Foreign Ownership and Exports of Thai Manufacturing Plants by Industry in 1996

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Abstract

This paper investigates how foreign multinational enterprises (MNEs) contributed to exports by Thai manufacturing plants at the industry level in 2006. The mean export-sales ratio (export propensities) in heavily-foreign MNEs with foreign ownership shares of 90 percent or more exceeded 50 percent and heavily-foreign MNEs accounted for one-third of plant exports. Minority-foreign (10-49% foreign shares) and majority-foreign (50-89% shares) MNEs combined to account for another one-fifth of plant exports but had lower export propensities, about 30 percent and 40 percent, respectively. The mean export propensity for local plants in 20 sample industries was only 15 percent. In large samples of all 20 industries combined, econometric estimates controlling for industry affiliation with intercept dummies as well as the effects of the scale, age, factor intensities or labor productivity, and BOI-promotion status of plants also indicated that export propensities were the highest in heavily-foreign MNEs, followed by majority-foreign MNEs, minority-foreign MNEs, and lastly by local plants. Moreover, ownership-related differences in export propensities were highly significant statistically. When inter-industry heterogeneity was more fully accounted for by allowing slope coefficients as well as intercepts to differ among the 20 industries, export propensities were the highest in heavily-foreign MNEs and significantly higher than in local plants in 12 industries. However, differences among MNE ownership groups were usually insignificant and MNE-local differentials in export propensities differed substantially among industries, suggesting it is important account for inter-industry heterogeneity as fully as possible.

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1. Introduction

This paper asks whether plants controlled by foreign multinational enterprises (MNEs) had higher export propensities than corresponding medium-large (20+ workers), local plants covered by the Thai manufacturing census for 2006. Jongwanich and Kohpaiboon (2008) and Cole et al. (2010) are the two previous studies we know that examine this issue for Thailand in 2006. However, both of these studies analyze heterogeneous samples of plants in a wide range of industries combined, using industry dummies or industry characteristics such as concentration and effective protection to control for industry effects. As a result, both of these studies assume that the relationship between MNE ownership and exporting is the same in all manufacturing industries. Furthermore, these studies assume that the between MNE ownership and exporting does not depend on the extent or share of MNE ownership. In contrast, previous studies of Thailand in 1996 (Umemoto and Ramstetter 2006) and related studies of Indonesia in 1990-2000 (Ramstetter and Takii 2006) and Vietnam in 2000-2001 (Phan and Ramstetter 2009) indicate that ownership effects differ substantially among manufacturing industries and that plants or firms with large foreign ownership shares export larger portions of their output than other MNEs, which in turn export more than local plants, most of which were still non-MNEs in 2006. This paper's major contribution is thus to examine whether the relationship between MNE ownership and exporting is related to foreign ownership shares and varies among industries.

The paper first reviews literature analyzing the effects of MNE ownership on plant or firm exports (Section 2). Second, it describes the database used and compares export propensities in MNEs and in local plants (Section 3). It then analyzes whether MNE-local differentials in export propensities persist after accounting for other factors (size, age, factor intensity or labor productivity) that may affect export propensities (Section 4). Section 5 concludes and discusses topics for future research.

2. Literature Review

Theory and empirical evidence suggest MNEs are likely to possess relatively large amounts of generally knowledge-based, intangible, firm-specific assets related to production technology, marketing, and entrepreneurship that should make these firms more productive than non-MNEs (Buckley and Casson 1992; Casson 1987; Caves 2007; Dunning 1993; Rugman 1980, 1985). This is reflected by larger firm size, higher factor productivity and factor returns, and/or higher capital or technology intensity. However, previous studies of Malaysia (Haji Ahmad 2010; Oguchi et al. 2002) and Thailand (Ramstetter 2006) indicate that MNE-local productivity differentials have generally been small, varied substantially among industries, and were usually insignificant statistically. On the other hand, MNE-local wage differentials were positive and often significant statistically (Ramstetter 2014; Movshuk and Matsuoka-Movshuk 2006). In other Southeast Asian economies, positive MNE-local productivity differentials appear to have been more common in Indonesia and Vietnam, but significant wage differentials were again more common, and variation of productivity and wage differentials among industries was substantial.[1]

The theoretical literature often focuses on the tendency for MNEs to possess relatively large amounts of technology-related intangible assets such as the results of research and development (R&D) or patents, for example. Possession of these assets in relatively large amounts implies that MNEs tend to have relatively high productivity. Correspondingly, MNEs may tend to export more than non-MNEs because exporting firms first tend to be more productive than non-exporters and MNEs have relatively high productivity. However, it is very difficult to sort out the direction of causality. Does high productivity lead to exporting, or does exporting force firms to become more productive, or does causality run both directions (Bernard and Jensen 2004, Melitz 2003)?

On the other hand, it is clear MNEs also invest substantial resources in international marketing networks. These investments are sunk costs and accumulation of related assets is a key reason that some firms become able to export relatively cheaply (Roberts and Tybout 1997). Moreover, it seems equally clear that MNEs invest more in their international marketing networks than non-MNEs. Thus, even if ownership-related productivity differentials are not pervasive, it is highly possible that MNEs might have higher export propensities than non-MNEs because their investments in international marketing networks lead to lower exporting costs in MNEs. This is an important part of the story told by the previous studies of Indonesia (Ramstetter and Takii 2006; Sjöholm and Takii 2006) and Thailand (Ramstetter and Umemoto 2006), which indicate MNEs are more likely to export, and

[1] For studies of Indonesia, see Takii (2004) on productivity and Lipsey and Sjöholm (2004) and Ramstetter and Narjoko (2013) on wages. For studies of Vietnam see Ramstetter and Phan (2013) on productivity and Nguyen and Ramstetter (2015, 2017) on wages.

more likely to export large portions of their output than local plants.

The other potentially important part the story relates to evidence that export propensities tend to be highest in heavily-foreign MNEs, or MNEs with very large foreign ownership shares of 90 percent or more, and that these ownership-related differences remain statistically significant after accounting for related firm- or plant-level characteristics, as summarized in the introduction. This evidence is also related to an important policy-oriented study by Moran (2001), who argues that MNE affiliates that are well integrated into the parent's network are likely to be better equipped to contribute to host economies than are affiliates which are isolated from the parent-controlled network by ownership restrictions or local content requirements. Moran's argument also suggests that productivity should be higher in MNEs with relatively large foreign ownership shares, but empirical evidence is often inconsistent with this latter hypothesis in Indonesia (Takii 2004), Thailand (Ramstetter 2006), or Vietnam (Ramstetter and Phan 2013), for example.

Although the existing evidence for Southeast Asia suggests that the level of foreign ownership is not strongly related to productivity, other evidence indicates that WFs or MNEs with large foreign ownership shares (e.g., 90 percent or more) have higher export propensities than other MNEs in Indonesia (Ramstetter and Takii 2006), Thailand (Ramstetter and Umemoto 2006), and Vietnam (Phan and Ramstetter 2009). This in turn suggests that parent MNEs often restrict access of affiliates with smaller ownership shares to exporting networks, more than they restrict access to technology-related firm-specific assets. Part of the reason may be that most MNE affiliates in Thailand and other developing economies utilize relatively simple technologies which are useful in labor-intensive assembly activities. Correspondingly, the risk of leaking sophisticated technologies through minority-owned affiliates in developing economies is likely to be relatively small. On the other hand, the risks of uncontrolled affiliates oversupplying specific markets may be large. This risk is also reflected by the fact that MNEs sometimes force local partners to sign agreements forbidding them from exporting the MNE's products.

After the financial crisis in 1997, Thailand and several developing economies in Southeast Asia (and elsewhere) relaxed ownership restrictions and local content requirements for MNEs exporting large portions of their output. In contrast, MNEs in Thailand faced considerably stricter regulations in 1996 and earlier years. Thus, strong correlations between foreign ownership shares and export propensities may also have resulted from policy biases, in addition to MNE strategies in past years, but such biases were relatively weak by 2006.

3. The Data

This study uses the plant-level data for 2006 underlying the Thai industrial census conducted in 2007. Published compilations report that there were 457,968 plants, 26,293 of which had 16 or more workers (National Statistical Office 2009; Table 1). The plant-level data includes records for all plants with 16 or more workers but only 11 percent of smaller plants reported in published compilations, which are extrapolated from stratified samples. Most MNEs (plants with foreign ownership shares of 10 percent or greater) had 16 or more workers (2,516 of 2,657). Plants with 16 or more workers also accounted for over 99.8 percent of all workers, paid workers, exports, output, and value added in MNEs. In contrast, plants with 16 or more workers accounted for only one-third of the local plants in the database, but markedly larger shares (91 percent or more) of all workers, paid workers, exports, output, and value added in local (non-MNE) plants.

In other words, plants with 15 or fewer workers are overwhelmingly local and account for relatively small shares of economic activities such as employment, production, and exporting. Correspondingly, comparisons between MNEs and local plants can easily be distorted if small plants are included. Because of this fact and because small plants reported negligible exports in all ownership groups, the analysis below focuses on a subsample of medium-large plants, defined as those with 20 or more workers. We choose the slightly higher cutoff of 20 workers primarily to facilitate comparisons with similar studies of Indonesia (where corresponding surveys only include plants with 20 or more workers) and Vietnam where similar cutoffs of firm size have been used. The higher cutoff also helps remove more extreme observations (likely outliers), which are much more common among small plants.

In addition to containing a large number of small, local plants that cannot be meaningfully compared to the predominately large MNEs, the census data had records for a number of medium-large plants that reported implausibly small values for key variables. For example, of the 22,934 plants with 20 or more workers, 4,169 plants had output per worker of less than 50,000 baht, value added per worker of less than 10,000 baht, or initial fixed assets per worker of less than 10,000 baht per worker (Appendix Table 1). These cutoffs are all less than 3.3% of corresponding averages for all medium and large plants and comparable nation-wide estimates (including small plants) from either the industrial census or alternative sources. They are also substantially smaller than per capita GDP in the country in 2006 (130,398 baht according to the revised series in National Economic Social and Development Board 2012). Plants with extremely low values of these key variables are also predominantly local (98 percent) and are excluded from the sample to avoid distorting ownership comparisons and reduce the influence of outliers.

Among the remaining 18,765 medium-large plants, the data set included several apparent duplicates. For example, 4,828 observations included exact duplicates for 12 key variables in at least one other record (Appendix Table 1).[2] The vast majority of these records (87 percent) had different locations but identical performance information. This suggests that several plants belonging to multiplant firms in different locations reported the identical firm-level information, as in the 1996 census (Ramstetter 2006).[3] Duplicates were primarily local plants (93 percent) but several duplicates were also MNEs.[4] In order to avoid double counting, maximize sample size, and coverage of large, multiplant firms, which are the focus of an MNE study, the 4,828 duplicates were dropped, leaving one record from each set of duplicates in the data set. Although this is probably the best feasible solution, it results in a database that mixes up firm- and plant-level information, thereby complicating interpretation of results and distorting location information.

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[2] The variables were: (a) output, (b) sales of goods produced, (c) intermediate consumption, (d) purchase of materials and parts, (e) export values (estimated as the product of the export propensity and output value), (f) initial fixed assets, (g) ending fixed assets, (h) female workers, (i) male workers, (j) female operatives, (k) male operatives, and (l) foreign ownership shares.

[3] Cross checking of duplicates with a data set on large firms compiled from Business On-Line (2008) suggests several cases in which plants recorded firm-level information in large firms.

[4] For example, duplicates accounted for 21 percent of heavily-foreign plants with 20 or more workers and 11 percent of minority-foreign plants.

After dropping plants with extreme values and duplicates, there were 13,947 plants remaining in the dataset (Table 1). Although this amounts to only 19 percent of the plants in the original database, sample plants accounted for much larger shares of employment and paid workers (68-70 percent) and even larger shares of fixed assets, exports, output, and value added (80-82 percent). Thus, sample plants account for the vast majority of economic activity reported by plants in the original database. However, the original database and published estimates (which include estimates for small plants not in the database) of economic activities based on the industrial census are substantially smaller than alternative estimates of manufacturing activity from labor forces surveys (employment), national accounts (output, value added) and related capital stock estimates, as well as manufacturing exports. Coverage of the census database and our sample is relatively high for value added and output (67-69 or 54-57 percent, respectively) but smaller for exports (58 or 47 percent, respectively).

Alternative estimates are less comparable to plant totals for exports than for other variables for two reasons. First, commodity classifications used to calculate alternative estimates of manufacturing exports often exclude resource-intensive products of manufacturing plants such as processed food, raw materials, and fuels. To address this problem, we use a Bank of Thailand (2018) classification that appears to define most processed, resource-intensive products as manufactures and reports that 87 percent of Thailand's exports were manufactures. Second, plants do not report export values, which are estimated as the product of the reported export propensity and gross output. The use of gross output instead of merchandise sales in this calculation results in a relatively large estimate of plant export values, but census and sample coverage of exports is relatively low compared to production. This probably results from the omission of some large exporters from the census or the underreporting of export propensities. Underreporting might result from substantial exports through trading firms, for example, which are not counted when reporting export propensities.

Reflecting the fact that sample plants account for relatively small shares of exports, they had slightly smaller export propensities (34 percent), compared to all plants or all medium-large plants covered in the census (35 percent each; Table 1). And these ratios were both much lower than estimates calculated from alternative sources (42 percent). This comparison suggests that the biggest discrepancies between sample or census estimates and alternative estimates result from differences between coverage and definitions in the census and in alternative sources, not from restricting samples to medium-large plants or from exclusion of plants with extremely low production (output or value added) or capital (fixed assets) per worker. On the other hand, sample restrictions, affected estimates of average export propensities and output, value added, or fixed assets per worker for local plants more than for all MNE ownership groups.[5]

Plants in the broadly defined electronics-related machinery industry were by far the largest exporters accounting for just over a third (35 percent) of sample plant exports (calculated from Table 2). This share is identical to the corresponding share of manufactured commodity exports calculated from Bank of Thailand (2018). Non-electric machinery and food product plants followed with shares

[5] Export propensities were 4.5 percent higher in sample local plants than all local plants in the database while output, value added, and fixed assets per worker were 24-27 percent higher. Corresponding differentials in export propensities were also relatively large (in absolute value) for some MNEs (e.g., -6.3 percent for heavily-foreign MNEs and -3.7 percent for minority-foreign MNEs), but relatively small for output, value added, or fixed assets per worker (never larger than 7.3 percent in absolute value for any MNE ownership group; calculations from Table 1).

of 12 percent each, but both of these shares were much smaller than corresponding shares reported by the Bank of Thailand (BOT, 7 percent each). Plants in rubber products, chemicals and motor vehicles followed with shares of 5-6 percent each; together these top six industries accounted for three-fourths of the exports by all sample plants. However, the BOT reports a markedly lower share for rubber (2 percent) and larger share for motor vehicles (10 percent). These large discrepancies between shares of firm and merchandise exports suggests that coverage of the plant sample varies among industries and/or indicates differences in definitions or classifications, which can be important when multi-product plants export, as in the Thai case.

MNEs accounted for 54 percent of the exports by sample plants and MNE shares were 69 percent or more in four industries: other transport machinery, paper, electronic-related machinery, and metal products (Table 2). MNE shares were also large (45-62 percent) in another eight industries but 22 percent or less in only six of the 20 sample industries. Heavily-foreign MNEs accounted for most MNE exports or 35 percent of the plant total. Heavily-foreign were also largest (57 percent or more) in paper, metal products, and electronics, but rather small (11 percent or less) in 10 of the 20 industries. Minority-foreign MNEs accounted 13 percent of sample plant exports and their shares 10 percent or less in 11 of the 20 industries; they were one-fourth or more in four industries: beverages, other transportation machinery, non-electric machinery, and basic metals. Majority-foreign MNEs accounted for only 8 percent of the sample total and had relatively small shares (4 percent or less) in half of the industries, but relatively large shares in other transportation machinery (44 percent) and textiles (24 percent).

If plants in the 20 sample industries are combined, mean export propensities were slightly over one half for heavily-foreign MNEs, two-fifths for majority-foreign MNEs, and 30 percent for minority-foreign MNEs (Table 3). Because mean propensities were only 12 percent for sample, local plants, mean, unconditional, MNE-local differentials ranged from 18 percentage points (for minority-foreign MNEs) to 39 percentage points (for heavily-foreign MNEs). These differentials varied greatly among the 20 sample industries, but there was a strong tendency for differentials to be largest for heavily-foreign MNEs and smallest for minority-foreign MNEs. For example, differentials were 40 percentage points or more in eight industries for heavily-foreign MNEs, but only four for majority-foreign MNEs, and none for minority-foreign MNEs. Conversely, differentials were less than 20 percentage points in only two industries for heavily-foreign MNEs, seven industries for majority-foreign MNEs, and 15 industries for minority-foreign affiliates.

Industry-level correlations to mean export propensities in local plants were also strongest for heavily-foreign MNEs (correlation coefficient of 0.81), but were also rather strong for minority-foreign (0.66) and majority-foreign (0.70) MNEs (calculated from Table 3). This suggests that industry effects, which may be related to levels of effective protection and producer concentration (Jongwanich and Kohpaiboon 2008) among other things, are important determinants of export propensities for all ownership groups. On the other hand, industry-level correlations of MNE-local differentials to mean export propensities in local plants were much higher for heavily-foreign MNEs (0.60) than for majority-foreign (0.37) and minority-foreign (0.17) MNEs.

Comparisons with alternative estimates from firm-level data also indicate it is likely that the 2006 census data substantially underestimates production by foreign MNEs compared to that by all or local firms. For example, calculations from Ramstetter and Kohpaiboon (2012, 38), suggest that MNE shares of large manufacturing firm revenues increased from 52 to 69 percent in 1996-2006. This increase is consistent with the large increase of flows and stocks of foreign direct investment (FDI) by foreign MNEs after the 1997 crisis, even though large portions of the increased FDI were used to finance buyouts of local partners in joint ventures, many of whom became insolvent, rather than to finance increases in production capacity.[6] However, during the same 1996-2006 period, the industrial census data indicate that the MNE shares of out fell from 54 percent (slightly larger than the corresponding share of firm revenues) to 43 percent (less than two-thirds of corresponding estimates from large firm data. This suggests that the 2006 data census not only underestimate exports substantially, but also underestimate MNE production relative to production by local or all firms or plants. As explained above, the existence of multiplant firms is an important cause of discrepancies between compilations from firm- and plant-level data, but the large decline in MNE shares suggested by the plant-level data seems implausible and most probably results of omitting several large MNEs from our 2006 samples.

[6] Increases were close to 4-fold for both the U.S. dollar value of FDI stocks (cumulative FDI flows from 1970 forward; $20 to $78 billion) and ratios FDI stocks to GDP (11 to 38 percent; Ramstetter 2012, 34).

4. Plant Characteristics and the Relationship between Foreign Ownership and Exporting

Patterns observed in the unconditional, aggregate and industry-level export propensities described above suggest a fairly strong tendency for them to be highest in heavily-foreign MNEs, followed by majority-foreign MNEs, minority-foreign MNEs, and lastly by local plants. These patterns are consistent with the expectation that MNEs have extensive international marketing networks which makes it relatively cheap for them to export and import and that MNEs often insist on ownership control before allowing their affiliates in developing economies like Thailand access to those networks. On the other hand, MNEs may have relatively high export propensities because they are relatively large and experienced, or because they have relatively high capital- or skilled labor intensity, or alternatively relatively high labor productivity.

In Thailand, the Board of Investment (BOI) has also relaxed restrictions on foreign ownership and imported inputs, for example, to investment projects of plants which are located outside of the greater Bangkok area or export a large portion of their output, or meet other BOI criteria.[7] In principle, projects of all ownership groups were eligible for BOI promotion privileges in a wide range of industries, including most manufacturing categories. However, relaxed foreign ownership restrictions and exemptions of import duties on inputs used for export production have been two of the biggest benefits of BOI promotion, and these benefits were probably important for larger proportions of MNEs than local plants. Thus, BOI promotion status is another potentially import determinant of export propensities in the Thai context.

[7] Note that restrictions on foreign ownership were much stricter before 1998 and the the benefits of BOI promotion were larger.

To account for these influences, we estimate the relationship between export propensities after accounting for plant size, plant age, factor intensity or labor productivity, and BOI promotion status using the following equations.

$$XS_i = \mathrm{f}(LOU_i, LOU_i^2, LYR_i, LYR_i^2, LKL_i, LKL_i^2, LPL_i, LPL_i^2, DBOI_i, DF1_i, DF5_i, DF9_i) + U1 \quad (1)$$

$$XS_i = \mathrm{g}(LOU_i, LOU_i^2, LYR_i, LYR_i^2, LVL_i, LVL_i^2, DBOI_i, DF1_i, DF5_i, DF9_i) + U2 \quad (2)$$

where
$DBOI_i$=dummy variable =1 if plant i is BOI-promoted, =0 otherwise
$DF1_i$=dummy variable =1 if plant i is a minority-foreign MNE, =0 otherwise
$DF5_i$=dummy variable =1 if plant i is a majority-foreign MNE, =0 otherwise
$DF9_i$=dummy variable =1 if plant i is a heavily-foreign MNE, =0 otherwise
LOU_i=plant size, natural log of output in plant i
LKL_i=natural log of initial fixed assets per employee in plant i
LPL_i=natural log of the ratio of production workers to all employees in plant i
LVL_i=natural log of value added per employee in plant i
LYR_i=plant age, natural log of years operated of plant i
U1, U2=error terms
XS_i=export propensity (percent) of plant i

Plant size and labor productivity are both expected to be positively correlated with export propensities, but the influence of these two factors may be smaller for large plants or plants with relatively high labor productivity. Correspondingly, coefficients on LOU_i and LVL_i are expected to be positive and coefficients on their squares negative or insignificant. Because capital intensity is usually positively correlated with labor productivity, while relatively unskilled (production) labor intensity is negatively correlated, if expectations about the influence of labor productivity are correct, coefficients on LKL_i and its square should also be positive and negative or insignificant, respectively, while coefficients on LPL_i and its square should be negative and positive or insignificant, respectively. Problems related to potential simultaneity between export propensities on the one hand,

and labor productivity or factor intensities on the other, are probably less severe in equation (1) because initial (as of 1 January) capital stocks are less influenced by exporting during the year than labor productivity during the year. However, the inability to find adequate instruments to account for potential simultaneity remains a potentially a major shortcoming of this cross section analysis.

The influence of plant age is indeterminate. On the one hand, experience might lead to relatively low transactions costs related to exporting for older plants. On the other hand, many older plants were established when policy emphasis on import substitution was relatively strong and export promotion relatively weak. Correspondingly, many older plants were established with the primary aim of serving the Thai market, while many newer plants emphasized exporting more. Several plants have also gradually shifted from emphasis on the Thai market to greater emphasis on export markets, especially during the 1990s.[8] In this respect, contrary to the assumptions made in many theoretical models of the MNE that emphasize the distinction between exporting plants and non-exporting plants or between plants that are vertically or horizontally integrated with MNE operations worldwide, it is important to recognize that several MNEs (and local plants) produce several products, servicing both local and foreign markets, and embodying both vertical and horizontal integration.

Because exporting a large portion of output is one of the main reasons for granting BOI promotion status, the coefficient on the BOI dummy is expected to be positive, as in previous studies

[8] The shift resulted from changes in MNE strategy (e.g., increased emphasis on integrating Thai affiliates into regional and global value chains), Thai policy (e.g., increased emphasis on export promotion and reduced import protection), and the large depreciation of the baht following the Asian Financial Crisis in 1998, among other factors.

(Ramstetter 2002). Coefficients on the foreign ownership dummies then reflect the sign and significance of conditional differentials in export propensities between the three MNE ownership groups and local plants, after accounting for the influences of plant size, age, labor productivity or factor intensity, and BOI promotion status. However, the values of these coefficients are not directly comparable to the unconditional differentials in Table 3 because a nonlinear Tobit estimator is used to account for the facts that the export propensity is a limited dependent variable (i.e., $0 \leq XS_i \leq 100$) and most plants do not export. Robust standard errors are also used to account for heteroscedasticity.

One of the most important contributions of this paper is to examine the sensitivity of the relationship between MNE ownership and exporting to industry effects in some detail. First, 3- and 4-digit industry dummies are included in all estimates as appropriate. When estimates are performed in large, heterogeneous samples of 20 industries combined, there are 50 3-digit dummies (51 industries) and 109 4-digit dummies (110 industries). Second, the influences of industry effects are further explored by performing separate estimates for each of the 20 sample industries. The industry-level samples yield more accurate estimates because they allow all slope coefficients, including coefficients on ownership dummies to vary among industries, and this variation is often substantial. Samples are large enough (a minimum of 147 observations for equation (1) in leather products, and usually several times larger) that the industry-level estimates should be reasonably reliable. On the other hand, the detailed disaggregation of manufacturing plants into 20 industries precludes meaningful examination of alternative industry-level influences such as the effect of producer concentration or import protection, as studied in Jongwanich and Kohpaiboon (2008).

5. Results

Table 4 presents estimates of all slope coefficients and other key information from estimates of equations (1) and (2) in large, heterogeneous samples of all 20 manufacturing industries combined. As hypothesized above, the coefficient on plant size was positive and highly significant at the 1 percent level in all four estimates (two levels of industry dummy aggregation for each equation), while coefficient on its square was negative and significant. In other words, larger plants had higher export propensities, but the effect of plant size diminished as plant size increased. BOI-promotion status was also positively, significantly, and strongly correlated with export propensities in all estimates. In contrast to the productivity-related expectations explained above, the coefficient on share the of production workers was positive and highly significant when equation (1) was estimated, suggesting that plants using production workers relatively intensively were better able to produce competitive exports than others, even though production worker shares are likely to be negatively correlated with productivity; the coefficient on this variable's square was insignificant. On the other hand, plant age and capital intensity or labor productivity were not significantly correlated with plant exports. Values of Psuedo-R^2 were 0.22 in all estimates, which are typical for large cross sections such as these.

Consistent with the patterns observed in Table 3, coefficients on all foreign ownership dummies were positive, highly significant, and largest for heavily-foreign MNEs, followed by majority-foreign MNEs, and lastly minority-foreign MNEs (Table 4). Wald tests of the null hypothesis that all ownership dummies were equal were also rejected at the 1 percent level. In other words, estimates in large heterogeneous samples of plants in all 20 industries combined strongly indicate that conditional MNE-local differentials in export propensities were positive and highly significant for all three MNE groups, largest for heavily-foreign MNEs and smallest for minority-foreign MNEs, after controlling for the influences of plant size, age, factor intensity or labor productivity, and BOI promotion status, as well as industry effects on the constant using two alternative levels of aggregation.

However, when estimates were performed in the 20 more homogeneous, industry-level samples, this pattern was never observed at the standard (5 percent or better) level of significance (Table 5). If the weak 10 percent significance level is used for the Wald test of coefficient equality, this pattern was observed in only one industry, metal products. The metal products industry has the second largest number of sample plants among these industries following food products, but accounts for under 9.4 percent of all sample plants so it is unlikely that this industry is driving results for the larger samples of all 20 industries combined. Rather, it is more likely that failing to allow all slope coefficients to vary among industries and more fully account for inter-industry heterogeneity leads to misleading estimates when estimates are conducted in large, heterogeneous samples.

There is relatively strong evidence that heavily-foreign MNEs had the highest export propensities (i.e. coefficients on the heavily-foreign dummy were largest and significant, and tests rejecting coefficient equality significant) in three industries: footwear, basic metals, and miscellaneous manufactures (Table 5). Coefficients on the heavily-foreign MNE dummy were also largest and usually significant at the 5 percent level in four more industries, chemicals, plastics, non-electric machinery, and electronics-related machinery, but tests of MNE dummy coefficient equality usually could not be rejected. These four include the largest industry of plant exports (electronics-related machinery), the third largest (non-electric machinery), and the sixth largest (chemicals), which combined to account for over half of all exports by sample plants (Table 2). MNEs typically dominate these three industries more than others in many countries, primarily because sunk costs of intangible assets related to development of production technology (e.g., R&D, patents, production processes) and marketing networks (e.g., those facilitating sales and after-care services) are relatively large.[9] There is also weaker evidence that heavily-foreign MNEs had the highest export propensities in leather, wood products, paper products, and other transport machinery, but these results were sensitive to specification (other transport machinery) or the aggregation of industry dummies (the other three industries), and tests of MNE dummy coefficient equality could not be rejected

Results for the second (food), fourth (rubber), and fifth (motor vehicles) largest export industries contrast because they indicate that heavily-foreign MNEs did not have significantly higher export propensities than local plants. Moreover, in motor vehicles, all MNE groups didn't have significantly higher export propensities than local plants. This result might is surprising because MNEs accounted for almost half of plant exports in the industry and six large MNEs are known to have accounted for over two-thirds of the Thailand's automotive exports and had relatively large export propensities in 2001 (Ramstetter and Umemoto 2006, 209, 212-213).

However, as indicated in Section 2, ratios of plant exports to corresponding Bank of Thailand (2018) estimates for 2006 were conspicuously low in motor vehicles (22 percent of the

[9] Firms in these industries can share key these intangible assets among alternative production locations worldwide at relatively low marginal cost more easily than firms in most other industries.

corresponding BOT automotive category). This large discrepancy, combined with the high probability that the six major auto firms continued to account for large portions of automotive exports in 2006, suggests that these samples (and the 2006 Census) probably omitted some large, MNE auto exporters.[10] In addition, many exports classified as automotive by the BOT, are probably produced by plants that the Census could easily classify as belonging to other industries (e.g, electronics, tires, leather, and plastics). For example, tire exports classified as automotive by the BOT but manufactured by rubber products' plants could partially explain why BOT estimates of rubber product exports were much lower than corresponding plant estimates.

Majority-foreign MNEs had the highest export propensities in food products, followed by minority-foreign plants, but differences between heavily-foreign MNEs and local plants were insignificant. This pattern reflects strong synergies resulting from numerous joint ventures in the industry, which are designed to take advantage of combining strong technological and marketing advantages in the numerous Thai conglomerates that dominate the industry and their foreign partners. In rubber, the only consistently significant differential was observed when equation (2) was estimated, suggesting relatively high export propensities in majority-foreign MNEs. In short, the patterns observed in large heteorgenous samples of many industries combined and in the 20 individual industries, which account for inter-industry heterogeneity more fully, often tell very different stories.

[10] The six large auto firms are MMC Sittiphol (Mitsubishi), AutoAlliance (Thailand) (Ford), General Motors (Thailand), Toyota Motor Thailand, Honda Automobile (Thailand), Isuzu Motor Thailand.

6. Conclusions

This paper has investigated how foreign multinational enterprises (MNEs) contributed to exports by Thai manufacturing plants at the industry level in 2006. The mean export-sales ratio (export propensities) in heavily-foreign MNEs exceeded 50 percent and heavily-foreign MNEs accounted for one-third of plant exports. Minority-foreign and majority-foreign MNEs accounted for another one-fifth of plant exports but had lower export propensities, about 30 percent and 40 percent, respectively. The mean export propensity for local plants in 20 sample industries was only 15 percent.

In large samples of all 20 industries combined, econometric estimates controlling for industry affiliation with intercept dummies as well as the effects of the scale, age, factor intensities or labor productivity, and BOI-promotion status of plants also indicated that export propensities were the highest in heavily-foreign MNEs, followed by majority-foreign MNEs, minority-foreign MNEs, and lastly by local plants. Moreover, ownership-related differences in export propensities were highly significant statistically. When inter-industry heterogeneity was more fully accounted for by allowing slope coefficients as well as intercepts to differ among the 20 industries, export propensities were the highest in heavily-foreign MNEs and significantly higher than in local plants in about half of the industries. However, differences among MNE ownership groups were usually insignificant and MNE-local differentials in export propensities differed substantially among industries, suggesting it is important to fully account for inter-industry heterogeneity.

As in most cross sectional studies of this nature, there are several technical problems affecting these estimates that mandate caution when interpreting the results and further examination of the data and the estimates. For example, it seems highly likely that the relationships between export propensities on the one hand, and labor productivity or factor intensities on the other, are affected by simultaneity bias. Unfortunately, panel data are not available and the cross section data contain few if any plausible instruments. Second, the lack of data on export or domestic prices for plant production means that the estimates ignore potentially important price effects, creating the possibility for omitted variable bias as well. To partially address this issue, it might be possible to use data on domestic and export quantities and values to create unit price indices at the industry level, but it is unlikely that such data can be gathered at the plant level. Finally, as mentioned in Sections 3 and 5, comparisons with alternative estimates from data on large firms suggest it is likely that the 2006 Census underestimates shares of MNEs in that year. To clarify the extent of this problem, more careful comparisons of the firm- and plant-level data (which differ for good reasons), and comparisons to newer data for 2011 are warranted. Similar analyses of the 2011 data would also be very helpful in this respect.

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Table 1: Key Indicators for Thai Manufacturing

Sample	Number of plants	Thousands: Workers	Paid workers	Values in billion baht: Fixed assets (avg.)	Exports	Output	Value added
Published industrial census estimates (National Statistical Office 2009)							
All plants	457,968	4,460.3	3,819.0	3,183.2	-	7,304.5	1,758.8
16+ workers	26,293	3,476.9	3,422.9	2,882.6	-	7,042.2	1,667.7
All plants in database underlying National Statistical Office (2009)							
All plants	73,931	3,726.4	3,591.5	2,972.9	2,475.6	7,146.6	1,716.6
16+ workers	26,293	3,476.9	3,422.9	2,882.6	2,473.4	7,042.2	1,672.5
20+ workers	22,934	3,418.6	3,371.0	2,859.4	2,471.7	7,001.2	1,661.7
Sample plants	13,947	2,519.1	2,509.8	2,403.6	2,012.9	5,855.8	1,378.6
Local plants in database (foreign shares 0-9%)							
All plants	71,274	2,782.5	2,648.9	1,764.9	1,106.3	4,093.3	1,007.1
16+ workers	23,777	2,534.5	2,481.7	1,676.1	1,104.8	3,993.9	963.8
20+ workers	20,503	2,477.7	2,431.3	1,654.5	1,103.9	3,956.4	953.6
Sample plants	11,960	1,727.4	1,719.0	1,356.0	911.5	3,228.6	794.3
Minority-foreign plants in database (foreign shares 10-49%)							
All plants	1,220	304.9	304.6	381.2	298.9	992.4	166.3
16+ workers	1,123	303.9	303.6	380.5	298.3	990.4	165.8
20+ workers	1,063	302.9	302.6	379.6	298.1	988.6	165.6
Sample plants	909	263.1	262.9	353.0	263.4	908.3	149.4
Majority-foreign plants in database (foreign shares 50-89%)							
All plants	440	178.1	178.0	270.4	183.9	495.7	95.7
16+ workers	420	177.9	177.8	270.2	183.8	495.0	95.6
20+ workers	409	177.7	177.6	269.9	183.4	494.0	95.5
Sample plants	355	156.3	156.2	225.6	164.9	451.3	87.6
Heavily-foreign plants in database (foreign shares 90-100%)							
All plants	997	460.8	460.1	556.5	886.6	1,565.2	447.6
16+ workers	973	460.6	459.8	555.8	886.5	1,563.0	447.2
20+ workers	959	460.3	459.6	555.3	886.4	1,562.2	447.1
Sample plants	723	372.2	371.8	469.0	673.1	1,267.6	347.2
Alternative estimates for Thai manufacturing and database ratios to alternative estimates							
Alternatives	-	5,504.1	-	6,114.2	4,280.2	10,285.2	2,548.5
All plants ratio %	-	68%	-	49%	58%	69%	67%
Sample ratio %	-	46%	-	39%	47%	57%	54%

Notes: For plant data, fixed assets are averages of initial and ending stocks abd exports are estimated as the product of export propensities and output from National Statistical Office (2009); for alternative estimates: employment is the average of labor force survey estimates for quarters 1-4 (National Statistical Office 2011); value added and gross output from national accounts data (National Economic and Social Development Board 2012); fixed assets (gross capital stock at replacement value) from capital stock estimates (National Economic and Social Development Board 2015); exports from Bank of Thailand's (2018) commodity classification; samples include one plant from each set of duplicates and exclude plants with unreasonably low output, value added, or fixed assets per worker (see text and Appendix Table 1 for details).

Table 2: Exports by Industry and Owner (total in billion baht, MNE shares in percent)

		MNE shares by ownership group			
Industry	Total	10%+	10-49%	50-89%	90%+
Manufacturing	2,012.88	55	13	8	33
Sample industries	1,949.97	54	11	8	35
Food products	231.74	22	11	4	7
Beverages	6.85	47	45	0	1
Textiles	76.76	36	6	24	6
Apparel	77.11	32	19	1	11
Leather	11.63	15	0	3	11
Footwear	6.58	11	5	1	5
Wood products	16.14	11	9	1	1
Paper products	22.39	79	6	2	71
Chemicals	93.69	45	10	9	26
Rubber products	123.50	49	13	10	26
Plastics	35.02	52	12	9	30
Non-metallic mineral products	23.34	21	10	3	8
Basic metals	43.91	62	25	1	36
Metal products	62.62	69	8	2	59
Non-electric machinery	230.88	59	29	8	22
Electronics-related machinery	689.17	70	3	9	57
Motor vehicles	97.15	48	4	9	36
Other transport machinery	12.69	79	34	44	1
Furniture	16.76	19	7	9	3
Miscellaneous manufactures	72.07	60	18	7	35
Excluded industries	62.91	91	84	6	1
Tobacco	2.16	63	63	0	0
Publishing	1.70	63	59	0	5
Petroleum products	58.67	93	86	7	0
Recycling	0.38	72	0	0	72

Note: Exports are estimated as the product of export propensities and output.

Source: Compilations from data underlying National Statistical Office (2009).

Table 3: Export Propensities (percent) in MNEs by Industry and Foreign Share and MNE-local differentials (percentage points)

	MNE Intensities			MNE-local differentials		
Industry	10-49%	50-89%	90%+	10-49%	50-89%	90%+
Manufacturing (plant mean)	30.28	39.98	50.68	18.66	28.36	39.06
Sample industries (plant mean)	30.57	40.04	51.14	18.42	27.89	38.99
Food products	50.35	54.29	46.81	36.67	40.61	33.13
Beverages	25.13	0.00	10.00	20.97	-4.16	5.84
Textiles	28.57	60.63	54.19	17.85	49.91	43.47
Apparel	55.73	54.00	96.64	34.04	32.31	74.95
Leather	5.62	24.83	74.75	-11.97	7.24	57.16
Footwear	28.00	95.00	92.25	6.37	73.37	70.62
Wood products	44.91	5.00	64.00	29.72	-10.19	48.81
Paper products	13.92	24.29	22.73	7.98	18.35	16.79
Chemicals	18.71	24.43	33.18	11.11	16.83	25.58
Rubber products	36.92	64.67	64.89	8.82	36.57	36.79
Plastics	20.72	31.55	37.87	14.42	25.25	31.57
Non-metallic mineral products	26.21	49.22	53.85	18.77	41.78	46.41
Basic metals	13.80	11.83	44.65	4.99	3.02	35.84
Metal products	15.25	29.00	34.97	12.35	26.10	32.07
Non-electric machinery	26.56	29.35	47.37	17.74	20.53	38.55
Electronics-related machinery	31.56	51.38	54.84	16.43	36.25	39.71
Motor vehicles	19.81	17.05	36.93	11.57	8.81	28.69
Other transport machinery	13.23	32.50	33.33	7.93	27.20	28.03
Furniture	31.75	51.83	80.00	17.73	37.81	65.98
Miscellaneous manufactures	62.82	75.35	89.80	25.66	38.19	52.64

Note: Data refer to export propensities reported by plants.

Source: Compilations from data underlying National Statistical Office (2009).

Table 4: Estimates of Slope Coefficients and Indicators for Equations (1) and (2) in 20 Sample Industries Combined (Tobit estimates; all p-values based on robust standard errors)

Independent variable,	3-digit industry dummies		4-digit industry dummies	
statistic, or indicator	Equation (1)	Equation (2)	Equation (1)	Equation (2)
LOU_i	44.8985 a	45.7469 a	49.2034 a	50.3082 a
LOU_i^2	-1.0766 a	-1.0849 a	-1.1845 a	-1.2011 a
LYR_i	0.5804	1.1007	0.1503	0.4637
LYR_i^2	0.0140	-0.1699	0.1110	-0.0062
LKL_i	2.4828	-	2.3613	-
LKL_i^2	-0.1745	-	-0.1361	-
LPL_i	13.3781 a	-	9.8368 b	-
LPL_i^2	1.5242	-	0.6130	-
LVL_i	-	-7.8888	-	-7.9833
LVL_i^2	-	0.1935	-	0.2275
$DBOI_i$	112.4571 a	112.1096 a	108.8477 a	108.5754 a
$DF1_i$	7.3738 a	6.7564 a	7.4226 a	6.9843 a
$DF5_i$	13.3433 a	12.3469 a	13.1321 a	12.5465 a
$DF9_i$	20.7570 a	19.7657 a	20.6866 a	20.0637 a
Test: $DF1_i=DF5_i=DF9_i$	13.46 a	12.75 a	13.71 a	13.34 a
F-statistic	158.30 a	164.32 a	87.77 a	89.33 a
Observations	13,264	13,306	13,264	13,306
Pseudo-R^2	0.22	0.22	0.22	0.22

Notes: a=signficant at the 1% level, b=significant at the 5% level, c=significant at the 10% level (all p-values based on robust standard errors); estimated equations also include 3- and 4-digit industry dummies as indicated and relevant (see explanation in the text); for further sample details and precise p-values, see Appendix Table 4.

Table 5: Estimates of MNE Slope Coefficients for Equations (1) and (2) for 20 Individual Sample Industries (Tobit estimates; all p-values based on robust standard errors)

Independent variable	3-digit industry dummies		4-digit industry dummies	
or statistic	Equation (1)	Equation (2)	Equation (1)	Equation (2)
FOOD PRODUCTS (1,983-1,989 observations; Pseudo-R2=0.27-0.28)				
$DF1_i$	12.6416 b	12.4587 b	16.1439 a	16.1207 a
$DF5_i$	37.5931 a	35.1289 a	38.7532 a	35.8560 a
$DF9_i$	11.8310	11.9554	13.1603	13.2341
Test: $DF1_i = DF5_i = DF9_i$	2.56 c	2.29 c	2.30 c	1.91
BEVERAGES (167 observations; Pseudo-R2=0.30; no 3-digit dummies)				
$DF1_i$	19.1976	22.8589 c	19.3134	20.9971
$DF5_i$	-86.2390 b	-86.2142 a	-85.8394 b	-87.5944 a
$DF9_i$	-57.8945 a	-50.6144 a	-58.2841 a	-47.5429 a
Test: $DF1_i = DF5_i = DF9_i$	8.43 a	12.29 a	6.75 a	8.96 a
TEXTILES (953-959 observations; Pseudo-R^2=0.22)				
$DF1_i$	0.7537	0.8041	0.8285	0.8710
$DF5_i$	-0.1932	-0.1884	-0.3026	-0.2847
$DF9_i$	-0.7258	-0.6791	-0.3692	-0.3347
Test: $DF1_i = DF5_i = DF9_i$	0.60	0.61	0.51	0.52
APPAREL (894-897 observations; Pseudo-R2=0.18)				
$DF1_i$	16.9266	17.9842 c	4-digit & 3 digit categories are identical	
$DF5_i$	22.0336	25.9962		
$DF9_i$	58.4210 a	59.5371 a		
Test: $DF1_i = DF5_i = DF9_i$	1.73	1.59		
LEATHER (147-151 observations; Pseudo-R2=0.19-0.21)				
$DF1_i$	-6.9743	-10.2583	-14.6068	-12.9462
$DF5_i$	34.4320 a	28.2590	13.5851	22.0107
$DF9_i$	47.7325 b	46.3196 b	34.2724 c	40.4391 c
Test: $DF1_i = DF5_i = DF9_i$	5.20 a	3.99 b	2.80 c	3.49 b
FOOTWEAR (192-193 observations; Pseudo-R2=0.19, no 3- or 4-digit dummies)				
$DF1_i$	-37.5707 a	-43.6288 a	4-digit & 3 digit categories are identical	
$DF5_i$	4.6527	13.5985		
$DF9_i$	99.5829 a	105.1374 a		
Test: $DF1_i = DF5_i = DF9_i$	9.86 a	12.88 a		
WOOD PRODUCTS (540-544 observations; Pseudo-R2=0.24-0.25)				
$DF1_i$	12.1705	11.7164	6.3341	4.3575
$DF5_i$	-30.8580 a	-55.8687 a	-29.6701 a	-45.5819 a
$DF9_i$	26.0682 c	23.9381 c	22.8279	19.5935
Test: $DF1_i = DF5_i = DF9_i$	8.72 a	29.30 a	5.20 a	11.18 a
PAPER PRODUCTS (486 observations; Pseudo-R2=0.26-0.27)				
$DF1_i$	5.8875	1.4731	8.0029	2.9066
$DF5_i$	7.3743	3.2299	-1.7922	-4.8177
$DF9_i$	18.6185 b	18.2517 b	15.7320	17.0999 c
Test: $DF1_i = DF5_i = DF9_i$	0.62	0.84	0.66	1.05

Table 5 (continued)

Independent variable or statistic	3-digit industry dummies Equation (1)	3-digit industry dummies Equation (2)	4-digit industry dummies Equation (1)	4-digit industry dummies Equation (2)
CHEMICALS (869-870 observations; Pseudo-R^2=0.16)				
$DF1_i$	5.3664	5.1027	5.8591	5.5133
$DF5_i$	14.9806 b	14.5457 c	13.5455 c	13.3298 c
$DF9_i$	16.4077 a	15.4246 a	18.4594 a	17.7401 a
Test: $DF1_i=DF5_i=DF9_i$	1.65	1.43	1.83	1.69
RUBBER PRODUCTS (331-332 observations; Pseudo-R^2=0.18-0.19)				
$DF1_i$	-12.9807 b	-8.7928	-11.0197 c	-6.8881
$DF5_i$	11.3778	15.8978 b	11.0614	16.8829 b
$DF9_i$	4.9093	10.6292	6.5681	13.2559 c
Test: $DF1_i=DF5_i=DF9_i$	4.03 b	4.33 b	4.06 b	4.62 a
PLASTICS (1,004-1,005 observations; Pseudo-R^2=0.21; no 3- or 4-digit dummies)				
$DF1_i$	4.6665	4.4907	4-digit & 3 digit categories are identical	
$DF5_i$	15.8722	18.4071 c		
$DF9_i$	20.7537 a	22.2606 a		
Test: $DF1_i=DF5_i=DF9_i$	2.07	2.72 c		
NON-METALLIC MINERAL PRODUCTS (890-894 observations; Pseudo-R^2=0.25-0.27)				
$DF1_i$	13.0016	10.5544	11.6763	11.5039
$DF5_i$	19.6126 c	23.3807 b	17.9874	19.7564
$DF9_i$	25.0683 b	20.7169 c	18.1048 b	13.7290
Test: $DF1_i=DF5_i=DF9_i$	0.45	0.55	0.20	0.17
BASIC METALS (372 observations; Pseudo-R2=0.22-0.23)				
$DF1_i$	-8.4504	-6.1531	-8.2128	-5.8052
$DF5_i$	16.1751	23.5286	16.9883	24.3527 c
$DF9_i$	21.4522 b	24.6034 a	22.0300 a	24.9297 a
Test: $DF1_i=DF5_i=DF9_i$	4.54 a	4.35 a	21.05 a	4.21 b
METAL PRODUCTS (1,241-1,242 observations; Pseudo-R2=0.24)				
$DF1_i$	11.1999 b	10.7901 b	13.9642 a	13.2235 b
$DF5_i$	18.3954 b	18.9223 b	16.8725 c	17.6731 c
$DF9_i$	31.2667 a	28.8647 a	34.3739 a	31.8335 a
Test: $DF1_i=DF5_i=DF9_i$	2.89 c	2.56 c	3.34 b	2.89 c
NON-ELECTRIC MACHINERY (701-704 observations; Pseudo-R2=0.21-0.22)				
$DF1_i$	-1.6621	-3.2780	0.0192	-1.6360
$DF5_i$	0.1064	-2.0678	2.3078	0.1809
$DF9_i$	11.7474 b	11.5456 b	10.8478 c	11.5735 b
Test: $DF1_i=DF5_i=DF9_i$	2.47 c	3.15 b	1.63	2.60 c
ELECTRONICS-RELATED MACHINERY (814-817 observations; Pseudo-R^2=0.21)				
$DF1_i$	3.2318	3.2166	3.1082	3.1003
$DF5_i$	13.2053 b	11.4802 c	12.9649 b	11.2881 c
$DF9_i$	14.7191 a	14.6135 a	14.6078 a	14.4989 a
Test: $DF1_i=DF5_i=DF9_i$	1.51	1.46	1.52	1.46

Table 5 (continued)

Independent variable or statistic	3-digit industry dummies		4-digit industry dummies	
	Equation (1)	Equation (2)	Equation (1)	Equation (2)
MOTOR VEHICLES (449 observations; Pseudo-R^2=0.21)				
$DF1_i$	6.0621	6.3948	4-digit & 3 digit categories are identical	
$DF5_i$	-12.8193 c	-11.2924		
$DF9_i$	1.6848	2.8073		
Test: $DF1_i = DF5_i = DF9_i$	2.85 c	2.66 c		
OTHER TRANSPORT MACHINERY (159 observations; Pseudo-R^2=0.31)				
$DF1_i$	16.4380	12.3009	16.3152	11.6822
$DF5_i$	-4.9919	-11.8793	-3.8801	-12.3564
$DF9_i$	51.1992 c	26.2200	53.2373 b	29.1965
Test: $DF1_i = DF5_i = DF9_i$	1.30	0.58	1.32	0.63
FURNITURE (466 observations; Pseudo-R^2=0.19; no 3- or 4-digit dummies)				
$DF1_i$	3.1979	0.5808	4-digit & 3 digit categories are identical	
$DF5_i$	-1.3404	4.2252		
$DF9_i$	36.3836	40.9637		
Test: $DF1_i = DF5_i = DF9_i$	0.41	0.54		
MISCELLANEOUS MANUFACTURES (606-608 observations; Pseudo-R^2=0.15)				
$DF1_i$	13.8128	15.1430 c	10.0287	11.4728
$DF5_i$	16.5036	12.2583	17.4389	13.9054
$DF9_i$	42.6890 a	39.4849 a	40.5026 a	37.8590 a
Test: $DF1_i = DF5_i = DF9_i$	3.64 b	2.97 b	3.85 b	3.04 b

Notes: a=signficant at the 1% level, b=significant at the 5% level, c=significant at the 10% level (all p-values based on robust standard errors); estimated equations also include 3- and 4-digit industry dummies as indicated and relevant (see explanation in the text); for further sample details and precise p-values, see Appendix Table 5.

Appendix Table 1: Sampling Details from the Database on Thai Manufacturing Plants

		Thousands		Values in billion baht			
Sample	Number of plants	Workers	Paid workers	Fixed assets (avg.)	Exports	Output	Value added
All plants in database underlying National Statistical Office (2009)							
All plants	73,931	3,726.4	3,591.5	2,972.9	2,475.6	7,146.6	1,716.6
16+ workers	26,293	3,476.9	3,422.9	2,882.6	2,473.4	7,042.2	1,672.5
20+ workers	22,934	3,418.6	3,371.0	2,859.4	2,471.7	7,001.2	1,661.7
Extreme values	4,169	292.2	256.9	64.2	59.7	147.6	25.5
Duplicates eliminated	4,818	607.3	604.3	391.7	399.1	997.9	257.6
20+ workers, sample	13,947	2,519.1	2,509.8	2,403.6	2,012.9	5,855.8	1,378.6
Local plants (foreign shares 0-9%)							
All plants	71,274	2,782.5	2,648.9	1,764.9	1,106.3	4,093.3	1,007.1
16+ workers	23,777	2,534.5	2,481.7	1,676.1	1,104.8	3,993.9	963.8
20+ workers	20,503	2,477.7	2,431.3	1,654.5	1,103.9	3,956.4	953.6
Extreme values	4,080	254.7	219.4	30.3	21.5	82.4	15.0
Duplicates eliminated	4,463	495.6	492.9	268.3	170.9	645.4	144.2
20+ workers, sample	11,960	1,727.4	1,719.0	1,356.0	911.5	3,228.6	794.3
Minority-foreign plants in database (foreign shares 10-49%)							
All plants	1,220	304.9	304.6	381.2	298.9	992.4	166.3
16+ workers	1,123	303.9	303.6	380.5	298.3	990.4	165.8
20+ workers	1,063	302.9	302.6	379.6	298.1	988.6	165.6
Extreme values	33	19.4	19.4	4.5	22.7	38.1	6.6
Duplicates eliminated	121	20.3	20.3	22.1	11.9	42.2	9.6
Sample plants	909	263.1	262.9	353.0	263.4	908.3	149.4
Majority-foreign plants in database (foreign shares 50-89%)							
All plants	440	178.1	178.0	270.4	183.9	495.7	95.7
16+ workers	420	177.9	177.8	270.2	183.8	495.0	95.6
20+ workers	409	177.7	177.6	269.9	183.4	494.0	95.5
Extreme values	17	3.3	3.3	25.7	3.5	8.2	0.8
Duplicates eliminated	37	18.1	18.1	18.6	15.0	34.5	7.0
Sample plants	355	156.3	156.2	225.6	164.9	451.3	87.6
Heavily-foreign plants in database (foreign shares 90-100%)							
All plants	997	460.8	460.1	556.5	886.6	1,565.2	447.6
16+ workers	973	460.6	459.8	555.8	886.5	1,563.0	447.2
20+ workers	959	460.3	459.6	555.3	886.4	1,562.2	447.1
Extreme values	39	14.8	14.8	3.7	12.0	18.9	3.1
Duplicates eliminated	197	73.3	73.0	82.7	201.3	275.7	96.8
Sample plants	723	372.2	371.8	469.0	673.1	1,267.6	347.2

Notes: Fixed assets are averages of initial and ending stocks abd exoirts are estimated as the product of export propensities and output output from data underlying National Statistical Office (2009).

Appendix Table 2a: Exports of Sample Plants by Industry and Owner (billion baht)

Industry	Total	Local	MNEs by foreign share 10-49%	50-89%	90%+
Manufacturing	2,012.88	911.49	263.39	164.89	673.11
Sample industries	1,949.97	905.64	210.63	160.95	672.76
Food products	231.74	181.82	24.85	9.53	15.54
Beverages	6.85	3.64	3.12	0.00	0.09
Textiles	76.76	49.30	4.43	18.38	4.65
Apparel	77.11	52.70	14.95	1.08	8.38
Leather	11.63	9.93	0.02	0.38	1.30
Footwear	6.58	5.86	0.32	0.08	0.32
Wood products	16.14	14.42	1.44	0.12	0.16
Paper products	22.39	4.72	1.35	0.34	15.97
Chemicals	93.69	51.47	9.07	8.68	24.47
Rubber products	123.50	62.69	16.30	12.35	32.15
Plastics	35.02	16.92	4.29	3.31	10.49
Non-metallic mineral products	23.34	18.49	2.29	0.73	1.82
Basic metals	43.91	16.63	11.06	0.43	15.79
Metal products	62.62	19.32	4.95	1.54	36.81
Non-electric machinery	230.88	93.80	66.44	19.61	51.03
Electronics-related machinery	689.17	208.91	23.57	63.66	393.03
Motor vehicles	97.15	50.21	3.65	8.36	34.92
Other transport machinery	12.69	2.63	4.30	5.60	0.15
Furniture	16.76	13.52	1.16	1.51	0.57
Miscellaneous manufactures	72.07	28.62	13.07	5.27	25.11
Excluded industries	62.91	5.86	52.76	3.94	0.35
Tobacco	2.16	0.80	1.37	0.00	0.00
Publishing	1.70	0.63	1.00	0.00	0.08
Petroleum products	58.67	4.33	50.40	3.94	0.00
Recycling	0.38	0.11	0.00	0.00	0.27

Note: Exports are estimated as the product of export propensities and output.

Source: Compilations from data underlying National Statistical Office (2009).

Appendix Table 2b: Output of Sample Plants by Industry and Owner (billion baht)

Industry	Total	Local	MNEs by foreign share 10-49%	50-89%	90%+
Manufacturing	5,855.75	3,228.59	908.28	451.29	1,267.59
Sample industries	5,386.92	3,063.42	610.66	447.20	1,265.64
Food products	729.21	638.49	46.40	15.25	29.06
Beverages	161.43	129.74	26.03	4.72	0.93
Textiles	221.96	173.33	11.58	30.12	6.94
Apparel	137.86	102.92	24.02	1.76	9.17
Leather	34.34	31.10	1.07	0.84	1.34
Footwear	17.74	15.90	1.33	0.08	0.43
Wood products	51.90	47.80	2.87	0.89	0.34
Paper products	150.39	92.79	24.11	2.45	31.04
Chemicals	431.31	281.65	52.20	30.23	67.23
Rubber products	224.79	129.23	34.66	18.89	42.02
Plastics	165.79	109.98	18.96	10.45	26.39
Non-metallic mineral products	183.49	165.73	8.79	3.13	5.84
Basic metals	243.61	147.04	39.74	24.42	32.42
Metal products	249.78	150.70	35.46	7.02	56.61
Non-electric machinery	335.21	145.81	74.68	33.15	81.57
Electronics-related machinery	1,038.37	316.30	79.36	90.76	551.94
Motor vehicles	708.61	260.41	73.70	83.84	290.66
Other transport machinery	145.34	32.09	31.23	81.07	0.94
Furniture	51.46	42.91	5.37	1.89	1.29
Miscellaneous manufactures	104.31	49.51	19.09	6.24	29.47
Excluded industries	468.83	165.17	297.62	4.09	1.95
Tobacco	44.25	42.65	1.60	0.00	0.00
Publishing	61.37	49.54	9.90	0.26	1.67
Petroleum products	362.03	72.07	286.13	3.83	0.00
Recycling	1.19	0.91	0.00	0.00	0.28

Source: Compilations from data underlying National Statistical Office (2009).

Appendix Table 2c: Number of Sample Plants by Industry and Owner

			MNEs by foreign share		
Industry	Total	Local	10-49%	50-89%	90%+
Manufacturing	13,947	11,960	909	355	723
Sample industries	13,306	11,350	890	352	714
Food products	1,989	1,861	81	21	26
Beverages	167	156	8	2	1
Textiles	959	860	56	27	16
Apparel	897	831	45	10	11
Leather	193	170	13	6	4
Footwear	151	136	10	1	4
Wood products	544	527	11	3	3
Paper products	486	432	36	7	11
Chemicals	870	718	72	30	50
Rubber products	332	252	37	15	28
Plastics	1,005	836	69	31	69
Non-metallic mineral products	894	833	39	9	13
Basic metals	372	308	35	6	23
Metal products	1,242	1,064	93	26	59
Non-electric machinery	704	549	61	34	60
Electronics-related machinery	817	494	79	53	191
Motor vehicles	449	303	36	39	71
Other transport machinery	159	137	13	6	3
Furniture	468	437	20	6	5
Miscellaneous manufactures	608	446	76	20	66
Excluded industries	641	610	19	3	9
Tobacco	29	28	1	0	0
Publishing	529	505	14	2	8
Petroleum products	60	55	4	1	0
Recycling	23	22	0	0	1

Source: Compilations from data underlying National Statistical Office (2009).

Appendix Table 3: Export Propensities of Sample Plants (percent)

Industry	Local	MNCs by foreign share 10-49%	50-89%	90%+
Manufacturing (plant mean)	11.62	30.28	39.98	50.68
Sample industries (plant mean)	12.15	30.57	40.04	51.14
Food products	13.68	50.35	54.29	46.81
Beverages	4.16	25.13	0.00	10.00
Textiles	10.72	28.57	60.63	54.19
Apparel	21.69	55.73	54.00	96.64
Leather	17.59	5.62	24.83	74.75
Footwear	21.63	28.00	95.00	92.25
Wood products	15.19	44.91	5.00	64.00
Paper products	5.94	13.92	24.29	22.73
Chemicals	7.60	18.71	24.43	33.18
Rubber products	28.10	36.92	64.67	64.89
Plastics	6.30	20.72	31.55	37.87
Non-metallic mineral products	7.44	26.21	49.22	53.85
Basic metals	8.81	13.80	11.83	44.65
Metal products	2.90	15.25	29.00	34.97
Non-electric machinery	8.82	26.56	29.35	47.37
Electronics-related machinery	15.13	31.56	51.38	54.84
Motor vehicles	8.24	19.81	17.05	36.93
Other transport machinery	5.30	13.23	32.50	33.33
Furniture	14.02	31.75	51.83	80.00
Miscellaneous manufactures	37.16	62.82	75.35	89.80
Excluded industries				
Tobacco	5.39	92.00	-	-
Publishing	1.06	10.79	0.00	3.38
Petroleum products	4.65	18.25	100.00	-
Recycling	8.64	-	-	100.00

- = not available (0 plants in category)

Source: Compilations from data underlying National Statistical Office (2009).

Appendix Table 4: Estimates of Slope Coefficients and Indicators for Equations (1) and (2) in 20 Sample Industries Combined (Tobit estimates; all p-values based on robust standard errors)

Independent variable, statistic, or indicator	3-digit industry dummies				4-digit industry dummies			
	Equation (1)		Equation (2)		Equation (1)		Equation (2)	
	Value	P-val.	Value	P-val.	Value	P-val.	Value	P-val.
20 SAMPLE INDUSTRIES COMBINED								
LOU_i	44.8985	0.00	45.7469	0.00	49.2034	0.00	50.3082	0.00
LOU_i^2	-1.0766	0.00	-1.0849	0.00	-1.1845	0.00	-1.2011	0.00
LYR_i	0.5804	0.87	1.1007	0.76	0.1503	0.97	0.4637	0.90
LYR_i^2	0.0140	0.99	-0.1699	0.83	0.1110	0.88	-0.0062	0.99
LKL_i	2.4828	0.66	-	-	2.3613	0.67	-	-
LKL_i^2	-0.1745	0.43	-	-	-0.1361	0.53	-	-
LPL_i	13.3781	0.00	-	-	9.8368	0.02	-	-
LPL_i^2	1.5242	0.57	-	-	0.6130	0.82	-	-
LVL_i	-	-	-7.8888	0.36	-	-	-7.9833	0.34
LVL_i^2	-	-	0.1935	0.57	-	-	0.2275	0.50
$DBOI_i$	112.4571	0.00	112.1096	0.00	108.8477	0.00	108.5754	0.00
$DF1_i$	7.3738	0.00	6.7564	0.00	7.4226	0.00	6.9843	0.00
$DF5_i$	13.3433	0.00	12.3469	0.00	13.1321	0.00	12.5465	0.00
$DF9_i$	20.7570	0.00	19.7657	0.00	20.6866	0.00	20.0637	0.00
Test: $DF1_i = DF5_i = DF9_i$	13.46	0.00	12.75	0.00	13.71	0.00	13.34	0.00
F-statistic	158.30	0.00	164.32	0.00	87.77	0.00	89.33	0.00
Obs XS_i=0/ =100	9,060	575	9,099	575	9,060	575	9,099	575
All Obs./Pseudo-R^2	13,264	0.22	13,306	0.22	13,264	0.22	13,306	0.22

Note: Test: $DF1_i = DF5_i = DF9_i$ is a Wald Statistic testing the null hypothesis that coefficients on the three foreign ownership dummies are equal; estimated equations also include 3- or 4-digit industry dummies as indicated and relevant (see explanation in the text; detailed estimates including all dummies and the constant are available from authors).

Appendix Table 5: Estimates of Slope Coefficients for Equations (1) and (2) for 20 Individual Sample Industries (Tobit estimates; all p-values based on robust standard errors)

Independent variable, statistic, or indicator	3-digit industry dummies				4-digit industry dummies			
	Equation (1)		Equation (2)		Equation (1)		Equation (2)	
	Value	P-val.	Value	P-val.	Value	P-val.	Value	P-val.
FOOD PRODUCTS (ISIC 151,152,153,154)								
LOU_i	61.3702	0.00	61.7332	0.00	53.8037	0.00	57.7508	0.00
LOU_i^2	-1.5249	0.00	-1.5073	0.00	-1.3193	0.00	-1.4059	0.00
LYR_i	10.7668	0.29	14.7433	0.14	11.2850	0.25	14.9644	0.12
LYR_i^2	-2.2072	0.27	-3.2024	0.11	-2.1621	0.27	-2.9504	0.13
LKL_i	45.0727	0.01	-	-	46.2761	0.00	-	-
LKL_i^2	-1.8796	0.00	-	-	-1.8866	0.00	-	-
LPL_i	45.5993	0.00	-	-	30.2036	0.01	-	-
LPL_i^2	20.8828	0.01	-	-	15.6533	0.05	-	-
LVL_i	-	-	-13.5502	0.46	-	-	-18.8714	0.29
LVL_i^2	-	-	0.3230	0.66	-	-	0.6121	0.38
$DBOI_i$	129.2486	0.00	129.7774	0.00	122.8611	0.00	123.1868	0.00
$DF1_i$	12.6416	0.02	12.4587	0.03	16.1439	0.00	16.1207	0.00
$DF5_i$	37.5931	0.00	35.1289	0.00	38.7532	0.00	35.8560	0.00
$DF9_i$	11.8310	0.26	11.9554	0.29	13.1603	0.20	13.2341	0.21
Test: $DF1_i = DF5_i = DF9_i$	2.56	0.08	2.29	0.10	2.30	0.10	1.91	0.15
F-statistic	100.32	0.00	112.61	0.00	68.48	0.00	72.37	0.00
Obs XS_i=0/ =100	1,424	96	1,430	96	1,424	96	1,430	96
All Obs./Pseudo-R^2	1,983	0.27	1,989	0.27	1,983	0.28	1,989	0.28
BEVERAGES (ISIC 155, no 3-digit industry dummies)								
LOU_i	113.7994	0.01	124.4523	0.01	113.9273	0.01	122.7557	0.01
LOU_i^2	-2.9608	0.01	-3.2493	0.01	-2.9643	0.01	-3.2120	0.01
LYR_i	-30.8684	0.17	-32.3573	0.15	-31.1076	0.19	-30.4921	0.19
LYR_i^2	4.8525	0.35	5.1683	0.28	4.8999	0.38	4.7930	0.35
LKL_i	49.4209	0.38	-	-	50.1545	0.39	-	-
LKL_i^2	-1.8736	0.37	-	-	-1.9021	0.38	-	-
LPL_i	-7.1864	0.87	-	-	-7.5472	0.87	-	-
LPL_i^2	-10.2818	0.74	-	-	-10.4093	0.74	-	-
LVL_i	-	-	-19.7035	0.73	-	-	-22.1393	0.71
LVL_i^2	-	-	0.6981	0.73	-	-	0.8273	0.71
$DBOI_i$	113.3978	0.00	115.4144	0.00	113.2525	0.00	116.4725	0.00
$DF1_i$	19.1976	0.28	22.8589	0.10	19.3134	0.32	20.9971	0.18
$DF5_i$	-86.2390	0.01	-86.2142	0.00	-85.8394	0.03	-87.5944	0.00
$DF9_i$	-57.8945	0.00	-50.6144	0.00	-58.2841	0.00	-47.5429	0.00
Test: $DF1_i = DF5_i = DF9_i$	8.43	0.00	12.29	0.00	6.75	0.00	8.96	0.00
F-statistic	12.42	0.00	12.09	0.00	11.47	0.00	11.31	0.00
Obs XS_i=0/ =100	139	3	139	3	139	3	139	3
All Obs./Pseudo-R^2	167	0.30	167	0.30	167	0.30	167	0.30

Appendix Table 5 (continued)

Independent variable, statistic, or indicator	3-digit industry dummies				4-digit industry dummies			
	Equation (1)		Equation (2)		Equation (1)		Equation (2)	
	Value	P-val.	Value	P-val.	Value	P-val.	Value	P-val.
TEXTILES (ISIC 17)								
LOU_i	27.6674	0.25	27.5714	0.21	28.8329	0.25	27.6363	0.22
LOU_i^2	-0.5690	0.37	-0.5402	0.35	-0.6002	0.36	-0.5420	0.37
LYR_i	22.4960	0.08	17.7440	0.14	23.2619	0.08	18.2845	0.14
LYR_i^2	-4.5632	0.10	-3.5951	0.17	-4.7546	0.09	-3.7416	0.17
LKL_i	-2.7769	0.91	-	-	-2.3467	0.92	-	-
LKL_i^2	0.2001	0.83	-	-	0.1983	0.83	-	-
LPL_i	20.7797	0.31	-	-	20.9523	0.31	-	-
LPL_i^2	-3.5762	0.74	-	-	-3.2625	0.77	-	-
LVL_i	-	-	-37.7398	0.30	-	-	-34.6819	0.34
LVL_i^2	-	-	1.4968	0.31	-	-	1.3798	0.35
$DBOI_i$	101.0844	0.00	102.0417	0.00	101.0072	0.00	102.2183	0.00
$DF1_i$	29.9043	0.00	27.9150	0.00	30.6898	0.00	28.5452	0.00
$DF5_i$	22.7910	0.00	22.4585	0.01	23.1780	0.00	22.9882	0.00
$DF9_i$	17.1700	0.01	16.2839	0.01	16.5481	0.01	15.9669	0.02
Test: $DF1_i=DF5_i=DF9_i$	0.86	0.42	0.70	0.50	0.99	0.37	0.75	0.47
F-statistic	51.23	0.00	59.10	0.00	42.21	0.00	46.59	0.00
Obs XS_i=0/ =100	702	23	707	23	702	23	707	23
All Obs./Pseudo-R^2	953	0.22	959	0.22	953	0.22	959	0.22
APPAREL (ISIC 18)								
LOU_i	154.5548	0.00	149.0271	0.00	4-digit & 3 digit categories are identical			
LOU_i^2	-3.8908	0.00	-3.7433	0.00				
LYR_i	-33.9519	0.02	-29.0040	0.04				
LYR_i^2	8.3434	0.02	7.1698	0.04				
LKL_i	63.1906	0.10	-	-				
LKL_i^2	-2.5565	0.11	-	-				
LPL_i	50.0988	0.06	-	-				
LPL_i^2	12.5981	0.21	-	-				
LVL_i	-	-	49.1583	0.44				
LVL_i^2	-	-	-1.9634	0.47				
$DBOI_i$	121.6452	0.00	125.6534	0.00				
$DF1_i$	16.9266	0.12	17.9842	0.10				
$DF5_i$	22.0336	0.25	25.9962	0.18				
$DF9_i$	58.4210	0.00	59.5371	0.01				
Test: $DF1_i=DF5_i=DF9_i$	1.73	0.18	1.59	0.20				
F-statistic	39.56	0.00	45.77	0.00				
Obs XS_i=0/ =100	567	85	570	85				
All Obs./Pseudo-R^2	894	0.18	897	0.18				

Appendix Table 5 (continued)

Independent variable, statistic, or indicator	3-digit industry dummies				4-digit industry dummies			
	Equation (1)		Equation (2)		Equation (1)		Equation (2)	
	Value	P-val.	Value	P-val.	Value	P-val.	Value	P-val.
LEATHER (ISIC 191)								
LOU_i	-70.5414	0.24	-75.2369	0.20	-64.0862	0.24	-66.3018	0.22
LOU_i^2	2.1382	0.20	2.3642	0.15	2.0376	0.18	2.1489	0.16
LYR_i	23.1160	0.12	28.5161	0.07	27.2810	0.05	28.3073	0.08
LYR_i^2	-1.3448	0.75	-2.7073	0.53	-1.4905	0.70	-2.1868	0.62
LKL_i	-45.4346	0.12	-	-	-49.7445	0.09	-	-
LKL_i^2	1.8958	0.12	-	-	2.3232	0.06	-	-
LPL_i	53.8487	0.17	-	-	69.9054	0.06	-	-
LPL_i^2	40.5954	0.23	-	-	46.1944	0.12	-	-
LVL_i	-	-	71.4996	0.41	-	-	17.6753	0.84
LVL_i^2	-	-	-3.3529	0.35	-	-	-0.9495	0.79
$DBOI_i$	98.7859	0.00	101.8768	0.00	97.3684	0.00	99.4029	0.00
$DF1_i$	-6.9743	0.60	-10.2583	0.44	-14.6068	0.25	-12.9462	0.30
$DF5_i$	34.4320	0.00	28.2590	0.13	13.5851	0.26	22.0107	0.24
$DF9_i$	47.7325	0.02	46.3196	0.03	34.2724	0.08	40.4391	0.06
Test: $DF1_i$=$DF5_i$=$DF9_i$	5.20	0.01	3.99	0.02	2.80	0.06	3.49	0.03
F-statistic	63.00	0.00	80.68	0.00	72.89	0.00	76.74	0.00
Obs XS_i=0/ =100	82	5	86	5	82	5	86	5
All Obs./Pseudo-R^2	147	0.19	151	0.20	147	0.21	151	0.20
FOOTWEAR (ISIC 192, no 3- or 4-digit industry dummies)								
LOU_i	156.9788	0.02	137.2675	0.07	4-digit & 3 digit categories are identical			
LOU_i^2	-4.1642	0.02	-3.6011	0.08				
LYR_i	7.6131	0.80	21.9560	0.54				
LYR_i^2	-1.9569	0.73	-4.4674	0.50				
LKL_i	159.6563	0.03	-	-				
LKL_i^2	-6.8318	0.02	-	-				
LPL_i	-168.314	0.16	-	-				
LPL_i^2	-376.833	0.11	-	-				
LVL_i	-	-	20.5568	0.80				
LVL_i^2	-	-	-0.8637	0.79				
$DBOI_i$	113.1505	0.00	111.2371	0.00				
$DF1_i$	-37.5707	0.00	-43.6288	0.00				
$DF5_i$	4.6527	0.80	13.5985	0.40				
$DF9_i$	99.5829	0.00	105.1374	0.00				
Test: $DF1_i$=$DF5_i$=$DF9_i$	9.86	0.00	12.88	0.00				
F-statistic	13.35	0.00	14.66	0.00				
Obs XS_i=0/ =100	123	11	124	11				
All Obs./Pseudo-R^2	192	0.19	193	0.19				

Appendix Table 5 (continued)

Independent variable, statistic, or indicator	3-digit industry dummies				4-digit industry dummies			
	Equation (1)		Equation (2)		Equation (1)		Equation (2)	
	Value	P-val.	Value	P-val.	Value	P-val.	Value	P-val.
WOOD PRODUCTS (ISIC 20)								
LOU_i	89.3915	0.11	111.0702	0.04	101.0119	0.06	105.2489	0.04
LOU_i^2	-2.2706	0.14	-2.9200	0.05	-2.5101	0.10	-2.6628	0.06
LYR_i	30.2422	0.03	26.6779	0.05	21.7490	0.09	15.1156	0.24
LYR_i^2	-4.3578	0.22	-3.3862	0.34	-2.8106	0.38	-1.2516	0.70
LKL_i	16.4017	0.70	-	-	8.0349	0.84	-	-
LKL_i^2	-1.0262	0.55	-	-	-0.6331	0.69	-	-
LPL_i	24.6169	0.23	-	-	13.2217	0.52	-	-
LPL_i^2	11.5232	0.21	-	-	8.7326	0.34	-	-
LVL_i	-	-	46.5727	0.27	-	-	66.4452	0.09
LVL_i^2	-	-	-2.1177	0.21	-	-	-2.8545	0.07
$DBOI_i$	134.0546	0.00	131.9681	0.00	124.0384	0.00	122.3038	0.00
$DF1_i$	12.1705	0.21	11.7164	0.21	6.3341	0.54	4.3575	0.66
$DF5_i$	-30.8580	0.00	-55.8687	0.00	-29.6701	0.01	-45.5819	0.00
$DF9_i$	26.0682	0.10	23.9381	0.08	22.8279	0.29	19.5935	0.35
Test: $DF1_i = DF5_i = DF9_i$	8.72	0.00	29.30	0.00	5.20	0.01	11.18	0.00
F-statistic	49.50	0.00	55.13	0.00	37.42	0.00	0.00	0.00
Obs XS_i=0/ =100	390	13	394	13	390	13	394	13
All Obs./Pseudo-R^2	540	0.24	544	0.24	540	0.25	544	0.25
PAPER PRODUCTS (ISIC 21)								
LOU_i	-22.6306	0.48	-7.6158	0.81	-30.4160	0.32	-15.5073	0.59
LOU_i^2	0.3324	0.70	0.0626	0.94	0.5683	0.49	0.3052	0.69
LYR_i	-1.2640	0.96	-0.8680	0.98	6.1081	0.83	6.0853	0.84
LYR_i^2	0.0004	1.00	-0.2884	0.96	-1.6379	0.76	-1.8419	0.75
LKL_i	29.1070	0.42	-	-	37.3661	0.29	-	-
LKL_i^2	-0.9875	0.47	-	-	-1.2927	0.33	-	-
LPL_i	-45.4769	0.07	-	-	-39.3518	0.10	-	-
LPL_i^2	-28.1351	0.02	-	-	-26.8423	0.02	-	-
LVL_i	-	-	-17.4442	0.80	-	-	4.8914	0.94
LVL_i^2	-	-	0.4295	0.87	-	-	-0.4649	0.86
$DBOI_i$	131.3337	0.00	127.5951	0.00	124.3675	0.00	120.5320	0.00
$DF1_i$	5.8875	0.58	1.4731	0.90	8.0029	0.39	2.9066	0.78
$DF5_i$	7.3743	0.54	3.2299	0.80	-1.7922	0.89	-4.8177	0.73
$DF9_i$	18.6185	0.05	18.2517	0.05	15.7320	0.13	17.0999	0.08
Test: $DF1_i = DF5_i = DF9_i$	0.62	0.54	0.84	0.43	0.66	0.52	1.05	0.35
F-statistic	12.17	0.00	14.30	0.00	11.13	0.00	13.24	0.00
Obs XS_i=0/ =100	387	12	387	12	387	12	387	12
All Obs./Pseudo-R^2	486	0.26	486	0.26	486	0.27	486	0.27

Appendix Table 5 (continued)

Independent variable, statistic, or indicator	3-digit industry dummies				4-digit industry dummies			
	Equation (1)		Equation (2)		Equation (1)		Equation (2)	
	Value	P-val.	Value	P-val.	Value	P-val.	Value	P-val.
CHEMICALS (ISIC 24)								
LOU_i	24.4703	0.13	8.9938	0.57	30.8982	0.06	16.0781	0.34
LOU_i^2	-0.6348	0.13	-0.1988	0.63	-0.8018	0.06	-0.3838	0.38
LYR_i	10.6639	0.17	10.2189	0.20	12.2501	0.13	11.8557	0.15
LYR_i^2	-2.2401	0.16	-2.2078	0.18	-2.4941	0.13	-2.4466	0.14
LKL_i	-28.8168	0.03	-	-	-30.8084	0.02	-	-
LKL_i^2	1.0790	0.02	-	-	1.1519	0.01	-	-
LPL_i	-1.5704	0.89	-	-	-1.9919	0.85	-	-
LPL_i^2	-7.8550	0.31	-	-	-6.4680	0.36	-	-
LVL_i	-	-	-2.1115	0.91	-	-	-4.7281	0.79
LVL_i^2	-	-	0.0079	0.99	-	-	0.1143	0.87
$DBOI_i$	70.0764	0.00	70.3974	0.00	68.4600	0.00	68.6238	0.00
$DF1_i$	5.3664	0.27	5.1027	0.29	5.8591	0.23	5.5133	0.26
$DF5_i$	14.9806	0.04	14.5457	0.05	13.5455	0.06	13.3298	0.07
$DF9_i$	16.4077	0.00	15.4246	0.01	18.4594	0.00	17.7401	0.00
Test: $DF1_i=DF5_i=DF9_i$	1.65	0.19	1.43	0.24	1.83	0.16	1.69	0.19
F-statistic	29.41	0.00	34.16	0.00	22.31	0.00	24.82	0.00
Obs XS_i=0/ =100	534	9	535	9	534	9	535	9
All Obs./Pseudo-R^2	869	0.16	870	0.16	869	0.16	870	0.16
RUBBER PRODUCTS (ISIC 251, no 3-digit industry dummies)								
LOU_i	28.5320	0.31	44.3480	0.11	21.4476	0.41	35.7419	0.20
LOU_i^2	-0.5785	0.42	-1.0142	0.16	-0.3888	0.56	-0.7617	0.29
LYR_i	-2.4628	0.88	-6.4963	0.72	-2.1536	0.89	-7.2039	0.67
LYR_i^2	0.1363	0.97	2.1253	0.58	0.6369	0.84	2.6412	0.46
LKL_i	-62.0428	0.04	-	-	-68.3719	0.03	-	-
LKL_i^2	2.3981	0.05	-	-	2.7312	0.03	-	-
LPL_i	-37.2199	0.28	-	-	-4.3112	0.90	-	-
LPL_i^2	-115.407	0.01	-	-	-84.8908	0.05	-	-
LVL_i	-	-	-101.415	0.00	-	-	-82.7374	0.00
LVL_i^2	-	-	3.9733	0.00	-	-	3.2177	0.00
$DBOI_i$	99.3440	0.00	97.6580	0.00	94.9031	0.00	93.0892	0.00
$DF1_i$	-12.9807	0.04	-8.7928	0.14	-11.0197	0.06	-6.8881	0.24
$DF5_i$	11.3778	0.19	15.8978	0.05	11.0614	0.17	16.8829	0.02
$DF9_i$	4.9093	0.57	10.6292	0.18	6.5681	0.43	13.2559	0.10
Test: $DF1_i=DF5_i=DF9_i$	4.03	0.02	4.33	0.01	4.06	0.02	4.62	0.01
F-statistic	47.65	0.00	56.61	0.00	46.98	0.00	48.65	0.00
Obs XS_i=0/ =100	151	13	151	13	151	13	151	13
All Obs./Pseudo-R^2	331	0.18	332	0.18	331	0.19	332	0.18

Appendix Table 5 (continued)

Independent variable, statistic, or indicator	3-digit industry dummies				4-digit industry dummies			
	Equation (1)		Equation (2)		Equation (1)		Equation (2)	
	Value	P-val.	Value	P-val.	Value	P-val.	Value	P-val.
PLASTICS (ISIC 252, no 3- or 4-digit industry dummies)								
LOU_i	21.2365	0.59	20.9478	0.58	4-digit & 3 digit categories			
LOU_i^2	-0.5917	0.58	-0.5488	0.59	are identical			
LYR_i	-11.0585	0.43	-9.5811	0.47				
LYR_i^2	2.9148	0.35	2.4473	0.42				
LKL_i	-25.7759	0.39	-	-				
LKL_i^2	1.0935	0.35	-	-				
LPL_i	0.4740	0.98	-	-				
LPL_i^2	-0.4155	0.98	-	-				
LVL_i	-	-	-73.6359	0.02				
LVL_i^2	-	-	2.8435	0.03				
$DBOI_i$	114.6588	0.00	113.3287	0.00				
$DF1_i$	4.6665	0.49	4.4907	0.49				
$DF5_i$	15.8722	0.15	18.4071	0.09				
$DF9_i$	20.7537	0.00	22.2606	0.00				
Test: $DF1_i=DF5_i=DF9_i$	2.07	0.13	2.72	0.07				
F-statistic	31.66	0.00	38.27	0.00				
Obs XS_i=0/ =100	738	27	738	27				
All Obs./Pseudo-R^2	1,004	0.21	1,005	0.21				
NON-METALLIC METAL PRODUCTS (ISIC 26)								
LOU_i	17.6439	0.43	31.4030	0.15	56.1400	0.02	76.2013	0.00
LOU_i^2	-0.5410	0.37	-0.9370	0.12	-1.5463	0.01	-2.1290	0.00
LYR_i	-20.5638	0.14	-19.4970	0.16	-23.8142	0.10	-23.1656	0.11
LYR_i^2	4.1529	0.19	3.7822	0.24	4.2000	0.19	4.0567	0.19
LKL_i	14.0010	0.58	-	-	11.8786	0.60	-	-
LKL_i^2	-0.8006	0.41	-	-	-0.5833	0.50	-	-
LPL_i	7.5805	0.72	-	-	-13.9965	0.50	-	-
LPL_i^2	-4.1742	0.75	-	-	-12.9112	0.31	-	-
LVL_i	-	-	-37.1994	0.25	-	-	-51.7201	0.08
LVL_i^2	-	-	1.3607	0.30	-	-	2.1443	0.07
$DBOI_i$	124.1426	0.00	126.7452	0.00	105.7978	0.00	107.0115	0.00
$DF1_i$	13.0016	0.12	10.5544	0.25	11.6763	0.13	11.5039	0.14
$DF5_i$	19.6126	0.09	23.3807	0.03	17.9874	0.17	19.7564	0.11
$DF9_i$	25.0683	0.02	20.7169	0.06	18.1048	0.04	13.7290	0.11
Test: $DF1_i=DF5_i=DF9_i$	0.45	0.64	0.55	0.58	0.20	0.82	0.17	0.84
F-statistic	39.11	0.00	44.57	0.00	31.64	0.00	35.34	0.00
Obs XS_i=0/ =100	712	13	716	4	712	13	716	4
All Obs./Pseudo-R^2	890	0.25	894	0.25	890	0.27	894	0.27

Appendix Table 5 (continued)

Independent variable, statistic, or indicator	3-digit industry dummies				4-digit industry dummies			
	Equation (1)		Equation (2)		Equation (1)		Equation (2)	
	Value	P-val.	Value	P-val.	Value	P-val.	Value	P-val.
BASIC METALS (ISIC 27)								
LOU_i	4.4779	0.89	6.4601	0.83	13.2229	0.69	13.2116	0.65
LOU_i^2	-0.4325	0.62	-0.4514	0.55	-0.6509	0.45	-0.6147	0.41
LYR_i	-0.4473	0.99	14.8501	0.55	-1.6848	0.94	14.3586	0.57
LYR_i^2	1.4314	0.75	-1.6566	0.72	1.7005	0.71	-1.5730	0.74
LKL_i	15.8248	0.61	-	-	11.1441	0.72	-	-
LKL_i^2	-0.1436	0.90	-	-	0.0254	0.98	-	-
LPL_i	-57.9316	0.13	-	-	-59.3582	0.12	-	-
LPL_i^2	-60.0221	0.22	-	-	-60.7817	0.22	-	-
LVL_i	-	-	-32.1845	0.43	-	-	-31.1556	0.45
LVL_i^2	-	-	1.5945	0.27	-	-	1.5427	0.30
$DBOI_i$	125.7904	0.00	121.4384	0.00	126.7159	0.00	122.0830	0.00
$DF1_i$	-8.4504	0.23	-6.1531	0.44	-8.2128	0.26	-5.8052	0.48
$DF5_i$	16.1751	0.39	23.5286	0.11	16.9883	0.36	24.3527	0.09
$DF9_i$	21.4522	0.01	24.6034	0.01	22.0300	0.01	24.9297	0.01
Test: $DF1_i=DF5_i=DF9_i$	4.54	0.01	4.35	0.01	21.05	0.00	4.21	0.02
F-statistic	22.56	0.00	23.33	0.00	4.43	0.01	21.10	0.00
Obs XS_i=0/ =100	259	6	259	6	259	6	259	6
All Obs./Pseudo-R^2	372	0.23	372	0.22	372	0.23	372	0.22
METAL PRODUCTS (ISIC 28)								
LOU_i	42.9051	0.04	44.1903	0.04	39.0592	0.04	41.4977	0.05
LOU_i^2	-1.0301	0.06	-1.0294	0.08	-0.9331	0.07	-0.9693	0.08
LYR_i	-4.9882	0.75	-3.3341	0.83	-9.0088	0.52	-7.0402	0.61
LYR_i^2	2.1043	0.51	1.7938	0.56	2.9541	0.32	2.5878	0.37
LKL_i	7.9526	0.75	-	-	14.4983	0.56	-	-
LKL_i^2	-0.4155	0.68	-	-	-0.6702	0.50	-	-
LPL_i	-29.2725	0.29	-	-	-35.1530	0.20	-	-
LPL_i^2	-45.2077	0.18	-	-	-53.6369	0.10	-	-
LVL_i	-	-	2.4686	0.96	-	-	-2.0949	0.96
LVL_i^2	-	-	-0.3259	0.86	-	-	-0.1197	0.95
$DBOI_i$	87.7567	0.00	86.7530	0.00	85.2827	0.00	84.5852	0.00
$DF1_i$	11.1999	0.04	10.7901	0.04	13.9642	0.01	13.2235	0.01
$DF5_i$	18.3954	0.03	18.9223	0.03	16.8725	0.07	17.6731	0.06
$DF9_i$	31.2667	0.00	28.8647	0.00	34.3739	0.00	31.8335	0.00
Test: $DF1_i=DF5_i=DF9_i$	2.89	0.06	2.56	0.08	3.34	0.04	2.89	0.06
F-statistic	27.25	0.00	31.50	0.00	22.00	0.00	23.90	0.00
Obs XS_i=0/ =100	1,014	11	1,015	11	1,014	11	1,015	11
All Obs./Pseudo-R^2	1,241	0.24	1,242	0.24	1,241	0.24	1,242	0.24

Appendix Table 5 (continued)

Independent variable, statistic, or indicator	3-digit industry dummies				4-digit industry dummies			
	Equation (1)		Equation (2)		Equation (1)		Equation (2)	
	Value	P-val.	Value	P-val.	Value	P-val.	Value	P-val.
NON-ELECTRIC MACHINERY (ISIC 29)								
LOU_i	-9.6429	0.52	-15.0571	0.35	-8.4666	0.55	-10.5015	0.46
LOU_i^2	0.4365	0.25	0.5599	0.17	0.3982	0.27	0.4245	0.25
LYR_i	41.8711	0.00	40.7714	0.00	44.9150	0.00	40.6848	0.00
LYR_i^2	-8.6804	0.00	-8.3508	0.00	-9.5929	0.00	-8.5520	0.00
LKL_i	-20.4913	0.13	-	-	-18.4695	0.19	-	-
LKL_i^2	0.7471	0.15	-	-	0.6857	0.21	-	-
LPL_i	-18.7793	0.22	-	-	-30.5424	0.05	-	-
LPL_i^2	-23.3173	0.02	-	-	-30.9308	0.00	-	-
LVL_i	-	-	0.1058	1.00	-	-	-7.2227	0.80
LVL_i^2	-	-	0.0795	0.94	-	-	0.3974	0.72
$DBOI_i$	86.7070	0.00	86.7948	0.00	83.1714	0.00	83.3490	0.00
$DF1_i$	-1.6621	0.78	-3.2780	0.57	0.0192	1.00	-1.6360	0.78
$DF5_i$	0.1064	0.98	-2.0678	0.69	2.3078	0.62	0.1809	0.97
$DF9_i$	11.7474	0.04	11.5456	0.04	10.8478	0.06	11.5735	0.04
Test: $DF1_i=DF5_i=DF9_i$	2.47	0.09	3.15	0.04	1.63	0.20	2.60	0.07
F-statistic	41.36	0.00	45.20	0.00	34.28	0.00	39.36	0.00
Obs XS_i=0/ =100	440	11	443	11	440	11	443	11
All Obs./Pseudo-R^2	701	0.21	704	0.21	701	0.22	704	0.22
ELECTRONICS-RELATED MACHINERY (ISIC 30,31,32,33)								
LOU_i	-7.2323	0.67	-18.0387	0.32	-7.0070	0.68	-17.7481	0.33
LOU_i^2	0.3241	0.44	0.6311	0.18	0.3192	0.45	0.6245	0.18
LYR_i	-12.3886	0.33	-11.4706	0.34	-12.2198	0.34	-11.3278	0.35
LYR_i^2	2.3300	0.41	2.1043	0.44	2.2708	0.43	2.0484	0.45
LKL_i	-28.0656	0.26	-	-	-27.6658	0.27	-	-
LKL_i^2	1.1042	0.25	-	-	1.0891	0.26	-	-
LPL_i	16.4648	0.28	-	-	15.7223	0.30	-	-
LPL_i^2	6.1881	0.56	-	-	5.6572	0.59	-	-
LVL_i	-	-	44.4311	0.12	-	-	44.4848	0.12
LVL_i^2	-	-	-1.9152	0.09	-	-	-1.9160	0.09
$DBOI_i$	114.0448	0.00	112.6724	0.00	113.8150	0.00	112.4040	0.00
$DF1_i$	3.2318	0.61	3.2166	0.61	3.1082	0.62	3.1003	0.62
$DF5_i$	13.2053	0.05	11.4802	0.09	12.9649	0.05	11.2881	0.09
$DF9_i$	14.7191	0.00	14.6135	0.00	14.6078	0.00	14.4989	0.00
Test: $DF1_i=DF5_i=DF9_i$	1.51	0.22	1.46	0.23	1.52	0.22	1.46	0.23
F-statistic	36.13	0.00	41.03	0.00	54.09	0.00	58.59	0.00
Obs XS_i=0/ =100	410	64	413	64	410	64	413	64
All Obs./Pseudo-R^2	814	0.21	817	0.21	814	0.21	817	0.21

Appendix Table 5 (continued)

Independent variable, statistic, or indicator	3-digit industry dummies				4-digit industry dummies			
	Equation (1)		Equation (2)		Equation (1)		Equation (2)	
	Value	P-val.	Value	P-val.	Value	P-val.	Value	P-val.
MOTOR VEHICLES (ISIC 34)								
LOU_i	-32.2191	0.06	-28.5417	0.10	4-digit & 3 digit categories are identical			
LOU_i^2	0.7047	0.10	0.6114	0.16				
LYR_i	-16.6412	0.07	-15.7141	0.08				
LYR_i^2	1.4545	0.53	1.4027	0.53				
LKL_i	-13.0692	0.35	-	-				
LKL_i^2	0.4799	0.34	-	-				
LPL_i	-22.4521	0.41	-	-				
LPL_i^2	-22.7416	0.47	-	-				
LVL_i	-	-	-25.7391	0.30				
LVL_i^2	-	-	0.9722	0.32				
$DBOI_i$	113.0596	0.00	113.0435	0.00				
$DF1_i$	6.0621	0.53	6.3948	0.50				
$DF5_i$	-12.8193	0.08	-11.2924	0.11				
$DF9_i$	1.6848	0.82	2.8073	0.70				
Test: $DF1_i$=$DF5_i$=$DF9_i$	2.85	0.06	2.66	0.07				
F-statistic	25.37	0.00	28.69	0.00				
Obs XS_i=0/ =100	283	10	283	10				
All Obs./Pseudo-R^2	449	0.21	449	0.21				
OTHER TRANSPORT MACHINERY (ISIC 35)								
LOU_i	10.9238	0.71	-47.3048	0.34	10.4748	0.73	-51.2932	0.31
LOU_i^2	-0.0232	0.98	1.5070	0.27	-0.0158	0.98	1.5957	0.25
LYR_i	101.0703	0.26	94.2725	0.29	95.5855	0.29	86.0753	0.34
LYR_i^2	-20.0299	0.25	-18.7159	0.28	-18.8236	0.29	-16.8972	0.34
LKL_i	125.5604	0.13	-	-	112.4592	0.13	-	-
LKL_i^2	-5.4862	0.10	-	-	-4.9603	0.10	-	-
LPL_i	-11.8751	0.88	-	-	-25.2448	0.75	-	-
LPL_i^2	-82.6245	0.53	-	-	-100.042	0.51	-	-
LVL_i	-	-	251.5247	0.01	-	-	266.7401	0.01
LVL_i^2	-	-	-10.5612	0.01	-	-	-11.0851	0.01
$DBOI_i$	83.7150	0.00	76.2475	0.00	84.3687	0.00	79.0185	0.00
$DF1_i$	16.4380	0.19	12.3009	0.34	16.3152	0.19	11.6822	0.35
$DF5_i$	-4.9919	0.83	-11.8793	0.64	-3.8801	0.86	-12.3564	0.63
$DF9_i$	51.1992	0.06	26.2200	0.36	53.2373	0.05	29.1965	0.30
Test: $DF1_i$=$DF5_i$=$DF9_i$	1.30	0.28	0.58	0.56	1.32	0.27	0.63	0.53
F-statistic	6.21	0.00	8.32	0.00	8.32	0.00	11.78	0.00
Obs XS_i=0/ =100	126	5	126	5	126	5	126	5
All Obs./Pseudo-R^2	159	0.31	159	0.31	159	0.31	159	0.31

Appendix Table 5 (continued)

Independent variable, statistic, or indicator	3-digit industry dummies				4-digit industry dummies			
	Equation (1)		Equation (2)		Equation (1)		Equation (2)	
	Value	P-val.	Value	P-val.	Value	P-val.	Value	P-val.
FURNITURE (ISIC 361; no 3- or 4-digit industry dummies)								
LOU_i	41.6936	0.55	44.9749	0.67	4-digit & 3 digit categories are identical			
LOU_i^2	-0.8397	0.67	-0.9115	0.61				
LYR_i	15.1346	0.53	12.3364	0.53				
LYR_i^2	-3.4594	0.52	-3.3943	0.83				
LKL_i	36.1734	0.56	-	-				
LKL_i^2	-1.5476	0.54	-	-				
LPL_i	44.8154	0.30	-	-				
LPL_i^2	-26.8228	0.45	-	-				
LVL_i	-	-	17.3472	0.83				
LVL_i^2	-	-	-0.8842	0.79				
$DBOI_i$	131.7225	0.00	133.0739	0.00				
$DF1_i$	3.1979	0.88	0.5808	0.98				
$DF5_i$	-1.3404	0.96	4.2252	0.89				
$DF9_i$	36.3836	0.32	40.9637	0.25				
Test: $DF1_i=DF5_i=DF9_i$	0.41	0.67	0.54	0.58				
F-statistic	20.18	0.00	23.62	0.00				
Obs XS_i=0/ =100	338	24	340	24				
All Obs./Pseudo-R^2	466	0.19	468	0.19				
MISCELLANEOUS MANUFACTURING (ISIC 369; no 3-digit industry dummies)								
LOU_i	197.3437	0.00	186.4923	0.00	187.1202	0.00	179.1043	0.00
LOU_i^2	-5.0935	0.00	-4.8104	0.00	-4.8476	0.00	-4.6241	0.00
LYR_i	-27.5396	0.09	-29.1625	0.08	-27.2323	0.09	-28.9825	0.07
LYR_i^2	3.5582	0.34	3.6967	0.33	4.3175	0.24	4.5096	0.22
LKL_i	-35.8484	0.41	-	-	-47.6251	0.28	-	-
LKL_i^2	1.2955	0.48	-	-	1.8361	0.32	-	-
LPL_i	-56.1672	0.01	-	-	-43.2982	0.04	-	-
LPL_i^2	-25.8295	0.00	-	-	-22.5741	0.00	-	-
LVL_i	-	-	108.8245	0.01	-	-	93.4141	0.03
LVL_i^2	-	-	-4.3959	0.02	-	-	-3.8633	0.03
$DBOI_i$	105.3984	0.00	103.7458	0.00	105.4551	0.00	103.5023	0.00
$DF1_i$	13.8128	0.11	15.1430	0.09	10.0287	0.24	11.4728	0.19
$DF5_i$	16.5036	0.16	12.2583	0.31	17.4389	0.15	13.9054	0.26
$DF9_i$	42.6890	0.00	39.4849	0.00	40.5026	0.00	37.8590	0.00
Test: $DF1_i=DF5_i=DF9_i$	3.64	0.03	2.97	0.05	3.85	0.02	3.04	0.05
F-statistic	36.99	0.00	43.32	0.00	28.33	0.00	31.64	0.00
Obs XS_i=0/ =100	241	134	243	134	241	134	243	134
All Obs./Pseudo-R^2	606	0.15	608	0.15	606	0.15	608	0.15

Note: Test: $DF1_i=DF5_i=DF9_i$ is a Wald Statistic testing the null hypothesis that coefficients on the three foreign ownership dummies are equal; estimated equations also include 3- or 4-digit industry dummies as indicated and relevant (see explanation in the text; detailed estimates including all dummies and the constant are available from authors).