The Relative Demand for Skilled Labor, Foreign Ownership, Trade and Capital Types in the Thai Manufacturing Sector, 1996

Atsuko Matsuoka
Research Assistant Professor, ICSEAD

Working Paper Series Vol. 2002-31
December 25, 2002
(Revised in January 2003)

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

The Relative Demand for Skilled Labor, Foreign Ownership, Trade and Capital Types in the Thai Manufacturing Sector, 1996

Atsuko Matsuoka*, Research Assistant Professor
The International Centre for the Study of East Asian Development (ICSEAD), Kitakyushu.
December25, 2002 (Revised in January 2003)

Abstract

This paper investigates the effect of foreign ownership, international trade, and technology-embodied capital on the demand for skilled labor relative to unskilled labor (the relative demand for skilled labor) using plant-level data for Thai manufacturing in 1996. The results first indicate that foreign MNC plants tend to have significantly higher relative demand for skilled labor than Thai plants in several industries. Second, the relative demand for skilled labor is negatively and significantly correlated with export propensities but there is no significant correlation with import propensities. Third, office equipment capital is significantly and positively correlated with the relative demand for skilled labor, however, the correlation with machinery capital is significantly negative in many industries, suggesting machinery may embody technologies with a bias toward unskilled labor. These results suggest that patterns observed in developed countries and related theories may not always apply in the Thai case.

Contents

* The author would like to thank Dr. Somsak Tambunlertchai and Dr. Eric D. Ramstetter for assistance with the dataset and advice on this project, and ICSEAD for funding this study. The author also would like to thank Dr. Asim Erdliek for helpful advises at Western Economic Association International Pacific Rim Conference held on January 9-12, 2003.

1. Introduction

Foreign direct investment (FDI) and economic activities of foreign multinational corporations (MNCs) have played an important rule in several developing countries, not only as the source of capital inflows, but also as a source of technology and access to international trade networks. On the other hand, economic development accompanied by rapid technological progress and international trade growth has induced a number of structural changes in host developing economies. Recent literature on developed countries has indicated that the international trade and the proliferation of skill-biased technology (R&D, computers, other technology-embodied capital, etc.) increase the demand for skilled labor relative to unskilled labor, and thus increase the wage gap between the two kinds of labor. Because foreign MNCs are thought to use skill-biased technology (Markusen 1991; Dunning 1993; Caves 1996) and previous research indicates that foreign MNCs are more dependent on international trade than local firms in Thailand and several other developing economies in Asia (e.g., Ramstetter 1994, 1999a, 1999b, 2002a), foreign MNCs may also affect the demand for skilled labor relative to unskilled labor.

The purpose of this paper is to investigate the effect of foreign ownership, international trade, and different types of capital on the relative demand for skilled labor in Thai manufacturing plants in 1996. More precisely, the paper first asks whether the demand for skilled labor relative to unskilled labor is higher in MNC plants than in local plants. Second, the paper investigates whether trade propensities affect the relative demand for skilled labor. Third, the paper examines the relationship between the demand for skilled labor relative to unskilled labor and the type of capital employed by the plant. In particular, the relationship between the relative demand for skilled labor and the two types of capital, namely, machinery and office equipment, are examined because these types of capital are thought to embody technology that is biased toward the use of skilled labor.

The remainder of this paper is organized as follows. Section 2 reviews the previous literature on the subjects examined and section 3 describes the data used. Section 4 then describes the regression methodology used and section 5 reports the results. Finally, some concluding remarks are offered in Section 6.

2. Review of the Literature

According to the former literatures, the rises of wage gap in the developed countries since 1980's could not be explained by the openness to international trade of unskilled-labor intensive goods from the developing countries derived from the

Hecksher-Ohlin model, because the changes of the relative demand for skilled labor was relatively small between industries. And the large part of the increase of the relative demand for skilled labor could be accounted by the changes within industries.[1] Therefore, the further investigations have been conducted to discover those effects by using disaggregated industry data, and firm-level or plant-level data. According to those analyses, there are two major causes to the increase of the relative demand for skilled labor within industries, one is the new aspect of international trade incorporated with technologies to the traditional international trade theory, and the other is the skill-biased technological change. Thus, activities of foreign MNC's are also considered to affect the relative labor demand and correspondent wage gaps between skilled and unskilled labor because of their superior technologies and dependence on international trade.

First of all, let us introduce analysis of the relationship between MNCs and the relative demand for skilled labor. Feenstra and Hansen (1996a, 1997) found an increase of the number of foreign establishments at region-industry level was positively correlated with an increase of relative demand for skilled labor in Mexico.[2] Figini and Gorg (1999) found the wage inequality of white-collar workers against blue-collar workers rose with an increase of the employment share of MNCs at sector-time level in Ireland when those shares were relatively small.[3] However, Slaugter(2000) did not find the positive correlation between relative demand for skilled labor in the U.S. and the affiliates of foreign MNCs located in the U.S., in which technology transfer from the foreign MNC affiliation is not important. Thus, Figini and Gorg (1999) emphasized that not only the entry of MNCs, but also the technology diffusion to the local producers from MNCs may also increase relative demand for skilled labor.

It is important to note that many of those analyses for the effect of MNC's are based on the fundamental premise of technological superiority of MNCs compared with non-MNCs or local producers. The possession of ownership advantages such as superior production technology, marketing know-how, and management ability are often thought to be a necessary condition for a firm to become a MNC (Markusen 1991;

---

[1] Davis and Haltiwanger (1991), Berman, Bound and Griliches (1994), and Bernard and Jensen (1997) found that within-industry effect dominated the increase of relative labor demand for skilled labor in the U.S. Berman, Bound and Machin (1997) also found it in OECD countries, and Hanson and Harrison (1995) in Mexico.

[2] Feenstra and Hanson (1996a, 1997) limits the import of outsourced products only from the MNCs of developed countries located in developing countries, whereas the import of outsourced products in Feenstra and Hanson (1996b) is not limited to the import from MNCs.

[3] Figini and Gorg (1999) actually found the inverse-U shaped relationship between wage inequality and the share of MNCs.

Dunning 1993; Caves 1996). There is general agreement among theorists that MNCs will tend to be more technology-intensive and a large body of empirical research suggesting that MNCs tend to have relatively high R&D-sales ratios and advertising expenditure-sales ratios, and to possess a relatively large number of patents.[4] Correspondingly, MNCs are generally expected to be more skill intensive or more technology intensive than local producers and to demand more skilled-labor than them. However, in Thai manufacturing sector, Ramstetter (2001a,b), Ramstetter (2002b), and Ito (2002b) did not find the strong evidences of higher productivities in MNC plants compared with local plants. Meanwhile, MNCs generally have more opportunities to face international trade, as Ramstetter (2002a) found foreign MNCs are more likely to have high trade propensities after controlling other plant characteristics in Thai manufacturing sector.

As shown in the above, the effects of MNC's on the relative demand for skilled labor are originated from the two aspects of their characteristics depending on international trade and superior technologies. The effects of international trade have been discussed as follows. Hanson and Harrison (1995) could not find the evidence of a correlation between relative product price changes and skill intensity after the trade reform in Mexico, indicating the openness to the international trade according to Stolper-Samuelson effect could not explain the wage gaps for skilled and unskilled labor. At the same time, Hanson and Harrison (1995) found foreign plants and exporting plant paid higher wages to skilled labor. Exporting plants may face greater demand for skill-intensive products, resulting in relatively higher demand for skilled labor. Bernard and Jensen (1997) found an increase of employment by exporting plant contributed to the increase of relative demand for skilled labor in the U.S. manufacturing sector in 1980s.[5] In developing countries, however, export may reflect the comparative advantage in unskilled labor according to the traditional trade theory, and have the opposite effect on the relative demand for skilled labor. Meanwhile, Feenstra and Hanson (1996b) stress the importance of imports from the developing countries as the causes of wage gaps between skilled and unskilled labor in the developed countries. They suggest that outsourced production lines into developing countries are usually unskilled-labor intensive, and import of those outsourced products

[4] This is associated with the results of higher productivities of MNCs than in local platns shown in Sjöholm (1999b), Okamoto and Sjöholm (2000), Takii and Ramstetter (2000), Takii (2002) and Ito (2002a) in Indonesia.

[5] And Sjöholm's (1999a) results suggest that exporters or importers have relatively high labor productivity levels, and exporters have relatively high labor productivity growth.

from the developing countries reduces unskilled labor demand in developed countries.[6] Furthermore, the theory of Feenstra and Hanson (1996a, 1997) suggest that wage gap increases not only in developed countries, but also in developing countries thorough the rise of average skill intensity in developing countries. For developing countries, there may be another explanation. Relative demand for skilled labor may be affected by imports of intermediate goods or capital goods from developed countries, because these goods may embody the latest technologies in developed countries and are often an important source of technology transfer, leading to higher demand for skilled labor (Romer 1993; Coe, Helpman and Hoffmaister 1997).

With regard to technologies and relative demand for skilled labor, more capital intensive or more technology intensive producers tend to demand more skilled labor. [7] Berman, Bound and Griliches(1994) found an increase of skilled labor intensity was highly correlated with investment in R&D and computers in the U.S. manufacturing sector. Doms, Dunne and Troske(1997) investigated the relationship between employment share and wages for skilled workers, and computer investment and some types of production machinery embodying various kind of technologies utilized in plants. Adams (1999) also found R&D and equipment capital were the cause of skill bias, whereas capital of structures (namely, buildings, etc.) was not. Thus, not only R&D and computers, but also some types of capital are related with technology, because capital such as machinery or office computers embody technologies, which may require certain kind of skills or educational attainment of workers.

3. The Data

Before turning to the analysis, this section discuses about the data. The National Statistical Office in Thailand has conducted the surveys of industrial performances at plant-level in manufacturing sector, which of the aggregated data have been published in Industry Survey and Industrial Census. Table 1 introduces those recent databases. Note the number of plants in the Industrial Census in 1996 (National Statistical Office, 1999) is larger than other databases of Industrial Survey in several years. And this study analyzes samples of plant-level data in the Industrial Census in 1996, before the Asian crisis hit the Thai economy.[8] The comparisons in this study

[6] Note that import of outsourced products for the developing countries implies export of them for the developing countries.

[7] See also explanations in Hermash (1993) and Troske (1999) for details about higher wages of larger firms and plants and for details about the substitutability and complementarity between various types of labor and various types of capital, or R&D.

[8] Unfortunately, it is impossible to obtain panel data, because there is no code number to identify

focus exclusively on relatively large plants with output of 25 million baht or greater because comparisons of foreign MNC plants and predominantly local smaller plants are not thought to be meaningful. In addition, some records thought to contain implausible data were removed from the sample.[9,10] The remaining sample used in this analysis consists of 4,400 plants with 1.3 million total workers (52 percent of the published data in 1996), and covers 52-53 percent of output and value added for the published database in 1996.

In this Industrial Census (and also in Industrial Survey), workers are distinguished into "Operatives" and "Other Employees". According to the definition of National Statistical Office (1999), the "Operatives" refer to those persons who were directly engaged in production or other related activities. The "Other Employees" referee to all employees except "Operatives", and they included administrative, technical and clerical personnel such as managers and directors, laboratory and research workers, clerks, typist, book-keepers, administrative supervisors, salesmen and the like. Thus, this analysis assumes "Operatives" as unskilled workers and "Other Employees" as skilled labor hereafter.[11] The employment shares of the skilled workers to the total workers (skilled workers plus unskilled workers) in the published data are 14-16 percent from 1993 to 1999 (Table 1). The shares of the wage bill for skilled workers to the total wage bill are 26-29 percent from 1996 to 1999.[12] They are higher than the employment shares by reflecting higher wage levels for skilled workers than unskilled workers, as it was suggested in Matsuoka (2001c).

Table 2 shows the sample means of several variables for Thai plants and foreign MNC plants at industry level.[13] The means of relative wage ($RW=W_S/W_U$) for

---

each of the plants in neither Industrial Census nor Industrial Survey.

[9] When the data of machinery capital stock and office equipment capital are not available, those records are removed from the sample. Furthermore, when variables (labor productivity as value added per hourly worked, capital intensity as capital stock per hourly worked, and hourly wage) for both skilled labor and unskilled labor fall in the top 1/64 and the bottom 1/64 at each industry level, those plant records are removed from the sample.

[10] The original samples underlying the published data (National Statistical Office 1999) contain numerous duplicates that were identified using a methodology explained in Ramstetter (2001a). In this study, one record from each set of duplicates has been retained in an effort to maximize sample coverage. For more details, see Ramstetter (2001a,b).

[11] "Operatives" and "Other Employees" are referred as "production workers" and "non-production workers" in Ramstetter (2001a,b), Ramstetter (2002a,b), Ito (2002b), and Matsuoka (2001a,b,c).

[12] The wage bill is defined to include wages and salaries, overtime, bonuses, and fringe benefits other than social security.

[13] Industries are classified into food, textiles, apparel, footwear & leather, chemicals, rubber, plastics, non-metallic mineral products, fabricated metals, general machinery, electric machinery, and motor vehicles. Other manufacturing includes beverages, tobacco, wood and wood products, paper and paper products, publishing and printing, oil, coke and nuclear etc., basic metals, and other transport

Thai plants varies 2.1 to 2.8 across industries, and 2.2 to 3.4 for foreign MNC plants, meaning wage gap between skilled and unskilled labor tend to be larger for foreign MNC plants.[14] The means of employment share of skilled labor to total labor (LS_S) and share of wage bill for skilled labor to total wage bill (CS_S) in Table 2 are put into charts in Figure 1. Though employment shares of skilled labor are smaller than share of wage bills, they distribute in the same way across industries, and between Thai plant groups and MNC plant groups. Those shares are relatively smaller in the light industries (such as food, textiles, apparel, footwear&leather), where those shares of Thai plant groups exceed those of MNC plant groups. On the other hand, those shares are relatively large in heavy industries and machinery industries, especially in chemicals. And the shares of MNC plant groups exceed those of Thai plant groups in such industries.

Figure 2 shows simple scatter diagrams indicating the relationship between the shares of skilled labor for both employment and wage bill, and other economic performances across industries. Figure 2-1, the diagrams of relative wage for skilled labor and the shares of skilled labor for both employment and wage bill, indicate negative correlation between them. Furthermore, from these diagrams, the shares of employment and wage bill for skilled labor tend to be higher in MNC plant groups than for Thai plant groups across industries. Figure 2-2 shows the relationship of the industry share of the number of exporting plants and the shares of skilled labor. From these diagrams, export is negatively correlated with the shares of skilled labor. And those shares tend to be higher in MNC plants than in Thai plants. However, from Figure 2-3, import does not seem to have strong correlation with the shares of skilled labor for both Thai plants and MNC plants when an outlier (chemicals) is neglected. In figure 2-4, the machinery share to the total capital stock (machinery capital share) and the shares of skilled labor tend to be negatively correlated for Thai plants, however it has opposite effect for MNC plants. On the other side, the office equipment share to the to the total capital stock (office equipment capital share) seems to have no relationship with the shares of skilled labor from figure 2-5. And labor productivity and capital intensity are positively correlated with the shares of skilled labor as indicated in Figure 2-6 and 2-7.

4. Regression Methods

In order to examine the effect of foreign ownership, trade and different types of

---

equipment.

[14] W_S and W_U denote hourly wage for skilled labor, and for unskilled labor, respectively.

capital on the relative demand for skilled labor, this analysis estimates two kinds of specifications indicating the relative demand for skilled labor. First, the share of wage bill for skilled labor to the total wage bill (CS_S, or cost share of skilled labor) is estimated, which is derived from the translog cost function under the assumption of two variable inputs of skilled and unskilled labor, and one quasi-fixed input of capital.[15]

$$CS_S = a_0 + a_{F\cdot} \cdot DF + a_{X\cdot} \cdot DX + a_{M\cdot} \cdot DM + a_{KM\cdot} \cdot RKM + a_{KO\cdot} \cdot RKO + a_{W\cdot} \cdot \ln RW + a_{Y\cdot} \cdot \ln Y + a_K \cdot \ln K + uc, \quad (1)$$

where,

CS_S : Share of wage bill for skilled labor to the total wage bill,

DF: Dummy variable taking 1 if foreign ownership share of the plant is 1% or greater,

DX: Dummy variable identifying a plant exporting 50% or more of its outputs,

DM: Dummy variable identifying a plant importing 50% or more of its inputs[16],

RKM : Machinery capital share to the total capital stock,

RKO : Office equipment capital share to the total capital stock,

RW: Relative wage of skilled labor to unskilled labor,

Y: Value added,

K: Total capital stock,

u_C : random term.

Second, the employment share of skilled labor to total labor input (LS_S) is assumed to be the function such as follows.

$$LS_S = b_0 + b_F \cdot DF + b_X \cdot DX + b_M \cdot DM + b_{KM} \cdot RKM + b_{KO} \cdot RKO + b_W \cdot \ln RW + b_{KL} \cdot \ln(K/L) + \sum_{j=2}^{4} b_{Sj} \cdot DSZ_j + u_L \quad (2),$$

where,

LS_S : Employment share of skilled labor to the total labor,

K/L: Capital intensity (the total capital stock divided by the total labor),

DSZ_j : Dummy variable for plant size, indicating j=1 to 4 as plant groups with the first quartile of output to the fourth quartile,

u_L : random term.

Those equations mentioned above are estimated with sample of all plants at each industry level. This method is intuitive to examine the effect of foreign ownership on the relative demand for skilled labor. However, it needs the assumption that the effects of other variables (such as relative wage, trade propensities, and two

[15] See Appendix for a derivation.

[16] The dataset used in this analysis contains only discrete variables of ownership share, exports and imports.

types of capital) are same between Thai plant groups and MNC plant groups. Furthermore, as indicated in Ramstetter (2002b), MNC plants tend to have higher trade propensities, which indicates the possibility of correlation between foreign ownership dummy and trade variables. Thus, the sample is divided into Thai plant groups and MNC plant groups, and equation (1) and (2) are also estimated without foreign ownership dummy (*DF*). All of the regression for both equation (1) and (2) are estimated using the ordinary least squares method with White's heteroscedasticity consistent standard errors to evaluate t-statistics.

5. Results

The whole regression results for equation (1) at each industry level are reported in Appendix Table A1 to A4.[17] Coefficients of log of relative wage (ln*RW*) are significantly positive, however, those of value added (ln*Y*) and total capital (ln*K*) were not significant.[18] Similarly, the whole regression results for equation (2) are reported in Appendix Table B1 to B5. Coefficients of log of relative wage (ln*RW*) for employment share of skilled are significantly negative, indicating labor demand is a decreasing function of wages, and coefficients of capital intensity (ln(*K/L*)) tend to be significantly positive. Table 3 shows the summary results of regressions for equation (1) and (2) extracting the coefficients of foreign ownership dummy (*DF*), export dummy (*DX*), import dummy (*DM*), machinery capital share (*RKM*), and office equipment capital share (*RKO*). Estimation results are summarized with the sample of all plant groups, Thai plant groups and MNC plant group at each industry level.

With the sample of all plant group, coefficients of foreign ownership dummy (*DF*) at all manufacturing sector in both equation (1) and (2) are significantly positive, indicating the shares of both wage bill and employment for skilled labor are larger in MNC plants than in Thai plants. At each industry level, significantly positive coefficients are observed at several industries (chemicals, plastics, fabricated metals, general machinery, and other manufacturing). Even after controlling for other plant characteristics, those results replicated the comparison of simple plant means across industries shown in Figure 1.

---

[17] This paper also attempted simultaneous estimations for equation (1) and (2), and the main results are unchanged, which were omitted from the report.

[18] Coefficients of ln*RW* are significantly positive, which assures the concavity of cost function in the case of two variable input, resulting in that Allen's partial elasticities of substitution for the two variable inputs are always positive, and demand elasticity respect to input price is assured to be negative. Note the coefficients of log of ln*Y* and ln*K* mean the twice differentials of ln*C* with respect to ln*RW* and ln*Y* or ln*RW* and ln*K*, which could be either positive or negative.

The effects of trade propensities on the relative demand for skilled labor are different between export and import. Coefficients of export dummy variable (*DX*) in both equation (1) and (2) are significantly negative at many industries, indicating relative demand for skilled labor is smaller in more exporting plants than in less exporting plants. This replicates the result in Ramstetter (2002a), in which non-production worker intensity was significantly and negatively correlated with export propensity in Thai manufacturing sector. This tendency are observed not only with this plant-level analysis, but also across industries indicated in Figure 2-2. Yet, it is somewhat more prominent for MNC plant groups than Thai plant groups with plant-level analysis. However, negative correlation of export and relative demand for skilled labor is unexpected when it is compared with the analysis of the United States in Bernard and Jensen (1997), though they analyzed the changes of relative demand for skilled labor, not levels of it. On the other hand, coefficients of import dummy variable (*DM*) tend to be slightly positive, though they are not significant at most industries. In the case of Thai manufacturing sector, import propensities seem to have no effect on the relative demand of skilled labor for both Thai plant groups and MNC plant groups.

Next, relationship between relative demand for skilled labor and two types of capital as proxies for technologies are as follows. The coefficients of machinery capital share (*RKM*) are generally negative regardless of plant groups in both equation (1) and (2), and significant at several industries. Namely, plants possessing more machinery capital tend to demand unskilled labor relative to skilled labor more than plants with less machinery. This tendency is somewhat more prominent in Thai plant groups, as it is also observed across industries shown in Figure 2-4. Conversely, the coefficients of office equipment capital share (*RKO*) are generally positive, and they are significant at several industries, especially in Thai plant groups. This result is intuitive and reasonable, as far as office equipment capital is directly related with non-operative workers such as administrative workers.

6. Conclusions

For developing countries, technological progress, international trade, and FDI or activities of MNCs are the important tools to achieve economic development. Meanwhile, as discussed in the literatures, those factors could introduce an increase of relative demand for skilled labor and rise in wage gap between skilled and unskilled workers. This paper investigates the effect of those factors on the relative demand for skilled labor in Thai manufacturing sector.

. The results first indicate that foreign MNC plants tend to have significantly higher relative demand for skilled labor than Thai plants in several industries. Second, the relative demand for skilled labor is negatively and significantly correlated with export propensities but there is no significant correlation with import propensities. Third, office equipment capital is significantly and positively correlated with the relative demand for skilled labor, however, the correlation with machinery capital is significantly negative in many industries.

Those results may imply that theories or empirical results in developed countries do not always apply to the case in developing countries. Negative correlation of export and relative demand for skilled labor suggest Thailand has comparative advantages in unskilled-labor-intensive goods. For exporters in developed countries it may be more important to produce technological products with higher quality in the worldwide competition. However, for developing countries it may be important to export goods with wide-use technologies at lower cost. As for technology, it is very intuitive that office equipment capital embodies skill-biased technology. Yet, other kinds of capital may have different technologies for skill of labor. If an introduction of machinery provides a simple work with less skill, it may lead to lower average wage through relatively large share of unskilled labor. In this case, technology embodied in machinery might be the one with a bias toward unskilled labor.

There are several tasks for future analysis. First, the analyses in the former literature are the relationship between the changes of relative labor demand and wage gaps for skilled labor, whereas the investigation in this paper is focused on the analysis of the level of the relative demand across plant, because of the limitation of the data. However, it is important to investigate the changes of them by using panel data to compare the results exactly with the case in the developed countries. Second, the regression methods used in this paper treat the relative wage as exogenous. However, there might be the endogenous problems between the relative labor demand and the relative wages, which should be concerned in the regression methods. Third, as already mentioned, the recent analysis have found that productivity differentials between MNC plants and Thai plants are not always observed in the case of Thai manufacturing sector, and it is important to relate these results to reinvestigate the issues of relative demand for skilled labor.

Appendix

Suppose a producer requires two kinds of variable inputs, skilled labor (L_S) and unskilled labor (L_U), and one quasi-fixed input of capital (K). And the variable cost function is assumed to be translog, and then log of variable cost ($\ln C$) can be written as follows.

$$\ln C = a_0 + \sum_i b_i \cdot \ln w_i + b_Y \cdot \ln Y + b_K \cdot \ln K + \sum_l b_l \cdot Z_l + \tfrac{1}{2}\sum_i \sum_j g_{ij} \cdot (\ln w_i)(\ln w_j)$$
$$+ \tfrac{1}{2} \cdot g_{YY} \cdot (\ln Y)^2 + \tfrac{1}{2} \cdot g_{KK} \cdot (\ln K)^2 + \tfrac{1}{2}\sum_l \sum_m g_{lm} \cdot Z_l \cdot Z_m + \sum_i g_{iY} \cdot (\ln w_i)(\ln Y)$$
$$+ \sum_i g_{iK} \cdot (\ln w_i)(\ln K) + \sum_l \sum_i g_{il} \cdot (\ln w_i) \cdot Z_l + g_{YK} \cdot (\ln Y)(\ln K) + \sum_l g_{Yl} \cdot (\ln Y) \cdot Z_l$$
$$+ \sum_l g_{Kl} \cdot (\ln K) \cdot Z_l$$

s.t.

$$\sum_i b_i = 1, \quad \sum_i g_{ij} = \sum_j g_{ij} = \sum_i g_{iY} = \sum_i g_{iK} = \sum_i g_{il} = 0, \quad g_{ij} = g_{ji} = g \ ,$$

$i,j=S, U, \quad l,m=DF, DX, DM, RKM, RKO.$

From the variable cost function, the cost share for skilled labor (CS_S : the share of wage bill for skilled labor to the total wage bill) is obtained by using Shepard's lemma as follow.

$$CS_S = \frac{w_S \cdot L_S}{C} = \frac{\partial \ln C}{\partial \ln w_S} = b_S + \sum_i g_{Si} \ln w_i + g_{SY} \ln Y + g_{SK} \ln K + \sum_l g_{Sl} Z_l$$
$$= b_S + g \ln RW + g_{SY} \ln Y + g_{SK} \ln K + \sum_l g_{Sl} Z_l \ ,$$

where,

C : Variable cost,

CS_S : Cost share for skilled labor (the share of wage bill for skilled labor to the total wage bill),

w_i : Wage for input i, $i=S$ for skilled labor, U for unskilled labor,

Y : Value added

K: Total capital stock,

Z_l : Plant characteristics affecting relative demand for skilled labor, $l=DF, DX, DM, RKM, RKO,$

DF :, Dummy variable taking 1 if foreign ownership share of the plant is 1% or greater

DX : Dummy variable identifying a plant exporting 50% or more of its outputs,

DM : Dummy variable identifying a plant importing 50% or more of its inputs.

RKM : Machinery capital share to the total capital,
RKO : Office equipment capital share to the total capital,
RW : Relative wage for skilled labor (w_S/w_U).

References

Adams, J.D. (1999), "The structure of Firm R&D, the Factor Intensity of Production, and Skill Bias," *The Review of Economics and Statistics*, Vol.81, No.3, pp.499-510.

Berman, E., J. Bound, and Z. Griliches (1994), "Changes in the Demand for Skilled labor within US Manufacturing: Evidence from the Annual Survey of Manufactures," *The Quarterly Journal of Economics*, Vol.109, No.2, pp.367-397.

Bernard, A.W. and J.B. Jensen (1997), "Exporters, skill upgrading, and the wage gap," *Journal of International Economics*, Vol.42, pp.3-31.

Caves, R. E. (1996), *Multinational Enterprise and Economic Analysis*, Cambridge, UK: Cambridge University Press.

Coe, D.T., E. Helpman and A.W. Hoffmaister (1997), " North-South R&D Spillovers," *Economic Journal*, Vol. 107 (January), pp.134-149.

Davis, S.J. and J. Haltiwanger (1991), "Wage Dispersion between and within U.S. Manufacturing Plants, 1963-86," *Brookings Papers on Economic Activity: Microeconomics*, 1991, pp.115-200.

Doms, M., T.Dunne and K.R.Troske (1997), "Workers, Wages, and Technology," *The Quarterly Journal of Economics*, Vol.112, No.1, pp. 253-290.

Feenstra, R. C., and G. H. Hanson (1996a), "Foreign Investment, Outsourcing, and Relative Wages," in R. C. Feenstra, G. M. Grossman, and D. A. Irwin, eds., *The Political Economy of Trade Policy*, Cambridge, MA: The MIT Press, pp.89-127.

Feenstra, R. C., and G. H. Hanson (1996b), "Globalization, Outsourcing, and Wage Inequality," *American Economic Review*, Vol. 86, pp.241-245.

Feenstra, R. C., and G. H. Hanson (1997), "Foreign Direct Investment and Relative Wages: Evidence from Mexico's maquiladoras," *Journal of International Economics*, Vol. 42, pp.371-393.

Figini, P., and H. Gorg (1999), "Multinational Companies and Wage Inequality in the Host Country: The Case of Ireland," *Weltwirtschaftlishes Archiv*, Vol.135, No.4, pp.594-612.

Hanson, G.H. and A. Harrison (1995), "Trade, Technology, and Wage Inequality," NBER Working Paper, No.5110, Cambridge, MA: National Bureau of Economic Research.

Hermash, S. D. (1993), *Labor Demand*, Princeton, NJ: Princeton University Press.

Ito, K (2002a), "Foreign Ownership and Productivity in the Indonesian Automobile Industry: Evidence from Establishment Data for 1990-1999," Working Paper Series, Forthcoming, Kitakyushu: The International Center for the Study of East Asian Economic Development.

Ito, K (2002b), "Are Foreign Multinationals More Efficient? Plant Productivity in the Thai Automobile Industry," Working Paper Series Vol. 2002-19, Kitakyushu: The International Center for the Study of East Asian Economic Development.

Lipsey, R.E. and F. Sjöholm (2001), "Foreign Direct Investment and Wages in Indonesian

Manufacturing," Working Paper Series Vol. 2001-02, Kitakyushu: The International Center for the Study of East Asian Economic Development.

Matsuoka, A. (2001a), "Wages, Foreign Multinationals, and Local Plants in Thai Manufacturing," Working Paper Series Vol. 2001-15, Kitakyushu: The International Center for the Study of East Asian Economic Development.

Matsuoka, A. (2001b), "Wage Differentials among Local Plants and Foreign Multinationals by Foreign Ownership Share and Nationality in Thai Manufacturing," Working Paper Series Vol. 2001-25, Kitakyushu: The International Center for the Study of East Asian Economic Development.

Matsuoka, A. (2001c), "Wage Differentials between Local Plants and Foreign Multinationals in Thai Manufacturing: Industry-level Analysis, " Working Paper Series Vol. 2001-26, Kitakyushu: The International Center for the Study of East Asian Economic Development.

National Statistical Office (1999), *Report of the 1997 Industrial Census: Whole Kingdom*, Bangkok: National Statistical Office and Office of Prime Minister

Okamoto, Y., and F. Sjöholm (2000), "Productivity in the Indonesian Automotive Industry," *ASEAN Economic Bulletin*, Vol.17, No.1, pp.60-73.

Ramstetter, E. D. (1994), "Comparisons of Japanese Multinationals and Other Firms in Thailand's Non-oil Manufacturing Industries," *ASEAN Economic Bulletin*, Vol.11, No.1, pp.36-58.

Ramstetter, E. D. (1999a), "Trade propensities and Foreign Ownership Shares in Indonesian Manufacturing in the Early 1990s," *Bulletin of Indonesian Economic Studies*, Vol.35, No.2, pp43-66.

Ramstetter, E. D. (1999b), "Comparison of Foreign Multinationals and Local Firms in Asian Manufacturing Over Time," *Asian Economic Journal*, Vol.13, No.3, pp.163-203.

Ramstetter, E. D. (2001a), "Labor Productivity in Local Plants and Foreign Multinationals in Thai Manufacturing, 1996 and 1998," Working Paper Series Vol. 2001-13, Kitakyushu: The International Center for the Study of East Asian Economic Development.

Ramstetter, E. D. (2001b), "Labor Productivity in Local Plants and Foreign Multinationals by nationality in Thai Manufacturing, 1996 and 1998," Working Paper Series Vol. 2001-31, Kitakyushu: The International Center for the Study of East Asian Economic Development.

Ramstetter, E. D. (2002a), "Trade propensities and Foreign Ownership Shares in Thai Manufacturing, 1996," Working Paper Series Vol. 2002-3, Kitakyushu: The International Center for the Study of East Asian Economic Development.

Ramstetter, E. D. (2002b), "Does Technology Differ in Local Plants and Foreign Multinationals in Thai Manufacturing? 1996 and 1998," Working Paper Series Vol. 2002-4, Kitakyushu: The International Center for the Study of East Asian Economic Development.

Romer, P. (1993), "Idea Gaps and Object Gaps in Economic Development," *Journal of Monetary*

Economics, Vol.32, pp.543-573.

Slaughter, M. J. (2000), "Production Transfer within Multinational Enterprises and American Wages," *Journal of International Economics,* Vol.50, pp.449-472.

Sjöholm, F. (1999a) " Exports, Imports and Productivity: Results from Indonesian Data," *World Development,* Vol.27, No.4, pp 705-715.

Sjöholm, F. (1999b) " Technology Gap, Competition and Spillovers from Direct Foreign Investment: Evidence from Establishment Data," *Journal of Development Studies,* Vol.36, No.1, pp 53-73.

Takii, S. (2002), "Productivity Differentials between Local and Foreign Plants in Indonesian Manufacturing, 1995," Working Paper Series Vol. 2002-2, Kitakyushu: The International Center for the Study of East Asian Economic Development.

Takii, S., and E. D. Ramstetter (2000), "Foreing Multinationals in Indonesian Manufacutring 1985-1998: Shares, Relative Size, and Relative Labor Productivity," Working Paper Series Vol. 2000-18, Kitakyushu: The International Center for the Study of East Asian Economic Development.

Table 1: Indices of database in the Thai manufacturing sector

	1993	1994	1996			1998	1999
				This sample	Coverage (%)		
Establishments	8,629	8,983	23,677	4,400	18.6	11,394	12,667
Output (mil.B)	101,493	76,254	3,541,257	1,887,524	53.3	2,483,298	3,103,917
Value added (mil.B)	24,864	22,803	998,145	519,409	52.0	641,942	606,105
Number of skilled workers (persons)	329,112	303,339	363,537	204,044	56.1	271,219	312,031
Number of unskilled workers (persons)	1,761,428	1,880,231	2,049,788	1,054,161	51.4	1,633,799	1,755,319
Employment share of skilled workers to the total workers (%)	15.7	13.9	15.1	16.2	-	14.2	15.1
Share of wage bill for skilled workers to total wage bill (%)	-	-	27.6	28.1	-	25.8	29.3
Source	(a)	(b)	(c)	(d)		(e)	(f)

Note) Data in this table are aggragation of establishments with 20 persons engaged or more.

Unilled workers refer "Operative employees", and skilled workers refere "Other employees" in the published data.

Source) Source (a) to (f) are published by National Statistical Office of Thailand;

(a): "Report of the 1994 Industry Survey,"

(b): "Report of the 1995 Industry Survey,"

(c): "Report of the 1997 Industry Census,"

(d): Plant-level data of (c)

(e): "Report of the 1999 Industry Survey,"

(f): "Report of the 2000 Manufacturing Industry Survey."

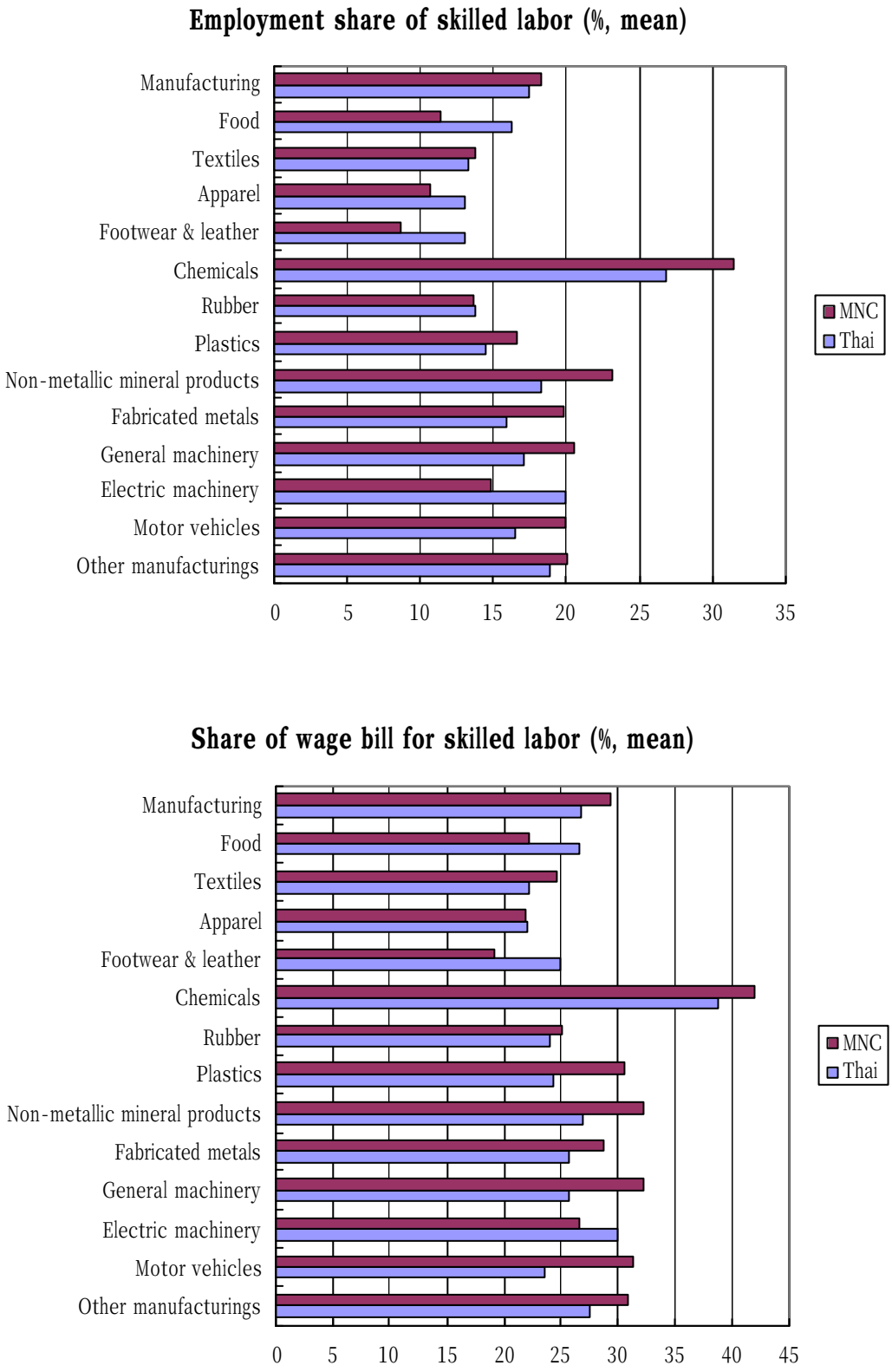
Table 2: Desctription of the data in Thai manufacturing sector (Sample means)

	Number of plants			W_S Hourly wage for skilled labor (Baht)		W_U Hourly wage for unskilled labor (Baht)		RW Relative wage of skilled labor		LS_S Employment share of skilled labor (%)		CS_S Share of wage bill for skilled labor (%)	
	All plants	Thai	MNC	Thai	MNC	Thai	MNC	Thai	MNC	Thai	MNC	Thai	MNC
Manufacturing	4,400	3,190	1,210	53	65	26	29	2.4	2.7	17.4	18.2	26.8	29.3
Food	295	222	73	44	47	20	19	2.8	2.8	16.3	11.4	26.6	22.3
Textiles	288	203	85	36	48	17	19	2.3	3.1	13.3	13.8	22.2	24.5
Apparel	301	240	61	57	73	25	28	2.5	3.0	13.0	10.7	22.1	21.8
Footwear & leather	113	88	25	66	92	27	32	2.8	3.4	13.0	8.6	24.9	19.2
Chemicals	313	203	110	65	81	33	40	2.3	2.4	26.8	31.4	38.8	42.0
Rubber	174	116	58	41	34	18	14	2.6	2.9	13.8	13.7	24.1	25.1
Plastics	267	198	69	40	48	18	20	2.5	2.9	14.5	16.6	24.4	30.5
Non-metallic mineral products	317	278	39	50	64	26	31	2.4	2.2	18.3	23.2	26.9	32.4
Fabricated metals	293	217	76	62	62	30	33	2.4	2.2	15.9	19.8	25.8	28.8
General machinery	218	147	71	69	81	33	37	2.5	2.5	17.1	20.5	25.6	32.2
Electric machinery	299	110	189	59	65	31	26	2.3	2.9	20.0	14.8	30.0	26.6
Motor vehicles	162	103	59	66	82	36	43	2.1	2.3	16.6	20.0	23.5	31.4
Other manufacturings	1,360	1,065	295	53	67	27	29	2.4	2.7	18.9	20.1	27.6	30.9

	SHDX* Share of exporting plants (%)		SHDM* Share of importing plants (%)		RKM Share of machinery capital to the total capital (%)		RKO Share of office equipment capital to the total capital (%)		ln(Y/L) Labor productivity		ln(K/L) Capital intensity	
	Thai	MNC	Thai	MNC	Thai	MNC	Thai	MNC	Thai	MNC	Thai	MNC
Manufacturing	22.6	55.4	22.0	48.3	38.7	45.0	4.5	4.0	4.2	4.2	3.3	3.8
Food	45.5	84.9	6.3	16.4	33.1	33.0	3.0	2.5	4.0	3.7	3.2	3.2
Textiles	18.7	44.7	23.2	44.7	54.7	58.1	2.5	2.4	3.5	3.7	3.4	4.0
Apparel	58.3	86.9	13.8	50.8	31.7	38.1	8.7	6.2	3.9	3.9	2.2	2.5
Footwear & leather	45.5	84.0	36.4	72.0	41.4	35.2	5.8	4.9	4.1	3.7	2.7	2.7
Chemicals	3.9	27.3	46.3	50.0	32.0	43.9	4.7	4.5	4.3	4.7	3.5	4.6
Rubber	50.0	81.0	7.8	20.7	36.1	43.2	2.9	2.2	4.2	3.7	3.2	3.6
Plastics	17.7	43.5	25.3	50.7	49.1	53.1	3.3	4.7	3.7	3.8	3.3	3.9
Non-metallic mineral products	5.4	38.5	6.1	28.2	33.3	47.4	2.5	3.2	4.5	4.1	3.8	3.8
Fabricated metals	8.3	36.8	29.5	61.8	40.2	48.0	4.7	2.8	4.3	4.7	3.3	4.1
General machinery	10.9	52.1	29.9	50.7	39.7	47.5	4.8	4.6	4.4	4.7	3.3	4.1
Electric machinery	15.5	73.0	50.0	77.2	41.7	51.3	8.2	4.5	4.4	4.1	3.1	3.7
Motor vehicles	10.7	22.0	25.2	40.7	39.0	48.6	4.9	2.9	4.6	5.4	3.3	4.6
Other manufacturings	21.1	53.6	20.4	40.3	38.4	38.9	4.5	4.6	4.3	4.3	3.4	3.6

Note) SHDX (or SHDM) are the share of the number of exporting (or importing) plant to the total number of plant for each plant group at each industry level.
Source) Author's calculation.

Figure1: The share of employment and wage bill for skilled labor



Source) Table 2.

Figure 2: Plots of share of skilled labor for employment (LS_S) and wage bill (CS_S) by industry

Figure 2-1: Relative wage (RW) v.s. LS_S and CS_S

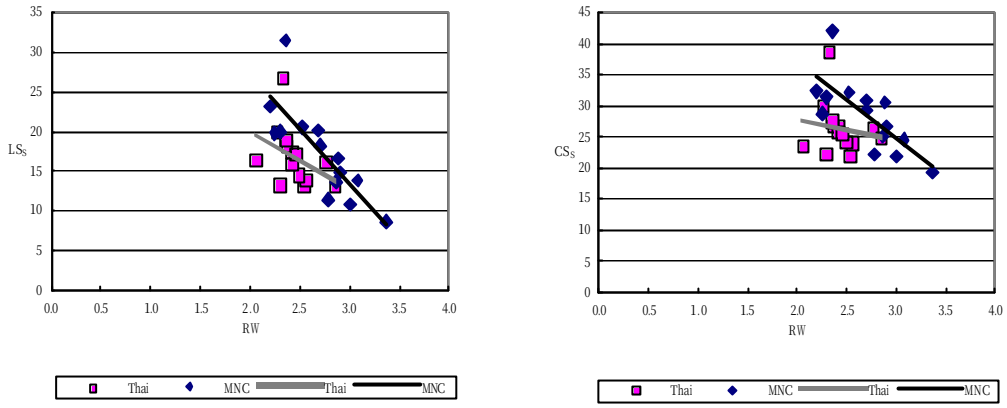


Figure 2-2: Industry share of exporting plants (SHDX) v.s. LS_S and CS_S

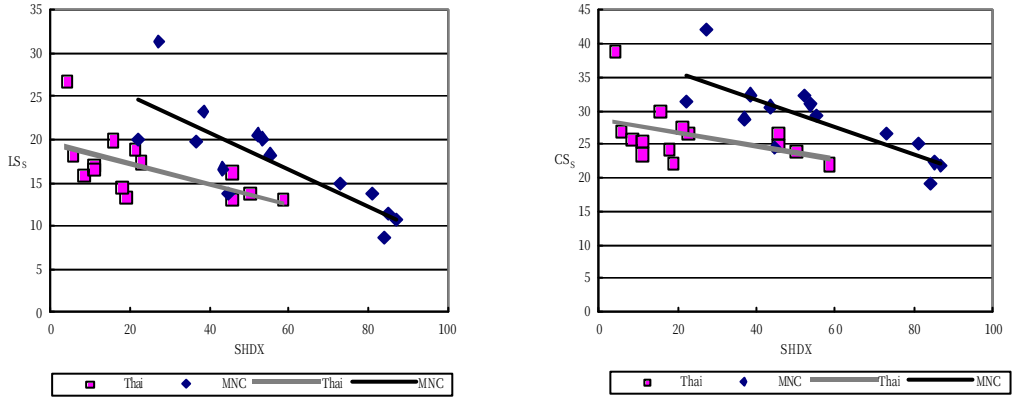
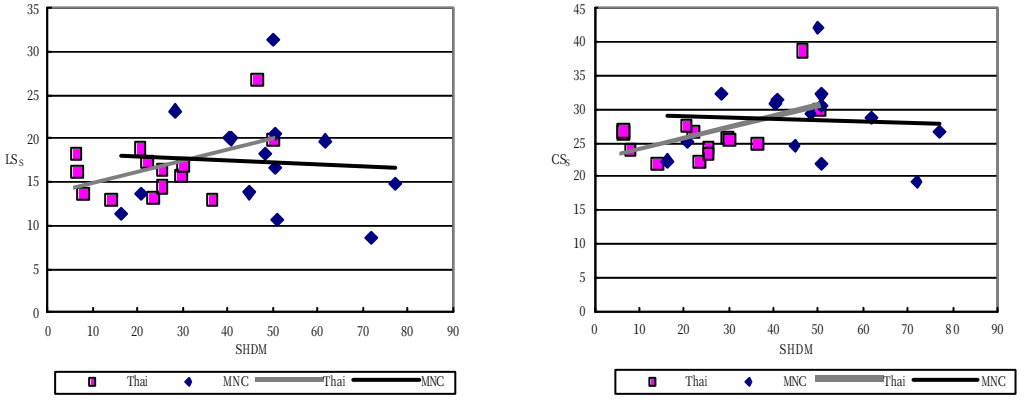


Figure 2-3: Industry share of importing plants (SHDM) v.s. LS_S and CS_S



(Continued)

Figure 2: (Continued)

Figure 2-4: Machinery capital share(RKM) v.s. LS_S and CS_S

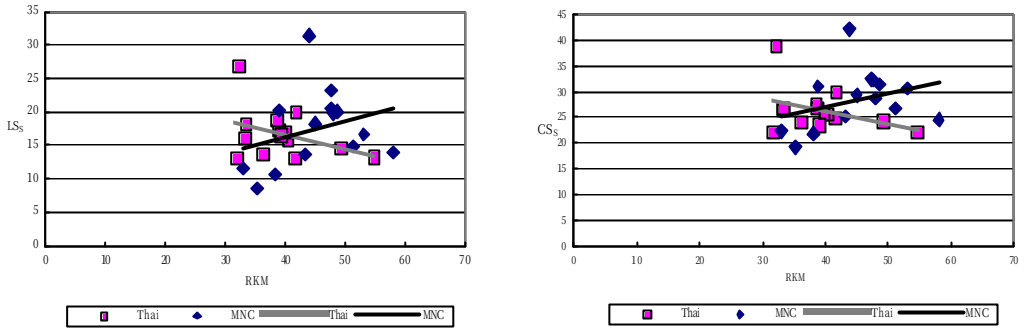


Figure 2-5: Office equipment capital share(RKO) v.s. LS_S and CS_S

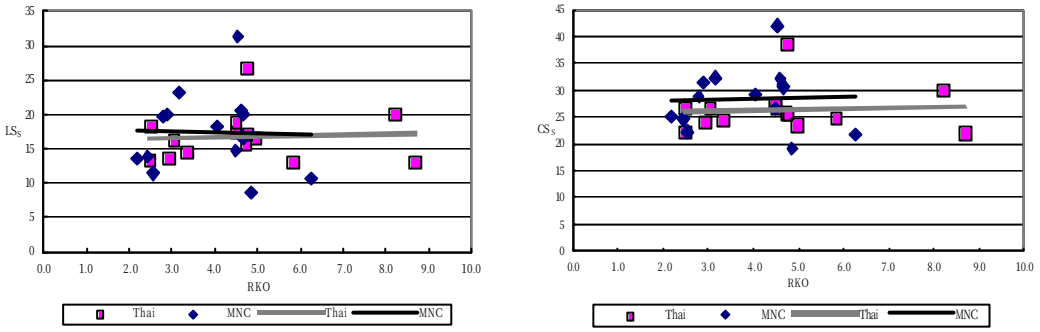


Figure 2-6: Labor productivity (ln(Y/L)) v.s. LS_S and CS_S

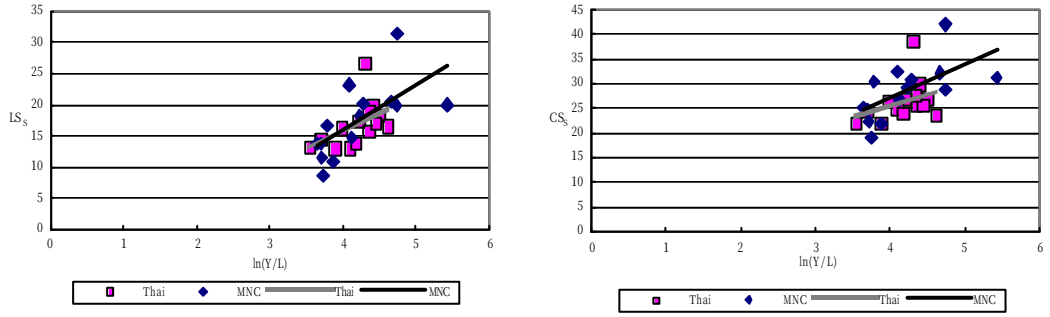
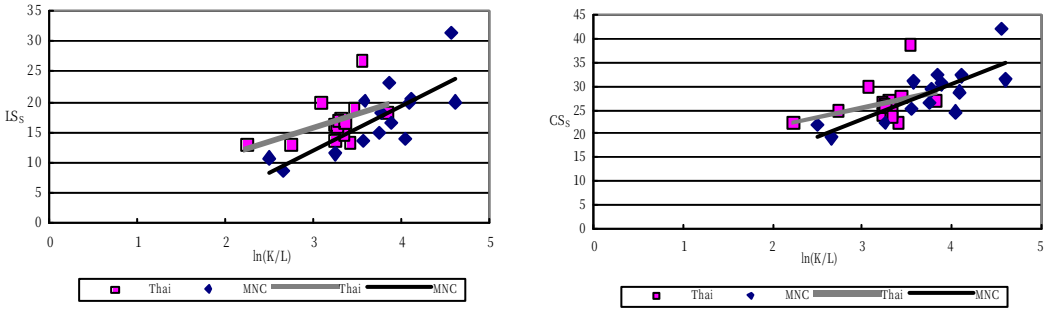


Figure 2-7: Capital intensity (ln(K/L)) v.s. LS_S and CS_S



Source) Table 2.

Table 3: Summary result of regression for equation (1) and equation(2)

		Equation (1) Dependent variable: CS_S						Equation (2) Dependent variable: LS_S					
	Obs.	*DF*	*DX*	*DM*	*RKM*	*RKO*	Adj.R^2	*DF*	*DX*	*DM*	*RKM*	*RKO*	Adj.R^2
Manufacturing													
All plants	4,400	0.03 ***	-0.08 ***	0.01 **	-0.06 ***	0.29 ***	0.27	0.02 ***	-0.05 ***	0.01	-0.05 ***	0.29 ***	0.21
Thai	3,190	---	-0.06 ***	0.01	-0.05 ***	0.25 ***	0.25	---	-0.04 ***	0.01	-0.05 ***	0.26 ***	0.18
MNC	1,210	---	-0.11 ***	0.02 **	-0.08 ***	0.34 ***	0.35	---	-0.08 ***	0.01	-0.08 ***	0.33 ***	0.30
Food													
All plants	295	-0.02	-0.10 ***	0.02	-0.05	0.05	0.29	-0.02 *	-0.07 ***	0.02	-0.04	0.32	0.24
Thai	222	---	-0.09 ***	0.03	-0.05	0.08	0.22	---	-0.07 ***	0.02	-0.04	0.34	0.21
MNC	73	---	-0.14 ***	0.00	-0.08	-0.48	0.49	---	-0.09 ***	0.00	-0.03	-0.17	0.37
Textiles													
All plants	288	0.03	-0.03 *	0.02	-0.03	0.54	0.21	0.00	-0.03 **	0.01	-0.05 *	0.60 **	0.16
Thai	203	---	-0.03	0.00	0.02	1.15 ***	0.22	---	-0.03 **	0.00	-0.02	1.13 ***	0.12
MNC	85	---	-0.06 *	0.04	-0.19 **	0.17	0.24	---	-0.06 ***	0.02	-0.12 **	0.18	0.43
Apparel													
All plants	301	0.00	-0.02	-0.01	-0.09 ***	0.15	0.23	-0.01	-0.03 **	-0.01	-0.05 **	0.08	0.10
Thai	240	---	-0.02	-0.02	-0.10 ***	0.15	0.21	---	-0.03 *	-0.01	-0.07 **	0.08	0.09
MNC	61	---	-0.10 *	0.01	0.01	-0.07	0.40	---	-0.07 *	0.00	0.02	-0.05	0.21
Footwear & leather													
All plants	113	-0.05 *	-0.05 *	-0.04	0.10 **	0.08	0.42	-0.01	-0.03 *	-0.03	0.11 ***	0.12	0.29
Thai	88	---	-0.03	-0.03	0.10 *	0.05	0.37	---	-0.03	-0.02	0.11 ***	0.11	0.17
MNC	25	---	-0.13 *	-0.06	0.12	-0.21	0.54	---	-0.03	-0.06 *	0.08 *	0.10	0.66
Chemicals													
All plants	313	0.05 **	-0.04	0.02	-0.17 ***	0.74 ***	0.23	0.04 *	-0.04	0.01	-0.16 ***	0.81 ***	0.16
Thai	203	---	-0.13 **	0.00	-0.19 ***	0.98 ***	0.27	---	-0.11 **	0.00	-0.17 ***	0.97 ***	0.16
MNC	110	---	-0.02	0.04	-0.21 ***	-0.10	0.22	---	-0.01	0.00	-0.22 ***	0.20	0.16
Rubber													
All plants	174	0.00	0.05 **	-0.03	-0.02	0.53	0.20	-0.01	0.03 *	-0.01	-0.04	0.51 **	0.14
Thai	116	---	0.06 **	-0.09 **	0.04	0.51	0.18	---	0.05 **	-0.03 **	-0.01	0.54 *	0.13
MNC	58	---	0.04	0.03	-0.13	0.68	0.26	---	-0.01	0.01	-0.09 *	0.31	0.15
Plastics													
All plants	267	0.05 **	-0.03	0.01	-0.07 *	0.14	0.24	0.02	-0.02	0.01	-0.06 **	0.07	0.09
Thai	198	---	-0.01	0.01	-0.09 **	0.03	0.15	---	-0.01	0.01	-0.08 ***	0.04	0.12
MNC	69	---	-0.05	0.02	0.03	0.34	0.33	---	-0.02	0.00	0.00	0.16	0.04

(Continued)

Table 3: (Continued)

		Equation (1) Dependent variable: CS_S						Equation (2) Dependent variable: LS_S					
	Obs.	*DF*	*DX*	*DM*	*RKM*	*RKO*	Adj.R^2	*DF*	*DX*	*DM*	*RKM*	*RKO*	Adj.R^2
Non-metallic mineral products													
All plants	317	0.07	-0.10 ***	0.08 *	-0.01	0.33 **	0.26	0.05	-0.07 **	0.06	-0.01	0.31 ***	0.12
Thai	278	---	-0.10 ***	0.03	0.01	0.37 ***	0.26	---	-0.06 **	0.04	0.01	0.28 **	0.12
MNC	39	---	-0.16 **	0.20 **	-0.15	-0.74	0.21	---	-0.11 *	0.12	-0.04	0.49	0.04
Fabricated metals													
All plants	293	0.07 ***	-0.07 ***	0.01	-0.09 ***	0.57 ***	0.33	0.05 **	-0.05 ***	0.00	-0.07 ***	0.48 ***	0.20
Thai	217	---	0.02	0.02	-0.09 ***	0.56 ***	0.35	---	0.01	0.01	-0.05 **	0.48 ***	0.15
MNC	76	---	-0.15 ***	0.02	-0.12	0.60	0.33	---	-0.10 ***	0.00	-0.11 *	0.79	0.26
General machinery													
All plants	218	0.09 ***	-0.07 ***	0.03	-0.05	0.81 ***	0.39	0.07 ***	-0.07 ***	0.01	-0.06 *	0.70 ***	0.18
Thai	147	---	-0.01	0.02	-0.02	0.65 **	0.31	---	-0.02	0.01	-0.02	0.50 **	0.09
MNC	71	---	-0.11 ***	0.01	-0.16 **	0.94 *	0.51	---	-0.11 ***	-0.01	-0.19 ***	0.94 **	0.36
Electric machinery													
All plants	299	-0.01	-0.10 ***	0.01	-0.05	0.29 *	0.24	-0.01	-0.07 ***	0.01	-0.06 **	0.25 *	0.19
Thai	110	---	-0.11 **	0.00	-0.09 *	0.23	0.16	---	-0.07 **	0.00	-0.09 *	0.20	0.13
MNC	189	---	-0.10 ***	0.02	0.00	0.31	0.26	---	-0.07 ***	0.02	-0.03	0.31	0.17
Motor vehicles													
All plants	162	0.03	-0.02	0.03	-0.07	-0.07	0.44	-0.01	-0.03	0.03	-0.06	0.04	0.17
Thai	103	---	-0.02	0.03	-0.08	-0.04	0.38	---	-0.01	0.02	-0.01	0.13	0.22
MNC	59	---	-0.04	0.01	0.01	-0.11	0.46	---	-0.04	0.04	-0.10	-0.06	-0.01
Other manufacturings													
All plants	1,360	0.04 ***	-0.11 ***	0.01	-0.06 ***	0.22 ***	0.23	0.03 ***	-0.08 ***	0.00	-0.06 ***	0.23 ***	0.18
Thai	1,065	---	-0.09 ***	0.01	-0.06 ***	0.16 **	0.20	---	-0.06 ***	0.01	-0.05 ***	0.20 ***	0.17
MNC	295	---	-0.17 ***	0.01	-0.07	0.59 **	0.35	---	-0.11 ***	0.00	-0.07 *	0.38 *	0.27

Source) Appendix Table A1-A4 for summary results of euation (1), and Appendix Table B1-B5 for equation (2).

Note) ***=significant at the 1 percent level, ** =significant at the 5 percent level, and *=significant at the 10 percent level.

Appendix Table A1: Regression results of equation (1), Dependent variable: CS_S

	All plants			Thai plants			MNC plants		
	Coef.	T-stat.		Coef.	T-stat.		Coef.	T-stat.	
Manufacturing									
C	0.31	47.10	***	0.30	42.23	***	0.39	23.43	***
DF	0.03	4.83	***	---	---		---	---	
DX	-0.08	-13.80	***	-0.06	-8.48	***	-0.11	-10.91	***
DM	0.01	2.29	**	0.01	1.47		0.02	2.15	**
RKM	-0.06	-5.96	***	-0.05	-4.95	***	-0.08	-3.90	***
RKO	0.29	6.55	***	0.25	5.53	***	0.34	3.04	***
lnRW	0.11	34.83	***	0.10	28.80	***	0.12	19.56	***
lnY	0.00	-0.36		0.00	0.31		-0.01	-2.36	**
lnK	0.01	4.82	***	0.00	2.34	**	0.02	5.19	***
Food	-0.02	-2.20	**	-0.01	-0.83		-0.06	-3.55	***
Textiles	-0.06	-6.42	***	-0.05	-4.92	***	-0.08	-4.31	***
Apparel	-0.05	-5.82	***	-0.06	-5.14	***	-0.07	-4.01	***
Footwear & leather	-0.05	-4.13	***	-0.04	-2.67	***	-0.11	-4.76	***
Chemicals	0.09	7.75	***	0.09	6.32	***	0.09	4.02	***
Rubber	-0.03	-2.48	**	-0.03	-2.22	**	-0.03	-1.47	
Plastics	-0.04	-3.98	***	-0.04	-3.92	***	-0.03	-1.59	
Non-metallic mineral products	-0.01	-0.93		-0.01	-1.00		0.02	0.51	
Fabricated metals	-0.03	-2.94	***	-0.03	-2.90	***	-0.02	-0.96	
General machinery	-0.01	-0.63		-0.02	-1.46		0.02	0.81	
Electric machinery	-0.03	-2.47	**	0.01	0.36		-0.04	-2.86	***
Motor vehicles	-0.02	-2.06	**	-0.03	-2.46	**	-0.02	-0.67	
Adj.R^2 / Obs.	0.27	4,400		0.25	3,190		0.35	1,210	
Mean and S.D. of Dependent variable	0.27	0.18		0.27	0.17		0.29	0.19	
Food									
C	0.33	13.60	***	0.32	11.71	***	0.38	7.18	***
DF	-0.02	-1.17		---	---		---	---	
DX	-0.10	-5.11	***	-0.09	-4.22	***	-0.14	-2.98	***
DM	0.02	0.62		0.03	0.58		0.00	0.07	
RKM	-0.05	-1.14		-0.05	-0.88		-0.08	-1.11	
RKO	0.05	0.20		0.08	0.30		-0.48	-0.86	
lnRW	0.10	9.32	***	0.10	7.23	***	0.13	6.67	***
lnY	0.00	-0.18		0.00	0.36		-0.02	-1.69	*
lnK	0.01	1.26		0.01	0.96		0.01	1.24	
Adj.R^2 / Obs.	0.29	295		0.22	222		0.49	73	
Mean and S.D. of Dependent variable	0.26	0.16		0.27	0.17		0.22	0.15	
Textiles									
C	0.22	8.31	***	0.19	7.00	***	0.36	7.01	***
DF	0.03	1.45		---	---		---	---	
DX	-0.03	-1.77	*	-0.03	-1.44		-0.06	-1.95	*
DM	0.02	1.00		0.00	0.05		0.04	1.29	
RKM	-0.03	-0.69		0.02	0.49		-0.19	-2.59	**
RKO	0.54	1.40		1.15	3.51	***	0.17	0.34	
lnRW	0.10	8.06	***	0.11	6.49	***	0.09	4.53	***
lnY	-0.01	-0.94		-0.01	-0.65		-0.02	-1.61	
lnK	0.00	-0.38		0.00	-0.24		0.01	1.06	
Adj.R^2 / Obs.	0.21	288		0.22	203		0.24	85	
Mean and S.D. of Dependent variable	0.23	0.15		0.22	0.15		0.25	0.16	

(Continued)

Appendix Table A2: (Continued)

	All plants			Thai plants			MNC plants		
	Coef.	T-stat.		Coef.	T-stat.		Coef.	T-stat.	
Apparel									
C	0.26	12.13	***	0.25	11.24	***	0.30	5.01	***
DF	0.00	-0.29		---	---		---	---	
DX	-0.02	-1.28		-0.02	-0.90		-0.10	-1.80	*
DM	-0.01	-0.65		-0.02	-0.78		0.01	0.61	
RKM	-0.09	-2.69	***	-0.10	-2.80	***	0.01	0.24	
RKO	0.15	1.43		0.15	1.38		-0.07	-0.27	
lnRW	0.10	8.60	***	0.10	7.36	***	0.11	4.51	***
lnY	0.01	1.66	*	0.02	1.80	*	0.00	0.13	
lnK	0.00	-0.41		0.00	-0.46		0.00	-0.38	
Adj.R^2 / Obs.	0.23	301		0.21	240		0.40	61	
Mean and S.D. of Dependent variable	0.22	0.15		0.22	0.16		0.22	0.12	
Footwear & leather									
C	0.24	9.73	***	0.23	8.80	***	0.31	4.02	***
DF	-0.05	-1.75	*	---	---		---	---	
DX	-0.05	-1.72	*	-0.03	-1.09		-0.13	-1.89	*
DM	-0.04	-1.45		-0.03	-0.99		-0.06	-0.65	
RKM	0.10	2.40	**	0.10	1.92	*	0.12	1.03	
RKO	0.08	0.37		0.05	0.21		-0.21	-0.60	
lnRW	0.13	8.31	***	0.13	6.90	***	0.12	3.86	***
lnY	-0.02	-2.05	**	-0.01	-1.19		-0.03	-1.05	
lnK	0.02	2.68	***	0.01	1.05		0.04	2.56	**
Adj.R^2 / Obs.	0.42	113		0.37	88		0.54	25	
Mean and S.D. of Dependent variable	0.24	0.15		0.25	0.15		0.19	0.14	
Chemicals									
C	0.40	15.59	***	0.41	14.18	***	0.50	9.64	***
DF	0.05	1.98	**	---	---		---	---	
DX	-0.04	-1.21		-0.13	-2.00	**	-0.02	-0.57	
DM	0.02	0.89		0.00	-0.02		0.04	1.09	
RKM	-0.17	-3.91	***	-0.19	-3.52	***	-0.21	-2.65	***
RKO	0.74	3.66	***	0.98	4.95	***	-0.10	-0.19	
lnRW	0.12	7.59	***	0.13	6.53	***	0.12	5.34	***
lnY	0.01	1.07		0.01	0.77		0.01	0.73	
lnK	0.01	0.66		0.00	-0.37		0.01	0.97	
Adj.R^2 / Obs.	0.23	313		0.27	203		0.22	110	
Mean and S.D. of Dependent variable	0.40	0.21		0.39	0.21		0.42	0.21	
Rubber									
C	0.21	8.62	***	0.19	6.64	***	0.26	5.24	***
DF	0.00	-0.18		---	---		---	---	
DX	0.05	2.09	**	0.06	2.05	**	0.04	0.87	
DM	-0.03	-0.93		-0.09	-2.54	**	0.03	0.51	
RKM	-0.02	-0.39		0.04	0.63		-0.13	-1.67	
RKO	0.53	1.36		0.51	1.14		0.68	0.85	
lnRW	0.09	6.36	***	0.09	4.80	***	0.10	3.97	***
lnY	-0.01	-1.28		-0.01	-0.73		-0.01	-0.78	
lnK	0.01	0.85		0.01	0.83		0.00	0.34	
Adj.R^2 / Obs.	0.20	174		0.18	116		0.26	58	
Mean and S.D. of Dependent variable	0.24	0.16		0.24	0.16		0.25	0.16	

(Continued)

Appendix Table A3: (Continued)

	All plants			Thai plants			MNC plants		
	Coef.	T-stat.		Coef.	T-stat.		Coef.	T-stat.	
Plastics									
C	0.28	12.20	***	0.28	11.94	***	0.29	3.36	***
DF	0.05	2.20	**	---	---		---	---	
DX	-0.03	-1.48		-0.01	-0.19		-0.05	-1.21	
DM	0.01	0.80		0.01	0.60		0.02	0.49	
RKM	-0.07	-1.89	*	-0.09	-2.45	**	0.03	0.29	
RKO	0.14	0.84		0.03	0.18		0.34	1.47	
lnRW	0.11	8.24	***	0.09	6.36	***	0.15	6.52	***
lnY	-0.01	-1.45		-0.01	-0.81		-0.02	-1.19	
lnK	0.01	1.35		0.01	1.06		0.01	0.55	
Adj.R^2 / Obs.	0.24	267		0.15	198		0.33	69	
Mean and S.D. of Dependent variable	0.26	0.15		0.24	0.14		0.31	0.19	
Non-metallic mineral products									
C	0.27	15.67	***	0.26	15.38	***	0.42	3.87	***
DF	0.07	1.64		---	---		---	---	
DX	-0.10	-2.85	***	-0.10	-2.87	***	-0.16	-2.26	**
DM	0.08	1.79	*	0.03	0.65		0.20	2.42	**
RKM	-0.01	-0.35		0.01	0.29		-0.15	-0.98	
RKO	0.33	2.36	**	0.37	3.31	***	-0.74	-0.49	
lnRW	0.12	10.31	***	0.11	9.81	***	0.13	2.94	***
lnY	-0.01	-0.83		0.00	-0.12		-0.03	-0.80	
lnK	0.01	0.97		0.00	0.24		0.03	1.36	
Adj.R^2 / Obs.	0.26	317		0.26	278		0.21	39	
Mean and S.D. of Dependent variable	0.28	0.18		0.27	0.17		0.32	0.26	
Fabricated metals									
C	0.27	15.57	***	0.26	14.70	***	0.37	6.91	***
DF	0.07	2.87	***	---	---		---	---	
DX	-0.07	-2.71	***	0.02	0.58		-0.15	-4.69	***
DM	0.01	0.81		0.02	0.82		0.02	0.53	
RKM	-0.09	-3.02	***	-0.09	-2.64	***	-0.12	-1.66	
RKO	0.57	4.05	***	0.56	3.81	***	0.60	0.89	
lnRW	0.12	10.61	***	0.12	9.61	***	0.11	4.73	***
lnY	-0.02	-2.01	**	-0.02	-1.78	*	-0.01	-0.93	
lnK	0.01	2.04	**	0.01	1.40		0.01	0.99	
Adj.R^2 / Obs.	0.33	293		0.35	217		0.33	76	
Mean and S.D. of Dependent variable	0.27	0.16		0.26	0.16		0.29	0.18	
General machinery									
C	0.24	10.01	***	0.23	8.51	***	0.41	6.13	***
DF	0.09	3.50	***	---	---		---	---	
DX	-0.07	-2.66	***	-0.01	-0.19		-0.11	-2.94	***
DM	0.03	1.17		0.02	0.85		0.01	0.35	
RKM	-0.05	-1.35		-0.02	-0.38		-0.16	-2.05	**
RKO	0.81	2.95	***	0.65	2.19	**	0.94	1.81	*
lnRW	0.13	10.51	***	0.12	8.32	***	0.14	5.98	***
lnY	0.00	-0.45		-0.02	-1.22		0.01	0.57	
lnK	0.00	-0.30		0.00	-0.28		0.00	-0.16	
Adj.R^2 / Obs.	0.39	218		0.31	147		0.51	71	
Mean and S.D. of Dependent variable	0.28	0.18		0.26	0.17		0.32	0.20	

(Continued)

Appendix Table A4: (Continued)

	All plants		Thai plants		MNC plants	
	Coef.	T-stat.	Coef.	T-stat.	Coef.	T-stat.
Electric machinery						
C	0.34	11.87 ***	0.34	10.21 ***	0.31	7.90 ***
DF	-0.01	-0.44	---	---	---	---
DX	-0.10	-4.50 ***	-0.11	-2.51 **	-0.10	-3.93 ***
DM	0.01	0.69	0.00	0.00	0.02	0.92
RKM	-0.05	-1.27	-0.09	-1.67 *	0.00	-0.03
RKO	0.29	1.85 *	0.23	1.17	0.31	1.20
lnRW	0.11	9.16 ***	0.11	5.47 ***	0.10	7.60 ***
lnY	0.00	0.38	0.01	0.56	0.00	-0.04
lnK	0.01	1.52	0.01	0.51	0.01	1.35
Adj.R^2 / Obs.	0.24	299	0.16	110	0.26	189
Mean and S.D. of Dependent variable	0.28	0.17	0.30	0.18	0.27	0.17
Motor vehicles						
C	0.28	10.74 ***	0.26	10.02 ***	0.32	7.73 ***
DF	0.03	1.05	---	---	---	---
DX	-0.02	-0.75	-0.02	-0.55	-0.04	-0.87
DM	0.03	1.21	0.03	0.84	0.01	0.15
RKM	-0.07	-1.47	-0.08	-1.43	0.01	0.12
RKO	-0.07	-0.32	-0.04	-0.19	-0.11	-0.23
lnRW	0.14	9.63 ***	0.12	6.74 ***	0.16	6.42 ***
lnY	-0.02	-2.82 ***	-0.01	-0.51	-0.02	-1.62
lnK	0.03	3.76 ***	0.03	3.31 ***	0.02	1.03
Adj.R^2 / Obs.	0.44	162	0.38	103	0.46	59
Mean and S.D. of Dependent variable	0.26	0.17	0.24	0.15	0.31	0.17
Other manufacturings						
C	0.32	32.40 ***	0.31	30.51 ***	0.40	13.13 ***
DF	0.04	3.66 ***	---	---	---	---
DX	-0.11	-11.85 ***	-0.09	-8.46 ***	-0.17	-7.28 ***
DM	0.01	0.65	0.01	0.81	0.01	0.25
RKM	-0.06	-3.48 ***	-0.06	-3.11 ***	-0.07	-1.52
RKO	0.22	3.37 ***	0.16	2.28 **	0.59	2.19 **
lnRW	0.10	17.64 ***	0.10	15.27 ***	0.11	9.18 ***
lnY	0.01	1.19	0.00	0.51	0.00	0.50
lnK	0.01	3.50 ***	0.01	2.17 **	0.02	3.04 ***
Adj.R^2 / Obs.	0.23	1,360	0.20	1,065	0.35	295
Mean and S.D. of Dependent variable	0.28	0.18	0.28	0.18	0.31	0.21

Note) T-statistics are calculated using White's heteroscedasticity-consistent standard errors.

***=significant at the 1 percent level, ** =significant at the 5 percent level, and *=significant at the 10 percent leve

Appendix Table B1: Regression results of equation (2), Dependent variable: LS_S

	All plants			Thai plants			MNC plants		
	Coef.	T-stat.		Coef.	T-stat.		Coef.	T-stat.	
Manufacturing									
C	0.15	16.71	***	0.16	15.18	***	0.16	7.80	***
DF	0.02	3.53	***	---	---		---	---	
DX	-0.05	-12.25	***	-0.04	-7.84	***	-0.08	-8.84	***
DM	0.01	1.55		0.01	1.29		0.01	1.00	
RKM	-0.05	-6.82	***	-0.05	-5.17	***	-0.08	-5.18	***
RKO	0.29	7.40	***	0.26	6.34	***	0.33	3.36	***
lnRW	-0.04	-14.99	***	-0.05	-13.89	***	-0.03	-6.14	***
ln(K/L)	0.02	11.74	***	0.02	8.33	***	0.03	8.79	***
DSZ2	0.01	2.13	**	0.01	2.04	**	0.00	0.24	
DSZ3	0.01	2.39	**	0.01	1.89	*	0.02	1.24	
DSZ4	0.02	3.76	***	0.02	2.33	**	0.02	1.84	*
Food	-0.02	-2.23	**	-0.01	-0.78		-0.05	-4.16	***
Textiles	-0.04	-6.35	***	-0.04	-4.90	***	-0.06	-4.40	***
Apparel	-0.03	-3.76	***	-0.03	-3.41	***	-0.03	-2.78	***
Footwear & leather	-0.04	-3.97	***	-0.03	-2.90	***	-0.06	-3.91	***
Chemicals	0.07	6.73	***	0.07	5.42	***	0.06	3.37	***
Rubber	-0.03	-2.90	***	-0.03	-2.36	**	-0.03	-1.82	*
Plastics	-0.03	-4.00	***	-0.03	-3.57	***	-0.03	-2.20	**
Non-metallic mineral products	-0.01	-1.76	*	-0.02	-1.89	*	0.02	0.71	
Fabricated metals	-0.03	-3.58	***	-0.03	-3.56	***	-0.02	-1.35	
General machinery	-0.02	-1.73	*	-0.02	-1.96	*	-0.01	-0.55	
Electric machinery	-0.02	-2.28	**	0.01	0.47		-0.03	-2.88	***
Motor vehicles	-0.03	-3.64	***	-0.03	-2.89	***	-0.05	-2.84	***
Adj.R^2 / Obs.	0.21	4,400		0.18	3,190		0.30	1,210	
Mean and S.D. of Dependent variable	0.18	0.14		0.17	0.14		0.18	0.15	
Food									
C	0.11	3.35	***	0.11	2.96	***	0.11	2.15	**
DF	-0.02	-1.97	*	---	---		---	---	
DX	-0.07	-4.20	***	-0.07	-3.48	***	-0.09	-3.17	***
DM	0.02	0.67		0.02	0.57		0.00	0.19	
RKM	-0.04	-1.14		-0.04	-0.95		-0.03	-0.74	
RKO	0.32	1.26		0.34	1.26		-0.17	-0.55	
lnRW	-0.04	-4.60	***	-0.05	-4.18	***	-0.02	-2.19	**
ln(K/L)	0.02	3.44	***	0.02	2.62	***	0.03	2.88	***
DSZ2	0.04	2.25	**	0.04	2.12	**	0.02	0.72	
DSZ3	0.04	1.95	*	0.05	1.96	*	-0.01	-0.46	
DSZ4	0.06	2.96	***	0.07	2.85	***	0.01	0.31	
Adj.R^2 / Obs.	0.24	295		0.21	222		0.37	73	
Mean and S.D. of Dependent variable	0.15	0.12		0.16	0.13		0.11	0.07	

(Continued)

Appendix Table B2: (Continued)

	All plants		Thai plants		MNC plants	
	Coef.	T-stat.	Coef.	T-stat.	Coef.	T-stat.
Textiles						
C	0.07	3.18 ***	0.05	1.49	0.09	2.60 **
DF	0.00	0.38	---	---	---	---
DX	-0.03	-2.51 **	-0.03	-2.02 **	-0.06	-3.28 ***
DM	0.01	0.74	0.00	-0.14	0.02	0.82
RKM	-0.05	-1.85 *	-0.02	-0.64	-0.12	-2.45 **
RKO	0.60	2.57 **	1.13	4.86 ***	0.18	0.89
lnRW	-0.03	-3.64 ***	-0.02	-1.78 *	-0.04	-3.74 ***
ln(K/L)	0.03	4.35 ***	0.03	3.09 ***	0.04	4.15 ***
DSZ2	0.00	-0.24	-0.01	-0.37	0.03	1.29
DSZ3	0.04	1.96 *	0.01	0.60	0.09	3.58 ***
DSZ4	-0.02	-1.26	-0.01	-0.40	-0.01	-0.45
Adj.R^2 / Obs.	0.16	288	0.12	203	0.43	85
Mean and S.D. of Dependent variable	0.13	0.10	0.13	0.10	0.14	0.10
Apparel						
C	0.15	5.83 ***	0.15	5.01 ***	0.17	3.41 ***
DF	-0.01	-1.02	---	---	---	---
DX	-0.03	-1.98 **	-0.03	-1.73 *	-0.07	-1.94 *
DM	-0.01	-0.37	-0.01	-0.24	0.00	0.28
RKM	-0.05	-2.04 **	-0.07	-2.11 **	0.02	0.79
RKO	0.08	1.23	0.08	1.13	-0.05	-0.27
lnRW	-0.03	-4.42 ***	-0.03	-3.73 ***	-0.03	-2.97 ***
ln(K/L)	0.01	1.30	0.01	1.05	0.00	-0.03
DSZ2	0.02	1.34	0.01	0.88	0.04	1.77 *
DSZ3	0.04	2.13 **	0.05	2.11 **	0.01	0.36
DSZ4	0.04	2.00 **	0.05	1.61	0.02	1.00
Adj.R^2 / Obs.	0.10	301	0.09	240	0.21	61
Mean and S.D. of Dependent variable	0.13	0.10	0.13	0.11	0.11	0.06
Footwear & leather						
C	0.04	1.33	0.04	1.01	0.07	1.04
DF	-0.01	-0.49	---	---	---	---
DX	-0.03	-1.70 *	-0.03	-1.26	-0.03	-1.14
DM	-0.03	-1.60	-0.02	-0.99	-0.06	-1.77 *
RKM	0.11	3.38 ***	0.11	2.67 ***	0.08	1.76 *
RKO	0.12	0.94	0.11	0.69	0.10	0.36
lnRW	-0.03	-2.61 **	-0.03	-2.22 **	-0.03	-1.59
ln(K/L)	0.03	3.80 ***	0.03	2.41 **	0.03	1.78 *
DSZ2	0.04	1.71 *	0.04	1.38	0.01	0.33
DSZ3	-0.02	-0.94	-0.02	-0.68	-0.02	-0.99
DSZ4	0.00	0.01	0.00	-0.15	0.00	0.02
Adj.R^2 / Obs.	0.29	113	0.17	88	0.66	25
Mean and S.D. of Dependent variable	0.12	0.08	0.13	0.09	0.09	0.07

(Continued)

Appendix Table B3: (Continued)

	All plants		Thai plants		MNC plants	
	Coef.	T-stat.	Coef.	T-stat.	Coef.	T-stat.
Chemicals						
C	0.26	6.28 ***	0.30	6.29 ***	0.25	2.84 ***
DF	0.04	1.69 *	---	---	---	---
DX	-0.04	-1.35	-0.11	-2.30 **	-0.01	-0.22
DM	0.01	0.42	0.00	0.02	0.00	-0.01
RKM	-0.16	-4.38 ***	-0.17	-3.80 ***	-0.22	-3.10 ***
RKO	0.81	4.35 ***	0.97	4.71 ***	0.20	0.44
lnRW	-0.07	-4.96 ***	-0.06	-3.36 ***	-0.06	-2.89 ***
ln(K/L)	0.02	2.00 **	0.01	0.93	0.02	1.38
DSZ2	-0.03	-0.94	-0.03	-1.06	0.03	0.72
DSZ3	0.00	-0.06	-0.02	-0.72	0.10	1.81 *
DSZ4	0.04	1.08	0.02	0.45	0.12	2.03 **
Adj.R^2 / Obs.	0.16	313	0.16	203	0.16	110
Mean and S.D. of Dependent variable	0.28	0.18	0.27	0.17	0.31	0.18
Rubber						
C	0.03	1.03	0.02	0.46	0.04	0.62
DF	-0.01	-0.51	---	---	---	---
DX	0.03	1.94 *	0.05	2.18 **	-0.01	-0.37
DM	-0.01	-0.66	-0.03	-2.02 **	0.01	0.23
RKM	-0.04	-1.09	-0.01	-0.29	-0.09	-1.83 *
RKO	0.51	2.08 **	0.54	1.89 *	0.31	0.51
lnRW	-0.03	-2.57 **	-0.02	-1.65	-0.04	-2.17 **
ln(K/L)	0.03	4.08 ***	0.04	3.16 ***	0.03	2.25 **
DSZ2	0.02	0.92	0.00	0.04	0.12	1.68 *
DSZ3	-0.01	-0.73	-0.03	-1.28	0.07	1.59
DSZ4	-0.01	-0.44	-0.02	-1.01	0.07	1.82 *
Adj.R^2 / Obs.	0.14	174	0.13	116	0.15	58
Mean and S.D. of Dependent variable	0.14	0.10	0.14	0.11	0.14	0.10
Plastics						
C	0.11	4.30 ***	0.12	4.27 ***	0.11	1.35
DF	0.02	1.30	---	---	---	---
DX	-0.02	-1.22	-0.01	-0.28	-0.02	-0.71
DM	0.01	0.39	0.01	0.39	0.00	0.14
RKM	-0.06	-2.41 **	-0.08	-2.83 ***	0.00	0.05
RKO	0.07	0.65	0.04	0.25	0.16	1.25
lnRW	-0.02	-2.14 **	-0.04	-2.87 ***	0.00	0.28
ln(K/L)	0.02	3.77 ***	0.02	3.36 ***	0.02	1.44
DSZ2	0.02	1.40	0.03	1.48	0.02	0.51
DSZ3	-0.01	-0.40	0.02	1.07	-0.06	-1.80 *
DSZ4	-0.02	-0.97	-0.01	-0.61	-0.05	-1.02
Adj.R^2 / Obs.	0.09	267	0.12	198	0.04	69
Mean and S.D. of Dependent variable	0.15	0.10	0.15	0.10	0.17	0.10

(Continued)

Appendix Table B4: (Continued)

	All plants		Thai plants		MNC plants	
	Coef.	T-stat.	Coef.	T-stat.	Coef.	T-stat.
Non-metallic mineral products						
C	0.12	3.79 ***	0.15	4.85 ***	-0.03	-0.14
DF	0.05	1.53	---	---	---	---
DX	-0.07	-2.30 **	-0.06	-2.04 **	-0.11	-1.81 *
DM	0.06	1.61	0.04	0.75	0.12	1.62
RKM	-0.01	-0.51	0.01	0.26	-0.04	-0.41
RKO	0.31	2.78 ***	0.28	2.45 **	0.49	0.47
lnRW	-0.04	-3.67 ***	-0.05	-4.47 ***	0.01	0.21
ln(K/L)	0.02	2.48 **	0.01	1.44	0.06	2.47 **
DSZ2	0.03	1.58	0.03	1.84 *	0.03	0.16
DSZ3	0.00	0.02	0.00	0.10	0.01	0.07
DSZ4	0.04	1.28	0.02	0.86	0.10	0.58
Adj.R^2 / Obs.	0.12	317	0.12	278	0.04	39
Mean and S.D. of Dependent variable	0.19	0.14	0.18	0.13	0.23	0.19
Fabricated metals						
C	0.09	3.73 ***	0.09	3.37 ***	0.14	1.85 *
DF	0.05	2.25 **	---	---	---	---
DX	-0.05	-2.63 ***	0.01	0.30	-0.10	-3.34 ***
DM	0.00	0.28	0.01	0.68	0.00	0.09
RKM	-0.07	-2.84 ***	-0.05	-2.17 **	-0.11	-1.68 *
RKO	0.48	4.40 ***	0.48	4.20 ***	0.79	1.53
lnRW	-0.04	-4.24 ***	-0.03	-3.81 ***	-0.04	-2.21 **
ln(K/L)	0.03	4.50 ***	0.03	3.80 ***	0.03	2.56 **
DSZ2	0.01	0.52	0.00	0.23	0.04	0.76
DSZ3	0.00	0.29	-0.01	-0.50	0.06	1.00
DSZ4	-0.03	-1.49	-0.03	-1.35	0.00	0.07
Adj.R^2 / Obs.	0.20	293	0.15	217	0.26	76
Mean and S.D. of Dependent variable	0.17	0.12	0.16	0.10	0.20	0.14
General machinery						
C	0.20	4.51 ***	0.22	4.80 ***	0.11	1.28
DF	0.07	3.09 ***	---	---	---	---
DX	-0.07	-3.28 ***	-0.02	-0.98	-0.11	-3.29 ***
DM	0.01	0.40	0.01	0.70	-0.01	-0.38
RKM	-0.06	-1.82 *	-0.02	-0.44	-0.19	-3.43 ***
RKO	0.70	2.85 ***	0.50	2.12 **	0.94	2.04 **
lnRW	-0.02	-1.93 *	-0.02	-2.17 **	-0.01	-0.51
ln(K/L)	0.00	-0.47	-0.01	-1.17	0.03	1.66
DSZ2	-0.04	-2.13 **	-0.05	-2.38 **	0.09	1.72 *
DSZ3	0.01	0.41	0.00	-0.04	0.10	1.66
DSZ4	0.00	0.12	-0.01	-0.53	0.11	1.85 *
Adj.R^2 / Obs.	0.18	218	0.09	147	0.36	71
Mean and S.D. of Dependent variable	0.18	0.13	0.17	0.12	0.21	0.15

(Continued)

Appendix Table B5: (Continued)

	All plants		Thai plants		MNC plants	
	Coef.	T-stat.	Coef.	T-stat.	Coef.	T-stat.
Electric machinery						
C	0.19	5.89 ***	0.22	4.33 ***	0.14	3.17 ***
DF	-0.01	-0.44	---	---	---	---
DX	-0.07	-3.38 ***	-0.07	-2.02 **	-0.07	-2.95 ***
DM	0.01	0.57	0.00	-0.17	0.02	0.93
RKM	-0.06	-2.17 **	-0.09	-1.90 *	-0.03	-0.83
RKO	0.25	1.82 *	0.20	1.21	0.31	1.54
lnRW	-0.04	-4.81 ***	-0.05	-2.50 **	-0.04	-3.80 ***
ln(K/L)	0.02	3.08 ***	0.02	1.83 *	0.02	2.31 **
DSZ2	-0.02	-0.88	-0.02	-0.51	-0.02	-0.70
DSZ3	-0.03	-1.02	-0.07	-1.74 *	0.02	0.49
DSZ4	0.00	-0.15	-0.01	-0.22	0.02	0.65
Adj.R^2 / Obs.	0.19	299	0.13	110	0.17	189
Mean and S.D. of Dependent variable	0.17	0.13	0.20	0.15	0.15	0.11
Motor vehicles						
C	0.06	1.65	0.01	0.27	0.07	0.88
DF	-0.01	-0.43	---	---	---	---
DX	-0.03	-1.38	-0.01	-0.40	-0.04	-1.01
DM	0.03	1.53	0.02	0.71	0.04	1.19
RKM	-0.06	-1.41	-0.01	-0.18	-0.10	-1.41
RKO	0.04	0.20	0.13	0.59	-0.06	-0.16
lnRW	-0.03	-1.82 *	-0.04	-1.91 *	0.00	0.05
ln(K/L)	0.03	3.44 ***	0.04	3.16 ***	0.02	1.41
DSZ2	0.03	1.03	0.03	0.93	0.01	0.17
DSZ3	0.06	2.67 ***	0.03	1.23	0.11	1.63
DSZ4	0.03	1.28	0.03	0.97	0.06	0.78
Adj.R^2 / Obs.	0.17	162	0.22	103	-0.01	59
Mean and S.D. of Dependent variable	0.18	0.12	0.17	0.12	0.20	0.10
Other manufacturing						
C	0.16	10.26 ***	0.16	9.46 ***	0.21	4.86 ***
DF	0.03	3.15 ***	---	---	---	---
DX	-0.08	-9.61 ***	-0.06	-7.16 ***	-0.11	-5.19 ***
DM	0.00	0.33	0.01	0.54	0.00	0.09
RKM	-0.06	-3.87 ***	-0.05	-3.33 ***	-0.07	-1.70 *
RKO	0.23	3.72 ***	0.20	3.26 ***	0.38	1.75 *
lnRW	-0.05	-9.52 ***	-0.06	-9.66 ***	-0.03	-2.61 ***
ln(K/L)	0.02	6.46 ***	0.02	5.49 ***	0.02	2.89 ***
DSZ2	0.01	0.69	0.01	1.35	-0.05	-1.80 *
DSZ3	0.01	1.18	0.02	1.71 *	-0.03	-0.91
DSZ4	0.03	2.79 ***	0.02	1.30	0.03	1.00
Adj.R^2 / Obs.	0.18	1,360	0.17	1,065	0.27	295
Mean and S.D. of Dependent variable	0.19	0.15	0.19	0.15	0.20	0.17

Note) T-statistics are calculated using White's heteroscedasticity-consistent standard errors.

***=significant at the 1 percent level, ** =significant at the 5 percent level, and *=significant at the 10 percent le