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*Phan Minh Ngoc, Faculty of Economics, Kyushu University  
and*

*Eric D. Ramstetter, ICSEAD and  
Graduate School of Economics, Kyushu University*

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**The International Centre for the Study of East Asian Development, Kitakyushu**

# **Foreign Ownership Shares and Exports of Multinational Firms in Vietnamese Manufacturing**

Phan Minh Ngoc, Faculty of Economics, Kyushu University

email: phanngoc@en.kyushu-u.ac.jp

and

Eric D. Ramstetter, International Centre for the Study of East Asian Development  
and Graduate School of Economics, Kyushu University, Email: ramst@icsead.or.jp

## **Abstract**

Previous studies indicate that foreign multinational corporations (MNCs) have generally accounted for relatively large shares of host country exports and thus had relatively high export propensities in Vietnam and other Southeast Asian countries. Furthermore, previous studies of Indonesia, Singapore, and Thailand suggest a strong correlation between foreign ownership shares and export propensities, even after many other determinants of export propensities are controlled for. This paper uses unpublished data on foreign investment projects in 2000-2001 to examine this relationship for the first time in Vietnam. Results indicate that export propensities tend to be significantly higher in MNCs with foreign ownership shares of 90 percent or greater, after controlling for the effects of other factors thought to affect export propensities, such as industry affiliation, firm size, vintage, and capital intensity. There is a large variation in the relationship between ownership shares and export propensities among industries and years, however.

**Keywords:** multinational corporation, export, manufacturing, Vietnam

**JEL Categories:** F23, F14, O53

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## 1. Introduction

Vietnam has undergone a large economic transition in the last two decades. Although the economy remains heavily agrarian with agriculture accounting for two-thirds of employment in 2002, rapid industrialization has been an important aspect of the transition. By 2002 manufacturing's share of gross domestic product (GDP) was roughly equal to that of agriculture (21 percent versus 23 percent if measured in current prices, International Centre for the Study of East Asian Development 2004). Another outstanding aspect of the economic transition has been the rapid growth of international trade. Merchandise exports (as reported in trade statistics and Table 1) increased from about one-quarter of GDP in 1991-1995 (23-27 percent) to slightly under half in 2001-2002 (46 percent). There were also important changes in export structure, with manufactures (narrowly defined) increasing from about one-fifth of total exports in 1991-1993 to slightly under half of the total in 1997-2001.<sup>1</sup> Among manufactures, growth was particularly conspicuous in footwear (from 1 percent of total exports in 1991-1992 to 13-14 percent in 1997-2001) and machinery (from 0-2 percent of total exports in 1991-1995 to 8-9 percent in 1997-2001). Using a broader definition of manufacturing, exports of manufactures accounted for about two-thirds of the total in 1997-2001. The increase in the broad definition of manufacturing exports was somewhat slower in 1997-2001, largely because the broad definition includes large amounts of slowly growing food processing exports which are excluded from the narrow definition.<sup>2</sup> In the broad classification, food processing was the largest category of manufacturing exports in the 1997-2001 period, followed by apparel, footwear and leather, and then office, computing, electric, and precision machinery (Table 1).

There is now a large literature demonstrating that foreign MNCs have made some of their largest direct contributions to host developing economies in terms of the international trade

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<sup>1</sup> These figures refer to the narrowest common definition of manufacturing exports, that is the sum of sections 5 to 8 of the Standard International Trade Classification (SITC). These shares were 18 percent in 1991, 16 percent in 1992, and 22 percent in 1993 (International Centre for the Study of East Asian Development 2004), and 44-48 percent in 1997-2001 (Table 1).

<sup>2</sup> The broad definition referred to here is section D of the International Standard Industrial Classification (ISIC). The main difference between the two classifications is that the narrow definition excludes almost all food products, crude materials, mineral fuels in sections 1 to 4 (non-manufactures) whereas the broad definition classifies large portions of these products as processed manufactures.

flows they generate, especially on the export side (Blomström 1990b; Ramstetter 1993, 1999a). Economy-wide estimates (Phan and Ramstetter 2004) also indicate that this has been the case in Vietnam, with foreign MNCs accounting for much larger shares of Vietnam's exports (27 percent in 1995, 37-47 percent in 1998-2002) and imports (18 percent and 23-34 percent, respectively) than of GDP (6 percent and 10-14 percent, respectively) or employment (less than 1 percent in 1997-2000). There is another group of studies indicating that export propensities have tended to be higher in foreign MNCs with large foreign ownership shares than in foreign MNCs with small or intermediate foreign ownership shares in Indonesia, Singapore, and Thailand (Ramstetter 1994, 1998, 1999a, 1999b, 2002b). Recently, we have gained access to a micro-data set with information on foreign MNC projects, making it possible to examine the relationship between export propensities and foreign ownership shares in Vietnam as well. The Vietnamese case is of particular interest in this respect, because Vietnam had relatively few restrictions on foreign ownership shares compared to other countries examined in previous studies of this relationship. In particular, Vietnam has not made exporting a condition for allowing high foreign ownership shares as was the case in Thailand and Indonesia.

The primary purpose of this paper is thus to examine the relationship between foreign ownership shares and export propensities in projects operated by foreign MNCs in Vietnam. To this end, section 2 reviews the relevant literature briefly while section 3 describes the data and some important patterns they reveal. Section 4 then presents a simple model used to further analyze the relationship between foreign ownership shares and export propensities, some descriptive statistics related to the model, and econometric comparisons of export propensities between heavily-foreign MNCs (MNCs with very large foreign ownership shares of 90 percent or more) and other MNCs. The major results and their implications are summarized in the final section.

## **2. A Brief Literature Review**

The theory of the multinational firm focuses first and foremost on the question of why a

firm chooses to become a MNC and bear the costs of cross-border operations not incurred by non-MNCs. The answer to this question is commonly thought to lie in identifying the advantages possessed by MNCs that allow them to overcome the additional costs of operating across borders. However, there is substantial disagreement in the theoretical literature over which advantages are necessary and/or sufficient for a firm to become a MNC.<sup>3</sup> Nonetheless, most observers agree that MNCs tend to possess a distinctive set of firm-specific assets including relatively advanced production technology, sophisticated marketing networks, and superior management know-how compared to non-MNCs. Differences in production technology and marketing networks have particularly important implications for trade propensities in MNCs. First, if production technology is indeed superior in MNCs, they may be able to produce internationally marketable products with relative ease. Second, in addition to possessing relatively sophisticated marketing networks in general, international marketing networks are likely to be particularly sophisticated in MNCs. This reduces transaction costs associated with international trade for MNCs, making it likely that they will be characterized by relatively high export and import propensities compared to non-MNCs, even if there are no differences in production technology.

Previous evidence about these relationships is relatively abundant for manufacturing industries in two other Southeast Asian economies, Indonesia and Thailand, where the existence of plant- and firm-level data sets has facilitated examining the relationships between efficiency or trade propensities on the one hand, and foreign ownership on the other. The Indonesian and Thai data sets are also rich enough to allow control for the effects of numerous other relevant variables such as factor intensities, scale, and vintage. Evidence for Indonesia suggests that MNCs are both more efficient (Sjöholm 1998, 1999a, 1999b; Takii 2001, 2002; Takii and

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<sup>3</sup> For good reviews of the theoretical and empirical literature on multinationals see Caves (1996), Dunning (1993), and Markusen (1991). According to Dunning (1981, 1993), three types of advantages are necessary, (1) ownership advantages or advantages accruing from exploitation of firm-specific assets (e.g., patents, marketing networks), (2) internalization advantages or advantages accruing from the internalization of economic transactions within a single firm unit (e.g., the reduction of transactions costs where uncertainty makes inter-firm transactions risky and thus costly), and (3) locational advantages or advantages accruing from operating in a specific location (e.g., reductions in transport or labor costs). In contrast, others (e.g., Buckley and Casson 1991, Casson 1987, Rugman 1980, 1985) argue that internalization alone is sufficient to explain the existence of the MNC and that the possession of firm-specific assets simply reflects the internalization process.

Ramstetter 2004) and characterized by relatively high trade propensities (Ramstetter 1998, 1999b), although differences in trade propensities are somewhat more prevalent than productivity differentials. Evidence for Thailand is consistent with evidence for Indonesia, suggesting that foreign MNCs generally have significantly higher export propensities (Ramstetter 1993, 1994, 1998, 2002a) but differs in that differences in efficiency between foreign MNCs and local firms or plants are often insignificant statistically (e.g., Brimble 1993; Ito 2002; Khanthachai et al. 1987; Ramstetter 1993, 1994, 2002b, 2004; Tambunlertchai and Ramstetter 1991). Micro-studies of trade propensities in other economies include a study of exporting manufacturers in Brazil, where Natke and Newfarmer (1985) find that foreign ownership and several other variables are positively related to export propensities. In a study of Sri Lanka by Authukorala et al. (1995), results of simultaneous-equation estimation suggest that foreign ownership is positively related to the decision to export, but not to the level of the export propensity.<sup>4</sup> There are also a number of studies suggesting that MNCs tend to be relatively efficient in Mexico (e.g., Blomström 1990) but we know of no other countries for which comparisons of the export-ownership relationship and the productivity- relationship are both available.

Of more relevance to this paper is the growing literature that stresses how foreign MNCs that are tightly controlled by the parent and integrated in an MNC's international network, usually through very large ownership shares, may differ from foreign MNCs where parent control is weaker (e.g., Moran 2001). In this literature it is often argued that parents restrict access of uncontrolled affiliates (e.g., minority-owned affiliates) to the firm-specific assets that the multinational possesses. For example, it is often asserted that MNCs restrict technology transfer to affiliates they do not control in order to protect intellectual property that is an important source of competitiveness for the MNCs. This probably occurs most often in

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<sup>4</sup> Note that the Athukorala et al. (1995) study avoids a potentially important sample selection bias problem in Natke and Newfarmer's (1985) samples, which exclude non-exporters. A number of simpler studies compare export propensities in samples of MNCs and non-MNCs in Asian economies including Vietnam (e.g., Cohen 1975, Indian Institute of Foreign Trade 1981, Lall and Streeten 1977, Phan and Ramstetter 2004, Ramstetter 1999a) or use Wilcoxon signed-rank test to compare export propensities in 'matched' pairs of firms (e.g., Riedel 1975). These simpler methods have the serious drawback of ignoring the influence of other variables affecting export propensities that are often controlled for in more sophisticated studies, but they have the advantage of smaller data requirements.

minority-foreign joint ventures but can also occur in some majority-foreign firms where local partners exercise relatively large control for one reason or another. If this is the case and foreign ownership shares are a reasonable proxy for control on average, there may be a positive correlation between technical efficiency and foreign ownership shares.<sup>5</sup> Simplistic time series evidence from manufacturing in Hong Kong and Singapore (Ramstetter 1999a) is consistent with this assertion, but more sophisticated tests using plant-level analysis data for Indonesia (Takii 2002; Takii and Ramstetter 2003) and Thailand (Ramstetter 2004) do not generally support this assertion in many industries and specifications. Nonetheless, to the extent that technical efficiency increases the ability to produce internationally marketable products, this could create a positive correlation between export propensities and foreign ownership shares.

Perhaps more important in this context is the fact that MNCs may also have a strong motive to restrict the access by uncontrolled affiliates to international marketing networks. This motive may exist because lack of marketing coordination between uncontrolled affiliates on the one hand, and the parent and/or other affiliates on the other, could result in excess supply of a firm's products in specific markets. Thus, if ownership shares are a reasonable proxy for control on average, firms with larger foreign ownership shares may have higher export propensities than firms with lower foreign ownership shares, even if technological differences do not affect export performance or do not exist. For example, despite the lack of evidence suggesting a correlation between productivity differentials and foreign ownership shares, evidence on export propensities for Thai manufacturing firms in 1990 (Ramstetter 1993, 1994, 1998) and Thai manufacturing plants in 1996 (Ramstetter 2002a) suggests that heavily- or wholly-foreign-owned MNCs had the highest propensities, followed by majority-foreign MNCs, minority-foreign MNCs, and lastly by local firms or plants.<sup>6</sup> Similarly, evidence from Indonesian manufacturing plants in the early-mid 1990s (Ramstetter 1999b) suggests a somewhat stronger positive correlation between foreign ownership shares and export

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<sup>5</sup> It is important to recognize that firms (MNCs or local partners) with minority-ownership shares can exercise substantial management control in a joint venture through the control of key inputs or marketing networks, or through connections with government policy makers.

<sup>6</sup> As in this paper, heavily-foreign MNCs are defined as MNCs with foreign ownership shares of 90 percent or more.

propensities than between foreign ownership shares and efficiency. On the other hand, it must also be recognized that multinational parents also have a strong motive to provide firm-specific assets, including access to marketing networks, to all affiliates in order to increase the profitability of the affiliates in question. Thus, the extent to which there actually is a relationship between foreign ownership shares and export propensities is clearly an empirical question and must be examined on a case by case basis.

The Vietnamese case is markedly different from the cases of other developing economies in Southeast Asia, primarily because government continues to play a relatively dominant role in Vietnam. In addition to implementing relatively high levels of import protection and taxation, the government continues to run a very large state-owned sector, which is especially conspicuous in some mining and manufacturing industries (Phan and Ramstetter 2004). Correspondingly, Pham (2001) focuses on the effect of policy variables on export propensities of foreign MNC projects in 1996-1998. His evidence suggests that a dummy variable for projects benefiting from high import protection and tax rates were negatively and significantly correlated with export propensities in all years. Projects MNCs from Japan, Hong Kong, Korea, Singapore, and Taiwan had significantly higher export propensities than others in all three years. Foreign ownership shares were also positively correlated while projects registered as having technology transfer was negatively correlated with export propensities, but these correlations were only significant in the 1998 sample.<sup>7</sup> However, Pham's (2001) approach differs greatly from others in this literature because standard controls such as those for factor intensity, scale, vintage, and industry affiliation, are omitted from his regressions.

### **3. The Data and Some Descriptive Statistics**

Similar to Pham (2001), this study is primarily based on a sample of manufacturing projects extracted from an unpublished database on projects of foreign MNCs that is maintained by the Ministry of Planning and Investment (MPI). The original data set contained information

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<sup>7</sup> Note that the 1997 and 1998 samples (164 and 195 projects, respectively) are much larger than the 1996 sample (47 projects), making these results much more reliable.



on 3,789 projects of foreign MNCs registered with the Vietnamese authorities by 2001, 2,426 of which were classified as manufacturing projects. These are thus neither plant- for firm-level data as used in many previous studies of this type and it is possible that one firm or even one plant to have more than one project.<sup>8</sup> Given the peculiarities of the data set, it is thus helpful to compare compilations from these data with compilations from other sources.

A very large number of manufacturing projects in the data set did not report positive sales for the period covered in the data set (1996-2001 for sales), most often because the project in question had not started up yet, was never implemented, or was dissolved after starting up.<sup>9</sup> In addition, a small number of projects did not report positive foreign ownership shares.<sup>10</sup> Positive turnover (sales) is required for a viable project and accurate measurement of foreign ownership is required for the analysis to follow. Thus, only projects reporting positive sales and positive foreign ownership shares were retained in the samples underlying the descriptive statistics presented in Tables 2 and 3. The total number of manufacturing projects in these samples rose from 391 in 1996 to 667 in 2000 before falling back to 549 in 2001 (Table 2). Because the project data were compiled in 2002 and economy-wide estimates reveal only a slight (0.2 percent) decline of foreign MNC exports in 2001, it seems likely that the substantial declines in the number of sample projects (18 percent) and exports of sample projects (20 percent) observed in 2001 result primarily from difficulties related to data collection for the most recent year in the sample, rather than an actual decline in the number of projects in operation or their exports in that year.

As indicated in the introduction, recent estimates suggest that exports of foreign firms increased from 30 percent of Vietnam's total exports in 1996 to 34-35 percent in 1997-1998, 40 percent in 1999, and 47 percent of the total in 2000 before falling back to 45 percent of the total in 2001 (Tables 1-2). In value terms, these exports amounted to US\$2.2 billion in 1998 and

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<sup>8</sup> A check of owner names indicates that 100 projects belonged to multi-project firms.

<sup>9</sup> The number of projects reporting zero sales was 2,023 in 1996, 1,948 in 1997, 1,920 in 1998, 1,858 in 1999, 1,741 in 2000, and 1,855 in 2001.

<sup>10</sup> The number of projects reporting positive sales but non-positive foreign ownership shares was 12 in 1996, 17 in 1997, 14 in 1998, 16 in 1999, 18 in 2000, 22 in 2001.

increased steadily before leveling off at US\$6.8 billion in 2000 and 2001.<sup>11</sup> Although an exact breakdown is not available for exports, data for 2000 from the enterprise census conducted in 2001 show that manufacturing firms accounted for about 63 percent of foreign firm sales (General Statistical Office 2002).<sup>12</sup> Put another way, foreign firms accounted for 42 percent of all firm sales in manufacturing but only 22 percent in all industries combined. Thus, it seems highly likely that the foreign MNC share of manufacturing exports was substantially larger than the 47 percent share observed for all industries.

According to the data in Table 2, exports of manufacturing projects that reported positive foreign ownership shares and positive sales amounted to a maximum of US\$2.5 billion in 2000, or only 28 percent of Vietnam's manufacturing exports using a broad definition of manufacturing exports or 38 percent using a narrow definition.<sup>13</sup> Assuming a relatively low share of foreign MNCs in manufacturing exports, 50 percent for example, implies that actual manufacturing exports by foreign MNCs probably was US\$4.4 billion or some 80 percent higher than exports by sample projects if the broad definition of manufacturing exports is used and US\$3.2 billion or 30 percent higher than exports by sample projects if the narrow definition is used. In short, it seems clear that these samples do not cover exports of foreign MNCs comprehensively. Accordingly, one must be careful to emphasize that the patterns observed in these project data may not apply to the universe of foreign MNCs in Vietnamese manufacturing. On the other hand, the samples do cover a significant portion of foreign MNC exports in manufacturing, and the data set includes some interesting information on a large number of exporting as well as non-exporting projects in a broad range of manufacturing industries, making it of analytical interest.

Of the foreign MNC projects in these samples, projects in textiles, apparel, footwear and leather were the largest exporters in 1996, accounting for half of manufacturing project exports, but this share declined to a little over one-third in 2000-2001 (Table 2). Office, computing,

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<sup>11</sup> Note that older estimates in General Statistical Office (various years) for 2000 and earlier years (and cited in Phan and Ramstetter 2004, for example), differ some from recently revised figures cited here.

<sup>12</sup> Mining of crude oil and gas was the other large category accounting for 25 percent of foreign MNC sales. All other industries combined accounted for only 12 percent of foreign firm sales covered in the enterprise census.

<sup>13</sup> The broad definition is probably more appropriate for comparison with the project data used in this study than the narrow definition.

electric, and precision machinery became the largest category of sample project exports in 1998 and accounted for about two-fifths of manufacturing project exports in 1998-2001. The only other industry to account for at least 10 percent of the manufacturing total was food and beverages in 1996-1997.

Shares of exports by foreign MNC projects in total Vietnamese exports for each individual manufacturing industry were also very large in office, computing, electric, and precision machinery (82-89 percent in 1998-2000, 64-66 percent in 1997 and 2001), indicating that foreign MNCs were the major source of these exports and their rapid growth (Tables 1, 2). The single largest MNC exporter identified by the *Vietnam Economic Times* for 2000-2001 was a member of this industry, Fujitsu Vietnam Co., and it alone accounted for 3-4 percent of Vietnam's total exports in these years. The second largest MNC exporter was a footwear firm, Tae Kwang Vina Shoe Co., but its exports were much smaller, only 1 percent of Vietnam's total exports. Shares of sample foreign MNCs in individual industry exports were also relatively large (40 percent or more) in chemicals, rubber and plastics in 2000 and in non-electric and transportation machinery in 2000-2001; however, shares of sample foreign MNCs were often markedly smaller for other years in these industries. Shares of sample foreign MNCs were generally smaller and more stable in the other large exporting industries, 5-7 percent in food and beverages and 17-23 percent in textiles, apparel, footwear, and leather.

In this study, we would ideally compare three groups of foreign MNCs, heavily-foreign MNCs with very large foreign ownership shares, minority-foreign MNCs with foreign ownership shares of 49 percent or less, and an intermediate group of majority-foreign MNCs. However, this is impossible with these samples because the number of minority-foreign MNCs is very small. Thus, we concentrate on comparison of heavily-foreign MNCs with all other MNCs including minority- and majority foreign MNCs. The next question is how to define heavily-foreign MNCs or MNCs that are tightly controlled by the parent. Some studies define these as wholly-owned subsidiaries, but here we follow previous studies of Indonesia and Thailand (e.g., Ramstetter 1994, 1999a, 1999b) and use a 90 percent ownership share cutoff because the control facilitated by a 90 percent shareholding is not thought to differ much from

control resulting from a 100 percent holding. On the other hand, smaller holdings may weaken the parent's control.<sup>14</sup>

These heavily-foreign MNCs accounted for the vast majority of manufacturing exports by foreign MNC projects, 64 percent in 1996 and 77-82 percent in 1997-2001 (Table 2). Heavily-foreign MNCs also accounted for 64 percent or more exports by foreign MNC projects in the two major exporting industries, textiles, apparel, footwear, and leather as well as office, computing, electric, and precision machinery. As in the samples of all projects, exports were concentrated in these two industries and heavily-foreign MNCs in these two industries accounted for about one-half (48 percent in 1996) to two-thirds (61-67 percent in 1997-2001) of the exports by all manufacturing projects.

Heavily-foreign MNCs also had much higher export propensities than other MNCs in a wide range of industries. For example, in all manufacturing industries combined, the export propensity of heavily-foreign MNCs was between 48 and 63 percent compared to only 21 to 37 percent for other MNC projects (Table 3). The difference between the two groups was particularly conspicuous in office, computing, electric, and precision machinery, where heavily foreign MNCs had export propensities of 49 percent in 1996 and 61-66 percent in 1997-2001, compared to only 13-26 percent for other MNC projects. In the other large export industry, textiles, apparel, footwear, and leather, the difference between export propensities was smaller, between 8 and 20 percentage points. However, with the exception of food and beverages, differences between heavily-foreign MNCs and other MNCs were always 10 percentage points or larger. Thus, with the exception of the food and beverage industry, there was a pervasive tendency for export propensities to be larger in heavily-foreign MNCs.

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<sup>14</sup> In practice, the difference between these two possible cutoffs is not that important in these samples. For example of the 761 manufacturing projects reporting positive sales and foreign ownership in 2000 or 2001, 482 had foreign ownership shares of 100 percent, 4 had shares of 90-99 percent, 0 had shares of 85-89 percent, 11 had shares of 80-85 percent, 247 had shares of 50-79 percent, and 17 had shares of 49 percent or less.

#### 4. Modeling the Relationship between Export Propensities and Foreign Ownership Shares

The evidence presented above suggests very strongly that heavily-foreign MNCs tend to have higher export propensities than other foreign MNCs in Vietnam. However, it is also important to recognize that heavily-foreign MNCs may have other characteristics that lead to relatively high export propensities and that the differences observed above may result from those differences, not a difference in ownership shares per se. For example, in labor-abundant developing economies like Vietnam, it is likely that less capital-intensive projects can export more easily because using the abundant factor (labor) more intensively lowers their relative costs. It also seems likely that large projects may have an advantage in exporting because they can exploit scale economies, though it is also possible that a reverse relationship may obtain if there are diseconomies of scale in an industry. Older projects may find it easier to export by exploiting economies resulting from the accumulation of knowledge. Alternatively, new projects might actually have an easier time exporting if older firms use older and inferior technology or if they were established in a less liberal trading environment and are thus less prepared to identify and exploit exporting alternatives.<sup>15</sup> In view of these considerations, export propensities are first viewed as a function of capital intensity, size, and vintage, and then a dummy variable identifying heavily-foreign MNCs is added to see if differences between ownership groups are statistically significant after controlling for these other factors thought to affect trade propensities. The result is the following model:

$$X/S = a_0 + a_1(AGE) + a_2(K/E) + a_3(DLG) + a_4(DFHVV) \quad (1)$$

where

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<sup>15</sup> Another potentially relevant factor is location (e.g., Bigsten et al. 1999) and a dummy variable for projects located in the Hanoi or Ho Chi Minh City areas was thus added in alternate estimates. However, the addition of this variable did not add much explanatory power or alter the results much. The variable was thus dropped in order to save degrees of freedom as some samples are rather small. Still another potentially relevant factor is nationality of foreign investor (see Pham 2001 as described above). However, analysis of this factor is not taken up here because the theoretical basis for distinguishing MNCs by nationality is thought to be relatively weak (e.g., Buckley and Casson 1991; Caves 1996), and most previous studies do not demonstrate clear and consistent differences between export propensities of different nationality groups (e.g., Hill and Johns 1985, Ramstetter 1993, 1994, 1999a).

$AGE$  = the age of the project in years;

$DLG$  = a dummy variable for large projects; =1 for projects with sales larger than the industry average sales plus one standard deviation, =0 for other projects;

$DFHVY$  = a dummy variable for heavily-foreign MNCs, =1 for projects with foreign ownership shares of 90 per cent or greater, =0 for other projects;

$K/E$  = capital intensity of the project, measured as paid-in capital  $K$  divided by employment  $E$ ;

$X/S$  = the export propensity of the project, measured as the ratio of project exports  $X$  to project sales  $S$ .

In addition to the characteristics identified in equation (1) above, it is also important to account for the influence of industry affiliation. This is done in two alternative ways. First, equation (1) is estimated in samples of projects in all manufacturing industries and a set of industry dummies used to account for differences in the constant  $a_0$  across industries in the sample. This technique has the advantage of facilitating the use of large samples but the disadvantage of forcing slope coefficients ( $a_1, a_2, a_3, a_4$ ) to be equal across industries. In order to avoid this disadvantage, equations are also estimated for each industry individually, though the latter approach results in uncomfortably small sample size in several industry-year combinations.

If the coefficient ( $a_4$ ) on the dummy for heavily-foreign projects ( $DFHVY$ ) is positive (negative) and statistically significant, it indicates that export propensities in heavily-foreign MNCs are relatively high (low) after controlling for differences in capital intensity, scale, age, and industry affiliation. If the coefficient is insignificant, it suggests a relatively large amount of variation in the difference between heavily-foreign MNCs and other MNC projects, which makes the probability of incorrectly concluding a difference exists higher than is usually acceptable.

In order to calculate the variables in equation (1), additional data are necessary but not always available. Of the additional variables required, the employment variable presents the most important constraint as it is available for 2000 and 2001 only, and is not reported for a few

additional projects.<sup>16</sup> The samples used to estimate equation (1) thus cover only 2000 and 2001, and are slightly smaller than corresponding samples in Tables 2 and 3 (661 vs. 667 for 2000 and 540 vs. 549 for 2001). As in the slightly larger samples shown in Tables 2 and 3, export propensities in these samples were generally much larger in heavily-foreign MNCs than in other MNC projects (Table 4). Differences between export propensities in heavily-foreign MNCs and other MNC projects were 9 percentage points or more in both years for all but one industry, food products.

These data also suggest that heavily-foreign MNCs were generally younger, less capital intensive, and had lower labor productivity than other MNC projects (Table 4). On average, heavily-foreign MNCs were 2 years or more younger than other MNC projects in 4 of the 7 individual industries in both years, food and beverages, textiles, apparel, footwear, and leather, non-electric and transportation machinery, and other manufacturing. Capital intensity was also markedly lower in non-metallic mineral products and metals, office, computing, electric, and precision machinery, as well as in non-electric and transportation machinery in both years, and in chemicals, rubber, and plastics, and other manufacturing in 2001. This measure of capital refers to disbursed investment, which is mainly equity and perhaps some loans.<sup>17</sup> Patterns observed in capital intensity are similar to those observed in sales per employee. This variable was also markedly lower for heavily-foreign MNCs in all individual industries except textiles, apparel, footwear, and leather in both years and in food and beverages in 2001. Although differences in age, capital intensity, and labor productivity were striking, differences in size (sales per project) were less consistent. Heavily-foreign MNCs were smaller than other MNC projects by 10 percent or more in 3 of 7 individual industries in both years (chemicals, rubber, and plastics, non-metallic mineral products and metals, and non-electric and transportation machinery) and larger in the other 4.

The export propensity is a truncated variable with a minimum of zero and a maximum of 100 percent, and a large number of observations near the extremes. Thus, the Tobit is the most

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<sup>16</sup> Note that there were no projects reporting zero capital but positive employment and sales. Hence, the availability of the capital variable was not a constraint.

<sup>17</sup> Fixed assets is the more standard measure of capital used when calculating capital intensity.

appropriate estimator to use. However, this technique precludes use of standard statistical tests for heteroscedasticity. Results of both weighted (by sales) and non-weighted Tobit estimates are thus presented to show how accounting for this likely cause of heteroscedasticity (firm size) affects the results. Small sample size is a problem in some industries (see Table 4 for sample sizes). Therefore, data for 2000 and 2001 are pooled in one set of regressions to increase sample size and efficiency.<sup>18</sup> Separate results for individual years are also presented.

Because a large number of equations are estimated and the details of the estimates themselves are not the focus of this paper, estimation details are reported in Appendix Table 5 and not discussed in detail here. Table 5 then summarizes the value of slope coefficients that were statistically significant at the 5 percent level or better. These results show that the signs and significance levels of coefficients on control variables varied greatly depending on industry, year, and whether the regression was weighted or not. Consistent results were rare with respect to several slope coefficients, and the coefficients were often statistically insignificant in the unweighted regressions.

For example, the coefficient on capital intensity  $K/E$  was insignificant in 15 of the 21 samples in the unweighted regressions but only in 4 of the 21 samples in the weighted regressions.<sup>19</sup> In the weighted regressions, this coefficient was generally negative as expected, but there were exceptions for all manufacturing in 2001, food and beverages in 2001 and in 2000-2001 (the combined sample), and in non-metallic mineral products and metals in 2000-2001. The coefficient on the dummy for large projects  $DLG$  was also insignificant in most of the unweighted regressions (19 of 21 cases), but became significant in most weighted regressions (16 of 21 cases). When significant, this coefficient was generally positive as expected, but here again there were notable exceptions in chemicals, rubber, and plastics (2000-2001), non-metallic mineral products and metals (all samples), non-electric and transportation machinery (all samples). The coefficient on  $AGE$  was significant somewhat more

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<sup>18</sup> In the pooled regressions, a dummy variable for 2001 observations is also added to account for differences in intercepts in 2000 and 2001.

<sup>19</sup> The fact that significant coefficients were more common in the weighted estimates may indicate that these estimates were able to purge heteroscedasticity present in the unweighted estimates. If this is the case, the weighted estimates are preferable.



often in the unweighted regressions (10 of 21 cases) and in most of the weighted regressions (15 of 21 cases). However, results differed between the weighted regressions, where this coefficient was generally negative, and the unweighted ones, where it was usually positive.

In marked contrast to the coefficients on the control variables, the results obtained for the coefficient on the dummy identifying heavily-foreign MNCs (*DFHVY*), were much more consistent. This coefficient was significantly positive in a little over half (13 of 21) of unweighted regressions and in the vast majority (19 of 21) of the weighted regressions. Moreover, there was only one case in which this coefficient was significantly negative, in food and beverages for 2001. These results thus suggest a strong and pervasive tendency for heavily-foreign MNCs to have relatively high export propensities even after controlling for the effects of capital intensity, size, and vintage.

In the regression for all manufacturing industries combined, the coefficient on this dummy was always positive and significant. The coefficient was larger in 2001 than in 2000, indicating that the difference between export propensities in heavily-foreign MNCs and other MNC projects increased between these two years. These results are both consistent with the patterns suggested by the descriptive statistics above. However, if one looks at the industry-level regressions, the results are much less consistent. First, there are wide variations in coefficients on the dummy for heavily-foreign MNCs, both across industries in a given year and across years or estimation techniques in a given industry. As might be expected, this coefficient was relatively large in office, computing, electric, and precision machinery in both years using both estimation techniques. Relatively large coefficients were also obtained in non-electric and transportation machinery in both years and in chemicals, rubber, and plastics, as well as in non-metallic mineral products and metals in 2001, but the coefficients in these industries were much larger in 2001 than in 2000. The large differences in the results for the two years and across industries, combined with low variances in many coefficient estimates indicated by their statistical significance, suggest that pooling years and industries may not be very wise in this data set. This appears to be particularly obvious in food and beverages where the coefficient was positive in 2000 but negative in 2001.

In summary, the simple Tobit estimates suggest that export propensities were significantly higher in heavily-foreign MNCs for about half of the samples examined while the weighted Tobit estimates suggest these differences existed in all but one industry (food and beverages) in both years. Although the simplicity of the model and the small samples used in some cases mandate caution when interpreting these results, the fact that these results are broadly consistent with patterns observed in the descriptive statistics suggests a strong probability that heavily-foreign MNCs tend to have higher export propensities than other MNC projects in Vietnamese manufacturing.

## **5. Implications and Conclusions**

Both descriptive and statistical analyses presented in this study strongly suggest that export propensities have been higher in heavily-foreign MNCs than in other MNC projects in Vietnamese manufacturing. This result is consistent with previous results for Indonesian and Thai manufacturing industries, as well as with more simplistic evidence for Singapore. It is also consistent with the notion that the marketing network and/or superior production technology are among the MNC's most prized assets and that the MNC parent often restricts the access of affiliates it does not control to these assets. The empirical results of this paper therefore add an important piece of evidence to the growing literature that suggests a strong relationship between foreign ownership shares and export propensities in Southeast Asian manufacturing.

Two direct implications can be drawn from the paper's findings. First, foreign MNCs in Vietnam have played an important role in exports of both traditional labor-intensive products such as apparel and footwear and more modern exports such as electronics and related machinery. Thus, foreign MNCs have helped to enhance Vietnam's traditional comparative advantages in labor intensive manufactures as well as to promote a structural shift of exports to electronics and related industries, albeit with an initial focus on labor-intensive assembly operations. Foreign MNCs are also likely to continue making relatively large contributions to Vietnam's export growth and that these will be some of the most important contributions they

will make to Vietnam's industrialization. Therefore, if the government wishes to maximize these contributions, it is straightforward to recommend that it should remove remaining barriers that target foreign MNCs and at the same time limit their ability to utilize their marketing networks and maximize exports (e.g., restrictions on trading activities or ownership shares, or other regulations that end up affecting them). On the other hand, in Vietnam foreign MNCs (along with state-owned enterprises) have generally been net beneficiaries of regulations on firm activities, often at the expense of Vietnam's own private enterprises. In this respect, it is also important to emphasize that MNCs do not require favorable treatment to exploit their marketing networks and exporting abilities.

Second, Vietnam has explicitly allowed for foreign firms with 100 per cent foreign ownership shares since the first draft of the foreign direct investment law in 1988 and thus largely avoided distorting decisions regarding ownership structure of foreign MNCs operating in the country. The lack of incentives for wholly-foreign MNCs to export more than other MNCs in Vietnam, combined with the theoretical logic suggesting that MNCs parents are likely restrict access of uncontrolled affiliates to its marketing networks, strongly suggests that foreign ownership shares determine export propensities in Vietnam, not the reverse. This further implies that Vietnam's policy has been highly successful at avoiding negative incentives for MNC exporters, which often resulted from restrictions on foreign ownership shares in other economies.<sup>20</sup> Correspondingly, Vietnam should be encouraged to build on this policy success by removing the remaining few restrictions on foreign ownership shares or incentives to lure foreign firms into joint ventures. These restrictions often take the form of regulations on land access and acquisitions by foreign MNCs and are used from time to time, often in an unpredictable manner. It may be politically difficult to implement their removal, but the results of this simple exercise clearly suggest that they are costly to the economy and thus to the Vietnamese people.

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<sup>20</sup> Even when restrictions were present, they were mitigated by policies that waived the restrictions for MNCs with very high export propensities. However, the restrictions still affected MNCs that may have begun with lower export propensities and subsequently might have been able to increase exports more if access to parent marketing networks was easier.

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**Table 1: Vietnam's Exports and Manufacturing Exports by Industry, ISIC-based estimates (US\$ millions)**

Industry	1996	1997	1998	1999	2000	2001
Vietnam Total	7,256	9,185	9,360	11,541	14,483	15,029
<b>BY SITC COMMODITY CATEGORY</b>						
Agriculture, forestry, fishing (SITC 0-1, 4)	2,466	2,751	3,180	3,321	3,870	4,129
Crude materials & mineral fuels (SITC 2-3)	2,072	2,030	1,827	2,675	4,209	3,881
Mineral fuels (SITC 3)	1,572	1,654	1,544	2,373	3,825	3,469
Manufacturing, narrow definition (SITC 5-8)	2,710	4,401	4,350	5,541	6,398	7,019
Other items	8	3	4	5	6	0
<b>BY ISIC INDUSTRY CATEGORY</b>						
Agriculture, forestry, fishing (ISIC A-B)	-	1,255	1,282	1,435	1,542	1,593
Mining & quarrying (ISIC C)	-	1,554	1,506	2,223	3,628	3,308
Mining & quarrying of oil and gas	-	1,423	1,371	2,092	3,503	3,126
Manufacturing, broad definition (ISIC D)	-	6,262	6,573	7,711	8,831	9,994
Food & beverages	-	1,809	2,088	2,040	2,383	2,795
Textiles, apparel, footwear, leather	-	2,788	2,845	3,445	3,751	4,056
Textiles	-	307	312	463	409	488
Apparel	-	1,338	1,305	1,484	1,696	1,739
Footwear & leather	-	1,144	1,227	1,498	1,647	1,829
Chemicals, plastics, rubber	-	182	164	270	255	375
Chemicals	-	95	107	158	131	213
Plastics & rubber	-	87	57	111	125	162
Non-metallic mineral products, metals, metal prod.	-	224	147	238	265	343
Non-metallic mineral products	-	87	69	124	145	164
Basic metals	-	97	43	43	62	76
Metal products	-	41	35	71	59	102
Office, computing, electric, & precision machinery	-	593	735	794	1,101	1,117
Office and computing machinery	-	262	431	420	486	446
Electrical machinery	-	105	115	159	254	338
Electronic machinery	-	209	172	175	320	271
Precision machinery	-	18	17	40	42	62
Non-electric & transportation machinery	-	122	124	221	201	339
Non-electric machinery	-	85	53	108	100	160
Motor vehicles	-	12	3	16	5	22
Other transportation machinery	-	26	68	97	96	156
Other manufacturing	-	544	471	704	874	968
Other items	-	113	0	172	481	134

Notes: ISIC=international standard industrial classification; SITC=standard international trade classification.  
Source: General Statistical Office (various years a; various years b).

**Table 2: Exports of All Foreign MNCs and by Foreign-Owned Manufacturing Projects Reporting Positive Sales and Foreign Ownership Shares in Each Respective Year (US\$ millions except as noted)**

Ownership Group, Industry	1996	1997	1998	1999	2000	2001
All foreign MNCs, all industries	2,155	3,213	3,215	4,682	6,810	6,798
11-12 large foreign MNCs, all industries	-	-	-	-	1,360	1,067
8-10 large foreign MNCs, manufacturing	-	-	-	-	1,240	931
Fujitsu Vietnam Co.	-	-	-	-	570	414
Tae Kwang Vina Shoe Co.	-	-	-	-	121	115
Pou Yuen Vietnam Stock Co.	-	-	-	-	87	111
All foreign projects, all manufacturing	742	1,191	1,530	1,731	2,458	1,976
(number of manufacturing projects)	391	461	492	552	667	549
Food & beverages	132	116	111	152	156	168
Food processing	131	114	109	149	152	162
Beverages	1	1	2	3	5	7
Textiles, apparel, footwear, leather	370	515	599	685	872	673
Textiles	93	73	82	119	157	70
Apparel	71	77	126	97	139	147
Footwear	175	322	327	437	549	406
Leather	31	42	64	32	26	50
Chemicals, rubber & plastics	32	62	62	83	159	90
Chemicals	7	13	16	22	76	27
Rubber products	10	15	14	20	22	14
Plastics	16	34	33	41	61	48
Non-metallic mineral products, metals, metal prod.	11	27	43	42	78	54
Non-metallic mineral products	7	11	11	9	27	10
Basic metal	0	2	1	0	5	4
Metal products	4	15	31	33	47	40
Office, computing, electric, & precision machinery	139	390	607	649	979	711
Office and computing machinery	1	0	0	0	0	0
Electrical machinery	4	12	82	87	252	185
Electronic machinery	131	375	518	558	724	509
Precision machinery	3	3	7	4	3	17
Non-electric & transportation machinery	5	10	29	46	81	155
Non-electric machinery	3	2	18	17	30	21
Motor vehicles	1	7	8	13	18	26
Other transportation machinery	2	0	4	17	33	109
Other manufacturing	53	71	78	74	133	124
All foreign projects, non-manufacturing	144	161	65	51	59	58
(number of non-manufacturing projects)	196	200	217	305	348	232
Heavily-foreign projects, all manufacturing	472	915	1,175	1,397	2,020	1,586
Food & beverages	53	75	75	103	85	90
Textiles, apparel, footwear, leather	290	418	475	588	781	587
Chemicals, rubber & plastics	27	54	52	68	131	78
Non-metallic mineral products, metals, metal prod.	3	8	13	21	36	38
Office, computing, electric, & precision machinery	67	313	487	548	857	615
Non-electric & transportation machinery	3	2	20	20	41	82
Other manufacturing	29	45	53	48	88	96

Notes: Heavily-foreign projects are projects where the foreign ownership share is 90% or greater.

Sources: General Statistical Office (various years a), *Vietnam Economic Times* April 2001-November 2003 issues, and compilations from unpublished official records of the Ministry of Planning and Investment (see Appendix Tables 1 and 2 for more details).



**Table 3: Export-Sales Ratios of Foreign-Owned Projects by Foreign Ownership Group and Industry: Projects Reporting Positive Sales and Foreign Ownership Shares in Each Respective Year (percent)**

Ownership Group, Industry	1996	1997	1998	1999	2000	2001
All foreign, all manufacturing	49.48	49.23	45.14	38.08	38.32	43.45
Food & beverages	36.60	42.47	39.16	26.65	28.85	33.26
Textiles, apparel, footwear, leather	79.47	77.60	82.20	74.41	75.02	74.87
Chemicals, rubber & plastics	41.27	31.94	24.08	23.20	24.64	24.81
Non-metallic mineral products, metals, metal prod.	24.81	35.88	19.90	13.47	18.28	21.02
Office, computing, electric, & precision machinery	30.85	42.32	42.08	39.02	40.96	45.36
Non-electric & transportation machinery	16.66	12.82	22.84	21.07	20.91	28.27
Other manufacturing	57.80	59.28	56.64	56.88	51.17	60.03
Heavily-foreign, all manufacturing	63.09	62.69	58.19	52.24	47.76	54.17
Food & beverages	42.17	49.36	39.81	28.77	30.59	29.74
Textiles, apparel, footwear, leather	87.19	80.96	86.12	77.90	79.08	76.53
Chemicals, rubber & plastics	55.79	47.22	31.61	34.14	30.31	34.44
Non-metallic mineral products, metals, metal prod.	32.94	50.77	28.55	29.24	26.00	40.78
Office, computing, electric, & precision machinery	49.08	62.44	68.18	60.90	63.06	66.38
Non-electric & transportation machinery	25.00	20.20	39.49	34.52	25.33	35.88
Other manufacturing	68.25	68.55	65.09	64.89	55.78	64.75
Minority- & majority-foreign, all manufacturing	37.13	36.06	30.76	21.36	23.52	25.61
Food & beverages	33.60	37.45	38.53	24.53	26.90	37.12
Textiles, apparel, footwear, leather	67.15	70.79	72.46	64.60	59.91	68.30
Chemicals, rubber & plastics	28.76	18.40	17.93	12.69	17.01	12.39
Non-metallic mineral products, metals, metal prod.	18.90	28.43	15.18	6.33	12.16	5.97
Office, computing, electric, & precision machinery	18.16	26.07	14.89	15.52	13.13	14.28
Non-electric & transportation machinery	11.53	8.94	11.18	10.20	14.34	17.05
Other manufacturing	47.60	47.76	44.69	38.09	38.38	43.38

Notes: Minority-foreign projects are projects where  $10\% \leq \text{foreign ownership share} \leq 49\%$ ;

majority-foreign projects are projects where  $50\% \leq \text{foreign ownership share} \leq 89\%$ ;

heavily-foreign projects are projects where  $\text{foreign ownership share} \geq 90\%$ .

Source: Compilations from unpublished official records of the Ministry of Planning and Investment (see Appendix Table 3 for more details).

**Table 4: Export Propensities and Related Characteristics for Foreign-Owned Projects by Foreign Ownership Group, Indicator, Year, and Industry: Projects Reporting Positive Sales, Employment, and Capital in Each Respective Year)**

Year, Industry	All	Minority- & majority-foreign projects (foreign ownership share = 10% to 89%)							Heavily-foreign projects (foreign ownership share = 90% or more)								
	N	X/S	X	S	E	AGE	K/E	S/E	N	X/S	X	S	E	AGE	K/E	S/E	N
2000, all manufacturing	661	23	437	2,715	62,038	8	97	54	258	48	2,020	3,234	196,308	6	39	22	403
Food & beverages	107	27	71	584	12,175	8	63	38	50	31	85	599	12,907	6	79	32	57
Textiles, apparel, footwear, leather	118	60	91	139	16,277	9	12	10	25	79	781	926	120,507	7	16	11	93
Chemicals, rubber & plastics	113	17	27	383	7,271	7	142	61	49	31	131	361	15,314	6	49	37	64
Non-metallic mineral products, metals, metal prod.	95	12	42	373	7,301	7	147	65	53	26	36	151	5,525	6	43	23	42
Office, computing, electric, & precision machinery	61	13	122	421	4,570	7	114	93	27	63	857	910	20,046	7	34	28	34
Non-electric & transportation machinery	72	14	41	707	9,457	7	93	66	29	25	41	141	6,066	5	30	16	43
Other manufacturing	95	36	42	107	4,987	8	37	34	25	57	88	147	15,943	6	35	17	70
2001, all manufacturing	540	25	379	2,323	57,846	9	83	59	205	54	1,560	2,364	191,233	7	40	24	335
Food & beverages	86	37	78	382	10,929	9	101	89	42	29	83	486	11,037	7	108	48	44
Textiles, apparel, footwear, leather	111	67	76	105	15,931	10	17	10	22	76	577	658	116,393	8	15	8	89
Chemicals, rubber & plastics	87	12	11	306	6,484	8	75	53	38	34	78	167	13,372	7	33	19	49
Non-metallic mineral products, metals, metal prod.	73	6	15	407	6,595	8	110	50	42	39	34	69	5,093	7	44	13	31
Office, computing, electric, & precision machinery	55	14	96	332	4,706	8	104	82	23	67	610	660	20,343	7	50	44	32
Non-electric & transportation machinery	52	17	73	720	9,890	8	85	82	21	36	82	156	4,107	5	37	43	31
Other manufacturing	76	43	29	70	3,311	10	45	29	17	64	96	170	20,888	7	25	18	59

Notes: X/S=exports/sales (sample mean percent); N=number of projects, X=exports (US\$ millions); S=sales (US\$ millions); S/N=sales/project (US\$ millions), AGE=age of project (years), K/E=capital per employee (US\$ thousands); S/E=sales per employee (US\$ thousands).

Source: Compilations from unpublished official records of the Ministry of Planning and Investment (see Appendix Table 4 for more details).

**Table 5: Slope Coefficients from Estimates of Equation (1) for Individual Manufacturing Industries and All Manufacturing Combined in 2000 and 2001**

Coefficient, Industry	2000		2001		2000-2001	
	Unweighted	Weighted by Sales	Unweighted	Weighted by Sales	Unweighted	Weighted by Sales
Coefficients on <i>K/E</i> , all manufacturing	ns	-0.506	ns	0.070	ns	-0.037
Food & beverages	-2.340	-0.761	ns	0.407	ns	0.254
Textiles, apparel, footwear, leather	-6.720	-9.149	-10.360	-10.454	-8.100	-9.555
Chemicals, rubber, plastics	ns	-0.257	ns	-1.026	ns	-0.564
Non-metallic mineral products, metals, metal products	ns	ns	ns	ns	ns	0.092
Office, computing, electric, & precision machinery	ns	ns	ns	ns	ns	-0.259
Non-electric & transportation machinery	-3.674	-3.098	ns	-4.622	-4.053	-5.164
Coefficients on <i>AGE</i> , all manufacturing	0.024	-0.008	0.020	-0.031	0.021	-0.018
Food & beverages	ns	ns	ns	-0.082	ns	-0.038
Textiles, apparel, footwear, leather	0.035	-0.024	0.044	ns	0.041	-0.015
Chemicals, rubber, plastics	ns	0.053	0.063	ns	0.056	0.033
Non-metallic mineral products, metals, metal products	ns	-0.068	ns	-0.073	ns	-0.066
Office, computing, electric, & precision machinery	-0.052	-0.059	ns	-0.058	-0.039	-0.031
Non-electric & transportation machinery	ns	ns	ns	ns	ns	ns
Coefficients on <i>DLG</i> , all manufacturing	ns	0.092	ns	ns	ns	0.056
Food & beverages	ns	0.167	ns	ns	ns	0.065
Textiles, apparel, footwear, leather	ns	0.101	ns	ns	ns	0.035
Chemicals, rubber, plastics	ns	ns	ns	ns	ns	-0.042
Non-metallic mineral products, metals, metal products	ns	-0.164	ns	-0.352	ns	-0.393
Office, computing, electric, & precision machinery	0.646	0.370	ns	0.384	0.555	0.287
Non-electric & transportation machinery	ns	-0.326	ns	-0.622	ns	-0.336
Coefficients on <i>DHVV</i> , all manufacturing	0.242	0.304	0.278	0.408	0.258	0.372
Food & beverages	ns	0.096	ns	-0.189	ns	ns
Textiles, apparel, footwear, leather	0.307	0.146	ns	0.193	0.264	0.172
Chemicals, rubber, plastics	0.244	0.334	0.324	0.465	0.286	0.366
Non-metallic mineral products, metals, metal products	ns	0.124	0.452	0.476	0.332	0.200
Office, computing, electric, & precision machinery	0.492	0.464	0.546	0.460	0.518	0.470
Non-electric & transportation machinery	ns	0.451	ns	0.727	ns	0.579

Notes: regressions for all manufacturing include industry dummies not included in the industry equation; see Appendix Table 5 for full estimation details; sample sizes (N for all projects) are shown in Table 4.

**Appendix Table 1: Exports of Foreign-Owned Projects by Foreign Ownership Group and Industry for Projects Reporting Positive Sales in Each Respective Year (US\$ millions except number of projects as noted)**

<b>Industry</b>	<b>1996</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>
<b>All foreign-owned projects</b>						
All manufacturing	741.958	1,191.060	1,530.408	1,731.259	2,458.213	1,975.643
(number of projects)	391	461	492	552	667	549
Food & beverages	131.506	115.787	111.121	152.074	156.353	168.488
Food processing	130.543	114.441	109.196	148.704	151.690	161.974
Beverages	0.963	1.347	1.925	3.370	4.664	6.514
Textiles, apparel, footwear, leather	370.083	515.092	598.632	685.265	871.647	673.098
Textiles	93.355	73.163	81.710	119.319	156.854	70.461
Apparel	71.093	77.423	125.916	97.436	139.419	146.789
Footwear	175.008	322.407	326.810	436.512	549.112	405.543
Leather	30.627	42.098	64.196	31.998	26.261	50.304
Chemicals, rubber & plastics	32.050	62.013	62.360	82.633	158.907	89.559
Chemicals	6.964	13.103	15.962	22.153	75.569	27.030
Rubber products	9.568	15.325	13.558	19.905	22.187	14.104
Plastics	15.519	33.585	32.840	40.576	61.151	48.425
Non-metallic mineral products, metals, metal prod.	10.503	27.486	43.336	41.876	78.479	53.754
Non-metallic mineral products	6.813	11.256	11.321	8.994	27.009	9.857
Basic metal	0.000	1.502	1.144	0.000	4.561	4.371
Metal products	3.690	14.727	30.871	32.882	46.909	39.527
Office, computing, electric, & precision machinery	139.071	390.173	607.279	649.334	979.012	711.004
Office & computing machinery	0.836	0.382	0.000	0.004	0.000	0.000
Electrical machinery	3.659	11.609	82.099	87.304	251.876	184.867
Electronic machinery	131.105	375.091	518.052	557.856	723.761	509.423
Precision machinery	3.472	3.090	7.128	4.170	3.374	16.715
Non-electric & transportation machinery	5.458	9.711	29.431	46.116	81.314	155.493
Non-electric machinery	3.013	2.222	17.946	16.855	30.445	21.179
Motor vehicles	0.617	7.233	7.542	12.592	17.769	25.613
Other transportation machinery	1.828	0.255	3.943	16.669	33.100	108.700
Other manufacturing	53.287	70.798	78.249	73.960	132.501	124.247
Tobacco	0.047	1.195	1.642	0.133	4.830	0.000
Wood products	4.763	6.857	2.347	4.081	7.196	3.929
Furniture	6.733	12.514	18.854	20.133	27.533	29.161
Paper	4.237	0.553	0.786	1.990	4.154	3.051
Printing & publishing	0.096	0.000	0.000	0.000	1.282	0.768
Oil & gas products	1.017	0.924	0.340	0.695	4.481	2.731
Miscellaneous manufacturing	36.394	48.756	54.280	46.929	83.025	84.608

**Appendix Table 1 (continued, 2/3)**

<b>Industry</b>	<b>1996</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>
<b>Heavily-foreign projects (foreign share = 90% or more)</b>						
All manufacturing	472.315	915.049	1,175.126	1,396.867	2,019.532	1,586.459
(number of projects)	186	228	258	299	407	343
Food & beverages	52.510	74.765	75.247	102.686	85.181	90.020
Food processing	51.810	74.242	73.718	100.822	81.385	85.019
Beverages	0.700	0.523	1.529	1.865	3.797	5.001
Textiles, apparel, footwear, leather	290.016	417.959	474.637	588.485	780.974	587.315
Textiles	67.255	59.438	70.330	106.278	147.090	63.404
Apparel	52.454	53.674	91.125	81.409	123.516	117.960
Footwear	153.116	286.747	275.581	383.458	484.296	359.494
Leather	17.191	18.101	37.600	17.339	26.072	46.458
Chemicals, rubber & plastics	27.376	54.459	52.336	68.349	131.486	78.331
Chemicals	5.106	8.581	10.385	14.188	57.806	20.284
Rubber products	8.420	14.354	12.707	16.150	14.910	10.625
Plastics	13.850	31.524	29.244	38.011	58.770	47.421
Non-metallic mineral products, metals, metal prod.	3.208	8.316	12.619	21.307	36.113	38.417
Non-metallic mineral products	0.307	2.251	1.959	2.259	6.574	4.050
Basic metal	0.000	0.000	0.000	0.000	4.160	4.161
Metal products	2.901	6.064	10.660	19.048	25.380	30.207
Office, computing, electric, & precision machinery	67.148	312.645	487.308	547.945	857.008	614.626
Office & computing machinery	0.614	0.382	0.000	0.004	0.000	0.000
Electrical machinery	3.456	8.937	65.628	67.461	232.826	175.146
Electronic machinery	59.829	300.271	414.551	476.310	620.808	422.771
Precision machinery	3.249	3.055	7.128	4.170	3.374	16.708
Non-electric & transportation machinery	2.670	2.220	19.591	20.156	40.642	82.076
Non-electric machinery	2.670	1.983	17.768	16.515	30.048	20.945
Motor vehicles	0.000	0.000	0.020	0.990	1.163	6.924
Other transportation machinery	0.000	0.237	1.804	2.651	9.431	54.207
Other manufacturing	29.389	44.685	53.388	47.939	88.127	95.675
Tobacco	0.000	0.000	0.000	0.000	0.000	0.000
Wood products	1.159	5.287	0.520	1.417	4.954	1.646
Furniture	5.601	3.458	9.046	6.570	7.288	18.100
Paper	3.685	0.000	0.603	1.582	3.288	2.474
Printing & publishing	0.096	0.000	0.000	0.000	1.282	0.768
Oil & gas products	0.000	0.000	0.000	0.000	0.899	0.594
Miscellaneous manufacturing	18.847	35.940	43.220	38.369	70.415	72.093

**Appendix Table 1 (continued, 3/3)**

<b>Industry</b>	<b>1996</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>
<b>Minority- &amp; majority-foreign projects (foreign share = 10%-89%)</b>						
All manufacturing	269.643	276.011	355.281	334.392	438.681	389.184
(number of projects)	205	233	234	253	260	206
Food & beverages	78.997	41.022	35.874	49.388	71.172	78.468
Food processing	78.733	40.199	35.478	47.883	70.305	76.955
Beverages	0.263	0.824	0.397	1.505	0.867	1.513
Textiles, apparel, footwear, leather	80.067	97.133	123.995	96.780	90.672	85.782
Textiles	26.100	13.726	11.380	13.041	9.763	7.057
Apparel	18.639	23.749	34.791	16.027	15.903	28.829
Footwear	21.892	35.660	51.228	53.053	64.816	46.049
Leather	13.436	23.998	26.595	14.659	0.190	3.846
Chemicals, rubber & plastics	4.674	7.554	10.024	14.284	27.422	11.229
Chemicals	1.857	4.523	5.577	7.964	17.763	6.746
Rubber products	1.148	0.971	0.851	3.756	7.277	3.479
Plastics	1.669	2.061	3.596	2.564	2.382	1.004
Non-metallic mineral products, metals, metal prod.	7.296	19.170	30.717	20.569	42.366	15.337
Non-metallic mineral products	6.506	9.005	9.361	6.735	20.436	5.807
Basic metal	0.000	1.502	1.144	0.000	0.401	0.210
Metal products	0.789	8.663	20.211	13.834	21.530	9.320
Office, computing, electric, & precision machinery	71.923	77.527	119.972	101.389	122.003	96.379
Office & computing machinery	0.222	0.000	0.000	0.000	0.000	0.000
Electrical machinery	0.203	2.672	16.471	19.843	19.051	9.720
Electronic machinery	71.276	74.820	103.501	81.546	102.953	86.652
Precision machinery	0.222	0.036	0.000	0.000	0.000	0.007
Non-electric & transportation machinery	2.788	7.491	9.839	25.960	40.671	73.417
Non-electric machinery	0.343	0.239	0.178	0.340	0.397	0.234
Motor vehicles	0.617	7.233	7.522	11.602	16.606	18.689
Other transportation machinery	1.828	0.019	2.139	14.018	23.669	54.494
Other manufacturing	23.898	26.113	24.861	26.022	44.374	28.573
Tobacco	0.047	1.195	1.642	0.133	4.830	0.000
Wood products	3.603	1.570	1.827	2.664	2.241	2.283
Furniture	1.132	9.056	9.808	13.563	20.245	11.061
Paper	0.552	0.553	0.183	0.407	0.866	0.576
Printing & publishing	0.000	0.000	0.000	0.000	0.000	0.000
Oil & gas products	1.017	0.924	0.340	0.695	3.583	2.137
Miscellaneous manufacturing	17.547	12.816	11.061	8.559	12.610	12.515

Source: Compiled by the authors from unpublished official records of the Ministry of Planning and Investment.

**Appendix Table 2: Exports and Imports by Large Foreign MNCs in Vietnam**

Firm	Industry	2000	2001	2002
Number of Firms	-	12	11	10
Manufacturing	-	10	8	8
TOTAL EXPORTS FOR ALL LARGE FOREIGN MNCs		1,360	1,117	1,054
Manufacturing		1,240	931	926
Freetrend Industry Vietnam Co.	Footwear	94	60	134
Samyang Vietnam Co.	Footwear	62	-	-
Tae Kwang Vina Shoe Co.	Footwear	121	115	120
Orion Hanel Tude Co.	Metal products	71	-	-
Fujitsu Vietnam Co.	Office, computing, electric, & precision machinery	570	414	241
Nidec Tosok Vietnam Co.	Office, computing, electric, & precision machinery	56	69	76
Ohmi Electric Wire Co.	Office, computing, electric, & precision machinery	54	-	-
Sam Sung Vina Vietnam Co.	Office, computing, electric, & precision machinery	-	36	-
Yazaki Eds. Viet. Ltd.	Office, computing, electric, & precision machinery	-	50	-
Furukawa Automotive Parts Co.	Transportation machinery	-	-	55
Mabuchi Motor Vietnam Strongman Co.	Transportation machinery	-	-	48
Pou Yuen Vietnam Stock Co.	Other manufacturing	87	111	176
Pouchen Vietnam Stock Co.	Other manufacturing	69	76	76
Unknown industry		120	186	128
Always Co. Ltd.	Unknown	-	62	58
Chang Shin Vietnam Co.	Unknown	54	55	70
Vedon Stock Co.	Unknown	66	69	-

Source: *Vietnam Economic Times*, April 2001-November 2003 issues.

**Appendix Table 3: Mean Export Propensities of Foreign-Owned Projects by Foreign Ownership Group and Industry for Projects Reporting Positive Sales in Each Respective Year (percent)**

Industry	1996	1997	1998	1999	2000	2001
<b>All foreign-owned projects</b>						
All manufacturing	49.48	49.23	45.14	38.08	38.32	43.45
Food & beverages	36.60	42.47	39.16	26.65	28.85	33.26
Food processing	53.08	51.04	45.70	33.28	35.11	40.36
Beverages	1.03	7.59	11.78	11.20	10.96	11.97
Textiles, apparel, footwear, leather	79.47	77.60	82.20	74.41	75.02	74.87
Textiles	62.56	45.39	52.59	56.01	41.18	31.80
Apparel	84.74	87.55	90.42	79.48	84.32	83.79
Footwear	85.23	85.36	88.37	80.20	85.57	87.57
Leather	75.83	91.63	92.23	81.78	91.18	89.43
Chemicals, rubber & plastics	41.27	31.94	24.08	23.20	24.64	24.81
Chemicals	29.78	19.05	15.08	9.80	15.60	13.17
Rubber products	47.43	42.91	32.71	55.28	51.15	53.32
Plastics	52.87	47.05	34.45	32.61	33.61	38.77
Non-metallic mineral products, metals, metal prod.	24.81	35.88	19.90	13.47	18.28	21.02
Non-metallic mineral products	24.46	45.35	18.64	9.54	15.20	18.72
Basic metal	0.00	6.65	5.32	0.00	6.47	14.91
Metal products	27.58	32.43	22.50	17.47	21.93	23.55
Office, computing, electric, & precision machinery	30.85	42.32	42.08	39.02	40.96	45.36
Office & computing machinery	66.67	65.87	0.00	1.04	0.00	0.00
Electrical machinery	19.29	40.32	43.33	39.71	45.10	52.21
Electronic machinery	30.35	47.89	49.35	44.38	43.56	42.95
Precision machinery	41.22	25.88	23.25	24.17	16.67	29.02
Non-electric & transportation machinery	16.66	12.82	22.84	21.07	20.91	28.27
Non-electric machinery	41.35	38.01	50.94	30.18	38.58	35.59
Motor vehicles	0.46	6.59	6.17	13.84	5.95	10.54
Other transportation machinery	24.18	13.48	32.24	21.72	24.23	40.90
Other manufacturing	57.80	59.28	56.64	56.88	51.17	60.03
Tobacco	6.09	51.73	100.00	77.03	56.51	0.00
Wood products	66.41	59.71	69.18	72.08	52.16	73.08
Furniture	66.11	66.21	76.34	85.65	75.51	67.92
Paper	37.92	12.78	18.59	34.12	23.87	30.06
Printing & publishing	25.00	0.00	0.00	0.00	12.50	37.44
Oil & gas products	1.35	1.23	0.24	0.56	9.28	2.15
Miscellaneous manufacturing	66.48	81.78	74.12	65.01	65.73	77.62



**Appendix Table 3 (continued, 2/3)**

<b>Industry</b>	<b>1996</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>
<b>Heavily-foreign projects (foreign share = 90% or more)</b>						
All manufacturing	63.09	62.69	58.19	52.24	47.76	54.17
Food & beverages	42.17	49.36	39.81	28.77	30.59	29.74
Food processing	62.88	61.56	50.05	36.75	39.33	36.47
Beverages	0.75	12.74	15.08	12.83	8.18	12.65
Textiles, apparel, footwear, leather	87.19	80.96	86.12	77.90	79.08	76.53
Textiles	72.03	51.23	60.54	58.77	45.65	34.05
Apparel	94.52	89.63	91.95	89.10	89.38	85.55
Footwear	87.27	87.31	90.82	75.05	86.92	90.96
Leather	84.78	99.73	99.12	81.95	90.82	88.37
Chemicals, rubber & plastics	55.79	47.22	31.61	34.14	30.31	34.44
Chemicals	27.02	20.72	11.73	13.57	16.63	19.60
Rubber products	56.61	58.18	46.44	63.93	69.28	65.70
Plastics	81.19	71.56	61.01	53.93	45.71	51.54
Non-metallic mineral products, metals, metal prod.	32.94	50.77	28.55	29.24	26.00	40.78
Non-metallic mineral products	16.59	57.23	16.20	18.88	18.36	35.86
Basic metal	0.00	0.00	0.00	0.00	24.54	84.20
Metal products	40.36	47.30	35.96	34.42	33.35	41.60
Office, computing, electric, & precision machinery	49.08	62.44	68.18	60.90	63.06	66.38
Office & computing machinery	50.00	65.87	0.00	1.04	0.00	0.00
Electrical machinery	43.02	61.03	69.95	53.80	61.47	69.62
Electronic machinery	49.29	65.22	81.94	84.38	79.64	74.03
Precision machinery	60.25	59.26	46.50	48.33	33.33	50.66
Non-electric & transportation machinery	25.00	20.20	39.49	34.52	25.33	35.88
Non-electric machinery	100.00	100.00	73.13	43.87	51.76	43.98
Motor vehicles	0.00	0.00	1.39	28.81	4.89	15.27
Other transportation machinery	0.00	20.41	36.32	26.20	19.88	40.12
Other manufacturing	68.25	68.55	65.09	64.89	55.78	64.75
Tobacco	0.00	0.00	0.00	0.00	0.00	0.00
Wood products	88.99	75.00	100.00	71.52	54.03	77.25
Furniture	89.86	99.40	100.00	97.06	81.41	63.54
Paper	40.00	0.00	27.18	42.79	27.66	35.10
Printing & publishing	50.00	0.00	0.00	0.00	16.67	56.16
Oil & gas products	0.00	0.00	0.00	0.00	17.26	1.54
Miscellaneous manufacturing	69.73	81.94	75.38	71.56	67.28	80.37

**Appendix Table 3 (continued, 3/3)**

Industry	1996	1997	1998	1999	2000	2001
<b>Minority- &amp; majority-foreign projects (foreign share = 10%-89%)</b>						
All manufacturing	37.13	36.06	30.76	21.36	23.52	25.61
Food & beverages	33.60	37.45	38.53	24.53	26.90	37.12
Food processing	48.00	44.22	42.39	30.12	30.67	44.24
Beverages	1.19	1.71	1.88	9.16	14.66	10.99
Textiles, apparel, footwear, leather	67.15	70.79	72.46	64.60	59.91	68.30
Textiles	43.63	32.27	34.42	45.54	27.77	21.12
Apparel	71.55	84.05	86.84	58.31	65.89	77.70
Footwear	79.91	79.91	80.53	99.50	80.63	75.97
Leather	65.39	73.40	75.00	81.26	94.76	100.00
Chemicals, rubber & plastics	28.76	18.40	17.93	12.69	17.01	12.39
Chemicals	31.34	18.02	18.12	6.17	14.17	5.68
Rubber products	29.08	16.19	15.55	44.91	33.03	40.94
Plastics	24.55	20.09	18.22	13.43	16.97	17.07
Non-metallic mineral products, metals, metal prod.	18.90	28.43	15.18	6.33	12.16	5.97
Non-metallic mineral products	28.04	39.81	19.80	6.14	12.04	5.87
Basic metal	0.00	6.65	5.32	0.00	1.96	1.05
Metal products	11.94	23.65	12.88	7.43	13.66	7.23
Office, computing, electric, & precision machinery	18.16	26.07	14.89	15.52	13.13	14.28
Office & computing machinery	100.00	0.00	0.00	0.00	0.00	0.00
Electrical machinery	1.50	17.31	14.49	22.36	16.83	11.58
Electronic machinery	21.75	39.89	20.38	11.66	13.02	20.35
Precision machinery	22.18	0.83	0.00	0.00	0.00	0.17
Non-electric & transportation machinery	11.53	8.94	11.18	10.20	14.34	17.05
Non-electric machinery	12.03	17.35	13.95	9.63	10.02	12.53
Motor vehicles	0.72	8.62	7.53	7.42	6.74	7.78
Other transportation machinery	48.36	1.94	25.45	17.25	35.43	42.91
Other manufacturing	47.60	47.76	44.69	38.09	38.38	43.38
Tobacco	6.09	51.73	100.00	77.03	56.51	0.00
Wood products	58.89	53.60	60.37	72.63	49.83	68.90
Furniture	42.36	46.30	44.78	66.64	65.19	98.56
Paper	34.46	25.55	1.41	3.78	6.84	7.37
Printing & publishing	0.00	0.00	0.00	0.00	0.00	0.00
Oil & gas products	1.80	1.64	0.43	1.30	2.90	2.61
Miscellaneous manufacturing	60.71	81.24	70.49	37.13	56.66	61.68

Source: Compiled by the authors from unpublished official records of the Ministry of Planning and Investment.

**Appendix Table 4: Export Propensities and Related Characteristics for Sample Foreign-Owned Projects by Foreign Ownership Group, Indicator, Year, and Industry for Projects Reporting Positive Sales, Employment and Cumulative Disbursed Investment (see notes for variable definitions and notes)**

Industry	X/S	X	S	E	AGE	K/E	S/E	N	K
<b>2000, All foreign-owned projects</b>									
All manufacturing	38.51	2,456	5,949	258,346	6.86	61.65	34.63	661	6,815
Food & beverages	29.12	156	1,183	25,082	7.01	71.21	34.72	107	1,800
Food processing	35.55	152	824	17,454	6.89	51.49	29.99	79	1,080
Beverages	10.96	5	359	7,628	7.36	126.87	48.08	28	720
Textiles, apparel, footwear, leather	75.02	872	1,065	136,784	7.39	15.29	10.43	118	1,059
Textiles	41.18	157	315	13,550	7.36	35.79	17.61	28	474
Apparel	84.32	139	154	26,154	7.80	10.67	8.59	51	160
Footwear	85.57	549	569	92,519	6.93	5.96	6.12	28	410
Leather	91.18	26	27	4,561	6.73	8.28	11.63	11	15
Chemicals, rubber, plastics	25.08	159	744	22,585	6.73	89.42	47.69	113	726
Chemicals	15.84	76	565	11,107	6.48	86.40	65.89	66	410
Rubber products	51.15	22	37	2,622	7.90	239.70	28.93	10	52
Plastics	34.52	61	142	8,856	6.84	54.19	20.29	37	263
Non-metallic mineral products, metals, metal products	18.28	78	524	12,826	6.87	100.95	46.13	95	993
Non-metallic mineral products	15.20	27	199	5,585	6.88	125.00	45.62	40	490
Basic metal	6.47	5	134	1,089	7.60	225.63	138.88	5	208
Metal products	21.93	47	191	6,152	6.80	69.24	37.25	50	295
Office, computing, electric, & precision machinery	40.96	979	1,331	24,616	6.92	69.31	57.08	61	922
Office & computing machinery	0.00	0	0	30	6.00	35.33	13.13	1	1
Electrical machinery	45.10	252	371	15,271	6.43	58.08	47.35	30	376
Electronic machinery	43.56	724	948	8,609	7.17	92.87	77.24	24	523
Precision machinery	16.67	3	12	706	8.50	36.91	32.40	6	22
Non-electric & transportation machinery	20.91	81	848	15,523	6.07	55.59	36.42	72	967
Non-electric machinery	38.58	30	50	2,605	6.11	31.73	16.87	19	52
Motor vehicles	5.95	18	644	6,715	7.00	95.17	63.84	28	608
Other transportation machinery	24.23	33	154	6,203	5.00	29.40	20.58	25	307
Other manufacturing	51.73	131	254	20,930	6.75	35.77	21.77	95	348
Tobacco	56.51	5	7	1,339	9.00	15.48	8.63	2	22
Wood products	52.16	7	11	1,504	6.89	9.54	8.76	9	9
Furniture	73.06	26	27	1,942	7.20	20.53	9.12	10	14
Paper	23.87	4	14	1,538	5.91	42.72	29.43	11	67
Printing & publishing	14.29	1	5	238	4.14	27.11	22.12	7	6
Oil & gas products	10.44	4	87	710	7.63	165.12	102.42	8	109
Miscellaneous manufacturing	65.73	83	104	13,659	6.96	22.82	12.15	48	120

**Appendix Table 4 (continued, 2/6)**

Industry	X/S	X	S	E	AGE	K/E	S/E	N	K
<b>2000, Heavily-foreign projects (foreign share = 90% or more)</b>									
All manufacturing	48.24	2,020	3,234	196,308	6.35	39.30	22.33	403	3,488
Food & beverages	30.59	85	599	12,907	6.05	78.53	31.57	57	1,166
Food processing	39.33	81	431	7,708	5.68	54.01	28.46	41	690
Beverages	8.18	4	168	5,199	7.00	141.36	39.56	16	476
Textiles, apparel, footwear, leather	79.08	781	926	120,507	7.03	16.10	10.64	93	953
Textiles	45.65	147	267	10,288	6.81	40.47	18.50	21	424
Apparel	89.38	124	130	20,832	7.57	10.92	9.34	40	123
Footwear	86.92	484	502	84,989	6.32	5.79	4.57	22	392
Leather	90.82	26	27	4,398	6.90	8.27	12.67	10	14
Chemicals, rubber & plastics	31.26	131	361	15,314	6.28	49.21	37.22	64	371
Chemicals	17.06	58	246	6,907	6.00	53.95	51.63	38	234
Rubber products	69.28	15	18	1,485	8.60	11.86	11.27	5	18
Plastics	47.89	59	97	6,922	6.24	49.52	17.31	21	119
Non-metallic mineral products, metals, metal products	26.00	36	151	5,525	6.33	42.94	22.51	42	177
Non-metallic mineral products	18.36	7	56	1,656	5.90	53.44	19.27	20	98
Basic metal	24.54	4	17	397	6.00	80.02	42.69	1	32
Metal products	33.35	25	78	3,472	6.76	31.17	24.64	21	47
Office, computing, electric, & precision machinery	63.06	857	910	20,046	6.71	33.89	28.34	34	396
Office & computing machinery	0.00	0	0	30	6.00	35.33	13.13	1	1
Electrical machinery	61.47	233	268	13,774	6.47	39.53	26.38	19	257
Electronic machinery	79.64	621	632	5,607	6.73	24.62	35.81	11	118
Precision machinery	33.33	3	9	635	8.33	31.73	18.37	3	19
Non-electric & transportation machinery	25.33	41	141	6,066	5.30	30.09	16.40	43	188
Non-electric machinery	51.76	30	37	2,037	5.69	24.07	13.86	13	35
Motor vehicles	4.89	1	21	1,212	6.25	47.85	19.27	12	43
Other transportation machinery	19.88	9	83	2,817	4.39	22.60	16.33	18	110
Other manufacturing	57.38	88	147	15,943	6.24	35.22	17.36	70	237
Tobacco	0.00	0	0	0	0.00	0.00	0.00	0	0
Wood products	54.03	5	5	813	4.20	8.42	4.06	5	5
Furniture	81.41	7	7	1,157	6.29	24.54	6.63	7	11
Paper	27.66	3	6	1,109	5.11	44.75	31.81	9	57
Printing & publishing	20.00	1	4	200	3.00	25.19	24.77	5	5
Oil & gas products	23.01	1	36	281	7.67	240.88	105.49	3	53
Miscellaneous manufacturing	67.28	70	87	12,383	7.02	24.39	10.29	41	107

**Appendix Table 4 (continued, 3/6)**

Industry	X/S	X	S	E	AGE	K/E	S/E	N	K
<b>2000, Minority- &amp; majority-foreign projects (foreign share = 10%-89%)</b>									
All manufacturing	23.32	437	2,715	62,038	7.66	96.55	53.83	258	3,327
Food & beverages	27.44	71	584	12,175	8.10	62.88	38.31	50	634
Food processing	31.47	70	393	9,746	8.18	48.77	31.64	38	390
Beverages	14.66	1	191	2,429	7.83	107.56	59.44	12	244
Textiles, apparel, footwear, leather	59.91	91	139	16,277	8.72	12.29	9.66	25	107
Textiles	27.77	10	48	3,262	9.00	21.74	14.96	7	50
Apparel	65.89	16	24	5,322	8.64	9.73	5.88	11	37
Footwear	80.63	65	67	7,530	9.17	6.61	11.82	6	19
Leather	94.76	0	0	163	5.00	8.34	1.23	1	1
Chemicals, rubber & plastics	17.01	27	383	7,271	7.31	141.94	61.37	49	354
Chemicals	14.17	18	319	4,200	7.14	130.44	85.24	28	176
Rubber products	33.03	7	19	1,137	7.20	467.54	46.59	5	34
Plastics	16.97	2	45	1,934	7.63	60.31	24.19	16	144
Non-metallic mineral products, metals, metal products	12.16	42	373	7,301	7.30	146.92	64.84	53	816
Non-metallic mineral products	12.04	20	143	3,929	7.85	196.55	71.98	20	392
Basic metal	1.96	0	117	692	8.00	262.03	162.93	4	176
Metal products	13.66	22	113	2,680	6.83	96.81	46.39	29	248
Office, computing, electric, & precision machinery	13.13	122	421	4,570	7.19	113.92	93.28	27	526
Office & computing machinery	0.00	0	0	0	0.00	0.00	0.00	0	0
Electrical machinery	16.83	19	102	1,497	6.36	90.14	83.57	11	118
Electronic machinery	13.02	103	316	3,002	7.54	150.61	112.30	13	404
Precision machinery	0.00	0	3	71	8.67	42.09	46.44	3	3
Non-electric & transportation machinery	14.34	41	707	9,457	7.21	93.41	66.10	29	779
Non-electric machinery	10.02	0	13	568	7.00	48.33	23.38	6	17
Motor vehicles	6.74	17	624	5,503	7.56	130.66	97.26	16	565
Other transportation machinery	35.43	24	71	3,386	6.57	46.89	31.51	7	197
Other manufacturing	35.92	42	107	4,987	8.16	37.32	34.13	25	112
Tobacco	56.51	5	7	1,339	9.00	15.48	8.63	2	22
Wood products	49.83	2	5	691	10.25	10.94	14.63	4	4
Furniture	53.59	18	19	785	9.33	11.18	14.93	3	4
Paper	6.84	1	8	429	9.50	33.59	18.74	2	11
Printing & publishing	0.00	0	1	38	7.00	31.90	15.49	2	1
Oil & gas products	2.90	4	50	429	7.60	119.66	100.58	5	56
Miscellaneous manufacturing	56.66	13	17	1,276	6.57	13.64	23.05	7	14

**Appendix Table 4 (continued, 4/6)**

Industry	X/S	X	S	E	AGE	S/E	K/E	N	K
<b>2001, All foreign-owned projects</b>									
All manufacturing	42.86	1,940	4,687	249,079	7.67	56.03	37.29	540	6,167
Food & beverages	32.87	162	868	21,966	7.93	104.14	68.08	86	1,492
Food processing	40.05	155	603	15,964	7.84	103.95	77.33	64	941
Beverages	11.97	7	265	6,002	8.18	104.71	41.19	22	550
Textiles, apparel, footwear, leather	74.19	653	763	132,324	8.09	15.10	8.71	111	1,067
Textiles	31.80	70	164	12,494	8.30	38.22	11.06	23	464
Apparel	83.45	137	146	22,398	8.44	9.87	10.42	48	158
Footwear	86.72	395	402	90,727	7.31	9.06	4.69	29	424
Leather	89.43	50	51	6,705	8.18	5.48	6.96	11	21
Chemicals, rubber & plastics	24.81	90	473	19,856	7.57	51.43	33.67	87	605
Chemicals	13.17	27	339	9,668	7.02	59.28	43.80	52	345
Rubber products	53.32	14	24	2,382	9.88	17.76	9.04	8	44
Plastics	38.77	48	110	7,806	7.96	46.28	21.45	27	216
Non-metallic mineral products, metals, metal products	19.94	49	475	11,688	7.67	81.89	34.16	73	919
Non-metallic mineral products	18.72	10	205	4,708	8.14	65.75	25.60	28	428
Basic metal	14.91	4	129	1,172	8.50	207.41	105.89	6	227
Metal products	21.59	35	141	5,808	7.21	74.17	29.27	39	264
Office, computing, electric, & precision machinery	45.06	707	992	25,049	7.73	72.16	59.86	55	929
Office & computing machinery	0.00	0	0	30	7.00	35.33	0.44	1	1
Electrical machinery	50.56	181	298	16,618	7.00	66.43	58.95	29	385
Electronic machinery	42.95	509	672	7,764	8.32	88.29	70.95	19	518
Precision machinery	32.65	17	22	637	9.50	54.91	39.05	6	25
Non-electric & transportation machinery	28.27	155	876	13,997	6.62	56.51	58.45	52	854
Non-electric machinery	35.59	21	29	1,909	7.13	33.04	9.72	15	37
Motor vehicles	10.54	26	638	5,707	7.58	94.51	87.30	19	500
Other transportation machinery	40.90	109	209	6,381	5.17	35.95	68.61	18	318
Other manufacturing	59.50	124	240	24,199	7.55	29.82	20.49	76	302
Tobacco	0.00	0	0	0	0.00	0.00	0.00	0	0
Wood products	73.08	4	5	1,202	8.33	7.64	4.75	6	6
Furniture	65.78	29	31	8,209	6.13	15.17	11.22	15	19
Paper	30.06	3	26	2,285	7.91	30.29	9.56	11	66
Printing & publishing	37.44	1	1	120	6.67	29.14	9.21	3	3
Oil & gas products	2.15	3	81	750	8.43	144.61	100.58	7	109
Miscellaneous manufacturing	77.62	85	96	11,633	7.82	16.48	15.41	34	100

**Appendix Table 4 (continued, 5/6)**

Industry	X/S	X	S	E	AGE	S/E	K/E	N	K
<b>2001, Heavily-foreign projects (foreign share = 90% or more)</b>									
All manufacturing	53.65	1,560	2,364	191,233	7.03	39.65	23.93	335	3,215
Food & beverages	28.81	83	486	11,037	6.95	107.54	48.46	44	1,030
Food processing	35.59	78	365	7,041	6.68	97.68	51.19	31	641
Beverages	12.65	5	121	3,996	7.62	131.06	41.96	13	388
Textiles, apparel, footwear, leather	76.01	577	658	116,393	7.57	14.71	8.33	89	954
Textiles	34.05	63	132	9,778	7.47	39.90	10.60	19	417
Apparel	85.55	118	124	17,853	8.03	8.91	9.93	38	120
Footwear	90.14	349	355	83,407	6.73	7.09	4.06	22	401
Leather	88.37	46	47	5,355	7.90	5.70	7.37	10	16
Chemicals, rubber & plastics	34.44	78	167	13,372	7.16	33.41	19.04	49	275
Chemicals	19.60	20	100	5,680	6.54	45.77	27.03	28	180
Rubber products	65.70	11	12	1,187	11.00	13.97	8.61	4	17
Plastics	51.54	47	55	6,505	7.29	17.64	8.33	17	77
Non-metallic mineral products, metals, metal products	38.87	34	69	5,093	6.97	44.46	12.80	31	140
Non-metallic mineral products	35.86	4	12	1,034	6.83	52.37	9.16	12	64
Basic metal	84.20	4	5	379	7.00	83.99	13.04	1	32
Metal products	38.35	25	51	3,680	7.06	36.99	15.21	18	45
Office, computing, electric, & precision machinery	67.18	610	660	20,343	7.22	49.54	44.31	32	421
Office & computing machinery	0.00	0	0	30	7.00	35.33	0.44	1	1
Electrical machinery	68.10	171	204	15,430	6.70	54.44	46.05	20	280
Electronic machinery	74.03	423	436	4,319	7.75	31.07	45.61	8	119
Precision machinery	65.14	17	20	564	9.33	70.83	43.84	3	22
Non-electric & transportation machinery	35.88	82	156	4,107	5.42	37.03	42.78	31	176
Non-electric machinery	43.98	21	23	1,413	6.36	32.99	9.10	11	25
Motor vehicles	15.27	7	17	633	6.57	51.42	25.82	7	37
Other transportation machinery	40.12	54	116	2,061	4.00	32.69	80.40	13	113
Other manufacturing	64.15	96	170	20,888	6.95	25.33	18.14	59	219
Tobacco	0.00	0	0	0	0.00	0.00	0.00	0	0
Wood products	77.25	2	2	530	4.33	5.35	4.98	3	2
Furniture	60.74	18	20	7,449	5.31	16.82	11.20	13	16
Paper	35.10	2	21	1,861	7.33	28.78	9.00	9	55
Printing & publishing	56.16	1	1	98	4.50	32.13	10.26	2	3
Oil & gas products	1.54	1	46	336	8.33	144.76	132.11	3	53
Miscellaneous manufacturing	80.37	72	80	10,614	7.86	17.32	14.21	29	90

**Appendix Table 4 (continued, 6/6)**

Industry	X/S	X	S	E	AGE	S/E	K/E	N	K
<b>2001, Minority- &amp; majority-foreign projects (foreign share = 10%-89%)</b>									
All manufacturing	25.25	379	2,323	57,846	8.71	82.80	59.10	205	2,953
Food & beverages	37.12	78	382	10,929	8.95	100.58	88.64	42	462
Food processing	44.24	77	238	8,923	8.94	109.84	101.88	33	300
Beverages	10.99	2	144	2,006	9.00	66.65	40.08	9	162
Textiles, apparel, footwear, leather	66.86	76	105	15,931	10.18	16.65	10.25	22	113
Textiles	21.12	7	32	2,716	12.25	30.25	13.26	4	47
Apparel	75.47	19	22	4,545	10.00	13.53	12.27	10	38
Footwear	75.97	46	47	7,320	9.14	15.23	6.69	7	23
Leather	100.00	4	4	1,350	11.00	3.33	2.85	1	5
Chemicals, rubber & plastics	12.39	11	306	6,484	8.11	74.66	52.52	38	331
Chemicals	5.68	7	239	3,988	7.58	75.05	63.35	24	165
Rubber products	40.94	3	11	1,195	8.75	21.55	9.47	4	26
Plastics	17.07	1	56	1,301	9.10	94.97	43.76	10	139
Non-metallic mineral products, metals, metal products	5.97	15	407	6,595	8.19	109.52	49.92	42	778
Non-metallic mineral products	5.87	6	193	3,674	9.13	75.79	37.93	16	364
Basic metal	1.05	0	124	793	8.80	232.10	124.46	5	195
Metal products	7.23	9	90	2,128	7.33	106.04	41.31	21	219
Office, computing, electric, & precision machinery	14.28	96	332	4,706	8.43	103.64	81.50	23	507
Office & computing machinery	0.00	0	0	0	0.00	0.00	0.00	0	0
Electrical machinery	11.58	10	94	1,188	7.67	93.08	87.63	9	105
Electronic machinery	20.35	87	236	3,445	8.73	129.91	89.37	11	399
Precision machinery	0.17	0	2	73	9.67	38.98	34.26	3	3
Non-electric & transportation machinery	17.05	73	720	9,890	8.38	85.27	81.59	21	678
Non-electric machinery	12.53	0	6	496	9.25	33.19	11.43	4	11
Motor vehicles	7.78	19	621	5,074	8.17	119.64	123.16	12	463
Other transportation machinery	42.91	54	93	4,320	8.20	44.43	37.95	5	204
Other manufacturing	43.38	29	70	3,311	9.65	45.41	28.65	17	83
Tobacco	0.00	0	0	0	0.00	0.00	0.00	0	0
Wood products	68.90	2	3	672	12.33	9.94	4.52	3	4
Furniture	98.56	11	11	760	11.50	4.44	11.38	2	2
Paper	7.37	1	5	424	10.50	37.09	12.07	2	11
Printing & publishing	0.00	0	0	22	11.00	23.17	7.11	1	1
Oil & gas products	2.61	2	36	414	8.50	144.50	76.93	4	56
Miscellaneous manufacturing	61.68	13	16	1,019	7.60	11.59	22.36	5	9

Variable names and units are as follows:

AGE=year of data + 2 - Year of license;

S=sales (US\$ millions);

E=employment in number;

K=cumulative disbursed investment (US\$ millions);

N=number of projects;

S=sales (US\$ millions);

X=exports (US\$ millions);

X/S in percent;

S/E and K/E in US\$ thousands.

Source: Compiled by the authors from unpublished official records of the Ministry of Planning and Investment.



Appendix Table 5: Results of Tobit Estimation of Equation (I) by Industry and Year

Industry, Independent Variables (X), Indicator	2000						2001						2000-2001 pooled					
	Unweighted			Weighted by Sales			Unweighted			Weighted by Sales			Unweighted			Weighted by Sales		
	dP/ dX =1	Coeffi- cients, etc.	Sig- nifi- cance	dP/ dX =1	Coeffi- cients, etc.	Sig- nifi- cance	dP/ dX =1	Coeffi- cients, etc.	Sig- nifi- cance	dP/ dX =1	Coeffi- cients, etc.	Sig- nifi- cance	dP/ dX =1	Coeffi- cients, etc.	Sig- nifi- cance	dP/ dX =1	Coeffi- cients, etc.	Sig- nifi- cance
ALL MANUFACTURING COMBINED																		
Constant	0.054	0.088	0.38	0.279	0.414	0.00	0.099	0.172	0.13	0.278	0.493	0.00	0.073	0.122	0.11	0.247	0.393	0.00
<i>K/E</i>	-0.087	-0.141	0.29	-0.342	-0.506	0.00	-0.073	-0.126	0.48	0.039	0.070	0.00	-0.081	-0.135	0.21	-0.023	-0.037	0.02
<i>AGE</i>	0.015	0.024	0.01	-0.005	-0.008	0.01	0.011	0.020	0.04	-0.018	-0.031	0.00	0.013	0.021	0.00	-0.011	-0.018	0.00
<i>DLG</i>	0.037	0.060	0.57	0.062	0.092	0.00	-0.027	-0.047	0.68	-0.004	-0.007	0.61	0.017	0.028	0.72	0.035	0.056	0.00
<i>DFHVV</i>	0.149	0.242	0.00	0.205	0.304	0.00	0.160	0.278	0.00	0.230	0.408	0.00	0.154	0.258	0.00	0.234	0.372	0.00
<i>DFDBV</i>	-0.159	-0.259	0.00	-0.332	-0.491	0.00	-0.156	-0.271	0.00	-0.226	-0.400	0.00	-0.159	-0.265	0.00	-0.282	-0.448	0.00
<i>DTALF</i>	0.166	0.269	0.00	0.104	0.154	0.00	0.086	0.150	0.07	0.166	0.295	0.00	0.127	0.213	0.00	0.139	0.220	0.00
<i>DCHPR</i>	-0.163	-0.264	0.00	-0.238	-0.353	0.00	-0.230	-0.400	0.00	-0.155	-0.275	0.00	-0.194	-0.324	0.00	-0.200	-0.318	0.00
<i>DNMET</i>	-0.242	-0.393	0.00	-0.205	-0.304	0.00	-0.278	-0.483	0.00	-0.249	-0.441	0.00	-0.259	-0.434	0.00	-0.253	-0.401	0.00
<i>DELCP</i>	-0.039	-0.064	0.48	0.085	0.126	0.00	-0.053	-0.093	0.35	0.103	0.183	0.00	-0.045	-0.076	0.26	0.095	0.152	0.00
<i>DMCTQ</i>	-0.236	-0.383	0.00	-0.371	-0.549	0.00	-0.216	-0.376	0.00	-0.207	-0.367	0.00	-0.231	-0.386	0.00	-0.293	-0.465	0.00
<i>D2001</i>	-	-	-	-	-	-	-	-	-	-	-	-	0.010	0.016	0.62	0.026	0.041	0.00
Sigma	-	0.525	0.00	-	0.341	0.00	-	0.539	0.00	-	0.386	0.00	-	0.532	0.00	-	0.365	0.00
Log likelihood ratio	-	-514	-	-	-2,549	-	-	-435	-	-	-2,430	-	-	-952	-	-	-5,148	-
Observations	-	661	-	-	661	-	-	540	-	-	540	-	-	1,201	-	-	1,201	-
Obs. X/S>0	-	425	-	-	425	-	-	357	-	-	357	-	-	782	-	-	782	-
FOOD, BEVERAGES																		
Constant	0.125	0.203	0.42	0.042	0.039	0.45	0.374	0.595	0.02	0.794	0.834	0.00	0.187	0.301	0.10	0.279	0.269	0.00
<i>K/E</i>	-1.439	-2.340	0.01	-0.819	-0.761	0.00	0.211	0.335	0.14	0.387	0.407	0.00	0.078	0.125	0.58	0.263	0.254	0.00
<i>AGE</i>	0.002	0.003	0.93	-0.012	-0.011	0.06	-0.028	-0.044	0.11	-0.078	-0.082	0.00	-0.014	-0.023	0.27	-0.039	-0.038	0.00
<i>DLG</i>	-0.012	-0.019	0.94	0.179	0.167	0.00	-0.180	-0.287	0.34	-0.045	-0.048	0.10	-0.124	-0.199	0.32	0.068	0.065	0.00
<i>DFHVV</i>	0.017	0.027	0.85	0.103	0.096	0.00	-0.123	-0.195	0.19	-0.179	-0.189	0.00	-0.069	-0.112	0.29	-0.001	-0.001	0.97
<i>D2001</i>	-	-	-	-	-	-	-	-	-	-	-	-	0.054	0.088	0.38	0.014	0.013	0.49
Sigma	-	0.616	0.00	-	0.360	0.00	-	0.593	0.00	-	0.338	0.00	-	0.625	0.00	-	0.370	0.00
Log likelihood ratio	-	-89	-	-	-600	-	-	-73	-	-	-408	-	-	-167	-	-	-1,101	-
Observations	-	107	-	-	107	-	-	86	-	-	86	-	-	193	-	-	193	-
Obs. X/S>0	-	58	-	-	58	-	-	52	-	-	52	-	-	110	-	-	110	-

Appendix Table 4 (continued 2/3)

Industry, Independent Variables (X), Indicator	2000						2001						2000-2001 pooled					
	Unweighted			Weighted by Sales			Unweighted			Weighted by Sales			Unweighted			Weighted by Sales		
	dP/ dX =1	Coeffi- cients, etc.	Sig- nifi- cance	dP/ dX =1	Coeffi- cients, etc.	Sig- nifi- cance	dP/ dX =1	Coeffi- cients, etc.	Sig- nifi- cance	dP/ dX =1	Coeffi- cients, etc.	Sig- nifi- cance	dP/ dX =1	Coeffi- cients, etc.	Sig- nifi- cance	dP/ dX =1	Coeffi- cients, etc.	Sig- nifi- cance
TEXTILES, APPAREL, LEATHER, FOOTWEAR																		
Constant	0.064	0.326	0.03	0.087	0.964	0.00	0.081	0.339	0.06	0.087	0.865	0.00	0.075	0.342	0.00	0.079	0.919	0.00
<i>K/E</i>	-1.327	-6.720	0.00	-0.822	-9.149	0.00	-2.482	-10.36	0.00	-1.048	-10.45	0.00	-1.776	-8.100	0.00	-0.823	-9.555	0.00
<i>AGE</i>	0.007	0.035	0.02	-0.002	-0.024	0.00	0.010	0.044	0.00	0.000	-0.003	0.46	0.009	0.041	0.00	-0.001	-0.015	0.00
<i>DLG</i>	0.017	0.087	0.44	0.009	0.101	0.00	0.023	0.095	0.45	-0.001	-0.010	0.49	0.016	0.074	0.42	0.003	0.035	0.00
<i>DFHVV</i>	0.061	0.307	0.00	0.013	0.146	0.00	0.049	0.203	0.05	0.019	0.193	0.00	0.058	0.264	0.00	0.015	0.172	0.00
<i>D2001</i>	-	-	-	-	-	-	-	-	-	-	-	-	-0.012	-0.053	0.31	0.003	0.032	0.00
Sigma	-	0.363	0.00	-	0.198	0.00	-	0.392	0.00	-	0.186	0.00	-	0.379	0.00	-	0.197	0.00
Log likelihood ratio	-	-58	-	-	161	-	-	-65	-	-	181	-	-	-125	-	-	306	-
Observations	-	118	-	-	118	-	-	111	-	-	111	-	-	229	-	-	229	-
Obs. X/S>0	-	106	-	-	106	-	-	93	-	-	93	-	-	199	-	-	199	-
CHEMICALS, RUBBER, PLASTICS																		
Constant	-0.248	-0.321	0.11	-0.331	-0.351	0.00	-0.410	-0.559	0.01	0.017	0.022	0.85	-0.312	-0.413	0.00	-0.180	-0.200	0.00
<i>K/E</i>	-0.053	-0.069	0.70	-0.242	-0.257	0.03	-0.284	-0.387	0.65	-0.814	-1.026	0.00	-0.053	-0.071	0.69	-0.509	-0.564	0.00
<i>AGE</i>	0.036	0.047	0.06	0.050	0.053	0.00	0.046	0.063	0.01	0.000	0.000	0.98	0.043	0.056	0.00	0.029	0.033	0.00
<i>DLG</i>	-0.087	-0.112	0.71	-0.038	-0.040	0.13	-0.073	-0.099	0.82	0.023	0.028	0.46	-0.098	-0.130	0.59	-0.038	-0.042	0.05
<i>DFHVV</i>	0.189	0.244	0.02	0.314	0.334	0.00	0.238	0.324	0.01	0.368	0.465	0.00	0.216	0.286	0.00	0.330	0.366	0.00
<i>D2001</i>	-	-	-	-	-	-	-	-	-	-	-	-	-0.063	-0.083	0.27	-0.011	-0.012	0.56
Sigma	-	0.479	0.00	-	0.319	0.00	-	0.488	0.00	-	0.293	0.00	-	0.484	0.00	-	0.312	0.00
Log likelihood ratio	-	-81	-	-	-300	-	-	-61	-	-	-133	-	-	-142	-	-	-454	-
Observations	-	113	-	-	113	-	-	87	-	-	87	-	-	200	-	-	200	-
Obs. X/S>0	-	72	-	-	72	-	-	50	-	-	50	-	-	122	-	-	122	-
NON-METALLIC MINERAL PRODUCTS, METALS, METAL PRODUCTS																		
Constant	-0.173	-0.245	0.34	0.555	0.601	0.00	0.072	0.113	0.68	0.422	0.562	0.00	-0.058	-0.086	0.64	0.508	0.596	0.00
<i>K/E</i>	0.189	0.268	0.21	-0.020	-0.021	0.70	-0.143	-0.225	0.75	0.073	0.097	0.36	0.180	0.266	0.19	0.079	0.092	0.05
<i>AGE</i>	0.005	0.006	0.84	-0.063	-0.068	0.00	-0.029	-0.046	0.15	-0.055	-0.073	0.00	-0.014	-0.020	0.37	-0.056	-0.066	0.00
<i>DLG</i>	0.026	0.037	0.87	-0.152	-0.164	0.00	-0.136	-0.214	0.58	-0.265	-0.352	0.00	-0.191	-0.283	0.19	-0.335	-0.393	0.00
<i>DFHVV</i>	0.171	0.242	0.07	0.115	0.124	0.00	0.287	0.452	0.00	0.357	0.476	0.00	0.224	0.332	0.00	0.170	0.200	0.00
<i>D2001</i>	-	-	-	-	-	-	-	-	-	-	-	-	0.023	0.034	0.73	0.003	0.004	0.90
Sigma	-	0.546	0.00	-	0.350	0.00	-	0.536	0.00	-	0.336	0.00	-	0.549	0.00	-	0.340	0.00
Log likelihood ratio	-	-68	-	-	-255	-	-	-50	-	-	-168	-	-	-120	-	-	-405	-
Observations	-	95	-	-	95	-	-	73	-	-	73	-	-	168	-	-	168	-
Obs. X/S>0	-	45	-	-	45	-	-	33	-	-	33	-	-	78	-	-	78	-

Appendix Table 5 (continued 3/3)

Industry, Independent Variables (X), Indicator	2000						2001						2000-2001 pooled					
	Unweighted			Weighted by Sales			Unweighted			Weighted by Sales			Unweighted			Weighted by Sales		
	dP/ dX =1	Coeffi- cients, etc.	Sig- nifi- cance	dP/ dX =1	Coeffi- cients, etc.	Sig- nifi- cance	dP/ dX =1	Coeffi- cients, etc.	Sig- nifi- cance	dP/ dX =1	Coeffi- cients, etc.	Sig- nifi- cance	dP/ dX =1	Coeffi- cients, etc.	Sig- nifi- cance	dP/ dX =1	Coeffi- cients, etc.	Sig- nifi- cance
OFFICE, COMPUTING, ELECTRIC, & PRECISION MACHINERY																		
Constant	0.264	0.427	0.06	0.326	0.632	0.00	0.162	0.285	0.21	0.349	0.680	0.00	0.175	0.292	0.07	0.207	0.487	0.00
<i>K/E</i>	-0.255	-0.412	0.62	-0.071	-0.137	0.14	0.235	0.414	0.55	-0.049	-0.096	0.42	0.062	0.104	0.84	-0.110	-0.259	0.00
<i>AGE</i>	-0.032	-0.052	0.04	-0.030	-0.059	0.00	-0.019	-0.033	0.18	-0.030	-0.058	0.00	-0.023	-0.039	0.03	-0.013	-0.031	0.00
<i>DLG</i>	0.400	0.646	0.04	0.191	0.370	0.00	0.324	0.570	0.06	0.197	0.384	0.00	0.332	0.555	0.03	0.122	0.287	0.00
<i>DFHVV</i>	0.304	0.492	0.00	0.239	0.464	0.00	0.311	0.546	0.00	0.236	0.460	0.00	0.310	0.518	0.00	0.200	0.470	0.00
<i>D2001</i>	-	-	-	-	-	-	-	-	-	-	-	-	0.052	0.087	0.29	0.023	0.054	0.00
Sigma	-	0.424	0.00	-	0.198	0.00	-	0.414	0.00	-	0.215	0.00	-	0.427	0.00	-	0.229	0.00
Log likelihood ratio	-	-41	-	-	156	-	-	-35	-	-	44	-	-	-78	-	-	-46	-
Observations	-	61	-	-	61	-	-	55	-	-	55	-	-	116	-	-	116	-
Obs. X/S>0	-	44	-	-	44	-	-	43	-	-	43	-	-	87	-	-	87	-
NON-ELECTRIC & TRANSPORTATION MACHINERY																		
Constant	-0.009	-0.012	0.96	0.096	0.163	0.03	-0.044	-0.079	0.84	0.159	0.463	0.00	-0.038	-0.061	0.78	0.127	0.305	0.00
<i>K/E</i>	-2.578	-3.674	0.02	-1.821	-3.098	0.00	-2.490	-4.485	0.08	1.588	-4.622	0.00	-2.536	-4.053	0.00	-2.158	-5.164	0.00
<i>AGE</i>	0.021	0.030	0.33	0.000	0.000	0.97	0.019	0.035	0.38	-0.003	-0.010	0.36	0.018	0.029	0.24	-0.005	-0.013	0.12
<i>DLG</i>	-0.069	-0.098	0.76	-0.192	-0.326	0.00	-0.153	-0.276	0.62	-0.213	-0.622	0.00	-0.059	-0.095	0.72	-0.140	-0.336	0.00
<i>DFHVV</i>	0.011	0.016	0.92	0.265	0.451	0.00	0.103	0.186	0.45	0.250	0.727	0.00	0.048	0.077	0.58	0.242	0.579	0.00
<i>D2001</i>	-	-	-	-	-	-	-	-	-	-	-	-	0.059	0.094	0.44	0.099	0.237	0.00
Sigma	-	0.527	0.00	-	0.390	0.00	-	0.654	0.00	-	0.416	0.00	-	0.588	0.00	-	0.441	0.00
Log likelihood ratio	-	-51	-	-	-322	-	-	-43	-	-	-320	-	-	-94	-	-	-703	-
Observations	-	72	-	-	72	-	-	52	-	-	52	-	-	124	-	-	124	-
Obs. X/S>0	-	35	-	-	35	-	-	26	-	-	26	-	-	61	-	-	61	-

*K/E*= paid-in capital per worker (US\$ millions); *AGE*=the age of the project in years;

*DLG*=a dummy variable for large projects (sales larger than the industry average plus one standard deviation);

*DFHVV*=a dummy variable for heavily-foreign MNCs (foreign ownership shares of 90 percent or more);

*DFDBV*=a dummy variable for projects in food and beverages; *DTALF*=a dummy variable for projects in textiles, apparel, leather, or footwear;

*DCHPR*=a dummy variable for projects in chemicals, rubber, or plastics;

*DNMET*=a dummy variable for projects in non-metallic mineral products, metals or metal products;

*DELCP*=a dummy variable for projects in office, computing, electric and precision machinery;

*DMCTQ*=a dummy variable for projects in non-electric and transportation machinery

*D2001*=a dummy variable for 2001 observations.