***	0.0741 *	0.1635 *	0.2051 ***
	(0.48)	(2.34)	(1.73)	(3.44)	(1.64)	(1.79)	(3.58)
Dummy for firms which merged with or were acquired by a	0.0022	-0.0026	-0.0057	-0.0047	0.0144	0.0382	0.0164
	(0.25)	(-0.32)	(-0.73)	(-0.16)	(0.89)	(1.17)	(0.80)
_cons	-0.0477 ***	-0.0692 ***	-0.0200 ***	0.1277 ***	0.4051 ***	0.2100 ***	0.1181 ***
	(-6.99)	(-11.12)	(-3.36)	(5.74)	(32.75)	(8.39)	(7.52)
Industry dummy	yes	yes	yes	yes	yes	yes	yes
Number of observations	10142	10142	10142	10002	10142	10142	10142
Adjusted R^2	0.309	0.4059	0.1005	0.0181	0.2104	0.0102	0.0073

	Growth rate of real asset (1994-98)	Growth rate of R&D expenditure per worker (94-	Growth rate of R&D expenditure-sales ratio (94-98)	Growth rate of current profit per worker (94-	Growth rate of current profit-sales ratio (94-98)	Growth rate of workers (94-98)
Dummy for firms which merged with or were acquired by a foreign	0.1651 *	0.5013 ***	0.5118	2.8527 ***	2.8403	-0.0013
	(1.83)	(3.72)	(1.33)	(5.38)	(1.00)	(-0.04)
Dummy for firms which merged with or were acquired by a	0.0477	0.0700	0.2863	0.2557	0.4827	0.0138
	(1.48)	(0.99)	(1.42)	(1.35)	(0.49)	(1.12)
_cons	0.1398 ***	0.2554 ***	0.8707 ***	0.0518	-1.1748	-0.0219 **
	(5.70)	(5.56)	(6.66)	(0.36)	(-1.48)	(-2.25)
Industry dummy	yes	yes	yes	yes	yes	yes
Number of observations	10142	4160	4160	10142	10142	10142
Adjusted R^2	0.0148	0.0105	0.01	0.036	0.0017	0.0301

All the values are in million yen. In the compilation of industry dummies, the computer industry is treated as a benchimark industry without an industry dummy variable.
The growth rate is calculated as ln(X98)-ln(X94)
Source: Murakami and Fukao (2003).

Table 3.6 OLS Estimation Results: Comparison of Out-In M&A, In-In M&A and Other Firms

	Growth rate of TFP (1994-98)	Growth rate of labor productivity (1994-98)	Growth rate of real sales (1994-98)	Growth rate of capital-labor ratio (1994-98)	Growth rate of wage rate (1994-98)
(Dummy for firms which merged with or were acquired by a foreign firm)*(no. of years passed since the investment)	0.0251	0.2253 ***	0.0160	0.0850	0.1490 ***
	(1.47)	(3.26)	(0.45)	(1.18)	(3.30)
(Dummy for firms which merged with or were acquired by a domestic firm)*(no. of years passed since the investment)	-0.0021	0.0012	0.0063	0.0072	0.0055
	(-0.84)	(0.12)	(1.19)	(0.67)	(0.82)
_cons	-0.0199 ***	0.1278 ***	0.4053 ***	0.2113 ***	0.1183 ***
	(-3.34)	(5.74)	(32.76)	(8.45)	(7.53)
Industry dummy	yes	yes	yes	yes	yes
Number of observations	10142	10002	10142	10142	10142
Adjusted R^2	0.14133	0.018	0.2103	0.01	0.0076

	Growth rate of R&D expenditure per worker (94-98)	Growth rate of R&D expenditure-sales ratio (94-98)	Growth rate of current profit per worker (94-98)	Growth rate of workers (94-98)
(Dummy for firms which merged with or were acquired by a foreign firm)*(no. of years passed since the investment)	0.3073 ***	0.0048 *	1.8543 ***	-0.0161
	(3.03)	(1.65)	(4.43)	(-0.59)
(Dummy for firms which merged with or were acquired by a domestic firm)*(no. of years passed since the investment)	0.0153	0.0007	0.0843	0.0088 **
	(0.64)	(1.00)	(1.35)	(2.14)
_cons	0.2589 ***	0.0087 ***	0.0553	-0.0225 **
	(5.64)	(6.67)	(0.38)	(-2.35)
Industry dummy	yes	yes	yes	yes
Number of observations	4160	4161	10142	10142
Adjusted R^2	0.0092	0.01	0.0351	0.0304

In the compilation of industry dummies, computer industry is treated as a standard industry without an industy dummy variable.
Source: Murakami and Fukao (2003).