Taking Another View on the Role of Multinationals in Industrialisation: An Indonesian Experience

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1. Introduction

1.1   The issue

Foreign firms play an important role in the industrialization of developing countries. Literature in development economics has established a fact that multinationals (MNCs) provides some positive contributions for developing countries. Among other, these are accelerating technological transfer, upgrading labour skill, creating employment, and improving export performance. Many other empirical studies have also confirmed this, and for Indonesia, these include Aswicahyono and Hill (1995) and Bird (1999). Bird (1999), for example, found that the significant improvement in Indonesian manufacturing export in late early 1990s has a positive relationship to the increased flow of foreign direct investment during the second half of 1980s.

While it is clear about the positive relationship between foreign ownership and industrialisation, only little is known on what have been the underlying mechanisms. Perhaps, this was caused by the fact that almost all of empirical studies utilised data only at aggregated level.

A momentum was gained for another stream of studies focusing on the role of foreign firms. Partly, this was contributed by a growing availability of micro-level data, either at firm- or plant-level. The emergence of new theoretical idea involving the behaviour of MNCs provided another impetus for studies that focus on foreign firms.

The momentum turned out to be even stronger. A rigorous study by Ng and Yeats (1999) revealed that there was a dramatic change in the style of production of MNCs in Asia. Their study suggested that MNCs in the East Asian region seems to have integrated their dispersed production units more closely within regional and global divisions of labor. The development of such systems led to the increasing importance of trade parts and components, as opposed to finished products. This, in turn, led to an increased interest by economists in product-fragmentation.

In the context of the development above, this study attempts to improve our understanding on the role of foreign firm in industrialization, using a case study of Indonesia. Implicit in this objective is the attempt to reveal the mechanism underlying the stylised fact of the positive impact of foreign ownership. Unlike the studies of the early 1990s, this study takes a different approach, which, in principle, utilises and focuses on micro-level data and behaviour.

1.2   Research Questions

This study, in particular, addresses the subject of export-spillover effect and product-sharing phenomenon.

Export-spillover effect by foreign firms

Empirical studies that detail the export-spillover effect from MNCs in developing countries are very limited. To the authors' knowledge, almost all studies elaborating this subject only concentrate on establishing the positive relationship between foreign ownership and export performance, and these, moreover, were often conducted at aggregate level. As noted, Bird (1999) was one of these for studies related to Indonesia.

Perhaps there are only two rigorous studies that specifically examine the export-spillover effect, at firm- or plant-level. These were done by Aitken et al. (1997) and Greenaway et al. (2004). Using plant-level data for Mexican manufacturing for 1986-1990 Aitken et al. found robust results supporting the prediction that export activity by MNCs generate exporting-spillover effect to the other firms in the industry. Greenaway et al. confirmed this finding, using a panel data of UK manufacturing firms. In particular, they found that multinationals not only increase the decision of domestic firms to export, but also export intensity.

The very limited studies on this subject motivated the authors to examine the extent and mechanism of export-spillover effect in Indonesian manufacturing. In particular, this study asks the following:

Research Question 1

Does the presence of foreign firms in an industry increase the likelihood of non-exporters to participate in export?

Research Question 2

If it does, what are the mechanisms at work? and how does foreign ownership contribute to the increased likelihood?

Production networks

Similar to the export-spillover effect, there has only been limited studies which examine the extent of production sharing. The major study within this context perhaps is the one done by Ng and Yeats (1999). Using a large data base inter-and intraregional trade in parts and components, Ng and Yeats detailed the extent of production sharing of MNCs in East Asia. The most important point is that, the extent of the production sharing in the East Asian region was in fact quite large, and this was more than what often recognised. To illustrate, Ng and Yeats found that by the late 1990s, export of components in the region constituted to about 20 per cent of total manufacturing exports in the region and grew faster than any other major product group over the period 1984-1996.

Ng and Yeats' study further found large variation on the division of specialisation across the countries in the region. While countries like Japan, Singapore and Taiwan increased their specialisation in the manufacturing components (i.e. upgraded their capability in the production value chain), other countries, which are Indonesia, Thailand, and Malaysia stayed at assembly stage, albeit the claim that these countries have the broadest and most mature assembly capacity.

With the limited knowledge on the subject, some researcher added another issue on the subject. They argued that the insertion into the network of production evidently have not increased the value-added. This is because the leading firms within these chains often outsource lower value-added activities to the countries mentioned above. In other words, the leading firms retain control over production in the higher value-added areas of core competencies. This is often characterized not only by higher technological and skill requirements, but also by entry barriers. Therefore, all in all, the involvement in the network might depend on the strategic decisions of the leading firms. Otherwise, specialization in production activities – within the value chain – may leave developing countries' suppliers with a limited understanding of market requirements and therefore, few opportunities to develop capabilities in the areas of design and marketing.

In the light of the importance of production networks in East Asia, and the issue above, we ask another question, which is the third research question:

Research Question 3
Which factors determine the success of the industries in upgrading to a higher value chain in the production networks, according to Indonesian experience?

Although the evolution of Indonesian competitiveness and industrial upgrading has been offered in the literature, those which focus on the firms' acquisition of capabilities and access within the global production network are scarce. This study attempts to fill this gap and aims to draw some lessons from Indonesia's experience, by examining the supply-side response of firms in Indonesian manufacturing.

1.3   Methodological approach

This study adopts quantitative and qualitative methods to answer the research questions. Some descriptive statistics were drawn to indicate whether or not foreign presence offers some positive export spillover effect to other firms. An econometric analysis was conducted to test some hypotheses related to the export spillover effect. The analysis tested some possibility of interrelationship between the export spillover effect with some firm characteristics.

Meanwhile, qualitative method was adopted to answer the question related to production network. The method adopts an in-depth interview approach with some senior managers of large joint-venture companies in Indonesia. The interviews, however, limits only to firms in automotive and electronics industries, given the limitation in time and resource.

1.4   Organisation of the report

This report is organised as follows. Chapter 2 reports the quantitative analysis that attempts to answer the question in the existence of export spillover effect from the presence of foreign firms. Chapter 3 reports the results of in-depth interviews to answer the question of situation in Indonesia regarding production network in the East Asia region. Included in this chapter is brief literature review on the subject. Chapter 4 finally summarises the empirical findings of this study and concludes.

2. Export-spillover by Multinationals Companies

2.1 Introduction

This chapter attempts to answer the first two questions of this study.[4] As written in the previous chapter, and to repeat, these questions are, first, does the presence of foreign firms in an industry increase the likelihood of non-exporters to participate in export?, and second, if it does, what are the mechanisms at work?, and how does foreign ownership contribute to the increased likelihood?

This chapter is organised as follows. Section 2.2 briefly reviews the relevant literature to provide an analytical framework to address the subject. Section 2.3 present our main hypothesis and some other hypotheses for the determinant of the export participation of domestic-non exporting firms in the Indonesian manufacturing plants over the period 1991-2001. Section 2.4 and 2.5 present the statistical framework, data, and measurements of variables. Section 2.6 presents and discusses the empirical analysis.

2.2 Analytical framework

This section reviews some relevant studies, either theoretical or empirical, to provide a framework for the analysis. All reviewed studies fall under the heading of literature on micro export behaviour or performance. This literature only developed quite recently, as a result of greater accessibility to plant- or firm-level data.

2.2.1 The 'selection hypothesis'

In the empirical literature, the neoclassical Heckscher-Ohlin model has long been adopted to explain the determinants of international trade across countries or industries. It was not until recently that research expanded to topics related to company export behaviour or performance, as a result of a greater accessibility to firm- or plant-level data.

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[4] As noted in Section 1.4 (i.e. Status of the research), this (first) draft report, however, only addresses the first question. The authors have not addressed the results that attempt to answer the second question, simply because the authors have not really finished conducting the research for the second question. The research results that aim at answering the second question will be presented in the draft of final report, which is due on August 2008.

One of the key findings from the empirical literature on micro export behaviour is that exporters are superior to non-exporters in some respects. For developed countries, Bernard et al. (1995) and Bernard and Jensen (1999), for example, documented that exporters in US manufacturing are larger, more productive, more capital intensive, pay higher wages, and employ more skilled workers. A similar finding was observed by Aw and Hwang (1995) and Berry (1992) for developing countries. For Indonesian manufacturing, Sjoholm and Takii (2003) observed that exporting plants are larger and more productive. They found that labour productivity of these plants was about twice as high as non-exporting plants and this difference seems to have increased over time during the 1990s.

The finding is attributed to the difference in productivity between exporters and non-exporters. However, the exact mechanism linking exporting and productivity is not clear. Two explanations have been put forward. The first, which is commonly referred to as the 'self-selection' hypothesis, argues that only the most productive firms are able to survive in the highly competitive export markets. The hypothesis is based on the presumption that there are additional costs involved in participating in export markets. These costs, which usually involve high fixed costs, include transport costs and expenses related to establishing distributional channels and production costs in adapting products for foreign tastes (Bernard and Jensen 1999). The alternative explanation argues that there is a learning effect from participating in exporting activities which will result in productivity improvement. One example is that exporters are often argued to be able to gain access to technical expertise, including product design and method, from their foreign buyers (Aw et al. 2000, p.67). This explanation is often termed as a 'learning-by-exporting' hypothesis. According to Aw et al., this kind of explanation might be particularly relevant for East Asian exporters.

While there has not been a consensus, some empirical studies (e.g. Bernard and Jensen 1999; Clerides et al. 1998; Aw et al. 2000; Hallward-Driemeier et al. 2002) give some support for the self-selection hypothesis. Bernard and Jensen found that exporters in US manufacturing are more efficient, larger and grow faster several years before they become exporters. Aw et al. found for manufacturing industry in Taiwan and Korea that the average productivity of continuing exporters and new entrants as exporters are significantly higher than exiting exporters and non-exporters. Nevertheless, for several industries, they were not able to strongly

conclude there was a wide gap in productivity difference between exporters and non-exporters. Using firm-level data of manufacturing industries in some South East Asian countries, Hallward-Driemeier et al. (2002, p.25) observed a substantial productivity difference between domestic firms that were established as exporters and domestic firms that were not. They interpret this finding as indicating that firms participating in export markets make a conscious decision to operate differently from ones that focus on the domestic market. Supporting this interpretation, they show that domestic exporters indeed bear a resemblance to foreign exporters. In particular, they are more capital intensive and use more equipment of recent vintage than domestic non-exporters.

The presumption that exporting requires additional costs, which can naturally be thought of as sunk costs (Bernard and Wagner 1998), has an important implication. That is, it produces persistence in export participation. Once a firm decides to service an export market in a period of time, it tends to stay an exporter in the next period of time.[5]

2.2.2 Export-spillover effect

The role of sunk costs in affecting a firm's decision to export has been another important topic in the empirical literature. While there has not been much study on this topic, a few studies do agree that sunk costs are a large and significant source of persistence in exporting. For example, Roberts and Tybout (1997) found that exporting experience in the previous year had a strong and positive effect in determining export participation in the current year for plants in Colombian manufacturing. Similar findings can also be observed in Campa (2004) and Bernard and Jensen (2004) for Spain and US manufacturing plants, respectively.

If entering foreign markets is costly, there might be localised spillovers associated with exporting by one firm that reduces the cost of foreign market access for nearby firms. This idea was put forward by Aitken et al. (1997). In particular, they test the hypotheses that any exporting activity, and especially exporting activities by multinationals, generates export spillovers. The first hypothesis is based on the argument that the geographic concentration of exporters may make it feasible to construct facilitates that are able to support export activities.

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[5] See Roberts and Tybout (1997) and Campa (2004), for example, for the theoretical model of the persistency.

The second hypothesis is based on the presumption that foreign firms are the natural conduit for information about foreign markets, export marketing channels and technology. The extent to which foreign firms provide this information may enhance the likelihood of domestic firms becoming exporters. Using plant-level data for Mexican manufacturing for 1986-1990 they found robust results supporting the second hypothesis. The probability of a domestic plant exporting is positively correlated with the proximity of multinationals. As for the first hypothesis, they found that the probability of exporting is positively correlated with the local concentration of overall export activity. However, this finding is not robust to changes in sample size. Their results suggest the lack of robustness is related to large differences in specific industry characteristics.

The positive export spillovers effect from multinationals was confirmed, among other, by Kokko et al. (1997) and Greenaway et al. (2004). Kokko et al., using the case study of Uruguay manufacturing firms in 1988, found that foreign ownership at sectoral level increases the likelihood of exporting. They, however, only found the positive impact for multinationals that were established after 1973, which was the more outward oriented period of Uruguay economy. There was no evidence of the export spillover for group of multinationals estabalished before 1973, when the policy was more inward oriented. Meanwhile, using a panel data of firms in UK, Greenawat et al. found that multinationals not only increase the decision of domestic firms to export, but also export intensity.

While some evidence on the existence, or the 'end-result', of the export spillovers do exist, it is very difficult to identify the channels through which the spillovers could occur. Nonetheless, somewhat a consensus was reached in the literature that the spillovers are channelled through some demonstration and imitation effect, such as, for example, contact with local clients (e.g. through outsourcings) and trainings of personnel and management staff (Greenaway et al. 2007, p.1030).

2.3   Hypotheses

This chapter follows previous studies in its empirical exercise, along the line of Kokko et al. (1997) and Greenaway et al. (2004). In particular, it tests the hypotheses within the framework of the determinants of export participation. Therefore, drawing on the discussion of the

previous section, this section identifies and presents the hypotheses related to the determinants of export participation in Indonesian manufacturing over the period 1991-2001.

Share of foreign ownership at industry level

This study follows Kokko et al. (1997) in using the share of foreign ownership at industry level ($MNC_{industry}$) as a proxy to measure the potential export spillovers effect from foreign firms. The theory of 'localised spillovers associated with exporting activities by one firm that reduce the exporting costs of nearby firms, through some demonstration and imitation effects' is hypothesised increase the likelihood of firms to engage in exporting activities, or to start to export. This is our main hypothesis, which implies a positive relationship between $MNC_{industry}$ and firm's export participation.

Variation across industries

The hypothesised positive impact of $MNC_{industry}$, however, might vary across industries according to the industries' factor intensity. In particular, this study hypothesised that the extent of the positive impact should be lower in capital-, technology-, and human capital-intensive industry (TI and HCI), rather than in unskilled labour- and resource-intensive industry (ULI and ARI). This is because, according to a strand of literature that puts some attention to the characteristics of exporters, firms need to be efficient for serving the highly competitive international markets, hence, here, the a potential positive export spillover effect from other foreign firms might only be realised if the firms have already been ready in terms of technology and human capital. In other words, in TI and HCI industries, any spillover information related to exporting, such as information about the export market, will not be useful firms unless firms acquire the 'right' technology.

It is important to note that, while the hypothesised for ULI industry is straightforward, it is not so for the hypothesis for ARI industry. The reason is the fact that there are some technology-intensive firms within the group of ARI industry. The variation of the technical aspect of technology in this industry group is very large (e.g. a coal manufacturing activity can be done

not only by using a very sophisticated technology, but also by some less modern (i.e. traditional) technology.

Dependency of the export spillover effect on several firm characteristics

The hypothesised positive impact of the export spillover might also depend on several firm characteristics. Here, we put forward a proposition that the positive impact depends on firm size, and firm-level labour productivity and level of technology.

The dependency on firm size

For a given industry, only larger firms a higher survival chance in the competitive foreign markets, for the reason of economies of scale (Bonacorsi 1992). This suggests that the hypothesised positive impact of the export spillovers should be higher for larger firms (i.e., higher $SIZE_{plant}$). In addition, it is often asserted that the more sophisticated management and better resource of large firms allow these firms to be more responsive than small firms in responding to any variation in demand (Calof 1994). Despite this, a negative interactive effect might also occur, simply because there are some ways that allow small firms, and this is particularly true in Indonesian manufacturing, to successfully perform in export markets, through sub-contracting, clustering, trading in foreign market niches, and access to informal financing (Berry et al. 2001; Sandee and van Diermen 2004).

The dependency on firm-level labour productivity and level of technology

The 'self-selection hypothesis' postulates that fiercer competition in export markets means firms need to be efficient in order to survive. This study, like other firm-level study, includes three variables, namely plant-level labour productivity, capital intensity, and skill intensity, to represent firm's level of efficiency. This study hypothesises that the positively hypothesised impact of export spillovers should be higher for firms with high labour productivity (LP_{plant}), capital intensity (CI_{plant}), and skill intensity (SI_{plant}). All these are based on the argument that firms using advanced technology and employing skilled workers are able to be more cost-efficient, and hence should moderate the hypothesised positive impact of the export spillovers.

2.4 Statistical framework

The econometric analysis is framed within a general model for firm' export participation. As noted, this adopts a similar approach to the previous studies on the subject. The model, in its general form, is given as the following:

$$EP_{plant,t} = \alpha_0 + \alpha_1'X_{plant,t-1} + \alpha_2'Y_{industry,t-1} + \varepsilon_{it} \qquad (2.1)$$

where t represents time (i.e. t=1991, ..., 2001). $EP_{plant,1}$ is a binary variable which takes the value of 1 if the plant was exporting in year t, or 0 otherwise. $X_{plant,t-1}$, and $Y_{industry,t-1}$ are sets of explanatory variables capturing plant and industry characteristics, respectively. The main hypothesis, represented by the variable $MNC_{industry}$, is included in the set of explanatory variables (i.e., $Y_{industry,t-1}$). The other plant- and industry-level variables are included to control for the other plant- and industry-level characteristics. Year and industry dummies are included to control for differences across years and industries, respectively. The year dummy variables should capture the other determinants which exogenously affect the dependent variables.

Sample for the estimations are restricted to only non-exporting domestic plants. Domestic plants are defined as plants that have no foreign ownership shares and non-exporting is defined as plants that do not conduct any exporting activities during the previous three years period.

The sample restriction is intended, for the reason to have a more direct-effect in answering the research question. We expect to really isolate the impact of the concentration of foreign ownership in an industry.[6] We exclude 'joint-venture/foreign' plants because including them would likely to confound estimation results. The reasoning is obvious; plants with some share of foreign ownership presumably would not need knowledge about export markets, and hence, including them would only give redundant effect. Restriction to only 'non-exporters', meanwhile, comes from the argument that any export-spillover impact – if any – could only be convincingly be tested by non-exporters. Presumably, presence of MNCs should not

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[6] This approach was suggested by a referee that reviewed the earlier version of this report. The earlier version of the report used all plants in the sample, unlike the approach of the experiments for this report.

substantially affect exporters, but arguably it would so for those which have not had any exporting experience before. This is because the importance of having many foreign firms in fact comes from all knowledge related to exporting, which is not owned by non-exporters, and domestic, firms. In short, our sample selection aims at maximising clearest demonstration of the largest potential marginal benefit coming from the presence or concentration of foreign firms.

Equation 2.1 was estimated within the framework of a linear probability model (LPM), instead of a binary choice model (i.e. probit or logit). The use of binary-choice model was experimented, and the results do not differ much with the use of LPM model.[7] This study decided to use the LPM model for the reason that it tends to produce less bias than the binary-choice model. This is pointed out by Wooldridge (2002) where potential for bias arising from neglected heterogeneity (i.e. omitted variables) is smaller in a LPM than in binary choice model. Despite this, LPM model has a number of shortcomings, and the most importantly is that the predicted probability derived from LPM may lie outside the 0-1 region, which is not reasonable in practice. All estimations of the equation were conducted under the panel-data estimation framework, for the period of 1991 to 2001.

2.5   Data and measurements of variables

The data for the empirical analysis in this chapter are drawn from the annual manufacturing surveys of medium- and large-scale establishments (*Statistik Industry*, or SI), from 1990 to 2001. The establishments are defined as those with 20 or more employees. The surveys are undertaken by the Indonesian Central Board of Statistics (*Badan Pusat Statistik or* BPS).[8]

As noted in many studies, SI data are considered one of the best by the standard of developing countries. The data cover a wide range of information on the establishments, including some basic information (ISIC classification, year of starting production, location), ownership (share of foreign, domestic and government), production (gross output, stocks, capacity utilisation, share of output exported), material costs and various type of expenses, labour (head-count and salary and wages), capital stock and investment, and sources of investment funds.

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[7] The experiments for the use of binary-choice model was also pointed out and suggested by the referee that reviewed the earlier version of this study. This study, as noted, keeps adopting the LPM estimation model for the reason of superiority it has, vis-à-vis the binary-choice model.
[8] BPS provided the authors with the raw data of these surveys in electronic form.

The data, however, have several limitations. Among other, they do not include information which can identify whether an establishment is a single-unit or a part of a multi-plant firm. As a result, establishments owned by an enterprise can not be linked up, and hence the number of enterprises is over-numerated: some plants may have been counted as firms whereas in practice they are not. While the extent of over-numeration is unknown, there are few reasons which suggest it actually might not have been so large, and therefore, we can consider or assume that each plant as a single-firm.[9]

Measurement of plant-level variables

Size ($SIZE_{plant}$) is proxied by number of employees. The other common alternatives, such as output or profits, are not used as they tend to be more sensitive to changes in the business cycle.[10] In addition, the use of output, in particular, could result in less precise estimate, for the reason of substantial limitation in the quality of price index computed by the statistical agency.

Age of plant (AGE_{plant}) is proxied by the number of years the plant has been in commercial production. Meanwhile, the percentage share of foreign ownership (MNC_{plant}) is adopted to proxy the foreign ownership of a plant.

This study employs real value added per labour as a proxy for labour productivity (LP_{plant}). Value added is chosen to proxy output, instead of gross output, because it avoids the double-counting problem and is less sensitive to the substitution between intermediate and labour inputs. Wholesale price indices at three-digit ISIC level are used to compute the real value added.

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[9] See Narjoko (2006) for the elaboration of these reasons, as well as the documentation of few other weaknesses of the SI data.

[10] Previous studies found mixed results on the relationship between profitability and business cycles. For example, Domowitz et al. (1986) found a positive relationship while Rotemberg and Saloner (1986) found a negative one.

Two variables were created to capture firm factor intensity: capital intensity (CI_{plant}) and skilled-labour intensity (SI_{plant}). In the absence of reliable data on capital stock, capital intensity is measured in two ways. CI_{plant} is defined as the ratio of energy costs to production labour, motivated by previous studies showing that capital and energy are complementary inputs in production (Globerman et al. 1994). For any plant,

$$CI_{plant} = \frac{(energy\ costs)_{plant}}{(total\ numbers\ of\ production\ employee)_{plant}}$$

$$= \frac{(fuel\ costs)_{plant} + (electricity\ costs)_{plant}}{(total\ numbers\ of\ production\ employee)_{plant}}$$

Meanwhile, any plant, SI_{plant} is defined as the average of wages and salary per employee,

$$SI_{plant} = \frac{(total\ \exp enditure\ on\ wages\ and\ salary)_{plant}}{(total\ numbers\ of\ employee)_{plant}}$$

The major limitation of this measurement is that it might be distorted by imperfection in the labour market, although the Indonesian labour market was generally competitive before the 1997/98 economic crisis.

Import dependence ($IMDEP_{plant}$) is proxied by the intensity of imported input in total input. For any plant, it is defined as

$$IMDEP_{plant} = \frac{(value\ of\ imported\ input)_{plant}}{(value\ of\ imported\ +\ domestic\ input)_{plant}}$$

The domestic input here is defined as the domestically produced input, which is different to the concept of domestic input in Input-Output Table sense.

Measurement of industry-level variables

The industry level is defined at the four digit ISIC level. Two industry-level variables are introduced, foreign presence ($MNC_{industry}$) and industry sales orientation ($IEXP_{industry}$).

$MNC_{industry}$ is introduced to test the main hypothesis, which is the export spillover effect from the presence of foreign firms in an industry. It is computed, any industry, it is defined as the ratio of number of plants with any foreign ownership share to the total number of plants in the industry, or

$$IMNC_{industry} = \frac{(\text{number of plants with any positive foreign ownership})_{industry}}{(\text{total number of plants in an industry})_{industry}}$$

Sales orientation is proxied by industry export propensity ($IEXP_{industry}$). For any industry, it is defined as the ratio of export to total output,

$$EXP_{industry} = \frac{EX_{industry}}{Output_{industry}}$$

where $IEXP_{industry}$ is exported output of an industry. $IEXP_{industry}$ is computed by summing up across the plant, the multiplication between the percentage of exported output in production (i.e. $PRPREX$ in SI data) and the output value of the plant.

The complete list of variables included in the models is given in Table 2.1.

Table 2.1 Variable description

Variable	Description
$EP_{plant,t}$	Export participation of any plant at time t
$EP_{plant,t-1}$	Export participation of any plant at time $t-1$
$SIZE_{plant,t}$	Size of any plant at time t
$AGE_{plant,t}$	Age of any plant at time t
$FOR_{plant,t}$	Foreign ownership of any plant at time t
$LP_{plant,t}$	Labour productivity of any plant at time t
$CI_{plant,t}$	Capital intensity of any plant at time t
$SI_{plant,t}$	Skill intensity of any plant at time t
$IMDEP_{plant,t}$	Import dependence of any plant at time t
$IMNC_{industry,t}$	Foreign presence of an industry at time t
$IEXP_{industry,t}$	Sales orientation of an industry at time t

2.6   Empirical results and analysis

Before analysing regression results, it is useful to get a descriptive picture on the importance of foreign ownership in moderating the switching from non-exporter to exporter. This is given in Figure 2.1 which plots the overtime movement of the frequency of plants that switched from non-exporter to exporter, by two groups of industries, low and high industry's foreign ownership share.[11] Here, unlike in the other studies, the industry foreign share was defined based on the number of plants (i.e., not by the value of industry output). The frequency was indexed to provide a clearer comparative picture between the two industry groups.

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[11] Foreign share industry groups are based the frequency of plants with any foreign ownership share over the total number of plants in an industry. The industry, here, is defined at two-digit ISIC level. A two-digit ISIC industry is considered to be an industry with a low foreign ownership share if the frequency – in per cent – is less than or equal to 10 per cent. Based on this, thus, the definition of foreign share industry groups is given as follows:
High: if the industries are the industry of ISIC 33, 34, 36,37, and 39; Low: if the industries are the industry of ISIC 31, 32, 35, and 38.

Figure 2.1. The importance of foreign ownership in moderating the switching from non-exporter to exporter, Indonesia, 1991-2001.

Source: SI Data, authors' computation.
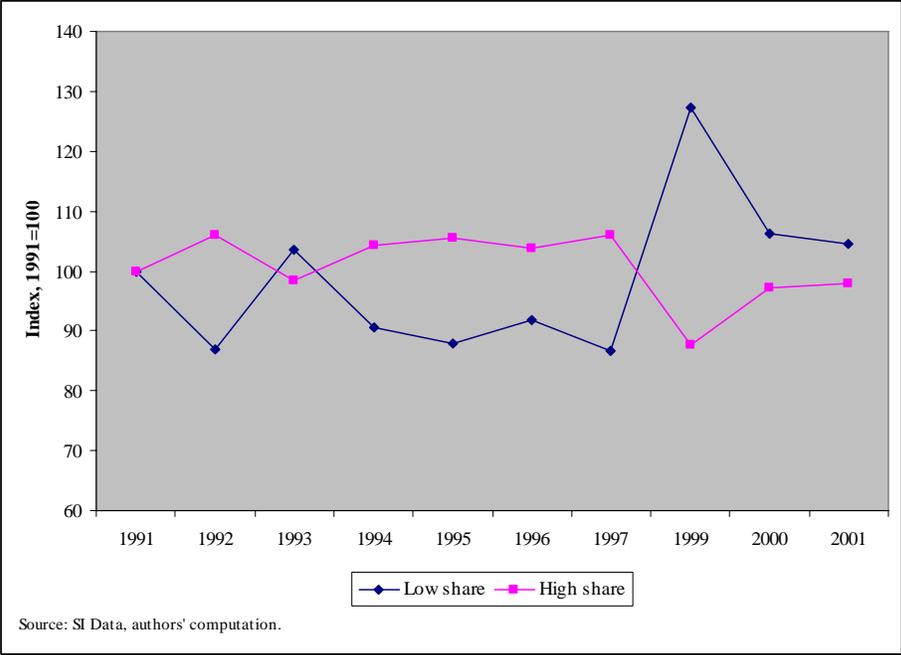
Discounting the figures for 1998, because of the very unusual situation (i.e., the 1997/98 economic crisis), Figure 2.1 provides some support on the importance of industry foreign ownership share in affecting firm decision to export. The trend line for the high foreign ownership share group, on the one hand, exhibits an upward slope over the period 1992-97 and 1999-2001, while, on the other hand, the trend line for the low foreign ownership share group exhibits a downward slope in the these two periods. This inference, however, is rather weak, given that the slopes of the trend lines are quite small.

It is worth noting here that despite the smallness in the slopes, the number of plants that switched to become exporter evidently were substantially higher for the group of high foreign ownership share group, compared to those in the low foreign ownership share group.

Regression results and analysis
Table 2.2 to 2.4 report the LPM estimation results of the model (2.1), for the sample of non-exporting domestic plants. The tables report the results of many experimented specifications in

the light of the hypotheses mentioned in Section 2.3. All specifications included industry and year dummy variables to incorporate the industry characteristics and changing economic situation over the estimation period, respectively. Overall significance in all specifications passed at 1 per cent level and robust standard error were used, given that variance is heteroscedastic. Three variables, $SIZE_{plant,t-1}$, $AGE_{plant,t-1}$, and $LP_{plant,t-1}$, were specified in their natural logarithmic forms to capture the non-linear relationship to the dependent variables –casual examination at the experimental stage indeed revealed this.

Specification 2.1 tests the main hypothesis, which is the relationship between $EP_{plan,t}$ to $IMNC_{industry,t-1}$ (see Table 2.2).[12] Specification 2.2, meanwhile, presents the same specification as in 2.1 but using binary-choice model (i.e., logit model) to estimate the equation. As noted, the result is similar, although perhaps the logit estimation provides stronger results. However, based on the theoretical prediction of lower bias potential of the LPM model, as mentioned earlier, this study continued using the LPM model for its estimations.

The positive coefficient of $IMNC_{industry,t-1}$ provide supports for theory of the positive export-spillover effect from the presence of foreign firms in an industry. The coefficient, however, is not very statistically significant; that is, it is only significant at 10 per cent level. This perhaps, to some extent, corresponds to the earlier observation in Figure 2.1, whereby it did not really show a clear difference in the extent of firms in switching to exporting between groups of industries with high and low foreign ownership share.

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[12] Other variables, which mostly at plant level, were included to control for firm characteristics and industry's export propensity ($IEXP_{industry,t-1}$). As for the former, some of the variables were included to facilitate hypothesis testing, and some other were not, simply just to control for some other differences.

Table 2.2 Determinants of export participation 1991-2001: regression results

Independent variable	Dependent variable $EP_{plant, t}$	
	Specification	
	(2.1)	(2.2)
$\ln(SIZE)_{plant, t-1}$	0.010	0.300
	(4.38)**	(2.22)*
$\ln(AGE)_{plant, t-1}$	-0.001	0.038
	(0.04)	(0.43)
$\ln(LP)_{plant, t-1}$	0.001	0.072
	(1.13)	(1.19)
$CI_{plant, t-1}$	2.80^a	-1.060^b
	(0.18)	(0.80)
$SI_{plant, t-1}$	-3.800^a	-0.072^a
	(0.96)	(0.64)
$IMDEP_{plant, t-1}$	0.011	0.510
	(1.97)*	(1.52)
$EXP_{industry, t-1}$	-0.038	-6.007
	(1.00)	(1.84)+
$MNC_{industry, t-1}$	0.124	14.691
	(1.94)+	(3.15)**
Dummy variables for industries$_{, t-1}$	Included	Included
Dummy variables for year	Included	Included
Constant	0.866	
	(35.40)**	
Number of observations	68758	5498
Number of plants	17254	1418
R-squared	0.13	

Notes: 1. Absolute value of t statistics in parentheses

        2. Significance sign and level:

          ** significant at 1%.

          * significant at 5%;

          + significant at 10%;

        3. Industry dummy variables used two-digit ISIC level.

        4. Dummy variable for ISIC 31 was used as the basis for industry dummy variables.

        5. Dummy variable for 1991 was used as the basis for year dummy variables.

        a) The coefficient was multiplied by 10^8 to improve presentation.

        b) The coefficient was multiplied by 10^5 to improve presentation.

The positive – but rather weakly statistical significance of $IMNC_{industry,t-1}$ – indicates that indeed there are some domestically oriented firms that are able to switch to become exporters with the help other foreign firms, or firms with some ownership shares, in that industry. The number of these firms, however, might not as big as one could have thought, compared to the total population of firms in that industry, for the reason of the weakly significance level of the coefficient.

One potential explanation for this finding is a possibility that the positive export spillover effect might different across industries. As presented in Section 2.3, factor intensity might be source of the difference. This hypothesis was tested and the results are presented in Table 2.3. Specification 2.2, 2.3, and 2.4 tested the hypothesis for natural resource-intensive (RI), labour-intensive (LI), and technology and human capital-intensive (HCI-and-TI) industries, respectively.

The results turn out to be rather mixed, particularly in terms of coefficient magnitude and statistical significance. The key point here, is that, only the estimation of labour-intensive industries that produce strong results, compare to those of the other industry groups (see particularly the result of specifications 2.4). The coefficient of $IMNC_{industry,t-1}$ for the specification for LI is the only coefficient that is statistically significant, albeit only at 10 per cent level. In addition, and it is equally important, the coefficient for the LI specification suggests that the effect of multinational export-spillover is higher for firms in labour-intensive industries, compared to the effect of the spillover effect on the other industry groups. This is indicated by the much larger $IMNC_{industry,t-1}$ coefficient for LI specification, compared to thar for RI and TI-and-HCI specification. Thus all in all, the results support the general hypothesis that the impact of export-spillover from foreign firms varies across industries.

Table 2.3 Determinants of export participation 1991-2001, by the group of industries' factor intensity: regression results

Independent variable	Dependent variable EP$_{plant, t}$			
	Specification			
	Rewriting (2.1)	(2.3) RI	(2.4) LI	(2.5) HCI and TI
ln(SIZE)$_{plant, t-1}$	0.010	0.011	0.006	0.013
	(4.38)**	(3.31)**	(1.16)	(2.60)**
ln(AGE)$_{plant, t-1}$	-0.001	-0.002	0.001	0.004
	(0.04)	(1.02)	(0.44)	(1.36)
ln(LP)$_{plant, t-1}$	0.001	-0.000	0.003	0.001
	(1.13)	(0.27)	(1.36)	(0.41)
CI$_{plant, t-1}$	2.80^a	2.490^a	-9.080^a	-3.410^a
	(0.18)	(0.00)	(0.15)	(0.14)
SI$_{plant, t-1}$	-3.800^a	4.400^a	1.990^a	0.178^a
	(0.96)	(0.49)	(0.22)	(0.73)
IMDEP$_{plant, t-1}$	0.011	-0.002	0.017	0.012
	(1.97)*	(0.13)	(1.24)	(1.28)
EXP$_{industry, t-1}$	-0.038	0.006	0.011	-0.071
	(1.00)	(0.07)	(0.12)	(0.83)
MNC$_{industry, t-1}$	0.124	0.068	0.520	0.127
	(1.94)+	(0.45)	(1.79)+	(1.40)
Dummy variables for industries$_{, t-1}$	Included	Not included	Not included	Not included
Dummy variables for year	Included	Included	Included	Included
Constant	0.866	-0.031	-0.088	-0.084
	(35.40)**	(1.65)+	(2.26)*	(2.70)**
Number of observations	68758	31879	18700	12774
Number of plants	17254	8025	5316	3185
R-squared	0.13	0.08	0.15	0.15

Notes: 1. Absolute value of t statistics in parentheses
 2. Significance sign and level:
 ** significant at 1%.
 * significant at 5%;
 + significant at 10%;
 3. Dummy variable for 1991 was used as the basis for year dummy variables.
 4. RI: Resource Intensive; LI: Labour Intensive; HCI and TI:
 HCI and TI: Human Capital Intensive and Technology Intensive.
 a) The coefficient was multiplied by 10^8 to improve presentation.

More importantly, the results provides strong support to the hypothesis that the effect of the multinational export-spillover is larger for labour-intensive industries rather than for technology- and human capital-intensive industries. In other words, the results support the idea that the positive export-spillover effect from the presence of foreign firms is rather redundant in

the industries where firms who populate those industries have already acquired necessary tools to make them competitive in international markets.

Specifications 2.6 to 2.9 in Table 2.4 introduce the variables representing firm size, firm-level labour productivity, and level of technology. They test the hypothesis that export spillover from the presence of foreign firms might depend on some firm characteristics. In other words, these specifications test the interactive effect between $IMNC_{industry,t-1}$ and the firm characteristics mentioned above.

The results are disappointing. The interactive coefficients in all specifications as presented in Table 2.4 are not statistically significant, and the level of this insignificance is very high. Thus, in other words, the effect of export-spillover from the presence of foreign firms does not seem to depend on the other firm characteristics, and it does not provide any support for the general hypothesis on the dependence of the spillover effect on firm characteristics.

Having said this, it is worth discussing here the direction of relationship of the size interactive variable, as suggested by the sign of the result – albeit their strong insignificance statistical insignificance. The result show a negative interactive effect between the export spillover effect with size of a firm. If for the moment one focuses only on the sign of the coefficient, this result implies that the positive effect of the export spillover effect on export participation is lower for large firms, and vice versa for small firms. It provides some supports for the argument flexibility argument of smaller firms, as explained in Section 2.3. However, the negative sign could also represent another explanation, and that is, the lower positive impact might be attributed to the fact larger firms are simply the firms that are ready for exporting, for the reason that they are able to offer a competitive price in global markets, stemming from economies of scale and capable management. Therefore, any positive effect from the presence of any or some foreign firms – if any – will not, or perhaps only marginally, add any value added in terms of exporting knowledge for these large firms. This argument thus implies that the positive impact from the presence of foreign firms helps smaller firms to participate in export by giving some exporting knowledge to these firms, which, at the same time,

compensates the weakness these firms from having no economies of scale and less capable management.

Table 2.4 Determinants of export participation 1991-2001, with some interaction effects: regression results

Independent variable	Dependent variable $EP_{plant, t}$				
	Specification				
	Rewriting (2.1)	(2.6)	(2.7)	(2.8)	(2.9)
$\ln(SIZE)_{plant, t-1}$	0.010	0.010	0.010	0.010	0.010
	(4.38)**	(3.21)**	(4.38)**	(4.32)**	(4.38)**
$\ln(AGE)_{plant, t-1}$	-0.001	-0.001	-0.001	-0.001	-0.001
	(0.04)	(0.04)	(0.04)	(0.03)	(0.04)
$\ln(LP)_{plant, t-1}$	0.001	0.001	0.001	0.001	0.001
	(1.13)	(1.13)	(0.77)	(1.16)	(1.06)
$CI_{plant, t-1}$	2.800[a]	2.800[a]	2.780[a]	3.940[a]	2.760[a]
	(0.18)	(0.18)	(0.18)	(0.25)	(0.18)
$SI_{plant, t-1}$	-3.800[a]	-3.850[a]	-3.850[a]	-3.850[a]	-4.040[a]
	(0.96)	(0.96)	(0.96)	(0.96)	(0.99)
$IMDEP_{plant, t-1}$	0.011	0.011	0.011	0.011	0.011
	(1.97)*	(1.97)*	(1.97)*	(1.98)*	(1.97)*
$EXP_{industry, t-1}$	-0.038	-0.038	-0.038	-0.038	-0.038
	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)
$MNC_{industry, t-1}$	0.124	0.124	0.115	0.145	0.086
	(1.94)+	(0.80)	(0.80)	(1.58)	(0.56)
$MNC_{industry, t-1} * \ln(SIZE)_{plant, t-1}$		-0.0001			
		(0.00)			
$MNC_{industry, t-1} * \ln(LP)_{plant, t-1}$			0.001		
			(0.07)		
$MNC_{industry, t-1} * CI_{plant, t-1}$				-0.003	
				(0.32)	
$MNC_{industry, t-1} * SI_{plant, t-1}$					0.005
					(0.27)
Dummy variables for industries, t-1	Included	Included	Included	Included	Included
Dummy variables for year	Included	Included	Included	Included	Included
Constant	0.866	0.866	0.866	0.866	0.866
	(35.40)**	(33.26)**	(33.77)**	(35.40)**	(35.40)**
Observations	68758	68758	68758	68758	68758
Number of psid	17254	17254	17254	17254	17254
R-squared	0.13	0.13	0.13	0.13	0.13

Notes: 1. Absolute value of t statistics in parentheses

2. Significance sign and level:
** significant at 1%.
* significant at 5%;
+ significant at 10%;

3. Industry dummy variables used two-digit ISIC level.

4. Dummy variable for ISIC 31 was used as the basis for industry dummy variables.

5. Dummy variable for 1991 was used as the basis for year dummy variables.

a) The coefficient was multiplied by 10^8 to improve presentation.

2.6.1 Extension: the impact of concentration of foreign ownership on the extent of exported output of the 'switchers'[13]

The empirical analysis so far have shown that foreign ownership concentration do increase the likelihood of non-exporting domestic firms to switch to become exporters – although it likely to vary substantially across industries with the largest positive effect is suggested to occur in labour-intensive industries. As an extention of this, as well as a related topic, there is a question of whether concentration of foreign firms in an industry and/or location could still give positive impact on the extent of firm's exported output, and this is once a domestic firm manages to switch to become an exporter.

This subsection attempts to answer this question, by estimating an equation of the determinants of firm-level export propensity. The estimating equation is give as the following,

$$EXP_{plant,t} = \alpha_0 + \alpha_3 'X_{plant,t-1} + \alpha_4 'Y_{industry,t-1} + \varepsilon_{it} \tag{2.2}$$

where $EXP_{plant,1}$ is a the ratio of exported output to the total output produced by a plant. $X_{plant,t-1}$, and $Y_{industry,t-1}$ are sets of explanatory variables capturing plant and industry characteristics, respectively, and t represents time (i.e. t=1991, ..., 2001).

Here, this subsection still tests the same hypotheses as in the previous exercises but it test them on different dependent variable. We should expect the same prediction as in the earlier hypotheses in terms of direction of the relationship (i.e., the positive or negative direction of the relationship).

The result of estimation of equation 2.2 is presented in Table 2.5, and it suggests that the positive impact of the concentration of foreign firm in an industry or location continuous even to domestic non-exporters that switch to become exporters. The coefficient of $IMNC_{industry,t-1}$ in

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[13] This extension was also suggested by the referee that reviews this report. The author took on board the referee's comment on this, and therefore they conducted this additional exercise as an extension of the earlier econometric exercise.

specification 2.10 is positive, although it is only statistically significant at 10 per cent level. This is the main inference since estimation of equation 2.2 used exactly the same sample as in the estimations of export participation.

Table 2.5 Determinants of the export propensity 1991-2001: regression results

Independent variable	Specification	
	Rewriting (2.1)	(2.10)
	Dependent variable $EP_{plant, t}$	Dependent variable $EXP_{plant, t}$
$\ln(SIZE)_{plant, t-1}$	0.010	0.008
	(4.38)**	(4.78)**
$\ln(AGE)_{plant, t-1}$	-0.001	-0.001
	(0.04)	(0.82)
$\ln(LP)_{plant, t-1}$	0.001	0.0001
	(1.13)	(0.18)
$CI_{plant, t-1}$	2.80^a	4.930^a
	(0.18)	(0.46)
$SI_{plant, t-1}$	-3.800^a	-6.110^a
	(0.96)	(0.22)
$IMDEP_{plant, t-1}$	0.011	0.008
	(1.97)*	(2.09)*
$EXP_{industry, t-1}$	-0.038	0.007
	(1.00)	(0.26)
$MNC_{industry, t-1}$	0.124	0.078
	(1.94)+	(1.82)+
Dummy variables for industries$_{, t-1}$	Included	Included
Dummy variables for year	Included	Included
Constant	0.866	0.570
	(35.40)**	(34.38)**
Number of observations	68758	68758
Number of plants	17254	17254
R-squared	0.13	0.12

Notes: 1. Absolute value of t statistics in parentheses
2. Significance sign and level:
  ** significant at 1%.
  * significant at 5%;
  + significant at 10%;
3. Industry dummy variables used two-digit ISIC level.
4. Dummy variable for ISIC 31 was used as the basis for industry dummy variables.
5. Dummy variable for 1991 was used as the basis for year dummy variables.
a) The coefficient was multiplied by 10^8 to improve presentation.

The positive impact of the foreign-firm concentration, however, seems to decline after the firms switched to become exporters. This is clear when we compare the result of specification 2.10

with the result of specification 2.1. from the earlier results (i.e., where it testes the same variables but in their relationship for export participation). In particular, the coefficient of $IMNC_{industry,t-1}$ is much lower from the estimation of equation 2.10. This implies that the positive effect of foreign-firm concentration (or $IMNC_{industry,t-1}$) in the affecting the extent of exported output of the 'switchers' is lower than its positive impact in affecting the firm to switch to become exporters.

Table 2.6, meanwhile, presents the estimation results of the export propensity equation (i.e., the equation 2.2) across industry groups defined by their factor intensity. The results indicate a similar finding as the earlier one we found in the export participation equation. That is, the positive impact of foreign-firms concentration on the extent of exported output of the domestic non-exporters that switched varies across industrt groups. As shown in the table, the coefficient of $IMNC_{industry,t-1}$ are all positive across the industry group estimations.

An as in the case of export participation, however, this positive impact seems to only appear for firms in labour-intensive industries. The coefficient of $IMNC_{industry,t-1}$ is only statistically significant for this industry group. This accords the earlier finding where the impact of foreign-firm concentration on domestic non-exporters seems also to occur for firms in labour-intensive industry.

Table 2.7 show the results of the experiment of whether the impact of $IMNC_{industry,t-1}$ on the extent of exported output of the 'switchers' depends on the other firm-level characteristics. Also similar to the earlier finding on export participation equation, there is no evidence on the dependency. All interactive $IMNC_{industry,t-1}$ variables are very statistically not significant. This also accords the earlier finding on export participation equation.

Table 2.6 Determinants of the export propensity 1991-2001, by the groups of industries'

factor intensity: regression results

Independent variable	Dependent variable $EXP_{plant, t}$			
	Specification			
	Rewriting (2.10)	(2.11) RI	(2.12) LI	(2.13) HCI and TI
$\ln(SIZE)_{plant, t-1}$	0.010	0.007	0.008	0.012
	(4.38)**	(2.87)**	(2.12)*	(4.16)**
$\ln(AGE)_{plant, t-1}$	-0.001	-0.003	0.001	0.001
	(0.04)	(2.20)*	(0.60)	(0.04)
$\ln(LP)_{plant, t-1}$	0.001	-0.001	0.0002	0.0004
	(1.13)	(0.89)	(0.11)	(0.31)
$CI_{plant, t-1}$	2.80[a]	9.790[a]	-0.264[a]	0.191[a]
	(0.18)	(0.07)	(0.60)	(1.36)
$SI_{plant, t-1}$	-3.800[a]	4.310[a]	1.640[a]	8.920[a]
	(0.96)	(0.66)	(0.26)	(0.65)
$IMDEP_{plant, t-1}$	0.011	0.007	0.010	0.006
	(1.97)*	(0.62)	(1.02)	(1.02)
$EXP_{industry, t-1}$	-0.038	0.076	-0.004	-0.003
	(1.00)	(1.23)	(0.07)	(0.06)
$MNC_{industry, t-1}$	0.124	0.018	0.476	0.051
	(1.94)+	(0.17)	(2.33)*	(0.99)
Dummy variables for industries, t-1	Included	Not included	Not included	Not included
Dummy variables for year	Included	Included	Included	Included
Constant	0.866	-0.017	-0.061	-0.062
	(35.40)**	(1.23)	(2.23)*	(3.51)**
Number of observations	68758	31879	18700	12774
Number of plants	17254	8025	5316	3185
R-squared	0.13	0.07	0.14	0.15

Notes: 1. Absolute value of t statistics in parentheses

2. Significance sign and level:

** significant at 1%.

* significant at 5%;

+ significant at 10%;

3. Dummy variable for 1991 was used as the basis for year dummy variables.

4. RI: Resource Intensive; LI: Labour Intensive; HCI and TI:

HCI and TI: Human Capital Intensive and Technology Intensive.

a) The coefficient was multiplied by 10^8 to improve presentation.

Table 2.7 Determinants of the export propensity 1991-2001, with some interaction effects: regression results

Independent variable	Dependent variable $EXP_{plant, t}$				
	Specification				
	Rewriting (2.10)	(2.14)	(2.15)	(2.16)	(2.17)
$\ln(SIZE)_{plant, t-1}$	0.010	0.008	0.008	0.007	0.008
	(4.38)**	(3.80)**	(4.78)**	(4.67)**	(4.79)**
$\ln(AGE)_{plant, t-1}$	-0.001	-0.001	-0.001	-0.001	-0.001
	(0.04)	(0.83)	(0.82)	(0.82)	(0.83)
$\ln(LP)_{plant, t-1}$	0.001	0.0001	0.0001	0.0002	0.0001
	(1.13)	(0.18)	(0.08)	(0.28)	(0.12)
$CI_{plant, t-1}$	2.80[a]	4.930[a]	4.910[a]	6.990[a]	4.900[a]
	(0.18)	(0.47)	(0.46)	(0.64)	(0.46)
$SI_{plant, t-1}$	-3.800[a]	-6.140[a]	-6.090[a]	-6.120[a]	-7.480[a]
	(0.96)	(0.22)	(0.22)	(0.22)	(0.27)
$IMDEP_{plant, t-1}$	0.011	0.008	0.008	0.008	0.008
	(1.97)*	(2.09)*	(2.08)*	(2.11)*	(2.08)*
$EXP_{industry, t-1}$	-0.038	0.007	0.007	0.006	0.007
	(1.00)	(0.26)	(0.26)	(0.24)	(0.26)
$MNC_{industry, t-1}$	0.124	0.120	0.072	0.117	0.051
	(1.94)+	(1.14)	(0.75)	(1.88)+	(0.49)
$MNC_{industry, t-1} * \ln(SIZE)_{plant, t-1}$		-0.010			
		(0.44)			
$MNC_{industry, t-1} * \ln(LP)_{plant, t-1}$			0.001		
			(0.07)		
$MNC_{industry, t-1} * CI_{plant, t-1}$				-0.006	
				(0.86)	
$MNC_{industry, t-1} * SI_{plant, t-1}$					0.004
					(0.29)
Dummy variables for industries $_{, t-1}$	Included	Included	Included	Included	Included
Dummy variables for year	Included	Included	Included	Included	Included
Constant	0.866	0.568	0.571	0.570	0.570
	(35.40)**	(32.15)**	(32.79)**	(34.38)**	(34.38)**
Observations	68758	68758	68758	68758	68758
Number of psid	17254	17254	17254	17254	17254
R-squared	0.13	0.12	0.12	0.12	0.12

Notes: 1. Absolute value of t statistics in parentheses

2. Significance sign and level:

** significant at 1%.

* significant at 5%;

+ significant at 10%;

3. Industry dummy variables used two-digit ISIC level.

4. Dummy variable for ISIC 31 was used as the basis for industry dummy variables.

5. Dummy variable for 1991 was used as the basis for year dummy variables.

a) The coefficient was multiplied by 10^8 to improve presentation.

2.6.2 Some insight from few in-depth interviews with firms

The empirical analysis so far have indicated a positive impact of a concentration of foreign firms on helping domestic non-exporting firms to switch to become exportes. The analysis also indicated, however, that the impact is rather limited, and it is particularly strong form firms in labour intensive industries. To gain more knowledge on this subject, and particularly for answering the question of what mechanism are at work for other multinationals firms in helping domestic firms to exports, this study resorts to qualitative approach by conducting interviews with several firms. This subsection presents the results of these interviews.

Given the constraints faced by the authorts, particularly in realising the interviews with companies' managers that the authors ask for, this study at the end managed to interviews only few firms, and particularly for this subject (i.e., the role of foreign-firms concentration in helping the domestic non-exporters to become exporters), the authors managed to interviews manager(s) from three garments companies.[14]

There are few key points that worth highlighting from the interviews, on the subject of how the presence of other foreign firms can help domestic non-expoters to switch to become exporters.

First, giving information regarding marketing in international market seems to be one way of how the foreign-firm concentration can help the domestic firms to switch to exporting. This, for example, including what are the potential markets that usually be the destination of the Indonesian products and the know-how for penetrating these markets. Much of this information, according to the managers we interviewed, comes from the networks they have with other companies in the industries, as well as from the hiring employees from foreign firms who export. However, at least according to two firms we interviewed – an all these are classified as large firms with more than 3,000 workers, it needs both substantial time and capital for be able to export, given the complete set of information they have about international

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[14] Initially the authors aim at interviewing more than five companies, but much of the invitation for the interviews were not realized because of the sudden change of the interview schedules which eventually leads to cancellation of the interviews; and given the limited time for this study, the authors decided to report the results based on the three firms that the authors managed to have the interviews.
The authors also managed to conduct interviews with few other companies, but they are in the context of the other part of research subject examined by this study, and this is reported in the next chapter.

markets. One company that we visit for the interview claimed that it needs to raise substantial capital from few methods (i.e., selling the ownership to some domestic investors and taking loans from banks) for this company to execute its first-time exports. The manager explained that much of this capital are needed to upgrade their machinery to be able to meet the demand required by the international buyers. The machinery upgrading is necessary because the competition is so tight, in the sense that once a potential buyer shows some interest to buy some products from a company, it could easily cancel the (potential) order if the seller (i.e., the domestic garment producer) can not demonstrate to them that they can produce the goods they require. The upgrading is also necessary because the international buyers need to ensure that the firm can produce the products according to the quality standard they want.

Second, another way that foreign-firms can help domestic firms to export seems by 'learning to exporting' through a long partnership with foreign firms. This is a case with a medium scale domestic garment producer that we interviewed. The producer has been for quite sometimes focuses on supplying to few larger foreign or joint-venture firms. These larger firms often outsource to some smaller companies for some export order that they can not meet, and the firm we interviewed happens to be one these source of this outsourcing.

The director, as well as owner, of the domestic medium company made the point that long partnership with the larger foreign or joint-venture companies always constantly force his company to always have excellent performance, and this is in terms of productivity and producing high-quality products (i.e., producing consistently good-quality products with small rejection rate). Again, the 'stick' to always have good performance comes from tight competition with other domestic firms that can be outsourced; a larger firm take the control and can rather easily swith to other domestic companies should a performance of its outsourcing partner decline. The experience to always be an efficient and reliable producer give the basis to be able to serve international markets, owing to the tight competition in those markets; and given the information about international market that can be accumulated during the partnership with the foreign or joint-venture companies, there are opportunities for directly supplying international markets, and this seems to what happened to the firm we interviewed. Although still quite small in terms of output, this company has started to export some of its output.

The other important point, which seems to be quite clear from all interviews, is that foreign firms positive contribution for the domestic non-exporting firms is not instantaneous. The interviews suggest that the companies needs substantial capital to facilite the positive spillover impact from foreign firms to be realised. The reason for this 'capital-requirement' is clear, and that is to make the domestic firms ready for serving the highly competitive international markets. Thus, although the domestic firms have receive all information it needs to start exporting, which comes from foreign firms in the industry, it is unlikely to initiate its exports until it has sufficient production technology or machinery, and this needs quite substantial amount of capital.

3. Production network and determinants of industry upgrading and export diversification in Indonesia: a case-study approach

3.1. Introduction

As noted earlier at the beginning of this report, there has been an increasing production activity within the East Asian region. In fact some other studies mentioned that it is a rapidly growing phenomenon for production method in the region.

This chapter addresses this subject. In particular, it attempts to answer the third research question of this study. As written in the first chapter, and to repeat, the question is, which factors determine the success of the industries in upgrading to a higher value chain in the production networks, according to Indonesian experience?

This chapter is organised as follows. Section 3.2 firstly reviews the literature on the subject. Section 3.3 reports the research for answering the question, which was conducted by conducting some in-depth interviews with some firms in Indonesia.

3.2. Brief literature review

It would be prudent to consider implementing policies that encourage exports diversification and movement up the value chain from raw materials towards processed products with higher skill content. Recent empirical literature had demonstrated that countries that manage to increase the sophistication of their export structure tend to experience faster economic growth (Hausmann et al. 2007). The study considers the way in which new forms of production network the possibilities for upgrading agricultural and manufacturing producers and traders in Indonesia.

Conceptions about what it means to be involved in global trade have changed in recent years. The traditional image of export activity would be an enterprise that designs, makes and exports a product. Now, exporters may work to a design supplied by an international buyer. Otherwise, the exporter may just produce a small part of the final product. Firms may act as the organizers of fragmented supply systems (Sturgeon and Lester, 2001: 46-49).

There is increasing recognition of this transformation. The development of these new forms of production network is widely seen as contributing to the rapid rise in manufactured exports from developing countries over the past two decades. Unfortunately, the process of export diversification and upgrading is not well understood. Neither are the determinants of exporting. Entering export markets for the first time is a major challenge for many firms in developing countries. It demands new skills and knowledge, for example concerning bureaucratic procedures, national standards and requirements, marketing channels and consumer tastes.

The prevalent view (Keesing and Lall 1992) is producers in developing countries are expected to meet requirements that frequently do not (yet) apply in their domestic markets. Production network is often associated with higher standards and technological capability, built through purposive innovation and learning. *The critical question is, however, how value chain relationships affect the process of learning, innovation and the acquisition of technological capabilities. Is upgrading relatively easy once firms are within global value chains? Or, in the words of Hobday (1995: 33), is technological learning "a dynamic, difficult and costly process", and one that needs strategic interventions by firms and support from governments and international agencies?*

The purpose of this paper is twofold. First, it will review some stylized facts on exporting firms and summarize the massage emerging the empirical literature on this subject. Second, it will assess the upgrading strategies for latecomer firms, which will be undertaken in the near future. The reference point for the literature on industrial upgrading is the East-Asian experience.

Foreign direct investment could also serve as a catalyst for upgrading of export products. Such upgrading can happen in two ways. First, multinationals using a country as an export platform may engage in production of more sophisticated goods that those previously exported by their host country. Second, the presence of multinationals may lead to knowledge spillovers to local firms in the same industry or in the supplying sectors, which will in turn facilitate product upgrading. For instance, in a recent World Bank survey; 24 percent of local enterprises in the Czech Republic and 15 percent in Latvia reported that they have learned about availability of new technologies by observing multinational enterprises operating in their country and their

sector. Fifty percent of suppliers of multinationals surveyed in the Czech Republic reported improving their quality control system in response to the request of their multinational customers (Javorcik 2008). And indeed in a study of 116 countries by Harding and Javorcik (2008) finds a positive link between FDI and unit values of exports in developing countries, but not developed countries. These findings are consistent with FDI bridging gaps in production and marketing techniques between developing and developed economies.

There appears to exist a strong link between investment pattern and exporting. Constantini and Melitz (2007) develop a theoretical model which incorporates a joint decision to upgrade product quality and enter export markets. Their model shows that the anticipation of future liberalization induce firms to innovate ahead of liberalization and thus also ahead of their anticipated, but yet unrealized, entry into export market. Using plant-level data from Chile, Alvarez and Lopez (2005) demonstrates that plants increase their investment outlays in years preceding exporting.

Interestingly, increased investment activity seems to be needed not only in order to enter export markets but also in order to keep up exports. For instance, Mexican data indicate that 77 percent of exporters introducing a new export variety invested physical capital, as opposed to 71 percent of exporters not introducing a new export product. In contrast, only 51 percent of non-exporters made such investments (see Iacovone and Javorcik 2008b).

3.3. Some insights from in-depth interview

While these stylized facts paint a detailed picture of exports, the exact mechanism that allows some firms, but not others, to successfully enter export markets and upgrade the products remains a black box. In particular, the studies cited above can only identify successful exporters. But what about firms that attempted to sell abroad but failed? What were the causes of their failures? Lack of information of about the expectations of foreign customers? Insufficient product quality? Lack of vision of the part of their managers?

Occasionally, a positive shock, such as a sharp devaluation, allows a large number of new exporters to emerge. Usually, however, only some of them survive, especially if the national currency experiences a subsequent appreciation. What distinguishes the survivors from quitters? Why some firms are able to adjust while others fail to do so?

This study undertook some in-depth interviews with senior-level managers of few firms in the Indonesian manufacturing, located in greater Jakarta. As noted, the interviews aim to gain more insights into the questions of the study and supplement the result of the statistical analysis. Because of the very limited respondents, some biases in the findings are unavoidable and hence the findings can offer no grounds for establishing reliability of generality of findings.

The interview results are outlining as follows: the first section focus on the Indonesian industries position in production networks and the stages of development. The rest then explore factors that determine the success of industries in upgrading to a higher value chain in production network.

Get trapped in low-ends?

The presence of industrial catch–up does exist in the Indonesian manufacturing. The current process of vertical integration engenders a gradual but accelerating shift of higher–end segments of the value chain. There is increasing recognition of this transformation, albeit its late trend compared to other neighboring countries. The interviews suggested that as firms become increasingly integrated their trades tend to be more diversify as a result and, hence reduce the likelihood that any of them will get trapped in lower–productivity goods.

Most contract manufacturers in electronics and automotives started under overseas ownership in the past one–and–half decade as assemblers for low–end products. At present, albeit there are still large volumes of such low–end mass products, however, there is definitely an upgrading in the product lines, which is increasingly switched on mass–products of higher complexity with stringent quality requirements in the assembly process. Furthermore, there is a pattern of producing great variety of products associated with high technology intensity and productivity.

More noticeably, an increasing number of engineering processes and related product designs, testing and even after sales service have been moving to local contract manufacturers, driven by cost–efficiency demands. Such evolving global strategies involve gaining entry of non-affiliated local suppliers, which benefited from economies of scale, into international design, production and marketing networks. Some contract firms interviewed that produce parts and component of name-brand electronics and automotive products are responsible to conduct

material and mechanical designs from the product profiles that customers provide, and be able to exploit direct export opportunities from these advantages. At this point, the firms attempt to increase the numbers of customers of its existing product lines to a certain limit, and price is no longer their sole competitive weapon.

Although it appears to be limited, named a few, an important element in this picture is also the emerging Indonesian electronics and automotives multinationals in the region as brand–name customers of contract manufacturers, thus producing important local upstream–linkages in the manufacturing chain.

How does production network affect upgrading opportunities?

Which factors determine the success of the industries in upgrading to a higher value chain in the production network? Does the emergence of buyer-supplier relationships characterized by explicit coordination facilitate access to global markets and upgrading?

Global production systems may affect market access and firm-level learning. It has been suggested that entering exports market is main non-tariff barriers to the firms in developing countries (Maidir and Atje, 2005). Being inserted into the network, then the barriers become much easier to overcome. Knowledge about markets, production processes and logistics can be attained. The global buyer can offer significant order volumes and more stability, in the short term, in relation to both the quantities ordered and the prices paid. Further, the upgrading support that the buyer can offer is directly relevant to the needs of the firm for the market that it is supplying.

However, this facilitation of entry may come at a price. To what extent may developing country producers become locked into narrowly-defined roles with correspondingly limited technological capabilities within global value chains? Here are some insights from the firm-level interviews.

Finding the right buyers can be a short cut to exporting. Take the case of an electronic parts firm without having a captive market. The challenges to open new export market for this firm might be formidable. What product specification might be preferred? What time of market year

are market conditions most favorable? What are the tariff levels and documents requirements? Is shipping available? At this point, a series of technical assistance –setting-up model production lines to produce samples, inspecting production schedules on sites, and arranging transports –from their buyers are able to overcome these problems. Such processes may provide conduits for the transfer of knowledge to facilitate entry into the value chain that cannot easily be acquired in other ways. Firms suggested that the learning process involves practical and tacit knowledge that is difficult to transmit in written instructions and instead refers in particular to process knowledge used in production as opposed to knowledge about markets. The buyer-supplier relationship therefore is important.

Given such investments how can buyers guarantee a return on their investment? In many cases, the skills transferred are generic and can be applied to many buyers and markets. Why should the suppliers not sell their newly acquired competences to other companies, including the direct competitors of the firm making the investment? There are two explanations that evidenced from the case study. First, buyers 'lock in' suppliers by taking a large proportion of a supplier's output, then the costs of switching to new suppliers are high. Second, in some cases, contract terms may exclude suppliers selling into the same market as the buyer. In these cases, buyer-promoted upgrading is likely to lead to incremental product and process upgrading. These are the areas in which improved capabilities for newly-integrated producers give the greatest return to global buyers.

However, some firms argued that opposition to move to higher value chain is likely to be particularly strong if the buyers are traders which might be by-passed by suppliers if the latter gain the ability to work directly with developed country customers as in most cases of electronic parts producers. By contrast, lead firms in global value chains in fact may support the acquisition by suppliers of competence that they regard as non-core. For example, leading global buyers may wish to outsource activities such as design and logistics to other firms in the value chain. However, buyers will not invest in the acquisition of such a capability. The supplier has to develop the capability and show its relevance to the buyer, and evolve with the industry itself.

The risks of being locked into low value activities within the value chain can be well-illustrated by the case of the semiconductor producers. The international traders and buyers of semiconductor created a sustained period of expansion, which increased output and employment and led to the emergence of a number of large vertically-integrated firms. These firms were specialized, focusing predominantly on the sourcing of inputs and the production process. They did not require design capabilities. This specialization was so evident that global buyers had clear perceptions of the strengths and weaknesses of Indonesian semiconductor firms compared to the global leader in the electronic parts industry, namely Malaysia.

According to the interviews, Indonesian suppliers were compared favourably to Malaysian suppliers on price and dealing flexibly with large orders, and more or less matched them with regard to quality, response time, punctuality and coping flexibly with small orders. However, as is evident, by far the largest gap in supplier appraisals of the two countries was on the question of innovative design, which Malaysian producers are benefiting from. These differences in assessments by global buyers reflect the way in which Indonesian producers were integrated into the global market. A slightly similar trend can also be examined in the auto parts, but with a possibly greater degree of locking in low value-added products of which brand-name manufacturers is likely to allocate from one country into another.

Supply-base capability

Over a period of time, contract manufacturers in the electronics and automotives have moved from being simple assemblers, putting together components supplied by their customers and to their specifications, to providing a broad range of services, including logistics, component purchasing and design adaptations. While it has been widely noted that widespread outsourcing results in the change of industrial landscape, most of firms argued that the evolving of supply-bases toward smaller, highly specialized firms – each of which has shed its 'non-core' activities to focus on a few 'core' competencies – are turn-key factors to meet the growing demand for full-service, and in turn, to upgrade into higher value chains.

Some firms interviewed have in many cases had to add entirely new competence areas, increasing their scope of activities while improving quality, delivery, and cost performance. Increased outsourcing has also, in many instances, vastly increased the scale of suppliers'

operations. Thus, increased outsourcing has led to a deepening of competence and an increase in scale at supplier firms. As supply-bases come to be comprised of large, highly capable suppliers the prospects for increased outsourcing are improved. In this way, suppliers and lead firms co-evolve in a recursive cycle of outsourcing increasing supply-base capability and scale.

Learning and marketing strategy

Firm-level strategies of learning from working within particular value chains and then developing and applying this knowledge are as part of an upgrading strategy. They show how a capability strategy has to be linked to a marketing strategy.

In order to upgrade, firms not only have to develop new competences, but also have to apply these competences in ways that do not endanger existing value chain relationships. Buyers are wary of potential competition from outsourcing partners and may therefore tend to be cautious in transferring design and development technology. Upgrading therefore involves two types of firm-level strategy. Firstly, competences have to be built up. The interviews emphasized the investment in human material resources required to make learning possible.

Secondly, interestingly, few firms suggested that the ability to make new products has to be complemented by product development and marketing strategies that do not directly challenge important customers. The continuing commitment of these customers is important for production scale and predictability of sales. Therefore, when contract manufacturers develop new products of their own, they might focus on low-end products that do not compete directly with those of major customers, and they may also direct them towards smaller markets which are less important for their customers. The extent of this challenge is not quite as daunting as it might appear. In particular, there is ample evidence that firms frequently sell to diverse markets and may be able to apply the knowledge and capabilities acquired in one market to new markets and customers.

The role of trade policy

This overview of the issues of global buyers, access to markets and upgrading, undertaken largely from the firm and value chain perspectives, should not ignore the importance of trade policy. Particular attention needs to be paid to the role of trade policy in preventing upgrading

by firms. Some preferential trade agreements actively discourage upgrading because of their restrictive conditions with respect to local content. Further, the requirements of the value chain in terms of traceability, standards, managerial systems and scale make it difficult for some firms to participate. There are certain subcontracting roles available to them, but if the requirements placed on producers at early stages in the value chain rise, one response is for production to be brought in-house. This has been seen in the increasing use of auto parts materials by Thai-based brand name auto manufacturers.

During interviews firms pointed to specific policy areas that require attention to facilitate the integration and coordination of activities that cross national boundaries:

– *Transport infrastructure development*. To the extent that global production and distribution systems become more integrated, the reliability and efficiency of transport infrastructure becomes more important. In particular, in explicitly coordinated value chains, buyers are dependent on a narrow range of suppliers and continuity of supply becomes increasingly important.

– *Access to imported inputs*. Firms in global value chains often specialize in just one part of the process, with the extreme case being firms that only assemble products. One consequence of this is that ease of access to imports becomes an essential part of export competitiveness. This ease of access involves not only low tariff or duty-free imports, but also the physical and bureaucratic infrastructure to enable goods to be imported quickly.

– *Market search.* The problem of 'lock-in' to low value-added activities needs to be addressed through active support for firms searching for new markets and customers. There is a role for publicly funded agencies in this area.

– *Capacity building and Export Promotion.* As part of the process of locating markets, more emphasis should be placed on the ability to diagnose value chain linkages and trade opportunities in capacity-building efforts. Capacity-building programs aimed at increasing national trade capacities should focus on value chain linkages and the implications of these linkages for market access. It is now recognized that market access issues include two components: trade policy and competitiveness, or in other words the capacities of firms to

take advantage of access opened up by trade policy changes. A global value chain perspective adds a third aspect to the analysis and diagnosis, namely consideration of market structures and differentiation. Different buyers have different requirements, which demand different capabilities from suppliers. Export promotion activities need to be able to analyse these differences.

Upgrading strategies for latecomer firms

As suppliers gain competence, new functions become more widespread and are established as the norm for the industry. They become an entry requirement. The entry barriers for latecomer firms in the global economy therefore rise.

These challenges are particularly problematic for small firms, smallholders and the informal sector. The requirements of the value chain in terms of traceability, managerial systems and scale make it difficult for these firms to participate. There are certain subcontracting roles available to them, but if the requirements placed on producers at early stages in the value chain rise, one response is for production to be brought in-house. This exclusionary tendency is driven by the increasing emphasis on standards, codes and labels. The more lead firms in the value chain are held responsible for events further back along the chain, the more they monitor activities and enforce standards along the chain.

How could the new exporter face this challenge? As the entry requirements for global markets are tending to increase as a result of both changing demands by global buyers and the increasing complexity of the regulatory environment, local and national policy becomes more important in facilitating the entry and upgrading of latecomer firms. Policy interventions can be found in the following areas:

• Local and national initiatives (sometimes in conjunction with international agencies) aimed at improving the capabilities of particular sectors and industries so that they can meet the requirements of international markets. These requirements may include compliance with standards (and proof of such compliance), as well as investment in basic infrastructure to meet

logistical requirements. In many cases, these investments cannot be made at the enterprise level and require collective action.

• Where entry requirements to particular markets are considerably beyond local capabilities, support agencies may be able to find less demanding customers. These may include markets that are less sophisticated in terms of product or regulatory requirements, or different types of buyers. In the case of the horticulture industry, for example, alternatives to large retailing chains in northern Europe might include customers in Middle Eastern and East European markets, or traders supplying the catering market.

• Given the increasing complexity of global standards for both products and processes, business organizations and governments should work towards simplifying the global standards system, not by reducing requirements, but by avoiding overlapping standards and the duplication of standards.

4. Summary and conclusion

The purpose of Chapter 2 has been to examine the export spillover effect from the presence of foreign firms. It reviews the relevant literature and postulate several testable hypotheses. The empirical analysis provides some insights into the picture of the export spillover effect and indicates some dependency of the spillover effect with some firm characteristics.

The overtime movement of the frequency of plants that switched from non-exporter to exporter, by two groups of industries: low and high industry's foreign ownership share, suggests only a weak positive impact of the export spillover effect. The movement show that the extent of the switched firms has been quite small for the period under consideration.

This picture is quite consistent with the econometric exercise, in the sense that although the exercise indeed show a positive relationship between concentration of foreign firms in an industry, the strength of this positive impact might not be so strong, at least in terms of statistical significance

A deeper econometric exercise reveals that the positive impact of the foreign-firms concentration in an industry turns to be occur most likely for plants or firms in labour-intensive industries. There is no evidence, meanwhile, that the positive impact depends a lot on the other firm characteristics, since many of the interactive variables involving the foreign-firm concentration variables are highly statistically insignificant.

The results support the general hypothesis that the impact of export-spillover from foreign firms is positive. Here, however, this study found that the impact varies across industries. But, again, it provides support for another hypothesis put forward by this study, that the effect of the multinational export-spillover is larger for labour-intensive industries rather than for technology- and human capital-intensive industries. In other words, the results support the idea that the positive export-spillover effect from the presence of foreign firms is rather redundant in the industries where firms who populate those industries have already acquired necessary tools to make them competitive in international markets.

Meanwhile, interviews with managers of few garments companies reveals few method for transferring the positive export-spillover effect from multinationals. The presence of foreign firms can help domestic non-exporters to switch to become exporters, According to the interviews, it can happen through increasing the knowledge related to marketing goods in international markets, including the potential destination markets and/or other know-how to supply these markets. Another mechanism which was suggested to occur is forcing the domestic non-exporters to 'learn to exporting', by establishing a long partnership with some foreign or joint-venture firms. The learning to exporting provides chances for the domestic firms to be ready for exports.

All these mechanisms, however, are suggested to depend on capital. In short, even if there is a positive transfer of knowledge that increase the readiness of the domestic firms to exports, it seems difficult for the domestic firms to switch to exporting if they do not have the necessary capital. The relatively large amount of capital is needed for firm upgrade and maintain their performance for surviving the highly competitive export markets.

Chapter 3 attempts to answer the question of which factors determine the success of the industrial upgrading in the production networks, from a case study Indonesia.

The in-depth interviews with senior managers of some automotive and electronics companies indicate that while industrial catch–up does exist in the Indonesian manufacturing, it is very slow. Moreover, the slow process contributes to the situation where many joint-venture companies in these sectors 'trapped' in producing low-ends product.

Meanwhile, the interviews found that industrial upgrading occurs from both demand and supply side. From demand side, it is motivated more from the needs of parent companies to meet the quality of products and efficiency level in production. The parent companies usually pay quite substantial investment money to upgrade the technology and management skill of the local counterpart. As from the supply side, the local part of the joint-venture firms learn from working within particular value chains, and hence are able to develop and apply the new knowledge they get as a part to upgrade their technology and capability.

The interviews also found the importance of trade policy in affecting upgrading strategy. Insights from the interview, in particular, confirm the classical of RoO problem, and that is, some preferential trade agreements turn to actively discourage technology upgrading, because of their restrictive conditions with respect to local content.

All in all, this study confirms many previous studies on the positive impact of foreign ownership, and hence, it supports a liberal approach for investment policy regime. As it was demonstrated in Chapter 2 and 3, there is indeed an important positive effect from having large numbers of firms with some foreign ownership, in terms of affecting other firms to become exporters and upgrading technological capability.

However, this study suggests that a liberal foreign investment policy alone would not be sufficient. The econometric analysis of the export spillover effect indicates the importance of capital in affecting decision of non-exporters – to become exporters. Also, equally important, the liberal investment regime needs to be complemented by a policy that is not discriminatory. In particular, this is in regard to the popular view that small firms performs better than large firms.

A liberal investment policy usually goes hand in hand with liberal trade policy. The results presented in Chapter 3, however, suggest a need to a very careful implementation of trade policy should the investment policy would give a maximum benefit. This is illustrated, for example, by a comment from the interviewed firms that bilateral trade agreements often give problems for moving up the technological ladder in the context of regionally more integrated production method in a region.

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