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International Production/Distribution Networks and Domestic Operations in terms of Employment and Corporate Organization: Microdata Analysis of Japanese Firms

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Abstract

This paper empirically investigates patterns of globalizing corporate activities and their domestic operations and trade, using firm-level panel data on Japanese firms in 1998-2003.

Journalistic literature in North America and Europe often claims that the globalization of corporate activities, particularly the expansion of operations in less-developed countries, is prone to reduce domestic corporate activities. This paper proves that such a claim of industrial hollowing-out is unwarranted, at least at the firm level, in the case of Japanese manufacturing firms investing in East Asia.

The manufacturing sector in Japan has had a secular trend of reducing domestic employment in the past decades. The regression analysis, however, finds that manufacturing firms expanding operations in East Asia are more likely to increase domestic employment than other manufacturing firms, while non-manufacturing firms, mostly in the wholesale sector, do not present such a significant pattern; the growth of domestic employment of globalizing manufacturing firms is higher by as much as three to eight percent.

As for domestic establishments and affiliates, manufacturing firms expanding operations in East Asia do not present any statistically significant differences from other manufacturing firms, while non-manufacturing firms tend to reduce it. Furthermore, firms expanding operations in East Asia tend to intensify export/import activities with East Asia more than other firms, suggesting the complementarity between trade and FDI. This is further supporting evidence for expanding fragmentation of production by Japanese firms and their involvement in further development of production/distribution networks in East Asia.

Overall, Japanese manufacturing firms globalizing corporate activities seem to retain larger domestic operations than other firms. Such tendency is actually stronger in machinery industries in which international production/distribution networks are actively extended.

1. Introduction

In East Asia, the international production/distribution networks started developing in the 1990s and further developed rapidly in recent years, which was accompanied by drastic increase in vertical back-and-forth transactions of parts and components within the region.[1] Japanese firms are one of the major players in the networks. Since the late 1990s in particular, Japanese investment in East Asia has accelerated; as Figure 1 describes, an upward trend is vividly observed for the direct investment position of Japan in East Asia based on the balance of payments statistics. Moreover, a predominant portion of the investment is in manufacturing sectors except the investment in Hong Kong; the manufacturing share of the Japanese direct investment position for 2006 is 72 percent for East Asia as a whole, 78 percent for China, 82 percent for the Association of Southeast Asian Nations 4 (ASEAN4) consisting of the Philippines (86 percent), Indonesia (77 percent), Thailand (79 percent), and Malaysia (89 percent), and 57 percent for the newly industrializing economies 4 (NIEs4) consisting of Taiwan (73 percent), Korea (59 percent), Singapore (64 percent), and Hong Kong (30 percent).

== Figure 1==

The expansion of corporate firms' operations abroad and the relocation of fragmented production blocks to lower-income countries raise concerns about domestic operations in high-income countries. A popular argument claims that domestic employment and operations may shrink due to the relocation of economic activities taking advantage of a large wage gap between developed and developing countries. In particular, the fear of losing jobs, in both the manufacturing and services sectors, and possible disruptive effects on wealthier society seem to be strong in journalistic as well as academic literature in Europe and North America. [2] However, even in the case when foreign direct investment (FDI) is pursuing inexpensive labor in developing countries, the effect of FDI on domestic operations is not necessarily negative; it

[1] See Kimura and Ando (2005), Ando and Kimura (2006), Ando (2006), and Kimura (2006) for empirical analyses and established facts on the production/distribution networks in East Asia.

[2] See for example Samuelson (2004) and Blinder (2006).

depends on whether the cost reduction through FDI allows the firm to strengthen its competitiveness and whether the firm maintains activities at home that are complementary to operations abroad, sometimes further shifting its activities to the procurement of specialized parts and components, headquarters functions, and/or new products. As Becker, Ekholm, Jackle, and Muendler (2005) address, the effect of FDI on the labor market at home is inherently an empirical issue. From the analysis of German multinational enterprises (MNEs) for 2000 and Swedish MNEs for 1998, they find that affiliate employment abroad tends to substitute for parent employment. Blomstrom, Fors, and Lipsey (1997) demonstrate that affiliate production in developing countries has a stronger negative effect on parent employment in the U.S. for 1989, while Swedish parents employ more labor at home for 1970-1994.[3]

Since the mid-1980s, Japan has been a country that typifies "hollowing-out" (*kūdōka*) concerns, reflected by the rapid development of international division of labor in East Asia. In particular, Japan is located in the neighborhood of extremely attractive China and has recently been expanding manufacturing operations there. Fukao and Amano (2004) provide an interesting survey on the effect of outward FDI by Japanese firms on skill composition in labor demand at home at the macro level, at the industry level,[4] and at the firm level, suggesting possible job creation or at least job retainment on the side of skilled labor with globalizing corporate activities.[5] At the same time, they

[3] See Brown and Spletzer (2005) for the relationship between offshoring and mass layoffs in the U.S.

[4] See Ito and Fukao (2005) for analysis at the detailed industry level. They use the share of vertical intra-industry trade as a broad outsourcing measure and find that vertical intra-industry trade, particularly with Asia, raises the skill intensity calculated as the share of those working as professional and technical or managerial and administrative in the period of 1988-2000. This may reflect the fact that vertical FDI in Asia consists of the transfer of low-skilled production work to the region while high-skilled employees remain at home. They address that Japanese manufacturing industries realized skill upgrading as a result of the international division of labor with Asian economies.

[5] Head and Ries (2002) investigate the influence of offshore production by Japanese multinationals on domestic skill intensity at the firm level, using Toyo Keizai's survey on Japanese Overseas Investment 1992-1993 (1070 firms), and find that additional foreign affiliate employment in low-income countries raise skill intensity expressed as non-production share of the wage bill at home. For other studies on the effect of offshoring on the skill composition of domestic labor demand at the firm level, see Ekholm and Hakkala (2006) with evidences from Sweden and Hijzen, Gorg, and Hine (2005) with evidence from the United Kingdom.

emphasize the importance of further comprehensive research at the firm level.

The paper attempts to investigate patterns of globalizing activities of Japanese firms, with a particular emphasis on East Asia, and their domestic impacts by using comprehensive firm-level panel data including both firms with and without expanding operations abroad. How do firms expanding operations abroad reorganize domestic operations in terms of employment, establishments, and affiliates at home and export/import activities? By analyzing these patterns, we would like to discuss whether the hollowing-out of industries exists due to globalizing activities, whether domestic operations and foreign operations are substitutive or complementary, and whether trade and FDI are substitutes or complements at the firm level.

The rest of this paper is organized as follows: section 2 provides a data description of micro data employed in our paper and descriptively analyzes patterns of globalizing activities of Japanese firms and their domestic operations. Then, section 3 quantitatively investigates those patterns, employing logit and ordinary least squares (OLS) regression analyses, and section 4 concludes.

2. Japanese investment in East Asia at the firm level: overview

2.1 Data description

The analysis in sections 2 and 3 is based on micro data of Japanese firms, which is collected by the Ministry of Economy, Trade and Industry (METI), Government of Japan (formerly the Ministry of International Trade and Industry [MITI]) in its *The Basic Survey of Business Structure and Activity*. This firm-level database provides detailed information on (parent) firms located in Japan as well as the number, industry, and regional location of their foreign affiliates with no less than 20 percent Japanese ownership. Unfortunately, this database does not include affiliates of these affiliates abroad. Moreover, the location of foreign affiliates is not identified on the country basis: the questionnaires from *The 1997F/Y Basic Survey* include only East Asia (Asia), North America, and Europe as regional categories.[6]

The Basic Survey was first conducted by the MITI for 1991F/Y, for 1994F/Y,

[6] Strictly speaking, "East Asia" includes all Asian countries east of Pakistan. Nevertheless, Japanese FDI to South Asia is minimal.

and annually since then. The samples in the survey are comprehensive, covering all firms with more than 50 workers, capital of more than 30 million yen, and establishments in mining, manufacturing, wholesale/retail trade, and restaurants. The ratios of questionnaire returns are high, though the actual ratios are not disclosed, since *The Basic Survey* is designated statistics; firms in the survey are required to return the questionnaires under the Statistics Law.[7] Our industry classification is presented in Table A.1. Note that the coverage of services sectors has expanded since the 2001F/Y survey, and the classification itself has been revised since 2002F/Y survey. Our study employs this survey for the latest available five years, namely, those from 1999F/Y to 2004F/Y with data from 1998F/Y to 2003F/Y.

2.2 Characteristics of Japanese firms investing in East Asia

This subsection investigates globalizing patterns of Japanese firms, with a particular emphasis on firms investing in East Asia. To shed light on the features for East Asia, we compare them with firms investing in North America and Europe. Table 1 presents the number of 1) all sized firms and 2) small- and medium-sized enterprises (SMEs) with affiliates in East Asia/North America/Europe and the number of affiliates in East Asia/North America/Europe by the industry of parent firms and by the industry of affiliates. In 2003, 4,119 out of 26,634 firms located in Japan (in the data set) have affiliates abroad. Among them, 3,442 firms have affiliates in East Asia. That is, over 80 percent of the Japanese firms going abroad have at least one affiliate in East Asia.

== Table 1 ==

Japanese manufacturing parent firms, particularly machinery parent firms are active investors in East Asia; almost 70 percent of the Japanese firms with affiliates in East Asia are in manufacturing sectors and close to half of them are in machinery sectors. Moreover, Japanese manufacturing affiliates, regardless of the industries of their parent firms, account for 59 percent of the total Japanese affiliates in the region, while 34 percent for North America and 31 percent for Europe.

[7] Statistics collected by the Government of Japan are legally classified into two categories: designated statistics (*shitei toukei*) and approved statistics (*shounin toukei*).

Parent firms in general have various activities across industries and establish foreign affiliates in order to conduct a subset of those activities.[8] Japanese manufacturing parent firms have 72 percent of their total affiliates in East Asia in manufacturing sectors. The corresponding portion is even higher for manufacturing SMEs with regular workers numbering less than 300; 84 percent of their affiliates in East Asia are manufacturing. Such investment patterns by SMEs reflect a typical strategy for firms involved in manufacturing activities, aimed at supplying intermediate goods for other firms and/or for their own affiliates and forming a critical mass of industrial clusters in manufacturing sectors. Japanese manufacturing parent firms also have non-manufacturing affiliates in East Asia (28 percent of total affiliates of manufacturing firms), particularly in the wholesale sector (18 percent) to establish distribution networks by internalizing wholesale trade activities.

In contrast with the case of East Asia, the share of manufacturing affiliates of manufacturing parent firms is low, and the share of their non-manufacturing affiliates is as high as 58 percent for North America and 62 percent for Europe. It indicates that Japanese manufacturing investment in North America or Europe aims at selling their products or producing goods to be sold there, rather than being involved in dense vertical production chains as is the case in East Asia.

Table 2 in turn presents globalizing patterns of Japanese firms in the two-period balanced panel data for 1998-2003. Although how to measure the expansion of globalizing activities at the firm level might be a controversial issue, this paper regards an increase in the number of foreign affiliates or affiliates in a specific region as the indication of globalizing activities.[9] During the five years, 9.5 percent of the firms in all industries and 12.6 percent of manufacturing firms in the sample enlarge

[8] A firm often has various activities at the same time. The industrial classification of a firm located in Japan is determined by the largest activities the concerned firm conducts in terms of the value of sales. See Table A.2 in the Appendix for the sector matching between industries of parent firms and affiliates in terms of the number of affiliates.

[9] Matsuura and Nagata (2005) investigate patterns of domestic job creation and destruction by Japanese firms by decomposing them into three types of firms, that is, those without foreign operations, those expanding operations abroad, and those shrinking operations abroad. They employ unbalanced panel data from 1991-2002 and use the number of workers of manufacturing affiliates abroad to distinguish those expanding operations abroad from those shrinking. Other possible variables for measuring the magnitude of foreign operation would be sales and/or value added by affiliates abroad.

their activities in East Asia. On the other hand, these portions are much lower for North America and Europe: 3.0 percent and 2.2 percent of the firms in all industries and 4.1 percent and 3.0 percent of manufacturing firms, respectively. Combined with the fact that the share of the firms expanding activities abroad (including East Asia) is 10.6 percent for all sectors and 14.1 percent for manufacturing sectors, these suggest that most of the globalizing Japanese firms in this period expand their activities in East Asia, particularly in manufacturing sectors. They certainly expand fragmentation of production processes and contribute to further development of production/distribution networks in East Asia.

== Table 2 ==

Interestingly, many firms that newly enter into East Asia during the sample period are SMEs; a share of 62 percent.[10] Their active FDI certainly contributes to the development of vertical production chains in the region.

While some firms globalize their activities, how do Japanese firms reorganize domestic operations? In the period of 1998-2003, 64 percent of the firms in the balanced panel dataset reduce the number of domestic employment, and aggregate employment in the domestic market drops, mainly in manufacturing sectors (Table 3). The shrinkage of employment has a gradual but steady trend in manufacturing sectors. Even in manufacturing sectors, however, the share of firms reducing the number of domestic employment is relatively low for firms expanding operations in East Asia, particularly those starting operations in East Asia, compared with those retreating operations or remaining intact in East Asia. The average growth rate of the number of domestic employment at the firms level is also much higher for manufacturing firms expanding operations in East Asia than those not; the average growth rate is 9.1 percent (new entry) and -2.2 percent for those with expansion of operations in East Asia, while it is -5.1 percent for those without entry in East Asia, -10.8 percent and -17.2 percent (exit) for those with shrinkage, and -8.2 percent for those intact.

[10] Whether a firm is an SME or not depends on the number of regular workers for the base year, 1998, in Table 2.

== Table 3 ==

Moreover, the share of firms with a reduced number in domestic employment is much lower for SMEs expanding operations in East Asia than for those not expanding activities in East Asia; for manufacturing SMEs, the ratios are 52 percent and 55 percent (new entry) for SMEs expanding operations in East Asia while it is 65 percent for those with no entry, 71 percent for those shrinking, 86 percent for those with exit, and 66 percent for those remaining. Furthermore, SMEs expanding operations in East Asia including those in manufacturing sectors have much higher average growth rates in domestic employment and indeed contribute to net domestic job creation at the aggregate level.[11]

Besides, newly globalizing firms in East Asia, regardless of whether manufacturing or not and whether they are SMEs or not, increase in the number of domestic establishments and domestic affiliates as well, rather than diminishing domestic operations. All of the abovementioned features indicate that intensified globalizing activities of Japanese firms through FDI in East Asia might be complements of domestic operations, rather than substitutes, and reduce the negative impacts on employment, establishments, and affiliates at home, though we need formal econometric analysis with controlling firm size and other variables to confirm these features.

3. Globalizing corporate activities and domestic operations at the firm level

This section quantitatively analyzes patterns of globalizing activities of Japanese firms, focusing on their domestic operations and transactions with foreign markets. Given the fact that most Japanese firms expanding operations abroad activate their operations in East Asia, this section investigates how these firms with expanding activities in East Asia change domestic operations and export/import activities compared with other firms, employing logit/OLS regression analyses.

[11] Large firms may reduce domestic operations by themselves and outsource some processes of productions to other firms, particularly SMEs. In such cases, it is more likely that SMEs hire new employment at home, resulting in the increase in domestic employment for SMEs.

3.1 Empirical method and data

The equation for our logit/OLS estimation analyses is as follows:

$$Y_{t_0}^t = \beta_0 + \beta_1 X_{t_0}^t + \beta_2 S_{t_0} + \beta_3 KL_{t_0} + \beta_4 EX_{t_0} + \beta_5 RD_{t_0} + \beta_6 AD_{t_0} + \beta_7 FC_{t_0} + \varepsilon,$$

where $Y_{t_0}^t$ expresses a change in domestic operations or a change in export/import activities with East Asia from the base year t_0 to 2003. As for domestic operations, 0/1 binary variables are used for a change in the number of domestic employment, in the number of domestic establishments, and in the number of domestic affiliates; $Y_{t_0}^t$ is one if a firm does not reduce the number of domestic employment/establishments/affiliates and is zero otherwise. As another variable for a change in the number of domestic employment, $Y_{t_0}^t$, a growth rate of the number of domestic employment is also used. As for export/import activities with East Asia, a change in the ratio of exports to/imports from East Asia in total sales/purchases is used; $Y_{t_0}^t$ is a difference obtained by subtracting the ratio for the base year from the ratio for 2003.

$X_{t_0}^t$ is a dummy variable for expanding corporate activities in East Asia; $X_{t_0}^t$ is one if a firm increases in the number of affiliates in East Asia from the base year to 2003 and is zero otherwise.[12] If a firm decreases the number of domestic employment/establishments/affiliates with their globalizing activities, or their activities in East Asia are substitutes for domestic operations, the coefficient for $X_{t_0}^t$ is expected to be negative. In contrast, if a firm increases (does not decrease) that number with their globalizing activities or their activities in East Asia are complements of domestic operations the coefficient for $X_{t_0}^t$ is expected to be positive. Moreover, if a firm expanding operations in East Asia relatively intensifies transactions with East Asia, the coefficient for $X_{t_0}^t$ is expected to be positive and to be negative otherwise. In particular, if FDI and exports are substitutes rather than complements, the coefficient is expected to be positive.

Other independent variables are included as control variables for the base

[12] Although the marginal impact of an increase in one (or more) affiliate(s) abroad may be different between large firms and SMEs, such a difference if any would be partially controlled in regression analyses with the size of firms as one of the control variables.

year: the size of firm in terms of the number of regular workers (natural log) (S_{t_0}), capital-labor ratio in terms of tangible assets per regular workers (natural log) (KL_{t_0}), foreign sales ratio (in total sales) (EX_{t_0}), in-house research and development (R&D) dummy (RD_{t_0}), advertisement expenditure ratio (in total sales) (AD_{t_0}), and foreign capital ratio (FC_{t_0}); these are all for domestic (parent) firms. Capital-labor ratio, foreign sales, R&D activities, and advertisement expenditure are proxy variables of firm specific assets. R&D dummy is one if a firm has in-house R&D activities and zero otherwise. A variable for foreign capital is included to examine whether there is any significant difference between purely domestic firms and firms with (higher) foreign capital in Japan.

For each of the dependent variables mentioned above, logit estimation analysis is conducted when there are binary variables measuring changes in domestic operations, while OLS estimation analysis is conducted when there are growth rates of the number of domestic employment or a change in exports to/imports from East Asia as a share of total sales/purchases. In addition, the sample set is divided into that for manufacturing firms and that for non-manufacturing firms, considering that their FDI strategies would be different. Furthermore, several two-period balanced paneled datasets with data for the base year and 2003 are used to see differences between long-term and short-term effects: the base year is 1998, 1999, 2000, 2001, or 2002.[13]

3.2 Empirical results

Tables 4 (1), 5, and 6 report results of logit regression analyses and Tables 4 (2), 7, and 8 reports results of OLS regression analyses for (a) manufacturing firms and (b) non-manufacturing firms. As Table 3 suggests, controlling the size of firm must take priority for our analysis. For manufacturing firms, the coefficient for the size of firm is negative and statistically significant in all equations for domestic operations and some equations for import activities with East Asia. This indicates that Japanese manufacturing firms with larger employment size at home are more likely to diminish domestic operations in terms of the number of domestic employment, domestic

[13] See Table A.3 for summary statistics and Table A.4 for a correlation matrix of independent variables for two-period balanced data for 1998-2003. As Table A.3 shows, large manufacturing firms tend to have higher values in all variables including in-house R&D dummy than manufacturing SMEs.

establishments, and domestic affiliates and to intensify transactions with East Asia particularly import activities.

The coefficient for capital-labor ratio is statistically significant with a positive value in the analysis on domestic employment and a negative value in the analysis on import activities with East Asia for manufacturing firms. This suggests that Japanese manufacturing firms with capital-intensive technology tend to expand domestic employment and strengthen transactions with East Asia, probably because they could succeed in specialization and involvement in production/distribution networks in East Asia, compared with those not expanding operations in East Asia. Furthermore, for manufacturing firms, the coefficient for in-house R&D dummy is negative with statistical significance in all equations for domestic establishment and affiliates, it is negative but not necessarily statistically significant in equations for domestic employment, and it is positive with statistical significance in most equations for export/import activities with East Asia. This implies that while R&D-intensive manufacturing firms are likely to diminish domestic operations in terms of the number of domestic establishments and domestic affiliates, they tend to intensify transactions with East Asia and are not necessarily likely to decrease employment at home.

Given the size of firm and other controls, our results provide several interesting insights. First, the expansion of operations in East Asia is positively associated with no decline in the number of domestic employment with statistical significance for manufacturing firms once the size of firm is controlled (Table 4).[14] On the other hand, the coefficient is statistically insignificant in most cases, regardless of whether a dependent variable is a binary one or a growth rate, for non-manufacturing firms. These suggest that globalizing manufacturing firms are unlikely to reduce their domestic employment, compared with other manufacturing firms. Moreover, their growth rates for the number of domestic employment are likely to be higher than those for other manufacturing firms by as much as three to eight percent (Table 4 [2]).

Although the total number of domestic employment in manufacturing sectors declines at the aggregate level, globalizing corporate manufacturing activities tend to

[14] The results do not change even when a variable for the expansion of manufacturing operations abroad is used. Moreover, the results do not change when the sample set only for machinery firms is used instead of that for manufacturing firms, though the coefficient becomes even higher.

partially offset job destruction and sometimes even contribute to job creation in the domestic market at the firm level. A rise in the number of domestic employment by Japanese manufacturing firms expanding operations in East Asia would partially reflect a need to expand domestic production of key parts and components to be exported to East Asia or an intensified specialization in headquarters services at home as a result of active and effective fragmentation of production and specialization. Another possible explanation for a relative rise in the number of domestic employment by globalizing manufacturing firms would be that they succeed in differentiating products to be produced in the domestic market from those to be produced in East Asia.

Second, positive impacts of globalizing manufacturing activities on domestic employment are likely to be larger over the longer term. The coefficient for a variable expressing expansion in East Asia is no doubt the largest for the five-year balanced paneled dataset and the smallest for the one-year balanced paneled dataset, regardless of whether a dependent variable is a binary one or a growth rate; from the longer term to the shorter term, the coefficient is 0.508, 0.382, 0.359, 0.271, and 0.235 for equations with a binary dependent variable and 0.082, 0.061, 0.049, 0.041, and 0.030 for equations with a growth rate as a dependent variable (Table 4).

Third, there is no statistically significant relationship between the expansion of manufacturing operations in East Asia and no decline in the number of domestic establishments and that in the number of domestic affiliates, though the coefficient is negative and statistically significant only in the case of the balanced paneled dataset for 2000-2003 (Tables 5 and 6). These results indicate that expanding manufacturing operations in East Asia are not substitutes for domestic operations and thus do not require shrinking domestic activities. Combined with the first point, specialization to competitive activities seems to be intensified in the domestic market.

Fourth, export/import activities with East Asia are intensified by globalizing firms in East Asia (Tables 7 and 8). The relationship between the expansion of manufacturing operations in East Asia and the relative intensification of transactions with East Asia is positively associated with statistical significance, suggesting that firms expanding operations in East Asia intensify their transactions with East Asia compared to other firms. This is further supporting evidence for expanding fragmentation of production by Japanese firms and their involvement in further development of production/distribution networks in East Asia where trade and FDI are in a sense

complementary.

4. Concluding remarks

Japanese investment in East Asia has accelerated, mainly in manufacturing sectors, and Japanese firms are among the major players in the international production/distribution networks. Our study attempted to investigate patterns of globalizing activities of Japanese firms, with a particular emphasis on firms investing in East Asia, and their domestic impacts by using comprehensive firm-level data including both firms with and without foreign operations. In addition to a change in domestic operations such as parent employment, domestic establishments, and domestic affiliates, a change in transactions with East Asia is examined.

Our descriptive analysis shows that most of the globalizing Japanese firms for the period 1998-2003 expand their activities in East Asia, particularly in manufacturing sectors. Moreover, our logit/OLS estimation analyses with a distinction between manufacturing and non-manufacturing firms demonstrates that given the size of firm and other controls, globalizing manufacturing firms are unlikely to reduce their domestic employment at the same time and tend to increase in the number by three to eight percent, compared with other manufacturing firms. Besides, positive impacts of globalizing manufacturing activities on domestic employment are likely to be larger in the longer term. Furthermore, globalizing manufacturing firms in East Asia intensify export/import activities with East Asia and do not necessarily require shrinking domestic activities in terms of the number of domestic establishment and domestic affiliates as well, compared with other firms. Their expanding manufacturing operations in East Asia are complements rather than substitutes for domestic operations and contribute to further development of production/distribution networks in the region where trade and FDI are in a sense complementary.

Our dataset unfortunately does not allow us to analyze the skill structure of employed labor directly. However, we at least clearly observe that Japanese firms intensifying operations in Eat Asia tend to somehow retain domestic operations including employment, more successfully than other firms. Particularly in the case of SMEs globalizing their activities, even domestic operations seems to be expanded. Further investigation on the Japanese case would provide a crucial key to fight against

the unwarranted fear of globalization.

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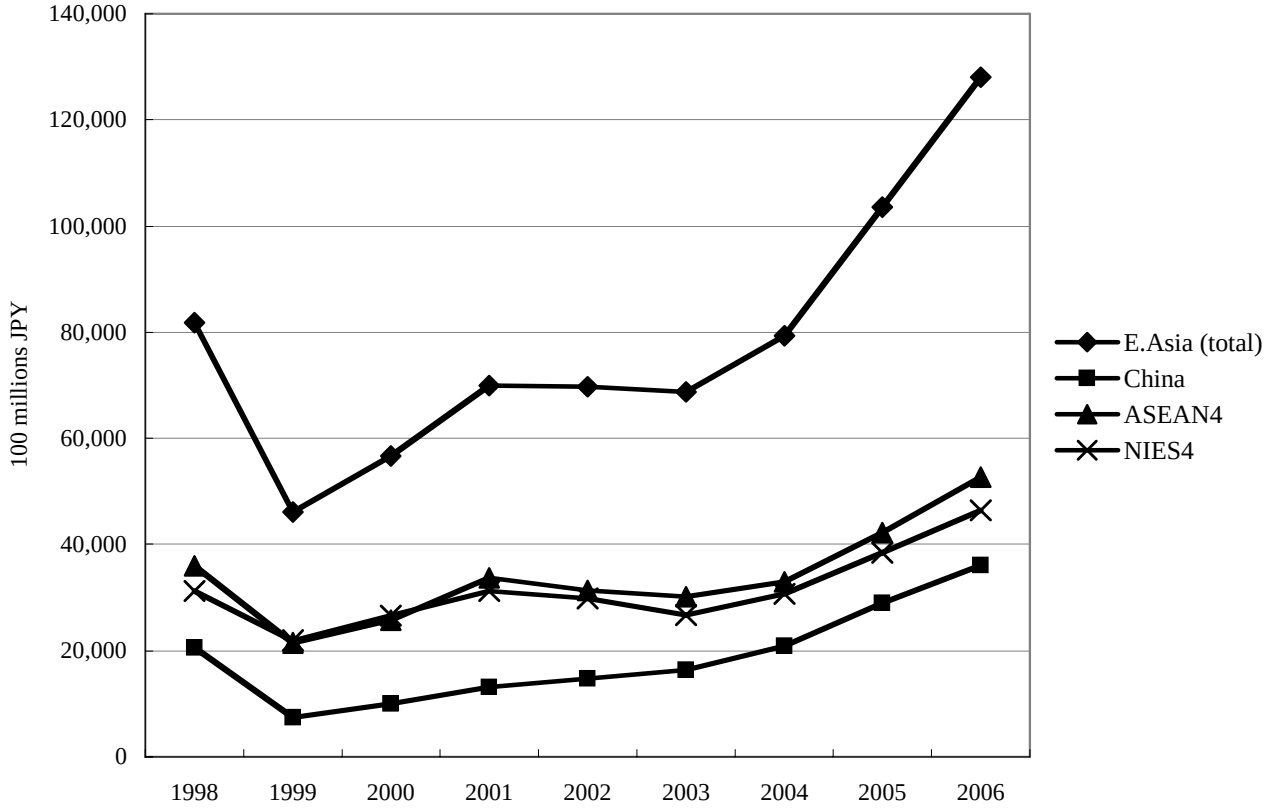
Figure 1 Direct investment position of Japan in East Asia



Data source: authors' calculation, based on balance of payments statistics available from the website of the Bank of Japan.

Table 1 Sectoral patterns of Japanese parent firms and their affiliates in East Asia, North America, and Europe for 2003

Industry of parent firm	Number of **all sized** parent firms	Number of total affiliates	Industry of affiliate: Manufacturing: Number of affiliates	Share	share (machinery)	Non-manufacturing: Number of affiliates	Share	share (wholesales)	Number of **SME** parent firms	Number of total affiliates	Industry of affiliate: Manufacturing: Number of affiliates	Share	share (machinery)	Non-manufacturing: Number of affiliates	Share	share (wholesales)
			(a-1) East Asia								(a-2) East Asia					
Manufacutring	2,050	8,680	6,284	72.4	38.6	2,396	27.6	18.1	1,160	1,782	1,488	83.5	38.4	294	16.5	11.7
-Machinery	1,176	4,802	3,307	68.9	35.7	1,495	31.1	20.5	511	854	682	79.9	73.4	172	20.1	15.1
Non-manufacturing	1,392	4,292	1,402	32.7	9.8	2,890	67.3	39.4	528	1,231	432	35.1	9.5	799	64.9	49.7
-Wholesales	744	3,383	1,281	37.9	10.3	2,102	62.1	48.7	471	1,065	407	38.2	9.6	658	61.8	56.6
Total	3,442	12,972	7,686	59.3	29.0	5,286	40.7	25.1	1,688	3,013	1,920	63.7	26.6	1,093	36.3	27.2
			(b-1) North America								(b-2) North America					
Manufacutring	1,153	3,147	1,317	41.8	26.1	1,830	58.2	22.3	305	353	187	53.0	28.0	166	47.0	34.6
-Machinery	683	2,129	787	37.0	35.6	1,342	63.0	22.0	194	213	101	47.4	44.1	112	52.6	41.3
Non-manufacturing	563	1,347	221	16.4	5.4	1,126	83.6	39.0	240	270	31	11.5	8.5	239	88.5	57.8
-Wholesales	341	919	207	22.5	7.0	712	77.5	53.8	161	198	29	14.6	10.6	169	85.4	75.3
Total	1,716	4,494	1,538	34.2	19.9	2,956	65.8	27.5	545	623	218	35.0	19.6	405	65.0	44.6
			(c-1) Europe								(c-2) Europe					
Manufacutring	647	2,675	1,005	37.6	24.9	1,670	62.4	37.5	100	131	60	45.8	23.7	71	54.2	40.0
-Machinery	416	1,871	635	33.9	33.2	1,236	66.1	39.2	70	87	32	36.8	35.6	55	63.2	50.6
Non-manufacturing	322	1,081	156	14.4	5.4	925	85.6	37.8	97	131	11	8.4	9.8	120	91.6	39.2
-Wholesales	191	843	145	17.2	6.2	698	82.8	47.3	76	112	11	9.8	8.0	101	90.2	73.2
Total	969	3,756	1,161	30.9	19.3	2,595	69.1	37.5	197	262	71	27.1	15.3	191	72.9	51.1

Data source: authors' calculation, based on METI database.

Notes: The figures for (a-1, b-1, c-1) are those of all sized parent firms and figures for (a-2, b-2, c-2) are of parernt SMEs. The figures for "share" for manufacuring, machinery, non-manufacturing, and wholesales expresse the shares of manufacturing affiliates, machinery affiliates, non-manufacturing affiliates, and wholesales affiliates in total number of affiliates of all sized/SMEs firms in each sectoral category.

Table 2 Patterns of globalizing firms from 1998 to 2003 in East Asia and other regions: the number of firms

	Number of firms	Share	Matrix between patterns of operations in East Asia and those in other regions: No entry	Expansion	Expansion (new entry)	Shrinkage	Shrinkage (exit)	Steady
			in foreign countries (incl. E.Asia)					
(a) All firms								
No entry in East Asia	14,427	83.0%	13,849	55	153	169	15	186
Expansion in East Asia	807	4.6%	-	727	-	36	0	44
Expansion in East Asia (new entry)	842	4.8%	-	125	672	11	0	34
Shrinkage in East Asia	459	2.6%	-	18	-	396	20	25
Shrinkage in East Asia (exit)	62	0.4%	-	3	-	10	44	5
Steady in East Asia	783	4.5%	-	92	-	80	0	611
Total	17,380	100%	13,849	1,020	825	702	79	905
	100%		79.7%	5.9%	4.7%	4.0%	0.5%	5.2%
(b) Manufacturing firms								
No entry in East Asia	7,486	78.1%	7,113	36	103	102	7	125
Expansion in East Asia	605	6.3%	-	549	-	25	0	31
Expansion in East Asia (new entry)	602	6.3%	-	91	486	6	0	19
Shrinkage in East Asia	279	2.9%	-	17	-	236	9	17
Shrinkage in East Asia (exit)	39	0.4%	-	1	-	7	28	3
Steady in East Asia	577	6.0%	-	70	-	56	0	451
Total	9,588	100%	7,113	764	589	432	44	646
	100%		74.2%	8.0%	6.1%	4.5%	0.5%	6.7%
(c) SMEs								
No entry in East Asia	11,207	89.7%	10,902	23	93	83	5	101
Expansion in East Asia	201	1.6%	-	190	-	2	0	9
Expansion in East Asia (new entry)	522	4.2%	-	36	469	4	0	13
Shrinkage in East Asia	155	1.2%	-	2	-	136	7	10
Shrinkage in East Asia (exit)	21	0.2%	-	0	-	4	15	2
Steady in East Asia	394	3.2%	-	16	-	25	0	353
Total	12,500	100%	10,902	267	562	254	27	488
	100%		87.2%	2.1%	4.5%	2.0%	0.2%	3.9%
(d) Manufacturing SMEs								
No entry in East Asia	6,046	87.2%	5,836	16	66	59	1	68
Expansion in East Asia	125	1.8%	-	118	-	2	0	5
Expansion in East Asia (new entry)	373	5.4%	-	24	340	2	0	7
Shrinkage in East Asia	90	1.3%	-	2	-	79	3	6
Shrinkage in East Asia (exit)	14	0.2%	-	0	-	3	10	1
Steady in East Asia	287	4.1%	-	11	-	17	0	259
Total	6,935	100%	5,836	171	406	162	14	346
	100%		79.7%	5.9%	4.7%	4.0%	0.5%	5.2%

	Matrix between patterns of operations in East Asia and those in other regions: No entry	Expansion	Expansion (new entry)	Shrinkage	Shrinkage (exit)	Steady
	in North America					
(a) All firms						
No entry in East Asia	13,986	22	116	21	107	175
Expansion in East Asia	282	150	39	81	26	229
Expansion in East Asia (new entry)	652	20	78	8	18	66
Shrinkage in East Asia	273	17	14	59	44	52
Shrinkage in East Asia (exit)	37	1	0	1	18	5
Steady in East Asia	544	31	36	25	27	120
Total	15,774	241	283	195	240	647
	90.8%	1.4%	1.6%	1.1%	1.4%	3.7%
(b) Manufacturing firms						
No entry in East Asia	7,189	13	83	14	65	122
Expansion in East Asia	196	123	28	60	22	176
Expansion in East Asia (new entry)	467	20	52	6	10	47
Shrinkage in East Asia	159	14	8	38	22	38
Shrinkage in East Asia (exit)	21	0	0	0	14	4
Steady in East Asia	402	23	26	17	23	86
Total	8,434	193	197	135	156	473
	88.0%	2.0%	2.1%	1.4%	1.6%	4.9%
(c) SMEs						
No entry in East Asia	10,969	10	69	6	54	99
Expansion in East Asia	148	6	5	2	6	34
Expansion in East Asia (new entry)	448	3	37	2	7	25
Shrinkage in East Asia	125	1	7	1	10	11
Shrinkage in East Asia (exit)	18	1	0	0	1	1
Steady in East Asia	331	1	10	4	9	39
Total	12,039	22	128	15	87	209
	96.3%	0.2%	1.0%	0.1%	0.7%	1.7%
(d) Manufacturing SMEs						
No entry in East Asia	5,873	7	53	4	40	69
Expansion in East Asia	97	3	3	0	5	17
Expansion in East Asia (new entry)	322	3	25	2	5	16
Shrinkage in East Asia	71	1	4	0	6	8
Shrinkage in East Asia (exit)	12	0	0	0	1	1
Steady in East Asia	245	0	8	2	7	25
Total	6,620	14	93	8	64	136
	90.8%	1.4%	1.6%	1.1%	1.4%	3.7%

	Matrix between patterns of operations in East Asia and those in other regions: No entry	Expansion	Expansion (new entry)	Shrinkage	Shrinkage (exit)	Steady
	in Europe					
(a) All firms						
No entry in East Asia	14,291	6	47	7	36	40
Expansion in East Asia	416	118	69	56	17	131
Expansion in East Asia (new entry)	741	14	55	0	7	25
Shrinkage in East Asia	333	13	10	40	28	35
Shrinkage in East Asia (exit)	43	1	0	1	15	2
Steady in East Asia	642	19	31	15	21	55
Total	16,466	171	212	119	124	288
	94.7%	1.0%	1.2%	0.7%	0.7%	1.7%
(b) Manufacturing firms						
No entry in East Asia	7,395	6	28	4	24	29
Expansion in East Asia	294	96	51	46	13	105
Expansion in East Asia (new entry)	534	12	32	0	6	18
Shrinkage in East Asia	192	10	7	24	20	26
Shrinkage in East Asia (exit)	28	1	0	0	10	0
Steady in East Asia	468	16	24	11	14	44
Total	8,911	141	142	85	87	222
	92.9%	1.5%	1.5%	0.9%	0.9%	2.3%
(c) SMEs						
No entry in East Asia	11,148	1	28	3	13	14
Expansion in East Asia	166	5	13	0	4	13
Expansion in East Asia (new entry)	493	0	23	0	1	5
Shrinkage in East Asia	146	1	0	0	3	5
Shrinkage in East Asia (exit)	17	0	0	1	3	0
Steady in East Asia	365	0	8	2	6	13
Total	12,335	7	72	6	30	50
	98.7%	0.1%	0.6%	0.0%	0.2%	0.4%
(d) Manufacturing SMEs						
No entry in East Asia	6,007	1	17	1	10	10
Expansion in East Asia	106	2	7	0	3	7
Expansion in East Asia (new entry)	359	0	10	0	1	3
Shrinkage in East Asia	87	0	0	0	1	2
Shrinkage in East Asia (exit)	13	0	0	0	1	0
Steady in East Asia	265	0	6	1	4	11
Total	6,837	3	40	2	20	33
	94.7%	1.0%	1.2%	0.7%	0.7%	1.7%

Source: authors' calculation, based on METI database.

Note: figures are consucted by using the two-period balanced panel data.

Table 3 Globalizing firms and changes in domestic operations from 1998 to 2003

	Domestic employment			Domestic establishments		Domestic affiliates	
	Share of firms with reduction	Average growth rates at the firm level	Aggregate change	Share of firms with reduction	Aggregate change	Share of firms with reduction	Aggregate change
(a) All firms							
No entry in East Asia	63%	0.013	173,939	29%	23,030	17%	-744
Expansion in East Asia	67%	-0.019	-209,350	49%	-1,131	41%	-350
Expansion in East Asia (new entry)	60%	0.125	13,955	34%	2,475	23%	685
Shrinkage in East Asia	77%	-0.128	-141,031	54%	397	53%	-3,101
Shrinkage in East Asia (exit)	74%	-0.083	8,909	58%	-517	66%	-295
Steady in East Asia	72%	-0.050	-44,505	40%	-561	32%	-191
Total	64%	0.009	-198,083	32%	23,693	20%	-3,996
(b) Manufacturing firms							
No entry in East Asia	67%	-0.051	-149,154	25%	700	16%	-685
Expansion in East Asia	68%	-0.022	-188,023	48%	-1,332	43%	-211
Expansion in East Asia (new entry)	59%	0.091	-20,418	31%	200	21%	561
Shrinkage in East Asia	78%	-0.108	-114,570	52%	-247	51%	-1,593
Shrinkage in East Asia (exit)	82%	-0.172	-8,873	59%	-25	67%	-161
Steady in East Asia	73%	-0.082	-51,548	37%	-211	33%	-319
Total	67%	-0.052	-532,586	29%	-915	20%	-2,408
(c) SMEs							
No entry in East Asia	63%	0.016	-4,016	27%	6,326	15%	-296
Expansion in East Asia	53%	0.174	339	30%	93	27%	-25
Expansion in East Asia (new entry)	57%	0.179	5,328	29%	497	19%	84
Shrinkage in East Asia	70%	-0.004	-1,636	41%	0	34%	-71
Shrinkage in East Asia (exit)	71%	-0.077	-646	57%	-87	43%	-41
Steady in East Asia	67%	0.022	-4,245	35%	-29	24%	-69
Total	63%	0.017	-4,876	27%	6,800	16%	-418
(d) Manufacturing SMEs							
No entry in East Asia	65%	-0.032	-45,401	23%	478	14%	-421
Expansion in East Asia	52%	0.212	173	26%	49	30%	-42
Expansion in East Asia (new entry)	55%	0.173	1,267	25%	151	17%	56
Shrinkage in East Asia	71%	0.081	-804	37%	-10	29%	-39
Shrinkage in East Asia (exit)	86%	-0.113	-616	71%	-17	36%	-20
Steady in East Asia	66%	0.006	-3,546	34%	-48	25%	-60
Total	65%	0.000	-48,927	24%	603	15%	-526

Source: authors' calculation, based on METI database.

Notes: figures are consucted by using the two-period balanced panel data.

Table 4 Globalizing corporate activities in East Asia and domestic employment
(1) dependent variable: binary variable with 1 for a firm not reducing the number of domestic employment

	Dependent variable: 1 if a firm does not reduce the number of domestic employment and 0 otherwise				
Indipendent variables	1998-2003	1999-2003	2000-2003	2001-2003	2002-2003
a) Manufacturing firms	(1)	(2)	(3)	(4)	(5)
Constant	0.944 ***	1.002 ***	0.782 ***	0.183	1.117 ***
	(6.79)	(7.54)	(6.06)	(1.26)	(9.84)
Expansion in East Asia	0.508 ***	0.382 ***	0.359 ***	0.271 ***	0.235 ***
(incl. new entry)	(7.17)	(5.43)	(5.1)	(3.43)	(3.26)
Firm size	-0.374 ***	-0.348 ***	-0.306 ***	-0.202 ***	-0.257 ***
	(-13.64)	(-13.28)	(-11.99)	(-7.24)	(-11.36)
Capital-labor ratio	0.125 ***	0.100 ***	0.116 ***	0.127 ***	0.053 ***
	(5.49)	(4.61)	(5.59)	(4.64)	(2.99)
Foreign sales ratio	0.180	0.142	0.069	-0.044	0.360 **
	(0.91)	(0.72)	(0.36)	(-0.19)	(1.99)
In-house R&D dummy	-0.030	-0.082 *	-0.077 *	-0.057	-0.029
	(-0.62)	(-1.77)	(-1.7)	(-1.05)	(-0.7)
Advertisement ratio	-0.300	1.601	4.166 ***	5.587 ***	1.567
	(-0.3)	(1.12)	(2.85)	(3.75)	(1.18)
Foreign capital ratio	0.001 **	0.000	0.000	0.007 ***	0.001
	(1.96)	(1.2)	(1.19)	(2.79)	(0.28)
Log likelihood	-5920	-6340	-6594.6	-4687.4	-7789.3
Number of observations	9572	9943	10231	7278	11360
b)Non-manufacturing firms	(1)'	(2)'	(3)'	(4)'	(5)'
Constant	-0.240 **	-0.169	-0.128	-0.012	0.373 ***
	(-1.85)	(-1.35)	(-1.06)	(-0.1)	(3.87)
Expansion in East Asia	0.060	0.026	0.030	0.048	0.265 ***
(incl. new entry)	(0.57)	(0.25)	(0.29)	(0.45)	(2.69)
Firm size	-0.011	-0.021	-0.014	0.003	-0.067 ***
	(-0.45)	(-0.88)	(-0.6)	(0.14)	(-3.67)
Capital-labor ratio	-0.093 ***	-0.065 ***	-0.056 ***	-0.119 ***	-0.050 ***
	(-5.37)	(-3.89)	(-3.57)	(-9.27)	(-4.92)
Foreign sales ratio	-0.381	-0.402	-0.113	-0.335	-0.152
	(-1.17)	(-1.18)	(-0.31)	(-0.78)	(-0.46)
In-house R&D dummy	-0.331 ***	-0.275 ***	-0.171 **	-0.093	-0.079
	(-4.53)	(-3.84)	(-2.49)	(-1.49)	(-1.43)
Advertisement ratio	9.161 ***	8.685 ***	5.692 ***	4.377 ***	3.198 ***
	(6.29)	(6.1)	(4.32)	(3.79)	(3.01)
Foreign capital ratio	-0.0004	0.001 **	0.000 **	0.003 *	0.003 *
	(-0.98)	(2.49)	(2.36)	(1.68)	(1.65)
Log likelihood	-5178.3	-5481.8	-5750.7	-6482.0	-8519.5
Number of observations	7775	8135	8428	9467	12330

Data source: Authors' calculation, based on METI database.

Notes: figures in parenthesis are t-statistics. *** indicates that the results are statistically significant at the 1 percent level, ** at the 5 percent level, and * at the 10 percent level.

(Continue)
(2) dependent variable: growth rate of the number of domestic employment

Indipendent variables	Dependent variable: growth rate of the number of domestic employment 1998-2003	1999-2003	2000-2003	2001-2003	2002-2003
a) Manufacturing firms	(1)	(2)	(3)	(4)	(5)
Constant	0.233 ***	0.212 ***	0.162 ***	0.090 ***	0.041 ***
	(10.03)	(9.42)	(8.29)	(5.06)	(3.93)
Expansion in East Asia	0.082 ***	0.061 ***	0.049 ***	0.041 ***	0.030 ***
(incl. new entry)	(6.39)	(4.84)	(4.37)	(4.08)	(4.44)
Firm size	-0.060 ***	-0.051 ***	-0.040 ***	-0.029 ***	-0.006 ***
	(-13.27)	(-11.61)	(-10.49)	(-8.49)	(-3.09)
Capital-labor ratio	0.013 ***	-0.100 ***	0.008 ***	0.012 ***	-0.001
	(3.33)	(2.71)	(2.65)	(3.58)	(-0.87)
Foreign sales ratio	-0.009	-0.028	-0.039	-0.035	0.006
	(-0.25)	(-0.79	(-1.28)	(-1.24)	(0.36)
In-house R&D dummy	-0.004	-0.015 *	-0.009	-0.0003	-0.002
	(-0.49)	(-1.76)	(-1.22)	(-0.05)	(-0.50)
Advertisement ratio	-0.068	0.496 *	0.486 **	0.517 ***	-0.027
	(-0.39)	(1.90)	(2.08)	(2.87)	(-0.22)
Foreign capital ratio	0.0001 *	0.0001 *	0.0001 **	0.001 ***	0.0002
	(1.90)	(1.79)	(2.08)	(3.02)	(1.26)
Adj R-squared	0.021	0.016	0.013	0.013	0.002
Number of observations	9572	9943	10231	7278	11360
b)Non-manufacturing firms	(1)'	(2)'	(3)'	(4)'	(5)'
Constant	0.112 **	0.112 **	0.073 *	0.093 ***	0.055 ***
	(2.34)	(2.49)	(1.93)	(2.90)	(3.72)
Expansion in East Asia	0.077 **	0.059	0.071	-0.007	0.024
(incl. new entry)	(2.00)	(1.54)	(2.15)	(-1.19)	(1.58)
Firm size	-0.002	-0.003	-0.001	(0.25)	-0.007 **
	(-0.17)	(-0.38)	(-0.21)	(-1.19)	(-2.51)
Capital-labor ratio	-0.017 ***	-0.018 ***	-0.011 **	0.119 **	-0.004 **
	(-2.71)	(-3.03)	(-2.12)	(-2.10)	(-2.47)
Foreign sales ratio	-0.210 *	-0.255 **	-0.261 **	-0.171	-0.013
	(-1.83)	(-2.14)	(-2.30)	(-1.39)	(-0.26)
In-house R&D dummy	-0.128 ***	-0.094 ***	-0.011	-0.029	-0.004
	(-4.89)	(-3.72)	(-0.51)	(-1.62)	(-0.43)
Advertisement ratio	2.857 ***	3.124 ***	2.057 ***	1.982 ***	0.843 ***
	(5.93)	(7.08)	(5.36)	(6.35)	(5.40)
Foreign capital ratio	-0.0001	0.00002 **	0.0001 **	0.001 **	0.001 **
	(-0.45)	(0.31)	(0.88)	(2.03)	(2.34)
Adj R-squared	0.009	0.009	0.0044	0.005	0.003
Number of observations	7775	8135	8428	9467	12330

Data source: Authors' calculation, based on METI database.

Notes: figures in parenthesis are t-statistics. *** indicates that the results are statistically significant at the 1 percent level, ** at the 5 percent level, and * at the 10 percent level.

Table 5 Globalizing corporate activities in East Asia and domestic establishments

Indipendent variables	Dependent variable: 1 if a firm does not reduce the number of domestic establishments and 0 otherwise 1998-2003	1999-2003	2000-2003	2001-2003	2002-2003
a) Manufacturing firms	(1)	(2)	(3)	(4)	(5)
Constant	3.377 ***	3.585 ***	3.561 ***	3.336 ***	4.635 ***
	(24.69)	(26.35)	(26.23)	(21.49)	(29.43)
Expansion in East Asia	-0.036	-0.060	-0.171 **	-0.074	-0.127
(incl. new entry)	(-0.5)	(-0.84)	(-2.35)	(-0.9)	(-1.36)
Firm size	-0.399 ***	-0.438 ***	-0.424 ***	-0.405 ***	-0.437 ***
	(-15.4)	(-16.97)	(-16.37)	(-13.98)	(-14.74)
Capital-labor ratio	-0.053 **	-0.044 *	-0.011	0.010	-0.048 *
	(-2.2)	(-1.84)	(-0.48)	(0.32)	(-1.69)
Foreign sales ratio	-0.151	-0.287	-0.329 *	-0.450 *	-0.142
	(-0.75)	(-1.44)	(-1.67)	(-1.94)	(-0.58)
In-house R&D dummy	-0.338 ***	-0.268 ***	-0.282 ***	-0.126 **	-0.403 ***
	(-6.67)	(-5.3)	(-5.46)	(-2.06)	(-6.18)
Advertisement ratio	-1.087	-4.971 ***	-3.199 **	-1.852	-3.710 **
	(-1.16)	(-3.45)	(-2.17)	(-1.26)	(-2.41)
Foreign capital ratio	-0.001 *	-0.0002	0.000	0.000	0.003
	(-1.66)	(-0.95)	(0.06)	(0.03)	(1.14)
Log likelihood	-5460.5	-5564.7	-5533.6	-4063.6	-4048.9
Number of observations	9571	9943	10231	7278	11360
b)Non-manufacturing firms	(1)'	(2)'	(3)'	(4)'	(5)'
Constant	2.016 ***	1.965 ***	2.308 ***	2.512 ***	3.209 ***
	(15.1)	(15.19)	(18.14)	(20.85)	(27.45)
Expansion in East Asia	-0.282 ***	-0.306 ***	-0.206 *	-0.206 *	-0.282 **
(incl. new entry)	(-2.72)	(-2.92)	(-1.92)	(-1.91)	(-2.54)
Firm size	-0.244 ***	-0.237 ***	-0.289 ***	-0.311 ***	-0.330 ***
	(-9.92)	(-9.93)	(-12.33)	(-14.09)	(-15.51)
Capital-labor ratio	-0.051 ***	-0.045 ***	-0.060 ***	-0.035 **	-0.021
	(-2.76)	(-2.56)	(-3.5)	(-2.52)	(-1.63)
Foreign sales ratio	-0.775 **	-0.490	-0.964 ***	-0.202	-0.627 *
	(-2.51)	(-1.48)	(-2.61)	(-0.45)	(-1.66)
In-house R&D dummy	-0.136 *	-0.161 **	-0.094	-0.184 ***	-0.039
	(-1.92)	(-2.27)	(-1.33)	(-2.82)	(-0.58)
Advertisement ratio	3.601 **	3.798 ***	3.490 **	4.698 ***	1.055
	(2.45)	(2.64)	(2.42)	(3.4)	(0.79)
Foreign capital ratio	-0.0004	-0.00004	0.000	0.002	0.003
	(-1.24)	(-0.2)	(0.99)	(0.94)	(1.3)
Log likelihood	-4963.8	-5192	-5289.3	-5739.8	-5979.6
Number of observations	7774	8135	8428	9467	12330

Data source: Authors' calculation, based on METI database.

Notes: figures in parenthesis are t-statistics. *** indicates that the results are statistically significant at the 1 percent level, ** at the 5 percent level, and * at the 10 percent level.

Table 6 Globalizing corporate activities in East Asia and domestic affiliates

Indipendent variables	Dependent variable: 1 if a firm does not reduce the number of domestic affiliates and 0 otherwise 1998-2003	1999-2003	2000-2003	2001-2003	2002-2003
a) Manufacturing firms	(1)	(2)	(3)	(4)	(5)
Constant	4.617 ***	4.895 ***	5.021 ***	5.025 ***	5.949 ***
	(29.83)	(31.26)	(31.59)	(27.39)	(34.14)
Expansion in East Asia	-0.089	-0.068	-0.146 *	-0.060	0.183
(incl. new entry)	(-1.14)	(-0.86)	(-1.82)	(-0.67)	(1.83)
Firm size	-0.475 ***	-0.496 ***	-0.499 ***	-0.501 ***	-0.548 ***
	(-16.67)	(-17.33)	(-17.11)	(-15.36)	(-17.43)
Capital-labor ratio	-0.230 ***	-0.266 ***	-0.274 ***	-0.297 ***	-0.345 ***
	(-7.73)	(-8.75)	(-8.96)	(-7.94)	(-10.1)
Foreign sales ratio	-0.738 ***	-0.502 **	-0.501 **	-0.609 **	-0.559
	(-3.49)	(-2.32)	(-2.32)	(-2.4)	(-2.3)
In-house R&D dummy	-0.231 ***	-0.299 ***	-0.277 ***	-0.161 **	-0.372 ***
	(-3.93)	(-5.03)	(-4.49)	(-2.22)	(-5.34)
Advertisement ratio	-1.934 *	-1.216	1.629	1.866	0.497
	(-1.95)	(-0.75)	(0.86)	(0.97)	(0.25)
Foreign capital ratio	0.001 ***	0.002 ***	0.001 ***	0.014 ***	0.010 ***
	(2.77)	(3.94)	(3.44)	(3.42)	(2.94)
Log likelihood	-4445.9	-4420.6	-4315.9	-3234.1	-3635.1
Number of observations	9572	9943	10231	7278	11360
b)Non-manufacturing firms	(1)'	(2)'	(3)'	(4)'	(5)'
Constant	3.716 ***	3.704 ***	3.865 ***	3.759 ***	4.209 ***
	(23.47)	(23.95)	(25.01)	(25.85)	(29.41)
Expansion in East Asia	-0.157	-0.234 **	-0.245 **	-0.361 ***	-0.310
(incl. new entry)	(-1.35)	(-1.99)	(-2.03)	(-3)	(-2.47)
Firm size	-0.359 ***	-0.353 ***	-0.367 ***	-0.342 ***	-0.355 ***
	(-12.87)	(-13)	(-13.53)	(-13.37)	(-14.03)
Capital-labor ratio	-0.261 ***	-0.244 ***	-0.247 ***	-0.169 ***	-0.185 ***
	(-10.5)	(-10.22)	(-10.32)	(-9.06)	(-10.65)
Foreign sales ratio	-0.727 **	-1.018 ***	-0.548	-0.816 **	-1.362 ***
	(-2.15)	(-2.83)	(-1.32)	(-1.63)	(-3.39)
In-house R&D dummy	-0.281 ***	-0.236 ***	-0.274 ***	-0.204 ***	-0.154
	(-3.53)	(-2.92)	(-3.38)	(-2.62)	(-1.93)
Advertisement ratio	5.322 ***	3.944 **	5.982 ***	2.263	4.396
	(2.78)	(2.17)	(2.98)	(1.4)	(2.3)
Foreign capital ratio	0.001 *	0.001 **	0.001 *	0.003	0.004
	(1.86)	(2.2)	(1.93)	(1.01)	(1.32)
Log likelihood	-3827.7	-3931.9	-3887.5	-4147.7	-4313.9
Number of observations	7775	8135	8428	9467	12330

Data source: Authors' calculation, based on METI database.

Notes: figures in parenthesis are t-statistics. *** indicates that the results are statistically significant at the 1 percent level, ** at the 5 percent level, and * at the 10 percent level.

Table 7 Globalizing corporate activities in East Asia and exports

Indipendent variables	Dependent variable: a change in the ratio of exports to East Asia in total sales 1998-2003	1999-2003	2000-2003	2001-2003	2002-2003
a) Manufacturing firms	(1)	(2)	(3)	(4)	(5)
Constant	0.005	0.006 **	0.005	0.002	-0.002
	(1.62)	(2.01)	(1.56)	(0.72)	(-1.04)
Expansion in East Asia	0.030 ***	0.026 ***	0.023 ***	0.019 ***	0.009 ***
(incl. new entry)	(16.14)	(15.19)	(13.35)	(10.25)	(7.08)
Firm size	-0.0002	-0.0004	-0.0003	0.000	0.001
	(-0.37)	(-0.70)	(-0.43)	(0.24)	(1.58)
Capital-labor ratio	-0.001	-0.001 *	-0.001	-0.0002	0.000
	(-0.94)	(-1.72)	(-1.20)	(-0.38)	(0.39)
Foreign sales ratio	-0.008	0.043 ***	0.028 ***	0.003	-0.028 ***
	(-1.53)	(9.13)	(5.92)	(0.63)	(-9.15)
In-house R&D dummy	0.003 **	0.005 ***	0.004 ***	0.003 **	0.001 *
	(2.26)	(4.22)	(3.25)	(2.43)	(1.84)
Advertisement ratio	-0.034	-0.070 **	-0.073 **	-0.051	-0.016
	(-1.35)	(-1.97)	(-2.00)	(-1.54)	(-0.75)
Foreign capital ratio	0.000 **	0.000	0.000 *	-0.0001	0.000
	(2.38)	(1.09)	(1.82)	(-1.01)	(1.05)
Adj R-squared	0.0312	0.0459	0.0311	0.0195	0.0104
Number of observations	9572	9943	10231	7278	11360
b)Non-manufacturing firms	(1)'	(2)'	(3)'	(4)'	(5)'
Constant	0.006 ***	0.005 ***	0.004 ***	0.004 ***	0.002 **
	(2.69)	(2.71)	(2.91)	(2.99)	(2.35)
Expansion in East Asia	0.030 ***	0.023 ***	0.020 ***	0.017 ***	0.006 ***
(incl. new entry)	(16.02)	(16.40)	(16.09)	(14.68)	(8.26)
Firm size	-0.001 **	-0.001 *	-0.001 **	-0.001 **	-0.0003 *
	(-2.25)	(-1.95)	(-2.14)	(-2.33)	(-1.84)
Capital-labor ratio	0.0001	-0.00002	0.000	0.000	-0.00002
	(0.45)	(-0.08)	(0.20)	(0.25)	(-0.19)
Foreign sales ratio	-0.103 ***	0.011 **	0.028 ***	0.004	-0.007 ***
	(-18.64)	(2.55)	(6.40)	(0.86)	(-2.70)
In-house R&D dummy	0.005 ***	0.000	0.000	0.000 ***	0.001 ***
	(3.67)	(0.27)	(-0.24)	(0.24)	(1.51)
Advertisement ratio	-0.053 ***	-0.034 **	-0.026 *	-0.016	-0.020 **
	(-2.29)	(-2.07)	(-1.75)	(-1.39)	(-2.51)
Foreign capital ratio	0.000 ***	0.000 ***	0.000	0.000	0.000 **
	(-1.23)	(-0.99)	(-0.44)	(0.42)	(2.36)
Adj R-squared	0.0627	0.0377	0.0436	0.0247	0.0063
Number of observations	7775	8135	8428	9467	12330

Data source: Authors' calculation, based on METI database.

Notes: figures in parenthesis are t-statistics. *** indicates that the results are statistically significant at the 1 percent level, ** at the 5 percent level, and * at the 10 percent level.

Table 8 Globalizing corporate activities in East Asia and imports

Indipendent variables	Dependent variable: a change in the ratio of imports from East Asia in total purchases 1998-2003	1999-2003	2000-2003	2001-2003	2002-2003
a) Manufacturing firms	(1)	(2)	(3)	(4)	(5)
Constant	0.021 ***	0.019 ***	0.020 ***	0.014 **	0.006 ***
	(3.77)	(3.58)	(3.85)	(2.42)	(1.46)
Expansion in East Asia	0.031 ***	0.026 ***	0.029 ***	0.019 ***	0.001
(incl. new entry)	(10.03)	(8.44)	(9.91)	(5.74)	(0.58)
Firm size	-0.002 *	-0.002 *	-0.002 *	-0.001	-0.001
	(-1.69)	(-1.67)	(-1.93)	(-0.46)	(-1.07)
Capital-labor ratio	-0.003 ***	-0.002 **	-0.002 **	-0.003 **	0.000
	(-2.74)	(-2.45)	(-2.46)	(-2.41)	(0.26)
Foreign sales ratio	0.042 ***	0.033 ***	0.029 ***	0.028 ***	-0.022 ***
	(4.86)	(3.91)	(3.74)	(2.94)	(-3.46)
In-house R&D dummy	0.003	0.005 ***	0.004 **	-0.001	0.002
	(1.39)	(2.62)	(2.09)	(-0.33)	(1.22)
Advertisement ratio	-0.017	-0.048	-0.005	-0.020	-0.056
	(-0.42)	(-0.77)	(-0.09)	(-0.34)	(-1.19)
Foreign capital ratio	0.000	0.000 **	0.000	0.000	0.000 ***
	(0.36)	(2.02)	(0.06)	(-0.71	(3.85)
Adj R-squared	0.0162	0.0125	0.0142	0.0068	0.0017
Number of observations	9360	9761	10044	7241	11226
b)Non-manufacturing firms	(1)'	(2)'	(3)'	(4)'	(5)'
Constant	0.003	0.005	0.003	0.000	-0.003
	(0.92)	(1.43)	(1.02)	(0.12)	(-1.18)
Expansion in East Asia	0.014 ***	0.024 ***	0.021 ***	0.014 ***	0.001
(incl. new entry)	(4.53)	(7.80)	(6.91)	(4.82)	(0.39)
Firm size	-0.0001	-0.0004	-0.0003	0.000	0.001
	(-0.21)	(-0.60)	(-0.42)	(0.06)	(1.50)
Capital-labor ratio	-0.0002	-0.0001	-0.0001	0.000	0.000
	(-0.42)	(-0.23)	(-0.32)	(1.21)	(0.70)
Foreign sales ratio	0.033 ***	0.004	0.051	-0.027 **	-0.029 ***
	(3.63)	(0.41)	(4.98)	(-2.25)	(-3.61)
In-house R&D dummy	0.009 ***	0.007 ***	0.007 ***	0.004 **	-0.001
	(4.58)	(3.50)	(3.84)	(2.22)	(-0.71)
Advertisement ratio	-0.034	0.007	0.016	0.011	-0.095 ***
	(-0.88)	(0.19)	(0.46)	(0.36)	(-3.72)
Foreign capital ratio	0.00004 ***	-0.00002 ***	-0.00001 **	0.00005	0.000
	(4.29)	(-2.72)	(-2.04)	(0.91)	(0.01)
Adj R-squared	0.0117	0.0106	0.0143	0.0032	0.0019
Number of observations	7715	8084	8377	8881	11570

Data source: Authors' calculation, based on METI database.

Notes: figures in parenthesis are t-statistics. *** indicates that the results are statistically significant at the 1 percent level, ** at the 5 percent level, and * at the 10 percent level.

Table A.1 Industry classification

Manufacturing sector		Non-manufacturing sector	
090	Food processing	480	Wholesale trade
100	Beverages, tobacco, and animal feed	550	Retail trade
110	Textiles	Other	Mining, services, and other
120	Apparel		
130	Wood and wood products		
140	Furniture and fixtures		
150	Pulp, paper, and paper products		
160	Publishing and printing		
170	Chemicals		
180	Petroleum and coal products		
190	Plastic products		
200	Rubber products		
210	Leather and leather products		
220	Ceramics, clay, and stone products		
230	Iron and steel		
240	Nonferrous metal		
250	Metal products		
260	General machinery		
270	Electric machinery		
280	Telecommunications machinery		
290	Electronic parts and device		
300	Transport equipment		
310	Precision machinery		
320	Other manufacturing		
260-310	Machinery		

Table A.2 Sector switching and non-sector switching Japanese affiliates aborad for 2003

(a-1) The number of affiliates in East Asia with all sized parent firms

Industry of parent firms \ Industry of affiliates	090	100	110	120	130	140	150	160	170	180	190	200	210	220	230	240	250	260	270	280	290	300	310	320	490	550	Other
090	202	2		1			1	1	8		1												1		27	2	25
100	6	31							15												1		1	1	23	3	18
110			79	14			3		2		4	3					1		1		1	4			26		2
120			5	63							3							1			3				7		2
130					22						1														1		2
140						21											4							2	3	2	2
150			6				64		1									3			1			5	7	4	5
160								101						1					1		1		1			2	4
170	5		35	4	1		2	4	669	2	32	9		7		11	14	11	1		15	2	3	2	232	8	79
180										4															10	4	21
190			8	2			1		19		262	6		1		1	9	1	2		6	2	1	25	66		10
200									1	1	3	103					2	3				2	1	8	32	6	6
210				3									8														
220	2		1						2		3			126	1		4	3	4		2		15	1	17	10	19
230									1		1				52	2	10	5	1	6	8	3			5	1	21
240									2		4	9		4		216	17	1	6	12	34	43	1	1	60		28
250					1			1			4	11		2	1	1	179	6	6	4	9	15	2	9	29	1	14
260	3	1					0	1	3		4	1			9	3	20	466	25	34	10	38	5	15	331	15	92
270			1			1			1		1			7	5	7	4	17	297	10	41	7	15	1	136	23	57
280								1			3						5	21	190	223	79	5	15	2	199	2	143
290	2			2					17		2			1		3	2	14	22	22	485	1	8	2	142	3	36
300									2		18	9		1	13		11	20	17	4	2	829	8	4	103	27	95
310						1			5		4	3		4			2	11	6		19		133	1	74	8	9
320			2			1					2	2	1				3	2		2	1	1	3	95	40	5	10
490	103	5	76	184	5	9	12	6	131	2	78	24	3	52	55	32	59	50	39	38	145	50	28	95	1646	79	377
550	1		2	7		1			1		2		1			1	2			5				18	19	102	34
Other	8			3	6			1	2	1	1				2	2	3	29	6	3	2	6	1	4	24	10	599

(b-1) The number of affiliates in North America with all sized parent firms

Industry of parent firms \ Industry of affiliates	090	100	110	120	130	140	150	160	170	180	190	200	210	220	230	240	250	260	270	280	290	300	310	320	490	550	Other
090	40																								10		19
100	1	12							2															1	11	2	10
110			5	2																		2			6		2
120				1							1										1				1		1
130					1																				1		
140						1																			1		1
150			1		1		9		1															2	5	3	3
160								19																	2		4
170			2						130		5	3				2	2	5	2		4	2	4	1	105	4	86
180																									1		6
190	1								1		43								1		1			3	18		11
200											2	21					2							4	9	4	20
210																											
220									1					14							1		5		8		9
230															8	2		2				2			5		9
240									1			5		2		45	6			2	2	19			14		19
250												1			1		37	1				5		1	18	1	5
260									4						1		2	114	3	5	1	12	1	2	172	10	67
270																		3	34		6	5			53	19	21
280																			33	99	4	1	1		82		576
290									4		1							1	2	8	64				56	2	19
300											2	4			3		3	12	2			312	2	2	71	17	122
310									1		1							2	3		3	1	23		34	7	14
320			2								1	1						1			1			17	29	7	18
490	18		4	6	4		4		34		10	8		2	14	6	13	20	6	5	6	19	9	19	495	22	195
550	1			1																					15	29	22
Other	1				2												1	2		2		3	1		16	7	325

(c-1) The number of affiliates in Europe with all sized parent firms

Industry of parent firms \ Industry of affiliates	090	100	110	120	130	140	150	160	170	180	190	200	210	220	230	240	250	260	270	280	290	300	310	320	490	550	Other
090	11								5															1	10		13
100		6																							10		14
110			1															1							3		1
120											1														1		1
130					1																						
140																											
150			1				2																		8	1	1
160								18																			5
170			4					1	133	1	6	1				2		1			2	4		1	128	3	66
180																									1		5
190									2		30							1			1			3	11	1	5
200						2						20					1								24	18	8
210																											
220														9			1		1				13		7	1	1
230															4		1								2		5
240									1			2				18	4					19			11		8
250																	12			1				3	7		2
260									1								1	98	4	4	2	16			314	9	45
270														2				9	49	1	7	4			66	38	24
280																		3	33	112	5	3	7		152		227
290									3					1					3	18	69				47		5
300											2	1		1				12		1		145		1	100	49	84
310														1				2	2				12		55	8	13
320																				1				16	41	6	5
490	8	1	1	8	2	1			34		8		1	3	4	1	5	9	2	5	17	16	3	16	399	19	280
550																								4	5	23	7
Other																		4	1			1		1	5	2	185

(Coninue)

(a-2) The number of affiliates in East Asia with parent SMEs

Industry of parent firms \ Industry of affiliates	090	100	110	120	130	140	150	160	170	180	190	200	210	220	230	240	250	260	270	280	290	300	310	320	490	550	Other
090	46			1					3														1		3		5
100		2																						1	1		
110			36	4					1			3													9		
120			3	35																					2		2
130					15						1														1		2
140						14											1							1	2		
150			1				20																		2		
160								14						1									1				1
170	2							1	107		2	3		1		1	6	4						1	19		7
180										4															5		1
190							1		1		121						4					1	1	4	12		1
200									1			22						1						1		2	1
210				3									8														
220														31			1	2						1	2	10	2
230									1		1				19		1	4	1			1				1	2
240																49	2		2	3	7	2			6		1
250					1			1			3				1		92	1	5	2	8	6		1	8		2
260		1						1			2				2	2	11	164	3		5	6	2	9	46	3	14
270			1								1					2	1	5	86	2	6	4	4		25	4	6
280											2						4		2	24	3		1		12	2	3
290	1										2			1			2	1	13	4	135	1	1	1	31		5
300									1		1				1		3	5	6	2	2	90	2	1	7		3
310																	1	3	3		2		40	1	8	1	2
320			2			1					1		1								1		3	42	8		2
490	36	1	11	76	1	3	4	4	32		33	10	1	12	7	17	25	13	14	14	32	15	14	32	603	15	40
550	1		1								1		1			1	1								5	4	3
Other											1					1	1	6	1	2	2	3	1	1	4	1	124

(b-2) The number of affiliates in North America with parent SMEs

Industry of parent firms \ Industry of affiliates	090	100	110	120	130	140	150	160	170	180	190	200	210	220	230	240	250	260	270	280	290	300	310	320	490	550	Other
090	6																										
100		1																							1	1	1
110			3																						1		
120																									1		
130					1																						
140																											
150							2																				1
160								3																	2		2
170									22		1							1							13	1	6
180																											
190											9														3		1
200												2														1	
210																											
220														2											2		1
230															2	1		1							1		2
240																7					1						
250																	12					1			7	1	1
260									1								1	29		1		2		2	33	4	8
270																		1	12			2			12	5	2
280																				3					8		1
290											1										12				18		
300																	1	3	1			24	1	1	11		1
310																							3		6		3
320			2																		1			5	3	1	
490	1		1				1		4								1	7		1		10	3		149	4	16
550																									2	4	3
Other																		1		1					5	3	53

(c-2) The number of affiliates in Europe with parent SMEs

Industry of parent firms \ Industry of affiliates	090	100	110	120	130	140	150	160	170	180	190	200	210	220	230	240	250	260	270	280	290	300	310	320	490	550	Other
090																											
100																											2
110																									1		
120																									1		1
130					1																						
140																											
150																											
160								3																			
170								1	6																2		2
180																											
190											2																
200																											
210																											
220														1			1									1	
230																											
240																4											
250																	3								2		
260																		12							18	2	4
270																		8	3			1			8	4	
280																									4		
290																			1		4				6		
300																						2		1	3		1
310																									5		
320																								6	2	1	1
490									1					1				2		1	1	3	2		82	6	13
550																										4	1
Other																										1	13

Source: authors' calculation, based on METI database.

Table A.3 Summary statistics for two-period panel data, 1998-2003

	Observations	Mean	SD	Min	Max
(a) All firms					
Expansion	17347	0.095	0.29	0	1
Firm size	17347	470.9	1939.37	48	75505
K/L ratio	17347	9.811	15.92	0.001	886
F-sales ratio	17347	0.028	0.10	0	1.000
R&D dummy	17347	0.334	0.47	0	1
AD ratio	17347	0.006	0.02	0	1.492
F-capital ratio	17347	7.688	67.52	0	1000
(b) Manufacturing firms					
Expansion	9572	0.126	0.33	0	1
Firm size	9572	492.4	2135.58	50	71138
K/L ratio	9572	10.409	14.94	0.001	806
F-sales ratio	9572	0.039	0.12	0	1.000
R&D dummy	9572	0.498	0.50	0	1
AD ratio	9572	0.005	0.02	0	1.492
F-capital ratio	9572	8.694	67.56	0	1000
(c) Non-manufacturig firms					
Expansion	7775	0.057	0.23	0	1
Firm size	7775	444.6	1666.13	48	75505
K/L ratio	7775	9.076	17.03	0.002	886
F-sales ratio	7775	0.014	0.08	0	1.000
R&D dummy	7775	0.131	0.34	0	1
AD ratio	7775	0.008	0.02	0	0.336
F-capital ratio	7775	6.449	67.46	0	1000
(d) Manufacturing SMEs					
Expansion	6922	0.072	0.26	0	1
Firm size	6922	138.5	63.00	50	300
K/L ratio	6922	9.463	11.49	0.004	269
F-sales ratio	6922	0.026	0.10	0	1.000
R&D dummy	6922	0.402	0.49	0	1
AD ratio	6922	0.004	0.02	0	1.492
F-capital ratio	6922	5.415	61.96	0	1000
(e) Manufacturing large firms					
Expansion	2650	0.267	0.44	0	1
Firm size	2650	1416.6	3909.72	219	71138
K/L ratio	2650	12.878	21.29	0.001	806
F-sales ratio	2650	0.072	0.14	0	0.996
R&D dummy	2650	0.749	0.43	0	1
AD ratio	2650	0.007	0.02	0	0.286
F-capital ratio	2650	17.259	79.77	0	1000

Table A.4 Correlation matrix for two-period panel data, 1998-2003

	Expansion	lnFirm size	lnK/L ratio	F-sales ratio	R&D dummy	AD ratio	F-capital ratio
(a) All firms (obs=17347)							
Expansion	1						
lnFirm size	0.260	1					
lnK/L ratio	0.096	0.107	1				
F-sales ratio	0.222	0.157	0.057	1			
R&D dummy	0.206	0.258	0.170	0.190	1		
AD ratio	-0.008	0.101	0.006	-0.009	0.032	1	
F-capital ratio	0.031	0.104	0.031	0.087	0.068	0.049	1
(b) Manufacturing firms (obs=9572)							
Expansion	1						
lnFirm size	0.341	1					
lnK/L ratio	0.103	0.159	1				
F-sales ratio	0.207	0.226	0.049	1			
R&D dummy	0.190	0.354	0.173	0.171	1		
AD ratio	0.012	0.063	0.033	0.015	0.082	1	
F-capital ratio	0.031	0.126	0.051	0.097	0.085	0.032	1
(c) Non-manufacturing firms (obs=7775)							
Expansion	1						
lnFirm size	0.133	1					
lnK/L ratio	0.058	0.061	1				
F-sales ratio	0.219	0.038	0.032	1			
R&D dummy	0.136	0.152	0.069	0.118	1		
AD ratio	-0.019	0.161	0.002	-0.030	0.044	1	
F-capital ratio	0.026	0.075	0.008	0.070	0.037	0.081	1