Trade Propensities and Foreign Ownership Shares in Thai Manufacturing, 1996

Eric D. Ramstetter
Chief, Research Division, ICSEAD
and
Visiting Professor, Graduate School of Economics,
Kyushu University

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

Trade Propensities and Foreign Ownership Shares in Thai Manufacturing, 1996

Eric D. Ramstetter

International Centre for the Study of East Asian Development (ICSEAD)

11-4 Otemachi, Kokurakita-ku, Kitakyushu, Japan; tel 81-93-583-6202, fax 81-93-583-4602

email: ramst@icsead.or.jp, website: www.icsead.or.jp

and Visiting Professor, Graduate School of Economics, Kyushu University

May 2002

Abstract

This paper examines the relationship between foreign ownership shares and trade propensities in Thai manufacturing in 1996. The results of this study suggest that foreign MNCs are more likely to have high trade propensities than local plants after controlling for differences in factor intensities, size, vintage, BOI-promotion status, and industry affiliation. Differences in trade propensities between foreign MNCs and local plants appear to be very pervasive, in contrast to the far less frequent observation of technological differences between these two groups of plants in numerous previous studies. Another important finding emerging from this study is the tendency low trade propensities to be more common in minority-foreign plants than in majority- or wholly-foreign plants, while differences between the latter majority- and wholly-foreign plants tended to be small. Moreover, in all of these cases, differences between local plants and foreign MNCs tended to be larger for export propensities than for import propensities. Combined with previous results for a smaller sample of Thai firms in 1990 and large samples of Indonesian manufacturing plants in 1992 and 1994, which also reveal similar patterns, these results suggest that the relationship between foreign ownership shares and trade propensities is an important aspect of foreign MNC activity in Southeast Asia.

1. Introduction

        Previous research suggests that one of the most striking differences between affiliates of

foreign multinational corporations (MNCs) and local firms in several Asian economies is that

foreign MNCs often appear to export a much larger portion of their output than local plants.

Moreover, export propensities appear to be highest in foreign MNCs with large foreign ownership

shares.   There is also evidence that foreign MNCs have imported a larger portion of their inputs

or sales than local plant, though the differences between local firms and foreign MNCs tend to be

smaller in terms of import propensities and differences among foreign ownership groups appear

less significant.   These patterns have been observed in the manufacturing sectors of several

economies, most notably in Indonesia and Thailand and on the export side in Singapore

(Ramstetter 1994, 1998, 1999a, 1999b).[1]   However, the previous evidence for Thailand comes

from a relatively limited sample of firms for 1990, most of which were promoted the Thai Board

of Investment (BOI).   Although this sample contains most foreign MNCs, the coverage of local

firms is far less comprehensive and there is thus the possibility that previous results for Thailand

pertain only to the rather limited set of firms included in the 1990 data set.   The purpose of this

paper is thus to see if the previous results for Thailand persist in a much larger sample of

manufacturing plants from the 1996 industrial census.   To this end the next section reviews the

analytical principles underlying the analysis and related literature, section 3 presents the statistical

methodology used, section 4 describes the data set used and summarizes some relevant descriptive

statistics, and section 5 analyzes the results of the statistical analysis performed here.   Finally, the

conclusion summarizes the findings and offers some suggestions for future research.

---

[1] Note that there are no data on imports or total procurements in Singapore.   Previous evidence
for Thailand suggests no significant differences in import propensities between foreign MNCs and
local firms.

2. Analytical Principles and the Previous Literature

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

firm chooses to become a MNC and incur costs of cross-border operations not incurred by

non-MNCs.[2]   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.   There is substantial disagreement in the theoretical literature over which

advantages are necessary and/or sufficient for a firm to become a MNC.[3]   However, when making

empirical comparisons of MNCs and non-MNCs, the general agreement that multinationals tend to

possess a distinctive set of firm-specific assets (e.g., production technology, marketing networks,

and management know-how) is more relevant, regardless of whether these assets are thought to be

necessary for a firm to become a MNC.

        Simply by virtue of possessing firm-specific assets in relatively large amounts, MNCs

can be expected to differ systematically from non-MNCs.   Two differences are particularly

important when analyzing differences in trade propensities between MNCs and non-MNCs.   First,

by virtue of their superior production technology and management know-how, MNCs may be able

to produce more efficiently than non-MNCs.   They thus tend to be better able to produce

---

[2] For good reviews of the theoretical and empirical literature on multinationals see Caves (1996),
Dunning (1993), and Markusen (1991).   This and the following three paragraphs draw heavily on
Ramstetter (1999b).

[3] For example, 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.

internationally marketable products. If this is the case, it then follows that export propensities will be higher in MNCs than in non-MNCs. Note, however, the previous evidence suggests that in Thai manufacturing MNCs are often no more efficient than local firms (e.g., Brimble 1993; Ito 2002; Khanthachai et al. 1987; Ramstetter 1993, 1994, 2001a, 2001b, 2001c; Tambunlertchai and Ramstetter 1991). This is in marked contrast to evidence from Indonesia for example (Sjöholm 1998, 1999a, 1999b; Takii 2001, 2002; Takii and Ramstetter 2000).

Second, MNCs tend to possess relatively sophisticated marketing networks in general, and international marketing networks in particular. Thus, transaction costs associated with international trade tend to be relatively low for MNCs, again suggesting that MNCs 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 for Thailand (Ramstetter 1993, 1994, 1998) suggests that in 1990 foreign firms had higher export propensities in Thai manufacturing in 1990, even though few significant differences in labor productivity, production functions, or import propensities were observed.

In addition to the distinction between MNCs and non-MNCs, distinctions among MNCs with different foreign ownership shares may also be important if multinationals restrict access by 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 (e.g., minority-owned or even some majority-owned joint ventures) in order to protect intellectual property that is an important source of competitiveness for the MNCs. If this is the case, there may be a positive correlation between technical efficiency and foreign ownership shares. Time series evidence from manufacturing in Hong Kong and Singapore (Ramstetter 1999a) is consistent with this assertion, but evidence from plant-level analysis of manufacturing in Indonesia (Takii 2002; Takii and Ramstetter 2000) and Thailand (Ramstetter 2001a), which is similar to the analysis performed in this paper, does not support this assertion in several samples 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.

It is also important to recognize that MNCs also have a strong motive to restrict the access by uncontrolled affiliates to international marketing networks. This motive exists 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. Accordingly, 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. Here again previous evidence for Thai manufacturing firms in 1990 (Ramstetter 1993, 1994, 1998) suggests that this may be the case. Evidence from Indonesian manufacturing plants in the early-mid 1990s is also similar in suggesting a strong correlation between foreign ownership shares and export propensities (Ramstetter 1999b) and the correlation between foreign ownership shares and efficiency is not as strong as might be expected (Takii 2002; Ramstetter and Takii 2000). On the other hand, multinational parents also have a strong motive to provide firm-specific assets, including marketing networks, to all affiliates in order to increase the profitability of the affiliates in question. Thus, the extent to which there is 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.

Although it is likely that multinationals will have lower transactions costs associated with importing than nonmultinationals, it is less clear whether these costs will differ among multinationals with different foreign ownership shares. Nonetheless, it is common to hear assertions that foreign multinationals with high foreign ownership shares import more than other multinationals or local firms. Moreover, government officials, including those in Thailand, often suggest this as a reason to restrict foreign ownership shares.[4] There could be a positive

---

[4] Of course, even if there is a positive relationship between import propensities and foreign ownership shares, this is probably not a good reason to restrict ownership shares.

relationship between import propensities and foreign ownership shares if, for example, (1) parents think that relatively high levels of imports will improve performance, either in the affiliate or the multinational firm as a whole, (2) parents are poorly informed about local suppliers in the host economy, (3) local partners are poorly informed about foreign suppliers, and/or (4) local partners are import averse.   Although the reasons listed above do not seem to constitute strong motives for foreign firms with different foreign ownership shares to have different import propensities, it is still of some interest to examine whether there actually is such a relationship.

3.   Statistical Methodology

This analysis uses plant-level data underlying the 1997 Thai industrial census, which has data on economic activity in 1996.   An important characteristic of this data set, which will be described in more detail in the following section, is that trade propensities are not reported as continuous variables (e.g., the percentage of production exported or the percentage of inputs imported) but rather as a discrete variable grouping plants into four groups (1) those with trade propensities of 0, (2) those with trade propensities of 1-49 percent, (3) those with trade propensities of 50-99 percent, and (4) those with trade propensities of 100 percent.   The first step in this analysis is thus to compile the distributions of trade propensities by ownership and industry group in the next section.

Although these compilations are informative, they cannot tell us whether differences in trade propensities between foreign MNCs and local plants are in any sense statistically significant. To test this hypothesis two measures of export and import propensities (one binomial and one multinomial) are estimated as a function of control variables thought to influence trade propensities and a dummy variable or set of dummy variables identifying foreign plants.   This allows one to test if foreign ownership is a significant determinant of trade propensities after the influence of control variables is accounted for.   The control variables used here are selected plant

characteristics and industry affiliation.   The plant characteristics thought to influence trade

propensities consist of two factor intensities, the capital-labor ratio (i.e., the ratio of fixed assets to

the number of workers) and the share of non-production workers in all workers, plant age, a

dummy variable identifying large plants, and a dummy variable identifying plants promoted by the

Thai BOI.

In general, it is expected that export propensities will be negatively correlated with

capital- and non-production worker intensities because these factors are thought to be relative

scare in Thailand.   On the other hand, the relationship between these factor intensities and import

propensities cannot be determined a priori because plants may import very different products than

they produce.   Both size and BOI promotion are thought to be positively correlated with trade

propensities because transactions costs related to international trade are thought to be lower for

larger firms and because the BOI actively promotes firms with high trade propensities, especially

high export propensities.   If one believes the learning by doing hypothesis, age is also likely to be

positively correlated with trade propensities but some evidence of a negative relationship has also

been found in previous studies (Ramstetter 1994).   Negative correlations between age and trade

propensities have been interpreted as reflecting the effects of Thailand's increasingly open trade

policies in the 1980s and the 1990s.

Industry affiliation is accounted for in two ways.   First, industry dummies are added for

all but one industry (food manufacturing is used as the control industry) are included when the

equations are estimated in samples of all manufacturing plants.   Second, in order to allow for

possible differences in slope coefficients across industries, separate estimates are performed for

each of 14 individual industries with relatively large samples when such estimates are possible.[5]

If the coefficient on a foreign ownership dummy is positive and significant, then there is

a significantly higher probability that foreign plants in the ownership group represented have

---

[5] Note that it is sometimes impossible to estimate industry-level equations because one or more of
the explanatory variables perfectly predicts one of the choices represented by the dependent
variables.

larger trade propensities than local plants, after controlling for differences in these factory and industry characteristics.   Moreover, because the dummy variable for large plants is not thought to be sufficient to account for all the influences of size and because comparisons of MNCs and non-MNCs are thought to be more meaningful in samples of large plants, estimates are performed for larger samples of all firms and smaller samples of large plants, where large plants are defined as plants with output of 25 million baht (about US$1 million) or more.

The simplest equations define both trade propensities and foreign ownership in binomial terms.   In other words, both the trade propensity and the foreign ownership variable take the value of 1 for plants with a positive trade propensity or a positive foreign ownership share and 0 otherwise.   A probit technique is used to estimate the resulting equations:

(a) $DX = a_0 + a_1(K/E) + a_2(EN/E) + a_3(AGE) + a_4(DLG) + a_5(DBOI) + a_6(DF)$

(b) $DM = b_0 + b_1(K/E) + b_2(EN/E) + b_3(AGE) + b_4(DLG) + b_5(DBOI) + b_6(DF)$

where

AGE=age of plant in years;

DBOI=1 if the plant belongs to a BOI-promoted firm, =0 otherwise;

DF=1 if the plant belongs to a foreign MNC, =0 otherwise;

DLG=dummy variable for large plants; =1 for plants with output equal to one sample standard deviation or more larger than the sample mean, =0 otherwise;

DM=1 if the plant has positive imports, =0 otherwise;

DX=1 if the plant has positive exports, =0 otherwise;

E=number of workers in the plant;

EN=number of non-production workers in the plant;

K=book value of the plant's fixed assets, average of values at 1 January and 31 December.

Note: Industry dummies are added when equations (a)-(d) are estimated for all manufacturing.

An ordered probit technique is then used to estimate similar equations where trade propensities are defined to take on one of four values as in the following equations:

(c) DXR=c0 + c1(K/E) + c2(EN/E) + c3(AGE) + c4(DLG) + c5(DBOI) + c6(DF)

(d) DMR=d0 + d1(K/E) + d2(EN/E) + d3(AGE) + d4(DLG) + d5(DBOI) + d6(DF)

where

DMR=1 if the plant imports nothing, =2 if the plant imports 1-49 percent of its materials, =3 if the plant imports 50-99 percent of its materials, =4 if the plant imports 100 percent of its materials;

DXR=1 if the plant exports nothing, =2 if the plant exports 1-49 percent of its output, =3 if the plant exports 50-99 percent of its output, =4 if the plant exports 100 percent of its output;

all other variables as defined above.

Note: Industry dummies are added when equations (c)-(d) are estimated for all manufacturing.

Finally, to see if trade propensities differ among groups of foreign plants with different foreign ownership shares, similar equations are estimated with three foreign ownership dummies as follows:

(e) DX=e0 + e1(K/E) + e2(EN/E) + e3(AGE) + e4(DLG) + e5(DBOI)

     + e6(DFMIN) + e7(DFMAJ) + e8(DF100)

(f) DM=f0 + f1(K/E) + f2(EN/E) + f3(AGE) + f4(DLG) + f5(DBOI)

     + f6(DFMIN) + f7(DFMAJ) + f8(DF100)

(g) DXR=g0 + g1(K/E) + g2(EN/E) + g3(AGE) + g4(DLG) + g5(DBOI)

     + g6(DFMIN) + g7(DFMAJ) + g8(DF100)

(h) DMR=h0 + h1(K/E) + h2(EN/E) + h3(AGE) + h4(DLG) + h5(DBOI)

     + h6(DFMIN) + h7(DFMAJ) + h8(DF100)

where

DFMIN=1 if the plant is a minority-foreign-owned plant, =0 otherwise;

DFMAJ=1 if the plant is a majority-foreign-owned plant, =0 otherwise;

DF100=1 if the plant is a wholly-foreign-owned plant, =0 otherwise;

all other variables as defined above.

Note: Industry dummies are added when equations (a)-(d) are estimated for all manufacturing.

        In some past research on Thailand probit estimates of equations similar to equations

(a)-(d) have been reported, but the emphasis has been on analysis of tobit estimates of similar

equations where dependent variables are continuous measures of trade propensities as in

Ramstetter (1994) and other papers on Thailand and Indonesia (e.g., Ramstetter 1998, 1999b),.

In this respect, this analysis differs somewhat from previous analyses.

4.   The Data and Some Descriptive Statistics

        As has been described in detail elsewhere (Ramstetter 2001a), the plant-level data from

the Thai industrial census for 1996 have numerous problems that must be addressed before they

can be used for meaningful economic analysis.   The data set obtained included data for a total of

32,489 plants of which 23,677 replied to the 1997 census and were included in the final

compilation by the National Statistical Office (NSO).   As illustrated in Ramstetter (2002, Table 1),

there are large differences between the estimates of manufacturing activity from the industrial

surveys/censuses and estimates from the labor force surveys or national accounts.[6]   For example,

according to Thailand's labor force surveys, manufacturing employment averaged about 4.64

million workers while published industrial census and survey data covered only 2.41 million

workers or 52 percent of the labor force survey average.   In addition, the national accounts'

estimate of manufacturing GDP was 1,385 billion baht compared to published census estimates of

---

[6] Data for 1996 from this table are repeated in Appendix Table A1.

998 billion baht or 72 percent of the national accounts estimate.   Relatively low coverage of

employment might be expected because the industrial census excludes a large number of plants

with 1-9 workers and these plants generally have relatively low labor productivity and thus

account for a relatively small portion of production.   However, the apparently low coverage of the

census even in terms of value added suggests that the census' coverage is by no means

comprehensive.   Moreover, comparisons of national accounts' estimates of GDP and NSO

estimates of value added at the industrial level reveal large differences in some industries.   For

example, NSO estimates are much smaller in jewelry, apparel, leather & footwear, and furniture,

among other industries and much larger in plastics and motor vehicles, among other industries.

Differences in industry definitions and classification practices are probably important in some of

these cases, but there are large differences than cannot be easily explained in many other cases.

Thus, in addition relatively low coverage rates in the aggregate, the coverage of the census seems

to vary greatly by industry.

The severity of the coverage problems are compounded when one confronts the fact that

this data set contains several duplicate or near duplicate records.   To conduct meaningful

economic analysis it was thus necessary to eliminate these duplicates and the samples used in this

paper are thus much smaller than those reported by official compilations.   The methodology for

eliminating duplicates has been explained in a separate paper (Ramstetter 2001a, pp. 8-10) and was

probably biased toward leaving a record in the database if there was some doubt as to whether it

was a duplicate.   A second problem with the database is that many plants are very small and

several other plants report apparently implausible values for important variables.

Correspondingly, plants that reported non-positive values for production workers, non-production

workers, intermediate consumption, or value added were also eliminated from the samples used in

this study because non-positive values do not make economic sense in this context.   Plants with

less than 20 employees were also eliminated because they are not thought to be comparable with

foreign MNC plants.   As a result the total sample used in study was reduced to 8,952 plants (see

Appendix Tables B1-B4 for details on the sample by trade propensity, industry, owner, and size group).   The samples used here thus accounted for only 69 percent of employment and 81 percent of the value added reported by official NSO estimates for 1996, and here again, there is great variation in coverage rates across industries (see Appendix Table A1).

Given these problems, it is clear that caution is mandated when interpreting any patterns observed in these data.   However, it also remains that this is by far the most comprehensive data set on Thai manufacturing plants or firms that has been assembled to date, making analysis of the data of great interest to students of the Thai economy.   Moreover, the distributions of export and import propensities shown in Tables 1 and 2 are consistent with previously observed patterns in firm-level data for 1990 (Ramstetter 1994, 1998) in showing that larger proportions of foreign plants tend to have relatively high export propensities.   For example in samples of all plants in all manufacturing, 53 percent of foreign plants exported half or more of their output compared to only 15 percent of local plants.   In the sample of large plants, this difference was smaller but still quite large, 54 percent versus 22 percent.   The proportion of foreign MNCs with high import propensities and the difference between foreign and local plants were somewhat smaller, 48 percent compared to 18 percent in the sample of all plants and 50 percent versus 22 percent in the sample of large plants.

Major industry categories (Table 1) in which a relatively large proportion of foreign plants had export propensities of 50 percent or more included food (62 percent in the sample of all plants and 63 percent in the sample of large plants), apparel (85 and 89 percent, respectively), leather and footwear (69 and 82 percent, respectively), rubber (77 and 80 percent, respectively), electric machinery (69 and 72 percent, respectively), furniture (72 and 79 percent, respectively), and jewelry (94 and 93 percent, respectively).   Notably, Thailand had a relatively large revealed comparative advantage in several of these industries as early as 1992 (Ramstetter 1997, Table 1). Ratios of these proportions to similar proportions for local plants were larger than the average for all manufacturing in a rather different set of industries, chemicals, plastics, nonmetallic mineral

products, metal products, general machinery, electric machinery, and motor vehicles (sample of all plants only). Several of these industries had a large proportion of plants, especially local plants, with relatively low export propensities (electric machinery being the major exception).

On the import side (Table 2) foreign plants had import propensities exceeding 50 percent in apparel (51 percent in the sample of large plants only), leather and footwear (67 percent in the sample of all plants and 75 percent in the sample of large plants), chemicals (50 and 52 percent, respectively), plastics (50 and 52 percent, respectively), metal products (63 and 64 percent, respectively), general machinery (53 percent in the sample of large plants only), electric machinery (78 and 80 percent, respectively), and jewelry (58 and 63 percent, respectively). This set of industries includes both industries in which Thailand has a strong revealed comparative advantage (e.g., apparel, leather and footwear, electric machinery, jewelry), illustrating the high import content of several of Thailand's major exports, and industries in which Thailand has a distinct revealed comparative disadvantage (e.g., chemicals, general machinery). The set of industries in which ratios of these proportions to similar proportions for local plants were larger than the average was similarly diverse, food, apparel, leather and footwear (sample of all plants only), plastics (sample of all plants only), nonmetallic mineral products, and metal products (sample of all plants only).

Table 3a, 3b, 4a, and 4b then make similar comparisons among the three foreign ownership groups, minority-foreign plants, majority-foreign plant, and wholly-foreign plants. Perhaps the most important pattern revealed by these tables is the strong tendency for a large proportion of minority-foreign plants to have relatively low trade propensities. A larger proportion of wholly-foreign plants also tended to have high trade propensities than of majority-foreign plants, but differences between wholly-foreign plants and majority-foreign plants were much smaller than differences between minority-foreign plants and the other two groups. These comparisons also reveal great variation across industries with the frequency of large (50 percent or more) export propensities being especially high in wholly- and/or majority-foreign

plants compared to minority-foreign plants in textiles, plastics, non-metallic mineral products, metal products, general machinery, and motor vehicles.   Industries in which the frequency of large import propensities was high in wholly- and/or majority-foreign plants compared to minority-foreign plants were textiles, apparel, rubber, plastics, nonmetallic mineral products, general machinery, and furniture.

5.   Results

To conserve space, full results of estimating equations (a)-(h) are reported in the Appendix Tables C1-C4 and this discussion focuses on the sign and significance of the coefficients on the foreign ownership dummies as this is the major issue of concern here.   The results were generally as expected in that vintage, size, and BOI-promotion were all positively and significantly correlated with both trade propensities in most equations and most samples.   Moreover, non-production worker intensity was negatively and significantly correlated with export propensities as expected in many cases but the relationship between capital intensity and export propensities was often insignificant and sometimes significantly positive.   This result is puzzling and insignificant results may be related to the possibility of heteroscedasticity, which has yet to be addressed.   However, the positive coefficients cannot be explained by this problem, which leads to inefficient but unbiased estimates.[7]   On the import side, coefficients on both factor intensities were generally positive but not always significant.   The fit of the equations was also markedly worse on the import side than on the export side in some industries (Tables 5, 6) but the fit of both import and export equations was generally what would be expected in large cross sections such as these.

Table 5 reports the significant coefficients on the foreign ownership dummy from

---

[7] These estimates were performed using the probit and ordered probit procedures in TSP version 4.5, which does not include options to address the problem of heteroscedasiticity.   To address this problem substantial further programming in TSP or use of another program will be required.

estimates of (a)-(d), where trade propensities are viewed as a function of a single dummy distinguishing foreign ownership. In the results for all manufacturing, where intercept dummies are estimated for each industry but all slopes are assumed to be equal for all industries, reveal that all foreign ownership dummies are positive and significant. The coefficient on the foreign ownership dummy was larger in the export equations than in corresponding import equations. The coefficient was also larger in samples of all plants than in samples of large plants only. These results suggest that on average, there is a greater probability that foreign plants will have high trade propensities than local plants and that the difference between foreign and local plants is larger in terms of export propensities than in terms of import propensities. However, the differences between foreign and local plants become smaller in samples of large plants. Notably these patterns are similar to those observed in Tables 1-2.

Looking next at the industry-level results, one first notes that some equations could not be estimated for several industries because one or more of the explanatory variables perfectly explains one of the choices defined by the dependent variable. There are also a few cases in which the coefficient on the foreign ownership dummy is not significant at the standard 0.05 level. However, the vast majority of estimated coefficients are again positive and significant, indicating that foreign-owned plants are more likely to have high trade propensities than local plants, even after controlling for factor intensities, size, vintage, BOI-promotion status, and industry affiliation. This is a very strong and pervasive result, which contrasts markedly with the results of productivity comparisons discussed above, for example. However, there is a wide variation of the foreign ownership coefficient across industries and closer examination of the full results in Appendix Tables C1-C2 reveal wide variation in other slope coefficients as well. This suggests that the results for all manufacturing do not necessarily apply to all industries equally. For example, in some industries (e.g., plastics and nonmetallic mineral products), the difference between foreign and local plants tended to be larger in terms of import propensities. However, even though there are some exceptions, the major results that foreign plants were more likely to

15

have relatively high trade propensities and especially relatively high export propensities, obtained in most individual industries as well.

Table 6 then reports the results for estimating equations (e)-(h) where foreign plants are distinguished by foreign ownership share. In the results for all manufacturing, all of the coefficients on foreign ownership dummies are again positive and significant. Coefficients are lowest on the dummy for minority-foreign plants and largest for the dummy on wholly-foreign plants, but the difference between the coefficients on wholly- and majority-foreign plants was rather small, while the differences between these coefficients and the coefficient on minority-foreign plants was rather large. This suggests that wholly- and majority-foreign plants are more likely to have high trade propensities than minority-foreign plants. Moreover, differences between foreign and local plants tend to be relatively large in terms of export propensities and relatively small in samples of large plants. Here again, these patterns are similar those observed in the descriptive statistics presented in Tables 3a-4b.

Results of estimating these equations by industry also indicate a wide variation in slope coefficients across industries and this is reflected in wide variation of coefficients on foreign ownership dummies across industries in Table 6. There are also a relatively large number of equations that cannot be estimated, especially when the trade propensity is defined in binomial terms, and a larger number of insignificant coefficients on foreign ownership dummies, especially on the import side. Notwithstanding these problems, there is still a strong tendency for low trade propensities, especially low export propensities, to be relatively common in minority-foreign plants compared to majority- and wholly-foreign plants. Moreover, there is still a tendency for coefficients on foreign ownership dummies to be larger in export equations than in import equations.

As mentioned above, one potential problem with the estimates reported in Tables 5-6 is the potential for heteroscedasticity, especially as related to the capital-intensity variable. Another important potential problem relates to simultaneity, especially the possibility that export

propensities may be a determinant of a plant's foreign ownership share. This is especially the case in Thailand and other Southeast Asian countries where foreign ownership restrictions are relaxed for plants that export a lot of their output. In a previous study of Indonesian manufacturing (Ramstetter 1999b) this problem was addressed by dropping plants with very high export propensities (80 percent or more) from the samples and showing that the same qualitative results obtained. Unfortunately, a similar procedure is not possible with this data set because of the way trade propensities are defined and it is very difficult to construct a model that accounts for any simultaneity that might exist. On the other hand, there is a very strong theoretical expectation that MNCs will restrict access of non-controlled affiliates to their international marketing networks, and these results are generally consistent with this expectation. Moreover, these results are consistent with previous results for a smaller sample of firms in 1990 (Ramstetter 1994, 1998), suggesting that foreign MNCs have higher export propensities than local plants and that minority-foreign plants have lower export propensities than local plants. However, previous results differ in suggesting little difference in import propensities among ownership groups, while these results suggest similar patterns on both the export and import sides.

6.   Conclusions and the Future Research Agenda

This paper has examined the relationship between foreign ownership shares and trade propensities in Thai manufacturing in 1996. The results of this study suggest that foreign MNCs are more likely to have high trade propensities than local plants after controlling for differences in factor intensities, size, vintage, BOI-promotion status, and industry affiliation. Differences in trade propensities between foreign MNCs and local plants appear to be very pervasive, in contrast to the far less frequent observation of technological differences between these two groups of plants in previous studies. Another important finding emerging from this study is tendency for low trade propensities to be more common in minority-foreign plants than in majority- or

wholly-foreign plants, while differences between majority- and wholly-foreign plants tended to be small.   Moreover, in all of these cases, differences between local plants and foreign MNCs tended to be larger for export propensities than for import propensities.

As mentioned above, there are two potential statistical problems in the results presented, heteroscedasiticity and simultaneity, that demand closer attention in future research.   It should be possible to address the possibility of heteroscedasticity with some additional programming or use of other statistical software but the simultaneity problem is more difficult to deal with.   Country of MNC origin is another potentially relevant determinant of trade propensities that should be considered in future research, though previous research suggests this dimension is not very important in Thailand (Ramstetter 1994).

In the final analysis, there are very good theoretical reasons to expect that causation runs primarily from foreign ownership shares to trade propensities as described in this paper and these empirical results are consistent with this view.   Combined with previous results for Indonesian manufacturing, which also reveal similar patterns and do address the simultaneity issue to some extent, the results also suggest that the relationship between foreign ownership shares and trade propensities is an important aspect of foreign MNC activity in Southeast Asia.

References:

Aitken, Brian, Gordon H. Hanson, and Ann E. Harrison, 1994.   "Spillovers, Foreign Investment, and Export Behavior", Working Paper No. 4967 (December).   Cambridge, MA: National Bureau of Economic Research.

Amemiya, Takeshi, 1984.   "Tobit Models: A Survey", *Journal of Econometrics*, Vol. 21 (January/February), pp. 3-61.

Blomström, Magnus, 1990.   *Transnational Corporations and Manufacturing Exports from Developing Countries*.   London: Routledge.

Brimble, Peter John, 1993.   "Industrial Development and Productivity Change", Ph.D. Dissertation, The Johns Hopkins University.

Buckley, Peter J. and Mark Casson, 1991.   *The Future of the Multinational Enterprise*, 2nd Edition. London: Macmillan.

Casson, Mark, 1987.   *The Firm and the Market: Studies on the Multinational and the Scope of the Firm*.   Cambridge, MA: MIT Press.

Caves, Richard E., 1996.   *Multinational Enterprise and Economic Analysis*, second edition. Cambridge, UK: Cambridge University Press.

Dunning, John H., 1981.   *International Production and the Multinational Enterprise*.   London: Allen & Unwin.

_____, 1993.   *Multinational Enterprises and the Global Economy*.   Workingham, U.K.: Addison-Wesley Publishing Co.

International Monetary Fund, 2002.   *International Financial Statistics Yearbook*, March CD-ROM.   Washington, D.C.:   International Monetary Fund.

Ito, Keiko, 2002. "Are Foreign Multinationals More Efficient?   Plant Productivity in the Thai Automobile Industry", Working Paper 2002-__, Kitakyushu: International Centre for the Study of East Asian Development, forthcoming.

Khanthachai, Nathabhol, Kanchana Tanmavad, Tawatchai Boonsiri, Chantana Nisaisook, and Anucha Arttanuchit, 1987. *Technology and Skills in Thailand*. Singapore: Institute of Southeast Asian Studies.

Lipsey, Robert E., 1987. "Direct Foeign Investment and Structural Change in the Asian Economies and the U.S.: Possibilities for Research", mimeo.prepared for the East-West Center.

Markusen, James R., 1991. "The Theory of the Multinational Enterprise: A Common Analytical Framework", in Eric D. Ramstetter, ed., *Direct Foreign Investment in Asia's Developing Economies and Structural Change in the Asia-Pacific Region*, Boulder, Co: Westview Press, pp. 11-32.

Matsuoka, Atsuko, 2001a. "Wages, Foreign Multinationals, and Local Plants in Thai Manufacturing", Working Paper 2001-15, Kitakyushu: International Centre for the Study of East Asian Development.

_____, 2001b. "Wage Differentials among Local Plants and Foreign Multinationals by Foreign Ownership Share and Nationality in Thai Manufacturing", Working Paper 2001-25, Kitakyushu: International Centre for the Study of East Asian Development.

_____, 2001c. "Wage Differentials among Local Plants and Foreign Multinaitonals in Thai Manufacturing: Industry-level Analysis", Working Paper 2001-26, Kitakyushu: International Centre for the Study of East Asian Development.

National Statistical Office, 1999. *Report on the 1997 Industrial Census of the Whole Kingdom*. Bangkok: National Statistical Office.

National Statistical Office, 2001. Compilations of data from various Labor Force Surveys, downloaded from the NSO website (http://www.nso.go.th/eng/stat/lfs/lfstab9.htm) in March 2001. Bangkok: National Statistical Office.

National Economic and Social Development Board, 2001. Data on value added and gross output by 5-digit Thai Standard Industrial Classification, data received by email. Bangkok: National Economic and Social Development Board.

Ramstetter, Eric D., 1993. "Production Technology in Foreign and Local Firms in Thai Manufacturing", Discussion Paper No. 8. Nagoya: Graduate School of International Development, Nagoya University.

_____, 1994.   "Comparisons of Japanese Multinationals and Other Firms in Thailand's Nonoil Manufacturing Industries", *ASEAN Economic Bulletin*, vol 11, no. 1, pp. 36-58.

_____, 1997.   " International Trade, Multinational Firms, and Regional Integration in Thailand" in Wendy Dobson and Chia Siow Yue, eds., *Multinationals and East Asian Integration*, Toronto: International Development Research Centre and Singapore: Institute of Southeast Asian Studies, pp. 107-130.

_____, 1998.   "Export Propensities and Foreign Ownership Shares in Southeast Asian Manufacturing", in F. Gerard Adams and Shinichi Ichimura, eds., *East Asian Development: Will the East Asian Miracle Survive?*   Westport, CN: Praeger, pp. 171-192.

_____, 1999a.   "Comparisons of Foreign Multinationals and Local Firms in Asian Manufacturing Over Time", *Asian Economic Journal*, Vol. 13, No. 3 (June), pp. 163-203.

_____, 1999b. "Trade Propensities and Foreign Ownership Shares in Indonesian Manufacturing in the Early 1990s", *Bulletin of Indonesian Economic Studies*, Vol. 35, No. 2 (August), pp. 43-66.

_____, 2001a.   "Labor Productivity in Foreign Multinationals and Local Plants in Thai Manufacturing, 1996 and 1998", Working Paper 2001-13, Kitakyushu: International Centre for the Study of East Asian Development.

_____, 2001b.   "Labor Productivity in Local Plants and Foreign Multinationals by Nationality in Thai Manufacturing, 1996 and 1998", Working Paper 2001-31, Kitakyushu: International Centre for the Study of East Asian Development.

_____, 2002.   "Does Technology in Differ in Local Plants and Foreign Multinationals in Thai Manufacturing?   Evidence from Translog Production Functions for 1996 and 1998", Working Paper 2002-04, Kitakyushu: International Centre for the Study of East Asian Development.

Rugman, Alan M., 1980.   "Internalization as a General Theory of Foreign Direct Investment: A Re-Appraisal of the Literature", *Weltwirtschaftliches Archiv*, Band 116, Heft 2, pp. 365-379.

_____, 1985.   "Internalization is Still a General Theory of Foreign Direct Investment", *Weltwirtschaftliches Archiv*, Band 121, Heft 3, pp. 570-575.

Sjöholm, Fredrik, 1998.   "Joint Ventures, Technology Transfer and Spillovers: Evidence from Indonesian Establishment Data", in Economic Planning Agency, ed., *Foreign Direct Investment in Asia*, papers and proceedings of an international symposium, 22-23 October, Tokyo: Economic Planning Agency, pp. 587-616.

_____, 1999a.   "Exports, Imports and Productivity: Results From Indonesian Establishment Data," *World Development*, Vol. 27, No. 4, pp. 705-715.

_____, 1999b.   "Technology Gap, Competition and Spillovers from Direct Foreign Investment: Evidence from Establishment Data, " *Journal of Development Studies*, Vol. 36(1), pp. 53-73.

_____, 2001a.   "Labor Productivity in Foreign Multinationals and Local Plants in Thai Manufacturing, 1996 and 1998", Working Paper 2001-13, Kitakyushu: International Centre for the Study of East Asian Development.

_____, 2001b.   "Labor Productivity in Local Plants and Foreign Multinationals by Nationality in Thai Manufacturing, 1996 and 1998", Working Paper 2001-31, Kitakyushu: International Centre for the Study of East Asian Development.

Takii, Sadayuki, 2001.   "Productivity Spillovers and Characteristics of Foreign Multinational Plants in Indonesian Manufacturing 1990-1995", Working Paper 2001-14, Kitakyushu: International Centre for the Study of East Asian Development.

_____, 2002.   "Productivity Differentials between Local and Foreign Plants in Indonesian Manufacturing, 1995", Working Paper 2002-02, Kitakyushu: International Centre for the Study of East Asian Development.

Takii, Sadayuki and Eric D. Ramstetter, 2000.   "Foreign Multinationals in Indonesian Manufacturing 1985-1998:   Shares, Relative Size, and Relative Labor Productivity", Working Paper 2000-18, Kitakyushu: International Centre for the Study of East Asian Development.

Tambunlertchai, Somsak and Eric D. Ramstetter, 1991.   "Foreign Firms in Promoted Industries and Structural Change in Thailand", in Eric D. Ramstetter, ed., *Direct Foreign Investment in Asia's Developing Economies and Structural Change in the Asia-Pacific Region*, Boulder, CO: Westview Press, pp. 65-104.

Table 1: Distribution of Local and Foreign Plants by Industry and Export Propensity, 1996 (percentages of industry-ownership group totals and ratios)

	All plants									Large plants								
	Local plants				Foreign plants				F/L	Local plants				Foreign plants				F/L
Industry	0	1-49	50-99	100	0	1-49	50-99	100	50-100	0	1-49	50-99	100	0	1-49	50-99	100	50-100
Manufacturing	72	12	9	6	24	23	29	24	3.5	61	17	13	9	21	25	31	23	2.5
Food	70	10	14	7	19	19	31	31	3.0	57	13	20	10	17	19	33	30	2.1
Textiles	72	14	8	5	31	30	27	13	2.9	58	23	11	8	23	35	29	13	2.3
Apparel	47	11	16	26	5	10	29	56	2.0	29	15	20	37	3	9	31	57	1.6
Leather & footwear	50	17	20	13	19	11	19	50	2.1	35	17	30	18	7	11	21	61	1.7
Chemicals & products	71	25	3	1	29	41	25	4	7.8	65	31	2	1	28	42	26	4	8.6
Rubber products	42	17	28	12	8	14	59	18	1.9	30	20	35	15	6	14	62	18	1.6
Plastics & products	73	17	8	3	29	28	28	16	4.2	59	25	12	4	24	33	32	12	2.7
Nonmetallic mineral products	87	7	6	1	37	26	26	11	5.4	86	8	5	1	38	29	23	10	6.0
Metal products	84	12	4	0	39	26	24	10	7.4	70	22	8	0	36	31	24	9	4.2
General machinery	77	17	5	1	21	31	34	14	8.3	65	25	10	1	19	30	41	11	5.1
Electric machinery	72	19	7	2	12	19	35	34	7.4	60	26	10	4	10	17	37	36	5.3
Office & computing machinery	50	0	50	0	7	7	27	60	1.7	50	0	50	0	0	7	30	63	1.9
Miscellaneous electric machinery	75	19	5	1	15	31	27	28	8.6	64	27	6	2	12	32	29	27	6.5
Radio, TV, communication	70	22	6	2	12	13	44	31	10.2	63	28	6	3	13	9	45	34	8.3
Precision machinery	64	15	15	5	13	13	38	38	3.7	38	19	31	13	8	12	38	42	1.8
Motor vehicles	86	9	4	1	32	47	18	3	4.3	71	18	9	2	27	50	20	3	2.1
Furniture	70	9	13	9	14	14	30	42	3.4	48	13	23	16	6	15	35	44	2.1
Jewelry	35	12	26	27	6	0	35	60	1.8	15	5	32	49	7	0	36	57	1.2
Other manufacturing industries	79	10	7	4	38	19	20	23	3.9	73	13	8	5	38	21	22	20	3.0
Beverages	80	17	2	0	83	17	0	0	0.0	69	25	6	0	83	17	0	0	0.0
Tobacco	75	9	9	6	0	0	33	67	6.4	33	33	33	0	0	0	33	67	3.0
Wood products	76	9	8	6	41	11	33	15	3.4	67	14	10	9	37	5	47	11	3.0
Paper products	88	9	1	2	58	13	20	10	9.3	86	11	2	1	59	16	22	3	8.6
Printing & publishing	94	5	1	0	67	22	11	0	10.4	90	9	1	0	73	20	7	0	8.1
Oil, coal, nuclear, etc.	92	8	0	0	30	70	0	0	-	92	8	0	0	30	70	0	0	-
Basic metals	83	12	3	2	60	34	6	0	1.0	73	19	5	4	55	38	7	0	0.8
Misc. transportation machinery	82	11	6	0	29	57	7	7	2.3	79	8	13	0	18	64	9	9	1.4
Other misc. manufacturing	45	15	24	16	10	5	31	54	2.1	35	13	31	22	7	5	34	54	1.7

Note: Large plants are plants with gross output equal to or exceeding 25 million baht.

Source: Compilations from plant-level data underlying National Statistical Office (1999).

Table 2: Distribution of Local and Foreign Plants by Industry and Import Propensity, 1996 (percentages of industry-ownership group totals and ratios)

	All plants									Large plants								
	Local plants				Foreign plants				F/L	Local plants				Foreign plants				F/L
Industry	0	1-49	50-99	100	0	1-49	50-99	100	50-100	0	1-49	50-99	100	0	1-49	50-99	100	50-100
Manufacturing	58	24	16	2	18	34	42	6	2.6	49	29	20	2	15	35	44	6	2.3
Food	75	19	6	0	45	39	16	1	2.7	69	24	6	0	43	40	17	1	2.8
Textiles	59	21	18	3	19	39	36	6	2.1	50	24	23	3	13	41	40	7	1.8
Apparel	64	24	11	1	21	36	41	1	3.6	52	33	14	1	10	39	50	1	3.5
Leather & footwear	42	35	21	1	8	25	67	0	3.0	25	39	34	2	0	25	75	0	2.1
Chemicals & products	22	34	41	3	10	40	46	4	1.1	16	36	44	3	8	40	48	4	1.1
Rubber products	58	31	10	1	44	37	20	0	1.9	59	32	9	1	44	35	21	0	2.3
Plastics & products	59	23	16	1	12	38	42	8	2.9	48	29	21	2	7	41	47	5	2.3
Nonmetallic mineral products	82	14	4	0	18	51	30	2	7.3	75	18	7	0	15	56	27	2	4.3
Metal products	51	26	20	2	16	21	53	10	2.8	38	33	26	2	14	22	54	11	2.2
General machinery	41	33	24	2	11	43	44	3	1.8	33	36	28	3	5	42	49	4	1.7
Electric machinery	27	32	38	3	3	19	65	12	1.9	22	32	44	2	3	17	67	13	1.7
Office & computing machinery	0	0	100	0	0	7	70	23	0.9	0	0	100	0	0	4	74	22	1.0
Miscellaneous electric machinery	27	37	34	2	6	20	64	10	2.0	20	38	40	2	5	19	66	11	1.8
Radio, TV, communication	30	24	46	0	3	21	67	10	1.7	28	22	50	0	3	20	67	10	1.5
Precision machinery	28	28	36	8	0	22	59	19	1.8	25	25	44	6	0	19	62	19	1.6
Motor vehicles	53	22	24	1	12	45	36	8	1.7	42	33	23	2	11	46	36	7	1.7
Furniture	59	31	9	1	30	49	21	0	2.1	49	40	10	1	24	56	21	0	1.9
Jewelry	36	20	37	7	14	28	43	15	1.3	20	27	44	10	13	25	46	16	1.2
Other manufacturing industries	55	23	18	5	20	34	42	4	2.0	43	29	23	6	17	34	45	4	1.7
Beverages	73	20	7	0	17	33	50	0	6.8	64	28	8	0	17	33	50	0	6.0
Tobacco	97	3	0	0	67	33	0	0	-	67	33	0	0	67	33	0	0	-
Wood products	52	13	21	15	30	41	26	4	0.8	39	19	28	14	16	53	32	0	0.7
Paper products	66	19	14	0	43	35	20	3	1.6	58	26	16	0	34	44	19	3	1.4
Printing & publishing	54	29	16	0	17	33	50	0	3.1	49	31	20	0	20	40	40	0	2.0
Oil, coal, nuclear, etc.	31	23	46	0	20	30	40	10	-	31	23	46	0	20	30	40	10	-
Basic metals	43	28	20	8	9	31	49	11	2.1	28	34	24	14	7	24	59	10	1.8
Misc. transportation machinery	49	29	22	0	7	43	36	14	2.3	36	31	33	0	0	45	36	18	1.6
Other misc. manufacturing	44	37	20	0	13	31	55	1	2.9	27	49	24	0	12	25	63	0	2.6

Note: Large plants are plants with gross output equal to or exceeding 25 million baht.

Source: Compilations from plant-level data underlying National Statistical Office (1999).

Table 3a: Distribution of Foreign Plants by Ownership Group, Industry and Export Propensity, All Plants 1996 (% of industry-ownership group and ratios)

Industry	Minority-foreign				Majority-foreign				Wholly foreign				Ratios, 50-100		
	0	1-49	50-99	100	0	1-49	50-99	100	0	1-49	50-99	100	Wh/Mi	Wh/Ma	Ma/Mi
Manufacturing	31	28	24	16	13	17	40	30	8	11	33	48	2.0	1.2	1.7
Food	23	18	32	27	10	16	29	45	11	28	22	39	1.0	0.8	1.3
Textiles	38	35	20	7	5	16	53	26	0	0	50	50	3.7	1.3	2.9
Apparel	7	13	31	49	0	0	35	65	0	0	0	100	1.3	1.0	1.3
Leather & footwear	31	19	19	31	15	8	31	46	0	0	0	100	2.0	1.3	1.5
Chemicals & products	34	44	19	3	16	32	45	6	29	43	24	5	1.3	0.6	2.3
Rubber products	9	13	62	17	15	23	62	0	0	9	45	45	1.2	1.5	0.8
Plastics & products	39	31	19	11	23	27	32	18	5	18	50	27	2.6	1.5	1.7
Nonmetallic mineral products	42	33	21	5	18	9	55	18	33	0	0	67	2.6	0.9	2.8
Metal products	49	35	11	5	19	19	48	14	24	5	48	24	4.5	1.2	3.9
General machinery	28	42	21	9	17	17	61	6	0	6	56	39	3.2	1.4	2.2
Electric machinery	23	32	27	17	4	13	46	36	7	8	35	51	1.9	1.0	1.8
Office & computing machinery	0	0	67	33	0	13	50	38	11	5	11	74	0.8	1.0	0.9
Miscellaneous electric machinery	25	46	19	10	4	15	46	35	5	15	20	60	2.7	1.0	2.8
Radio, TV, communication	20	17	40	23	8	15	35	42	7	7	54	32	1.4	1.1	1.2
Precision machinery	31	31	15	23	0	0	86	14	0	0	33	67	2.6	1.0	2.6
Motor vehicles	41	48	9	2	11	47	37	5	0	33	67	0	6.0	1.6	3.8
Furniture	14	17	34	34	13	13	38	38	17	0	0	83	1.2	1.1	1.1
Jewelry	11	0	37	53	0	0	33	67	0	0	31	69	1.1	1.0	1.1
Other manufacturing industries	47	24	19	10	30	9	23	37	6	3	23	68	3.1	1.5	2.1
Beverages	82	18	0	0	100	0	0	0	-	-	-	-	-	-	=0/0
Tobacco	0	0	50	50	-	-	-	-	0	0	0	100	1.0	-	-
Wood products	43	9	35	13	25	25	25	25	-	-	-	-	-	-	1.0
Paper products	57	17	20	7	67	0	11	22	0	0	100	0	3.8	3.0	1.3
Printing & publishing	67	27	7	0	100	0	0	0	0	0	100	0	15.0	-	0.0
Oil, coal, nuclear, etc.	38	63	0	0	0	100	0	0	-	-	-	-	-	-	=0/0
Basic metals	63	31	6	0	0	100	0	0	50	50	0	0	0.0	=0/0	0.0
Misc. transportation machinery	31	62	0	8	0	0	100	0	-	-	-	-	-	-	13.0
Other misc. manufacturing	13	13	42	32	13	0	30	57	4	0	19	77	1.3	1.1	1.2

Note: Large plants are plants with gross output equal to or exceeding 25 million baht; - = no plants in this industry-ownership group.

Source: Compilations from plant-level data underlying National Statistical Office (1999).

Table 3b: Distribution of Foreign Plants by Ownership Group, Industry and Export Propensity, Large Plants 1996 (% of industry-ownership group and ratios)

Industry	Minority-foreign				Majority-foreign				Wholly foreign				Ratios, 50-100		
	0	1-49	50-99	100	0	1-49	50-99	100	0	1-49	50-99	100	Wh/Mi	Wh/Ma	Ma/Mi
Manufacturing	28	31	26	16	12	17	43	28	7	11	35	46	2.0	1.1	1.7
Food	21	18	34	27	8	17	33	42	6	31	25	38	1.0	0.8	1.2
Textiles	28	42	22	7	6	17	50	28	0	0	57	43	3.4	1.3	2.6
Apparel	4	11	32	53	0	0	45	55	0	0	0	100	1.2	1.0	1.2
Leather & footwear	17	17	25	42	0	11	33	56	0	0	0	100	1.5	1.1	1.3
Chemicals & products	32	46	20	2	17	31	45	7	29	43	24	5	1.3	0.6	2.4
Rubber products	5	12	67	16	17	25	58	0	0	9	45	45	1.1	1.6	0.7
Plastics & products	31	39	22	8	16	26	37	21	7	20	60	13	2.5	1.3	2.0
Nonmetallic mineral products	43	35	19	3	22	11	44	22	0	0	0	100	4.6	1.5	3.1
Metal products	45	41	9	5	21	21	47	11	22	6	50	22	5.2	1.2	4.2
General machinery	25	46	25	4	19	6	69	6	0	6	59	35	3.2	1.3	2.6
Electric machinery	22	33	28	17	3	11	48	37	5	7	36	52	2.0	1.0	1.9
Office & computing machinery	0	0	67	33	0	13	50	38	0	6	13	81	0.9	1.1	0.9
Miscellaneous electric machinery	21	48	21	10	0	17	50	33	5	16	21	58	2.6	0.9	2.7
Radio, TV, communication	24	14	38	24	8	8	38	46	8	5	54	33	1.4	1.0	1.3
Precision machinery	25	38	13	25	0	0	83	17	0	0	33	67	2.7	1.0	2.7
Motor vehicles	35	52	10	2	11	47	37	5	0	33	67	0	5.3	1.6	3.4
Furniture	0	19	43	38	14	14	43	29	17	0	0	83	1.0	1.2	0.9
Jewelry	13	0	34	53	0	0	36	64	0	0	40	60	1.1	1.0	1.1
Other manufacturing industries	45	26	21	8	30	9	27	33	5	5	18	73	3.1	1.5	2.1
Beverages	82	18	0	0	100	0	0	0	-	-	-	-	-	-	=0/0
Tobacco	0	0	50	50	-	-	-	-	0	0	0	100	1.0	-	-
Wood products	41	6	47	6	0	0	50	50	-	-	-	-	-	-	1.9
Paper products	52	20	24	4	86	0	14	0	-	-	-	-	-	-	0.5
Printing & publishing	69	23	8	0	100	0	0	0	-	-	-	-	-	-	0.0
Oil, coal, nuclear, etc.	38	63	0	0	0	100	0	0	-	-	-	-	-	-	=0/0
Basic metals	59	33	7	0	0	100	0	0	0	100	0	0	0.0	=0/0	0.0
Misc. transportation machinery	20	70	0	10	0	0	100	0	-	-	-	-	-	-	10.0
Other misc. manufacturing	9	14	45	32	6	0	35	59	5	0	20	75	1.2	1.0	1.2

Note: Large plants are plants with gross output equal to or exceeding 25 million baht; - = no plants in this industry-ownership group.

Source: Compilations from plant-level data underlying National Statistical Office (1999).

Table 4a: Distribution of Foreign Plants by Ownership Group, Industry and Import Propensity, All Plants 1996 (% of industry-ownership group and ratios)

Industry	Minority-foreign				Majority-foreign				Wholly foreign				Ratios, 50-100		
	0	1-49	50-99	100	0	1-49	50-99	100	0	1-49	50-99	100	Wh/Mi	Wh/Ma	Ma/Mi
Manufacturing	21	41	33	4	15	23	56	6	11	20	58	11	1.9	1.1	1.7
Food	42	41	16	1	55	29	16	0	44	44	11	0	0.7	0.7	1.0
Textiles	23	40	33	4	5	42	47	5	0	13	50	38	2.4	1.7	1.4
Apparel	23	41	35	1	18	29	53	0	14	0	86	0	2.4	1.6	1.5
Leather & footwear	6	38	56	0	15	15	69	0	0	14	86	0	1.5	1.2	1.2
Chemicals & products	13	46	40	1	0	26	61	13	14	33	48	5	1.3	0.7	1.8
Rubber products	53	32	15	0	8	46	46	0	45	45	9	0	0.6	0.2	3.1
Plastics & products	14	52	30	5	14	14	64	9	5	23	55	18	2.1	1.0	2.1
Nonmetallic mineral products	19	60	21	0	9	18	73	0	33	33	0	33	1.6	0.5	3.5
Metal products	17	23	48	12	19	14	62	5	10	19	62	10	1.2	1.1	1.1
General machinery	15	55	30	0	6	28	56	11	0	11	83	6	3.0	1.3	2.2
Electric machinery	4	30	56	10	6	7	78	9	1	15	66	17	1.3	1.0	1.3
Office & computing machinery	0	0	33	67	0	13	63	25	0	5	79	16	0.9	1.1	0.9
Miscellaneous electric machinery	6	31	52	10	8	0	85	8	5	20	65	10	1.2	0.8	1.5
Radio, TV, communication	3	26	66	6	8	12	73	8	0	22	63	15	1.1	1.0	1.1
Precision machinery	0	46	46	8	0	14	86	0	0	0	58	42	1.9	1.2	1.6
Motor vehicles	13	52	26	9	11	21	63	5	0	67	33	0	0.9	0.5	1.9
Furniture	28	55	17	0	38	50	13	0	33	17	50	0	2.9	4.0	0.7
Jewelry	18	39	32	11	6	17	56	22	13	13	56	19	1.8	1.0	1.8
Other manufacturing industries	20	39	36	5	26	28	44	2	13	16	68	3	1.7	1.5	1.1
Beverages	18	36	45	0	0	0	100	0	-	-	-	-	-	-	2.2
Tobacco	50	50	0	0	-	-	-	-	100	0	0	0	=0/0	-	-
Wood products	30	39	26	4	25	50	25	0	-	-	-	-	-	-	0.8
Paper products	40	37	20	3	44	33	22	0	100	0	0	0	0.0	0.0	1.0
Printing & publishing	13	33	53	0	50	50	0	0	0	0	100	0	1.9	=100/0	0.0
Oil, coal, nuclear, etc.	25	38	38	0	0	0	50	50	-	-	-	-	-	-	2.7
Basic metals	9	28	50	13	0	100	0	0	0	50	50	0	0.8	=50/0	0.0
Misc. transportation machinery	8	46	31	15	0	0	100	0	-	-	-	-	-	-	2.2
Other misc. manufacturing	10	52	39	0	22	22	57	0	8	15	73	4	2.0	1.4	1.5

Note: Large plants are plants with gross output equal to or exceeding 25 million baht; - = no plants in this industry-ownership group.

Source: Compilations from plant-level data underlying National Statistical Office (1999).

Table 4b: Distribution of Foreign Plants by Ownership Group, Industry and Import Propensity, Large Plants 1996 (% of industry-ownership group and ratios)

Industry	Minority-foreign				Majority-foreign				Wholly foreign				Ratios, 50-100		
	0	1-49	50-99	100	0	1-49	50-99	100	0	1-49	50-99	100	Wh/Mi	Wh/Ma	Ma/Mi
Manufacturing	18	43	35	4	12	22	59	7	9	21	60	10	1.8	1.1	1.7
Food	40	41	17	1	58	25	17	0	38	50	13	0	0.7	0.8	0.9
Textiles	16	43	36	5	6	39	50	6	0	14	57	29	2.1	1.5	1.4
Apparel	9	45	43	2	9	27	64	0	17	0	83	0	1.8	1.3	1.4
Leather & footwear	0	33	67	0	0	22	78	0	0	14	86	0	1.3	1.1	1.2
Chemicals & products	10	46	43	1	0	28	62	10	14	33	48	5	1.2	0.7	1.6
Rubber products	56	28	16	0	0	50	50	0	45	45	9	0	0.6	0.2	3.1
Plastics & products	6	59	31	4	11	11	74	5	7	20	67	7	2.1	0.9	2.2
Nonmetallic mineral products	16	65	19	0	11	22	67	0	0	50	0	50	2.6	0.8	3.5
Metal products	16	24	48	12	11	16	68	5	11	22	56	11	1.1	0.9	1.2
General machinery	6	56	38	0	6	31	50	13	0	12	82	6	2.4	1.4	1.7
Electric machinery	5	28	56	11	3	6	81	10	1	15	67	16	1.2	0.9	1.3
Office & computing machinery	0	0	33	67	0	13	63	25	0	0	88	13	1.0	1.1	0.9
Miscellaneous electric machinery	7	29	52	12	0	0	92	8	5	21	63	11	1.1	0.7	1.6
Radio, TV, communication	3	24	66	7	8	8	75	8	0	23	64	13	1.1	0.9	1.2
Precision machinery	0	50	50	0	0	17	83	0	0	0	58	42	2.0	1.2	1.7
Motor vehicles	13	54	25	8	11	21	63	5	0	67	33	0	1.0	0.5	2.1
Furniture	19	67	14	0	29	57	14	0	33	17	50	0	3.5	3.5	1.0
Jewelry	19	38	34	9	7	7	57	29	0	10	70	20	2.1	1.1	2.0
Other manufacturing industries	17	39	39	4	21	27	48	3	9	14	77	0	1.8	1.5	1.2
Beverages	18	36	45	0	0	0	100	0	-	-	-	-	-	-	2.2
Tobacco	50	50	0	0	-	-	-	-	100	0	0	0	=0/0	-	-
Wood products	18	53	29	0	0	50	50	0	-	-	-	-	-	-	1.7
Paper products	32	44	20	4	43	43	14	0	-	-	-	-	-	-	0.6
Printing & publishing	15	38	46	0	50	50	0	0	-	-	-	-	-	-	0.0
Oil, coal, nuclear, etc.	25	38	38	0	0	0	50	50	-	-	-	-	-	-	2.7
Basic metals	7	22	59	11	0	100	0	0	0	0	100	0	1.4	=100/0	0.0
Misc. transportation machinery	0	50	30	20	0	0	100	0	-	-	-	-	-	-	2.0
Other misc. manufacturing	14	41	45	0	18	18	65	0	5	15	80	0	1.8	1.2	1.4

Note: Large plants are plants with gross output equal to or exceeding 25 million baht; - = no plants in this industry-ownership group.

Source: Compilations from plant-level data underlying National Statistical Office (1999).

Table 5: Coefficients on the Foreign Ownership Dummy (=DF) and R-squared (R2) or Scaled R-squared (SR2) from Estimates of Equations (a)-(d)
(see Appendix Tables C1-C2 for detailed results, including details on equations that cannot be estimated; ns=coefficient not significant at 0.05)

Indicator	Equation (a), Dep. Var.=DX				Equation (b), Dep. Var.=DM				Equation (c), Dep. Var.=DXR				Equation (d), Dep. Var.=DMR			
	All		Large		All		Large		All		Large		All		Large	
	DF	SR2	DF	SR2	DF	SR2	DF	SR2	DF	SR2	DF	SR2	DF	SR2	DF	SR2
All manufacturing	1.038	0.27	0.860	0.27	0.807	0.20	0.730	0.21	0.911	0.29	0.736	0.34	0.591	0.22	0.519	0.25
Food	1.181	0.22	1.013	0.18	0.655	0.09	0.585	0.08	0.959	0.22	0.792	0.21	0.597	0.08	0.572	0.09
Textiles	0.698	0.20	0.629	0.17	0.751	0.16	cannot estimate		0.568	0.16	0.463	0.15	0.475	0.13	0.438	0.15
Apparel	1.441	0.15	1.321	0.09	1.049	0.19	1.238	0.18	0.908	0.13	0.696	0.08	0.829	0.19	0.900	0.21
Leather & footwear	cannot estimate		cannot estimate		cannot estimate		cannot estimate		0.820	0.16	1.067	0.22	0.708	0.25	0.806	0.29
Chemicals & products	0.843	0.19	0.690	0.19	0.474	0.04	ns	0.02	0.918	0.22	0.820	0.24	ns	0.02	ns	0.01
Rubber products	0.851	0.18	0.722	0.14	ns	0.04	ns	0.05	0.534	0.14	0.440	0.09	0.366	0.04	0.385	0.06
Plastics & products	0.956	0.21	0.779	0.16	1.237	0.18	1.288	0.17	0.862	0.21	0.602	0.19	0.905	0.20	0.749	0.18
Nonmetallic mineral products	1.163	0.18	1.029	0.26	1.555	0.23	1.394	0.29	1.092	0.13	0.992	0.20	1.191	0.18	0.910	0.25
Metal products	0.907	0.22	0.656	0.18	0.648	0.10	0.464	0.11	1.009	0.21	0.784	0.23	0.663	0.16	0.503	0.20
General machinery	1.286	0.29	0.937	0.25	cannot estimate		cannot estimate		1.323	0.34	0.982	0.35	0.496	0.09	0.584	0.09
Electric machinery	1.157	0.48	0.945	0.43	cannot estimate		cannot estimate		1.247	0.55	1.068	0.51	0.618	0.25	0.508	0.23
Motor vehicles	1.329	0.35	1.196	0.34	cannot estimate		cannot estimate		1.106	0.23	0.846	0.22	0.581	0.12	0.591	0.15
Furniture	1.299	0.25	1.264	0.24	0.630	0.07	0.677	0.08	1.034	0.27	0.841	0.33	0.508	0.05	0.527	0.06
Jewelry	1.119	0.20	cannot estimate		0.544	0.14	ns	0.06	0.875	0.26	ns	0.18	ns	0.25	ns	0.26

Table 6: Significant Coefficients on Foreign Ownership Dummies and Goodness of Fit Measures from Estimates of Equations (e)-(h)
(see Appendix Tables C3-C4 for detailed results, including details on equations that cannot be estimated; ns=coefficient not significant at 0.05)

| | Dependent variable = DX or DXR (equations (e) or (g)) | | | | | | | | Dependent variable = DM or DMR (equations (f) or (h)) | | | | | | | |
| | All plants | | | | Large plants | | | | All plants | | | | Large plants | | | |
Indicator	DFMIN	DFMAJ	DF100	Fit	DFMIN	DFMAJ	DF100	Fit	DFMIN	DFMAJ	DF100	Fit	DFMIN	DFMAJ	DF100	Fit
PROBIT ESTIMATION (dependent variable = DX (equation (e) or DM equation (f)); Fit=R-squared																
All manufacturing	0.898	1.409	1.504	0.28	0.720	1.208	1.307	0.27	0.784	0.828	0.925	0.20	0.704	0.786	0.809	0.21
Food	1.093	1.487	1.586	0.23	0.904	1.311	1.912	0.19	ns	ns	ns	0.09	0.645	ns	0.793	0.08
Textiles	cannot estimate				cannot estimate				cannot estimate				cannot estimate			
Apparel	cannot estimate				cannot estimate				ns	ns	ns	0.19	1.268	1.317	ns	0.19
Leather & footwear	cannot estimate				cannot estimate				cannot estimate				cannot estimate			
Chemicals & products	0.709	1.304	0.916	0.20	0.559	1.046	0.756	0.19	cannot estimate				cannot estimate			
Rubber products	cannot estimate				cannot estimate				ns	ns	ns	0.07	cannot estimate			
Plastics & products	0.769	1.181	1.851	0.21	0.650	1.140	1.265	0.17	ns	ns	ns	0.18	1.472	1.078	ns	0.18
Nonmetallic mineral prod.	1.049	1.661	ns	0.19	cannot estimate				ns	ns	ns	0.23	cannot estimate			
Metal products	0.793	1.384	1.046	0.22	0.572	0.895	0.807	0.18	ns	ns	ns	0.11	0.467	ns	ns	0.11
General machinery	cannot estimate				cannot estimate				cannot estimate				cannot estimate			
Electric machinery	0.980	1.869	1.147	0.49	0.756	1.656	1.040	0.44	cannot estimate				cannot estimate			
Motor vehicles	cannot estimate				cannot estimate				cannot estimate				cannot estimate			
Furniture	1.471	ns	ns	0.25	cannot estimate				ns	ns	ns	0.07	0.771	ns	ns	0.08
Jewelry	cannot estimate				cannot estimate				ns	ns	ns	0.14	cannot estimate			
ORDERED PROBIT ESTIMATION (dependent variable = DXR (equation (g) or DMR equation (h)); Fit=Scaled R-Squared																
All manufacturing	0.761	1.173	1.412	0.30	0.575	1.007	1.256	0.35	0.525	0.721	0.781	0.22	0.442	0.695	0.694	0.26
Food	0.889	1.177	1.182	0.22	0.722	0.963	1.132	0.22	0.640	0.420	0.541	0.08	0.616	ns	0.675	0.09
Textiles	0.390	1.206	1.659	0.18	ns	1.133	1.408	0.19	0.385	0.634	1.559	0.14	0.340	0.657	1.291	0.16
Apparel	1.268	1.317	ns	0.20	1.268	1.317	ns	0.20	0.758	1.035	1.235	0.19	0.861	1.024	1.100	0.21
Leather & footwear	cannot estimate				cannot estimate				ns	0.675	1.189	0.25	ns	0.857	1.095	0.29
Chemicals & products	0.768	1.401	0.999	0.23	0.648	1.308	0.894	0.26	ns	0.835	ns	0.05	ns	0.716	ns	0.04
Rubber products	0.585	ns	1.016	0.16	0.489	ns	1.015	0.12	ns	1.185	ns	0.07	ns	1.339	ns	0.11
Plastics & products	0.694	1.089	1.262	0.22	0.436	1.042	0.743	0.20	0.757	1.222	1.191	0.21	0.613	1.134	0.806	0.19
Nonmetallic mineral prod.	0.895	1.674	2.045	0.13	cannot estimate				1.042	1.839	1.580	0.18	0.817	1.363	1.944	0.25
Metal products	0.823	1.408	1.464	0.22	0.594	1.042	1.299	0.24	0.706	ns	0.716	0.16	0.526	ns	0.571	0.19
General machinery	1.187	1.549	2.462	0.37	0.756	1.314	2.109	0.39	ns	1.009	1.511	0.12	ns	0.920	1.496	0.14
Electric machinery	0.965	1.559	1.687	0.57	0.766	1.395	1.562	0.54	0.552	0.642	0.755	0.25	0.448	0.573	0.604	0.23
Motor vehicles	0.847	1.461	2.339	0.25	0.573	1.185	1.984	0.26	0.495	0.813	ns	0.12	ns	0.793	ns	0.16
Furniture	1.097	ns	1.372	0.27	0.991	ns	ns	0.33	0.519	ns	ns	0.05	ns	ns	ns	0.07
Jewelry	0.822	0.910	1.040	0.26	ns	ns	ns	0.18	ns	ns	ns	0.25	ns	ns	ns	0.28

Appendix Table A1: Estimates of Employment and Value Added in Thailand, 1996

Industry	Labor Force Surveys-a or National Accounts	Industrial Census	
		Publication	This sample
EMPLOYMENT (NUMBER OF PRODUCTION & NON-PRODUCTION WORKERS)			
Manufacturing	4,644,150	2,413,584	1,669,504
VALUE ADDED (MILLION BAHT); NSO CLASSIFICATION (based on ISIC rev 3)			
Manufacturing	1,385,689	998,114	809,576
Food -b	107,949	113,563	96,725
Textiles	92,651	46,467	32,590
Apparel	161,443	23,940	18,813
Leather & footwear	44,044	15,752	9,642
Chemicals & products	47,970	58,880	53,110
Rubber products	22,418	36,043	32,248
Plastics & products	14,155	27,039	19,124
Non-metallic mineral products	74,422	65,018	34,914
Metal products	37,883	35,208	27,069
General machinery	55,788	38,513	32,488
Electric machinery	180,041	127,992	110,106
Office & computing machinery	51,640	28,024	24,060
Miscellaneous electric machinery	19,554	40,073	32,228
Radio, TV, communication	92,510	47,977	42,675
Precision machinery	16,337	11,918	11,142
Motor vehicles	104,165	139,673	129,402
Furniture	36,177	14,425	10,392
Jewelry	98,029	9,184	8,023
Other manufacturing industries	308,555	246,418	194,929
Beverages	86,381	69,669	61,691
Tobacco	29,555	30,669	23,651
Wood products	8,872	14,983	12,646
Paper products	22,685	32,120	27,234
Printing & publishing	15,888	30,087	12,345
Oil, coal, nuclear, etc.	104,900	33,039	31,301
Basic metals	20,744	17,822	13,397
Misc. transportation machinery	15,858	6,667	4,415
Other misc. manufacturing	3,672	11,362	8,248

Note: a=Labor Force Survey data refer to the averages of rounds 1 and 3.

b=for 1999 survey publication, one small beverage plant with 10 employees is included in food;

Sources: Compilations from plant-level data underlying National Statistical Office (1999); National Statistical Office (1999); National Economic and Social Development Board (2001).

Appendix Table B1: Number of Local and Foreign Plants by Export Propensity and Industry, 1996

Industry	All plants								Large plants							
	Local plants				Foreign plants				Local plants				Foreign plants			
	0	1-49	50-99	100	0	1-49	50-99	100	0	1-49	50-99	100	0	1-49	50-99	100
Manufacturing	5,228	884	679	423	414	400	504	420	2,265	646	502	329	305	356	452	339
Food	745	106	145	73	36	35	57	58	363	82	128	64	28	31	53	49
Textiles	343	67	40	24	39	38	34	16	140	55	26	19	24	37	31	14
Apparel	237	56	83	132	5	10	29	55	80	41	56	102	2	6	22	40
Leather & footwear	104	35	41	26	7	4	7	18	34	16	29	17	2	3	6	17
Chemicals & products	243	87	9	4	43	60	37	6	153	73	5	3	37	56	34	5
Rubber products	83	34	56	24	6	10	42	13	42	28	50	21	4	9	41	12
Plastics & products	313	73	33	12	31	30	30	17	134	56	27	10	20	28	27	10
Nonmetallic mineral products	596	46	41	6	21	15	15	6	280	27	16	2	18	14	11	5
Metal products	486	68	25	2	46	31	28	12	176	56	19	1	34	29	23	9
General machinery	256	58	17	2	22	32	35	14	109	42	16	1	15	24	33	9
Electric machinery	170	45	17	5	32	48	90	88	79	34	13	5	24	40	84	82
Office & computing machinery	1	0	1	0	2	2	8	18	1	0	1	0	0	2	8	17
Miscellaneous electric machinery	106	27	7	2	14	29	25	26	52	22	5	2	10	27	25	23
Radio, TV, communication	38	12	3	1	12	13	45	32	20	9	2	1	12	8	41	31
Precision machinery	25	6	6	2	4	4	12	12	6	3	5	2	2	3	10	11
Motor vehicles	285	29	14	2	24	36	14	2	83	21	11	2	19	35	14	2
Furniture	227	29	42	28	6	6	13	18	73	20	34	24	2	5	12	15
Jewelry	28	10	21	22	4	0	25	43	6	2	13	20	4	0	20	32
Other manufacturing industries	1,112	141	95	61	92	45	48	54	513	93	59	38	72	39	41	38
Beverages	65	14	2	0	10	2	0	0	25	9	2	0	10	2	0	0
Tobacco	24	3	3	2	0	0	1	2	1	1	1	0	0	0	1	2
Wood products	295	36	32	23	11	3	9	4	126	27	19	17	7	1	9	2
Paper products	189	20	3	4	23	5	8	4	119	15	3	1	19	5	7	1
Printing & publishing	264	14	3	0	12	4	2	0	110	11	1	0	11	3	1	0
Oil, coal, nuclear, etc.	12	1	0	0	3	7	0	0	12	1	0	0	3	7	0	0
Basic metals	118	17	5	3	21	12	2	0	62	16	4	3	16	11	2	0
Misc. transportation machinery	65	9	5	0	4	8	1	1	31	3	5	0	2	7	1	1
Other misc. manufacturing	80	27	42	29	8	4	25	43	27	10	24	17	4	3	20	32

Note: Large plants are plants with gross output equal to or exceeding 25 million baht.

Source: Compilations from plant-level data underlying National Statistical Office (1999).

Appendix Table B2: Number of Local and Foreign Plants by Import Propensity and Industry, 1996

	All plants								Large plants							
	Local plants				Foreign plants				Local plants				Foreign plants			
Industry	0	1-49	50-99	100	0	1-49	50-99	100	0	1-49	50-99	100	0	1-49	50-99	100
Manufacturing	4,165	1,726	1,179	144	319	594	725	100	1,819	1,097	738	88	222	504	644	82
Food	797	208	61	3	83	73	29	1	442	156	37	2	69	64	27	1
Textiles	278	98	85	13	24	49	46	8	120	57	55	8	14	43	42	7
Apparel	326	122	57	3	21	36	41	1	145	93	38	3	7	27	35	1
Leather & footwear	87	73	43	3	3	9	24	0	24	37	33	2	0	7	21	0
Chemicals & products	77	115	140	11	15	58	67	6	38	85	103	8	11	53	63	5
Rubber products	115	62	19	1	31	26	14	0	83	45	12	1	29	23	14	0
Plastics & products	256	101	70	4	13	41	45	9	110	65	48	4	6	35	40	4
Nonmetallic mineral products	564	95	30	0	10	29	17	1	245	58	22	0	7	27	13	1
Metal products	298	153	119	11	19	24	62	12	96	84	66	6	13	21	51	10
General machinery	137	110	80	6	11	44	45	3	55	61	47	5	4	34	40	3
Electric machinery	65	77	89	6	9	49	168	32	29	42	57	3	7	40	154	29
Office & computing machinery	0	0	2	0	0	2	21	7	0	0	2	0	0	1	20	6
Miscellaneous electric machinery	38	53	48	3	6	19	60	9	16	31	32	2	4	16	56	9
Radio, TV, communication	16	13	25	0	3	21	68	10	9	7	16	0	3	18	62	9
Precision machinery	11	11	14	3	0	7	19	6	4	4	7	1	0	5	16	5
Motor vehicles	175	72	79	4	9	34	27	6	49	39	27	2	8	32	25	5
Furniture	193	101	28	4	13	21	9	0	74	61	15	1	8	19	7	0
Jewelry	29	16	30	6	10	20	31	11	8	11	18	4	7	14	26	9
Other manufacturing industries	768	323	249	69	48	81	100	10	301	203	160	39	32	65	86	7
Beverages	59	16	6	0	2	4	6	0	23	10	3	0	2	4	6	0
Tobacco	31	1	0	0	2	1	0	0	2	1	0	0	2	1	0	0
Wood products	199	51	80	56	8	11	7	1	73	36	53	27	3	10	6	0
Paper products	143	42	30	1	17	14	8	1	80	36	22	0	11	14	6	1
Printing & publishing	153	82	46	0	3	6	9	0	60	38	24	0	3	6	6	0
Oil, coal, nuclear, etc.	4	3	6	0	2	3	4	1	4	3	6	0	2	3	4	1
Basic metals	62	40	29	12	3	11	17	4	24	29	20	12	2	7	17	3
Misc. transportation machinery	39	23	17	0	1	6	5	2	14	12	13	0	0	5	4	2
Other misc. manufacturing	78	65	35	0	10	25	44	1	21	38	19	0	7	15	37	0

Note: Large plants are plants with gross output equal to or exceeding 25 million baht.

Source: Compilations from plant-level data underlying National Statistical Office (1999).

Appendix Table B3a: Number of Foreign Plants by Foreign Ownership Share, Export Propensity, and Industry, All Plants, 1996

Industry	Minority-foreign				Majority-foreign				Wholly foreign			
	0	1-49	50-99	100	0	1-49	50-99	100	0	1-49	50-99	100
Manufacturing	344	311	267	181	46	59	142	104	24	30	95	135
Food	31	25	44	37	3	5	9	14	2	5	4	7
Textiles	38	35	20	7	1	3	10	5	0	0	4	4
Apparel	5	10	23	37	0	0	6	11	0	0	0	7
Leather & footwear	5	3	3	5	2	1	4	6	0	0	0	7
Chemicals & products	32	41	18	3	5	10	14	2	6	9	5	1
Rubber products	4	6	29	8	2	3	8	0	0	1	5	5
Plastics & products	25	20	12	7	5	6	7	4	1	4	11	6
Nonmetallic mineral products	18	14	9	2	2	1	6	2	1	0	0	2
Metal products	37	26	8	4	4	4	10	3	5	1	10	5
General machinery	19	28	14	6	3	3	11	1	0	1	10	7
Electric machinery	23	32	27	17	3	9	31	24	6	7	32	47
Office & computing machinery	0	0	2	1	0	1	4	3	2	1	2	14
Miscellaneous electric machinery	12	22	9	5	1	4	12	9	1	3	4	12
Radio, TV, communication	7	6	14	8	2	4	9	11	3	3	22	13
Precision machinery	4	4	2	3	0	0	6	1	0	0	4	8
Motor vehicles	22	26	5	1	2	9	7	1	0	1	2	0
Furniture	4	5	10	10	1	1	3	3	1	0	0	5
Jewelry	4	0	14	20	0	0	6	12	0	0	5	11
Other manufacturing industries	77	40	31	17	13	4	10	16	2	1	7	21
Beverages	9	2	0	0	1	0	0	0	0	0	0	0
Tobacco	0	0	1	1	0	0	0	0	0	0	0	1
Wood products	10	2	8	3	1	1	1	1	0	0	0	0
Paper products	17	5	6	2	6	0	1	2	0	0	1	0
Printing & publishing	10	4	1	0	2	0	0	0	0	0	1	0
Oil, coal, nuclear, etc.	3	5	0	0	0	2	0	0	0	0	0	0
Basic metals	20	10	2	0	0	1	0	0	1	1	0	0
Misc. transportation machinery	4	8	0	1	0	0	1	0	0	0	0	0
Other misc. manufacturing	4	4	13	10	3	0	7	13	1	0	5	20

Note: Large plants are plants with gross output equal to or exceeding 25 million baht.

Source: Compilations from plant-level data underlying National Statistical Office (1999).

Appendix Table B3b: Number of Foreign Plants by Foreign Ownership Share, Export Propensity, and Industry, Large Plants, 1996

Industry	Minority-foreign				Majority-foreign				Wholly foreign			
	0	1-49	50-99	100	0	1-49	50-99	100	0	1-49	50-99	100
Manufacturing	250	277	235	142	37	51	130	83	18	28	87	114
Food	25	22	41	33	2	4	8	10	1	5	4	6
Textiles	23	34	18	6	1	3	9	5	0	0	4	3
Apparel	2	6	17	28	0	0	5	6	0	0	0	6
Leather & footwear	2	2	3	5	0	1	3	5	0	0	0	7
Chemicals & products	26	38	16	2	5	9	13	2	6	9	5	1
Rubber products	2	5	29	7	2	3	7	0	0	1	5	5
Plastics & products	16	20	11	4	3	5	7	4	1	3	9	2
Nonmetallic mineral products	16	13	7	1	2	1	4	2	0	0	0	2
Metal products	26	24	5	3	4	4	9	2	4	1	9	4
General machinery	12	22	12	2	3	1	11	1	0	1	10	6
Electric machinery	18	27	23	14	2	7	30	23	4	6	31	45
Office & computing machinery	0	0	2	1	0	1	4	3	0	1	2	13
Miscellaneous electric machinery	9	20	9	4	0	4	12	8	1	3	4	11
Radio, TV, communication	7	4	11	7	2	2	9	11	3	2	21	13
Precision machinery	2	3	1	2	0	0	5	1	0	0	4	8
Motor vehicles	17	25	5	1	2	9	7	1	0	1	2	0
Furniture	0	4	9	8	1	1	3	2	1	0	0	5
Jewelry	4	0	11	17	0	0	5	9	0	0	4	6
Other manufacturing industries	61	35	28	11	10	3	9	11	1	1	4	16
Beverages	9	2	0	0	1	0	0	0	0	0	0	0
Tobacco	0	0	1	1	0	0	0	0	0	0	0	1
Wood products	7	1	8	1	0	0	1	1	0	0	0	0
Paper products	13	5	6	1	6	0	1	0	0	0	0	0
Printing & publishing	9	3	1	0	2	0	0	0	0	0	0	0
Oil, coal, nuclear, etc.	3	5	0	0	0	2	0	0	0	0	0	0
Basic metals	16	9	2	0	0	1	0	0	0	1	0	0
Misc. transportation machinery	2	7	0	1	0	0	1	0	0	0	0	0
Other misc. manufacturing	2	3	10	7	1	0	6	10	1	0	4	15

Note: Large plants are plants with gross output equal to or exceeding 25 million baht.

Source: Compilations from plant-level data underlying National Statistical Office (1999).

Appendix Table B4a: Number of Foreign Plants by Foreign Ownership Share, Import Propensity, and Industry, All Plants, 1996

Industry	Minority-foreign				Majority-foreign				Wholly foreign			
	0	1-49	50-99	100	0	1-49	50-99	100	0	1-49	50-99	100
Manufacturing	235	457	365	46	54	79	196	22	30	58	164	32
Food	58	56	22	1	17	9	5	0	8	8	2	0
Textiles	23	40	33	4	1	8	9	1	0	1	4	3
Apparel	17	31	26	1	3	5	9	0	1	0	6	0
Leather & footwear	1	6	9	0	2	2	9	0	0	1	6	0
Chemicals & products	12	43	38	1	0	8	19	4	3	7	10	1
Rubber products	25	15	7	0	1	6	6	0	5	5	1	0
Plastics & products	9	33	19	3	3	3	14	2	1	5	12	4
Nonmetallic mineral products	8	26	9	0	1	2	8	0	1	1	0	1
Metal products	13	17	36	9	4	3	13	1	2	4	13	2
General machinery	10	37	20	0	1	5	10	2	0	2	15	1
Electric machinery	4	30	55	10	4	5	52	6	1	14	61	16
Office & computing machinery	0	0	1	2	0	1	5	2	0	1	15	3
Miscellaneous electric machinery	3	15	25	5	2	0	22	2	1	4	13	2
Radio, TV, communication	1	9	23	2	2	3	19	2	0	9	26	6
Precision machinery	0	6	6	1	0	1	6	0	0	0	7	5
Motor vehicles	7	28	14	5	2	4	12	1	0	2	1	0
Furniture	8	16	5	0	3	4	1	0	2	1	3	0
Jewelry	7	15	12	4	1	3	10	4	2	2	9	3
Other manufacturing industries	33	64	60	8	11	12	19	1	4	5	21	1
Beverages	2	4	5	0	0	0	1	0	0	0	0	0
Tobacco	1	1	0	0	0	0	0	0	1	0	0	0
Wood products	7	9	6	1	1	2	1	0	0	0	0	0
Paper products	12	11	6	1	4	3	2	0	1	0	0	0
Printing & publishing	2	5	8	0	1	1	0	0	0	0	1	0
Oil, coal, nuclear, etc.	2	3	3	0	0	0	1	1	0	0	0	0
Basic metals	3	9	16	4	0	1	0	0	0	1	1	0
Misc. transportation machinery	1	6	4	2	0	0	1	0	0	0	0	0
Other misc. manufacturing	3	16	12	0	5	5	13	0	2	4	19	1

Note: Large plants are plants with gross output equal to or exceeding 25 million baht.

Source: Compilations from plant-level data underlying National Statistical Office (1999).

Appendix Table B4b: Number of Foreign Plants by Foreign Ownership Share, Import Propensity, and Industry, Large Plants, 1996

Industry	Minority-foreign				Majority-foreign				Wholly foreign			
	0	1-49	50-99	100	0	1-49	50-99	100	0	1-49	50-99	100
Manufacturing	163	386	317	38	36	66	179	20	23	52	148	24
Food	49	50	21	1	14	6	4	0	6	8	2	0
Textiles	13	35	29	4	1	7	9	1	0	1	4	2
Apparel	5	24	23	1	1	3	7	0	1	0	5	0
Leather & footwear	0	4	8	0	0	2	7	0	0	1	6	0
Chemicals & products	8	38	35	1	0	8	18	3	3	7	10	1
Rubber products	24	12	7	0	0	6	6	0	5	5	1	0
Plastics & products	3	30	16	2	2	2	14	1	1	3	10	1
Nonmetallic mineral products	6	24	7	0	1	2	6	0	0	1	0	1
Metal products	9	14	28	7	2	3	13	1	2	4	10	2
General machinery	3	27	18	0	1	5	8	2	0	2	14	1
Electric machinery	4	23	46	9	2	4	50	6	1	13	58	14
Office & computing machinery	0	0	1	2	0	1	5	2	0	0	14	2
Miscellaneous electric machinery	3	12	22	5	0	0	22	2	1	4	12	2
Radio, TV, communication	1	7	19	2	2	2	18	2	0	9	25	5
Precision machinery	0	4	4	0	0	1	5	0	0	0	7	5
Motor vehicles	6	26	12	4	2	4	12	1	0	2	1	0
Furniture	4	14	3	0	2	4	1	0	2	1	3	0
Jewelry	6	12	11	3	1	1	8	4	0	1	7	2
Other manufacturing industries	23	53	53	6	7	9	16	1	2	3	17	0
Beverages	2	4	5	0	0	0	1	0	0	0	0	0
Tobacco	1	1	0	0	0	0	0	0	1	0	0	0
Wood products	3	9	5	0	0	1	1	0	0	0	0	0
Paper products	8	11	5	1	3	3	1	0	0	0	0	0
Printing & publishing	2	5	6	0	1	1	0	0	0	0	0	0
Oil, coal, nuclear, etc.	2	3	3	0	0	0	1	1	0	0	0	0
Basic metals	2	6	16	3	0	1	0	0	0	0	1	0
Misc. transportation machinery	0	5	3	2	0	0	1	0	0	0	0	0
Other misc. manufacturing	3	9	10	0	3	3	11	0	1	3	16	0

Note: Large plants are plants with gross output equal to or exceeding 25 million baht.

Source: Compilations from plant-level data underlying National Statistical Office (1999).

Table C1: Probit or Ordered Probit Estimation of Equations (a)-(d) for All Manufacturing Combined

Independent Variables, Indicator	Probit Estimation of Equation (a), Dep. Var.=DX				Probit Estimation of Equation (b), Dep. Var.=DM				Ordered Probit Estimation of Equation (c), Dep. Var.=DXR				Ordered Probit Estimation of Equation (d), Dep. Var.=DMR			
	All plants		Large plants		All plants		Large plants		All plants		Large plants		All plants		Large plants	
	Coefficients, etc.	Significance	Coefficients, etc.	Significance	Coefficients, etc.	Significance	Coefficients, etc.	Significance	Coefficients, etc.	Significance	Coefficients, etc.	Significance	Coefficients, etc.	Significance	Coefficients, etc.	Significance
Constant	-0.5359	0.00	-0.1797	0.00	-0.9599	0.00	-0.8312	0.00	-0.2846	0.00	0.1827	0.00	-0.8620	0.00	-0.7102	0.00
K/E	0.0037	0.70	-0.0018	0.83	0.0345	0.01	0.0151	0.25	-0.0005	0.42	-0.0119	0.04	-0.0005	0.44	0.0149	0.02
ES/E	-1.0805	0.00	-1.2785	0.00	0.1847	0.07	0.0756	0.57	-1.3725	0.00	-1.6314	0.00	0.1544	0.08	0.0286	0.79
AGE	0.0093	0.00	0.0099	0.00	0.0098	0.00	0.0116	0.00	0.0043	0.00	0.0025	0.15	0.0064	0.00	0.0069	0.00
DLG	0.8565	0.00	0.7195	0.00	0.6416	0.00	0.5432	0.00	0.2732	0.00	0.2504	0.00	0.1707	0.03	0.0958	0.24
DBOI	0.8859	0.00	0.7831	0.00	0.5523	0.00	0.4979	0.00	0.7011	0.00	0.6167	0.00	0.4970	0.00	0.4468	0.00
DF	1.0383	0.00	0.8597	0.00	0.8069	0.00	0.7302	0.00	0.9110	0.00	0.7364	0.00	0.5908	0.00	0.5194	0.00
Dtextiles	-0.1292	0.06	-0.1078	0.21	0.5699	0.00	0.6524	0.00	-0.2687	0.00	-0.3148	0.00	0.6378	0.00	0.7558	0.00
Dapparel	0.6686	0.00	0.7880	0.00	0.4844	0.00	0.6800	0.00	0.7356	0.00	0.8402	0.00	0.4524	0.00	0.6355	0.00
Dleather & footwear	0.4521	0.00	0.4682	0.00	0.9939	0.00	1.3538	0.00	0.3931	0.00	0.4216	0.00	0.8828	0.00	1.1842	0.00
Dchemicals	-0.0119	0.87	-0.1297	0.13	1.3646	0.00	1.4423	0.00	-0.2670	0.00	-0.4106	0.00	1.1858	0.00	1.2358	0.00
Drubber	0.6141	0.00	0.6061	0.00	0.2904	0.00	0.1388	0.17	0.3583	0.00	0.2894	0.00	0.2558	0.00	0.1494	0.11
Dplastics	-0.0936	0.19	-0.0704	0.43	0.6086	0.00	0.7678	0.00	-0.2663	0.00	-0.3238	0.00	0.6222	0.00	0.7814	0.00
Dnonmetallic	-0.5348	0.00	-0.8201	0.00	-0.0708	0.28	0.0379	0.66	-0.6335	0.00	-0.9460	0.00	-0.0856	0.17	0.0269	0.73
Dmetal products	-0.4390	0.00	-0.3762	0.00	0.7667	0.00	0.9338	0.00	-0.5961	0.00	-0.6185	0.00	0.8143	0.00	0.9977	0.00
Dgeneral machinery	-0.1322	0.09	-0.1293	0.19	1.0054	0.00	1.1300	0.00	-0.3487	0.00	-0.4160	0.00	0.8912	0.00	1.0102	0.00
Delectric machinery	0.0441	0.58	0.0598	0.53	1.3854	0.00	1.4327	0.00	-0.0840	0.19	-0.0754	0.31	1.2503	0.00	1.3786	0.00
Dmotor vehicles	-0.5633	0.00	-0.4386	0.00	0.7172	0.00	0.8055	0.00	-0.7456	0.00	-0.7118	0.00	0.7356	0.00	0.7698	0.00
Dfurniture	0.0545	0.50	0.2519	0.02	0.5243	0.00	0.6176	0.00	0.0569	0.43	0.2351	0.01	0.4242	0.00	0.4661	0.00
Djewelry	0.9182	0.00	1.0074	0.00	1.0369	0.00	1.1911	0.00	0.9070	0.00	1.0537	0.00	1.1722	0.00	1.3677	0.00
Dother manufacturing	-0.3044	0.00	-0.4670	0.00	0.6378	0.00	0.7650	0.00	-0.3342	0.00	-0.4971	0.00	0.7351	0.00	0.8718	0.00
(Scaled) R-squared-a	0.2719	-	0.2696	-	0.1969	-	0.2135	-	0.2946	-	0.3352	-	0.2165	-	0.2531	-
Log likelihood ratio	-4,609	-	-2,812	-	-5,231	-	-2,865	-	-8,044	-	-5,466	-	-9,024	-	-5,488	-
Observations	8,952	-	5,194	-	8,952	-	5,194	-	8,952	-	5,194	-	8,952	-	5,194	-

a-R-squared for equations (a) and (b), scaled R-squared for equations (c) and (d).

Table C2: Probit of Ordered Probit Estimation of Equations (a)-(d) by Industry (1/7)

Independent Variables, Indicator	Probit Estimation of Equation (a), Dep. Var.=DX				Probit Estimation of Equation (b), Dep. Var.=DM				Ordered Probit Estimation of Equation (c), Dep. Var.=DXR				Ordered Probit Estimation of Equation (d), Dep. Var.=DMR			
	All plants		Large plants		All plants		Large plants		All plants		Large plants		All plants		Large plants	
	Coeffi-cients, etc.	Sig-nifi-cance	Coeffi-cients, etc.	Sig-nifi-cance	Coeffi-cients, etc.	Sig-nifi-cance	Coeffi-cients, etc.	Sig-nifi-cance	Coeffi-cients, etc.	Sig-nifi-cance	Coeffi-cients, etc.	Sig-nifi-cance	Coeffi-cients, etc.	Sig-nifi-cance	Coeffi-cients, etc.	Sig-nifi-cance
FOOD																
Constant	-0.3993	0.00	-0.0396	0.71	-0.8420	0.00	-0.6959	0.00	-0.2542	0.00	0.1342	0.16	-0.8220	0.00	-0.7047	0.00
K/E	-0.0516	0.11	-0.0554	0.07	-0.0137	0.60	-0.0131	0.61	-0.0560	0.04	-0.0625	0.02	-0.0180	0.46	-0.0187	0.44
ES/E	-1.3779	0.00	-1.7909	0.00	0.5728	0.02	0.5799	0.04	-1.6056	0.00	-2.0494	0.00	0.6312	0.00	0.6707	0.01
AGE	0.0035	0.33	0.0119	0.01	-0.0006	0.87	-0.0010	0.81	0.0005	0.88	0.0074	0.06	-0.0010	0.77	-0.0006	0.89
DLG	0.9694	0.00	0.5302	0.01	0.6394	0.00	0.5179	0.00	0.5585	0.00	0.2480	0.10	0.5597	0.00	0.5606	0.00
DBOI	0.6649	0.00	0.4429	0.00	0.3619	0.00	0.3406	0.01	0.5847	0.00	0.4151	0.00	0.2861	0.01	0.2790	0.01
DF	1.1810	0.00	1.0130	0.00	0.6548	0.00	0.5845	0.00	0.9592	0.00	0.7919	0.00	0.5974	0.00	0.5722	0.00
(Scaled) R-squared-a	0.2243	-	0.1847	-	0.0886	-	0.0791	-	0.2194	-	0.2136	-	0.0777	-	0.0850	-
Log likelihood ratio	-690	-	-473	-	-714	-	-491	-	-1,197	-	-898	-	-944	-	-655	-
Observations	1,255	-	798	-	1,255	-	798	-	1,255	-	798	-	1,255	-	798	-
TEXTILES																
Constant	-0.9382	0.00	-0.4652	0.01	-0.4961	0.00	CANNOT BE		-0.6299	0.00	-0.0921	0.52	-0.3041	0.00	0.0960	0.49
K/E	0.1173	0.23	0.0574	0.56	0.1697	0.13	ESTIMATED		-0.0064	0.85	-0.0069	0.84	0.0088	0.79	0.0132	0.70
ES/E	-0.1158	0.82	-0.4988	0.43	0.4740	0.34	BECAUSE		-0.6237	0.20	-1.1753	0.04	0.2294	0.59	-0.6470	0.22
AGE	0.0196	0.00	0.0156	0.03	0.0069	0.22	DLG>0		0.0093	0.06	0.0037	0.51	0.0050	0.29	0.0013	0.81
DLG	0.7409	0.01	0.7095	0.10	1.2268	0.00	PERFECTLY		0.1261	0.54	0.0238	0.93	0.3810	0.06	0.4135	0.11
DBOI	0.9346	0.00	0.7887	0.00	0.8046	0.00	PREDICTS		0.8185	0.00	0.7092	0.00	0.6402	0.00	0.5975	0.00
DF	0.6984	0.00	0.6292	0.00	0.7511	0.00	DM=1		0.5680	0.00	0.4629	0.00	0.4753	0.00	0.4381	0.00
(Scaled) R-squared-a	0.2028	-	0.1667	-	0.1581	-	-	-	0.1580	-	0.1527	-	0.1289	-	0.1463	-
Log likelihood ratio	-331	-	-207	-	-362	-	-	-	-570	-	-397	-	-645	-	-395	-
Observations	601	-	346	-	601	-	346	-	601	-	346	-	601	-	346	-

a-R-squared for equations (a) and (b), scaled R-squared for equations (c) and (d).

Independent Variables, Indicator	Probit Estimation of Equation (a), Dep. Var.=DX				Probit Estimation of Equation (b), Dep. Var.=DM				Ordered Probit Estimation of Equation (c), Dep. Var.=DXR				Ordered Probit Estimation of Equation (d), Dep. Var.=DMR			
	All plants		Large plants		All plants		Large plants		All plants		Large plants		All plants		Large plants	
	Coefficients, etc.	Significance	Coefficients, etc.	Significance	Coefficients, etc.	Significance	Coefficients, etc.	Significance	Coefficients, etc.	Significance	Coefficients, etc.	Significance	Coefficients, etc.	Significance	Coefficients, etc.	Significance
APPAREL																
Constant	-0.0818	0.49	0.2751	0.11	-0.7714	0.00	-0.5326	0.00	0.1292	0.22	0.6982	0.00	-0.6116	0.00	-0.3008	0.04
K/E	-0.0525	0.87	0.5229	0.37	0.1567	0.61	0.4083	0.44	-0.2701	0.29	-0.1572	0.66	0.2906	0.27	0.5675	0.14
ES/E	-0.8100	0.10	-0.1899	0.78	-0.3587	0.46	-0.3715	0.56	-1.0878	0.01	-1.1135	0.04	-0.5092	0.26	-0.6564	0.26
AGE	0.0268	0.00	0.0228	0.06	0.0375	0.00	0.0399	0.00	0.0168	0.02	0.0088	0.32	0.0253	0.00	0.0237	0.01
DLG	0.8588	0.02	0.4551	0.38	1.0803	0.00	0.4842	0.27	0.1484	0.48	-0.2418	0.39	0.2985	0.15	-0.0092	0.97
DBOI	0.3202	0.21	0.0331	0.91	0.8884	0.00	0.7227	0.01	0.3412	0.07	0.1226	0.56	0.9500	0.00	0.7823	0.00
DF	1.4409	0.00	1.3208	0.00	1.0495	0.00	1.2380	0.00	0.9077	0.00	0.6956	0.00	0.8286	0.00	0.9000	0.00
(Scaled) R-squared-a	0.1473	-	0.0900	-	0.1903	-	0.1848	-	0.1272	-	0.0795	-	0.1877	-	0.2131	-
Log likelihood ratio	-358	-	-172	-	-352	-	-203	-	-738	-	-443	-	-546	-	-347	-
Observations	607	-	349	-	607	-	349	-	607	-	349	-	607	-	349	-
LEATHER AND FOOTWEAR																
Constant	CANNOT BE ESTIMATED BECAUSE DLG>0 PERFECTLY PREDICTS DX=1		CANNOT BE ESTIMATED BECAUSE DLG>0 PERFECTLY PREDICTS DX=1		CANNOT BE ESTIMATED BECAUSE DLG>0 PERFECTLY PREDICTS DM=1		CANNOT BE ESTIMATED BECAUSE DLG>0 PERFECTLY PREDICTS DM=1		-0.0437	0.79	0.5167	0.04	-0.0688	0.67	0.2725	0.28
K/E									0.0331	0.92	-0.1797	0.64	0.9842	0.01	1.3856	0.00
ES/E									-1.1031	0.10	-2.3404	0.03	-1.3283	0.05	-1.5704	0.14
AGE									0.0105	0.26	0.0163	0.19	0.0222	0.02	0.0269	0.04
DLG									0.4254	0.18	0.0385	0.93	0.2072	0.53	-0.2555	0.57
DBOI									0.5453	0.01	0.2574	0.28	1.0249	0.00	0.8753	0.00
DF									0.8196	0.00	1.0670	0.00	0.7081	0.00	0.8064	0.00
(Scaled) R-squared-a	-	-	-	-	-	-	-	-	0.1568	-	0.2168	-	0.2489	-	0.2852	-
Log likelihood ratio	-	-	-	-	-	-	-	-	-290	-	-154	-	-244	-	-119	-
Observations	242	-	124	-	242	-	124	-	242	-	124	-	242	-	124	-

a-R-squared for equations (a) and (b), scaled R-squared for equations (c) and (d).

Independent Variables, Indicator	Probit Estimation of Equation (a), Dep. Var.=DX				Probit Estimation of Equation (b), Dep. Var.=DM				Ordered Probit Estimation of Equation (c), Dep. Var.=DXR				Ordered Probit Estimation of Equation (d), Dep. Var.=DMR			
	All plants		Large plants		All plants		Large plants		All plants		Large plants		All plants		Large plants	
	Coefficients, etc.	Significance	Coefficients, etc.	Significance	Coefficients, etc.	Significance	Coefficients, etc.	Significance	Coefficients, etc.	Significance	Coefficients, etc.	Significance	Coefficients, etc.	Significance	Coefficients, etc.	Significance
CHEMICALS & PRODUCTS																
Constant	-0.6614	0.00	-0.4929	0.00	0.3545	0.02	0.6658	0.00	-0.5019	0.00	-0.2965	0.06	0.5950	0.00	0.8544	0.00
K/E	0.1075	0.03	0.1058	0.05	-0.0078	0.72	-0.0153	0.46	0.0097	0.50	0.0056	0.71	0.0147	0.34	0.0110	0.48
ES/E	-0.3114	0.38	-0.3524	0.37	0.9948	0.01	0.4938	0.29	-0.6123	0.05	-0.6634	0.06	0.4461	0.11	0.2171	0.49
AGE	0.0053	0.33	0.0036	0.59	0.0097	0.10	0.0120	0.15	0.0036	0.48	-0.0002	0.98	0.0061	0.17	0.0081	0.14
DLG	0.4625	0.26	0.4341	0.30	0.5325	0.34	0.4236	0.45	0.0137	0.96	0.0011	1.00	-0.0616	0.82	-0.1032	0.71
DBOI	0.4796	0.01	0.5908	0.00	0.1003	0.63	0.1502	0.55	0.6334	0.00	0.7360	0.00	0.0889	0.55	0.0957	0.56
DF	0.8434	0.00	0.6903	0.00	0.4742	0.01	0.3812	0.06	0.9177	0.00	0.8202	0.00	0.2082	0.08	0.1481	0.26
(Scaled) R-squared-a	0.1923	-	0.1865	-	0.0445	-	0.0224	-	0.2202	-	0.2392	-	0.0233	-	0.0149	-
Log likelihood ratio	-282	-	-216	-	-225	-	-139	-	-421	-	-330	-	-563	-	-405	-
Observations	489	-	366	-	489	-	366	-	489	-	366	-	489	-	366	-
RUBBER PRODUCTS																
Constant	0.2832	0.12	0.5279	0.01	-0.2892	0.09	-0.2638	0.18	0.3379	0.03	0.6025	0.00	-0.2233	0.16	-0.2416	0.19
K/E	0.0700	0.43	0.0105	0.90	0.2402	0.05	0.2210	0.10	-0.0068	0.79	-0.0131	0.61	0.0665	0.01	0.0604	0.03
ES/E	-1.4104	0.04	-0.1925	0.82	-0.1581	0.81	0.2856	0.72	-0.7349	0.19	0.2823	0.66	0.0065	0.99	0.4987	0.46
AGE	-0.0043	0.64	-0.0097	0.36	0.0012	0.88	-0.0071	0.44	-0.0049	0.49	-0.0086	0.28	0.0003	0.97	-0.0055	0.52
DLG	0.7960	0.14	0.6213	0.24	-0.1928	0.60	-0.0661	0.86	0.2341	0.45	0.1933	0.54	-0.4071	0.24	-0.3182	0.36
DBOI	0.8311	0.00	0.6934	0.01	-0.0357	0.85	-0.0512	0.81	0.5287	0.00	0.3651	0.04	-0.0199	0.91	-0.0138	0.94
DF	0.8506	0.00	0.7219	0.01	0.3492	0.07	0.3521	0.09	0.5343	0.00	0.4403	0.01	0.3663	0.04	0.3848	0.04
(Scaled) R-squared-a	0.1763	-	0.1356	-	0.0382	-	0.0469	-	0.1382	-	0.0936	-	0.0446	-	0.0608	-
Log likelihood ratio	-144	-	-96	-	-179	-	-137	-	-330	-	-258	-	-255	-	-197	-
Observations	268	-	207	-	268	-	207	-	268	-	207	-	268	-	207	-

a-R-squared for equations (a) and (b), scaled R-squared for equations (c) and (d).

Table C2 (continued, 4/7)

Independent Variables, Indicator	Probit Estimation of Equation (a), Dep. Var.=DX				Probit Estimation of Equation (b), Dep. Var.=DM				Ordered Probit Estimation of Equation (c), Dep. Var.=DXR				Ordered Probit Estimation of Equation (d), Dep. Var.=DMR			
	All plants		Large plants		All plants		Large plants		All plants		Large plants		All plants		Large plants	
	Coefficients, etc.	Significance	Coefficients, etc.	Significance	Coefficients, etc.	Significance	Coefficients, etc.	Significance	Coefficients, etc.	Significance	Coefficients, etc.	Significance	Coefficients, etc.	Significance	Coefficients, etc.	Significance
PLASTICS & PRODUCTS																
Constant	-0.6989	0.00	-0.1734	0.31	-0.5505	0.00	-0.1183	0.50	-0.5255	0.00	0.0212	0.89	-0.3810	0.00	0.0757	0.61
K/E	0.1311	0.22	0.0231	0.83	0.1796	0.11	0.0809	0.49	0.0373	0.63	-0.0059	0.94	0.0939	0.21	0.0543	0.50
ES/E	-1.0521	0.05	-1.0769	0.08	0.2203	0.66	0.0352	0.96	-1.1523	0.01	-1.1548	0.03	0.0623	0.88	-0.0310	0.95
AGE	0.0113	0.21	-0.0019	0.86	0.0156	0.07	0.0024	0.82	0.0011	0.89	-0.0132	0.16	0.0086	0.25	-0.0042	0.63
DLG	0.9260	0.01	0.7656	0.02	0.5855	0.12	0.4459	0.23	0.4085	0.09	0.3684	0.13	-0.0299	0.90	-0.0489	0.84
DBOI	0.7304	0.00	0.6424	0.00	0.6441	0.00	0.6148	0.02	0.7688	0.00	0.7194	0.00	0.6753	0.00	0.6077	0.00
DF	0.9556	0.00	0.7793	0.00	1.2368	0.00	1.2884	0.00	0.8619	0.00	0.6022	0.00	0.9053	0.00	0.7485	0.00
(Scaled) R-squared-a	0.2052	-	0.1627	-	0.1832	-	0.1742	-	0.2123	-	0.1886	-	0.1999	-	0.1808	-
Log likelihood ratio	-297	-	-189	-	-317	-	-173	-	-484	-	-337	-	-545	-	-339	-
Observations	539	-	312	-	539	-	312	-	539	-	312	-	539	-	312	-
NONMETALLIC MINERAL PRODUCTS																
Constant	-1.2416	0.00	-1.3309	0.00	-1.0955	0.00	-0.9571	0.00	-1.0816	0.00	-1.1297	0.00	-1.0409	0.00	-0.8873	0.00
K/E	0.1088	0.08	0.0704	0.36	0.0643	0.24	-0.0057	0.93	0.0183	0.71	-0.0272	0.65	0.0660	0.18	0.0250	0.67
ES/E	-1.1341	0.01	-0.8802	0.11	-0.7389	0.06	-0.5579	0.26	-1.3015	0.00	-0.9164	0.07	-0.4122	0.24	-0.1350	0.75
AGE	0.0193	0.01	0.0178	0.07	0.0187	0.01	0.0203	0.03	0.0144	0.03	0.0113	0.22	0.0111	0.08	0.0109	0.18
DLG	0.6431	0.04	0.7892	0.02	0.8257	0.01	0.7992	0.02	0.1851	0.51	0.3770	0.21	0.4152	0.12	0.4147	0.13
DBOI	0.6982	0.00	0.9553	0.00	0.9429	0.00	1.2852	0.00	0.6333	0.00	0.8947	0.00	0.8665	0.00	1.1682	0.00
DF	1.1634	0.00	1.0293	0.00	1.5545	0.00	1.3943	0.00	1.0916	0.00	0.9923	0.00	1.1914	0.00	0.9100	0.00
(Scaled) R-squared-a	0.1834	-	0.2612	-	0.2287	-	0.2870	-	0.1251	-	0.1980	-	0.1758	-	0.2483	-
Log likelihood ratio	-291	-	-146	-	-330	-	-182	-	-417	-	-218	-	-442	-	-264	-
Observations	746	-	373	-	746	-	373	-	746	-	373	-	746	-	373	-

a-R-squared for equations (a) and (b), scaled R-squared for equations (c) and (d).

Table C2 (continued, 5/7)

Independent Variables, Indicator	Probit Estimation of Equation (a), Dep. Var.=DX				Probit Estimation of Equation (b), Dep. Var.=DM				Ordered Probit Estimation of Equation (c), Dep. Var.=DXR				Ordered Probit Estimation of Equation (d), Dep. Var.=DMR			
	All plants		Large plants		All plants		Large plants		All plants		Large plants		All plants		Large plants	
	Coefficients, etc.	Significance	Coefficients, etc.	Significance	Coefficients, etc.	Significance	Coefficients, etc.	Significance	Coefficients, etc.	Significance	Coefficients, etc.	Significance	Coefficients, etc.	Significance	Coefficients, etc.	Significance
METAL PRODUCTS																
Constant	-0.8386	0.00	-0.2878	0.09	-0.2090	0.06	-0.0938	0.59	-0.6921	0.00	-0.1026	0.51	-0.1729	0.08	0.0162	0.91
K/E	0.0020	0.98	0.0041	0.96	0.2099	0.05	0.1771	0.16	-0.0957	0.17	-0.0946	0.20	0.1123	0.07	0.1213	0.08
ES/E	-1.4537	0.01	-2.3567	0.00	-0.0998	0.81	-0.1643	0.78	-1.6324	0.00	-2.5448	0.00	0.0694	0.85	-0.0477	0.92
AGE	0.0023	0.73	0.0054	0.56	0.0091	0.12	0.0287	0.01	-0.0052	0.42	-0.0054	0.52	0.0072	0.16	0.0189	0.01
DLG	0.2582	0.39	0.0740	0.81	0.6615	0.11	0.4105	0.32	0.2212	0.38	0.1111	0.67	0.2981	0.22	0.2110	0.40
DBOI	1.0951	0.00	0.9164	0.00	0.7921	0.00	0.6933	0.01	0.9524	0.00	0.8536	0.00	0.6862	0.00	0.6824	0.00
DF	0.9073	0.00	0.6562	0.00	0.6481	0.00	0.4636	0.03	1.0092	0.00	0.7841	0.00	0.6627	0.00	0.5030	0.00
(Scaled) R-squared-a	0.2167	-	0.1770	-	0.1041	-	0.1147	-	0.2090	-	0.2318	-	0.1582	-	0.1957	-
Log likelihood ratio	-317	-	-201	-	-440	-	-194	-	-453	-	-306	-	-758	-	-392	-
Observations	698	-	347	-	698	-	347	-	698	-	347	-	698	-	347	-
GENERAL MACHINERY																
Constant	-0.9241	0.00	-0.5406	0.01	CANNOT BE		CANNOT BE		-0.7843	0.00	-0.3869	0.03	0.0871	0.48	0.3367	0.05
K/E	0.0132	0.75	-0.0066	0.87	ESTIMATED		ESTIMATED		0.0323	0.24	0.0167	0.56	0.0147	0.58	0.0131	0.63
ES/E	-0.8058	0.13	-0.9070	0.17	BECAUSE		BECAUSE		-1.2534	0.01	-1.2028	0.03	0.8122	0.05	0.4100	0.44
AGE	0.0234	0.01	0.0202	0.06	DLG>0		DLG>0		0.0184	0.01	0.0115	0.20	0.0022	0.72	0.0090	0.28
DLG	0.6008	0.32	0.6665	0.30	PERFECTLY		PERFECTLY		0.0335	0.91	0.1260	0.70	-0.1065	0.73	-0.2553	0.42
DBOI	0.8454	0.00	0.9560	0.00	PREDICTS		PREDICTS		0.7212	0.00	0.8739	0.00	0.4104	0.02	0.2671	0.20
DF	1.2858	0.00	0.9366	0.00	DM=1		DM=1		1.3234	0.00	0.9822	0.00	0.4960	0.00	0.5837	0.00
(Scaled) R-squared-a	0.2862	-	0.2464	-	-	-	-	-	0.3401	-	0.3479	-	0.0875	-	0.0913	-
Log likelihood ratio	-219	-	-137	-	-	-	-	-	-349	-	-237	-	-492	-	-284	-
Observations	436	-	249	-	436	-	249	-	436	-	249	-	436	-	249	-

a-R-squared for equations (a) and (b), scaled R-squared for equations (c) and (d).

Table C2 (continued, 6/7)

Independent Variables, Indicator	Probit Estimation of Equation (a), Dep. Var.=DX				Probit Estimation of Equation (b), Dep. Var.=DM				Ordered Probit Estimation of Equation (c), Dep. Var.=DXR				Ordered Probit Estimation of Equation (d), Dep. Var.=DMR			
	All plants		Large plants		All plants		Large plants		All plants		Large plants		All plants		Large plants	
	Coefficients, etc.	Significance	Coefficients, etc.	Significance	Coefficients, etc.	Significance	Coefficients, etc.	Significance	Coefficients, etc.	Significance	Coefficients, etc.	Significance	Coefficients, etc.	Significance	Coefficients, etc.	Significance
ELECTRIC MACHINERY (INCLUDING OFFICE AND COMPUTING MACHINERY AND PRECISION MACHINERY)																
Constant	-0.6629	0.00	-0.3168	0.14	CANNOT BE		CANNOT BE		-0.2848	0.05	0.1840	0.30	0.6222	0.00	0.8437	0.00
K/E	0.1029	0.45	0.0379	0.80	ESTIMATED		ESTIMATED		-0.0006	0.35	-0.0704	0.50	-0.0009	0.17	0.0029	0.98
ES/E	-1.5049	0.00	-1.6341	0.00	BECAUSE		BECAUSE		-1.9677	0.00	-2.3877	0.00	-0.4293	0.20	-0.2256	0.58
AGE	0.0142	0.15	0.0151	0.22	DLG>0		DLG>0		-0.0031	0.70	-0.0056	0.55	0.0066	0.36	-0.0026	0.77
DLG	1.4721	0.05	1.2987	0.07	PERFECTLY		PERFECTLY		0.6489	0.00	0.6635	0.00	0.0972	0.64	0.0943	0.66
DBOI	1.3614	0.00	1.3512	0.00	PREDICTS		PREDICTS		0.9164	0.00	0.8439	0.00	0.7781	0.00	0.8246	0.00
DF	1.1567	0.00	0.9448	0.00	DM=1		DM=1		1.2468	0.00	1.0676	0.00	0.6176	0.00	0.5075	0.00
(Scaled) R-squared-a	0.4809	-	0.4277	-	-	-	-	-	0.5484	-	0.5061	-	0.2519	-	0.2332	-
Log likelihood ratio	-195	-	-132	-	-	-	-	-	-486	-	-385	-	-512	-	-350	-
Observations	495	-	361	-	495	-	361	-	495	-	361	-	495	-	361	-
MOTOR VEHICLES																
Constant	-1.5241	0.00	-1.1385	0.00	CANNOT BE		CANNOT BE		-1.1873	0.00	-0.4744	0.03	-0.2923	0.02	-0.1121	0.56
K/E	-0.2535	0.02	-0.3281	0.01	ESTIMATED		ESTIMATED		-0.1382	0.08	-0.1790	0.03	0.0318	0.48	0.0421	0.41
ES/E	-0.2173	0.77	-0.3745	0.69	BECAUSE		BECAUSE		-0.8701	0.18	-1.3691	0.08	0.8977	0.08	0.7079	0.30
AGE	0.0422	0.00	0.0533	0.00	DLG>0		DLG>0		0.0251	0.00	0.0199	0.05	0.0078	0.25	0.0164	0.08
DLG	1.9928	0.06	2.1929	0.09	PERFECTLY		PERFECTLY		-0.1131	0.73	-0.1008	0.77	-0.5726	0.07	-0.6123	0.06
DBOI	0.9563	0.00	0.8749	0.00	PREDICTS		PREDICTS		0.8055	0.00	0.6927	0.00	0.5301	0.01	0.4673	0.04
DF	1.3293	0.00	1.1958	0.00	DM=1		DM=1		1.1058	0.00	0.8455	0.00	0.5813	0.00	0.5906	0.01
(Scaled) R-squared-a	0.3506	-	0.3430	-	-	-	-	-	0.2348	-	0.2239	-	0.1188	-	0.1522	-
Log likelihood ratio	-156	-	-92	-	-	-	-	-	-247	-	-173	-	-442	-	-211	-
Observations	406	-	187	-	406	-	187	-	406	-	187	-	406	-	187	-

a-R-squared for equations (a) and (b), scaled R-squared for equations (c) and (d).

Table C2 (continued, 7/7)

Independent Variables, Indicator	Probit Estimation of Equation (a), Dep. Var.=DX				Probit Estimation of Equation (b), Dep. Var.=DM				Ordered Probit Estimation of Equation (c), Dep. Var.=DXR				Ordered Probit Estimation of Equation (d), Dep. Var.=DMR			
	All plants		Large plants		All plants		Large plants		All plants		Large plants		All plants		Large plants	
	Coefficients, etc.	Significance	Coefficients, etc.	Significance	Coefficients, etc.	Significance	Coefficients, etc.	Significance	Coefficients, etc.	Significance	Coefficients, etc.	Significance	Coefficients, etc.	Significance	Coefficients, etc.	Significance
FURNITURE																
Constant	-0.4768	0.00	0.3463	0.12	-0.4105	0.00	-0.1795	0.41	-0.2860	0.04	0.6367	0.00	-0.3635	0.01	-0.0549	0.77
K/E	-0.0699	0.58	-0.2197	0.25	-0.1304	0.32	-0.2740	0.22	-0.0995	0.47	-0.3318	0.24	-0.1181	0.40	-0.2195	0.27
ES/E	-1.8798	0.00	-2.9437	0.00	0.3559	0.45	0.7031	0.35	-2.5044	0.00	-3.8389	0.00	0.3591	0.41	0.6364	0.34
AGE	0.0116	0.13	0.0013	0.90	0.0078	0.29	0.0081	0.44	0.0074	0.31	-0.0034	0.72	0.0073	0.29	0.0026	0.78
DLG	1.0340	0.00	0.6045	0.05	0.9246	0.00	0.6962	0.02	0.6633	0.00	0.4031	0.10	0.4247	0.06	0.2760	0.25
DBOI	1.0318	0.00	0.8745	0.01	0.2425	0.29	0.0596	0.83	1.0099	0.00	0.8374	0.00	0.1822	0.37	0.0432	0.85
DF	1.2986	0.00	1.2637	0.00	0.6302	0.01	0.6766	0.02	1.0341	0.00	0.8413	0.00	0.5078	0.01	0.5273	0.02
(Scaled) R-squared-a	0.2484	-	0.2385	-	0.0689	-	0.0843	-	0.2696	-	0.3284	-	0.0466	-	0.0584	-
Log likelihood ratio	-196	-	-100	-	-240	-	-119	-	-336	-	-208	-	-350	-	-180	-
Observations	369	-	185	-	369	-	185	-	369	-	185	-	369	-	185	-
JEWELRY																
Constant	0.4423	0.07	CANNOT BE		0.3312	0.16	0.7361	0.13	0.6542	0.00	1.9669	0.00	0.5041	0.01	0.6729	0.06
K/E	-0.1752	0.53	ESTIMATED		0.0660	0.82	-0.1448	0.65	0.0498	0.83	-0.2460	0.37	0.0601	0.80	0.0166	0.95
ES/E	-2.0610	0.04	BECAUSE		-1.6570	0.07	-1.0889	0.38	-1.6075	0.03	-1.9756	0.03	-1.7487	0.02	-1.0699	0.23
AGE	0.0179	0.30	DBOI>0		0.0169	0.30	0.0210	0.52	-0.0028	0.85	-0.0315	0.18	0.0094	0.50	0.0171	0.44
DLG	0.9165	0.28	PERFECTLY		0.8238	0.28	0.3389	0.65	-0.0248	0.95	-0.4822	0.27	0.7051	0.09	0.4628	0.28
DBOI	1.2387	0.02	PREDICTS		0.8103	0.01	0.7079	0.08	0.6385	0.01	0.6494	0.02	1.0188	0.00	1.1559	0.00
DF	1.1193	0.00	DX=1		0.5443	0.04	0.1580	0.66	0.8748	0.00	-0.0704	0.79	0.2331	0.23	0.0990	0.69
(Scaled) R-squared-a	0.1959	-	-	-	0.1449	-	0.0632	-	0.2618	-	0.1770	-	0.2465	-	0.2615	-
Log likelihood ratio	-60	-	-	-	-75	-	-38	-	-166	-	-89	-	-178	-	-109	-
Observations	153	-	97	-	153	-	97	-	153	-	97	-	153	-	97	-

a-R-squared for equations (a) and (b), scaled R-squared for equations (c) and (d).

Table C3: Probit or Ordered Probit Estimation of Equations (e)-(h) for All Manufacturing Combined

Independent Variables, Indicator	Probit Estimation of Equation (e), Dep. Var.=DX				Probit Estimation of Equation (f), Dep. Var.=DM				Ordered Probit Estimation of Equation (g), Dep. Var.=DXR				Ordered Probit Estimation of Equation (h), Dep. Var.=DMR			
	All plants		Large plants		All plants		Large plants		All plants		Large plants		All plants		Large plants	
	Coefficients, etc.	Significance	Coefficients, etc.	Significance	Coefficients, etc.	Significance	Coefficients, etc.	Significance	Coefficients, etc.	Significance	Coefficients, etc.	Significance	Coefficients, etc.	Significance	Coefficients, etc.	Significance
Constant	-0.5368	0.00	-0.1793	0.00	-0.9603	0.00	-0.8313	0.00	-0.2810	0.00	0.1902	0.00	-0.8616	0.00	-0.7086	0.00
K/E	0.0043	0.66	-0.0014	0.87	0.0345	0.01	0.0151	0.25	-0.0006	0.36	-0.0112	0.06	-0.0005	0.40	0.0153	0.01
ES/E	-1.0483	0.00	-1.2403	0.00	0.1913	0.06	0.0825	0.54	-1.3192	0.00	-1.5665	0.00	0.1769	0.04	0.0580	0.59
AGE	0.0094	0.00	0.0101	0.00	0.0098	0.00	0.0117	0.00	0.0046	0.00	0.0029	0.09	0.0065	0.00	0.0071	0.00
DLG	0.8549	0.00	0.7162	0.00	0.6448	0.00	0.5452	0.00	0.2595	0.00	0.2348	0.00	0.1641	0.04	0.0897	0.27
DBOI	0.8527	0.00	0.7542	0.00	0.5439	0.00	0.4910	0.00	0.6479	0.00	0.5684	0.00	0.4721	0.00	0.4233	0.00
DFMIN	0.8975	0.00	0.7197	0.00	0.7844	0.00	0.7044	0.00	0.7612	0.00	0.5746	0.00	0.5253	0.00	0.4419	0.00
DFMAJ	1.4087	0.00	1.2077	0.00	0.8284	0.00	0.7864	0.00	1.1729	0.00	1.0072	0.00	0.7207	0.00	0.6946	0.00
DF100	1.5039	0.00	1.3068	0.00	0.9253	0.00	0.8087	0.00	1.4125	0.00	1.2558	0.00	0.7810	0.00	0.6940	0.00
Dtextiles	-0.1194	0.08	-0.0990	0.25	0.5712	0.00	0.6534	0.00	-0.2582	0.00	-0.3047	0.00	0.6423	0.00	0.7606	0.00
Dapparel	0.6708	0.00	0.7882	0.00	0.4851	0.00	0.6799	0.00	0.7422	0.00	0.8485	0.00	0.4537	0.00	0.6365	0.00
Dleather & footwear	0.4410	0.00	0.4557	0.00	0.9921	0.00	1.3508	0.00	0.3792	0.00	0.4033	0.00	0.8751	0.00	1.1720	0.00
Dchemicals	-0.0261	0.72	-0.1527	0.08	1.3627	0.00	1.4395	0.00	-0.2871	0.00	-0.4453	0.00	1.1807	0.00	1.2251	0.00
Drubber	0.6141	0.00	0.6013	0.00	0.2901	0.00	0.1384	0.17	0.3621	0.00	0.2894	0.00	0.2552	0.00	0.1455	0.12
Dplastics	-0.1021	0.15	-0.0812	0.36	0.6071	0.00	0.7655	0.00	-0.2863	0.00	-0.3481	0.00	0.6166	0.00	0.7740	0.00
Dnonmetallic	-0.5352	0.00	-0.8196	0.00	-0.0705	0.28	0.0379	0.66	-0.6358	0.00	-0.9493	0.00	-0.0862	0.16	0.0252	0.75
Dmetal products	-0.4470	0.00	-0.3891	0.00	0.7653	0.00	0.9316	0.00	-0.6141	0.00	-0.6473	0.00	0.8101	0.00	0.9900	0.00
Dgeneral machinery	-0.1327	0.09	-0.1370	0.17	1.0051	0.00	1.1284	0.00	-0.3625	0.00	-0.4455	0.00	0.8880	0.00	1.0019	0.00
Delectric machinery	-0.0059	0.94	-0.0036	0.97	1.3785	0.00	1.4227	0.00	-0.1724	0.01	-0.1921	0.01	1.2193	0.00	1.3345	0.00
Dmotor vehicles	-0.5607	0.00	-0.4371	0.00	0.7174	0.00	0.8048	0.00	-0.7410	0.00	-0.7088	0.00	0.7373	0.00	0.7704	0.00
Dfurniture	0.0534	0.51	0.2440	0.03	0.5236	0.00	0.6157	0.00	0.0546	0.45	0.2288	0.01	0.4218	0.00	0.4603	0.00
Djewelry	0.9172	0.00	1.0186	0.00	1.0323	0.00	1.1900	0.00	0.8841	0.00	1.0375	0.00	1.1588	0.00	1.3568	0.00
Dother manufacturing	-0.3073	0.00	-0.4700	0.00	0.6369	0.00	0.7640	0.00	-0.3408	0.00	-0.5052	0.00	0.7328	0.00	0.8693	0.00
(Scaled) R-squared-a	0.2752	-	0.2734	-	0.1969	-	0.2135	-	0.3027	-	0.3474	-	0.2181	-	0.2559	-
Log likelihood ratio	-4,587	-	-2,796	-	-5,230	-	-2,865	-	-8,000	-	-5,426	-	-9,016	-	-5,480	-
Observations	8,952	-	5,194	-	8,952	-	5,194	-	8,952	-	5,194	-	8,952	-	5,194	-

a-R-squared for equations (e) and (f), scaled R-squared for equations (g) and (h).

Table C4: Probit or Ordered Probit Estimation of Equations (e)-(h) by Industry (1/7)

Independent Variables, Indicator	Probit Estimation of Equation (e), Dep. Var.=DX				Probit Estimation of Equation (f), Dep. Var.=DM				Ordered Probit Estimation of Equation (g), Dep. Var.=DXR				Ordered Probit Estimation of Equation (h), Dep. Var.=DMR			
	All plants		Large plants		All plants		Large plants		All plants		Large plants		All plants		Large plants	
	Coeffi-cients, etc.	Sig-nifi-cance	Coeffi-cients, etc.	Sig-nifi-cance	Coeffi-cients, etc.	Sig-nifi-cance	Coeffi-cients, etc.	Sig-nifi-cance	Coeffi-cients, etc.	Sig-nifi-cance	Coeffi-cients, etc.	Sig-nifi-cance	Coeffi-cients, etc.	Sig-nifi-cance	Coeffi-cients, etc.	Sig-nifi-cance
FOOD																
Constant	-0.3989	0.00	-0.0333	0.75	-0.8428	0.00	-0.6977	0.00	-0.2508	0.00	0.1392	0.15	-0.8229	0.00	-0.7054	0.00
K/E	-0.0588	0.09	-0.0763	0.04	-0.0147	0.58	-0.0173	0.52	-0.0610	0.03	-0.0714	0.01	-0.0173	0.48	-0.0217	0.39
ES/E	-1.3524	0.00	-1.7606	0.00	0.5644	0.02	0.5752	0.04	-1.5918	0.00	-2.0343	0.00	0.6233	0.01	0.6625	0.01
AGE	0.0034	0.34	0.0118	0.01	-0.0005	0.90	-0.0008	0.85	0.0004	0.91	0.0073	0.06	-0.0009	0.80	-0.0003	0.94
DLG	0.9757	0.00	0.5461	0.01	0.6336	0.00	0.5284	0.00	0.5667	0.00	0.2617	0.08	0.5545	0.00	0.5680	0.00
DBOI	0.6567	0.00	0.4406	0.00	0.3758	0.00	0.3502	0.00	0.5711	0.00	0.4047	0.00	0.2947	0.01	0.2837	0.01
DFMIN	1.0925	0.00	0.9040	0.00	0.7153	0.00	0.6446	0.00	0.8894	0.00	0.7216	0.00	0.6398	0.00	0.6160	0.00
DFMAJ	1.4874	0.00	1.3109	0.00	0.3691	0.12	0.1470	0.58	1.1773	0.00	0.9635	0.00	0.4199	0.05	0.2595	0.29
DF100	1.5858	0.00	1.9115	0.00	0.6680	0.03	0.7927	0.02	1.1817	0.00	1.1321	0.00	0.5407	0.05	0.6749	0.02
(Scaled) R-squared-a	0.2251	-	0.1873	-	0.0903	-	0.0838	-	0.2211	-	0.2162	-	0.0784	-	0.0875	-
Log likelihood ratio	-689	-	-471	-	-713	-	-489	-	-1,196	-	-897	-	-943	-	-654	-
Observations	1,255	-	798	-	1,255	-	798	-	1,255	-	798	-	1,255	-	798	-
TEXTILES																
Constant	CANNOT BE		CANNOT BE		CANNOT BE		CANNOT BE		-0.6181	0.00	-0.0626	0.66	-0.3121	0.00	0.0932	0.50
K/E	ESTIMATED		ESTIMATED		ESTIMATED		ESTIMATED		-0.0011	0.97	-0.0053	0.88	0.0125	0.70	0.0153	0.66
ES/E	BECAUSE		BECAUSE		BECAUSE		BECAUSE		-0.6210	0.20	-1.2165	0.04	0.2851	0.51	-0.6132	0.25
AGE	DF100>0		DF100>0		DF100>0		DLG>0 &		0.0093	0.06	0.0032	0.57	0.0055	0.25	0.0017	0.76
DLG	PERFECTLY		PERFECTLY		PERFECTLY		DF100>0		0.2398	0.25	0.2288	0.39	0.4661	0.02	0.5210	0.05
DBOI	PREDICTS		PREDICTS		PREDICTS		PERFECTLY		0.6854	0.00	0.5940	0.00	0.5447	0.00	0.5269	0.00
DFMIN	DX=1		DX=1		DM=1		PREDICT		0.3898	0.01	0.2680	0.09	0.3846	0.00	0.3399	0.03
DFMAJ	-	-	-	-	-	-	DM=1		1.2059	0.00	1.1333	0.00	0.6336	0.02	0.6567	0.02
DF100	-	-	-	-	-	-	-	-	1.6586	0.00	1.4082	0.00	1.5586	0.00	1.2905	0.00
(Scaled) R-squared-a	-	-	-	-	-	-	-	-	0.1817	-	0.1873	-	0.1415	-	0.1599	-
Log likelihood ratio	-	-	-	-	-	-	-	-	-562	-	-390	-	-640	-	-393	-
Observations	601	-	346	-	601	-	346	-	601	-	346	-	601	-	346	-

a-R-squared for equations (e) and (f), scaled R-squared for equations (g) and (h).

Table C4 (continued, 2/7)

Independent Variables, Indicator	Probit Estimation of Equation (e), Dep. Var.=DX				Probit Estimation of Equation (f), Dep. Var.=DM				Ordered Probit Estimation of Equation (g), Dep. Var.=DXR				Ordered Probit Estimation of Equation (h), Dep. Var.=DMR			
	All plants		Large plants		All plants		Large plants		All plants		Large plants		All plants		Large plants	
	Coefficients, etc.	Significance	Coefficients, etc.	Significance	Coefficients, etc.	Significance	Coefficients, etc.	Significance	Coefficients, etc.	Significance	Coefficients, etc.	Significance	Coefficients, etc.	Significance	Coefficients, etc.	Significance
APPAREL																
Constant	CANNOT BE		CANNOT BE		-0.7748	0.00	-0.5327	0.00	-0.5327	0.00	-0.5327	0.00	-0.6166	0.00	-0.3053	0.04
K/E	ESTIMATED		ESTIMATED		0.1638	0.59	0.4027	0.44	0.4027	0.44	0.4027	0.44	0.3025	0.25	0.5743	0.13
ES/E	BECAUSE		BECAUSE		-0.3499	0.48	-0.3672	0.57	-0.3672	0.57	-0.3672	0.57	-0.4956	0.27	-0.6453	0.26
AGE	DFMAJ>0		DFMAJ>0		0.0376	0.00	0.0398	0.00	0.0398	0.00	0.0398	0.00	0.0256	0.00	0.0240	0.01
DLG	PERFECTLY		PERFECTLY		1.0872	0.00	0.4799	0.28	0.4799	0.28	0.4799	0.28	0.3393	0.10	0.0074	0.98
DBOI	PREDICTS		PREDICTS		0.8724	0.00	0.7406	0.01	0.7406	0.01	0.7406	0.01	0.9000	0.00	0.7616	0.00
DFMIN	DX=1		DX=1		0.9932	0.00	1.2683	0.00	1.2683	0.00	1.2683	0.00	0.7584	0.00	0.8615	0.00
DFMAJ	-	-	-	-	1.2831	0.00	1.3168	0.02	1.3168	0.02	1.3168	0.02	1.0354	0.00	1.0240	0.00
DF100	-	-	-	-	1.1505	0.08	0.8482	0.21	0.8482	0.21	0.8482	0.21	1.2354	0.01	1.0999	0.02
(Scaled) R-squared-a	-	-	-	-	0.1906	-	0.1861	-	0.2028	-	0.2028	-	0.1901	-	0.2140	-
Log likelihood ratio	-	-	-	-	-352	-	-203	-	-203	-	-203	-	-545	-	-347	-
Observations	607	-	349	-	607	-	349	-	607	-	349	-	607	-	349	-
LEATHER & FOOTWEAR																
Constant	CANNOT BE		CANNOT BE		CANNOT BE		CANNOT BE		CANNOT BE		CANNOT BE		-0.0770	0.63	0.2544	0.32
K/E	ESTIMATED		ESTIMATED		ESTIMATED		ESTIMATED		ESTIMATED		ESTIMATED		1.0132	0.00	1.4148	0.00
ES/E	BECAUSE		BECAUSE		BECAUSE		BECAUSE		BECAUSE		BECAUSE		-1.2687	0.06	-1.4799	0.16
AGE	DF100>0		DLG>0,		DLG>0 &		DLG>0,		DF100		DF100		0.0218	0.02	0.0269	0.04
DLG	PERFECTLY		DFMAJ>0, &		DF100>0		DFMIN>0,		PERFECTLY		PERFECTLY		0.2744	0.41	-0.1772	0.70
DBOI	PREDICTS		DF100>0		PERFECTLY		DFMAJ>0, &		PREDICTS		PREDICTS		1.0153	0.00	0.8802	0.00
DFMIN	DX=1		PERFECTLY		PREDICT		DF100>0		DXR		SOME		0.5305	0.08	0.5946	0.12
DFMAJ	-	-	PREDICT		DM=1		PERFECTLY		-	-	OBSER-		0.6746	0.04	0.8570	0.05
DF100	-	-	DX=1		-	-	PREDICT		-	-	VATIONS		1.1894	0.01	1.0953	0.03
(Scaled) R-squared-a	-	-	-	-	-	-	DM=1		-	-	-	-	0.2544	-	0.2902	-
Log likelihood ratio	-	-	-	-	-	-	-	-	-	-	-	-	-244	-	-118	-
Observations	242	-	124	-	242	-	124	-	242	-	124	-	242	-	124	-

a-R-squared for equations (e) and (f), scaled R-squared for equations (g) and (h).

Table C4 (continued, 3/7)

Independent Variables, Indicator	Probit Estimation of Equation (e), Dep. Var.=DX				Probit Estimation of Equation (f), Dep. Var.=DM				Ordered Probit Estimation of Equation (g), Dep. Var.=DXR				Ordered Probit Estimation of Equation (h), Dep. Var.=DMR			
	All plants		Large plants		All plants		Large plants		All plants		Large plants		All plants		Large plants	
	Coefficients, etc.	Significance	Coefficients, etc.	Significance	Coefficients, etc.	Significance	Coefficients, etc.	Significance	Coefficients, etc.	Significance	Coefficients, etc.	Significance	Coefficients, etc.	Significance	Coefficients, etc.	Significance
CHEMICALS & PRODUCTS																
Constant	-0.6331	0.00	-0.4572	0.01	CANNOT BE		CANNOT BE		-0.4597	0.00	-0.2379	0.13	0.6416	0.00	0.8996	0.00
K/E	0.1138	0.02	0.1075	0.05	ESTIMATED		ESTIMATED		0.0139	0.34	0.0079	0.60	0.0197	0.20	0.0175	0.27
ES/E	-0.3989	0.27	-0.4443	0.27	BECAUSE		BECAUSE		-0.7214	0.02	-0.7773	0.03	0.3499	0.22	0.1244	0.70
AGE	0.0049	0.36	0.0027	0.68	DFMAJ>0		DFMAJ>0		0.0030	0.56	-0.0017	0.78	0.0056	0.21	0.0079	0.15
DLG	0.4154	0.31	0.6944	0.15	PERFECTLY		PERFECTLY		0.0048	0.99	0.1417	0.63	-0.0766	0.78	-0.2363	0.42
DBOI	0.4465	0.02	0.5842	0.01	PREDICTS		PREDICTS		0.5905	0.00	0.6930	0.00	0.0318	0.83	0.0450	0.78
DFMIN	0.7095	0.00	0.5592	0.00	DM=1		DM=1		0.7676	0.00	0.6476	0.00	0.0273	0.84	-0.0113	0.94
DFMAJ	1.3041	0.00	1.0456	0.00	-	-	-	-	1.4011	0.00	1.3080	0.00	0.8353	0.00	0.7157	0.00
DF100	0.9156	0.00	0.7564	0.02	-	-	-	-	0.9987	0.00	0.8938	0.00	0.2453	0.33	0.1390	0.58
(Scaled) R-squared-a	0.1982	-	0.1925	-	-	-	-	-	0.2342	-	0.2579	-	0.0475	-	0.0397	-
Log likelihood ratio	-280	-	-214	-	-	-	-	-	-417	-	-326	-	-557	-	-400	-
Observations	489	-	366	-	489	-	366	-	489	-	366	-	489	-	366	-
RUBBER PRODUCTS																
Constant	CANNOT BE		CANNOT BE		-0.3316	0.06	CANNOT BE		0.3469	0.02	0.6195	0.00	-0.2508	0.12	-0.2708	0.14
K/E	ESTIMATED		ESTIMATED		0.2193	0.07	ESTIMATED		0.0046	0.86	-0.0008	0.98	0.0512	0.07	0.0415	0.14
ES/E	BECAUSE		BECAUSE		0.0031	1.00	BECAUSE		-0.7131	0.21	0.3850	0.56	0.1277	0.83	0.6205	0.37
AGE	DF100>0		DF100>0		0.0036	0.66	DFMAJ>0		-0.0057	0.42	-0.0101	0.20	0.0023	0.76	-0.0032	0.71
DLG	PERFECTLY		PERFECTLY		-0.2525	0.52	PERFECTLY		0.3128	0.31	0.3461	0.30	-0.5201	0.14	-0.4006	0.28
DBOI	PREDICTS		PREDICTS		-0.0366	0.85	PREDICTS		0.5036	0.00	0.3178	0.07	0.0022	0.99	0.0240	0.90
DFMIN	DX=1		DX=1		0.1310	0.55	DM=1		0.5848	0.00	0.4893	0.01	0.1746	0.39	0.1489	0.49
DFMAJ	-	-	-	-	1.6010	0.00	-	-	-0.0050	0.99	-0.2020	0.56	1.1846	0.00	1.3393	0.00
DF100	-	-	-	-	0.3542	0.39	-	-	1.0162	0.01	1.0149	0.01	0.2017	0.59	0.2177	0.56
(Scaled) R-squared-a	-	-	-	-	0.0658	-	-	-	0.1554	-	0.1240	-	0.0740	-	0.1064	-
Log likelihood ratio	-	-	-	-	-174	-	-	-	-328	-	-255	-	-251	-	-192	-
Observations	268	-	207	-	268	-	207	-	268	-	207	-	268	-	207	-

a-R-squared for equations (e) and (f), scaled R-squared for equations (g) and (h).

Table C4 (continued, 4/7)

Independent Variables, Indicator	Probit Estimation of Equation (e), Dep. Var.=DX				Probit Estimation of Equation (f), Dep. Var.=DM				Ordered Probit Estimation of Equation (g), Dep. Var.=DXR				Ordered Probit Estimation of Equation (h), Dep. Var.=DMR			
	All plants		Large plants		All plants		Large plants		All plants		Large plants		All plants		Large plants	
	Coefficients, etc.	Significance	Coefficients, etc.	Significance	Coefficients, etc.	Significance	Coefficients, etc.	Significance	Coefficients, etc.	Significance	Coefficients, etc.	Significance	Coefficients, etc.	Significance	Coefficients, etc.	Significance
PLASTICS & PRODUCTS																
Constant	-0.6985	0.00	-0.1597	0.36	-0.5519	0.00	-0.1192	0.50	-0.5218	0.00	0.0436	0.78	-0.3777	0.00	0.0921	0.54
K/E	0.1370	0.21	-0.0054	0.96	0.1815	0.11	0.0716	0.55	0.0413	0.60	-0.0133	0.87	0.0962	0.20	0.0477	0.56
ES/E	-1.0392	0.05	-1.1197	0.08	0.2375	0.64	0.0501	0.94	-1.1532	0.01	-1.2787	0.02	0.0498	0.91	-0.0873	0.86
AGE	0.0118	0.19	-0.0018	0.87	0.0156	0.07	0.0023	0.83	0.0018	0.82	-0.0126	0.18	0.0092	0.22	-0.0047	0.59
DLG	0.9576	0.01	1.1717	0.01	0.5919	0.11	0.5149	0.22	0.4128	0.09	0.4339	0.11	-0.0359	0.88	0.0632	0.82
DBOI	0.6173	0.00	0.6010	0.01	0.6181	0.00	0.6697	0.02	0.6831	0.00	0.7041	0.00	0.6153	0.00	0.5903	0.00
DFMIN	0.7686	0.00	0.6504	0.00	1.2256	0.00	1.4722	0.00	0.6936	0.00	0.4355	0.01	0.7565	0.00	0.6132	0.00
DFMAJ	1.1810	0.00	1.1402	0.00	1.1540	0.00	1.0781	0.01	1.0890	0.00	1.0425	0.00	1.2220	0.00	1.1338	0.00
DF100	1.8507	0.00	1.2651	0.02	1.4495	0.00	0.9289	0.09	1.2616	0.00	0.7435	0.02	1.1913	0.00	0.8061	0.01
(Scaled) R-squared-a	0.2135	-	0.1726	-	0.1838	-	0.1752	-	0.2206	-	0.2045	-	0.2068	-	0.1899	-
Log likelihood ratio	-293	-	-186	-	-317	-	-173	-	-482	-	-335	-	-543	-	-338	-
Observations	539	-	312	-	539	-	312	-	539	-	312	-	539	-	312	-
NONMETALLIC MINERAL PRODUCTS																
Constant	-1.2424	0.00	CANNOT BE		-1.0942	0.00	CANNOT BE		-1.0881	0.00	CANNOT BE		-1.0483	0.00	-0.9220	0.00
K/E	0.1126	0.07	ESTIMATED		0.0646	0.24	ESTIMATED		0.0341	0.49	ESTIMATED		0.0780	0.11	0.0539	0.37
ES/E	-1.1387	0.01	BECAUSE		-0.7482	0.06	BECAUSE		-1.3220	0.00	BECAUSE		-0.4137	0.24	-0.1144	0.79
AGE	0.0195	0.01	DF100>0		0.0187	0.01	DF100>0		0.0151	0.02	DF100		0.0116	0.07	0.0140	0.08
DLG	0.6080	0.06	PERFECTLY		0.8189	0.01	PERFECTLY		0.1666	0.55	PERFECTLY		0.3812	0.15	0.1853	0.56
DBOI	0.6766	0.00	PREDICTS		0.9432	0.00	PREDICTS		0.5845	0.00	PREDICTS		0.8388	0.00	1.1014	0.00
DFMIN	1.0493	0.00	DX=1		1.5396	0.00	DM=1		0.8945	0.00	SOME		1.0416	0.00	0.8174	0.00
DFMAJ	1.6613	0.00	-	-	1.8943	0.00	-	-	1.6736	0.00	OBSER-		1.8392	0.00	1.3635	0.00
DF100	1.2201	0.14	-	-	0.9013	0.29	-	-	2.0447	0.00	VATIONS		1.5800	0.02	1.9435	0.02
(Scaled) R-squared-a	0.1881	-	-	-	0.2302	-	-	-	0.1332	-	-	-	0.1813	-	0.2513	-
Log likelihood ratio	-290	-	-	-	-330	-	-	-	-414	-	-	-	-440	-	-264	-
Observations	746	-	373	-	746	-	373	-	746	-	373	-	746	-	373	-

a-R-squared for equations (e) and (f), scaled R-squared for equations (g) and (h).

Table C4 (continued, 5/7)

Independent Variables, Indicator	Probit Estimation of Equation (e), Dep. Var.=DX				Probit Estimation of Equation (f), Dep. Var.=DM				Ordered Probit Estimation of Equation (g), Dep. Var.=DXR				Ordered Probit Estimation of Equation (h), Dep. Var.=DMR			
	All plants		Large plants		All plants		Large plants		All plants		Large plants		All plants		Large plants	
	Coefficients, etc.	Significance	Coefficients, etc.	Significance	Coefficients, etc.	Significance	Coefficients, etc.	Significance	Coefficients, etc.	Significance	Coefficients, etc.	Significance	Coefficients, etc.	Significance	Coefficients, etc.	Significance
METAL PRODUCTS																
Constant	-0.8684	0.00	-0.3155	0.07	-0.2052	0.07	-0.1098	0.53	-0.7466	0.00	-0.1744	0.28	-0.1650	0.10	0.0002	1.00
K/E	-0.0043	0.96	0.0047	0.96	0.2173	0.04	0.2106	0.10	-0.0768	0.27	-0.0598	0.43	0.1177	0.06	0.1503	0.04
ES/E	-1.2873	0.02	-2.2207	0.00	-0.1328	0.75	-0.1974	0.74	-1.3568	0.01	-2.2721	0.00	0.0169	0.96	-0.0945	0.85
AGE	0.0032	0.64	0.0064	0.49	0.0090	0.13	0.0304	0.00	-0.0035	0.59	-0.0022	0.79	0.0071	0.17	0.0205	0.01
DLG	0.2686	0.37	0.0797	0.83	0.6675	0.11	0.0582	0.90	0.2339	0.36	0.0423	0.89	0.3043	0.21	-0.0043	0.99
DBOI	1.0487	0.00	0.8787	0.00	0.8059	0.00	0.6759	0.02	0.8136	0.00	0.7328	0.00	0.7060	0.00	0.6897	0.00
DFMIN	0.7930	0.00	0.5718	0.01	0.6886	0.00	0.4671	0.05	0.8230	0.00	0.5942	0.00	0.7056	0.00	0.5264	0.00
DFMAJ	1.3843	0.00	0.8948	0.02	0.3103	0.41	0.5000	0.25	1.4084	0.00	1.0419	0.00	0.3958	0.14	0.4426	0.12
DF100	1.0458	0.00	0.8066	0.03	0.8079	0.05	0.5637	0.20	1.4644	0.00	1.2987	0.00	0.7157	0.01	0.5713	0.05
(Scaled) R-squared-a	0.2189	-	0.1769	-	0.1059	-	0.1120	-	0.2182	-	0.2448	-	0.1600	-	0.1942	-
Log likelihood ratio	-316	-	-200	-	-439	-	-195	-	-450	-	-304	-	-757	-	-392	-
Observations	698	-	347	-	698	-	347	-	698	-	347	-	698	-	347	-
GENERAL MACHINERY																
Constant	CANNOT BE		CANNOT BE		CANNOT BE		CANNOT BE		-0.8408	0.00	-0.4422	0.02	0.0505	0.68	0.2857	0.10
K/E	ESTIMATED		ESTIMATED		ESTIMATED		ESTIMATED		0.0450	0.11	0.0248	0.40	0.0246	0.36	0.0252	0.36
ES/E	BECAUSE		BECAUSE		BECAUSE		BECAUSE		-1.0041	0.04	-0.9159	0.11	1.0157	0.01	0.7028	0.19
AGE	DF100>0		DLG>0 &		DLG>0 &		DLG>0 &		0.0209	0.00	0.0141	0.11	0.0042	0.49	0.0113	0.18
DLG	PERFECTLY		DF100>0		DF100>0		DF100>0		-0.3104	0.35	0.0036	0.99	-0.3717	0.26	-0.6171	0.09
DBOI	PREDICTS		PERFECTLY		PERFECTLY		PERFECTLY		0.5644	0.00	0.7137	0.00	0.2212	0.23	0.1280	0.55
DFMIN	DX=1		PREDICT		PREDICT		PREDICT		1.1867	0.00	0.7555	0.00	0.2951	0.06	0.3673	0.06
DFMAJ	-	-	DX=1		DM=1		DM=1		1.5489	0.00	1.3136	0.00	1.0093	0.00	0.9204	0.00
DF100	-	-	-	-	-	-	-	-	2.4616	0.00	2.1086	0.00	1.5110	0.00	1.4957	0.00
(Scaled) R-squared-a	-	-	-	-	-	-	-	-	0.3677	-	0.3947	-	0.1227	-	0.1353	-
Log likelihood ratio	-	-	-	-	-	-	-	-	-341	-	-230	-	-483	-	-278	-
Observations	436	-	249	-	436	-	249	-	436	-	249	-	436	-	249	-

a-R-squared for equations (e) and (f), scaled R-squared for equations (g) and (h).

Table C4 (continued, 6/7)

Independent Variables, Indicator	Probit Estimation of Equation (e), Dep. Var.=DX				Probit Estimation of Equation (f), Dep. Var.=DM				Ordered Probit Estimation of Equation (g), Dep. Var.=DXR				Ordered Probit Estimation of Equation (h), Dep. Var.=DMR			
	All plants		Large plants		All plants		Large plants		All plants		Large plants		All plants		Large plants	
	Coefficients, etc.	Significance	Coefficients, etc.	Significance	Coefficients, etc.	Significance	Coefficients, etc.	Significance	Coefficients, etc.	Significance	Coefficients, etc.	Significance	Coefficients, etc.	Significance	Coefficients, etc.	Significance
ELECTRIC MACHINERY (INCLUDING OFFICE AND COMPUTING MACHINERY AND PRECISION MACHINERY)																
Constant	-0.6597	0.00	-0.3469	0.11	CANNOT BE		CANNOT BE		-0.3041	0.03	0.1316	0.46	0.6164	0.00	0.8288	0.00
K/E	0.1261	0.35	0.0696	0.64	ESTIMATED		ESTIMATED		-0.0007	0.26	-0.0671	0.52	-0.0009	0.18	0.0044	0.97
ES/E	-1.5857	0.00	-1.5668	0.01	BECAUSE		BECAUSE		-1.7944	0.00	-2.1287	0.00	-0.3895	0.25	-0.1787	0.66
AGE	0.0150	0.13	0.0165	0.17	DLG>0		DLG>0		-0.0014	0.86	-0.0019	0.84	0.0068	0.35	-0.0018	0.84
DLG	1.5048	0.04	1.2291	0.09	PERFECTLY		PERFECTLY		0.6425	0.00	0.7506	0.00	0.0744	0.72	0.0813	0.72
DBOI	1.3100	0.00	1.2581	0.00	PREDICTS		PREDICTS		0.7835	0.00	0.6935	0.00	0.7411	0.00	0.7888	0.00
DFMIN	0.9801	0.00	0.7562	0.00	DM=1		DM=1		0.9654	0.00	0.7661	0.00	0.5519	0.00	0.4478	0.01
DFMAJ	1.8690	0.00	1.6561	0.00	-	-	-	-	1.5594	0.00	1.3949	0.00	0.6423	0.00	0.5735	0.01
DF100	1.1468	0.00	1.0403	0.00	-	-	-	-	1.6875	0.00	1.5617	0.00	0.7546	0.00	0.6044	0.00
(Scaled) R-squared-a	0.4862	-	0.4355	-	-	-	-	-	0.5730	-	0.5421	-	0.2542	-	0.2349	-
Log likelihood ratio	-192	-	-130	-	-	-	-	-	-476	-	-375	-	-511	-	-350	-
Observations	495	-	361	-	495	-	361	-	495	-	361	-	495	-	361	-
MOTOR VEHICLES																
Constant	CANNOT BE		CANNOT BE		CANNOT BE		CANNOT BE		-1.1626	0.00	-0.4325	0.04	-0.2803	0.03	-0.0625	0.75
K/E	ESTIMATED		ESTIMATED		ESTIMATED		ESTIMATED		-0.1642	0.05	-0.1982	0.02	0.0324	0.48	0.0222	0.66
ES/E	BECAUSE		BECAUSE		BECAUSE		BECAUSE		-0.7566	0.25	-1.2718	0.11	0.8994	0.08	0.7618	0.27
AGE	DF100>0		DLG>0 &		DLG>0 &		DLG>0 &		0.0224	0.01	0.0166	0.10	0.0067	0.33	0.0130	0.17
DLG	PERFECTLY		DF100>0		DF100>0		DF100>0		0.0389	0.91	-0.1070	0.79	-0.5667	0.07	-0.7684	0.05
DBOI	PREDICTS		PERFECTLY		PERFECTLY		PERFECTLY		0.8626	0.00	0.7799	0.00	0.5354	0.01	0.5038	0.03
DFMIN	DX=1		PREDICT		PREDICT		PREDICT		0.8468	0.00	0.5732	0.02	0.4952	0.02	0.4393	0.06
DFMAJ	-	-	DX=1		DM=1		DM=1		1.4612	0.00	1.1852	0.00	0.8135	0.00	0.7928	0.01
DF100	-	-	-	-	-	-	-	-	2.3387	0.00	1.9839	0.00	0.5925	0.34	0.6337	0.32
(Scaled) R-squared-a	-	-	-	-	-	-	-	-	0.2539	-	0.2604	-	0.1216	-	0.1621	-
Log likelihood ratio	-	-	-	-	-	-	-	-	-243	-	-169	-	-442	-	-210	-
Observations	406	-	187	-	406	-	187	-	406	-	187	-	406	-	187	-

a-R-squared for equations (e) and (f), scaled R-squared for equations (g) and (h).

Table C4 (continued, 7/7)

Independent Variables, Indicator	Probit Estimation of Equation (e), Dep. Var.=DX				Probit Estimation of Equation (f), Dep. Var.=DM				Ordered Probit Estimation of Equation (g), Dep. Var.=DXR				Ordered Probit Estimation of Equation (h), Dep. Var.=DMR			
	All plants		Large plants		All plants		Large plants		All plants		Large plants		All plants		Large plants	
	Coefficients, etc.	Significance	Coefficients, etc.	Significance	Coefficients, etc.	Significance	Coefficients, etc.	Significance	Coefficients, etc.	Significance	Coefficients, etc.	Significance	Coefficients, etc.	Significance	Coefficients, etc.	Significance
FURNITURE																
Constant	-0.4775	0.00	CANNOT BE		-0.4142	0.00	-0.1394	0.53	-0.2851	0.04	0.6705	0.00	-0.3650	0.01	-0.0326	0.86
K/E	-0.0707	0.57	ESTIMATED		-0.1303	0.32	-0.2839	0.33	-0.0966	0.48	-0.3255	0.27	-0.1165	0.40	-0.2196	0.32
ES/E	-1.9124	0.00	BECAUSE		0.3439	0.47	0.7226	0.35	-2.5377	0.00	-3.8179	0.00	0.3666	0.40	0.6433	0.34
AGE	0.0116	0.14	DFMIN>0		0.0078	0.29	0.0078	0.46	0.0074	0.31	-0.0031	0.74	0.0074	0.28	0.0026	0.78
DLG	1.0724	0.00	PERFECTLY		0.9588	0.00	1.1982	0.03	0.6853	0.00	0.3333	0.32	0.4295	0.06	0.4606	0.16
DBOI	1.0745	0.00	PREDICTS		0.2957	0.22	0.0907	0.75	1.0245	0.00	0.8347	0.00	0.1743	0.40	0.0035	0.99
DFMIN	1.4706	0.00	DX=1		0.7571	0.00	0.7715	0.03	1.0966	0.00	0.9908	0.00	0.5192	0.02	0.4479	0.09
DFMAJ	0.8566	0.15	-	-	0.2495	0.60	0.2511	0.64	0.6295	0.13	0.2247	0.61	0.2650	0.52	0.3242	0.47
DF100	0.7219	0.33	-	-	0.4575	0.43	0.3449	0.56	1.3724	0.03	0.9996	0.11	0.7929	0.10	0.8294	0.09
(Scaled) R-squared-a	0.2521	-	-	-	0.0698	-	0.0842	-	0.2729	-	0.3310	-	0.0487	-	0.0655	-
Log likelihood ratio	-195	-	-	-	-240	-	-118	-	-335	-	-208	-	-349	-	-180	-
Observations	369	-	185	-	369	-	185	-	369	-	185	-	369	-	185	-
JEWELRY																
Constant	CANNOT BE		CANNOT BE		0.3282	0.16	CANNOT BE		0.6512	0.00	1.9651	0.00	0.5028	0.02	0.6885	0.06
K/E	ESTIMATED		ESTIMATED		0.0609	0.83	ESTIMATED		0.0468	0.84	-0.2552	0.35	0.0508	0.83	0.0339	0.90
ES/E	BECAUSE		BECAUSE		-1.6087	0.08	BECAUSE		-1.5907	0.04	-1.8791	0.05	-1.6984	0.02	-0.8191	0.38
AGE	DFMAJ>0 &		DBOI>0,		0.0168	0.30	DF100>0		-0.0021	0.88	-0.0335	0.15	0.0101	0.47	0.0188	0.39
DLG	DF100>0		DFMAJ>0, &		0.8266	0.28	PERFECTLY		-0.0036	0.99	-0.5515	0.29	0.7460	0.07	0.1837	0.72
DBOI	PERFECTLY		DF100>0		0.7770	0.02	PREDICTS		0.5971	0.02	0.6178	0.03	0.9504	0.00	1.0832	0.00
DFMIN	PREDICT		PERFECTLY		0.4891	0.09	DM=1		0.8215	0.00	-0.0757	0.80	0.1344	0.54	-0.1368	0.61
DFMAJ	DX=1		PREDICT		0.9020	0.11	-	-	0.9104	0.01	-0.0536	0.90	0.4315	0.18	0.4492	0.24
DF100	-	-	DX=1		0.4776	0.31	-	-	1.0401	0.00	0.0165	0.97	0.3746	0.25	0.4769	0.25
(Scaled) R-squared-a	-	-	-	-	0.1424	-	-	-	0.2635	-	0.1764	-	0.2519	-	0.2822	-
Log likelihood ratio	-	-	-	-	-75	-	-	-	-166	-	-90	-	-178	-	-108	-
Observations	153	-	97	-	153	-	97	-	153	-	97	-	153	-	97	-

a-R-squared for equations (e) and (f), scaled R-squared for equations (g) and (h).