ADBI Working Paper Series

SME Internationalization through Global Value Chains and Free Trade Agreements: Malaysian Evidence

Menaka Arudchelvan and

Ganeshan Wignaraja

No. 515
February 2015

Asian Development Bank Institute

Menaka Arudchelvan is a Project Consultant at the Asian Development Bank Institute. Ganeshan Wignaraja is Director of Research at the Asian Development Bank Institute.

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Suggested citation:

Arudchelvan, M., and G. Wignaraja. 2015. SME Internationalization through Global Value Chains and Free Trade Agreements: Malaysian Evidence. ADBI Working Paper 515. Tokyo: Asian Development Bank Institute. Available: http://www.adbi.org/working-paper/2015/02/16/6535.sme.internationalization.malaysia/

Please contact the authors for information about this paper.

Email: marudchelvan@adbi.org, gwignaraja@adbi.org

Asian Development Bank Institute
Kasumigaseki Building 8F
3-2-5 Kasumigaseki, Chiyoda-ku
Tokyo 100-6008, Japan

Tel: +81-3-3593-5500
Fax: +81-3-3593-5571
URL: www.adbi.org
E-mail: info@adbi.org

Abstract

Growing internationalization of firms in Asia through participation in global value chains (GVCs) and free trade agreements (FTAs) has focused attention on small and medium-sized enterprises (SMEs). Yet there is scant literature on the characteristics of SMEs involved in GVCs and FTAs. Malaysia is reputed for its engagement in GVCs and is actively pursuing FTAs. Drawing on a survey of Malaysian enterprises, this paper examines the characteristics of SMEs in GVCs and FTAs and explores the policy implications. It finds that even among SMEs, firm size matters for participation in GVCs and FTAs. But size is not the whole story for SME internationalization. Licensing of foreign technology and investment in research and development are also positively associated with SMEs joining GVCs. Furthermore, increased exposure to international trade, knowledge of FTA provisions and central location positively affects the use of FTAs by SMEs. More business support for SMEs can help them to engage in GVCs and FTAs.

JEL Classification: F13, F14, F15

Contents

1. INTRODUCTION

Regionalism in Asia, led by global value chains (GVCs)[1] and free trade agreements (FTAs), has increasingly put the spotlight on small and medium-sized enterprises (SMEs). Now, more than ever, SMEs in Asia have the opportunity to engage in international trade due to falling barriers to trade and fragmentation of production, whereby the production of final goods is spread over firms located in several countries, with each one undertaking an individual "task" in the overall process. Firms no longer need to have the expertise to export to a modern market; instead, they can simply support the value chain as suppliers of intermediate inputs, such as parts and components, and act as subcontractors several levels down from the ultimate buyer (Lim and Kimura 2010).

Increased internationalization through participation in GVCs and international trade provides SMEs in Asia the opportunity to achieve economies of scale, expand market share, and increase productivity. Additionally, participation in GVCs and cooperation within a network of upstream and downstream partners can enhance a firm's information flows and learning possibilities, as well as introduce new business practices and more advanced technology, leading to greater growth and earning potential (UNCTAD 2010). Despite the substantial gains from internationalization, SMEs are underrepresented in international trade even in middle-income economies in Asia (Harvie 2010). In Malaysia, SMEs account for 97% of all enterprises but only 19% of total exports. Furthermore, despite the increasing number of FTAs to smooth the flow of trade, there is mixed evidence of FTA utilization (Kawai and Wignaraja 2011, 2013; Tambunan and Chandra 2014).

At the firm level there can be notable benefits of joining GVCs and using FTA preferences, but there are also costs, and SMEs are particularly disadvantaged given their size and available resources. With the increased availability of micro data, we can better understand the firm-level characteristics associated with successful participation in GVCs and use of FTA preferences as well as the barriers facing SMEs. This paper examines the characteristics of SMEs that have successfully internationalized through participation in GVCs and FTAs, with reference to Malaysia using enterprise survey data of 234 exporters and importers collected in 2012. It seeks to improve our understanding of the internationalization of SMEs in Malaysia and contribute to the scant literature in this area. Policy implications from the research are also explored. To the best of our knowledge, this is the only study that has attempted to examine the internationalization of SMEs in Asia both in terms of participation in GVCs as well as in FTAs.

Malaysia is an interesting case study of SME internationalization. The country and its enterprises have considerable engagement in GVC trade and are actively pursuing liberalization through various routes, including unilateral liberalization and FTAs (Kam 2013; WTO 2014). Although the People's Republic of China (PRC) is increasingly dominating Asia's GVC trade, Malaysia is also an active participant and accounted for 2.7% of global and 5.2% of Asian GVC trade over the period 2009–2013. Interestingly, Malaysia ranks as the fourth most active Asian economy in GVC trade and is only behind the PRC, Japan, and the Republic of Korea. The electronics sector is particularly well-integrated and is the key driver of Malaysia's participation in these chains. Relatively good infrastructure, bureaucratic efficiency when dealing with multinational corporations, political stability, abundant and cheap local and foreign

[1] Also known as production network trade.

labor, and an English-speaking labor force are some of the drawcards that distinguish Malaysia from other countries for electronics firms looking to develop locations for labor-intensive assembly activities (Kam 2013).

Furthermore, Malaysia has been actively pursuing the Economic Transformation Programme (ETP), which aims to elevate the country to developed nation status by 2020, targeting a gross national income per capita of $15,000 (Pemandu 2014). Encouraging SMEs to move up the production chain and achieve greater internationalization are important steps in reenergizing private sector activity and achieving developed nation status.

One of the six Strategic Reform Initiatives under the ETP is related to trade liberalization (Pemandu 2014). In an effort to strengthen local capabilities, enhance capacity through greater foreign investment and technology, and foster GVC participation, Malaysia has been following a multitrack approach of negotiating multilateral trade and bilateral FTAs alongside unilateral liberalization (WTO 2014). Since signing the Association of Southeast Asian Nations Free Trade Area (AFTA) in 1993, Malaysia's network of FTAs has grown to 12 bilateral and regional FTAs with 18 trading partners as of 2014. A further six agreements are under negotiation (ADB 2015).

The paper is organized as follows. Section 2 reviews relevant literature on firm-level participation in GVCs and the use of FTA preferences. Section 3 discusses the data used in the analysis and summary statistics. Section 4 looks at the SME characteristics related to GVC participation. Section 5 considers the SME characteristics associated with FTA use and looks at the barriers faced by SMEs to using FTAs. Finally, Section 6 concludes.

2. LITERATURE REVIEW

2.1 Global Value Chain Participation

Several related strands of literature have provided insights on GVCs and the role of firms, particularly SMEs. The fragmentation of production approach—as found in seminal works by Jones and Kierzkowski (1990) and Arndt and Kierzkowski (2001)—refines these insights. It shows how increasing returns and the advantages of specialization of factors within firms encourage the location of different stages of production across geographical space connected by service links. Products traded between firms in different countries are components rather than final goods. Two alternative approaches have been used to quantify the magnitude of fragmentation trade. One uses national trade data obtained from the United Nations trade data reporting system to identify trade in parts and components (e.g., Ng and Yeats [2003] and Athukorala [2011]). It suggests that East Asia's trade is increasingly made up of parts and components trade, suggesting that global production networks are growing in importance. Another approach—relying on input–output tables to trace value added in production networks—suggests that value added seems a more accurate means of capturing production network activity than trade data (e.g., Koopman, Powers, Wang, and Wei [2010] and WTO and IDE-JETRO [2011]). Neither approach, however, sheds light on factors affecting firms joining supply chains. Case studies show that large multinational corporations (MNCs), which use the region as an international production base, drive the process of production fragmentation (Kuroiwa and Heng 2008; Kuroiwa 2009).

Another related strand of literature is the "new new" trade theory of Melitz (2003) and Helpman et al. (2004), which emphasizes firm heterogeneity in international trade (i.e., that firms are considered different in terms of efficiency and fixed and variable costs when involved in trade). Accordingly, only a few highly efficient firms are able to export and invest overseas as only they are able to make sufficient profits to cover the large trade costs required for overseas operations.

Finally, the technological capability and national innovation systems approach reveals a different channel through which firm behavior affects export performance. Focusing on innovation and learning processes in developing countries, proponents emphasize the acquisition of technological capabilities as a major source of export advantage at the firm level (Bell and Pavitt 1993; Lall 1992; Iammarino et al. 2008). The underlying evolutionary theory of technical change emphasizes that difficult firm-specific processes and complex interactions with institutions are needed to absorb imported technologies efficiently (Nelson and Winter 1992).

Implicit in most of the above theories is the notion that SMEs are at a disadvantage in participating in supply chains compared with larger firms. Compared to larger firms, SMEs face many challenges in the global environment. Ting's (2004) analysis of Malaysian SMEs identified five key challenges: lack of access to finance, human resources constraints, limited or no ability to adopt technology, lack of information on potential markets and customers, and global competition. He also argued that there is a high risk SMEs will be wiped out if they do not increase their competitiveness in the new, rapidly changing world of globalization. Given these challenges, the probability of SMEs joining supply chains (as direct exporters, indirect exporters, or overseas investors) is lower than that of large firms.

There is very little empirical literature on the characteristics of SMEs that participate in production networks, but a study by Harvie, Narjoko, and Oum (2010) is one of the few that consider this issue. They utilize the results from an Economic Research Institute for ASEAN and East Asia survey on SME participation in production networks, conducted over a 3-month period at the end 2009 in most ASEAN economies. The results suggest that size, productivity, foreign ownership, and to some extent innovation efforts and managerial attitude are the key characteristics of SMEs in production networks. Rasiah, Rosli, and Sanjivee (2010) also consider the characteristics of SMEs in value chains, with particular focus on Malaysia. They find that SME size and labor productivity are positively and significantly associated with firms that participate in global value chains.

Wignaraja (2013) is the third study that addresses the characteristics of SMEs in production networks. The study utilizes the World Bank's Enterprise Survey data of 5,900 manufacturing enterprises data from five ASEAN economies. The results find that in the late 2000s, large firms were the leading players in production networks in ASEAN economies while SMEs were relatively minor, but since the late 2000s there has been an increase in the participation of SMEs. More developed ASEAN economies such as Malaysia and Thailand, which are more established in production networks, have higher SME export shares than other ASEAN economies. The study also finds that firm heterogeneity matters in relation to firm-level participation in production networks. The econometric analysis finds that size, foreign ownership, educated workers, experienced chief executive officers (CEOs), building of technological capabilities, and access to commercial bank credit all positively affect the probability of SME participation in production networks. By contrast, age has a negative relationship.

2.2 Free Trade Agreement Preference Utilization

One of the major challenges to researching the impact of FTAs is the lack of published information on trade flows (or individual business transactions) enjoying tariff preferences. Transaction records on exports and imports for preferential tariff purposes are filed with the authorities of origin, such as national customs authorities or trade ministries, but not published. Thailand is one exception to this norm, publishing annual information on FTA preference use, albeit in the Thai language. Using Thai data, Chirathivat (2008) has shown that the overall actual utilization rate for Thailand's FTA partners has been rising, and nearly doubled (from 16% to 27%) during 2005–2008. The 2008 utilization rates of Thailand's partners vary by market, with 72% for the Thailand–Australia FTA and 28% for AFTA. Using data from Thai secondary sources, Kawai and Wignaraja (2013) have shown that the overall actual utilization rate for Thailand's FTA partners rose further to around 61% in 2011, while the FTA utilization rate for the Thailand–Australia FTA increased to 91% and AFTA to 52%. Tambunan and Chandra (2014) narrow in on SMEs in ASEAN. In their scan of economic literature and government supported programs they find that SMEs are by far the least active economic actors in the region to make use of the flourishing trade agreements.

In the absence of published data on preference utilization, micro-level information obtained from interviews with firms as well as large-scale enterprise surveys can be useful. In an early study, Kumar (1992) interviewed 15 trading companies and manufacturers in Kuala Lumpur, Singapore, and Jakarta to identify possible impediments to successful implementation of AFTA in the future. Kumar reported that the main bottlenecks were likely to be non-tariff barriers (standards, testing procedures, and customs procedures), a lack of information about the Common Effective Preferential Tariff (CEPT) scheme of ASEAN, domestic investment regulations, and subsidy schemes.

The Asian Development Bank (ADB) and the Asian Development Bank Institute (ADBI) have also conducted comprehensive enterprise surveys in recent years on the business impact of FTAs in several Asian countries (Kawai and Wignaraja 2011). The economies of Japan, the PRC, the Republic of Korea, and three Southeast Asian countries (Singapore, Thailand, and the Philippines) were included in the first round of surveys of 841 firms, with 28% indicating they used FTA preferences. Interestingly, the average FTA use among the three Southeast Asian economies was reported to be somewhat lower than for manufacturing giants like Japan and the PRC. Furthermore, only 20% of the sampled firms said that multiple rules of origin (ROOs) significantly added to business costs. Weighing up the firm-level evidence, the study concluded that concerns about the Asian FTA "noodle bowl" effect on business might have been overstated at the time of the surveys.[2] Nonetheless, the study noted the risk of an Asian "noodle bowl" problem in the future with the growing number of FTAs in the region.

Some studies have explored the factors affecting FTA use at the firm level using econometric analysis. Using a sample of Japanese firms, Takahashi and Urata (2008) examined the influence of several enterprise characteristics (e.g. firm size, trading relations with FTA partners, the ratio of overseas sales to total sales, overseas business bases, and manufacturing membership) on FTA use. Firm size and trading relations with FTA partners were found to be positive and significant parameters. The authors concluded that large firms were more likely to use FTAs, reflecting the costs of

[2] The "noodle bowl" refers to the observation that multiple rules of origin in overlapping Asian FTAs may raise transaction costs for businesses, particularly SMEs, for using tariff preferences in FTAs.

such practices, and that trading experience in FTA markets also influenced the likelihood of FTA use.

In their study of Japanese multinational corporations (MNCs), Hiratsuka et al. (2009) tested the relationship between firm size and FTA use, and various enterprise characteristics (e.g., the share of local inputs among total inputs, the share of imports with zero tariffs, and sector and country dummy variables). One key finding was that large firm size (proxied by employment) positively correlated with FTA use. Another was that firms actively engaged in international fragmentation are likely to use FTAs for exports.

These econometric studies provide useful insights into the determinants of FTA use at the firm level. However, they also focus on firms from Japan—a developed industrial economy with relatively well-functioning markets and institutions—from which it is difficult to extrapolate to newly industrializing economies. Furthermore, there may be methodological gaps in these studies. For instance, in Takahashi and Urata (2008) the exclusive use of dummy variables as regressors resulted in a model with weak explanatory power. On the other hand, Hiratsuka et al. (2009) employed a sophisticated panel data analysis of a large sample of Japanese MNCs but only a few explanatory variables were explored, which could contribute to omitted-variable bias in the results.

Factors affecting firm-level FTA use in Indonesia, Malaysia, and the Philippines were considered by Wignaraja (2014). Econometric analysis using firm-level data produced some interesting results. Key results included: firm-heterogeneity matters in FTA use. Acquiring knowledge about FTAs through in-house efforts and actively forging links with FTA support institutions, building technological capabilities, and membership of industrial clusters show up as significant factors affecting the likelihood of firm-level regional trade agreement (RTA) use. A lack of information about FTAs and the absence of FTAs with major trading partners are the main reasons for non-use of RTAs. Key policy implications include the need to improve business support for RTAs, to conclude RTAs with major trading partners, and to create a database on preference use in RTAs. The methodological approach of the paper will be utilized in this paper in assessing the characteristics of firms participating in production networks and FTAs.

3. DATA AND SUMMARY STATISTICS

In 2012, ADB and ADBI developed and conducted a survey of 234 exporters and importers in Malaysia. Manufacturing firms and in particular textiles and garments; food and beverages; wood and wood products; electronics and components; and automotive parts firms were targeted. The survey was conducted across Malaysia covering firms in the northern, central, and southern regions.

Firms in the sample were asked whether they used tariff preferences in FTAs for exports, imports or both, and whether they were part of the regional/global supply chain. These questions, along with those covering firm characteristics, form the basis of this analysis on the characteristics of SMEs that have internationalized through GVCs and FTAs.

Characteristics of firms

The survey included both exporters and importers and the majority of firms (216) were importers compared with 86 exporters (see Table 1). Of these firms, 69 were both exporters and importers of goods. The firms were distributed across five key

manufacturing sectors and were predominantly small firms—88.5% of the firms in the sample were small firms with fewer than 100 employees.

Table 1: Characteristics of Surveyed Firms

	Count	%
Type of Traders		
Exporters only	17	7.3
Importers only	147	62.8
Export and import	69	29.5
No answer	1	0.4
Size		
Small	207	88.5
Large	20	8.5
Giant	7	3
Sector		
Textiles and garments	49	20.9
Food and beverages	26	11.1
Wood and wood products	23	9.8
Electronic products and components	87	37.2
Automotive and parts	47	20.1
Other	2	0.9
Foreign Ownership		
Foreign owned	24	10.3
Domestically owned	210	89.7
Total Number of Respondents	**234**	**100**

Source: Authors' calculations based on ADB/ADBI survey data.

Participation in GVCs by firm size and use of FTA preference by firm size is shown in Table 2. GVC participation is positively correlated to size, with over 86% of giant firms engaged in production network trade compared to less than 20% of SMEs. Similarly, use of FTA preferences is also positively related to size.

Table 2: Participation in GVCs and Use of FTAs by Firm Size

	Firm Count		
	Participate in GVCs	**Use FTA Preferences**	**Participate in GVCs and Use FTAs**
Small	39	45	13
Large	10	12	6
Giant	6	6	6
Total	55	63	25
	% of firms		
Small	18.8	21.7	6.3
Large	50.0	60.0	30.0
Giant	85.7	85.7	85.7
Total	23.5	26.9	10.7

Source: Authors' calculations based on ADB/ADBI survey data.

Narrowing in on SMEs, we consider the first and second research questions—SME characteristics related to participation in GVCs and FTA use. This is initially considered in the form of a t-test that looks at the difference in means between firms in/not in GVCs and firms using/not using FTA preferences. The results are shown in Table 3.

Table 3: Participation in GVCs and use of FTA by SMEs

	GVC Participation			FTA Use		
	Yes	**No**	**t-test**	**Yes**	**No**	**t-test**
Size	30.41	15.01	2.88***	28.71	14.91	2.67***
Age	10.62	10.86	0.15	10.89	10.79	0.07
Proportion of firms in electronics	0.36	0.35	0.09	0.24	0.38	-1.84*
Proportion of firms in auto	0.26	0.20	0.70	0.33	0.18	2.00*
Central location	0.38	0.31	0.87	0.47	0.28	2.20**
Proportion of firms that are foreign owned	0.15	0.02	2.29**	0.09	0.03	1.29
Proportion of firms with a technology license from a foreign-owned company	0.44	0.10	4.07***	0.27	0.13	1.91*
R&D spending as a share of total sales	25.79	6.84	3.70***	15.60	8.97	2.02**
Proportion of firms with ISO certification	0.28	0.07	2.78***	0.20	0.09	1.77*
Export share of total sales	39.36	9.61	4.50***	31.89	10.59	3.66***
Proportion of raw materials imported	33.59	8.81	4.10***	30.78	8.67	3.70***
Labor productivity (turnover in RM million per employee)	15,166	7,515	0.76	10,956	1,760	1.96*
Knowledge of FTAs				0.38	0.19	2.43**

FTA = free trade agreement, GVC = global value chain, R&D = research and development.

Note: ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Source: Authors' calculations based on ADB/ADBI survey data.

The following findings are noteworthy:

- SMEs in production networks and those utilizing FTAs are much larger than other SMEs. The average size of SMEs in production networks is 30 employees, twice the average size of SMEs not in production networks. The size of SMEs utilizing FTA preferences (29 employees) is also almost twice as large as SMEs not utilizing preference (15 employees).
- SMEs with foreign ownership are on average more likely to participate in production networks than domestically owned SMEs. However, there is no significant difference in foreign ownership among users and non-users of FTAs.
- Technological capability, as measured by ISO certification, holding of a technology license from overseas, and R&D spending as a share of total sales, is also a significant point of difference among SMEs in GVCs/users of FTA preferences and other SMEs.
- SMEs with a greater outward orientation, that is a greater share of exports to sales, greater proportion of imported raw materials, and exports to multiple countries, are more likely to participate in GVCs and utilize FTA preferences than other SMEs.
- Given the high tariff barriers, firms in the auto sector are more likely to use FTA preferences. The data also suggest that a greater number of firms in the electronics sector are non-users of FTAs than users. This could be explained by the free trade zones in Malaysia, which have been set up to foster the electronics sector. Firms in these sectors have no incentive to use preferences available in FTAs since they are exempt from the country's normal customs barriers and other constraining legislation.

4. GLOBAL VALUE CHAIN PARTICIPATION

4.1 Characteristics of SMEs that Participate in Global Value Chains

Having identified some key characteristics that differentiate GVC participants/SMEs utilizing FTA preferences from other SMEs in our sample, it is of interest to investigate the extent to which some of these characteristics are related to GVC participation.

Econometric results

The characteristics related to SME participation in GVCs are examined by a probit regression.

The GVC participation model is specified as:

$$GVC_{participation} = F(\alpha_o + \alpha_1 SIZE + \alpha_2\ AGE + \alpha_3 ELECTRONICS + \alpha_4 LOCATION + \alpha_5 TECHLICENSE + \alpha_6 FOREIGNOWNERSHIP + \alpha_7 R\&D + \alpha_8 ISO + \alpha_9 LABORPRODUCTIVITY)$$

The variables and the expected direction of association are described below.

$GVC_{participation}$ is the dependent variable. It takes on the value of 1 if the firm responds positively to the question "is your firm part of a regional/global supply chain" or is 0 otherwise.

SIZE measures the number of permanent employees. Even among SMEs, i.e., firms with fewer than 100 employees, it is expected that bigger firms are more likely to participate in production network trade (i.e. a positive relationship). Larger SMEs can benefit from economies of scale and therefore set a lower price than their smaller counterparts. Additionally, larger SMEs are likely to have greater access to resources including finance that are important for SME growth. Therefore, size is positively related to participation in GVCs.

AGE is measured as the number of years the SME has been in operation. We are ambivalent about the direction of causation. Older firms have more accumulated experience in production and tacit knowledge, making them more likely to participate in production networks. However, it is also possible that a firm's maturity may cause it to become set in its ways and less inclined to participate in production networks. Younger firms on the other hand, might be more active in seeking out new sources of information and knowledge and therefore better able to realize the opportunities from GVCs.

ELECTRONICS is a dummy variable taking on the value of 1 if the firm is in the electronics sector, or 0 otherwise. The sector variable is expected to be positively related to GVC participation since electronics accounts for around 60% of Malaysia total exports and the sector is heavily exposed to GVCs.

LOCATION takes on a value of 1 if the firm is located in central Malaysia or 0 otherwise. SMEs located in central Malaysia are more likely to have greater access to transportation, infrastructure, and information and communication technologies and therefore are better able participate in GVCs. A central location is expected to be positively associated with GVC participation.

A firm's exposure to foreign technology is captured by the *FOREIGN OWNERSHIP* and *TECHNOLOGY LICENSE* variables. *FOREIGN OWNERSHIP* is a dummy variable

taking on the value of 1 if the firm has some level of foreign ownership or 0 otherwise. Technology license is also a dummy variable, taking on the value of 1 if the firm uses technology licensed from a foreign-owned company (excluding office software) or is 0 otherwise. Both foreign ownership and holding a foreign technology license would give domestic firms access to knowledge of international production, technology, management know-how, and sophisticated international networks and therefore are expected to be positively related to GVC participation.

Firm-level investment in learning is captured by the two technology variables *R&D* and *ISO*. These variables are expected to be positively related to production network participation. Research and development is measured as the share of R&D spending to sales. *ISO* is a dummy variable taking on the value of 1 if the firm has ISO certification or is 0 otherwise. Firm-level effort in investing in R&D and technology is expected to improve the quality of the product or service and increase the competitiveness of the firm in getting invited to participate in GVCs.

Finally, *LABOR PRODUCTIVITY*, measured as annual sales turnover in RM million per employee is expected to be positively related to GVC participation. Productive firms are better able to compete against other firms in gaining a foothold onto the production chain following on from Bernard and Jensen's (1999) argument that there is a cost involved in participating in the export market/production network. But even after entering a GVC, productive firms are more likely to maintain their foothold by learning and adapting their product as per market needs (Clerides, Lach, and Tybout 1998).

The regression results are summarized in Table 4 as a baseline specification (equation i) and alternative specifications (equations ii–iv). In the discussion that follows we will be referring to the full model (equation iv). The pseudo R2 in equation (i) and (iv) suggest that the regressions explain about 20% of the variation in the data.

Table 4: Probit Model of Factors Influencing Participation in GVCs

	Malaysia			
	(i)	(ii)	(iii)	(iv)
SIZE	0.0142 (0.00)***	0.0092 (0.00)**	0.0085 (0.00)*	0.0088 (0.00)*
AGE	-0.0141 (0.01)	-0.0111 (0.01)	-0.0098 (0.01)	-0.0078 (0.01)
ELECTRONICS	0.0743 (0.22)	-0.0083 (0.24)	-0.0796 (0.25)	-0.0618 (0.25)
LOCATION	0.2687 (0.22)	0.3685 (0.22)*	0.3070 (0.24)	0.2242 (0.25)
TECH LICENSE		0.9629 (0.31)***	0.8665 (0.31)***	0.8760 (0.31)***
FOREIGN OWNERSHIP		0.3996 (0.5)4	0.0435 (0.54)	0.0192 (0.54)
R&D			0.0156 (0.01)***	0.0164 (0.01)***
ISO			0.3466 (0.34)	0.3557 (0.34)
LABOR PRODUCTIVITY				0.0000 (0.00)
Constant	-1.1483 (0.21)***	-1.3258 (0.22)***	-1.4981 (0.22)***	-1.5464 (0.23)***
n	207	207	207	207
Wald Chi2	12.98	29.64	38.48	40.4
Pseudo R2	0.07	0.15	0.22	0.23

Notes: Dependent binary variable: 1 = firm part of production network.

Standard errors are reported in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

The Pearson correlation coefficient matrix can be found in the Appendix (see Table A1).

Source: Authors' calculations based on ADB/ADBI survey data.

The results suggest that firm size is positive and significant, and even among SMEs, it is the larger firms that are more likely to participate in GVCs. For example, the probability of participating in GVCs increases from 16% to 22% when firm size increases from 25 to 50 employees. It increases further from 29% to 37% when firm size increases from 75 to 100 employees. The results suggest economies of scale are important in overcoming the initial fixed costs of entering and maintaining a foothold in a GVC.

The foreign technology license variable is also positively significant. Having a foreign technology license increases GVC participation by 20%. R&D expenditure as a proportion of sales also has a considerable effect on SME participation in GVCs. An increase in the R&D-to-sales ratio from 10% to 30% increases the probability of participation from 15% to 23%. An R&D-to-sales ratio of 50% increases the probability of participation to 35%..

The results suggest that sizeand technological capability are positively associated with SME participation in GVCs.

5. FREE TRADE AGREEMENT USE

5.1 Characteristics of SMEs that Use Free Trade Agreements

In seeking out the SME characteristics related to FTA utilization we use a probit model.

The FTA use model is specified as:

$$FTA_{USE} = F(\alpha_o + \alpha_1 SIZE + \alpha_2\, AGE + \alpha_3 AUTO + \alpha_4 LOCATION + +\alpha_5 FOREIGNOWNERSHIP + \alpha_6 EXPORTSHARE\ OFSALES + \alpha_7 PROPORTIONOFRAW\ MATERIALS\ IMPORTED) + \alpha_8 KNOWLEDGEOFFTA$$

The hypotheses and variables in the model are described below.

FTA$_{USE}$ is the dependent variable. It takes on a value of 1 if the firm responds positively to the question "does your firm use tariff preference in FTAs for exports, imports, or both," or is 0 otherwise.

SIZE is measured by the number of permanent employees and is expected to be positively related to FTA use. The larger the SME, the more resources it is likely to have to meet the associated costs of using FTAs.

AGE is measured as the number of years the SME has been in operation. Once again, we are ambivalent about the direction of causation. Older firms may be more experienced in navigating trading rules and utilizing FTAs, but could also be set in their ways and less inclined to utilize preferential tariff rates. Alternatively, younger firms might be more active in taking advantage of the opportunities made available through FTAs.

LOCATION takes on a value of 1 if the firm is located in central Malaysia or 0 otherwise. A firm's geographical location is expected to be positively associated with FTA use. Firms concentrated in major industrial centers are more likely to use FTAs than geographically isolated firms, for two reasons. First, geographical clusters of networked firms are characterized by information spillovers and exchanges (including know-how on tariff preferences, rules of origin, and origin administration). Second, public and private sector FTA support institutions are more likely to provide technical assistance to firms in major industrial centers.

The sectoral dummy *AUTO* takes on the value of 1 if the firm is in the auto industry or is 0 otherwise. Auto imports in Malaysia attract a high tariff and therefore firms engaging in auto trade have a greater incentive to use preferences available in FTAs. This variable is therefore expected to be positively correlated with FTA use.

The variables *FOREIGN OWNERSHIP*, *EXPORT SHARE OF SALES*, and *PROPORITON OF RAW MATERIALS IMPORTED* capture the extent to which the firm is outward oriented. These variables are expected to be positively related to FTA use. The greater the outward orientation the higher the likelihood the firm is aware of international markets and trade regulations (including import tariffs, FTA preferences, rules of origin, and custom procedures). Additionally, firms with higher exposure to international trade have more to gain for using preferences made available in FTAs.

KNOWLEDGE OF FTA is a dummy variable taking on the value of 1 if a firm has some knowledge of FTAs or 0 otherwise. The variable captures the firm's proactive efforts in better understanding FTAs. FTA texts are complex, lengthy legal documents requiring significant investment in specialist skills (e.g., trade law, customs procedures, and business strategy) to derive the benefits of FTAs. Given this firms that invest time in

acquiring relevant in-house FTA expertise and that actively build linkages with FTA support institutions are more likely to be equipped to take advantage of FTA provisions.

The regression results of factors affecting the use of FTAs are summarized in Table 5 with a baseline specification (equation i) and alternative specifications (equations ii–iv). In the discussion that follows we will be referring to the full model (i.e., equation iv). The pseudo R2 in equation (iv) suggests that the regressions explain about 20% of the variation in the data.

Table 5: Probit Model of Factors Influencing FTA Use

	Malaysia			
	(i)	(ii)	(iii)	(iv)
SIZE	0.0125 (0.00)***	0.0135 (0.00)***	0.0106 (0.00)**	0.0103 (0.00)**
AGE	-0.0110 (0.01)	-0.0118 (0.014)	-0.0075 (0.01)	-0.0081 (0.01)
AUTO	0.4716 (0.23)**	0.4321 (0.24)**	0.6732 (0.25)***	0.6119 (0.26)**
LOCATION		0.5142 (0.21)**	0.8069 (0.23)***	0.7889 (0.24)***
FOREIGN OWNERSHIP			-0.6325 (0.56)	-0.5235 (0.57)
EXPORT SHARE OF SALES			0.0062 (0.00)	0.0082 (0.00)*
PROPORTION OF RAW MATERIALS IMPORTED			0.0157 (0.00)***	0.0135 (0.00)***
SOME KNOWLEDGE				0.4884 (0.25)*
Constant	-1.0303 (0.18)***	-1.2227 (0.20)***	-1.7589 (0.25)***	-1.8764 (0.27)
n	207	207	207	207
Wald Chi2	14.72	20.64	47.33	51.16
Pseudo R2	0.07	0.10	0.22	0.24

Notes: Dependent binary variable: 1 = use of FTA preferences.

Standard errors are reported in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

The Pearson correlation coefficient matrix can be found in the Appendix (see Table A1).

Source: Authors' calculations based on ADB/ADBI survey data.

Similar to the GVC model, size is significantly and positively associated with FTA use, suggesting once again that even among a group of SMEs it is the larger firms that are more likely use FTA preferences. The model suggests that the probability of use increases from 17% to 25% as the firm size increases from 25 to 50 employees. It increases further from 34% to 44% as firm size increases from 75 to 100 employees.

FTA use among firms in the auto industry is also significant and positive, with the probability of using FTA preferences increasing by 15% for firms in the auto industry. SMEs located in central Malaysia are also more likely to use FTAs than geographically isolated firms. The probability of using FTA preferences increases by 19% if the SME is

located in central Malaysia, highlighting the greater availability of support and technical assistance in major industrial centers and the scope for information spillovers and exchanges between firms.

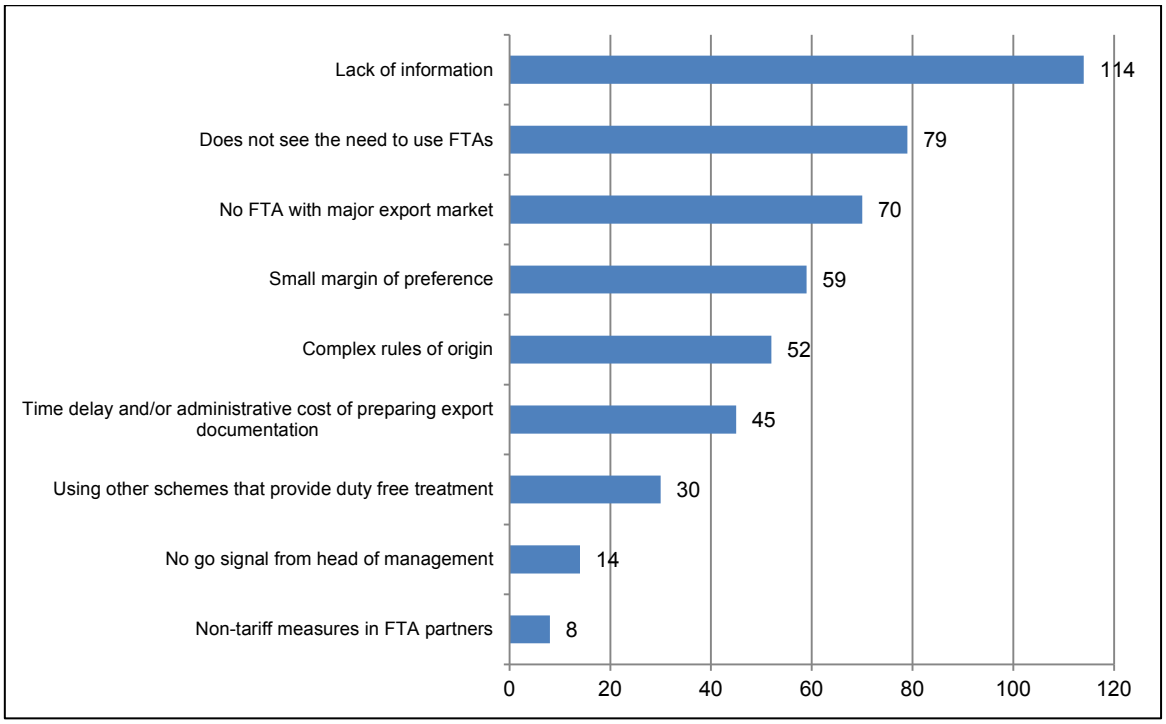
Exposure to international trade, as captured by the export share of sales, and the proportion of raw materials imported are positive indicators of FTA use. The probability of FTA use increases from 24% to 30% when the export share of total sales increases form 50% to 75%. Similarly, as the proportion of raw materials increases from 50% to 75%, probability of FTA use increases from 31% to 43%. Finally, a firm's investment in acquiring knowledge to use FTAs also increases the probability of use by 12%.

This is a very interesting result suggesting that an SME's use of FTAs is largely related to its capability in terms of understanding FTA provision, access to financial and human resources captured by size, exposure to trade captured by the proportion of raw materials imported, and firm location and sector.

5.2 Impediments to Free Trade Agreement Use and Support Sought

The perceived barriers by SMEs to using FTAs and the support sought is the final research question. The survey results suggest that the most significant barrier to FTA use among SME firms is lack of information, with 114 SMEs ranking lack of information as one of their top three reasons for not using FTAs (see Figure 1). Two other major barriers are that firms do not see the need to use FTAs and are not interested in trading with current FTA partners.

Figure 1: Impediments to FTA Use
(number of firms)



FTA = free trade agreement.

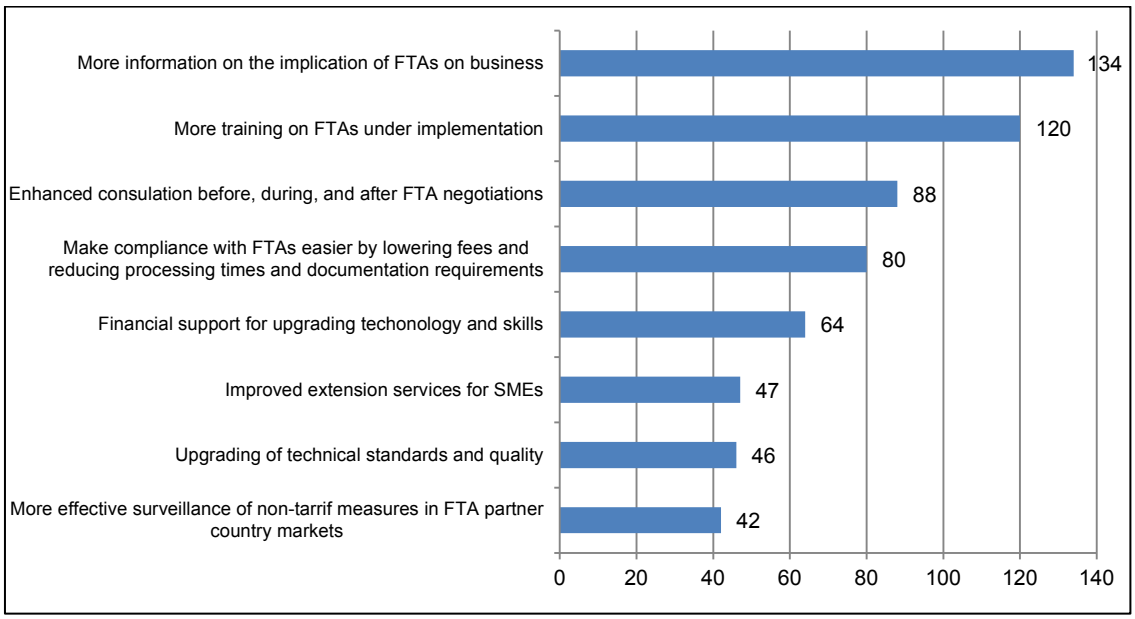
Source: Authors' calculations based on ADB/ADBI survey data.

To encourage greater FTA use, the SMEs in the sample would like the government to provide more information on the implications of FTAs for businesses, more training on

the FTAs under implementation, and enhanced consultations before, during, and after FTA negotiations (see Figure 2). This suggests there is a real role for public policy in addressing limited FTA use.

Figure 2: Services Requested by Firms to Adjust to FTAs

(number of firms)



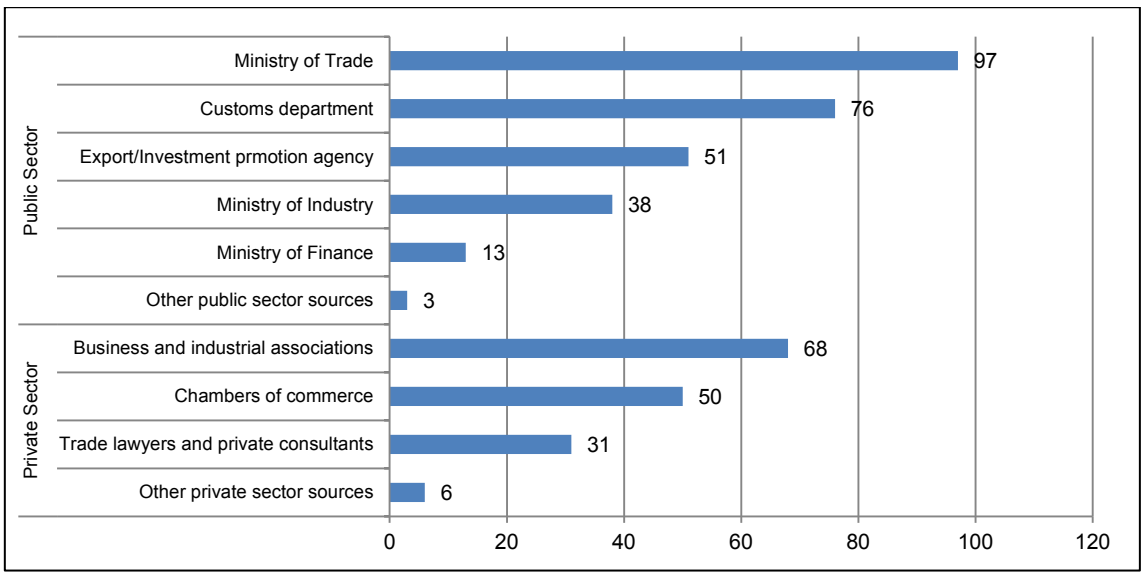
FTA = free trade agreement, SME = small and medium-sized enterprise.

Source: Authors' calculations based on ADB/ADBI survey data.

The most sought public sector organizations for FTA-related issues were Malaysia's Ministry of Trade and Customs department (see Figure 3). Among private sector institutions were business and industrial associations and chambers of commerce.

Figure 3: Forms of Institutional Support Sought by SMEs when Encountering Problems with FTAs

(number of firms)



Source: Authors' calculations based on ADB/ADBI survey data.

6. CONCLUSION

This paper evaluated the characteristics of SMEs that have successfully internationalized by participating in GVCs and FTAs in Malaysia, and the policy implications. Analysis was carried out using survey data of 234 exporters and importers. It sought to improve our understanding of the internationalization of SMEs in Asia and contribute to the scant literature.

Three findings come out of the analysis. Firstly, SME size matters in GVC participation. Even among SMEs, firm size was found to be positively and significantly associated with participation in GVCs. This key result highlights that economies of scale and firm resources, which are positively linked with size, are important in overcoming the initial fixed costs of entering the value chain. In addition to size, technological capability of enterprises, as captured by the ownership of a foreign technology license and R&D share of sales, was found to be positively and significantly associated with SME participation in GVC trade. This suggests that the extent to which a firm actively engages in improving its technology, production, and processes positively influences its participation in GVCs. Surprisingly, foreign ownership was not found to be a significant predictor of value chain participation.

Secondly, size was also found to be positively associated with FTA use capturing perhaps the costs associated with understanding the complex and lengthy legal documents. In addition to size, a good understanding of FTA provision and exposure to trade results in greater use of FTAs. Firms that invest time in acquiring relevant in-house FTA expertise and that actively build linkages with FTA support institutions were found to be more likely to use FTAs. The study also found a positive and significant relationship between exposure to trade, as measured by export share of sales and the proportion of raw materials imported, and FTA use. This result is not surprising since the greater the outward orientation, the higher the likelihood the firm is aware of international markets and trade regulations (including import tariffs, FTA preferences, rules of origin, and customs procedures). Additionally, firms with higher exposure to international trade have more to gain from using the preferences made available in FTAs. Firms located in central Malaysia are also more likely to use FTA preferences, highlighting perhaps the greater availability of support and technical assistance in major industrial centers and the scope for information spillovers and exchanges between firms.

Finally, the descriptive analysis on the barriers to FTA use found that lack of information is the predominant reason for not utilizing preferences under an FTA. Other top responses included not seeing the need to use FTAs and not being interested in trade with the current FTA partners.

The above results reinforce what researchers have known from micro-level studies of international trade—importing technology from abroad and investment in R&D are positively related to business internationalization. Given this, a conducive business environment with effective business support institutions and programs for internationalization of SMEs is vital. Support services to facilitate the import of technology from abroad as well as assistance for stimulating research and development seem particularly beneficial for SME entry into GVCs.

Additionally, the “lack of information” barrier to FTA use can be addressed by providing more information on the implications of FTAs on businesses, more training on FTAs under implementation, and enhanced consultations before, during, and after FTA negotiations.

A combination of public and private institutional support services is an effective means of delivering such services to SMEs. This would involve close coordination among the following intuitions: the Ministry of Trade and Customs, business and industrial associations, and chambers of commerce. With these policies in place, SMEs in Malaysia and Asia may internationalize more efficiently and access the global market.

This was the first Asian study, to our knowledge, to consider the characteristics of firms that participate in GVCs and utilize FTA preferences. Some limitations in the data and methodology should be noted. Firstly, given the small sample size, the statistical power of the estimation is reduced leading to the possibility of a Type II error, where the significance of a variable under consideration is incorrectly dismissed. Secondly, the GVC participation model and the FTA preference use model are static as only cross-sectional data were available. As panel data becomes available over time, we will become increasingly able to investigate the changes in policy and enterprise responses. Finally, there are other factors that may influence participation in GVCs and FTA preference use, such as trade policies, domestic regulations, infrastructure, and business support services. Attempting to incorporate these policy factors in future econometric work may provide additional insights. Thus, the results should be interpreted with caution.

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APPENDIX

Table A1: Pearson correlation coefficients

	Size	Age	Auto	Electronics	Central	Foreign ownership	Tech license	R&D	ISO	Labor productivity	Export share of sales	Proportion of raw materials imported
Size	1.00											
Age	0.25	1.00										
Auto	0.06	0.02	1.00									
Electronics	-0.07	-0.03	-0.38	1.00								
Central	-0.05	0.01	0.07	-0.06	1.00							
Foreign ownership	0.28	-0.04	0.01	-0.01	-0.10	1.00						
Tech license	0.31	0.02	-0.10	0.09	-0.05	0.49	1.00					
R&D	0.05	-0.10	0.06	0.10	0.06	0.28	0.25	1.00				
ISO	0.35	0.15	0.15	-0.04	0.05	0.23	0.22	0.31	1.00			
Labor productivity	-0.08	-0.10	-0.03	-0.03	0.25	-0.02	-0.05	-0.08	-0.05	1.00		
Export share of sales	0.36	0.02	-0.05	-0.08	-0.14	0.37	0.42	0.15	0.14	-0.06	1.00	
Proportion of raw materials imported	0.18	-0.04	-0.10	-0.03	-0.15	0.44	0.33	0.14	-0.01	-0.06	0.67	1.00
Some knowledge of FTAs	0.02	0.02	0.20	-0.21	0.09	-0.06	-0.08	-0.07	-0.01	0.07	-0.06	0.10

FTA = free trade agreement, R&D = research and development.

Source: Authors' calculations based on ADB/ADBI survey data.