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

*Phan Minh Ngoc, Faculty of Economics, Kyushu University*
*and*
*Eric D. Ramstetter, ICSEAD and*
*Graduate School of Economics, Kyushu University*

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

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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 This paper uses unpublished data on foreign investment projects in 2000-2001 to examine this relationship for the first time in Vietnam.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.

## 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.[1] 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.[2] 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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[1] 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).

[2] 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.[3] 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 on 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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[3] 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.[4] 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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[4] 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 Wilconxen 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.[5] 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.[6] 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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[5] 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.
[6] 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.[7] 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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[7] 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.[8] 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.[9] In addition, a small number of projects did not report positive foreign ownership shares.[10] 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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[8]  A check of owner names indicates that 100 projects belonged to multi-project firms.
[9]  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.
[10]  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.[11]  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).[12]  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.[13]  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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[11]  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.

[12]  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.

[13]  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.[14]

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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[14] 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.[15] 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:

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

where

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[15] 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.[16] 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.[17] 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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[16] 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.

[17] 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 heteroscedasiticy (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.[18] 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.[19] 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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[18] In the pooled regressions, a dummy variable for 2001 observations is also added to account for differences in intercepts in 2000 and 2001.

[19] 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 propensies 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.[20]    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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[20] 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 |
| | | | | | | |
| BY SITC COMMODITY CATEGORY | | | | | | |
| 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 defintion (SITC 5-8) | 2,710 | 4,401 | 4,350 | 5,541 | 6,398 | 7,019 |
| Other items | 8 | 3 | 4 | 5 | 6 | 0 |
| | | | | | | |
| BY ISIC INDUSTRY CATEGORY | | | | | | |
| 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 defintion (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%<=foreign ownership share<=49%;
majority-foreign projects are projects where 50%<=foreign ownership share<=89%;
heavily-foreign projects are projects where foreign ownership share>=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 Unweighted | 2000 Weighted by Sales | 2001 Unweighted | 2001 Weighted by Sales | 2000-2001 Unweighted | 2000-2001 Weighted by Sales |
|---|---|---|---|---|---|---|
| Coefficients on $K/E$, 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 $AGE$, 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 $DLG$, 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 $DHVY$, 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)**

| Industry | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 |
|---|---|---|---|---|---|---|
| **All foreign-owned projects** | | | | | | |
| 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 |

| Industry | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 |
|---|---|---|---|---|---|---|
| **Heavily-foreign projects (foreign share = 90% or more)** | | | | | | |
| 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 |

| Industry | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 |
|---|---|---|---|---|---|---|
| **Minority- & majority-foreign projects (foreign share = 10%-89%)** | | | | | | |
| 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 | Transportation machinery | - | - | 48 |
| Strongman Co. | Transportation machinery | 56 | - | - |
| 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 |
|---|---|---|---|---|---|---|
| **All foreign-owned projects** | | | | | | |
| 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)**

| Industry | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 |
|---|---|---|---|---|---|---|
| **Heavily-foreign projects (foreign share = 90% or more)** | | | | | | |
| 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 |

| Industry | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 |
|---|---|---|---|---|---|---|
| **Minority- & majority-foreign projects (foreign share = 10%-89%)** | | | | | | |
| 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 defintions and notes)**

| Industry | X/S | X | S | E | AGE | K/E | S/E | N | K |
|---|---|---|---|---|---|---|---|---|---|
| **2000, All foreign-owned projects** | | | | | | | | | |
| 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 pr | 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 machine | 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 |

| Industry | X/S | X | S | E | AGE | K/E | S/E | N | K |
|---|---|---|---|---|---|---|---|---|---|
| **2000, Heavily-foreign projects (foreign share = 90% or more)** | | | | | | | | | |
| 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 pr | 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 machin | 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 |

| Industry | X/S | X | S | E | AGE | K/E | S/E | N | K |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |
| **2000, Minority- & majority-foreign projects (foreign share = 10%-89%)** | | | | | | | | | |
| 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 pr | 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 machin | 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 |

| Industry | X/S | X | S | E | AGE | S/E | K/E | N | K |
|---|---|---|---|---|---|---|---|---|---|
| **2001, All foreign-owned projects** | | | | | | | | | |
| 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 pr | 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 machin | 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 |

| Industry | X/S | X | S | E | AGE | S/E | K/E | N | K |
|---|---|---|---|---|---|---|---|---|---|
| **2001, Heavily-foreign projects (foreign share = 90% or more)** | | | | | | | | | |
| 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 pr | 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 machin | 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 |
|---|---|---|---|---|---|---|---|---|---|
| **2001, Minority- & majority-foreign projects (foreign share = 10%-89%)** | | | | | | | | | |
| 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 pr | 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 machine | 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 |
| K/E | -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 |
| AGE | 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 |
| DLG | 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 |
| DFHVY | 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 |
| DFDBV | -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 |
| DTALF | 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 |
| DCHPR | -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 |
| DNMET | -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 |
| DELCP | -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 |
| DMCTQ | -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 |
| D2001 | - | - | - | - | - | - | - | - | - | - | - | - | 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 |
| K/E | -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 |
| AGE | 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 |
| DLG | -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 |
| DFHVY | 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 |
| D2001 | - | - | - | - | - | - | - | - | - | - | - | - | 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 | - |

| 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 |
| K/E | -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 |
| AGE | 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 |
| DLG | 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 |
| DFHVY | 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 |
| D2001 | - | - | - | - | - | - | - | - | - | - | - | - | -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 |
| K/E | -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 |
| AGE | 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 |
| DLG | -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 |
| DFHVY | 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 |
| D2001 | - | - | - | - | - | - | - | - | - | - | - | - | -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 |
| K/E | 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 |
| AGE | 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 |
| DLG | 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 |
| DFHVY | 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 |
| D2001 | - | - | - | - | - | - | - | - | - | - | - | - | 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 | - |

| 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 | Coefficients, etc. | Significance | dP/dX=1 | Coefficients, etc. | Significance | dP/dX=1 | Coefficients, etc. | Significance | dP/dX=1 | Coefficients, etc. | Significance | dP/dX=1 | Coefficients, etc. | Significance | dP/dX=1 | Coefficients, etc. | Significance |
| **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 |
| *K/E* | -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 |
| *AGE* | -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 |
| *DLG* | 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 |
| *DFHVY* | 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 |
| *D2001* | - | - | - | - | - | - | - | - | - | - | - | - | 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 |
| *K/E* | -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 |
| *AGE* | 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 |
| *DLG* | -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 |
| *DFHVY* | 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 |
| *D2001* | - | - | - | - | - | - | - | - | - | - | - | - | 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;

*DFHVY* = 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.